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MAY 1986



AUTOMATION BULLETIN NO. 3-D

GLOSSARY OF TERMS FOR NUMERICALLY CONTROLLED MACHINES

Engineering Department

ELECTRONIC INDUSTRIES ASSOCIATION

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GLOSSARY OF TERMS
FOR
NUMERICALLY CONTROLLED MACHINES

"A"

Reference
Standard

ABSOLUTE DIMENSION

ISO 2806

The absolute distances or angles that specify the position of a point with respect to the datum of a coordinate system

ACCELERATION, PROGRAMMED

A controlled increase to the programmed velocity

ACCURACY, DYNAMIC

NBSIR-81-2340

Degree of conformance to the desired or commanded value when relevant variables are changing with time

ACCURACY, STATIC

NBSIR-81-2340

Degree to which actual position corresponds to desired or commanded position

ACTUATOR

NBSIR-81-2340

A motor or transducer which converts electrical, hydraulic, or pneumatic energy to effect motion

ADAPTER, TOOL

A holding device for a cutting tool which is inserted into the spindle of the machine

ADAPTIVE CONTROL

ISO 2806

A control system that adjusts the control parameters in response to conditions detected during the process



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VocabularyReference
Standard

ADDRESS, WORD

ISO 2806

A character, or group of characters, at the beginning of a word, that identifies the data following in the word.

ASCII, AMERICAN NATIONAL STANDARD CODE FOR INFORMATION INTERCHANGE

ISO 2806

The set of 128 control and data characters defined as a standard data communications code in American National Standard Code for Information Interchange, X3.4-1977.

ARC, CLOCKWISE (2-DIMENSIONAL)

An arc generated by the coordinated motion of two axes in which curvature of the path of the tool with respect to the workpiece is clockwise, when viewing the plane of motion in the negative direction of the perpendicular axis.

ARC, CLOCKWISE (3-DIMENSIONAL)

An arc generated by the coordinated motion of three axes in which the curvature of the path of the tool with respect to the workpiece is clockwise when viewed along a line splitting the first octant (see line LO in Figure 1) when viewed in the negative direction of the three axes. This line has angles $= \cos^{-1}(1/\sqrt{3})$ with all axes (see Figure 1, $A = B = C$)

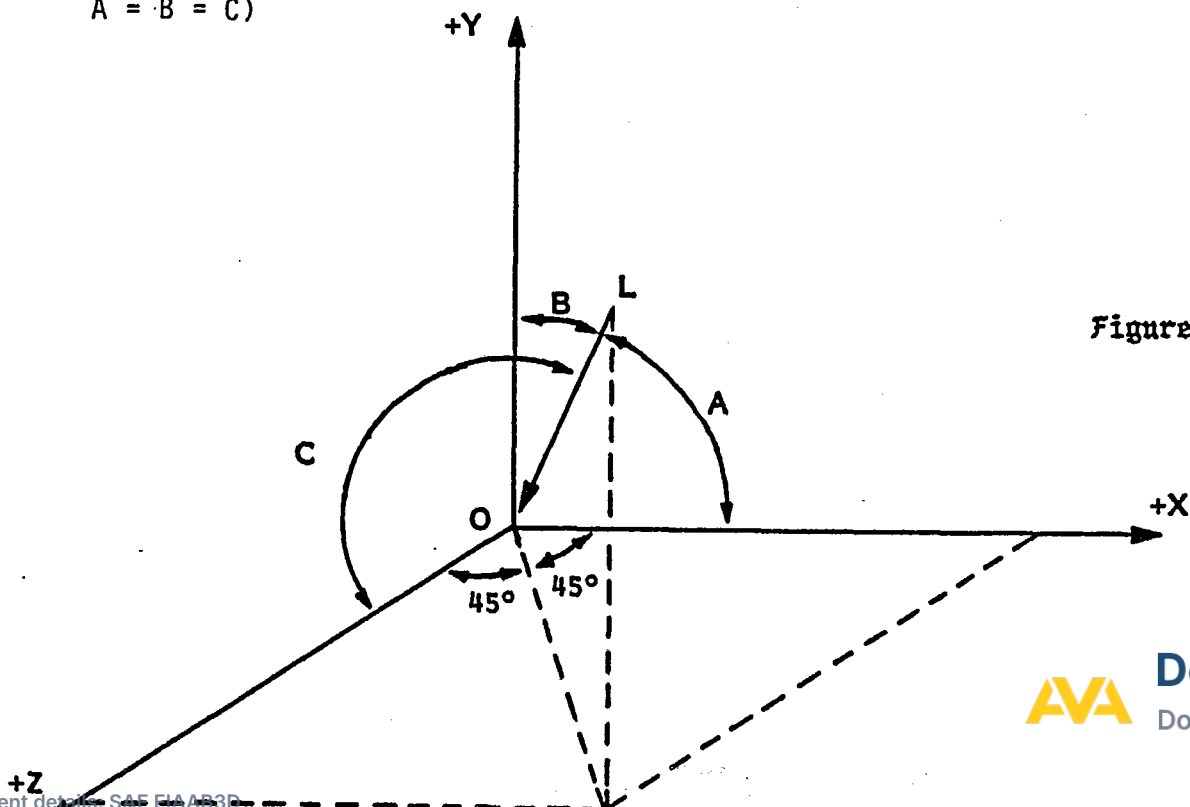


Figure 1

VocabularyReference
Standard

ARC, COUNTERCLOCKWISE (2-DIMENSIONAL)

An arc generated by the coordinated motion of two axes in which curvature of the path of the tool with respect to the workpiece is counterclockwise, when viewing the plane of motion in the negative direction of the perpendicular axis.

ARC, COUNTERCLOCKWISE (3-DIMENSIONAL)

An arc generated by the coordinated motion of three axes in which the curvature of the path of the tool with respect to the workpiece is counterclockwise when viewed along a line splitting the first octant (see line L0 in Figure 1) when viewed in the negative direction of the three axes. This line has angles = $\cos^{-1}(1/3)$ with all axes (See Figure 1, A = B = C).

APT

EIA-494

Acronym for Automatically Programmed Tools. Name applied to the APT part programming language and the APT language processor. Standards for APT are established by the ANSI X3J7 Committee.

AXIS COMPENSATION

A method of correcting for position errors by applying measured values.

AXIS INHIBIT

The ability to prevent the movement of the selected axis.

VocabularyReference
Standard

"B"

BACKLASH

ANSI MC85-IM

A relative movement between interacting mechanical parts, resulting from looseness

BCL CONVERTER

EIA 494

A postprocessor which produces a BCL format file from a CL file

BCL FORMAT

EIA 494

Thirty-two bit binary CL exchange format

BLOCK

ISO 2382

A word or group of words considered as a unit and separated from other such units by an end of block character

BLOCK DELETE

ISO 2806

A facility that allows the operator to cause the control system to omit the execution of a block of data which contains the block delete character.

BLOCK FORMAT

ISO 2806

The arrangement of the words, characters and data in a block

BUFFER STORAGE

A routine or storage used to compensate for a difference in rate of flow of data, or time of occurrence of events, when transmitting data from one device to another



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VocabularyReference
Standard

"C"

CANCEL

ISO 2806

A command that cancels a previously commanded function

CANNED CYCLE

See Fixed Cycle

CIRCULAR INTERPOLATION

A mode of contouring control which uses the information contained in a single block to produce an arc of a circle in which the tangential velocity is held constant

CL

Cutter location

CLDATA

EIA 494

The logical contents of the CL file

CL FILE

EIA 494

A file containing the CLDATA produced by an APT processor, or other systems capable of creating CLDATA

CL RECORD

EIA 494

The unit of identifiable contents in CLDATA is the logical CL record. Typically, a single CL record will correspond to, and contain, the same logical data as its corresponding single BCL record

COMMAND

ISO 2806

An operative order which initiates a movement or a function.

NOTE: The order may be:

1. direct input to the machine in coded form
2. results from a logical interaction of instructions from an outside source with conditions sensed by the machine
3. outputs derived from the computing or comparing function



Vocabulary**COMMAND MODE**

A mode of operation of the command or data entry device and display device in which entries are interpreted as functions to be executed.

COMPUTER NUMERICAL CONTROL (CNC)

A numerical control system in which the data handling sequence, the control functions, and the response to data input are determined primarily by a control program executed by a computer.

CONSTANT SURFACE SPEED

In turning applications, the condition achieved by varying the speed of rotation of the workpiece relative to the tool inversely proportional to the distance of the tool from the center of rotation

CONTOURING CONTROL SYSTEM

ISO 2806

A system of control in which two or more controlled motions move in relation to each other so that a desired angular path or contour is generated

CONTOURING MODE

A mode of operation of an NC system that operates in one of the defined modes of interpolation, e.g., linear, circular, parabolic

CONTROL PROGRAM

An ordered set of instructions in computer language and format which provides a computer based control system with the capability of properly executing system functions and commands of the machine program.

NOTE: The control program may come in the form of a source program, object program, or special format as specified by the supplier

COORDINATE DIMENSION WORD

EIA 274D

A word defining an absolute dimension

VocabularyReference
Standard

CUTTER DIAMETER (RADIUS) COMPENSATION

EIA 274D

A displacement normal to the cutter path to adjust for the difference between actual and programmed cutter radius or diameter. NOTE: Typically used on contouring control systems

CUTTER DIAMETER (RADIUS) OFFSET

EIA 274D

A displacement normal to a cutter path which is along a machine axis, to adjust for the difference between actual and programmed cutter radius or diameter NOTE: Typically used for axis milling on straight cut control systems

CYCLE TIME

NBSIR-81-2340

The period of time from starting one machine operation to starting another (in a pattern of continuous repetition)