

SPAWAR S-100 Testbed Report

Presented by SPAWAR

for S100WG4

Feb 2019

SPAWAR Testbed

Respondents

SPAWAR Testbed Respondents

S-100 Part 13 Scripting functions clarification

- Functions execute in the hosts Lua sandbox
- Lua environment can be implemented in language of choice (C++, Java, etc.)
- **RECOMMENDATION 1:** SPAWAR to provide a C++ reference implementation of an S-100 Part 9a/Part 13 interpreter

SPAWAR Testbed Respondents

S-100 Part 10a Data Structure Codes are incorrect

- Presented at TSM6
- Action to prepare change proposal for WG4
- Change proposal S-100WG4-4.10

SPAWAR Testbed Respondents

S-100 Viewer 1.5 Bug

- Expects all feature catalogue attributes to be provided in *ATCS* fields, even if not used within the dataset
- Fixed in v1.6

SPAWAR Testbed Respondents

S-100 Part 13 Encode/DecodeDEFString

- Functions were missing from SPAWAR S-101 Portrayal Catalogue provided with Viewer 1.5
- Functions are included in SPAWAR S-101 Portrayal Catalogue 1.0 provided with Viewer 1.6

SPAWAR Testbed Respondents

SAFCON5X Symbols

- KHOA provided updated SAFCON5X symbols
- Included in SPAWAR S-101 Portrayal Catalogue 1.0 provided with Viewer v1.6

Help



Calibrate Monitor



Open Dataset



SPAWAR Testbed

Enhancements

Open Feature Catalogue



Import Feature Catalogue



Import Portrayal Catalogue



S-100 Viewer v1.6

Download from Basecamp

New render engine

- Skia
- Targeted to Shore ECDIS requirements

Used to review

- S-101 FC 1.0
- Dataset converter
- S-101 PC 1.0

Requires
S-100 4.0

Feature Catalogues

- Prior feature catalogues are not supported

Requires
S-100 4.0

Portrayal Catalogues

- XSLT and Lua

Provides

SPAWAR S-101
Portrayal Catalogue
v1.0

S-100 Viewer v1.6

Symbols

- Cursor from CURSRA01 / CURSRB01
- Colors change with selected palette
 - Placement per S-52 8.5.1
 - Enhanced SVG support

Masked Spatial

- Implements S-100 9-7.5

Line Suppression

- Implements S-100 9-11.1.8
 - (XSLT)
- Implements S-100 9a-11.2.1
 - (Lua)

Shows Nautical Information text

- Attribute value
- External file contents
- No pictures (yet)

Datasets / Encoding

- Validates *InformationAssociations* / *FeatureAssociations*
- Detects orphan *InformationObjects*

Bug Fixes

- Mandatory attribute values
- ISO-8211 ATCS field handling

SPAWAR S-101 Portrayal Catalogue v1.0

Requires

- S-101 FC v1.0
- Latest S-101 dataset converter
- Old datasets not supported

Validated against S-100
portrayal schemas available
on GitHub

Provides all viewing groups,
including manufacturers and
mariners

- Viewing group ranges are not provided

Features with
NauticalInformation get
INFORM01

Abbreviations implemented
per S-52 PresLib part 1 14.6

Implements results of PCB
project

- Uses testPCB symbol
- PC updated per S-101
PCB_New_Features spreadsheet



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S-100 Results

Portrayal Catalogue *DisplayPlanes* container

UML (Fig. 9-20, Table 9-13.3.1) defines *displayPlanes* (correct)

XSD (9-A-5, GitHub) defines *displayPlane* (incorrect)

9-13.3.1 PortrayalCatalog

Role Name	Name	Description	Mult.	Type
Class	PortrayalCatalog	A container of all the Catalogue items	-	-
Attribute	productId	The ID of the product for which the Catalogue is intended	1	string
Attribute	version	The version of the product the Catalogue is defined for	1	string
Role	pixmaps	Container of XML Pixmap file references	1	Pixmaps
Role	colorProfiles	Container of XML Colour Profile file references	1	ColorProfiles
Role	symbols	Container of SVG Symbol file references	1	Symbols
Role	lineStyles	Container of XML Line Style file references	1	LineStyles
Role	areaFills	Container of XML Area Fill file references	1	AreaFills
Role	fonts	Container of True Type font references	1	Fonts
Role	viewingGroups	Container of viewing group definitions	1	ViewingGroups
Role	foundationMode	The definition of the foundation of the portrayal	1	FoundationMode
Role	viewingGroupLayers	Container of viewing group layers.	1	ViewingGroupLayers
Role	displayModes	Container of display mode definitions	1	DisplayModes
Role	displayPlanes	Container of display plane definitions	1	DisplayPlanes
Role	context	Container of context parameter definitions	1	Context
Role	rules	Container of rule file references	1	Rules

```
</xs:element>
<xs:element name="displayModes" type="DisplayModes">
  <xs:key name="displayModeKey">
    <xs:selector xpath="displayMode"/>
    <xs:field xpath="@id"/>
  </xs:key>
</xs:element>
<xs:element name="displayPlane" type="DisplayPlanes">
  <xs:key name="displayPlaneKey">
    <xs:selector xpath="displayPlane"/>
    <xs:field xpath="@id"/>
  </xs:key>
</xs:element>
<xs:element name="context" type="Context">
  <xs:key name="contextKey">
    <xs:selector xpath="parameter"/>
    <xs:field xpath="@id"/>
  </xs:key>
</xs:element>
<xs:element name="rules" type="Rules">
```

RECOMMENDATION 2: Address at TSM7 w/ any other proposed portrayal schema changes

Temporary Overlays

Features with associated
NauticalInformation get
INFORM01 symbol

- Viewing group 31030
(no external file)
- Viewing group 31031
(external file)



Temporary Overlays

S-52 PresLib Part 1 10.6.1.1

- “SY(INFORM01) is intended as a temporary overlay”

S-100 Part 9

- No provision for temporary overlays
- Toggle viewing group?

RECOMMENDATION 3:

- Determine implementation of “temporary” overlays
 - Address at TSM7

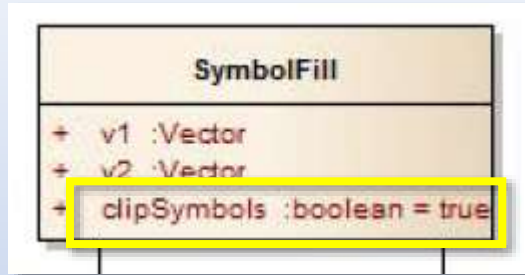
Viewing Group Range

- *ViewingGroup*
 - *id* attribute (String)
 - *Description*
 - Can only represent a single value
- Requires adding many individual entries to the PC
 - Allow viewing group ranges when description is shared?
- **RECOMMENDATION 4:** Address at TSM7 w/ any other proposed portrayal schema changes

```
<viewingGroups>
  <!--***** BASE DISPLAY ELEMENTS *****-->
  <!-- 00000-09999 reserved for administrative purposes -->

  <!-- CHART INFORMATION - DISPLAY BASE -->
  <!-- 10000-10999 Reserved for chart information -->
  <!-- A, B - CHART FURNITURE -->
  <viewingGroup id="11000">
    <description>
      <name>Information about the chart display</name>
      <description>Base: A, B - Chart Furniture</description>
      <language>en</language>
    </description>
  </viewingGroup>
  <viewingGroup id="11010">
    <description>
      <name>cursor [symbol SY(CURSRA01)]</name>
      <description>Base: A, B - Chart Furniture</description>
      <language>en</language>
    </description>
  </viewingGroup>
  .....
```


SymbolFill::clipSymbols



9-12.5.1.6 SymbolFill

Role Name	Name	Description	Mult.	Type
Class	SymbolFill	Pattern fill where the pattern is defined by repeated symbols	-	-
Role	symbol	The symbol used for the pattern	1	Symbol
Attribute	v1	Defines the offset of the next symbol in the first dimension of the pattern according to the local CRS	1	Vector
Attribute	v2	Defines the offset of the next symbol in the second dimension of the pattern according to the local CRS	1	Vector



```
<!-- Class SymbolFill -->
<xs:complexType name="SymbolFill">
  <xs:complexContent>
    <xs:extension base="PatternFill">
      <xs:sequence>
        <xs:element name="symbol" type="Symbol"/>
        <xs:element name="v1" type="Vector"/>
        <xs:element name="v2" type="Vector"/>
      </xs:sequence>
      <xs:attribute name="clipSymbols" type="xs:boolean" default="true"/>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
```

RECOMMENDATION 5: Provide direction on intent, course of action

Part 9a support for *endOffset*

XSLT provides *endOffset*

9-12.6.3.6 TextLine

Role Name	Name	Description	Mult.	Type
Class	TextLine	A graphic element for depicting text along linear geometry	-	-
Attribute	startOffset	This offset specifies the anchor point on the line	1	double
Attribute	endOffset	This offset specifies the stop point of the text at the line. If present the startOffset does not specify an anchor point but the start point of the text. The text will evenly be spaced between the two positions. Horizontal alignment has no effect in this case	0..1	double
Attribute	placementMode	Specifies how the offsets have to be interpreted	1	Symbol: LinePlacementMode

Lua doesn't provide *endOffset*

9a-11.2.2.2 Transform Commands

Transform commands apply transformations to elements, such as symbols, rendered by applicable drawing commands which follow.

Table 9a-8 – Transform Commands

Command	Parameters	Type	Initial State	Part 9 Reference
LocalOffset	xOffsetMM	double	0	9-12.2.2.7
	yOffsetMM	double	0	
LinePlacement	linePlacementMode	string	Relative	9-12.3.1.5
	Offset	double	0.5	

RECOMMENDATION 6: SPAWAR to prepare change forms for discussion at TSM7

Symbol / Viewing Group Dependencies

Caution with INFORM01



Caution off, INFORM01 still visible



RECOMMENDATION 7: SPAWAR to prepare a paper for TSM7

Positioning Centred Symbols and Text

Does S-52 PresLib 8.5.1 apply to all product types?

- Incorporate into Part 9?
- Alternatively, each product will need to indicate how centred symbols and text should be placed.
- **RECOMMENDATION 8:** Provide guidance; use to prepare change forms for TSM7

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S-101 Results

Light Sector Extension

- DCEG 30.4
 - *“The displayed sector must not exceed the nominal range of the light sector on the ECDIS display.”*
 - Requirement doesn't exist in S-52
 - Can't be implemented in PC
 - Sector extension uses *LocalCRS* (mm)
 - On-screen radius in NM is affected by scale



RECOMMENDATION 9: Resolve with S-101PT

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S-102 Results

S-102 Support

Working towards S-100 4.0 compliance

- Preliminary support using product-specific implementation
 - Dataset loading
 - Determination of feature / attribute relationships
- Use S-111 as a model

S-102 Bounding Box Definition

S-102 uses product-specific metadata

- Root group metadata should be encoded per S-100 Table 10c-6
- **RECOMMENDATION 10:** Resolve with S-102PT

HDF5 File Family

HDF5 File Families insufficiently described

- Brief mention in 10c-5, paragraph “Stored Data”
- Datasets using file families can’t be loaded using standard tools
- Use of file families can’t be discovered prior to opening
- **RECOMMENDATION 11:** Address at TSM7, possibly via flag added to exchange set metadata

SPAWAR Testbed

S-111 Results

S-111 Support

Working towards S-100 4.0 compliance

- Partial support in S100Viewer 1.6
 - S-100 conformant HDF5 dataset loading using modified FC
 - Supports prototype visualization using modified PC implementing Coverage instructions

S-111 Portrayal Catalogue

Failed validation against S-100
portrayal schemas

- **RECOMMENDATION 12:** Instruct product teams to validate all deliverables against GitHub schemas prior to release

Time Series Portrayal

S-111 portrayal requires time series

- How to implement via portrayal catalogue?
- **RECOMMENDATION 13:** Address at TSM7, reviewing S-100 Part 9 Portrayal to ensure time series data is able to be represented without product specific rules. May dovetail with implementation of Date Dependent portrayal.

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Unresolved Items

Alerts and Indications

- A model was presented at TSM6 (TSM6-4.4)
- **RECOMMENDATION 14:** SPAWAR to prepare an updated model for TSM7 based on feedback received

Change Proposals

- S-100WG4-4.6: Catalogue CSS files
- S-100WG4-4.7: Palette Support for Symbols
- S-100WG4-4.8: Color Profile doesn't allow for Transparency
- S-100WG4-4.9: Stylesheet Folder
- S-100WG4-4.10: Incorrect ISO-8211 Data Descriptive Fields

Date Dependent Portrayal

- Reference S-100WG3-8.5 5.1.1.2
- Many issues to be resolved
- **RECOMMENDATION 15:** SPAWAR to work with interested parties to prepare a proposal for TSM7

Manufacturer Responsibilities

- Portrayal requirements which must be implemented by manufacturers
 - Consider extending Part 9 portrayal catalogue to allow consistent machine-readable implementation of manufacturer responsibilities (e.g. via provision of symbols, linestyles, and pre-defined drawing commands).
- **RECOMMENDATION 16:** SPAWAR to prepare a paper for discussion at TSM7

S-100 Manufacturer Responsibilities

- Masked Edges
 - S-100 Spatial Schema doesn't support masked edges
 - Must be tracked by manufacturer outside of GFM
 - Part 9a calls out host responsibility
- **RECOMMENDATION 17:** Update Part 9 to indicate manufacturer responsibility for XSLT portrayal

S-101 Manufacturer Responsibilities

- Symbolization of Chart Updates
- Symbolization of Chart Scale Boundaries
- Symbolization of Overscale Data Pattern
- Symbolization of Non-HO (Non-ENC) Chart Information
- Symbolization of No Data Areas
- **RECOMMENDATION 18:** Develop a standard method for products to indicate manufacturer responsibilities

Coverage Drawing Instruction

- Interpolation method for colour
 - Assumed linear
 - Add interpolation method to *LookupEntry* class. One of *CV_InterpolationMethod* consistent with the coverage type of the data.
 - **RECOMMENDATION 19:** SPAWAR prepare change forms for discussion at TSM7
- Colour space for interpolation of colour
 - Not specified
 - Linear interpolation in sRGB colour space produces undesirable results
 - Explicitly state in text (CIE recommended), or add colour space to *LookupEntry* class
 - **RECOMMENDATION 20:** SPAWAR to prepare change forms for discussion at TSM7

CONCLUSIONS

- Steady progress continues
- S-100 Viewer 1.6 supports S-100 v4 / S-101 v1
- Issues presented can be resolved within the allotted timelines for S-100 v5 / S-101 v2

S-100 Testbed Portrayal Issues

Date Dependent Portrayal

Issues apply to Lua and XSLT

- Current portrayal requires regeneration whenever a date dependent selector is changed
- Products may require users make frequent changes to date selectors

Implementing Date Dependent selector(s) poses challenges

- Selector must be able to represent:
 - A mariner selected date, such as the current date
 - A date range

There is no way to specify the following as default values for context parameters

- The current date and/or time
- The date and/or time of creation or modification

S-100 Testbed Portrayal Issues

Date Dependent Portrayal

Granularity of “Date” context parameter may be insufficient

- Granularity of one day
- Future products may require more granularity
- Consider required granularity

Part 9 context parameter enumerated type “Date” is unclear

OPTIONS:

- Reference an ISO or S-100 date type in enumeration comments
 - S-100 4a-5.6.4 “Data and Date Time Information”
- Provide a context parameter type capable of expressing a date or date range in a standard format
- Provide date / date range in the drawing instruction(s) (similar to line suppression) so that portrayal does not require periodic regeneration