NOTE: MIL-STD-1908 has been redesignated as a handbook, and is to be used for guidance purposes only. This document is no longer to be cited as a requirement. For administrative expediency, the only physical change from MIL-STD-1908 is this cover page. However, this document is no longer to be cited as a requirement. If cited as a requirement, contractors may disregard the requirements of this document and interpret its contents only as guidance.

METRIC

MIL-HDBK-1908
11 December 1995
SUPERSEDING
MIL-STD-1908
24 December 1992

DEPARTMENT OF DEFENSE

HANDBOOK FOR DEFINITIONS OF HUMAN FACTORS TERMS (METRIC)

This handbook is for guidance only. Do not cite this document as a requirement.

AMSC N/A

AREA HFAC

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FOREWORD

1. This Military Standard has been approved for use by all Departments and Agencies of the Department of Defense.

2. Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to Commander, U.S. Army Missile Command, ATTN: AMSMI-RD-SE-TD-ST, Redstone Arsenal, AL 35898-5270 by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

3. This military standard consolidates definitions contained in human factors (HFAC) standardization documents. The goal is to reduce or eliminate overlap, duplication, and conflict. As HFAC documents are revised, they should cite this standard for definitions and thereby accomplish this standard's objectives and reduce the length of the definitions sections.

4. This standard has not adopted or modified definitions of human factors terms from non-HFAC documents other than FED-STD-1037, where applicable. Definitions from such sources will be evaluated for inclusion in the first and later revisions. Non-human factors terms have been adopted from MIL-STD-280 since they are used very frequently in HFAC documents that, typically, have cited or been in harmony with MIL-STD-280.

CONTENTS

1. SCOPE

1.1 Scope. This standard defines terms frequently used in human factors standardization documents by providing common meanings of such terms to ensure that they will be interpreted consistently and in the manner intended.

2. APPLICABLE DOCUMENTS

2.1 Government documents

2.1.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplements thereto, cited in the solicitation (see 6.2)

STANDARDS

FEDERAL

FED-STD-376	-	Preferred Metric Units for General Use by the Federal Government

MILITARY

MIL-STD-280	-	Definition of Item Levels, Item Exchangeability, Models, and Related Terms
MIL-STD-1333	-	Aircrew Station Geometry for Military Aircraft
MIL-STD-1388-1	-	Logistic Support Analysis
MIL-STD-1388-2	-	Logistic Support Analysis Record, DoD Requirements for a
MIL-STD-1474	-	Noise Limits for Military Materiel
MIL-STD-1621	-	Acoustical and Vibrational Standard Reference Quantities
MIL-STD-1815	-	ADA Programming Language

(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from the Standardization Documents Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

2.2 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted are those listed in the issue of the DODISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS are the issues of the documents cited in the solicitation (see 6.2)

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI S1.4	-	Sound Level Meters, Specification for (ASA 47)
ANSI S1.6	-	Preferred Frequencies, Frequency Levels, and Band Numbers for Acoustical Measurements (ASA 53)
ANSI S3.5	-	Calculation of the Articulation Index, Methods for
ANSI X3.4	-	Information Systems, Coded Character Sets - 7 Bit American National Standard Code for Information Exchange (7 Bit ASCII)

(Application for copies of ANSI S1.4 and S1.6 (ASA 47 and 53) should be addressed to Professional Book Distributors, Inc., ASA Standards Distribution Center, 1650 Bluegrass Lake Parkway, P.O. Box 6996, Alpharetta, GA 30239-6996. Application for copies of other ANSI standards should be addressed to the American National Standards Institute, Inc., 11 West 42nd Street, New York, NY 10036.)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM E 380 - Standard Practice for the Use of the International System of Units (SI) (the Modernized Metric System)

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103-1187.)

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO)

ISO 226 - Acoustics - Normal Equal-Loudness Level Contours.

(Application for copies should be addressed to the American National Standards Institute, Inc., 11 West 42nd Street, New York, NY 10036.)

COMMISSION INTERNATIONALE DE L'ECLAIRAGE (CIE)

CIE 1931 - Chromaticity Space
CIE 1976 - Uniform Chromaticity Scale (UCS)

(Application for copies should be addressed to the American National Standards Institute, Inc., 11 West 42nd Street, New York, NY 10036.)

(Non-Government standards and other publications are normally available from the organizations that prepare or distribute the documents. These documents also may be available in or through libraries or other information services.)

2.3 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. DEFINITIONS

NOTE: Each term is un-numbered, but appears alphabetically, in bold face, followed by one or more annotations, in italics, of the application(s) to which the definition was created to support. The definitions do not necessarily apply to other applications. Annotations are used as follows:

gen *General human engineering applications.*

uci *User/computer interface or interaction.* Applies to terms that have specific meaning when used in the context of user-computer interaction or supporting human engineering application of computers

snv *Sound, noise, vibration.* Applies to materiel design standards for acoustics and vibration, germane to maximum limits for exposure to steady-state or impulse noise, aural non-detectability, or habitability.

dsi *Display symbol information.* Applies to design criteria and standards for symbolic and alphanumeric information used on electronically and optically generated displays--primarily airborne displays. Does not include qualities that affect legibility, such as resolution, brightness, uniformity, contrast, flicker, noise, minimum line movement, or color, that may appear as *gen* or *uci* definitions.

acq *Acquisition.* Includes (a) human engineering tasking requirements and guidelines, (b) non-human factors acquisition terms frequently used to express programmatic human factors provisions, and (c) equipment terms used to express human engineering programmatic, design, and test provisions.

A term having more than one definition is listed separately for each application-dependent definition. A term used by several or all applications is designated as *gen.* Terms for sub-definitions are underlined and presented in alphabetical order under the major term to which they apply.

A-duration (pressure wave duration) *snv.* The time required for the pressure to rise to its principal positive peak and return momentarily to ambient pressure (see Figure 1).

A-weighted sound level (dBA) *snv.* Sound pressure level (in decibels) measured using a sound level meter with an A-weighting network. The A-weighted response is maximum at 2500 Hz and drops rapidly as frequency decreases below 1000 Hz and gradually decreases above 4000 Hz, thereby approximating the frequency dependent human response to moderate sound levels. See ANSI S1.4 for definition of A-weighting filter characteristics.

Abort *uci.* A capability that cancels all user entries in a defined transaction sequence.

Accessible *gen.* An item is considered accessible when it can be operated, manipulated, removed, or replaced by the suitably clothed and equipped user with applicable body dimensions conforming to the anthropometric range and database specified by the procuring activity or if not specified by the procuring activity, with applicable 5th to 95th percentile body dimensions. Applicable body dimensions are those dimensions which are design-critical to the operation, manipulation, removal, or replacement task.

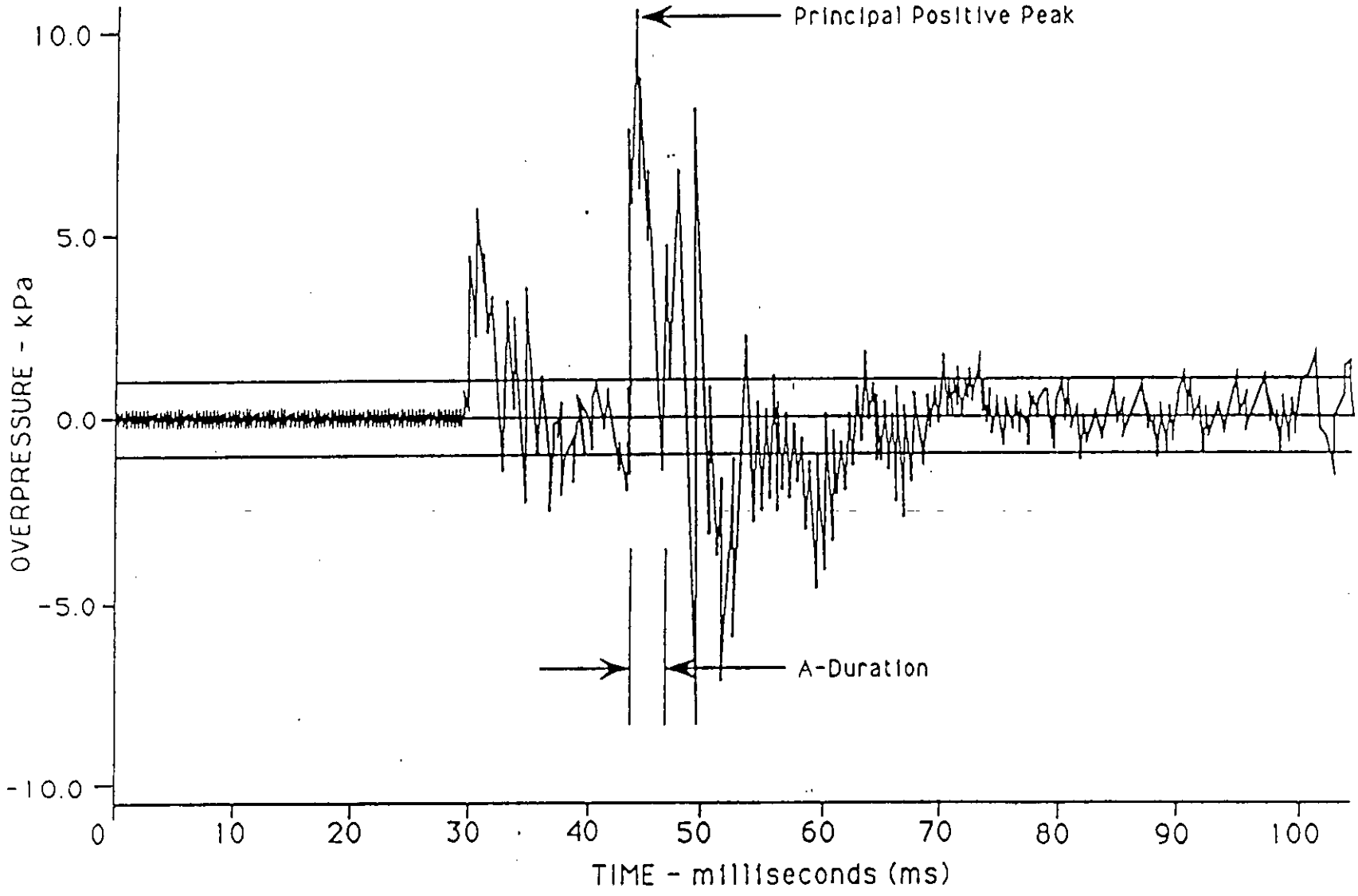


FIGURE 1. Example of A-duration of actual pressure-time history of an impulse noise

Acquisition phases *acq*:

Phase 0 - Concept exploration and definition. An early acquisition effort undertaken to explore various materiel alternatives to satisfy a documented mission need, define the most promising system concept(s), develop supporting analyses and information to include identifying high risk areas and risk management approaches to satisfy the Milestone I (Concept Demonstration Approval) decision, and develop a proposed acquisition strategy and initial program objectives for cost, schedule, and performance for the most promising system concepts. Competitive, parallel, short-term studies by the Government and/or industry are normally used during this phase.

Phase I - Demonstration and validation. The acquisition phase undertaken to better define critical design characteristics and expected capabilities of the system concept(s), demonstrate that the technologies critical to the most promising concept(s) can be incorporated into system design(s) with confidence, provide that the processes critical to the most promising system concept(s) are understood and attainable, develop the analyses/information needed to support a Milestone II (Development Approval) decision, and establish proposed development baseline containing refined program cost, schedule, and performance objectives for the most promising design approach.

Phase II - Engineering and manufacturing development. The acquisition phase undertaken to translate the most promising design approach developed in Demonstration and Validation into a stable, producible, and cost effective system design; validate the manufacturing or production process; and demonstrate through testing that the system capabilities meet contract specification requirements, satisfy the mission need, and meet minimum acceptable operational performance requirements.

Phase III - Production and Deployment. The acquisition phase undertaken to establish a stable, efficient production and support base, achieve an operational capability that satisfies the mission need, and conduct follow-on operational and production verification testing to confirm and monitor performance and quality and verify the correction of deficiencies.

Phase IV - Operations and Support. The acquisition phase undertaken to ensure that the fielded system continues to provide the capabilities required to meet the identified mission need and identify shortcomings or deficiencies that must be corrected to improve performance. This phase overlaps Production and Deployment and begins after initial systems have been fielded.

Action *uci*. The process of changing the present state of the system (that is, processing data, carrying out a command).

Ada® *uci* The official, high-level computer language of DoD for embedded-computer, real-time applications as defined in MIL-STD-1815. *Note:* Ada® is a registered trademark of the U.S. Government (Ada Joint Program Office).

Advisory Signal *gen*. A signal to indicate safe or normal configuration, condition of performance, operation of essential equipment, or to attract attention and impart information for routine action purposes.

Aided communication *snv*. Electrically or electronically enhanced, real-time, analog or digital voice communications. In aircraft systems, the communication parts include intra-aircraft, inter-aircraft, and aircraft-to-ground links.

Aircraft pre-flight inspection *gen*. Checking the aircraft prior to each flight for flight preparedness by performing visual examinations and operational tests to discover defects and maladjustments which, if not corrected, could aversely affect safety or mission accomplishment. Also includes a check to determine that the aircraft has been properly serviced for the next flight.

Alpha *gen/uci.* A descriptive term used to define a character set containing the letters of an ethnic alphabet, and generally punctuation marks.

Alphanumeric *gen/uci.* A descriptive term used to define a character set containing the letters of an ethnic alphabet, the digits Ø (ZERO) through 9, and generally special symbols and punctuation marks.

Angle of incidence *gen.* The angle between the line of direction of anything (as a ray of light or line of sight) striking a surface and a line perpendicular to that surface drawn to the point of contact. See Figure 2.

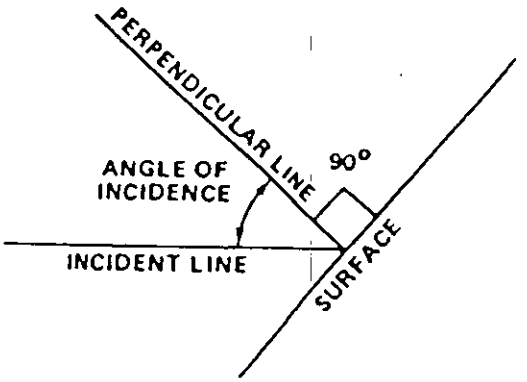


FIGURE 2. Angle of Incidence

Anthropometric dimensions *gen.* Measured dimensions that describe the size and shape of the human body. These dimensions are often presented in the form of summary statistics that describe the range of body dimensions that are observed in a population.

Articulation index (AI) *snv.* A weighted number representing, for a given set of speech and noise conditions, the effective proportion of the normal speech signal that is available to a listener for conveying speech intelligibility. AI is computed from acoustical measurements (or estimates) of the speech spectrum and of the effective masking spectrum, and is defined on a scale of 0 to 1.0. See ANSI S3.5. (Also see "Speech intelligibility.")

ASCII *uci.* Acronym for "American Standard Code for Information Interchange. The standard code, using a coded character set consisting of 7-bit coded characters (8 bits including parity check), used for information interchange among data processing systems, data communications systems, and associated equipment.. Note: The ASCII set consists of control characters and graphic characters and is properly an alphabet and not a code. It is the U.S implementation of International Alphabet No 5 (IA No. 5) as specified in International Telegraph and Telephone Committee (CCITT) Recommendation V.3.

Assembly *acq.* A number of parts or subassemblies or any combination thereof joined together to perform a specific function and capable of disassembly. (Examples, Power-shovel front fan assembly, audio frequency amplifier.) *Note: The distinction between an assembly and a subassembly is determined by the individual application. An assembly in one instance may be a subassembly in another where it forms a portion of an assembly.*

Attenuating helmets or headsets *snv*. Hearing protectors that provide the wearer with electronic communications.

Aural nondetectability distance *snv*. The distance at which, for given conditions, the one-third octave-band pressure levels of a noise source at a listener's location are below both the sound level of a quiet environment and average hearing in all one-third octave bands. For a more detailed explanation and examples, see MIL-STD-1474.

Average hearing *snv*. The binaural free-field hearing threshold of normal ears for steady-state noise, given in ISO 226.

B-duration (pressure envelope duration) *snv*. The duration of the primary portion of an impulse noise plus the duration of significant subsequent fluctuations. These durations are considered to be the time interval during which the envelope of pressure fluctuations [positive and negative] is within 20 dB of the peak pressure level. Significant subsequent pressure fluctuations are those whose summed duration is greater than 10% of the duration of the primary portion. The primary portion of an impulse noise is the period of time followed by a level that remains 20 dB below the peak pressure level for a significant duration. For a more detailed explanation and examples, see MIL-STD-1474.

Backup *uci*. A capability that returns a user to the last previous display, field, or character in a defined transaction sequence. Also refers to preserving a second copy of files for data protection purposes.

Band *snv*. A continuous spread of frequencies. In communications, the frequency spectrum between two defined limits.

Band level *snv*. The level of the sound or vibration contained within a particular band.

Band-center frequency (f_c) (geometric) *snv*. The mid-band frequency is the geometric mean between the band edge frequencies of a band. The geometric mean is the square root of the product of the band edge frequencies (see "band-edge frequencies, filter"), $f_c = (f_1 \times f_2)^{1/2}$.

Band-edge frequencies, filter *snv*. The upper (f_2) and lower (f_1) frequencies, above and below the frequency of maximum response of a filter, at which the response to a sinusoidal signal is 3 dB below the maximum response.

Bandwidth, filter *snv*. The difference between f_1 and f_2 (see "band-edge frequencies, filter"). This difference may be expressed in Hz, as a percentage of the mid-band frequency, or as the interval between the band-edge frequencies, in terms of octaves or parts thereof, such as one-third or one-fifteenth.

Basic item *acq*. A term used to distinguish an end item of equipment from individual components, assemblies, subassemblies, and parts; e.g., overhaul of the basic item weapon system (AH-64 helicopter air frame including components repaired while on the air frame) versus overhaul of engines, accessories and components, and assemblies which have been removed from the basic item and overhauled to meet established supply requirements for the AH-64 helicopter.

Biomedical *gen/acq*. The element including every area that requires provisions for the promotion of health and safety and in particular the protection, sustenance, escape, survival and recovery of personnel employed within the total system environment. This support is provided for operations, maintenance and support personnel under both normal and emergency conditions. It also includes health protection from conditions resulting from system functioning for personnel who are not included in the total system complex, but who will be affected by the system.

Bit (binary digit) *uci.* 1. A character used to represent one of the two digits in the numeration system with a base of two, each digit representing one of two, and only two, possible states of a physical entity or system. 2. In binary notation, either of the characters 0 or 1. 3. A unit of information equal to one binary decision or the designation of one of two possible and equally likely states of anything used to store or convey information.

Blank *uci.* The space character (ASCII 20 (hexadecimal)).

C-weighted sound level (dBC) *snv.* Sound pressure level (in decibels) measured using a sound level meter with a C-weighting network. It is generally used to limit the low and high frequency response of the instrument so that the instrument will not respond to signals outside the human hearing frequency range at high sound levels. See ANSI S1.4 for definition of C-weighting filters.

Cancel *uci.* A capability that regenerates or re-initializes the current display without processing or retaining any changes made by the user. Cancel usually means omitting only the action of the last command.

Category *uci.* A grouping of data values along a dimension for operational purposes. For example, an air traffic controller might be instructed to implement the same procedures for all aircraft with speeds in the category of 600 to 800 knots. (Also see "Value.")

Caution signal *gen.* A signal which alerts the operator to an impending dangerous condition requiring attention, but not necessarily immediate action. (See "Master caution [warning] signal").

Channel *uci.* A path along which signals can be sent, e.g., data channel, output channel.

Chemical warfare agent *gen.* A chemical agent in a solid, liquid, or gas which produces lethal or damaging effects on man, animals, plants, or materials, or negatively affects their performance.

Chromaticity coordinates *gen.* A three coordinate system for specifying chromaticity. The chromaticity coordinates can be interpreted as the fraction of the red primary, the fraction of the green primary and the fraction of the blue primary needed in a mixture of the primaries that matches the given color. (See CIE 1931, and CIE 1976.)

Clo unit *gen.* The measurement unit of the insulation value provided by clothing and defined mathematically as: F/(BTU/hr)(ft^2 of body area). One clo unit is that amount of insulation required to keep a nude sedentary man comfortable at 70°F, 50% relative humidity in a normally vented room.

Coding *gen.* Use of a system of symbols, shapes, colors or other variable sensory stimuli to represent specific information.

Coding characteristics *dsi.* Readily identifiable attributes commonly associated with a symbol by means of which such symbols are differentiated; e.g., size, shape, color.

Command *uci.* That part of a computer instruction word that specifies the operation to be performed.

Command and control system. *acq* The facilities, equipment, communications, procedures, and personnel essential to a commander for planning, directing, and controlling operations of assigned forces pursuant to the missions assigned.

Command and control system equipment *acq*. The main mission element, equipment and related ground equipment used in collecting, transmitting, processing, and displaying information for command and control.

Command entry *uci*. A single command that causes a computer to perform a series of steps.

Command information *dsi*. Displayed information directing a control action.

Command language *uci*. A type of dialogue in which a user composes control entries.

Common hand tool *acq*. A tool found in common usage or applicable to a variety of operations or to a single operation on a variety of material. Screwdrivers, hammers, and wrenches are examples of common hand tools.

Common part *acq*. A part or component which is generic because (a) equivalent parts are available from more than one manufacturer and (b) it is not designed or intended for exclusive use in or by a single system or piece of equipment.

Common tool *acq*. A tool, routinely found in the tool supply of maintenance organizations for a similar class of system or equipment, which is generic because it is available from more than one manufacturer, and is not designed or intended for exclusive use on or with a single system or piece of equipment.

Components *acq*. Those constituent materials, parts, assemblies, and subassemblies that make up a piece of equipment or a unit. (Also see"Unit.")

Compound number *uci*. A quantity involving different units of measure, for example, 3 feet 4 inches or 10 pounds 5 ounces.

Compound mount *snv*. A three element holding or support device consisting of an intermediate mass contained between resilient elements used for protection of a supported device from vibration or acceleration. Also called a two stage mount.

Confirm *acq*. When used relative to test and evaluation, "confirm" implies a qualitative test that requires comparison of test results to an applicable requirement(s) (See "Demonstration").

Context definition *uci*. Displaying an indication of previous user actions or computer processing that will affect the results of current actions to help a user predict how the system will respond.

Contrast *gen*. See "Luminance contrast."

Contrast ratio *gen*. (Sometimes called brightness ratio). The measured luminance at one point divided by the measured luminance at another, equal to L_T/L_B, $(L_S + L_B)/L_B$, or $1 + L_S/L_B$, where:

L_T = total luminance, or luminance of the image in the presence of background;
L_S = luminance of the symbol without background (luminance emitted by CRT in the case of CRT displays, sometimes called trace brightness); and
L_B = luminance of background.

Contrast ratio, rather than contrast, is often specified by display manufacturers, because it is numerically larger (by one) than contrast.

Control *gen.* A mechanism used to regulate or guide the operation of a machine, equipment component, subsystem, or system.

Control character *uci.* A character whose occurrence in a particular context specifies a control function. A control character may be recorded for use in a subsequent action. A control character is not a graphic character but may have a graphic representation in some circumstances. (Control characters are intended to be interpreted by machines rather than human beings; therefore, they are normally non-printing characters. In the Military Standard Code for Information Interchange (MSCII) code table they comprise columns Ø and 1.)

Control entry *uci.* User input of data for computer processing/sequence control (e.g., function key actuation, menu selection, command entry) whereby the character or symbol and a control key are jointly activated, requiring computer responses to such inputs.

Control mode *uci.* The condition of the keyboard when the control (CTL) is depressed. In this mode the alpha keys, which are also labelled with a control character, generate that associated control character.

Controller *uci.* Any device used to position the cursor on the computer monitor screen. (Examples are: mouse, joystick, cursor keys, light pen, touch screen, track ball.)

Critical display *gen.* A display required for mission success.

Critical fusion frequency (CFF) *gen.* The threshold frequency of a flickering light stimulus at which the light intensity changes can no longer be detected.

Critical task *acq.* A task requiring human performance which, if not accomplished in accordance with system requirements, will most likely have adverse effects on cost, system reliability, efficiency, effectiveness, or safety. Critical performance is usually part of a single line or flow in the operation or maintenance cycle of the system. An example of a single line of flow involving human performance is the transmission of a message which must be passed for operations or maintenance cycles to commence or to continue, such as an order to prepare a missile for launching. If this order is not passed, or if it is garbled, the entire missile operation cycle may cease to function as required. A task is also considered critical whenever equipment design characteristics demand human performance which approaches the limits of human capabilities (e.g., human performance functions and tasks are too demanding, information presented to personnel is inadequate to meet human performance requirements, appropriate information displayed is not perceived, or controls provided cannot be effectively operated) and thereby significantly contributes to the occurrence of one or more of the following conditions, but not necessarily limited thereto:

a. Jeopardized performance of an authorized mission.

b. Degradation of the circular error probability (CEP) to an unacceptable level.

c. Delay of a mission beyond acceptable time limits; e.g., human time to react will not meet required system reaction time.

d. Improper operation resulting in a system""no-go," inadvertent weapons firing, or failure to achieve operational readiness alert.

e. The exceeding of predicted times for maintenance personnel and maintenance ground equipment (MGE) to complete maintenance tasks. As a rule, performance times will be considered critical if the total maintenance response time significantly exceeds maintenance analysis estimates, and affects MGE quantitative requirements.

f. Degradation of system equipment below reliability requirements; i.e., mean time between failures (MTBF) is reduced.

g. The damaging of system equipment, resulting either in a return to a maintenance facility for major repair, or in unacceptable costs, spare requirements, or system downtime.

h. A serious compromise of weapons system security.

i. Injury or illness to personnel.

j. Unacceptable degradation of NBC survivability.

Critical warning *gen.* A warning that indicates a condition which, if not corrected, will result in mission failure, equipment damage, or personal injury. (See "Warning signal.")

Cursor *uci.* A marker on the display screen that indicates the position where the computer expects the next input or will display the next output. The cursor may be positioned under computer control or by the user. (See "Controller.")

Data *uci.* The raw materials from which a user extracts information. Data may include numbers, words, pictures, etc.

Data display *uci.* Communication of visual, audio, or other output from a computer to its users.

Data entry *uci.* User input of data (numeric, textual, graphic, or analog) for computer processing and computer responses to such inputs.

Data field *uci.* An area of the display screen reserved for user entry of a data item.

Data field label *uci.* An area of the display screen that serves as a prompt for entering a data item. It usually cannot be changed by a user.

Data item *uci.* A subunit of descriptive information or value classified under a data element. For example, the data element,"military personnel grade," contains data items such as "sergeant," "captain," and "colonel." Sometimes a data item may contain only a single character. Data items may be entered by a user or may be supplied by the computer.

Data protection *uci.* Functional capabilities that guard against unauthorized data access, data tampering, user errors, and computer failure.

Data transmission *uci.* Message exchange among system users, and also message exchange with other systems. Transmitted data may include numbers, words, pictures, or other representations of data.

Data validation *uci.* Functional capabilities that check data entry items for correct content or format as defined by software.

dBA *snv.* The unit used to express sound level measured through the A-weighting network of a sound level meter. See "A-weighted sound level (dBA)."

dBC *snv.* The unit used to express sound level measured through the C-weighting network of a sound level meter. See "C-weighted sound level (dBC)."

dBP *snv.* The unit used to express peak pressure level as measured with a peak-reading sound level meter or combination of instruments with equivalent characteristics, without weighting networks, and with total rise time not exceeding 1/20 of the measured A-duration.

Dead-man control *gen.* A control which requires a continuous pressure or contact by the operator to maintain machine, equipment component, subsystem, or system operation. Such operation automatically returns to a noncritical state once operator pressure or contact is removed.

Decibel (dB) *snv.* A unit to express sound pressure level. The decibel is the unit of level when the base of the logarithm is the tenth root of ten, and the quantities concerned are proportional to power. The dB has meaning only when the referenced quantity is known. The internationally accepted reference pressure in acoustics is 20 micropascals (μPa) which corresponds to 0 dB. See "Sound pressure level."

Decibel (dB) reference level (0dB) *snv.* The level that corresponds to an RMS pressure of 20 micropascals (μPa) or 20 micronewtons per square meter ($\mu N/m^2$) or 0.0002 μbar or 0.0002 $dyne/cm^2$.

Decontamination *gen.* Use of chemical solution or physical processes to absorb, destroy, neutralize, or remove nuclear, chemical, or biological agents from persons, objects, or areas.

Dedicated key *uci.* A key which produces one code and is never affected by the position of either the CTL or SHIFT keys.

De-emphasis *snv.* The inverse of pre-emphasis, employed to restore original vowel-consonant amplitude relationships in pre-emphasized speech; primarily useful in maintaining the "natural" sound quality. (See "Pre-emphasis.")

Default value *uci.* A predetermined, frequently-used value for a data field or control entry, intended to reduce required user entry actions.

Delimiter *uci.* A character marking the beginning or end of a unit of data.

Demonstrate *acq.* When used relative to test and evaluation, "demonstrate" implies a qualitative test that does not require comparison of test results to an applicable requirement(s). (See "Confirm.")

Depot level maintenance *acq.* Maintenance performed on material requiring major overhaul or a complete rebuild of parts, assemblies, subassemblies, and end items, including the manufacture of parts, modification, testing, and reclamation as required.

Determine *acq.* When used relative to test and evaluation, implies a quantitative test that does not require comparison of test results to an applicable requirement(s). (See "Evaluate.")

Developmental test and evaluation (DT&E) *acq.* Test and evaluation performed to (1) identify potential operational and technological limitations of the alternative concepts and design options being pursued, (2) support the identification of cost-performance trade-offs, (3) support the identification and description of design risks, (4) substantiate that contract technical performance and manufacturing process requirements have been achieved, and (5) support the decision to certify the system ready for operational test and evaluation.

Dialogue (or dialog) *uci.* A structured series of interchanges between a user and a computer. Dialogues can be computer initiated, e.g., question and answer, or user initiated, e.g., command languages.

Dichotic *snv*. The condition in which the sound stimulus presented at one ear differs from the sound stimulus presented at the other ear. The stimulus may differ in sound pressure, frequency, phase, time, duration, bandwidth, or other characteristics.

Dimension *uci*.. A scale or categorization along which data may vary, taking different values at different times. For example, relevant dimensions for an aircraft might include its heading, speed, and altitude.

Direction designation *uci*. User entry of directional data (azimuth, bearing, heading) on a display.

Display format *uci*.. The organization of different types of data in a display, including information about the data such as labels, and other user guidance, such as prompts of error messages.

Display framing *uci*. User control of display coverage by display movement, including paging, scrolling, offset, and expansion.

Display generation *uci*. The means of specification of data outputs, either by a user or automatically by the computer.

Display tailoring *uci*. Designing displays to meet the specific task needs of a user, rather than providing a general display which can be used for many purposes.

Display update *uci*. Regeneration of changed data to show current status, by user request or automatically by the computer.

Duty *acq*. See "Task analysis."

Effective temperature *gen*. An empirically determined index which combines into a single value the effect of temperature, humidity, and air movement on the sensation of warmth or cold felt by the human body. The numerical value is that of the temperature of still, saturated air which would induce an identical sensation.

Eight-hour time-weighted average sound level (TWA) *snv*. A measurement of the employee's workday noise environment. The TWA is that constant noise level, in dBA, slow response, which may cause hearing loss in 8 hours to the same extent as the exposure to the actual workday noise. The workday noise environment may or may not last for 8-hours, but the TWA is always computed as if the TWA level was present for an 8-hour work shift. Implicit in the TWA is a stipulated exchange rate between sound level and doubling of exposure time.

$$TWA = \frac{Q}{\log_{10} 2} \cdot \log_{10} \left\{ \frac{1}{8} \int_0^T 2^{L(t)/Q} \, dt \right\}$$

where: T = total workshift time in hours
t = varying time
L(t) = the time varying A-weighted sound pressure level
Q = exchange rate, usually 3, 4, 5, or 6 dB.

The TWA value can be calculated from the following alternate expression when the sound level takes on a sequence of N constant levels, L_i, each lasting for a time period of C_i hours:

$$TWA = 85 + \frac{Q}{\log_{10}2} \cdot \log_{10}(D)$$

where: $D = \sum_{i=1}^{N} \frac{C_i}{T_i}$

T_i = Limiting exposure time at each A-weighted sound pressure level = $\frac{8}{2^{(L_i-85)/Q}}$

L_i = i^{th} A-weighted sound pressure level.

The exchange rate must be specified when referring to TWA. *Note: TWA is identical to L_{eq8}, utilized by U.S. and international sound and noise standards.*

Electroluminescent device (EL) *gen.* A device that produces light through electrical excitation of a phosphor.

Electronic attitude director indicator (EADI) *gen.* The EADI is a replacement for the standard ADI, but with no moving parts other than controls and switches. The EADI presents the symbols on a display using either a CRT or direct view flat plate technology. Basic symbology consists of an aircraft symbol; vertical and horizontal director indices (when applicable); heading information; and line, sky-ground color, or shading separation for horizon reference. If desired, other symbols can be generated and displayed by mode selection, such as instrument landing system (ILS) window, collective, cyclic and yaw command, airspeed deviation, altitude, flight path, predicted flight path, range, or other flight data. Specific symbols and formats can be selectable for a given mode of operation. Modes may consist of take-off, landing, hover, cruise, weapon delivery, and off.

Enter *uci.* An explicit user action that effects computer processing of user entries. For example, after typing a series of numbers, a user might press an ENTER key that will add them to a data base, subject to data validation.

Entry *uci.* See "Data entry" or "Control entry."

Environment *gen.* The aggregate of all the conditions and influences including physical location and operating characteristics of surrounding equipment and occupants, including temperature, humidity, and contaminants or surrounding air; operational procedures, acceleration, shock, vibration, and radiation.

Equipment *gen.* General term designating any item or group of items.

Equipment, powered ground (PGE) *acq.* An assembly of mechanical components including an internal combustion engine or motor, gas turbine, or steam turbine engine mounted as a single unit on an integral base or chassis. Equipment may pump gases, liquids, or solids; or produce compressed, cooled, refrigerated or heater air; or generate electricity and oxygen. Examples of this equipment: portable cleaners, filters, hydraulic test stands, pumps and welders, air compressors, air conditioners. Term applies primarily to aeronautical systems.

Equipment failure *gen.* Cessation of the ability to meet the minimum performance requirements of the equipment specifications. Further, equipment failure shall imply that the minimum specified performance cannot be restored through permissible readjustment of operator controls.

Equipment grades *snv*. Categories of equipment undergoing measurements of airborne sound measurements of shipboard equipment to classify usage-driven acceptance criteria. Equipment grades are defined below:

Grade A3. Equipment to be installed in spaces where direct speech communication must be understood with minimal error and without repetition over a distance of 2 meters (6-1/2 ft) or less.

Grade A12. Equipment to be installed in spaces where direct speech communication must be understood with minimal error and without repetition over a distance greater than 2 meters (6-1/2 ft).

Grade B. Equipment to be placed in spaces where comfort of personnel in their quarters is the principal consideration.

Grade C. Equipment to be placed in the sonar room, sickbay, library, or other spaces requiring low sound levels and which are not covered in other categories.

Grade D. Equipment to be placed in spaces where avoidance of hearing loss is the prime consideration and intelligible speech communication is not normally required.

Grade E. Equipment to be placed in high sound level areas where voice communication is accomplished with high vocal effort and where amplified speech and telephones are normally available.

Equivalent A-weighted sound level *snv*. Equivalent A-weighted sound level is the level equivalent to the octave-band levels for the equipment being measured. It is not the weighted sum of the individual octave-band levels, but an equivalent level based on experience with spectral shapes of actual shipboard equipment and shipboard spaces.

Error management *uci*. Interface design to facilitate the detection and correction of user errors.

Evaluate *acq*. When used relative to test and evaluation, "evaluate" implies a quantitative test that requires comparison of test results to an applicable requirement(s). (See "Determine.")

Facilities *acq*. A physical plant, such as real estate and improvements thereto, including building and equipment, which provides the means for assisting or making easier the performance of a system function. The facilities to which this standard apply are those in which personnel perform system operational or maintenance duties.

Fail-safe design *gen*. Design where a failure will not adversely affect the safe operation of the system, equipment or facility.

Feedback *gen*. Product response (e.g., visual, aural, or tactile) which indicates the extent to which the operator's desired effect was accomplished. Feedback can be either intrinsic or extrinsic. Intrinsic feedback (feel) is that which the individual senses directly from the operation of the control devices (e.g., clicks, detents, resistance, response ratios, stops, control displacement). Extrinsic feedback is that which is sensed from an external source that indicates the consequences of the control action (e.g., aural tones, display changes, indicator lights).

Field *uci*. See "Data Field."

Field maintenance *gen/acq*. That maintenance authorized and performed by designated maintenance activities in direct support of using organizations. It is normally limited to replacement of unserviceable parts, subassemblies, or assemblies.

File *uci.* A collection of data that is stored in a computer, treated as a single unit by the operating system of the computer.

Focal point *acq.* An individual designated as a central source of information or guidance on a specific program or project requiring coordinated action by two or more agencies. The designation of a focal point does not relieve any functional area of its basic responsibility.

Format *uci.* See "Display format."

Form filling *uci.* A type of dialog in which the computer displays forms containing labeled fields for data entry by a user.

Framing *uci.* See "Display framing."

Full mission capable (FMC) *acq.* A status code meaning that the system or equipment has all systems working which are needed to perform all of its primary missions.

Function *uci.* A computer-supported capability provided to users as an aid for task performance. Examples of functions are position designation or direction designation.

Function *acq.* See "Task analysis."

Function key *uci.* A key, such as the SHIFT key, which initiates or modifies a machine function, (e.g., effects a control entry, instructs the computer to perform a step, or series of steps) but does not generate or represent a coded character in the Military Standard Code for Information Exchange (MSCII).

Graphic character *uci.* A character, other than an alphanumeric character, intended to be written, printed or otherwise displayed in a form which can be read by human beings. In the MSCII code table they comprise columns 2 through 7, including DEL (position 7/15). Note that a space is considered a graphic character.

Government furnished equipment (GFE) *acq* Equipment furnished by the Government which is designed into or will otherwise become a part (or subsystem) of the total system being acquired.

Hard copy *uci/gen* In computer graphics or telecommunications, a permanent reproduction of the data displayed or transmitted. The reproduction may be on any media suitable for direct use by a person. *Note 1:* Teletypewriter pages, continuous printed tapes, facsimile pages, computer printouts, and radiophoto prints are all examples of hard copy. *Note 2:* Magnetic tapes or diskettes or nonprinted punched paper tapes are not hard copy.

Head-up display (HUD) *gen.* The HUD is a display that projects collimated symbolic information into the crewmember's forward field-of-view. For aeronautical systems, the technique results in the combination of flight control and weapon delivery information with external visual cues from the scene normally viewed through the windscreen. Specific symbols and formats can be selectable for a given mode of operation. Take-off, landing, navigation, hover, bob-up, terrain following/avoidance, sling load transportation, air-to-air, and weapon delivery modes may be provided. Video images may also be displayed, such as those from television (TV), forward looking infrared (FLIR), or scan converted radar, along with symbology.

Hearing conservation criteria *snv.* Noise exposure limits that, when exceeded, indicate the need for hearing conservation measures.

Hearing damage-risk criteria (DRC) *snv*. Comprehensive statements about the relation between various descriptive parameters of the noise exposure (e.g., sound pressure level, exposure time) and the probability of temporary or permanent hearing loss.

Hearing Protectors *snv*. Devices, approved by the appropriate military Surgeon General, designed primarily to reduce the noise reaching the auditory system. They may be of any type: earplugs, noise muffs (circumaural), or attenuating helmets or headsets.

Helmet-mounted display (HMD) *gen*. The HMD is a display that projects video imagery, symbolic and/or alphanumeric information on a display medium (e.g., combining glass or visor) into one or both eyes of the crewmember. In most aeronautical system applications the display medium is attached to a flight helmet which is a part of a head tracking system. The line of sight of the helmet is determined by the head tracking system and a designated sensor is slewed in a one-to-one angular correspondence with this line of sight. The display medium then displays the image from the designated sensor: television (TV), forward looking infrared (FLIR), or scan converted radar. Specific symbols and formats can be selectable for a given mode of operation.

Help *uci*. A capability that displays information upon user request for on-line guidance. HELP may inform a user generally about system capabilities, or may provide more specific guidance in data or information handling transactions.

Highlighting *uci*. Emphasizing displayed data or format features in some way, e.g., through the use of underlining, bolding, or inverse video.

Hooking *uci*. A task performed by a human operator using a display interactive device (e.g., joystick, mouse) to select/designate specific display information (e.g., symbols) for further action or modification.

Horizontal situation display (HSD) *gen*. An HSD is a display which aids the crew members in navigation. Basically, it consists of heading, distance-to-go, bearing-to-destination or some other navigation facility or reference, track, map, course, aircraft position, and steering error. Modes may consist of manual, north-up, track-up, data, test, and off. Selection of map scale factors may also be provided. Navigation update can be accomplished with the proper computer techniques. The HSD also has the capability of combining symbols with the map information. Symbols may be used for annotation of the projected map, such as check points, various legs of the mission, high-risk areas, ground track deviation, and radar homing and threat warning. Specific modes and formats can be selectable for a given mode of operation.

Hover, in ground effect *gen*. A condition when the helicopter is motionless with respect to the ground and the rotor is operating at one rotor diameter height or less above ground level.

Human engineering *gen*. The application of knowledge about human capabilities and limitations to system or equipment design and development to achieve efficient, effective, and safe system performance at minimum cost and manpower, skill, and training demands. Human engineering assures that the system or equipment design, required human tasks, and work environment are compatible with the sensory, perceptual, mental, and physical attributes of the personnel who will operate, maintain, control and support it.

Human engineering design criteria *gen*. Stated limits on design to achieve the objectives of human engineering. (See "Human engineering.")

Human factors *gen*. A body of scientific facts about human characteristics. The term covers all biomedical and psychosocial considerations; it includes, but is not limited to, principles and applications in the areas of human engineering, personnel selection, training, life support, job performance aids, and human performance evaluation.

Human Factors test and evaluation (HFTE) *acq*. Part of the system testing effort conducted in accordance with approved test plans. HFTE includes all testing directed toward validation and evaluation of human factors analyses, studies, criteria, decisions, and operational and maintenance design characteristics, and features. These may include engineering design tests, model tests, mockup evaluations, demonstrations, and subsystem tests conducted to verify system level requirements. Human factors tests are a part of system developmental test and evaluation and operational test and evaluation.

Human performance *gen*. A measure of human functions and action in a specified environment, reflecting the ability of actual users and maintainers to meet the system's performance standards, including reliability and maintainability, under the conditions in which the system will be employed.

Illuminance *gen*. A measure of the amount of light falling on a surface. The metric unit for illuminance is lm/m^2, or lux (light flux). (See "Metric equivalents, abbreviations, and prefixes.")

Impulse noise *snv*. A short burst of acoustic energy consisting of either a single impulse or a series of impulses. The pressure history of a single impulse includes a rapid rise to a peak pressure, followed by a somewhat slower decay of the pressure envelope to ambient pressure, both occurring within 1 second. A series of impulses may last longer than 1 second.

Information *uci*/gen Organized data that users need to perform their tasks successfully. Information serves as an answer to a user's questions about data and implies effective assimilation of data by a user. Data that have been processed and formulated by automated or manual means to satisfy ā knowledge requirement for use by a decision maker.

Information system. gen. A system, whether automated or manual, that comprises people, machines, and/or methods, organized to collect, process, transmit, and disseminate data that represent user information.

Information system *uci*. A computer-supported, task-oriented tool designed to help users perform defined information handling tasks.

Input *uci*. (1) The data entered into a computer for processing, (2) the process of entering data or (3) pertaining to the devices that enter data. (See "Control entry" and "Data entry.")

Integrated Logistics Support (ILS) *acq* A disciplined, unified, and iterative approach to the management and technical activities necessary to integrate support considerations into system and equipment design; develop support requirements that are related consistently to readiness objectives, to design, and to each other; acquire the required support; and provide the required support during the operational phase at minimum cost.

Intermediate level maintenance *acq* Maintenance that is normally the responsibility of, and performed by, designated maintenance activities for direct support of using organizations. Its phases normally consist of calibrating, repairing, or replacing damaged or unserviceable parts, components, or assemblies; modification of material, emergency manufacturing of unavailable parts; and providing technical assistance to using organizations. Intermediate maintenance is normally accomplished by the using commands in fixed or mobile shops.

Interaction *uci*. See "Transaction."

Interface *uci*. A common boundary between automatic data processing systems or parts of a single system, or between the system and a user. (See "User-system interface.")

Interrupt *uci*. Stopping an ongoing transaction in order to redirect the course of the processing. Examples of interrupt options are ABORT, BACKUP, CANCEL, and RESTART.

Job *acq*. See "Task analysis."

Joystick *uci*. A stick type input device with at least two degrees of freedom, typically used as a locator, such as to control continuous cursor control in any direction on a display screen.

Keyboard *uci*. An input device used to enter data by manual depression of keys which causes the generation of the selected code element. That area of the device in which keys associated with characters are arranged

Keyboard arrangement *uci*. The positioning of keys with relation to each other and their association with specific characters.

Keyboard classification *uci*. A categorization to indicate the area of machine application and the kind of textual traffic for which an arrangement is best suited. Type refers to machine application and Class refers to the kind of textual traffic.

Type I. The arrangement for keyboard that produces a compound, or encoded, electrical output for the subsequent indirect control of another device, for example a teletypewriter or a computer.

Type II. The arrangement for keyboard that directly controls its associated device, for example a typewriter.

Class 1. The arrangement for keyboard for that kind of textual traffic that normally has a high alpha content, for example the usual inter-office correspondence.

Class 2. The arrangement for keyboard for that kind of textual traffic that normally has a high numeric content, for example stock lists or data for problem solving.

Keytop *uci*. A finger contact member which allows effective operation of the device, also called a key.

Label *uci*. A title or descriptor that helps a user identify displayed data. (See "data field label.")

Lesson learned *acq*. A proven experience of value in the conduct of future programs. It is normally a conclusion drawn from evaluation of feedback information or from analysis of the performance resulting from technical and management functional activities. A lesson learned is usually recorded and eventually incorporated, where applicable, in regulations, technical manuals, specifications, standards, or handbooks.

Life support *acq*. That area of human factors which applies scientific knowledge to items which require special attention or provisions for health promotion, biomedical aspects of safety, protection, sustenance, escape, survival, and recovery of personnel.

Light-emitting diode (LED) *gen*. A pn-junction semiconductor device that emits incoherent optical radiation when biased in the forward direction. Primarily used in place of incandescent lamps as indicators and in alphanumeric assemblies.

Line replaceable unit (LRU) *acq*. A component, assembly, or subassembly which is normally removed and replaced as a single unit to correct a deficiency or malfunction. LRUs may

be composed of shop replaceable units (SRUs) which are generally removed and replaced in a maintenance shop.

Liquid crystal display (LCD) *gen.* A segmented, solid state, passive display device consisting of a liquid crystal material, composed of specialized molecules, sandwiched between two conductive plates, at lease one of which is transparent. Transmission of light through the medium containing the crystals is affected by the orientation of the crystals. When a current is applied, the orientation of the crystals, and therefore the transmission characteristics of the medium, are altered, resulting in contrast between particular segments/pixels and their background.

Local tracks *dsi.* Tracks generated by the co-located sensor(s) upon which the air defense system relies to acquire targets, e.g., tracks obtained from the system's own radar.

Logistic Support Analysis (LSA) *acq* The selective application of scientific and engineering efforts undertaken during the acquisition process, as part of the system engineering and design processes to assist in complying with supportability and other ILS objectives.

Logistic Support Analysis Record (LSAR) *acq* That portion of LSA documentation consisting of detailed data pertaining to the identification of logistic support resource requirements of a system/equipment.

Lowercase letters *uci.* The "small" letters. Letters that are not capitalized.

Luminance *gen.* The amount of light per unit area emitted or reflected from a surface. Luminance units are candelas per square meter (foot Lamberts).

Luminance contrast *gen.* The contrast between the background and a figure equals the difference between the higher lIluminance (L_1) and the lower luminance (L_2) divided by the lower luminance (L_2), i.e.,

$$C = \frac{L_1 - L_2}{L_2}$$

Conversions to the other contrast formulae are as follows:

L_1 (brighter)	L_2 (dimmer)	$\frac{L_1-L_2}{L_2}$	$\frac{L_1-L_2}{L_1}$	$\frac{L_1-L_2}{L_1+L_2}$	$\frac{L_1}{L_2}$
100	50	1.0	0.50 (50%)	0.33	2.0
100	25	3.0	0.75 (75%)	0.60	4.0
100	10	9.0	0.90 (90%)	0.82	10.0

For display applications: L1 is the total luminance of the symbol or image, including any background or reflected light, as measured in the specified lighting conditions; L2 is the luminance of the background or dimmer area, measured in the specified lighting conditions, including any reflected light and any stray display emissions.

Luminance ratio (LR) *gen.* The ratio of the target, subject, or symbol luminance to the surrounding field or background luminance. For projection systems, the luminance ratio is equal to the light output of a projector (measured with no film in the projector) reflected off the screen (image luminance) divided by all the light falling on the screen (measured from the greatest viewing angle) other than that actually forming the image (nonimage or background), i.e.,

$LR = L / L_n$, where: L = Image or subject luminance
L_n = Nonimage or background luminance

Macro *uci.* The capability to allow the user to assign a single name or function key to a defined series of commands for use with subsequent command entry. Sometimes called "smart key" or "script." Examples of use are storage of addresses or signature blocks that are frequently used. Usually initiated through use of a function key.

Maintainability, design for *gen.* Design considerations directed toward achieving those combined characteristics of equipment and facilities which will enable the accomplishment of necessary maintenance quickly, safely, accurately, and effectively with minimum requirements for personnel, skills, special tools, and cost.

Maintenance *gen.* All actions necessary for retaining material in (or restoring it to) a serviceable condition. Maintenance includes servicing, repair, modification, modernization, overhaul, inspection, condition determination, corrosion control, and initial provisioning of support items.

Management information system (MIS) *uci/acq.* An organized assembly of resources and procedures required to collect, process, and distribute data for use in decision making.

Manpower and personnel requirements *acq.* The number of trained personnel required to operate, maintain and support system equipment in its operational environment. Manpower refers to the number of people and personnel refers to their skills. Efficient operation of the system, or piece of equipment, depends in part on the proper mix and skill level of military and civilian personnel. Information generated by this element serves as a basis for manpower and personnel planning and programming decisions and setting related parameters and constraints on human engineering analysis and design.

Masked threshold *snv.* The sound pressure level, in dB, at which a signal becomes distinguishable from other signals and/or noise.

Master caution (warning) signal *gen.* A signal which indicates that one or more caution (warning) lights have been actuated. (See "Caution signal" and "Warning signal.")

Materiel design standard *snv.* Design standards that provide specific noise limits and other requirements to equipment designers and manufacturers.

Menu selection *uci.* A type of dialogue in which the user selects one item out of a list of displayed alternatives, whether the selection is by pointing, by entry of an associated option code, or by actuation of an assigned function key.

Message *uci.* Data that are transmitted from one computer user to another as a discrete transaction or data that are displayed to users to aid in performing their tasks. (See "Data transmission" and "User guidance.")

Metric equivalents, abbreviations, and prefixes *gen.* Metric (SI) units, inch-pound units, and multipliers to convert from inch-pound to metric units are presented in Table I. For a more complete listing and discussion, see FED-STD-376 and ASTM E 380.

Military Standard Code for Information Interchange (MSCII) *uci.* The American Standard Code for Information Interchange (ANSI X3.4) used by the Department of Defense.

Mission *acq.* See "Task analysis."

Mode *gen.* Present condition (status) of the product, e.g., off, standby, on.

Modified Rhyme Test (MRT) *snv.* See "Speech intelligibility."

TABLE I. Metric equivalents, abbreviations, and prefixes

EQUIVALENTS

TO CONVERT FROM	TO	MULTIPLY BY
degree (angle)(sec)	radian(rad)	0.017 453 29
foot (ft)	meter (m)	*0.304 8
foot^2(ft^2)	meter^2(m^2)	*0.092 903 04
foot^3 (ft3)	meter^3 (m^3)	0.028 316 85
footcandle (fc)	lux (lx)	10.763 91
footlambert (fL)	candela per square meter (cd/m^2)	3.426 259
inch (in. or ")	millimeter	*25.4
inch^2 (in^2)	millimeter^2 (m2)	*645.16
inch^3 (in^3)	meter^3 (m^3)	0.000 163 870 6
minute (angle) (min)	radian (rad)	0.0002908882
ounce-force (ozf)	newton (N)	0.278 013 9
ounce-inch (ozf-in.)	newton meter (N•m)	0.007 0615 52
pound (lb) avoirdupois	kilogram	*0.453 592 37
pound force (lbf)	newton (N)	4.448 222
pound-inch (lbf-in.)	newton meter (N•m)	0.112 984 8
pound force/inch^2 (lbf/in^2) (formerly psi)	kilopascals (KPa)	6.894 757
second (angle) (sec)	radian (rad)	0.00004848137

*Indicates exact conversion

PREFIXES						TEMPERATURE CONVERSION
Nano	n	10^{-9}	Centi	c	10^{-2}	$^oC = 5/9 (^oF - 32)$
Micro	μ	10^{-6}	Kilo	k	10^3	$^oF = 9/5\ ^oC + 32$
Milli	m	10^{-3}	Mega	M	10^6	

Mouse *uci*. A finger- or hand-held computer input device that generates the coordinates of a position indicator (e.g., converted to analogous movements of a cursor across a screen) and is operated by being moved on a flat surface.

Multifunction display (MFD) *dsi*. A general-purpose display which may be used in many places in the cockpit. In addition to the modes listed for the HSD (horizontal situation display) and VSD (vertical situation display), other possible modes are energy management, engine management, aircraft subsystem information, and integrated test and maintenance. Specific modes and formats can be selectable for a given mode of operation. It is sometimes called a Multipurpose Display (MPD).

Narrowband *snv*. When used in connection with vibration measurements, refers to that measurement bandwidth, obtained with the use of a 400 line fast fourier transform, with increments from zero to 400 Hz., 400 to 2000 Hz., and 2000 to approximately 10,000 Hz.

Natural language *uci*. A type of dialog in which users compose control entries in a restricted subset of their natural language, for example, English, Japanese, Arabic, Hindi.

New line (NL) *uci*. A control character which directs a printing or display device to position itself at the first printing or display position in the next line. That is, it causes the device to perform both the carriage return (CR) and the line feed (LF) function. It is standard to assign to NL the same code representation as LF in ITA Nr. 5, ASCII and MSCII.

Night vision goggles *gen*. Goggles which amplify visible and near infrared energy, allowing a person to see in the dark.

Night vision goggle compatibility (NVGC) *gen*. The designing of visual displays so that they can be read by the unaided eye and while wearing NVGs, without degrading NVG performance.

Noise *snv*. A sound having a complex character with numerous separate frequency components extending over a wide range of frequencies and not generated to convey meaning or information. (Also see "Steady state noise.")

Noise criterion (NC) curves *snv*. Widely accepted sets of octave-band pressure levels used as the basis for indoor noise criteria. These criteria specify the maximum level permitted in each octave band for various types of communication requirements.

Noise-cancelling (microphone) *snv*. A feature that reduces the masking effect of ambient noise upon speech impressed on a microphone, usually by providing equal access of the ambient noise to both surfaces of a diaphragm to achieve approximate equilibrium, effectively causing the noise to cancel itself out. Since the talker's own voice output impinges on one side of the microphone diaphragm, the talker's signals are not subject to this cancellation, and so are transmitted more favorably than if both ambient noise and speech fell simultaneously upon one face of the diaphragm.

Nominal band-center frequency (f_c) *snv*. The nominal band center frequency may be either the arithmetic or geometric mean between the band-edge frequencies of a band, the arithmetic mean being $f_c = (f_1 + f_2)/2$ and the geometric mean being $f_c = (f_1 \times f_2)^{1/2}$. The arithmetic mean is normally used when constant bandwidth filters, such as 50 Hz are specified. The geometric mean is normally used for filters of constant percentage bandwidth, such as one-third octave band filters.

Nuclear, biological, chemical (NBC) survivability *gen*. The instantaneous, cumulative, and residual effects of NBC weapons upon a system including its personnel. NBC survivability describes the capability of a system to withstand the NBC environment, including decontamination, without losing the ability to accomplish its mission. For any system to be considered survivable in an NBC contaminated battlefield, it must have at least three essential characteristics: hardness, decontaminability, and compatibility:

Hardness. The ability of materiel to withstand the materiel damaging effects of NBC contamination and any decontaminants and procedures required to remove it.

Decontaminability. The ability to make personnel and materiel safe by absorbing, destroying, neutralizing, making harmless, or removing chemical or biological agents, or by removing radioactive material clinging to or around them.

Compatibility. The ability of a system to be effectively operated, maintained, and resupplied by persons wearing the full NBC protective ensemble in all climates for which the system is designed, and for the period specified in the operational requirements document.

Null *uci*. A control character that fills a file by adding non-significant zeros (ASCII 00 Hexadecimal).

Numeric *uci*. A descriptive term used to define a character set containing the digits Ø (ZERO) through 9, and generally a limited number of punctuation marks.

Numeric keypad *uci*. A numeric keypad is a keyboard type entry device dedicated to the entry of numeric data.

Octave band *snv*. An octave band is a band of frequencies in which the ratio of the upper band-edge frequency to the lower band-edge frequency is equal to 2:1. The band-center frequencies are the preferred frequencies as specified in ASA-53. The width of an octave band in Hz is approximately 71 percent of its mid-band frequency.

One-third octave band *snv*. One-third octave bands whose band-center frequencies are preferred one-third octave bands specified in ANSI S1.6. The width of a one-third octave band is approximately 23 percent of its band-center frequency.

Operator *gen*. A human performer; one who operates a (specified) item; such as a test set operator, a crane operator, a tool operator, a valve operator (it is used in human factors in the conventional sense as distinguished from the operations-maintenance dichotomy).

Operator *uci*. See "user."

Optical character recognition (OCR). The machine identification of printed characters through use of light-sensitive devices.

Optical character recognition (OCR) device *uci*. A device that transcribes information directly from a hard copy onto a computer memory device.

Optimal visual zone *gen*. Refers to a 30 degree cone symmetrical about a line from the design eye position extending outward to the center of the instrument panel, the apex of the cone being at the design eye.

Organizational maintenance *acq*. That maintenance authorized for the responsibility of and performed by a using organization on its assigned equipment. In aeronautical systems, organizational maintenance normally consists of pre-flight, post-flight, and periodic inspection of

aircraft; daily or minor inspection of other material, servicing, preventive maintenance, calibration of systems,and removal and replacement of components.

Output *uci*. See "data display."

Overall layout drawings *acq*. System design drawings which include but are not limited to: (1) the configuration and arrangement of major items of equipment for manned stations, such as a pilot's or astronaut's station, or launch control officer's station, or shipboard command station; (2) the configuration and arrangement of items of equipment, such as modular rack or maintenance ground equipment, which may not be a part of a manned station for operation, but require human access for maintenance; (3) the arrangement of interior lighting for operating or maintaining the equipment; and (4) labels identifying general panel content, e.g., flight mission panel, countdown status panel, communications panel, or malfunction status panel.

Page *uci*. The data appearing at one time on a single display screen.

Panel *gen*. The front face of an assembly, normally used for mounting controls and displays.

Panel layout drawings *acq*. Equipment detail drawings which include, but are not necessarily limited to: (1) a scale layout of the controls and displays on each panel or an item of equipment, such as an astronaut's, pilot's or launch control officer's console; (2) a description of all symbols used; (3) identification of the color coding used for displays and controls; (4) the labeling used on each control or display; and (5) the identification of control type (e.g., alternate action or momentary) and a clear differentiation between controls and indicators.

Panning *uci*. An orientation of display framing in which a user conceives of the display frame as moving over a fixed array of data. The opposite of scrolling.

Part *acq*. One piece, or two or more pieces joined together which are not normally subject to disassembly without destruction of designed use, (Examples: outer front wheel bearing of a 3/4 ton truck, computer chip, composition resistor, screw, gear, mica capacitor, audio transformer, milling cutter.)

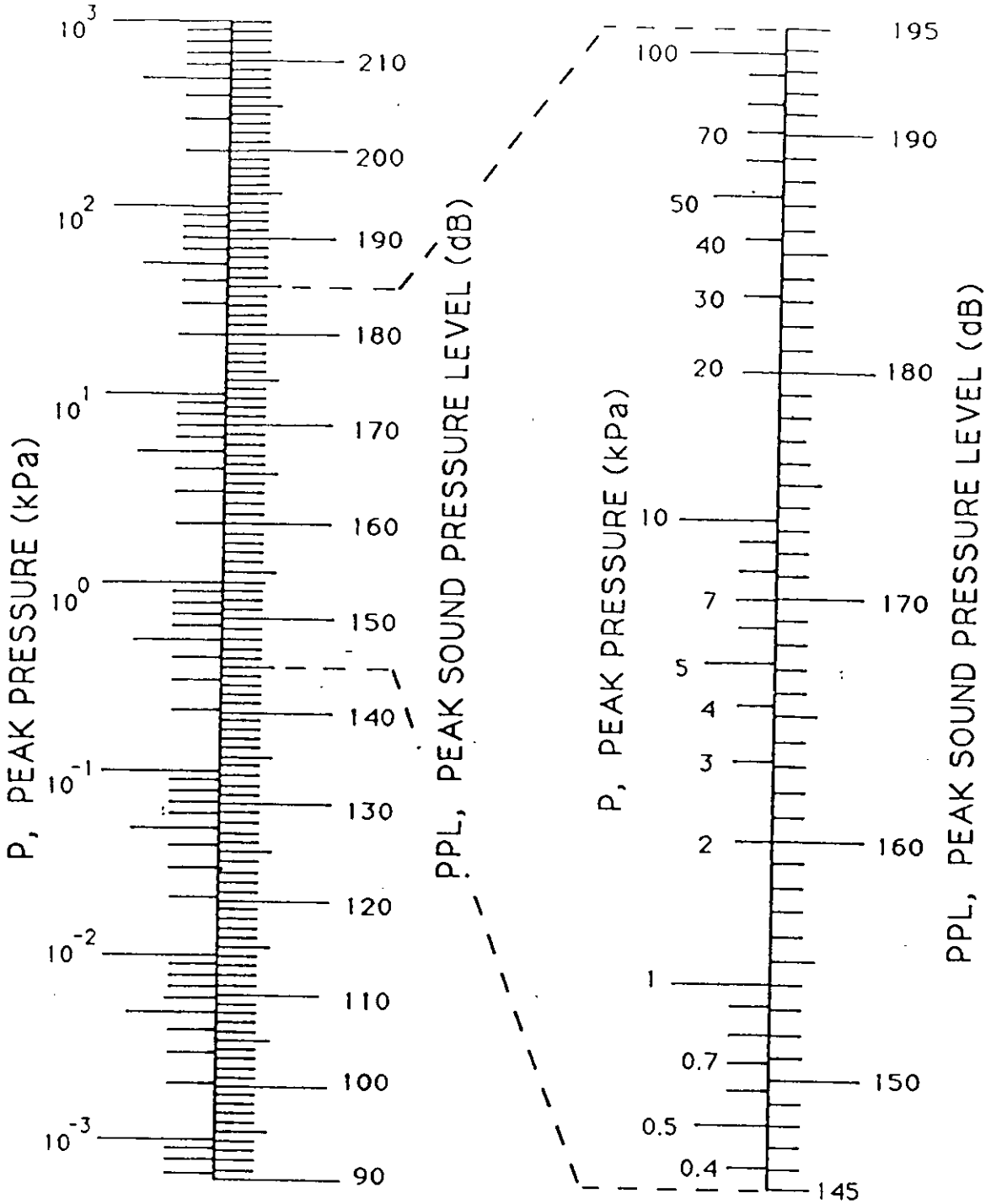
Peak A-weighted sound pressure level *snv*. The A-weighted sound pressure level measured by a peak reading sound level meter or a combination of instruments with equivalent characteristics, such as a sound level meter and an impact meter, or a sound level meter and a calibrated oscilloscope, where the sound level meter has a peak sound pressure level measuring circuit with total rise time of 200 microseconds or less.

Peak-clipping (of speech signals) *snv*. A technique for controlling amplitude relationships in speech by limiting the excursions of instantaneous peak-amplitudes to improve intelligibility of speech, usually followed by amplification of the signal to increase the amplitude of the clipped peaks to their original level, with proportional increase of the weaker speech sounds.

Peak pressure level *snv*. The highest level, in dB, achieved. (Peak pressure is the highest level, in Pa, achieved). Conversion between either kPa or psi and dB is shown in Figure 3. The reference pressure is 20 µPa (peak). (See dBP)

Phonetically Balanced (PB) Monosyllabic Word Intelligibility Test *snv*. See "Speech intelligibility."

Physical-ear attenuation *snv*. The arithmetic difference (in decibels) between the one-third octave band pressure levels of the signals measured by the microphone in the subject's ears with and without the device being worn.



GIVEN: P, peak pressure in kPa or psi
THEN
PPL, The peak sound pressure level in dB is given by:

$$PPL = 20 \log (P) + 153.98 \text{ dB, P in kPa}$$
$$PPL = 20 \log (P) + 170.75 \text{ dB, P in psi}$$

FIGURE 3. Scale for conversion between kPa and dB

Pointer *dsi*. A transmittable symbol under the direct control of the operator, used to point to displayed information, for highlighting or identifying areas of interest.

Position designation *uci*. User selection and entry of a position on a display, or of a displayed item. (See "Cursor.")

Predictive information *dsi*. Information predicting future status, condition, or position of the aircraft, a system, or a subsystem.

Pre-emphasis *snv*. Systematic distortion of the speech spectrum to improve intelligibility of speech sound by attenuating the low-frequency components of vowels (relatively unimportant for intelligibility) and proportionately increasing the amplitude of high frequency vowel components and consonants (highly important for intelligible speech transmission).

Primary display *uci*. The display that is most accessible to the user and usually the one most frequently used.

Prime visual signal area (PVSA) *gen*. The PVSA is an area of the instrument panel which is enclosed by a circular arc whose radius is 12 inches and whose center is defined by the intersection of the top of the instrument panel and the crew members' vertical centerline plane. The area is the optimum location on the instrument panel for the pilot's flight instruments and the master caution and warning lights.

Prompt *uci*. A cue or reminder provided by the computer that alerts and guides the user to take some action.

Qualitative information *dsi*. Information presented by a display in a manner which permits the display user to assess the information without requiring attention to an exact numerical quantity.

Quantitative information *dsi*. Information presented by a display in a manner which permits the display user to observe or extract a numerical value associated with the information. Quantitative information may be displayed in either digital or analog form.

Query language *uci*. A type of dialogue in which users compose control entries for displaying specified data from a data base.

Question and answer *uci*. A type of dialogue in which the computer displays questions, one at a time, for a user to answer.

Random incidence corrector *snv*. A device that reduces the directionality of free field microphones allowing their use in diffuse or random incident sound fields.

Random incidence field *snv*. A sound field in which the angle of arrival of sound at a given point is random in time.

Raster-written CRT Display *gen*. A method of refreshing the information displayed on a CRT in which the electron beam scans the entire screen in some predetermined pattern, refreshing portions of the screen as necessary. Variations of the raster method include (1) the noninterlace method, which involve scanning every line in succession and, when finished with the entire display, returning to the the beginning and repeating the process and (2) the interlace method, in which every other line is scanned on one pass, the remaining lines are scanned on the next pass, and the process is repeated.

Rated engine speed *snv*. If not specified (for acoustic testing), 10% less than maximum governed engine speed with no load.

Record *uci*. A group of related data fields that are operated on as a single entity in a database.

Reference vibratory acceleration (a_o) *snv*. The reference quantity is 10 micrometers per second squared ($\mu m/s^2$) root mean square (rms). 10 $\mu m/s^2 = 10^{-3}$ cm/s^2 (393.7 X 10^{-6} in/s^2). Units of the International System (SI) as specified in MIL-STD-1621 are prescribed for the measurement of vibrational quantities. The acceleration of 10 $\mu m/s^2$ is nearly one millionth of the international standard acceleration of free fall $g_n = 0.80665$ $m/s^2 = 386.089$ in/s^2. Therefore, for reporting, the reference vibratory acceleration may be described as $a_o = 1\mu g_n$ (rms). For calibration, 1 g_n (rms) = 120 dB re a_o is used.

Remote tracks *dsi*. Tracks generated by other than the co-located sensors upon which the air defense system relies to acquire targets, e.g., tracks received from interfacing systems.

Restart *uci*. A capability that returns a user to the first display in a defined transaction sequence.

Reverberation time *snv*. The time that would be required for the mean-square sound pressure level, originally in a steady state, to fall 60 dB after the source is stopped.

Scenario/conditions *acq*. See "Task analysis."

Screen *uci*. The viewing surface of a cathode ray tube. Also see "Page."

Scrolling *uci*. An orientation for display framing in which the user conceives of data as moving behind a fixed display frame. The opposite of panning or windowing.

Seat reference point (SRP) *gen*. The point at which the center line of the seat back surface (depressed) and seat bottom surface (depressed) intersect. When the seat is positioned at the midpoint of the adjustment range(s), this intersection point is called the neutral seat reference point (NSRP). (See MIL-STD-1333 for Army and Navy aircraft definition.)

Sequence control *uci*. Logic and means by which user actions and computer responses are linked to become coherent transactions

Shift mode *uci*. (Also **shifted mode**.) The condition of the keyboard when a SHIFT key is operated. In this mode, the alphabetic keys are associated with the uppercase letters, other character keys with the corresponding upper graphic symbol, and certain function keys with alternate functional operations.

Sound *snv*. Sound is: (a) An oscillation in pressure, stress, particle displacement, particle velocity, etc., in a medium with internal forces (e.g., elastic, viscous) or the superposition of such propagated oscillations, or (b) An auditory sensation evoked by the oscillation described above. In the case of possible confusion the term "sound wave" or "elastic wave" may be used for concept (a), and the term "sound sensation" for concept (b). The medium in which the sound exists is often indicated by an appropriate adjective, e.g., airborne, waterborne, structureborne.

Sound level *snv*. Sound level is the quantity in dB measured by a sound level meter satisfying the requirements of ANSI S1.4. Sound level is the frequency weighted sound pressure level obtained with the standardized dynamic characteristics "fast" or "slow" and weighting A, B, or C. The unit of any of the sound levels is the dB. The weighting employed shall be indicated, otherwise the A-weighting is understood.

Sound pressure *snv*. Sound pressure is the root mean square (rms) value of the vibratory pressure.

Sound pressure level (SPL) *snv*. The pressure level of an acoustic wave, usually expressed in decibels (dB), equal to 20 times the logarithm to the base 10 of the ratio of the measured, effective root-mean-square sound pressure to the reference pressure, i.e.,

$$SPL = 20\ Log_{10} \frac{P}{20\mu Pa} = 20\ Log_{10}(P) + 94$$

where P = the effective (rms) sound pressure in pascals (Pa) or newtons per square meter (N/m2). (20 μPa = 20 μN/m2 = 0.0002 microbar = 0.0002 dynes/cm^2.)

Sound spectrum *snv*. The pattern of distribution of energy or sound pressure in different bands along a frequency scale.

Source document *uci*. The user's application document, which is a source of data eventually processed by the computer program. Examples include time cards, target lists, vouchers, supply codes, parts lists, and bills of lading.

Special tools *acq*. Tools not listed in the Federal Supply Catalog.

Spectroradiometer *gen*. A radiometer equipped with a device for separating (dispersing) the incoming light into its component wavelengths, used to measure the spectral power distribution.

Speech intelligibility *snv*. A measure of the percentage of words, phrases or sentences correctly understood over a given speech communication system in a given noise situation. It may be measured by either the Phonetically Balanced (PB) Monosyllabic Word Intelligibility Test or the Modified Rhyme Test (MRT). The former consists of a list of 1,000 words in which each word is spoken and written down by a listener. The latter consists of a list of 300 words in which a word is spoken and the listener responds on a prepared multiple format selecting one of six words as the item heard. Speech intelligibility may also be predicted by the Articulation Index (AI) in which calculation is performed on the peak-speech-to-root-mean-square noise ratio obtained in selected frequency bands from 200 to 7,000 Hertz, i.e., peak amplitude of speech in relation to the root-mean-square amplitude of the background noise.

Speech Interference Level (SIL) *snv*. A measure of the effectiveness of noise in masking speech. SIL is the arithmetic mean, in dB re 20μPa, of sound pressure levels in the four octave bands with center frequencies of 500, 1000, 2000, and 4000 Hz. (Previously, SIL was computed as the arithmetic mean, in dB, of the sound pressure levels in the three octave bands 600 to 1200, 1200 to 2500, and 2500 to 5800 Hz. Another previously used term is the preferred SIL (PSIL) which is the arithmetic mean, in dB, of the sound pressure levels in the three octave bands with center frequencies of 500, 1000, and 2000 Hz. Later, researchers defined the four octave bands used today (centered at 500, 1000, 2000 and 4000 Hz) and coined "PSIL-4," now referred to simply as SIL.)

Speech signal processing *snv*. The modification of the electrical signal representing speech to enhance the capability of a speech communications channel. Some examples are simple analog processing, automatic gain control (AGC), frequency shaping, peak clipping, and syllabic compression.

Speech spectrum *snv*. A segment of the range of audible frequencies containing the sounds of speech, defined as approximately the range from 80 to 8000 Hz.

Speech-to-noise ratio (peak speech-to-rms noise) *snv*. The ratio between the arithmetic mean of peak amplitudes of speech and the root mean square (rms) amplitude of background noise.

Standard tools *acq*. Standard tools (normally hand tools) used for the assembly, disassembly, inspection, servicing, repair and maintenance of equipment, and which are manufactured by two or more recognized tool manufacturing companies and listed in those companies' catalogs.

State-of-the-art *acq*. The highest level of scientific and technical knowledge existing at the time of contract award.

Status information *gen/dsi*. Current condition information about the system and its surroundings.

Steady-state noise *snv*. A periodic or random variation in atmospheric pressure at audible frequencies. It may be continuous, intermittent or fluctuating, with the sound pressure level varying over a wide range, provided such variations have a duration exceeding 1 second.

String *uci*. In the user's context, a word, phrase, or number (string of characters) in the test or file. Normally employed in the context of causing the computer to search for, find, or replace a desired "string."

Stroke-written CRT display *gen*. A CRT in which the character generator generates a succession of short strokes in sequence that are combined to form a character or symbol.

Structureborne vibratory acceleration level (La) *snv*. La, in decibels (dB) is 20 times the logarithm to base 10 of the ratio of the measured structureborne vibratory acceleration to a_0; this is:

$$L_a \text{ in dB} = 20 \log_{10} \frac{\text{measured acceleration in } \mu m/s^2 \text{ (rms)}}{10\ \mu m/s^2 \text{ (rms)}}$$

Subassembly *acq*. Two or more units which form a portion of an assembly or a unit replaceable as a whole, but having a part or parts which are individually replaceable. (Examples: gun mount stand, window recoil mechanism, floating piston, telephone dial, IF strip, mounting board with mounted parts, power shovel dipper stick.)

Subtask *acq*. See "Task analysis."

Support equipment (SE) *acq*. All equipment required to perform the support function, except that which is an integral part of the mission equipment. SE includes tools, test equipment, automatic test equipment (ATE) (when the ATE is accomplishing a support function), organizational, intermediate, and related computer programs and software. It does not include any of the equipment required to perform mission operations functions.

Suppression *uci*. User control of display coverage by temporary deletion of specified data categories.

Suspense file *uci*. A temporary collection of data saved by the computer for later use.

Symbol *dsi*. A geometric form or alphanumeric information used to represent the state of a parameter on a display.

Symbol size *dsi*. Actual symbol size at the display, based on design eye distance from the display, can be calculated using the following formula:

$$L = 2D \tan (a/2)$$

where: L = size of symbol at the display
D = design eye distance from the display
a = symbol subtense (degrees) at D

Example: The breakaway symbol is 100 mrad long. What is the size of the symbol at the display in cm, if the design eye distance is 71 cm (28 inches)?

$$a = 100 \text{ mr} \times \frac{0.0573}{\text{mr}} = 5.73 \text{ degrees}$$

$$L = 2(71) \tan (5.73/2) = 7.11 \text{ cm}$$

This formula does not apply for head-up displays. Computer ray traces for HUD optics trains are required to determine symbol size on HUD CRTs.

System *acq*. A composite of equipment, skills, and techniques capable of performing or supporting an operational role, or both. A complete system includes all equipment, related facilities, material, software, services, and personnel required for its operation and support to the degree that it can be a self-sufficient unit in its intended operational environment. (Examples: STINGER, AEGIS, F-15.) When GFE is required for system operation, whether or not operation with GFE occurs in all cases of system operation, that GFE is part of the system.)

System engineering *acq*. A basic process for systematically defining the equipment, personnel, facilities, and procedural data required to meet system objectives. The process is iterative, requiring updating, and having feedback loops to ensure that each component developed contributes to the system in meeting mission objectives. A system engineering analysis may include, but is not necessarily limited to, the following:

a. Preparation of operationally-realistic mission profiles and mission scenarios.

b. Preparation of functional flow block diagrams for the system.

c. Functional analysis of each flow block and definition of operational and support equipment and facilities requirements.

d. Preparation of system and subsystem schematic block diagrams.

e. Study of detailed functions, environment and technical design requirements to allocate assignment of tasks to personnel, equipment, software, or some combination thereof.

f. Preparation of operations and maintenance timeline analyses to determine system reaction time.

g. Preparation and analysis of operational and maintenance task data to determine equipment quantities, personnel loads, and system down-time for scheduled and unscheduled maintenance.

h. Training implications.

i. Development of training equipment requirements.

j. Conduct of failure mode analysis.

k. Preparation of test planning analysis.

Tailoring *acq*. The process by which individual requirements (paragraphs or sentences) of the selected specifications, standards, and related documents are evaluated to determine the extent to which they are most available for a specific system and equipment acquisition and the modification of these requirements to ensure that each achieves an optimal balance between operational needs and cost. The tailoring process must, however, conform to provisions of existing regulations governing human factors engineering program and take care not to exclude those requirements which are determined as essential for meeting minimum operational needs.

Task *acq*. See "Task analysis."

Task analysis *acq*. A systematic method used to develop a time-oriented description of personnel-equipment/software interactions brought about by an operator, controller or maintainer in accomplishing a unit of work with a system or item of equipment. It shows the sequential and simultaneous manual and intellectual activities of personnel operating, maintaining or controlling equipment, in addition to sequential operation of the equipment. It is a part of system engineering analysis where system engineering is required. The following taxonomy is used to inventory or analyze tasks, with mission and scenario conditions stated by the procuring activity and the remaining levels dependent on the current phase of system development and purpose (e.g., gross analysis of tasks, analysis of critical tasks) for which the analysis is being conducted:

Mission. What the system is supposed to accomplish, e.g., combat reconnaissance.

Scenario/conditions. Categories of factors or constraints under which the system will be expected to operate and be maintained, e.g., day/night, all weather, all terrain operation.

Function. A broad category of activity performed by a system, e.g., transportation.

Job. The combination of all human performance required for operation and maintenance of one personnel position in a system, e.g., driver.

Duty. A set of operationally-related tasks within a given job, e.g., driving, weapon servicing, communicating, target detection, self protection, operator maintenance.

Task. A composite of related activities (perceptions, decisions, and responses) performed for an immediate purpose, written in operator/maintainer language, e.g., change a tire.

Subtask. Activities (perceptions, decisions and responses) which fulfill a portion of the immediate purpose within the task, e.g., remove lug nuts.

Task element. The smallest logically and reasonably definable unit of behavior required in completing a task or subtask, e.g., apply counterclockwise torque to the lug nuts with a lug wrench."

Task definition *acq*. The process of preparing a task inventory.

Task element *acq*. See "Task analysis."

Task inventory *acq*. A comprehensive listing (prepared in accordance with MIL-STD-1388-1 and documented in accordance with MIL-STD-1388-2) of all tasks performed upon system hardware by operations, maintenance, and support personnel.

Task performance analysis *acq.* A process performed on tasks, subtasks, and task elements selected from a task inventory by the procuring activity. The component steps of a task performance analysis are selected by the procuring activity (based on the nature of the acquisition, the complexity of the human performance requirements, and the stage of design maturity).

Temporal sequence *uci.* The order in which information (for example, words, or data) corresponding to a sequence of events is phrased or arranged to maintain a meaningful relationship.

Terminal *uci.* An input/output device used to enter and display data. Data are usually entered via a keyboard, and are usually displayed via a video screen ("soft copy") or a printer ("hard copy").

Text entry *uci.* Initial entry and subsequent editing of textual material, including messages.

Throughput *uci.* The total amount of productive work performed by a data processing system during a given period of time.

Time-weighted average level (L_{avg}) *snv.* The time-weighted sound level dBA that is derived from the actual varying sound level of the source during a given sample time (T), Implicit in this derivation is an exchange between sound level and time of 0 dB per doubling of time. The criterion level is 85 dBA for a duration of 8 hours.

$$L_{avg} = \frac{Q}{\log_{10}2} \cdot \log_{10}\left\{\frac{1}{T}\int_0^T 2^{L(t)/Q}\,dt\right\}$$

where: T = total time in hours
t = varying time
L(t) = the time varying A-weighted sound pressure level
Q = exchange rate, usually 3, 4, 5, or 6 dB.

The L_{avg} value can be calculated from the following alternate expression when the sound level takes on a sequence of N constant levels, L_i, each lasting for a time period of C_i hours:

$$L_{avg} = 85 + \frac{Q}{\log_{10}2} \cdot \log_{10}\left(\frac{D \cdot 8}{T}\right)$$

where: $D = \sum_{i=1}^{N} \frac{C_i}{T_i}$

T_i = Limiting exposure time at each A-weighted sound pressure level = $\frac{8}{2^{(L_i-85)/Q}}$

L_i = i^{th} A-weighted sound pressure level.

The exchange rate must be specified when referring to L_{avg}.

Touch panel *uci.* A control device that allows the user to communicate with the computer by touching the screen. Especially useful for menu driven systems.

Trackball *uci.* A trackball is a control device with which the user can control cursor movement in any direction by rotating the ball. Trackballs are especially useful when it is desirable to move the cursor long distances quickly.

Transaction *uci.* An action by a user followed by a response from the computer. The term is used here to represent the smallest functional "molecule" of user-computer interaction.

Transient sounds *snv.* Sounds that occur during turn-on and turn-off of the equipment and infrequent sounds that are less than 15 seconds in duration. If sounds occur at intervals of 1/2 second or less, the sound is considered steady-state sound.

Transillumination *gen.* Light passed through rather than reflected off, an element to be viewed, e.g., illumination used on console panels or indicators utilizing edge and/or back lighting techniques on clear, translucent, fluorescent, or sandwich type materials.

Transmission control *uci.* Controlling the sequence, content, format, routine, timing, or other data transmission characteristics.

Trouble shooting *gen.* Actions performed to isolate and identify the specific component which caused a malfunction of a system or complex component when the determination could not be made by the operator or mechanic who initially found the discrepancy.

Unit *acq.* An assembly or any combination of parts, subassemblies and assemblies mounted together normally capable of independent operation in a variety of situations., (Examples: hydraulic jack, electric motor, electronic power supply, internal combustion engine, electric generator, radio receiver.) This term replaces the term "component." Note: The size of an item is a consideration in some cases. An electric motor for a clock may be considered as a part inasmuch as it is not normally subject to disassembly.

Unshifted mode *uci.* The condition of the keyboard when the SHIFT keys are not operated. In this mode the alphabetic keys are associated with the lowercase letters, the numeric keys with the numerals, other keys with their corresponding lower graphic symbols, and function keys with their normal functional operations.

Uppercase letters *uci.* The "Capital" letters.

User *uci.* Any person who uses an information system in performing a job.

User-computer interface (UCI) *uci.* The modes by which the human user and the computer communicate information and by which control is commanded, including areas such as: information presentation, displays, displayed information, formats and data elements; command modes and languages; input devices and techniques; dialog, interaction and transaction modes; timing and pacing of operations; feedback, error diagnosis, prompting, queuing and job performance aiding; and decision aiding.

User guidance *uci.* Computer prompts and feedback that aid users in performing their tasks. Examples include data field labels, alarm or alert signals, error messages, and HELP messages.

User records *uci.* Automatic recording of user performance, for example, data access records, error records, HELP access record.

User-system interface *uci.* All aspects of information system design that effect a user's participation in information-handling transactions.

Value *uci*. Specified data for a particular dimension, field, or variable. For example, values for an aircraft's speed might be 800 knots during one observation and 500 knots during another. Also see "category."

Variable *uci*. See "Dimension," "Data field."

Vertical situation display (VSD) *dsi*. The VSD has all of the features of an EADI, with the increased capability of displaying sensor data. Additional modes may consist of TV, infrared (IR), attack radar, weapon TV, or terrain-following radar. Specific symbols and formats can be selectable for a given mode of operation. When any mode, other than one of the primary EADI modes is selected, the VSD may present basic symbolic information for flight control superimposed on the sensor data. VSD formats generally do not use sky/ground shading.

Vibration level *snv*. The logarithm of the ratio of a vibratory quantity to a reference quantity of the same kind, with the base of the logarithm, the reference quantity, and the kind of level indicated.

Warning signal *gen*. A signal which alerts the operator to a dangerous condition requiring immediate action. (See "Master caution [warning] signal").

Weapon system *gen*. A composite of equipment, skills, and techniques that forms an instrument of combat. The complete weapon system includes all related equipment, material, services, and personnel required solely for operation, or other major elements of the system, so that the instrument of combat becomes a self-sufficient unit of striking power in its intended operational environment.

Wet bulb globe temperature (WBGT) *gen*. A meteorological measurement which can be used as an index to designate conditions of temperature and humidity at which on-set of heat stress can be expected at a particular energy expenditure level. It is calculated as follows:

$$WBGT = 0.7T_{WB_{np}} + 0.2T_g + 0.1T_A$$

where $T_{WB_{np}}$ = non-psychrometric (np) wet-bulb (WB) temperature

T_g = temperature at interior center of a 15.2 cm (6 in) black globe)

T_A = non-psychrometric, but shaded, dry bulb (air) temperature.

Windowing *uci*. An orientation for display framing in which the user conceives of the display frame as a window moving over a fixed array of data. The opposite of scrolling.

Work station *uci*. The general physical environment in which the user works. It includes such things as computer terminals, source documents, desks, chairs, and lighting. Also used to refer to a computer terminal capable of sophisticated stand-alone operation, such as computer-aided-design, computer-aided-engineering, and desktop publishing.

4. GENERAL REQUIREMENTS

This section is not applicable to this standard.

5. DETAILED REQUIREMENTS

This section is not applicable to this standard.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. This standard is intended for use in conjunction with current human factors and related specifications, standards, and handbooks to define terms, frequently used in those documents, and thereby provide consistency, eliminate overlap and duplication, and minimize repetition. For these same reasons, this standard is also intended for reference during the preparation of new human factors and related specifications, standards, and handbooks. Telecommunication terms in this standard are consistent with those in FED-STD-1037B. Use of telecommunication terms in new human factors standardization documents that do not appear herein should use or harmonize with applicable definitions in the current revision of FED-STD-1037.

6.2 Issue of DODISS. When this standard is used in acquisition, the applicable issue of the DODISS must be cited in the solicitation (see 2.1.1 and 2.2).

6.3 Subject term (key word) listing.

Abbreviations
Acoustics
Acquisition/programmatic
Acronyms
Display symbology
Human factors engineering
Terminology
User/Computer interface
Vibration

CONCLUDING MATERIAL

Custodians:
Army - MI
Navy - AS
Air Force - 11

Preparing activity:
Army-MI

Review activities:
Army - AR, AT, AV, CR, EA, ER, GL, ME, MD, MR, TE, TM
Navy - EC, MC, OS, PE, SH, TD
Air Force - 13, 14, 15, 19, 24

(Project HFAC-0057)

User activities:
Army - AL
Navy - YD

Civilian agencies:
COM - NIST
DOL - TEC
DOT - FAA
EPA
NASA - MSF

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The *preparing activity* must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7.
3. The preparing activity must provide a reply within 30 days from receipt of the form.

NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

I RECOMMEND A CHANGE:	1. DOCUMENT NUMBER MIL-STD-1908	2. DOCUMENT DATE (YYMMDD) 921224

3. DOCUMENT TITLE
DEFINITIONS OF HUMAN FACTORS TERMS

4. NATURE OF CHANGE (*Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.*)

5. REASON FOR RECOMMENDATION

6. SUBMITTER

a. NAME (Last, First, Middle Initial)	b. ORGANIZATION	
c. ADDRESS (Include Zip Code)	d. TELEPHONE (Include Area Code) (1) Commercial (2) AUTOVON (If applicable)	7. DATE SUBMITTED (YYMMDD)

8. PREPARING ACTIVITY

a. NAME COMMANDER U.S. ARMY MISSILE COMMAND	b. TELEPHONE (Include Area Code) (1) Commercial: (205)876-6980 (2) AUTOVON: 746-6980
c. ADDRESS (Include Zip Code) ATTN: AMSMI-RD-SE-TD-ST REDSTONE ARSENAL, AL 35898-5270	IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT: Defense Quality and Standardization Office 5203 Leesburg Pike, Suite 1403, Falls Church, VA 22041-3466 Telephone (703) 756-2340 AUTOVON 289-2340

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