

Man-Systems Integration Standards
NASA-STD-3000, Volume II
Revision B, July 1995

Foreword

The original document was assembled for NASA by the Boeing Aerospace Company (BAC), Kent Washington, in conjunction with subcontractors Lockheed Missiles and Space Company (LMSC), Sunnyvale, California; Essec Corporation, Huntsville, Alabama; and CAMUS, Inc., Springdale, Arkansas.

A Government/Industry Advisory Group (GIAG), composed of a panel of "experts" and "users", met four times to review the technical content as it was being developed.

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The GIAG user group was composed of invited representatives from all of the prime aerospace contractors, support contractors, NASA centers and Headquarters, other Government agencies and some non-aerospace contractors.

The technical content of these documents has been thoroughly reviewed by the GIAG participants. The data can be used with confidence that all known relevant human engineering requirements applicable to the space environment have been documented and are as technically valid as it is possible to determine. Iterations to NASA-STD-3000 will be developed as physiological and technical knowledge and requirements dictate.

Technical comments from any user are welcome and will be considered for updating the documentation.

MAN-SYSTEMS INTEGRATION STANDARDS, VOLUME II

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USER'S GUIDE

This bibliography includes all of the human engineering standards, data books, and technical documents that were reviewed to obtain the human-systems integration design considerations, requirements, and examples given in this document. The references that are cited as source documents for either the text or figures are noted by having an asterisk located after the reference number. Those references that are not so notated were given due consideration but found not to have data appropriate for these standards.

In the following listing, the reference citation is as follows:

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This appendix provides references between the requirements in Volume I and the literature that the authors considered whilst developing these requirements. A specific document, paragraph, and/or page number is cited for each paragraph in the standards. Where a paragraph is not listed, no reference documents were applied (e.g., this is the case for introductory paragraphs).

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USER'S GUIDE

This appendix contains a listing of the terms used in the text and figures of Volume I. Scroll down through the list or use the alphabetical links below to go directly to the section where your word is located.

Numerical

5th Percentile Japanese Female

Females falling at the 5th percentile based on the size of the Japanese female population. This is the smallest human size considered for design purposes.

95th Percentile Caucasian Male

Males falling at the 95th percentile based on the size of the Caucasian male population. This is the largest size considered for design purposes.

A

Abduction

The movement of a body segment away from the midline of the body or body part to which it is attached.

Acceleration

The rate of change of velocity with respect to time.

Acidosis

Reduction of alkali reserve due to excess of acid metabolites.

Actuation force

The force required to operate a mechanical device such as a tool, access door, or fastener.

Acute CO₂ Toxicity

Condition of exposure to high-level concentrations of carbon dioxide; associated physiological response.

Adaptive Response

Change in structure, form, or behavior of an organism to suit a new environment.

Adduction

The movement of a body segment or segment combination toward the midline of the body or body part to which it is attached.

Aerobic Power

Aerobic power is the total amount of power an individual generates. It is related to useable power output by an efficiency factor which varies with the task and the individual.

Alveolar Pressure

Gas pressure existing within alveoli.

Alveoli

The air-containing cells of the lungs.

Anatomical Position

A baseline posture for measuring joint motion range. The posture is standing upright, head facing forward, arms hanging down with the palms facing forward.

Annoyance

The sense of being troubled, irritated, or disturbed by unwanted noise.

Anoxia

[Hypoxia](#) especially of such severity as to result in permanent damage.

Anthropometry

Anthropometry is the application of scientific physical measurement methods to human subjects for the development of engineering design standards and specific requirements and for evaluation of engineering drawings, mock-ups, and manufactured products for the purpose of assuring suitability of these products for the intended user population.

Anxiety

Nervous or fear reaction to perception of danger.

Astigmatism

A defect of an optical system in consequence of which rays from a point fail to meet in a focal point resulting in a blurred and imperfect image.

Atelactasis

Collapsed or airless state of all or part of the lung.

Atmosphere

1. The mixture of gasses surrounding the Earth or filling the habitable volume of a spacecraft.
2. The pressure exerted by a column of mercury 760 mm high at 1 G, equal to 101.329 kilopascals.

B

Beats

A periodic sound resulting from the interaction of two or more sounds of different frequencies.

Bends

See [Decompression Sickness](#).

Binary Number System

A base 2 number system using only 1's and 0's. Well suited for electronic logic where the 1's and 0's can be represented by signal present and signal absent.

Binaural

Of, relating to, or involving both ears.

Biomechanics

Biomechanics is the interdisciplinary science (comprising mainly anthropometry, mechanics, physiology, and engineering) of the mechanical structure and behavior of biological materials. It concerns primarily the dimensions, composition, and mass properties of body segments; the joints linking the body segments together; the mobility in the joints; the mechanical reactions of the body to force fields, vibrations, and impacts; the voluntary actions of the body in bringing about controlled movements, in applying forces, torques, energy and power to external objects like controls, tools, and other equipment.

Bit-Mapped Graphics

The data that defines the pixel color which is behind the screen pixel.

Blackout

See [Graying of Vision](#).

Body Envelope

The volume envelope which just encloses the body and body motions during an activity.

Bolus

Used in this document to designate mass of fecal discharge.

Bremsstrahlung

1. Gamma radiation emitted by an electron when it is deflected by the Coulomb field of an atomic nucleus of charge Z ; the fraction of energy radiated as photons by an electron of initial energy E (Mev) is approximated numerically by $ZE/1000$.
2. The electromagnetic radiation produced by the sudden retardation of a charged particle in an intense electric field (as of an atomic nucleus); *also* : the process that produces such radiation.

Brightness

The amount of light emitted or reflected from a surface.

Brightness Ratio

The ratio of the luminance of two areas or surfaces.

British Thermal Unit (Btu)

The amount of heat required to raise 1 lb of water 60 degrees F, 1 degree F.

C

Cabinet

A structural housing into which drawers and shelves are installed. Generally, there is no utility connections between the cabinet and the items installed within it. See [Housing](#).

Carcinogenesis

Origin or production of cancer

Cardiac Arrhythmias

Periodic irregular heartbeat; an alteration in rhythm of the heartbeat either in time or force.

Cardiovascular System

Pertaining to the heart and blood vessels.

Cartwheeling

Vernacular descriptive of inertial resultant of human body to rotational acceleration around the x-axis. ([Refer to Figure 5.3.1-1](#)).

Cataractogenesis

The formation of cataracts.

Central Acuity

Center part of the visual field.

Cerebral Hemodynamic Effects

Relating to or functioning in the mechanics of blood circulation in the brain.

Chassis Leakage Currents

Currents generated by such internal sources as filter capacitors terminated to accessible parts or ground, and capacitive and inductive coupling to accessible parts or ground. These currents can be conveyed from accessible parts and subsequently applied to a crew member.

Chokes

Syndrome of chest pain, cough, and respiratory distress.

Chronic CO₂Toxicity

Condition of exposure to long-term, low-level excess concentrations of carbon dioxide, associated physiological response.

Circadian Rhythms

Bodily functions rhythmically fluctuating with time. These functions include heart rate, blood pressure, body temperature, and respiratory volume. Generally, these metabolic functions slow for a period of time once during a 24 hour period. The most important activity geared to circadian rhythms is sleep.

CO₂Withdrawal

Symptoms arising from cessation of exposure to excess CO₂.

Color Saturation

Saturation is the extent to which an object has more or less color. Saturation is, therefore, relative colorfulness.

Coma

A state of profound unconsciousness caused by disease, injury, or poison.

Command Language (command set)

A set of terms, each with a precise function, used to control the operations of a computer.

Conjunctiva

The mucous membrane that lines the inner surface of the eyelids and is continued over the forepart of the eyeball.

Contaminants

Unwanted material or bacteria.

Continuous Noise

A noise with negligibly small fluctuations of level within the period of observation

Contrast

The difference between the luminance of an object or figure $C = [(L_c + L_r) - (L_d + L_r)] / (L_c + L_d + 2L_r)$

and its immediate background.

C = Contrast

L_c = Object luminance

L_d = Background luminance

L_r = Reflected luminance

Control

A manually operated hardware item used to operate or change the performance of a machine or system.

Core-Shell Concept

Concept of representing a human as a heat-producing core surrounded by a shell (skin) through which heat exchange with the environment takes place.

Coronary Occlusion

Occlusion of a branch of the arterial system that supplies blood to the heart muscle.

Coulomb Friction

Sliding or kinetic Friction.

Crew Station

Any location where a task or activity is performed. There are two basic types of crew stations: workstation and activity center.

Critical Flicker Fusion Frequency

The frequency at which a flashing light will appear as a steady state light - approximately 65 Hz.

Cyanosis

A bluish or purplish discoloration (as of skin) due to deficient oxygenation of the blood.

D

Dark Adaptation

Dark adaptation is the state of being adapted (sensitive) to low levels of ambient luminance (brightness). At any one time the visual system operates well within only a limited range of luminance levels. This range is centered about a particular adaptation level that is determined by the prevailing luminance. As the prevailing luminance changes the adaptation level will also change. The adaptation level shifts more quickly to higher than lower luminance levels.

Dead-Faced

An electrically conductive surface incapable of supplying sufficient energy under normal conditions to present a hazard (e.g., the output of a solid-state switch when in the "STANDBY" state).

Decompression Sickness

A sometimes fatal disorder that is marked by neuralgic pains and paralysis, distress in breathing, and often collapse and that is caused by the release of gas bubbles (as of nitrogen) in tissue upon too rapid decrease in air pressure after a stay in a compressed atmosphere; called also *caisson disease*, *the bends*.

Default Values

A value or option automatically provided by the computer system for use in processing when no alternative has been specified by the operator.

Delirium

A condition of mental confusion, often with hallucinations.

Denitrogenation

The act of reducing dissolved nitrogen concentration in tissues, usually by breathing mixture devoid of nitrogen.

Dependent Elbow

The elbow being engorged with blood during acceleration.

Design Eye Volume

That volume of space in front of a workstation within which a user's head and eyes should be located to guarantee visual access to all display information. The design of displays and display layout may be guided by a specified design eye volume.

Desquamation

To peel off in scales.

Diluent Gas

Physiologically inert component of an atmosphere, purpose of which is to reduce oxygen partial pressure.

Direct Contact

The personal contact of a crewmember to electrically powered surfaces.

Direct Glare

Glare produced by a light source located within a person's field-of-view.

Display

Hardware item used to present system information needed by the operator to make decisions for controlling the system.

Door

Used in Section 8.0, Architecture, to denote a full opening body passageway. A door opening is closed with a door cover. A door cannot be sealed against a differential pressure.

Double Insulated Enclosure/Chassis

An enclosure/chassis which incorporates an insulation system comprised of basic insulation and supplementary insulation with the two insulations physically separated and so arranged that they are not subject to the same deteriorating influences (e.g., temperature, contaminants, and the like) to the same degree.

Drawer

A hardware element designed to slide in and out of a cabinet, rack, or housing. See [Equipment drawer](#).

Dry Bulb Temperature

Air temperature measured by a common thermometer.

Dysbarism

Condition arising from differential pressures between gas pockets in body and ambient. In this document, considered to indicate greater pressure within body cavities.

Dysentery

A disease characterized by severe diarrhea with passage of mucus and blood and usually caused by infection.

Dyskinesia

Impairment of voluntary movements resulting in fragmented or jerky motions (as in Parkinson's disease).

Dysmetria

Dysmetria is lack of coordination of movement typified by under- or over-shooting the intended position with the hand, arm or leg. Dysmetria of a hand can make writing and picking things up difficult or even impossible. Dysmetria that involves undershooting is called hypometria and overshooting is called hypermetria.

Dyspnea

Difficult or labored respiration.

E

Ear Clearing

Act of equalizing pressure between inner ear and ambient.

Ebullism

Vaporization of body fluids at body temperature and low barometric pressure.

Edema

An abnormal infiltration and excess accumulation of serous fluid in connective tissue or in a serous cavity (for example, [Edematous Eyelids](#)).

Edematous Eyelids

Excessive accumulation of fluid in eyelids due to the disturbances of fluid exchange.

Effective Temperature

Empirical sensory index accounting for temperature, humidity and air movement.

Electrical Shock

Sudden stimulation of the nerves and convulsive constriction of the muscles caused by the discharge of electricity through the body.

Embolus

An abnormal particle such as an air bubble circulating in the blood. Compare to [Thrombus](#).

Embolism

Occlusion of a blood vessel. In the case of gas embolism, by a bubble of gas.

Emphysema

A condition characterized by air-filled expansions of body tissues; *specifically* : a condition of the lung marked by abnormal dilation of its air spaces and distension of its walls and frequently by impairment of heart action. See [Mediastinal Emphysema](#).

Enclosure/Chassis

The outer casing of an electrical/electronic device.

Enhancement Coding

Any of a variety of techniques used to enhance, or increase the salience of selected items of information (e.g., color coding). It is well suited for interactive computer applications.

Environmental Control

Control of ambient conditions to produce habitable environments.

Equipment Drawer

A drawer used to house subsystem components. The installed components are generally attached to the drawer using fasteners which require tools for attachment/detachment. It has utility connections to its housing's utility distribution system.

Erythema

Abnormal redness of the skin due to capillary congestion.

EVA (Extravehicular Activity)

Activities performed by a space-suited crewmember in an unpressurized or space environment.

EVA Restraint

A means of stabilizing the EVA crewmember which requires physical ingress and egress by the crewmember.

EVA Workstation

Any area at which an EVA task is performed.

Exchange Rate

The increase in sound level (dBA) for which permissible exposure time is halved.

Exposure Limit

Maximum safe acceleration exposure limit as a function of vibration frequency and exposure time.

Extension

Straightening or increasing the angle between the parts of the body.

Extravasation

To pass by infiltration or effusion from a proper vessel or channel (as a blood vessel) into surrounding tissue.

Extravehicular Mobility Unit

An independent anthropometric space suit system that provides crewmembers with environmental protection, life support, mobility, communications, and visibility while performing various EVAs.

Eyeballs Down

Vernacular descriptive of inertial resultant of human body to linear acceleration in the upward +Gz vector. ([Refer to Figure 5.3.1-1](#)).

Eyeballs In

Vernacular descriptive of inertial resultant of human body to linear acceleration in the forward -Gx vector. ([Refer to Figure 5.3.1-1](#)).

Eyeballs Left

Vernacular descriptive of inertial resultant of human body to linear acceleration in the left yaw +Gy vector. ([Refer to Figure 5.3.1-1](#)).

Eyeballs Out

Vernacular descriptive of inertial resultant of human body to linear acceleration in the backward +Gx vector. ([Refer to Figure 5.3.1-1](#)).

Eyeballs Right

Vernacular descriptive of inertial resultant of human body to linear acceleration in the right yaw -Gy vector. ([Refer to Figure 5.3.1-1](#)).

Eyeballs Up

Vernacular descriptive of inertial resultant of human body to linear acceleration in the downward -Gz vector. ([Refer to Figure 5.3.1-1](#)).

F

Facility

Equipment or equipment and the area dedicated to a specific crew activity. Similar to the term "Center," but "Facility" can refer to only equipment without specifying an area of use. Examples: Shaving Facilities, Recreation Facility.

Fatigue Decreased Proficiency Boundary

Acceleration boundaries as a function of vibration and exposure time for the preservation of working efficiency.

Flexion

Bending or decreasing the angle between the parts of the body.

Follower

The visual movable indicator on a computer video screen that points to or marks the current position at which a character may be entered.

Foot Restraint

A restraint which stabilizes a crewmember by providing a platform for immobilizing the feet.

G

Gas Exchange

The flow of gas through a membrane in the small air sacs in the lungs to the blood stream and vice versa.

Gas Tension

The partial pressure exerted by a gas.

Glare

A consequence of bright light sources in the visual field that cause discomfort and/or a decrease in visual functioning. The effect is worse the closer the light source is to the line of gaze. The amount of light scattering within the eye (which varies between individuals effects susceptibility to glare.

Globe Temperature

Physical composite of dry bulb temperature, radiation, and wind effects measured by placing a temperature sensing device in the center of a blackened sphere.

Glottis

The elongated space between the vocal cords; *also* : the structures that surround this space.

Graying of Vision

Due to the draining of blood from the occipital region of the brain during acceleration, the vision begins to narrow (tunnel vision) and things appear less bright.

Grayout

See [Graying of Vision](#).

Grounded Enclosure/Chassis

An enclosure/chassis electrically connected to the ground return.

Gustatory Sensations

Pertaining to the sense of taste.

H

Habitable Volume

Habitable volume is defined as free, pressurized volume, excluding the space required for equipment, fixtures, and stowage.

Handhold, Handrail

A handle or grasp area which is slightly larger than the hand and is used as a mobility aid, hand restraint, or as a hardware mounting surface.

Harmonic

An overtone having a frequency that is an integral multiple of a given primary tone.

Hatch

Used in this document to denote a full body passageway. A hatch opening is closed with a hatch cover. A hatch can be sealed against a differential pressure.

Heart Arrhythmia

An alteration in rhythm of the heartbeat either in time or force. See [Cardiac Arrhythmia](#).

Heat Exhaustion

(Also known as heat prostration) - A syndrome resulting from exposure to high temperatures; characterized by a moist, cold skin, poor circulation, a normal temperature but elevated rectal temperature, restlessness and anxiety.

Heat Stroke

The body temperature rises because of faulty heat dissipation due to high environmental temperature and humidity. Rectal temperatures may go from 106 - 100 deg F.

Hematopoietic

Blood producing. Hematopoiesis is the formation of blood or of blood cells in the living body.

Hemoglobin

Oxygen carrying cells of the blood.

Hemorrhage

Escape of blood from vessels.

Hexadecimal Number System

A base 16 number system used by computers in which each digit represents a power of sixteen. For each digit of a hexadecimal number four digits ($2^4=16$) of binary logic are required.

Hierarchical Menu

A set of embedded menus such that entries in all but the lowest level menu will produce another menu when selected.

Housing

A structure into which equipment is installed. See [Cabinet](#), [Rack](#).

Hyperbaric

Dealing with ambient pressures which are greater than the gas pressures in the body.

Hyperoxia

Oxygen excess condition arising when greater than normal oxygen partial pressures are encountered.

Hypobaric

Dealing with ambient pressures which are less than the gas pressures within the body.

Hypotension

Abnormally low blood pressure.

Hypothermia

Subnormal temperature of the body.

Hypoxia

A deficiency of oxygen reaching the tissues of the body.

I

Icon

A symbol that graphically resembles its intended meaning (e.g., a schematic drawing or a headlight on the control that is used to control an automobile's headlights).

Illumination

The amount of light (luminance flux) falling on a surface. Measured in lumen/m² lux = 0.093 ft-c. Illumination decreases with the square of the distance from a point source.

Impact Acceleration

Pulsed or short-duration accelerations of less than 1 second duration.

Impact Noise

See [Impulse Noise](#).

Impulse Noise

A noise consisting of one or more bursts of sound energy, each of a duration less than about one second.

Inaccessible area

Any area with an opening that will accept a loose and floating object of 10mm (0.4in.) diameter and cannot be retrieved or captured by using a retrieval tool and/or crewmember reaching their hand and forearm into the area.

Inclusions

Tiny particles of foreign matter or air bubbles entrained in glass.

Incontinence

Unable to retain a bodily discharge (as urine) voluntarily. Inability to control the natural evacuation of the feces or urine; specifically, involuntary evacuation due to organic causes.

Infrasonic

Sound at frequencies below the audibility range of the human ear, f 20 Hz.

Indirect Contact

The contact of a crewmember to electrically powered surfaces through an electrically conducting medium (e.g., probe, rod).

In-Line Circuit Leakage Currents

Unintentional currents which can flow in a conductor. These currents may result from the inability of solid-state electronics to reach an "infinite" impedance "OFF" state, as is the ability of a mechanical switch. The solid-state electronic device has a finite impedance which undesirably completes the input/output circuit thus providing a means for current to flow. Connections to in-line circuits are normally isolated from crewmember inadvertent contact by barriers and may be considered a hazard if accessible to inadvertent crewmember contact. In-line circuits with leakage currents are referred to as in "STANDBY" when placed in the high impedance state since a complete disconnect is not possible and the circuit output is still energized.

Intermittent Noise

A noise whose level suddenly drops to the level of the background noise several times during the period of observation, the time during which the level remains at a constant value, different from that of the ambient being of the order of magnitude of one second or more.

Ischial Tuberosities

Two bony protuberances in the hip structure. These bones support a major portion of the seated body weight in 1-G conditions.

Isolated Patient Contact

A direct or indirect patient contact that is deliberately separated from the supply circuit and ground by virtue of spacings, insulation, protective impedance, or a combination thereof (e.g. intra-aortic pressure monitor).

Isometric Joystick

The isometric joystick, often referred to as a force joystick or a pressure joystick, is a lever that doesn't move. The output of the isometric joystick is a function of the amount of force applied to it.

Isotonic Joystick

The isotonic joystick, often referred to as a displacement joystick, provides an output which is proportional to the displacement of the joystick from the center.

J

None

K

Keratitis

Inflammation of the cornea of the eye. See [Photokeratitis](#).

Keystone Effect

A distortion in the shape of a projected image resulting from the film plane and screen plane not being parallel. Usually, magnification will vary from top to bottom or right to left.

Kinesthetic System

Sensations originating in the sense organs of the muscles, tendons, and joints that provide us with a sense of relative body segment movement and position.

L

Lacrimation

The secretion of tears especially when abnormal or excessive.

Lateral Rotation

The turning away from the midline of the body.

Leakage Currents

Unconditional currents which can be applied to a crewmember.

Level Equivalent or L_{eq}

Equivalent sound level or time-average sound level in dB. The level of steady sound which, in a stated time period and at a stated location, has the same A-weighted sound in dB energy as the time-varying sound.

Leukopenia

A condition in which the number of white blood cells circulating in the blood is abnormally low.

Light scatter fraction

The ratio of scattered light to [specular reflected](#) light.

Line of sight

The optical axis extending from the observers eyes to the target viewed.

Line of sight deviation

The angle which the line of sight is redirected into the eye due to intervening optically refractive material (e.g., prism).

Linear Acceleration

The rate of change of velocity of a mass; the direction of movement of which is kept constant.

Local Vertical

Local vertical is achieved by a consistent arrangement of vertical cues within a given visual field to provide an definable demarcation at the crew station boundary within the visual field. A consistent local vertical within modules is highly desirable.

Long Term Mission

Any mission in which crewmembers are away from earth for a period greater than two weeks.

Luminance

The photometric equivalent of the brightness of an area as viewed from a given direction. More technically, luminance flux per unit of projected area per unit solid angle. Measured in candela per square meter (cd/m^2), foot-lamberts (ft-L, or millilamberts (mL). $1.0 cd/m^2 = 0.31 mL = 0.29 ft-L$. The luminance of a surface does not vary with the distance of the observer from the surface being viewed.

Luminance Ratio

The difference between the luminance of an object and its surroundings.

M

Masking Noise

A background noise or signal with dynamic range in frequency and level sufficient to obscure another noise or signal from aural awareness.

Mean Perception

A mild shock perceived by 50% of the population.

Medial Rotation

The toning toward the midline of the body.

Mediastinum

The space in the chest between the pleural sacs of the lungs that contains all the viscera of the chest except the lungs and pleurae; *also* : this space with its contents.

Mediastinal Emphysema

Accumulation of gas in the tissues of the chest, specifically in the [Mediastinum](#). Compare to [Emphysema](#).

Menu

A method for inputting information to a computer. The menu is a list of the available input options that may be selected.

Meridional

Of, relating to, or situated on or along a meridian. A line or a plane which is normal to the line of sight.

Metabolism

Physiological activity involving utilization of foodstuffs and oxygen to produce tissues and provide for production of energy.

Micturition

To urinate.

Minimal Passageway

A minimal passageway is a translation path which is only large enough to permit passage of a space suited crewmember with his or her long axis in the direction of travel.

Mobility Aid

A device (such as a handle) or a surface (padding which facilitates translation in a microgravity environment).

N

Narcosis

A state of profound stupor, produced by toxic effect of certain substances, in diluent gas narcosis, by excessive partial pressure of diluent.

Narrow Band Noise

A simple or complex tone having intense and steady state frequency components, relative to wideband noise components, in a very narrow band (1, of the octave band or 5Hz, whichever is less) and is heard as a musical sound either harmonic or discordant.

Nausea

Discomfort in stomach with aversion to food and tendency to vomit.

Neurocirculatory System

Concerned with both nervous and vascular systems.

Neutral Body Posture

The characteristic posture that the relaxed human body assumes in microgravity.

No Sensation

The level of perception only perceived by a fractional percentage of the population.

Noise Canceling

A technique to delete, neutralize, or counteract any unwanted electrical signal within a communication system that interferes with the sound or image being communicated.

Noise Shields

The physical coverings or shells used to protect or screen any unwanted electrical signal within a communication system that interferes with the sound or image being communicated.

Non-adaptive Response

Pathological response to a new environment which presents conditions beyond an organisms ability to adapt.

Normoxic

Having a normal level of oxygen.

Neurocirculatory collapse

R psychosomatic disorder characterized by dyspnea, palpitation, vertigo, faintness, fatigue. Tremor, caused by stress, fear, and violent exercise.

O

Octal Number System

A base 8 number system in which each digit represents a power of eight. For each digit of an octal number three digits ($2^3 = 8$ of binary logic are required).

Octave Band

The band of frequencies where the highest frequency is twice that of the lowest frequency.

One-Third Octave Band

The band of frequencies In which the ratio of the extreme frequencies is equal to the cubic root of 2: i.e. $f_n/f_e = 1.260$, where f_n and f_e are the highest and lowest cutoff frequencies of the band.

Orbital Replacement Unit (ORU)

A piece of equipment (a single item or module containing an assembly of components) which is designed for removal and replacement as a unit.

Ordinary Patient Connection

A direct patient contact that does not have the spacing, insulation, or protective impedance associated with an isolated patient connection (e.g., blood pressure cuff).

Orthostatic Intolerance

Difficulty in standing erect in a 1-G environment. This could be due to any number of effects of exposure to microgravity (cardiovascular, muscular, skeletal, or coordination).

ORU Chassis Leakage Currents

Currents generated by such internal sources as filter capacitors terminated to accessible parts or ground, and capacitive and inductive coupling to accessible parts or ground. These currents can be conveyed from accessible parts to ground or other accessible parts and subsequently applied to a crewmember.

Overall SPL

Overall SPL (Sound Pressure Level) is interpreted as including all noise within the frequency range from 22.4 to 11,200 Hz.

Oxygen Atelectasis

Collapse of the expanded lung.

Oxygen Toxicity

Toxic effects of excess oxygen partial pressure.

P

Parallax Error

The perceived change in relative position of objects at different distances from an observer when viewed from different positions. Can cause errors in the reading of some instruments.

Paresthesias

A sensation of tingling, crawling, or burning of the skin that has no objective cause.

Paroxysm

A fit, attack, or sudden increase or recurrence of symptoms

Pass-Through

A pass-through is a translation path which is only large enough to permit passage by an IVA clothed crewmember with his or her long axis in the direction of travel.

Passageway

A pass-through area between non-adjacent modules or spaces.

Patient

A crewmember instrumented with electrical/electronic equipment.

Patient Connection Leakage Current

Leakage currents measured between patient leads at the patient interface, or between patient leads at the patient interface and ground.

Pattern Coding

A perceptual indicator used to differentiate areas of interest to the observer, or reduce operator search time.

Peak Pressure Level

Peak sound pressure for any specified time interval is the maximum absolute value of the instantaneous sound pressure in that interval.

Percentile

A point on a scale indicating the percentage of persons within a population who have a body dimension of a certain size or smaller. The value of the statistical variable that marks the boundary between the consecutive intervals in a distribution of 100 intervals, each containing one percent of the total population.

Perception

The awareness of the elements of environment through physical sensation such as perceiving a mild shock.

Perfusional changes

Changes in the flow rate of blood in blood vessels.

Petechial Hemorrhages

A minute reddish or purplish spot containing blood that appears in skin, mucous membrane, serous membrane, or on a cross-sectional surface of an organ especially in some infectious diseases.

Photokeratoconjunctivitis

Photochemical injury to the cornea of the eye by ultraviolet exposure may result in photokeratoconjunctivitis. This painful condition may last for several days and is very debilitating; called also *welders flash*, *snow blindness*. See [Conjunctiva](#).

Photokeratitis

Photokeratitis is essentially a reversible sunburn of the cornea resulting from excessive UV-B exposure. It occurs when someone spends hours on the beach or snow without eye protection. It can be extremely painful for one to two days and can result in temporary loss of vision. See [Keratitis](#).

Physiologically Inert

Substance that does not interact chemically with the body.

Physiology

The organic processes and phenomena of an organism or any of its parts or of a particular bodily process.

Pixel Addressability

The capability to store or retrieve from, a specific location in memory, the basic unit or picture element that makes up the image displayed in a video screen.

Pleura

The delicate serous membrane that lines each half of the thorax of mammals and is folded back over the surface of the lung of the same side. This membrane envelopes the lung and lining the thoracic cavity.

Pneumothorax

A condition in which air or other gas is present in the pleural cavity and which occurs spontaneously as a result of disease or injury of lung tissue or puncture of the chest wall or is induced as a therapeutic measure to collapse the lung

Postrun Headache

Headache that occurs after an event.

Predicted Four-hour Sweat Rate

Empirical index incorporating environment, work and clothing to predict sweat production.

Pre-Emphasis

The intentional alteration of the relative strengths of signals at different frequencies (as in radio and in disc recording) to reduce adverse effects (as noise) in the following parts of the system.

Primary Passageway

A primary passageway is a translation path which accommodates a space suited crewmember in an upright working position or neutral body posture.

Prompt

A message or other signal displayed on a computer generated display advising the operator that he or she is expected to provide some specific response.

Pronation

The rotation of the hand and forearm so that the palm faces backwards or downwards.

Proxemics

The study of the nature, degree, and effect of the spatial separation individuals naturally maintain (as in various social and interpersonal situations) and of how this separation relates to environmental and cultural factors.

Proximity Operations

Any space module related activity that is performed outside the space module and within a specified boundary.

Q

None

R

R value

Ratio of initial nitrogen partial pressure to the final total pressure.

Rack

A structure into which equipment drawers or other types of equipment mounting hardware is installed. A rack generally has a built-in utility distribution system that provides interfaces for connecting the installed equipment's utilities.

Random Noise

A sound whose instantaneous amplitudes occur, as a function of time, according to a normal (Gaussian) distribution curve. Random noise need not have a uniform frequency spectrum.

Reaction Time

The time between the presentation of a stimulus and the beginning of a response to that stimulus.

Reduced Comfort Boundary

Acceleration boundaries as a function of vibration and exposure time for the preservation of comfort.

Remote Operation

An operation which permits personnel to send and receive information or commands to a distant environment.

Replacement Unit

General term that includes Orbital replacement units (ORU), Line replacement units (LRU), and Shop replacement units (SRU).

Respiration

The series of actions resulting in the supply of oxygen to tissues of the body.

Response Time

The time interval during which the actual response to the stimulus is accomplished.

Restraint

A mechanism for restricting unwanted movements of an object or a person in microgravity environments. Restraints can be mechanical (such as a strap) or non-mechanical (magnetism or vacuum).

Reverberation Time

Time required for the average sound energy density in an enclosure to decrease to -60 dB of the initial value after the source has stopped.

Roentgen Equivalents, Man

The absorbed dose of any ionizing radiation which produces the same biological effects in crewmembers as those resulting from the absorption of 1 roentgen of x-rays.

Rotational Acceleration

The rate of change of the direction of a mass, the velocity of which is kept constant. In this regard, the rotational acceleration is directly proportional to the square of the velocity and inversely proportional to the radius of the turn.

S

Sacrificial surfaces

A protective surface placed over a delicate surface which will absorb environmental damage.

Scrolling

An operation or facility of a VDT in which display elements make a continuous bottom-to-top vertical movement across the screen (or window) under control of the operator, with display lines appearing at the bottom edge and dropping off at the top.

Segment

A body segment is the largest dimensional mass which when moved will maintain a constant geometry.

Shock

Physical or emotional trauma; clinical manifestations of inadequate amount of circulating blood. See [Impact Acceleration](#).

Shock - Electrical

See [Electrical Shock](#)

Shock Load

See [Impact Acceleration](#)

Signal-To-Noise Ratio

The ratio of the amplitude of the signal transmitted through an instrumentation system to the amplitude of the noise generated within the system.

Somersaulting

Vernacular descriptive of inertial resultant of human body to rotational acceleration around the y-axis. ([Refer to Figure 5.3.1-1](#)).

Sonic

1. Relating to the speed of sound in air (about 761 miles per hour or 1224 kilometers per hour) at sea level at 59°F (15°C).
2. Sound at frequencies with the human ear's audibility limit (between 20 Hz and 20KHz). See [Ultrasonic](#), [Infrasonic](#).

Space Module

An inhabited establishment away from the earth.

Space Motion Sickness

A malady occurring in approximately 50% of people initially exposed to microgravity. Symptoms are similar to that of motion sickness and last 2-4 days. To date, susceptibility to space motion sickness has not been predictable from responses in a 1-G environment. Only limited success has been achieved in controlling space motion sickness.

Specular

Of, relating to, or having the qualities of a mirror.

Specular Glare

Glare which is created by the image of a light source reflecting off a surface within a person's field-of-view.

Specular Reflection

The reflected image of the light source corresponds very closely in size and shape to the original light source.

Speech Interference Level

The background or sound noise level in dB at frequencies between 150 and 7500 Hz that will result in the loss of intelligibility conversation.

Squeeze

Condition arising when gas pocket is compressed to a smaller size than its normal residual volume.

Standby

A high impedance state of an electronic device, usually to minimize the amount of energy consumed or supplied (e.g., the off state of an electronic switch).

Standard Passageway

A standard passageway is a translation path which accommodates an IVA clothed crewmember in an upright working position or neutral body posture.

Stroke

Common term for apoplexy; hemorrhage into the brain, causing sudden onset of coma and neurological signs.

Subcutaneous Emphysema

Accumulation of gas under the surface of the skin.

Suffusion

1. To spread over or through in the manner of fluid or light.
2. A spreading or flow of any fluid of the body into surrounding tissue; an extensive superficial [extravasation](#) of blood.

Supination

The rotation of the forearm and hand so that the palm faces forward or upward and the radius lies parallel to the ulna

Symbol

A character or graphic that stands for or represents something else such as operations, quantities, elements, relations, or qualities.

Syncope

The loss of consciousness resulting from insufficient blood flow to the brain.

T

Teleoperator

A remotely controlled mobility module which incorporates sensory and manipulative subsystems for the purpose of extending the human operator's skills and cognitive capabilities into hostile or remote environments.

Tether

A hook and lanyard which is used to attach a crewmember or a piece of hardware to a piece of hardware.

Thermal Comfort

That condition of mind which expresses satisfaction with the thermal environment. Specifically, when the core temperature is normal, and the rate of body heat storage is zero.

Thermogenesis

The production of heat, for example, muscular heat production by shivering.

Thermoregulation

Regulation of temperature, particularly self-regulation of body temperature.

Thrombocytopenia

Persistent decrease in the number of blood platelets that is often associated with hemorrhagic conditions.

Thrombus

A clot of blood formed within a blood vessel and remaining attached to its place of origin. Compare to [Embolus](#).

Tinnitus

A sensation of noise (as a ringing or roaring) that is caused by a bodily condition (as a disturbance of the auditory nerve or wax in the ear) and can usually be heard only by the one affected.

Tissue

An aggregate of cells usually of a particular kind together with their intercellular substance that form one of the structural materials of a plant or an animal.

Touch Temperature

Temperature of objects in direct physical contact.

Toxicity

The quality of poison; the kind and amount of poison produced by a microorganism.

Tracheal Pressure

Gas pressure existing within the trachea (wind pipe).

Translation

To move from one place to another by use of reaction power.

Transmissivity

The proportion of luminous flux which passes completely through a window to the eyes or sensor to the amount of luminous flux incident upon the outside of the window.

Troland

Retinal illuminance resulting from viewing a surface with a luminance of 1 cd/m² through an artificial pupil with an area of 1mm².

Tunnel

A passageway which allows the crewmember to move only along his/her longitudinal axis.

Twist

Vernacular descriptive of inertial resultant of human body to rotational acceleration around the z-axis. [\(Refer to Figure 5.3.1-1\).](#)

U

Ultrasonic

Sound at frequencies above the human ear's audibility limit of about 20,000 hertz -- used of waves and vibrations.

Urethra

The canal that carries urine from the bladder.

V

Vasoconstriction

Narrowing of the blood vessels in order to decrease blood flow to the skin to preserve body heat.

Vasodilation (Variant: Vasodilatation)

Widening of the blood vessels to allow increased blood flow to the skin to promote heat loss.

Vestibular System

Located in the inner ear, the vestibular system is responsible for the sense of balance (and relative position of the body with respect to the environment). The vestibular system senses acceleration and direction of gravity.

Viewport

A transparency located such that an observer can see from one compartment into another.

Visual acuity

Refers to the smallest resolvable detail an observer can see.

Visual Angle

The angle formed at the eye by two imaginary lines drawn to either side of the object in question.

Visual Clutter

Visual clutter results when the quantity of information in a visual display becomes great enough so that it starts to result in information overload. Accuracy and speed of performance will decline as visual clutter increases.

Visual Display Terminal

An electronic device used to present visual information that is usually computer generated. They are used in conjunction with both the input and output of information. Examples include: cathode ray tube (CRT), liquid crystal diode (LCD), light emitting diode (LED), plasma, and electro-luminescent (EL).

W

Wavefront Deviation

Any change in the reflected wavefront of a set of rays as compared with the incident wavefront of the same set.

Wet Bulb Globe Temperature

Calculated refinement of globe temperature by weighting dry bulb and wet bulb temperatures with the standard globe temperature.

Wet/Dry Index

Calculated prediction of human stress temperature accounting for wet and dry bulb temperatures.

Wing Tab Connector

An electrical utilities or other connector with two opposed radial tabs to facilitate EVA connect or disconnect.

X

X-axis

The axis of a plane Cartesian coordinate system parallel to which ordinates are measured. This refers to the direction of back to chest, anatomically.

Y

Y-axis

The axis of a plane Cartesian coordinate system parallel to which ordinates are measured. This refers to the direction of right to left side, anatomically.

Z

Z-axis

The axis of a plane Cartesian coordinate system parallel to which ordinates are measured. This refers to the direction of foot or buttocks to head, anatomically.

Appendix D
Abbreviations and Acronyms

[A](#) | [B](#) | [C](#) | [D](#) | [E](#) | [F](#) | [G](#) | [H](#) | [I](#) | [J](#) | [K](#) | [L](#) | [M](#) | [N](#) | [O](#) | [P](#) | [Q](#) | [R](#) | [S](#) | [T](#) | [U](#) | [V](#) | [W](#) |
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USER'S GUIDE

This appendix contains an alphabetized listing of the abbreviations and acronyms used in the text and figures of Volume I. Scroll down through the list or use the alphabetical links below to go directly to the section where your word is located.

Symbols

+Gx	Forward acceleration (see Figure 5.3.1-1)
+Gy	Right yaw acceleration (see Figure 5.3.1-1)
+Gz	Upward acceleration (see Figure 5.3.1-1)
+Rx	Left roll velocity (see Figure 5.3.1-1)
+Ry	Forward pitch down velocity (see Figure 5.3.1-1)
+Rz	Right yaw velocity
- Gx	Backward acceleration (see Figure 5.3.1-1)
- Gy	Left yaw acceleration (see Figure 5.3.1-1)
- Gz	Downward acceleration (see Figure 5.3.1-1)
- Rx	Right roll velocity (see Figure 5.3.1-1)
- Ry	Backward pitch up velocity (see Figure 5.3.1-1)
- Rz	Left yaw velocity
1/3 OB	One-third octave band

A

ACGIH	American Conference of Governmental Industrial Hygienists
ADS	Altitude decompression sickness
A/E	Ascent and Entry

MAN-SYSTEMS INTEGRATION STANDARDS, VOLUME II

AFSC	Air Force Space Command
AI	Articulation index
ALARA	As low as reasonably achievable
AMU	Atomic Mass Unit
ANSI	American National Standards Institute
Ar	Argon
ASHRAE Engineers	American Society of Heating, Refrigeration, and Air Conditioning
ATA	Atmospheres, absolute
a_x	x-axis acceleration
a_y	y-axis acceleration
a_z	z-axis acceleration

B

BHS	Body heat storage
BIB	Built-in breathing
BITE	Built-in test equipment
BTPS	Body temperature and pressure saturated with water
Btu	British thermal unit

C

CCTV	Closed circuit television
CFU	Colony forming units
CO ₂	Carbon dioxide
CRS	Cosmic ray source
CRT	Cathode ray tube

CWS Control and warning system

D

D Absorbed dose
DACT Disposable absorbent containment trunk
dB Decibels
DO Dry bulb temperature
DCS Decompression sickness
DE Dose equivalent
DIPS Dynamic isotope power system
DOD Department of Defense

E

e Electron
ECG Electrocardiogram
ECLSS Environmental control and life support system
ED10 10% of pop. showing physiological response to ionizing radiation
EDK Electric dynamic katathermometer
EEG Electroencephalograph
EKG Electrocardiogram
EL Exposure limits
ELF Extremely low frequencies
EM Electromagnetic
EMU Extravehicular mobility unit
ET Effective temperature
ev Electron volts

EVA Extravehicular activity

F

FDA Food and Drug Administration

FDP Fatigue decreased proficiency

Fe Iron

FMEA Failure modes and effects analysis

FSW Feet of seawater (33 FSW =1 Atmosphere)

G

G Gravitational acceleration

GC/MS Gas chromatograph/mass spectrometer

GCR Galactic cosmic radiation

GEO Geosynchronous Earth orbit

GIAG Government Industry Advisory Group

GT Globe temperature

g_x Vibrational acceleration in the direction of the x-axis

g_y Vibrational acceleration in the direction of the y-axis

Gy Gray (radiation dosage unit of measure)

g_z Vibrational acceleration in the direction of the z-axis

H

H Hydrogen

He Helium

HUT Hard upper torso

MAN-SYSTEMS INTEGRATION STANDARDS, VOLUME II

Hx	Diatonic hydrogen
Hz	Hertz (cycles per second)
HZE	Ultra heavy nuclear particles

I

Icl	Insulation value of clothing
IDB	In-suit drink bag
IEEE	International Electronics and Electrical Engineers
INIRC	International Non-ionizing Radiation Committee
IR	Infrared
IRPA	International Radiation Protection Association
ISO	International Standards Organization
IVA	Intravehicular Activity

J

JSC	Johnson Space Center
-----	----------------------

K

kcal	Kilocalories (1000 calories)
kp	Kilopascal
Kr	Krypton
KSC	Kennedy Space Center

L

LBNP	Lower body negative pressure
------	------------------------------

MAN-SYSTEMS INTEGRATION STANDARDS, VOLUME II

LCVG	Liquid cooling ventilation garment
LD50	Lethal dose of ionizing radiation for 50% of population
LED	Light emitting diode
LEO	Low Earth orbit
L_{eq}	Equivalent level in dB
LET	Linear energy transfer
LOS	Line of sight
LTA	Lower torso assembly

M

MeV	Millions of electron volts
MFR	Manipulator foot restraint
MIL	Military
mmHg	Millimeters of mercury - used to indicate pressure level
MMU	Manned maneuvering unit
MSFC	Marshall Space Flight Center
MSIS	Man-Systems Integration Standards
MTBF	Mean time between failure
MW	Microwave

N

N_2	Nitrogen
N/A	Not Applicable
NASA	National Aeronautics and Space Administration
N_c	Convective heat transfer coefficient
NC (Curve)	Noise criteria curve

MAN-SYSTEMS INTEGRATION STANDARDS, VOLUME II

NCRP	National Council on Radiation Protection and Measurements
Ne	Neon
NIR	Non-ionizing radiation
nm	Nanometer (1E-9 meters); (also) nautical miles
NTU	Nethlometric turbidity units

O

O ₂	Diatonic oxygen
O ₂	Oxygen
OASPL	Overall sound pressure level
OB	Octave band
OBS	Operational bioinstrumentation system
ORU	Orbital replacement unit
OSHA	Occupational Safety and Health Administration
OTC	Over the counter

P

p	Proton
P4SR	Predicted 4-hour sweat rate
PB	Phonetically Balanced
PEO	Polar Earth orbit
PFR	Portable foot restraint
pH	Measure of acidity
PLSS	Primary life support system
PSIL	Preferred speech interference level
Pt/Co	Platinum/cobalt color measurement

PTS Permanent threshold shift

Q

Q Quality factor

qs Body heat storage index

R

Ra Radium

rads Radiation dose absorbed by tissue

RBE Relative biological effectiveness

Rcl Total heat transfer resistance

RDA Recommended dietary allowance

REM, rem Roentgen equivalent man

RF Radio frequency

RFPG Radio frequency protection guides

rms Root -mean -square

RMS Remote manipulator system

RTG Radioisotope thermoelectric generator

S

SAA South Atlantic anomaly

SAE Society of Automotive Engineers

SAR Specific absorption rate

SCR Solar cosmic radiation

SDMS Standards Database Management System

MAN-SYSTEMS INTEGRATION STANDARDS, VOLUME II

SEP	Solar energetic particles
SIL	Speech interference level
SMF	Space medical facility
SPE	Solar particle event
SPF	Specific pathogen free
SPL	Sound pressure level
Sr	Strontium
SSA	Space suit assembly
STD	Standard
STP	Standard temperature and pressure
STS	Space Transportation System
Sv	Sievert (radiation dose unit of measure)

T

tb	Weighted mean body temperatures
TBT	Total body temperature
tc	Core temperature
TLV	Threshold limit values
TMG	Thermal micrometeoroid garment
Tmrt	Mean radiant temperature
TOC	Total organic carbon
TON	Threshold odor number
tr	Skin temperature
TTN	Threshold taste number
TTS	Temporary threshold shift (hearing)
TTS2	Temporary threshold shift measured 2 minutes after exposure

U

UCD	Urine collection device
UV	Ultraviolet
UVR	Ultraviolet radiation

V

VDT	Visual display terminal
-----	-------------------------

W

WB	Wet bulb temperature
WBGT	Wet bulb globe temperature
WD	Wet/dry index
WFI	Water for Injection

X

Xe	Xenon
----	-------

Y

None

Z

Z	Ultra heavy nuclei
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Appendix E
Units of Measure and Conversion Factors

| [A](#) | [B](#) | [C](#) | [D](#) | [E](#) | [F](#) | [G](#) | [H](#) | [I](#) | [J](#) | [K](#) | [L](#) | [M](#) | [N](#) | [O](#) | [P](#) | [Q](#) | [R](#) | [S](#) | T | U | V | W |
X | Y | Z |

USER'S GUIDE

This section presents definitions, physical constants and conversion factors that are used in the text and may be useful as reference data. Scroll down through the list or use the alphabetical links below to go directly to the section where your word or symbol is located.

A

ATMOSPHERE (atm):

The pressure exerted by 76 cm mercury with a density of 13.5951 gm/cm³ at 1g (the standard barometric pressure at sea level).

$$1\text{atm} = 325 \times 10^6 \text{ dynes/cm}^2$$

$$1\text{atm} = 1033.2 \text{ gm/cm}^2$$

$$1\text{atm} = 760 \text{ mm Hg}$$

$$1\text{atm} = 14.696 \text{ psi}$$

$$1\text{atm} = 101.329 \text{ kPa (kilo Pascals)}$$

B

BRITISH THERMAL UNIT (Btu):

$$1 \text{ Btu} = 1.0559 \times 10^{10} \text{ ergs}$$

$$1 \text{ Btu} = 1055.9 \text{ joules}$$

$$1 \text{ Btu} = 251.995 \text{ gm-cal}$$

$$1 \text{ Btu} = 778.77 \text{ ft-lbs}$$

$$1 \text{ Btu} = 0.25199 \text{ kcal}$$

$$1 \text{ Btu/hr} = 0.1667 \text{ Btu/min}$$

$$1 \text{ Btu/hr} = 0.04199 \text{ kcal/min}$$

$$1 \text{ Btu/hr} = 0.2932 \text{ watt}$$

$$1 \text{ Btu/min} = 0.25199 \text{ kcal/min}$$

$$1 \text{ Btu/min} = 0.23599 \text{ hp}$$

$$1 \text{ Btu/min} = 17.595 \text{ watts}$$

$$1 \text{ Btu/ft}^2, \text{ hr} = 2.7125 \text{ kcal/m}^2 \text{ hr}$$

Btu/hr to joules:

$$1 \text{ Btu/hr} = 1.05435 \times 10^3 \text{ joule/hr}$$

$$800 \text{ Btu/hr} \times 1054.35 = 843480 \text{ joule/hr}$$

C

CANDELA (cd):

$$1 \text{ cd} = 1.018 \text{ candle}$$

CANDLE (c):

The unit of luminous intensity.

$$1 \text{ c} = 1 \text{ lumen/steradian}$$

CELSIUS (°C):

(See [Degrees Centigrade](#))

CENTIGRADE (°C):

(See [Degrees Centigrade](#))

CENTIMETER (cm):

(See also [Square Centimeter](#), [Cubic Centimeter](#)).

$$1 \text{ cm} = 0.03280 \text{ ft}$$

$$1 \text{ cm} = 0.3937 \text{ in}$$

$$1 \text{ cm} = 0.01 \text{ m}$$

$$1 \text{ cm} = 10\text{mm}$$

$$1 \text{ cm} = 1 \times 10^4 \mu \text{ (micron)}$$

CENTIMETER-CANDLE (phot):

$$1 \text{ phot} = 1 \times 10^4 \text{ lux}$$

CENTIMETERS PER SECOND PER SECOND:

$$1 \text{ cm/sec}^2 = 0.0328 \text{ ft/sec}^2$$

CLO (clo):

The unit of insulation resistance for clothing.

$$1 \text{ clo} = 0.18^{\circ}\text{C m}^2\text{hr/kcal}$$

$$1 \text{ clo} = 0.88^{\circ}\text{F ft}^2\text{hr/Btu}$$

CUBIC CENTIMETER (cc or cm³):

$$1 \text{ CC} = 3.531 \times 10^{-5} \text{ ft}^3$$

$$1 \text{ CC} = 0.061023 \text{ in}^3$$

$$1 \text{ CC} = 1 \times 10^{-6} \text{ m}^3$$

$$1 \text{ CC} = 1000 \text{ mm}^3$$

$$1 \text{ CC} = 2.6417 \times 10^{-4} \text{ gal (US fluid)}$$

$$1 \text{ CC} = 0.0338 \text{ oz (US fluid)}$$

$$1 \text{ CC} = 2.113 \times 10^{-3} \text{ pint (US fluid)}$$

$$1 \text{ cc/sec} = 0.0021186 \text{ ft}^3/\text{min}$$

CUBIC FOOT

$$1 \text{ ft}^3 = 1728 \text{ in}^3$$

$$1 \text{ ft}^3 = 28.32 \text{ liters}$$

$$1 \text{ ft}^3 = 0.02832 \text{ m}^3$$

$$1 \text{ ft}^3/\text{min} = 472.0 \text{ cc/sec}$$

$$1 \text{ ft}^3/\text{min} = 0.4720 \text{ liter/sec}$$

$$1 \text{ ft}^3/\text{min} = 62.43 \text{ lbs H}_2\text{O}/\text{min}$$

$$1 \text{ ft}^3/\text{sec} = 1699.3 \text{ liters}/\text{min}$$

CUBIC INCH:

$$1 \text{ in}^3 = 5.787 \times 10^{-4} \text{ ft}^3$$

$$1 \text{ in}^3 = 1.639 \times 10^2 \text{ liter}$$

$$1 \text{ in}^3 = 1.639 \times 10^{-5} \text{ m}^3$$

CUBIC METER:

$$1 \text{ m}^3 = 35.3144 \text{ ft}^3$$

$$1 \text{ m}^3 = 6.1023 \times 10^4 \text{ in}^3$$

$$1 \text{ m}^3 = 999.973 \text{ liters}$$

D

DECIBEL (db):

Used for comparing power levels, acoustical or electrical. (See also [Sound Pressure Level](#)).

$$1 \text{ db} = 10 \log_{10} P/PO$$

where P is the power to be compared to a reference power PO

$$1 \text{ db} = 1 \text{ bel is equal to an increase in power (P) by a factor of 10}$$

DEGREE (ANGULAR) (deg):

$$1 \text{ deg} = 60 \text{ minutes}$$

$$1 \text{ deg} = 0.01745 \text{ radian}$$

$$1 \text{ deg} = 3600 \text{ seconds}$$

$$1 \text{ deg} = 3.0462 \times 10^{-2} \text{ steradian}$$

DEGREES TO RADIANS:

$$1 \text{ deg} = \pi/180 \text{ rad}$$

$$60^\circ \times \pi/180 = 1.0472 = 1 \text{ rad}$$

DEGREES CENTIGRADE (°C):

$$^\circ\text{C} = 5/9 * (^\circ\text{F} - 32)$$

DEGREES FAHRENHEIT (°F):

$$^\circ\text{F} = (9/5 * ^\circ\text{C}) + 32$$

DEGREES PER SECOND:

$$1 \text{ deg/sec} = 0.017453 \text{ radian/sec}$$

$$1 \text{ deg/sec} = 0.1667 \text{ rpm}$$

DYNE (dyne):

$$1 \text{ dyne} = 1.0197 \times 10^{-6} \text{ kg}$$

$$1 \text{ dyne} = 2.2481 \times 10^{-6} \text{ lb}$$

$$1 \text{ dyne-cm} = 1 \text{ erg}$$

DYNE PER SQUARE CENTIMETER

$$1 \text{ dyne/cm}^2 = 9.8692 \times 10^{-7} \text{ atm}$$

$$1 \text{ dyne/cm}^2 = 0.0010197 \text{ gm/cm}^2$$

$$1 \text{ dyne/cm}^2 = 4.0148 \times 10^{-4} \text{ in H}_2\text{O}$$

$$1 \text{ dyne/cm}^2 = 7.5006 \times 10^{-4} \text{ mm Hg}$$

$$1 \text{ dyne/cm}^2 = 1.4504 \times 10^{-5} \text{ psi}$$

E

ERG (erg):

$$1 \text{ erg} = 9.4805 \times 10^{-11} \text{ Btu}$$

$$1 \text{ erg} = 7.3756 \times 10^{-8} \text{ ft-lb}$$

$$1 \text{ erg} = 2.3889 \times 10^{-11} \text{ kcal}$$

$$1 \text{ erg} = 8.8510 \times 10^{-7} \text{ lb-in}$$

$$1 \text{ erg} = 1 \text{ dyne-cm}$$

F

FAHRENHEIT (°F):

(See [Degrees Fahrenheit](#)).

FOOT (ft):

(See also [Square Foot](#), [Cubic Foot](#)).

$$1 \text{ ft} = 30.48 \text{ cm}$$

$$1 \text{ ft} = 12 \text{ in}$$

$$1 \text{ ft} = 0.3048 \text{ m}$$

FOOT-CANDLE (fc):

$$1 \text{ ft-c} = 1 \text{ lumen/ft}^2$$

$$1 \text{ ft-c} = 10.764 \text{ lumen/m}^2$$

$$1 \text{ ft-c} = 10.75 \text{ lux}$$

FOOT-LAMBERT (ft-L):

$$1 \text{ ft-L} = 1.0764 \text{ millilamberts}$$

$$1 \text{ ft-L} = 0.32 \text{ decibels with respect to 1 mL}$$

FOOT PER MINUTE

$$1 \text{ ft/min} = 0.3048 \text{ m/min}$$

$$1 \text{ ft/min} = 0.005080 \text{ m/sec}$$

$$1 \text{ ft/min} = 0.011364 \text{ mph}$$

FOOT PER SECOND:

$$1 \text{ ft/sec} = 1.0973 \text{ km/hr}$$

$$1 \text{ ft/sec} = 0.5921 \text{ knot}$$

$$1 \text{ ft/sec} = 0.6818 \text{ mph}$$

FOOT-POUND (ft-lb):

$$1 \text{ ft-lb} = 0.001285 \text{ Btu}$$

$$1 \text{ ft-lb} = 1.3558 \times 10^7 \text{ ergs}$$

$$1 \text{ ft-lb} = 3.2389 \times 10^{-4} \text{ kcal}$$

$$1 \text{ ft-lb/min} = 3.0303 \times 10^{-5} \text{ hp}$$

$$1 \text{ ft-lb/min} = 0.01667 \text{ ft-lb/sec}$$

$$1 \text{ ft-lb/min} = 0.022597 \text{ watt}$$

$$1 \text{ ft-lb/sec} = 0.001818 \text{ hp}$$

$$1 \text{ ft-lb/sec} = 0.01943 \text{ kcal/min}$$

$$1 \text{ ft-lb/sec} = 1.3558 \text{ watts}$$



G (g):

The acceleration of gravity (also the acceleration of a vehicle).

$$1 \text{ ft/sec} = 1.0973 \text{ km/hr}$$

$$1 \text{ ft/sec} = 0.5921 \text{ knot}$$

$$1 \text{ ft/sec} = 0.6818 \text{ mph}$$

GRAM (gm):

$$1 \text{ gm} = 0.001 \text{ kg}$$

$$1 \text{ gm} = 1000 \text{ mg}$$

$$1 \text{ gm} = 0.03527 \text{ oz}$$

$$1 \text{ gm} = 0.0022046 \text{ lb}$$

$$1 \text{ gm/cm}^3 = 62.428 \text{ lbs/ft}^3$$

$$1 \text{ gm/hr} = 0.540 \text{ lb/day}$$

$$1 \text{ gm/hr} = 0.0003757 \text{ lb/min}$$

$$1 \text{ gm/liter} = 0.062427 \text{ lb/ft}^3$$

$$1 \text{ gm/cm}^2 = 9.6784 \times 10^{-4} \text{ atm}$$

$$1 \text{ gm/cm}^2 = 980.665 \text{ dynes/cm}^2$$

$$1 \text{ gm/cm}^2 = 0.9356 \text{ mm Hg}$$

$$1 \text{ gm/cm}^2 = 0.014223 \text{ psi}$$

$$1 \text{ gm/m}^2/\text{hr} = 2.78 \times 10^{-5} \text{ gm/cm}^2/\text{sec}$$

$$1 \text{ gm/m}^2/\text{hr} = 0.7448 \text{ lb/ft}^2/\text{hr}$$

GRAM-CALORIE (gm-cal):

1 gm-cal = 30874 ft-lbs

1 gm-cal = 0.001 kcal

GRAY (Gy):

The International System of Units (SI) unit for the amount of ionizing radiation energy absorbed by tissue.

1 Gy = 100 rads

H

HORSEPOWER (hp):

1 hp = 3.300×10^4 ft-lbs/min

1 hp = 550 ft-lbs/sec

1 hp = 10.688 kcal/min

1 hp = 745.7 watts

I

INCH (in):

(See also [Cubic Inch](#), [Square Inch](#))

1 in = 2.540 cm

1 in = 0.0833 ft

1 in = 25.40 mm

INCH OF WATER (in H₂O):

- 1 in H₂O (at 4° C) = 0.002458 atm
- 1 in H₂O (at 4° C) = 2490.82 dynes/cm²
- 1 in H₂O (at 4° C) = 0.0361 psi
- 1 in H₂O (at 4° C) = 1.868 mm Hg

J

JOULE (joule):

- 1 joule = 1 watt-sec

K

KILOGRAM (kg):

- 1 kg = 1000 gm
- 1 kg = 2.205 lb
- 1 kg = 35.28 oz

KILOGRAM-CALORIE (kcal or large Calorie):

- 1 kcal = 3.9683 Btu
- 1 kcal = 4.186 x 10¹⁰ ergs
- 1 kcal = 1000 gm-cal
- 1 kcal = 3087 ft-lbs

- 1 kcal/hr = 0.0661 Btu/min
- 1 kcal/hr = 0.857 ft-lbs/sec
- 1 kcal/hr = 0.1667 kcal/min
- 1 kcal/hr = 1.161 watts

MAN-SYSTEMS INTEGRATION STANDARDS, VOLUME II

$$1 \text{ kcal/m}^2\text{hr} = 0.3687 \text{ Btu/ft}^2\text{hr}$$

$$1 \text{ kcal/min} = 3.9685 \text{ Btu/min}$$

$$1 \text{ kcal/min} = 51.457 \text{ ft-lbs/sec}$$

$$1 \text{ kcal/min} = 0.093557 \text{ hp}$$

$$1 \text{ kcal/min} = 69.767 \text{ watts}$$

KILOGRAM-CENTIMETER SQUARED:

$$1 \text{ kg-cm}^2 = 0.3417 \text{ lb-in}^2$$

KILOGRAM-METER PER SECOND:

$$1 \text{ kg-m/sec} = 7.2330 \text{ ft-lb/sec}$$

$$1 \text{ kg-m/sec} = 9.80665 \text{ watts}$$

KILOMETER (km):

$$1 \text{ km} = 105 \text{ cm}$$

$$1 \text{ km} = 3281 \text{ ft}$$

$$1 \text{ km} = 103 \text{ meters, m}$$

$$1 \text{ km} = 0.6214 \text{ statute miles, mi}$$

$$1 \text{ km} = 0.54 \text{ nautical miles, nm}$$

KILOPASCAL:

$$1 \text{ kPa} = 6.895 \text{ psi}$$

$$1 \text{ kPa} = 4.754 \times 10^5 \text{ dynes/cm}^2$$

$$1 \text{ psi} = 0.145 \text{ kPa}$$

KILOMETERS PER HOUR:

$$1 \text{ km/hr} = 0.9113 \text{ ft/sec}$$

$$1 \text{ km/hr} = 0.5396 \text{ knot}$$

$$1 \text{ km/hr} = 0.6214 \text{ mph}$$

KNOT (nautical mile per hour):

$$1 \text{ knot} = 1.689 \text{ ft/sec}$$

$$1 \text{ knot} = 1.853 \text{ km/hr}$$

$$1 \text{ knot} = 1.1516 \text{ mph}$$

L

LAMBERT (L):

Unit of surface brightness.

$$1\text{L} = 0.3183 \text{ c/cm}^2$$

$$1\text{L} = 2.0536 \text{ c/in}^2$$

$$1\text{L} = 1 \text{ lumen/cm}^2$$

LITER (l):

$$1 \text{ liter} = 0.03531 \text{ ft}^3$$

$$1 \text{ liter} = 61.02 \text{ in}^3$$

$$1 \text{ liter} = 1000 \text{ ml}$$

$$1 \text{ liter/min} = 5.886 \times 10^{-4} \text{ ft}^3/\text{sec}$$

$$1 \text{ liter/sec} = 2.12 \text{ ft}^3/\text{min}$$

LUMEN (lumen):

1 lumen = 0.001496 watt

1 lumen = 0.07958 spherical candle power

1 lumen/ft² = 1 ft-c

1 lumen/ft² = 10.764 lumen/m²

LUMENS PER SQ. METER TO FT CANDLES:

1 lumen/m² = 0.0929 ft. candle

LUX:

1 lux = 0.093 ft-c (see [meter-candle](#))

M

METER (m):

(See also [Cubic Meter](#)).

1m = 100 cm

1m = 3.281 ft

1m = 39.37 in

METER-CANDLE (lux):

1 lux = 1 lumen/m²

1 lux = 0.092903 ft-c

METER PER SECOND (m/sec):

$$1 \text{ m/sec} = 3.281 \text{ ft/sec}$$

$$1 \text{ m/sec} = 3.600 \text{ km/hr}$$

$$1 \text{ m/sec} = 2.2369 \text{ mph}$$

MICRON (μ or μm):

A unit of length equal to one-millionth of a meter or one-thousandth of a millimeter, usually called micrometer.

$$1 \mu = 10^{-6} \text{ meter}$$

$$1 \mu = 3.937 \times 10^{-5} \text{ in}$$

$$1 \mu = 0.001 \text{ mm}$$

MIL (mil):

$$1 \text{ mil} = 0.001 \text{ in}$$

$$1 \text{ mil} = 0.0254 \text{ mm}$$

$$1 \text{ mil} = 25.40\mu \text{ (microns)}$$

MILES (statute) (mi):

$$1 \text{ mi} = 1,609 \times 10^5 \text{ cm}$$

$$1 \text{ mi} = 5,280 \text{ ft}$$

$$1 \text{ mi} = 1.609 \text{ km}$$

MILES PER HOUR (mph)

$$1 \text{ mph} = 88 \text{ ft/min}$$

$$1 \text{ mph} = 1.4667 \text{ ft/sec}$$

$$1 \text{ mph} = 1.6093 \text{ km/hr}$$

$$1 \text{ mph} = 0.8684 \text{ knot}$$

MILLIGRAM (mg):

$$1 \text{ mg} = 0.001 \text{ gm}$$

$$1 \text{ mg} = 3.5274 \times 10^{-5} \text{ oz}$$

$$1 \text{ mg} = 2.2046 \times 10^{-6} \text{ lb}$$

$$1 \text{ mg/m}^3 = 6.243 \times 10^{-4} \text{ lb/ft}^3$$

MILLILAMBERT (ml):

(perfectly diffused light)

$$1 \text{ mL} = 0.929 \text{ lumen/ft}^2$$

MILLILITER (ml):

$$1 \text{ ml} = 1.000028 \text{ cc}$$

$$1 \text{ ml} = 0.061025 \text{ in}^3$$

$$1 \text{ ml} = 0.001 \text{ liter}$$

$$1 \text{ ml} = 0.0338 \text{ oz (US fluid)}$$

MILLILITERS PER HOUR:

$$1 \text{ ml/hr} = 0.06102 \text{ in}^3/\text{hr}$$

MILLIMETER (mm):

(See also [Square Millimeter](#))

$$1\text{ mm} = 0.10\text{ cm}$$

$$1\text{ mm} = 0.03937\text{ in}$$

$$1\text{ mm} = 1000\ \mu$$

MILLIMETER OF MERCURY (mm Hg):

$$1\text{ mm Hg (at } 0^\circ\text{C)} = 0.0013158\text{ atm}$$

$$1\text{ mm Hg (at } 0^\circ\text{C)} = 1333.22\text{ dyne/cm}^2$$

$$1\text{ mm Hg (at } 0^\circ\text{C)} = 1.3595\text{ gm/cm}^2$$

$$1\text{ mm Hg (at } 0^\circ\text{C)} = 0.019337\text{ psi}$$

$$1\text{ mm Hg (at } 0^\circ\text{C)} = 0.535\text{ in H}_2\text{O}$$

$$1\text{ mm Hg (at } 0^\circ\text{C)} = 0.1333\text{ kPa}$$

MILLISECONDS (msec):

$$1\text{ msec} = 0.001\text{ sec}$$

N

NAUTICAL MILES (nm):

$$1\text{ nm} = 0.87\text{ statute miles}$$

$$1\text{ nm} = 1.85\text{ kilometers}$$

NEWTONS TO POUNDS:

$$1\text{ N} = 0.22507\text{ lbf}$$

NEWTON CENTIMETERS TO INCH OUNCES:

$$1 \text{ N-cm} = 1/.706 \text{ in oz}$$

$$70\text{N-cm} \times 1/.706 = 99.15 = 100 \text{ in oz}$$

NEWTON METERS TO FOOT POUNDS:

$$1\text{Nm} = 1/1.356 \text{ ft lb}$$

$$15\text{Nm} \times 1/1.356 = 11.06 = 11 \text{ ft lb}$$

NEWTON METERS TO INCH POUNDS:

$$1 \text{ Nm} = 1/1.11298 \text{ in lb}$$

$$4 \text{ Nm} \times 1/1.11298 = 35.4 = 35 \text{ in lb}$$

NIT:

Unit of luminance equal to the luminance provided by one candle of radiant flux emitted per square meter of surface - candela per square meter (Cd m^2).

O

OUNCE (oz):

$$1 \text{ oz} = 28.3495 \text{ gm}$$

$$1 \text{ oz} = 0.0625 \text{ lb}$$

P

PASCALS (Pa)

$$\text{Pa} = 4.75389 \text{ dynes/cm}^2$$

$$\text{Pa} = 6.895 \times 10^{-3} \text{ psi}$$

PARTS PER MILLION (ppm).

$$1 \text{ ppm} = 1.0 \text{ mg/liter of H}_2\text{O}$$

1 ppm = 8.345 lbs/million gallons

PHON (phon):

1 phon unit = SPL of a 1000 cycle/sec tone

PHOT:

(See [Centimeter Candle](#))

PHYSICAL CONSTANTS:

Acceleration of gravity (g)

$$= 32.17 \text{ ft/sec}^2 = 980.6 \text{ cm/sec}^2$$

Avogadro's number (N)

$$= 6.0221367 \times 10^{23} \text{ molecules/gram-mole}$$

Density of air at 0°C and 760 mm Hg

$$= 0.0012929 \text{ grams/cm}^3 (0.0807 \text{ lb/ft}^3)$$

Density of water at 0°C

$$= .999984 \text{ grams/cm}^3$$

Heat of fusion of water at 1.0 atm

$$= 79.7 \text{ calories/gram} = 144 \text{ Btu/pound}$$

Heat of vaporization of water at 1.0 atm

$$= 540 \text{ calories/gram} = 970 \text{ Btu/pound}$$

Naperian-logarithm base

$$= 2.71828183$$

Pi (π)

$$= 3.14159265$$

Specific heat of air

$$= C_p = 0.238 \text{ cal/gram (}^\circ\text{C)}$$

Velocity of light (c)

$$= 2.99792458 \times 10^{10} \text{ cm/sec}$$

Velocity of sound in dry air at 0°C, 1 atm

$$= 33,136 \text{ cm/sec} \quad = 1,089 \text{ feet/sec}$$

POISE: Unit of viscosity.

$$1 \text{ poise} = 1 \text{ dyne/sec, cm}^2$$

$$1 \text{ poise} = 1 \text{ gm/cm, sec}$$

$$1 \text{ poise} = 0.067196 \text{ lb/ft, sec}$$

POUND (lb):

$$1 \text{ lb} = 453.5924 \text{ gm}$$

$$1 \text{ lb} = 0.45359 \text{ kg}$$

$$1 \text{ lb} = 16 \text{ oz}$$

$$1 \text{ lb} = 4.448 \text{ N}$$

$$1 \text{ lb/day} = 18.89 \text{ gm/hr}$$

$$1 \text{ lb/hr} = 0.7559 \text{ gm/min}$$

$$1 \text{ lb/hr} = 10.886 \text{ kg/day}$$

POUND-INCH (lb-in):

$$1 \text{ lb-in} = 1.1298 \times 10^6 \text{ dyne/cm}$$

POUND-INCH SQUARED:

Unit of moment of inertia

$$1 \text{ lb-in}^2 = 2.9264 \text{ kg-cm}^2$$

POUND OF WATER PER MINUTE (lb H₂O/min):

$$1 \text{ lb H}_2\text{O/min} = 0.01603 \text{ ft}^3/\text{min}$$

$$1 \text{ lb H}_2\text{O/min} = 2.670 \times 10^{-4} \text{ ft}^3/\text{sec}$$

POUND PER CUBIC FOOT (lb/ft³):

$$1 \text{ lb/ft}^3 = 0.01602 \text{ gm/cm}^3$$

POUNDS PER SQUARE INCH (psi):

$$1 \text{ psi} = 0.06805 \text{ atm}$$

$$1 \text{ psi} = 6.8947 \times 10^4 \text{ dyne/cm}^2$$

$$1 \text{ psi} = 70.307 \text{ gm/cm}^2$$

$$1 \text{ psi} = 51.715 \text{ mmHg}$$

$$1 \text{ psi} = 27.7 \text{ in H}_2\text{O}$$

$$1 \text{ psi} = 145.03 \text{ Pa}$$

POUNDS PER SQUARE INCH ABSOLUTE (psia):

Absolute pressure, where 0 psia = vacuum

$$1 \text{ psia} = 0.1449 \text{ kpascals}$$

POUND WEIGHT (1 wt):

$$1 \text{ lb wt} = 4.4482 \times 10^5 \text{ dynes}$$

$$1 \text{ lb wt} = 453.59 \text{ gm wt}$$

$$1 \text{ lb wt} = 16 \text{ oz}$$

Q

none

R

RAD (rad):

Radiation absorbed dose.

$$1 \text{ rad} = 100 \text{ ergs/gm of irradiated material}$$

RADIAN (rad):

$$1 \text{ radian} = \frac{1}{2}\pi \text{ circumference revolution (0.15915)}$$

$$1 \text{ radian} = 57.296 \text{ deg}$$

$$1 \text{ radian/sec} = 57.296 \text{ deg/sec}$$

$$1 \text{ radian/sec} = 9.549 \text{ rpm}$$

$$1 \text{ radian/sec}^2 = 572.96 \text{ rpm}^2$$

REVOLUTIONS PER MINUTE (rpm):

$$1 \text{ rpm} = 6 \text{ deg/sec}$$

$$1 \text{ rpm} = 0.10472 \text{ radian/sec}$$

$$1 \text{ rpm}^2 = 0.001745 \text{ radian/sec}^2$$

ROENTGEN (r):

1 r = ionization by x-rays or gamma-rays producing 1 electrostatic unit of charge in 1 cm³ of air (STP)

1 r = 83.0 ergs/gm

S

SIEVIERT (Sv):

Sv is the International System of Units (SI) unit for ionizing radiation dose equivalent. (Refer to [Figure 5.7.2.1.3.1-1](#) for definition of Q values)

1 Sv = 100 rem = (Gy) (Q)

SOUND PRESSURE LEVEL (SPL):

SPL is sound pressure related logarithmically to a reference level of pressure (P₀), which by convention is 0.0002 dynes/cm². The defining equation is:

SPL = 20 log₁₀ P/P₀ in decibels

SQUARE CENTIMETER (cm²):

1 cm² = 1.076 x 10⁻³ ft²

1 cm² = 0.1550 in²

1 cm² = 100 mm²

SQUARE FOOT (ft²):

1 ft² = 929.0 m²

1 ft² = 144 in²

SQUARE INCH (in²):

1 in² = 6.4516 cm²

1 in² = 0.006944 ft²

1 in² = 645.1626 mm²

SQUARE MILLIMETER (mm²):

$$1 \text{ mm}^2 = 0.01 \text{ cm}^2$$

$$1 \text{ mm}^2 = 0.001550 \text{ in}^2$$

STERADIAN:

The solid angle which encloses a surface on a sphere equal to the square of the radius.

Appendix G

Acceleration Regime Applicability

USER'S GUIDE

Most sections of Volume I contain design considerations that are applicable to space and planetary missions. While some standards may only be relevant to microgravity operations (i.e., orbital operations), another standard may be applied to launch and entry conditions where extreme forces of gravity are imposed.

The code shown in brackets { } at the beginning of each section indicates which environment, or acceleration regime, is applicable to the section. Definitions of the codes are provided below:

{O} = Orbital: The microgravity acceleration environments encountered in orbital and very low acceleration transorbital operations.

{L} = Launch/Entry: The multi-G launch, entry, and abort acceleration environments.

{P} = Planetary: The G-loads encountered on the moon and Mars. Long-term, low-level accelerations encountered in some transorbital flight operations may be applicable. An artificial gravity system may also fall into this acceleration regime.

{ALL} This regime includes all of the above along with one-G acceleration environment.

(blank) None of the above apply.

The requirements in this document will be applied to equipment that is intended for different mission phases. For instance, a space shuttle handrail must withstand the pressures of launch acceleration whilst an object which is installed on-orbit would not. Thus, we have made an effort to identify which of these requirements must withstand launch accelerations, among others, and this data is presented here. You may investigate the applicable acceleration regime for specific requirements by looking in the appropriate sections below.

Acceleration Regime List

- 1,2 [Regime for Introduction and General Requirements](#)
- 3 [Regime for Anthropometry and Biomechanics Requirements](#)
- 4 [Regime for Human Performance Capability Requirements](#)
- 5 [Regime for Natural and Induced Environment Requirements](#)
- 6 [Regime for Crew Safety Requirements](#)
- 7 [Regime for Health Management Requirements](#)
- 8 [Regime for Architecture Requirements](#)
- 9 [Regime for Workstation Requirements](#)

- 10 [Regime for Activity Center Requirements](#)
- 11 [Regime for Hardware and Equipment Requirements](#)
- 12 [Regime for Design for Maintainability Requirements](#)
- 13 [Regime for Facility Management Requirements](#)
- 14 [Regime for Extravehicular Activity \(EVA\) Requirements](#)

This appendix can also be used to identify all requirements that are applicable to these specific acceleration regimes: [Orbital accelerations only](#), [Planetary accelerations only](#), [Launch and Re-entry accelerations only](#), and [all of the acceleration regimes](#).

**Appendix G
Acceleration Regime Applicability for Sections 1 & 2**

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
1.0	All			
1.1	All			
1.2	All			
1.3	All			
1.4	All			
1.4.1	All			
1.4.2	All			
1.4.3	All			
1.4.3.1	All			
1.4.3.2	All			
1.4.3.3	All			
1.4.3.4	All			
1.4.3.5	All			
1.4.4	All			
1.5	All			
2.0	All			
2.1	All			
2.2	All			
2.2.1	All			
2.2.2	All			

MAN-SYSTEMS INTEGRATION STANDARDS, VOLUME II

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
2.3	All			
2.3.1	All			
2.3.2	All			

**Appendix G
Acceleration Regime Applicability for Section 3**

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
3.0	All			
3.1	All			
3.1.1	All			
3.1.2	All			
3.2	All			
3.2.1	All			
3.2.2	All			
3.2.3	All			
3.2.3.1		Orbital		
3.2.3.2	All			
3.2.3.3	All			
3.3	All			
3.3.1	All			
3.3.1.1	All			
3.3.1.2	All			
3.3.1.3	All			
3.3.2	All			
3.3.2.1	All			
3.3.2.2	All			
3.3.2.2.1	All			
3.3.2.2.2	All			

MAN-SYSTEMS INTEGRATION STANDARDS, VOLUME II

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
3.3.2.2.3	All			
3.3.2.3	All			
3.3.2.3.1	All			
3.3.2.3.2	All			
3.3.3	All			
3.3.3.1	All			
3.3.3.2	All			
3.3.3.2.1	All			
3.3.3.2.2	All			
3.3.3.2.3	All			
3.3.3.2.4	All			
3.3.3.2.5	All			
3.3.3.2.6	All			
3.3.3.3	All			
3.3.3.3.1	All			
3.3.3.3.2			Launch/ReEntry	
3.3.4		Orbital		
3.3.4.1		Orbital		
3.3.4.2		Orbital		
3.3.4.3	All			
3.3.5	All			
3.3.5.1	All			

MAN-SYSTEMS INTEGRATION STANDARDS, VOLUME II

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
3.3.5.2	All			
3.3.5.3	All			
3.3.6	All			
3.3.6.1	All			
3.3.6.2	All			
3.3.6.3	All			
3.3.6.3.1	All			
3.3.6.3.2	All			
3.3.7	All			
3.3.7.1	All			
3.3.7.2	All			
3.3.7.3	All			
3.3.7.3.1	All			
3.3.7.3.1.1	All			
3.3.7.3.1.2	All			
3.3.7.3.2	All			
3.3.7.3.2.1	All			
3.3.7.3.2.2	All			
3.3.7.3.3	All			
3.3.7.3.3.1	All			
3.3.7.3.3.2	All			

Appendix G
Acceleration Regime Applicability for Section 4

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
4.0	All			
4.1	All			
4.2	All			
4.2.1	All			
4.2.2	All			
4.3	All			
4.3.1	All			
4.3.2	All			
4.3.2.1	All			
4.3.2.2	All			
4.4	All			
4.4.1	All			
4.4.2	All			
4.4.2.1	All			
4.4.2.2	All			
4.5	All			
4.5.1	All			
4.5.2		Orbital		
4.5.2.1		Orbital		
4.5.2.2		Orbital		

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
4.6	All			
4.6.1	All			
4.6.2		Orbital		
4.7	All			
4.7.1	All			
4.7.2		Orbital		
4.8		Orbital		
4.8.1		Orbital		
4.8.2		Orbital		
4.9	All			
4.9.1	All			
4.9.2		Orbital		
4.9.3		Orbital		
4.10	All			
4.10.2	All			
4.11	All			
4.11.1	All			
4.11.2	All			
4.11.3	All			

**Appendix G
Acceleration Regime Applicability for Section 5**

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
5.0	All			
5.1	All			
5.1.1	All			
5.1.2	All			
5.1.2.1	All			
5.1.2.1.1	All			
5.1.2.1.2	All			
5.1.2.1.3	All			
5.1.2.1.4	All			
5.1.2.1.4.1	All			
5.1.2.1.4.2	All			
5.1.2.1.4.3	All			
5.1.2.2	All			
5.1.2.2.1	All			
5.1.2.2.1.1	All			
5.1.2.2.1.2	All			
5.1.2.2.1.3	All			
5.1.2.2.1.4	All			
5.1.2.2.1.5	All			
5.1.2.2.1.6	All			
5.1.2.2.1.7	All			

MAN-SYSTEMS INTEGRATION STANDARDS, VOLUME II

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
5.1.2.2.1.7.1	All			
5.1.2.2.1.7.2	All			
5.1.2.2.1.7.3	All			
5.1.2.3.	All			
5.1.2.3.1	All			
5.1.2.3.2	All			
5.1.2.3.3	All			
5.1.3	All			
5.1.3.1	All			
5.1.3.2	All			
5.1.3.3	All			
5.1.3.4	All			
5.1.3.4.1	All			
5.1.3.4.2	All			
5.1.3.4.3		Orbital	Launch/ReEntry	Planetary
5.1.3.5	All			
5.2		Orbital		
5.2.1		Orbital		
5.2.2		Orbital		
5.2.2.1		Orbital		
5.2.2.2.		Orbital		
5.2.3		Orbital		

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
5.3	All			
5.3.1	All			
5.3.2	All			
5.3.2.1	All			
5.3.2.1.1	All			
5.3.2.1.2	All			
5.3.2.1.3	All			
5.3.2.2	All			
5.3.2.2.1	All			
5.3.2.2.2	All			
5.3.2.2.3	All			
5.3.2.3	All			
5.3.2.4	All			
5.3.3	All			
5.3.3.1	All			
5.3.3.1.1	All			
5.3.3.2	All			
5.3.3.3	All			
5.4	All			
5.4.1	All			
5.4.2	All			
5.4.2.1	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
5.4.2.1.1			Launch/ReEntry	
5.4.2.1.2		Orbital		
5.4.2.1.3			Launch/ReEntry	
5.4.2.2	All			
5.4.2.3	All			
5.4.2.3.1	All			
5.4.2.3.2	All			
5.4.2.3.3	All			
5.4.2.4	All			
5.4.2.4.1	All			
5.4.2.4.1.1	All			
5.4.2.4.1.1.1	All			
5.4.2.4.1.1.2	All			
5.4.2.4.1.2	All			
5.4.2.4.2	All			
5.4.2.4.2.1	All			
5.4.2.4.2.2	All			
5.4.2.4.3	All			
5.4.2.4.3.1	All			
5.4.2.4.3.2	All			
5.4.3	All			
5.4.3.1	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
5.4.3.2	All			
5.4.3.2.1	All			
5.4.3.2.1.1	All			
5.4.3.2.1.2	All			
5.4.3.2.1.3	All			
5.4.3.2.1.4	All			
5.4.3.2.1.5	All			
5.4.3.2.2	All			
5.4.3.2.2.1	All			
5.4.3.2.2.2	All			
5.4.3.2.3	All			
5.4.3.2.3.1	All			
5.4.3.2.3.2	All			
5.4.3.2.3.3	All			
5.4.3.2.3.4	All			
5.4.3.2.4	All			
5.4.3.2.5	All			
5.4.4	All			
5.4.4.1	All			
5.4.4.2	All			
5.4.4.3	All			
5.5	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
5.5.1	All			
5.5.2	All			
5.5.2.1	All			
5.5.2.1.1			Launch/ReEntry	
5.5.2.1.2		Orbital		Planetary
5.5.2.1.3			Launch/ReEntry	
5.5.2.2	All			
5.5.2.3	All			
5.5.2.3.1	All			
5.5.2.3.2	All			
5.5.2.3.3	All			
5.5.2.4	All			
5.5.2.4.1	All			
5.5.2.4.2	All			
5.5.2.4.3	All			
5.5.2.4.4	All			
5.5.3	All			
5.5.3.1	All			
5.5.3.2	All			
5.5.3.2.1	All			
5.5.3.2.2	All			
5.5.3.2.3	All			

MAN-SYSTEMS INTEGRATION STANDARDS, VOLUME II

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
5.5.3.2.4	All			
5.5.3.2.5	All			
5.5.3.3	All			
5.5.3.3.1			Launch/ReEntry	
5.5.3.3.2	All			
5.5.3.3.3	All			
5.5.3.3.4	All			
5.5.4	All			
5.5.4.1	All			
5.5.4.2	All			
5.5.4.3	All			
5.6	All			
5.7	All			
5.7.1	All			
5.7.2	All			
5.7.2.1	All			
5.7.2.1.1	All			
5.7.2.1.2	All			
5.7.2.1.2.1	All			
5.7.2.1.2.2	All			
5.7.2.1.2.3	All			
5.7.2.1.2.4	All			

MAN-SYSTEMS INTEGRATION STANDARDS, VOLUME II

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
5.7.2.1.3	All			
5.7.2.1.3.1	All			
5.7.2.1.3.2	All			
5.7.2.1.3.3	All			
5.7.2.1.3.3.1	All			
5.7.2.1.3.3.2	All			
5.7.2.1.3.3.3	All			
5.7.2.1.3.3.4	All			
5.7.2.1.3.3.5	All			
5.7.3.1.3.3.6	All			
5.7.2.1.3.4	All			
5.7.2.1.4	All			
5.7.2.1.4.1	All			
5.7.2.1.4.2	All			
5.7.2.1.4.3	All			
5.7.2.1.4.4	All			
5.7.2.1.4.5	All			
5.7.2.1.4.6	All			
5.7.2.1.5	All			
5.7.2.2	All			
5.7.2.2.1	All			
5.7.2.2.2	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
5.7.2.2.3	All			
5.7.2.2.4	All			
5.7.3	All			
5.7.3.1	All			
5.7.3.1.1	All			
5.7.3.1.2	All			
5.7.3.1.3	All			
5.7.3.1.4	All			
5.7.3.2	All			
5.7.3.2.1	All			
5.7.3.2.2	All			
5.8	All			
5.8.1	All			
5.8.2	All			
5.8.2.1	All			
5.8.2.2	All			
5.8.2.2.1	All			
5.8.2.2.2	All			
5.8.2.2.2.1	All			
5.8.2.2.3	All			
5.8.2.2.4	All			
5.8.2.2.5	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
5.8.3	All			
5.8.3.1	All			
5.8.3.2	All			
5.9	All			
5.9.1	All			
5.9.2	All			

**Appendix G
Acceleration Regime Applicability for Section 6**

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
6.0	All			
6.1	All			
6.2	All			
6.2.1	All			
6.2.2	All			
6.2.2.1	All			
6.2.2.2	All			
6.2.3	All			
6.3	All			
6.3.1	All			
6.3.2	All			
6.3.3	All			
6.3.3.1	All			
6.3.3.2	All			
6.3.3.3	All			
6.3.3.4	All			
6.3.3.5	All			
6.3.3.6	All			
6.3.3.7	All			
6.3.3.8	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
6.3.3.9	All			
6.3.3.10	All			
6.3.3.11	All			
6.3.4	All			
6.4	All			
6.4.1	All			
6.4.2	All			
6.4.2.1	All			
6.4.2.1.1	All			
6.4.2.2	All			
6.4.2.2.1	All			
6.4.2.3	All			
6.4.2.4	All			
6.4.3	All			
6.4.3.1	All			
6.4.3.1.1	All			
6.4.3.2	All			
6.4.3.3	All			
6.4.3.4	All			
6.4.3.5	All			
6.4.3.6	All			
6.4.3.7	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
6.4.3.8	All			
6.4.3.9	All			
6.4.3.10	All			
6.4.3.11	All			
6.4.3.12	All			
6.4.3.13	All			
6.4.3.13.1	All			
6.4.3.14	All			
6.4.3.15	All			
6.4.3.15.1	All			
6.4.3.16	All			
6.4.3.17	All			
6.4.3.18	All			
6.4.3.18.1	All			
6.4.3.18.1.1	All			
6.4.3.18.1.2	All			
6.4.3.18.2	All			
6.4.3.18.2.1	All			
6.4.3.18.2.2	All			
6.4.3.18.2.3	All			
6.4.3.18.2.4	All			
6.4.3.18.2.5	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
6.4.3.19	All			
6.5	All			
6.5.1	All			
6.5.2	All			
6.5.3	All			
6.6	All			
6.6.1	All			
6.6.2	All			
6.6.3	All			
6.6.3.1	All			
6.6.3.1.1	All			
6.6.3.1.2	All			
6.6.3.2	All			
6.6.3.2.1	All			
6.6.3.2.2	All			
6.6.3.2.3	All			
6.6.3.3	All			
6.6.3.4	All			
6.7	All			
6.7.1	All			
6.7.2	All			
6.7.3	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
6.7.4	All			
6.7.5	All			

**Appendix G
Acceleration Regime Applicability for Section 7**

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
7.0		Orbital		Planetary
7.1	All			
7.2	All			
7.2.1	All			
7.2.2	All			
7.2.2.1	All			
7.2.2.2	All			
7.2.2.2.1	All			
7.2.2.2.2	All			
7.2.2.2.3	All			
7.2.2.3	All			
7.2.2.3.1	All			
7.2.2.3.2	All			
7.2.2.4		Orbital		Planetary
7.2.3		Orbital		Planetary
7.2.3.1		Orbital		Planetary
7.2.3.2		Orbital		Planetary
7.2.3.3		Orbital		Planetary
7.2.3.3.1		Orbital		Planetary
7.2.3.3.2		Orbital		Planetary

MAN-SYSTEMS INTEGRATION STANDARDS, VOLUME II

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
7.2.3.3.2.1		Orbital		Planetary
7.2.3.3.2.2		Orbital		Planetary
7.2.3.3.3		Orbital		Planetary
7.2.3.4		Orbital		Planetary
7.2.3.4.1		Orbital		Planetary
7.2.3.4.2		Orbital		Planetary
7.2.3.4.3		Orbital		Planetary
7.2.4	All			
7.2.4.1	All			
7.2.4.2	All			
7.2.4.3	All			
7.2.5	All			
7.2.5.1	All			
7.2.5.2	All			
7.2.5.1	All			
7.2.5.2	All			
7.2.5.3	All			
7.2.5.3.1	All			
7.2.5.3.2	All			
7.2.5.3.3	All			
7.2.5.3.4	All			
7.2.5.3.5	All			

MAN-SYSTEMS INTEGRATION STANDARDS, VOLUME II

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
7.2.5.3.6	All			
7.2.6	All			
7.2.6.1	All			
7.2.6.2	All			
7.2.6.3	All			
7.2.7	All			
7.2.7.1	All			
7.2.7.2	All			
7.2.7.2.1	All			
7.2.7.2.2	All			
7.2.7.2.2.1	All			
7.2.7.2.2.2	All			
7.2.7.2.2.3	All			
7.2.7.3	All			
7.2.7.3.1	All			
7.2.7.3.2	All			
7.2.7.3.2.1	All			
7.2.7.3.2.2	All			
7.2.7.3.2.3	All			
7.2.7.3.2.4	All			
7.2.7.3.3	All			
7.2.8	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
7.3	All			
7.3.1	All			
7.3.2	All			
7.3.2.1	All			
7.3.2.2	All			
7.3.2.3	All			
7.3.3	All			
7.3.3.1	All			
7.3.3.2	All			
7.3.3.3	All			
7.3.3.4	All			
7.4	All			
7.4.1	All			
7.4.2	All			
7.4.3	All			
7.4.3.1	All			
7.4.3.2	All			

**Appendix G
Acceleration Regime Applicability for Section 8**

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
8.0	All			
8.1	All			
8.2	All			
8.2.1	All			
8.2.2	All			
8.2.2.1		Orbital		
8.2.2.2	All			
8.2.2.3	All			
8.2.2.4	All			
8.2.2.5	All			
8.2.2.6	All			
8.2.2.7	All			
8.2.2.8	All			
8.2.3	All			
8.2.3.1	All			
8.2.3.2	All			
8.3	All			
8.3.1	All			
8.3.2	All			
8.3.2.1	All			
8.3.2.2	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
8.3.3	All			
8.3.3.1	All			
8.3.3.2	All			
8.4		Orbital		
8.4.1		Orbital		
8.4.2		Orbital		
8.4.3		Orbital		
8.4.4		Orbital		
8.5	All			
8.5.1	All			
8.5.2	All			
8.5.2.1	All			
8.5.2.2	All			
8.5.3	All			
8.5.3.1	All			
8.5.3.2	All			
8.5.3.3	All			
8.5.3.4	All			
8.6	All			
8.6.1	All			
8.6.2	All			
8.6.2.1	All			

MAN-SYSTEMS INTEGRATION STANDARDS, VOLUME II

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
8.6.2.2	All			
8.6.2.3	All			
8.6.2.4	All			
8.6.3	All			
8.6.3.1	All			
8.6.3.2	All			
8.6.4		Orbital		
8.6.4.1		Orbital		
8.6.4.2		Orbital		
8.6.4.3		Orbital		
8.7	All			
8.7.1	All			
8.7.2	All			
8.7.2.1	All			
8.7.2.2		Orbital		
8.7.2.3		Orbital		
8.7.3	All			
8.7.3.1	All			
8.7.3.2	All			
8.7.3.3	All			
8.7.3.4	All			
8.8	All			

MAN-SYSTEMS INTEGRATION STANDARDS, VOLUME II

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
8.8.1		Orbital		
8.8.2		Orbital		
8.8.3	All			
8.8.3.1		Orbital		
8.8.3.2		Orbital		
8.8.3.3	All			
8.8.3.4	All			
8.9		Orbital		
8.9.1		Orbital		
8.9.2		Orbital		
8.9.2.1		Orbital		
8.9.2.2		Orbital		
8.9.3		Orbital		
8.9.3.1		Orbital		
8.9.3.2		Orbital		
8.9.4		Orbital		
8.10	All			
8.10.1	All			
8.10.2	All			
8.10.3	All			
8.10.3.1	All			
8.10.3.2	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
8.10.3.3	All			
8.10.3.4	All			
8.10.3.5	All			
8.10.3.6	All			
8.10.3.7	All			
8.10.4	All			
8.11	All			
8.11.1	All			
8.11.2	All			
8.11.2.1	All			
8.11.2.2	All			
8.11.3	All			
8.12	All			
8.12.1	All			
8.12.2	All			
8.12.2.1	All			
8.12.2.2	All			
8.12.2.3	All			
8.12.2.4	All			
8.12.3	All			
8.12.3.1	All			
8.12.3.2	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
8.12.3.3	All			
8.12.3.4	All			
8.12.3.5	All			
8.12.3.6	All			
8.13	All			
8.13.1	All			
8.13.2	All			
8.13.2.1	All			
8.13.2.2	All			
8.13.2.3	All			
8.13.2.4	All			
8.13.2.5	All			
8.13.2.6	All			
8.13.2.7	All			
8.13.3	All			
8.13.3.1	All			
8.13.3.1.1	All			
8.13.3.1.2	All			
8.13.3.1.3	All			
8.13.3.1.4	All			
8.13.3.2	All			
8.13.3.2.1	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
8.13.3.2.2	All			
8.13.3.2.3	All			
8.13.3.3	All			
8.13.3.4	All			
8.13.3.5	All			
8.13.3.6	All			

**Appendix G
Acceleration Regime Applicability for Section 9**

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
9.0	All			
9.1	All			
9.2	All			
9.2.1	All			
9.2.2	All			
9.2.2.1	All			
9.2.2.1.1	All			
9.2.2.1.2	All			
9.2.2.1.3	All			
9.2.2.2	All			
9.2.2.2.1	All			
9.2.2.2.2	All			
9.2.2.2.3	All			
9.2.2.2.4	All			
9.2.2.2.5	All			
9.2.2.2.6	All			
9.2.3	All			
9.2.3.1	All			
9.2.3.2	All			
9.2.3.2.1.	All			

MAN-SYSTEMS INTEGRATION STANDARDS, VOLUME II

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
9.2.3.2.2	All			
9.2.3.2.3	All			
9.2.3.2.4.	All			
9.2.3.2.5	All			
9.2.3.2.6	All			
9.2.3.2.7	All			
9.2.3.2.8	All			
9.2.3.2.9	All			
9.2.3.2.10	All			
9.2.4	All			
9.2.4.1	All			
9.2.4.1.1	All			
9.2.4.2	All			
9.2.4.2.1	All			
9.2.4.2.2	All			
9.2.4.2.3	All			
9.2.5	All			
9.2.5.1	All			
9.2.5.1.1	All			
9.2.5.1.2	All			
9.2.5.2	All			
9.2.5.2.1	All			

MAN-SYSTEMS INTEGRATION STANDARDS, VOLUME II

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
9.2.5.2.2		Orbital		Planetary
9.2.6	All			
9.3	All			
9.3.1	All			
9.3.2	All			
9.3.2.1	All			
9.3.2.2	All			
9.3.3	All			
9.3.3.1	All			
9.3.3.2	All			
9.3.3.3	All			
9.3.3.3.1	All			
9.3.3.3.2	All			
9.3.3.3.3	All			
9.3.3.3.4	All			
9.3.3.3.5	All			
9.3.3.3.6	All			
9.3.3.3.7	All			
9.3.3.3.8	All			
9.3.3.3.9	All			
9.3.3.3.10	All			
9.3.3.3.11	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
9.3.3.3.12	All			
9.3.3.3.13	All			
9.3.3.3.14	All			
9.3.3.3.15	All			
9.3.3.3.16	All			
9.3.3.3.17	All			
9.3.3.4	All			
9.3.3.4.1	All			
9.3.3.4.1.1	All			
9.3.3.4.1.2	All			
9.3.3.4.2	All			
9.3.3.4.3	All			
9.3.3.4.4	All			
9.3.3.4.5	All			
9.3.3.4.6	All			
9.3.3.4.7	All			
9.3.3.4.8	All			
9.3.3.5	All			
9.3.3.6	All			
9.3.3.7	All			
9.3.4	All			
9.4	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
9.4.1	All			
9.4.2	All			
9.4.2.1	All			
9.4.2.2	All			
9.4.2.3	All			
9.4.2.3.1	All			
9.4.2.3.1.1	All			
9.4.2.3.1.2	All			
9.4.2.3.1.3	All			
9.4.2.3.1.4	All			
9.4.2.3.1.5	All			
9.4.2.3.2	All			
9.4.2.3.3	All			
9.4.2.3.3.1	All			
9.4.2.3.3.2	All			
9.4.2.3.3.3	All			
9.4.2.3.3.4	All			
9.4.2.3.3.5	All			
9.4.2.3.3.6	All			
9.4.2.3.3.7	All			
9.4.2.3.3.8	All			
9.4.2.3.3.9	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
9.4.2.3.3.10	All			
9.4.2.3.4	All			
9.4.3	All			
9.4.3.1	All			
9.4.3.2	All			
9.4.3.3	All			
9.4.3.3.1	All			
9.4.3.3.2	All			
9.4.3.3.3	All			
9.4.3.3.4	All			
9.4.4	All			
9.4.4.1	All			
9.4.4.2	All			
9.4.4.3	All			
9.4.4.3.1	All			
9.4.4.3.1.1	All			
9.4.4.3.1.2	All			
9.4.4.3.1.3	All			
9.4.4.3.2	All			
9.4.4.3.3	All			
9.4.4.3.4	All			
9.4.4.3.4.1	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
9.4.4.3.4.2	All			
9.4.4.3.4.3	All			
9.4.5	All			
9.4.5.1	All			
9.4.5.1.1	All			
9.4.5.1.2	All			
9.5	All			
9.5.1	All			
9.5.2	All			
9.5.3	All			
9.5.3.1	All			
9.5.3.1.1	All			
9.5.3.1.2	All			
9.5.3.1.3	All			
9.5.3.1.4	All			
9.5.3.1.5	All			
9.5.3.1.6	All			
9.5.3.1.7	All			
9.5.3.1.8	All			
9.5.3.1.9	All			
9.5.3.1.10	All			
9.5.3.1.11	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
9.5.3.1.12	All			
9.5.3.1.13	All			
9.5.3.1.14	All			
9.5.3.1.14.1	All			
9.5.3.1.14.2	All			
9.5.3.1.14.3	All			
9.5.3.1.14.4	All			
9.5.3.1.14.5	All			
9.5.3.1.14.6	All			
9.5.3.1.14.7	All			
9.5.3.1.14.8	All			
9.5.3.1.14.9	All			
9.5.3.1.14.10	All			
9.5.3.2	All			
9.6	All			
9.6.1	All			
9.6.2	All			
9.6.2.1	All			
9.6.2.2	All			
9.6.2.3	All			
9.6.2.3.1	All			
9.6.2.3.2	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
9.6.2.4	All			
9.6.2.4.1	All			
9.6.2.4.2	All			
9.6.2.4.3	All			
9.6.2.4.3.1	All			
9.6.2.4.3.2	All			
9.6.2.4.4	All			
9.6.2.4.4.1	All			
9.6.2.4.4.2	All			
9.6.2.5	All			
9.6.2.5.1	All			
9.6.2.5.2	All			
9.6.2.6	All			
9.6.2.6.1	All			
9.6.2.6.2	All			
9.6.2.7	All			
9.6.2.7.1	All			
9.6.2.7.2	All			
9.6.2.8	All			
9.6.2.8.1	All			
9.6.2.8.2	All			
9.6.2.9	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
9.6.2.9.1	All			
9.6.2.9.2	All			
9.6.3	All			
9.6.3.1	All			
9.6.3.1.1	All			
9.6.3.1.2.	All			
9.6.3.1.3	All			
9.6.3.1.3.1	All			
9.6.3.1.3.2	All			
9.6.3.1.4	All			
9.6.3.1.5	All			
9.6.3.1.6	All			
9.6.3.1.6.1	All			
9.6.3.1.6.2	All			
9.6.3.1.6.3	All			
9.6.3.1.6.3.1	All			
9.6.3.1.6.3.2	All			
9.6.3.1.6.4	All			
9.6.3.1.6.4.1	All			
9.6.3.1.6.4.2	All			
9.6.3.1.7	All			
9.6.3.1.7.1	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
9.6.3.1.7.2	All			
9.6.3.1.7.3	All			
9.6.3.1.7.3.1	All			
9.6.3.1.7.3.2	All			
9.6.3.1.7.4	All			
9.6.3.1.7.5	All			
9.6.3.1.7.5.1	All			
9.6.3.1.7.5.2	All			
9.6.3.1.8	All			
9.6.3.1.8.1	All			
9.6.3.1.8.2	All			
9.6.3.2.8.3	All			
9.6.3.1.9	All			
9.6.3.1.9.1	All			
9.6.3.1.9.2	All			
9.6.3.1.10	All			
9.6.3.1.10.1	All			
9.6.3.1.10.2	All			
9.6.3.2	All			
9.6.3.2.1	All			
9.6.3.2.1.1	All			
9.6.3.2.1.2	All			

MAN-SYSTEMS INTEGRATION STANDARDS, VOLUME II

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
9.6.3.2.2	All			
9.6.3.2.3	All			
9.6.3.2.4	All			
9.6.3.2.5	All			
9.6.3.2.5.1	All			
9.6.3.2.5.2	All			
9.6.3.3	All			
9.6.3.3.1	All			
9.6.3.3.1.1	All			
9.6.3.3.1.2	All			
9.6.3.3.1.3	All			
9.6.3.3.2	All			
9.6.3.3.2.1	All			
9.6.3.3.2.2	All			
9.6.3.4	All			
9.6.3.4.1	All			
9.6.3.4.2	All			
9.6.3.4.2.1	All			
9.6.3.4.2.2	All			
9.6.3.4.3	All			
9.6.3.4.3.1	All			
9.6.3.4.3.2	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
9.6.3.4.4	All			
9.6.3.4.5	All			
9.6.3.4.5.1	All			
9.6.3.4.5.2	All			
9.6.3.4.6	All			
9.6.3.4.6.1	All			
9.6.3.4.6.2	All			
9.6.3.4.7	All			
9.6.3.4.7.1	All			
9.6.3.4.7.2	All			
9.6.3.5	All			
9.6.4	All			
9.6.4.1	All			
9.6.4.2	All			
9.6.4.3	All			
9.6.4.4	All			

**Appendix G
Acceleration Regime Applicability for Section 10**

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
10.0	All			
10.1	All			
10.2	All			
10.2.1	All			
10.2.2	All			
10.2.3	All			
10.2.3.1	All			
10.2.3.2	All			
10.2.3.3	All			
10.2.3.4	All			
10.2.3.5	All			
10.3	All			
10.3.1	All			
10.3.2	All			
10.3.3	All			
10.3.3.1	All			
10.3.3.2	All			
10.3.4		Orbital		
10.4	All			
10.4.1	All			
10.4.2		Orbital		

MAN-SYSTEMS INTEGRATION STANDARDS, VOLUME II

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
10.4.3	All			
10.5	All			
10.5.1	All			
10.5.2	All			
10.5.3	All			
10.5.3.1	All			
10.5.3.2	All			
10.5.3.3	All			
10.5.3.4	All			
10.6	All			
10.6.1	All			
10.6.2	All			
10.6.3	All			
10.6.4		Orbital		
10.7	All			
10.7.1	All			
10.7.2	All			
10.7.3	All			
10.8		Orbital		
10.8.1		Orbital		
10.8.2		Orbital		
10.8.3		Orbital		

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
10.8.3.1		Orbital		
10.8.3.1.1		Orbital		
10.8.3.1.2		Orbital		
10.8.3.1.2.1		Orbital		
10.8.3.1.2.2		Orbital		
10.8.3.2		Orbital		
10.8.3.2.1		Orbital		
10.8.3.2.1.1		Orbital		
10.8.3.2.1.2		Orbital		
10.8.3.2.1.3		Orbital		
10.8.3.3		Orbital		
10.8.3.4		Orbital		
10.8.3.5		Orbital		
10.8.4		Orbital		
10.9	All			
10.9.1	All			
10.9.2	All			
10.9.2.1	All			
10.9.2.2	All			
10.9.2.3	All			
10.9.3	All			
10.9.3.1	All			

MAN-SYSTEMS INTEGRATION STANDARDS, VOLUME II

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
10.9.3.2	All			
10.9.3.2.1	All			
10.9.3.2.2	All			
10.9.3.2.3	All			
10.9.3.2.4	All			
10.9.3.2.5	All			
10.9.3.2.6	All			
10.9.3.2.7	All			
10.9.3.2.8	All			
10.9.3.2.9	All			
10.9.3.2.10	All			
10.9.3.2.11	All			
10.9.3.2.12	All			
10.9.3.2.13	All			
10.9.3.2.14	All			
10.9.3.2.15	All			
10.9.3.2.15.1	All			
10.9.3.2.15.2	All			
10.9.3.2.16	All			
10.10	All			
10.10.1	All			
10.10.2	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
10.10.3	All			
10.11	All			
10.11.1	All			
10.11.2	All			
10.11.3	All			
10.12	All			
10.12.1	All			
10.12.2	All			
10.12.3	All			

**Appendix G
Acceleration Regime Applicability for Section 11**

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
11.0	All			
11.1	All			
11.2	All			
11.2.1	All			
11.2.2	All			
11.2.2.1	All			
11.2.2.2	All			
11.2.3	All			
11.2.3.1	All			
11.2.3.1.1	All			
11.2.3.1.2	All			
11.2.3.1.3	All			
11.2.3.2	All			
11.2.3.3	All			
11.2.3.4	All			
11.2.3.5	All			
11.2.3.6	All			
11.2.3.7	All			
11.2.4	All			
11.2.4.1	All			
11.2.4.2	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
11.3	All			
11.3.1	All			
11.3.2	All			
11.3.3	All			
11.3.3.1	All			
11.3.3.2	All			
11.3.3.3	All			
11.3.3.4	All			
11.4	All			
11.4.1	All			
11.4.2	All			
11.4.3	All			
11.4.4	All			
11.5	All			
11.5.1	All			
11.5.2	All			
11.5.3.1	All			
11.5.3.2	All			
11.5.4	All			
11.6	All			
11.6.1	All			
11.6.2	All			

MAN-SYSTEMS INTEGRATION STANDARDS, VOLUME II

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
11.6.3	All			
11.6.3.1	All			
11.6.3.2	All			
11.6.3.3	All			
11.6.3.4	All			
11.7	All			
11.7.1	All			
11.7.2	All			
11.7.2.1	All			
11.7.2.2	All			
11.7.2.3	All			
11.7.2.3.1	All			
11.7.2.3.2	All			
11.7.2.3.2.1	All			
11.7.2.3.2.2	All			
11.7.2.3.2.3	All			
11.7.2.3.2.4	All			
11.7.2.3.3	All			
11.7.2.3.3.1	All			
11.7.2.3.3.2		Orbital		
11.7.2.3.3.3	All			
11.7.2.3.3.4	All			

MAN-SYSTEMS INTEGRATION STANDARDS, VOLUME II

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
11.7.2.3.4		Orbital		Planetary
11.7.2.4		Orbital		
11.7.3	All			
11.7.3.1	All			
11.7.3.2	All			
11.7.3.3	All			
11.7.3.4		Orbital		
11.8	All			
11.8.1	All			
11.8.2	All			
11.8.2.1	All			
11.8.2.2	All			
11.8.2.2.1	All			
11.8.2.2.2	All			
11.8.2.2.3	All			
11.8.2.2.4	All			
11.8.2.2.5	All			
11.8.2.2.6	All			
11.8.3	All			
11.8.3.1	All			
11.8.3.2	All			
11.8.3.3		Orbital		

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
11.9	All			
11.9.1	All			
11.9.2	All			
11.9.3	All			
11.9.3.1	All			
11.9.3.2	All			
11.9.3.3	All			
11.9.3.4	All			
11.9.4	All			
11.10	All			
11.10.1	All			
11.10.2	All			
11.10.3	All			
11.10.3.1	All			
11.10.3.2	All			
11.10.3.3	All			
11.10.3.4	All			
11.10.3.5	All			
11.10.3.6	All			
11.10.4	All			
11.11	All			
11.11.1	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
11.11.2	All			
11.11.2.1	All			
11.11.2.2	All			
11.11.2.3	All			
11.11.2.4	All			
11.11.3	All			
11.11.3.1	All			
11.11.3.1.1	All			
11.11.3.1.2	All			
11.11.3.1.3	All			
11.11.3.1.4	All			
11.11.3.1.5	All			
11.11.3.1.6	All			
11.11.3.1.7	All			
11.11.3.1.8	All			
11.11.3.1.9	All			
11.11.3.2	All			
11.11.3.2.1	All			
11.11.3.2.1.1	All			
11.11.3.2.2	All			
11.11.3.2.3	All			
11.11.3.2.4	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
11.11.3.3	All			
11.11.3.4	All			
11.11.3.5	All			
11.11.3.6	All			
11.11.4	All			
11.12	All			
11.12.1	All			
11.12.2	All			
11.12.3	All			
11.13	All			
11.13.1	All			
11.13.1.1	All			
11.13.1.2	All			
11.13.1.2.1	All			
11.13.1.2.2	All			
11.13.1.2.3	All			
11.13.1.3	All			
11.13.1.3.1	All			
11.13.1.3.2	All			
11.13.1.4	All			
11.13.2	All			
11.13.2.1	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
11.13.2.2	All			
11.13.2.3	All			
11.13.2.4	All			
11.14	All			
11.14.1	All			
11.14.2	All			
11.14.3	All			
11.14.4	All			

**Appendix G
Acceleration Regime Applicability for Section 12**

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
12.0	All			
12.1	All			
12.2	All			
12.3	All			
12.3.1	All			
12.3.1.1	All			
12.3.1.2	All			
12.3.1.3	All			
12.3.1.4	All			
12.3.2	All			
12.3.2.1	All			
12.3.2.2	All			
12.3.3	All			

**Appendix G
Acceleration Regime Applicability for Section 13**

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
13.0	All			
13.1	All			
13.2	All			
13.2.1	All			
13.2.2	All			
13.2.3	All			
13.2.3.1	All			
13.2.3.2	All			
13.2.3.3	All			
13.2.3.4	All			
13.2.4	All			
13.3	All			
13.3.1	All			
13.3.2	All			
13.3.3	All			
13.3.3.1	All			
13.3.3.2	All			
13.4	All			
13.4.1	All			
13.4.2	All			

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ ReEntry Only	Planetary Only
13.4.3	All			
13.4.3.1	All			
13.4.3.2	All			
13.4.3.3	All			
13.4.4	All			

**Appendix G
Acceleration Regime Applicability for Section 14**

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
14.0	All			
14.1	All			
14.1.1	All			
14.1.2	All			
14.1.2.1	All			
14.1.2.1.1	All			
14.1.2.1.2	All			
14.1.2.1.3	All			
14.1.2.1.4	All			
14.1.3	All			
14.1.4	All			
14.2	All			
14.2.1	All			
14.2.2	All			
14.2.2.1	All			
14.2.2.2	All			
14.2.2.3	All			
14.2.2.4	All			
14.2.2.5	All			
14.2.2.6	All			

MAN-SYSTEMS INTEGRATION STANDARDS, VOLUME II

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
14.2.2.7	All			
14.2.2.8	All			
14.2.2.9	All			
14.2.2.10	All			
14.2.2.11	All			
14.2.3	All			
14.2.3.1	All			
14.2.3.2	All			
14.2.3.3	All			
14.2.3.4	All			
14.2.3.5	All			
14.2.3.6	All			
14.2.3.7	All			
14.2.3.8	All			
14.2.3.9	All			
14.2.3.10	All			
14.2.3.11	All			
14.2.4		Orbital		Planetary
14.2.4.1		Orbital		Planetary
14.2.4.2		Orbital		Planetary
14.2.4.3	All			
14.2.4.4	All			

MAN-SYSTEMS INTEGRATION STANDARDS, VOLUME II

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
14.2.4.5	All			
14.3	All			
14.3.1	All			
14.3.2	All			
14.3.2.1	All			
14.3.2.1.1	All			
14.3.2.1.2	All			
14.3.2.1.3	All			
14.3.2.2	All			
14.3.2.3	All			
14.3.2.3.1	All			
14.3.2.4	All			
14.3.2.5	All			
14.3.2.6	All			
14.3.2.7	All			
14.3.3	All			
14.3.4	All			
14.3.4.1	All			
14.3.4.2	All			
14.3.4.3	All			
14.3.4.4	All			
14.3.4.5	All			

MAN-SYSTEMS INTEGRATION STANDARDS, VOLUME II

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
14.4	All			
14.4.1	All			
14.4.2	All			
14.4.2.1	All			
14.4.2.2	All			
14.4.2.3	All			
14.4.2.4	All			
14.4.2.5	All			
14.4.3	All			
14.4.3.1	All			
14.4.3.2	All			
14.4.3.3	All			
14.4.3.4	All			
14.4.3.5	All			
14.4.4	All			
14.4.4.1	All			
14.4.4.2		Orbital		Planetary
14.4.4.3		Orbital		Planetary
14.5	All			
14.5.1	All			
14.5.2	All			
14.5.2.1	All			

MAN-SYSTEMS INTEGRATION STANDARDS, VOLUME II

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
14.5.2.2	All			
14.5.2.3	All			
14.5.2.4	All			
14.5.2.5	All			
14.5.2.6	All			
14.5.3	All			
14.5.3.1	All			
14.5.3.2	All			
14.5.3.3	All			
14.5.3.4	All			
14.5.3.5	All			
14.5.3.6	All			
14.6	All			
14.6.1	All			
14.6.2	All			
14.6.2.1	All			
14.6.2.2	All			
14.6.2.3	All			
14.6.2.4	All			
14.6.2.4.1	All			
14.6.2.4.2	All			
14.6.3	All			

MAN-SYSTEMS INTEGRATION STANDARDS, VOLUME II

Acceleration Stages Applicable to this Section

Paragraph No	All	Orbital Only	Launch/ReEntry Only	Planetary Only
14.6.3.1	All			
14.6.3.2	All			
14..6.3.3	All			
14.6.4	All			
14.6.4.1	All			
14.6.4.2	All			
14.6.4.3	All			
14.7	All			
14.7.1	All			
14.7.2	All			
14.7.3	All			
14.7.4	All			
14.7.4.1	All			
14.7.4.2		Orbital		
14.7.4.3		Orbital		

**Acceleration Regime Applicability
for Orbital Acceleration Only**
Paragraph Numbers

All Paragraphs applicable for Orbital acceleration			
3.2.3.1	7.2.3	8.7.2.3	10.8.3.1.2
3.3.4	7.2.3.1	8.8.1	10.8.3.1.2.1
3.3.4.1	7.2.3.2	8.8.2	10.8.3.1.2.2
3.3.4.2	7.2.3.3	8.8.3.1	10.8.3.2
4.5.2	7.2.3.3.1	8.8.3.2	10.8.3.2.1
4.5.2.1	7.2.3.3.2	8.9	10.8.3.2.1.1
4.5.2.2	7.2.3.3.2.1	8.9.1	10.8.3.2.1.2
4.6.2	7.2.3.3.2.2	8.9.2	10.8.3.2.1.3
4.7.2	7.2.3.3.3	8.9.2.1	10.8.3.3
4.8	7.2.3.4	8.9.2.2	10.8.3.4
4.8.1	7.2.3.4.1	8.9.3	10.8.3.5
4.8.2	7.2.3.4.2	8.9.3.1	10.8.4
4.9.2	7.2.3.4.3	8.9.3.2	11.7.2.3.3.2
4.9.3	8.2.2.1	8.9.4	11.7.2.3.4
5.2	8.4	9.2.5.2.2	11.7.2.4
5.2.1	8.4.1	10.3.4	11.7.3.4
5.2.2	8.4.2	10.4.2	11.8.3.3
5.2.2.1	8.4.3	10.6.4	14.2.4
5.2.2.2.	8.4.4	10.8	14.2.4.1
5.2.3	8.6.4	10.8.1	14.2.4.2
5.4.2.1.2	8.6.4.1	10.8.2	14.4.4.2
5.5.2.1.2	8.6.4.2	10.8.3	14.4.4.3

Paragraph Numbers

All Paragraphs applicable for Orbital acceleration			
7.0	8.6.4.3	10.8.3.1	14.7.4.2
7.2.2.4	8.7.2.2	10.8. 3.1.1	14.7.4.3

**Acceleration Regime Applicability
for Planetary Acceleration Only**

These paragraphs are applicable for Planetary acceleration regimes:

5.5.2.1.2	7.0
7.2.2.4	7.2.3
7.2.3.1	7.2.3.2
7.2.3.3	7.2.3.3.1
7.2.3.3.2	7.2.3.3.2.1
7.2.3.3.2.2	7.2.3.3.3
7.2.3.4	7.2.3.4.1
7.2.3.4.2	7.2.3.4.3
9.2.5.2.2	11.7.2.3.4
14.2.4	14.2.4.1
14.2.4.2	14.4.4.2
14.4.4.3	

Appendix G
Acceleration Regime Applicability
for Launch and Re-Entry Acceleration Only

These paragraphs are applicable for Launch and Re-Entry acceleration regimes:

3.3.3.3.2	5.4.2.1.1
5.4.2.1.3	5.5.2.1.1
5.5.2.1.3	5.5.3.3.1

Appendix G
Acceleration Regime Applicability for All Regimes

Section | [1](#) | [2](#) | [3](#) | [4](#) | [5](#) | [6](#) | [7](#) | [8](#) | [9](#) | [10](#) | [11](#) | [12](#) | [13](#) | [14](#) |

Sections 1 - 4

1.0	2.0	3.0	3 (continued)	4.0
1.1	2.1	3.1	3.3.3.2.4	4.1
1.2	2.2	3.1.1	3.3.3.2.5	4.2
1.3	2.2.1	3.1.2	3.3.3.2.6	4.2.1
1.4	2.2.2	3.2	3.3.3.3	4.2.2
1.4.1	2.3	3.2.1	3.3.3.3.1	4.3
1.4.2	2.3.1	3.2.2	3.3.4.3	4.3.1
1.4.3	2.3.2	3.2.3	3.3.5	4.3.2
1.4.3.1		3.2.3.2	3.3.5.1	4.3.2.1
1.4.3.2		3.2.3.3	3.3.5.2	4.3.2.2
1.4.3.3		3.3	3.3.5.3	4.4
1.4.3.4		3.3.1	3.3.6	4.4.1
1.4.3.5		3.3.1.1	3.3.6.1	4.4.2
1.4.4		3.3.1.2	3.3.6.2	4.4.2.1
1.5		3.3.1.3	3.3.6.3	4.4.2.2
		3.3.2	3.3.6.3.1	4.5
		3.3.2.1	3.3.6.3.2	4.5.1
		3.3.2.2	3.3.7	4.6
		3.3.2.2.1	3.3.7.1	4.6.1
		3.3.2.2.2	3.3.7.2	4.7
		3.3.2.2.3	3.3.7.3	4.7.1

MAN-SYSTEMS INTEGRATION STANDARDS, VOLUME II

Sections 1 - 4

1.0	2.0	3.0	3 (continued)	4.0
		3.3.2.3	3.3.7.3.1	4.9
		3.3.2.3.1	3.3.7.3.1.1	4.9.1
		3.3.2.3.2	3.3.7.3.1.2	4.10
		3.3.3	3.3.7.3.2	4.10.2
		3.3.3.1	3.3.7.3.2.1	4.11
		3.3.3.2	3.3.7.3.2.2	4.11.1
		3.3.3.2.1	3.3.7.3.3	4.11.2
		3.3.3.2.2	3.3.7.3.3.1	4.11.3
		3.3.3.2.3	3.3.7.3.3.2	

Section 5

5.0	5 (continued)	5 (continued)	5 (continued)
5.1	5.3.3	5.5	5.7.2.1.3.3.5
5.1.1	5.3.3.1	5.5.1	5.7.3.1.3.3.6
5.1.2	5.3.3.1.1	5.5.2	5.7.2.1.3.4
5.1.2.1	5.3.3.2	5.5.2.1	5.7.2.1.4
5.1.2.1.1	5.3.3.3	5.5.2.2	5.7.2.1.4.1
5.1.2.1.2	5.4	5.5.2.3	5.7.2.1.4.2
5.1.2.1.3	5.4.1	5.5.2.3.1	5.7.2.1.4.3
5.1.2.1.4	5.4.2	5.5.2.3.2	5.7.2.1.4.4
5.1.2.1.4.1	5.4.2.1	5.5.2.3.3	5.7.2.1.4.5
5.1.2.1.4.2	5.4.2.2	5.5.2.4	5.7.2.1.4.6
5.1.2.1.4.3	5.4.2.3	5.5.2.4.1	5.7.2.1.5

MAN-SYSTEMS INTEGRATION STANDARDS, VOLUME II

Section 5

5.0	5 (continued)	5 (continued)	5 (continued)
5.1.2.2	5.4.2.3.1	5.5.2.4.2	5.7.2.2
5.1.2.2.1	5.4.2.3.2	5.5.2.4.3	5.7.2.2.1
5.1.2.2.1.1	5.4.2.3.3	5.5.2.4.4	5.7.2.2.2
5.1.2.2.1.2	5.4.2.4	5.5.3	5.7.2.2.3
5.1.2.2.1.3	5.4.2.4.1	5.5.3.1	5.7.2.2.4
5.1.2.2.1.4	5.4.2.4.1.1	5.5.3.2	5.7.3
5.1.2.2.1.5	5.4.2.4.1.1.1	5.5.3.2.1	5.7.3.1
5.1.2.2.1.6	5.4.2.4.1.1.2	5.5.3.2.2	5.7.3.1.1
5.1.2.2.1.7	5.4.2.4.1.2	5.5.3.2.3	5.7.3.1.2
5.1.2.2.1.7.1	5.4.2.4.2	5.5.3.2.4	5.7.3.1.3
5.1.2.2.1.7.2	5.4.2.4.2.1	5.5.3.2.5	5.7.3.1.4
5.1.2.2.1.7.3	5.4.2.4.2.2	5.5.3.3	5.7.3.2
5.1.2.3.	5.4.2.4.3	5.5.3.3.2	5.7.3.2.1
5.1.2.3.1	5.4.2.4.3.1	5.5.3.3.3	5.7.3.2.2
5.1.2.3.2	5.4.2.4.3.2	5.5.3.3.4	5.8
5.1.2.3.3	5.4.3	5.5.4	5.8.1
5.1.3	5.4.3.1	5.5.4.1	5.8.2
5.1.3.1	5.4.3.2	5.5.4.2	5.8.2.1
5.1.3.2	5.4.3.2.1	5.5.4.3	5.8.2.2
5.1.3.3	5.4.3.2.1.1	5.6	5.8.2.2.1
5.1.3.4	5.4.3.2.1.2	5.7	5.8.2.2.2
5.1.3.4.1	5.4.3.2.1.3	5.7.1	5.8.2.2.2.1

MAN-SYSTEMS INTEGRATION STANDARDS, VOLUME II

Section 5

5.0	5 (continued)	5 (continued)	5 (continued)
5.1.3.4.2	5.4.3.2.1.4	5.7.2	5.8.2.2.3
5.1.3.4.3	5.4.3.2.1.5	5.7.2.1	5.8.2.2.4
5.1.3.5	5.4.3.2.2	5.7.2.1.1	5.8.2.2.5
5.3	5.4.3.2.2.1	5.7.2.1.2	5.8.3
5.3.1	5.4.3.2.2.2	5.7.2.1.2.1	5.8.3.1
5.3.2	5.4.3.2.3	5.7.2.1.2.2	5.8.3.2
5.3.2.1	5.4.3.2.3.1	5.7.2.1.2.3	5.9
5.3.2.1.1	5.4.3.2.3.2	5.7.2.1.2.4	5.9.1
5.3.2.1.2	5.4.3.2.3.3	5.7.2.1.3	5.9.2
5.3.2.1.3	5.4.3.2.3.4	5.7.2.1.3.1	
5.3.2.2	5.4.3.2.4	5.7.2.1.3.2	
5.3.2.2.1	5.4.3.2.5	5.7.2.1.3.3	
5.3.2.2.2	5.4.4	5.7.2.1.3.3.1	
5.3.2.2.3	5.4.4.1	5.7.2.1.3.3.2	
5.3.2.3	5.4.4.2	5.7.2.1.3.3.3	
5.3.2.4	5.4.4.3	5.7.2.1.3.3.4	

Paragraphs 6 - 9

6.0	7.0	8.0	9.0	9 (continue)
6.1	7.1	8.1	9.1	9.5.3.1
6.2	7.2	8.2	9.2	9.5.3.1.1
6.2.1	7.2.1	8.2.1	9.2.1	9.5.3.1.2

MAN-SYSTEMS INTEGRATION STANDARDS, VOLUME II

Paragraphs 6 - 9

6.0	7.0	8.0	9.0	9 (continue
6.2.2	7.2.2	8.2.2	9.2.2	9.5.3.1.3
6.2.2.1	7.2.2.1	8.2.2.2	9.2.2.1	9.5.3.1.4
6.2.2.2	7.2.2.2	8.2.2.3	9.2.2.1.1	9.5.3.1.5
6.2.3	7.2.2.2.1	8.2.2.4	9.2.2.1.2	9.5.3.1.6
6.3	7.2.2.2.2	8.2.2.5	9.2.2.1.3	9.5.3.1.7
6.3.1	7.2.2.2.3	8.2.2.6	9.2.2.2	9.5.3.1.8
6.3.2	7.2.2.3	8.2.2.7	9.2.2.2.1	9.5.3.1.9
6.3.3	7.2.2.3.1	8.2.2.8	9.2.2.2.2	9.5.3.1.10
6.3.3.1	7.2.2.3.2	8.2.3	9.2.2.2.3	9.5.3.1.11
6.3.3.2	7.2.4	8.2.3.1	9.2.2.2.4	9.5.3.1.12
6.3.3.3	7.2.4.1	8.2.3.2	9.2.2.2.5	9.5.3.1.13
6.3.3.4	7.2.4.2	8.3	9.2.2.2.6	9.5.3.1.14
6.3.3.5	7.2.4.3	8.3.1	9.2.3	9.5.3.1.14.1
6.3.3.6	7.2.5	8.3.2	9.2.3.1	9.5.3.1.14.2
6.3.3.7	7.2.5.1	8.3.2.1	9.2.3.2	9.5.3.1.14.3
6.3.3.8	7.2.5.2	8.3.2.2	9.2.3.2.1.	9.5.3.1.14.4
6.3.3.9	7.2.5.1	8.3.3	9.2.3.2.2	9.5.3.1.14.5
6.3.3.10	7.2.5.2	8.3.3.1	9.2.3.2.3	9.5.3.1.14.6
6.3.3.11	7.2.5.3	8.3.3.2	9.2.3.2.4.	9.5.3.1.14.7
6.3.4	7.2.5.3.1	8.5	9.2.3.2.5	9.5.3.1.14.8
6.4	7.2.5.3.2	8.5.1	9.2.3.2.6	9.5.3.1.14.9
6.4.1	7.2.5.3.3	8.5.2	9.2.3.2.7	9.5.3.1.14.1

MAN-SYSTEMS INTEGRATION STANDARDS, VOLUME II

Paragraphs 6 - 9

6.0	7.0	8.0	9.0	9 (continue
6.4.2	7.2.5.3.4	8.5.2.1	9.2.3.2.8	9.5.3.2
6.4.2.1	7.2.5.3.5	8.5.2.2	9.2.3.2.9	9.6
6.4.2.1.1	7.2.5.3.6	8.5.3	9.2.3.2.10	9.6.1
6.4.2.2	7.2.6	8.5.3.1	9.2.4	9.6.2
6.4.2.2.1	7.2.6.1	8.5.3.2	9.2.4.1	9.6.2.1
6.4.2.3	7.2.6.2	8.5.3.3	9.2.4.1.1	9.6.2.2
6.4.2.4	7.2.6.3	8.5.3.4	9.2.4.2	9.6.2.3
6.4.3	7.2.7	8.6	9.2.4.2.1	9.6.2.3.1
6.4.3.1	7.2.7.1	8.6.1	9.2.4.2.2	9.6.2.3.2
6.4.3.1.1	7.2.7.2	8.6.2	9.2.4.2.3	9.6.2.4
6.4.3.2	7.2.7.2.1	8.6.2.1	9.2.5	9.6.2.4.1
6.4.3.3	7.2.7.2.2	8.6.2.2	9.2.5.1	9.6.2.4.2
6.4.3.4	7.2.7.2.2.1	8.6.2.3	9.2.5.1.1	9.6.2.4.3
6.4.3.5	7.2.7.2.2.2	8.6.2.4	9.2.5.1.2	9.6.2.4.3.1
6.4.3.6	7.2.7.2.2.3	8.6.3	9.2.5.2	9.6.2.4.3.2
6.4.3.7	7.2.7.3	8.6.3.1	9.2.5.2.1	9.6.2.4.4
6.4.3.8	7.2.7.3.1	8.6.3.2	9.2.6	9.6.2.4.4.1
6.4.3.9	7.2.7.3.2	8.7	9.3	9.6.2.4.4.2
6.4.3.10	7.2.7.3.2.1	8.7.1	9.3.1	9.6.2.5
6.4.3.11	7.2.7.3.2.2	8.7.2	9.3.2	9.6.2.5.1
6.4.3.12	7.2.7.3.2.3	8.7.2.1	9.3.2.1	9.6.2.5.2
6.4.3.13	7.2.7.3.2.4	8.7.3	9.3.2.2	9.6.2.6

MAN-SYSTEMS INTEGRATION STANDARDS, VOLUME II

Paragraphs 6 - 9

6.0	7.0	8.0	9.0	9 (continue
6.4.3.13.1	7.2.7.3.3	8.7.3.1	9.3.3	9.6.2.6.1
6.4.3.14	7.2.8	8.7.3.2	9.3.3.1	9.6.2.6.2
6.4.3.15	7.3	8.7.3.3	9.3.3.2	9.6.2.7
6.4.3.15.1	7.3.1	8.7.3.4	9.3.3.3	9.6.2.7.1
6.4.3.16	7.3.2	8.8	9.3.3.3.1	9.6.2.7.2
6.4.3.17	7.3.2.1	8.8.3	9.3.3.3.2	9.6.2.8
6.4.3.18	7.3.2.2	8.8.3.3	9.3.3.3.3	9.6.2.8.1
6.4.3.18.1	7.3.2.3	8.8.3.4	9.3.3.3.4	9.6.2.8.2
6.4.3.18.1.1	7.3.3	8.10	9.3.3.3.5	9.6.2.9
6.4.3.18.1.2	7.3.3.1	8.10.1	9.3.3.3.6	9.6.2.9.1
6.4.3.18.2	7.3.3.2	8.10.2	9.3.3.3.7	9.6.2.9.2
6.4.3.18.2.1	7.3.3.3	8.10.3	9.3.3.3.8	9.6.3
6.4.3.18.2.2	7.3.3.4	8.10.3.1	9.3.3.3.9	9.6.3.1
6.4.3.18.2.3	7.4	8.10.3.2	9.3.3.3.10	9.6.3.1.1
6.4.3.18.2.4	7.4.1	8.10.3.3	9.3.3.3.11	9.6.3.1.2.
6.4.3.18.2.5	7.4.2	8.10.3.4	9.3.3.3.12	9.6.3.1.3
6.4.3.19	7.4.3	8.10.3.5	9.3.3.3.13	9.6.3.1.3.1
6.5	7.4.3.1	8.10.3.6	9.3.3.3.14	9.6.3.1.3.2
6.5.1	7.4.3.2	8.10.3.7	9.3.3.3.15	9.6.3.1.4
6.5.2		8.10.4	9.3.3.3.16	9.6.3.1.5
6.5.3		8.11	9.3.3.3.17	9.6.3.1.6
6.6		8.11.1	9.3.3.4	9.6.3.1.6.1

MAN-SYSTEMS INTEGRATION STANDARDS, VOLUME II

Paragraphs 6 - 9

6.0	7.0	8.0	9.0	9 (continue)
6.6.1		8.11.2	9.3.3.4.1	9.6.3.1.6.2
6.6.2		8.11.2.1	9.3.3.4.1.1	9.6.3.1.6.3
6.6.3		8.11.2.2	9.3.3.4.1.2	9.6.3.1.6.3.1
6.6.3.1		8.11.3	9.3.3.4.2	9.6.3.1.6.3.2
6.6.3.1.1		8.12	9.3.3.4.3	9.6.3.1.6.4
6.6.3.1.2		8.12.1	9.3.3.4.4	9.6.3.1.6.4.1
6.6.3.2		8.12.2	9.3.3.4.5	9.6.3.1.6.4.2
6.6.3.2.1		8.12.2.1	9.3.3.4.6	9.6.3.1.7
6.6.3.2.2		8.12.2.2	9.3.3.4.7	9.6.3.1.7.1
6.6.3.2.3		8.12.2.3	9.3.3.4.8	9.6.3.1.7.2
6.6.3.3		8.12.2.4	9.3.3.5	9.6.3.1.7.3
6.6.3.4		8.12.3	9.3.3.6	9.6.3.1.7.3.1
6.7		8.12.3.1	9.3.3.7	9.6.3.1.7.3.2
6.7.1		8.12.3.2	9.3.4	9.6.3.1.7.4
6.7.2		8.12.3.3	9.4	9.6.3.1.7.5
6.7.3		8.12.3.4	9.4.1	9.6.3.1.7.5.1
6.7.4		8.12.3.5	9.4.2	9.6.3.1.7.5.2
6.7.5		8.12.3.6	9.4.2.1	9.6.3.1.8
		8.13	9.4.2.2	9.6.3.1.8.1
		8.13.1	9.4.2.3	9.6.3.1.8.2
		8.13.2	9.4.2.3.1	9.6.3.2.8.3
		8.13.2.1	9.4.2.3.1.1	9.6.3.1.9

MAN-SYSTEMS INTEGRATION STANDARDS, VOLUME II

Paragraphs 6 - 9

6.0	7.0	8.0	9.0	9 (continue)
		8.13.2.2	9.4.2.3.1.2	9.6.3.1.9.1
		8.13.2.3	9.4.2.3.1.3	9.6.3.1.9.2
		8.13.2.4	9.4.2.3.1.4	9.6.3.1.10
		8.13.2.5	9.4.2.3.1.5	9.6.3.1.10.1
		8.13.2.6	9.4.2.3.2	9.6.3.1.10.2
		8.13.2.7	9.4.2.3.3	9.6.3.2
		8.13.3	9.4.2.3.3.1	9.6.3.2.1
		8.13.3.1	9.4.2.3.3.2	9.6.3.2.1.1
		8.13.3.1.1	9.4.2.3.3.3	9.6.3.2.1.2
		8.13.3.1.2	9.4.2.3.3.4	9.6.3.2.2
		8.13.3.1.3	9.4.2.3.3.5	9.6.3.2.3
		8.13.3.1.4	9.4.2.3.3.6	9.6.3.2.4
		8.13.3.2	9.4.2.3.3.7	9.6.3.2.5
		8.13.3.2.1	9.4.2.3.3.8	9.6.3.2.5.1
		8.13.3.2.2	9.4.2.3.3.9	9.6.3.2.5.2
		8.13.3.2.3	9.4.2.3.3.10	9.6.3.3
		8.13.3.3	9.4.2.3.4	9.6.3.3.1
		8.13.3.4	9.4.3	9.6.3.3.1.1
		8.13.3.5	9.4.3.1	9.6.3.3.1.2
		8.13.3.6	9.4.3.2	9.6.3.3.1.3
			9.4.3.3	9.6.3.3.2
			9.4.3.3.1	9.6.3.3.2.1

MAN-SYSTEMS INTEGRATION STANDARDS, VOLUME II

Paragraphs 6 - 9

6.0	7.0	8.0	9.0	9 (continue)
			9.4.3.3.2	9.6.3.3.2.2
			9.4.3.3.3	9.6.3.4
			9.4.3.3.4	9.6.3.4.1
			9.4.4	9.6.3.4.2
			9.4.4.1	9.6.3.4.2.1
			9.4.4.2	9.6.3.4.2.2
			9.4.4.3	9.6.3.4.3
			9.4.4.3.1	9.6.3.4.3.1
			9.4.4.3.1.1	9.6.3.4.3.2
			9.4.4.3.1.2	9.6.3.4.4
			9.4.4.3.1.3	9.6.3.4.5
			9.4.4.3.2	9.6.3.4.5.1
			9.4.4.3.3	9.6.3.4.5.2
			9.4.4.3.4	9.6.3.4.6
			9.4.4.3.4.1	9.6.3.4.6.1
			9.4.4.3.4.2	9.6.3.4.6.2
			9.4.4.3.4.3	9.6.3.4.7
			9.4.5	9.6.3.4.7.1
			9.4.5.1	9.6.3.4.7.2
			9.4.5.1.1	9.6.3.5
			9.4.5.1.2	9.6.4
			9.5	9.6.4.1

MAN-SYSTEMS INTEGRATION STANDARDS, VOLUME II

Paragraphs 6 - 9

6.0	7.0	8.0	9.0	9 (continue
			9.5.1	9.6.4.2
			9.5.2	9.6.4.3
			9.5.3	9.6.4.4

Paragraphs 10 - 14

10.0	11.0	12.0	13.0	14.0
10.1	11.1	12.1	13.1	14.1
10.2	11.2	12.2	13.2	14.1.1
10.2.1	11.2.1	12.3	13.2.1	14.1.2
10.2.2	11.2.2	12.3.1	13.2.2	14.1.2.1
10.2.3	11.2.2.1	12.3.1.1	13.2.3	14.1.2.1
10.2.3.1	11.2.2.2	12.3.1.2	13.2.3.1	14.1.2.1
10.2.3.2	11.2.3	12.3.1.3	13.2.3.2	14.1.2.1
10.2.3.3	11.2.3.1	12.3.1.4	13.2.3.3	14.1.2.1
10.2.3.4	11.2.3.1.1	12.3.2	13.2.3.4	14.1.3
10.2.3.5	11.2.3.1.2	12.3.2.1	13.2.4	14.1.4
10.3	11.2.3.1.3	12.3.2.2	13.3	14.2
10.3.1	11.2.3.2	12.3.3	13.3.1	14.2.1
10.3.2	11.2.3.3		13.3.2	14.2.2
10.3.3	11.2.3.4		13.3.3	14.2.2.1
10.3.3.1	11.2.3.5		13.3.3.1	14.2.2.2
10.3.3.2	11.2.3.6		13.3.3.2	14.2.2.3

MAN-SYSTEMS INTEGRATION STANDARDS, VOLUME II

Paragraphs 10 - 14

10.0	11.0	12.0	13.0	14.0
10.4	11.2.3.7		13.4	14.2.2.4
10.4.1	11.2.4		13.4.1	14.2.2.5
10.4.3	11.2.4.1		13.4.2	14.2.2.6
10.5	11.2.4.2		13.4.3	14.2.2.7
10.5.1	11.3		13.4.3.1	14.2.2.8
10.5.2	11.3.1		13.4.3.2	14.2.2.9
10.5.3	11.3.2		13.4.3.3	14.2.2.10
10.5.3.1	11.3.3		13.4.4	14.2.2.11
10.5.3.2	11.3.3.1			14.2.3
10.5.3.3	11.3.3.2			14.2.3.1
10.5.3.4	11.3.3.3			14.2.3.2
10.6	11.3.3.4			14.2.3.3
10.6.1	11.4			14.2.3.4
10.6.2	11.4.1			14.2.3.5
10.6.3	11.4.2			14.2.3.6
10.7	11.4.3			14.2.3.7
10.7.1	11.4.4			14.2.3.8
10.7.2	11.5			14.2.3.9
10.7.3	11.5.1			14.2.3.10
10.9	11.5.2			14.2.3.11
10.9.1	11.5.3.1			14.2.4.3
10.9.2	11.5.3.2			14.2.4.4

MAN-SYSTEMS INTEGRATION STANDARDS, VOLUME II

Paragraphs 10 - 14

10.0	11.0	12.0	13.0	14.0
10.9.2.1	11.5.4			14.2.4.5
10.9.2.2	11.6			14.3
10.9.2.3	11.6.1			14.3.1
10.9.3	11.6.2			14.3.2
10.9.3.1	11.6.3			14.3.2.1
10.9.3.2	11.6.3.1			14.3.2.1
10.9.3.2.1	11.6.3.2			14.3.2.1
10.9.3.2.2	11.6.3.3			14.3.2.1
10.9.3.2.3	11.6.3.4			14.3.2.2
10.9.3.2.4	11.7			14.3.2.3
10.9.3.2.5	11.7.1			14.3.2.3
10.9.3.2.6	11.7.2			14.3.2.4
10.9.3.2.7	11.7.2.1			14.3.2.5
10.9.3.2.8	11.7.2.2			14.3.2.6
10.9.3.2.9	11.7.2.3			14.3.2.7
10.9.3.2.10	11.7.2.3.1			14.3.3
10.9.3.2.11	11.7.2.3.2			14.3.4
10.9.3.2.12	11.7.2.3.2.1			14.3.4.1
10.9.3.2.13	11.7.2.3.2.2			14.3.4.2
10.9.3.2.14	11.7.2.3.2.3			14.3.4.3
10.9.3.2.15	11.7.2.3.2.4			14.3.4.4
10.9.3.2.15.1	11.7.2.3.3			14.3.4.5

MAN-SYSTEMS INTEGRATION STANDARDS, VOLUME II

Paragraphs 10 - 14

10.0	11.0	12.0	13.0	14.0
10.9.3.2.15.2	11.7.2.3.3.1			14.4
10.9.3.2.16	11.7.2.3.3.3			14.4.1
10.10	11.7.2.3.3.4			14.4.2
10.10.1	11.7.3			14.4.2.1
10.10.2	11.7.3.1			14.4.2.2
10.10.3	11.7.3.2			14.4.2.3
10.11	11.7.3.3			14.4.2.4
10.11.1	11.8			14.4.2.5
10.11.2	11.8.1			14.4.3
10.11.3	11.8.2			14.4.3.1
10.12	11.8.2.1			14.4.3.2
10.12.1	11.8.2.2			14.4.3.3
10.12.2	11.8.2.2.1			14.4.3.4
10.12.3	11.8.2.2.2			14.4.3.5
	11.8.2.2.3			14.4.4
	11.8.2.2.4			14.4.4.1
	11.8.2.2.5			14.5
	11.8.2.2.6			14.5.1
	11.8.3			14.5.2
	11.8.3.1			14.5.2.1
	11.8.3.2			14.5.2.2
	11.9			14.5.2.3

MAN-SYSTEMS INTEGRATION STANDARDS, VOLUME II

Paragraphs 10 - 14

10.0	11.0	12.0	13.0	14.0
	11.9.1			14.5.2.4
	11.9.2			14.5.2.5
	11.9.3			14.5.2.6
	11.9.3.1			14.5.3
	11.9.3.2			14.5.3.1
	11.9.3.3			14.5.3.2
	11.9.3.4			14.5.3.3
	11.9.4			14.5.3.4
	11.10			14.5.3.5
	11.10.1			14.5.3.6
	11.10.2			14.6
	11.10.3			14.6.1
	11.10.3.1			14.6.2
	11.10.3.2			14.6.2.1
	11.10.3.3			14.6.2.2
	11.10.3.4			14.6.2.3
	11.10.3.5			14.6.2.4
	11.10.3.6			14.6.2.4
	11.10.4			14.6.2.4
	11.11			14.6.3
	11.11.1			14.6.3.1
	11.11.2			14.6.3.2

MAN-SYSTEMS INTEGRATION STANDARDS, VOLUME II

Paragraphs 10 - 14

10.0	11.0	12.0	13.0	14.0
	11.11.2.1			14.6.3.3
	11.11.2.2			14.6.4
	11.11.2.3			14.6.4.1
	11.11.2.4			14.6.4.2
	11.11.3			14.6.4.3
	11.11.3.1			14.7
	11.11.3.1.1			14.7.1
	11.11.3.1.2			14.7.2
	11.11.3.1.3			14.7.3
	11.11.3.1.4			14.7.4
	11.11.3.1.5			14.7.4.1
	11.11.3.1.6			
	11.11.3.1.7			
	11.11.3.1.8			
	11.11.3.1.9			
	11.11.3.2			
	11.11.3.2.1			
	11.11.3.2.1.1			
	11.11.3.2.2			
	11.11.3.2.3			
	11.11.3.2.4			
	11.11.3.3			

MAN-SYSTEMS INTEGRATION STANDARDS, VOLUME II

Paragraphs 10 - 14

10.0	11.0	12.0	13.0	14.0
	11.11.3.4			
	11.11.3.5			
	11.11.3.6			
	11.11.4			
	11.12			
	11.12.1			
	11.12.2			
	11.12.3			
	11.13			
	11.13.1			
	11.13.1.1			
	11.13.1.2			
	11.13.1.2.1			
	11.13.1.2.2			
	11.13.1.2.3			
	11.13.1.3			
	11.13.1.3.1			
	11.13.1.3.2			
	11.13.1.4			
	11.13.2			
	11.13.2.1			
	11.13.2.2			

MAN-SYSTEMS INTEGRATION STANDARDS, VOLUME II

Paragraphs 10 - 14

10.0	11.0	12.0	13.0	14.0
	11.13.2.3			
	11.13.2.4			
	11.14			
	11.14.1			
	11.14.2			
	11.14.3			
	11.14.4			

Appendix H Video User's Guide

What is this videotape and why is it useful?

A videotape entitled, "Living and Working in Space," illustrates the various man-systems integration problems that have been identified during Gemini, Apollo, Skylab, and Shuttle manned space flights. The videotape contains scenes from on-orbit crew activities. The video has been prepared by the ex-Skylab astronauts, Bill Pogue and Jerry Carr, for the Boeing Aerospace Company. This videotape incorporates scenes from Gemini, Apollo, Skylab, and Shuttle. It is intended to provide a wide scope general introduction to microgravity human factors/human engineering issues.

This videotape is specifically designed to create awareness of the basic microgravity considerations for workers involved in planning, engineering, and design work who are new to space programs. The content is biased towards the specific requirements of the Space Station and other long-duration space flights.

How is this videotape to be used?

The 34 minute videotape has been divided into 37 scenes. An on-screen clock serves as a counter for locating these scenes. The time read-out correlates with paragraph numbers from Volume 1.

There are 3 lists that are to be used for locating human factors information on this videotape:

[Appendix H1 - Video Scene Descriptions](#)

The video scenes are listed by number. Links to applicable Volume I paragraphs are associated with each scene.

[Appendix H2 - Video Scene Titles Organized by Section](#)

The video scenes are provided in common groupings.

[Appendix H3 - Paragraphs Applicable to Video Scenes](#)

The video scenes are listed by associated paragraph in Volume I.

Appendix H1

Video Scene Titles with Paragraph References

Video Scenes and Applicable Paragraphs in Volume I		
Number	Title	Applicable Paragraphs
1	Skylab in Orbit	5.1, 5.2
2	Shuttle Orbiter in orbit	5.1, 5.2
3	Crew on Orbiter flight deck	3.3.4, 5.2, 8.4, 8.6, 8.12, 8.13, 9.2.4, 10.4
4	Graphic: space neutral posture	3.3.4, 5.2, 8.4, 8.6, 9.2.4, 10.2.3.2, 10.4, 11.6, 11.7, 11.8, 12.3
5	Crewman at Skylab wardroom window	3.3.4, 5.2, 8.11, 9.2.5.1, 11.7, 11.11
6	Spacelab crewmember holds arms	3.3.4, 4.6, 5.2, 8.6, 8.9, 10.8, 11.7
7	Skylab crewmember on exercise ergometer	3.3.4, 5.2, 7.2.3, 8.9, 10.8, 11.7
8	Skylab crewmember don suits	3.3.2, 3.3.3, 4.8, 5.2, 8.6, 11.7, 11.9, 14.1
9	Space Motion Sickness Experiments: crew participation	4.5, 5.2, 7.2.3, 11.7
10	Fluid shift: graphics and discussion	5.2, 7.2.3, 7.2.7
11	Sequence showing body rotations and rapid translations	3.3, 4.0, 5.2, 6.3, 8.2, 8.6, 8.8, 8.9, 11.6
12	Contingency maintenance: poor restraint & bad lighting	3.3, 4.2, 4.8, 5.2, 6.3, 8.2, 8.4, 8.6, 8.9, 11.6, 11.8, 11.9, 12.3
13	Earth scene & scene showing docking-discussion of sense of vision	4.2, 5.1, 10.7
14	Crewmember translate through Skylab-discussion of sense of orientation	4.2, 4.5, 4.6, 5.2, 6.3, 8.2, 8.3, 8.4, 8.6, 8.9, 8.10, 8.12, 8.13, 9.2.2, 9.2.4, 11.6, 11.7
15	Wardroom table and eating scenes from Skylab	3.3, 4.8, 5.2, 8.2, 8.6, 8.9, 8.12, 8.13, 10.4
16	Skylab and Orbiter sleep stations	3.3, 4.6, 4.10, 5.2, 7.2.4, 7.2.5, 8.4, 8.6, 8.9, 10.7, 10.8, 11.7
17	Exercise: scenes from Skylab & Shuttle showing different types of exercise	3.3, 4.6, 4.8, 4.9, 4.10, 5.2, 7.2.3, 7.2.7, 8.9, 10.7, 10.8, 11.7
18	Body cleansing scenes from Skylab and Shuttle	8.6, 10.2.3.1, 10.2.3.2, 11.3, 11.7
19	Space Housekeeping on Shuttle and Skylab	5.2, 8.3, 8.6, 8.7, 8.8, 8.9, 8.10, 9.2.5.2, 11.4, 11.6, 11.7, 12.3, 13.2, 13.3
20	Medical monitoring: Shuttle	7.2.7, 10.9
21	Body restraint illustrations	3.3, 5.2, 6.4, 8.7, 8.8, 8.9, 11.2, 11.6, 11.10, 12.3
22	Paper/hand copy/document management, document restraint	4.8, 5.2, 8.6, 8.9, 11.7, 13.4
23	Manual dexterity during task performance: tool restraint during tasks	3.3.2, 4.8, 8.6, 8.9, 9.2.2, 9.2.4, 11.2, 11.7
24	Work bench innovations on Skylab: fan housing and filter screen	5.2, 8.4, 8.6, 9.2.2, 11.7, 12.3
25	Difficulty in handling small items	3.3.2, 3.3.3, 4.8, 5.2, 8.9, 9.2.2, 11.7, 11.11
26	Workstation/work area architecture and panel orientation considerations	4.2, 4.5, 5.2, 8.2, 8.3, 8.4, 8.6, 8.12, 9.2.4, 12.3
27	Windows as work stations: crowding and interference issues	3.3, 5.2, 8.6, 8.11, 9.2.2, 11.7, 11.11, 11.12

Video Scenes and Applicable Paragraphs in Volume I

Number	Title	Applicable Paragraphs
28	Manipulation of hardware in microgravity and difficulty created by poorly restrained documents. Difficulty in freeing stuck mechanisms	3.3, 4.2, 4.8, 4.9, 4.10, 5.1, 6.3, 8.6, 9.2, 12.3, 13.4
29	Cable and hose management clutter, snag and interference potential	5.2, 6.3, 8.2, 8.7, 8.8, 11.14, 12.3
30	Body translation-equipment vulnerability/inadvertent control actuation or damage potential during crew translations	3.3, 4.8, 5.2, 6.3, 8.2, 8.6, 8.7, 8.8, 8.9, 11.7, 11.8
31	Equipment translation illustrations, body restraint during equipment handling	3.3, 4.8, 5.2, 8.6, 8.7, 8.8, 8.9, 11.7, 11.8
32	Introduction to EVA-suited restrictions dexterity/mobility and body/equipment restraints and mobility aids	14.1, 14.2, 14.3, 14.4, 14.5
33	Body and equipment restraints: EVA considerations and provisions Gemini to Shuttle	14.3, 14.4
34	Equipment manipulation and translation - EVA	14.4, 14.5, 14.7
35	Manned maneuvering unit operations: satellite retrieval operations	14.5, 14.7
36	EVA lighting consideration, vehicle external lighting considerations/ requirements	14.4
37	Summary: Posture, restraints, access, single reference frame	

Appendix H2
Video Scene Titles Organized by Section

Section | 1 | 2 | [3](#) | [4](#) | [5](#) | [6](#) | [7](#) | [8](#) | [9](#) | [10](#) | [11](#) | [12](#) | [13](#) | [14](#) |

Section 3 Anthropometry and Biomechanics

Body restraint illustrations

Body translation-equipment vulnerability/inadvertent control actuation or damage potential during crew translations

Contingency maintenance: poor restraint & bad lighting

Crew on Orbiter flight deck

Crewman at Skylab wardroom window

Difficulty in handling small items

Equipment translation illustrations, body restraint during equipment handling

Exercise: scenes from Skylab & Shuttle showing different types of exercise

Graphic: space neutral posture

Manipulation of hardware in microgravity and difficulty created by poorly restrained documents. Difficulty in freeing stuck mechanisms

Sequence showing body rotations and rapid translations

Skylab and Orbiter sleep stations

Wardroom table and eating scenes from Skylab

Windows as work stations: crowding and interference issues

Manual dexterity during task performance: tool restraint during tasks

Skylab crewmember don suits

Skylab crewmember on exercise ergometer

Spacelab crewmember holds arms

Section 4 Human Performance Capabilities

Body translation-equipment vulnerability/inadvertent control actuation or damage potential during crew translations

Contingency maintenance: poor restraint & bad lighting

Crewmember translate through Skylab-discussion of sense of orientation

Difficulty in handling small items

Earth scene & scene showing docking-discussion of sense of vision

Equipment translation illustrations, body restraint during equipment handling

Exercise: scenes from Skylab & Shuttle showing different types of exercise
Manipulation of hardware in microgravity and difficulty created by poorly restrained documents. Difficulty in freeing stuck mechanisms
Manual dexterity during task performance: tool restraint during tasks
Paper/hand copy/document management, document restraint
Sequence showing body rotations and rapid translations
Skylab crewmember don suits
Skylab and Orbiter sleep stations
Space Motion Sickness Experiments: crew participation
Spacelab crewmember holds arms
Workstation/work area architecture and panel orientation considerations
Wardroom table and eating scenes from Skylab

Section 5 Natural and Induced Environments

Body restraint illustrations
Body translation-equipment vulnerability/inadvertent control actuation or damage potential during crew translations
Cable and hose management clutter, snag and interference potential
Contingency maintenance: poor restraint & bad lighting
Crew on Orbiter flight deck
Crewman at Skylab wardroom window
Crewmember translate through Skylab-discussion of sense of orientation
Difficulty in handling small items
Earth scene & scene showing docking-discussion of sense of vision
Equipment translation illustrations, body restraint during equipment handling
Exercise: scenes from Skylab & Shuttle showing different types of exercise
Fluid shift: graphics and discussion
Graphic: space neutral posture
Manipulation of hardware in microgravity and difficulty created by poorly restrained documents. Difficulty in freeing stuck mechanisms
Paper/hand copy/document management, document restraint
Sequence showing body rotations and rapid translations
Shuttle Orbiter in orbit

Skylab and Orbiter sleep stations

Skylab crewmember don suits

Skylab crewmember on exercise ergometer

Skylab in Orbit

Space Housekeeping on Shuttle and Skylab

Space Motion Sickness Experiments: crew participation

Spacelab crewmember holds arms

Wardroom table and eating scenes from Skylab

Windows as work stations: crowding and interference issues

Work bench innovations on Skylab: fan housing and filter screen

Workstation/work area architecture and panel orientation considerations

Section 6 Crew Safety

Body restraint illustrations

Body translation-equipment vulnerability/inadvertent control actuation or damage potential during crew translations

Cable and hose management clutter, snag and interference potential

Contingency maintenance: poor restraint & bad lighting

Crewmember translate through Skylab-discussion of sense of orientation

Manipulation of hardware in microgravity and difficulty created by poorly restrained documents. Difficulty in freeing stuck mechanisms

Section 7 Health Management

Body cleansing scenes from Skylab and Shuttle

Exercise: scenes from Skylab & Shuttle showing different types of exercise

Fluid shift: graphics and discussion

Medical monitoring: Shuttle

Skylab crewmember on exercise ergometer

Skylab and Orbiter sleep stations

Space Motion Sickness Experiments: crew participation

Section 8 Architecture

Body cleansing scenes from Skylab and Shuttle

MAN-SYSTEMS INTEGRATION STANDARDS, VOLUME II

Body restraint illustrations

Body translation-equipment vulnerability/inadvertent control actuation or damage potential during crew translations

Cable and hose management clutter, snag and interference potential

Contingency maintenance: poor restraint & bad lighting

Crew on Orbiter flight deck

Crewman at Skylab wardroom window

Crewmember translate through Skylab-discussion of sense of orientation

Equipment translation illustrations, body restraint during equipment handling

Exercise: scenes from Skylab & Shuttle showing different types of exercise

Graphic: space neutral posture

Manipulation of hardware in microgravity and difficulty created by poorly restrained documents. Difficulty in freeing stuck mechanisms

Manual dexterity during task performance: tool restraint during tasks

Paper/hand copy/document management, document restraint

Sequence showing body rotations and rapid translations

Skylab and Orbiter sleep stations

Skylab crewmember don suits

Space Housekeeping on Shuttle and Skylab

Spacelab crewmember holds arms

Wardroom table and eating scenes from Skylab

Windows as work stations: crowding and interference issues

Work bench innovations on Skylab: fan housing and filter screen

Workstation/work area architecture and panel orientation considerations

Section 9 Workstations

Body translation-equipment vulnerability/inadvertent control actuation or damage potential during crew translations

Contingency maintenance: poor restraint & bad lighting

Crew on Orbiter flight deck

Crewman at Skylab wardroom window

Crewmember translate through Skylab-discussion of sense of orientation

Difficulty in handling small items

Graphic: space neutral posture

Manipulation of hardware in microgravity and difficulty created by poorly restrained documents. Difficulty in freeing stuck mechanisms

Manual dexterity during task performance: tool restraint during tasks

Spacelab crewmember holds arms

Space Housekeeping on Shuttle and Skylab

Windows as work stations: crowding and interference issues

Work bench innovations on Skylab: fan housing and filter screen

Workstation/work area architecture and panel orientation considerations

Section 10 Activity Centers

Body cleansing scenes from Skylab and Shuttle

Crew on Orbiter flight deck

Earth scene & scene showing docking-discussion of sense of vision

Exercise: scenes from Skylab & Shuttle showing different types of exercise

Graphic: space neutral posture

Medical monitoring: Shuttle

Skylab crewmember on exercise ergometer

Space Housekeeping on Shuttle and Skylab

Wardroom table and eating scenes from Skylab

Section 11 Hardware and Equipment

Body cleansing scenes from Skylab and Shuttle

Body restraint illustrations

Body translation-equipment vulnerability/inadvertent control actuation or damage potential during crew translations

Cable and hose management clutter, snag and interference potential

Contingency maintenance: poor restraint & bad lighting

Crewman at Skylab wardroom window

Crewmember translate through Skylab-discussion of sense of orientation

Difficulty in handling small items

Equipment translation illustrations, body restraint during equipment handling

Exercise: scenes from Skylab & Shuttle showing different types of exercise

Graphic: space neutral posture

Manipulation of hardware in microgravity and difficulty created by poorly restrained documents. Difficulty in freeing stuck mechanisms

Manual dexterity during task performance: tool restraint during tasks

Paper/hand copy/document management, document restraint

Sequence showing body rotations and rapid translations

Skylab and Orbiter sleep stations

Skylab crewmember don suits

Skylab crewmember on exercise ergometer

Space Housekeeping on Shuttle and Skylab

Space Motion Sickness Experiments: crew participation

Spacelab crewmember holds arms

Wardroom table and eating scenes from Skylab

Windows as work stations: crowding and interference issues

Work bench innovations on Skylab: fan housing and filter screen

Section 12 Design for Maintainability

Body restraint illustrations

Cable and hose management clutter, snag and interference potential

Contingency maintenance: poor restraint & bad lighting

Difficulty in handling small items

Graphic: space neutral posture

Manipulation of hardware in microgravity and difficulty created by poorly restrained documents. Difficulty in freeing stuck mechanisms

Manual dexterity during task performance: tool restraint during tasks

Space Housekeeping on Shuttle and Skylab

Work bench innovations on Skylab: fan housing and filter screen

Workstation/work area architecture and panel orientation considerations

Section 13 Facility Management

Manipulation of hardware in microgravity and difficulty created by poorly restrained documents. Difficulty in freeing stuck mechanisms

Paper/hand copy/document management, document restraint

Space Housekeeping on Shuttle and Skylab

Section 14 Extravehicular Activity (EVA)

Body and equipment restraints: EVA considerations and provisions Gemini to Shuttle

Equipment manipulation and translation - EVA

EVA lighting consideration, vehicle external lighting considerations/ requirements

Introduction to EVA-suited restrictions dexterity/mobility and body/equipment restraints and mobility aids

Manned maneuvering unit operations: satellite retrieval operations

Skylab crewmember don suits

Appendix H3
Paragraphs Applicable to Video Scenes

Section | [3](#) | [4](#) | [5](#) | [6](#) | [7](#) | [8](#) | [9](#) | [10](#) | [11](#) | [12](#) | [13](#) | [14](#) |

3.0 Anthropometry and Biomechanics

- 3.3.1 Scenes: 11, 12, 15, 16, 17, 21, 27, 28, 30, 31
- 3.3.2 Scenes: 8, 11, 12, 15, 16, 17, 21, 23, 25, 27, 28, 30, 31
- 3.3.3 Scenes: 8, 11, 12, 15, 16, 17, 21, 27, 28, 30, 31
- 3.3.4 Scenes: 3, 4, 5, 6, 7, 11, 12, 15, 16, 17, 21, 27, 28, 30, 31

4.0 Human Performance Capabilities

- 4.2 Scenes: 12, 13, 14, 26
- 4.3 Scenes: 13
- 4.5 Scenes: 9, 13, 14, 26
- 4.6 Scenes: 13, 14, 16, 17
- 4.8 Scenes: 8, 13, 15, 17, 22, 23, 25, 28, 30, 31
- 4.9 Scenes: 13, 17, 28
- 4.10 Scenes: 13, 16, 17, 28

5.0 Natural and Induced Environments

- 5.1 Virtually all scenes

6.0 Crew Safety

- 6.3 Scenes: 11, 12, 14, 28, 29, 30
- 6.4 Scenes: 21

7.0 Health Management

- 7.2.3 Scenes: 7, 9, 10, 17
- 7.2.4 Scenes: 16
- 7.2.5 Scenes: 16
- 7.2.7 Scenes: 10, 17, 20

8.0 Architecture

- 8.2 Scenes: 11, 12, 14, 26, 29, 30
- 8.3 Scenes: 14, 19, 26
- 8.4 Scenes: 3, 12, 14, 16, 17, 24, 26
- 8.6 Scenes: 3, 4, 6, 8, 11, 12, 17, 18, 19, 22, 23, 24, 26, 27, 28, 30, 31
- 8.7 Scenes: 11, 14, 19, 21, 29, 30, 31
- 8.8 Scenes: 11, 14, 19, 21, 29, 30, 31
- 8.9 Scenes: 9, 11, 12, 14, 17, 19, 21, 22, 23, 25, 30

- 8.10 Scenes: 14, 19
- 8.11 Scenes: 5, 27
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Appendix J Keyword List

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USER'S GUIDE

In the years before the search engine was created, the keyword was used to assist with finding standards related to specific keywords. For example, the user may find standards relating to "acceleration" by scanning the "A" list (available by clicking on the "A").

Underneath the keyword is provided a list of section subheadings where the relevant standards can be found. Although a subheading may not include the keyword itself, once reviewing the section, the user would find that it contains information that is relevant to the subject. In order to review the section material, it is necessary to open the applicable section of Volume I.

The keyword list is not absolute but it provides a starting place for those researching specific subject matter.

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9.6.3.2.1.2 Design Requirements for Place-holding Cursor

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9.6.3.2.1.2 Design Requirements for Place-holding Cursor

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Potable water temperature

7.2.2.3.2.3 Potable Water Temperature Design Requirements

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8.10.3.2 Pressure Hatch Indicator/Visual Display Design Requirements

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Printed circuit switches

9.3.3.3.16 Printed Circuit (DIP) Switches Design Requirements

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