Illustration rules (S1000D) - Introduction

1. S1000D v 4.0

1.1. Primary rules of illustration:

- Illustrations must be prepared to present the view and scale that is most favorable for the user.
- Illustrated parts must be clearly identifiable to the user and annotated appropriately. If required for clarification, a location drawing and/or direction indicators are used.
- Location arrows, leader lines, annotations, etc. must be clearly shown and free from surrounding detail.
- Reusability and uniformity are of prime importance for clarity and the complete set of information. Uses of "typical" views for similar equipment are important elements in good illustration.
- The illustrations must be clear, showing only the detail required and what is being described to the user. The inclusion of unnecessary details, such as shaded areas, as well as the presentation of detailed parts not visible in the perspective view by using broken lines, must be avoided. The exact presentation of details, such as threads on screws or their head style, can be omitted. Limit the artistic effects, do not use shadow effects. The use of artistic embellishment is to be limited and only used to add visual clarity for the user.
- The level of detail in the illustration must be measured, simple and relevant to the amount of information that the end user can process. Highly detailed source material like 3D Computer-Aided Design (CAD) data, digital mockups or 2D drawings, can risk complex and unnecessary modifications.
- Always construct the layouts, building the illustrations logically and in sequence.
- Graphics must be produced to a realistic and sensible size. Whenever the scale of a graphic does not allow small detail to be clearly shown, these details must be enlarged.
- Where the disassembly order or detail parts can be properly identified from the plan view representation of a production drawing, that representation must also be used in the illustration. This form is applicable to items such as hose assemblies, control rods, clamps, instrument panels, circuit boards or ground equipment.
- Do not overcrowd the illustration reproduction area.
- If several identical parts are used in the same assembly, only one of them need be illustrated if it is possible to positively allocate them to their respective location and/or orientation.
- Wiring or system diagrams, schematics or other charts where symbols are used are also acceptable as an illustration if they provide for the proper identification of the detail parts.
- The project must decide if schematics derived from engineering drawings include the original drawing number and revision status within the illustration reproduction area.

1.2. 2.1.2 Specific rules for IETP illustrations.

- Fundamentally, no constant, printable page layouts are required. Only the necessary illustration part is displayed on the screen in the required size. However the need for printing of data module pages or the illustration itself must be considered.
- Objects are named to facilitate easy reference to multiple components of an illustration that have the same name. For example, graphic objects can be given a name applicable to a certain configuration with the same name. It can also be useful to name sets of hotspots that need to be turned on and off. Naming schemes and groupings must be coordinated.
- Information regarding graphic object identifiers, names, or coordinates that will be referenced in an IETP must be documented and communicated in such a manner that hotspots can be defined.
- The use of color to show the clarity of important information has priority.

1.3. 2.4.1 General Illustration of views, details and sections:

- If enlarged views, details, and sections are to be shown, they must be located on the illustration in alphabetic order. It is preferable to start in the top right corner of the illustration with View A/Detail A/Section A-A (whichever applies) and proceed, if possible, in a clockwise mode locating as necessary.

2. MIL-STD-3031A Rev 1

2.1. 5.13.1.3 Use of human figures.

- When necessary, illustrations may include parts of the human body such as a hand, arm, leg or foot. The human figure shall not contain any information that can identify the person including a face, rank insignia, identification numbers, unit/company/brigade patches, medals/wings, etc. Jewelry shall not appear in any illustration. The human figure shall not be permitted to obscure details of the equipment necessary for a complete understanding of its operation. The human figure shall be clothed as designated by the acquiring activity. A cross section of races and genders shall be used.

2.2. **5.13.1.4 Procedural steps.**

- Procedural step text shall not be placed on an illustration

2.3. **5.13.1.6 Multisheet illustrations.**

- Multisheet illustrations may be used to clarify, identify significant features, or further detail equipment assemblies, subassemblies, and detailed parts.

2.4. **5.13.1.7 Placement.**

- Illustrations are placed as close as possible, immediately above or below, to the supporting text or the procedural step or group of steps. Whenever possible, place illustrations on the same or facing page of associated text. Illustrations may float on a page to reduce the white space on a page.

2.5. **5.13.1.14 Leader lines.**

- Leader lines shall be uniform, short, and as straight as possible; avoid the use of dogleg-shaped lines unless absolutely necessary. Arrowheads may be added for clarity. Do not allow leader lines to touch the callout. Do not allow arrowheads to enter the object to which they apply. If it is necessary to enter the object to provide for greater clarity, a break off symbol shall be used in lieu of an arrowhead.

2.6. **5.13.1.15 Index numbers.**

- Index numbers shall start with Arabic numeral 1 and continue consecutively within an illustration. For multi-sheet illustrations, index numbers continue in sequence from one sheet to another.

2.7. **5.13.1.16 Index number order.**

- When index numbers are used to locate and identify equipment components or parts, the index numbers shall be assigned in clockwise sequence (beginning at 11 o'clock).

2.8. **5.13.1.16A Nomenclature callouts.**

Nomenclature callouts may be used to identify items on a graphic. When used, they should follow the guidance below:

- Nomenclature callouts should only be used for graphics with a small number of callouts (generally no more than 10). If there is a larger number of callouts (generally more than 10), numerical callouts (index numbers) should be used to avoid overcrowding and degrading readability.
- Nomenclature callouts if used should not make the graphic look crowded or cluttered. They should be clear and easy to read.
- When using nomenclature callouts, type size should not be reduced to accommodate more callouts. Reducing type size will degrade readability. Type size should be no smaller than 8 points.

2.9. **5.13.1.17 Identification of significant features.**

- Index numbers, reference designators, nomenclature, leader lines, sweep arrows, legends, and other identifiers shall be used, when necessary, to identify significant features.

2.10. **5.13.1.18 Index numbers and nomenclature.**

- Both index numbers and nomenclature can be used in the same document. However, they shall not be used together in the same illustration.

2.11. **5.13.1.19 Index numbers in multi-sheet illustrations.**

- Within a multi-sheet illustration, if an item already assigned an index number is used in more than one illustration in that multi-sheet illustration, it shall retain the same index number.

2.12. **5.13.1.20 Legends.**

- Illustrations shall not contain legends. If a legend is required, it shall only be prepared using appropriate XML markup.

2.13. **5.13.1.22.1 General.**

- Illustration formats shall be as specified by the acquiring activity in accordance with AR 25-30. Line drawings (black lines on white background) shall be used throughout the publication/IETP. Illustrations, including diagrams and schematics, shall be clear, simple, and complete, and shall contain all necessary callouts to support the text. The number of callouts on a single illustration or a single sheet of a multi-sheet illustration shall be 25 or less. If more than 25 callouts are required, the total number required shall be equally divided between two identical or similar illustrations. Broadsides (illustrations that have been turned 90 degrees on the page) shall not be used.

2.14. **5.13.2.1 Portrait.**

For ease of reading and cross-reference, the preferred layout is portrait (IPD illustrations shall always be in portrait layout). Fold-outs or landscape shall only be allowed as exceptions, as defined in the project business rules.

2.15. 5.13.2.2 Case.

The project shall decide on the use of sentence case or uppercase for text annotation.

2.16. 5.13.2.3 Schematics.

The project shall decide if schematics derived from engineering drawings shall include the original drawing number and revision status within the illustration area.

2.17. 5.15.2.1 Color.

Unless specified otherwise by the acquiring activity, black and shades of black (one color) shall be used for paper publications. Prior approval for color will be obtained by the acquiring activity from the Logistics Support Activity (LOGSA). The acquiring activity will provide written approval, designating color(s) to be used. The use of some colors may not be appropriate for certain environmental conditions.

2.18. 5.63.1.5 Unique identifier.

The illustration originator shall determine how to populate the unique identifier of the ICN.

2.19. Change Marks

2.19.1. Chapter 6.2.2 paragraph 2.13. Illustrations – General

Changes to illustrations shall be indicated by a pointing hand symbol opposite the updated content. Revisions confined to the same general area of an illustration shall be indicated only once.

2.19.2. Chapter 6.2.2 paragraph 2.13. Illustrations – Callouts

If a callout is deleted from an illustration, the word "DELETED" may be placed after the appropriate number in the legend, if applicable. If a callout is deleted from an illustration without a legend, such as those used to supplement illustrated parts data, the word "DELETED" may be placed on the illustration at the end of the leader line.

3. Line Weights and Styles

If alternate lines are needed they must meet S1000D specs and be named Special 1, Special 2, etc.

Table 1. Line Weights and Styles

Pen names	Line width	Line style	Halo
Object Lines	0.35 mm	Solid Linestyle	No
Hidden Lines	0.18 mm	Hidden Linestyle	No
Center Lines	0.18 mm	Center Linestyle	Yes
Locator Lines	0.25 mm	Solid Linestyle	No
Highlight Lines	0.50 mm	Solid Linestyle	No
Leader Lines	0.18 mm	Solid Linestyle	Yes
Phantom Lines	0.25 mm	Phantom Linestyle	No

4. Page size modification rules.

- RPSTL illustrations must be Full Page.
- Page size must not be changed for Schematics on Foldout or Full Page templates.
- Height dimensions can only be change for Maintenance and Description illustrations.

Table 2. Illustration sizes and orientation.

Page names	Page dimensions
Full Page	170 mm x 210 mm

Flex Height	170 mm x (45-210 mm)
Foldout	360 mm x 210 mm

5. **Font special Instances.**

- If schematics are brought in from an engineering drawing and not altered font sizes can remain untouched.
- If it is possible schematic fonts should be 8 PT.

Table 3. Font Sizes.

Instance Description	Font Size	Font Face
Number Callouts	10 PT	Normal Face
Text Callouts	8 PT	Normal Face
Titles	10 PT	Normal Face
Notes	10 PT	Normal Face
References (STA,WL,BL)	10 PT	Normal Face
Filename	6 PT	Normal Face
Detail Callouts	14 PT	Bold Face

6. **S1000D Color Specs.**

Table 4. Standard Colors.

Standard RED RGB=255 0 0 CMYK= 0 100 100 0 Pantone= Red 032 or BS381C Number 537	Standard YELLOW RGB=255 255 0 CMYK= 0 0 100 0 Pantone= Yellow or BS381C Number 309	Standard CYAN RGB=0 255 255 CMYK= 31 0 6 0 Pantone= 304
Standard BLUE RGB=0 0 255 CMYK= 100 43 0 0 Pantone= 300 or BS381C Number 108	Standard GREEN RGB=0 255 0 CMYK= 43 0 79 0 Pantone= 375 or BS381C Number 262	Standard MAGENTA RGB=255 0 255 CMYK= 18 83 0 0 Pantone= 238
Standard ORANGE RGB=255 105 0 CMYK= 0 60 94 0 Pantone= 1585 or BS381C Number 557	Standard AMBER RGB=255 153 0 CMYK= 0 38 94 0 Pantone= 1385 or BS381C Number 568	Standard LT GREY RGB=204 204 204 CMYK= 23 17 17 0 BS381C Number 627
Standard LT YELLOW RGB=255 255 204 CMYK= 0 0 20 0 Pantone= 600	Standard LT BLUE RGB=204 255 255 CMYK= 23 0 10 0 Pantone= 566	

END OF DATA MODULE