Operations Nomenclature

International Space Station Program

Revision F
September 2002

Russian Space Agency

Canadian Space Agency

Agence spatiale canadienne

esa european space agency

NASDA 宇宙開発事業団

National Aeronautics and Space Administration

Space Station Program
Johnson Space Center
Houston, Texas

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Operations Nomenclature
Revision F

This document is controlled by the Operations Data File Control Board (ODFCB) and is used for the development and management of all International Space Station (ISS) operations products. All changes to the document are approved by the members of the ODFCB and are signed by the ODFCB Chairperson.

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Operations Nomenclature

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1.0 INTRODUCTION

1.1 PURPOSE

The purpose of the Operations Nomenclature (OpNom) is to document methods for denoting all hardware and software and associated data referenced by operations products produced by the International Space Station (ISS) operations community. This includes Operations Data File (ODF) procedures, ground and onboard displays, mission rules, commands, messages and advisories, planning products, etc.

It is imperative for ISS operation that all operations personnel, including all ground controllers and onboard crew members, communicate using common nomenclature that unambiguously and uniquely defines all hardware and software items that may be utilized, the methods by which these are used, and data concerning these items. This nomenclature also must be common among all operational products, including commands, procedures, displays, planning products, reference information, system handbooks, system briefs, mission rules, schematics, and payloads operations products.

Exacting nomenclature becomes of increased importance over previous programs when the use of automated commanding in the ISS is taken into consideration. These automated systems require that exacting syntax and format standards be used when producing procedures or commands executed by ISS hardware or software.

For these reasons, the development of an Operations Nomenclature was begun. The definition of this Operations Nomenclature is an ongoing activity that must involve all operations organizations as well as satisfy each organization's requirements. Timely definition of this nomenclature is required as some operations products have already been produced and many more are imminent.

1.2 ORGANIZATIONS

All partners involved in ODF procedure development will abide by the guidelines published in this document. Operations Data File Control Board (ODFCB) and component boards will share responsibility to ensure Operations Nomenclature compliance with all ODFCB products. Compliance with other products (e.g., panels, engineering drawings, flight software, etc.) dealing with vehicle or design documentation will be the responsibility of the appropriate program or Partner board.

1.3 SCOPE

This document applies to all agencies and individuals participating in or contributing to ISS mission operations. Mission operations include ground checkout, training, and simulations as well as real-time activities. The document also applies to all operations documentation (paper or electronic media) and other products making reference to ISS-related equipment or activities.

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The prescribed nomenclature will, at a minimum, be used to prepare the following:

- ODF procedures and reference data
- Onboard portable computer systems and ground displays
- Vehicle panels
- Onboard equipment decals
- Onboard Short Term Plan (OSTP)
- Inventory Management database and plans
- Uplinked messages to the crew
- Intercenter communications (those which deal specifically with the items on this list)
- Preflight checkout
- Flight rules
- Console handbooks
- Mission Integration Plan (MIP)
- Command and telemetry lists
- Schematics and other graphics provided for operational use
- Crew and ground controller training resources

Although not a design specification for ISS or payload equipment, it is recommended that designers use it as a reference in developing nomenclature for hardware or software that will be operated by ISS crews or ground controllers.

A situation may occur that precludes the use of the Operations Nomenclature in the development of operations products. When this occurs, a waiver form should be completed and signed by the organization management. The form should then be submitted to the ODFCB for approval. See Section 13 for specifics on the use of waiver forms.

When approving a new ODF standard/policy, the ODFCB must consider the implementation of the change for its criticality, when it is needed, and who is affected within or outside of the ODF community. It is recognized that not all affected areas can implement a new standard/policy immediately; thus implementation criteria must be

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developed for each change based on its criticality. Criticality may vary from area to area and on need date. Each change must be evaluated on a case-by-case basis. In the comments part of the Change Request (CR), each evaluator should denote his/her implementation plan if other than immediate. Once approved, exceptions to the standard implementation should be defined in the appropriate Standards annex(es). If the new standard/policy is known to have affectivity on another area (board/panel/ working group), it should be noted on the CR, and the area should be notified of the disposition by the ODFCB. When approving a change to the ODF Operations Nomenclature, the ODFCB must consider the implementation of the change per ODF Management Plan, Section 4.4.3.

1.4 AUTHORITY FOR IMPLEMENTATION OF OPERATIONS NOMENCLATURE

The Procedures and Operations group wrote this document under the authority vested in the Johnson Space Center (JSC) Mission Operations Directorate (MOD) by the Station Program Implementation Plan (SPIP), SSP 50200-08.

1.5 PUBLICATION AND REVISION OF THIS DOCUMENT

The Procedures Management Office (PMO) is responsible for overseeing the preparation, coordination, and maintenance of this document. The document is configuration managed by the ODFCB CR process. All proposed changes to the document must be submitted through the ODF CR system. The ODFCB chairperson distributes the CRs to ODFCB members for review. ODFCB board members are responsible for any required review within the agency they represent. This is to ensure that any organizations, within their agency, that must implement Operations Nomenclature have an opportunity to comment on the proposed changes. ODFCB board members also are responsible for providing their agency's recommendation for disposition of the CR.

The ODFCB dispositions the CR. The document is updated periodically into the International Space Station Program configuration management system, via a program CR and directive, to include all approved CRs. The chairperson of the ODFCB signs this document. The implementation of approved CRs may be done before the document is formally updated. The annex approval process is covered in Section 12.1. Questions concerning the technical content of this document may be directed to DO35/Lisa P. Payne, (281) 483-8682, lisa.p.payne1@jsc.nasa.gov.

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1.6 DOCUMENT ORGANIZATION

The Operations Nomenclature document is divided into two parts.

1.6.1 PART 1

The generic portion of the book contains standards and guidelines that apply to all partners, and includes Section 1.0 through Section 15.0.

Section 1 of this document introduces the reader to the document and defines the scope and authority aspects of the document.

Section 2 lists some of the documents and databases used in the development of the Operations Nomenclature.

Section 3 gives the reader a conceptual understanding of the basic nomenclature format and guidelines, location coding, coordinate nomenclature, and crew positions.

Section 4 details units of measurement used in the ISS Program.

Section 5 serves a similar function as the Space Shuttle Program Procedural Nomenclature (SSP PNOM) document. Drawings of ISS controls and command callouts for these are included in this section.

Section 6 contains the naming registration. These are the actual short words, abbreviations, and acronyms from which nomenclature is constructed.

Section 7 defines the guidelines for Caution and Warning (C&W) messages.

Section 8 defines the generic nomenclature for the ISS Robotics.

Section 9 defines the generic video/camera nomenclature.

Section 10 defines the Hierarchy for use in the ISS Program.

Section 11 defines verbal communication.

Section 12 defines processes established for nomenclature.

Section 13 defines the purpose of the waiver form, how to complete it, and how to process it.

Section 14 contains definitions and terms.

Section 15 contains a copy of the ISS Program Change Directive that baselines the November 1996 release of the Operations Nomenclature document.

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1.6.2 PART 2

The Partner-specific portions of the book are found in Annexes A through E. These sections apply to the generic standards and guidelines to the Partner element.

Annex A, Part 1, defines the specific Operations Nomenclature used by the Canadian Space Agency (CSA) systems.

Annex A, Part 2, defines the specific Operations Nomenclature used by CSA Payloads.

Annex B defines the specific Operations Nomenclature used by the European Space Agency (ESA).

Annex C defines the specific Operations Nomenclature used by National Space Development Agency (NASDA).

Annex D defines the specific Operations Nomenclature used by the Russian Space Agency (RSA).

Annex E, Part 1, defines the specific Operations Nomenclature used by National Aeronautics and Space Administration (NASA) systems.

Annex E, Part 2, defines the specific Operations Nomenclature used by United States (U.S.) Payloads.

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2.0 DOCUMENTS

2.1 APPLICABLE DOCUMENTS

These documents are programmatic or multilateral agreed upon sources for nomenclature to be used by all partners. These documents are specifically referenced in the generic portion of this document.

Document	Relevance to Operations Nomenclature
Space Station Reference Coordinate Systems, SSP 30219, Rev. D	Controlling program document for coordinate system nomenclature (see Section 3.4 of SSP 50254, Rev. F)
Standard Practice for Use of International System of Units (SI), ASTM E380-92	Source for multilateral agreements for SI. Source for metric and English units abbreviations (see Section 4.0 of SSP 50254, Rev. F)
Configuration Management Requirements, SSP 41170	Source for ISS Program CM requirements (see Section 1.5 of SSP 50254, Rev. F)
Station Program Implementation Plan (SPIP), SSP 50200-08	Controlling program document (see Section 1.4 of SSP 50254, Rev. F)
ODF Standards, SSP 50253	Controlling program document for standards in developing procedures; also a source for symbols (see Section 6.5 of SSP 50254, Rev. F)

2.2 REFERENCE DOCUMENTS

These documents were used as sources for development of Operations Nomenclature or provide background information for the generic section and annexes of this document.

Document	Relevance to Operations Nomenclature
Concept of Operation and Utilization (COU) ISSA Program, SSP 50011-01	Controlling program document
Space Station Interior and Exterior Operational Location Coding System, SSP 30575C	Controlling program document for location coding nomenclature (see Section 3.3 of SSP 50254, Rev. F)
Space Station Inventory Management System Label Specification, Basic, SSP 50007, March 1994	List of US requirements for labeling (see Annex E1 of SSP 50254, Rev. A)
User Interface Language (UIL) Specification, SSP 30539, June 1995, Rev. B	US restrictions for UIL compatible nomenclature (see Annex E1 of SSP 50254, Rev. A)

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Document	Relevance to Operations Nomenclature
Mission Build Facility Standard Output Definition, Boeing D684-10177-01, March 22, 1996	Source of the contents of the Standard Out file (see Annex E1 of SSP 50254, Rev. A)
Display and Graphics Commonality Standard, SSP 50313, refer to URL http://139.169.159.8/IDAGS/DGCS.html	Source of HCI guidelines for development of U.S. onboard and ground displays (see Annex E1 of SSP 50254, Rev. A)
Interface Requirements Document (IRD) Space Station Manned Base to Japanese Experiment Module (JEM), SSP 41151, Baseline, March 22, 1994	Source of information for JEM terminology (see Annex C of SSP 50254,)
International Space Station Flight Crew Integration Standards, SSP 50005, Rev. B, August 1995	Source of information for units and acronyms
Concepts, Guidelines, and Standards for Crew Interface to ISS Automated Crew Procedure (ACP) Executor White Paper, Final Draft, June 23, 1995	Source for NASA/ESA ACP Task Force guidelines, operations concepts, and standards for the crew interface to Automated Crew Procedures
NASA/RSA Joint Specifications Standards Document for the ISSA Russian Segment, SSP 50094, Draft, April 12, 1995	Source of information for U.S./Russian agreements for coding nomenclature, coordinate systems, etc.
PCS User's Guide	Source for U.S. PCS nomenclature (see Annex E1 of SSP 50254, Rev. A)
PCS Display document, JSC-26975	Source for U.S. PCS display requirements and guidelines (see Annex E1 of SSP 50254, Rev. A)
PCS C&W Summary Requirements, JSC-26975, Appendix 2A-02	Source for C&W Requirements
CSA SSP MSS Operations and Engineering Specific Operations Nomenclature, CSA-SS-RD-003, Initial Release, March 31, 1998	Source for CSA specific nomenclature (see Annex A of SSP 50254, Rev. A)

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3.0 NOMENCLATURE GUIDELINES

This section addresses the most general form of Operations Nomenclature and discusses the uses of Operations Nomenclature in different types of operations products. This section also discusses the nomenclature guidelines for location coding, coordinate system, and crew positions. Operations Nomenclature also should be followed when “commenting” automated procedures.

3.1 NOMENCLATURE FORMAT GUIDELINES

The preferred format should be based on a hierarchical structure, from largest to smallest.

The preferred format for hardware nomenclature is as follows:

Assembly Subassembly Component Location

The preferred format for software nomenclature is as follows:

System Subsystem Function

The abbreviations and acronyms to be used in these fields are supplied in Section 6. The ordering of the fields is flexible. For instance, it may make more sense to identify the location first before the assembly or subassembly.

Note that in some instances, not all of these fields are applicable. When developing a designator for either a hardware or software, the developer should carefully consider whether each field is appropriate. Hardware that is not fixed in location should not receive a location designator. Many items may not be part of a particular assembly, subassembly, system, etc. Additional guidelines on determining which fields are appropriate will be supplied as additional experience in naming items is gained and will be included in this section in future editions.

In some instances, the location portion of the format should be only that piece of the location that makes the item unique. For instance, if there are two identical components on the Space Station, one in the LAB 1 and the other in Node 1, it will be sufficient to designate the module where the specific piece of equipment is located.

Examples: LAB 1 MDM

N1-1 MDM

Additional guidelines on location designation are included in Section 3.3.

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3.2 ASSIGNMENT AND USAGE GUIDELINES

Using complete words is the preferred method when creating nomenclature. Wherever possible, the use of abbreviations and acronyms should be avoided. Where not possible, standard abbreviations and acronyms shall conform to the guidelines specified in this section. If the contextual use of an abbreviation or acronym is confusing, it is recommended to use complete words.

When using an abbreviation or acronym, reference the Name/Abbreviation List in Section 6.2 or the Name/Acronyms List in Section 6.3. Use only approved abbreviations and acronyms. Requests for additional abbreviations or acronyms should be submitted on a CR form (see Section 1.5). Some abbreviations and acronyms are mandatory for use in crew procedures. These are denoted by " ****** " in the abbreviation list in Section 6.2 and in the acronym list in Section 6.3. If an Operations Nomenclature is proposed that violates these guidelines, the CR should identify the guideline(s) violated and the rationale for the violation. If the CR is disapproved, an Operations Nomenclature waiver may be requested per Section 13.

1. All abbreviations and acronyms should meet format standards defined in SSP 50254.

2. Register all new payload/system names and acronyms/abbreviations.

3. Define an Operations Nomenclature, full name for every part (stowed or installed hardware) that requires crew interface.

4. All words should be spelled out, unless the system/payload name is a real word (e.g., Ultrasound). Real words do not need to be registered in the book.

5. Typically, words less than six characters should not be abbreviated.

6. If abbreviations or acronyms are used (due to space constraints) ensure that they are unique, commonly recognized (do not create uncommon or ambiguous abbreviations), and are easily understood by a prospective user.

7. Abbreviations and acronyms should not include punctuation.

8. If an acronym or abbreviation already exists in the Operations Nomenclature document, with same meaning, no additional registration is needed to use the acronym or abbreviation.

9. Acronyms should be in all capital letters, with the exception of those that are not part of the normal naming registration. These exceptions are identified in Section 6.

10. Units of measure should be in all lowercase letters, unless this is not part of the conventional use of the unit.

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11. Real words or abbreviations should have the first character capitalized and subsequent letters in lowercase.

12. When developing displays and panels, use real words. Use acronyms or abbreviations only if required due to space constraints. If a standard/approved abbreviation or acronym already exists, use it before creating a new one.

13. Acronyms and abbreviations for display and panel labels should be registered.

14. Non-IMS ISS Hardware labels will follow the Operations Nomenclature. The labels shall be in upper case in accordance with, SSP 50005, Section 9.5.3.1.8.F (For ISS vehicle and Government Furnished Equipment hardware), and SSP 57000, Appendix C, Section C.3.5.1.E (for payloads).

3.3 LOCATION CODING

The Space Station Interior and Exterior Operational Location Coding System (SSP 30575) document specifies location coding in products covered by Operations Nomenclature. When denoting location coding down to the rack level, use SSP 30575. When specifying modules in a general manner, use the Operations Nomenclature denoted in Tables 3-1 through 3-6.

Table 3-1. U.S. Modules and Truss Segments Operations Nomenclature

OpNom	Module description
A/L	Airlock
C/L	Crew Lock
E/L	Equipment Lock
CUP	Cupola
HAB	Habitation Module
LAB	Laboratory
N1	Node 1 (only abbreviate due to space limitations)
N2	Node 2 (only abbreviate due to space limitations)
PMA1	Pressurized Mating Adapter 1
PMA2	Pressurized Mating Adapter 2
PMA3	Pressurized Mating Adapter 3
MPLM	Multi Purpose Logistics Module
TRU	Truss
S0	Starboard Truss Segment 0
S1	Starboard Truss Segment 1
S3	Starboard Truss Segment 3
S4	Starboard Truss Segment 4
S5	Starboard Truss Segment 5

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OpNom	Module description
S6	Starboard Truss Segment 6
P1	Port Truss Segment 1
P3	Port Truss Segment 3
P4	Port Truss Segment 4
P5	Port Truss Segment 5
P6	Port Truss Segment 6

Table 3-2. Russian Modules Operations Nomenclature

OpNom	Module description
STV	Soyuz Transfer Vehicle
PTV	Progress Transfer Vehicle
DC	Docking Compartment
DSM	Docking and Stowage Module
FGB	Functional Cargo Block
LSM	Life Support Module
RM1	Research Module 1
RM2	Research Module 2
RM3	Research Module 3
SM	Service Module
SPP1	Science Power Platform 1
SPP2	Science Power Platform 2
UDM	Universal Docking Module

Table 3-3. Japanese Modules Operations Nomenclature

OpNom	Module description
JEM	Japanese Experiment Module
JEMRMS	JEM Remote Manipulator System
JEF	JEM Exposed Facility
JLE	JEM Experiment Logistics Module - Exposed Section
JPM	JEM Pressurized Module
JLP	Japanese Experiment Logistics Module - Pressurized Section
HTV	H-II Transfer Vehicle

Table 3-4. European Modules Operations Nomenclature

OpNom	Module description
COL	ESA Columbus Module
ATV	Automatic Transfer Vehicle

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Table 3-5. Orientation Abbreviations Denoting Location

OpNom	Description
S	Starboard
P	Port
F	Forward
A	Aft
O	Overhead (interior use)
D	Deck (interior use)
N	Nadir (exterior use)
Z	Zenith (exterior use)

Table 3-6. Orientation Abbreviations Denoting Directions

OpNom	Description
Stbd	Starboard
Port	Port
Fwd	Forward
Aft	Aft
Ovhd	Overhead
Deck	Deck
Nad	Nadir
Zen	Zenith

3.4 COORDINATE SYSTEM

Space Station Reference Coordinate Systems, SSP 30219, Rev. D, specifies the methods for denoting directions and coordinates in products covered by the Operations Nomenclature. This document will be used for all ISS operations where global coordinate and attitude information is required, including displays, procedures, and communications with the ISS crews. Specifically:

1. The ground will utilize the ISS Body Coordinate System (as defined in SSP 30219, Space Station Reference Coordinate Systems) as the standard body axis definition for coordination with the flight crew.

2. The ground will utilize an Y, P, R Euler sequence when describing station attitudes to the flight crew. The following attitude reference frames will be utilized for coordination of ISS flight attitudes with the flight crew:

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J2000 INERTIAL COORDINATE SYSTEM - The J2000 inertial coordinate system is an Earth-centered, inertial, equatorial, mean of epoch reference system (see Figure 3-1). The origin is located at the center of mass of the Earth, and the epoch used is the Julian ephemeris date 2451545.0. The +X axis points toward the mean vernal equinox of epoch; the +Z axis points along the Earth's mean rotational axis of epoch; and the +Y axis completes the right-handed coordinate system. Both the X- and Y-axes lie in the plane of the Earth's mean equatorial plane of epoch.

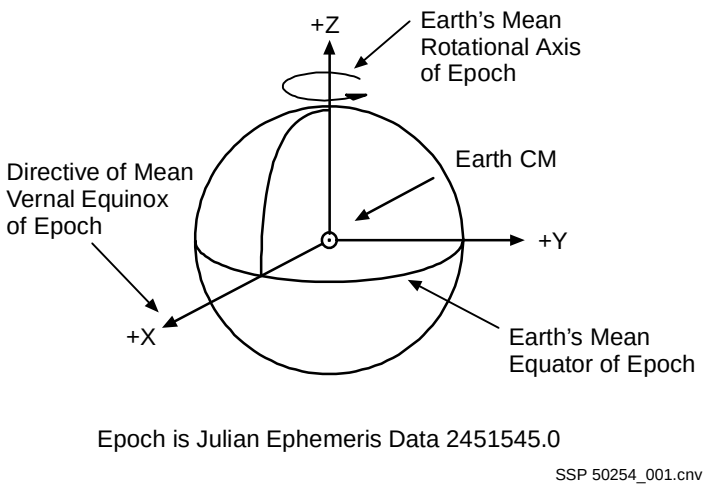

Figure 3-1. Geocentric Equatorial Inertial (known to NASA as J2000)

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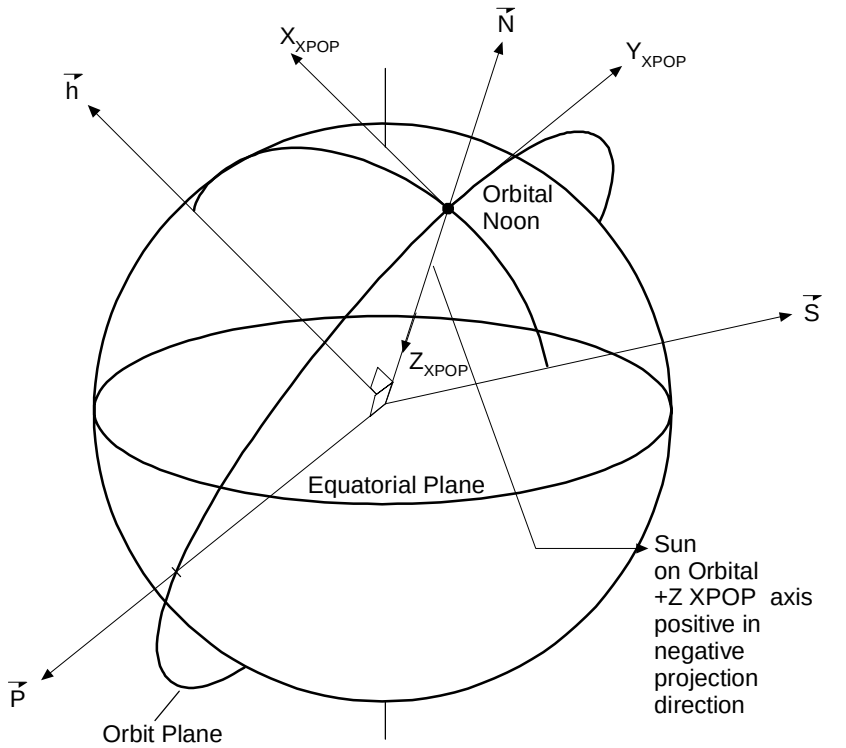

$\vec{N}$ = Sun projection on orbit
$\vec{h}$ plane = Angular Momentum Vector
$\vec{S}$ = Sun Vector
$\vec{P}$ = Perpendicular Vector To S & h Plane, (S x h)

$$X_{XPOP} = \vec{h}$$
$$Y_{XPOP} = \vec{h} \times \vec{S}$$
$$Z_{XPOP} = (\vec{S} \times \vec{h}) \times \vec{h}$$
$$\vec{N} = \vec{h} \times (\vec{S} \times \vec{h})$$

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Figure 3-2. Quasi-Inertial Vehicle-Centered Reference Frame (known to NASA as XPOP)

<u>LVLH COORDINATE SYSTEM</u> - This coordinate system (Local Vertical/Local Horizontal (LVLH)) is a vehicle centered, rotating, reference system (see Figure 3-3). The +Z axis points toward the Earth's center of mass; the +Y axis points in the opposite direction of the angular momentum vector of the orbit; and the +X axis completes the right-handed coordinate system. If the orbit of the vehicle is circular, the +X axis will be aligned with the velocity vector of the vehicle, and the +Z axis will be aligned with the radius vector and positive in the negative radius vector direction.

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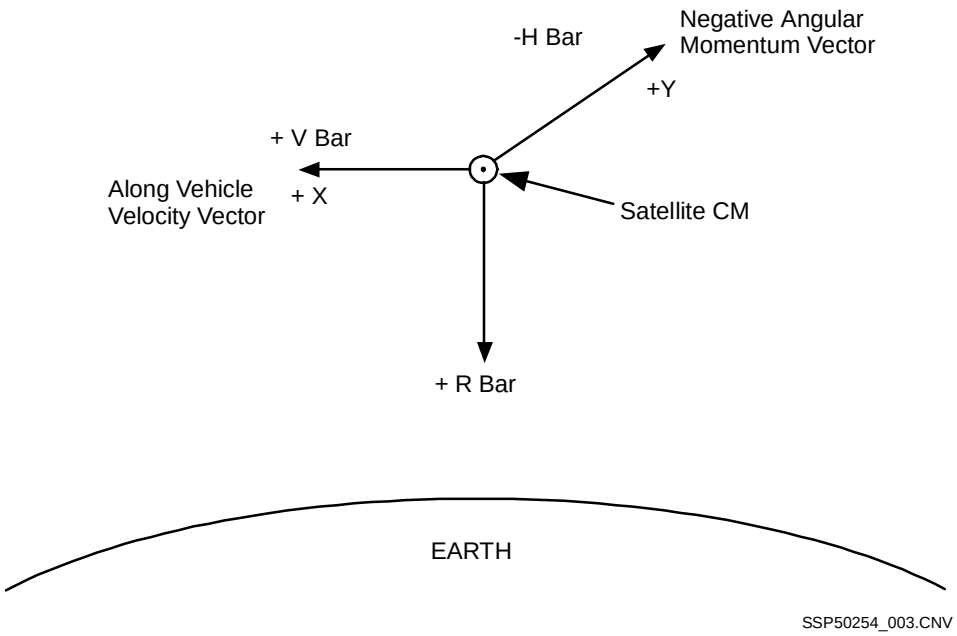

Figure 3-3. Vehiclecentric Orbital Rotating (known to NASA as LVLH)

3. Special coordinate systems will be established for particular operations, such as EVA and robotics, consistent with SSP 30219.

4. Separate coordinate systems based on modules or segments of the station will not be used as a global reference for station attitudes.

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3.5 CREW POSITIONS

Table 3-7 shows the crew positions.

Table 3-7. Crew Positions Operations Nomenclature

Operations Nomenclature	
Abbreviation	**Full name**
**CDR	Commander
**PLT	Pilot
**FE+	Flight Engineer
**SS+	Scientist
	Extra Vehicular Activity (EVA)/Intra Vehicular Activity (IVA) Crewmember
**EV1	EVA Crewmember 1
**EV2	EVA Crewmember 2
**IV	IVA Crewmember
	Robotics Operators
**R1	SRMS Operator 1 (Shuttle)
**R2	SRMS Operator 2 (Shuttle)
**M1	MSS Operator 1 (ISS)
**M2	MSS Operator 2 (ISS)
**J1	JEMRMS Operator 1
**J2	JEMRMS Operator 2
**E1	ERA Operator 1
**E2	ERA Operator 2
**CMO	Crew Medical Officer
**SUB	Subject
**OP	Operator

** Mandatory that they appear abbreviated.

+ If there is more than one of these positions, the abbreviation should be followed by numerical designations. Example: FE1, FE2.

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3.6 CONTROL CENTERS

Table 3-8 shows the control centers.

Table 3-8. Control Center Operations Nomenclature

Operations Nomenclature	
Full name	**Abbreviation**
JSC Mission Control Center	**MCC-H
RSC-E Mission Control Center	**MCC-M
Payload Operations Control Center	**POIC
Canadian Operations Engineering Center	**C-OEC
CSA Payload Telescience Operations Center	*PTOC
Columbus Mission Control Center	**COL-CC
ATV Mission Control Center	**ATV-CC
NASDA Operations Control Center	**SSIPC

** Mandatory that they appear abbreviated.

3.7 LOGISTICS

Table 3-9 describes the logistics hardware for pressurized and unpressurized carriers.

Table 3-9. Logistics hardware for pressurized and unpressurized carriers

OpNom	Hardware description
SLP	Spacelab Logistics Pallet
RSR	Resupply Stowage Rack
ASC	Aisle Stowage Container
Locker	Stowage Locker
Tray	Stowage Tray
Drawer	Stowage Drawer
Cushion	Stowage Locker, Tray, Drawer Cushion
Soft Bag	Stowage Bag
UCC	Unpressurized Cargo Carrier
Refrigerator	Refrigerator
Freezer	Freezer
-80 Freezer	-80 Degrees Freezer

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3.8 LAB SYSTEM RACKS

5A Racks

LOW TL	Low temperature loop (Thermal Control System)
MOD TL	Moderate temperature loop (Thermal Control System)
ARS	Air revitalization system
AV-1	Avionics system rack 1
AV-2	Avionics system rack 2

5A.1 Racks

MSS-1	Mobil servicing system rack 1
MSS-2	Mobil servicing system rack 2
DDCU-1	DC to DC converter unit rack 1
DDCU-2	DC to DC converter unit rack 2
AV-3	Avionics system rack 3
CHeCS	Crew health care systems

3.9 RUSSIAN EQUIPMENT AND OPERATIONS

As defined in SSP 50200, SPIP Volume 9, the ISS Program will use English as the common operational language for documentation, crew interfaces, and systems onboard the ISS, between the ISS and any ground center or orbiting vehicle, and between ground centers. To ensure crew safety and to promote efficient operations, the following guidelines are established for standardization of common nomenclature for Russian terminology in operations products. Table 3-10 lists the nomenclature guidelines for Russian equipment and operations.

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Table 3-10. English Nomenclature Guidelines for Russian Equipment and Operations

	Type of terminology	English representation	Examples
A	Russian modules, systems, and components referred to by proper names (in the case of modules, may also be referred to by their Latin acronyms, e.g., FGB, SM, SPP)	Names will be transliterated (replacing Cyrillic characters with Latin characters)	Zarya, Elektron, Rodnik, Vozdukh, Komparus
B	Major Russian subsystems, components, or compartments referred to by Cyrillic acronyms	The Cyrillic acronym will be used for operations products, where possible (English translation may also be provided)	СОЖ, [СОТР], ОДУ, ПГО, ПхО
C	General classes of equipment, components, or generic terms	Translate from Russian into the operational equivalent English term	датчик = sensor клапан = valve дым = smoke
D	English acronyms for existing Russian equipment	These should be rarely used	

Nomenclature in Category B will be limited to the most common terms used during operations. These terms are listed below. In cases where Cyrillic letters are used which may be confused with Latin letters, square brackets may be used to identify the Cyrillic characters (e.g., [СТТС] = communication system), in cases where the usage and context does not eliminate the potential for confusion.

In operations products are used by the crew, (e.g., procedures, displays, panel labels, and training material) transliteration will not be used. However, for management documentation, and where Cyrillic fonts are not supported, transliteration of the Cyrillic characters is recommended, using the following standard transliteration key. To avoid confusion, transliterated letters may be enclosed in angle brackets to identify them as transliterated letters (e.g., [СОТР] becomes <SOTR>, and СОЖ becomes <SOZh>). Terminology for new equipment (without precedent) used aboard the ISS will be in English.

Table 3-11. Transliteration Key

А – A Б – B В – V Г – G Д – D Е – E	Ё – Yo Ж – Zh З – Z И – I Й – Y К – K	Л – L М – M Н – N О – O П – P Р – R	С – S Т – T У – U Ф – F Х – Kh Ц – Ts	Ч – Ch Ш – Sh Щ – Shch Ы – Y Ь – (none) Ъ – (none)	Э – E Ю – Yu Я – Ya

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Category B: The following terms are considered major Russian subsystems, components or compartments. The Russian Cyrillic acronym should be used as the proper Operations Nomenclature. The English full name may be used as amplifying information but should not be used without the Cyrillic acronym. In the event the Cyrillic font is not supported, the English transliteration should be used and, if necessary, 163 terms should be identified as a transliteration by the guidelines listed in Section 3.7.

OpNom	Russian full name	English full name
АБ	Аккумуляторная батарея	storage battery
АВК	Аварийный вакуумный клапан	emergency vacuum valve
АО	Агрегатный отсек	assembly compartment
АСН	Аппаратура спутниковой навигации	satellite navigation equipment
АСС	Аппаратура сбора сообщений	message acquisition equipment
АСУ	Ассенизационно-санитарное устройство	Toilet
АФУ	Антенно-фидерное устройство	antenna feeder unit
Б01	Блок ручного управления	manual control unit
Б03	Блок сопряжения с СУД	СУД interface unit
Б12	Датчик солнца	sun sensor
Б13	Усилитель – преобразователь	amplifier – converter
Б14М	Блок логики и управления	logic and control unit
Б16	Привод мотора	solar array drive
Б15	Статический преобразователь	static converter
БВ	Блок вентиляторов	fan assembly
БВДО	Блок включения двигателей ориентации	attitude thruster controller
БВК	Блок выдачи команд	command output unit
БВС	Бортовая вычислительная система	onboard computer system
БДУС	Блок датчиков угловых скоростей	angular rate sensors
БИНС	Бесплатформенная инерциальная навигационная система	strapdown inertial navigation system
БИТС2-12	Бортовая измерительная телеметрическая система	onboard measurement telemetry subsystem
БК-3	Блок кислородный СК	oxygen tank
БКС	Бортовая кабельная сеть	onboard cable network
БМП	блок очистки от микропримесей	micropurification unit
БНП	Блок наддува переносной	portable repress tank
БО	Бытовой отсек	orbital compartment
БОКЗ	Блок определения координат звезд	fixed star mapper

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OpNom	Russian full name	English full name
БОКС	Блок определения координат Солнца	fixed sun sensor
БПП	Блок плавких предохранителей	fuse box panel
БР-9ЦУ-8	Радиотелеметрическая система ФГБ	FGB radio telemetry subsystem
БРК*	Бортовой радиотехнический комплекс	onboard radio complex
БРП-М	Блок раздачи и подогрева модифицированный	water distribution and heating unit
БРТА	Блок радиотелеметрической аппаратуры	Orlan telemetry unit
БСК	Блок силовой коммутации	power switching unit
БСКН	Блок силовой коммутации нагрузки	power load switching unit
БСС	Блок система стыкови СК с бортом	Orlan interface unit
БСУ	Блок согласующих устройств	matching unit assembly
БСШ	Блок сьемных шин	main bus assembly
БУ	Блок управления	control unit
БУПТ	Блок управления преобразователем тока	current converter control unit
БФ	Блок фильтров	filter unit
БЦВК	Бортовой цифровой вычислительный комплекс	digital computer complex
ВГК	Внутренний гидравлический контур	FGB internal thermal loop
ВД	Воздуховод	air duct
ВКУ	Видеоконтрольное устройство	video control monitor
ВТ	Вентилятор теплообменника	heat exchanger fan
ГА	Газоанализатор	gas analyzer
ГА	Герметичный адаптер	pressurized adapter
ГГТ	Газо-газовый теплообменник	gas-gas heat exchanger
ГЖТ	Газо-жидкостный теплообменник	gas-liquid heat exchanger
ГСО	Готовность системы ориентации	in attitude
ДД	Датчик давления	pressure sensor
ДМК	Датчик максимального напряжения	maximum voltage sensor
ДМН	Датчик минимального напряжения	minimum voltage sensor
ДО	Двигатель ориентации	SM attitude control thrusters (13.3 kg)
ДПО	Двигатель причаливания и ориентации	approach and attitude control thruster
ДТ	Датчик температуры	temperature sensor
ЕДВ	Емкость для воды	water container
ЖЖТ	Жидко-жидкостный теплообменник	liquid-liquid heat exchanger

Verify that this is the correct version before use

OpNom	Russian full name	English full name
ЗИП	Запасные части, инструменты и принадлежности	spares kit
ЗРУ	Зарядно-разрядное устройство	charge/discharge unit
ЗУ	Запоминающее устройство	memory device
ИнПУ	Интегрированный пульт управления	integrated control panel
ИП	Измеритель потока	directional air flow sensor
ИПК-1	Изолирующий противогаз космонавта	gas mask
ИСК	Инерциальная система координат	inertial coordinate system
ИУС	Измеритель угловых скоростей	angular rate sensor
КВД	Клапан выравнивания давления	pressure equalization valve
КД	Корректирующий двигатель	SM reboost engine (313 kg)
ККТ	Клапан контроля давления в тоннеле	pressure monitoring valve
КОБ	Контур обогрева	SM internal thermal loop
КОХ	Контур охлаждения	SM external thermal loop
КРЛ	Командная радиолиния	command radio link
КСД	Клапан стравливания давления	depress valve
КСР	Коммутатор согласующих резисторов	terminal switch unit
КЦП	Компьютер центрального поста	central post computer
ЛК	Локальный коммутатор	local commutator
МИРТ	Микроэлектронный интегратор разрядно-зарядных токов	charge/discharge current integrator
МНА	Малонаправленная антенна	low gain antenna
НГК	Наружный гидравлический контур	FGB external thermal loop
НИП	Наземный измерительный пункт	ground station
НКУ	Наземный комплекс управления	ground control complex
НОК	Насос откачки конденсата	condensate pump
ОВК	Особо важная команда	critical command
ОДУ	Объединенная двигательная установка	Integrated propulsion system
ОКР-1	Ручной огнетушитель	handheld fire extinguisher
ОНА	Остронаправленная антенна	high gain antenna
ОСК	Орбитальная система координат	orbital coordinate system
ОСП-4	Огнетушитель струйно-пенный	backpack fire extinguisher
ПхО	Переходной отсек	transfer compartment
ПАО	Приборно-агрегатный отсек	propulsion compartment
ПВУ	Программно-временное устройство	program timing device
ПГО	Приборно-грузовой отсек	instrumentation cargo compartment

Verify that this is the correct version before use

OpNom	Russian full name	English full name
ПОВ	Пульт обеспечения выхода	EVA support panel
ПП	Поглотительный патрон	Absorbent cartridge
ППС	Пульт питания систем	system power panel
ПрК	Переходная камера	transfer tunnel
ПС	Пылесборник	dust collector
ПС-28/120	Преобразователь статический	28/120 converter
ПСС	Пульт системы сигнализации	C&W panel
ПТАБ	Преобразователь тока аккумуляторной батареи	storage battery current converter
ПУ	Пульт управления	control panel
РБС	Розетка бортовой сети	power outlet
РО	Рабочий отсек	working compartment
РОМ	Разряд отключенного модуля	capacity restoration mode
РРЖ	Регулятор расхода жидкости	flow control valve
РТ	Регулятор тока	current regulator
РТС	Радиотелеметрическая система	FGB radio telemetry system
РТК	Радиотехнический комплекс	communication system
РТУ	Радиотелеметрическое устройство	radio telemetry device
РУД	Ручка управления движением	translational hand controller
РУО	Ручка управления ориентацией	rotational hand controller
СА	Спускаемый аппарат	descent module
СБ	Солнечная батарея	solar array
СБИ	Система бортовых измерений	onboard measurement system
СВ	Система вентиляции	ventilation subsystem
СВО-ЗВ	Система водообеспечения на запасах воды	water supply equipment
СГ	Силовой гиродин	gyrodine
СГО	Санитарно-гигиеническое оборудование	sanitary hygiene equipment
СД	Сигнализатор дыма	smoke detector
СИС	Система интеграции и согласования	integration and matching system
СИТНП	Система измерения текущих навигационных параметров	current navigational parameters measurement system
СКВ	Система кондиционирования воздуха	air conditioner
СКД	Сближающе- корректирующий двигатель	orbital maneuvering engine
СКО	Средства кислородообеспечения	oxygen generation hardware

Verify that this is the correct version before use

OpNom	Russian full name	English full name
СММК	Система микрометиоритного контроля	micrometeoroid measuring system
СНТ-50МП	Стабилизатор напряжения и тока	voltage and current stabilizer
СОГС	Средства обеспечения газового состава	atmosphere revitalization subsystem
СОЖ	Средства жизнеобеспечения	life support system
СОП	Система обеспечения пищей	food supply subsystem
СОСБ	Система ориентации солнечных батарей	solar array orientation system
СОТР	Система обеспечения теплового режима	thermal control system
СПИПТ	Система подачи и перекачки топлива	fuel supply and transfer system
СПК-У	Средства приема и консервации урины	urine collection and pretreat assembly
СПН	Сменная панель насосов	replaceable pump panel
СПОПТ	Система пожарообнаружения и пожаротушения	fire detection and suppression subsystem
СРВ-К2М	Система регенерации воды из конденсата	condensate water processor
ССВП	Система стыковки и внутреннего перехода	docking and internal transfer system
СТ	Стабилизатор тока	current stabilizer
СТТС	Система телефонно-телеграфной связи	SM audio subsystem
СУ	Стыковочный узел	docking vestibule
СУБА	Система управления бортовой аппаратурой	onboard equipment control system
СУБК	Система управления бортовым комплексом	onboard complex control system
СУДН	Система управления движением и навигацией	motion control and navigation system
СЭП	Система электропитания	SM power supply system
СЭС	Система электроснабжения	FGB power supply system
Т/К	Телевизионная камера	television camera
ТВ	Телевидение	television
ТВМ	Терминальная вычислительная машина	terminal computer
ТВС	Телевизионная система	television subsystem
ТГК	Твердотопливный генератор кислорода	solid oxygen generator
ТОР	Техническое обслуживание и ремонт	in-flight maintenance
ТП	Текущее положение	inertial hold
ТП	Термоплата	coldplate

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OpNom	Russian full name	English full name
ТТК	Трубы теплового контура	heat pipes
УПЛУ	Устройство программно-логического управления	program logic control device
УС	Устройство сопряжения	matching unit
ФВП	Фильтр вредных примесей	harmful contaminants filter
ЦВ	Циркуляционный вентилятор	circulation fan
ЦВМ	Центральная вычислительная машина	Service Module central computer
ЦП	Центральный пост	central post
ЭН	Электронагреватель	electrical heater
ЭНА	Электронасосный агрегат	electric pump assembly

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4.0 UNITS

This section contains a list of all the unit of measurements used by all of the ISS partners. There are three tables. Table 4-1 lists those units that conform to the International System of Units (SI) (reference ASTM - E 380-92, Standard Practice for Use of the International System of Units). Table 4-2 lists those units that do not conform to SI. These tables will expand as the program matures. Table 4-3 lists units currently under review by the International Bureau of Weights and Measures (BIPM) (at http://www.bipm.fr/enus/3_SI/) for electrical unit measurement.

4.1 INTERNATIONAL SYSTEM OF UNITS

The following table reflects those units used by the ISS Program that conform to the SI. The majority of this data is displayed using SI. A complete set of SI units is in ASTM – E 380-92. The standard system of multiplier prefixes for SI is shown in Table 4-1.

Table 4-1. Multiplier prefixes for International System of Units

Prefix	Symbol	Multiplier
yotta-	Y	10^{24}
zetta-	Z	10^{21}
exa-	E	10^{18}
peta-	P	10^{15}
tera-	T	10^{12}
giga-	G	10^{9}
mega-	M	10^{6}
kilo-	k	10^{3}
hecto-	h	10^{2}
deca-	da	10
—	—	1
deci-	d	10^{-1}
centi-	c	10^{-2}
milli-	m	10^{-3}
micro-	µ	10^{-6}
nano-	n	10^{-9}
pico-	p	10^{-12}
femto-	f	10^{-15}
atto-	a	10^{-18}
zepto-	z	10^{-21}
yocto-	y	10^{-24}

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Table 4-2. International System of Units (SI)

Parameter	Symbol	Units
Absorbed dose	Gy	gray
Absorbed dose	mrad	millirad
Absorbed dose rate	mrad/min, mrad/s	millirad per minute, millirad per second
Acceleration	cm/s^2	centimeter per second squared
Acceleration	m/s^2	meter per second squared
Activity (of radioactive source)	1/s	disintegration per second, one per second
Activity (of a radionuclide)	Bq	becquerel
Altitude	km	kilometer
Angle	deg	degree
Angle	rad, mrad	radian, milliradian
Angle	sr	steradian
Angular acceleration	rad/s^2	radian per second squared
Angular momentum	N•m• s	newton meter second
Angular velocity	rad/s	radian per second
Area	m^2	square meter
Bandwidth	Hz	hertz
Brightness	cd	candela
Change in mass	µg/min	microgram per minute
Concentration	%	percent
Concentration	µg/mL, $\mu g/m^3$	microgram per milliliter, microgram per cubic meter
Current	A, mA, µA	ampere, milliampere, microampere
Density	kg/m^3	kilogram per cubic meter
Dose equivalent	rem	roentgen equivalent man
Dose equivalent	Sv	siebert
Electric capacitance	F	farad
Electric charge, quantity of electricity	C	coulomb
Electric field strength	V/m	volt per meter
Electric inductance	H	henry
Electric potential difference	V	volt
Electric resistance	Ω, kΩ, MΩ	Ohm, preferred multipliers
Electrical conductance	S	siemen
Electromotive force	V, mV, µV	volt, millivolt, microvolt

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Table 4-2. International System of Units (SI) (continued)

Parameter	Symbol	Units
Energy	J	joule
Energy per area time	kW/m^2	kilowatt per meter squared
Entropy	J/K	joule per kelvin
Exposure (Xand gamma rays)	R, mR	roentgen, milli-roentgen
Exposure rate	mR/min	milliroentgen per minute
Flame detection values	mW/cm^2, $\mu W/cm^2$	milliwatt per square centimeter, microwatt per square centimeter
Flowrate	m^3/min	cubic meters per minute
Flowrate	kg/h	kilogram per hour
Flowrate	ml/h	milliliter per hour
Flowrate	NL/min	normal liter per minute
Force	kgf	kilogram force
Force	N	newton
Frequency	Hz, kHz	hertz, kilohertz
Gas volume	%	percent
Heat rate	kW, W, µW, mW	kilowatt, watt, microwatt, milliwatt
Illuminance	lm/m^2	lumen per meter squared
Illuminance	lx	lux
Inductance	H, mH, µH	Henry, preferred multipliers
Linear dimensions	m, mm, µm, km, cm	meter, millimeter, micrometer, kilometer, centimeter
Luminance	cd/m^2	candela per square meter
Luminous flux	cd•sr	lumen (lm)
Magnetic field strength	A/m	ampere per meter
Magnetic flux	Wb	weber
Magnetic flux density	T	tesla
Magnetomotive force	A	ampere
Mass	g, kg	grams, kilograms
Mass rate	Mass/Time	see definitions for Mass and Time
Molecule	mol, mmol, µmol	mole, millimole, micromole
Moment	N•m	newton meter
Phase error	deg	degrees
Position (state vector)	m, m/s, m/s^2,time	meter, meter per second, meter per second squared, time
Position (non-state vector)	cm, m, km	centimeter, meter, kilometer

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Table 4-2. International System of Units (SI) (continued)

Parameter	Symbol	Units
Power	W, kW, mW, µW	watt, kilowatt, milliwatt, microwatt
Power density	W/m^2	watt per square meter
Pressure	kgf/cm^2	kilogram force per centimeter squared
Pressure	Pa	pascal
Pressure rate	$Pa/M^2/sec$	pascal per square meter per second
Quantity	%	percentage
Quantity of heat	J	joule
Radiant intensity	W/sr	watt per steradian
Resistance	Ω ohms	ohms
RF power	kW, W,mW	kilowatt, watt, milliwatt
Rotational rate	deg/sec	degree per second
Saturation	%	percent
Seal leak	Pa/cm^2	Pascal per square centimeter differential
Serum/plasma level	mmol/L	millimole per liter
Signal detection threshold	A, mA	ampere, milliampere
Solid angle	sr	steradian
Specific heat	J/kg•K	joule per kilogram-kelvin
Specific impulse	N•s	newton second
Stress	Pa	pascal
Temperature	deg C	degree Celsius
Temperature	K	kelvin
Temperature rate	deg C/min	degree Celsius per minute
Thermal conductivity	W/(m•K)	watt per meter-kelvin
Thrust	Kg	Kg
Time	MET, GMT, CDT	Mission Elapsed Time, Greenwich Mean Time, Count Down Time
Time	d/h, d/h/min/s	day per hour, day per hour per minute per second
Time	d, h, min, s, ns, ms, µs	day, hour, minute, second, nanosecond, millisecond, microsecond
Torque	N•m	newton meter
Translational rate	cm/s	centimeter per second
Velocity	cm/s, m/s	centimeter per second, meter per second
Viscosity, dynamic	Pa•s	pascal-second

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Table 4-2. International System of Units (SI) (concluded)

Parameter	Symbol	Units
Viscosity, kinematic	m^2/s	square meter per second
Voltage	V, mV, µV	volt, millivolt, microvolt
Volume	m^3, cm^3, mm^3	cubic meter, cubic centimeter, cubic millimeter
Volume	L, mL, dL	liter, milliliter, deciliter
Wavelength	nm	nanometer
Wavenumber	1/m	reciprocal meter, one per meter
Weight	kg, g, µg, mg	kilogram, gram, microgram, milligram
Whole blood	g/dL	grams per deciliter
Work	J, mJ	joule, millijoule

4.2 MISCELLANEOUS UNITS (NON-SI UNITS)

The following table reflects those units used by the ISS Program that do not conform to the SI, including English units and other industry recognized units of measurements. These are non-SI units for which no SI equivalents exist. These units should not be used unless they are required to be consistent with hardware or display labeling.

Table 4-3. Miscellaneous units

Parameter	Symbol	Units
Absorbance	ABU	absorption unit
Acceleration	ft/s^2, in/s^2	feet per second squared, inch per second squared
Acceleration	G, mG,µG	gravity, milligravity, microgravity
Acceleration	kt/s, $nmi/ft/s^2$, $nmi\text{-}ft/s^2$	knot per second, nautical miles per foot per second squared, nautical miles-foot per second squared
Acceleration	rad/s/grad	radian per second per gradient
Acceleration	GPP	gravity peak to peak
Acceleration	µG/G	microgravity per gravity
Acceleration	s^2/ft	second squared per foot
Altitude	deg	degrees in YPR
Angular acceleration	deg/s^2	degree per second squared
Angular momentum	ftlb•s	foot pound second
Angular rate	deg/s, deg/h	degree per second, degree per hour
Angular rate	rpm, kr/m	revolution per minute, kilorevolution per minute

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Table 4-3. Miscellaneous units (continued)

Parameter	Symbol	Units
Angular strain	deg/deg^2	degree per degree per degree
Angular velocity	rad/s, deg/s, grad/s	radians per second, degrees per second, grad per second
Area	rad^2	radians squared
Atomic charge	z	atomic number
Attitude	deg	degree
Attitude rate noise	deg^2/s^3	degree squared per second cubed
Attitude rate threshold	deg/s	degree per second
Bandwidth	bps	bit per second
Brightness (magnitude)	Mag Inten	magnitude intensity
Charge	z	atomic number
Concentration	ppb	part per billion
Concentration	ppm	part per million
Conductivity	µmhos/cm	microreciprocal ohms per centimeter
Current	A/deg	ampere per degree
Cycle	cy	cycle
Data rate	bps, kbps, Mbps	bit per seconds, kilobit per second, Megabit per second
Differential pressure	psid	pound per square inch differential
Effective drag area	ft2	feet squared
Flame detection values	FC	foot candle
Flame detection values	pps	pulses per second
Flowrate	ft^3/min, gal/min	cubic feet per minute, gallon per minute
Flowrate	lb/h	pound per hour
Force	lbf	pound force
Force rate	lbf/ft/s	pound force per foot per second
Heart rate	BPM	heart beats per minute
Inverse volt	1/V	Inverse volt
Length	AU, mi	astronomical unit, mile
Linear dimensions	ft, kft, Mft	feet, kilofeet, megafeet
Linear dimensions	in, µin	inch, microinch
Linear energy transfer	keV/µm	kiloelectronvolt per micrometer (micron)
Linear energy transfer	MeV/cm	mega electronvolt per centimeter
Linear strain	µin/in	microinch per inch
Mass	slug, lbm	slug, pound mass

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Table 4-3. Miscellaneous units (continued)

Parameter	Symbol	Units
Mass rate	lbm/h, lbm/s	pound mass per hour, pound mass per second
Mean AC voltage	VRMS	volt root mean square
Microbial formation	CFU	colony forming unit
Particle energy	MeV, eV, keV	megaelectronvolt, electronvolt, kilo electronvolt
Position (state vector)	ft, ft/s, ft/s^2, time	feet, feet per second, feet per second squared, time
Power density	BTU/ft^2/s	British Thermal Unit per square foot per second
Pressure	mmHg, inHg	millimeter of mercury, inch of mercury
Pressure	inH20	inch of water
Pressure	psi , psia, psig	pound per square inch, pound per square absolute, pound per square inch gauge
Pressure	Torr	torr
Pressure rate	psi/min, psi/s	pound per square inch per minute, pound per square inch per second
Pressure rate	psia/min, psia/s	pound per square inch absolute per minute, pound per square inch absolute per second
Quantity	lbm	pound mass
Rate invalid threshold	deg^2	degree squared
Rate threshold	(deg/s)^2	(degree per second) squared
Relative parameter	dB	decibel
Respiratory rate	breaths/min	breath per minute
RF power	dB, dBm	decibel, decibel referred to one milliwatt
Rotational rate	deg/s	degree per second
Seal leak	psid	pound per square inch differential
Serum/plasma level	IU/L	International Unit per liter
Signal detection threshold	dB, dBm, dBc	decibel, decibel referred to one milliwatt, decibel carrier
Smoke levels	% / ft	percent obscuration per foot
Specific energy	eV/n	electronvolt per nucleon
Specific impulse	lb•s	pound second
Statistics	% ile	percentile
Stress	lbf/ft^2	pound force per square foot
Temperature	deg F, deg R	degree Fahrenheit, degree rankin

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Table 4-3. Miscellaneous units (concluded)

Parameter	Symbol	Units
Temperature rate	deg F /min, deg F/h	degree Fahrenheit per minute, degrees Fahrenheit per hour
Thrust	lbf	pound force
Torque	ft-lb, in-lb	foot pound, inch pound
Turbidity	NTU	nephelometry turbidity unit
Velocity	kt, Mach	knot, mach
Velocity	ft/s, kft/s, in/s, mi/s	feet per second, kilofeet per second, inch per second mile per second
Velocity	s/ft, s/rad	second per foot, second per radian
Video frame rate	fps	frame per second
Virtual track	arc•s, arc•min	arc second, arc minutes
Voltage	VPP	volt peak to peak
Voltage	VDC, mVDC	volt direct current, millivolt direct current
Voltage	VAC, mVAC	volt alternating current, millivolt alternating current
Voltage rate	$V/ft^3/min$, V/s	volt per cubic foot per minute, volt per second
Volume (liquid)	gal, kgal	gallon, kilogallon
Volume	ft^3	cubic feet
Weight	lb	pound
Weight	lbm	pound mass
Work	lbm/ft^3	pound mass per cubic feet
Work	BTU	British Thermal Unit

4.3 ALLOWED (WAIVED) NON-SI UNITS

The units in Table 4-4 are derived units currently being reviewed by the BIPM for inclusion into the international SI. These derived units are primarily for measurement of electricity.

Table 4-4. Waived non-SI units

Parameter	Symbol	Units
Capacitance	F, μF, nF, pF	farad, preferred multipliers
Inductance	H, mH, μH	henry, preferred multipliers
Frequency	Hz, kHz, MHz, GHz	hertz, preferred multipliers

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4.4 STANDARD TIME ZONES

Table 4-5 displays standard time zones.

Table 4-5. Standard time zones

Description	Abbreviation	Difference to GMT
Central European Time	CET	GMT +1 hour
Eastern Standard Time	EST	GMT -5 hours
GMT Relative	GMT +/-	
Japanese Standard Time	JST	GMT +9 hours
Moscow Decreed Time	MDT	GMT +3 hours
USA Central	CST (Central Standard Time)	GMT -6 hours

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5.0 CONTROLS AND DISPLAYS

System and Payload Vehicle hardware panels and software displays used on station will be included in the partner-specific annexes of this document. Software display nomenclature may be made available in an electronic format that is not necessarily incorporated in the Partner-specific annex itself. The annex must, in such cases, define where and how the software display nomenclature can be acquired.

- List of panel nomenclature
- List of associated procedural nomenclature (if different from the panel)

The following is an example of the information to be provided. Figure 5-1 is a preliminary copy of the Mobile Servicing System (MSS) Robotic Workstation (RWS) Display and Control Panel (DCP) drawing. Following the panel drawing is an example of the panel nomenclature list with the associated manual procedural nomenclature.

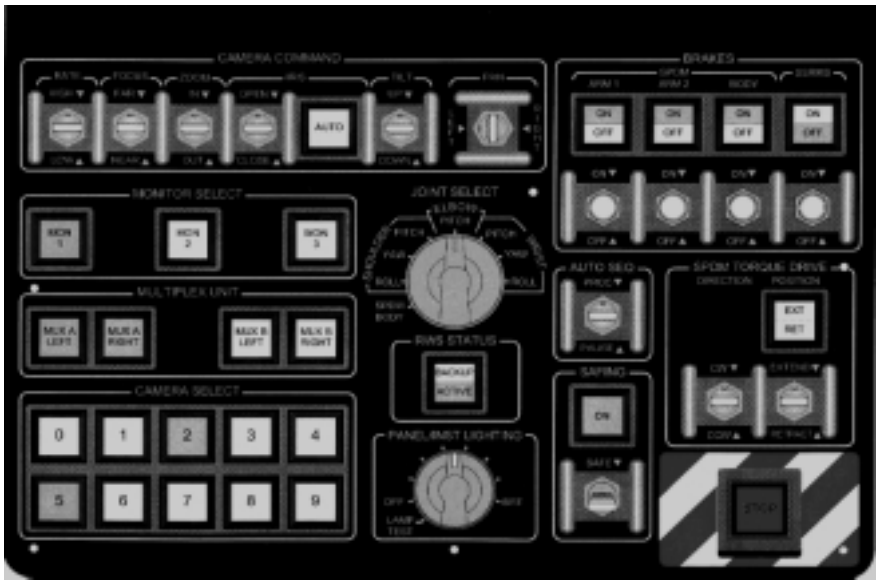

Figure 5-1. Sample MSS RWS DCP

MSS panel - RWS DCP

D&C Nomenclature	Manual Procedure Nomenclature
RWS DCP CAMERA COMMAND RATE HIGH	**cmd** CAMERA COMMAND RATE HIGH
RWS DCP CAMERA COMMAND RATE LOW	**cmd** CAMERA COMMAND RATE LOW
RWS DCP PANEL/INST LIGHTING LAMP TEST	**cmd** PANEL/INST LIGHTING LAMP TEST
RWS DCP JOINT SELECT ELBOW PITCH	**cmd** JOINT SELECT ELBOW PITCH

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6.0 ODF NAMING REGISTRATION

6.1 INTRODUCTION TO NAMING REGISTRATION

The names contained in the ODF naming registration are the building blocks from which Operations Nomenclature is constructed. These are the legal values to use in assigning names.

Chemical elements and/or compounds should be abbreviated per the standard abbreviation in the periodic tables.

Examples:	Ammonia	NH3
	**Carbon Dioxide	CO2
	Carbon Monoxide	CO
	Copper	Cu
	Hydrogen	H2
	Methane	CH4
	Nickel	Ni
	Nitrogen	N2
	Oxygen	O2
	Silicon	Si
	Water	H2O

6.2 NAME/ABBREVIATION LIST

The list in Table 6-1 contains abbreviations that denote standard industry usage. The names preceded by an " ** " are mandatory that they appear abbreviated when used in crew procedures. Other abbreviations should not be used unless necessary, per Section 6.2. The first listed abbreviation is preferred. The second abbreviation may be used in the case of space limitations. In the case of multiple meanings for a given abbreviation, spell out the word if the contextual usage might be confusing to the reader.

Table 6-1. Name/abbreviation list

Full name	OpNom
1553 (bus)	1553
Absolute	Abs
Adsorbent/Desorbent	AD/DES
Adsorption	Adsorb
Acceleration	Accel

Verify that this is the correct version before use

Table 6-1. Name/abbreviation list (continued)

Full name	OpNom
Acceptance	Accept
Accumulator	Accum
Acknowledge	Ack
Acquired, Acquisition	Acq
Active, Activate, Activation, Actuator	Act
Ada Programming Language	Ada
Adapter	Adapt
Address	Addr
Adjust	Adj
Advisory	Adv
Altitude	Alt
Analog to Digital	A/D, AtoD
Ancillary	Anc
Angle	Ang
Annunciation	Annun
Antenna	Ant
Application	App
April	Apr
Assembly	Assy
Asynchronous	Async
Atmosphere	Atmos
Attempted	Attmpd
Attitude	Att
Audio	Aud
Augment, August	Aug
Authorize, Authorized	Auth
**Automatic	Auto
Autosequence	Autoseq
Auxiliary	Aux
Available, Availability	Avail
Average	Avg
Avionics	Av
Azimuth	Az
Backdriving	Backdrv
Background	Bkgd
Backup	B/U, Bkup

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Table 6-1. Name/abbreviation list (continued)

Full name	OpNom
Balance	Bal
Baseplate	Bsplt
Battery	Batt
Bearing	Brg
Block	Blk
Bottle	Btl
Brake	Brk
Bright	Brt
Broadcast	Brdcst
Buffer	Buff
Bulkhead	Blkhd
Bus Current	Ibus
Bus voltage	Vbus
Butterfly	Bfly
Bypass	Byp
Cabin	Cab
Calculate	Calc
Calibration	Cal
Camera	Camr, Cam
Cancel	Cncl
Capacity, Capture	Cap
Cartridge	Cart, CART
Catalytic	Cat
Change	Chg
Channel	Ch
Character, Charcoal	Char
Charge	Chrg
Charger	Chgr
Check, Checker	Ck
Checklist	C/L, Cklst
Checkout	C/O, Ckout
Checksum	Cksum
Chi_Square	Chi_Sq
Circuit Breaker	cb
Cleaning	Cln, CLN
Clear	Clr

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Table 6-1. Name/abbreviation list (continued)

Full name	OpNom
Clockwise	CW
Clogged	Clog
Close, Closed	Cl
Coefficient	Coeff
Coherent	Coh
Collection, Collector	Clct, CLCT
Command	Cmd, cmd
Command Status	Cmdst
**Commander	CDR
Communication	Comm
Complete	Cplt
Compressor	Cmprsr
Configure, Configuration	Config
Confirm, Confirmation	Cfrm
Condensate, Condensation	Cnds
Condition	Cond
Connect	Cnct
Connector	Cnctr
Containment	Cntmt, CNTMT
Contamination	Contam
Continue, Contingency	Cont
Control	Cntl
Convert, Converter	Conv
Coordinate	Coord
Correction	Corr
Cosine	Cos
Count, Counter	Cnt
Covariant	Covar
Critical	Crit
Crossfeed	Xfd
Crossing	Xing
Crossover	Xovr
Cryogenic	Cryo
Crystal	Xtal
Current (electric)	I
Current (time)	Curr

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Table 6-1. Name/abbreviation list (continued)

Full name	OpNom
Cutout	C-O
Damper	Damp
Database	Dbase
Deactivate	Deact
Deceleration	Decel
December	Dec
Declination	Decl
Decrease	Decr
Default	Deflt
Definition	Def
Degree	Deg
**Delta Velocity	Delta_V
Demultiplexer	Demux
Deploy, Deployed	Dply
Depressurize	Depress
Derigidize	Derigid
Desaturate, Desaturation	Desat
Deselect	Desel
Desiccant	Desicnt
Desorbtion	Desorb
Destination	Dest
Detect, Detector	Det
Deterministic	Detrm
Deviation	Dev
Diagnostic	Diag
Difference	Dif
Digital	Dig
Digital to Analog	D/A, DtoA
Dimension	Dim
Direct	Dir
Disable	Dis
Discharge	Disch
Disconnect	Discnct
Discrete	Disc
Disengage	Diseng
Display	Disp

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Table 6-1. Name/abbreviation list (continued)

Full name	OpNom
Distribution	Dist
Docking, Docked	Dock
Document	Doc
Down	Dn
Downlink	D/L, Dnlk
Drawing	Dwg
Drive	Dr
Duration	Dur
Elbow	Elb
Electronic, Electrical	Elect
Elevation	El
Emergency	Emer
Enable	Ena
Engine, Engineering	Eng
Entry	Ent
Environment	Envir
Ephemeris	Ephem
Equipment	Equip
Equivalent	Equiv
Error	Err
Essential	Ess
Estimate	Est
European	Euro
Evacuation	Evac
Evaporator	Evap
Exception	Except
Exchange	Exch
Execute	Exec
Exhaust	Exh
Existence	Exist
Experiment	Exp
Extended BIT	eBIT
Extend, External, Extension	Ext
Fail, Failure	Fail
False	F
February	Feb

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Table 6-1. Name/abbreviation list (continued)

Full name	OpNom
Feedback	Fdbk
Field, Flood	Fld
Filter	Fltr
Fixed	Fxd
Flexible	Flex
Flight	Flt
Flow through	Flothru
Force	For
Format	Fmt
Forward	Fwd
Frame	Frm
Frequency	Freq
Fuel	Fu
Fuse	F
Function	Func
General, Generate, Generation, Generator	Gen
Gimbal	Gmbl
Government	Govt
Grapple	Grpl
Ground	Gnd
Group	Grp
Guidance	Guid
Gyrodyne	GyroD
Gyroscope	Gyro
** Habitat	HAB
Handshake	Hs
Hard dock	Hdock
Hazard	Haz
Header	Hdr
Heading	Hdg
Heater	Htr
Height	H
High	Hi
High Pressure	Hi Press, Hi P
High Temperature	Hi Temp, Hi T
High Speed	Hi Spd

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Table 6-1. Name/abbreviation list (continued)

Full name	OpNom
High Voltage	Hi Volt, Hi V
Horizontal	Horz
**Identification	ID
In Progress	InProg
Inactive	Inact
Inboard	Inbd
Include	Incl
Increase, Increment	Incr
Incorporate	Incorp
Incubation	Inc, INC
Indeterminate	Indet
Indicate, Indicator, Indication	Ind
Inertial	Inert
Information	Info
Inhibit	Inh
**Initial Load	I-load, Iload
Initial, Initialize, Initiate	Init
Inject	Inj
Inlet, Input	In
Inoperative	Inop
Input current	Lin
Input voltage	Vin
Instrument, Instrumentation	Inst
Integrate, Integration	Integ
Interface	I/F, Inf
Interior, Internal, Integer	Int
Intensity	Inten
Interrupt	Intrpt
Introduction	Intro
Invalid	Inval
Inverter	Inv
Isolate, Isolation	Isol
Isolation Valve	Isov
Jack	J
January	Jan
Joint	Jnt

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Table 6-1. Name/abbreviation list (continued)

Full name	OpNom
July	Jul
Jumper	Jmpr
June	Jun
Keyboard	KB, Kybd
Ku-Band	Ku-Bd, KuBd
**Laboratory	LAB
Latch, Latitude	Lat
Large	Lg
Left	L
Length	L, Lgth
Light	Lt
Lighting	Ltg
Limit	Lim
Line	Ln
Linear	Lin
Liquid	Liq
Location	Loc
Lock	Lk
Longitude	Long
Loopback	Lpbk
Low	Lo
Low Pressure	Lo Press, Lo P
Low Temperature	Lo Temp, Lo T
Low Speed	Lo Spd
Low Voltage	Lo Volt, Lo V
Lower	Lwr
Magnetometer	Magnet
Magnitude	Mag
Main	Mn
Maintenance	Maint
Major	Maj
Malfunction	Mal
Management	Mgmt
Manager	Mgr
Maneuver	Mnvr
Manifold	Manf

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Table 6-1. Name/abbreviation list (continued)

Full name	OpNom
Manual	Man
March	Mar
Master	Mstr
Maximum	Max
Measure, Measurement	Meas
Mechanical	Mech
Medical	Med
Message	Msg
Metal, Metallic	Met
Microphone	Mic
Midcourse 1,2,3,4 Burn	MC1 burn
Middle	Mid
Minimum	Min
Misalignment	Misalign
Miscompare	Miscmpr
Modify, Modulator, Modulating	Mod
Momentary, Momentum	Mom
Monitor	Mon
Motor, Meter (instrument)	Mtr
Movement	Mov
Multiple, Multiply	Mult
Multiplex	Mux
Navigate, Navigation	Nav
Negative	Neg
Network	Net
Nominal Correction burn	NC burn
Nominal Corrective Combination burn	NCC burn
Nominal	Nom
Normal	Norm
November	Nov
Nozzle	Noz
Number	Num
Obscuration	Obsc
Observation	Obs
October	Oct
Open	Op

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Table 6-1. Name/abbreviation list (continued)

Full name	OpNom
Open Rate	Op Rate
Operate	Oper
Operations, Operational	Ops
Operator	Opr
Option	Opt
Orbit	Orb
Oscilloscope, Oscillator	Osc
Outboard	Outbd
Outlet, Output	Out
Output current	Iout
Output pressure	Pout
Output temperature	Tout
Output voltage	Vout
Overcurrent	Ovcurr, Ov I
Overflow	Ovfl
Overhead	Ovhd
Overlay	Ovlay
Overload	Ovld
Overpressure	Ovpress, Ov P
Overrate	Ovrate
Override	Ovrd
Overrun	Ovrun
Overspeed	Ovspd
Overtemperature	Ovtemp, Ov T
Overvoltage	Ovvolt, Ov V
Oxidizer	Ox
Package	Pkg
Packet	Pkt
Pallet	Pal
Panel	Pnl
Parameter	Param
Parity	Prty
Partial	Partl
Partial Pressure	pp
Pattern	Patrn
Pending	Pndg

Verify that this is the correct version before use

Table 6-1. Name/abbreviation list (continued)

Full name	OpNom
Performance, Perforate	Perf
Permanent	Perm
Phase	Ph
Piecewise	Pcwise
Pitch	P
Plug	P
Pneumatic	Pneum
Point	Pt
Pointer	Ptr
Pointing	Ptg
Position	Posn
Positive	Pos
Power	Pwr
Powered	Pwrd
Powerup	Pwrup
Precondition	Precond
Preliminary	Prelim
Prepare	Prep
Prerequisite	Preq
Pressure, Pressurize, Pressurization	Press, P
Primary	Pri, Prim
Procedure	Proc
Process	Prcs
Processor	Prcsr
Processing	Prcsng
Profile	Pfile
Program	Pgm
Propulsion	Prop
Pump	Pmp
**Pyrotechnics	Pyro
Quality	Qual
Quantity	Qty
Quaternion	Quatrn
Queue	Que
Radiator	Rad
Radius Vector	Rbar

Verify that this is the correct version before use

Table 6-1. Name/abbreviation list (continued)

Full name	OpNom
Range	Rng
Rapid	Rpd
Rate of Change in Pressure (delta pressure/delta time)	DP/DT
Ready, Readiness	Rdy
Reasonableness	Rsbl
Recalibrate	Recal
Receive	Rcv
Received	Rcvd
Receiver	Rcvr
Recharge	Rchrg
Reconfiguration	Recon
Record	Rcd
Recorder	Rcdr
Recovery	Rcvy
Redistribution	Redist
Redundancy, Redundant	Redun
Reference	Ref
Reflect	Refl
Regenerative	Regen
Regulator	Reg
Reject, Rejected	Rej
Relative, Release	Rel
Relief	Rlf
Repressurize	Repress
Request, Require	Req
Required	Req'd
Requirement	Reqrmt
Reset	Rst
Resolver	Rslvr
Response, Responsibility	Resp
Retracted	Ret
Resolver to Digital	R/D, RtoD
Retention	Reten
Return	Rtn
Reverse, Review, Revolution	Rev
Rewind	Rew

Verify that this is the correct version before use

Table 6-1. Name/abbreviation list (continued)

Full name	OpNom
Rheostat	Rheo
Right	R
Roll	R
Rotate, Rotation	Rot
**S-Band	S-Bd, SBd
Safe	Sf
Sample	Smpl
Satellite	Satt
Saturate, Saturation	Sat
Scatter	Sctr
Schedule	Sched
Schematic, Schema	Schem
Secondary	Sec
Segment	Seg
Select, Selection	Sel, sel
Sensor	Snsr
Separation, September	Sep
Sequence	Seq
Serial	Ser
Servomechanism	Servo
Session	Sess
Setpoint	Setpt
Shoulder	Shldr
Shutdown	Shutdn
Signal	Sig
Significant	Signif
Simulation	Sim
Single	Sngl
Solution	Soln
Soft dock	Sdock
Sorbent	Sorb
Spare	Sp
Specification	Spec
Spectrometer	Spect
Speed	Spd
Spin bearing	Spin brg

Verify that this is the correct version before use

Table 6-1. Name/abbreviation list (continued)

Full name	OpNom
Spin down	Spin dn
Spin motor	Spin mtr
Square	Sq
Subject	Subj
Standard	Std
Standby	Stby
Standoff	Stdoff
Starboard	Stbd
Startup	Strtup
Status	Stat
Stick	Stk
Stimulus	Stim
Stowage	Stow
Strength	Str
Structure	Struc
Subsystem	Subsys
Subwindow	Subwin
Summary	Sum
Supply	Sply
Suppress	Supp
Survival	Surv
Switch	Sw, sw
**Synchronize	Sync
System	Sys
**Tachometer	Tach
Tank	Tk
Target	Tgt, Trgt
Telemetry	Tlm
Telephone	Phone
Temperature	Temp, T
Template	Tmplt
Temporary	Tmpry
Terminal Phase Initiation burn	Ti burn
Terminal Phase Initiation delay burn	Ti delay burn
Terminate	Term
Threshold	Thold

Verify that this is the correct version before use

Table 6-1. Name/abbreviation list (continued)

Full name	OpNom
Throttle	Throt
Through	Thru
Thruster	Thrstr
Toggle	Tog
Tolerance	Tol
Tools	Tls
Torque	Trq
Total	Tot
Track	Trk
Tracker	Trkr
Trajectory	Traj
Transceiver	Xcvr
Transducer	Xdcr
Transfer	Xfer
Transition	Xtion
Translate	Xlate
Transmit	Xmit
Transmitter	Xmtr
Transponder	Xpdr
Treadmill	Trdmll
True	T
Ullage	Ull
Umbilical	Umb
Underspeed	Undspd
Undertemperature	Undtemp, Und T
Undervoltage	Undvolt, Und V
Undetermined	Undetrm
Undock, Undocking	Undock
Universal	Univ
Update	Updt
Unlatch	Unlch
Unlock	Unlk
Uplink	Uplk, U/L
Up, Upper	Up
Utility	Util
Vacuum	Vac

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Table 6-1. Name/abbreviation list (concluded)

Full name	OpNom
Valid, Validity, Validation	Valid
Value	Val
Valve	Vlv
Variance	Var
Vehicle	Veh
Velocity	Vel
Velocity Vector	Vbar
Verify	Verif
Version	Ver
Vernier	Vern
Vertical	Vert
Vibration	Vibe
Video	Vid
Visual	Vis
Violate, Violation	Viol
Voltag Output	Vout
Volts	V
Volume	Vol
Warning	Warn
Water	H2O
Water Separator	H2O Sep
Weight	Wt
Wheel	Whl
Wheel speed	Whlspd
Width	W
Window	Win
Yaw	Y

6.3 NAME/ACRONYM LIST

The subset of acronyms in Table 6-2 have been identified to provide a basic set of standardized acronyms. These acronyms are well established, are always used, and promote efficient operations. For acronyms preceded by "******," it is mandatory that they appear as acronyms in crew procedures.

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Table 6-2. Name/acronym list

Full name	OpNom
Accumulator Relief Valve	ARV
Accumulator Vent Valve	AVV
**Acquisition of Signal	AOS
Activation Check-out and Verification	AC&V
Active BIT	ABIT
Active Common Berthing Mechanism	ACBM
Active Thermal Control System	ATCS
Advanced Life Support	ALS
Advanced Life Support Pack	ALSP
Aft Cargo Carrier	ACC
Airlock	A/L, AL
Alternating Digital Autopilot	Alt DAP
Alternating Current	AC
Ambulatory Medical Pack	AMP
American Echo Research Imaging System	AERIS
American to Russian Converter Unit	ARCU
Ammonia Coolant Loop	ACL
Ammonia Tank Assembly	ATA
Antenna Controller	ACON
Application Program Interface	API
Application Programming Interface Definition	APID
Articulating Portable Foot Restraints	APFR
Artificial Intelligence	AI
Assembly Complete Baseband Signal Processor	ACBSP
Assembly Completed	AC
Assembly Power Conversion Unit	APCU
Assembly Truss and Structure	ATS
Assembly Work Platform	AWP
Astronaut Support Tool	AST
Atmosphere Control & Supply	ACS
Atmosphere Revitalization	AR
Attached Payload Accommodation Equipment	APAE
Attached Payload Equipment	APE
Attitude Control Assembly	ACA
Attitude Control & Stabilization	AC&S
Attitude Control System	ACS

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Table 6-2. Name/acronym list (continued)

Full name	OpNom
Attitude Determination Control System	ADCS
Attitude Determination System	ADS
Attitude Reading Reference System	ARRS
Audio Network Interface Unit	ANIU
Audio Terminal Unit	ATU
Automated Payload Switch	APS
Automated Trajectory File	ATF
Automated Transfer Vehicle	ATV
Automatic Level Control	ALC
Auxiliary Power Unit	APU
Avionics Air Assembly	AAA
Bandwidth	BW
Barberpole	bp
Baseband Signal Processor	BSP
Baseline	BL
Battery Charge/Discharge Unit	BCDU
Battery Signal Conditioning and Control Module	BSCCM
Bearing Assembly	BA
Bearing, Motor, and Roll Ring Module	BMRRM
Bending Moment	BM
Berthing Latch Interface Mechanism	BLIM
Berthing Site Interface Coordinate System	BSICS
Beta Gimbal	BG
Beta Gimbal Assembly	BGA
Binary Data Table	BDT
Binary Phase Shift Keying	BPSK
Bit Error Rate	BER
Bit Summary Table	BST
Bit Status Register	BSR
Bitstream Protocol Data Unit	BPDU
Blood Pressure	BP
Body Mass Measurement Device	BMMD
Bolt Bus Controller	BBC
Bolt Motor Actuator	BMA
Built In Test	BIT
Built In Test Equipment	BITE

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Table 6-2. Name/acronym list (continued)

Full name	OpNom
Built In Unit	BIU
Bus Communication System	BCS
Bus Control Unit	BCU
Bus Controller	BC
Bus Interface Adapter	BIA
Bus Interface Circuit	BIC
Bus Network Interface Unit	BNIU
Bus Program Unique Identifier	BPUI
Cabin Pressure Sensor	CPS
Camera Control Panel	CCP
Canadian Space Agency	CSA
Cargo Handling Interface Adapter	CHIA
Cathode Ray Tube	CRT
Caution & Warning	C&W
Caution & Warning Panel	C&WP
**Center of Gravity	CG, c.g.
Centrifuge Accommodation Module	CAM
**Central Processor Unit	CPU
**Central Standard Time	CST
Central Supplies	CS
Channel Access Data Unit	CADU
**Charge Coupled Device	CCD
Charged Particle Directional Spectrometer	CPDS
Clockwise	CW
Closed Circuit Television	CCTV
Closed Loop Control	CLC
Code Division Multiple Access	CDMA
Coefficient of Thermal-Expansion	CTE
Coldplate	CP
Columbus	COL
Command and Control	CC, C&C
Command and Control Workstation	CCWS
Command and Control Zone	CCZ
Command and Data Handling	CDH
Command Signal Limiter	CSL
Commanded BIT Status	CBST

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Table 6-2. Name/acronym list (continued)

Full name	OpNom
Common Attach System	CAS
Common Berthing Mechanism	CBM
Common Database	CD
Common Database Processor	CDBP
Common User Interface	CUI
Common Video Interface Unit	CVIU
Communications & Data Handling	C&DH
Communication & Tracking	C&T
Communication & Tracking System	C&TS
Communications Interface Equipment	CIE
Communications Outage Recorder	COR
Compact Disk Read Only Memory	CD ROM
Companion System Database	CSDB
Complementary Metal Oxide Semiconductor	CMOS
Compound Specific Analyzer-Combustible Products	CSA-CP
Compound Specific Analyzer-Hydrazine	CSA-H
Computer Generated Images	CGI
Condensing Heat Exchanger	CHX
Configuration Control Board Direction	CCBD
Constructive Solid Geometry	CSG
Contingency Landing Sites	CLS
Control & Data Transformer	C&DT
Control & Display Workstation	CDW
Control & Monitor	C&M
Control Bus	CB
Control Moment Gyroscope	CMG
Control System Development Workstation	CSDW
Controller Multiplexer/Demultiplexer	C-MDM
Controller Panel Assembly	CPA
Conversion Program Unique Identifiers	CPUI
Coordinate System	CS
Core Local Area Network	C-LANet
Corrective Maintenance	CM
Counter Clockwise	CCW
Countermeasures System	CMS
Crew Accommodations & Support Equipment	CASE

Verify that this is the correct version before use

Table 6-2. Name/acronym list (continued)

Full name	OpNom
Crew Activity Plan	CAP
Crew and Equipment Translation Aid	CETA
Crew Contamination Protection Kit	CCPK
Crew Health Care System	CHeCS
Crew Maintenance Time	CMT
Crew Medical Restraint System	CMRS
Crew Optical Alignment System - Orbiter	COAS
Crew Personal Dosimeters	CPD
Crew Transfer Tunnel	CTT
Cupola Multi-Purpose Applications Console	C-MPAC
Current Value Table	CVT
Customer Data & Operations Language	CDOL
Data & Command Services	DCS
Database System	DBS
Data Encryption System	DES
Data Gathering	DG
Data Handling Center	DHC
Data Interface Unit	DIU
Data Management Systems	DMS
Data Processing Remote Terminal	DPRT
Data Reduction & Analysis Function	DRAF
Data Retrieval Center	DRC
Data Source Information Record	DSIR
Data Storage & Retrieval	DSAR
Data Storage Information	DSI
Data Word	DW
Data Wrap Read Word	DWRW
Day-Hour-Minute-Second	DHMS
DC Power Supply	DCPS
DC Switching Unit	DCSU
DC to DC Converter Unit	DDCU
**Deadband	DB
**Degree(s) of Freedom	DOF
Delta Pressure	DP, ΔP
Delta Time	DT
Dental Hand Drill	DHD

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Table 6-2. Name/acronym list (continued)

Full name	OpNom
Depot Maintenance	DM
Depress Assembly	DA
Descent Module (Soyuz return vehicle)	DM
Design Reference Mission	DRM
Diagnostic BIT	dBIT
Diagnostic Support System	DSS
Dielectric Resonance Oscillator	DRO
Digital Autopilot	DAP
Digital Multi-Meter	DMM
Digital Signal Processor	DSP
Digital Storage Scope	DSC
Digital Versatile Disc	DVD
Digital Voice Intercommunications System	DVIS
**Direct Current	DC
Direct Manipulation Interface Language	DMIL
Direct Memory Access	DMA
Discrete Input Output	DIO
Distributed Operating System	DOS
Distributed Sensor	DS
Docking & Berthing	D&B
Docking Berthing Module	DBM
Docking Port Data	DPD
Drive Locking Assembly	DLA
Dynamic Random Access Memory	DRAM
Early External Active Thermal Control	EEATC
Early External Active Thermal Control System	EEATCS
Earth Observing System	EOS
Earth-to-Orbit Vehicle	ETOV
Effector Conversion Set	ECS
Electric Power Consuming Equipment	EPCE
Electrical Flight Grapple Fixture	EFGF
Electrical Ground Support Equipment	EGSE
Electrical Interface Box	EIB
Electrical Power System	EPS
Electronic Erasable/Programmable Read Only Memory	EEPROM
Electrocardiogram	ECG

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Table 6-2. Name/acronym list (continued)

Full name	OpNom
Electromagnetic Capability Frequency Analysis	EMCFA
Electromagnetic Compatibility	EMC
Electromagnetic Effects	EME
Electromagnetic Interference	EMI
Electromyogram	EMG
Electronic Assembly	EA
Electronics Compartment	EC
Electronics Control Unit	ECU
Element Control Workstation	ECWS
Embedded Control Module	ECM
Embedded Controller Board	ECB
Embedded Data Processor	EDP
Embedded Data Processor Low Power	EDP-LP
Embedded Software	ES
Emergency Monitor & Distribution System	EMADS
Emergency Warning and Caution Advisory	EWCA
End Effector	EE
End of Life	EOL
End to End	ETE
Energy Storage Subsystem	ESS
Engineering Graphics Database	EGD
Engineering Operations & Integration	EO&I
Engineering Unit	EU
Environmental Control & Life Support System	ECLSS
Environmental Health System	EHS
Error Detection and Correction	EDAC
European Space Agency	ESA
Execute Function Configuration	EFC
Experiment Logistics Module	ELM
Exposed Facility	EF
Extended BIT	eBIT
Extended Data-Out	EDO
Extended Duration Crew Operations	EDCO
Extended Loss of Comm	ELOC
External Active Thermal Control System	EATCS
External Sampling Adapter	ESA

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Table 6-2. Name/acronym list (continued)

Full name	OpNom
External Self Test	EST
External Video Switch Unit	EVSU
Extravehicular	EV
**Extravehicular Activity	EVA
Extravehicular Activity Human Computer Interface Software	EHS
Extravehicular Activity System	EVAS
Extravehicular Excursion Unit	EEU
Extravehicular Maneuvering Unit Decontamination System	EMUDS
**Extravehicular Mobility Unit	EMU
Extravehicular Robotics	EVR
Extremely High Frequency	EHF
Fan Motor Controller	FMC
Fault Detection	FD
Fault Detection and Isolation	FDI
Fault Detection, Isolation, and Recovery	FDIR
Fault Isolator	FI
Fiber Distributed Data Interface	FDDI
Fiber Optic	F/O
Fiber Optic Cable	FOC
Fiber Optic Data Bus	FODB
Fiber Optics Rate Sensor	FORS
Field Effect Transistor	FET
Field of View	FOV
File Transfer Protocol	FTP
Fire Detection & Suppression	FDS
Fire Indicator (on a rack)	FI
Firmware	F/W, FW
Firmware Controller	FWC, FC
First Element Launch	FEL
First-In-First-Out	FIFO
Flat Panel Display	FPD
Flex Hose Interface Heat Exchanger	IFHX
Flight Crew Equipment	FCE
Flight Crew Systems	FCS

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Table 6-2. Name/acronym list (continued)

Full name	OpNom
Flight Day	FD
Flight Equivalent Unit	FEU
Flight Model	FM
Flight Off-the-Shelf	FOTS
Flight Releasable Grapple Fixture	FRGF
Flight Support Equipment	FSE
Flight Support Equipment Grapple Fixture	FSEGF
Floating Point Operations per Second	FLOPS
Flow Adjusting Assembly	FAA
Flow Control Valve	FCV
Fluid Quick Disconnect Coupling	FQDC
Free Onboard Delivery Site	FOB
Frequency-Division Multiple Access	FDMA
Fuel Cell	FC
Full Body Cleansing Compartment	FBCC
Full Power	FP
Full Scale High	FSH
Full Scale Low	FSL
Function/Sweep Generator	F/SG
Functional Cargo Block	FGB
Functional Inhibit	FI
Fungal Spore Sampler	FSS
Gas Chromatograph	GC
Gas Pressure Regulating Valve	GPRV
**Global Positioning System	GPS
Graphical User Interface	GUI
Graphics Interchange Format	GIF
**Gravity Gradient	GG
**Greenwich Mean Time	GMT
Ground Fault Interrupter	GFI
Ground Operated Robotics	GOR
Ground Processing	GP
Ground Rules and Constraints	GR&C
Ground Support Equipment	GSE
Ground Support Unit	GSU
Ground System	GS

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Table 6-2. Name/acronym list (continued)

Full name	OpNom
Guidance, Navigation & Control	GNC
Hardline	HL
Hardware	H/W, HW
Head Mounted Display	HMD
Health and Status	H&S, HS
Health Maintenance System	HMS
Heart Rate Monitor	HRM
Heat Exchanger	HX
High Data Rate	HDR
High Efficiency Particulate Air	HEPA
High Level Analog	HLA
High Voltage Power Supply	HVPS
High Rate	HR
High Rate Buffer Formatter	HBF
High Rate Buffer Formatter Optical	HBFO
High Rate Dosimeter	HRD
High Rate Multiplexer Switch	HRMS
High Speed	HS
High Speed Data Log	HSDL
Housekeeping & Trash Management	HKG
Human Computer Interface	HCI
Human Computer Interface Display Attribute Tool	HDAT
Human Machine Interface	HMI
IMU Processor Interface	IPI
Inflight Blood Collection System	IBCS
Inflight Maintenance	IFM
Information Sharing Protocol	ISP
Initial Condition	IC
Inner Gimbal	IG
** Input/Output	I/O, IO
Input/Output Controller Card	IOCC
Institute of Electrical and Electronic Engineers	IEEE
Institutional Robotics Tool	IRT
Instruction Set Architecture	ISA
Instrumentation Compartment (equipment area)	IC
Integrated Assembly & Checkout	IACO

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Table 6-2. Name/acronym list (continued)

Full name	OpNom
Integrated Drive Electronics	IDE
Integrated Equipment Assembly	IEA
Integrated Logistics Support	ILS
Integrated Motion Controller Actuator	IMCA
Integrated Motor Controller Assembly	IMCA
Integrated Station Executive	ISE
Integrated Truss Assembly	ITA
Integrated Truss Segment	ITS
Integrated Truss Structure	ITS
Integration & Test Equipment	I&TE
Inter-Module Ventilation	IMV
Intermediate Maintenance	IM
Internal Active Thermal Control System	IATCS
Internal Audio System	IAS
Internal Sampling Adapter	ISA
International Standard Payload Rack	ISPR
International Space Station	ISS
Intravehicular	IV
**Intravehicular Activity	IVA
Intravehicular Activity Control Station	IVACS
Inventory Management System	IMS
Ion Mobility Spectometry	IMS
Ion Selective Electrode Assembly	ISEA
Japanese Experiment Module	JEM
Lab Cradle Assembly	LCA
Lab Nitrogen System	LNS
Laboratory Support System	LSE
Latching End Effector	LEE
Lease Attached Pallet	LAP
Left Blanket Box	LBB
Less Significant Bit	LSB
**Light Emitting Diode	LED
Liquid Crystal Display	LCD
Liquid Crystal Panels	LCP
Liquid Sensor	LS
Load Cell	LC

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Table 6-2. Name/acronym list (continued)

Full name	OpNom
Load Distribution Unit	LDU
Load Control Assembly	LCA
Load Transfer Unit	LTU
Local Area Network	LAN
Local Bus	LB
Local Bus Transaction Monitor	LBTM
Local Data Interface	LDI
Local Vertical-Local Horizontal	LVLH
Logistics Support Analysis	LSA
Logical Data Processor	LDP
Logistics & Maintenance	L&M
Logistics Data & Integration	LD&I
Logistics Information System	LIS
Logistics Information System Program	LISP
Logistics Management Responsibility Transfer	LMRT
Logistics Support Module	LSM
Logistics Support System	LSS
Loop Crossover Assembly	LCA
Loss of Communication	LOC
Loss of Insight	LOI
**Loss of Signal	LOS
Low Data Rate	LDR
Low Earth Orbit	LEO
Low Level Analog	LLA
Low Power	LP
Low Rate	LR
Low Temperature Loop	LTL
Lower Body Negative Pressure	LBNP
Lower Limit	LL
Main Bus Controller Unit	MBCU
Main Bus Switching Unit	MBSU
Maintenance Data Management System	MDMS
Maintenance Switch Assembly	MSA
Maintenance Task	MT
Maintenance Work Area	MWA
Manual Pressure Equalization Valve	MPEV

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Table 6-2. Name/acronym list (continued)

Full name	OpNom
Mass Storage Unit	MSU
Mean-Time-Between-Failure	MTBF
Mean Time to Repair	MTR
Mechanical Assembly	MA
Medical Equipment Computer	MEC
Megabits per Second	MBPS
Metabolic Gas Analyzer System	MGAS
Metabolic Gas Monitor	MGM
Metal-to-Metal (Bond)	MTM
Microbial Air Sampler	MAS
Microbial Safety Cabinet	MSC
Microscopic Imaging System	MIS
Microscopic Video Camera	MVC
Mini-Pressurized Logistics Module	MPLM
**Mission Control Center Houston	MCC-H
**Mission Control Center Moscow	MCC-M
**Mission Elapsed Time	MET
Mobile Remote Servicer	MRS
Mobile Remote Servicer Base System	MBS
Mobile (communications) Satellite Program	MSAT
Mobile Servicing Center	MSC
Mobile Servicing Depot	MSD
Mobile Servicing System	MSS
Mobile Transporter	MT
Mobile Transporter Element	MTE
Moderate Temperature Loop	MTL
Module to Truss Structural Attachment System	MTSAS
Moment of Inertia	MOI
Motion Control System	MCS
Motor Drive Amplifier	MDA
Motor Drive Assembly	MDA
Motorized Bolt Assembly	MBA
Mobile Service System (MSS) Maintenance Depot	MMD
Multi-Channel Option	MCO
Multi-Layer Insulation	MLI
Multiplex Protocol Data Unit	MPDU

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Table 6-2. Name/acronym list (continued)

Full name	OpNom
Multiplexer Demultiplexer	MDM
National Space Transportation System	NSTS
National Space Development Agency	NASDA
National Television Standards Committee	NTSC
Negative Pressure Relief	NPR
Negative Pressure Relief Assembly	NPRA
Negative Pressure Relief Valve	NPRV
Network Operating System	NOS
Network Time Protocol	NTP
Next Higher Assembly	NHA
Nitrogen Introduction Assembly	NIA
Nitrogen Introduction Valve	NIV
Nitrogen Tank Assembly	NTA
Node Control Software	NCS
Non Real-time	NRT
Non Return to Zero-Level	NRZ-L
Non Return to Zero-Mark	NRZ-M
Nonmaskable Interrupt	NMI
Null Frame Generator	NFG
Off Scale High	OSH
Off Scale Low	OSL
Online Background Test	OBT
On-Orbit Maintenance	OOM
Onboard Short Term Plan	OSTP
Operating System	OS
Operational & Personal Equipment	OPE
Operational Control Software	OCS
Operational Sequence Health Monitoring	OSHM
Operations & Management Control Software	OMCS
Operations Data File	ODF
Orbital Maneuvering System	OMS
Orbital Replacement Unit	ORU
Orbital System Coordinates	OSC
Orbital Vehicle	OV
Organizational Maintenance	OM
Out of Limits	OOL

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Table 6-2. Name/acronym list (continued)

Full name	OpNom
Out the Window (view)	OTW
Outer Gimbal	OG
Packaging, Handling, Storage & Transportation	PHS&T
Pan-Tilt Unit	PTU
Part Number	P/N, PN
Partitions & Closeouts	PAR
Passive BIT	pBIT
Passive Common Berthing Mechanism	PCBM
Passive Thermal Control System	PTCS
**Payload	P/L,PL
Payload Accommodations Handbook	PAH
Payload Attach System	PAS
Payload Bay	PLB
Payload Data Grapple Fixture	PDGF
Payload Data Library	PDL
Payload Data Services System	PDSS
Payload Ethernet Hub Gateway	PEHG
Payload Operations Integration Center	POIC
Payload Power Switching Unit	PPSU
Pending Function Configuration	PFC
Performance Check	PC
Peripheral Component Interconnect	PCI
Peripheral Nerve Stimulator	PNS
Permanent Human Capability	PHC
Personal Computer Memory Card International Association	PCMCIA
Personal Hygiene System	PHS
Photovoltaic	PV
Photovoltaic Control Application	PVCA
Photovoltaic Controller	PVC
Photovoltaic Controller Unit	PVCU
Photovoltaic Radiator	PVR
Physical Integration	PI
Plasma Contactor Unit	PCU
Plume Check	PLMCHK
Point to Point	PTP

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Table 6-2. Name/acronym list (continued)

Full name	OpNom
Portable Breathing Apparatus	PBA
Portable Clinical Blood Analyzer	PCBA
Portable Computer Receptacle	PCR
Portable Computer	PC
Portable Computer System	PCS
Portable Fire Extinguisher	PFE
Portable Emergency Provisions	PEP
Positive Pressure Relief	PPR
Positive Pressure Relief Assembly	PPRA
Positive Pressure Relief Valve	PPRV
Power Converter Controller	PCC
Power/Data Interface Unit	PDIU
Power Distribution Box	PDB
Power Interface Unit	PIU
Power Level Control	PLC
Power Management and Distribution	PMD
Power Management Controller Application	PMCA
Power Management Controller Unit	PMCU
Power On Self Test	POST
Power Supply	PS
Power Supply Node	PSN
Power Switch Unit	PSU
Precooler	P/C
Pre-Positioned Load	PPL
Pressure Equalization Valve (commandable valve)	PEV
Pressure Transducer	PT
Pressurized Berthing Adapter	PBA
Pressurized Berthing Module	PBM
Pressurized Berthing Module Coordinate System	PBMCS
Pressurized Docking Adapter	PDA
Pressurized Logistics Carrier	PLC
Pressurized Logistics Module	PLM
Pressurized Mating Adapter	PMA
Preventive Maintenance	PM
Primary Instruction Block	PIB
Primary Power System (160 VDC)	PPS

Verify that this is the correct version before use

Table 6-2. Name/acronym list (continued)

Full name	OpNom
Private Medical Conference	PMC
Program Unique Identifier	PUI
**Programmable Read-Only Memory	PROM
Propulsion Module	PM
Propulsion Module Attachment System	PMAS
Psuedo Noise	PN
Pulse Frequency Modulation	PFM
Pulse-Width Modulation	PWM
Pump and Flow Control Subassembly	PFCS
Pump Package Assembly	PPA
Pump Motor Controller	PMC
Push Button	pb
PV Radiator Deployment System	PVRDS
Program Unique Identifier	PUI
PV Thermal Control Subsystem	PVTCS
**Quick Disconnect	QD
Quick Disconnect Motor Controller	QDMC
Rack Flow Control Assembly	RFCA
Rack Standalone Temperature Sensor	RSTS
Radiation Area Monitor	RAM
Radiator Beam Valve Module	RBVM
Radio Frequency	RF
**Random Access Memory	RAM
**Reaction Control System	RCS
**Read Only Memory	ROM
Ready to Latch	RTL
Ready to Latch Indicator	RTLI
Red-Green-Blue a color module	RGB
Receiver Processor Module	RPM
Recharge Ratio	RR
Reed-Solomon	R-S
Remote Bus Isolator	RBI
Remote Power Controller	RPC
Remote Power Controller Assembly	RPCA
Remote Power Controller Module	RPCM
Remote Power Distribution Assembly	RPDA

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Table 6-2. Name/acronym list (continued)

Full name	OpNom
Remote Manipulating System	RMS
Remotely Operated Electrical Umbilical	ROEU
Remote Terminal	RT
Remove and Replace	R&R
Resistive Exercise Device	RED
Resolver to Digital	RD
Resource Allocation Data System	RADS
Resource Utilization Products	RUP
Respiratory Support Pack	RSP
Restraints & Mobility Aids	RMA, R&MA
**Revolutions Per Minute	RPM
Right Blanket Box	RBB
Robotic Workstation	RWS
Rotary Fluid Management Device	RFMD
Rotary Joint Motor Controller	RJMC
Rotational Hand Controller	RHC
Russian to American Converter Unit	RACU
Russian Segment	RS
Safety & Mission Assurance	S&MA
Safing Remote Terminal	SRT
Sample Distribution System	SDS
Satellite Data System	SDS
Science Power Platform	SPP
Secondary Electrical Power System	SEPS
Secondary Power Control Application	SPCA
Secondary Power Controller	SPC
Secondary Power Distribution Assembly	SPDA
Secondary Power System	SPS
Segment to Segment Attach System	SSAS
Sequential Shunt Unit	SSU
Serial Number	S/N, SN
Service Module	SM
Shadow RAM	SRAM
Shadow RAM Block	SRAMB
Shared Memory Interface	SMI
Shop Replaceable Unit	SRU

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Table 6-2. Name/acronym list (continued)

Full name	OpNom
Shut Off Valve	SOV
Shuttle Based Wireless Instrumentation System	SWIS
Signal Program Unique Identifier	SPUI
Signal to Noise Ratio	SNR, S/N
Slide Staining Apparatus	SSA
Small Computer Systems Interface	SCSI
Smoke Detector	SD
Software	S/W, SW
Solar Array	SA
Solar Alpha Rotary Joint	SARJ
Solar Array Wing	SAW
Solar Power Module	SPM
Solenoid Driver Output	SDO
Solid State Power Amplifier	SSPA
Space Acceleration Measurement Unit	SAMS
Space Lab Pallet	SLP
Space Station	SS
Space Station Buffer Amplifier	SSBA
Space Station Cupola Coordinate System	SSCCS
Space Station Element	SSE
Space Station Manned Base	SSMB
Space Station PDGF Coordinate System	SSPCS
Space Station Program	SSP
Space Station Reference Coordinate System	SSRCS
Space Station Remote Manipulating System	SSRMS
Space Transportation System	STS
Space Vision System	SVS
Special Purpose Dexterous Manipulator	SPDM
Special Tools & Test Equipment	STTE
Squib Firing Unit	SFU
Standard Data Processor	SDP
Standard Module Equipment Rack	SMER
Standard Tool List	STL
Star Tracker	ST
Starboard Thermal Control Radiator	STCR
State of Charge	SOC

Verify that this is the correct version before use

Table 6-2. Name/acronym list (continued)

Full name	OpNom
Static Random Access Memory	SRAM
Station Management Controller	SMC
Stowage Integration	SI
Stowage Integration System	SIS
Structure and Mechanism	S&M
Surface Sampler Kit	SSK
Support Equipment	SE
Synchronization & Control Unit	SCU
Switch Enable Pulse	SWEP
System Health Monitoring Checks	SHMC
Systems Flow Control Assembly	SFCA
Systems Operating Procedure	SOP
Systems Operations Data File	SODF
**Talkback	tb
Telemetry Format List	TFL
Telemetry Mode	TM
Telemetry Object List	TOL
Television	TV
Temperature & Humidity Control	THC
Terminal Computer	TC
Test Control & Monitor System	TCMS
Test Null Frame Generator	TNFG
Test Pattern	TP
Thermal Control System	TCS
Thermal Radiator Rotary Joint	TRRJ
Three Way Mix Valve	TWMV
Time Distribution Generation System	TDS
Time Generation Unit	TGU
Time Out	T/O
Time/Prom	T/P
Time to go	Tgo
Time to Launch	L-Time
Tissue Equivalent Proportional Counter	TEPC
Torque Equilibrium Attitude	TEA
Total Organic Carbon Analyzer	TOCA
Tracking and Data Relay Satellite System	TDRSS

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Table 6-2. Name/acronym list (continued)

Full name	OpNom
Tracking System	TKS
Trailing Thermal Control Radiator	TTCR
Trailing Umbilical System Transceiver	TUST
Transfer Compartment	TC
Transfer Tunnel	TT
Translational Hand Controller	THC
Transparent Asynchronous Transceiver Interface	TAXI
UHF Communications System	UCS
**Ultra High Frequency	UHF
**Ultraviolet	UV
Umbilical Interface Assembly	UIA
Umbilical Mechanism Assembly	UMA
Universal Docking Module	UDM
Universal Resource Interface Panel	URIP
Universal Serial Bus	USB
Unpressurized Logistics Carrier	ULC
Unpressurized Logistics Carrier Attach System	ULCAS
Upper Limit	UL
User Application Software	UAS
Utility Port	UP
Vacuum Exhaust System	VES
Vacuum Resource System	VRS
Vent Relief Assembly	VRA
Vent Relief Valve	VRV
Vibration Isolation System	VIS
Video Assembly	VAS
Video Cassette Recorder	VCR
Video Control Unit	VCU
Video Distribution System	VDS
Video Distribution Unit	VDU
Video Graphics Array	VGA
Video Graphics Software	VGS
Video Switch	VSW
Video Switch Unit	VSU
Video Tape Recorder	VTR
Virtual Channel Data Unit	VCDU

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Table 6-2. Name/acronym list (concluded)

Full name	OpNom
Virtual Environmental Generator	VEG
Virtual Reality	VR
Volatile Organic Analyzer	VOA
Volts Direct Current	V_DC
Waste Collection System	WCS
Waste Gas	WG
Waste Management	WM
Watchdog Timer	WDT
Water Coolant Loop	WCL, H2O_Loop
Water Microbiology Kit	WMK
Water Recovery & Management	WRM
Water Sampler/Archiver	WS/A
White Sands Ground Terminal	WSGT
Working Compartment	WC
Workstation	WS
Zone of Exclusion	ZOE

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6.4 SYMBOLS GUIDELINES

The following symbols are acceptable for operational products. The symbols marked with ****** are mandatory. For additional symbols to be used in procedures, reference the ODF Standards, SSP 50253.

**	Equal	=
**	Greater Than	>
**	Less Than	<
**	Greater Than or = to	≥
**	Less Than or = to	≤
	Delta	Δ
**	Negative	-
**	Positive	+
	Number	#
	Phase	ϕ
	High	↑
	Low	↓

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7.0 CAUTION AND WARNING

This section addresses nomenclature guidelines for C&W messages and advisories. These guidelines are to be used to generate the text messages for the ISS C&W System events that will be displayed to the crew. These guidelines are based on an 80-character message line to be displayed on the Portable Computer System (PCS) displays. The basic format for a C&W message is as follows:

<Alarm Trace> <Alarm Status> <Alarm Severity> <Ack> <System> <Message Text><Date/Time>

A C&W message line is composed of the following information in order of priority, from left to right:

- Alarm Trace
  - *: Alarm Trace enabled
  - Blank: Alarm Trace disabled

- Alarm Status - 4 characters
  - Alrm: In alarm
  - Norm: Normal

- Alarm Severity - 1 character
  - E: Emergency (Class 1)
  - W: Warning (Class 2)
  - C: Caution (Class 3)
  - A: Advisory (Class 4)
  - R: Robotics Advisory (Class 5)

- ACK - 1 character
  - X: acknowledged
  - Blank: not acknowledged

- System name identifying where fault/condition occurred - 3 characters
  - CDH: Command and Data Handling
  - CHC: Crew Health Care System
  - CNT: Communications and Tracking
  - DMS: Columbus Data Management System

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EPS: Electrical Power System

ECL: Environmental Control and Life Support

EVA: Extra-Vehicular Activity

MCS: Motion Control System

MSS: Mobile Servicing System

PL: Payload

TCS: Thermal Control System

SNM: Structures and Mechanisms

- Message Text - 64 characters

  Includes equipment identification, fault/condition/event, location, and element identification. The wording of the message text should be spelled in English as much as possible. The wording should provide a logical explanation of the fault or failure. Exceptions may be used for well-known acronyms or for brevity to reduce the length of a line to fit the 64-character limit. If an abbreviation is needed, follow the rules and standards as specified in Section 6. The Message Text should have a suffix of the form “-Element Name.”

- Time of occurrence of event - 16 characters (DDMmmYY HH:MM:SS)

  DD Days of the Month Mmm Month
  YY/ Year
  HH: Hours (00 to 23)
  MM: Minutes (00 to 59)
  SS Seconds (00 to 59)

  Example: 23Oct01 09:10:12

Example:

STAT Cl ACK SYS Message (Subsys, Fault, Module/Location) Time

```
         1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890

*Alrm W  X ECL Cabin Press Low-Node 1                          DDMmmYY HH:MM:SS
*Alrm E    ECL FIRE - Smoke Detector 1-Node 1                  DDMmmYY HH:MM:SS
Alrm C   X CDH Primary CC MDM Detected Control Bus INT 1 Fail-LAB   DDD/HH:MM:SS
Norm  C  X EPS DDCU LA2A Trip-LAB                              DDMmmYY HH:MM:SS
```


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8.0 ISS ROBOTICS

Table 8-1 shows the agreed-upon nomenclature for the ISS Robotics systems. Refer to Partner-specific appendix for manipulator-unique nomenclature.

Table 8-1. ISS Robotics systems nomenclature

OpNom	Description
BP	Basepoint
EP	Elbow Pitch
ERA	European Robotic Arm
EMMI	EVA Man Machine Interface (ERA)
IMMI	IVA Man Machine Interface (ERA)
GF	Grapple Fixture
JEMRMS	Japanese Experiment Module Remote Manipulator System
MA	Main Arm (JEMRMS)
MBS	Mobile Base System
MSS	Mobile Servicing System
MT	Mobile Transporter
POC	Point of Control
POR	Point of Resolution
RWS	Robotic Workstation (JEMRMS and MSS)
SFA	Small Fine Arm (JEMRMS)
SJ	Single Joint
SP	Shoulder Pitch
SPDM	Special Purpose Dexterous Manipulator
SR	Shoulder Roll
SRMS	Shuttle Remote Manipulator System
SSRMS	Space Station Remote Manipulator System
SY	Shoulder Yaw
WP	Wrist Pitch
WR	Wrist Roll
WY	Wrist Yaw

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9.0 VIDEO/CAMERA NOMENCLATURE

Table 9-1 shows the nomenclature for the internal camera port (display purposes).

Table 9-1. Internal camera port nomenclature

OpNom	Description	Module
HAB Camr	Internal HAB Camera Port	USOS HAB
LAB Camr	Internal LAB Camera Port	USOS LAB
Node1 Camr	Internal Node 1 Camera Port	USOS Node 1
Node2 Camr	Internal Node 2 Camera Port	USOS Node 2
ESA Camr	Internal ESA Camera Port	ESA COL
JEM Int S Camr	Internal JEM PM STB-A Camera Port	JEM PM
JEM Int P Camr	Internal JEM PM PRT-B Camera Port	JEM PM
JEM Int O Camr	Internal JEM ELM-PS Camera Port	JEM ELM-PS

Table 9-2 lists the video sources that can be routed automatically to the MSS Robotics Workstation in response to manipulation of the pushbuttons on the Display and Control panel. The abbreviations in the left column will be used in a 6-character field of the video monitor overlay displays that are documented in JSC-33322. The "_" symbol is used to denote a space in the abbreviation. Operations Nomenclature for internal video sources is documented in a separate table.

Table 9-2. Video sources nomenclature

OpNom	Description
S3_AFT	S3 Aft (Bay 19)
S1UPOB	S1 Upper Outboard (Bay 15)
S1LOOB	S1 Lower Outboard (Bay 15)
S1UPIB	S1 Upper Inboard (Bay 5)
S1LOIB	S1 Lower Inboard (Bay 5)
P1UPIB	P1 Upper Inboard (Bay 6)
P1LOIB	P1 Lower Inboard (Bay 6)
P1UPOB	P1 Upper Outboard (Bay 16)
P1LOOB	P1 Lower Outboard (Bay 16)
P3_AFT	P3 Aft (Bay 20)
NOD2LO	Node 2 Nadir
NOD1UP	Node 1 Zenith
LAB_S	LAB Starboard/Zenith

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Table 9-2. Video sources nomenclature (continued)

OpNom	Description
HAB_S	HAB Starboard/Forward
BASE	SSRMS Base LEE Camera
B_ELB	SSRMS Base Boom (Elbow) Camera
T_ELB	SSRMS Tip Boom (Elbow) Camera
TIP	SSRMS Tip LEE Camera
POA	MBS POA Camera
MBS	MBS CLPA Camera (Central Location)
MBS_L	MBS CLPA Launch Camera (Keel Location)
BODY_L	SPDM Body Camera 1 (Left)
BODY_R	SPDM Body Camera 2 (Right)
DM_LEE	SPDM LEE Camera
OTCM_L	SPDM OTCM Camera 1 (Left)
OTCM_R	SPDM OTCM Camera 2 (Right)
DM_PL1	SPDM OTCM Payload Camera 1
DM_PL2	SPDM OTCM Payload Camera 2
MSSPL1	MSS Payload Camera 1
MSSPL2	MSS Payload Camera 2
MSSPL3	MSS Payload Camera 3
MSSPL4	MSS Payload Camera 4
MSSPL5	MSS Payload Camera 5
JEM1	JEM Channel 1
JEM2	JEM Channel 2
COL1	COL Channel 1
COL2	COL Channel 2
ORB1	Orbiter Channel 1
ORB2	Orbiter Channel 2
AVU1A	AVU1 Channel A
AVU1B	AVU1 Channel B
AVU2A	AVU2 Channel A
AVU2B	AVU2 Channel B
VTR1	VTR1 PLAYBACK
VTR2	VTR2 PLAYBACK
MUX1	SCU 1 MUX Output
MUX2	SCU 2 MUX Output
TEST1	SCU 1 Test Pattern
TEST2	SCU 2 Test Pattern

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Table 9-2. Video sources nomenclature (concluded)

OpNom	Description
LABCAM	LAB Camcorder
AL_CAM	Airlock Camcorder
N1_CAM	Node 1 Camcorder
HABCAM	HAB Camcorder
LAB1D3	ISPR LAB1D3
LAB1P2	ISPR LAB1P2
LAB1P4	ISPR LAB1P4
LAB1O5	ISPR LAB1O5
LAB1O4	ISPR LAB1O4
LAB1O3	ISPR LAB1O3
LAB1O2	ISPR LAB1O2
LAB1O1	ISPR LAB1O1
LAB1S1	ISPR LAB1S1
LAB1S2	ISPR LAB1S2
LAB1S3	ISPR LAB1S3
LAB1S4	ISPR LAB1S4

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10.0 ISS HIERARCHY <TBR 10.1: HIERARCHY>

10.1 PURPOSE

The ISS Hierarchy represents an integrated framework by which training and operations products can be consistently organized throughout the ISS program and to provide a logical standard order from which these products follow.

The ISS Hierarchy consists of two different hierarchical organizations: functional and physical. The functional hierarchy describes the functionalities provided by the ISS (e.g., provides power, provides a habitable environment, etc.). The physical hierarchy describes a physical breakdown of the ISS (e.g., ISS, element, module, etc.).

Operations products will be organized either by the functional or by the physical hierarchy, and possibly, where applicable, by both. Examples of operations products, which would be organized by the functional hierarchy, include the following:

- Development of integrated flight planning products and ISS Crew Loading Report
- Onboard documentation (ODF)
- Crew Qualification & Responsibility matrices
- Databases to support the development of training
- Training materials
- Displays on laptops

Examples of operations products, which are organized per the physical hierarchy, include the following:

- Schematics
- Imagery
- Inventory
- Location coding

All ISS operations products will follow the hierarchy unless there is a safety/mission success or operationally compelling reason not to. Exceptions will be documented by waiver. Current products that are not organized per the hierarchy do not need to be immediately upgraded. However, it is the program goal to have all ISS operations and training products follow the hierarchy by the end of calendar year 2002 unless “grand-fathered” and documented, due to cost impacts.

Each operations product owner will determine the level in the ISS Hierarchy to which they organize their products. Eighteen months prior to a Partner adding a new component to the ISS, that partner will be responsible for submitting a CR to the Operations Nomenclature to update the ISS Hierarchy to reflect the component addition. The ISS Hierarchy will be approved and controlled by the ODFCB.

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10.2 FUNCTIONAL HIERARCHY

The current, approved ISS Functional Hierarchy is located in Section 10.4. The functional hierarchy consists of the following levels: groups, systems, subsystems, and where required, sub-subsystems. The group level is independent of element. The systems and subsystems levels may be element specific. The ordered structure of the ISS Hierarchy is shown below:

Group	Acronym
1. Command and Data Group (including C&W)	CDG
2. Communication and Tracking Group	CTG
3. Environment Control (and Life Support) Group	ECG
4. Electrical Power Group	EPG
5. Motion Control Group	MCG
6. Structures and Mechanisms Group	SMG
7. Thermal Control Group	TCG
8. Crew Support Group	CSG
9. EVA Group	EVG
10. Integrated Medical Group	IMG
11. Maintenance & Repair Group	MRG
12. Payloads Group	PLG
13. Robotics Group	RBG
14. Transfer Vehicles Group	TVG

For the purposes of determining the order of the Groups within the hierarchy, the Groups have been divided into two categories based on their relative importance to the operation of the ISS. Groups 1-7 represent core functions of the ISS that are considered of equal importance. The remaining groups are of equal importance to each other but are ancillary to the core functions. Within each category the Groups are arranged alphabetically by their English acronyms.

In addition, at the Group level there are Integrated Operations that integrate or utilize the functionality of multiple Groups to accomplish a given function or task. Similarly, there may be integrated operations at lower levels of the hierarchy as well. Examples of Integrated Operations are the following:

- Emergency Operations
- Station Reconfiguration
- Activation/Deactivation
- Stowage/Inventory

An icon will be associated with each functional hierarchical group. These icons shall be controlled and maintained by the Integrated Display and Graphics Standards (IDAGS) Panel in the ISS Displays and Graphics Commonality Standard (DGCS), SSP 50313.

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A numerical representation of the functional hierarchy will also be maintained by the ODFCB. The purpose for this numerical representation and details are described in Section 10.2.1.

10.2.1 FUNCTIONAL HIERARCHY NUMBERING SYSTEM

TBD

10.3 PHYSICAL HIERARCHY

TBD

10.4 APPROVED FUNCTIONAL HIERARCHY

Approved functional hierarchy is shown in Table 10-1.

Verify that this is the correct version before use

Table 10-1. Approved functional hierarchy

Vehicle	Groups/ Integrated Ops	Systems	Subsystems	Sub-subsystems	Hierarchy no.	Category no.
ISS						
	IO 1 - Emergency Ops.				01	05
		Rapid Depress			01	05.05
		Fire			01	05.10
		Toxic Atmosphere			01	05.15
	IO 2 - ISS Reconfiguration				01	10
	IO 3 - Activation/ Deactivation				01	15
	IO 4 - Stowage/ Inventory				01	20
		Transfer Operations			01	20.05
		Stowage Operations			01	20.10
		Inventory Management System (IMS)			01	20.15
	Command & Data Group				01.01	0
		Operations Local Area Network (Ops LAN)			01.01.05	0
			Station Support Computer (SSC)		01.01.05.05	0
		Command & Data Handling (CDH)			01.01.10	0
			Portable Computer System (PCS)		01.01.10.05	
			1553 Network		01.01.10.10	
			Caution & Warning (C&W)		01.01.10.15	

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Table 10-1. Approved functional hierarchy (continued)

Vehicle	Groups/ Integrated Ops	Systems	Subsystems	Sub-subsystems	Hierarchy no.	Category no.
		Бортовая вычислительная система (БВС) Onboard Computer System			01.01.15	0
			System Software		01.01.15.05	0
			RS ISS Control Modes		01.01.15.10	0
			Computer Equipment, Networks, Laptops		01.01.15.15	0
		Система управления бортовым комплексом (СУБК/А) Onboard Equipment Control System			01.01.20	0
			SM Система управления бортовой аппаратурой (СУБА) SM Onboard Equipment Control System		01.01.20.05	0
			FGB Система управления бортовым комплексом (СУБК) FGB Onboard Equipment Control System		01.01.20.10	0

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Table 10-1. Approved functional hierarchy (continued)

Vehicle	Groups/ Integrated Ops	Systems	Subsystems	Sub-subsystems	Hierarchy no.	Category no.
			FGB Система интеграции и согласования (СИС) FGB Integration & Matching System		01.01.20.15	0
	Communication & Tracking Group				01.02	0
		Communication & Tracking (C&T)			01.02.05	0
			Audio		01.02.05.05	0
			Video		01.02.05.10	0
			Early Comm		01.02.05.15	0
			S-band		01.02.05.20	0
			Ku-band		01.02.05.25	0
			Ultrahigh Frequency (UHF)		01.02.05.30	0
		Система бортовых измерений (СБИ) Onboard Measurement System			01.02.10	0
			Радиотелеметрическая система (БР-9ЦУ) Radiotelemetry System		01.02.10.05	0
			Бортовая измерительная телеметрическая система (БИТС) Flight Data Telemetry System		01.02.10.10	0

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Table 10-1. Approved functional hierarchy (continued)

Vehicle	Groups/ Integrated Ops	Systems	Subsystems	Sub-subsystems	Hierarchy no.	Category no.
			Аппаратура сбора сообщений модулей (АСС) Message Acquisition Hardware		01.02.10.15	0
			Транзит Transit		01.02.10.20	0
		Бортовой радиотехнический комплекс (БРТК) Onboard Communication Complex			01.02.15	0
			Регул-Радиотехническая система управления и связи (РСУС) Regul-OS Radio Control & Comm System		01.02.15.05	0
			Лира-Бортовая радиотехническая система (БРС) Lira-Onboard Radio System		01.02.15.10	0
			SM Система телефонно-телеграфной связи (СТТС) SM Comm System		01.02.15.15	0

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Table 10-1. Approved functional hierarchy (continued)

Vehicle	Groups/ Integrated Ops	Systems	Subsystems	Sub-subsystems	Hierarchy no.	Category no.
			Телевизионная система (ТВС) Television System		01.02.15.20	0
			Радиоконтроль орбиты (РКО) Orbit Radio Tracking Hardware		01.02.15.25	0
			Радиотехнические системы модулей Modules' Radio Systems		01.02.15.30	0
			Компарус Komparus (Uplink system for FGB)		01.02.15.35	0
			Межкомпьютерный обмен "Борт-Земля-Борт" (МКО) Packet Comm		01.02.15.40	0
	Environmental Control Group (ECG)				01.03	0
		Environmental Control & Life Support System (ECLSS)			01.03.05	0
			Atmosphere Control & Supply (ACS)		01.03.05.05	0
			Atmosphere Revitalization (AR)		01.03.05.10	0
			Fire Detection & Suppression (FDS)		01.03.05.15	0

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Table 10-1. Approved functional hierarchy (continued)

Vehicle	Groups/ Integrated Ops	Systems	Subsystems	Sub-subsystems	Hierarchy no.	Category no.
			Water Recovery & Management (WRM)		01.03.05.20	0
			Temperature & Humidity Control (THC)		01.03.05.25	0
		Flight Crew System			01.03.10	0
			Housekeeping & Trash Management		01.03.10.05	0
		Средства жизнеобеспечения (СОЖ) Life Support System			01.03.15	0
			Средства обеспечения газового состава (СОГС) Atmospheric Revitalization System		01.03.15.05	0
			Система водообеспечения (СВО) Water Supply System		01.03.15.10	0
			Санитарно-гигиеническое оборудование (СГО) Hygiene Maintenance System		01.03.15.15	0

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Table 10-1. Approved functional hierarchy (continued)

Vehicle	Groups/ Integrated Ops	Systems	Subsystems	Sub-subsystems	Hierarchy no.	Category no.
			SM Система противопожарной защиты (СППЗ) Fire Protection Equipment		01.03.15.20	0
			FGB Средства пожарообнаружения и пожаротушения (СПОПТ) FGB Fire Detection & Suppression		01.03.15.25	0
		Integrated Food Supply			01.03.20	0
			Система обеспечения пищей (СОП) Food Supply System		01.03.20.05	0
			U.S. Food & Galley		01.03.20.10	0
	Electrical Power Group (EPG)				01.04	0
		Electrical Power System (EPS)			01.04.05	0
			Primary Power System		01.04.05.05	0
			Secondary Power System		01.04.05.10	0
		Система энергоснабжения (СЭС) Electrical Supply System			01.04.10	0

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Table 10-1. Approved functional hierarchy (continued)

Vehicle	Groups/ Integrated Ops	Systems	Subsystems	Sub-subsystems	Hierarchy no.	Category no.
			SM Система электропитания (СЭП) SM Electrical Power System		01.04.10.05	0
			SM Система ориентации солнечных батарей (СОСБ) SM Solar Array Orientation System		01.04.10.10	0
			FGB Система электроснабжения (СЭС) FGB Electrical Supply System		01.04.10.15	0
			FGB Система ориентации солнечных батарей (СОСБ) FGB Solar Array Orientation System		01.04.10.20	0
	Motion Control Group (MCG)				01.05	0
		Motion Control System (MCS)			01.05.05	0
			Attitude Control System (ACS)		01.05.05.05	0
			Attitude & State Determination System (ASDS)		01.05.05.10	0

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Table 10-1. Approved functional hierarchy (continued)

Vehicle	Groups/ Integrated Ops	Systems	Subsystems	Sub-subsystems	Hierarchy no.	Category no.
		Исполнительные элементы Actuator Elements			01.05.10	0
			SM Объединённая двигательная установка (ОДУ) SM Integrated Propulsion System		01.05.10.05	0
			FGB Система перекачки топлива (СПТ) FGB Propellant Refueling System		01.05.10.10	0
			Силовые гироскопы Powered Gyroscopes		01.05.10.15	0
			Комбинированная двигательная установка транспортных и грузовых кораблей Transport/Cargo Vehicle Propulsion System		01.05.10.20	0
		Система управления движением и навигацией (СУДН) Guidance, Navigation & Motion Control System			01.05.15	0

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Table 10-1. Approved functional hierarchy (continued)

Vehicle	Groups/ Integrated Ops	Systems	Subsystems	Sub-subsystems	Hierarchy no.	Category no.
			Датчиковая аппаратура Sensor Hardware		01.05.15.05	0
			Режимы СУДН Modes of Motion Control System		01.05.15.10	0
			Оптико-визуальные средства (ОВС) Optical Visual Equipment		01.05.15.15	0
	Structures & Mechanisms Group (SMG)				01.06	0
		Structures & Mechanisms (S&M)			01.06.05	0
			Common Berthing Mechanism (CBM)		01.06.05.05	0
			Manual Berthing Mechanism (MBM)		01.06.05.10	0
			Lab Cradle Assembly (LCA)		01.06.05.15	0
			Common Attachment System (CAS)		01.06.05.20	0
			Segment-to-Segment Attach System (SSAS)		01.06.05.25	0
			Rocketdyne Truss Attachment System (RTAS)		01.06.05.30	0
			Structure Repair Kits		01.06.05.35	0

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Table 10-1. Approved functional hierarchy (continued)

Vehicle	Groups/ Integrated Ops	Systems	Subsystems	Sub-subsystems	Hierarchy no.	Category no.
			Androgynous Peripheral Attachment System (APAS)		01.06.05.40	0
		Конструкция и компоновка (КИК) Design & Configuration			01.06.10	0
			Схема размещения оборудования Hardware Layout		01.06.10.05	0
			Элементы конструкций Structural Elements		01.06.10.10	0
		Система стыковки (СС) Docking System			01.06.15	0
			Система стыковки и внутреннего перехода (ССВП) Docking & Internal Transfer System		01.06.15.05	0
			Система стыковки и внутреннего перехода гибридная (ССВП-Г) Hybrid Docking & Internal Transfer System		01.06.15.10	0
			Андрогинная периферийная система стыковки (АПСС) Androgynous Peripheral Docking System		01.06.15.15	0

Verify that this is the correct version before use

Table 10-1. Approved functional hierarchy (continued)

Vehicle	Groups/ Integrated Ops	Systems	Subsystems	Sub-subsystems	Hierarchy no.	Category no.
			Автоматическая система перестыковки (АСП) Automated Redocking System		01.06.15.20	0
	Thermal Control Group (TCG)				01.07	0
		Thermal Control System (TCS)			01.07.05	0
			Early External Thermal Control System (EETCS)		01.07.05.05	0
			External Thermal Control System (ETCS)		01.07.05.10	0
			Internal Thermal Control System (ITCS)		01.07.05.15	0
			Passive Thermal Control System (PTCS)		01.07.05.20	0
		SM Система обеспечения теплового режима (SM СОТР) SM Thermal Mode Control System			01.07.10	0
			Система управления (СУ) СОТР Control System (СУ) for SM СОТР		01.07.10.05	0

Verify that this is the correct version before use

Table 10-1. Approved functional hierarchy (continued)

Vehicle	Groups/ Integrated Ops	Systems	Subsystems	Sub-subsystems	Hierarchy no.	Category no.
			Система вентиляции (СВ) Ventilation System		01.07.10.10	0
			Система терморегулирования (СТР) Active Thermal Control System		01.07.10.15	0
				Контур обогрева (КОБ) Internal Thermal Control Loop	01.07.10.15.05	0
				Контур охлаждения (КОХ) External Thermal Control Loop	01.07.10.15.10	0
			Система кондиционирования воздуха (СКВ) Air Conditioning System		01.07.10.20	0
			Централизованная система теплообмена (ЦСТО) Centralized Heat Rejection System		01.07.10.25	0

Verify that this is the correct version before use

Table 10-1. Approved functional hierarchy (continued)

Vehicle	Groups/ Integrated Ops	Systems	Subsystems	Sub-subsystems	Hierarchy no.	Category no.
			Средства пассивного терморегулирования (СТР-П) Passive Thermal Control System		01.07.10.30	0
		FGB Система обеспечения теплового режима (FGB СОТР) FGB Thermal Mode Control System			01.07.15	0
			Система терморегулирования (СТР) Active Thermal Control System		01.07.15.05	0
				Внутренний гидравлический контур (ВГК) Internal Thermal Control Loop	01.07.15.05.05	0
				Наружный гидравлический контур (НГК) External Thermal Control Loop	01.07.15.05.10	0

Verify that this is the correct version before use

Table 10-1. Approved functional hierarchy (continued)

Vehicle	Groups/ Integrated Ops	Systems	Subsystems	Sub-subsystems	Hierarchy no.	Category no.
			Средства пассивного терморегулирования (СТР-П) Passive Thermal Control System		01.07.15.10	0
			Система вентиляции (СВ) Ventilation System		01.07.15.15	0
	Crew Support Group (CSG)				01.08	0
		ODF/Manual Procedure Viewer (MPV)			01.08.05	0
			Station ODF (SODF)		01.08.05.05	0
			Russian ODF (RODF)		01.08.05.10	0
		Crew Onboard Support System (COSS)			01.08.10	0
			Training Software		01.08.10.05	0
			Hand-over Tools		01.08.10.10	0
			Reference Materials		01.08.10.15	0
			Crew Psychological Support		01.08.10.20	0
		Training Hardware & Support			01.08.15	0
			Training Hardware		01.08.15.05	0
			Onboard Training		01.08.15.10	0
		Photo/Video			01.08.20	0
			Видеокомплекс LIV LIV Video Complex		01.08.20.05	0
			Digital Cameras		01.08.20.10	0

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Table 10-1. Approved functional hierarchy (continued)

Vehicle	Groups/ Integrated Ops	Systems	Subsystems	Sub-subsystems	Hierarchy no.	Category no.
			Photographic Equipment		01.08.20.15	0
			Глиссер Glisser		01.08.20.20	0
		Audio			01.08.25	0
			Комплекс АГАТ AGAT Complex		01.08.25.05	0
		Аппаратура любительской радиосвязи (ЛРС) Ham Radio			01.08.30	0
		Flight Crew Equipment			01.08.35	0
			Personal Hygiene Equipment		01.08.35.05	0
			Crew Preference Items		01.08.35.10	0
			Clothing		01.08.35.15	0
	Extravehicular Activity Group (EVG)				01.09	0
		IO 1 - Russian Segment Generic EVA Operations			01.09	05
			EVA Preparations		01.09	05.05
			Depress/Repress		01.09	05.10
			Generic EVA Tasks		01.09	05.15
			Orlan Operations During EVA		01.09	05.20
			Post EVA Operations		01.09	05.25

Verify that this is the correct version before use

Table 10-1. Approved functional hierarchy (continued)

Vehicle	Groups/ Integrated Ops	Systems	Subsystems	Sub-subsystems	Hierarchy no.	Category no.
			EVA Hardware Maintenance		01.09	05.30
		IO 2 - U.S. Segment Generic EVA Operations			01.09	10
			EVA Preparations		01.09	10.05
			Depress/Repress		01.09	10.10
			Generic EVA Tasks		01.09	10.15
			EMU Operations During EVA		01.09	10.20
			Post EVA Operations		01.09	10.25
			EVA Hardware Maintenance		01.09	10.30
		IO 3 - Specific EVA Procedures by Increment/Flight			01.09	15
		Russian Segment EVA Hardware			01.09.05	0
			Orlan		01.09.05.05	0
			Orlan SAFER		01.09.05.10	0
			EVA Support and Airlock Operations Equipment (СШОВ)		01.09.05.15	0
			EVA Tools and Equipment		01.09.05.20	0
			Russian Segment Exterior		01.09.05.25	0

Verify that this is the correct version before use

Table 10-1. Approved functional hierarchy (continued)

Vehicle	Groups/ Integrated Ops	Systems	Subsystems	Sub-subsystems	Hierarchy no.	Category no.
		U.S. Segment EVA Hardware			01.09.10	0
			EMU		01.09.10.05	0
			EMU SAFER		01.09.10.10	0
			Joint Airlock		01.09.10.15	0
			EVA Tools and Equipment		01.09.10.20	0
			U.S. Segment Exterior		01.09.10.25	0
	Integrated Medical Group (IMG)				01.10	0
		Crew Health Care System (CHeCS)			01.10.05	0
			Health Maintenance System (HMS)		01.10.05.05	0
				Health Status Evaluations	01.10.05.05.05	0
				Diagnosis and Therapy	01.10.05.05.10	0
				EVA Medical Monitoring	01.10.05.05.15	0
			Countermeasures System (CMS)		01.10.05.10	0
				Physical Exercise and Evaluation	01.10.05.10.05	0
				Behavioral Health and Performance	01.10.05.10.10	0

Verify that this is the correct version before use

Table 10-1. Approved functional hierarchy (continued)

Vehicle	Groups/ Integrated Ops	Systems	Subsystems	Sub-subsystems	Hierarchy no.	Category no.
			Environmental Health System (EHS)		01.10.05.15	0
				Radiation	01.10.05.15.05	0
				Toxicology	01.10.05.15.10	0
				Microbiology	01.10.05.15.15	0
				Water Quality	01.10.05.15.20	0
				Acoustics	01.10.05.15.25	0
		Medical Support System (CMO)			01.10.10	0
			Means of Crew Health Maintenance		01.10.10.05	0
				Medical Monitoring and Evaluation Hardware	01.10.10.05.05	0
				Means of Rendering Medical Aid	01.10.10.05.10	0
				EVA Medical Monitoring	01.10.10.05.15	0
				Means of Sanitary-Hygiene Support	01.10.10.05.20	0
			Prevention of Deleterious Effects of Space Flight		01.10.10.10	0
				Means of Physical Countermeasures	01.10.10.10.05	0

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Table 10-1. Approved functional hierarchy (continued)

Vehicle	Groups/ Integrated Ops	Systems	Subsystems	Sub-subsystems	Hierarchy no.	Category no.
				Means of Pharmacological Countermeasures	01.10.10.10.10	0
				Means of Psychological Support	01.10.10.10.15	0
			Environmental Health System (EHS)		01.10.10.15	0
				Radiation Dosimetry Monitoring System	01.10.10.15.05	0
				Means of Maintaining and Monitoring Atmospheric Purity	01.10.10.15.10	0
		NASA Operational Biomedical Research			01.10.15	0
			Science Monitoring Objective		01.10.15.05	0
			Systems Development Test Objective (SDTO)		01.10.15.10	0
			Risk Mitigation Experiment (RME)		01.10.15.15	0
		Медико-биологические исследования Biomedical Research RU/P			01.10.20	0

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Table 10-1. Approved functional hierarchy (continued)

Vehicle	Groups/ Integrated Ops	Systems	Subsystems	Sub-subsystems	Hierarchy no.	Category no.
	Maintenance & Repair Group (MRG)				01.11	0
		American IVA Tools (Includes Diagnostic Equipment)			01.11.05	0
			Tools		01.11.05.05	0
			Diagnostic Tools		01.11.05.10	0
			Materials		01.11.05.15	0
		Русские инструменты для ВнКД Russian IVA Tools			01.11.10	0
			Инструменты Tools		01.11.10.05	0
			Диагностическое оборудование Diagnostic Tools		01.11.10.10	0
			Материалы Materials		01.11.10.15	0
		Generic Tasks			01.11.15	0
	Payloads Group (PLG)				01.12	0
		TBD				0

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Table 10-1. Approved functional hierarchy (concluded)

Vehicle	Groups/Integrated Ops	Systems	Subsystems	Sub-subsystems	Hierarchy no.	Category no.
	Robotics Group (RBG)				01.14	0
		Mobile Servicing System			01.14.05	0
			Mobile Transporter (MT) [USA]		01.14.05.05	0
			Mobile Servicing System Base Structure (MBS) [Canada]		01.14.05.10	0
			Space Station Remote Manipulator System (SSRMS) [Canada]		01.14.05.15	0
			Special Purpose Dexterous Manipulator (SPDM) [Canada]		01.14.05.20	0
			Artificial Vision Unit (AVU)		01.14.05.25	0
			Remote Workstation (RWS)		01.14.05.30	0
		European Robotic Arm (ERA)			01.14.15	0
			EVA Man-Machine Interface		01.14.15.05	0
			IVA Man-Machine Interface		01.14.15.10	0
	Transfer Vehicles Group				01.15	0
		TBD				0

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11.0 VERBAL COMMUNICATION

The English and Russian phonetic alphabets are shown in Table 11-1 and Table 11-2.

Table 11-1. English Phonetic Alphabet

A	Alpha
B	Bravo
C	Charlie
D	Delta
E	Echo
F	Foxtrot
G	Golf
H	Hotel
I	India
J	Juliet
K	Kilo
L	Lima
M	Mike
N	November
O	Oscar
P	Papa
Q	Quebec
R	Romeo
S	Sierra
T	Tango
U	Uniform
V	Victor
W	Whiskey
X	X-ray
Y	Yankee
Z	Zulu

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Table 11-2. Russian Phonetic Alphabet

А	АННА	ah
Б	БОРИС	b
В	ВАСИЛИЙ	v
Г	ГРИГОГИЙ	g
Д	ДМИТРИЙ	d
Е	ЕЛЕНА	ye
Ж	ЖЕНЯ	zh
З	ЗИНАИДА	z
Й	ИВАН	ee
И	ИВАН КАТКИЙ	
К	КОНСТАНТИН	k
Л	ЛЕОНИД	l
М	МИХАИЛ	m
Н	НИКОЛАЙ	n
О	ОЛЬГА	o
П	ПАВЕЛ	p
Р	РОМАН	r
С	СЕМЁН	s
Т	ТАТЬЯНА	t
У	УЛЬЯНА	oo
Ф	ФЁДОП	f
Х	ХАРИТОН	kh
Ц	ЦАПЛЯ	ts
Ч	ЧЕЛОВЕК	ch
Ш	ШУРА	sh
Щ	ЩУКА	shch
Э	ЭХО	eh
Ю	ЮРИЙ	yoo
Я	ЯКОВ	ya
Ы	ЕРЫ	
Ь	МЯГКИЙ ЗНАК	
Ъ	ТВЁРДЫЙ ЗНАК	

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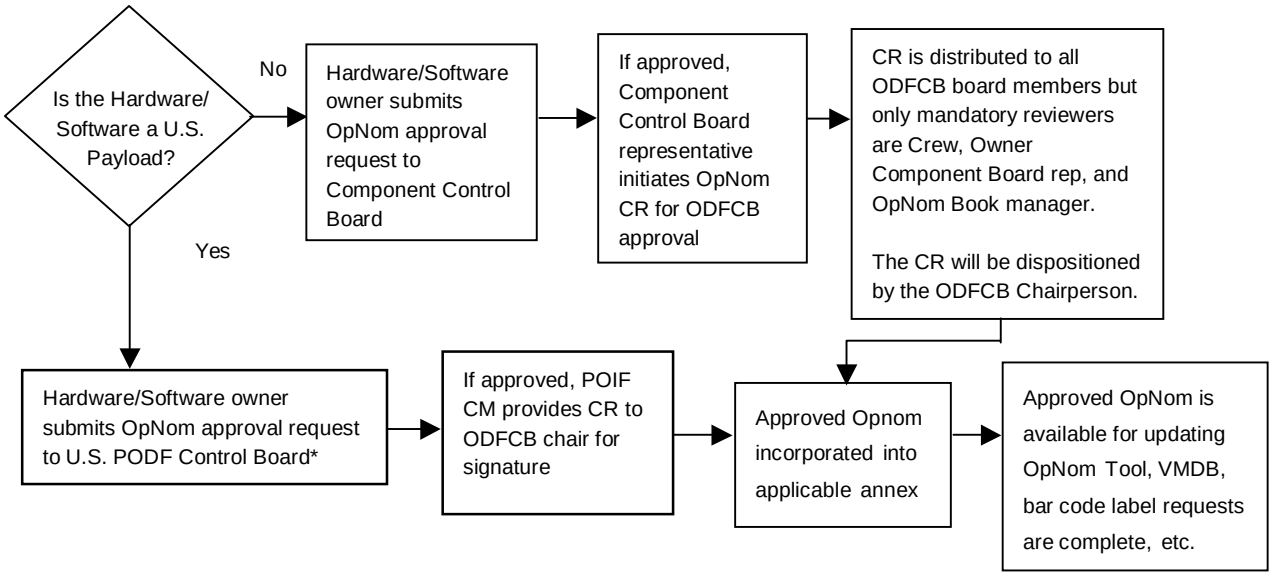
12.0 PROCESSES

12.1 OPERATIONS NOMENCLATURE ANNEX APPROVAL PROCESS

The following process is used for obtaining hardware or software Operations Nomenclature approval. Generic Operation Nomenclature change process is discussed in Section 1.5.



This process needs a quick turnaround (~ 1 - 2 weeks)

<u>*Mandatory reviewers are the Operations Nomenclature book manager, PODFCB chairperson, and PODF CB representative. The ODFCB chairperson and all members of PODFCB and ODFCB are optional reviewers.</u>

12.2 WAIVER PROCESS

The following steps are for generating an Operations Nomenclature waiver and how to submit it to the Procedures Management Office for review.

1. Identify the operation product conflict with the Operations Nomenclature guidelines.

2. Provide the following information on an Operations Nomenclature Waiver Form. This form is available electronically.

   (a) ODFCB waiver tracking number - To be assigned by the ODFCB.

   (b) Date - Date the waiver is initiated.

   (c) Initiator name/phone number - Name of the person who initiated the waiver and his/her phone number.

   (d) Organization/address - Who the initiator represents and how he/she can be reached (partner identifier, mailcode, e-mail address).

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(e) Effectivity - Is the waiver temporary or permanent? If temporary, how long is the initiator requesting it to be in effect?

(f) Correction Date - What ODF delivery will it be corrected in?

(g) Justification - Justification for why the nomenclature cannot conform to guidelines.

(h) Management Name/Title/Date - Initiator obtains the appropriate management signature, along with his/her title and the date the form was signed.

(i) ODFCB Representative Signature - Initiator obtains the signature of the ODFCB representative for that organization.

(j) Applicability - What operation products are affected.

(k) Nomenclature requiring waiver/nomenclature per Operations Nomenclature document - Document the nomenclature that does not conform to the guidelines; document what the nomenclature should be per the guidelines.

3. ODFCB member submits waiver form to ODFCB. Two copies of the form must be submitted. One is an electronic copy, the other is the original completed form (with signatures).

4. Copies of the waiver are sent to ODFCB members. If all ODFCB members review the form and give their concurrence, the waiver is approved. The variance is included in the Operations Nomenclature document.

5. If approval is not granted, the initiator either must request that it is reviewed by the ODFCB or must withdraw it.

Once a waiver has been approved by the ODFCB, it is maintained in this section of the document. However, if the effectivity of the waiver is permanent, then the discrepancy is added to the appropriate section(s) of the applicable annex and is identified as a waiver by adding “Waiver” after the word(s). The permanent waiver is then removed from this document. However, a file of permanent waivers is maintained by the PMO for record. Hardware/software providers of waivers should make every attempt possible to correct the discrepancy in the future.

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OPERATIONS NOMENCLATURE WAIVER FORM

ODFCB WAIVER TRACKING NUMBER:
DATE:
INITIATOR NAME/PHONE #:
ORGANIZATION/ADDRESS (mailcode or e-mail):
EFFECTIVITY (weeks, months, permanent/end date):
CORRECTION DATE (if temporary):
JUSTIFICATION:
MANAGEMENT NAME/TITLE/DATE:
ODFCB REPRESENTATIVE SIGNATURE:
APPLICABILITY: (List the operation products affected such as ODF, onboard/ground displays, panels, books, IMS, hardware components, files, C&W messages, flight rules, planning products, etc.)

LIST AFFECTED NOMENCLATURE: (attach additional pages if needed)

NOMENCLATURE requiring waiver	NOMENCLATURE per OpNom document

Comments:
Interim Approval by ODFCB Chairperson (Date):

ODFCB Representative Disposition

	Approve	Disapprove	Mandatory Reviewer		Approve	Disapprove	Mandatory Reviewer
U.S. SODF Rep				RSA rep			
U.S. PODF rep				CSA rep			
ESA rep				NASDA rep			
Crew rep				Vehicle rep			
Safety rep				ODFCB Chair			

Date:	Final Disposition: Approve
OpNom Book Manager Concurrence:	
ODFCB Chairperson Concurrence:	

Verify that this is the correct version before use

13.0 WAIVERS

This section discusses the ground rules for handling Operations Nomenclature noncompliance. All operation products under configuration management control must be in compliance with Operations Nomenclature guidelines. Those products that are noncompliant must be documented with a waiver form. The responsible developer for that product should write and submit the waiver to the ODFCB.

13.1 WAIVER CRITERIA

Waivers are considered for the following situations:

a. The operations product was developed to a prior version of the Operations Nomenclature document.

b. Schedule and cost constraints prevent the correction of existing, incorrectly named products.

c. Space limitations.

d. Safety concerns.

The ODFCB reviews and dispositions all Operations Nomenclature waivers.

13.2 REJECTED WAIVERS

If a waiver is rejected by the ODFCB, it is the responsibility of the hardware or software provider to comply with the ODFCB decision and to make appropriate changes to the products to meet Operations Nomenclature requirements. It is the ODFCB's responsibility to notify the provider's management and/or controlling board of the rejection in writing. An action should be assigned to the appropriate ODFCB member to status compliance. If the hardware or software provider decides to appeal the decision of the ODFCB, it is their management's or controlling board's responsibility to go to the Mission Integration and Operations Control Board (MIOCB) within 30 days for resolution.

13.3 APPROVED WAIVERS

Verify that this is the correct version before use

OPERATIONS NOMENCLATURE WAIVER FORM

ODFCB WAIVER TRACKING NUMBER: OpNom-001
DATE: March 17, 2000
INITIATOR NAME/PHONE #: John M. Koudelka (216) 433-2852 Physics of Colloids in Space
ORGANIZATION/ADDRESS (mailcode or e-mail): NASA GRC 500-102 John.Koudelka@grc.nasa.gov
EFFECTIVITY (weeks, months, permanent/end date): Temporary: 6A through UF2
CORRECTION DATE (if temporary):
JUSTIFICATION: Project Crew Procedures and Project Drawings already existing use the IMS OpNom/Item Name and Unique Identifier/Serial Number in accordance with Revision A of SSP 50007. Unique number used to indicate specific item and/or item use in the Physics of Colloids in Space experiment setup and operations.
MANAGEMENT NAME/TITLE/DATE: John M. Koudelka/Project Manager/NASA GRC Microgravity Science Division
ODFCB REPRESENTATIVE SIGNATURE:
APPLICABILITY: (List the operation products affected such as ODF, onboard/ground displays, panels, books, IMS, hardware components, files, C&W messages, flight rules, planning products, etc.) **IMS labels, Crew Procedures**

LIST AFFECTED NOMENCLATURE: (attach additional pages if needed)

NOMENCLATURE requiring waiver	NOMENCLATURE per OpNom document
See page #2 for details OpNOM-nn (used on IMS label in place where only OpNom is expected; nn is a unique identifier/serial number used to distinguish specific implementation/configuration of part)	**OpNom (used on first line of IMS label)**

Comments:
IMS label is in accordance with SSP50007 Revision A, but not compliant with SSP 50007 Revision B which is in approval process. Approval/direction required to get IMS labels made and applied to hardware being delivered to KSC May 2000 for 6A processing.

Interim Approval by ODFCB Chairman (Date):

ODFCB Representative Disposition

	Approve	Disapprove	Mandatory Reviewer		Approve	Disapprove	Mandatory Reviewer
U.S. SODF Rep				RSA rep			
U.S. PODF rep				CSA rep			
ESA rep				NASDA rep			
Crew rep				Vehicle rep			
Safety rep				ODFCB Chair			

Date: 29 Mar 00	**Final Disposition: Approved**
OpNom Book Manager Concurrence:	Original signed by Lisa Payne
ODFCB Chairman Concurrence:	Original signed by Dick Snyder

Verify that this is the correct version before use

Physics of Colloids in Space Operations Nomenclature Waiver (continued)
ODFCB Waiver Tracking Number:

Operations Nomenclature and Use on IMS Label

OP NOM	Common name	Vendor part number	IMS label text (above bar code)	Explanation of number in IMS label (waiver info only)
EXPPCS-ACCL	EXPPCS Acoustic Closeout Cover – Lower	60050NMA1126	EXPPCS-ACCL-1	Serial #
EXPPCS-ACCU	EXPPCS Acoustic Closeout Cover – Upper	60050NMA1125	EXPPCS-ACCU-1	Serial #
EXPPCS-AVLD	EXPPCS Avionics Section Lower Drawer	60050AMA3672	EXPPCS-AVLD-1	Serial #
EXPPCS-AVUD	EXPPCS Avionics Section Upper Drawer	60050AMA3300	EXPPCS-AVUD-1	Serial #
EXPPCS-CBLE	EXPPCS Electrical Cable	60050AEA5010	EXPPCS-CBLE-1	Power Output #1 Harness
		60050AEA5011	EXPPCS-CBLE-2	Power Output #2 Harness
		60050AEA5012	EXPPCS-CBLE-3	Analog/SCSI Signal Harness
		60050AEA5015	EXPPCS-CBLE-4	Motor Power Harness
		60050AEA5018	EXPPCS-CBLE-5	Analog Signal Harness
		60050AEA5017	EXPPCS-CBLE-6	Correlator Harness
		60050AEA5016	EXPPCS-CBLE-7	Camera Harness
		60050AEA5019	EXPPCS-CBLE-8	Laser Harness
		60050AEA5020	EXPPCS-CBLE-9	RIC Interface Harness
		60050AEA5013	EXPPCS-CBLE-10	Power Input #1 Harness
		60050AEA5014	EXPPCS-CBLE-11	Power Input #2 Harness
EXPPCS-COMP	EXPPCS Volume Compensator	60050UMA2209	EXPPCS-COMP-1	Test Section
		60050NMA5021	EXPPCS-COMP-2	Rack to Test Section - Hose
		60050UMA2209	EXPPCS-COMP-3	Test Section to Avionics Section - Hose
		60050NMA5021	EXPPCS-COMP-4	Avionics Section
		60050NMA5021	EXPPCS-COMP-5	Avionics Section to Rack Return - Hose

Verify that this is the correct version before use

(concluded)

OP NOM	Common name	Vendor part number	IMS label text (above bar code)	Explanation of number in IMS label (waiver info only)
EXPPCS-HD	EXPPCS Hard Drive and Carrier Assembly	60050AMA3308	EXPPCS-HD-1 EXPPCS-HD-11 EXPPCS-HD-12 EXPPCS-HD-2 EXPPCS-HD-3 EXPPCS-HD-4 EXPPCS-HD-5 EXPPCS-HD-6 EXPPCS-HD-7 EXPPCS-HD-8 EXPPCS-HD-9 EXPPCS-HD-10	Operating System Drive – Drive A only Operating System Drive – Drive A only Operating System Drive – Drive A only Data Storage Drive – Drive B or C Data Storage Drive – Drive B or C Data Storage Drive – Drive B or C Data Storage Drive – Drive B or C Data Storage Drive – Drive B or C Data Storage Drive – Drive B or C Data Storage Drive – Drive B or C Data Storage Drive – Drive B or C Data Storage Drive – Drive B or C
EXPPCS-HOSE	EXPPCS Coolant Hose	60050NMA5003 60050NMA5004 60050NMA5005	EXPPCS-HOSE-1 EXPPCS-HOSE-2 EXPPCS-HOSE-3	Rack Supply to Test Section Coolant Hose Test Section to Avionics Section Coolant Hose Avionics Section to Rack Return Coolant Hose
EXPPCS-MNT	EXPPCS T-Bar Handle Mount	60050LMA1204	EXPPCS-MNT-1	Serial #
EXPPCS-PMP	EXPPCS Modified Payload Mounting Panel Assembly	60050LMA1100	EXPPCS-PMP-1	Serial #
EXPPCS-TBAR	EXPPCS T-Bar Handle	60050LMA1201	EXPPCS-TBAR-1 EXPPCS-TBAR-2	Serial # Serial #
EXPPCS-TMPL	EXPPCS PMP Template Assembly	60050LMA1106	EXPPCS-TMPL-1	Serial #
EXPPCS-TS	EXPPCS Test Section	60050UMA2000	EXPPCS-TS-1	Serial #

Verify that this is the correct version before use

OPERATIONS NOMENCLATURE WAIVER FORM

ODFCB WAIVER TRACKING NUMBER: OpNom-002
DATE: July 20, 2000
INITIATOR NAME/PHONE #: 256 828-6305
ORGANIZATION/ADDRESS (mailcode or e-mail): Maria Shelby – ZCG payload/gmshelby@hiwaay.net
EFFECTIVITY (weeks, months, permanent/end date): permanent
CORRECTION DATE (if temporary):
JUSTIFICATION: The usage of TU for the word tube has been incorporated into the ZCG experiment flight software and procedures. The software displays have a set character length and cannot be modified easily. Changing the software at this late date would impact the delivery of the flight hardware/software, flight procedures, and simulator software. (It violates 2 OpNom standards.) 1. abbreviations for words of 6 letters or less. 2. should be title case.
MANAGEMENT NAME/TITLE/DATE: Nurcan Bac/ZCG Payload developer
ODFCB REPRESENTATIVE SIGNATURE:
APPLICABILITY: (List the operation products affected such as ODF, onboard/ground displays, panels, books, IMS, hardware components, files, C&W messages, flight rules, planning products, etc.) **ZCG Flight Software** **ZCG Flight Procedures** **ZCG Simulator Software**

LIST AFFECTED NOMENCLATURE: (attach additional pages if needed)

NOMENCLATURE requiring waiver	NOMENCLATURE per OpNom document
TU	**Tube**

Comments:
Interim Approval by ODFCB Chairman (Date):

ODFCB Representative Disposition

	Approve	Disapprove	Mandatory Reviewer		Approve	Disapprove	Mandatory Reviewer
U.S. SODF Rep				RSA rep			
U.S. PODF rep				CSA rep			
ESA rep				NASDA rep			
Crew rep				Vehicle rep			
Safety rep				ODFCB Chair			

Date: 8 Jan 01	**Final Disposition: Approved**
OpNom Book Manager Concurrence:	**Original signed by Lisa Payne**
ODFCB Chairman Concurrence:	**Original signed by Dick Snyder**

Verify that this is the correct version before use

OPERATIONS NOMENCLATURE WAIVER FORM

ODFCB WAIVER TRACKING NUMBER: OpNom-004
DATE: 3Nov00
INITIATOR NAME/PHONE #: Gerald Lewis 281 335-6362
ORGANIZATION/ADDRESS (mailcode or e-mail): Gerald.lewis@lmco.com
EFFECTIVITY (weeks, months, permanent/end date): ISS Increments 2-4
CORRECTION DATE (if temporary):Corrected at I-7 for Increment 5
JUSTIFICATION: The OpNom for HRF has been baselined as of October 6, 2000 and that OpNom was approved as "HRF Rack." However the label prepared for the Rack states "Human Research Facility (HRF) Rack 1." (Such notation will differentiate this Rack from Rack 2 that launches in 2002.) There already exist procedures (in excess of 80 files) that have completed the baseline process and that reference this item in compliance with the OpNom as "HRF Rack." Since the acronym HRF is included in the acronym list as Human Research Facility, and HRF exists on the label, and there is only one HRF Rack present on ISS throughout Increments 2 --- 5, we feel that there is no danger of confusion as to the appropriate item for operations performance. Furthermore, it would take a considerable amount of time to change in excess of 80 files to match the label. Such time would not only result in a budget impact but also would endanger the schedule for incorporation of the procedures and OpNom for Increment 2 operations.
MANAGEMENT NAME/TITLE/DATE:
ODFCB REPRESENTATIVE SIGNATURE:
APPLICABILITY: (List the operation products affected such as ODF, onboard/ground displays, panels, books, IMS, hardware components, files, C&W messages, flight rules, planning products, etc.) I2 and subsequent Operations Nomenclature for HRF Rack (MHUEHRFRACKON001), all crew procedures that reference the HRF Rack.

LIST AFFECTED NOMENCLATURE: (attach additional pages if needed)

NOMENCLATURE requiring waiver	NOMENCLATURE per OpNom document
HRF Rack label: HUMAN RESEARCH FACILITY (HRF) RACK 1	**HRF Rack**

Comments:
Interim Approval by ODFCB Chairman (Date):

ODFCB Representative Disposition

	Approve	Disapprove	Mandatory Reviewer		Approve	Disapprove	Mandatory Reviewer
U.S. SODF Rep				**RSA rep**			
U.S. PODF rep				**CSA rep**			
ESA rep				**NASDA rep**			
Crew rep				**Vehicle rep**			
Safety rep				**ODFCB Chair**			

Date:	**Final Disposition: Approved**
OpNom Book Manager Concurrence:	**Original signed by Lisa Payne**
ODFCB Chairman Concurrence:	**Original signed by Dick Snyder**

Verify that this is the correct version before use

OPERATIONS NOMENCLATURE WAIVER FORM

ODFCB WAIVER TRACKING NUMBER: OpNom-005
DATE: 8-21-00
INITIATOR NAME/PHONE #: Kristina Lovio-Taskov/650 604-0450
ORGANIZATION/ADDRESS (mailcode or e-mail): ARC/Ktaskov@mail.arc.nasa.gov
EFFECTIVITY (weeks, months, permanent/end date): permanent
CORRECTION DATE (if temporary):
JUSTIFICATION: **The Hungarian Space Agency provided the Passive Dosimeter System (PDS) as their contribution to the ISS. The PDS front panel display was developed prior to the IDAGS Display Standards; therefore, the LCD displays have been grandfathered and approved by the Payload Display Review Panel 11-01-99.** **The PDS acronyms (on front panel display) need to be registered as PDS Operations Nomenclature (OpNom). The PDS acronyms either contain similar text as registered OpNom acronyms, with different contextual meanings; or the same contextual meaning, but dissimilar text. In addition, PDS acronyms violate two ODF standards -- abbreviations are to be title-case, and abbreviations are for words of seven or more letters (acronym DEV).** **The PDS displays AUTO, BGND, DEV, and ERR cannot be changed.**
MANAGEMENT NAME/TITLE/DATE: John Ulman/Crew Training Manager/8-21-00
ODFCB REPRESENTATIVE SIGNATURE: Rose Lindsey /s/ 13Feb01
APPLICABILITY: (List the operation products affected such as ODF, onboard/ground displays, panels, books, IMS, hardware components, files, C&W messages, flight rules, planning products, etc.) **ODF OpNom Standards** **Passive Dosimeter System (PDS) Hardware Displays and Labels** **PDS Crew Procedures** **PDS Training Manuals**

LIST AFFECTED NOMENCLATURE: (attach additional pages if needed)

NOMENCLATURE requiring waiver	NOMENCLATURE per OpNom document
AUTO	**Auto -- Automatic**
BGND – Background	**Bkgd -- Background**
DEV -- Device (TLD Reader Number)	**Dev -- Deviation**
DEV_BGND -- Device Background (Testing background of TLD READER)	
ERR – Error	**Err -- Error**

Comments:
Interim Approval by ODFCB Chairman (Date):

ODFCB Representative Disposition

	Approve	Disapprove	Mandatory Reviewer		Approve	Disapprove	Mandatory Reviewer
U.S. SODF Rep				**RSA rep**			
U.S. PODF rep				**CSA rep**			
ESA rep				**NASDA rep**			
Crew rep				**Vehicle rep**			
Safety rep				**ODFCB Chair**			

Date: 14Mar01	**Final Disposition: Approved**
OpNom Book Manager Concurrence:	**Original Signed by Lisa Payne**
ODFCB Chairman Concurrence:	**Original Signed by Dick Snyder**

Verify that this is the correct version before use

OPERATIONS NOMENCLATURE WAIVER FORM

ODFCB WAIVER TRACKING NUMBER: OpNom-007
DATE: February 20, 2001
INITIATOR NAME/PHONE #: Helen Brown (216) 977-0309/Carol Kurta (216) 977-0398 SAMS-II
ORGANIZATION/ADDRESS (mailcode or e-mail): NASA GRC/ZIN Technologies Helen.Brown@grc.nasa.gov/ckurta@grc.nasa.gov
EFFECTIVITY (weeks, months, permanent/end date): Until UF-3
CORRECTION DATE (if temporary):
JUSTIFICATION: Project Crew Procedures, Project Drawings and Flight Hardware already exist.
MANAGEMENT NAME/TITLE/DATE: William Foster / Project Manager / NASA GRC Microgravity Science Division
ODFCB REPRESENTATIVE SIGNATURE: /s/ Rose Lindsey 20Feb01
APPLICABILITY: (List the operation products affected such as ODF, onboard/ground displays, panels, books, IMS, hardware components, files, C&W messages, flight rules, planning products, etc.) Crew Procedures, Project Drawings and Flight Hardware

LIST AFFECTED NOMENCLATURE: (attach additional pages if needed)

NOMENCLATURE requiring waiver	NOMENCLATURE per OpNom document
C/B (Circuit Breaker)	50254C does not cite C/B, but does cite cb as Circuit Breaker, and CB as Control Bus
L/T (Laptop)	50254C suggests to be spelled out Laptop

Comments:
The listed nomenclature has been incorporated into flight hardware that has been delivered and installed in the MPLM. Due to schedule and budget constraints, the IPLAT comments could not be fully implemented prior to turnover.

The C/B and L/T are silk-screened on a subassembly within the ICU Drawer and are used to designate connector function. This subassembly (Power Control Box) is not part of the normal crew interfaces; it does not appear in any of the nominal crew procedures. There are two corrective procedures that call out the cable mates/demates of the PCB. For both procedures, the main action is the PCB removal and reinstallation. In one procedure, a spare PCB is installed. In the other procedure, the PCB is removed to gain access to a fan; the original PCB is reinstalled after the fan is replaced.
The ICU Drawer, including the PCB, will be replaced at UF-3 with a Control Unit. After this switchover, the waiver will no longer be needed.

Interim Approval by ODFCB Chairman (Date):

ODFCB Representative Disposition

	Approve	Disapprove	Mandatory Reviewer		Approve	Disapprove	Mandatory Reviewer
U.S. SODF Rep				**RSA rep**			
U.S. PODF rep				**CSA rep**			
ESA rep				**NASDA rep**			
Crew rep				**Vehicle rep**			
Safety rep				**ODFCB Chair**			

Date: 14Mar01	**Final Disposition: Approved**
OpNom Book Manager Concurrence:	**Original signed by Lisa Payne**
ODFCB Chairman Concurrence:	**Original signed by Dick Snyder**

Verify that this is the correct version before use

OPERATIONS NOMENCLATURE WAIVER FORM

ODFCB WAIVER TRACKING NUMBER: OpNom-008
DATE: February 9, 2001
INITIATOR NAME/PHONE #: Helen Brown (216) 977-0309/Carol Kurta (216) 977-0398 SAMS-II
ORGANIZATION/ADDRESS (mailcode or e-mail): NASA GRC/ZIN Technologies **Helen.Brown@grc.nasa.gov/ckurta@grc.nasa.gov**
EFFECTIVITY (weeks, months, permanent/end date): Permanent
CORRECTION DATE (if temporary):
JUSTIFICATION: Project Crew Procedures, Project Drawings and Flight Hardware already exist.
MANAGEMENT NAME/TITLE/DATE: William Foster/Project Manager/NASA GRC Microgravity Science Division
ODFCB REPRESENTATIVE SIGNATURE:/s/ Rose Lindsey 20Feb01
APPLICABILITY: (List the operation products affected such as ODF, onboard/ground displays, panels, books, IMS, hardware components, files, C&W messages, flight rules, planning products, etc.) **Crew Procedures, Project Drawings and Flight Hardware**

LIST AFFECTED NOMENCLATURE: (attach additional pages if needed)

NOMENCLATURE requiring waiver	**NOMENCLATURE per OpNom document**
FD (Flight Drawer)	50254C does cite FD as Flight Day and Fault Detection

Comments:
The listed nomenclature has been incorporated into flight hardware that has been delivered and installed in the MPLM. Due to schedule and budget constraints, the IPLAT comments could not be fully implemented prior to turnover.
The FD appears on the front panel of all three SAMS drawers as follows:

INTERIM CONTROL UNIT FD01	REMOTE TRIAXIAL SENSOR SYSTEM FD01	REMOTE TRIAXIAL SENSOR SYSTEM FD02

FD is not referenced in the crew or ground procedures. The IMS number and Op Nom (ICU/D1, RTS/D1, and RTS/D2) are the primary means of distinguishing between the drawers.

Interim Approval by ODFCB Chairman (Date):

ODFCB Representative Disposition

	Approve	**Disapprove**	**Mandatory Reviewer**		**Approve**	**Disapprove**	**Mandatory Reviewer**
U.S. SODF Rep				**RSA rep**			
U.S. PODF rep				**CSA rep**			
ESA rep				**NASDA rep**			
Crew rep				**Vehicle rep**			
Safety rep				**ODFCB Chair**			

Date: 14Mar01	**Final Disposition: Approved**
OpNom Book Manager Concurrence:	**Original signed by Lisa Payne**
ODFCB Chairman Concurrence:	**Original signed by Dick Snyder**

Verify that this is the correct version before use

OPERATIONS NOMENCLATURE WAIVER FORM

ODFCB WAIVER TRACKING NUMBER: OpNom-009
DATE: January 26, 2001
INITIATOR NAME/PHONE #: Carol E. Kurta (216) 977-0398 Physics of Colloids in Space
ORGANIZATION/ADDRESS (mailcode or e-mail): NASA GRC/ZIN Technologies ckurta@grc.nasa.gov
EFFECTIVITY (weeks, months, permanent/end date): Temporary : 6A through UF-2 [Increment 2,3 & 4 ; ~10 months]
CORRECTION DATE (if temporary):
JUSTIFICATION: Project Crew Procedures, Project Drawings and Flight Hardware already exist using the IMS Op Nom / Item Name and Unique Identifier / Serial Number in accordance with Revision A of SSP 50007. Unique number used to indicate specific item used in the Physics of Colloids in Space experiment.
MANAGEMENT NAME/TITLE/DATE: Mike Doherty / Project Manager / NASA GRC Microgravity Science Division
ODFCB REPRESENTATIVE SIGNATURE: /s/ Rose Lindsey
APPLICABILITY: (List the operation products affected such as ODF, onboard/ground displays, panels, books, IMS, hardware components, files, C&W messages, flight rules, planning products, etc.) IMS labels, Crew Procedures, EXPPCS Avionics Section Control Structure (AVCS)

LIST AFFECTED NOMENCLATURE: (attach additional pages if needed)

NOMENCLATURE requiring waiver	NOMENCLATURE per OpNom document
EXPPCS-AVCS-1 (used on IMS label in place where only OpNOM is expected; 1 is a unique identifier / serial number used to distinguish specific implementation / configuration of part) Details: Op Nom: EXPPCS-AVCS Common Name: EXPPCS Avionics Section Control Structure Vendor Part Number: 60050AMA3002 IMS Label Text (above bar code): EXPPCS-AVCS-1 Explanation of Number on IMS Label (Waiver Information Only): serial number	OpNOM (used on first line of IMS label)

Comments:

This label was inadvertently left off of the initial EXPPCS Operations Nomenclature Waiver. The first waiver was written in accordance with SSP 50007 Revision A, but not compliant with SSP 50007 Revision B which was in the approval process, at that time. Approval is required to get Operations Nomenclature approved for I2 MPV installation and on-orbit use. Label has been applied to flight hardware and completed turnover at KSC.

Interim Approval by ODFCB Chairman (Date):

ODFCB Representative Disposition

	Approve	Disapprove	Mandatory Reviewer		Approve	Disapprove	Mandatory Reviewer
U.S. SODF Rep				**RSA rep**			
U.S. PODF rep				**CSA rep**			
ESA rep				**NASDA rep**			
Crew rep				**Vehicle rep**			
Safety rep				**ODFCB Chair**			

Date: 14Mar01	**Final Disposition: Approved**
OpNom Book Manager Concurrence:	**Original Signed by Lisa Payne**
ODFCB Chairman Concurrence:	**Original signed by Dick Snyder**

Verify that this is the correct version before use

OPERATIONS NOMENCLATURE WAIVER FORM

ODFCB WAIVER TRACKING NUMBER: OpNom-10

DATE: 2-27-01

INITIATOR NAME/PHONE #: Alexandra Branson /(650) 604-2582

ORGANIZATION/ADDRESS (mailcode or e-mail): ARC/abranson@mail.arc.nasa.gov

EFFECTIVITY (weeks, months, permanent/end date): One Inc only (currently scheduled for Inc 4)

CORRECTION DATE (if temporary):

JUSTIFICATION: The Biomass Production System (BPS) was originally developed as a Shuttle Middeck Payload to support a one time only flight. The BPS front panel displays were developed prior to the IDAGS Display Standards; therefore, the displays have been grand fathered and approved by the Payload Display Review Panel 10-27-99.
Correcting Opnom for one flight is cost prohibitive.
The BPS payload has completed their dry runs and the majority of their training. There have been no comments from the crew.

~~The BPS is only intended to fly once aboard the ISS.~~

MANAGEMENT NAME/TITLE/DATE: John Ulman/Crew Training Manager/2-27-01

ODFCB REPRESENTATIVE SIGNATURE: Rose M. Lindsey 4/19/01

APPLICABILITY: (List the operation products affected such as ODF, onboard/ground displays, panels, books, IMS, hardware components, files, C&W messages, flight rules, planning products, etc.)

ODF OpNom Standards
Biomass Production System (BPS) Hardware Displays and Labels
BPS Crew Procedures
BPS Training Manuals

LIST AFFECTED NOMENCLATURE: (attach additional pages if needed)

NOMENCLATURE requiring waiver	NOMENCLATURE per OpNom document
ACS Atmospheric Control System	ACS Attitude Control System
AV Avionics Bay	AV Avionics
CH Chamber	Abbreviations are Title case, Ch Channel
CAB Chamber Access Bay	Cab Cabin
DewP Dew Point	Pt Point
DIO Digital In Out	DIO Discrete Input Output
DAP Double Adapter Plate	DAP Digital Auto Pilot
L Lock	L Left, or Level, Lk Lock
LAB Lower Avionics Bay	LAB Laboratory
N Nominal (software mode)	Nom Nominal
Ovw Overview	
Plt Plate	Plt Pilot
RR Rear Right	RR Recharge Ratio
ROT Rotation	Rot Rotation
s SERVICE LED	Abbreviation is title case
S Special (software mode)	
sp setpoint	Sp acronyms use upper case
SRT Sensor Reset Time	SRT Safing Remote Terminal
T Temporary (software mode)	T Temperature or True
Tra Transfer pump	Xfer Transfer
y Yellow (ALERT LED)	Abbreviation is title case

Comments:

Interim Approval by ODFCB Chairman (Date):

ODFCB Representative Disposition

	Approve	Disapprove	Mandatory Reviewer		Approve	Disapprove	Mandatory Reviewer
U.S. SODF Rep				**RSA rep**			
U.S. PODF rep				**CSA rep**			
ESA rep				**NASDA rep**			
Crew rep				**Vehicle rep**			
Safety rep				**ODFCB Chair**			

Date: 11May01	**Final Disposition: Approved**
OpNom Book Manager Concurrence:	**Original signed by Lisa Payne**
ODFCB Chairman Concurrence:	**Original signed by Dick Snyder**

Verify that this is the correct version before use

OPERATIONS NOMENCLATURE WAIVER FORM

ODFCB WAIVER TRACKING NUMBER: MSG-WAV-001 OpNom-11
DATE: 4-23-01
INITIATOR NAME/PHONE #: Kathy Roeske/256-890-3030
ORGANIZATION/ADDRESS (mailcode or e-mail): Kathy.Roeske@msfc.nasa.gov
EFFECTIVITY (weeks, months, permanent/end date): permanent
CORRECTION DATE (if temporary):
JUSTIFICATION: MSG is being developed as part of an International barter agreement and consists of 4 different units. There are significant cost and schedule impacts to both hardware and software that is completed and/or late in the development and testing flow for each of these different units that this waiver seeks to avoid. Hardware panels and etched labels on sub-elements have been cut for all four units and will not be replaced, and software is complete for two of the units, and in late testing for the other two and cannot be changed. Final development and test activities on the current schedule contain no slack, therefore any of these changes would impact delivery to meet launch and complete international milestones and cost more that ESA will approve. Procedures and documentation for facility and experiment use have been developed and cannot be reworked and retrained with the crew within current cost and schedule bounds. **MSG Crew Training will be worked with these nomenclature comments in consideration, and the crew should be well equipped to understand these items as is after receiving the proper instruction.**
MANAGEMENT NAME/TITLE/DATE: Cynthia A. Coker/MSG Project Engineer 4/26/01
ODFCB REPRESENTATIVE SIGNATURE: /s/ Rose M. Lindsey 5/10/01
APPLICABILITY: (List the operation products affected such as ODF, onboard/ground displays, panels, books, IMS, hardware components, files, C&W messages, flight rules, planning products, etc.) **ODF Opnom Standards** **Microgravity Science Glovebox (MSG) Facility** **MSG Crew Procedures** **MSG Training Manuals**

LIST AFFECTED NOMENCLATURE: (attach additional pages if needed)

NOMENCLATURE requiring waiver	NOMENCLATURE per OpNom document
C – Center	C – Celsius and/or coulomb
Ctrl – Control	Cntrl – Control
E-Box	Box is a real word / Electronic – Elect/per OpNom Standards correct usage would be "Ebox"
Filt – Filter	Fltr-Filter
Illum, Ill – Illumination	It is not recommended to use two abbreviations fro the same word. Possible source of confusion to the crew.
Nor – Normal	Norm – Normal
R - Rear	R – Right or Roll / Words should not be typically be abbreviated if less than six letters.
RF – Rear Filter	RF – Radio Frequency
Setpnt – Setpoint	Setpt - Setpoint

Comments:

Interim Approval by ODFCB Chairman (Date):

ODFCB Representative Disposition

	Approve	Disapprove	Mandatory Reviewer		Approve	Disapprove	Mandatory Reviewer
U.S. SODF Rep				RSA rep			
U.S. PODF rep				CSA rep			
ESA rep				NASDA rep			
Crew rep				Vehicle rep			
Safety rep				ODFCB Chair	x		

Date: 17May01	Final Disposition: Approve
OpNom Book Manager Concurrence:	
ODFCB Chairman Concurrence:	

Verify that this is the correct version before use

OPERATIONS NOMENCLATURE WAIVER FORM

ODFCB WAIVER TRACKING NUMBER: PCG-SSTES/BAG-001 OpNom-12
DATE: February 2, 2001
INITIATOR NAME/PHONE #: Tammy Hone/256-726-1498
ORGANIZATION/ADDRESS (mailcode or e-mail): PCG-STES & PCG-BAG/ TBE MS 52 tammy.hone@tbe.com
EFFECTIVITY (weeks, months, permanent/end date): permanent
CORRECTION DATE (if temporary):
JUSTIFICATION: The nomenclature listed below is on our hardware and/or our hardware's LCD. Our LCD has limited character length; therefore, much of the data must be abbreviated so as to fit all necessary data on the LCD. The nomenclature used on the hardware itself is permanently fixed on the hardware and cannot be changed. Our hardware's nomenclature violates 2 OpNom standards: 1) abbreviations should be title case, and 2) abbreviations used for words of 6 letters or less.
MANAGEMENT NAME/TITLE/DATE: Todd Holloway/ BiC Project Manager
ODFCB REPRESENTATIVE SIGNATURE: /s/ Rose M. Lindsey 20Feb01
APPLICABILITY: (List the operation products affected such as ODF, onboard/ground displays, panels, books, IMS, hardware components, files, C&W messages, flight rules, planning products, etc.) **PCG-STES hardware displays (flight and training)** **PCG-STES software (flight and training)** **PCG-STES procedures (flight and ground)** **PCG-BAG procedures (flight and ground)** **PCG-BAG hardware displays (flight and training)**

LIST AFFECTED NOMENCLATURE: (attach additional pages if needed)

NOMENCLATURE requiring waiver	NOMENCLATURE per OpNom document
BAT	Battery
BATT	Battery
M	Mixing
P	Plug
PWR	Power
SEQ	Sequence
T	Thermistor

Comments:

Interim Approval by ODFCB Chairman (Date):

ODFCB Representative Disposition

	Approve	Disapprove	Mandatory Reviewer		Approve	Disapprove	Mandatory Reviewer
U.S. SODF Rep				RSA rep			
U.S. PODF rep				CSA rep			
ESA rep				NASDA rep			
Crew rep				Vehicle rep			
Safety rep				ODFCB Chair	x		

Date: Feb 2001	Final Disposition: Approve
OpNom Book Manager Concurrence:	
ODFCB Chairman Concurrence:	

Verify that this is the correct version before use

OPERATIONS NOMENCLATURE WAIVER FORM

ODFCB WAIVER TRACKING NUMBER: FOOT WAV-001 OpNom-13
DATE: 01Aug2001
INITIATOR NAME/PHONE #: Gerald Lewis 281-335-6362256 828-6305
ORGANIZATION/ADDRESS (mailcode or e-mail): Gerald.lewis@lmco.com
EFFECTIVITY (weeks, months, permanent/end date): Increment 5 and beyond
CORRECTION DATE (if temporary):
JUSTIFICATION: The HRF FOOT procedures make reference to several human muscle groups of the leg to describe attachment points for Electromyelogram sensors. In full medical terminology these names are rather clumsy Latin terms. To make this easier for crewmembers 2 letter abbreviations are used. One abbreviation used by FOOT is TB for the muscle "Triceps Brachii". SSP 50254 lists "tb" as reserved term for "talk back" A second abbreviation used by FOOT is "RF" with a meaning of the muscle "Rectus Femoris". SSP 50254 lists "rf" as a reserved term for "radio frequency: In the FOOT experiment flaps in an experiment provided armband and pants have a number of Velcro sealed fabric flaps which are identified by these 2 letter abbreviations and identify locations for EMG electrodes to be placed. We do not feel that there is an acceptable substitute acronym for either TB or RF as used in the context of the FOOT experiment. We feel that the application is so specialized that there is no likelihood that there would be any confusion with the term "talk back" or "radio frequency". Additionally, the crew representative reviewer did not comment on either abbreviation or cite any possible confusion.
MANAGEMENT NAME/TITLE/DATE:
ODFCB REPRESENTATIVE SIGNATURE:
APPLICABILITY: (List the operation products affected such as ODF, onboard/ground displays, panels, books, IMS, hardware components, files, C&W messages, flight rules, planning products, etc.) **I5 and subsequent Operations Nomenclature for HRF FOOT (MGUEHRFFOOTON001), I and subsequent crew procedures for HRF FOOT.**

LIST AFFECTED NOMENCLATURE: (attach additional pages if needed)

NOMENCLATURE requiring waiver	NOMENCLATURE per OpNom document
TB used as an abbreviation for "Triceps Brachii" RF used as an abbreviation for "Rectus Femoris"	In SSP-50254 Rev D, Annex E "tb" is a reserved term for "talk back" In SSP-50254 Rev D, cites "RF" is a reserved term for "radio frequency"

Comments:

Interim Approval by ODFCB Chairman (Date):

ODFCB Representative Disposition

	Approve	Disapprove	Mandatory Reviewer		Approve	Disapprove	Mandatory Reviewer
U.S. SODF Rep				RSA rep			
U.S. PODF rep				CSA rep			
ESA rep				NASDA rep			
Crew rep				Vehicle rep			
Safety rep				ODFCB Chair	x		

Date: October 2001	Final Disposition: Approve
OpNom Book Manager Concurrence:	
ODFCB Chairman Concurrence:	

Verify that this is the correct version before use

OPERATIONS NOMENCLATURE WAIVER FORM

ODFCB WAIVER TRACKING NUMBER: OpNom-14
DATE: 13Jul2001
INITIATOR NAME/PHONE #: Gerald Lewis 281-335-6362
ORGANIZATION/ADDRESS (mailcode or e-mail): gerald.lewis@lmco.com
EFFECTIVITY (weeks, months, permanent/end date): Permanent : Increment 6 and beyond
CORRECTION DATE (if temporary): N/A
JUSTIFICATION: We are using COTS (Commercial Off The Shelf) hardware for the HRF refrigerated centrifuge. The control panel is a digital display and a plastic film touch pad that cannot be modified without incurring substantial cost and schedule impact. The conflicting OpNoms are not easily misinterpreted, as they are specific to the HRF refrigerated centrifuge hardware and procedures. The crew will also become familiar with the touch pad nomenclature during training.
MANAGEMENT NAME/TITLE/DATE:
ODFCB REPRESENTATIVE SIGNATURE:
APPLICABILITY: (List the operation products affected such as ODF, onboard/ground displays, panels, books, IMS, hardware components, files, C&W messages, flight rules, planning products, etc.) **I6 and subsequent Operations Nomenclature for HRF Refrigerated Centrifuge (MGUEHRFRCFGON001), I6 and subsequent crew procedures for HRF Refrigerated Centrifuge.**

LIST AFFECTED NOMENCLATURE: (attach additional pages if needed)

NOMENCLATURE requiring waiver	**NOMENCLATURE per OpNom document**
On the RCFG touch pad **PROG is used for "PROGRAM" on the RCFG touch pad (See attached image)** **ROT is used for "ROTOR" in the digital display of the RCFG touch pad.**	**In SSP-50254 Rev. D, Annex E., PROG is listed as "IN PROGRESS" on the CBM display.** **In SSP-50254 Rev D., Sec. 6.2, p. 33 Rot is listed for Rotate and Rotation and p.80, ODFCB Waiver # 10, Biomass Production System ROT is listed for "ROTATION"**

Comments:

See attached figure.

Interim Approval by ODFCB Chairman (Date):

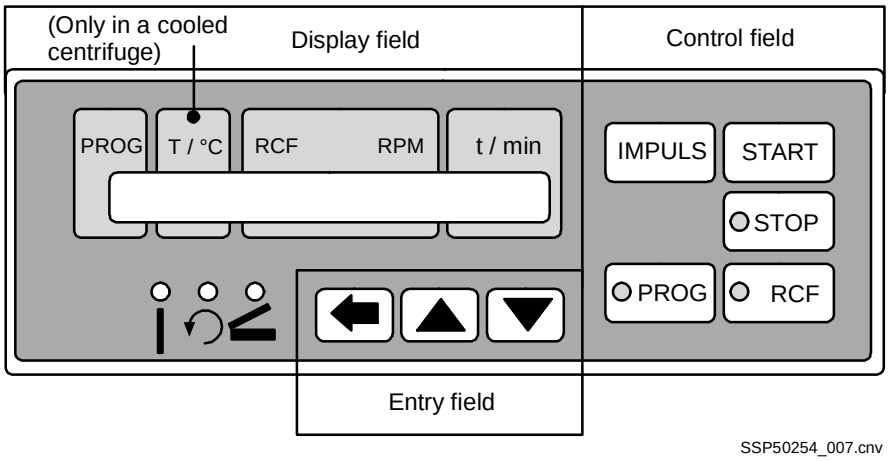
ODFCB Representative Disposition

	Approve	Disapprove	Mandatory Reviewer		Approve	Disapprove	Mandatory Reviewer
U.S. SODF Rep				RSA rep			
U.S. PODF rep				CSA rep			
ESA rep				NASDA rep			
Crew rep				Vehicle rep			
Safety rep				ODFCB Chair	x		

Date: 15Nov 2001	**Final Disposition: Approve**
OpNom Book Manager Concurrence:	
ODFCB Chairman Concurrence:	

Verify that this is the correct version before use

3. Front Panel Control and Display Elements



Verify that this is the correct version before use

OPERATIONS NOMENCLATURE WAIVER FORM

ODFCB WAIVER TRACKING NUMBER: ZCG-OpNom-15
DATE: June 12, 2001
INITIATOR NAME/PHONE #: 256 828-6305
ORGANIZATION/ADDRESS (mailcode or e-mail): Maria Shelby - ZCG payload/mshelby@ispchannel.com
EFFECTIVITY (weeks, months, permanent/end date): permanent
CORRECTION DATE (if temporary):
JUSTIFICATION: ZCG hardware, software, and procedures were too far along to make changes to acronyms and abbreviations when the OpNom requirements were levied. Would be too costly to make corrections. The crew has been trained on the procedures, using flight-like hardware and software and has not be confused by any of our abbreviations or acronyms.
MANAGEMENT NAME/TITLE/DATE: Nurcan Bac/ ZCG Payload Developer /
ODFCB REPRESENTATIVE SIGNATURE: Mercedes Galloway/28Aug01
APPLICABILITY: (List the operation products affected such as ODF, onboard/ground displays, panels, books, IMS, hardware components, files, C&W messages, flight rules, planning products, etc.) **ZCG Flight Software** **ZCG Flight Procedures** **ZCG Simulator Software**

LIST AFFECTED NOMENCLATURE: (attach additional pages if needed)

NOMENCLATURE requiring waiver	NOMENCLATURE per OpNom document
SS for Steady State	SS is scientist in Section 3.5 of SSP 50254, SS is space station in Section 6.4 and seconds in the time format
AV for Average	Av is avionics in Section 6.4 and AV is avionics bay in BPS approved waiver (ODFCB Waiver 10). Should be title case. Avg could not be used because of limited space on LCD.
ctrl pt for control point	Control is abbreviated cntl in Section 6.3.
del for delete	Abbreviated a word less than 6 characters. This was necessitated by limited space on LCD.
FU for Furnace Unit	Fu is fuel in Section 6.3. Unlikely to cause confusion.
Htup for Heat-up (Used in flight software displays.)	Abbreviated a word less than 6 characters and because of application in payload use two different abbreviations for Heat Up.
HU for Heat Up (Refers to switch on top panel)	Abbreviated a word less than 6 characters and because of application in payload use two different abbreviations for Heat Up.
diff for difference	Difference is dif in Section 6.3. This was necessitated by limited space on LCD.

Comments:

Interim Approval by ODFCB Chairman (Date):

ODFCB Representative Disposition

	Approve	Disapprove	Mandatory Reviewer		Approve	Disapprove	Mandatory Reviewer
U.S. SODF Rep				RSA rep			
U.S. PODF rep				CSA rep			
ESA rep				NASDA rep			
Crew rep				Vehicle rep			
Safety rep				ODFCB Chair	x		

Date: October 2001	Final Disposition: Approve
OpNom Book Manager Concurrence:	
ODFCB Chairman Concurrence:	

Verify that this is the correct version before use

14.0 DEFINITIONS AND TERMS

Abort - Used only to cease operations when an emergency situation has occurred where the situation is time-critical and the result of continuing the operation will result in injury to personnel or damage to hardware. Alternatively, abort may be used when the command rapidly ceases operations in such a way that there is risk of the hardware being permanently damaged. It is then accepted that to use the command and risk damaging the hardware is preferable to alternative consequences; e.g., loss of life, etc. The term “terminate” may be used for all other cases. For payloads, the term “abort” should not be used. Payloads uses “terminate” or “stop.”

Activate/Deactivate - Initiates a software or hardware function to begin operation of a particular subsystem. The activate function should include multiple automated subactivities that encompass more than enabling or powering a routine or device.

For example, in the case of activating the Common Berthing Mechanism (CBM):

a. Clears the values of certain parameters in the MDM's CBM software

b. Selects the appropriate CBM RT based on the activate command and enables it on the 1553 bus

c. Begins cyclic communication with the CBM’s master controller by sending a 1553 command to the CBM

d. Enables RT FDIR for the CBM RT after establishing communication with the CBM master controller

Active/Standby - Used to refer to equipment where any number can be selected as active and the remainder is therefore in standby.

Arm/Disarm

a. Used in a two-step command when an action is being performed that is time critical with respect to the “Arm” and the operator is expected to only have the action available for a short period of time. It is the type of action where the action command is expected to be sent immediately after the Arm command. Enable will be used for all the other cases.

b. The hardware portion of a robotic system composed of joints and booms that affect translational and rotational motion.

Auto or Automatic - Performed by a machine or a system; no human interaction required.

Verify that this is the correct version before use

Auto Sequence - Usually used to identify the type of trajectory a robot/payload moves along. When a robot/payload moves through an “auto sequence,” it moves from point to point in space without the operator being in the control loop. The sequence is defined by the series of points in the trajectory, each point being composed of a position (X, Y, Z), and attitude (Pitch, Yaw, Roll (PYR)). Points are start points, pause points, fly-by points, or last points. The start and last points are always pause points. When the trajectory achieves a pause point, it stops until the operator takes a positive action to continue the trajectory (usually via the “proceed button” on the Display and Control Panel (DCP) or Graphical User Interface (GUI).

Built-in Test (BIT) - Acceptable forms of BIT

a. **Active BIT** - Crew action is necessary to execute the test function. The button is labeled “Active BIT.”

b. **Passive BIT** - The test is run automatically without crew involvement and the results are displayed at the completion of the test or when the BIT detects a fault. (This label replaces any previous labels associated with “cyclic” or continuous BITs.)

c. **Detailed BIT** - The Active BIT executed is more detailed. (This label replaces “extended” BITs.)

Bus

a. **CDG** - The Data distribution path of the 1553 bus used to transmit data between bus controllers and remote terminals.

b. **EPG** - Electrical hardware associated with the distribution of secondary power to downstream devices. An electrical bus is a subset of a channel.

Cancel - Closes a window without saving the changes. For Robotics, cancel is used to halt a process.

Cartesian - Six degrees-of-freedom space defined by three orthonormal directions (right-handed set of three mutually perpendicular vectors) and by three Euler sequence angles in the PYR sequence.

Catastrophic hazard - Any hazard that causes loss of crew or on-orbit life sustaining system function.

Caution and Warning - There are four levels of C&W

a. **Emergency** - A life threatening condition that requires immediate attention. Predefined crew responses may be required before taking corrective action. Safe haven concept activation may be necessary. Included are the presence of fire and smoke, the presence of toxicity in the atmosphere, and the rapid loss of atmospheric pressure.

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b. **Warning** - Conditions that require immediate correction to avoid loss of major impact to mission or potential loss of crew. Included are faults, failures, and out of tolerance conditions for functions critical to ISS survival and crew survival.

c. **Caution** - Conditions that are less time-critical but have the potential for further degradation if crew attention is not given. Included are faults, failures, and out of tolerance conditions for functions critical to mission success.

d. **Advisory**

1. Annunciated to denote anomalous conditions in which a system or operations capability is degraded, but does not directly affect the crew or mission.

2. To denote nominal system status.

Channel

a. **CDG** - The 1553 bus consists of two redundant paths. Each is referred to as a channel.

b. **CTG** - A pathway for routing high rate data and video. For example, channels are selected in the High-Rate Frame Multiplexer (HRFM) (8 channels for routing Orbiter Communications Adapter (OCA) and payload data), Video Baseband Signal Processor (VBSP) (4 channels for routing video), and Medium-rate Communications Outage Recorder (MCOR) (2 channels for routing MDM payload data for recording).

c. **EPG** - Entire power generation and distribution hardware from solar array to device including primary and secondary power. One channel exists per solar array wing.

Command - An instruction given from the ground or onboard computer that causes the end item to perform a function. For example, sending a command to initiate a valve opening opens the valve.

Command, One-Step - The user only needs to send a single command (sometimes in conjunction with using an Execute button) for the intended action to be performed.

Command, Two Step - Requires that two separate commands be executed (each of which may also require the use of an Execute button) before the intended action is performed.

Common/or Equivalent/Same - Terms used to denote the results of comparisons with two or more items. A common system component either can be **equivalent** to its counterpart, or can be the **same** as its counterpart. When two systems produce the same result using different hardware, software, or similar techniques, they are said to be **equivalent**. When it is not possible to distinguish one component from another component, the components that are indistinguishable are the **same**.

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Corrective maintenance - Performed to restore system hardware/software integrity following ORU/equipment failure.

Critical hazard - Any hazard that may cause a nondisabling injury, severe occupational illness, or loss of emergency procedures or that involves major damage to the launch or servicing vehicle, manned base, or an on-orbit life-sustaining function.

Data - Factual information organized for analysis or used to make decisions.

Dead - When used as a status character, the parameter is in the telemetry stream but no initial data is received.

Delta and Error - Delta = Target - Current; Error = Current – Target.

Display - The grouped set of data and information contained within a window. This term refers to software-generated textual and graphic images or video output. Displays are used for monitoring and commanding purposes.

Effectiveness - The accuracy and completeness with which crewmembers can achieve their goals.

Efficiency - The relationship between the resources expended and the accuracy and completeness with which crewmembers can achieve their goals.

Element - All on-orbit hardware and software belonging to an ISS Partner.

Enable/Inhibit - Enable is used when allowing automatic processes (such as software routines) to operate or when allowing the specified action to occur whenever commanded. There may be no time criticality associated with this terminology. Inhibit is used when preventing a command from being executed or an action from being performed. Nomenclature used in telemetry fields for feedback may read enable(d)/inhibit(ed), or if space is limited, Ena/Inh.

End Effector - The hardware at the tip of a robot used to connect to or service a Tool payload. An End Effector (EE) that also includes a latch is called a Latching End Effector (LEE). Both EE and LEE are used with large robots intended for gross translations.

Euler Sequence

a. **Yaw** - Yaw is positive when rotated in a right-handed manner around the Z-axis.

b. **Pitch** - Pitch is positive when rotated in a right-handed manner around the Y-axis.

c. **Roll** - Roll is positive when rotated in a right-handed manner around the X-axis.

Verify that this is the correct version before use

Execute - This term is used exclusively on the button used to grant permission to the laptop or workstation to send a command. The Execute function is local to the laptop or workstation. The term may not be used for any other function, and no other term may be used in place of Execute.

Failure - The inability of a system, component, or part to perform its required function within specified limits, conditions, and/or duration.

Fire - Used only when referring to a physical fire or the “firing” of thrusters.

Frame of Resolution (FOR) - Reference frame associated with the end effector or payload. The origin of the FOR is the Point of Resolution (POR) or the point around which rotations will occur. The Display Frame uses the axes of the FOR to computer the Euler Sequence Angles.

Graphics or Graphic Symbol - Graphic symbols are used in flight displays, ground displays, procedures, and training documentation to denote the function, structure, and operation of different systems and components. Symbols include icons, compounds symbols, and primitives.

Hardware - Items of identifiable equipment including piece parts, components, assemblies, subsystems, and systems.

Hazard - The presence of a potential risk situation caused by an unsafe act or condition.

Hazard Control - Design or operational features used to reduce the likelihood of occurrence of a hazardous effect. Hazard controls are implemented in the following order of precedence:

a. Elimination of hazards by removal of hazardous sources and operations by appropriate design measures.

b. Prevention of hazards through the use of safety devices or features.

c. Control of hazards through the use of warning devices.

d. Special procedures, and/or emergency devices.

e. Minimizing of hazards through a maintainability program and adherence to adequate maintenance and repair schedule(s).

Icon - A small graphic symbol that uses a simplified picture to denote a system, component, state, or function. Examples: pumps, filters, and entire systems.

Learnability - The resources expended to acquire and maintain the knowledge and skills for effective and efficient operations.

Verify that this is the correct version before use

Load/Set - The Load button sends data for a template command to a buffer before the command is sent. The Set button sends the buffered template command and executes the command if no Execute button is present. Set also can be used in template commands without Load if data is not buffered. CSA deviation: Load sends a command to download a new set of parameters without the use of the set button.

Malfunction Fault Isolation and Recovery - Performed to isolate a system/function anomaly to an ORU/hardware or to recover from a system/hardware/software failure.

Manual - Requires human involvement.

Manual Jog - Moving a robot/payload one axis at a time. For example, translating in the X-direction, then in the Y-direction, then rotating in pitch, rather than in all three at once. (ERA does not have hand controllers that allow multidirectional commands.)

Menu - Implies a list of choices normally presented in a graphic form.

Missing - When used as a status character, parameter is not in the telemetry stream.

Mode

a. Primarily used in terms of software configuration at the system level or above.

b. When used in Robotics, a “mode” or “mode of operation” designates the type of input required by the operator and the type of motion output by the robotic system.

Navigation Path - The string of display selections required to reach the desired display from the primary window.

Nominal - According to plan.

Nominal operations - That portion of the on-orbit operations during which planned activities are carried out free from the influence of shuttle arrival or departure or from malfunctions and failures. Can also be described as procedures used to carry out the day-to-day operation of the systems or individual subsystem components.

Off-nominal - Not according to plan. A situation when a failure occurs or something happens at a particular point to prevent the normal flow of activities.

Operations - Day-to-day sequences of activities associated with systems, processes, experiments, and payloads onboard the ISS or on the ground in support of the onboard activities.

Operator - The person who closes the loop in a manual control system.

Verify that this is the correct version before use

Overlay

a. A type of display that is superimposed on a base layer. An overlay contains information about the base layer.

b. Digital images superimposed on a video image to aid in monitoring a vehicle.

Pass/Fail - To undergo a test (un)successfully.

Pause - Used when an operation is to be either nominally or off-nominally stopped or canceled; it may be resumed from that point in the process.

Payload Alert - Annunciated to denote a payload operational status or to denote when crew action is required to continue nominal operations or prevent the loss of science or hardware.

Preventive maintenance - Periodically performed on ORUs performing within specification. Considered a requirement on the flight hardware/software. If duration is less than 30 minutes and/or IFM tools are not required, the procedure will reside in its systems book. Procedures must be identified for Maintenance and Resupply (M&R).

Primary/Backup - Used when referring to the logical state or designation of equipment where only one can be logically selected as the Primary and all others selected as backup. When the backup is running in a powered state, it can be referred to as “Hot” backup. When the backup is not powered or is not receiving supporting data from the Primary equipment so that it can immediately begin to assume the Primary Functions, it is referred to as "Cold" backup. Exceptions are the following:

a. For the Node 1 MDMs, one is considered Primary and the other is considered Secondary

b. For the C&C MDMs, one is considered Primary, another is Backup, and the third is Standby

Reference information - Nonexecutable information and nonprocedural data used to aid in ISS operations.

Relocatable - Signifies that an automatic sequence can be performed from more than one robot base location.

Satisfaction - The comfort and acceptability of use.

Stale - When used as a status character, parameter is in the telemetry stream but connection with the telemetry stream has been lost. Also associated with Loss of Signal (LOS).

Verify that this is the correct version before use

Start/Stop - Used specifically with hardware and is defined as the cessation of motion in moving parts (hardware). For example, a mechanism is commanded to “Stop.”

State - The physical configuration (On/Off, Open/Close, etc.) at the subsystem level or below.

Status - A qualitative assessment of the overall condition or health of the system at any level.

String - CTG: In a communications system, string refers to redundant sets of equipment providing identical functionality. For example: The C&W system issues a message that describes which set of redundant S-Band equipment is annunciating the C&W: String 1 or String 2.

Terminate - Used when an operation is to be either nominally or off-nominally stopped or canceled and will result in the operation having to restart from the beginning. For example, software routines can be terminated.

Usability - The effectiveness, efficiency, and satisfaction with which the crewmembers can achieve their goals, according to the operational procedures and displays.

Vernier - A rate slower than coarse rate. It is selected to ensure that when the brakes are applied, the robot and payload stops before hitting structure or an obstacle.

Tables 14-1 and 14-2 define the standards for acceptable terms used on a display.

Table 14-1. Group terms used on displays

Term	Used with
Activate	Deactivate
Active	Standby
Arm	Disarm
Blank	Checkmark (√)
Blank	X
Complete	Incomplete
Enable	Inhibit
Load	Set
Normal	Failed
On	Off
Open	Close
Pass	Fail
Primary	Backup
Run	Pause/Terminate (for software)
Start	Pause/Stop (for hardware)
True	False
Valid	Invalid
Play(back)	Record/Stop/Pause/Fast Forward/Rewind (for recorders)

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Table 14-2. Unused terms on command button labels

Do not use	Suggested terms
Authorize	Enable, Arm, On
Cancel*	Inhibit, Off, No, Terminate, Stop
Confirm	Yes, Run, Start
Fire	Use the name of the action
Incorporate	Set

***Cancel is used only to close a window without saving the changes. Robotics uses cancel to halt a process.**

Verify that this is the correct version before use

15.0 OPNOM ISS PROGRAM CHANGE DIRECTIVE

This section of the Operations Nomenclature document contains a copy of the ISS Program Change Directive, SSCN # 000638. This directive baselines the November 1996 version of the SSP 50254 and delegates configuration controls to the ODFCB.

1

Directive No. | |2.IPT/AIT/Board/Date:

SSCN: 000638 | International Space Station | SSCB - 5/14/97

| Program Change Directive |

3. Revision: | |4. Page 1 of 1

N/A |

5. Title: Baseline SSP 50254, Operations Nomenclature and delegate Configuration Control to the Operations Data File Control Board (ODFCB)

6. Baseline Documents Affected:

Document Number: None Revision:

Document Title:

7.

a) Direction: This directive baselines SSP50254, Operations Nomenclature (OpNom). All Partners shall use the OpNom document for denoting all hardware and software and associated data when producing ISS mission operations products, including but not limited to the following: ODF procedures and reference data, Onboard portable computer system and ground displays, Onboard equipment decals, Onboard short term plan, Inventory management database and plans, Uplinked messages to the crew, Intercenter communications, Pre-flight checkout, Flight Rules, Console handbooks, Mission Integration Plan, Command and telemetry lists, Schematics and other graphics provided for operational use, and Crew and ground controller training resources.

This directive should not be construed to require rework of completed Ops products. The intent is to use the operations nomenclature for all new work.

This directive delegates future configuration control authority to the Operations Data File Control Board (ODFCB).

b) Program Impact: No Cost Impacts have been Identified.

c) Actions:

Action: (1-1)
Actionee: NASA ISS Configuration Management (CM) AIT
Action: Release SSP-50254 through the ISS Engineering Release Unit (ERU).
Due Date: Five working days after receipt of the change notice

8. Total | | | | | | |

Approved Cost	FY 96	FY 97	FY 98	FY 99	FY 00	Balance to Completion	Total Cost
DEV:	$	$	$	$	$	$ -0-	
OPS:	$	$	$	$	$	$ -0-	

9. Background/Reason for Directive:

It is imperative for the operation of the ISS that all operations personnel, including ground controllers and onboard crew, communicate using common nomenclature that unambiguously and uniquely defines all hardware and software items that may be utilized, the methods by which these will be used, and the data concerning these items. The OpNom document defines the standard nomenclature.

10. Directive Signatures:

NASA/Date CSA/Date ESA/Date NASDA/Date RSA/Date

ASI/Date

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APPENDIX A
ACRONYMS AND ABBREVIATIONS

ACP	Automated Crew Procedure
BIPM	International Bureau of Weights and Measures
C&W	Caution and Warning
CR	Change Request
CSA	Canadian Space Agency
DCP	Display and Control Panel
DGCS	Display and Graphics Commonality Standard
ESA	European Space Agency
ETOV	Earth-to-Orbit Vehicle
FOR	Frame of Resolution
GUI	Graphical User Interface
HRFM	High-Rate Frame Multiplexer
IDAGS	Integrated Display and Graphics Standards
IO	Integrated Operation
IMS	Inventory Management System
IRD	Interface Requirements Document
ISS	International Space Station
LVLH	Local Vertical/Local Horizontal
MCOR	Medium-rate Communications Outage Recorder
MIOCB	Mission Integration and Operations Control Board
MIP	Mission Integration Plan
MOD	Mission Operations Directorate
NASA	National Aeronautics and Space Administration
NASDA	National Space Development Agency
OCA	Orbiter Communications Adapter
ODF	Operations Data File
ODFCB	Operations Data File Control Board
OpNom	Operations Nomenclature
OSTP	Onboard Short Term Plan
PMO	Procedures Management Office
PODF	Payload Operations Data File

Verify that this is the correct version before use

POR	Point of Resolution
PYR	Pitch Yaw Roll
RODF	Russian Operations Data File
RSA	Russian Space Agency
SI	International System of Units
SODF	Station Operations Data File
SPIP	Station Program Implementation Plan
SSP PNOM	Space Shuttle Procedural Nomenclature
TBD	To Be Determined
TBR	To Be Resolved
UIL	User Interface Language
U.S.	United States
VBSP	Video Baseband Signal Processor
XPOP	X-axis Perpendicular to Orbit Plane
YPR	Yaw Pitch Roll

Verify that this is the correct version before use

APPENDIX B
DOCUMENT 'TO BE DETERMINED' (TBD) AND 'TO BE RESOLVED' (TBR) INFORMATION

To Be Resolved:

<TBR 10.1: Hierarchy> Hierarchy – The HWG will continue to define the scope and implementation of the hierarchy.

To Be Determined

Verify that this is the correct version before use