NBSIR 83-2704 (USAF)

Initial Graphics Exchange Specification Test Library, Version 1.3

U.S. DEPARTMENT OF COMMERCE
National Bureau of Standards
National Engineering Laboratory
Center for Manufacturing Engineering
Automated Production Technology Division
Washington, DC 20234

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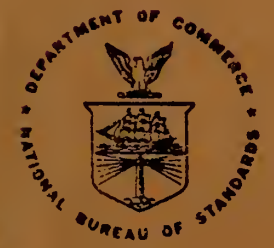

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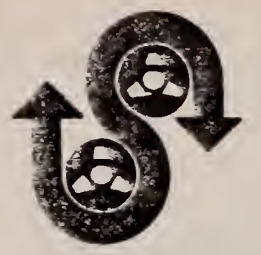

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INITIAL GRAPHICS EXCHANGE SPECIFICATION TEST LIBRARY, VERSION 1.3

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IGES Test, Evaluate & Support Committee

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U.S. DEPARTMENT OF COMMERCE, Malcolm Baldrige, *Secretary*
NATIONAL BUREAU OF STANDARDS, Ernest Ambler, *Director*

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1.0 INTRODUCTION

This document contains a library of benchmark tests to be used to verify the interface capability possible with the Initial Graphics Exchange Specification (IGES) (Reference A). IGES provides a common data format to facilitate the exchange of data between different Computer Aided Design/Computer Aided Manufacturing (CAD/CAM) systems.

The test cases outlined in this document provide data for software modules which translate IGES format to and from the format of a particular CAD/CAM system. The geometric and drafting entities contained in these parts comprise only a limited portion of all IGES entities and are intended to demonstrate some capabilities of an IGES translator on an individual entity basis. This set of tests does not constitute a test of compliance with any existing or proposed standardization of IGES. Subsequent tests with more complex parts should be made to insure the suitability of the processors for a user's production environment.

The library has been prepared by the IGES Test, Evaluate, and Support Committee and has been iterated through several versions during its development. Test Library Versions 1.0, 1.1, and 1.2 were made available only to Test, Evaluate, and Support Committee members for verification of accuracy and to evaluate the utility of individual cases. During this process, many cases and the associated documentation were modified to address errors, make the case more useful, or clarify the supporting documentation. Version 1.3 represents the results of this effort, and is the first version of the Test Library to be made available to the general community. Future versions will incorporate additional cases and address any reported errors.

While the Test, Evaluate, and Support Committee has attempted to remove all errors from this library, no responsibility or liability is accepted by IGES, by members of IGES committees, or by firms represented in IGES for decisions made on the basis of the use of these test cases.

2.0 TEST METHODOLOGY

2.1 TEST OBJECTIVES

The objective of this series of tests is to demonstrate the ability of CAD/CAM systems to accept data in IGES format and transform the data into a format compatible with the receiving CAD/CAM system without significant loss of data accuracy or design intent.

The intended users of IGES span a wide range of applications, each having differing requirements on the data retrieved from IGES format. Each application's requirements will determine what constitutes acceptable results from these tests. Due to a wide range of requirements, no acceptance criteria are given and it is left to each user to determine if the results of these tests are acceptable in his environment.

Each entity listed in Section 3.0 will be tested individually and in combination with other entities to verify the ability of the CAD/CAM system to process the IGES entity. Each test case will contain a variety of examples of the entity such as a wide range of coordinate values, rotations, intersecting entities, non-model definition spaces, various fonts, various text/arrow configurations, and complex sub-entity arrangements.

2.2 TEST PROCEDURE

While IGES does not endorse any explicit testing and evaluation procedures, the parts in this library are intended as input to a software module which translates IGES format to the format of a particular CAD/CAM system. The output of this module will be a set of parts in the native format of the receiving system. In order to evaluate the conversion, the user will have to develop evaluation techniques and acceptance criteria suited to the user's needs. This criteria may include a combination of usability and functionality of the entities created, retention of design intent, visual display, and numeric comparison of parameter data. None of these by themselves is, in general, a complete or accurate evaluation criterion. Different users will have differing circumstances in which IGES will be utilized. These may

range from a single pre-processor and post-processor to several of each. Figure 2.2-1 illustrates a very simple test flow which transfers a test case once through a post-processor and once through a pre-processor. Evaluators must decide for themselves at what points evaluation will be performed. They must also decide whether they will evaluate upon a single pass or multiple loops through the pre- and post-processors. Users having more than one pre- and/or post-processor will have more than one route possible and must make their own selection of routes to evaluate. The visual and IGES formatted representations contained in this document are not "master definitions" which other representations should be compared against. Valid representations of the data in the test parts may be generated which differ substantially in parameterization from the examples in this document.

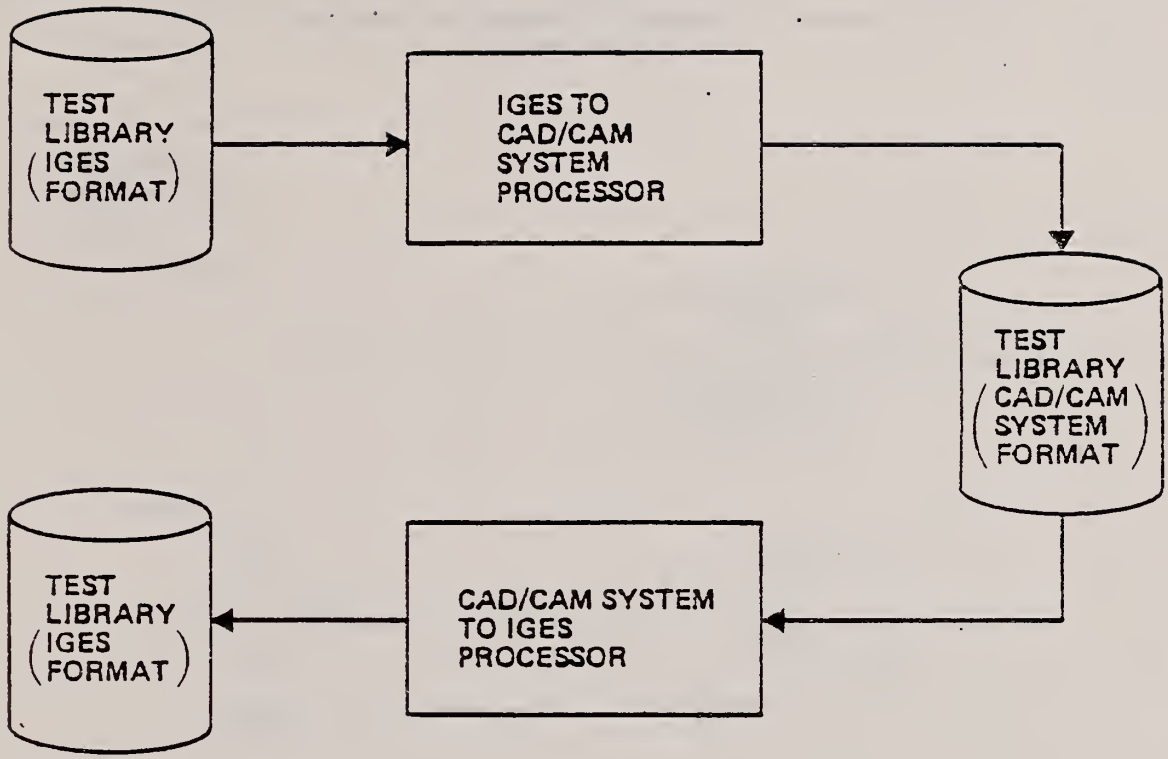

Figure 2.2-1 - Simple Test Flow

2.3 TEST CASE GENERATION

The majority of these test cases were developed within the Boeing CAD/CAM Integrated Information Network (CIIN) (Reference C) environment and transformed into IGES format through an IGES/CIIN post-processor. Additional cases were provided by participating CAD/CAM system developers. Figure 2.3-1 shows the data flow.

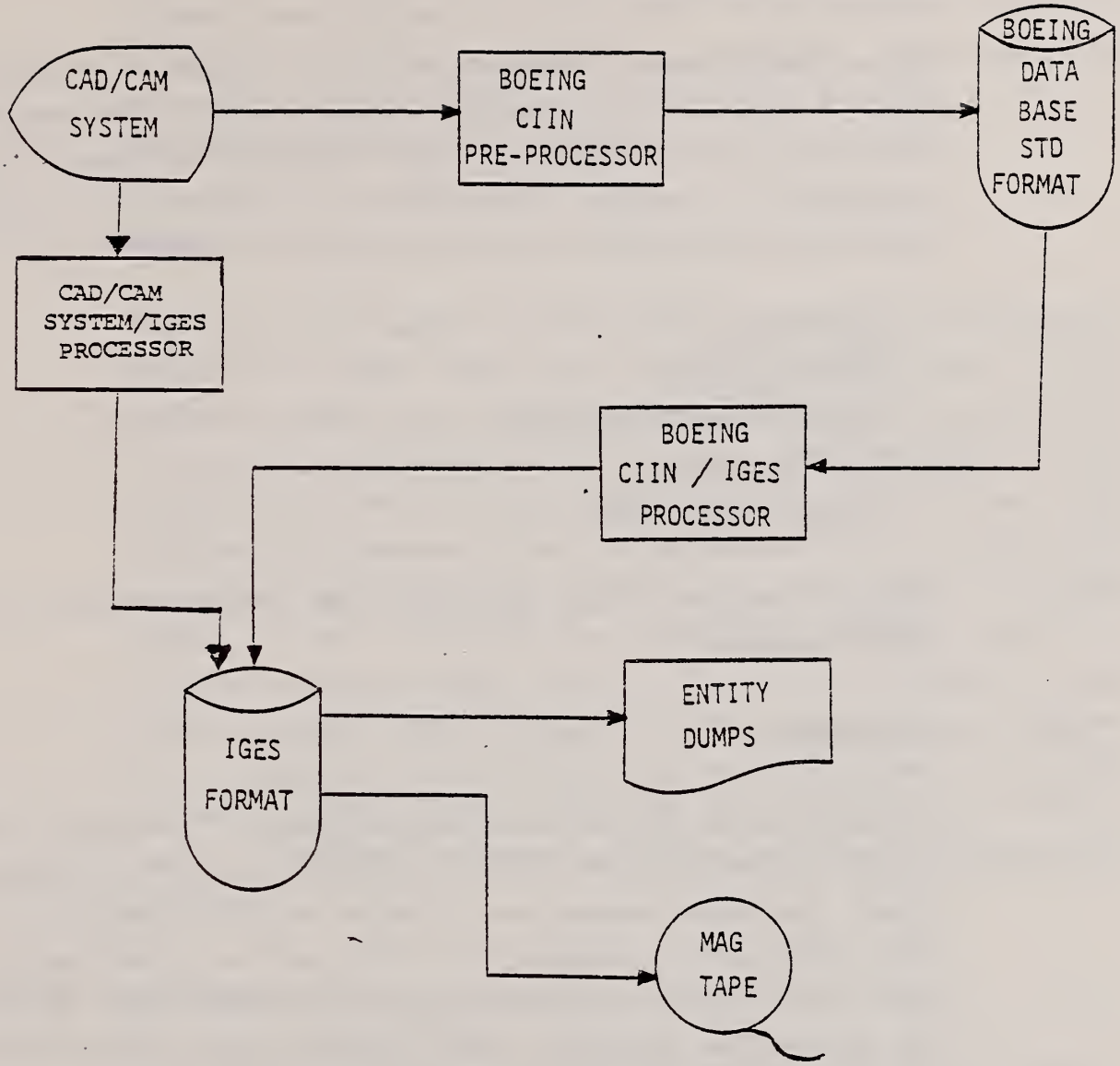

Figure 2.3-1 - Data Flow

2.4 TESTING LIMITATIONS

2.4.1 Validation of Test Cases

The test cases presented in this document have themselves on the date of issuance received only limited testing. Despite the efforts of the preparers and reviews by Test, Evaluate, and Support Committee undetected errors may persist in the test cases. Only extensive use of these files will reveal such errors. If any problems are found, they should be reported to

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Subsequent versions of this test library will attempt to correct any reported problems.

2.4.2 Completeness

This version of the IGES test library does not attempt to exhaustively test all IGES entities, attributes, associativities, properties, and combinations thereof. Each case addresses only a limited set of functionality and is largely independent of the other cases. The tests are rather general in nature and do not have any particular application thrust. In later versions this library will be extended to cover additional entities and attributes. Moreover, the test cases in these future versions will be organized into groups appropriate to the more common application areas. The inclusion or exclusion of a particular entity or attribute should not be interpreted as a statement of its relative usefulness. No attempt has been or will be made to establish a priority scheme in this area.

The initial set of test cases has been provided by a small number of sources. This may have caused some unintentional bias to be introduced into the test cases. This would be reflected not only in the specific

features chosen for testing but also the manner in which the features are tested. Even subtle choices such as range of coordinate values and viewing orientation can inadvertently affect the test cases. The software used to generate these files uses a limited range of numeric representations (i.e., in number of decimal places), of global parameter values, and in the sequencing of data. Further tests with data from a variety of different sources constitutes a more complete test.

2.4.3 Figures

The figures which appear in this document were derived from hardcopy taken from the CRT screen of the originating graphics system. These figures were appropriately scaled for viewing clarity and are therefore not a one-to-one representation of the data file. The appearance of small details such as line font pattern which appear in the file may have been distorted by this procedure. Even the appearance of actual geometry may be distorted as when relatively large and small items appear in the same figure. In order to reproduce these figures on the graphics screen of a CAD/CAM system processing these test cases it may be necessary to issue several viewing commands to achieve the same scale and viewing orientation. A simple visual comparison is not sufficient to accurately verify successful transfer of data. The intent of the figures is to provide a visually recognizable description of the test cases, not a "template" for evaluation.

2.4.4 Attributes

Some IGES attributes are not defined in geometric detail but rather in terms of the default values of the active CAD/CAM system. For example the line font parameter has value 1, 2, 3, or 4 for solid, dashed, phantom, and centerline font respectively. The spacing and line pattern for the last three forms may vary from graphics system to graphics system and are not defined in the IGES specification. Therefore some changes in the appearance of line font may be introduced when transferring from system A to system B but such a change would not be due to a processor error. Other attributes which fall into this category include line weight and text

font. The figures which appear in the document were generated on a specific CAD/CAM system. This should not be interpreted as an endorsement by IGES of that specific implementation of these attributes.

2.4.5 Compound Test

Even though the test cases presented in this document are limited in scope, each case addresses multiple functionality. For example the transfer of a geometric entity is frequently tied with its cosmetic appearance e.g., line font. In the majority of cases, the multiplicity is limited to an entity and its attributes. Careful examination of the output of an IGES processor is required to determine whether all aspects of the test case have been successfully transferred. Conversely a cursory or simple visual examination of output may lead to erroneous conclusions on completeness of data transfer. It is up to each individual user to decide the relative importance of each feature.

2.4.6 Numeric Accuracy

The internal representation of geometric entities in the various CAD/CAM systems differ greatly among themselves and also from the IGES representation. Therefore in transferring data to or from IGES format, calculations must be performed on the source representation in order to achieve the target representation. In the course of this procedure some computational inaccuracies may be introduced. Parameters which identically match in one representation may differ slightly in a second representation. Parameters with zero value in one representation may have small non-zero values in another representation. Within the parameter data of some entities in the test library, two values intended to be identical may differ by some small amount. For example, the start and terminate points of a curve intended to be closed may not have identical coordinate values. Further, these small representational inaccuracies may lead to boundary points for mathematical curves that do not lie exactly on those curves. Sophisticated numerical analysis techniques may be required to reduce the adverse effects of this problem. Careful examination of the output of IGES processors is required to detect such problems and even more detailed

analysis is needed to determine the point where the error may have been introduced.

2.4.7 System Incompatibilities

There is a significant amount of overlap of functionality provided by the various CAD/CAM systems. However, the user interfaces and internal data representation employed to support this common functionality differ greatly among these systems and also from IGES. A given graphics system may provide perfectly acceptable functionality to its user community without having a direct correspondence to each and every IGES entity, property, and associativity. An obvious example would be an electronics system which did not support ruled and parametric spline surfaces. Conversely data which does reside in a given graphics system may have no corresponding entity, property, or associativity in IGES to directly map into. The inclusion or exclusion of a specific data type in the specifications should not be interpreted as a statement by IGES on its relative merits.

When an IGES pre-processor encounters an entity in the native data base which has no equivalent IGES entity, it has two basic choices. It can ignore the information or convert it to one or more IGES entities. The user-defined IGES entities (macro, associativity and property) will be useful in this context.

When an IGES post-processor encounters an entity in the IGES file which has no equivalent entity in its native data base, it has two basic choices. It can either discard the data or store it in an "equivalent" form in the target system. There are no hard and fast IGES rules for determining what is an appropriate "equivalent" representation. It is up to each user to determine whether data has been adequately captured in the target system. It is also a subjective judgment whether any loss of data or transformation of data is acceptable in a given user environment.

A user may minimize this type of problem by eliminating or restricting the usage of features and data structures in one system which have little or no

correspondence in a second system into which it is intended to transfer data via IGES. Future extensions to IGES will also help alleviate this type of problem.

3.0 TEST LIBRARY STRUCTURE

For each entity type, one or more test cases are provided:

- Case 1 contains multiple occurrences of the entity in a definition space which coincides with model space (XYZ). Several different variations of the entity are provided.
- Case 2 is identical to the first except the entities are in a non-model definition space (XT, YT, ZT).
- Case 3 contains unusual or extreme examples of the entity.
- Case 4 is identical to the third case except it is in a non-model definition space.

For each entity a figure for the test case with descriptive annotation is given along with a figure of the actual test case. The descriptive annotation is not part of the test case and will not be present in the IGES file.

The following conventions are followed for the test cases:

- Test cases contain only the entities being tested
- Test cases contain values (coordinates and coefficients) with magnitudes from 0 to 1000 except for the point case where larger magnitudes were used
- All transformation matrices have zero translation components
- All text originates from Computervision CADDS-3 Rev. 10.020V6B
- No provision made for properties

The test cases contain geometric and drafting entities defined in an appropriate coordinate system, but do not include the IGES Drawing or View entities. All figures in this document have a viewing orientation corresponding to looking along the positive ZT axis toward the origin of the unrotated XT-YT plane (right-handed coordinate system). Thus the figures for the model and non-model definition space cases are identical when viewed from the appropriate orientation. The regeneration of the

appropriate orientation is left to the user interface of the particular system using, if necessary, the orientation information given with the case description. This information consists of a series of rotations which will move the model relative to the user's viewing perspective. The rotations are described by an ordered triple (A,B,C) where the values are rotation angles measured in degrees. For example, an orientation of (30^{o}, 60^{o}, 90^{o}) means the user must enter the commands to rotate the model relative to the user's viewing perspective as follows:

- Begin with a viewing orientation corresponding to looking along the positive Z axis toward the origin of the unrotated X-Y plane (right-handed coordinate system).

- First, 30^{o} top out, bottom in

- Second, 60^{o} left out, right in

- Third, 90^{o} counter clockwise

These orientation descriptions are for use as an aid to the user in reaching a viewing orientation similar to the figure in the document and do not supercede the IGES transformation matrix entity.

3.1 ENTITY SET

The following IGES geometric entities are contained in this library:

- Circular Arc (entity #100)
- Composite Entity (entity #102)
- Conic (entity #104) FORM 1, 2, 3
- Copious Data Entity (entity #106) FORM 11, 12, 13, 40
- Line (entity #110)
- Parametric Spline (entity #112)
  - Cubic Splines
  - Wilson Fowler Splines
  - Modified Wilson Fowler Splines

B-spline

- Point (entity #116)
- Transformation Matrix (entity #124)

The following IGES annotation entities are contained:

- Angular Dimension (entity #202)
- Diameter Dimension (entity #206)
- General Label (entity #210)
- General Note (entity #212)
- Leader (entity #214)
- Linear Dimension (entity #216)
- Radius Dimension (entity #222)

The IGES structural entity Associativity Instance (FORM #1) is also contained.

Section 3.3 describes the individual tests to be performed. For each test an explanation of the test case and a corresponding IGES formatted definition are given.

3.2 ENTITY ATTRIBUTES

The following IGES features (attributes) are contained in this library:

- Line Fonts
- Levels
- Entity Labels/Subscript
- Blanked Status

3.3 TEST CASES

NOTE: Some test cases contain zero values in the DE Reserved fields (16 and 17)

3.3.1 Circular Arc

- Case 1 (Figures 3.3.1-1 and 3.3.1-2) tests the following items:
  - Full circles
  - Fonted circles (solid, dashed, phantom, centerline)
  - Arcs

- Case 2
  - Identical to Case 1 except non-model space is used with rotation (30°, 60°, 90°) per section 3.0

- Case 3 (Figures 3.3.1-3 and 3.3.1-4) tests the following:
  - Large circle (diameter = 1000 in)
  - Small circle (diameter = 0.01 in)

- Case 4
  - Identical to Case 3 except non-model space is used with rotation (60°, 120°, -60°) per section 3.0

NOTE: Circle entities that appear closed may have start and terminate points which are not identical but which differ by 10^{4}

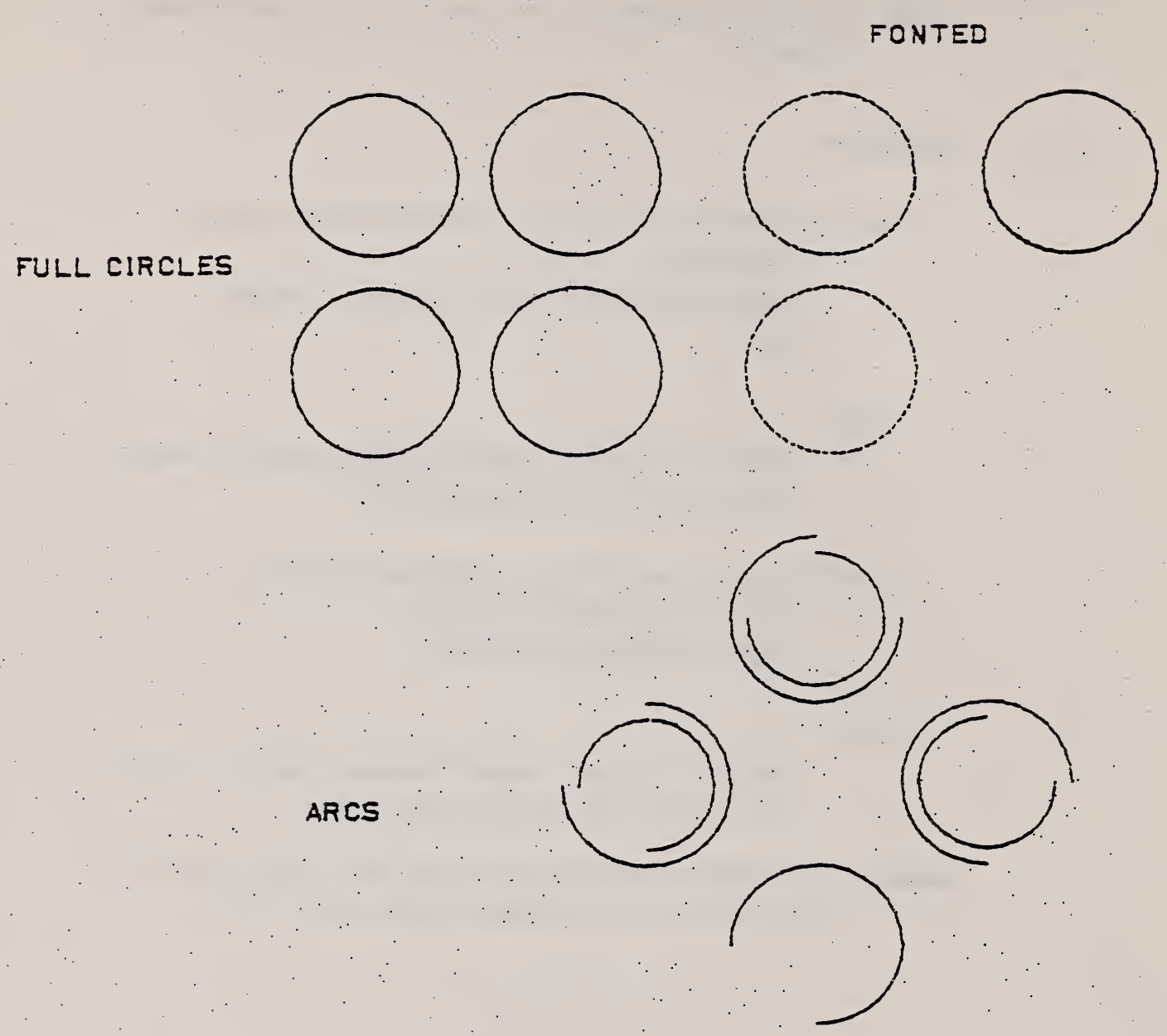

Figure 3.3.1-1 Circular Arc Cases 1 and 2 (with annotation)
Case 1: Rotation (0^{o}, 0^{o}, 0^{o})
Case 2: Rotation (30^{o}, 60^{o}, 90^{o})

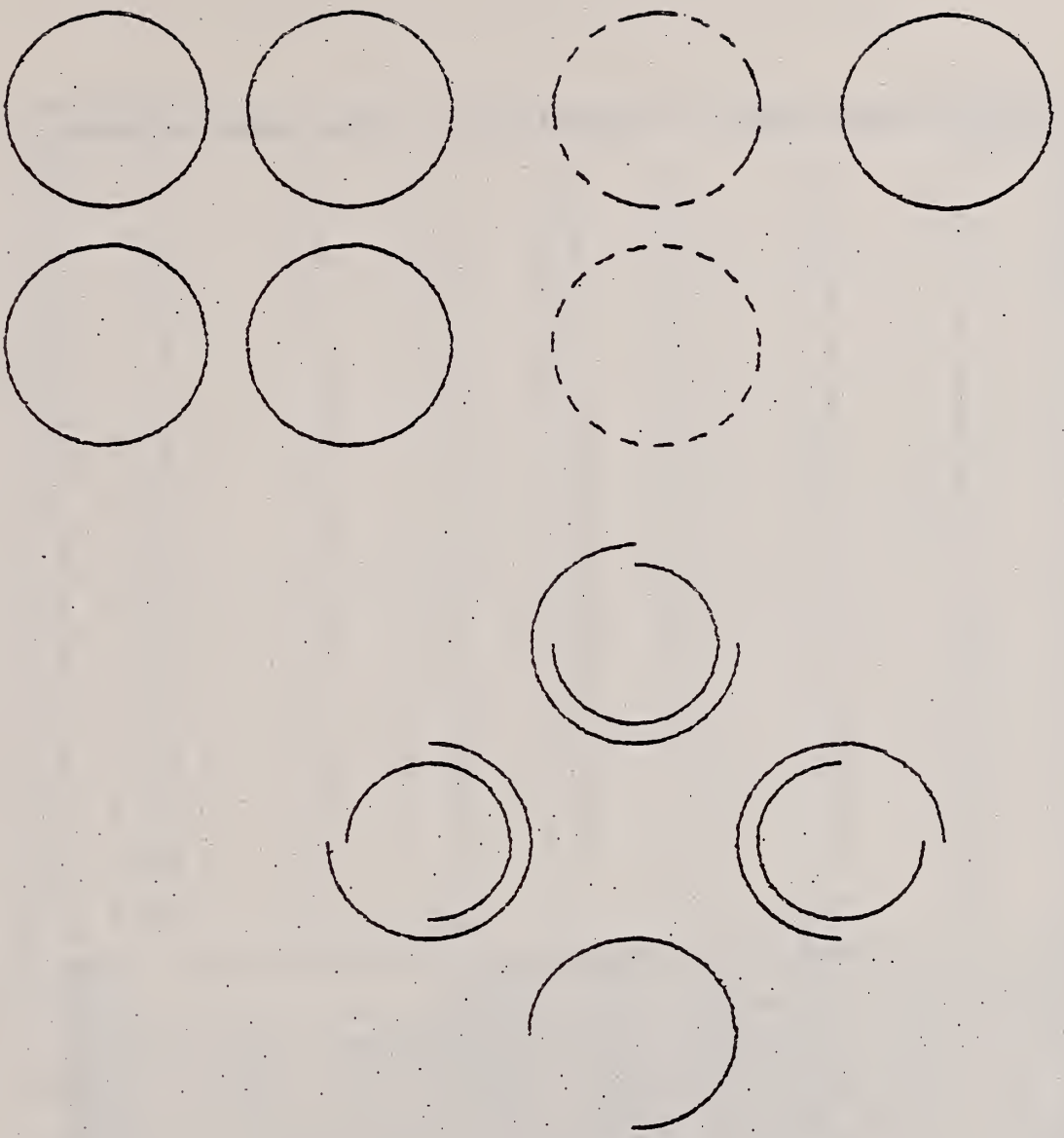

Figure 3.3.1-2 Circular Arc Cases 1 and 2 (actual part)

```
CIRCLE TEST CASE 1                                                              S       1
1H,,1H;,,7HCIRCLE1,4HCIIN,6H2.1.2 ,16,8,24,8,56,,1.000,1,4HINCH,0,,13H81G       1
0714.092244,,,,;                                                                G       2
     124        1        1        1        0        0        0        0 0 0 0  D       1
     124        0        0        1        0        0        0                 0D      2
     100        2        1        1        0        0        1        0 0 0 0  D       3
     100        0        0        1        0        0        0                 0D      4
     100        3        1        1        0        0        1        0 0 0 0  D       5
     100        0        0        1        0        0        0                 0D      6
     100        4        1        1        0        0        1        0 0 0 0  D       7
     100        0        0        1        0        0        0                 0D      8
     100        5        1        1        0        0        1        0 0 0 0  D       9
     100        0        0        1        0        0        0                 0D      10
     100        6        1        3        0        0        1        0 0 0 0  D       11
     100        0        0        1        0        0        0                 0D      12
     100        7        1        2        0        0        1        0 0 0 0  D       13
     100        0        0        1        0        0        0                 0D      14
     100        8        1        4        0        0        1        0 0 0 0  D       15
     100        0        0        1        0        0        0                 0D      16
     100        9        1        1        0        0        1        0 0 0 0  D       17
     100        0        0        1        0        0        0                 0D      18
     100       10        1        1        0        0        1        0 0 0 0  D       19
     100        0        0        1        0        0        0                 0D      20
     100       11        1        1        0        0        1        0 0 0 0  D       21
     100        0        0        1        0        0        0                 0D      22
     100       12        1        1        0        0        1        0 0 0 0  D       23
     100        0        0        1        0        0        0                 0D      24
     100       13        1        1        0        0        1        0 0 0 0  D       25
     100        0        0        1        0        0        0                 0D      26
     100       14        1        1        0        0        1        0 0 0 0  D       27
     100        0        0        1        0        0        0                 0D      28
     100       15        1        1        0        0        1        0 0 0 0  D       29
     100        0        0        1        0        0        0                 0D      30
124,1.000,0.0,0.0,0.0,0.0,1.000,0.0,0.0,0.0,0.0,1.000,0.0,0,0;                  1P      1
100,0.0,6.000,6.000,11.000,6.000,11.000,6.000,0,0;                              3P      2
100,0.0,-6.000,6.000,-1.000,6.000,-1.000,6.000,0,0;                             5P      3
100,0.0,-6.000,-6.000,-1.000,-6.000,-1.000,-6.000,0,0;                          7P      4
100,0.0,6.000,-6.000,11.000,-6.000,11.000,-6.000,0,0;                           9P      5
100,0.0,21.000,6.000,26.000,6.000,26.000,6.000,0,0;                            11P     6
100,0.0,21.000,-6.000,26.000,-6.000,26.000,-6.000,0,0;                         13P     7
100,0.0,35.000,6.000,40.000,6.000,40.000,6.000,0,0;                            15P     8
100,0.0,30.000,-31.000,35.000,-31.000,30.000,-36.000,0,0;                      17P     9
100,0.0,20.000,-21.000,20.000,-16.000,25.000,-21.000,0,0;                      19P     10
100,0.0,10.000,-31.000,5.000,-31.000,10.000,-26.000,0,0;                       21P     11
100,0.0,20.000,-41.000,20.000,-46.000,15.000,-41.000,0,0;                      23P     12
100,0.0,30.000,-31.000,30.000,-27.000,34.000,-31.000,0,0;                      25P     13
100,0.0,20.000,-21.000,16.000,-21.000,20.000,-17.000,0,0;                      27P     14
100,0.0,10.000,-31.000,10.000,-35.000,6.000,-31.000,0,0;                       29P     15
S       1G       2D      30P      15                                            T       1
```

```
CIRCLE TEST CASE 2                                                              S       1
1H,,1H;,,7HCIRCLE2,4HCIIN,6H2.1.2 ,16,8,24,8,56,,1.0000,1,4HINCH,0,,13H8G       1
10714.092709,,,,;                                                               G       2
     124       1       1       1       0       0       0       0 0 0 0  D      1
     124       0       0       2       0       0       0                0D     2
     100       3       1       1       0       0       1       0 0 0 0  D      3
     100       0       0       1       0       0       0                0D     4
     100       4       1       1       0       0       1       0 0 0 0  D      5
     100       0       0       1       0       0       0                0D     6
     100       5       1       1       0       0       1       0 0 0 0  D      7
     100       0       0       1       0       0       0                0D     8
     100       6       1       1       0       0       1       0 0 0 0  D      9
     100       0       0       1       0       0       0                0D     10
     100       7       1       3       0       0       1       0 0 0 0  D      11
     100       0       0       1       0       0       0                0D     12
     100       8       1       2       0       0       1       0 0 0 0  D      13
     100       0       0       1       0       0       0                0D     14
     100       9       1       4       0       0       1       0 0 0 0  D      15
     100       0       0       1       0       0       0                0D     16
     100      10       1       1       0       0       1       0 0 0 0  D      17
     100       0       0       1       0       0       0                0D     18
     100      11       1       1       0       0       1       0 0 0 0  D      19
     100       0       0       1       0       0       0                0D     20
     100      12       1       1       0       0       1       0 0 0 0  D      21
     100       0       0       1       0       0       0                0D     22
     100      13       1       1       0       0       1       0 0 0 0  D      23
     100       0       0       1       0       0       0                0D     24
     100      14       1       1       0       0       1       0 0 0 0  D      25
     100       0       0       1       0       0       0                0D     26
     100      15       1       1       0       0       1       0 0 0 0  D      27
     100       0       0       1       0       0       0                0D     28
     100      16       1       1       0       0       I       0 0 0 0  D      29
     100       0       0       1       0       0       0                0D     30
124,0.0,.5000,-.8660,0.0,-.8660,.4330,.2500,0.0,.5000,.7500,                    1P      1
.4330,0.0,0,0;                                                                  1P      2
100,0.0,6.0000,6.0000,11.0000,6.0000,11.0000,6.0000,0,0;                        3P      3
100,0.0,-6.0000,6.0000,-1.0000,6.0000,-1.0000,6.0000,0,0;                       5P      4
100,0.0,-6.0000,-6.0000,-1.0000,-6.0000,-1.0000,-6.0000,0,0;                    7P      5
100,0.0,6.0000,-6.0000,11.0000,-6.0000,11.0000,-6.0000,0,0;                     9P      6
100,0.0,21.0000,6.0000,26.0000,6.0000,26.0000,6.0000,0,0;                       11P     7
100,0.0,21.0000,-6.0000,26.0000,-6.0000,26.0000,-6.0000,0,0;                    13P     8
100,0.0,35.0000,6.0000,40.0000,6.0000,40.0000,6.0000,0,0;                       15P     9
100,0.0,30.0000,-31.0000,35.0000,-31.0000,30.0000,-36.0000,0,0;                 17P     10
100,0.0,20.0000,-21.0000,20.0000,-16.0000,25.0000,-21.0000,0,0;                 19P     11
100,0.0,10.0000,-31.0000,5.0000,-31.0000,10.0000,-26.0000,0,0;                  21P     12
100,0.0,20.0000,-41.0000,20.0000,-46.0000,15.0000,-41.0000,0,0;                 23P     13
100,0.0,30.0000,-31.0000,30.0000,-27.0000,34.0000,-31.0000,0,0;                 25P     14
100,0.0,20.0000,-21.0000,16.0000,-21.0000,20.0000,-17.0000,0,0;                 27P     15
100,0.0,10.0000,-31.0000,10.0000,-35.0000,6.0000,-31.0000,0,0;                  29P     16
S      1G      2D     30P     16                                                T       1
```

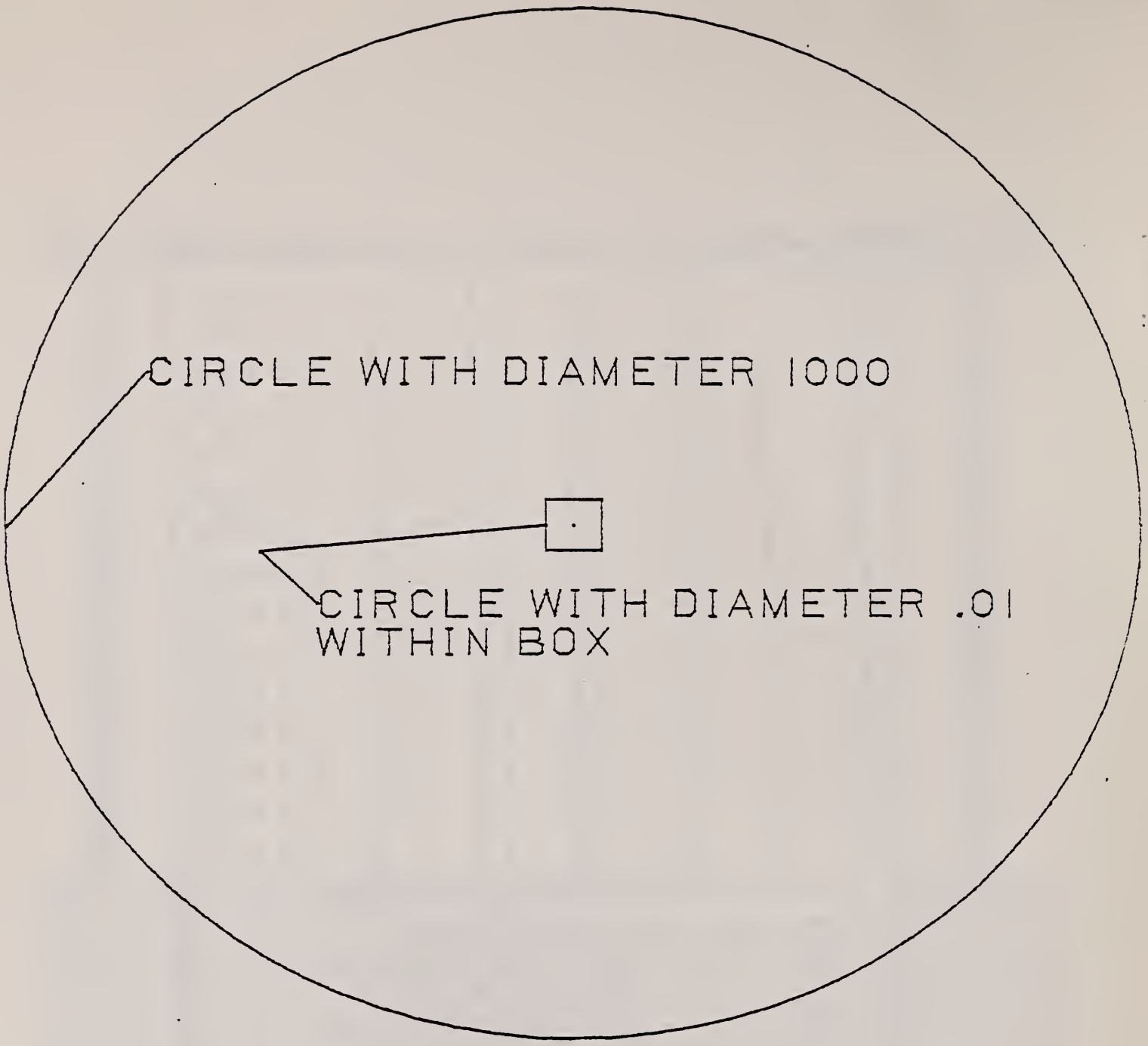

Figure 3.3.1-3 Circular Arc Cases 3 and 4 (with annotation)
Case 3: Rotation (0°, 0°, 0°)
Case 4: Rotation (60°, 120°, -60°)

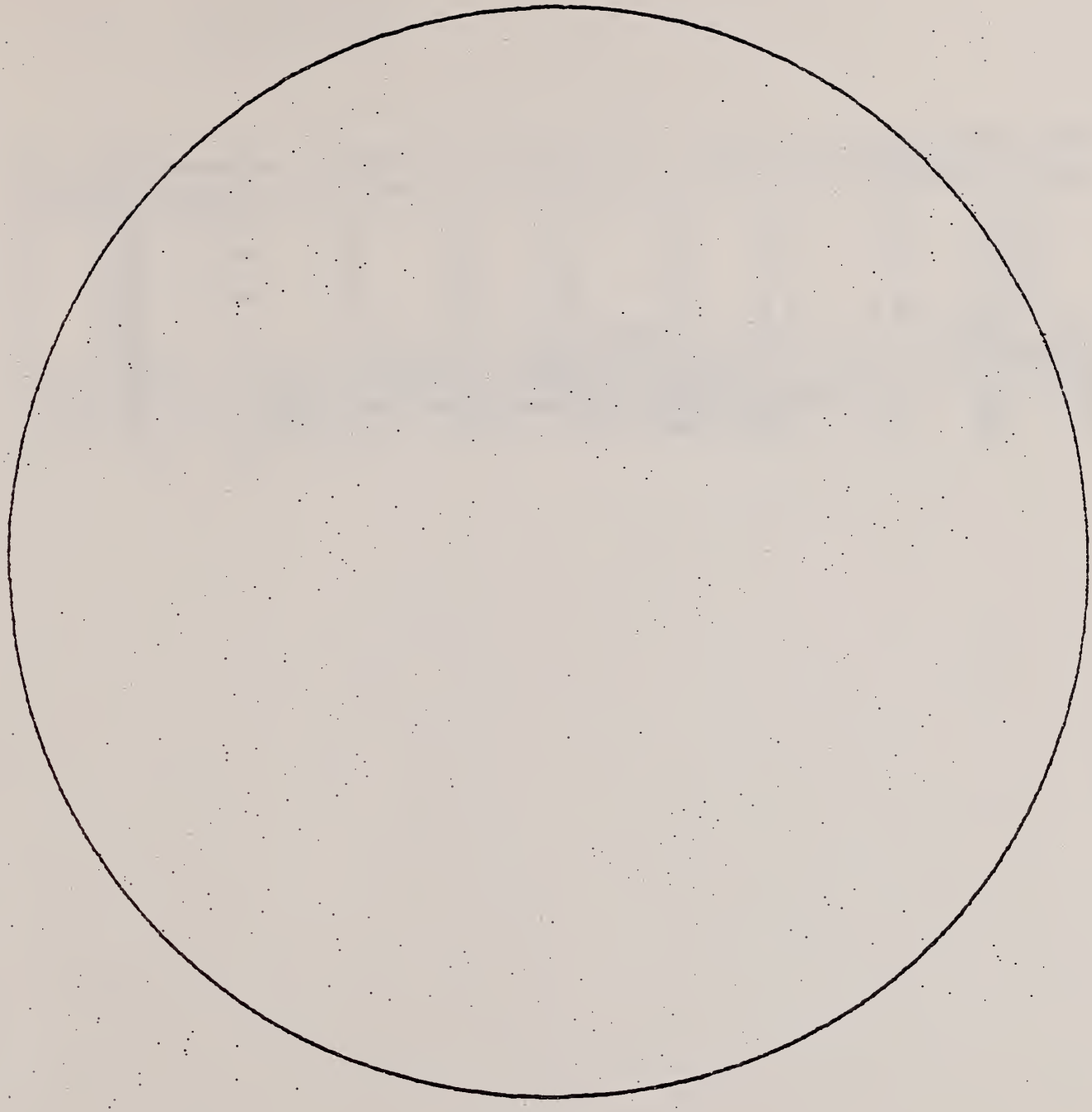

Figure 3.3.1-4 Circular Arc Cases 3 and 4 (actual part)

```
CIRCLE TEST CASE 3                                                              S       1
1H,,1H;,,7HCIRCLE3,4HCIIN,6H2.1.2 ,16,8,24,8,56,,1.0000000,1,4HINCH,0,,1G       1
3H810713.191302,,,,;                                                            G       2
     124       1       1       1       0       0       0       0 0 0 0  D      1
     124       0       0       2       0       0       0                0D     2
     100       3       1       1       0       0       1       0 0 0 0  D      3
     100       0       0       1       0       0       0                0D     4
     100       4       1       1       0       0       1       0 0 0 0  D      5
     100       0       0       1       0       0       0                0D     6
124,1.0000000,0.0,0.0,0.0,0.0,1.0000000,0.0,0.0,0.0,0.0,                       1P      1
1.0000000,0.0,0,0;                                                              1P      2
100,0.0,0.0,0.0,500.0000000,0.0,500.0000000,-.0003894,0,0;                      3P      3
100,0.0,0.0,0.0,.0050000,0.0,.0050000,-.3894144E-08,0,0;                        5P      4
S       1G      2D      6P      4                                               T       1
```

```
CIRCLE TEST CASE 4                                                      S       1
1H,,1H;,,7HCIRCLE4,4HCIIN,6H2.1.2 ,16,8,24,8,56,,1.0000000,1,4HINCH,0,,1G       1
3H810713.191408,,,,;                                                    G       2
     124       1       1       1       0       0       0       0 0 0 0  D       1
     124       0       0       2       0       0       0                0D      2
     100       3       1       1       0       0       1       0 0 0 0  D       3
     100       0       0       1       0       0       0                0D      4
     100       4       1       1       0       0       1       0 0 0 0  D       5
     100       0       0       1       0       0       0                0D      6
124,-.2499999,.4330126,-.8660254,0.0,.8080128,-.3995191,                1P      1
-.4330126,0.0,-.5334937,-.8080127,-.2500000,0.0,0,0;                    1P      2
100,0.0,0.0,0.0,500.0000000,0.0,500.0000000,-.0003894,0,0;              3P      3
100,0.0,0.0,0.0,.0050000,0.0,.0050000,-.3894144E-08,0,0;                5P      4
S      1G      2D      6P      4                                        T       1
```

3.3.2 Composite Entity

Case 1 (Figures 3.3.2-1 and 3.3.2-2) tests the following:

- Composite entities with the following subentities:
  - 5 lines
  - 2 circular arcs
  - 1 cubic spline

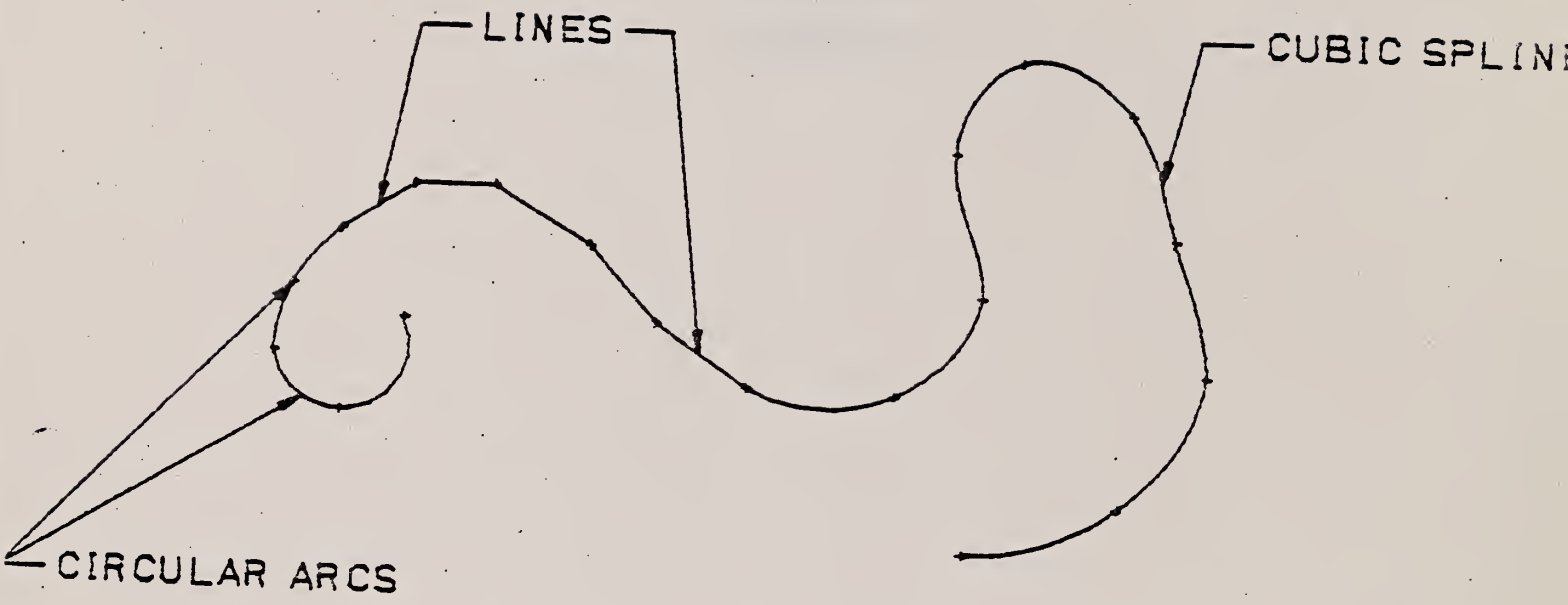

Figure 3.3.2-1 Composite Entity Case 1 (with annotation)
Case 1: Rotation (0°, 0°, 0°)

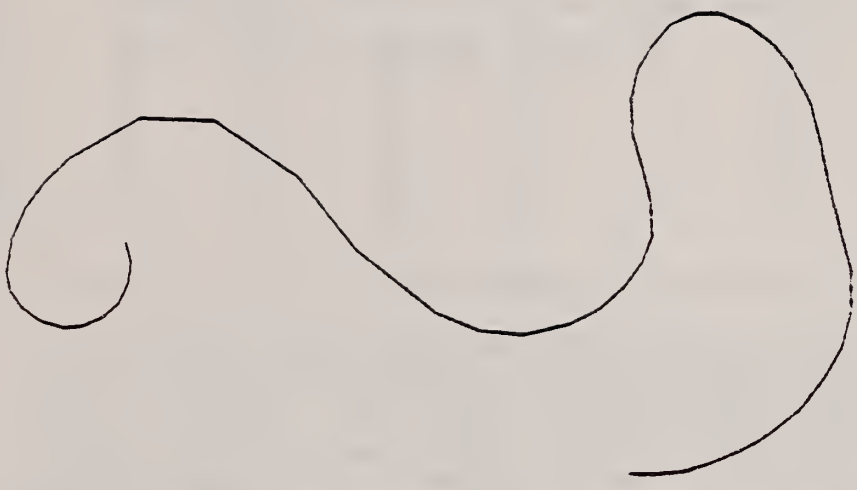

Figure 3.3.2-2 Composite Entity Case 1 (actual part)

```
COMPOSITE ENTITY TEST CASE 1                                                    S       1
1H,,1H;,,5HCOMP1,4HCIIN,6H2.1.2 ,16,8,24,8,56,,1.00000,1,4HINCH,0,,13H8912G       1
0912.145333,,,,;                                                                G       2
     102        1        1        1        0        0        0        0 0 0 0  D       1
     102        0        0        2        0        0        0                 0D      2
     124        3        1        1        0        0        0        0 0 0 0  D       3
     124        0        0        2        0        0        0     MTX1        0D      4
     112        5        1        1        0        0        3        0 0 1 0  D       5
     112        0        0       15        0        0        0      CS1        0D      6
     110       20        1        1        0        0        0        0 0 1 0  D       7
     110        0        0        1        0        0        0       L1          0D      8
     110       21        1        1        0        0        0        0 0 1 0  D       9
     110        0        0        1        0        0        0       L2          0D      10
     110       22        1        1        0        0        0        0 0 1 0  D       11
     110        0        0        1        0        0        0       L3          0D      12
     110       23        1        1        0        0        0        0 0 1 0  D       13
     110        0        0        1        0        0        0       L4          0D      14
     110       24        1        1        0        0        0        0 0 1 0  D       15
     110        0        0        1        0        0        0       L5          0D      16
     100       25        1        1        0        0        3        0 0 1 0  D       17
     100        0        0        1        0        0        0       C1          0D      18
     100       26        1        1        0        0        3        0 0 1 0  D       19
     100        0        0        1        0        0        0       C2          0D      20
102,8,     5,     7,     9,     11,    13,    15,    17,    19,0,                  1P      1
0;                                                                              1P      2
124,1.00000,0.0,0.0,0.0,0.0,1.00000,0.0,0.0,0.0,0.0,1.00000,0.0,               3P      3
0,0;                                                                            3P      4
112,3,0,3,10,0.0,1.02466,2.05777,2.97944,3.85023,4.61964,                      5P      5
5.35851,6.33129,7.18463,8.12094,8.12094,5.57600,.99989,.00585,                 5P      6
-.03527,1.61600,-.01453,.35191,-.01727,0.0,0.0,0.0,0.0,6.54400,                5P      7
.82834,-.17328,-.12953,1.95200,.65223,.29881,-.09500,0.0,0.0,                  5P      8
0.0,0.0,7.07200,.05556,-.57473,.28229,2.84000,.96545,.00437,                   5P      9
.00315,0.0,0.0,0.0,0.0,6.85600,-.28448,.20579,-.32156,3.73600,                 5P      10
.98153,.01307,-.07362,0.0,0.0,0.0,0.0,6.55200,-.65756,-.63423,                 5P      11
.40704,4.55200,.83681,-.17926,-.46045,0.0,0.0,0.0,0.0,5.85600,                 5P      12
-.91064,.30531,.24335,4.88000,-.25680,-1.24210,.62433,0.0,0.0,                 5P      13
0.0,0.0,5.44800,-.06091,.84473,-.58673,4.26400,-1.06979,.14179,                5P      14
-.04943,0.0,0.0,0.0,0.0,5.64800,-.08313,-.86756,.26824,3.31200,                5P      15
-.93426,-.00247,.21733,0.0,0.0,0.0,0.0,5.11200,-.97778,-.19085,                5P      16
.16818,2.64800,-.46371,.55389,-.03339,0.0,0.0,0.0,0.0,4.17600,                 5P      17
0.0,0.0,0.0,2.67200,0.0,0.0,0.0,0.0,0.0,0.0,0.0,4.17600,0.0,0.0,               5P      18
0.0,2.67200,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0,0;                               5P      19
110,4.17600,2.67200,0.0,3.59200,3.08000,0.0,0,0;                               7P      20
110,3.59200,3.08000,0.0,3.16000,3.57600,0.0,0,0;                               9P      21
110,3.16000,3.57600,0.0,2.53600,3.95200,0.0,0,0;                               11P     22
110,2.53600,3.95200,0.0,2.02400,3.94400,0.0,0,0;                               13P     23
110,2.02400,3.94400,0.0,1.56000,3.63200,0.0,0,0;                               15P     24
100,0.0,2.23906,2.78276,1.56000,3.63200,1.15200,2.80800,0,0;                   17P     25
100,0.0,1.58626,2.87073,1.15200,2.80800,1.98400,3.05600,0,0;                   19P     26
S      1G      2D     20P     26                                                T       1
```

3.3.3 Conic

- Case 1 (Figures 3.3.3-1 and 3.3.3-2) tests the following:
  - Closed and partial ellipses (FORM 1)
  - Ellipses with fonts (solid, dashed, phantom, centerline)
  - Symmetric and partial parabolas (FORM 3)
  - Parabolas with fonts (solid, dashed, phantom, centerline)
  - Symmetric and partial hyperbolas (FORM 2)
  - Hyperbolas with fonts (solid, dashed, phantom, centerline)

- Case 2
  - Identical to Case 1 except non-model space with rotation (33^{o}, 77^{o}, 99^{o}) is used per section 3.0

NOTE: The start and terminate point of the conic may not exactly lie on the conic curve but may differ by 10^{-4}

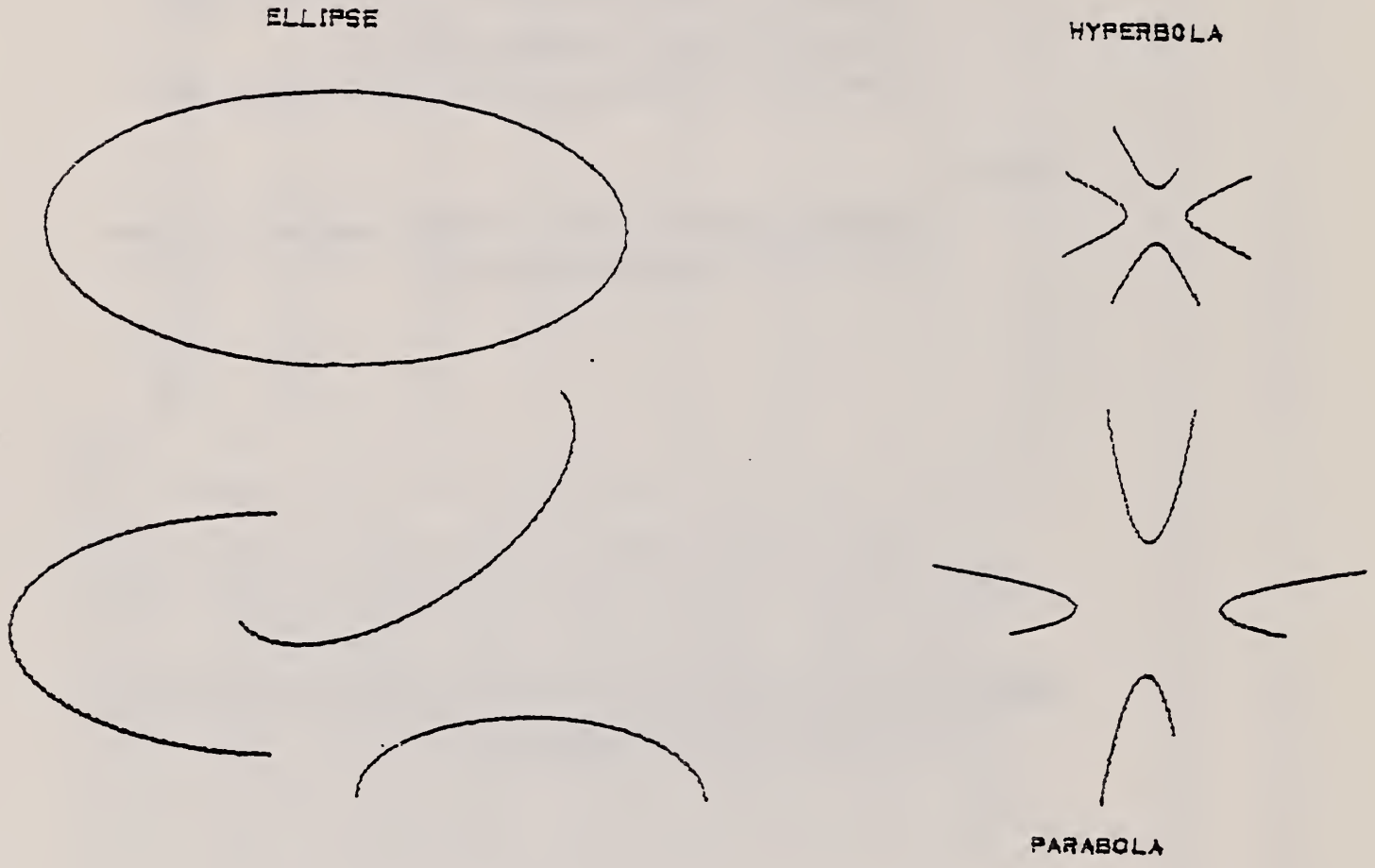

Figure 3.3.3-1 Conic Cases 1 and 2 (with annotation)
Case 1: Rotation (0°, 0°, 0°)
Case 2: Rotation (33°, 77°, 99°)

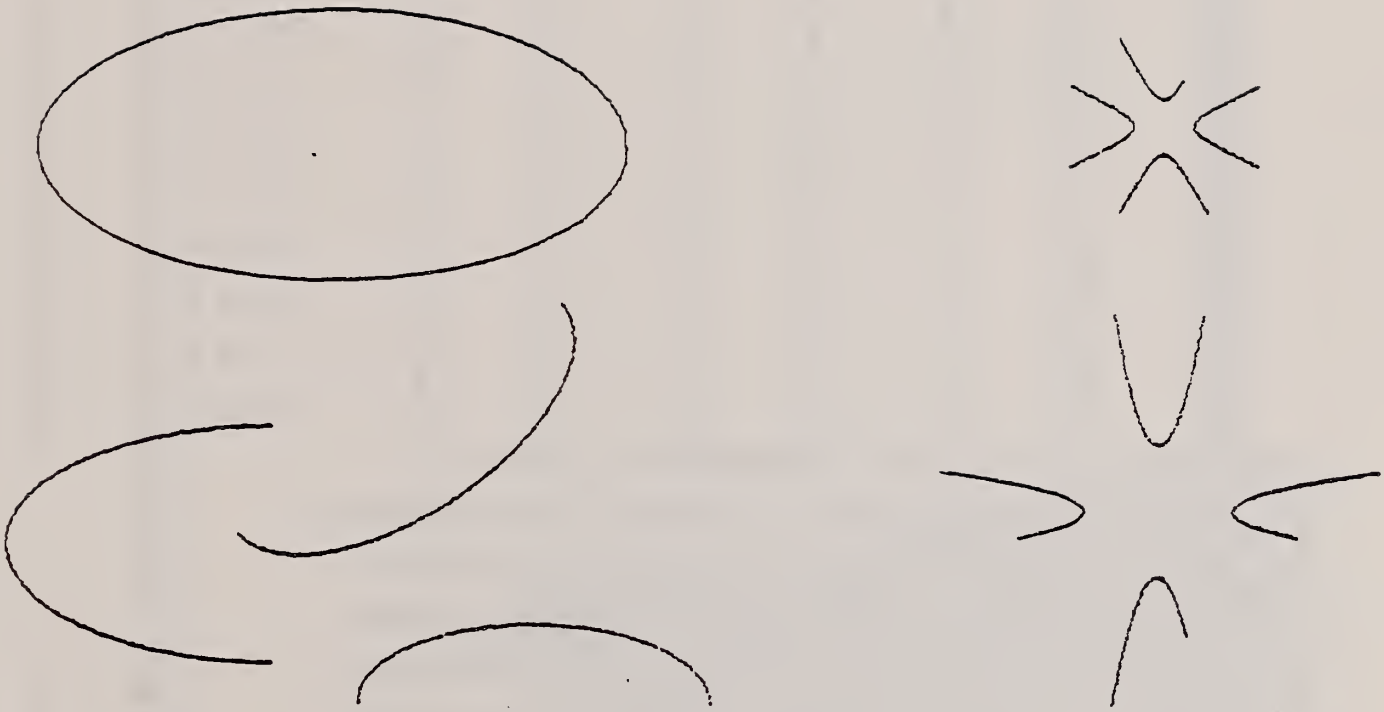

Figure 3.3.3-2 Conic Cases 1 and 2 (actual part)

```
CONIC TEST CASE 1                                                                S       1
1H,,1H;,,6HCONIC1,4HCIIN,6H2.1.2 ,16,8,24,8,56,,1.0000000,1,4HINCH,0,,          G       1
13H810713.191441,,,,;                                                            G       2
     124        1        1        0        0        0        0 0 0 0  D        1
     124        0        0        2        0        0        0                 0D       2
     104        3        1        1        0        0        1        0 0 0 0  D        3
     104        0        0        2        1        0        0                 0D       4
     104        5        1        4        0        0        1        0 0 0 0  D        5
     104        0        0        2        1        0        0                 0D       6
     104        7        1        3        0        0        1        0 0 0 0  D        7
     104        0        0        2        1        0        0                 0D       8
     104        9        1        2        0        0        1        0 0 0 0  D        9
     104        0        0        2        1        0        0                 0D      10
     104       11        1        4        0        0        1        0 0 0 0  D       11
     104        0        0        2        2        0        0                 0D      12
     104       13        1        1        0        0        1        0 0 0 0  D       13
     104        0        0        2        2        0        0                 0D      14
     104       15        1        2        0        0        1        0 0 0 0  D       15
     104        0        0        2        2        0        0                 0D      16
     104       17        1        3        0        0        1        0 0 0 0  D       17
     104        0        0        3        2        0        0                 0D      18
     104       20        1        3        0        0        1        0 0 0 0  D       19
     104        0        0        2        3        0        0                 0D      20
     104       22        1        2        0        0        1        0 0 0 0  D       21
     104        0        0        3        3        0        0                 0D      22
     104       25        1        1        0        0        1        0 0 0 0  D       23
     104        0        0        3        3        0        0                 0D      24
     104       28        1        4        0        0        1        0 0 0 0  D       25
     104        0        0        3        3        0        0                 0D      26
124,1.0000000,0.0,0.0,0.0,0.0,1.0000000,0.0,0.0,0.0,0.0,                         1P       1
1.0000000,0.0,0,0;                                                               1P       2
104,.0025000,0.0,.0100000,0.0,0.0,-1.0000000,0.0,20.0000000,0.0,                 3P       3
20.0000000,-.1907349E-04,0,0;                                                    3P       4
104,.0030864,0.0,.0123457,.0246914,.7407407,10.1604938,0.0,                      5P       5
-3.9999957,-21.0000019,-4.0000086,-39.0000000,0,0;                               5P       6
104,.0110752,-.0149328,.0144350,-.4104281,.6609945,6.7296818,                    7P       7
0.0,-6.1815600,-29.1839848,15.6827803,-11.6925392,0,0;                           7P       8
104,.0069444,0.0,.0277778,-.1944444,2.3333333,49.3611111,0.0,                    9P       9
26.0000000,-42.0000000,2.0000010,-41.9999924,0,0;                                9P      10
104,.2500000,0.0,-1.0000000,-28.2500000,3.8000000,793.4525001,                  11P      11
0.0,62.8245392,-1.0999905,62.8245544,4.8999991,0,0;                             11P      12
104,-.9999999,.5960464E-06,.2500000,112.9999854,-.9500336,                       13P      13
-3192.3470556,0.0,57.8370590,5.2392955,53.5000038,8.2245541,0,0;                 13P      14
104,.2500000,-.1192093E-05,-1.0000000,-28.2499977,3.8000673,                     15P      15
793.4523721,0.0,50.1754646,4.8999934,50.1754456,-1.0999961,0,0;                  15P      16
104,-.9999999,-.2980232E-06,.2500000,112.9999871,-.9499830,                      17P      17
-3192.3471516,0.0,53.5000114,-4.4245372,59.5000000,-4.4245529,0,                 17P      18
0;                                                                               17P      19
104,0.0,0.0,1.0000000,-.9200000,54.2000008,790.8060245,0.0,                      19P      20
65.6478271,-29.1000004,71.0826111,-24.1000004,0,0;                               19P      21
104,.9999999,-.4768371E-06,.5684342E-13,-112.6000034,-.9199731,                  21P      22
3149.3585719,0.0,59.3000069,-12.3173933,53.3000069,-12.3173914,                  21P      23
```

```
0,0;                                                                    21P     24
104,.2273737E-12,.9536743E-06,1.0000000,.9200259,54.1999514,            23P     25
687.2126793,0.0,41.5173950,-24.0999966,46.9521751,-29.0999985,0,        23P     26
0;                                                                      23P     27
104,.9999999,.2384186E-06,.1421085E-13,-112.5999851,.9199865,           25P     28
3199.2215419,0.0,53.3000031,-41.8826103,58.3000031,-36.4478264,         25P     29
0,0;                                                                    25P     30
S       1G      2D      26P     30                                        T      1
```

```
CONIC TEST CASE 2                                                                S       1
1H,,1H;,,6HCONIC2,4HCIIN,6H2.1.2 ,16,8,24,8,56,,1.0000000,1,4HINCH,0,,13G       1
H810713.191457,,,,;                                                              G       2
     124       1       1       1       0       0       0       0 0 0 0  D       1
     124       0       0       2       0       0       0                0D      2
     104       3       1       1       0       0       1       0 0 0 0  D       3
     104       0       0       2       1       0       0                0D      4
     104       5       1       4       0       0       1       0 0 0 0  D       5
     104       0       0       2       1       0       0                0D      6
     104       7       1       1       0       0       1       0 0 0 0  D       7
     104       0       0       2       1       0       0                0D      8
     104       9       1       3       0       0       1       0 0 0 0  D       9
     104       0       0       2       1       0       0                0D     10
     104      11       1       2       0       0       1       0 0 0 0  D      11
     104       0       0       2       1       0       0                0D     12
     104      13       1       4       0       0       1       0 0 0 0  D      13
     104       0       0       2       2       0       0                0D     14
     104      15       1       1       0       0       1       0 0 0 0  D      15
     104       0       0       2       2       0       0                0D     16
     104      17       1       2       0       0       1       0 0 0 0  D      17
     104       0       0       2       2       0       0                0D     18
     104      19       1       3       0       0       1       0 0 0 0  D      19
     104       0       0       3       2       0       0                0D     20
     104      22       1       3       0       0       1       0 0 0 0  D      21
     104       0       0       2       3       0       0                0D     22
     104      24       1       2       0       0       1       0 0 0 0  D      23
     104       0       0       3       3       0       0                0D     24
     104      27       1       1       0       0       1       0 0 0 0  D      25
     104       0       0       3       3       0       0                0D     26
     104      30       1       4       0       0       1       0 0 0 0  D      27
     104       0       0       3       3       0       0                0D     28
124,-.0351901,.2221817,-.9743701,0.0,-.9113618,.3929496,                        1P      1
.1225172,0.0,.4100994,.8923150,.1886600,0.0,0,0;                                1P      2
104,.0025000,0.0,.0100000,0.0,0.0,-1.0000000,0.0,20.0000000,0.0,                3P      3
20.0000000,-.1907349E-04,0,0;                                                   3P      4
104,.0030864,0.0,.0123457,0.0,0.0,-1.0000000,0.0,.4291534E-05,                  5P      5
8.9999990,-.8583069E-05,-9.0000000,0,0;                                         5P      6
104,.0039063,0.0,.0156250,0.0,0.0,-1.0000000,0.0,.7629395E-05,                  7P      7
-8.0000000,.1525879E-04,7.9999995,0,0;                                          7P      8
104,.0051020,0.0,.0204082,0.0,0.0,-1.0000000,0.0,-13.9999990,                   9P      9
.8344650E-05,14.0000000,-.6675720E-05,0,0;                                      9P     10
104,.0069444,0.0,.0277778,0.0,0.0,-1.0000000,0.0,12.0000000,0.0,               11P     11
-11.9999990,.7152557E-05,0,0;                                                  11P     12
104,.2500000,0.0,-1.0000000,-28.2500000,3.8000000,793.4525001,                 13P     13
0.0,62.8245392,-1.0999905,62.8245544,4.8999991,0,0;                            13P     14
104,-.9999999,.5960464E-06,.2500000,112.9999854,-.9500336,                     15P     15
-3192.3470556,0.0,59.4999924,8.2245359,53.5000038,8.2245541,0,0;               15P     16
104,.2500000,-.1192093E-05,-1.0000000,-28.2499977,3.8000673,                   17P     17
793.4523721,0.0,50.1754646,4.8999934,50.1754456,-1.0999961,0,0;                17P     18
104,-.9999999,-.2980232E-06,.2500000,112.9999871,-.9499830,                    19P     19
-3192.3471516,0.0,53.5000114,-4.4245372,59.5000000,-4.4245529,0,               19P     20
0;                                                                             19P     21
```

```
104,0.0,0.0,1.0000000,-.9200000,54.2000008,765.0460240,0.0,          21P      22
27.6478310,-29.1000004,43.0826111,-24.1000004,0,0;                   21P      23
104,.9999999,-.4768371E-06,.5684342E-13,-56.6000063,-.9199865,       23P      24
780.5582742,0.0,31.3000031,-12.3173933,25.3000031,-12.3173914,0,     23P      25
0;                                                                   23P      26
104,.2273737E-12,.9536743E-06,1.0000000,.9200259,54.1999781,         25P      27
712.9734052,0.0,13.5173941,-24.0999966,18.9521751,-29.0999985,0,     25P      28
0;                                                                   25P      29
104,.9999999,.2384186E-06,.1421085E-13,-56.5999880,.9199932,         27P      30
830.4217567,0.0,25.3000031,-41.8826103,30.3000011,-36.4478264,0,     27P      31
0.                                                                   27P      32
S       1G       2D      28P      32                                   T       1
```

3.3.4 Copious Data Entity

- Case 1 tests the following forms of the copious data entity:

  - Level 1 (Figure 3.3.4-1) contains 2-D linear strings (FORM 11) in model space.

  - Level 2 (Figure 3.3.4-2) contains 3-D linear strings (FORM 12) in a model space.

  - Level 3 (Figure 3.3.4-3) contains a 3-D linear string (FORM 13) with associated normal vectors. Non-model space rotation (90°, 111.80°, 125.94°) is used per section 3.0.

Figure 3.3.4-1 Linear String Form 11 (actual part)
Case 1: Rotation (0^{o}, 0^{o}, 0^{o})

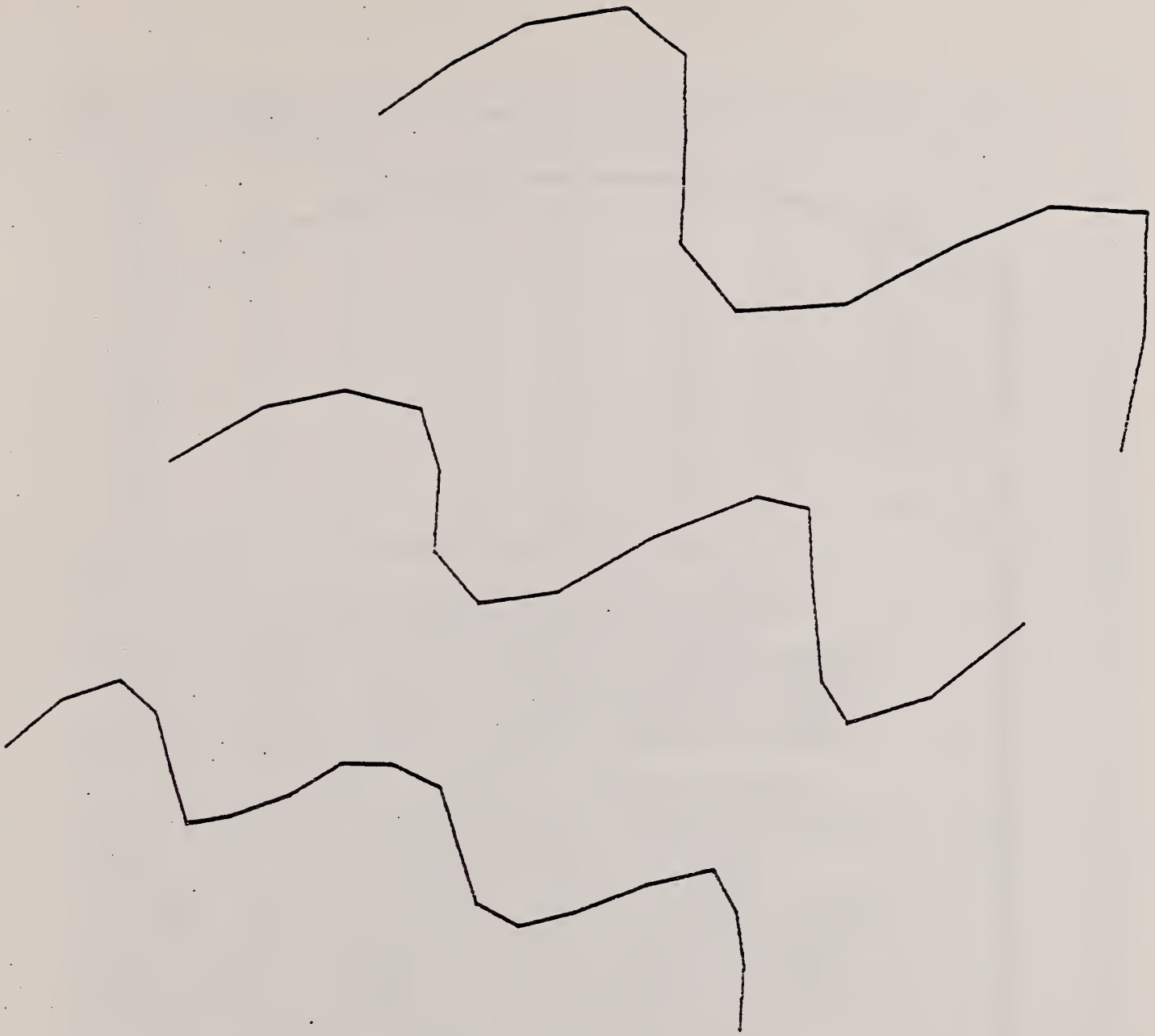

Figure 3.3.4-2 Linear String Form 12 (actual part)
Case 1: Rotation (0^{o}, 0^{o}, 0^{o})

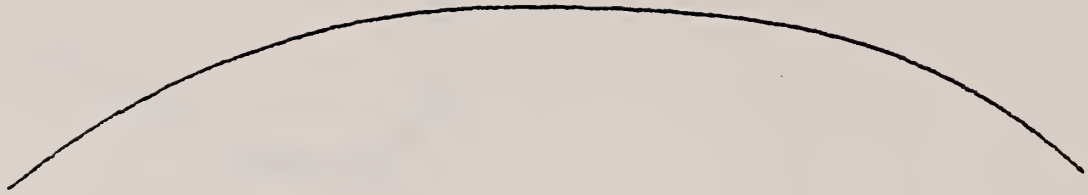

Figure 3.3.4-3 Linear String Form 13 (actual part)

Rotation: (90°, 111.80°, 125.94°)

```
LINEAR STRING CASE 1                                                    S       1
1H,,1H;,,13HLINEARSTRING1,4HCIIN,6H2.1.2 ,16,8,24,8,56,,1.0000000,1,4HING       1
CH,0,,13H810714.085946,,,,;                                             G       2
     124       1       1       1       0       0       0       0 0 0 0  D       1
     124       0       0       2       0       0       0                0D      2
     106       3       1       1       1       0       1       0 0 0 0  D       3
     106       0       0       9      11       0       0      S1        0D      4
     106      12       1       1       1       0       1       0 0 0 0  D       5
     106       0       0      12      11       0       0      S2        0D      6
     106      24       1       1       1       0       1       0 0 0 0  D       7
     106       0       0      12      11       0       0      S3        0D      8
     106      36       1       1       2       0       1       0 0 0 0  D       9
     106       0       0      16      12       0       0      S4        0D     10
     106      52       1       1       2       0       1       0 0 0 0  D      11
     106       0       0      13      12       0       0      S5        0D     12
     106      65       1       1       2       0       1       0 0 0 0  D      13
     106       0       0      11      12       0       0      S6        0D     14
     124      76       1       1       0       0       0       0 0 0 0  D      15
     124       0       0       2       0       0       0                0D     16
     106      78       1       1       3       0      15       0 0 0 0  D      17
     106       0       0     224      13       0       0                0D     18
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1.0000000,0.0,0,0;                                                      1P      2
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839.6495048,230.3230892,127.1475987,0.0,230.3814659,                    17P    205
3977.8591494,828.0278090,231.2634303,127.0894888,0.0,                   17P    206
231.3255024,3754.9629202,816.1396168,232.2036913,127.0277794,           17P    207
0.0,232.2692573,3568.0050953,805.0753309,233.2425285,                   17P    208
126.9556260,0.0,233.3117374,3393.9617380,793.7279116,                   17P    209
234.2812593,126.8795290,0.0,234.3538987,3246.8172358,                   17P    210
783.2241467,234.8587052,126.8355865,0.0,234.9334986,                    17P    211
3159.9628145,777.9393647,235.4348102,126.7892475,0.0,                   17P    212
235.5150121,2948.4124121,774.8133054,236.0087684,126.7396356,           17P    213
0.0,236.0943007,2765.4348370,771.5524579,236.8398942,                   17P    214
126.6616642,0.0,236.9330756,2538.3545304,766.7620336,                   17P    215
237.6670834,126.5767795,0.0,237.7678251,2346.5838777,                   17P    216
762.0895218,238.4860587,126.4854586,0.0,238.5942515,                    17P    217
2182.6595817,757.6736176,239.2927918,126.3882808,0.0,                   17P    218
239.4082962,2041.2985131,753.5789294,239.4222339,126.3720110,           17P    219
0.0,239.5389080,2020.2330718,752.9381208,240.2046068,                   17P    220
126.2696244,0.0,240.3283360,1901.0485052,749.2612489,                   17P    221
240.9763373,126.1617209,0.0,241.1069849,1795.8149370,                   17P    222
745.8385012,241.7376261,126.0484165,0.0,241.8750488,                    17P    223
1702.2543293,742.6344356,242.4855419,125.9303370,0.0,                   17P    224
242.6295617,1618.9104823,739.6212809,243.2210690,125.8075515,           17P    225
0.0,243.3715118,1544.1656501,736.7678949,243.9451270,                   17P    226
125.6801109,0.0,244.1018241,1476.6967581,734.0649967,                   17P    227
244.6583700,125.5480850,0.0,244.8211594,1415.4140054,                   17P    228
731.5309585,245.3610170,125.4116031,0.0,245.5297418,                    17P    229
1359.4147513,729.2158445,246.0528256,125.2709564,0.0,                   17P    230
246.2271780,1309.2671107,727.4659823,246.7415957,125.1246129,           17P    231
0.0,246.9215876,1261.1038215,726.5633868,247.4179314,                   17P    232
124.9744614,0.0,247.6034795,1215.4909801,726.3820147,                   17P    233
248.0634710,124.8249121,0.0,248.2543013,1173.6635336,                   17P    234
726.7638016,248.6833467,124.6753477,0.0,248.8791998,                    17P    235
1135.1538520,727.5575847,249.2820407,124.5251571,0.0,                   17P    236
249.4826757,1099.5371255,728.6496141,249.8631976,124.3738085,           17P    237
0.0,250.0683915,1066.4538803,729.9517469,249.9415521,                   17P    238
124.3529757,0.0,250.1473540,1062.1125494,730.1301221,                   17P    239
```

```
250.4989696,124.2018695,0.0,250.7090959,1032.8924793,                    17P    240
729.8753426,251.0639183,124.0434611,0.0,251.2783611,                     17P    241
1004.4853333,729.7255299,251.6227420,123.8814334,0.0,                    17P    242
251.8413841,977.5029551,729.6955642,252.1709439,123.7172018,0.0,         17P    243
252.3936335,952.0500476,729.7785240,252.7088019,123.5508607,0.0,         17P    244
252.9353893,928.0020683,729.9656609,253.2367447,123.3824493,0.0,         17P    245
253.4670841,905.2416538,730.2483067,253.7552228,123.2119883,0.0,         17P    246
253.9891726,883.6631002,730.6179404,254.2646800,123.0394878,0.0,         17P    247
254.5021028,863.1719211,731.0661705,254.7655511,122.8649486,0.0,         17P    248
255.0063141,843.6834283,731.5847472,255.2582611,122.6883626,0.0,         17P    249
255.5022359,825.1215000,732.1655542,255.7432243,122.5097132,0.0,         17P    250
255.9902875,807.4175252,732.8005999,256.2208443,122.3289760,0.0,         17P    251
256.4708771,790.5094977,733.4820135,256.6915137,122.1461193,0.0,         17P    252
256.9444023,774.3412426,734.2020246,257.1556140,121.9611037,0.0,         17P    253
257.4112496,758.8617410,734.9529656,257.6135161,121.7738834,0.0,         17P    254
257.8717949,744.0245532,735.7272542,258.0655804,121.5844054,0.0,         17P    255
258.3264036,729.7873128,736.5173867,258.5121569,121.3926105,0.0,         17P    256
258.7754309,716.1112897,737.3159242,258.9535861,121.1984330,0.0,         17P    257
259.2192222,702.9610048,738.1154874,259.3901988,121.0018008,0.0,         17P    258
259.6581138,690.3038937,738.9087493,259.8223173,120.8026355,0.0,         17P    259
260.0924329,678.1100120,739.6884259,260.2502552,120.6008527,0.0,         17P    260
260.5224983,666.3517740,740.4472713,260.6743185,120.3963615,0.0,         17P    261
260.9486212,655.0037241,741.1780689,261.0948058,120.1890647,0.0,         17P    262
261.3711053,644.0423284,741.8736461,261.5120088,119.9788589,0.0,         17P    263
261.7902472,633.4457991,742.5268494,261.9262129,119.7656340,0.0,         17P    264
262.2063377,623.1939296,743.1305608,262.3376976,119.5492734,0.0,         17P    265
262.6196613,613.2679520,743.6776944,262.7467373,119.3296537,0.0,         17P    266
263.0304972,603.6504067,744.1612071,263.1536012,119.1066447,0.0,         17P    267
263.4391199,594.3250294,744.5740964,263.5585544,118.8801091,0.0,         17P    268
263.8457992,585.2766446,744.9094228,263.9618576,118.6499021,0.0,         17P    269
264.2508010,576.4910748,745.1603073,264.3637680,118.4158717,0.0,         17P    270
264.6543873,567.9550547,745.3199560,264.7645397,118.1778579,0.0,         17P    271
265.0568168,559.6561540,745.3816800,265.1644235,117.9356930,0.0,         17P    272
265.4583454,551.5827115,745.3389035,265.5636675,117.6892013,0.0,         17P    273
265.8592257,543.7237694,745.1851997,265.9625173,117.4381986,0.0,         17P    274
266.2597080,536.0690171,744.9143149,266.3612159,117.1824923,0.0,         17P    275
266.6600401,528.6087394,744.5201974,266.7600041,116.9218813,0.0,         17P    276
267.0604672,521.3337677,743.9970403,267.1591202,116.6561558,0.0,         17P    277
267.4612320,514.2354375,743.3393121,267.5588000,116.3850972,0.0,         17P    278
267.8625745,507.3055475,742.5418061,267.9592762,116.1084784,0.0,         17P    279
268.2647320,500.5363226,741.5996883,268.2344488,115.9154752,0.0,         17P    280
268.5410720,495.9849496,740.8611570,268.6372034,115.6282994,0.0,         17P    281
268.9449562,489.1576074,741.7972167,269.0120147,115.3565583,0.0,         17P    282
269.3217087,483.4292899,739.3828502,269.4335290,115.0456782,0.0,         17P    283
269.7453226,477.0745943,736.9396235,269.8511828,114.7320469,0.0,         17P    284
270.1650127,470.8914197,734.6411791,270.2672561,114.4139867,0.0,         17P    285
270.5830957,464.8539542,732.3849334,270.6830635,114.0904646,0.0,         17P    286
271.0009074,458.9465226,730.1136926,271.0994002,113.7607971,0.0,         17P    287
271.4192565,453.1591826,727.7926236,271.5168213,113.4244554,0.0,         17P    288
271.8387078,447.4845193,725.3990541,271.9357592,113.0809840,0.0,         17P    289
272.2597008,441.9163842,722.9176332,272.3565760,112.7299633,0.0,         17P    290
272.6826034,436.4493543,720.3378512,272.7795905,112.3709912,0.0,         17P    291
```

```
273.1077388,431.0784688,717.6526694,273.2050909,112.0036732,0.0,      17P     292
273.5353991,425.7990857,714.8577311,273.6333424,111.6276182,0.0,      17P     293
273.9658526,420.6067972,711.9509131,274.0645902,111.2424364,0.0,      17P     294
274.3993466,415.4973741,708.9320707,274.4990593,110.8477396,0.0,      17P     295
274.8361081,410.4667307,705.8028866,274.9369541,110.4431427,0.0,      17P     296
275.2763422,405.5108946,702.5668347,275.3784550,110.0282675,0.0,      17P     297
275.7202299,400.6259874,699.2291590,275.8237151,109.6027469,0.0,      17P     298
276.1679236,395.8082076,695.7969096,276.2728548,109.1662307,0.0,      17P     299
276.6195426,391.0538198,692.2789764,276.6496432,108.7943474,0.0,      17P     300
276.9984275,387.1429341,689.2937702,0,0;                              17P     301
S       1G      2D      18P     301                                     T       1
```

3.3.5 Line

- Case 1 (Figures 3.3.5-1 and 3.3.5-2) tests the following:
  - horizontal lines
  - vertical lines
  - lines at angles
  - 4 connected lines
  - fonted lines (solid, dashed, phantom and centerline)

- Case 2
  This is identical to Case 1 except lines are in 3-D parallel to a plane with rotation (89°, 89°, 89°) is used per section 3.0

- Case 3 (Figures 3.3.5-3 and 3.3.5-4) tests the following:
  - long vertical, horizontal and angled lines
    (length $>$ 1000 in.)

  - short vertical horizontal and angled lines
    (length $\leq$ .001 in.)

  Case 4
  This case tests lines in 3-D
  - long lines (length $>$1000 in)
  - short lines (length $\leq$.001 in)

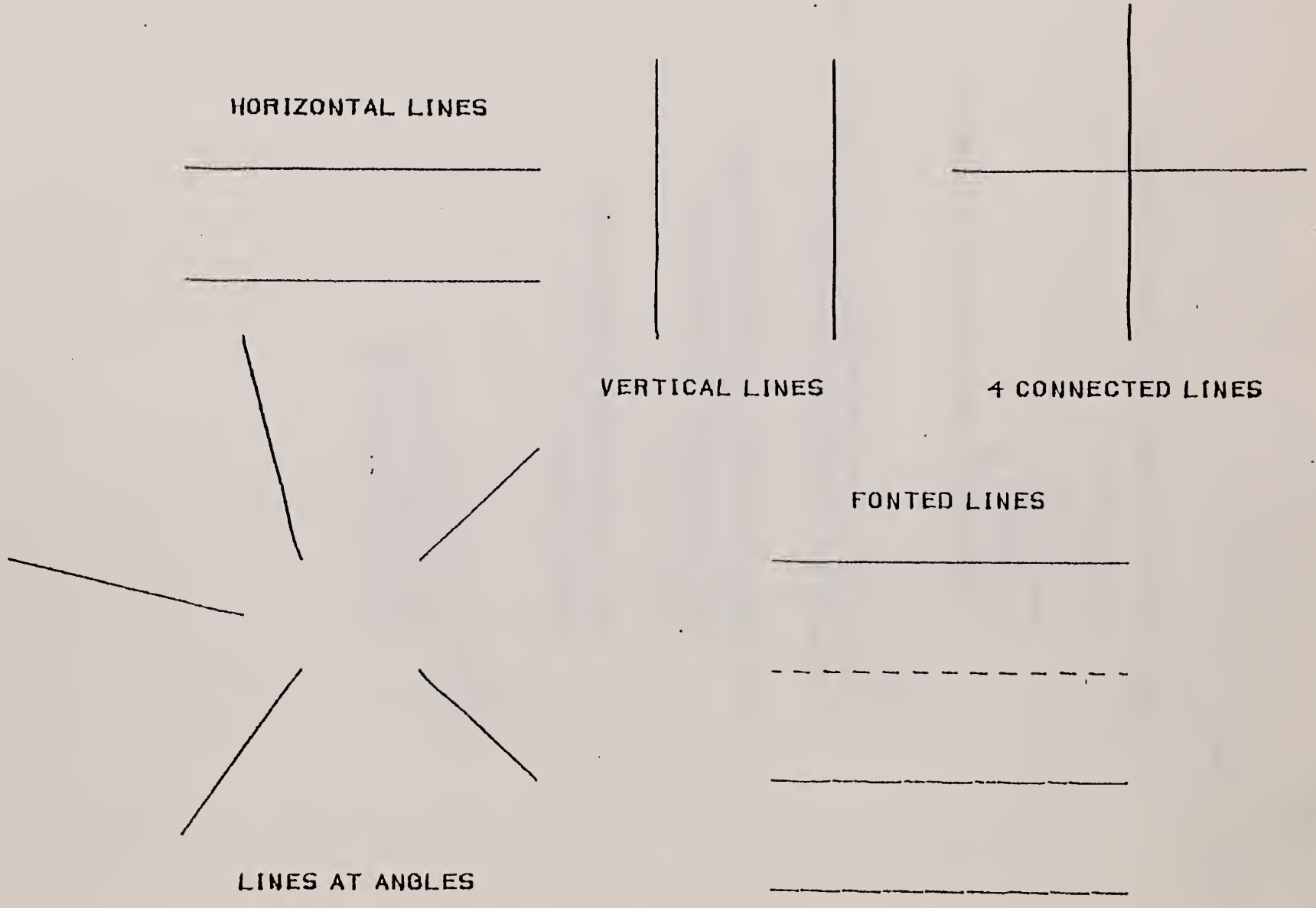

Figure 3.3.5-1 Line Cases 1 and 2 (with annotation)
Case 1: Rotation (0^{o}, 0^{o}, 0^{o})
Case 2: Rotation (89^{o}, 89^{o}, 89^{o})

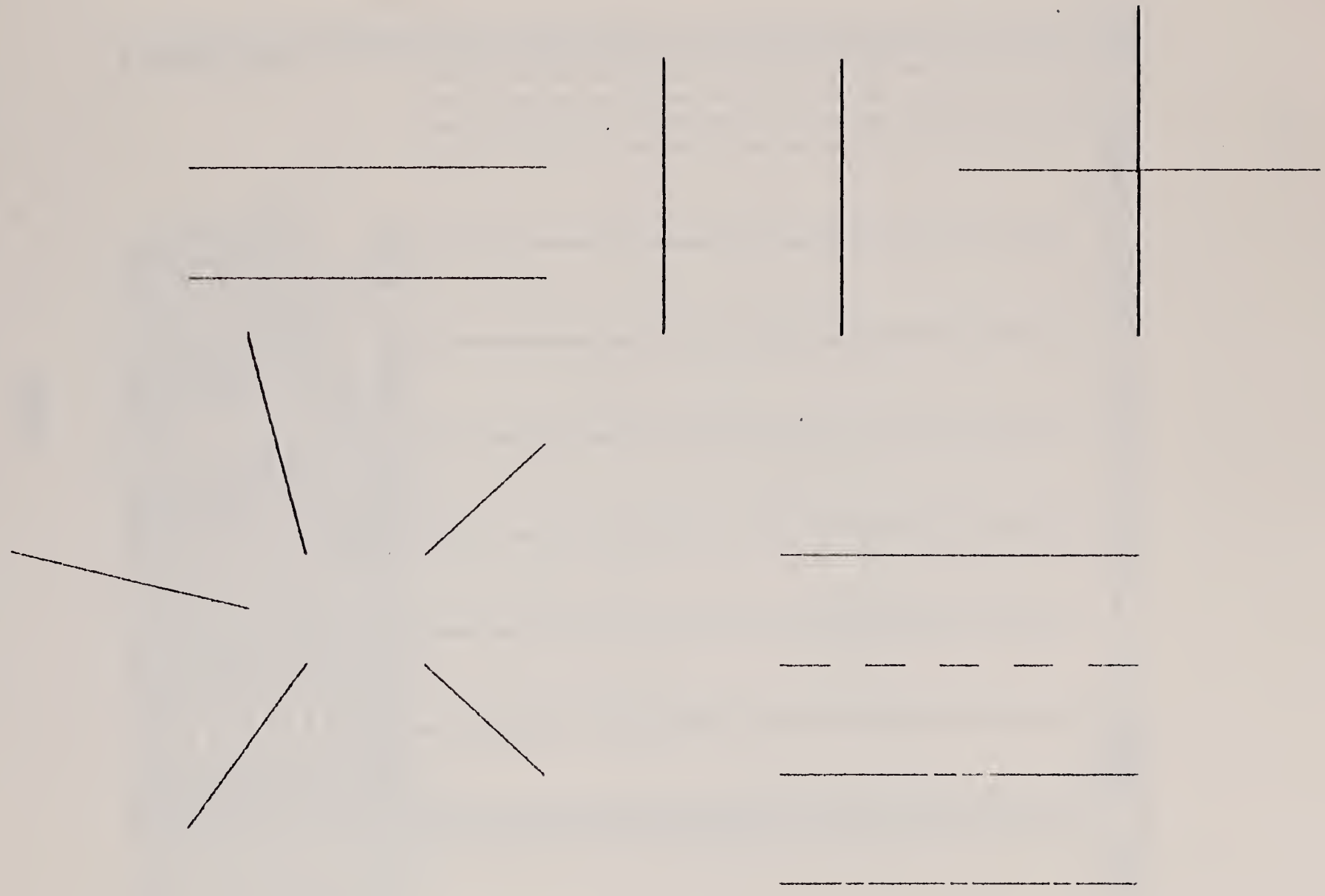

Figure 3.3.5-2 Line Case 1 and 2 (actual part)

```
LINE TEST CASE 1                                                                S       1
1H,,1H;,,5HLINE1,4HCIIN,6H2.1.2 ,16,8,24,8,56,,1.0000000,1,4HINCH,0,,13HG       1
810713.191724,,,,;                                                              G       2
     110       1       1       1       0       0       0       0 0 0 0  D      1
     110       0       0       1       0       0       0                0D     2
     110       2       1       1       0       0       0       0 0 0 0  D      3
     110       0       0       1       0       0       0                0D     4
     110       3       1       1       0       0       0       0 0 0 0  D      5
     110       0       0       1       0       0       0                0D     6
     110       4       1       1       0       0       0       0 0 0 0  D      7
     110       0       0       1       0       0       0                0D     8
     110       5       1       1       0       0       0       0 0 0 0  D      9
     110       0       0       1       0       0       0                0D    10
     110       6       1       1       0       0       0       0 0 0 0  D     11
     110       0       0       1       0       0       0                0D    12
     110       7       1       1       0       0       0       0 0 0 0  D     13
     110       0       0       1       0       0       0                0D    14
     110       8       1       1       0       0       0       0 0 0 0  D     15
     110       0       0       1       0       0       0                0D    16
     110       9       1       1       0       0       0       0 0 0 0  D     17
     110       0       0       1       0       0       0                0D    18
     110      10       1       1       0       0       0       0 0 0 0  D     19
     110       0       0       1       0       0       0                0D    20
     110      11       1       2       0       0       0       0 0 0 0  D     21
     110       0       0       1       0       0       0                0D    22
     110      12       1       3       0       0       0       0 0 0 0  D     23
     110       0       0       1       0       0       0                0D    24
     110      13       1       4       0       0       0       0 0 0 0  D     25
     110       0       0       1       0       0       0                0D    26
     110      14       1       1       0       0       0       0 0 0 0  D     27
     110       0       0       1       0       0       0                0D    28
     110      15       1       1       0       0       0       0 0 0 0  D     29
     110       0       0       1       0       0       0                0D    30
     110      16       1       1       0       0       0       0 0 0 0  D     31
     110       0       0       1       0       0       0                0D    32
     110      17       1       1       0       0       0       0 0 0 0  D     33
     110       0       0       1       0       0       0                0D    34
110,-8.0000000,5.0000000,0.0,-2.0000000,5.0000000,0.0,0,0;                      1P      1
110,-8.0000000,3.0000000,0.0,-2.0000000,3.0000000,0.0,0,0;                      3P      2
110,0.0,2.0000000,0.0,0.0,7.0000000,0.0,0,0;                                    5P      3
110,3.0000000,2.0000000,0.0,3.0000000,7.0000000,0.0,0,0;                        7P      4
110,-4.0000000,-2.0000000,0.0,-2.0000000,0.0,0.0,0,0;                           9P      5
110,-4.0000000,-4.0000000,0.0,-2.0000000,-6.0000000,0.0,0,0;                   11P      6
110,-6.0000000,-4.0000000,0.0,-8.0000000,-7.0000000,0.0,0,0;                   13P      7
110,-7.0000000,-3.0000000,0.0,-11.0000000,-2.0000000,0.0,0,0;                  15P      8
110,-6.0000000,-2.0000000,0.0,-7.0000000,2.0000000,0.0,0,0;                    17P      9
110,2.0000000,-2.0000000,0.0,8.0000000,-2.0000000,0.0,0,0;                     19P     10
110,2.0000000,-4.0000000,0.0,8.0000000,-4.0000000,0.0,0,0;                     21P     11
110,2.0000000,-6.0000000,0.0,8.0000000,-6.0000000,0.0,0,0;                     23P     12
110,2.0000000,-8.0000000,0.0,8.0000000,-8.0000000,0.0,0,0;                     25P     13
110,8.0000000,8.0000000,0.0,8.0000000,5.0000000,0.0,0,0;                       27P     14
110,5.0000000,5.0000000,0.0,8.0000000,5.0000000,0.0,0,0;                       29P     15
```

```
110,8.0000000,2.0000000,0.0,8.0000000,5.0000000,0.0,0,0;                31P      16
110,11.0000000,5.0000000,0.0,8.0000000,5.0000000,0.0,0,0;               33P      17
S       1G      2D      34P     17                                        T       1
```

```
LINE TEST CASE 2                                                                S       1
1H,,1H;,,5HLINE2,4HCIIN,6H2.1.2 ,16,8,24,8,56,,1.0000000,1,4HINCH,0,,13HG       1
810713.191729,,,,;                                                              G       2
     110       1       1       1       0       0       0       0 0 0 0  D      1
     110       0       0       2       0       0       0                0D     2
     110       3       1       1       0       0       0       0 0 0 0  D      3
     110       0       0       2       0       0       0                0D     4
     110       5       1       1       0       0       0       0 0 0 0  D      5
     110       0       0       2       0       0       0                0D     6
     110       7       1       1       0       0       0       0 0 0 0  D      7
     110       0       0       2       0       0       0                0D     8
     110       9       1       1       0       0       0       0 0 0 0  D      9
     110       0       0       2       0       0       0                0D    10
     110      11       1       1       0       0       0       0 0 0 0  D     11
     110       0       0       2       0       0       0                0D    12
     110      13       1       1       0       0       0       0 0 0 0  D     13
     110       0       0       2       0       0       0                0D    14
     110      15       1       1       0       0       0       0 0 0 0  D     15
     110       0       0       2       0       0       0                0D    16
     110      17       1       1       0       0       0       0 0 0 0  D     17
     110       0       0       2       0       0       0                0D    18
     110      19       1       1       0       0       0       0 0 0 0  D     19
     110       0       0       2       0       0       0                0D    20
     110      21       1       2       0       0       0       0 0 0 0  D     21
     110       0       0       2       0       0       0                0D    22
     110      23       1       3       0       0       0       0 0 0 0  D     23
     110       0       0       2       0       0       0                0D    24
     110      25       1       4       0       0       0       0 0 0 0  D     25
     110       0       0       2       0       0       0                0D    26
     110      27       1       1       0       0       0       0 0 0 0  D     27
     110       0       0       2       0       0       0                0D    28
     110      29       1       1       0       0       0       0 0 0 0  D     29
     110       0       0       2       0       0       0                0D    30
     110      31       1       1       0       0       0       0 0 0 0  D     31
     110       0       0       2       0       0       0                0D    32
     110      33       1       1       0       0       0       0 0 0 0  D     33
     110       0       0       2       0       0       0                0D    34
110,-3.8349369,6.1070509,-6.0825319,.6650635,4.8080130,                         1P      1
-2.3325319,0,0;                                                                 1P      2
110,-4.7009621,4.3570509,-5.6495194,-.2009619,3.0580127,                        3P      3
-1.8995192,0,0;                                                                 3P      4
110,.8660254,1.7500001,-.4330127,3.0310991,6.1250000,-1.5155445,                5P      5
0,0;                                                                            5P      6
110,3.1160254,1.1004810,1.4419874,5.2810888,5.4754810,.3594556,                 7P      7
0,0;                                                                            7P      8
110,-3.8660257,-.8839747,-2.0669875,-1.5000001,.4330127,                        9P      9
-1.2500001,0,0;                                                                 9P     10
110,-4.7320509,-2.6339748,-1.6339748,-4.0980763,-4.8169875,                    11P     11
.0490381,0,0;                                                                  11P     12
110,-6.2320509,-2.2009621,-2.8839748,-9.0310888,-4.3929491,                    13P     13
-3.4844558,0,0;                                                                13P     14
110,-6.5490384,-1.1094556,-3.7254813,-9.1160259,.6315699,                      15P     15
```

```
-6.4419875,0,0;                                                          15P      16
110,-5.3660254,-.4509619,-3.3169875,-4.3839746,3.2655447,                17P      17
-4.8080130,0,0;                                                          17P      18
110,.6339747,-2.1830127,1.6830128,5.1339750,-3.4820509,                  19P      19
5.4330130,0,0;                                                           19P      20
110,-.2320508,-3.9330130,2.1160254,4.2679496,-5.2320509,                 21P      21
5.8660259,0,0;                                                           21P      22
110,-1.0980762,-5.6830130,2.5490382,3.4019241,-6.9820509,                23P      23
6.2990384,0,0;                                                           23P      24
110,-1.9641017,-7.4330130,2.9820509,2.5358987,-8.7320509,                25P      25
6.7320514,0,0;                                                           25P      26
110,9.4641018,5.2679496,3.2679496,8.1650639,2.6429493,3.9174685,         27P      27
0,0;                                                                     27P      28
110,5.9150639,3.2924683,2.0424683,8.1650639,2.6429493,3.9174685,         29P      29
0,0;                                                                     29P      30
110,6.8660259,.0179492,4.5669875,8.1650639,2.6429493,3.9174685,          31P      31
0,0;                                                                     31P      32
110,10.4150639,1.9934303,5.7924685,8.1650639,2.6429493,                  33P      33
3.9174685,0,0;                                                           33P      34
S       1G       2D      34P      34                                       T       1
```

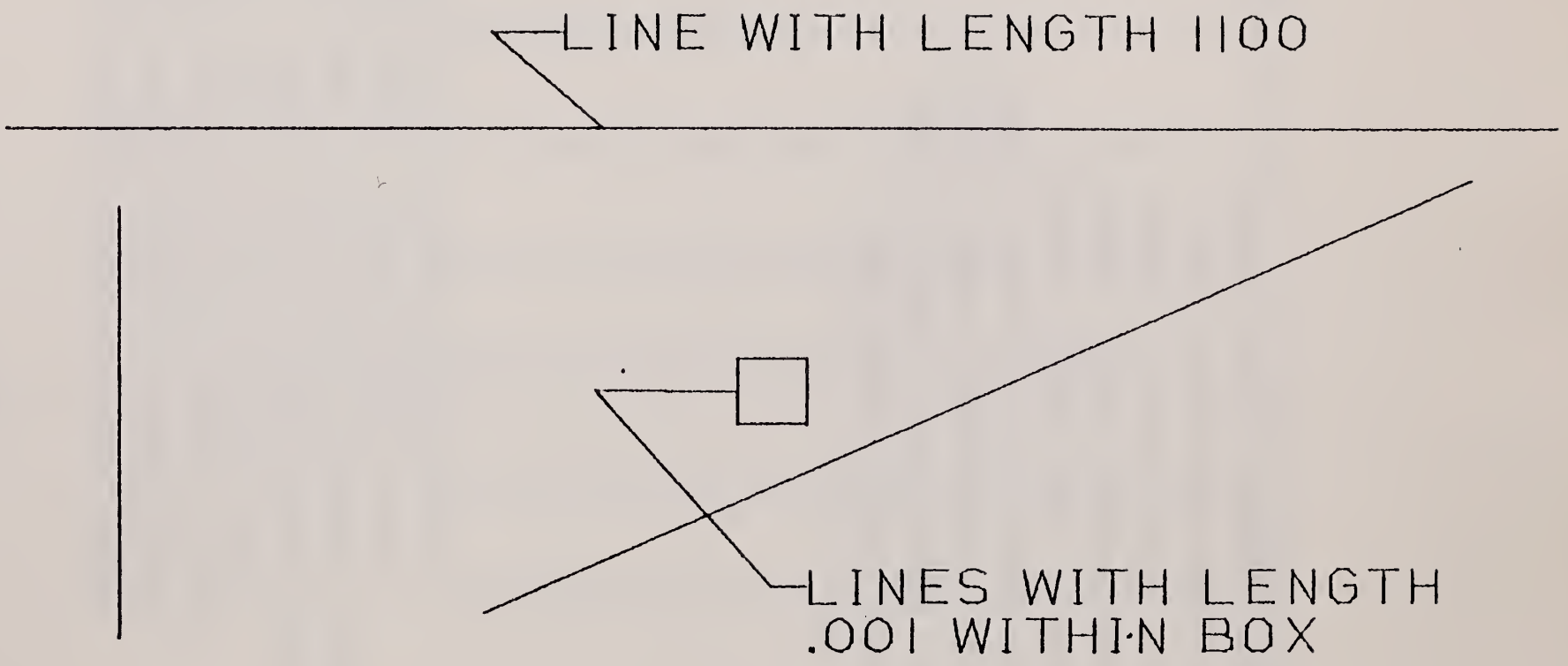

Figure 3.3.5-3 Line Cases 3 and 4 (with annotation)
Case 3: Rotation (0^{o}, 0^{o}, 0^{o})

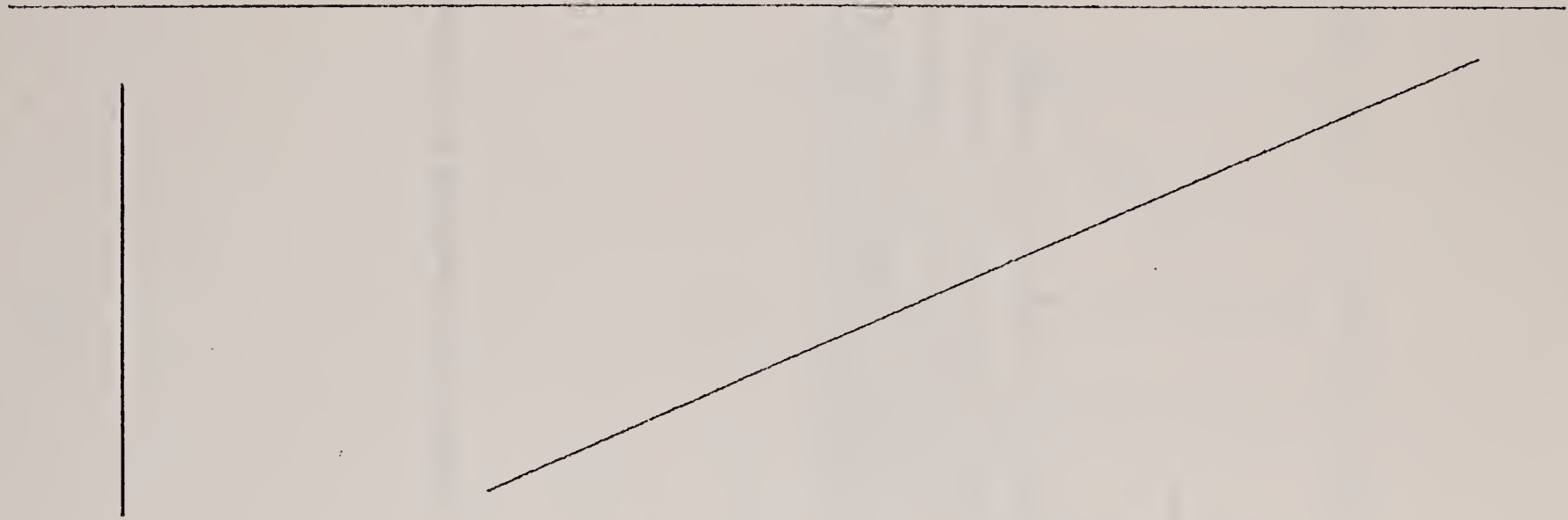

Figure 3.3.5-4 Line Cases 3 and 4 (actual part)

Figure 3.3.5-5 Line Cases 3 and 4 (magnified to show small lines)

```
LINE TEST CASE 3                                                        S       1
1H,,1H;,,5HLINE3,4HCIIN,6H2.1.2 ,16,8,24,8,56,,1.0000000,1,4HINCH,0,,13HG       1
810713.191733,,,,;                                                      G       2
     110       1       1       1       0       0       0       0 0 0 0  D       1
     110       0       0       2       0       0       0                0D      2
     110       3       1       1       0       0       0       0 0 0 0  D       3
     110       0       0       2       0       0       0                0D      4
     110       5       1       1       0       0       0       0 0 0 0  D       5
     110       0       0       2       0       0       0                0D      6
     110       7       1       1       0       0       0       0 0 0 0  D       7
     110       0       0       1       0       0       0                0D      8
     110       8       1       1       0       0       0       0 0 0 0  D       9
     110       0       0       1       0       0       0                0D     10
     110       9       1       1       0       0       0       0 0 0 0  D      11
     110       0       0       1       0       0       0                0D     12
110,-520.0000000,100.0000000,0.0,580.0000000,100.0000000,0.0,0,         1P      1
0;                                                                      1P      2
110,-440.0000000,-290.0000000,0.0,-440.0000000,40.0000000,0.0,0,        3P      3
0;                                                                      3P      4
110,-180.0000000,-270.0000000,0.0,520.0000000,60.0000000,0.0,0,         5P      5
0;                                                                      5P      6
110,29.9980011,-94.9990082,0.0,29.9990005,-94.9990082,0.0,0,0;          7P      7
110,29.9980011,-95.0010071,0.0,29.9980011,-95.0000076,0.0,0,0;          9P      8
110,30.0000019,-94.9990082,0.0,30.0010014,-95.0000076,0.0,0,0;         11P      9
S       1G      2D      12P     9                                       T       1
```

```
LINE TEST CASE 4                                                        S       1
1H,,1H;,,5HLINE4,4HCIIN,6H2.1.2 ,16,8,24,8,56,,1.0000000,1,4HINCH,0,,13HG       1
810713.191737,,,,;                                                      G       2
     110       1       1       1       0       0       0       0 0 0 0  D       1
     110       0       0       2       0       0       0                0D      2
     110       3       1       1       0       0       0       0 0 0 0  D       3
     110       0       0       2       0       0       0                0D      4
     110       5       1       1       0       0       0       0 0 0 0  D       5
     110       0       0       2       0       0       0                0D      6
     110       7       1       1       0       0       0       0 0 0 0  D       7
     110       0       0       2       0       0       0                0D      8
     110       9       1       1       0       0       0       0 0 0 0  D       9
     110       0       0       2       0       0       0                0D     10
     110      11       1       1       0       0       0       0 0 0 0  D      11
     110       0       0       2       0       0       0                0D     12
110,1.5866011,99.9861374,-520.0001831,1.9216517,99.9832153,                   1P      1
579.9996338,0,0;                                                              1P      2
110,-5.1944871,-289.9546204,-439.9991760,.5639753,39.9950714,                 3P      3
-440.0000305,0,0;                                                             3P      4
110,-4.7662959,-269.9583435,-179.9992523,1.2053807,59.9894714,                5P      5
519.9997559,0,0;                                                              5P      6
110,-1.6485848,-94.9846039,29.9982491,-1.6485845,-94.9846039,                 7P      7
29.9992485,0,0;                                                               7P      8
110,-1.6486197,-94.9866028,29.9982491,-1.6486022,-94.9856033,                 9P      9
29.9982491,0,0;                                                               9P     10
110,-1.6485842,-94.9846039,30.0002499,-1.6486013,-94.9856033,                11P     11
30.0012493,0,0;                                                              11P     12
S       1G      2D     12P     12                                              T      1
```

3.3.6 Parametric Spline

- Case 1

  Spline types of linear, cubic, Wilson-Fowler and Modified Wilson-Fowler are tested.

  - Level 2 (Figures 3.3.6-1 and 3.3.6-2) contains a 2D and 3D cubic spline in model space.

  - Level 3 (Figure 3.3.6-3) contains a Wilson-Fowler spline in model space.

  - Level 4 (Figure 3.3.6-4) contains 3 Modified Wilson-Fowler splines.

    - One in model space.

    - One in non-model space with rotation (0°, 0°, 2°) per section 3.0.

    - One in non-model space with rotation (0°, 0°, 71°) per section 3.0.

- Case 2 (Figure 3.3.6-5)

  - A uniform, cubic B-spline in model space

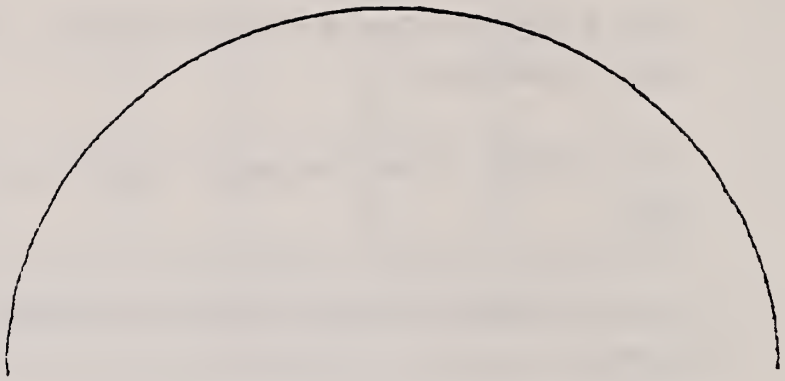

Figure 3.3.6-1 2D Cubic Spline (actual part)
Case 1: Rotation (0^{o}, 0^{o}, 0^{o})

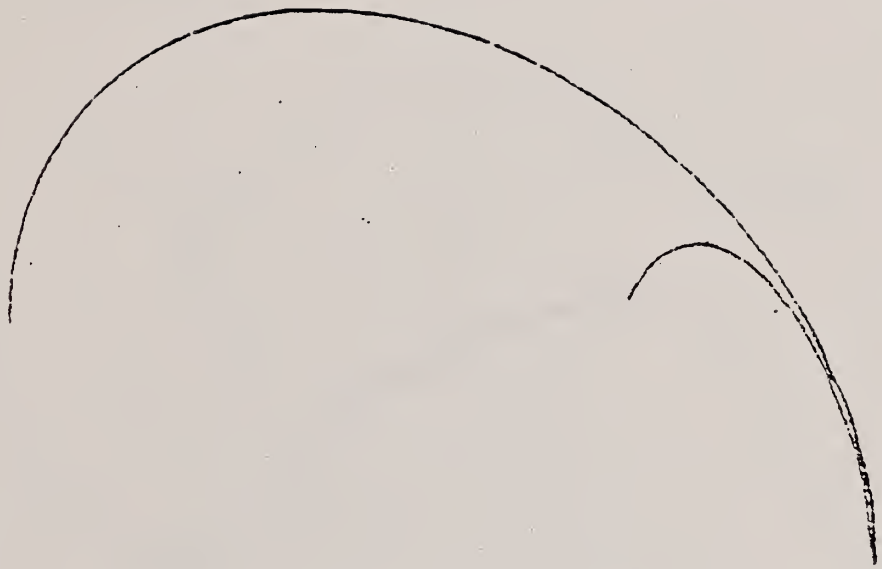

Figure 3.3.6-2 3D Cubic Spline (actual part)
Case 1: Rotation (0^{o}, 0^{o}, 0^{o})

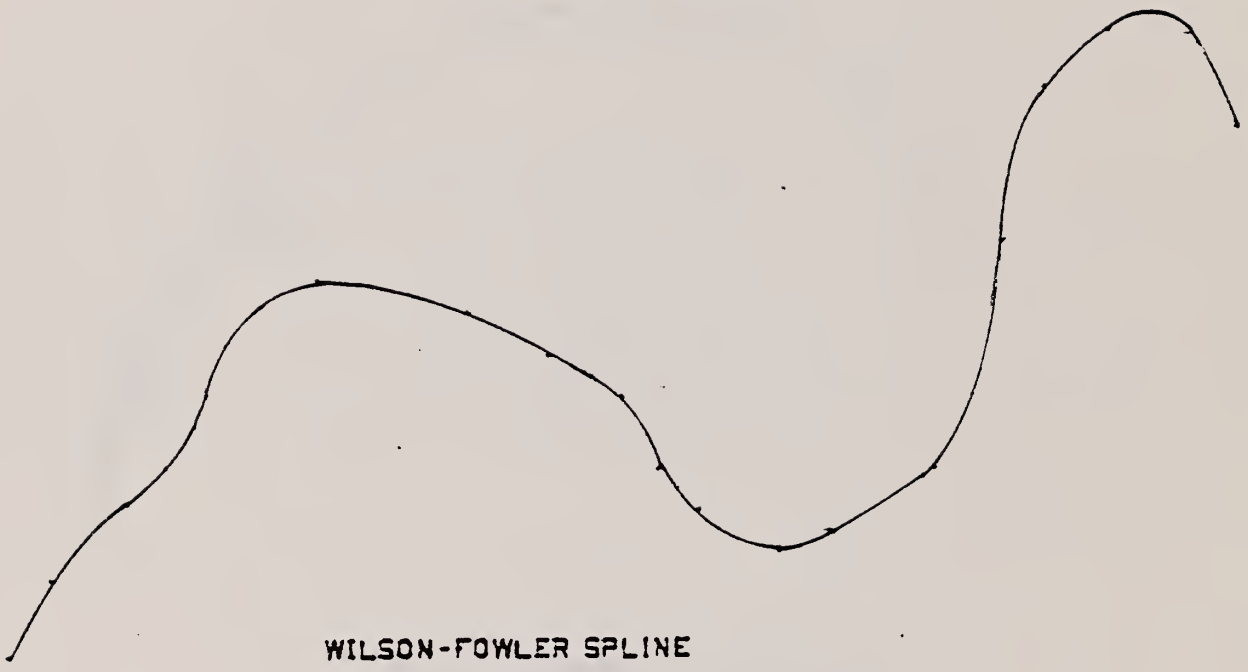

Figure 3.3.6-3 Wilson Fowler Spline (actual part)
Case 1: Rotation (0^{o}, 0^{o}, 0^{o})

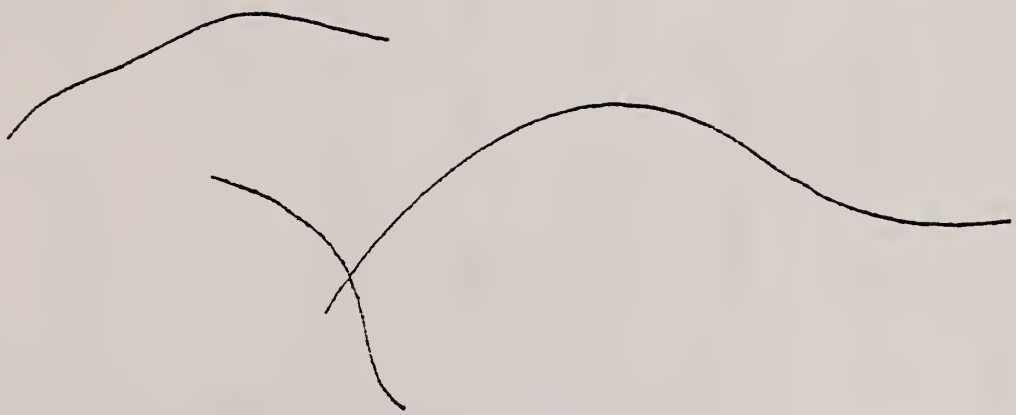

Figure 3.3.6–4 Modified Wilson Fowler Splines (actual part)
Case 1: Rotation (0^{o}, 0^{o}, 0^{o})

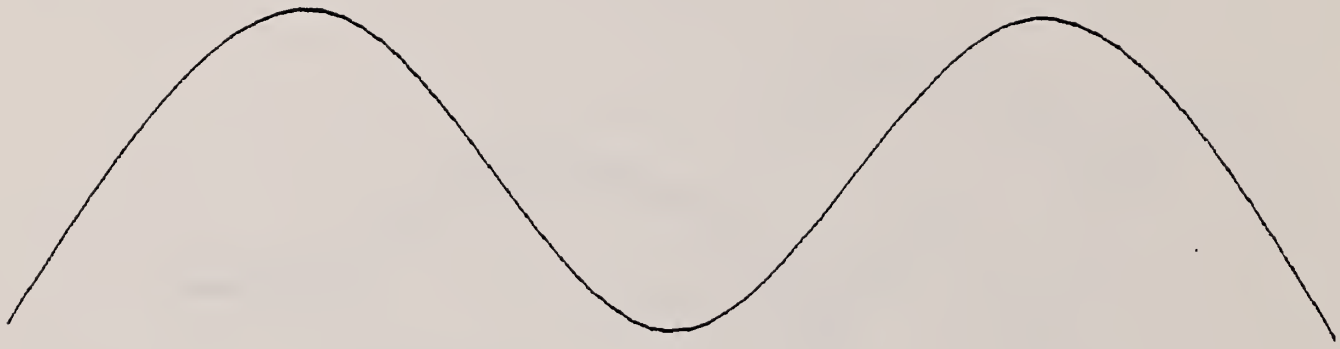

Figure 3.3.6-5 Uniform B-Spline (actual part)
Case 2: Rotation (0^o, 0^o, 0^o)

```
SPLINE TEST CASE 1                                                              S       1
1H,,1H;,,,7HSPLINE1,4HCIIN,6H2.1.2 ,16,8,24,8,56,,1.0000000,1,4HINCH,0,,1G      1
3H810806.100051,,,,;                                                            G       2
     124        1        1        1        0        0        0      0 0 0 0  D       1
     124        0        0        2        0        0        0   MTX001      0D      2
     112        3        1        1        3        0        1      0 0 0 0  D       3
     112        0        0       39        0        0        0    TAB1      0D      4
     112       42        1        1        4        0        1      0 0 0 0  D       5
     112        0        0       16        0        0        0     MS       1D      6
     124       58        1        1        0        0        0      0 0 0 0  D       7
     124        0        0        2        0        0        0     MTX       3D      8
     112       60        1        1        4        0        7      0 0 0 0  D       9
     112        0        0       13        0        0        0     MS        2D     10
     124       73        1        1        0        0        0      0 0 0 0  D      11
     124        0        0        2        0        0        0     MTX       4D     12
     112       75        1        1        4        0       11      0 0 0 0  D      13
     112        0        0       13        0        0        0     MS        3D     14
     112       88        1        1        2        0        1      0 0 0 0  D      15
     112        0        0       38        0        0        0     CS        3D     16
     112      126        1        1        2        0        1      0 0 0 0  D      17
     112        0        0       67        0        0        0     CS        4D     18
124,1.0000000,0.0,0.0,0.0,0.0,1.0000000,0.0,0.0,0.0,0.0,                        1P      1
1.0000000,0.0,0,0;                                                              1P      2
112,4,0,2,21,0.0,2.2360680,5.0644951,6.4787087,8.7147756,                       3P      3
10.9508446,13.1869126,17.3100182,19.5460862,21.7821542,                         3P      4
24.0182222,25.4324357,27.6685037,29.9045717,32.1406397,                         3P      5
34.3767076,38.4998133,42.6229189,44.0371324,46.2732004,                         3P      6
47.6874140,50.9234819,0.0,,.2863025,.0719617,.2482534E-17,0.0,                  3P      7
.9748828,-.0359808,-.1241267E-17,0.0,0.0,0.0,0.0,1.0000000,                     3P      8
.6047539,.0562470,-.0070922,2.0000000,.9094597,-.0562470,                       3P      9
.0070922,0.0,0.0,0.0,0.0,3.0000000,.7527220,-.0041021,-.0199070,                3P     10
4.0000000,.6614916,.0041021,.0199070,0.0,0.0,0.0,0.0,4.0000000,                 3P     11
.6299371,-.1164693,.0155419,5.0000000,.8030654,.0582346,                        3P     12
-.0077710,0.0,0.0,0.0,0.0,5.0000000,.3421998,-.0121861,.0264526,                3P     13
7.0000000,.9469341,.0060931,-.0132263,0.0,0.0,0.0,0.0,6.0000000,                3P     14
.7136276,.0934254,-.0056212,9.0000000,.8088127,-.1868508,                       3P     15
.0112424,0.0,0.0,0.0,0.0,8.0000000,1.0669029,-.0320162,.0020733,                3P     16
10.0000000,.1445060,-.1280649,.0082932,0.0,0.0,0.0,0.0,                         3P     17
12.0000000,.8811303,-.0106132,.0074057,9.0000000,-.4738074,                     3P     18
-.0212264,.0148115,0.0,0.0,0.0,0.0,14.0000000,.9447528,.0391509,                3P     19
-.0275739,8.0000000,-.3465624,.0783018,-.0551479,0.0,0.0,0.0,                   3P     20
0.0,16.0000000,.6710102,-.2504998,.0672676,7.0000000,-.7825289,                 3P     21
-.1252499,.0336338,0.0,0.0,0.0,0.0,17.0000000,.5662827,.1643924,                3P     22
-.0458309,5.0000000,-.8479309,.1643924,-.0458309,0.0,0.0,0.0,                   3P     23
0.0,18.0000000,.7791212,-.0210232,.0324631,4.0000000,-.6778255,                 3P     24
-.0420464,.0649261,0.0,0.0,0.0,0.0,20.0000000,1.0687788,                        3P     25
-.1494600,.0319702,3.0000000,.0985104,.2989201,-.0639405,0.0,                   3P     26
0.0,0.0,0.0,22.0000000,.8799268,.0651619,-.0262412,4.0000000,                   3P     27
.4752144,-.1303237,.0524824,0.0,0.0,0.0,0.0,24.0000000,.8130257,                3P     28
-.2536401,.0402689,5.0000000,.7115211,.1268201,-.0201344,0.0,                   3P     29
0.0,0.0,0.0,25.0000000,.2782724,.0173781,-.0063170,7.0000000,                   3P     30
.9612083,-.0043445,.0015792,0.0,0.0,0.0,0.0,26.0000000,.0994104,                3P     31
```

```
-.0508631,.0231806,11.0000000,1.0059238,.0152158,-.0057951,0.0,          3P      32
0.0,0.0,0.0,27.0000000,.6825473,.1104887,-.0658476,15.0000000,           3P      33
.7316663,-.1104887,.0658476,0.0,0.0,0.0,0.0,28.0000000,.6660642,         3P      34
-.1463434,.1111193,16.0000000,.9039396,.2926868,-.2222387,0.0,           3P      35
0.0,0.0,0.0,30.0000000,.8479882,-.1224687,.0161578,17.0000000,           3P      36
-.5662254,-.1224687,.0161578,0.0,0.0,0.0,0.0,31.0000000,                 3P      37
.6002002,-.0684177,.7447602E-17,16.0000000,-.8179339,-.0342089,          3P      38
.3723801E-17,0.0,0.0,0.0,0.0,31.0000000,.6002002,-.1368354,              3P      39
.4468561E-16,16.0000000,-.8179339,-.0684177,.2234281E-16,0.0,            3P      40
0.0,0.0,0.0,0.0;                                                         3P      41
112,5,0,2,9,1.2719991,1.4799993,1.8559990,2.3199992,2.9999976,           5P      42
3.7999983,4.2639980,4.9159981,5.4399977,6.0399971,1.2719991,             5P      43
1.0000000,0.0,0.0,2.3359985,5.5851707,-25.0423965,49.4484100,            5P      44
0.0,0.0,0.0,0.0,1.4799993,1.0000000,0.0,0.0,3.0239983,2.1695476,         5P      45
-2.0233784,1.4731183,0.0,0.0,0.0,0.0,1.8559990,1.0000000,0.0,            5P      46
0.0,3.6319976,1.2727575,-.5658737,.1929117,0.0,0.0,0.0,0.0,              5P      47
2.3199992,1.0000000,0.0,0.0,4.1199980,.8722259,-.3455377,                5P      48
-.0042488,0.0,0.0,0.0,0.0,2.9999976,1.0000000,0.0,0.0,4.5519981,         5P      49
.3964018,-.3492873,-.0421438,0.0,0.0,0.0,0.0,3.7999983,                  5P      50
1.0000000,0.0,0.0,4.6239977,-.2433746,-.4788300,.0001601,0.0,            5P      51
0.0,0.0,0.0,0.0,4.2639980,1.0000000,0.0,0.0,4.4079981,-.6876252,         5P      52
-.4716988,.6379271,0.0,0.0,0.0,0.0,4.8159981,1.0000000,0.0,0.0,          5P      53
3.9919977,-.6252437,.4901187,-.1345374,0.0,0.0,0.0,0.0,                  5P      54
5.4399977,1.0000000,0.0,0.0,3.7599974,-.1707328,.2538025,                5P      55
-.0228200,0.0,0.0,0.0,0.0,5.4399977,1.0000000,0.0,0.0,3.7599974,         5P      56
-.1707328,.5076050,-.1369200,0.0,0.0,0.0,0.0,0.0,0;                      5P      57
124,.9993906,.0348992,0.0,0.0,-.0348992,.9993906,0.0,0.0,0.0,            7P      58
0.0,1.0000000,0.0,0,0;                                                   7P      59
112,5,0,2,7,-.9707423,-.8516917,-.6198565,-.2815026,.2698888,            9P      60
.9277999,1.5857108,1.9240549,-.9707423,1.0000000,0.0,0.0,                9P      61
3.5215421,5.1570997,-18.3800507,46.7533646,0.0,0.0,0.0,0.0,              9P      62
-.8516917,1.0000000,0.0,0.0,3.9538841,2.7687006,-3.7920985,              9P      63
4.0661001,0.0,0.0,0.0,0.0,-.6198565,1.0000000,0.0,0.0,4.4426165,         9P      64
1.6660461,-1.6373434,.4771601,0.0,0.0,0.0,0.0,-.2815026,                 9P      65
1.0000000,0.0,0.0,4.8373642,.7219237,-.9007666,.8209391,0.0,0.0,         9P      66
0.0,0.0,.2698888,1.0000000,0.0,0.0,5.1005287,.4846470,.3580946,          9P      67
-.5858296,0.0,0.0,0.0,0.0,.9277999,1.0000000,0.0,0.0,5.4075537,          9P      68
.1951118,-.7513818,.3832674,0.0,0.0,0.0,0.0,1.5857108,1.0000000,         9P      69
0.0,0.0,5.3198318,-.2958844,.0445810,.3499294,0.0,0.0,0.0,0.0,           9P      70
1.5857108,1.0000000,0.0,0.0,5.3198318,-.2958844,.0891619,                9P      71
2.0995764,0.0,0.0,0.0,0.0,0,0;                                           9P      72
124,.3255681,.9455184,0.0,0.0,-.9455184,.3255681,0.0,0.0,0.0,            11P     73
0.0,1.0000000,0.0,0,0;                                                   11P     74
112,5,0,2,7,-3.7373052,-3.4709454,-3.1987929,-2.8861094,                 13P     75
-2.6313286,-2.3128533,-1.9248936,-1.7975037,-3.7373052,                  13P     76
1.0000000,0.0,0.0,2.2780337,1.3976610,-1.5699646,1.2084587,0.0,          13P     77
0.0,0.0,0.0,-3.4709454,1.0000000,0.0,0.0,2.5617661,.8185215,             13P     78
-.6787245,.3479272,0.0,0.0,0.0,0.0,-3.1987929,1.0000000,0.0,0.0,         13P     79
2.7412710,.5263982,-.4534544,-.3350706,0.0,0.0,0.0,0.0,                  13P     80
-2.8861094,1.0000000,0.0,0.0,2.8512888,.1445419,-.7457788,               13P     81
.7004392,0.0,0.0,0.0,0.0,-2.6313286,1.0000000,0.0,0.0,2.8512888,         13P     82
-.0990749,-.2099753,.1989091,0.0,0.0,0.0,0.0,-2.3128533,                 13P     83
```

```
1.0000000,0.0,0.0,2.8049655,-.1716579,-.0077140,.9620458,0.0,          13P     84
0.0,0.0,0.0,-1.9248936,1.0000000,0.0,0.0,2.7933846,.2567570,           13P     85
1.0833561,3.6833868,0.0,0.0,0.0,0.0,-1.9248936,1.0000000,0.0,          13P     86
0.0,2.7933846,.2567570,2.1667123,22.1003208,0.0,0.0,0.0,0.0,0,0;       13P     87
112,3,0,2,20,0.0,.2255125,.6248973,1.0244054,1.4238676,                15P     88
1.8236292,2.0955628,2.4947605,2.8943290,3.2938080,3.6934843,           15P     89
3.9653941,4.3649945,4.6366426,4.9085522,5.1804630,5.4525724,           15P     90
5.7243701,5.9962628,6.2681369,6.2681369,-2502.6000977,.0384577,        15P     91
0.0,.4358998,599.0290527,1.0000929,0.0,-.0379968,0.0,0.0,0.0,          15P     92
0.0,-2502.5864258,.1049619,.2949025,-.0551033,599.2541504,             15P     93
.9942958,-.0257063,-.0450447,0.0,0.0,0.0,0.0,-2502.5009766,            15P     94
.3141528,.2288803,-.0065292,599.6442871,.9522075,-.0796767,            15P     95
-.0367165,0.0,0.0,0.0,0.0,-2502.3393555,.4939055,.2210548,             15P     96
-.0253096,600.0096436,.8709639,-.1236823,-.0353520,0.0,0.0,0.0,        15P     97
0.0,-2502.1083984,.6583957,.1907242,-.0340757,600.3355713,             15P     98
.7552277,-.1660477,-.0284184,0.0,0.0,0.0,0.0,-2501.8168945,            15P     99
.7945473,.1498578,-.0290074,600.6091309,.6088442,-.2001294,            15P    100
-.0186703,0.0,0.0,0.0,0.0,-2501.5903320,.8696149,.1261935,             15P    101
-.0394897,600.7595215,.4958584,-.2153607,-.0219202,0.0,0.0,0.0,        15P    102
0.0,-2501.2255859,.9514881,.0789009,-.0414603,600.9217529,             15P    103
.3134360,-.2416121,-.0056566,0.0,0.0,0.0,0.0,-2500.8354492,            15P    104
.9946827,.0292022,-.0407993,601.0080566,.1176455,-.2483927,            15P    105
-.0024372,0.0,0.0,0.0,0.0,-2500.4360352,.9984813,-.0196932,            15P    106
-.0447514,601.0152588,-.0819767,-.2513135,.0081693,0.0,0.0,0.0,        15P    107
0.0,-2500.0429688,.9612936,-.0733514,-.0293878,600.9428711,            15P    108
-.2789499,-.2415183,.0160201,0.0,0.0,0.0,0.0,-2499.7875977,            15P    109
.9148853,-.0973239,-.0451330,600.8494873,-.4067390,-.2284502,          15P    110
.0178055,0.0,0.0,0.0,0.0,-2499.4404297,.8154834,-.1514293,             15P    111
-.0194162,600.6516113,-.5807870,-.2071050,.0343843,0.0,0.0,0.0,        15P    112
0.0,-2499.2304688,.7289141,-.1672525,-.0385164,600.4792480,            15P    113
-.6856945,-.1790837,.0233108,0.0,0.0,0.0,0.0,-2499.0454102,            15P    114
.6294159,-.1986714,-.0102541,600.2800293,-.7779132,-.1600684,          15P    115
.0409681,0.0,0.0,0.0,0.0,-2498.8891602,.5190996,-.2070361,             15P    116
-.0457711,600.0574951,-.8558749,-.1266494,.0282874,0.0,0.0,0.0,        15P    117
0.0,-2498.7641602,.3962595,-.2444003,.0340867,599.8157959,             15P    118
-.9185164,-.1035576,.0474737,0.0,0.0,0.0,0.0,-2498.6738281,            15P    119
.2709590,-.2166062,-.1235455,599.5594482,-.9642986,-.0648479,          15P    120
.0368954,0.0,0.0,0.0,0.0,-2498.6186523,.1257722,-.3173796,             15P    121
.3891256,599.2932129,-.9913694,-.0347532,.0426094,0.0,0.0,0.0,         15P    122
0.0,-2498.6000977,0.0,0.0,0.0,599.0219727,0.0,0.0,0.0,0.0,0.0,         15P    123
0.0,0.0,-2498.6000977,0.0,0.0,0.0,599.0219727,0.0,0.0,0.0,0.0,         15P    124
0.0,0.0,0.0,0,0;                                                       15P    125
112,3,0,3,31,0.0,.2719033,.6714031,.9433063,1.3428058,1.7423051,       17P    126
2.0142084,2.4137074,2.8132071,3.2127060,3.6122057,4.0117048,           17P    127
4.4112046,4.8107045,5.2102045,5.6097035,5.8816074,6.1535108,           17P    128
6.2741145,6.5753975,6.8766794,7.0818746,7.2870688,7.4922637,           17P    129
7.7935460,8.0948280,8.3000226,8.5052167,8.7104114,8.9156066,           17P    130
9.0052996,9.0052996,.9838046,.0348794,0.0,.3244740,2.1824389,          17P    131
.8564018,0.0,-.1267781,1.9159014,.5176959,0.0,.1431206,.9998111,       17P    132
.1068459,.2646767,-.0627361,2.4127488,.8282831,-.1034142,              17P    133
-.0215909,2.0595417,.5494392,.1167449,-.0542858,1.0807383,             17P    134
.2882843,.1894875,.0103111,2.7257662,.7353175,-.1292908,               17P    135
```

```
-.0301380,2.2942138,.6167263,.0516833,-.0105403,1.1733401,          17P     136
.3936158,.1978983,-.0232532,2.9155369,.6583239,-.1538747,          17P     137
-.0261188,2.4655128,.6424942,.0430856,-.0305710,1.3606913,         17P     138
.5406028,.1700295,-.0264296,3.1523132,.5228725,-.1851781,          17P     139
-.0188928,2.7271161,.6622822,.0064463,-.0285366,1.6021132,         17P     140
.6638016,.1383537,-.0250792,3.3304415,.3658696,-.2078211,          17P     141
-.0109925,2.9909067,.6537694,-.0277548,-.0230526,1.7923276,        17P     142
.7334768,.1178964,-.0342911,3.4143372,.2504171,-.2167878,          17P     143
-.0080331,3.1661534,.6335632,-.0465591,-.0275076,2.1019807,        17P     144
.8112573,.0767986,-.0346088,3.4792671,.0733578,-.2264155,          17P     145
.0010430,3.4100766,.5831921,-.0795268,-.0224660,2.4361281,         17P     146
.0000400,.0033200,-.0363817,3.4725041,-.1070486,-.2251654,         17P     147
.0080932,3.6289368,.5088935,-.1064523,-.0195787,2.7814360,         17P     148
.8668497,-.0082834,-.0359517,3.3943181,-.2830803,-.2154657,        17P     149
.0155069,3.8140011,.4144641,-.1299173,-.0150304,3.1241279,         17P     150
.8430176,-.0513715,-.0342648,3.2478280,-.4478126,-.1968807,        17P     151
.0215453,3.9578862,.3034637,-.1479312,-.0103413,3.4505291,         17P     152
.7855659,-.0924378,-.0312447,3.0388789,-.5948040,-.1710587,        17P     153
.0290698,4.0548506,.1803155,-.1603252,-.0042977,3.7476172,         17P     154
.6967482,-.1298845,-.0266683,2.7758074,-.7175612,-.1362185,        17P     155
.0268075,4.1010246,.0501580,-.1654760,-.0013400,4.0035381,         17P     156
.5802017,-.1618465,-.0222198,2.4691105,-.8135644,-.1040898,        17P     157
.0556307,4.0945673,-.0826989,-.1670819,.0136968,4.2080812,         17P     158
.4402475,-.1884769,-.0124730,2.1310258,-.8700961,-.0374164,        17P     159
-.0377731,4.0357361,-.2096393,-.1506663,-.0166505,4.3530836,       17P     160
.2836828,-.2034258,-.0278086,1.7750432,-.9180774,-.0826873,        17P     161
.5315399,3.9268775,-.3379936,-.1706218,.2017731,4.4146194,         17P     162
.1668905,-.2261096,.0734518,1.5299864,-.8451503,.3508961,          17P     163
-1.9093353,3.8264174,-.3860268,-.0060332,-.7141670,4.4447575,      17P     164
.0602218,-.1661942,-.9666144,1.2877476,-1.0778103,-1.2065677,      17P     165
24.0700000,3.7066531,-.5477058,-.5885863,9.0735209,4.4479074,      17P     166
-.0220445,-.5159261,.4546422,1.1824400,-.3183741,7.5035233,        17P     167
-10.5686030,3.6479535,-.2937472,2.6943143,-4.3488745,4.4068680,    17P     168
-.2091184,-.1049981,-.0876423,1.4785960,1.3250118,-2.0488981,      17P     169
2.7983145,3.6850867,.1454941,-1.2364115,1.2334575,4.3319368,       17P     170
-.2962525,-.1842132,.0948841,1.7683451,.8524356,.4803464,          17P     171
-1.4080201,3.6504235,-.2636370,-.1215563,-.5012857,4.2642107,      17P     172
-.3598665,-.1258039,.0368399,1.9513209,.8717107,-.3864106,         17P     173
.2406320,3.5868773,-.3768426,-.4301406,.2054004,4.1853895,         17P     174
-.4068416,-.1031259,.0535461,2.1160002,.7435275,-.2382817,         17P     175
-.1725876,3.4932151,-.5274224,-.3036997,.0307898,4.0980282,        17P     176
-.4423998,-.0701638,.0610086,2.2570443,.6239388,-.3445240,         17P     177
-.0589758,3.3724694,-.6481685,-.2847460,.1016837,3.9600406,        17P     178
-.4680645,-.0150213,.0633914,2.4121404,.4002809,-.3978290,         17P     179
-.0380688,3.1541219,-.7920565,-.1928395,.1134978,3.8193913,        17P     180
-.4598536,.0422747,.0517269,2.4955854,.1501968,-.4322374,          17P     181
.7220595E-04,2.9010892,-.8773478,-.0902549,.1058269,3.7272587,     17P     182
-.4359706,.0741170,.0598137,2.5082064,-.0271796,-.4321930,         17P     183
.0053276,2.7181764,-.9010199,-.0251096,.1241773,3.6414375,         17P     184
-.3879986,.1109372,.0311158,2.4844780,-.2038735,-.4289134,         17P     185
.0675528,2.5333080,-.8956393,.0513317,.0911214,3.5647101,          17P     186
-.3485407,.1300916,.1036357,2.4251685,-.3713621,-.3873290,         17P     187
```

```
-.0529834,2.3524761,-.8630633,.1074246,.1898821,3.4995642,                17P     188
-.2820616,.1938883,-.7205624,2.3322005,-.5370108,-.4199448,               17P     189
1.5606746,2.1815434,-.7949923,.2243133,-.8336334,3.4753051,0.0,           17P     190
0.0,0.0,2.2817822,0.0,0.0,0.0,2.1114411,0.0,0.0,0.0,3.4753051,           17P     191
0.0,0.0,0.0,2.2817822,0.0,0.0,0.0,2.1114411,0.0,0.0,0.0,0,0;             17P     192
S       1G      2D      18P     192                                       T       1
```

```
THIS IS A BENCHMARK OF A UNIFORM BSPLINE THAT IS OF                      S      1
DEGREE 3. POINTS WERE EXPLICITLY ENTERED AS FOLLOWS;                     S      2
  X2Y6,X6Y10,X10Y6,X14Y10,X18Y6                                          S      3
                                                                         S      4
1H,,1H;,9HSYSTEM #1,25HBMC.BENCHMARK.BSPLINE.PUT,45HCOMPUTERVISION.CADDSG      1
4 REV.2.00 GRAPHIC SYSTEM,14HIGES REV 01.00,16,08,24,08,56,9HSYSTEM #2, G      2
156.000,1,4HINCH,,,13H810724.092702,,,18HINSTAVIEW OPERATOR,14HCOMPUTERVG      3
ISION;                                                                   G      4
     124       1       1                                      000000   D      1
     124                       3                                       D      2
     112       4       1                                1     000000   D      3
     112                      13                                       D      4
124,      1.000000,      0.000000,      0.000000,      0.000000,        1P     1
          0.000000,      1.000000,      0.000000,      0.000000,        1P     2
          0.000000,      0.000000,      1.000000,      0.000000;        1P     3
112,3,1,2,5,.0000000,1.000000,2.000000,3.000000,4.000000,                3P     4
5.000000,2.000000,3.980861,-0.2384186E-06,.01913905,6.000000,            3P     5
6.889953,.0000000,-2.889952,.0000000,.0000000,.0000000,.0000000,         3P     6
6.000000,4.038278,.05741692,-.09569439,10.00000,-1.779904,               3P     7
-8.669857,6.449761,.0000000,.0000000,.0000000,.0000000,10.00000,         3P     8
3.866028,-.2296662,.3636374,6.000000,.2296648,10.67943,                  3P     9
-6.909091,.0000000,.0000000,.0000000,.0000000,14.00000,4.497608,         3P    10
.8612461,-1.358853,10.00000,.8612442,-10.04785,5.186603,                 3P    11
.0000000,.0000000,.0000000,.0000000,18.00000,2.143540,-3.215314,         3P    12
1.071773,6.000000,-3.674642,5.511961,-1.837319,.0000000,                 3P    13
.0000000,.0000000,.0000000,18.00000,-1.071768,.00001120567,              3P    14
6.430639,6.000000,1.837322,.000005722046,-11.02392,.0000000,             3P    15
.0000000,.0000000,.0000000;                                              3P    16
S      4G      4D      4P     16                                         T      1
```

3.3.7 Point

Case 1 (Figure 3.3.7-1) tests the following:

- points defined in 3-D
- points with large absolute coordinate values (-224355 to 200122)

Points are also tested in level Case 1 (Section 3.3.20).

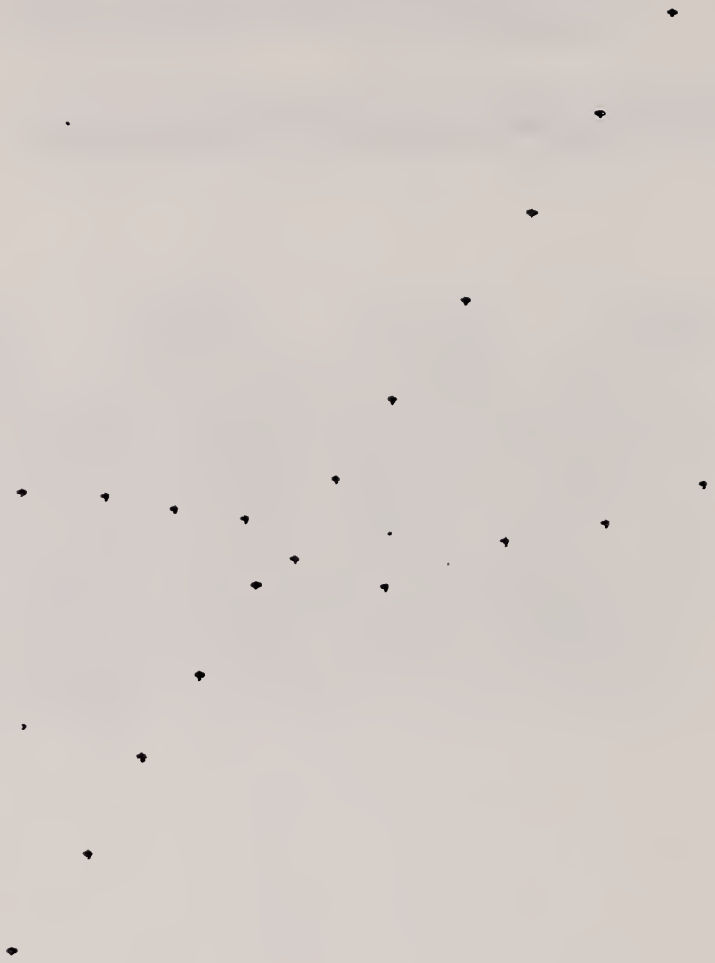

Figure 3.3.7-1 Point Case 1 (actual part)
Case 1: Rotation (0^{o}, 0^{o}, 0^{o})

```
POINT TEST CASE 1                                                                S       1
1H,,1H;,,6HPOINT1,4HCIIN,6H2.1.2 ,16,8,24,8,56,,1.0000000,1,4HINCH,0,,13G       1
H810714.085649,,,,;                                                              G       2
     116       1       1       1       1       0       0       0 0 0 0  D      1
     116       0       0       1       0       0       0                0D     2
     116       2       1       1       1       0       0       0 0 0 0  D      3
     116       0       0       1       0       0       0                0D     4
     116       3       1       1       1       0       0       0 0 0 0  D      5
     116       0       0       1       0       0       0                0D     6
     116       4       1       1       1       0       0       0 0 0 0  D      7
     116       0       0       1       0       0       0                0D     8
     116       5       1       1       1       0       0       0 0 0 0  D      9
     116       0       0       1       0       0       0                0D     10
     116       6       1       1       1       0       0       0 0 0 0  D      11
     116       0       0       1       0       0       0                0D     12
     116       7       1       1       1       0       0       0 0 0 0  D      13
     116       0       0       1       0       0       0                0D     14
     116       8       1       1       1       0       0       0 0 0 0  D      15
     116       0       0       1       0       0       0                0D     16
     116       9       1       1       1       0       0       0 0 0 0  D      17
     116       0       0       1       0       0       0                0D     18
     116      10       1       1       1       0       0       0 0 0 0  D      19
     116       0       0       1       0       0       0                0D     20
     116      11       1       1       1       0       0       0 0 0 0  D      21
     116       0       0       1       0       0       0                0D     22
     116      12       1       1       1       0       0       0 0 0 0  D      23
     116       0       0       1       0       0       0                0D     24
     116      13       1       1       1       0       0       0 0 0 0  D      25
     116       0       0       1       0       0       0                0D     26
     116      14       1       1       1       0       0       0 0 0 0  D      27
     116       0       0       1       0       0       0                0D     28
     116      15       1       1       1       0       0       0 0 0 0  D      29
     116       0       0       1       0       0       0                0D     30
     116      16       1       1       1       0       0       0 0 0 0  D      31
     116       0       0       1       0       0       0                0D     32
     116      17       1       1       1       0       0       0 0 0 0  D      33
     116       0       0       1       0       0       0                0D     34
     116      18       1       1       1       0       0       0 0 0 0  D      35
     116       0       0       1       0       0       0                0D     36
     116      19       1       1       1       0       0       0 0 0 0  D      37
     116       0       0       1       0       0       0                0D     38
     116      20       1       1       1       0       0       0 0 0 0  D      39
     116       0       0       1       0       0       0                0D     40
116,134641.8281250,4462.3056641,185949.9687500,0,0,0;                            1P      1
116,98410.5156250,6261.1948242,132912.2656250,0,0,0;                             3P      2
116,69033.7734375,11927.7695313,85700.7109375,0,0,0;                             5P      3
116,38351.3945313,16344.7177734,37892.3398438,0,0,0;                             7P      4
116,17461.2656250,33561.1757813,-8867.2158203,0,0,0;                             9P      5
116,-20729.4980469,46052.3320313,-75366.8515625,0,0,0;                           11P     6
116,-72301.0000000,26884.7089844,-129133.7500000,0,0,0;                          13P     7
116,-114734.0781250,19728.5800781,-181987.0468750,0,0,0;                         15P     8
116,-156187.9218750,3472.6152344,-224355.6718750,0,0,0;                          17P     9
```

```
116,-144763.6250000,-199308.9218750,-5417.7568359,0,0,0;                19P      10
116,-113754.8437500,-154860.2343750,-6013.4018555,0,0,0;                21P      11
116,-84704.5156250,-112122.7890625,-7667.4790039,0,0,0;                 23P      12
116,-55980.5898438,-75165.0859375,-4003.4172363,0,0,0;                  25P      13
116,140843.5781250,200122.8437500,-939.9491577,0,0,0;                   27P      14
116,-24318.9882813,-33518.8710938,-873.3706055,0,0,0;                   29P      15
116,107223.5312500,158071.0156250,-6434.0532227,0,0,0;                  31P      16
116,-.0264881,-.4046917,0.0,0,0,0;                                      33P      17
116,34434.4960938,44583.8359375,4113.8930664,0,0,0;                     35P      18
116,58915.1171875,82457.9687500,860.5867310,0,0,0;                      37P      19
116,84048.5468750,116876.8046875,1985.7882080,0,0,0;                    39P      20
S       1G       2D      40P      20                                       T       1
```

3.3.8 Transformation Matrix

Transformation matrices are tested in most of the other cases. A wide range of values are included in those cases.

3.3.9 Angular Dimension

The angular dimensions contain subentities which include leaders, witness lines, vertex points, and general notes.

The following conventions were followed:

- general note sub-entities to be single string with no box rotation
- arrows limited to one or two segments

- Case 1 (Figures 3.3.9-1 through 3.3.9-4) tests the following:
  - text in, arrows in configuration
  - text in, arrows out configuration
  - acute and obtuse angles
  - no witness lines suppressed
  - first witness line suppressed
  - second witness line suppressed
  - both witness lines suppressed

- Case 2
  - This is identical to Case 1 except non-model space with rotation (-6.07°, -67.48°, 92.37°) is used per section 3.0

- Case 3 (Figures 3.3.9-5 and 3.3.9-6) tests the following:
  - different witness line gaps
  - very small angles
  - nearly 360° angles
  - nearly 180° angles

- Case 4
  - This is identical to Case 3 except non-model space with rotation (11°, 22°, 33°) is used per section 3.0

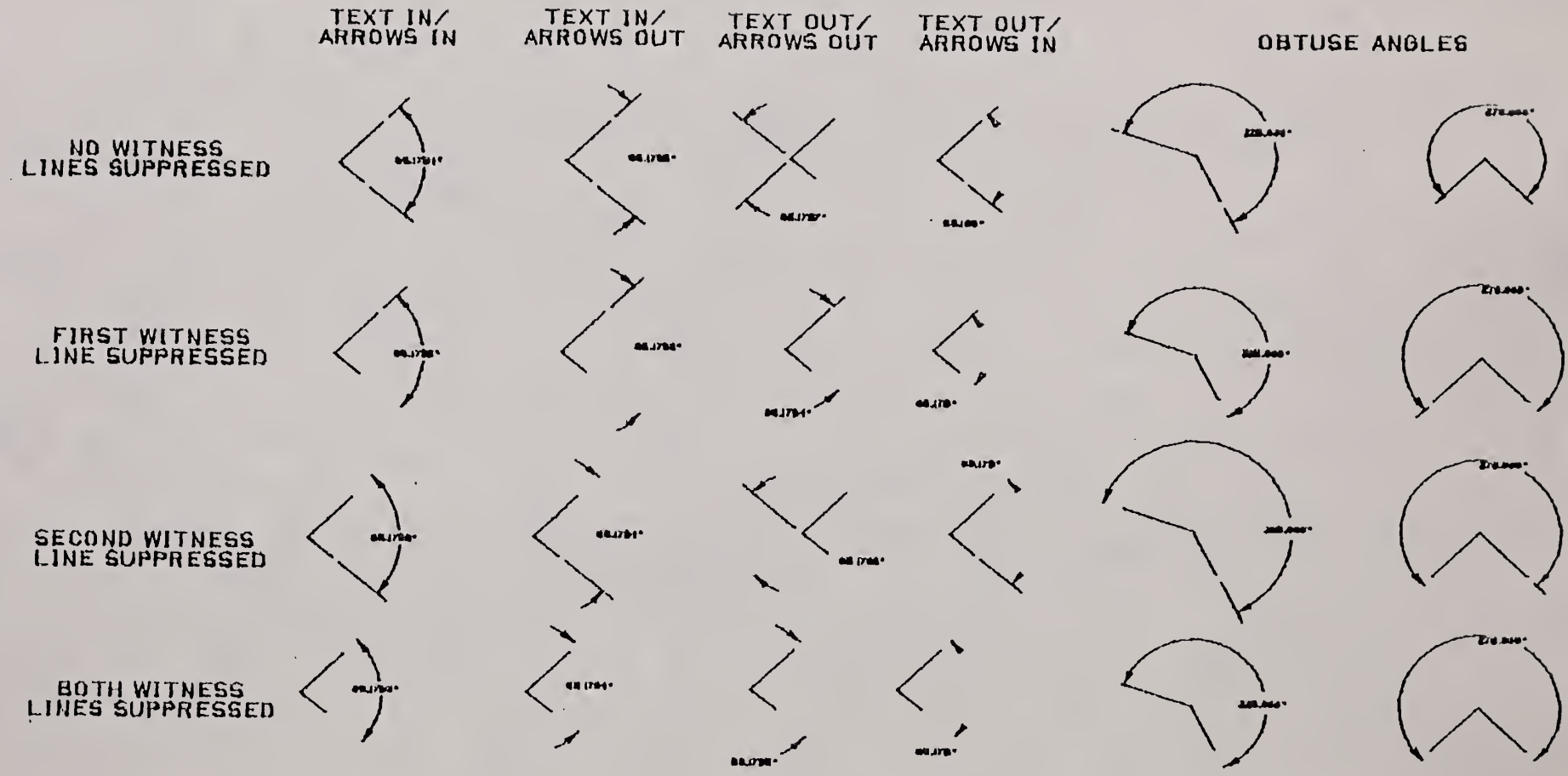

Figure 3.3.9-1 Angular Dimension Cases 1 and 2 (with annotation)
Case 1: Rotation (0^{o}, 0^{o}, 0^{o})
Case 2: Rotation (-6.07^{o}, -67.48^{o}, 92.37^{o})

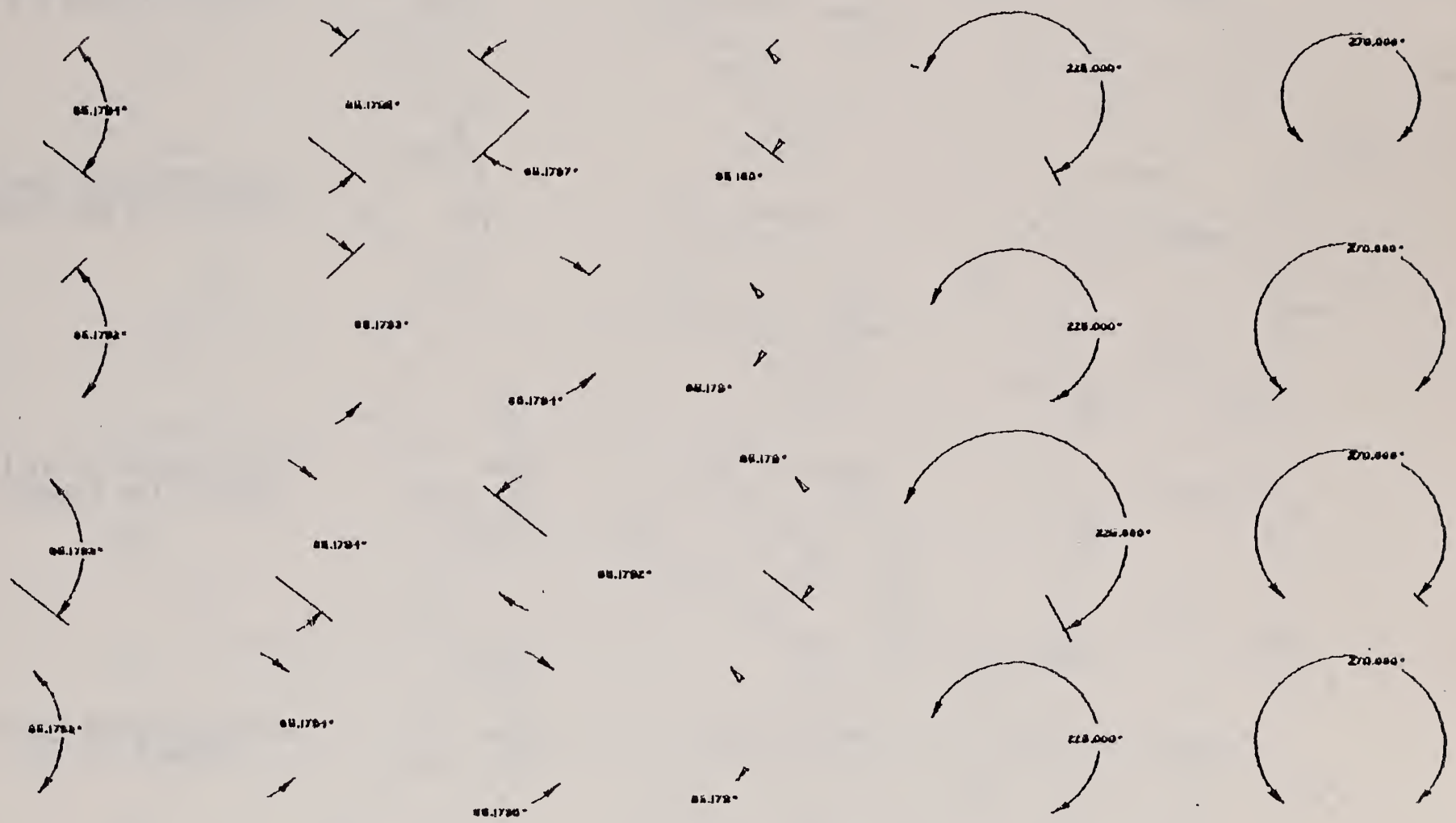

Figure 3.3.9-2 Angular Dimension Cases 1 and 2 (actual part)

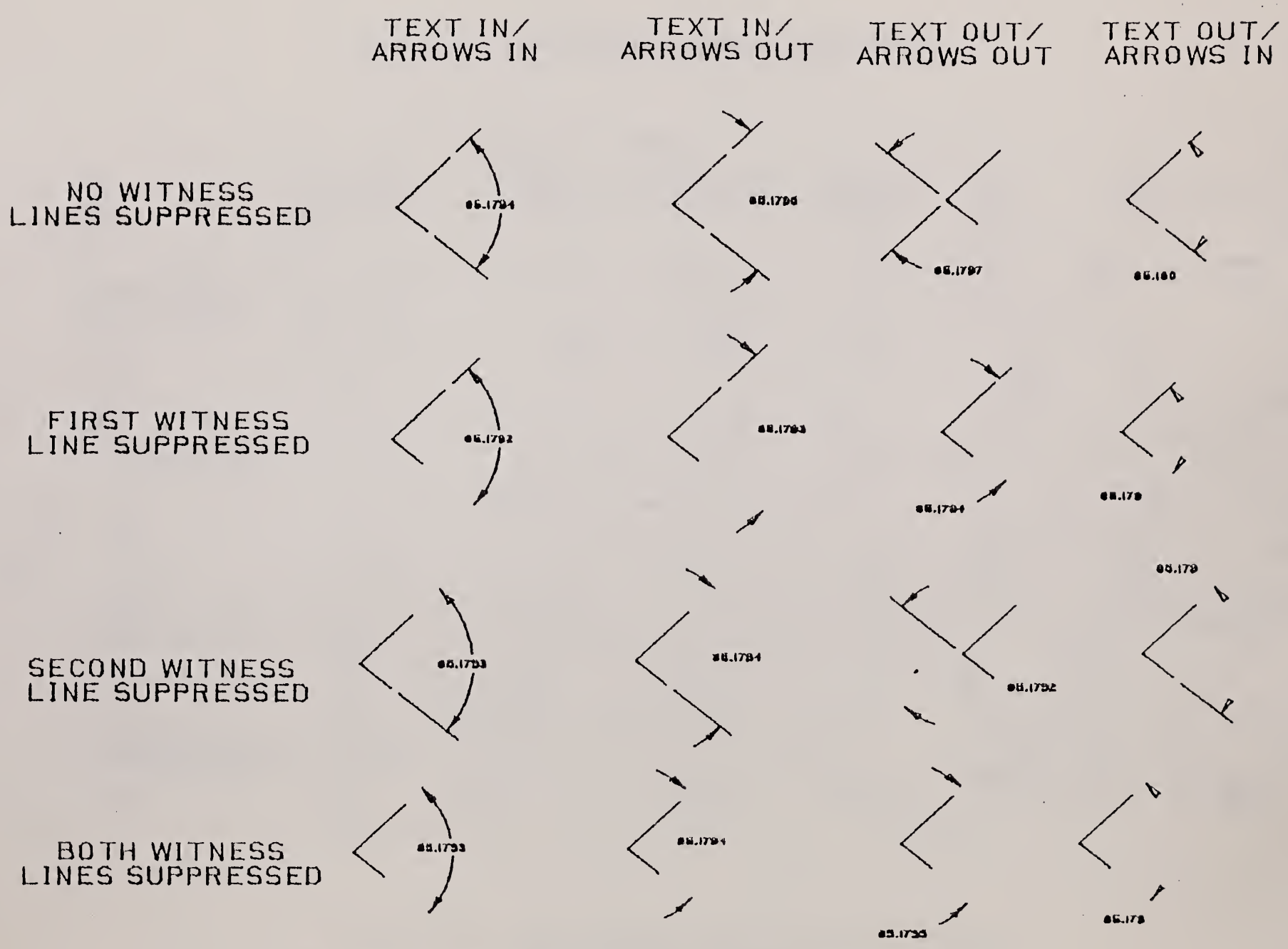

Figure 3.3.9-3 Angular Dimension Cases 1 and 2 (left side magnified)

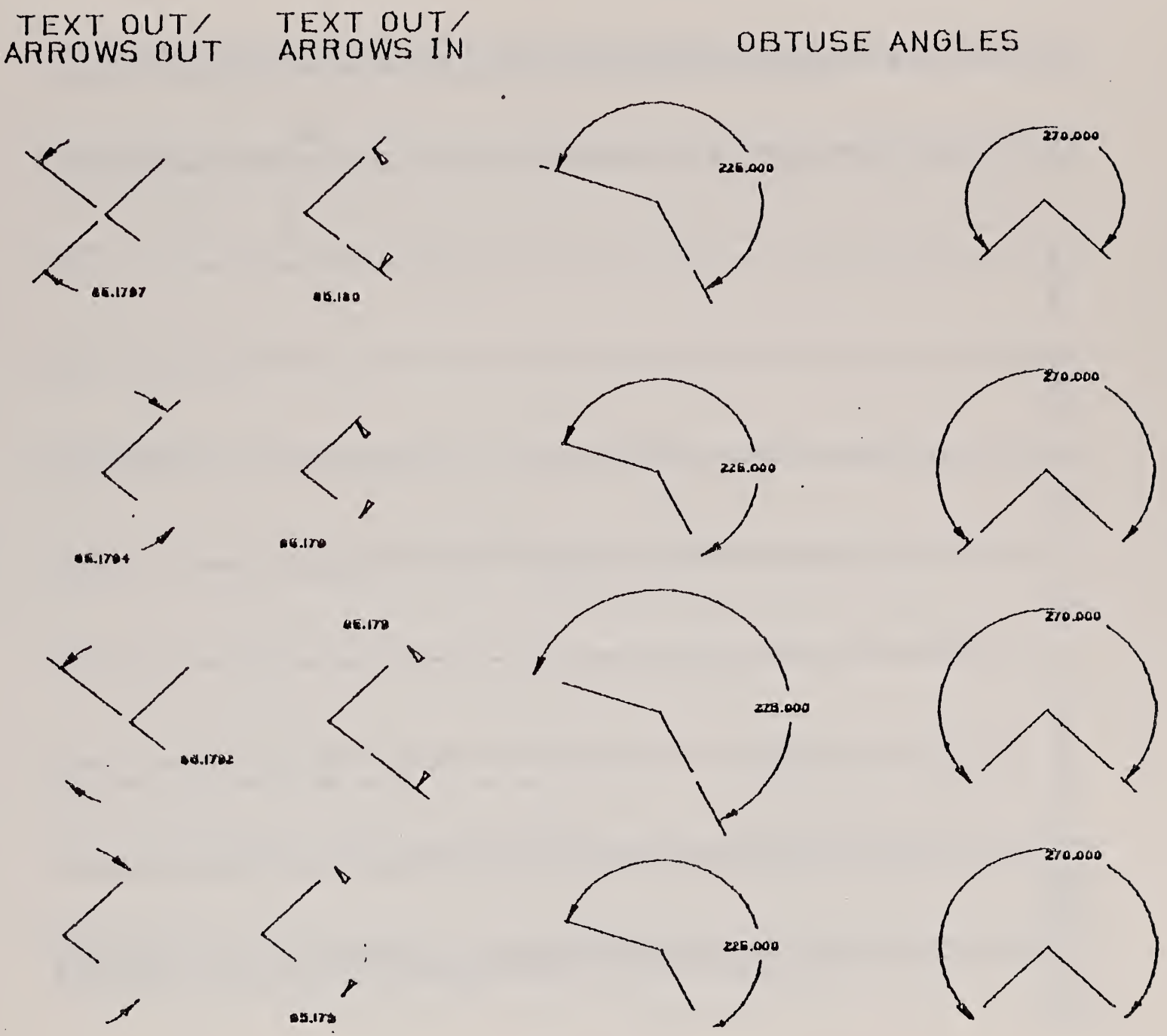

Figure 3.3.9-4 Angular Dimension Cases 1 and 2 (right side magnified)

```
ADIM TEST CASE 1                                                                S       1
1H,,1H;,,5HADIM1,4HCIIN,6H2.1.3 ,16,8,24,8,56,,1.0000000,1,4HINCH,0,,13HG       1
810827.122247,,,,;                                                              G       2
     124        1        1        1        0        0        0        0 0 0 0  D       1
     124        0        0        2        0                                  0D      2
     212        3        1        1        0        0        1        0 0 1 1  D       3
     212        0        0        2        0                                  0D      4
     214        5        1        1        0        0        1        0 0 1 1  D       5
     214        0        0        2        3                                  0D      6
     214        7        1        1        0        0        1        0 0 1 1  D       7
     214        0        0        2        3                                  0D      8
     106        9        1        1        0        0        1        0 1 1 1  D       9
     106        0        0        2       40                                  0D      10
     106       11        1        1        0        0        1        0 1 1 1  D       11
     106        0        0        2       40                                  0D      12
     202       13        1        1        0        0        1        0 0 0 1  D       13
     202        0        0        1        0                                  0D      14
     212       14        1        1        0        0        1        0 0 1 1  D       15
     212        0        0        2        0                                  0D      16
     214       16        1        1        0        0        1        0 0 1 1  D       17
     214        0        0        2        3                                  0D      18
     214       18        1        1        0        0        1        0 0 1 1  D       19
     214        0        0        2        3                                  0D      20
     106       20        1        1        0        0        1        0 1 1 1  D       21
     106        0        0        2       40                                  0D      22
     106       22        1        1        0        0        1        0 1 1 1  D       23
     106        0        0        2       40                                  0D      24
     202       24        1        1        0        0        1        0 0 0 1  D       25
     202        0        0        1        0                                  0D      26
     212       25        1        1        0        0        1        0 0 1 1  D       27
     212        0        0        2        0                                  0D      28
     214       27        1        1        0        0        1        0 0 1 1  D       29
     214        0        0        2        3                                  0D      30
     214       29        1        1        0        0        1        0 0 1 1  D       31
     214        0        0        2        3                                  0D      32
     106       31        1        1        0        0        1        0 0 1 1  D       33
     106        0        0        2       40                                  0D      34
     106       33        1        1        0        0        1        0 1 1 1  D       35
     106        0        0        2       40                                  0D      36
     202       35        1        1        0        0        1        0 0 0 1  D       37
     202        0        0        1        0                                  0D      38
     212       36        1        1        0        0        1        0 0 1 1  D       39
     212        0        0        2        0                                  0D      40
     214       38        1        1        0        0        1        0 0 1 1  D       41
     214        0        0        2        3                                  0D      42
     214       40        1        1        0        0        1        0 0 1 1  D       43
     214        0        0        2        3                                  0D      44
     106       42        1        1        0        0        1        0 1 1 1  D       45
     106        0        0        2       40                                  0D      46
     106       44        1        1        0        0        1        0 1 1 1  D       47
     106        0        0        2       40                                  0D      48
     202       46        1        1        0        0        1        0 0 0 1  D       49
```

202	0	0	1	0						0D		50
212	47	1	1	0	0	1	0	0	1	1	D	51
212	0	0	2	0							0D	52
214	49	1	1	0	0	1	0	0	1	1	D	53
214	0	0	2	3							0D	54
214	51	1	1	0	0	1	0	0	1	1	D	55
214	0	0	2	3							0D	56
106	53	1	1	0	0	1	0	0	1	1	D	57
106	0	0	2	40							0D	58
106	55	1	1	0	0	1	0	0	1	1	D	59
106	0	0	2	40							0D	60
202	57	1	1	0	0	1	0	0	0	1	D	61
202	0	0	1	0							0D	62
212	58	1	1	0	0	1	0	0	1	1	D	63
212	0	0	2	0							0D	64
214	60	1	1	0	0	1	0	0	1	1	D	65
214	0	0	2	3							0D	66
214	62	1	1	0	0	1	0	0	1	1	D	67
214	0	0	2	3							0D	68
106	64	1	1	0	0	1	0	0	1	1	D	69
106	0	0	2	40							0D	70
106	66	1	1	0	0	1	0	1	1	1	D	71
106	0	0	2	40							0D	72
202	68	1	1	0	0	1	0	0	0	1	D	73
202	0	0	1	0							0D	74
212	69	1	1	0	0	1	0	0	1	1	D	75
212	0	0	2	0							0D	76
214	71	1	1	0	0	1	0	0	1	1	D	77
214	0	0	2	3							0D	78
214	73	1	1	0	0	1	0	0	1	1	D	79
214	0	0	2	3							0D	80
106	75	1	1	0	0	1	0	1	1	1	D	81
106	0	0	2	40							0D	82
106	77	1	1	0	0	1	0	0	1	1	D	83
106	0	0	2	40							0D	84
202	79	1	1	0	0	1	0	0	0	1	D	85
202	0	0	1	0							0D	86
212	80	1	1	0	0	1	0	0	1	1	D	87
212	0	0	2	0							0D	88
214	82	1	1	0	0	1	0	0	1	1	D	89
214	0	0	2	3							0D	90
214	84	1	1	0	0	1	0	0	1	1	D	91
214	0	0	2	3							0D	92
106	86	1	1	0	0	1	0	1	1	1	D	93
106	0	0	2	40							0D	94
106	88	1	1	0	0	1	0	1	1	1	D	95
106	0	0	2	40							0D	96
202	90	1	1	0	0	1	0	0	0	1	D	97
202	0	0	1	0							0D	98
212	91	1	1	0	0	1	0	0	1	1	D	99
212	0	0	2	0							0D	100
214	93	1	1	0	0	1	0	0	1	1	D	101

214	0	0	2	3						0D		102
214	95	1	1	0	0	1	0	0	1	1	D	103
214	0	0	2	3						0D		104
106	97	1	1	0	0	1	0	0	1	1	D	105
106	0	0	2	40						0D		106
106	99	1	1	0	0	1	0	0	1	1	D	107
106	0	0	2	40						0D		108
202	101	1	1	0	0	1	0	0	0	1	D	109
202	0	0	1	0						0D		110
212	102	1	1	0	0	1	0	0	1	1	D	111
212	0	0	2	0						0D		112
214	104	1	1	0	0	1	0	0	1	1	D	113
214	0	0	2	3						0D		114
214	106	1	1	0	0	1	0	0	1	1	D	115
214	0	0	2	3						0D		116
106	108	1	1	0	0	1	0	0	1	1	D	117
106	0	0	2	40						0D		118
106	110	1	1	0	0	1	0	0	1	1	D	119
106	0	0	2	40						0D		120
202	112	1	1	0	0	1	0	0	0	1	D	121
202	0	0	1	0						0D		122
212	113	1	1	0	0	1	0	0	1	1	D	123
212	0	0	2	0						0D		124
214	115	1	1	0	0	1	0	0	1	1	D	125
214	0	0	2	3						0D		126
214	117	1	1	0	0	1	0	0	1	1	D	127
214	0	0	2	3						0D		128
106	119	1	1	0	0	1	0	0	1	1	D	129
106	0	0	2	40						0D		130
106	121	1	1	0	0	1	0	0	1	1	D	131
106	0	0	2	40						0D		132
202	123	1	1	0	0	1	0	0	0	1	D	133
202	0	0	1	0						0D		134
212	124	1	1	0	0	1	0	0	1	1	D	135
212	0	0	2	0						0D		136
214	126	1	1	0	0	1	0	0	1	1	D	137
214	0	0	2	3						0D		138
214	128	1	1	0	0	1	0	0	1	1	D	139
214	0	0	2	3						0D		140
106	130	1	1	0	0	1	0	0	1	1	D	141
106	0	0	2	40						0D		142
106	132	1	1	0	0	1	0	0	1	1	D	143
106	0	0	2	40						0D		144
202	134	1	1	0	0	1	0	0	0	1	D	145
202	0	0	1	0						0D		146
212	135	1	1	0	0	1	0	0	1	1	D	147
212	0	0	2	0						0D		148
214	137	1	1	0	0	1	0	0	1	1	D	149
214	0	0	2	3						0D		150
214	139	1	1	0	0	1	0	0	1	1	D	151
214	0	0	2	3						0D		152
106	141	1	1	0	0	1	0	1	1	1	D	153

106	0	0	2	40							0D	154
106	143	1	1	0	0	1	0	0	1	1	D	155
106	0	0	2	40							0D	156
202	145	1	1	0	0	1	0	0	0	1	D	157
202	0	0	1	0							0D	158
212	146	1	1	0	0	1	0	0	1	1	D	159
212	0	0	2	0							0D	160
214	148	1	1	0	0	1	0	0	1	1	D	161
214	0	0	2	3							0D	162
214	150	1	1	0	0	1	0	0	1	1	D	163
214	0	0	2	3							0D	164
106	152	1	1	0	0	1	0	1	1	1	D	165
106	0	0	2	40							0D	166
106	154	1	1	0	0	1	0	0	1	1	D	167
106	0	0	2	40							0D	168
202	156	1	1	0	0	1	0	0	0	1	D	169
202	0	0	1	0							0D	170
212	157	1	1	0	0	1	0	0	1	1	D	171
212	0	0	2	0							0D	172
214	159	1	1	0	0	1	0	0	1	1	D	173
214	0	0	2	3							0D	174
214	161	1	1	0	0	1	0	0	1	1	D	175
214	0	0	2	3							0D	176
106	163	1	1	0	0	1	0	1	1	1	D	177
106	0	0	2	40							0D	178
106	165	1	1	0	0	1	0	0	1	1	D	179
106	0	0	2	40							0D	180
202	167	1	1	0	0	1	0	0	0	1	D	181
202	0	0	1	0							0D	182
212	168	1	1	0	0	1	0	0	1	1	D	183
212	0	0	2	0							0D	184
214	170	1	1	0	0	1	0	0	1	1	D	185
214	0	0	2	3							0D	186
214	172	1	1	0	0	1	0	0	1	1	D	187
214	0	0	2	3							0D	188
106	174	1	1	0	0	1	0	1	1	1	D	189
106	0	0	2	40							0D	190
106	176	1	1	0	0	1	0	1	1	1	D	191
106	0	0	2	40							0D	192
202	178	1	1	0	0	1	0	0	0	1	D	193
202	0	0	1	0							0D	194
212	179	1	1	0	0	1	0	0	1	1	D	195
212	0	0	2	0							0D	196
214	181	1	1	0	0	1	0	0	1	1	D	197
214	0	0	2	3							0D	198
214	183	1	1	0	0	1	0	0	1	1	D	199
214	0	0	2	3							0D	200
106	185	1	1	0	0	1	0	0	1	1	D	201
106	0	0	2	40							0D	202
106	187	1	1	0	0	1	0	1	1	1	D	203
106	0	0	2	40							0D	204
202	189	1	1	0	0	1	0	0	0	1	D	205

202	0	0	1	0							0D	206
212	190	1	1	0	0	1	0	0	1	1	D	207
212	0	0	2	0							0D	208
214	192	1	1	0	0	1	0	0	1	1	D	209
214	0	0	2	3							0D	210
214	194	1	1	0	0	1	0	0	1	1	D	211
214	0	0	2	3							0D	212
106	196	1	1	0	0	1	0	0	1	1	D	213
106	0	0	2	40							0D	214
106	198	1	1	0	0	1	0	1	1	1	D	215
106	0	0	2	40							0D	216
202	200	1	1	0	0	1	0	0	0	1	D	217
202	0	0	1	0							0D	218
212	201	1	1	0	0	1	0	0	1	1	D	219
212	0	0	2	0							0D	220
214	203	1	1	0	0	1	0	0	1	1	D	221
214	0	0	2	3							0D	222
214	205	1	1	0	0	1	0	0	1	1	D	223
214	0	0	2	3							0D	224
106	207	1	1	0	0	1	0	0	1	1	D	225
106	0	0	2	40							0D	226
106	209	1	1	0	0	1	0	1	1	1	D	227
106	0	0	2	40							0D	228
202	211	1	1	0	0	1	0	0	0	1	D	229
202	0	0	1	0							0D	230
212	212	1	1	0	0	1	0	0	1	1	D	231
212	0	0	2	0							0D	232
214	214	1	1	0	0	1	0	0	1	1	D	233
214	0	0	2	3							0D	234
214	216	1	1	0	0	1	0	0	1	1	D	235
214	0	0	2	3							0D	236
106	218	1	1	0	0	1	0	0	1	1	D	237
106	0	0	2	40							0D	238
106	220	1	1	0	0	1	0	1	1	1	D	239
106	0	0	2	40							0D	240
202	222	1	1	0	0	1	0	0	0	1	D	241
202	0	0	1	0							0D	242
212	223	1	1	0	0	1	0	0	1	1	D	243
212	0	0	2	0							0D	244
214	225	1	1	0	0	1	0	0	1	1	D	245
214	0	0	2	3							0D	246
214	227	1	1	0	0	1	0	0	1	1	D	247
214	0	0	2	3							0D	248
106	229	1	1	0	0	1	0	1	1	1	D	249
106	0	0	2	40							0D	250
106	231	1	1	0	0	1	0	1	1	1	D	251
106	0	0	2	40							0D	252
202	233	1	1	0	0	1	0	0	0	1	D	253
202	0	0	1	0							0D	254
212	234	1	1	0	0	1	0	0	1	1	D	255
212	0	0	2	0							0D	256
214	236	1	1	0	0	1	0	0	1	1	D	257

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     214       0       0       2       3                                   0D      258
     214     238       1       1       0       0       1       0 0 1 1      D      259
     214       0       0       2       3                                   0D      260
     106     240       1       1       0       0       1       0 1 1 1      D      261
     106       0       0       2      40                                   0D      262
     106     242       1       1       0       0       1       0 1 1 1      D      263
     106       0       0       2      40                                   0D      264
     202     244       1       1       0       0       1       0 0 0 1      D      265
     202       0       0       1       0                                   0D      266
     212     245       1       1       0       0       1       0 0 1 1      D      267
     212       0       0       2       0                                   0D      268
     214     247       1       1       0       0       1       0 0 1 1      D      269
     214       0       0       2       3                                   0D      270
     214     249       1       1       0       0       1       0 0 1 1      D      271
     214       0       0       2       3                                   0D      272
     106     251       1       1       0       0       1       0 1 1 1      D      273
     106       0       0       2      40                                   0D      274
     106     253       1       1       0       0       1       0 1 1 1      D      275
     106       0       0       2      40                                   0D      276
     202     255       1       1       0       0       1       0 0 0 1      D      277
     202       0       0       1       0                                   0D      278
     212     256       1       1       0       0       1       0 0 1 1      D      279
     212       0       0       2       0                                   0D      280
     214     258       1       1       0       0       1       0 0 1 1      D      281
     214       0       0       2       3                                   0D      282
     214     260       1       1       0       0       1       0 0 1 1      D      283
     214       0       0       2       3                                   0D      284
     106     262       1       1       0       0       1       0 1 1 1      D      285
     106       0       0       2      40                                   0D      286
     106     264       1       1       0       0       1       0 1 1 1      D      287
     106       0       0       2      40                                   0D      288
     202     266       1       1       0       0       1       0 0 0 1      D      289
     202       0       0       1       0                                   0D      290
124,1.0000000,0.0,0.0,0.0,0.0,1.0000000,0.0,0.0,0.0,0.0,                    1P        1
1.0000000,0.0,0,0;                                                          1P        2
212,1,7,.4080300,.0609000,1,1.5707963,0.0,0,0,12.7500000,                   3P        3
6.7500000,0.0,7H270.000,0,0;                                                3P        4
214,1,.1500000,.0500000,0.0,13.1775412,5.8224588,13.1708072,                5P        5
6.6841708,0,0;                                                              5P        6
214,1,.1500000,.0500000,0.0,12.3224588,5.8224588,12.8461883,                7P        7
6.8469345,0,0;                                                              7P        8
106,1,3,0.0,13.3162913,5.6837087,13.3162913,5.6837087,                      9P        9
13.2659296,5.7340704,0,0;                                                   9P       10
106,1,3,0.0,12.1837087,5.6837087,12.1837087,5.6837087,                     11P       11
12.2340704,5.7340704,0,0;                                                  11P       12
202,3,9,11,12.7500000,6.2500000,.6046346,5,7,0,0;                          13P       13
212,1,7,.4019400,.0609000,1,1.5707963,0.0,0,0,10.2500000,0.0,              15P       14
0.0,7H225.000,0,0;                                                         15P       15
214,1,.1500000,.0500000,0.0,10.0939196,-.6878392,10.5127277,               17P       16
-.0982342,0,0;                                                             17P       17
214,1,.1500000,.0500000,0.0,9.0204363,.2431879,10.4981652,                 19P       18
.1779113,0,0;                                                              19P       19
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106,1,3,0.0,10.0419263,-.5838525,10.0419263,-.5838525,                  21P     20
10.1498213,-.7996426,0,0;                                               21P     21
106,1,3,0.0,8.9110609,.2796464,8.9110609,.2796464,8.9018509,            23P     22
.2827164,0,0;                                                           23P     23
202,15,21,23,9.7500000,0.0,.7690277,17,19,0,0;                          25P     24
212,1,7,.4019400,.0609000,1,1.5707963,0.0,0,0,10.5000000,               27P     25
2.0000000,0.0,7H225.000,0,0;                                            27P     26
214,1,.1500000,.0500000,0.0,10.2056059,1.0887882,10.7639457,            29P     27
1.9010157,0,0;                                                          29P     28
214,1,.1500000,.0500000,0.0,8.7835139,2.3221620,10.7528776,             31P     29
2.1792215,0,0;                                                          31P     30
106,1,3,0.0,10.0419263,1.4161475,10.0419263,1.4161475,                  33P     31
10.2615076,.9769848,0,0;                                                33P     32
106,1,3,0.0,8.9110609,2.2796464,8.9110609,2.2796464,8.6649285,          35P     33
2.3616905,0,0;                                                          35P     34
202,27,33,35,9.7500000,2.0000000,1.0187658,29,31,0,0;                   37P     35
212,1,7,.4019400,.0609000,1,1.5707963,0.0,0,0,10.2500000,               39P     36
4.0000000,0.0,7H225.000,0,0;                                            39P     37
214,1,.1500000,.0500000,0.0,10.0939196,3.3121608,10.5127277,            41P     38
3.9017660,0,0;                                                          41P     39
214,1,.1500000,.0500000,0.0,9.0204363,4.2431879,10.4981651,             43P     40
4.1779116,0,0;                                                          43P     41
106,1,3,0.0,10.0419263,3.4161475,10.0419263,3.4161475,                  45P     42
10.1498213,3.2003574,0,0;                                               45P     43
106,1,3,0.0,8.9110609,4.2796464,8.9110609,4.2796464,8.9018509,          47P     44
4.2827164,0,0;                                                          47P     45
202,39,45,47,9.7500000,4.0000000,.7690277,41,43,0,0;                    49P     46
212,1,7,.4019400,.0609000,1,1.5707963,0.0,0,0,10.2500000,               51P     47
6.5000000,0.0,7H225.000,0,0;                                            51P     48
214,1,.1500000,.0500000,0.0,10.1171928,5.5156143,10.5564698,            53P     49
6.4041407,0,0;                                                          53P     50
214,1,.1500000,.0500000,0.0,8.9710664,6.5096446,10.4565812,             55P     51
6.6682056,0,0;                                                          55P     52
106,1,3,0.0,10.0419263,5.6661475,10.0419263,5.6661475,                  57P     53
10.1730945,5.4038109,0,0;                                               57P     54
106,1,3,0.0,8.9110609,6.5296464,8.9110609,6.5296464,8.8524810,          59P     55
6.5491730,0,0;                                                          59P     56
202,51,57,59,9.7500000,6.2500000,.8210682,53,55,0,0;                    61P     57
212,1,7,.4080300,.0609000,1,1.5707963,0.0,0,0,12.7500000,               63P     58
2.7500000,0.0,7H270.000,0,0;                                            63P     59
214,1,.1500000,.0500000,0.0,13.3409027,1.4090973,13.2171124,            65P     60
2.6929199,0,0;                                                          65P     61
214,1,.1500000,.0500000,0.0,12.1590973,1.4090973,12.8062794,            67P     62
2.8337653,0,0;                                                          67P     63
106,1,3,0.0,13.3162913,1.4337087,13.3162913,1.4337087,                  69P     64
13.4292910,1.3207090,0,0;                                               69P     65
106,1,3,0.0,12.1837087,1.4337087,12.1837087,1.4337087,                  71P     66
12.0707090,1.3207090,0,0;                                               71P     67
202,63,69,71,12.7500000,2.0000000,.8356626,65,67,0,0;                   73P     68
212,1,7,.4080300,.0609000,1,1.5707963,0.0,0,0,12.7500000,               75P     69
4.7500000,0.0,7H270.000,0,0;                                            75P     70
214,1,.1500000,.0500000,0.0,13.3409028,3.4090972,13.2171053,            77P     71
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4.6929249,0,0;                                                          77P     72
214,1,.1500000,.0500000,0.0,12.1590972,3.4090972,12.8062877,            79P     73
4.8337649,0,0;                                                          79P     74
106,1,3,0.0,13.3162913,3.4337087,13.3162913,3.4337087,                  81P     75
13.4292912,3.3207088,0,0;                                               81P     76
106,1,3,0.0,12.1837087,3.4337087,12.1837087,3.4337087,                  83P     77
12.0707088,3.3207088,0,0;                                               83P     78
202,75,81,83,12.7500000,4.0000000,.8356628,77,79,0,0;                   85P     79
212,1,7,.4080300,.0609000,1,1.5707963,0.0,0,0,12.7500000,               87P     80
.7500000,0.0,7H270.000,0,0;                                             87P     81
214,1,.1500000,.0500000,0.0,13.3409027,-.5909027,13.2171124,            89P     82
.6929199,0,0;                                                           89P     83
214,1,.1500000,.0500000,0.0,12.1590973,-.5909027,12.8062794,            91P     84
.8337653,0,0;                                                           91P     85
106,1,3,0.0,13.3162913,-.5662913,13.3162913,-.5662913,                  93P     86
13.4292910,-.6792910,0,0;                                               93P     87
106,1,3,0.0,12.1837087,-.5662913,12.1837087,-.5662913,                  95P     88
12.0707090,-.6792910,0,0;                                               95P     89
202,87,93,95,12.7500000,0.0,.8356626,89,91,0,0;                         97P     90
212,1,7,.4019400,.0609000,1,1.5707963,0.0,0,0,1.3335195,                99P     91
6.0924616,0.0,7H85.1794,0,0;                                            99P     92
214,1,.1500000,.0500000,0.0,1.4129652,5.5212946,1.6220727,             101P     93
6.0315438,0,0;                                                         101P     94
214,1,.1500000,.0500000,0.0,1.3618900,6.7347125,1.6174298,             103P     95
6.2142524,0,0;                                                         103P     96
106,1,3,0.0,1.0592672,5.8199757,1.0592672,5.8199757,1.5084687,         105P     97
5.4406467,0,0;                                                         105P     98
106,1,3,0.0,1.2459306,6.6187529,1.2459306,6.6187529,1.4502783,         107P     99
6.8231009,0,0;                                                         107P    100
202,99,105,107,.7273991,6.1002216,.8973057,101,103,0,0;                109P    101
212,1,7,.3958500,.0609000,1,1.5707963,0.0,0,0,3.7858014,               111P    102
6.1401320,0.0,7H85.1795,0,0;                                           111P    103
214,1,.1500000,.0500000,0.0,3.8469553,5.5143649,3.7162957,             113P    104
5.3866646,0,0;                                                         113P    105
214,1,.1500000,.0500000,0.0,3.7924764,6.8086880,3.6515481,             115P    106
6.9249570,0,0;                                                         115P    107
106,1,3,0.0,3.4475477,5.8516462,3.4475477,5.8516462,3.9424585,         117P    108
5.4337167,0,0;                                                         117P    109
106,1,3,0.0,3.6342111,6.6504234,3.6342111,6.6504234,3.8808649,         119P    110
6.8970763,0,0;                                                         119P    111
202,111,117,119,3.1156802,6.1318932,.9571335,113,115,0,0;              121P    112
212,1,7,.3958500,.0609000,1,1.5707963,0.0,0,0,5.4941936,               123P    113
5.5083507,0.0,7H85.1797,0,0;                                           123P    114
214,1,.1500000,.0500000,0.0,4.9675483,6.6129165,5.1033343,             125P    115
6.7351517,0,0;                                                         125P    116
214,2,.1500000,.0500000,0.0,5.0057302,5.7057691,5.2832936,             127P    117
5.5388007,5.4332936,5.5388007,0,0;                                     127P    118
106,1,3,0.0,5.4084452,6.2405977,5.4084452,6.2405977,4.8720451,         129P    119
6.6935649,0,0;                                                         129P    120
106,1,3,0.0,5.4137822,6.1138211,5.4137822,6.1138211,4.9173418,         131P    121
5.6173807,0,0;                                                         131P    122
202,123,129,131,5.4800725,6.1801114,.6708214,125,127,0,0;              133P    123
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212,1,6,.3349500,.0609000,1,1.5707963,0.0,0,0,7.0992069,          135P  124
5.4429245,0.0,6H85.180,0,0;                                       135P  125
214,1,.1500000,.0500000,0.0,7.5983694,5.6951459,7.5983694,        137P  126
5.6951460,0,0;                                                    137P  127
214,1,.1500000,.0500000,0.0,7.5555836,6.7116229,7.5555836,        139P  128
6.7116228,0,0;                                                    139P  129
106,1,3,0.0,7.3559408,5.8998650,7.3559408,5.8998650,7.6938728,    141P  130
5.6144979,0,0;                                                    141P  131
106,1,3,0.0,7.5426034,6.6986427,7.5426034,6.6986427,7.6439719,    143P  132
6.8000113,0,0;                                                    143P  133
202,135,141,143,7.0240726,6.1801114,.7516703,137,139,0,0;         145P  134
212,1,7,.3897600,.0609000,1,1.5707963,0.0,0,0,1.3302597,          147P  135
3.9236999,0.0,7H85.1792,0,0;                                      147P  136
214,1,.1500000,.0500000,0.0,1.4018294,3.3481638,1.6171509,        149P  137
3.8627899,0,0;                                                    149P  138
214,1,.1500000,.0500000,0.0,1.3489565,4.6042754,1.6158312,        151P  139
4.0454843,0,0;                                                    151P  140
106,1,3,0.0,1.0240077,3.6672140,1.0240077,3.6672140,1.4973330,    153P  141
3.2675161,0,0;                                                    153P  142
106,1,3,0.0,1.2106713,4.4659909,1.2106713,4.4659909,1.4373450,    155P  143
4.6926637,0,0;                                                    155P  144
202,147,153,155,.6921390,3.9474597,.9288789,149,151,0,0;          157P  145
212,1,7,.3958500,.0609000,1,1.5707963,0.0,0,0,3.8625412,          159P  146
4.0193701,0.0,7H85.1793,0,0;                                      159P  147
214,1,.1500000,.0500000,0.0,3.8984568,3.2883423,3.7691025,        161P  148
3.1593199,0,0;                                                    161P  149
214,1,.1500000,.0500000,0.0,3.8375103,4.7362208,3.6977707,        163P  150
4.8539159,0,0;                                                    163P  151
106,1,3,0.0,3.4122883,3.6988844,3.4122883,3.6988844,3.9939605,    165P  152
3.2076946,0,0;                                                    165P  153
106,1,3,0.0,3.5989513,4.4976620,3.5989513,4.4976620,3.9258987,    167P  154
4.8246092,0,0;                                                    167P  155
202,159,165,167,3.0804195,3.9791300,1.0706880,161,163,0,0;        169P  156
212,1,7,.4019400,.0609000,1,1.5707963,0.0,0,0,5.0241055,          171P  157
3.3770704,0.0,7H85.1794,0,0;                                      171P  158
214,2,.1500000,.0500000,0.0,5.9888410,3.5679451,5.7952855,        173P  159
3.4075204,5.6452855,3.4075204,0,0;                                173P  160
214,1,.1500000,.0500000,0.0,5.9483098,4.5308470,5.8036153,        175P  161
4.6423942,0,0;                                                    175P  162
106,1,3,0.0,5.7766815,3.7471037,5.7766815,3.7471037,6.0843445,    177P  163
3.4872973,0,0;                                                    177P  164
106,1,3,0.0,5.9633435,4.5458807,5.9633435,4.5458807,6.0366981,    179P  165
4.6192353,0,0;                                                    179P  166
202,171,177,179,5.4448123,4.0273495,.7120531,173,175,0,0;         181P  167
212,1,6,.3288600,.0609000,1,1.5707963,0.0,0,0,6.8264465,          183P  168
3.4030139,0.0,6H85.179,0,0;                                       183P  169
214,1,.1500000,.0500000,0.0,7.4360137,3.6497102,7.4360137,        185P  170
3.6497103,0,0;                                                    185P  171
214,1,.1500000,.0500000,0.0,7.4026967,4.4412337,7.4026967,        187P  172
4.4412337,0,0;                                                    187P  173
106,1,3,0.0,7.3206811,3.7471029,7.3206811,3.7471029,7.5315171,    189P  174
3.5690623,0,0;                                                    189P  175
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106,1,3,0.0,7.5073437,4.5458807,7.5073437,4.5458807,7.4910850,          191P    176
4.5296221,0,0;                                                          191P    177
202,183,189,191,6.9888124,4.0273495,.5853207,185,187,0,0;               193P    178
212,1,7,.3958500,.0609000,1,1.5707963,0.0,0,0,1.1058791,                195P    179
1.8199995,0.0,7H85.1793,0,0;                                            195P    180
214,1,.1500000,.0500000,0.0,1.1659350,1.2216534,1.3919861,              197P    181
1.7590941,0,0;                                                          197P    182
214,1,.1500000,.0500000,0.0,1.1103433,2.5423430,1.3922339,              199P    183
1.9417878,0,0;                                                          199P    184
106,1,3,0.0,.7516278,1.5715137,.7516278,1.5715137,1.2614386,            201P    185
1.14[illegible]0056,0,0;                                                201P    186
106,1,3,0.0,.9382913,2.3702906,.9382913,2.3702906,1.1987316,            203P    187
2.6307313,0,0;                                                          203P    188
202,195,201,203,.4197590,1.8517594,.9766332,197,199,0,0;                205P    189
212,1,7,.4019400,.0609000,1,1.5707963,0.0,0,0,3.4781609,                207P    190
1.8836700,0.0,7H85.1794,0,0;                                            207P    191
214,1,.1500000,.0500000,0.0,3.5390949,1.2660912,3.4084319,              209P    192
1.1383944,0,0;                                                          209P    193
214,1,.1500000,.0500000,0.0,3.4846301,2.5600204,3.3436981,              211P    194
2.6762850,0,0;                                                          211P    195
106,1,3,0.0,3.1399088,1.6031842,3.1399088,1.6031842,3.6345984,          213P    196
1.1854433,0,0;                                                          213P    197
106,1,3,0.0,3.3265714,2.4019615,3.3265714,2.4019615,3.5730184,          215P    198
2.6484088,0,0;                                                          215P    199
202,207,213,215,2.8080406,1.8834301,.9568427,209,211,0,0;               217P    200
212,1,7,.3897600,.0609000,1,1.5707963,0.0,0,0,6.3890426,                219P    201
1.4712123,0.0,7H85.1792,0,0;                                            219P    202
214,1,.1500000,.0500000,0.0,5.1029579,2.3936551,5.2380745,              221P    203
2.5166299,0,0;                                                          221P    204
214,2,.1500000,.0500000,0.0,5.1427211,1.4490310,6.1781426,              223P    205
1.5016623,6.3281426,1.5016623,0,0;                                      223P    206
106,1,3,0.0,5.5650342,2.0034576,5.5650342,2.0034576,5.0074541,          225P    207
2.4743026,0,0;                                                          225P    208
106,1,3,0.0,5.5703717,1.8766816,5.5703717,1.8766816,5.0543327,          227P    209
1.3606427,0,0;                                                          227P    210
202,219,225,227,5.6366620,1.9429719,.6985381,221,223,0,0;               229P    211
212,1,6,.3288600,.0609000,1,1.5707963,0.0,0,0,7.3094230,                231P    212
2.7152557,0.0,6H85.179,0,0;                                             231P    213
214,1,.1500000,.0500000,0.0,7.8516844,1.3763279,7.8516846,              233P    214
1.3763281,0,0;                                                          233P    215
214,1,.1500000,.0500000,0.0,7.8016917,2.5640013,7.8016917,              235P    216
2.5640013,0,0;                                                          235P    217
106,1,3,0.0,7.5125309,1.6627255,7.5125309,1.6627255,7.9471879,          237P    218
1.2956801,0,0;                                                          237P    219
106,1,3,0.0,7.6991934,2.4615030,7.6991934,2.4615030,7.8900800,          239P    220
2.6523897,0,0;                                                          239P    221
202,231,237,239,7.1806622,1.9429715,.8782686,233,235,0,0;               241P    222
212,1,7,.3958500,.0609000,1,1.5707963,0.0,0,0,.9173290,.0833981,        243P    223
0.0,7H85.1793,0,0;                                                      243P    224
214,1,.1500000,.0500000,0.0,1.0071373,-.4867494,1.2085609,              245P    225
.0228094,0,0;                                                           245P    226
214,1,.1500000,.0500000,0.0,.9582702,.6742086,1.1985497,                247P    227
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.2052020,0,0;                                                          247P    228
106,1,3,0.0,.6830777,-.2130974,.6830777,-.2130974,1.1026408,           249P    229
-.5673972,0,0;                                                         249P    230
106,1,3,0.0,.8697411,.5856799,.8697411,.5856799,1.0466586,             251P    231
.7625968,0,0;                                                          251P    232
202,243,249,251,.3512089,.0671486,.8585134,245,247,0,0;                253P    233
212,1,7,.4019400,.0609000,1,1.5707963,0.0,0,0,3.1773295,               255P    234
.1458504,0.0,7H85.1794,0,0;                                            255P    235
214,1,.1500000,.0500000,0.0,3.2839415,-.3561670,3.1502479,             257P    236
-.4806873,0,0;                                                         257P    237
214,1,.1500000,.0500000,0.0,3.2403780,.6787810,3.0966931,              259P    238
.7916258,0,0;                                                          259P    239
106,1,3,0.0,3.0310769,-.1426350,3.0310769,-.1426350,3.3794449,         261P    240
-.4368149,0,0;                                                         261P    241
106,1,3,0.0,3.2177395,.6561427,3.2177395,.6561427,3.3287663,           263P    242
.7671694,0,0;                                                          263P    243
202,255,261,263,2.6992087,.1376110,.7653295,257,259,0,0;               265P    244
212,1,7,.3958500,.0609000,1,1.5707963,0.0,0,0,4.7031802,               267P    245
-.5973330,0.0,7H85.1795,0,0;                                           267P    246
214,2,.1500000,.0500000,0.0,5.6679149,-.3997418,5.4743603,             269P    247
-.5668830,5.3243603,-.5668830,0,0;                                     269P    248
214,1,.1500000,.0500000,0.0,5.6214326,.7045106,5.4786027,              271P    249
.8184356,0,0;                                                          271P    250
106,1,3,0.0,5.3758932,-.1531452,5.3758932,-.1531452,5.7634184,         273P    251
-.4803896,0,0;                                                         273P    252
106,1,3,0.0,5.5625551,.6456324,5.5625551,.6456324,5.7098208,           275P    253
.7928991,0,0;                                                          275P    254
202,267,273,275,5.0440249,.1271007,.8165793,269,271,0,0;               277P    255
212,1,6,.3288600,.0609000,1,1.5707963,0.0,0,0,6.8689485,               279P    256
-.5844389,0.0,6H85.179,0,0;                                            279P    257
214,1,.1500000,.0500000,0.0,7.2677093,-.3763738,7.2677093,             281P    258
-.3763738,0,0;                                                         281P    259
214,1,.1500000,.0500000,0.0,7.2215309,.7206866,7.2215309,              283P    260
.7206866,0,0;                                                          283P    261
106,1,3,0.0,6.9797512,-.1332080,6.9797512,-.1332080,7.3632129,         285P    262
-.4570216,0,0;                                                         285P    263
106,1,3,0.0,7.1664137,.6655694,7.1664137,.6655694,7.3099192,           287P    264
.8090750,0,0;                                                          287P    265
202,279,285,287,6.6478825,.1470380,.8112615,281,283,0,0;               289P    266
S       1G      2D     290P    266                                       T      1
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ADIM TEST CASE 2                                                                S       1
1H,,1H;,,5HADIM2,4HCIIN,6H2.1.3 ,16,8,24,8,56,,1.0000000,1,4HINCH,0,,13HG       1
810827.122507,,,,;                                                              G       2
     124       1       1       1       0       0       0       0 0 0 0  D      1
     124       0       0       2       0                                0D      2
     212       3       1       1       0       0       1       0 0 1 1  D      3
     212       0       0       2       0                                0D      4
     214       5       1       1       0       0       1       0 0 1 1  D      5
     214       0       0       2       3                                0D      6
     214       7       1       1       0       0       1       0 0 1 1  D      7
     214       0       0       2       3                                0D      8
     106       9       1       1       0       0       1       0 1 1 1  D      9
     106       0       0       2      40                                0D     10
     106      11       1       1       0       0       1       0 1 1 1  D     11
     106       0       0       2      40                                0D     12
     202      13       1       1       0       0       1       0 0 0 1  D     13
     202       0       0       1       0                                0D     14
     212      14       1       1       0       0       1       0 0 1 1  D     15
     212       0       0       2       0                                0D     16
     214      16       1       1       0       0       1       0 0 1 1  D     17
     214       0       0       2       3                                0D     18
     214      18       1       1       0       0       1       0 0 1 1  D     19
     214       0       0       2       3                                0D     20
     106      20       1       1       0       0       1       0 1 1 1  D     21
     106       0       0       2      40                                0D     22
     106      22       1       1       0       0       1       0 1 1 1  D     23
     106       0       0       2      40                                0D     24
     202      24       1       1       0       0       1       0 0 0 1  D     25
     202       0       0       1       0                                0D     26
     212      25       1       1       0       0       1       0 0 1 1  D     27
     212       0       0       2       0                                0D     28
     214      27       1       1       0       0       1       0 0 1 1  D     29
     214       0       0       2       3                                0D     30
     214      29       1       1       0       0       1       0 0 1 1  D     31
     214       0       0       2       3                                0D     32
     106      31       1       1       0       0       1       0 0 1 1  D     33
     106       0       0       2      40                                0D     34
     106      33       1       1       0       0       1       0 1 1 1  D     35
     106       0       0       2      40                                0D     36
     202      35       1       1       0       0       1       0 0 0 1  D     37
     202       0       0       1       0                                0D     38
     212      36       1       1       0       0       1       0 0 1 1  D     39
     212       0       0       2       0                                0D     40
     214      38       1       1       0       0       1       0 0 1 1  D     41
     214       0       0       2       3                                0D     42
     214      40       1       1       0       0       1       0 0 1 1  D     43
     214       0       0       2       3                                0D     44
     106      42       1       1       0       0       1       0 1 1 1  D     45
     106       0       0       2      40                                0D     46
     106      44       1       1       0       0       1       0 1 1 1  D     47
     106       0       0       2      40                                0D     48
     202      46       1       1       0       0       1       0 0 0 1  D     49
```

202	0	0	1	0							0D		50
212	47	1	1	0	0	1	0	0	1	1	D		51
212	0	0	2	0							0D		52
214	49	1	1	0	0	1	0	0	1	1	D		53
214	0	0	2	3							0D		54
214	51	1	1	0	0	1	0	0	1	1	D		55
214	0	0	2	3							0D		56
106	53	1	1	0	0	1	0	0	1	1	D		57
106	0	0	2	40							0D		58
106	55	1	1	0	0	1	0	0	1	1	D		59
106	0	0	2	40							0D		60
202	57	1	1	0	0	1	0	0	0	1	D		61
202	0	0	1	0							0D		62
212	58	1	1	0	0	1	0	0	1	1	D		63
212	0	0	2	0							0D		64
214	60	1	1	0	0	1	0	0	1	1	D		65
214	0	0	2	3							0D		66
214	62	1	1	0	0	1	0	0	1	1	D		67
214	0	0	2	3							0D		68
106	64	1	1	0	0	1	0	0	1	1	D		69
106	0	0	2	40							0D		70
106	66	1	1	0	0	1	0	1	1	1	D		71
106	0	0	2	40							0D		72
202	68	1	1	0	0	1	0	0	0	1	D		73
202	0	0	1	0							0D		74
212	69	1	1	0	0	1	0	0	1	1	D		75
212	0	0	2	0							0D		76
214	71	1	1	0	0	1	0	0	1	1	D		77
214	0	0	2	3							0D		78
214	73	1	1	0	0	1	0	0	1	1	D		79
214	0	0	2	3							0D		80
106	75	1	1	0	0	1	0	1	1	1	D		81
106	0	0	2	40							0D		82
106	77	1	1	0	0	1	0	0	1	1	D		83
106	0	0	2	40							0D		84
202	79	1	1	0	0	1	0	0	0	1	D		85
202	0	0	1	0							0D		86
212	80	1	1	0	0	1	0	0	1	1	D		87
212	0	0	2	0							0D		88
214	82	1	1	0	0	1	0	0	1	1	D		89
214	0	0	2	3							0D		90
214	84	1	1	0	0	1	0	0	1	1	D		91
214	0	0	2	3							0D		92
106	86	1	1	0	0	1	0	1	1	1	D		93
106	0	0	2	40							0D		94
106	88	1	1	0	0	1	0	1	1	1	D		95
106	0	0	2	40							0D		96
202	90	1	1	0	0	1	0	0	0	1	D		97
202	0	0	1	0							0D		98
212	91	1	1	0	0	1	0	0	1	1	D		99
212	0	0	2	0							0D		100
214	93	1	1	0	0	1	0	0	1	1	D		101

214	0	0	2	3							0D	102
214	95	1	1	0	0	1	0	0	1	1	D	103
214	0	0	2	3							0D	104
106	97	1	1	0	0	1	0	0	1	1	D	105
106	0	0	2	40							0D	106
106	99	1	1	0	0	1	0	0	1	1	D	107
106	0	0	2	40							0D	108
202	101	1	1	0	0	1	0	0	0	1	D	109
202	0	0	1	0							0D	110
212	102	1	1	0	0	1	0	0	1	1	D	111
212	0	0	2	0							0D	112
214	104	1	1	0	0	1	0	0	1	1	D	113
214	0	0	2	3							0D	114
214	106	1	1	0	0	1	0	0	1	1	D	115
214	0	0	2	3							0D	116
106	108	1	1	0	0	1	0	0	1	1	D	117
106	0	0	2	40							0D	118
106	110	1	1	0	0	1	0	0	1	1	D	119
106	0	0	2	40							0D	120
202	112	1	1	0	0	1	0	0	0	1	D	121
202	0	0	1	0							0D	122
212	113	1	1	0	0	1	0	0	1	1	D	123
212	0	0	2	0							0D	124
214	115	1	1	0	0	1	0	0	1	1	D	125
214	0	0	2	3							0D	126
214	117	1	1	0	0	1	0	0	1	1	D	127
214	0	0	2	3							0D	128
106	119	1	1	0	0	1	0	0	1	1	D	129
106	0	0	2	40							0D	130
106	121	1	1	0	0	1	0	0	1	1	D	131
106	0	0	2	40							0D	132
202	123	1	1	0	0	1	0	0	0	1	D	133
202	0	0	1	0							0D	134
212	124	1	1	0	0	1	0	0	1	1	D	135
212	0	0	2	0							0D	136
214	126	1	1	0	0	1	0	0	1	1	D	137
214	0	0	2	3							0D	138
214	128	1	1	0	0	1	0	0	1	1	D	139
214	0	0	2	3							0D	140
106	130	1	1	0	0	1	0	0	1	1	D	141
106	0	0	2	40							0D	142
106	132	1	1	0	0	1	0	0	1	1	D	143
106	0	0	2	40							0D	144
202	134	1	1	0	0	1	0	0	0	1	D	145
202	0	0	1	0							0D	146
212	135	1	1	0	0	1	0	0	1	1	D	147
212	0	0	2	0							0D	148
214	137	1	1	0	0	1	0	0	1	1	D	149
214	0	0	2	3							0D	150
214	139	1	1	0	0	1	0	0	1	1	D	151
214	0	0	2	3							0D	152
106	141	1	1	0	0	1	0	1	1	1	D	153

106	0	0	2	40							0D		154
106	143	1	1	0	0	1	0	0	1	1	D		155
106	0	0	2	40							0D		156
202	145	1	1	0	0	1	0	0	0	1	D		157
202	0	0	1	0							0D		158
212	146	1	1	0	0	1	0	0	1	1	D		159
212	0	0	2	0							0D		160
214	148	1	1	0	0	1	0	0	1	1	D		161
214	0	0	2	3							0D		162
214	150	1	1	0	0	1	0	0	1	1	D		163
214	0	0	2	3							0D		164
106	152	1	1	0	0	1	0	1	1	1	D		165
106	0	0	2	40							0D		166
106	154	1	1	0	0	1	0	0	1	1	D		167
106	0	0	2	40							0D		168
202	156	1	1	0	0	1	0	0	0	1	D		169
202	0	0	1	0							0D		170
212	157	1	1	0	0	1	0	0	1	1	D		171
212	0	0	2	0							0D		172
214	159	1	1	0	0	1	0	0	1	1	D		173
214	0	0	2	3							0D		174
214	161	1	1	0	0	1	0	0	1	1	D		175
214	0	0	2	3							0D		176
106	163	1	1	0	0	1	0	1	1	1	D		177
106	0	0	2	40							0D		178
106	165	1	1	0	0	1	0	0	1	1	D		179
106	0	0	2	40							0D		180
202	167	1	1	0	0	1	0	0	0	1	D		181
202	0	0	1	0							0D		182
212	168	1	1	0	0	1	0	0	1	1	D		183
212	0	0	2	0							0D		184
214	170	1	1	0	0	1	0	0	1	1	D		185
214	0	0	2	3							0D		186
214	172	1	1	0	0	1	0	0	1	1	D		187
214	0	0	2	3							0D		188
106	174	1	1	0	0	1	0	1	1	1	D		189
106	0	0	2	40							0D		190
106	176	1	1	0	0	1	0	1	1	1	D		191
106	0	0	2	40							0D		192
202	178	1	1	0	0	1	0	0	0	1	D		193
202	0	0	1	0							0D		194
212	179	1	1	0	0	1	0	0	1	1	D		195
212	0	0	2	0							0D		196
214	181	1	1	0	0	1	0	0	1	1	D		197
214	0	0	2	3							0D		198
214	183	1	1	0	0	1	0	0	1	1	D		199
214	0	0	2	3							0D		200
106	185	1	1	0	0	1	0	0	1	1	D		201
106	0	0	2	40							0D		202
106	187	1	1	0	0	1	0	1	1	1	D		203
106	0	0	2	40							0D		204
202	189	1	1	0	0	1	0	0	0	1	D		205

202	0	0	1	0							0D	206
212	190	1	1	0	0	1	0	0	1	1	D	207
212	0	0	2	0							0D	208
214	192	1	1	0	0	1	0	0	1	1	D	209
214	0	0	2	3							0D	210
214	194	1	1	0	0	1	0	0	1	1	D	211
214	0	0	2	3							0D	212
106	196	1	1	0	0	1	0	0	1	1	D	213
106	0	0	2	40							0D	214
106	198	1	1	0	0	1	0	1	1	1	D	215
106	0	0	2	40							0D	216
202	200	1	1	0	0	1	0	0	0	1	D	217
202	0	0	1	0							0D	218
212	201	1	1	0	0	1	0	0	1	1	D	219
212	0	0	2	0							0D	220
214	203	1	1	0	0	1	0	0	1	1	D	221
214	0	0	2	3							0D	222
214	205	1	1	0	0	1	0	0	1	1	D	223
214	0	0	2	3							0D	224
106	207	1	1	0	0	1	0	0	1	1	D	225
106	0	0	2	40							0D	226
106	209	1	1	0	0	1	0	1	1	1	D	227
106	0	0	2	40							0D	228
202	211	1	1	0	0	1	0	0	0	1	D	229
202	0	0	1	0							0D	230
212	212	1	1	0	0	1	0	0	1	1	D	231
212	0	0	2	0							0D	232
214	214	1	1	0	0	1	0	0	1	1	D	233
214	0	0	2	3							0D	234
214	216	1	1	0	0	1	0	0	1	1	D	235
214	0	0	2	3							0D	236
106	218	1	1	0	0	1	0	0	1	1	D	237
106	0	0	2	40							0D	238
106	220	1	1	0	0	1	0	1	1	1	D	239
106	0	0	2	40							0D	240
202	222	1	1	0	0	1	0	0	0	1	D	241
202	0	0	1	0							0D	242
212	223	1	1	0	0	1	0	0	1	1	D	243
212	0	0	2	0							0D	244
214	225	1	1	0	0	1	0	0	1	1	D	245
214	0	0	2	3							0D	246
214	227	1	1	0	0	1	0	0	1	1	D	247
214	0	0	2	3							0D	248
106	229	1	1	0	0	1	0	1	1	1	D	249
106	0	0	2	40							0D	250
106	231	1	1	0	0	1	0	1	1	1	D	251
106	0	0	2	40							0D	252
202	233	1	1	0	0	1	0	0	0	1	D	253
202	0	0	1	0							0D	254
212	234	1	1	0	0	1	0	0	1	1	D	255
212	0	0	2	0							0D	256
214	236	1	1	0	0	1	0	0	1	1	D	257

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      214        0        0        2        3                                                    0D      258
      214      238        1        1        0        0        1        0 0 1 1  D      259
      214        0        0        2        3                                                    0D      260
      106      240        1        1        0        0        1        0 1 1 1  D      261
      106        0        0        2       40                                                    0D      262
      106      242        1        1        0        0        1        0 1 1 1  D      263
      106        0        0        2       40                                                    0D      264
      202      244        1        1        0        0        1        0 0 0 1  D      265
      202        0        0        1        0                                                    0D      266
      212      245        1        1        0        0        1        0 0 1 1  D      267
      212        0        0        2        0                                                    0D      268
      214      247        1        1        0        0        1        0 0 1 1  D      269
      214        0        0        2        3                                                    0D      270
      214      249        1        1        0        0        1        0 0 1 1  D      271
      214        0        0        2        3                                                    0D      272
      106      251        1        1        0        0        1        0 1 1 1  D      273
      106        0        0        2       40                                                    0D      274
      106      253        1        1        0        0        1        0 1 1 1  D      275
      106        0        0        2       40                                                    0D      276
      202      255        1        1        0        0        1        0 0 0 1  D      277
      202        0        0        1        0                                                    0D      278
      212      256        1        1        0        0        1        0 0 1 1  D      279
      212        0        0        2        0                                                    0D      280
      214      258        1        1        0        0        1        0 0 1 1  D      281
      214        0        0        2        3                                                    0D      282
      214      260        1        1        0        0        1        0 0 1 1  D      283
      214        0        0        2        3                                                    0D      284
      106      262        1        1        0        0        1        0 1 1 1  D      285
      106        0        0        2       40                                                    0D      286
      106      264        1        1        0        0        1        0 1 1 1  D      287
      106        0        0        2       40                                                    0D      288
      202      266        1        1        0        0        1        0 0 0 1  D      289
      202        0        0        1        0                                                    0D      290
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6.7500000,0.0,7H270.000,0,0;                                                                     3P        4
214,1,.1500000,.0500000,0.0,13.1775412,5.8224588,13.1708072,                                     5P        5
6.6841708,0,0;                                                                                   5P        6
214,1,.1500000,.0500000,0.0,12.3224588,5.8224588,12.8461883,                                     7P        7
6.8469345,0,0;                                                                                   7P        8
106,1,3,0.0,13.3162913,5.6837087,13.3162913,5.6837087,                                           9P        9
13.2659296,5.7340704,0,0;                                                                        9P       10
106,1,3,0.0,12.1837087,5.6837087,12.1837087,5.6837087,                                          11P       11
12.2340704,5.7340704,0,0;                                                                       11P       12
202,3,9,11,12.7500000,6.2500000,.6046346,5,7,0,0;                                               13P       13
212,1,7,.4019400,.0609000,1,1.5707963,0.0,0,0,10.2500000,0.0,                                   15P       14
0.0,7H225.000,0,0;                                                                              15P       15
214,1,.1500000,.0500000,0.0,10.0939196,-.6878392,10.5127277,                                    17P       16
-.0982342,0,0;                                                                                  17P       17
214,1,.1500000,.0500000,0.0,9.0204363,.2431879,IC.4981652,                                      19P       18
.1779113,0,0;                                                                                   19P       19
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106,1,3,0.0,10.0419263,-.5838525,10.0419263,-.5838525,                  21P     20
10.1498213,-.7996426,0,0;                                               21P     21
106,1,3,0.0,8.9110609,.2796464,8.9110609,.2796464,8.9018509,            23P     22
.2827164,0,0;                                                           23P     23
202,15,21,23,9.7500000,0.0,.7690277,17,19,0,0;                          25P     24
212,1,7,.4019400,.0609000,1,1.5707963,0.0,0,0,10.5000000,               27P     25
2.0000000,0.0,7H225.000,0,0;                                            27P     26
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1.9010157,0,0;                                                          29P     28
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10.2615076,.9769848,0,0;                                                33P     32
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2.3616905,0,0;                                                          35P     34
202,27,33,35,9.7500000,2.0000000,1.0187658,29,31,0,0;                   37P     35
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4.0000000,0.0,7H225.000,0,0;                                            39P     37
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3.9017660,0,0;                                                          41P     39
214,1,.1500000,.0500000,0.0,9.0204363,4.2431879,10.4981651,             43P     40
4.1779116,0,0;                                                          43P     41
106,1,3,0.0,10.0419263,3.4161475,10.0419263,3.4161475,                  45P     42
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4.2827164,0,0;                                                          47P     45
202,39,45,47,9.7500000,4.0000000,.7690277,41,43,0,0;                    49P     46
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6.4041407,0,0;                                                          53P     50
214,1,.1500000,.0500000,0.0,3.9710664,6.5096446,10.4565812,             55P     51
6.6682056,0,0;                                                          55P     52
106,1,3,0.0,10.0419263,5.6661475,10.0419263,5.6661475,                  57P     53
10.1730945,5.4038109,0,0;                                               57P     54
106,1,3,0.0,8.9110609,6.5296464,8.9110609,6.5296464,8.8524810,          59P     55
6.5491730,0,0;                                                          59P     56
202,51,57,59,9.7500000,6.2500000,.8210682,53,55,0,0;                    61P     57
212,1,7,.4080300,.0609000,1,1.5707963,0.0,0,0,12.7500000,               63P     58
2.7500000,0.0,7H270.000,0,0;                                            63P     59
214,1,.1500000,.0500000,0.0,13.3409027,1.4090973,13.2171124,            65P     60
2.6929199,0,0;                                                          65P     61
214,1,.1500000,.0500000,0.0,12.1590973,1.4090973,12.8062794,            67P     62
2.8337653,0,0;                                                          67P     63
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13.4292910,1.3207090,0,0;                                               69P     65
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212,1,7,.4080300,.0609000,1,1.5707963,0.0,0,0,12.7500000,               75P     69
4.7500000,0.0,7H270.000,0,0;                                            75P     70
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13.4292910,-.6792910,0,0;                                               93P     87
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5.4337167,0,0;                                                         117P    109
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106,1,3,0.0,7.3559408,5.8998650,7.3559408,5.8998650,7.6938728,    141P    130
5.6144979,0,0;                                                    141P    131
106,1,3,0.0,7.5426034,6.6986427,7.5426034,6.6986427,7.6439719,    143P    132
6.8000113,0,0;                                                    143P    133
202,135,141,143,7.0240726,6.1801114,.7516703,137,139,0,0;         145P    134
212,1,7,.3897600,.0609000,1,1.5707963,0.0,0,0,1.3302597,          147P    135
3.9236999,0.0,7H85.1792,0,0;                                      147P    136
214,1,.1500000,.0500000,0.0,1.4018294,3.3481638,1.6171509,        149P    137
3.8627899,0,0;                                                    149P    138
214,1,.1500000,.0500000,0.0,1.3489565,4.6042754,1.6158312,        151P    139
4.0454843,0,0;                                                    151P    140
106,1,3,0.0,1.0240077,3.6672140,1.0240077,3.6672140,1.4973330,    153P    141
3.2675161,0,0;                                                    153P    142
106,1,3,0.0,1.2106713,4.4659909,1.2106713,4.4659909,1.4373450,    155P    143
4.6926637,0,0;                                                    155P    144
202,147,153,155,.6921390,3.9474597,.9288789,149,151,0,0;          157P    145
212,1,7,.3958500,.0609000,1,1.5707963,0.0,0,0,3.8625412,          159P    146
4.0193701,0.0,7H85.1793,0,0;                                      159P    147
214,1,.1500000,.0500000,0.0,3.8984568,3.2883423,3.7691025,        161P    148
3.1593199,0,0;                                                    161P    149
214,1,.1500000,.0500000,0.0,3.8375103,4.7362208,3.6977707,        163P    150
4.8539159,0,0;                                                    163P    151
106,1,3,0.0,3.4122883,3.6988844,3.4122883,3.6988844,3.9939605,    165P    152
3.2076946,0,0;                                                    165P    153
106,1,3,0.0,3.5989513,4.4976620,3.5989513,4.4976620,3.9258987,    167P    154
4.8246092,0,0;                                                    167P    155
202,159,165,167,3.0804195,3.9791300,1.0706880,161,163,0,0;        169P    156
212,1,7,.4019400,.0609000,1,1.5707963,0.0,0,0,5.0241055,          171P    157
3.3770704,0.0,7H85.1794,0,0;                                      171P    158
214,2,.1500000,.0500000,0.0,5.9888410,3.5679451,5.7952855,        173P    159
3.4075204,5.6452855,3.4075204,0,0;                                173P    160
214,1,.1500000,.0500000,0.0,5.9483098,4.5308470,5.8036153,        175P    161
4.6423942,0,0;                                                    175P    162
106,1,3,0.0,5.7766815,3.7471037,5.7766815,3.7471037,6.0843445,    177P    163
3.4872973,0,0;                                                    177P    164
106,1,3,0.0,5.9633435,4.5458807,5.9633435,4.5458807,6.0366981,    179P    165
4.6192353,0,0;                                                    179P    166
203,171,177,179,5.4448123,4.0273495,.7120531,173,175,0,0;         181P    167
212,1,6,.3288600,.0609000,1,1.5707963,0.0,0,0,6.8264465,          183P    168
3.4030139,0.0,6H85.179,0,0;                                       183P    169
214,1,.1500000,.0500000,0.0,7.4360137,3.6497102,7.4360137,        185P    170
3.6497103,0,0;                                                    185P    171
214,1,.1500000,.0500000,0.0,7.4026967,4.4412337,7.4026967,        187P    172
4.4412337,0,0;                                                    187P    173
106,1,3,0.0,7.3206811,3.7471029,7.3206811,3.7471029,7.5315171,    189P    174
3.5690623,0,0;                                                    189P    175
```

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106,1,3,0.0,7.5073437,4.5458807,7.5073437,4.5458807,7.4910850,          191P    176
4.5296221,0,0;                                                          191P    177
202,183,189,191,6.9888124,4.0273495,.5853207,185,187,0,0;               193P    178
212,1,7,.3958500,.0609000,1,1.5707963,0.0,0,0,1.1058791,                195P    179
1.8199995,0.0,7H85.1793,0,0;                                            195P    180
214,1,.1500000,.0500000,0.0,1.1659350,1.2216534,1.3919861,              197P    181
1.7590941,0,0;                                                          197P    182
214,1,.1500000,.0500000,0.0,1.1103433,2.5423430,1.3922339,              199P    183
1.9417878,0,0;                                                          199P    184
106,1,3,0.0,.7516278,1.5715137,.7516278,1.5715137,1.2614386,            201P    185
1.1410056,0,0;                                                          201P    186
106,1,3,0.0,.9382913,2.3702906,.9382913,2.3702906,1.1987316,            203P    187
2.6307313,0,0;                                                          203P    188
202,195,201,203,.4197590,1.8517594,.9766332,197,199,0,0;                205P    189
212,1,7,.4019400,.0609000,1,1.5707963,0.0,0,0,3.4781609,                207P    190
1.8836700,0.0,7H85.1794,0,0;                                            207P    191
214,1,.1500000,.0500000,0.0,3.5390949,1.2660912,3.4084319,              209P    192
1.1383944,0,0;                                                          209P    193
214,1,.1500000,.0500000,0.0,3.4846301,2.5600204,3.3436981,              211P    194
2.6762850,0,0;                                                          211P    195
106,1,3,0.0,3.1399088,1.6031842,3.1399088,1.6031842,3.6345984,          213P    196
1.1854433,0,0;                                                          213P    197
106,1,3,0.0,3.3265714,2.4019615,3.3265714,2.4019615,3.5730184,          215P    198
2.6484088,0,0;                                                          215P    199
202,207,213,215,2.8080406,1.8834301,.9568427,209,211,0,0;               217P    200
212,1,7,.3897600,.0609000,1,1.5707963,0.0,0,0,6.3890426,                219P    201
1.4712123,0.0,7H85.1792,0,0;                                            219P    202
214,1,.1500000,.0500000,0.0,5.1029579,2.3936551,5.2380745,              221P    203
2.5166299,0,0;                                                          221P    204
214,2,.1500000,.0500000,0.0,5.1427211,1.4490310,6.1781426,              223P    205
1.5016623,6.3281426,1.5016623,0,0;                                      223P    206
106,1,3,0.0,5.5650342,2.0034576,5.5650342,2.0034576,5.0074541,          225P    207
2.4743026,0,0;                                                          225P    208
106,1,3,0.0,5.5703717,1.8766816,5.5703717,1.8766816,5.0543327,          227P    209
1.3606427,0,0;                                                          227P    210
202,219,225,227,5.6366620,1.9429719,.6985381,221,223,0,0;               229P    211
212,1,6,.3288600,.0609000,1,1.5707963,0.0,0,0,7.3094230,                231P    212
2.7152557,0.0,6H85.179,0,0;                                             231P    213
214,1,.1500000,.0500000,0.0,7.8516844,1.3763279,7.8516846,              233P    214
1.3763281,0,0;                                                          233P    215
214,1,.1500000,.0500000,0.0,7.8016917,2.5640013,7.8016917,              235P    216
2.5640013,0,0;                                                          235P    217
106,1,3,0.0,7.5125309,1.6627255,7.5125309,1.6627255,7.9471879,          237P    218
1.2956801,0,0;                                                          237P    219
106,1,3,0.0,7.6991934,2.4615030,7.6991934,2.4615030,7.8900800,          239P    220
2.6523897,0,0;                                                          239P    221
202,231,237,239,7.1806622,1.9429715,.8782686,233,235,0,0;               241P    222
212,1,7,.3958500,.0609000,1,1.5707963,0.0,0,0,.9173290,.0833881,        243P    223
0.0,7H85.1793,0,0;                                                      243P    224
214,1,.1500000,.0500000,0.0,1.0071373,-.4867494,1.2085609,              245P    225
.0225094,0,0;                                                           245P    226
214,1,.1500000,.0500000,0.0,.9582702,.6742086,1.1985497,                247P    227
```

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.2052020,0,0;                                                          247P    228
106,1,3,0.0,.6830777,-.2130974,.6830777,-.2130974,1.1026408,           249P    229
-.5673972,0,0;                                                         249P    230
106,1,3,0.0,.8697411,.5856799,.8697411,.5856799,1.0466586,             251P    231
.7625968,0,0;                                                          251P    232
202,243,249,251,.3512089,.0671486,.8585134,245,247,0,0;                253P    233
212,1,7,.4019400,.0609000,1,1.5707963,0.0,0,0,3.1773295,               255P    234
.1458504,0.0,7H85.1794,0,0;                                            255P    235
214,1,.1500000,.0500000,0.0,3.2839415,-.3561670,3.1502479,             257P    236
-.4806873,0,0;                                                         257P    237
214,1,.1500000,.0500000,0.0,3.2403780,.6787810,3.0966931,              259P    238
.7916258,0,0;                                                          259P    239
106,1,3,0.0,3.0310769,-.1426350,3.0310769,-.1426350,3.3794449,         261P    240
-.4368149,0,0;                                                         261P    241
106,1,3,0.0,3.2177395,.6561427,3.2177395,.6561427,3.3287663,           263P    242
.7671694,0,0;                                                          263P    243
202,255,261,263,2.6992087,.1376110,.7653295,257,259,0,0;               265P    244
212,1,7,.3958500,.0609000,1,1.5707963,0.0,0,0,4.7031802,               267P    245
-.5973330,0.0,7H85.1795,0,0;                                           267P    246
214,2,.1500000,.0500000,0.0,5.6679149,-.3997418,5.4743603,             269P    247
-.5668830,5.3243603,-.5668830,0,0;                                     269P    248
214,1,.1500000,.0500000,0.0,5.6214326,.7045106,5.4786027,              271P    249
.8184356,0,0;                                                          271P    250
106,1,3,0.0,5.3758932,-.1531452,5.3758932,-.1531452,5.7634184,         273P    251
-.4803896,0,0;                                                         273P    252
106,1,3,0.0,5.5625551,.6456324,5.5625551,.6456324,5.7098208,           275P    253
.7928991,0,0;                                                          275P    254
202,267,273,275,5.0440249,.1271007,.8165793,269,271,0,0;               277P    255
212,1,6,.3288600,.0609000,1,1.5707963,0.0,0,0,6.8689485,               279P    256
-.5844389,0.0,6H85.179,0,0;                                            279P    257
214,1,.1500000,.0500000,0.0,7.2677093,-.3763738,7.2677093,             281P    258
-.3763738,0,0;                                                         281P    259
214,1,.1500000,.0500000,0.0,7.2215309,.7206866,7.2215309,              283P    260
.7206866,0,0;                                                          283P    261
106,1,3,0.0,6.9797512,-.1332080,6.9797512,-.1332080,7.3632129,         285P    262
-.4570216,0,0;                                                         285P    263
106,1,3,0.0,7.1664137,.6655694,7.1664137,.6655694,7.3099192,           287P    264
.8090750,0,0;                                                          287P    265
202,279,285,287,6.6478825,.1470380,.8112615,281,283,0,0;               289P    266
S       1G      2D     290P     266                                      T       1
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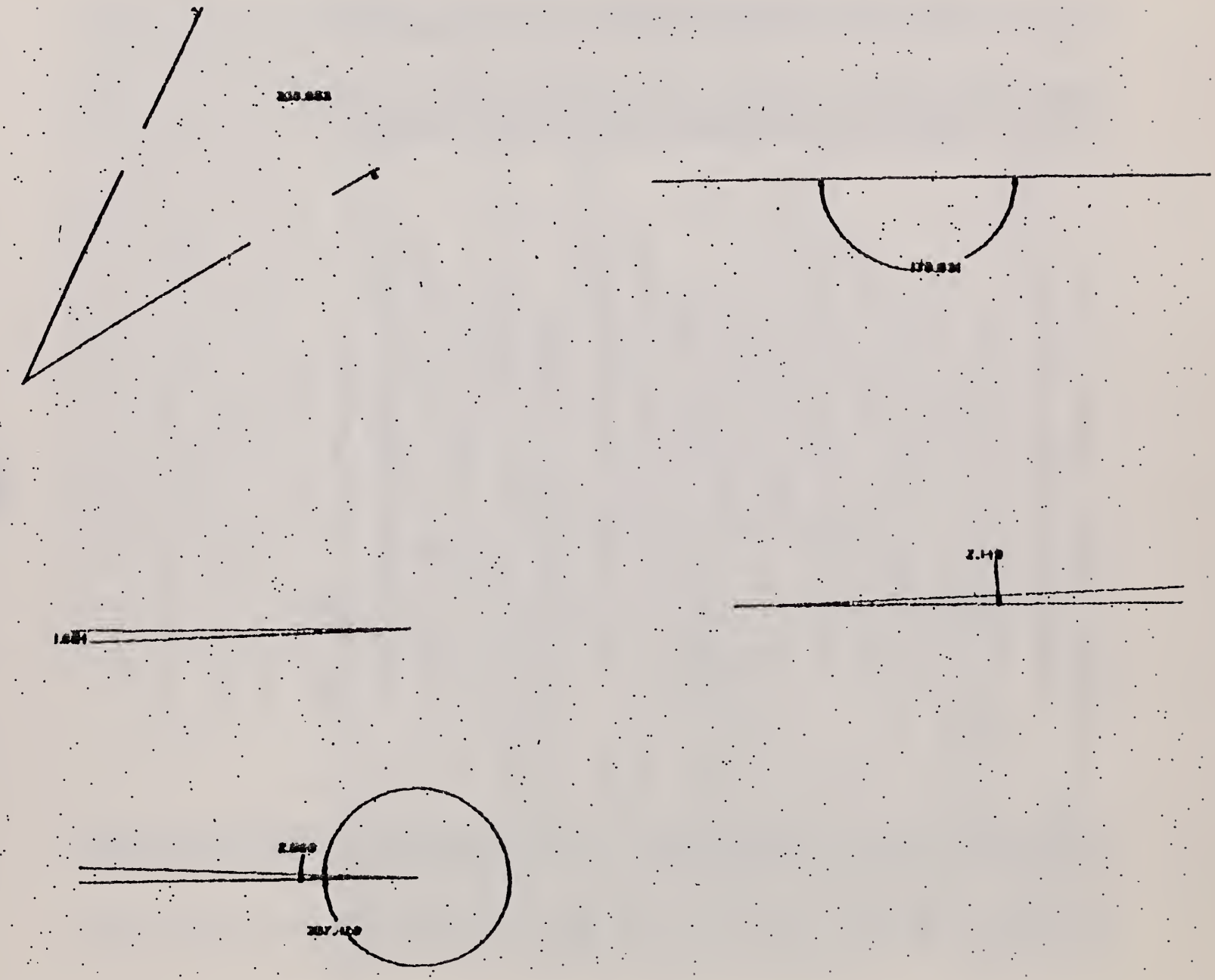

Figure 3.3.9-5 Angular Dimension Cases 3 and 4 (with lines)
Case 3: Rotation (0^{o}, 0^{o}, 0^{o}) Case 4: Rotation (11^{o}, 22^{o}, 33^{o})

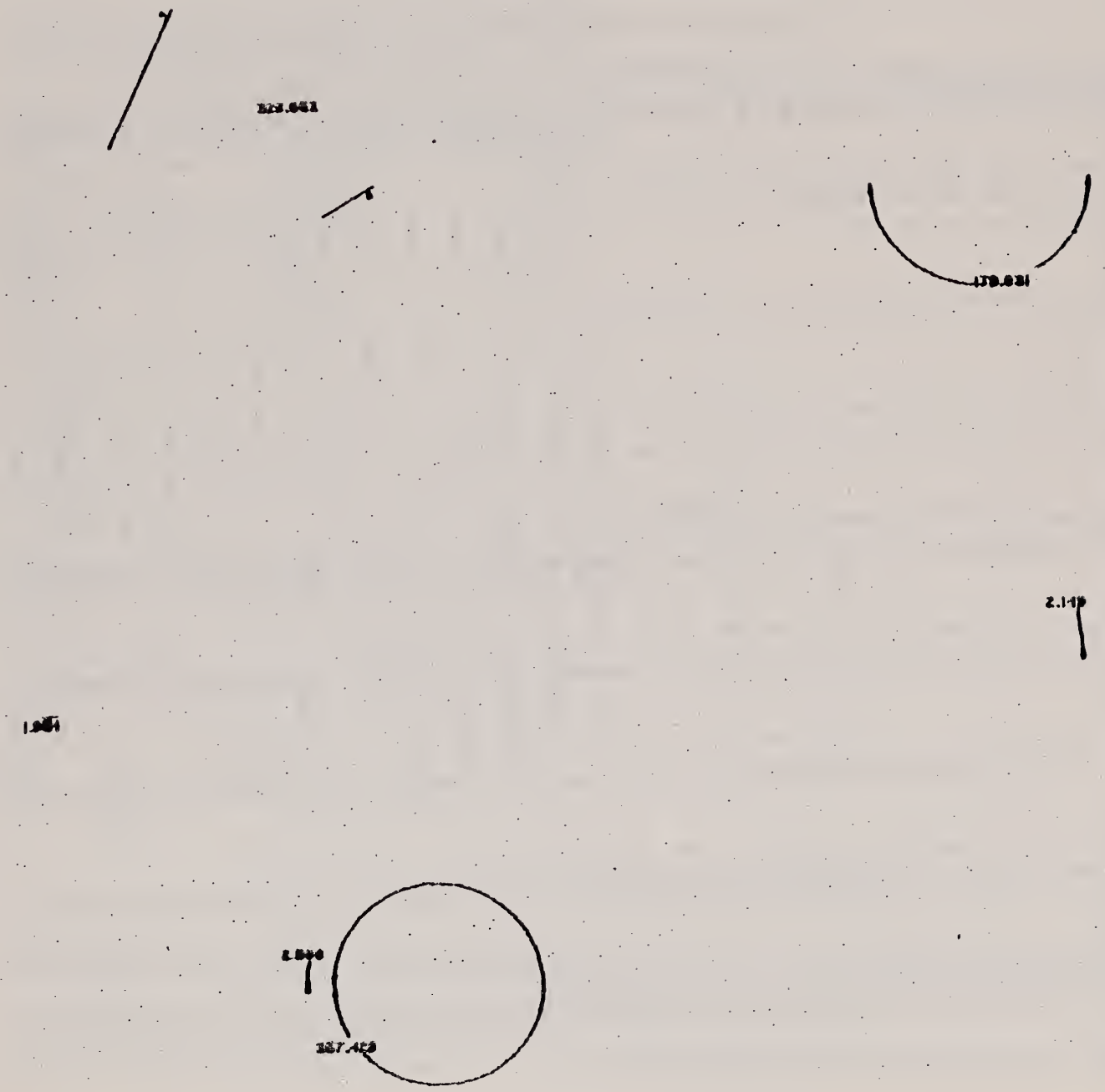

Figure 3.3.9-6 Angular Dimension Cases 3 and 4 (actual part)

```
ADIM TEST CASE 3                                                                S       1
1H,,1H;,,5HADIM3,4HCIIN,6H2.1.3 ,16,8,24,8,56,,1.0000000,1,4HINCH,0,,13HG       1
810827.122606,,,,;                                                              G       2
     124       1       1       1       0       0       0       0 0 0 0  D      1
     124       0       0       2       0                                0D      2
     212       3       1       1       0       0       1       0 0 1 1  D      3
     212       0       0       2       0                                0D      4
     214       5       1       1       0       0       1       0 0 1 1  D      5
     214       0       0       2       3                                0D      6
     214       7       1       1       0       0       1       0 0 1 1  D      7
     214       0       0       2       3                                0D      8
     106       9       1       1       0       0       1       0 1 1 1  D      9
     106       0       0       2      40                                0D     10
     106      11       1       1       0       0       1       0 1 1 1  D     11
     106       0       0       2      40                                0D     12
     202      13       1       1       0       0       1       0 0 0 1  D     13
     202       0       0       1       0                                0D     14
     212      14       1       1       0       0       1       0 0 1 1  D     15
     212       0       0       2       0                                0D     16
     214      16       1       1       0       0       1       0 0 1 1  D     17
     214       0       0       2       3                                0D     18
     214      18       1       1       0       0       1       0 0 1 1  D     19
     214       0       0       2       3                                0D     20
     106      20       1       1       0       0       1       0 0 1 1  D     21
     106       0       0       2      40                                0D     22
     106      22       1       1       0       0       1       0 0 1 1  D     23
     106       0       0       2      40                                0D     24
     202      24       1       1       0       0       1       0 0 0 1  D     25
     202       0       0       1       0                                0D     26
     212      25       1       1       0       0       1       0 0 1 1  D     27
     212       0       0       2       0                                0D     28
     214      27       1       1       0       0       1       0 0 1 1  D     29
     214       0       0       2       3                                0D     30
     214      29       1       1       0       0       1       0 0 1 1  D     31
     214       0       0       2       3                                0D     32
     106      31       1       1       0       0       1       0 0 1 1  D     33
     106       0       0       2      40                                0D     34
     106      33       1       1       0       0       1       0 1 1 1  D     35
     106       0       0       2      40                                0D     36
     202      35       1       1       0       0       1       0 0 0 1  D     37
     202       0       0       1       0                                0D     38
     212      36       1       1       0       0       1       0 0 1 1  D     39
     212       0       0       2       0                                0D     40
     214      38       1       1       0       0       1       0 0 1 1  D     41
     214       0       0       2       3                                0D     42
     214      40       1       1       0       0       1       0 0 1 1  D     43
     214       0       0       2       3                                0D     44
     106      42       1       1       0       0       1       0 1 1 1  D     45
     106       0       0       2      40                                0D     46
     106      44       1       1       0       0       1       0 1 1 1  D     47
     106       0       0       2      40                                0D     48
     202      46       1       1       0       0       1       0 0 0 1  D     49
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```
     202        0        0        1        0                                                  0D       50
     212       47        1        1        0        0        1        0 0 1 1  D             51
     212        0        0        2        0                                                  0D       52
     214       49        1        1        0        0        1        0 0 1 1  D             53
     214        0        0        2        3                                                  0D       54
     214       51        1        1        0        0        1        0 0 1 1  D             55
     214        0        0        2        3                                                  0D       56
     106       53        1        1        0        0        1        0 1 1 1  D             57
     106        0        0        2       40                                                  0D       58
     106       55        1        1        0        0        1        0 1 1 1  D             59
     106        0        0        2       40                                                  0D       60
     202       57        1        1        0        0        1        0 0 0 1  D             61
     202        0        0        1        0                                                  0D       62
     212       58        1        1        0        0        1        0 0 1 1  D             63
     212        0        0        2        0                                                  0D       64
     214       60        1        1        0        0        1        0 0 1 1  D             65
     214        0        0        2        3                                                  0D       66
     214       62        1        1        0        0        1        0 0 1 1  D             67
     214        0        0        2        3                                                  0D       68
     106       64        1        1        0        0        1        0 1 1 1  D             69
     106        0        0        2       40                                                  0D       70
     106       66        1        1        0        0        1        0 1 1 1  D             71
     106        0        0        2       40                                                  0D       72
     202       68        1        1        0        0        1        0 0 0 1  D             73
     202        0        0        1        0                                                  0D       74
124,1.0000000,0.0,0.0,0.0,0.0,1.0000000,0.0,0.0,0.0,0.0,                                     1P       1
1.0000000,0.0,0,0;                                                                           1P       2
212,1,7,.7360000,.1560000,1,1.5707963,0.0,0,0,9.7659798,                                     3P       3
3.1625695,0.0,7H179.831,0,0;                                                                 3P       4
214,1,.1500000,.0500000,0.0,7.9445788,5.0871626,9.9548096,                                   5P       5
3.1922900,0,0;                                                                               5P       6
214,1,.1500000,.0500000,0.0,11.8118275,5.1565377,10.8410751,                                 7P       7
3.4475394,0,0;                                                                               7P       8
106,1,3,0.0,4.5023680,5.0203238,4.5023680,5.0203238,7.8196024,                               9P       9
5.0847359,0,0;                                                                               9P      10
106,1,3,0.0,16.2026584,5.2288150,16.2026584,5.2288150,                                      11P      11
11.9368106,5.1585951,0,0;                                                                   11P      12
202,3,9,11,9.8781519,5.1247077,1.9339375,5,7,0,0;                                           13P      13
212,1,7,1.0608000,.1560000,1,1.5707963,0.0,0,0,-3.0394285,                                  15P      14
6.7518706,0.0,7H326.853,0,0;                                                                15P      15
214,1,.1500000,.0500000,0.0,-4.6677636,8.5493691,-4.6677627,                                17P      16
8.5493692,0,0;                                                                              17P      17
214,1,.1500000,.0500000,0.0,-1.0990795,5.2368504,-1.0990797,                                19P      18
5.2368508,0,0;                                                                              19P      19
106,1,3,0.0,-5.8518827,6.1529373,-5.8518827,6.1529373,                                      21P      20
-4.6123899,8.6614350,0,0;                                                                   21P      21
106,1,3,0.0,-1.9059879,4.7604312,-1.9059879,4.7604312,-.9914409,                            23P      22
5.3004030,0,0;                                                                              23P      23
202,15,21,23,-8.4487181,.8974361,8.5350866,17,19,0,0;                                       25P      24
212,1,5,.4864000,.1560000,1,1.5707963,0.0,0,0,-7.7697778,                                   27P      25
-4.4404740,0.0,5H1.984,0,0;                                                                 27P      26
214,1,.1500000,.0500000,0.0,-7.2654505,-4.2080320,-7.2654505,                               29P      27
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-4.2080307,0,0;                                                    29P      28
214,1,.1500000,.0500000,0.0,-7.2585234,-4.4484209,-7.2585236,      31P      29
-4.4484201,0,0;                                                    31P      30
106,1,3,0.0,-7.1065645,-4.2062057,-7.1065645,-4.2062057,           33P      31
-7.3904423,-4.2094687,0,0;                                         33P      32
106,1,3,0.0,-7.0808301,-4.4402197,-7.0808301,-4.4402197,           35P      33
-7.3833905,-4.4541840,0,0;                                         35P      34
202,27,33,35,-.3205132,-4.1282053,6.9453959,29,31,0,0;             37P      35
212,1,5,.6396000,.1560000,1,1.5707963,0.0,0,0,10.9063444,          39P      36
-2.6749942,0.0,5H2.149,0,0;                                        39P      37
214,1,.1500000,.0500000,0.0,11.5155231,-3.6310084,11.4372584,      41P      38
-2.7734415,0,0;                                                    41P      39
214,1,.1500000,.0500000,0.0,11.5101315,-3.4346487,11.5101314,      43P      40
-3.4346487,0,0;                                                    43P      41
106,1,3,0.0,15.2190965,-3.5988032,15.2190965,-3.5988032,           45P      42
11.6405184,-3.6299214,0,0;                                         45P      43
106,1,3,0.0,15.2446404,-3.2619545,15.2446404,-3.2619545,           47P      44
11.6349981,-3.4288745,0,0;                                         47P      45
202,39,45,47,6.2791958,-3.6765418,5.2365255,41,43,0,0;             49P      46
212,1,5,.7176000,.1560000,1,1.5707963,0.0,0,0,-3.0077527,          51P      47
-8.7907066,0.0,5H2.580,0,0;                                        51P      48
214,1,.1500000,.0500000,0.0,-2.5673502,-9.2751873,-2.5673502,      53P      49
-9.2751869,0,0;                                                    53P      50
214,1,.1500000,.0500000,0.0,-2.5678348,-9.3828250,-2.5252591,      55P      51
-8.8886105,0,0;                                                    55P      52
106,1,3,0.0,-7.3038775,-9.1471730,-7.3038775,-9.1471730,           57P      53
-2.6923046,-9.2718101,0,0;                                         57P      54
106,1,3,0.0,-7.3038965,-9.4681596,-7.3038965,-9.4681596,           59P      55
-2.6928145,-9.3850769,0,0;                                         59P      56
202,51,57,59,-.1779904,-9.3397646,2.3902323,53,55,0,0;             61P      57
212,1,7,1.0452000,.1560000,1,1.5707963,0.0,0,0,-2.4164591,         63P      58
-10.5645876,0.0,7H357.420,0,0;                                     63P      59
214,1,.1500000,.0500000,0.0,-2.0859765,-9.3741428,-1.8444463,      65P      60
-10.2695590,0,0;                                                   65P      61
214,1,.1500000,.0500000,0.0,-2.0855896,-9.2882078,-1.5782240,      67P      62
-10.6362750,0,0;                                                   67P      63
106,1,3,0.0,-7.3038965,-9.4681596,-7.3038965,-9.4681596,           69P      54
-2.2109562,-9.3763947,0,0;                                         69P      65
106,1,3,0.0,-7.3038775,-9.1471730,-7.3038775,-9.1471730,           71P      66
-2.2105440,-9.2848307,0,0;                                         71P      67
202,63,69,71,-.1779899,-9.3397646,1.9082963,65,67,0,0;             73P      68
S       1G      2D      74P     68                                  T       1
```

```
ADIM TEST CASE 4                                                                S       1
1H,,1H;,,5HADIM4,4HCIIN,6H2.1.3 ,16,8,24,8,56,,1.0000000,1,4HINCH,0,,13HG       1
810827.122620,,,,;                                                              G       2
     124         1         1         1         0         0         0         0 0 0 0 D       1
     124         0         0         2         0                             0D      2
     212         3         1         1         0         0         1         0 0 1 1 D       3
     212         0         0         2         0                             0D      4
     214         5         1         1         0         0         1         0 0 1 1 D       5
     214         0         0         2         3                             0D      6
     214         7         1         1         0         0         1         0 0 1 1 D       7
     214         0         0         2         3                             0D      8
     106         9         1         1         0         0         1         0 1 1 1 D       9
     106         0         0         2        40                             0D      10
     106        11         1         1         0         0         1         0 1 1 1 D       11
     106         0         0         2        40                             0D      12
     202        13         1         1         0         0         1         0 0 0 1 D       13
     202         0         0         1         0                             0D      14
     212        14         1         1         0         0         1         0 0 1 1 D       15
     212         0         0         2         0                             0D      16
     214        16         1         1         0         0         1         0 0 1 1 D       17
     214         0         0         2         3                             0D      18
     214        18         1         1         0         0         1         0 0 1 1 D       19
     214         0         0         2         3                             0D      20
     106        20         1         1         0         0         1         0 0 1 1 D       21
     106         0         0         2        40                             0D      22
     106        22         1         1         0         0         1         0 0 1 1 D       23
     106         0         0         2        40                             0D      24
     202        24         1         1         0         0         1         0 0 0 1 D       25
     202         0         0         1         0                             0D      26
     212        25         1         1         0         0         1         0 0 1 1 D       27
     212         0         0         2         0                             0D      28
     214        27         1         1         0         0         1         0 0 1 1 D       29
     214         0         0         2         3                             0D      30
     214        29         1         1         0         0         1         0 0 1 1 D       31
     214         0         0         2         3                             0D      32
     106        31         1         1         0         0         1         0 0 1 1 D       33
     106         0         0         2        40                             0D      34
     106        33         1         1         0         0         1         0 1 1 1 D       35
     106         0         0         2        40                             0D      36
     202        35         1         1         0         0         1         0 0 0 1 D       37
     202         0         0         1         0                             0D      38
     212        36         1         1         0         0         1         0 0 1 1 D       39
     212         0         0         2         0                             0D      40
     214        38         1         1         0         0         1         0 0 1 1 D       41
     214         0         0         2         3                             0D      42
     214        40         1         1         0         0         1         0 0 1 1 D       43
     214         0         0         2         3                             0D      44
     106        42         1         1         0         0         1         0 1 1 1 D       45
     106         0         0         2        40                             0D      46
     106        44         1         1         0         0         1         0 1 1 1 D       47
     106         0         0         2        40                             0D      48
     202        46         1         1         0         0         1         0 0 0 1 D       49
```

```
      202        0        0        1        0                                    0D      50
      212       47        1        1        0        0        1        0 0 1 1  D       51
      212        0        0        2        0                                    0D      52
      214       49        1        1        0        0        1        0 0 1 1  D       53
      214        0        0        2        3                                    0D      54
      214       51        1        1        0        0        1        0 0 1 1  D       55
      214        0        0        2        3                                    0D      56
      106       53        1        1        0        0        1        0 1 1 1  D       57
      106        0        0        2       40                                    0D      58
      106       55        1        1        0        0        1        0 1 1 1  D       59
      106        0        0        2       40                                    0D      60
      202       57        1        1        0        0        1        0 0 0 1  D       61
      202        0        0        1        0                                    0D      62
      212       58        1        1        0        0        1        0 0 1 1  D       63
      212        0        0        2        0                                    0D      64
      214       60        1        1        0        0        1        0 0 1 1  D       65
      214        0        0        2        3                                    0D      66
      214       62        1        1        0        0        1        0 0 1 1  D       67
      214        0        0        2        3                                    0D      68
      106       64        1        1        0        0        1        0 1 1 1  D       69
      106        0        0        2       40                                    0D      70
      106       66        1        1        0        0        1        0 1 1 1  D       71
      106        0        0        2       40                                    0D      72
      202       68        1        1        0        0        1        0 0 0 1  D       73
      202        0        0        1        0                                    0D      74
124,.8165318,.5346325,-.2178168,0.0,-.4450338,.8232620,.3523988,                    1P       1
0.0,.3677241,-.1908090,.9101489,0.0,0,0;                                            1P       2
212,1,7,.7360000,.1560000,1,1.5707963,0.0,0,0,9.7659798,                            3P       3
3.1625695,0.0,7H179.831,0,0;                                                        3P       4
214,1,.1500000,.0500000,0.0,7.9445788,5.0871626,9.9548096,                          5P       5
3.1922900,0,0;                                                                      5P       6
214,1,.1500000,.0500000,0.0,11.8118275,5.1565377,10.8410751,                        7P       7
3.4475394,0,0;                                                                      7P       8
106,1,3,0.0,4.5023680,5.0203238,4.5023680,5.0203238,7.8196024,                      9P       9
5.0847359,0,0;                                                                      9P      10
106,1,3,0.0,16.2026584,5.2288150,16.2026584,5.2288150,                             11P      11
11.9368106,5.1585951,0,0;                                                          11P      12
202,3,9,11,9.8781519,5.1247077,1.9339375,5,7,0,0;                                  13P      13
212,1,7,1.0608000,.1560000,1,1.5707963,0.0,0,0,-3.0394285,                         15P      14
6.7518706,0.0,7H326.853,0,0;                                                       15P      15
214,1,.1500000,.0500000,0.0,-4.6677636,8.5493691,-4.6677627,                       17P      16
8.5493692,0,0;                                                                     17P      17
214,1,.1500000,.0500000,0.0,-1.0990795,5.2368504,-1.0990797,                       19P      18
5.2368508,0,0;                                                                     19P      19
106,1,3,0.0,-5.8518827,6.1529373,-5.8518827,6.1529373,                             21P      20
-4.6123899,8.6614350,0,0;                                                          21P      21
106,1,3,0.0,-1.9059879,4.7604312,-1.9059879,4.7604312,-.9914409,                   23P      22
5.3004030,0,0;                                                                     23P      23
202,15,21,23,-8.4487181,.8974361,8.5350866,17,19,0,0;                              25P      24
212,1,5,.4864000,.1560000,1,1.5707963,0.0,0,0,-7.7697778,                          27P      25
-4.4404740,0.0,5H1.984,0,0;                                                        27P      26
214,1,.1500000,.0500000,0.0,-7.2654505,-4.2080320,-7.2654505,                      29P      27
```

```
-4.2080307,0,0;                                                    29P     28
214,1,.1500000,.0500000,0.0,-7.2585234,-4.4484209,-7.2585236,      31P     29
-4.4484201,0,0;                                                    31P     30
106,1,3,0.0,-7.1065645,-4.2062057,-7.1065645,-4.2062057,           33P     31
-7.3904423,-4.2094687,0,0;                                         33P     32
106,1,3,0.0,-7.0808301,-4.4402197,-7.0808301,-4.4402197,           35P     33
-7.3833905,-4.4541840,0,0;                                         35P     34
202,27,33,35,-.3205132,-4.1282053,6.9453959,29,31,0,0;             37P     35
212,1,5,.6396000,.1560000,1,1.5707963,0.0,0,0,10.9063444,          39P     36
-2.6749942,0.0,5H2.149,0,0;                                        39P     37
214,1,.1500000,.0500000,0.0,11.5155231,-3.6310084,11.4372584,      41P     38
-2.7734415,0,0;                                                    41P     39
214,1,.1500000,.0500000,0.0,11.5101315,-3.4346487,11.5101314,      43P     40
-3.4346487,0,0;                                                    43P     41
106,1,3,0.0,15.2190965,-3.5988032,15.2190965,-3.5988032,           45P     42
11.6405184,-3.6299214,0,0;                                         45P     43
106,1,3,0.0,15.2446404,-3.2619545,15.2446404,-3.2619545,           47P     44
11.6349981,-3.4288745,0,0;                                         47P     45
202,39,45,47,6.2791958,-3.6765418,5.2365255,41,43,0,0;             49P     46
212,1,5,.7176000,.1560000,1,1.5707963,0.0,0,0,-3.0077527,          51P     47
-8.7907066,0.0,5H2.580,0,0;                                        51P     48
214,1,.1500000,.0500000,0.0,-2.5673502,-9.2751873,-2.5673502,      53P     49
-9.2751869,0,0;                                                    53P     50
214,1,.1500000,.0500000,0.0,-2.5678348,-9.3828250,-2.5252591,      55P     51
-8.8886105,0,0;                                                    55P     52
106,1,3,0.0,-7.3038775,-9.1471730,-7.3038775,-9.1471730,           57P     53
-2.6923046,-9.2718101,0,0;                                         57P     54
106,1,3,0.0,-7.3038965,-9.4681596,-7.3038965,-9.4681596,           59P     55
-2.6928145,-9.3850769,0,0;                                         59P     56
202,51,57,59,-.1779904,-9.3397646,2.3902323,53,55,0,0;             61P     57
212,1,7,1.0452000,.1560000,1,1.5707963,0.0,0,0,-2.4164591,         63P     58
-10.5645876,0.0,7H357.420,0,0;                                     63P     59
214,1,.1500000,.0500000,0.0,-2.0859765,-9.3741428,-1.8444463,      65P     60
-10.2695590,0,0;                                                   65P     61
214,1,.1500000,.0500000,0.0,-2.0855896,-9.2882078,-1.5782240,      67P     62
-10.6362750,0,0;                                                   67P     63
106,1,3,0.0,-7.3038965,-9.4681596,-7.3038965,-9.4681596,           69P     64
-2.2109562,-9.3763947,0,0;                                         69P     65
106,1,3,0.0,-7.3038775,-9.1471730,-7.3038775,-9.1471730,           71P     66
-2.2105440,-9.2848307,0,0;                                         71P     67
202,63,69,71,-.1779899,-9.3397646,1.9082963,65,67,0,0;             73P     68
S       1G      2D      74P     68                                   T      1
```

3.3.10 Diameter Dimension

The diameter dimensions contain subentities which include leaders, arc center points and general notes.

The following conventions were followed:

- general note subentities to be single string with no box rotation
- leaders to have one, two, or three segments

Case 1 (Figures 3.3.10-1 and 3.3.10-2) tests the following:

- text in, arrows in configuration
- text out, arrows out configuration
- single segment leaders
- multiple segment leaders

Case 2

- This is identical to Case 1 except non-model space with rotation (-25.86°, 158.76°, 33.48°) is used per section 3.0

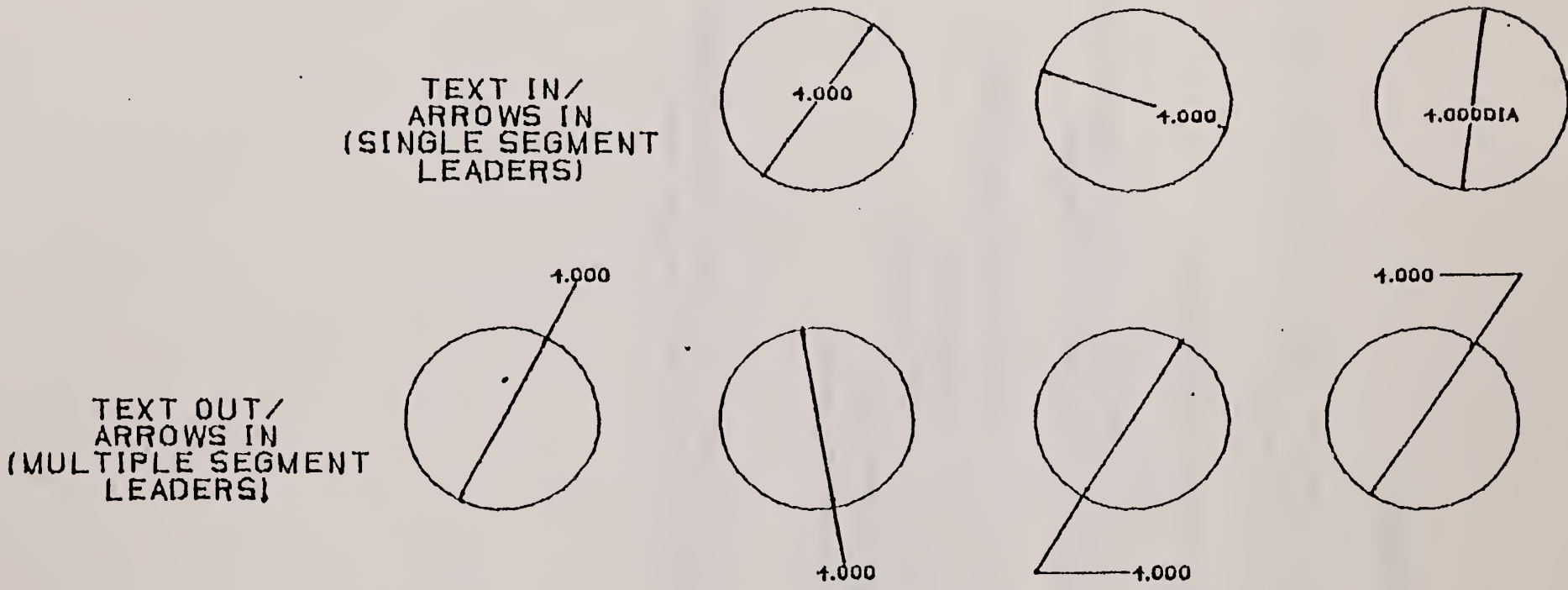

Figure 3.3.10-1 Diameter Dimension Cases 1 and 2 (with annotation)
Case 1: Rotation (0^{o}, 0^{o}, 0^{o})
Case 2: Rotation (-25.86^{o}, 158.76^{o}, 33.48^{o})

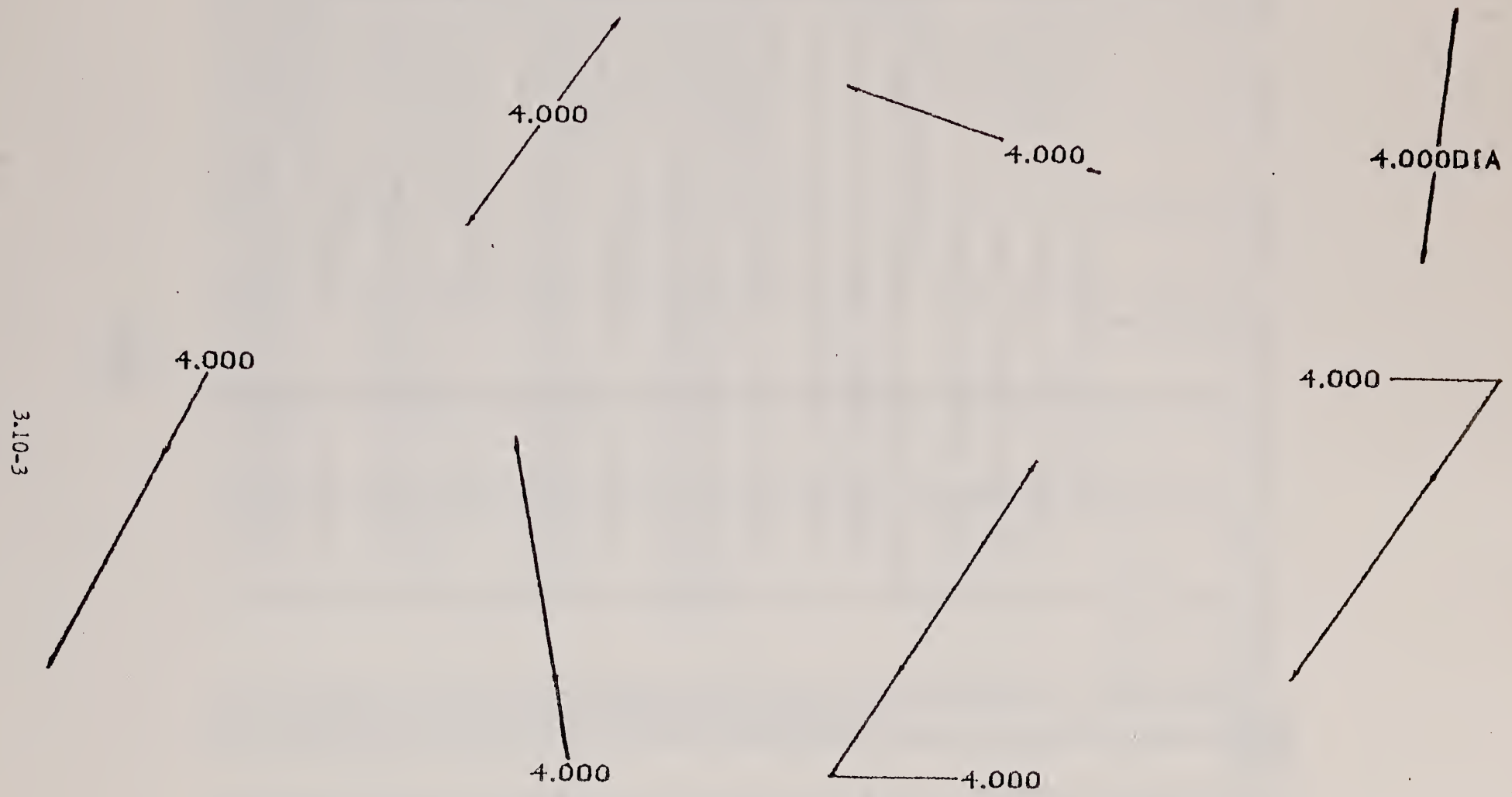

Figure 3.3.10-2 Diameter Dimension Cases 1 and 2 (actual part)

```
DDIM TEST CASE 1                                                        S       1
1H,,1H;,,5HDDIM1,4HCIIN,6H2.1.3 ,16,8,24,8,56,,1.0000000,1,4HINCH,0,,13HG       1
810827.122705,,,,;                                                      G       2
     124       1       1       1       0       0       0       0 0 0 0  D       1
     124       0       0       2       0                                0D      2
     212       3       1       1       0       0       1       0 0 1 1  D       3
     212       0       0       2       0                                0D      4
     214       5       1       1       0       0       1       0 0 1 1  D       5
     214       0       0       2       3                                0D      6
     214       7       1       1       0       0       1       0 0 1 1  D       7
     214       0       0       2       3                                0D      8
     206       9       1       1       0       0       1       0 0 0 1  D       9
     206       0       0       1       0                                0D     10
     212      10       1       1       0       0       1       0 0 1 1  D      11
     212       0       0       2       0                                0D     12
     214      12       1       1       0       0       1       0 0 1 1  D      13
     214       0       0       2       3                                0D     14
     214      14       1       1       0       0       1       0 0 1 1  D      15
     214       0       0       2       3                                0D     16
     206      16       1       1       0       0       1       0 0 0 1  D      17
     206       0       0       1       0                                0D     18
     212      17       1       1       0       0       1       0 0 1 1  D      19
     212       0       0       2       0                                0D     20
     214      19       1       1       0       0       1       0 0 1 1  D      21
     214       0       0       2       3                                0D     22
     214      21       1       1       0       0       1       0 0 1 1  D      23
     214       0       0       2       3                                0D     24
     206      23       1       1       0       0       1       0 0 0 1  D      25
     206       0       0       1       0                                0D     26
     212      24       1       1       0       0       1       0 0 1 1  D      27
     212       0       0       2       0                                0D     28
     214      26       1       1       0       0       1       0 0 1 1  D      29
     214       0       0       2       3                                0D     30
     214      28       1       1       0       0       1       0 0 1 1  D      31
     214       0       0       2       3                                0D     32
     206      30       1       1       0       0       1       0 0 0 1  D      33
     206       0       0       1       0                                0D     34
     212      31       1       1       0       0       1       0 0 1 1  D      35
     212       0       0       2       0                                0D     36
     214      33       1       1       0       0       1       0 0 1 1  D      37
     214       0       0       2       3                                0D     38
     214      35       1       1       0       0       1       0 0 1 1  D      39
     214       0       0       2       3                                0D     40
     206      37       1       1       0       0       1       0 0 0 1  D      41
     206       0       0       1       0                                0D     42
     212      38       1       1       0       0       1       0 0 1 1  D      43
     212       0       0       2       0                                0D     44
     214      40       1       1       0       0       1       0 0 1 1  D      45
     214       0       0       2       3                                0D     46
     214      42       1       1       0       0       1       0 0 1 1  D      47
     214       0       0       2       3                                0D     48
     206      44       1       1       0       0       1       0 0 0 1  D      49
```

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     206       0       0       1       0                                   0D      50
     212      45       1       1       0       0       1       0 0 1 1  D      51
     212       0       0       2       0                                   0D      52
     214      47       1       1       0       0       1       0 0 1 1  D      53
     214       0       0       2       3                                   0D      54
     214      49       1       1       0       0       1       0 0 1 1  D      55
     214       0       0       2       3                                   0D      56
     206      51       1       1       0       0       1       0 0 0 1  D      57
     206       0       0       1       0                                   0D      58
124,1.0000000,0.0,0.0,0.0,0.0,1.0000000,0.0,0.0,0.0,0.0,                    1P       1
1.0000000,0.0,0,0;                                                          1P       2
212,1,5,1.1500000,.2500000,1,1.5707963,0.0,0,0,-7.5000000,                  3P       3
2.5000000,0.0,5H4.000,0,0;                                                  3P       4
214,1,.1500000,.0500000,0.0,-8.1236267,.8454127,-7.0678113,                 5P       5
2.4000002,0,0;                                                              5P       6
214,1,.1500000,.0500000,0.0,-5.8762851,4.1544089,-6.7621890,                7P       7
2.8499999,0,0;                                                              7P       8
206,3,5,7,-6.9999559,2.4999108,0,0;                                         9P       9
212,1,5,1.1500000,.2500000,1,1.5707963,0.0,0,0,0.0,2.0000000,              11P      10
0.0,5H4.000,0,0;                                                           11P      11
214,1,.1500000,.0500000,0.0,-2.3903754,3.1530671,-.0661823,                13P      12
2.3499999,0,0;                                                             13P      13
214,1,.1500000,.0500000,0.0,1.3903035,1.8467474,1.2361828,                 15P      14
1.9000000,0,0;                                                             15P      15
206,11,13,15,-.5000359,2.4999073,0,0;                                      17P      16
212,1,5,1.1500000,.2500000,1,1.5707963,0.0,0,0,-12.5000000,                19P      17
-1.5000000,0.0,5H4.000,0,0;                                                19P      18
214,3,.1500000,.0500000,0.0,-13.3404798,-2.5064119,-13.4999123,            21P      19
-4.5000467,-13.2500000,-1.3750000,-12.7500000,-1.3750000,0,0;              21P      20
214,1,.1500000,.0500000,0.0,-13.6593447,-6.4936816,-13.4999123,            23P      21
-4.5000467,0,0;                                                            23P      22
206,19,21,23,-13.4999123,-4.5000467,0,0;                                   25P      23
212,1,5,1.1500000,.2500000,1,1.5707963,0.0,0,0,-7.0000000,                 27P      24
-8.0000000,0.0,5H4.000,0,0;                                                27P      25
214,3,.1500000,.0500000,0.0,-7.4339069,-6.4524032,-7.0000978,              29P      26
-4.5000176,-7.7500000,-7.8750000,-7.2500000,-7.8750000,0,0;                29P      27
214,1,.1500000,.0500000,0.0,-6.5662886,-2.5476321,-7.0000978,              31P      28
-4.5000176,0,0;                                                            31P      29
206,27,29,31,-7.0000978,-4.5000176,0,0;                                    33P      30
212,1,5,1.1500000,.2500000,1,1.5707963,0.0,0,0,-.5000000,                  35P      31
-8.0000000,0.0,5H4.000,0,0;                                                35P      32
214,3,.1500000,.0500000,0.0,-1.5195628,-6.2206080,-.4999143,               37P      33
-4.5000505,-2.5000000,-7.8750000,-.6000000,-7.8750000,0,0;                 37P      34
214,1,.1500000,.0500000,0.0,.5197343,-2.7794931,-.4999143,                 39P      35
-4.5000505,0,0;                                                            39P      36
206,35,37,39,-.4999143,-4.5000505,0,0;                                     41P      37
212,1,5,1.1500000,.2500000,1,1.5707963,0.0,0,0,4.5000000,                  43P      38
-1.5000000,0.0,5H4.000,0,0;                                                43P      39
214,3,.1500000,.0500000,0.0,6.5780690,-2.8154324,5.4999166,                45P      40
-4.4999466,7.5000000,-1.3750000,5.8499999,-1.3750000,0,0;                  45P      41
214,1,.1500000,.0500000,0.0,4.4217641,-6.1844608,5.4999166,                47P      42
-4.4999466,0,0;                                                            47P      43
```

```
206,43,45,47,5.4999166,-4.4999466,0,0;                                  49P     44
212,1,8,1.9250000,.2500000,1,1.5707963,0.0,0,0,5.5000000,               51P     45
2.0000000,0.0,8H4.000DIA,0,0;                                           51P     46
214,1,.1500000,.0500000,0.0,6.7115493,4.4887428,6.4839445,              53P     47
2.3500000,0,0;                                                          53P     48
214,1,.1500000,.0500000,0.0,6.2882600,.5112029,6.4360556,               53P     49
1.9000000,0,0;                                                          55P     50
206,51,53,55,6.4999046,2.4999729,0,0;                                   57P     51
S       1G      2D      58P     51                                        T      1
```

```
DDIM TEST CASE 2                                                                S       1
1H,,1H;,,5HDDIM2,4HCIIN,6H2.1.3 ,16,8,24,8,56,,1.0000000,1,4HINCH,0,,13HG       1
810827.122719,,,,;                                                              G       2
     124       1       1       1       0       0       0       0 0 0 0  D      1
     124       0       0       2       0                                0D      2
     212       3       1       1       0       0       1       0 0 1 1  D      3
     212       0       0       2       0                                0D      4
     214       5       1       1       0       0       1       0 0 1 1  D      5
     214       0       0       2       3                                0D      6
     214       7       1       1       0       0       1       0 0 1 1  D      7
     214       0       0       2       3                                0D      8
     206       9       1       1       0       0       1       0 0 0 1  D      9
     206       0       0       1       0                                0D     10
     212      10       1       1       0       0       1       0 0 1 1  D     11
     212       0       0       2       0                                0D     12
     214      12       1       1       0       0       1       0 0 1 1  D     13
     214       0       0       2       3                                0D     14
     214      14       1       1       0       0       1       0 0 1 1  D     15
     214       0       0       2       3                                0D     16
     206      16       1       1       0       0       1       0 0 0 1  D     17
     206       0       0       1       0                                0D     18
     212      17       1       1       0       0       1       0 0 1 1  D     19
     212       0       0       2       0                                0D     20
     214      19       1       1       0       0       1       0 0 1 1  D     21
     214       0       0       2       3                                0D     22
     214      21       1       1       0       0       1       0 0 1 1  D     23
     214       0       0       2       3                                0D     24
     206      23       1       1       0       0       1       0 0 0 1  D     25
     206       0       0       1       0                                0D     26
     212      24       1       1       0       0       1       0 0 1 1  D     27
     212       0       0       2       0                                0D     28
     214      26       1       1       0       0       1       0 0 1 1  D     29
     214       0       0       2       3                                0D     30
     214      28       1       1       0       0       1       0 0 1 1  D     31
     214       0       0       2       3                                0D     32
     206      30       1       1       0       0       1       0 0 0 1  D     33
     206       0       0       1       0                                0D     34
     212      31       1       1       0       0       1       0 0 1 1  D     35
     212       0       0       2       0                                0D     36
     214      33       1       1       0       0       1       0 0 1 1  D     37
     214       0       0       2       3                                0D     38
     214      35       1       1       0       0       1       0 0 1 1  D     39
     214       0       0       2       3                                0D     40
     206      37       1       1       0       0       1       0 0 0 1  D     41
     206       0       0       1       0                                0D     42
     212      38       1       1       0       0       1       0 0 1 1  D     43
     212       0       0       2       0                                0D     44
     214      40       1       1       0       0       1       0 0 1 1  D     45
     214       0       0       2       3                                0D     46
     214      42       1       1       0       0       1       0 0 1 1  D     47
     214       0       0       2       3                                0D     48
     206      44       1       1       0       0       1       0 0 0 1  D     49
```

```
     206       0       0       1       0                                   0D      50
     212      45       1       1       0       0       1       0 0 1 1  D      51
     212       0       0       2       0                                   0D      52
     214      47       1       1       0       0       1       0 0 1 1  D      53
     214       0       0       2       3                                   0D      54
     214      49       1       1       0       0       1       0 0 1 1  D      55
     214       0       0       2       3                                   0D      56
     206      51       1       1       0       0       1       0 0 0 1  D      57
     206       0       0       1       0                                   0D      58
124,-.7774290,-.5141294,-.3623211,0.0,-.6281896,.6634107,                    1P       1
.4065283,0.0,.0313596,.5436527,-.8387246,0.0,0,0;                            1P       2
212,1,5,1.1500000,.2500000,1,1.5707963,0.0,0,0,-7.5000000,                   3P       3
2.5000000,0.0,5H4.000,0,0;                                                   3P       4
214,1,.1500000,.0500000,0.0,-8.1236267,.8454127,-7.0678113,                  5P       5
2.4000002,0,0;                                                               5P       6
214,1,.1500000,.0500000,0.0,-5.8762851,4.1544089,-6.7621890,                 7P       7
2.8499999,0,0;                                                               7P       8
206,3,5,7,-6.9999559,2.4999108,0,0;                                          9P       9
212,1,5,1.1500000,.2500000,1,1.5707963,0.0,0,0,0.0,2.0000000,               11P      10
0.0,5H4.000,0,0;                                                            11P      11
214,1,.1500000,.0500000,0.0,-2.3903754,3.1530671,-.0661823,                 13P      12
2.3499999,0,0;                                                              13P      13
214,1,.1500000,.0500000,0.0,1.3903035,1.8467474,1.2361828,                  15P      14
1.9000000,0,0;                                                              15P      15
206,11,13,15,-.5000359,2.4999073,0,0;                                       17P      16
212,1,5,1.1500000,.2500000,1,1.5707963,0.0,0,0,-12.5000000,                 19P      17
-1.5000000,0.0,5H4.000,0,0;                                                 19P      18
214,3,.1500000,.0500000,0.0,-13.3404798,-2.5064119,-13.4999123,             21P      19
-4.5000467,-13.2500000,-1.3750000,-12.7500000,-1.3750000,0,0;               21P      20
214,1,.1500000,.0500000,0.0,-13.6593447,-6.4936816,-13.4999123,             23P      21
-4.5000467,0,0;                                                             23P      22
206,19,21,23,-13.4999123,-4.5000467,0,0;                                    25P      23
212,1,5,1.1500000,.2500000,1,1.5707963,0.0,0,0,-7.0000000,                  27P      24
-8.0000000,0.0,5H4.000,0,0;                                                 27P      25
214,3,.1500000,.0500000,0.0,-7.4339069,-6.4524032,-7.0000978,               29P      26
-4.5000176,-7.7500000,-7.8750000,-7.2500000,-7.8750000,0,0;                 29P      27
214,1,.1500000,.0500000,0.0,-6.5662886,-2.5476321,-7.0000978,               31P      28
-4.5000176,0,0;                                                             31P      29
206,27,29,31,-7.0000978,-4.5000176,0,0;                                     33P      30
212,1,5,1.1500000,.2500000,1,1.5707963,0.0,0,0,-.5000000,                   35P      31
-8.0000000,0.0,5H4.000,0,0;                                                 35P      32
214,3,.1500000,.0500000,0.0,-1.5195628,-6.2206080,-.4999143,                37P      33
-4.5000505,-2.5000000,-7.8750000,-.6000000,-7.8750000,0,0;                  37P      34
214,1,.1500000,.0500000,0.0,.5197343,-2.7794931,-.4999143,                  39P      35
-4.5000505,0,0;                                                             39P      36
206,35,37,39,-.4999143,-4.5000505,0,0;                                      41P      37
212,1,5,1.1500000,.2500000,1,1.5707963,0.0,0,0,4.5000000,                   43P      38
-1.5000000,0.0,5H4.000,0,0;                                                 43P      39
214,3,.1500000,.0500000,0.0,6.5780690,-2.8154324,5.4999166,                 45P      40
-4.4999466,7.5000000,-1.3750000,5.8499999,-1.3750000,0,0;                   45P      41
214,1,.1500000,.0500000,0.0,4.4217641,-6.1844608,5.4999166,                 47P      42
-4.4999466,0,0;                                                             47P      43
```

```
206,43,45,47,5.4999166,-4.4999466,0,0;                                  49P     44
212,1,8,1.9250000,.2500000,1,1.5707963,0.0,0,0,5.5000000,               51P     45
2.0000000,0.0,8H4.000DIA,0,0;                                           51P     46
214,1,.1500000,.0500000,0.0,6.7115493,4.4887428,6.4839445,              53P     47
2.3500000,0,0;                                                          53P     48
214,1,.1500000,.0500000,0.0,6.2882600,.5112029,6.4360556,               55P     49
1.9000000,0,0;                                                          55P     50
206,51,53,55,6.4999046,2.4999729,0,0;                                   57P     51
S      1G      2D     58P     51                                         T       1
```

3.3.11 General Label

The general labels contain subentities which include leaders and general notes.

Case 1 (Figures 3.3.11-1 and 3.3.11-2) tests the following:

- leader from head of text
- leader from tail of text
- single leader labels
- multiple leader labels
- leaders with variable horizontal segments

Case 2

- This is identical to Case 1 except non-model space with rotation (45^{o}, 99^{o}, 1^{o}) is used per section 3.0

Case 3 (Figures 3.3.11-3 and 3.3.11-4) tests the following:

- rotated labels with leader from head of text
- rotated labels with leader from tail of text
- rotated labels with multiple leaders
- rotated labels with variable horizontal segments

Case 4

- This is identical to Case 3 except non-model space with rotation (90^{o}, 33^{o}, 100^{o}) is used per section 3.0

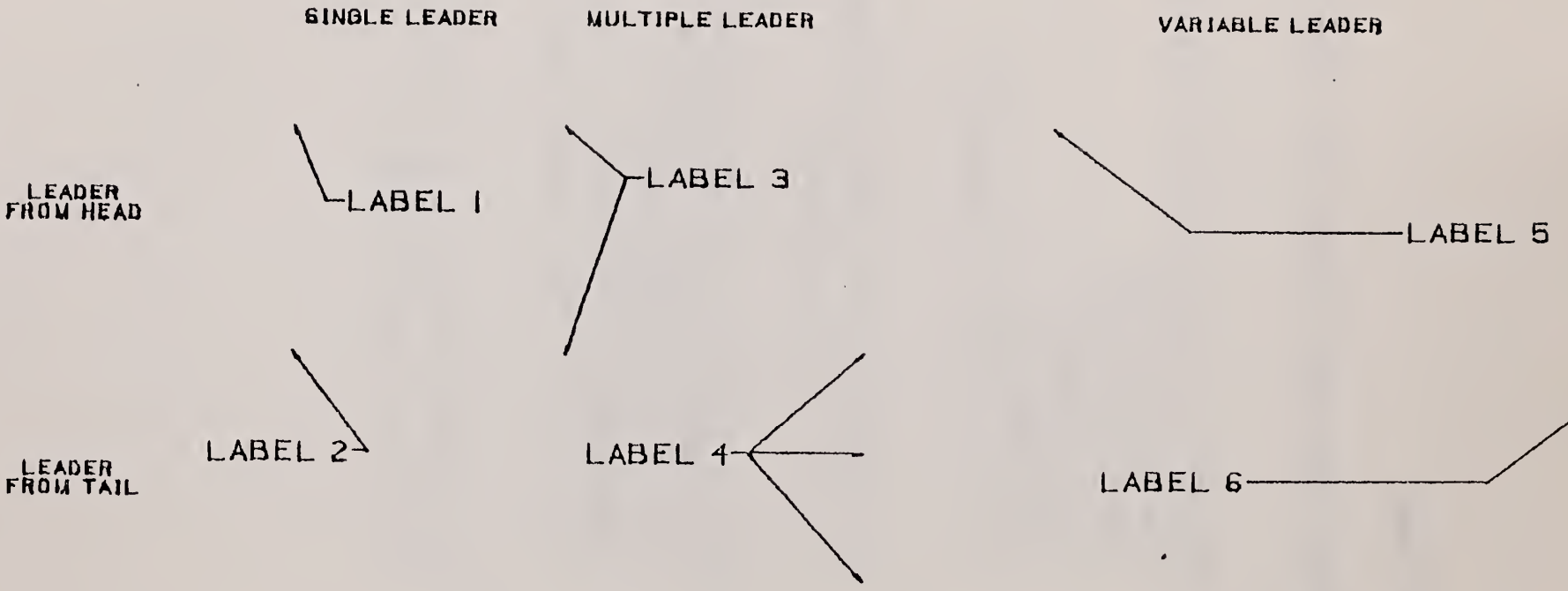

Figure 3.3.11-1 General Label Cases 1 and 2 (with annotation)
Case 1: Rotation (0^{o}, 0^{o}, 0^{o})
Case 2: Rotation (45^{o}, 99^{o}, 1^{o})

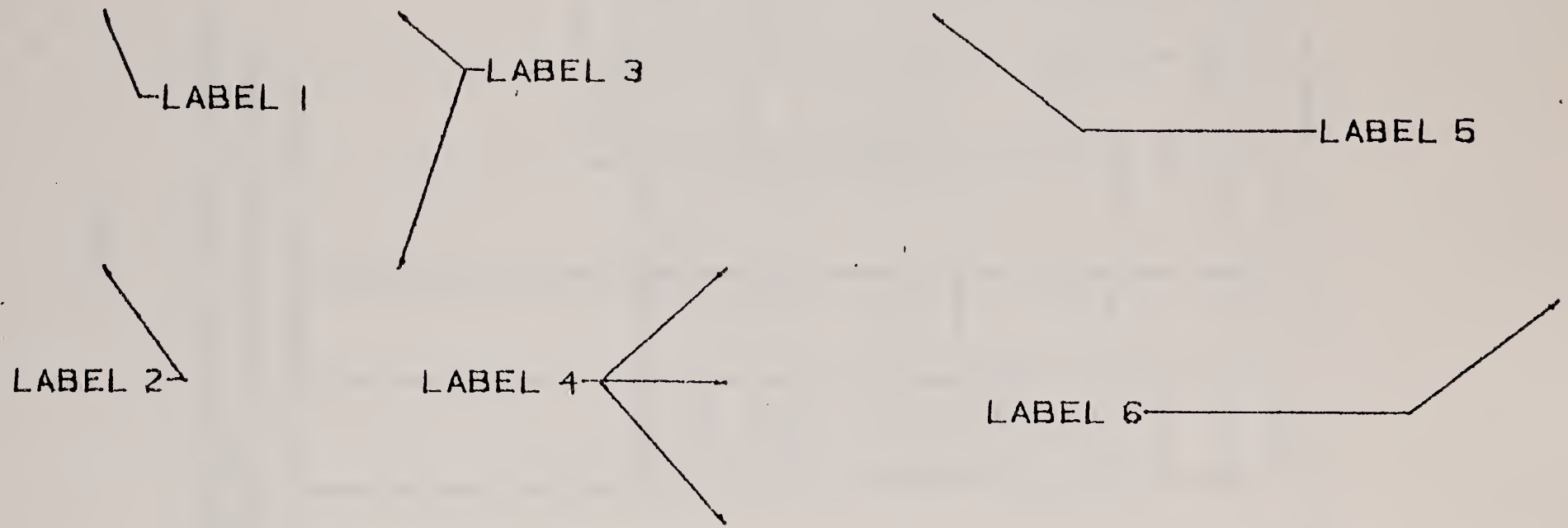

Figure 3.3.11-2 General Label Cases 1 and 2 (actual part)

```
LABEL CASE 1                                                                    S       1
1H,,1H;,,6HLABEL1,4HCIIN,6H2.1.3 ,16,8,24,8,56,,1.0000000,1,4HINCH,0,,13G       1
H810827.122837,,,,;                                                             G       2
     124       1       1       1       0       0       0       0 0 0 0  D      1
     124       0       0       2       0                                0D      2
     212       3       1       1       0       0       1       0 0 1 1  D      3
     212       0       0       2       0                                0D      4
     214       5       1       1       0       0       1       0 0 1 1  D      5
     214       0       0       2       3                                0D      6
     210       7       1       1       0       0       1       0 0 0 1  D      7
     210       0       0       1       0                                0D      8
     212       8       1       1       0       0       1       0 0 1 1  D      9
     212       0       0       2       0                                0D     10
     214      10       1       1       0       0       1       0 0 1 1  D     11
     214       0       0       2       3                                0D     12
     210      12       1       1       0       0       1       0 0 0 1  D     13
     210       0       0       1       0                                0D     14
     212      13       1       1       0       0       1       0 0 1 1  D     15
     212       0       0       2       0                                0D     16
     214      15       1       1       0       0       1       0 0 1 1  D     17
     214       0       0       2       3                                0D     18
     214      17       1       1       0       0       1       0 0 1 1  D     19
     214       0       0       2       3                                0D     20
     210      19       1       1       0       0       1       0 0 0 1  D     21
     210       0       0       1       0                                0D     22
     212      20       1       1       0       0       1       0 0 1 1  D     23
     212       0       0       2       0                                0D     24
     214      22       1       1       0       0       1       0 0 1 1  D     25
     214       0       0       2       3                                0D     26
     214      24       1       1       0       0       1       0 0 1 1  D     27
     214       0       0       2       3                                0D     28
     214      26       1       1       0       0       1       0 0 1 1  D     29
     214       0       0       2       3                                0D     30
     210      28       1       1       0       0       1       0 0 0 1  D     31
     210       0       0       1       0                                0D     32
     212      29       1       1       0       0       1       0 0 1 1  D     33
     212       0       0       2       0                                0D     34
     214      31       1       1       0       0       1       0 0 1 1  D     35
     214       0       0       2       3                                0D     36
     210      33       1       1       0       0       1       0 0 0 1  D     37
     210       0       0       1       0                                0D     38
     212      34       1       1       0       0       1       0 0 1 1  D     39
     212       0       0       2       0                                0D     40
     214      36       1       1       0       0       1       0 0 1 1  D     41
     214       0       0       2       3                                0D     42
     210      38       1       1       0       0       1       0 0 0 1  D     43
     210       0       0       1       0                                0D     44
124,1.0000000,0.0,0.0,0.0,0.0,1.0000000,0.0,0.0,0.0,0.0,                        1P      1
1.0000000,0.0,0,0;                                                              1P      2
212,1,7,2.4200002,.3500000,1,1.5707963,0.0,0,0,-10.5480003,                     3P      3
-1.1750001,0.0,7HLABEL 2,0,0;                                                   3P      4
214,2,.1500000,.0500000,0.0,-9.0000000,1.0000000,-7.5999999,                    5P      5
```

```
-1.0000000,-7.9000001,-1.0000000,0,0;                                    5P       6
210,3,1,5,0,0;                                                           7P       7
212,1,7,2.2800002,.3500000,1,1.5707963,0.0,0,0,-8.0000000,               9P       8
3.8250000,0.0,7HLABEL 1,0,0;                                             9P       9
214,2,.1500000,.0500000,0.0,-9.0000000,5.5000000,-8.3999996,            11P      10
4.0000000,-8.1000004,4.0000000,0,0;                                     11P      11
210,9,1,11,0,0;                                                         13P      12
212,1,7,2.4550002,.3500000,1,1.5707963,0.0,0,0,-2.5000000,              15P      13
4.3249998,0.0,7HLABEL 3,0,0;                                            15P      14
214,2,.1500000,.0500000,0.0,-4.0000000,5.5000000,-2.9000001,            17P      15
4.5000000,-2.5999999,4.5000000,0,0;                                     17P      16
214,2,.1500000,.0500000,0.0,-4.0000000,1.0000000,-2.9000001,            19P      17
4.5000000,-2.5999999,4.5000000,0,0;                                     19P      18
210,15,2,17,19,0,0;                                                     21P      19
212,1,7,2.4900002,.3500000,1,1.5707963,0.0,0,0,-3.5830004,              23P      20
-1.1750001,0.0,7HLABEL 4,0,0;                                           23P      21
214,2,.1500000,.0500000,0.0,1.5000000,1.0000000,-.6000000,              25P      22
-1.0000000,-.9000000,-1.0000000,0,0;                                    25P      23
214,2,.1500000,.0500000,0.0,1.5000000,-1.0000000,-.6000000,             27P      24
-1.0000000,-.9000000,-1.0000000,0,0;                                    27P      25
214,2,.1500000,.0500000,0.0,1.5000000,-3.5000000,-.6000000,             29P      26
-1.0000000,-.9000000,-1.0000000,0,0;                                    29P      27
210,23,3,25,27,29,0,0;                                                  31P      28
212,1,7,2.4550002,.3500000,1,1.5707963,0.0,0,0,11.5000000,              33P      29
3.3250000,0.0,7HLABEL 5,0,0;                                            33P      30
214,2,.1500000,.0500000,0.0,5.0000000,5.5000000,7.5000000,              35P      31
3.5000000,11.4000006,3.5000000,0,0;                                     35P      32
210,33,1,35,0,0;                                                        37P      33
212,1,7,2.4550002,.3500000,1,1.5707963,0.0,0,0,5.9169998,               39P      34
-1.6750001,0.0,7HLABEL 6,0,0;                                           39P      35
214,2,.1500000,.0500000,0.0,15.5000000,.5000000,13.0000000,             41P      36
-1.5000000,8.6000004,-1.5000000,0,0;                                    41P      37
210,39,1,41,0,0;                                                        43P      38
S       1G       2D      44P      38                                      T       1
```

```
LABEL TEST CASE 2                                                              S       1
1H,,1H;,,6HLABEL2,4HCIIN,6H2.1.3 ,16,8,24,8,56,,1.0000000,1,4HINCH,0,,13G      1
H810827.122851,,,,;                                                            G       2
     124       1       1       1       0       0       0       0 0 0 0  D      1
     124       0       0       2       0                                0D     2
     212       3       1       1       0       0       1.      0 0 1 1  D      3
     212       0       0       2       0                                0D     4
     214       5       1       1       0       0       1       0 0 1 1  D      5
     214       0       0       2       3                                0D     6
     210       7       1       1       0       0       1       0 0 0 1  D      7
     210       0       0       1       0                                0D     8
     212       8       1       1       0       0       1       0 0 1 1  D      9
     212       0       0       2       0                                0D     10
     214      10       1       1       0       0       1       0 0 1 1  D      11
     214       0       0       2       3                                0D     12
     210      12       1       1       0       0       1       0 0 0 1  D      13
     210       0       0       1       0                                0D     14
     212      13       1       1       0       0       1       0 0 1 1  D      15
     212       0       0       2       0                                0D     16
     214      15       1       1       0       0       1       0 0 1 1  D      17
     214       0       0       2       3                                0D     18
     214      17       1       1       0       0       1       0 0 1 1  D      19
     214       0       0       2       3                                0D     20
     210      19       1       1       0       0       1       0 0 0 1  D      21
     210       0       0       1       0                                0D     22
     212      20       1       1       0       0       1       0 0 1 1  D      23
     212       0       0       2       0                                0D     24
     214      22       1       1       0       0       1       0 0 1 1  D      25
     214       0       0       2       3                                0D     26
     214      24       1       1       0.      0       1       0 0 1 1  D      27
     214       0       0       2       3                                0D     28
     214      26       1       1       0       0       1       0 0 1 1  D      29
     214       0       0       2       3                                0D     30
     210      28       1       1       0       0       1       0 0 0 1  D      31
     210       0       0       1       0                                0D     32
     212      29       1       1       0       0       1       0 0 1 1  D      33
     212       0       0       2       0                                0D     34
     214      31       1       1       0       0       1       0 0 1 1  D      35
     214       0       0       2       3                                0D     36
     210      33       1       1       0       0       1       0 0 0 1  D      37
     210       0       0       1       0                                0D     38
     212      34       1       1       0       0       1       0 0 1 1  D      39
     212       0       0       2       0                                0D     40
     214      36       1       1       0       0       1       0 0 1 1  D      41
     214       0       0       2       3                                0D     42
     210      38       1       1       0       0       1       0 0 0 1  D      43
     210       0       0       1       0                                0D     44
124,-.1564105,-.0027302,-.9876884,0.0,.6859540,.7191879,                       1P      1
-.1106158,0.0,.7106355,-.6948103,-.1106158,0.0,0,0;                            1P      2
212,1,7,2.4200002,.3500000,1,1.5707963,0.0,0,0,-10.5480003,                    3P      3
-1.1750001,0.0,7HLABEL 2,0,0;                                                  3P      4
214,2,.1500000,.0500000,0.0,-9.0000000,1.0000000,-7.5999999,                   5P      5
```

```
-1.0000000,-7.9000001,-1.0000000,0,0;                                    5P       6
210,3,1,5,0,0;                                                           7P       7
212,1,7,2.2800002,.3500000,1,1.5707963,0.0,0,0,-8.0000000,               9P       8
3.8250000,0.0,7HLABEL 1,0,0;                                             9P       9
214,2,.1500000,.0500000,0.0,-9.0000000,5.5000000,-8.3999996,            11P      10
4.0000000,-8.1000004,4.0000000,0,0;                                     11P      11
210,9,1,11,0,0;                                                         13P      12
212,1,7,2.4550002,.3500000,1,1.5707963,0.0,0,0,-2.5000000,              15P      13
4.3249998,0.0,7HLABEL 3,0,0;                                            15P      14
214,2,.1500000,.0500000,0.0,-4.0000000,5.5000000,-2.9000001,            17P      15
4.5000000,-2.5999999,4.5000000,0,0;                                     17P      16
214,2,.1500000,.0500000,0.0,-4.0000000,1.0000000,-2.9000001,            19P      17
4.5000000,-2.5999999,4.5000000,0,0;                                     19P      18
210,15,2,17,19,0,0;                                                     21P      19
212,1,7,2.4900002,.3500000,1,1.5707963,0.0,0,0,-3.5830004,              23P      20
-1.1750001,0.0,7HLABEL 4,0,0;                                           23P      21
214,2,.1500000,.0500000,0.0,1.5000000,1.0000000,-.6000000,              25P      22
-1.0000000,-.9000000,-1.0000000,0,0;                                    25P      23
214,2,.1500000,.0500000,0.0,1.5000000,-1.0000000,-.6000000,             27P      24
-1.0000000,-.9000000,-1.0000000,0,0;                                    27P      25
214,2,.1500000,.0500000,0.0,1.5000000,-3.5000000,-.6000000,             29P      26
-1.0000000,-.9000000,-1.0000000,0,0;                                    29P      27
210,23,3,25,27,29,0,0;                                                  31P      28
212,1,7,2.4550002,.3500000,1,1.5707963,0.0,0,0,11.5000000,              33P      29
3.3250000,0.0,7HLABEL 5,0,0;                                            33P      30
214,2,.1500000,.0500000,0.0,5.0000000,5.5000000,7.5000000,              35P      31
3.5000000,11.4000006,3.5000000,0,0;                                     35P      32
210,33,1,35,0,0;                                                        37P      33
212,1,7,2.4550002,.3500000,1,1.5707963,0.0,0,0,5.9169998,               39P      34
-1.6750001,0.0,7HLABEL 6,0,0;                                           39P      35
214,2,.1500000,.0500000,0.0,15.5000000,.5000000,13.0000000,             41P      36
-1.5000000,8.6000004,-1.5000000,0,0;                                    41P      37
210,39,1,41,0,0;                                                        43P      38
S       1G       2D      44P      38                                      T       1
```

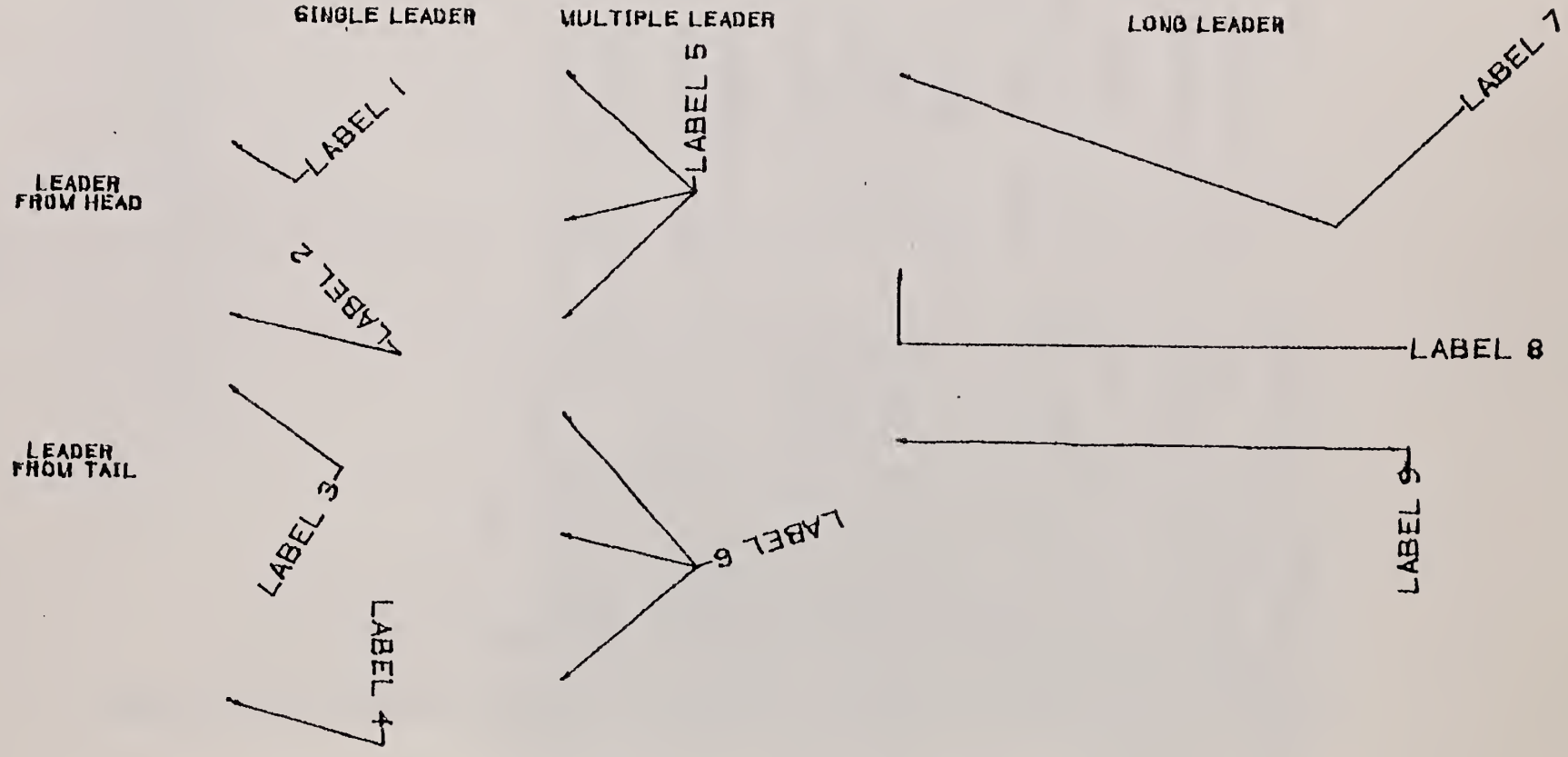

Figure 3.3.11-3 General Label Cases 3 and 4 (with annotation)
Case 3: Rotation (0^o, 0^o, 0^o)
Case 4: Rotation (90^o, 33^o, 100^o)

Figure 3.3.11-4 General Label Cases 3 and 4 (actual part)

```
LABEL TEST CASE 3                                                                S       1
1H,,1H;,,6HLABEL3,4HCIIN,6H2.1.3 ,16,8,24,8,56,,1.0000000,1,4HINCH,0,,13G       1
H810827.122906,,,,;                                                              G       2
     124       1       1       1       0       0       0       0 0 0 0  D      1
     124       0       0       2       0                                0D      2
     212       3       1       1       0       0       1       0 0 1 1  D      3
     212       0       0       2       0                                0D      4
     214       5       1       1       0       0       1       0 0 1 1  D      5
     214       0       0       2       3                                0D      6
     210       7       1       1       0       0       1       0 0 0 1  D      7
     210       0       0       1       0                                0D      8
     212       8       1       1       0       0       1       0 0 1 1  D      9
     212       0       0       2       0                                0D     10
     214      10       1       1       0       0       1       0 0 1 1  D     11
     214       0       0       2       3                                0D     12
     210      12       1       1       0       0       1       0 0 0 1  D     13
     210       0       0       1       0                                0D     14
     212      13       1       1       0       0       1       0 0 1 1  D     15
     212       0       0       2       0                                0D     16
     214      15       1       1       0       0       1       0 0 1 1  D     17
     214       0       0       2       3                                0D     18
     210      17       1       1       0       0       1       0 0 0 1  D     19
     210       0       0       1       0                                0D     20
     212      18       1       1       0       0       1       0 0 1 1  D     21
     212       0       0       2       0                                0D     22
     214      20       1       1       0       0       1       0 0 1 1  D     23
     214       0       0       2       3                                0D     24
     210      22       1       1       0       0       1       0 0 0 1  D     25
     210       0       0       1       0                                0D     26
     212      23       1       1       0       0       1       0 0 1 1  D     27
     212       0       0       2       0                                0D     28
     214      25       1       1       0       0       1       0 0 1 1  D     29
     214       0       0       2       3                                0D     30
     214      27       1       1       0       0       1       0 0 1 1  D     31
     214       0       0       2       3                                0D     32
     214      29       1       1       0       0       1       0 0 1 1  D     33
     214       0       0       2       3                                0D     34
     210      31       1       1       0       0       1       0 0 0 1  D     35
     210       0       0       1       0                                0D     36
     212      32       1       1       0       0       1       0 0 1 1  D     37
     212       0       0       2       0                                0D     38
     214      34       1       1       0       0       1       0 0 1 1  D     39
     214       0       0       2       3                                0D     40
     214      36       1       1       0       0       1       0 0 1 1  D     41
     214       0       0       2       3                                0D     42
     214      38       1       1       0       0       1       0 0 1 1  D     43
     214       0       0       2       3                                0D     44
     210      40       1       1       0       0       1       0 0 0 1  D     45
     210       0       0       1       0                                0D     46
     212      41       1       1       0       0       1       0 0 1 1  D     47
     212       0       0       2       0                                0D     48
     214      43       1       1       0       0       1       0 0 1 1  D     49
```

```
     214        0        0        2        3                                                    0D       50
     210       45        1        1        0        0        1        0 0 0 1  D       51
     210        0        0        1        0                                                    0D       52
     212       46        1        1        0        0        1        0 0 1 1  D       53
     212        0        0        2        0                                                    0D       54
     214       48        1        1        0        0        1        0 0 1 1  D       55
     214        0        0        2        3                                                    0D       56
     210       50        1        1        0        0        1        0 0 0 1  D       57
     210        0        0        1        0                                                    0D       58
     212       51        1        1        0        0        1        0 0 1 1  D       59
     212        0        0        2        0                                                    0D       60
     214       53        1        1        0        0        1        0 0 1 1  D       61
     214        0        0        2        3                                                    0D       62
     210       55        1        1        0        0        1        0 0 0 1  D       63
     210        0        0        1        0                                                    0D       64
124,1.0000000,0.0,0.0,0.0,0.0,1.0000000,0.0,0.0,0.0,0.0,                                      1P        1
1.0000000,0.0,0,0;                                                                            1P        2
212,1,7,2.2800002,.3500000,1,1.5707963,.7853981,0,0,-8.3762560,                               3P        3
4.3762560,0.0,7HLABEL 1,0,0;                                                                  3P        4
214,2,.1500000,.0500000,0.0,-10.0000000,5.0000000,-8.7828426,                                 5P        5
4.4292893,-8.5707111,4.4292893,0,0;                                                           5P        6
210,3,1,5,0,0;                                                                                7P        7
212,1,7,2.4200002,.3500000,1,1.5707963,2.3387411,0,0,-6.8741155,                              9P        8
1.1215653,0.0,7HLABEL 2,0,0;                                                                  9P        9
214,2,.1500000,.0500000,0.0,-10.0000000,1.5000000,-6.7221365,                                11P       10
.9280660,-6.9305344,.9280660,0,0;                                                            11P       11
210,9,1,11,0,0;                                                                              13P       12
212,1,7,2.4550002,.3500000,1,1.5707963,1.0471975,0,0,-9.1399450,                             15P       13
-4.3244443,0.0,7HLABEL 3,0,0;                                                                15P       14
214,2,.1500000,.0500000,0.0,-10.0000000,0.0,-7.7999997,                                      17P       15
-1.9133974,-7.9499998,-1.9133974,0,0;                                                        17P       16
210,15,1,17,0,0;                                                                             19P       17
212,1,7,2.4900002,.3500000,1,1.5707963,4.7123887,0,0,-7.1750002,                             21P       18
-4.4169998,0.0,7HLABEL 4,0,0;                                                                21P       19
214,2,.1500000,.0500000,0.0,-10.0000000,-6.5000000,-7.0000000,                               23P       20
-7.0999999,-7.0000000,-7.0999999,0,0;                                                        23P       21
210,21,1,23,0,0;                                                                             25P       22
212,1,7,2.4550002,.3500000,1,1.5707963,1.5707962,0,0,-.8249998,                              27P       23
4.5000000,0.0,7HLABEL 5,0,0;                                                                 27P       24
214,2,.1500000,.0500000,0.0,-3.5000000,6.5000000,-1.0000000,                                 29P       25
4.4000001,-1.0000000,4.4000001,0,0;                                                          29P       26
214,2,.1500000,.0500000,0.0,-3.5000000,3.5000000,-1.0000000,                                 31P       27
4.4000001,-1.0000000,4.4000001,0,0;                                                          31P       28
214,2,.1500000,.0500000,0.0,-3.5000000,1.5000000,-1.0000000,                                 33P       29
4.4000001,-1.0000000,4.4000001,0,0;                                                          33P       30
210,27,3,29,31,33,0,0;                                                                       35P       31
212,1,7,2.4550002,.3500000,1,1.5707963,3.4906584,0,0,1.8673725,                              37P       32
-2.4521160,0.0,7HLABEL 6,0,0;                                                                37P       33
214,2,.1500000,.0500000,0.0,-3.5000000,-.5000000,-.8758771,                                  39P       34
-3.5342021,-.5939693,-3.5342021,0,0;                                                         39P       35
214,2,.1500000,.0500000,0.0,-3.5000000,-3.0000000,-.8758771,                                 41P       36
-3.5342021,-.5939693,-3.5342021,0,0;                                                         41P       37
```

```
214,2,.1500000,.0500000,0.0,-3.5000000,-6.0000000,-.8758771,          43P      38
-3.5342021,-.5939693,-3.5342021,0,0;                                  43P      39
210,37,3,39,41,43,0,0;                                                45P      40
212,1,7,2.4550002,.3500000,1,1.5707963,.7853981,0,0,14.1237440,       47P      41
5.8762560,0.0,7HLABEL 7,0,0;                                          47P      42
214,2,.1500000,.0500000,0.0,3.0000000,6.5000000,11.5000000,           49P      43
5.9292893,13.9292889,5.9292893,0,0;                                   49P      44
210,47,1,49,0,0;                                                      51P      45
212,1,7,2.4550002,.3500000,1,1.5707963,0.0,0,0,13.0000000,            53P      46
.8250000,0.0,7HLABEL 8,0,0;                                           53P      47
214,2,.1500000,.0500000,0.0,3.0000000,2.5000000,3.0000000,            55P      48
1.0000000,12.8999996,1.0000000,0,0;                                   55P      49
210,53,1,55,0,0;                                                      57P      50
212,1,7,2.4550002,.3500000,1,1.5707963,1.5707962,0,0,13.1750002,      59P      51
-4.0830007,0.0,7HLABEL 9,0,0;                                         59P      52
214,2,.1500000,.0500000,0.0,3.0000000,-1.0000000,13.0000000,          61P      53
-1.4000000,13.0000000,-1.4000000,0,0;                                 61P      54
210,59,1,61,0,0;                                                      63P      55
S       1G       2D      64P      55                                    T       1
```

```
LABEL TEST CASE 4                                                                S       1
1H,,1H;,,6HLABEL4,4HCIIN,6H2.1.3 ,16,8,24,8,56,,1.0000000,1,4HINCH,0,,13G       1
H810827.122920,,,,;                                                              G       2
     124       1       1       1       0       0       0       0 0 0 0  D      1
     124       0       0       2       0                               0D      2
     212       3       1       1       0       0       1       0 0 1 1  D      3
     212       0       0       2       0                               0D      4
     214       5       1       1       0       0       1       0 0 1 1  D      5
     214       0       0       2       3                               0D      6
     210       7       1       1       0       0       1       0 0 0 1  D      7
     210       0       0       1       0                               0D      8
     212       8       1       1       0       0       1       0 0 1 1  D      9
     212       0       0       2       0                               0D     10
     214      10       1       1       0       0       1       0 0 1 1  D     11
     214       0       0       2       3                               0D     12
     210      12       1       1       0       0       1       0 0 0 1  D     13
     210       0       0       1       0                               0D     14
     212      13       1       1       0       0       1       0 0 1 1  D     15
     212       0       0       2       0                               0D     16
     214      15       1       1       0       0       1       0 0 1 1  D     17
     214       0       0       2       3                               0D     18
     210      17       1       1       0       0       1       0 0 0 1  D     19
     210       0       0       1       0                               0D     20
     212      18       1       1       0       0       1       0 0 1 1  D     21
     212       0       0       2       0                               0D     22
     214      20       1       1       0       0       1       0 0 1 1  D     23
     214       0       0       2       3                               0D     24
     210      22       1       1       0       0       1       0 0 0 1  D     25
     210       0       0       1       0                               0D     26
     212      23       1       1       0       0       1       0 0 1 1  D     27
     212       0       0       2       0                               0D     28
     214      25       1       1       0       0       1       0 0 1 1  D     29
     214       0       0       2       3                               0D     30
     214      27       1       1       0       0       1       0 0 1 1  D     31
     214       0       0       2       3                               0D     32
     214      29       1       1       0       0       1       0 0 1 1  D     33
     214       0       0       2       3                               0D     34
     210      31       1       1       0       0       1       0 0 0 1  D     35
     210       0       0       1       0                               0D     36
     212      32       1       1       0       0       1       0 0 1 1  D     37
     212       0       0       2       0                               0D     38
     214      34       1       1       0       0       1       0 0 1 1  D     39
     214       0       0       2       3                               0D     40
     214      36       1       1       0       0       1       0 0 1 1  D     41
     214       0       0       2       3                               0D     42
     214      38       1       1       0       0       1       0 0 1 1  D     43
     214       0       0       2       3                               0D     44
     210      40       1       1       0       0       1       0 0 0 1  D     45
     210       0       0       1       0                               0D     46
     212      41       1       1       0       0       1       0 0 1 1  D     47
     212       0       0       2       0                               0D     48
     214      43       1       1       0       0       1       0 0 1 1  D     49
```

```
     214        0        0        2        3                                                  0D       50
     210       45        1        1        0        0        1        0 0 0 1  D       51
     210        0        0        1        0                                                  0D       52
     212       46        1        1        0        0        1        0 0 1 1  D       53
     212        0        0        2        0                                                  0D       54
     214       48        1        1        0        0        1        0 0 1 1  D       55
     214        0        0        2        3                                                  0D       56
     210       50        1        1        0        0        1        0 0 0 1  D       57
     210        0        0        1        0                                                  0D       58
     212       51        1        1        0        0        1        0 0 1 1  D       59
     212        0        0        2        0                                                  0D       60
     214       53        1        1        0        0        1        0 0 1 1  D       61
     214        0        0        2        3                                                  0D       62
     210       55        1        1        0        0        1        0 0 0 1  D       63
     210        0        0        1        0                                                  0D       64
124,-.1456336,.8259293,-.5446391,0.0,-.0945756,.5363647,                                     1P        1
.8386707,0.0,.9848077,.1736481,0.0,0.0,0,0;                                                  1P        2
212,1,7,2.2800002,.3500000,1,1.5707963,.7853981,0,0,-8.3762560,                              3P        3
4.3762560,0.0,7HLABEL 1,0,0;                                                                 3P        4
214,2,.1500000,.0500000,0.0,-10.0000000,5.0000000,-8.7828426,                                5P        5
4.4292893,-8.5707111,4.4292893,0,0;                                                          5P        6
210,3,1,5,0,0;                                                                               7P        7
212,1,7,2.4200002,.3500000,1,1.5707963,2.3387411,0,0,-6.8741155,                             9P        8
1.1215653,0.0,7HLABEL 2,0,0;                                                                 9P        9
214,2,.1500000,.0500000,0.0,-10.0000000,1.5000000,-6.7221365,                               11P       10
.9280660,-6.9305344,.9280660,0,0;                                                           11P       11
210,9,1,11,0,0;                                                                             13P       12
212,1,7,2.4550002,.3500000,1,1.5707963,1.0471975,0,0,-9.1399450,                            15P       13
-4.3244443,0.0,7HLABEL 3,0,0;                                                               15P       14
214,2,.1500000,.0500000,0.0,-10.0000000,0.0,-7.7999997,                                     17P       15
-1.9133974,-7.9499998,-1.9133974,0,0;                                                       17P       16
210,15,1,17,0,0;                                                                            19P       17
212,1,7,2.4900002,.3500000,1,1.5707963,4.7123887,0,0,-7.1750002,                            21P       18
-4.4169998,0.0,7HLABEL 4,0,0;                                                               21P       19
214,2,.1500000,.0500000,0.0,-10.0000000,-6.5000000,-7.0000000,                              23P       20
-7.0999999,-7.0000000,-7.0999999,0,0;                                                       23P       21
210,21,1,23,0,0;                                                                            25P       22
212,1,7,2.4550002,.3500000,1,1.5707963,1.5707962,0,0,-.8249998,                             27P       23
4.5000000,0.0,7HLABEL 5,0,0;                                                                27P       24
214,2,.1500000,.0500000,0.0,-3.5000000,6.5000000,-1.0000000,                                29P       25
4.4000001,-1.0000000,4.4000001,0,0;                                                         29P       26
214,2,.1500000,.0500000,0.0,-3.5000000,3.5000000,-1.0000000,                                31P       27
4.4000001,-1.0000000,4.4000001,0,0;                                                         31P       28
214,2,.1500000,.0500000,0.0,-3.5000000,1.5000000,-1.0000000,                                33P       29
4.4000001,-1.0000000,4.4000001,0,0;                                                         33P       30
210,27,3,29,31,33,0,0;                                                                      35P       31
212,1,7,2.4550002,.3500000,1,1.5707963,3.4906584,0,0,1.8673725,                             37P       32
-2.4521160,0.0,7HLABEL 6,0,0;                                                               37P       33
214,2,.1500000,.0500000,0.0,-3.5000000,-.5000000,-.8758771,                                 39P       34
-3.5342021,-.5939693,-3.5342021,0,0;                                                        39P       35
214,2,.1500000,.0500000,0.0,-3.5000000,-3.0000000,-.8758771,                                41P       36
-3.5342021,-.5939693,-3.5342021,0,0;                                                        41P       37
```

```
214,2,.1500000,.0500000,0.0,-3.5000000,-6.0000000,-.8758771,          43P      38
-3.5342021,-.5939693,-3.5342021,0,0;                                  43P      39
210,37,3,39,41,43,0,0;                                                45P      40
212,1,7,2.4550002,.3500000,1,1.5707963,.7853981,0,0,14.1237440,       47P      41
5.8762560,0.0,7HLABEL 7,0,0;                                          47P      42
214,2,.1500000,.0500000,0.0,3.0000000,6.5000000,11.5000000,           49P      43
5.9292893,13.9292889,5.9292893,0,0;                                   49P      44
210,47,1,49,0,0;                                                      51P      45
212,1,7,2.4550002,.3500000,1,1.5707963,0.0,0,0,13.0000000,            53P      46
.8250000,0.0,7HLABEL 8,0,0;                                           53P      47
214,2,.1500000,.0500000,0.0,3.0000000,2.5000000,3.0000000,            55P      48
1.0000000,12.8999996,1.0000000,0,0;                                   55P      49
210,53,1,55,0,0;                                                      57P      50
212,1,7,2.4550002,.3500000,1,1.5707963,1.5707962,0,0,13.1750002,      59P      51
-4.0830007,0.0,7HLABEL 9,0,0;                                         59P      52
214,2,.1500000,.0500000,0.0,3.0000000,-1.0000000,13.0000000,          61P      53
-1.4000000,13.0000000,-1.4000000,0,0;                                 61P      54
210,59,1,61,0,0;                                                      63P      55
S       1G       2D      64P      55                                    T       1
```

3.3.12 General Note

The following conventions were followed:

- CV originated text only
- all text has a font characteristic of 1
- slant angle is 0°
- non-mirror condition

Case 1 (Figure 3.3.12-1) tests the following:

- Full alphabetic, numeric, and special character set
- Multi-line text notes
- Text at positive and negative rotation angles

Case 2

- This is identical to Case 1 except non-model space with rotation (30°, 45°, 77°) is used per section 3.0

Case 3 (Figures 3.3.12-2 through 3.3.12-5) tests the following:

- large text height (100 in)
- text at positive and negative rotation angles
- long text strings (> 400 characters)
- small text height (.001 in)

Case 4

- This is identical to Case 3 except non-model space with rotation (45°, 45°, 45°) is used per section 3.0

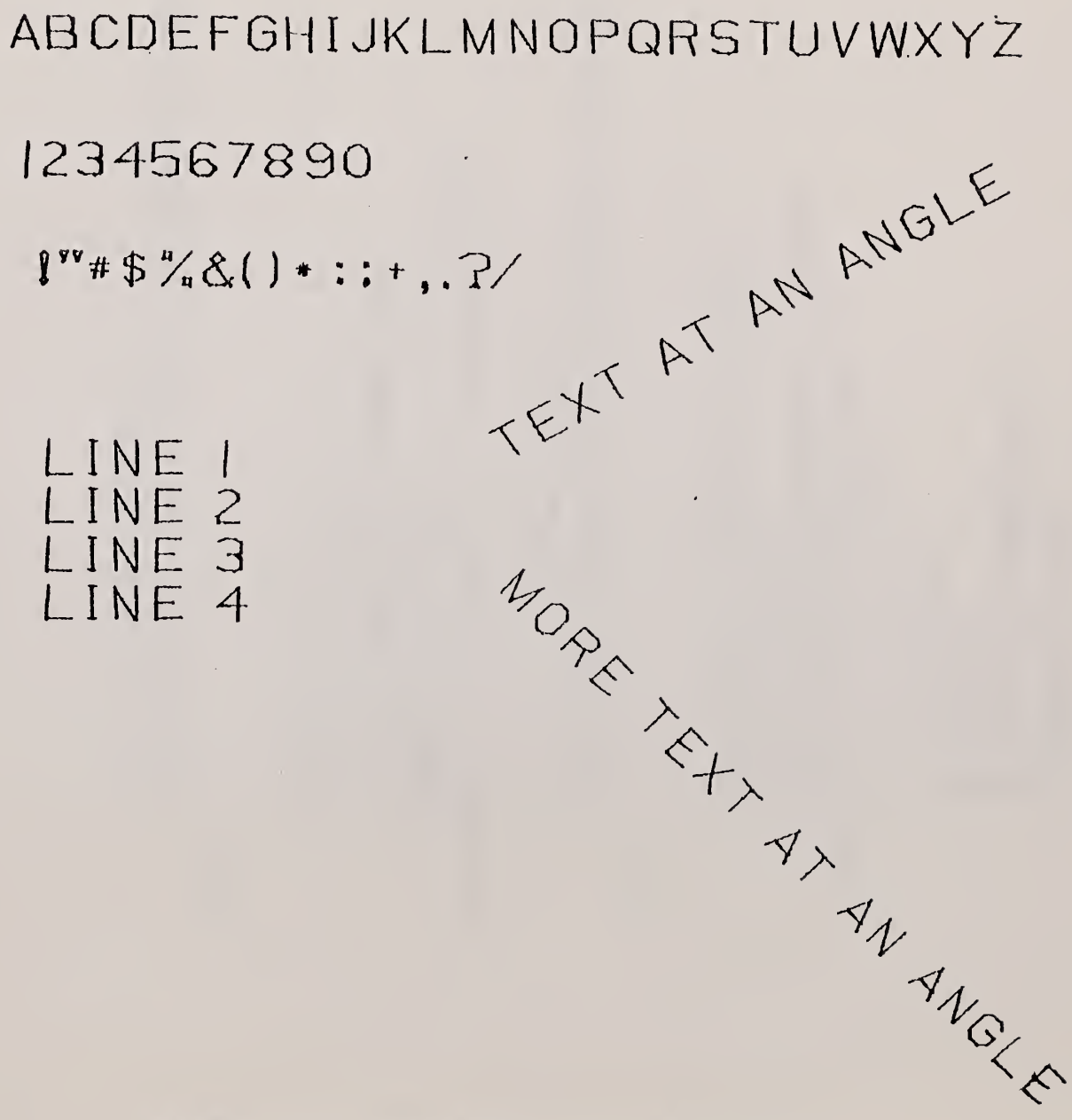

Figure 3.3.12-1 General Note Cases 1 and 2 (actual part)
Case 1: Rotation (0^{o}, 0^{o}, 0^{o})
Case 2: Rotation (30^{o}, 45^{o}, 77^{o})

```
GENERAL NOTE CASE 1                                                    S      1
1H,,1H;,,6HGNOTE1,4HCIIN,6H2.1.3 ,16,8,24,8,56,,1.0000000,1,4HINCH,0,,13G      1
H810827.122734,,,,;                                                    G      2
     124       1       1       1       0       0       0       0 0 0 0 D      1
     124       0       0       2       0                               0D     2
     212       3       1       1       0       0       1       0 0 0 1 D      3
     212       0       0       2       0                               0D     4
     212       5       1       1       0       0       1       0 0 0 1 D      5
     212       0       0       2       0                               0D     6
     212       7       1       1       0       0       1       0 0 0 1 D      7
     212       0       0       2       0                               0D     8
     212       9       1       1       0       0       1       0 0 0 1 D      9
     212       0       0       6       0                               0D    10
     212      15       1       1       0       0       1       0 0 0 1 D     11
     212       0       0       2       0                               0D    12
     212      17       1       1       0       0       1       0 0 0 1 D     13
     212       0       0       2       0                               0D    14
124,1.0000000,0.0,0.0,0.0,0.0,1.0000000,0.0,0.0,0.0,0.0,                    1P     1
1.0000000,0.0,0,0;                                                          1P     2
212,1,26,29.4000000,1.0000000,1,1.5707963,0.0,0,0,-9.8846159,               3P     3
2.0256412,0.0,26HABCDEFGHIJKLMNOPQRSTUVWXYZ,0,0;                            3P     4
212,1,10,10.0000000,1.0000000,1,1.5707963,0.0,0,0,-9.5904703,               5P     5
-1.9306393,0.0,10H1234567890,0,0;                                           5P     6
212,1,16,13.1000000,1.0000000,1,1.5707963,0.0,0,0,-9.2979488,               7P     7
-5.2946324,0.0,16H!"#$%&()*:;+,.?/,0,0;                                     7P     8
212,4,6,5.2000000,1.0000000,1,1.5707963,0.0,0,0,-8.8445415,                 9P     9
-11.1158066,0.0,6HLINE 1,6,5.6000000,1.0000000,1,1.5707963,0.0,             9P    10
0,0,-8.8445415,-12.6158066,0.0,6HLINE 2,6,5.7000000,1.0000000,1,            9P    11
1.5707963,0.0,0,0,-8.8445415,-14.1158066,0.0,6HLINE 3,6,                    9P    12
5.8000000,1.0000000,1,1.5707963,0.0,0,0,-8.8445415,-15.6158066,             9P    13
0.0,6HLINE 4,0,0;                                                           9P    14
212,1,16,16.8000000,1.0000000,1,1.5707963,.5235988,0,0,                    11P    15
4.6699367,-10.6477728,0.0,16HTEXT AT AN ANGLE,0,0;                         11P    16
212,1,21,22.4000000,1.0000000,1,1.5707963,-.7853981,0,0,                   13P    17
4.4359198,-14.6260605,0.0,21HMORE TEXT AT AN ANGLE,0,0;                    13P    18
S       1G      2D     14P     18                                           T      1
```

```
GENERAL NOTE CASE 2                                                    S       1
1H,,1H;,,6HGNOTE2,4HCIIN,6H2.1.3 ,16,8,24,8,56,,1.0000000,1,4HINCH,0,,13G      1
H810827.122750,,,,;                                                    G       2
     124       1       1       1       0       0       0       0 0 0 0  D      1
     124       0       0       2       0                                0D      2
     212       3       1       1       0       0       1       0 0 0 1  D      3
     212       0       0       2       0                                0D      4
     212       5       1       1       0       0       1       0 0 0 1  D      5
     212       0       0       2       0                                0D      6
     212       7       1       1       0       0       1       0 0 0 1  D      7
     212       0       0       2       0                                0D      8
     212       9       1       1       0       0       1       0 0 0 1  D      9
     212       0       0       6       0                                0D     10
     212      15       1       1       0       0       1       0 0 0 1  D     11
     212       0       0       2       0                                0D     12
     212      17       1       1       0       0       1       0 0 0 1  D     13
     212       0       0       2       0                                0D     14
124,.1590645,.6889837,-.7071068,0.0,-.7642970,.5393053,.3535534,       1P      1
0.0,.6249390,.4842018,.6123725,0.0,0,0;                                1P      2
212,1,26,29.4000000,1.0000000,1,1.5707963,0.0,0,0,-9.8846159,          3P      3
2.0256412,0.0,26HABCDEFGHIJKLMNOPQRSTUVWXYZ,0,0;                       3P      4
212,1,10,10.0000000,1.0000000,1,1.5707963,0.0,0,0,-9.5904703,          5P      5
-1.9306393,0.0,10H1234567890,0,0;                                      5P      6
212,1,16,13.1000000,1.0000000,1,1.5707963,0.0,0,0,-9.2979488,          7P      7
-5.2946324,0.0,16H!"#$%&()*:;+,.?/,0,0;                                7P      8
212,4,6,5.2000000,1.0000000,1,1.5707963,0.0,0,0,-8.8445415,            9P      9
-11.1158066,0.0,6HLINE 1,6,5.6000000,1.0000000,1,1.5707963,0.0,        9P     10
0,0,-8.8445415,-12.6158066,0.0,6HLINE 2,6,5.7000000,1.0000000,1,       9P     11
1.5707963,0.0,0,0,-8.8445415,-14.1158066,0.0,6HLINE 3,6,               9P     12
5.8000000,1.0000000,1,1.5707963,0.0,0,0,-8.8445415,-15.6158066,        9P     13
0.0,6HLINE 4,0,0;                                                      9P     14
212,1,16,16.8000000,1.0000000,1,1.5707963,.5235988,0,0,               11P     15
4.6699367,-10.6477723,0.0,16HTEXT AT AN ANGLE,0,0;                    11P     16
212,1,21,22.4000000,1.0000000,1,1.5707963,-.7853981,0,0,              13P     17
4.4359198,-14.6260605,0.0,21HMORE TEXT AT AN ANGLE,0,0;               13P     18
S      1G      2D     14P     18                                       T       1
```

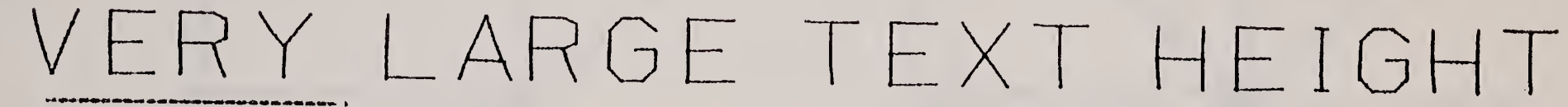

Figure 3.3.12-2 General Note Cases 3 and 4 (actual part)
Case 3: Rotation (0^{o}, 0^{o}, 0^{o})
Case 4: Rotation (45^{o}, 45^{o}, 45^{o})

Figure 3.3.12-3 General Note Cases 3 and 4 (rotated text magnified)

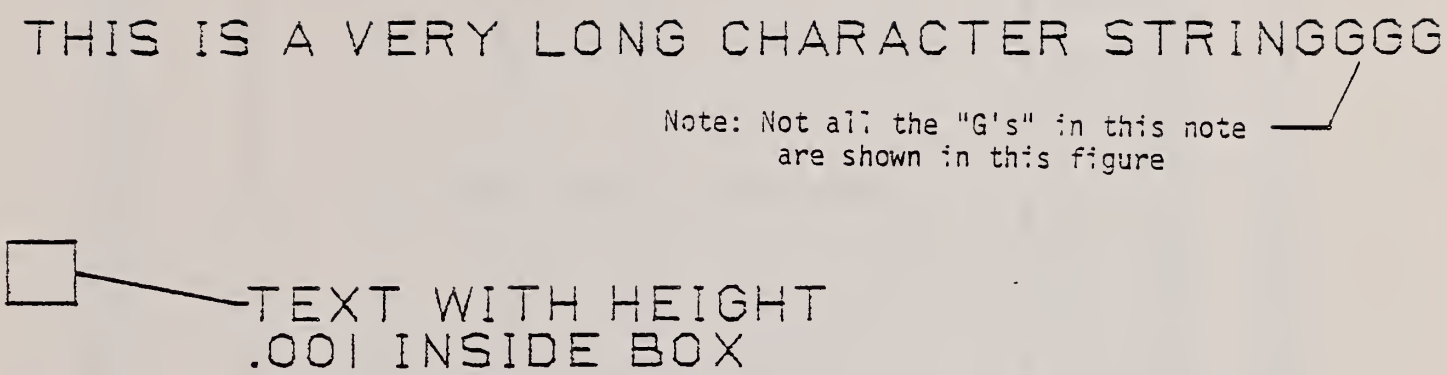

Figure 3.3.12-4 General Note Cases 3 and 4 (long text magnified)

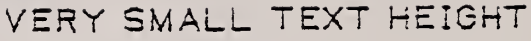

Figure 3.3.12-5 General Note Cases 3 and 4 (small text magnified)

```
GENERAL NOTE CASE 3                                                                                                  S       1
1H,,1H;,,6HGNOTE3,4HCIIN,6H2.1.3 ,16,8,24,8,56,,1.0000000,1,4HINCH,0,,13G       1
H810827.122803,,,,;                                                                                                  G       2
     124       1       1       1       0       0       0       0 0 0 0  D       1
     124       0       0       2       0                                0D       2
     212       3       1       1       0       0       1       0 0 0 1  D       3
     212       0       0       2       0                                0D       4
     212       5       1       1       0       0       1       0 0 0 1  D       5
     212       0       0       2       0                                0D       6
     212       7       1       1       0       0       1       0 0 0 1  D       7
     212       0       0       2       0                                0D       8
     212       9       1       1       0       0       1       0 0 0 1  D       9
     212       0       0       2       0                                0D      10
     212      11       1       1       0       0       1       0 0 0 1  D      11
     212       0       0       2       0                                0D      12
     212      13       1       1       0       0       1       0 0 0 1  D      13
     212       0       0       2       0                                0D      14
     212      15       1       1       0       0       1       0 0 0 1  D      15
     212       0       0       2       0                                0D      16
     212      17       1       1       0       0       1       0 0 0 1  D      17
     212       0       0       2       0                                0D      18
     212      19       1       1       0       0       1       0 0 0 1  D      19
     212       0       0       2       0                                0D      20
     212      21       1       1       0       0       1       0 0 0 1  D      21
     212       0       0       2       0                                0D      22
     212      23       1       1       0       0       1       0 0 0 1  D      23
     212       0       0       2       0                                0D      24
     212      25       1       1       0       0       1       0 0 0 1  D      25
     212       0       0       2       0                                0D      26
     212      27       1       1       0       0       1       0 0 0 1  D      27
     212       0       0       2       0                                0D      28
     212      29       1       1       0       0       1       0 0 0 1  D      29
     212       0       0       2       0                                0D      30
     212      31       1       1       0       0       1       0 0 0 1  D      31
     212       0       0       2       0                                0D      32
     212      33       1       1       0       0       1       0 0 0 1  D      33
     212       0       0       9       0                                0D      34
124,1.0000000,0.0,0.0,0.0,0.0,1.0000000,0.0,0.0,0.0,0.0,                        1P       1
1.0000000,0.0,0,0;                                                              1P       2
212,1,22,2340.0000000,100.0000000,1,1.5707963,0.0,0,0,                          3P       3
-10.7564106,2.0256412,0.0,22HVERY LARGE TEXT HEIGHT,0,0;                        3P       4
212,1,22,.0236000,.0010000,1,1.5707963,0.0,0,0,14.1943779,                      5P       5
-50.5557480,0.0,22HVERY SMALL TEXT HEIGHT,0,0;                                  5P       6
212,1,17,18.4000000,1.0000000,1,1.5707963,0.0,0,0,19.0201511,                   7P       7
-90.9595032,0.0,17HROTATED 0 DEGREES,0,0;                                       7P       8
212,1,18,19.5000000,1.0000000,1,1.5707963,.5235988,0,0,                         9P       9
19.0201511,-90.9595032,0.0,18HROTATED 30 DEGREES,0,0;                           9P      10
212,1,18,19.5000000,1.0000000,1,1.5707963,.7853981,0,0,                        11P      11
19.0201511,-90.9595032,0.0,18HROTATED 45 DEGREES,0,0;                          11P      12
212,1,18,19.5000000,1.0000000,1,1.5707963,1.5707963,0,0,                       13P      13
19.0201511,-90.9595032,0.0,18HROTATED 90 DEGREES,0,0;                          13P      14
212,1,19,20.2000000,1.0000000,1,1.5707963,2.3561945,0,0,                       15P      15
```

```
19.0201511,-90.9595032,0.0,19HROTATED 135 DEGREES,0,0;                  15P      16
212,1,19,20.3000000,1.0000000,1,1.5707963,3.1415925,0,0,                17P      17
19.0201511,-90.9595032,0.0,19HROTATED 180 DEGREES,0,0;                  17P      18
212,1,19,20.4000000,1.0000000,1,1.5707963,3.9269907,0,0,                19P      19
19.0201511,-90.9595032,0.0,19HROTATED 225 DEGREES,0,0;                  19P      20
212,1,19,20.5000000,1.0000000,1,1.5707963,4.7123890,0,0,                21P      21
19.0201511,-90.9595032,0.0,19HROTATED 270 DEGREES,0,0;                  21P      22
212,1,19,20.2000000,1.0000000,1,1.5707963,5.4977870,0,0,                23P      23
19.0201511,-90.9595032,0.0,19HROTATED 315 DEGREES,0,0;                  23P      24
212,1,19,20.6000000,1.0000000,1,1.5707963,-.7853981,0,0,                25P      25
-27.3520813,-91.0622711,0.0,19HROTATED -45 DEGREES,0,0;                 25P      26
212,1,19,20.6000000,1.0000000,1,1.5707963,-1.5707963,0,0,               27P      27
-27.3520813,-91.0622711,0.0,19HROTATED -90 DEGREES,0,0;                 27P      28
212,1,20,21.4000000,1.0000000,1,1.5707963,-3.1415925,0,0,               29P      29
-27.3520813,-91.0622711,0.0,20HROTATED -180 DEGREES,0,0;                29P      30
212,1,20,21.6000000,1.0000000,1,1.5707963,-4.7123890,0,0,               31P      31
-27.3520813,-91.0622711,0.0,20HROTATED -270 DEGREES,0,0;                31P      32
212,1,470,514.9000000,1.0000000,1,1.5707963,0.0,0,0,13.5163784,         33P      33
-44.0563965,0.0,470HTHIS IS A VERY LONG CHARACTER STRINGGGGGGGGG        33P      34
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG    33P      35
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG    33P      36
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG    33P      37
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG    33P      38
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG    33P      39
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG    33P      40
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG,0,0;                       33P      41
S       1G       2D      34P      41                                       T       1
```

```
GENERAL NOTE CASE 4                                                    S      1
1H,,1H;,,6HGNOTE4,4HCIIN,6H2.1.3 ,16,8,24,8,56,,1.0000000,1,4HINCH,0,,13G      1
H810827.122824,,,,;                                                    G      2
     124       1       1       1       0       0       0       0 0 0 0  D      1
     124       0       0       2       0                               0D     2
     212       3       1       1       0       0       1       0 0 0 1  D      3
     212       0       0       2       0                               0D     4
     212       5       1       1       0       0       1       0 0 0 1  D      5
     212       0       0       2       0                               0D     6
     212       7       1       1       0       0       1       0 0 0 1  D      7
     212       0       0       2       0                               0D     8
     212       9       1       1       0       0       1       0 0 0 1  D      9
     212       0       0       2       0                               0D     10
     212      11       1       1       0       0       1       0 0 0 1  D      11
     212       0       0       2       0                               0D     12
     212      13       1       1       0       0       1       0 0 0 1  D      13
     212       0       0       2       0                               0D     14
     212      15       1       1       0       0       1       0 0 0 1  D      15
     212       0       0       2       0                               0D     16
     212      17       1       1       0       0       1       0 0 0 1  D      17
     212       0       0       2       0                               0D     18
     212      19       1       1       0       0       1       0 0 0 1  D      19
     212       0       0       2       0                               0D     20
     212      21       1       1       0       0       1       0 0 0 1  D      21
     212       0       0       2       0                               0D     22
     212      23       1       1       0       0       1       0 0 0 1  D      23
     212       0       0       2       0                               0D     24
     212      25       1       1       0       0       1       0 0 0 1  D      25
     212       0       0       2       0                               0D     26
     212      27       1       1       0       0       1       0 0 0 1  D      27
     212       0       0       2       0                               0D     28
     212      29       1       1       0       0       1       0 0 0 1  D      29
     212       0       0       2       0                               0D     30
     212      31       1       1       0       0       1       0 0 0 1  D      31
     212       0       0       2       0                               0D     32
     212      33       1       1       0       0       1       0 0 0 1  D      33
     212       0       0       9       0                               0D     34
124,.5000001,.5000000,-.7071068,0.0,-.1464466,.8535534,.5000000,               1P     1
0.0,.8535534,-.1464466,.5000001,0.0,0,0;                               1P     2
212,1,22,2340.0000000,100.0000000,1,1.5707963,0.0,0,0,                 3P     3
-10.7564106,2.0256412,0.0,22HVERY LARGE TEXT HEIGHT,0,0;               3P     4
212,1,22,.0236000,.0010000,1,1.5707963,0.0,0,0,14.1943779,             5P     5
-50.5557480,0.0,22HVERY SMALL TEXT HEIGHT,0,0;                         5P     6
212,1,17,18.4000000,1.0000000,1,1.5707963,0.0,0,0,19.0201511,          7P     7
-90.9595032,0.0,17HROTATED 0 DEGREES,0,0;                              7P     8
212,1,18,19.5000000,1.0000000,1,1.5707963,.5235988,0,0,                9P     9
19.0201511,-90.9595032,0.0,18HROTATED 30 DEGREES,0,0;                  9P     10
212,1,18,19.5000000,1.0000000,1,1.5707963,.7853981,0,0,                11P    11
19.0201511,-90.9595032,0.0,18HROTATED 45 DEGREES,0,0;                  11P    12
212,1,18,19.5000000,1.0000000,1,1.5707963,1.5707963,0,0,               13P    13
19.0201511,-90.9595032,0.0,18HROTATED 90 DEGREES,0,0;                  13P    14
212,1,19,20.2000000,1.0000000,1,1.5707963,2.3561945,0,0,               15P    15
```

```
19.0201511,-90.9595032,0.0,19HROTATED 135 DEGREES,0,0;                  15P      16
212,1,19,20.3000000,1.0000000,1,1.5707963,3.1415925,0,0,                17P      17
19.0201511,-90.9595032,0.0,19HROTATED 180 DEGREES,0,0;                  17P      18
212,1,19,20.4000000,1.0000000,1,1.5707963,3.9269907,0,0,                19P      19
19.0201511,-90.9595032,0.0,19HROTATED 225 DEGREES,0,0;                  19P      20
212,1,19,20.5000000,1.0000000,1,1.5707963,4.7123890,0,0,                21P      21
19.0201511,-90.9595032,0.0,19HROTATED 270 DEGREES,0,0;                  21P      22
212,1,19,20.2000000,1.0000000,1,1.5707963,5.4977870,0,0,                23P      23
19.0201511,-90.9595032,0.0,19HROTATED 315 DEGREES,0,0;                  23P      24
212,1,19,20.6000000,1.0000000,1,1.5707963,-.7853981,0,0,                25P      25
-27.3520813,-91.0622711,0.0,19HROTATED -45 DEGREES,0,0;                 25P      26
212,1,19,20.6000000,1.0000000,1,1.5707963,-1.5707963,0,0,               27P      27
-27.3520813,-91.0622711,0.0,19HROTATED -90 DEGREES,0,0;                 27P      28
212,1,20,21.4000000,1.0000000,1,1.5707963,-3.1415925,0,0,               29P      29
-27.3520813,-91.0622711,0.0,20HROTATED -180 DEGREES,0,0;                29P      30
212,1,20,21.6000000,1.0000000,1,1.5707963,-4.7123890,0,0,               31P      31
-27.3520813,-91.0622711,0.0,20HROTATED -270 DEGREES,0,0;                31P      32
212,1,470,514.9000000,1.0000000,1,1.5707963,0.0,0,0,13.5163784,         33P      33
-44.0563965,0.0,470HTHIS IS A VERY LONG CHARACTER STRINGGGGGGGGG        33P      34
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG    33P      35
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG    33P      36
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG    33P      37
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG    33P      38
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG    33P      39
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG    33P      40
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG,0,0;                         33P      41
S       1G       2D      34P      41                                      T        1
```

3.3.13 Linear Dimension

The linear dimensions contain subentities which include leaders, witness lines and general notes.

The following conventions were followed:

- general note sub-entities to be single text string with no box rotation

Case 1 (Figures 3.3.13-1 through 3.3.13-4) tests the following:

- text in, arrows in configuration
- text in, arrows out configuration
- text out, arrows out configuration
- text out, arrows in configuration
- no witness lines suppressed
- first witness line suppressed
- second witness line suppressed
- both witness lines suppressed
- vertical and horizontal orientations

Case 2

- This is identical to Case 1 except non-model space with rotation (-40.80°, -7.24°, -8.31°) is used per Section 3.0

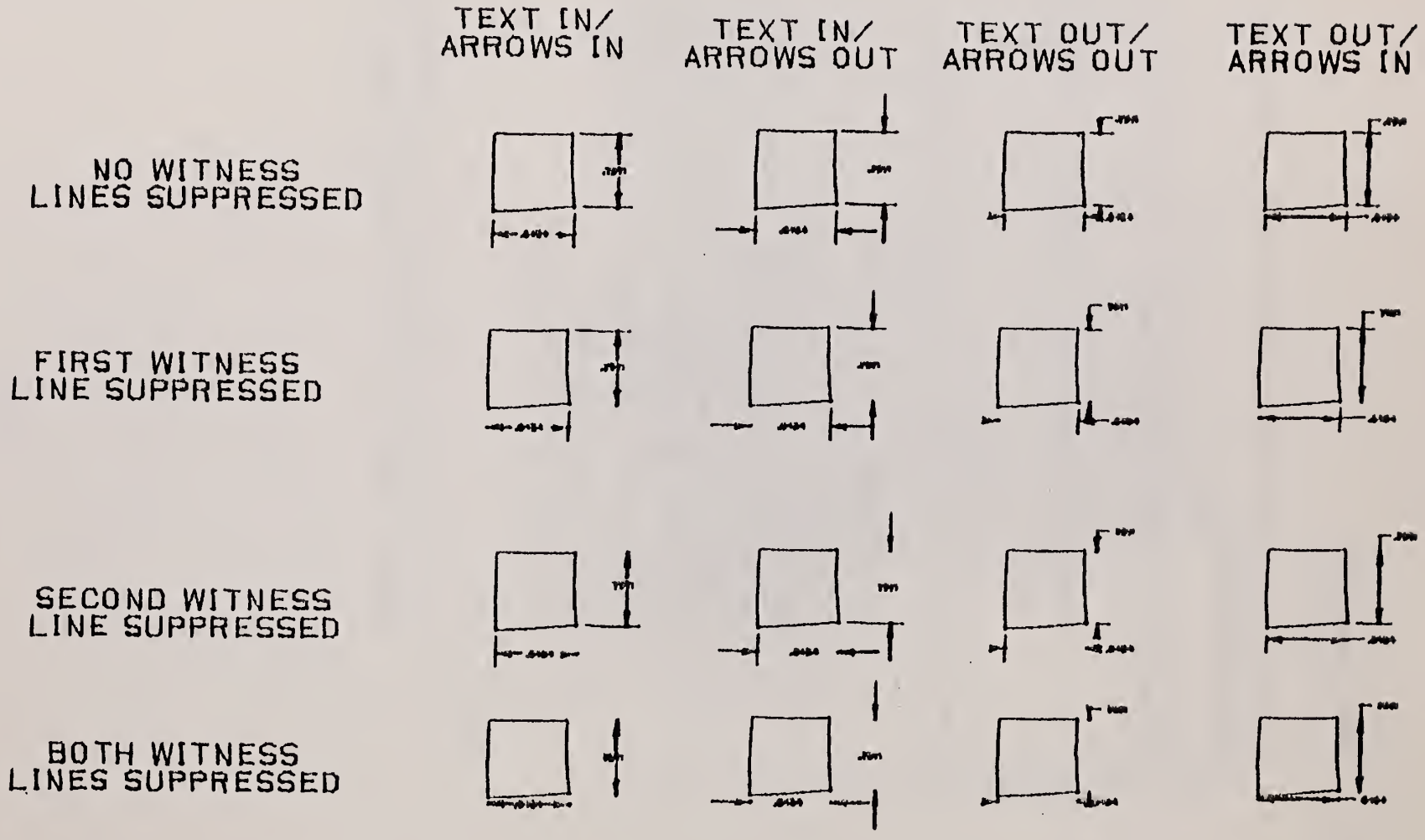

Figure 3.3.13-1 Linear Dimension Cases 1 and 2 (with annotation)
Case 1: Rotation (0^{o}, 0^{o}, 0^{o})
Case 2: Rotation (-40.80^{o}, -7.24^{o}, -8.31^{o})

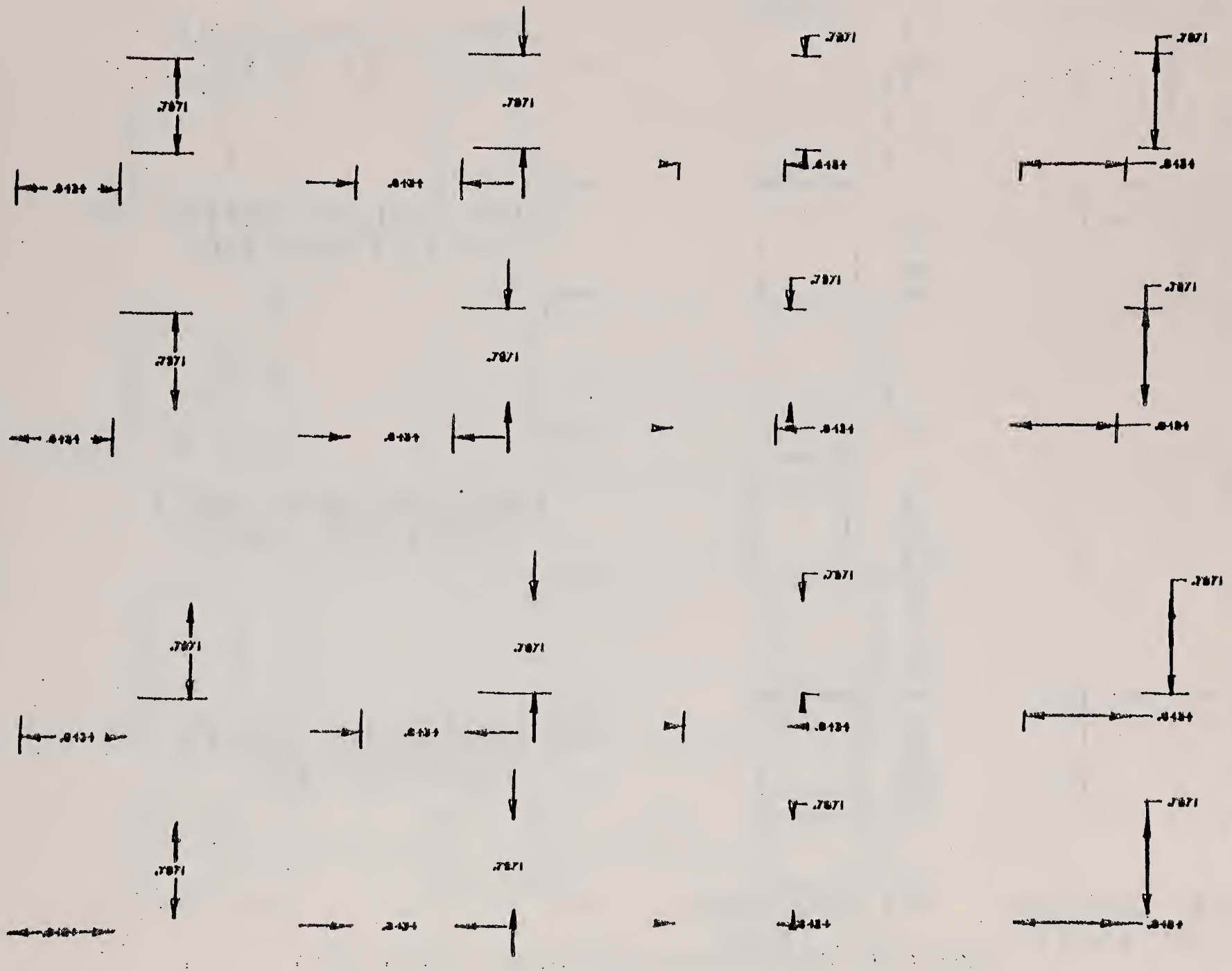

Figure 3.3.13-2 Linear Dimension Cases 1 and 2 (actual part)

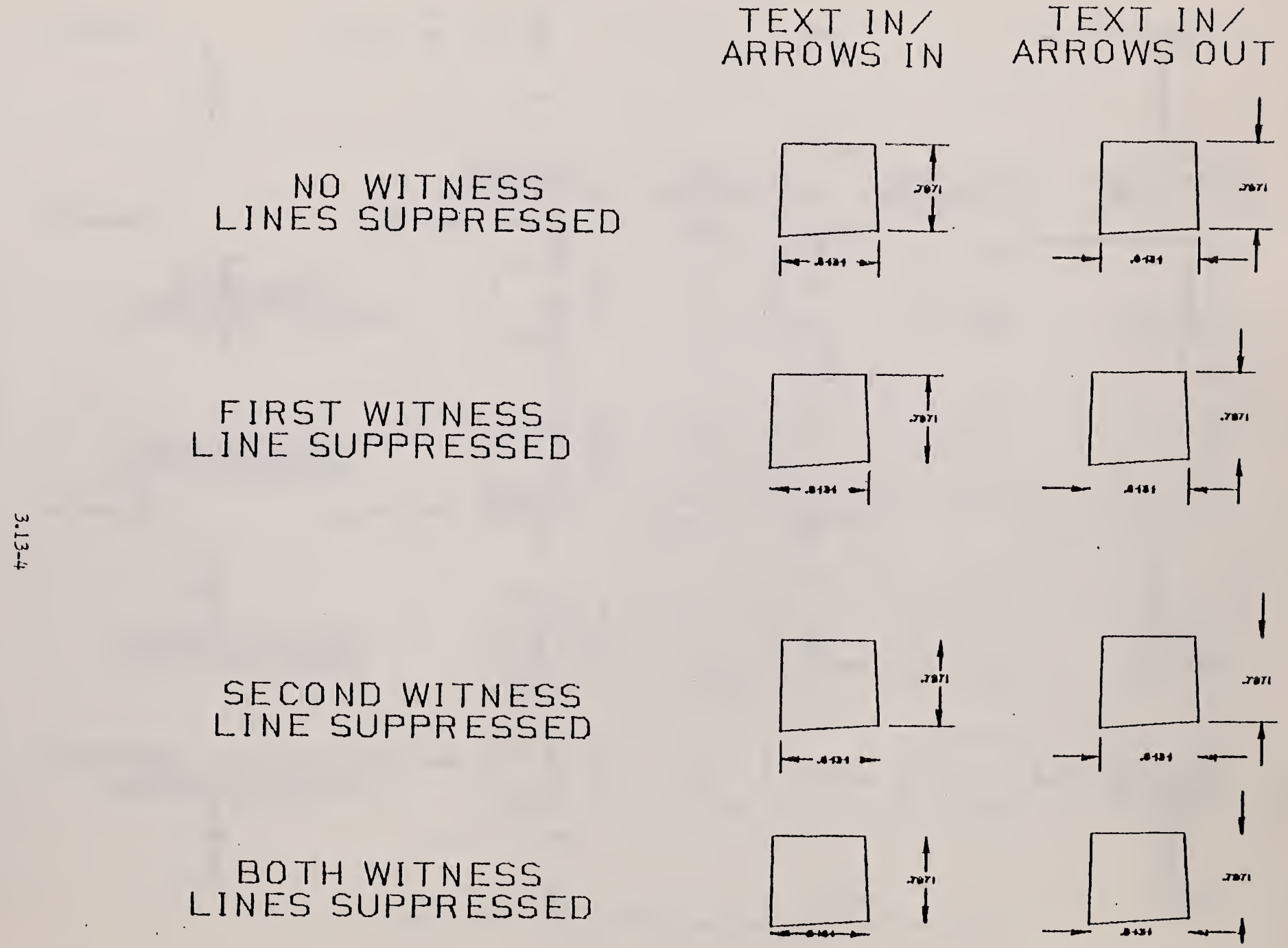

Figure 3.3.13-3 Linear Dimension Cases 1 and 2 (left side magnified)

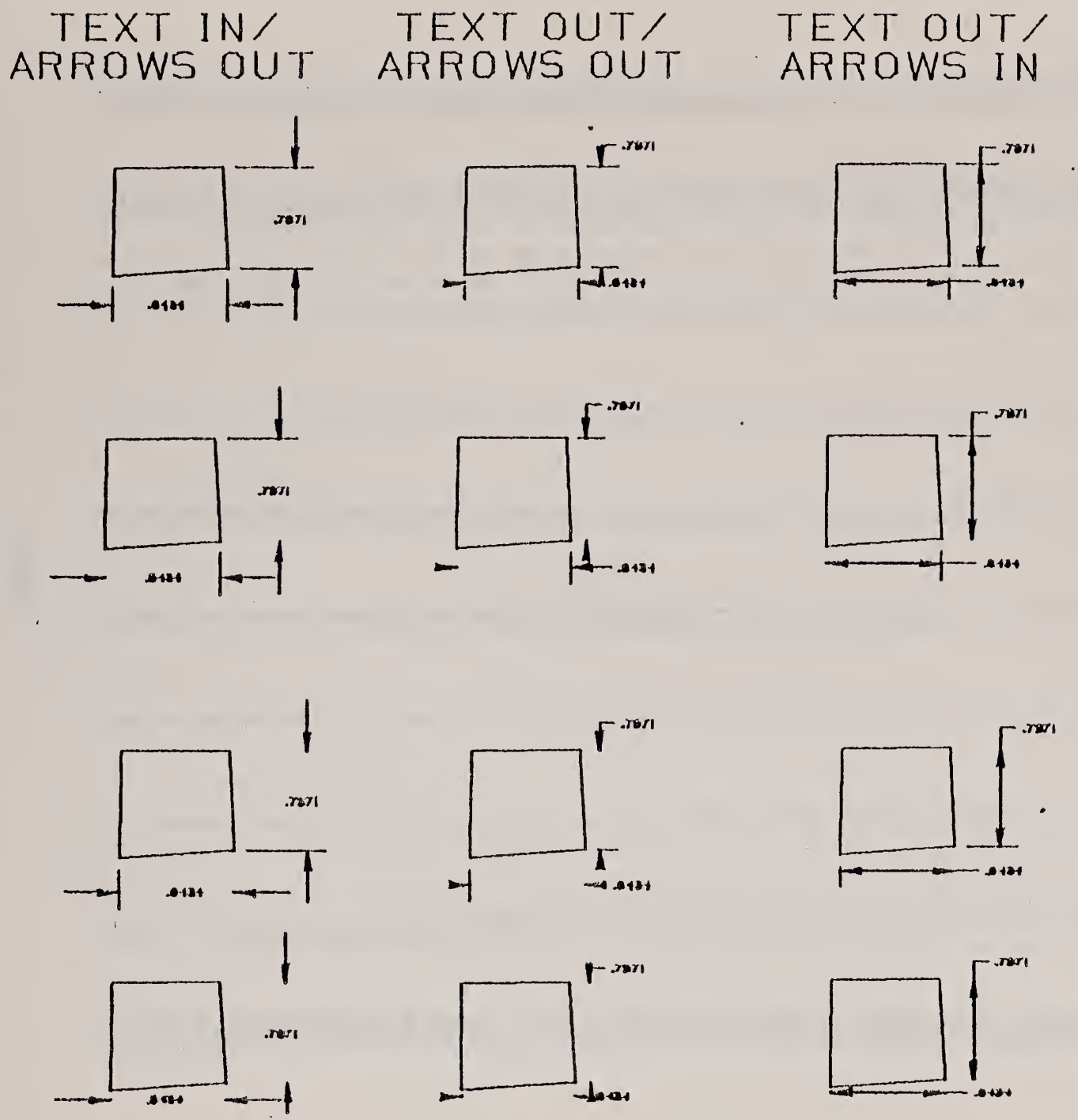

Figure 3.3.13-4 Linear Dimension Cases 1 and 2 (right side magnified)

```
LDIM TEST CASE 1                                                                S       1
1H,,1H;,,5HLDIM1,4HCIIN,6H2.1.3 ,16,8,24,8;56,,1.0000000,1,4HINCH,0,,13HG       1
810827.122938,,,,;                                                              G       2
     124       1       1       1       0       0       0       0 0 0 0  D      1
     124       0       0       2       0                               0D      2
     212       3       1       1       0       0       1       0 0 1 1  D      3
     212       0       0       2       0                               0D      4
     214       5       1       1       0       0       1       0 0 1 1  D      5
     214       0       0       2       3                               0D      6
     214       7       1       1       0       0       1       0 0 1 1  D      7
     214       0       0       2       3                               0D      8
     106       9       1       1       0       0       1       0 0 1 1  D      9
     106       0       0       2      40                               0D     10
     106      11       1       1       0       0       1       0 0 1 1  D     11
     106       0       0       2      40                               0D     12
     216      13       1       1       0       0       1       0 0 0 1  D     13
     216       0       0       1       0                               0D     14
     212      14       1       1       0       0       1       0 0 1 1  D     15
     212       0       0       2       0                               0D     16
     214      16       1       1       0       0       1       0 0 1 1  D     17
     214       0       0       2       3                               0D     18
     214      18       1       1       0       0       1       0 0 1 1  D     19
     214       0       0       2       3                               0D     20
     106      20       1       1       0       0       1       0 0 1 1  D     21
     106       0       0       2      40                               0D     22
     106      22       1       1       0       0       1       0 0 1 1  D     23
     106       0       0       2      40                               0D     24
     216      24       1       1       0       0       1       0 0 0 1  D     25
     216       0       0       1       0                               0D     26
     212      25       1       1       0       0       1       0 0 1 1  D     27
     212       0       0       2       0                               0D     28
     214      27       1       1       0       0       1       0 0 1 1  D     29
     214       0       0       2       3                               0D     30
     214      29       1       1       0       0       1       0 0 1 1  D     31
     214       0       0       2       3                               0D     32
     106      31       1       1       0       0       1       0 0 1 1  D     33
     106       0       0       2      40                               0D     34
     106      33       1       1       0       0       1       0 0 1 1  D     35
     106       0       0       2      40                               0D     36
     216      35       1       1       0       0       1       0 0 0 1  D     37
     216       0       0       1       0                               0D     38
     212      36       1       1       0       0       1       0 0 1 1  D     39
     212       0       0       2       0                               0D     40
     214      38       1       1       0       0       1       0 0 1 1  D     41
     214       0       0       2       3                               0D     42
     214      40       1       1       0       0       1       0 0 1 1  D     43
     214       0       0       2       3                               0D     44
     106      42       1       1       0       0       1       0 0 1 1  D     45
     106       0       0       2      40                               0D     46
     106      44       1       1       0       0       1       0 0 1 1  D     47
     106       0       0       2      40                               0D     48
     216      46       1       1       0       0       1       0 0 0 1  D     49
```

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212	47	1	1	0	0	1	0	0	1	1	D	51
212	0	0	2	0							0D	52
214	49	1	1	0	0	1	0	0	1	1	D	53
214	0	0	2	3							0D	54
214	51	1	1	0	0	1	0	0	1	1	D	55
214	0	0	2	3							0D	56
106	53	1	1	0	0	1	0	1	1	1	D	57
106	0	0	2	40							0D	58
106	55	1	1	0	0	1	0	0	1	1	D	59
106	0	0	2	40							0D	60
216	57	1	1	0	0	1	0	0	0	1	D	61
216	0	0	1	0							0D	62
212	58	1	1	0	0	1	0	0	1	1	D	63
212	0	0	2	0							0D	64
214	60	1	1	0	0	1	0	0	1	1	D	65
214	0	0	2	3							0D	66
214	62	1	1	0	0	1	0	0	1	1	D	67
214	0	0	2	3							0D	68
106	64	1	1	0	0	1	0	1	1	1	D	69
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106	66	1	1	0	0	1	0	0	1	1	D	71
106	0	0	2	40							0D	72
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216	0	0	1	0							0D	74
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212	0	0	2	0							0D	76
214	71	1	1	0	0	1	0	0	1	1	D	77
214	0	0	2	3							0D	78
214	73	1	1	0	0	1	0	0	1	1	D	79
214	0	0	2	3							0D	80
106	75	1	1	0	0	1	0	1	1	1	D	81
106	0	0	2	40							0D	82
106	77	1	1	0	0	1	0	0	1	1	D	83
106	0	0	2	40							0D	84
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216	0	0	1	0							0D	86
212	80	1	1	0	0	1	0	0	1	1	D	87
212	0	0	2	0							0D	88
214	82	1	1	0	0	1	0	0	1	1	D	89
214	0	0	2	3							0D	90
214	84	1	1	0	0	1	0	0	1	1	D	91
214	0	0	2	3							0D	92
106	86	1	1	0	0	1	0	1	1	1	D	93
106	0	0	2	40							0D	94
106	88	1	1	0	0	1	0	0	1	1	D	95
106	0	0	2	40							0D	96
216	90	1	1	0	0	1	0	0	0	1	D	97
216	0	0	1	0							0D	98
212	91	1	1	0	0	1	0	0	1	1	D	99
212	0	0	2	0							0D	100
214	93	1	1	0	0	1	0	0	1	1	D	101

214	0	0	2	3							0D		102
214	95	1	1	0	0	1	0	0	1	1	D		103
214	0	0	2	3							0D		104
106	97	1	1	0	0	1	0	0	1	1	D		105
106	0	0	2	40							0D		106
106	99	1	1	0	0	1	0	1	1	1	D		107
106	0	0	2	40							0D		108
216	101	1	1	0	0	1	0	0	0	1	D		109
216	0	0	1	0							0D		110
212	102	1	1	0	0	1	0	0	1	1	D		111
212	0	0	2	0							0D		112
214	104	1	1	0	0	1	0	0	1	1	D		113
214	0	0	2	3							0D		114
214	106	1	1	0	0	1	0	0	1	1	D		115
214	0	0	2	3							0D		116
106	108	1	1	0	0	1	0	0	1	1	D		117
106	0	0	2	40							0D		118
106	110	1	1	0	0	1	0	1	1	1	D		119
106	0	0	2	40							0D		120
216	112	1	1	0	0	1	0	0	0	1	D		121
216	0	0	1	0							0D		122
212	113	1	1	0	0	1	0	0	1	1	D		123
212	0	0	2	0							0D		124
214	115	1	1	0	0	1	0	0	1	1	D		125
214	0	0	2	3							0D		126
214	117	1	1	0	0	1	0	0	1	1	D		127
214	0	0	2	3							0D		128
106	119	1	1	0	0	1	0	0	1	1	D		129
106	0	0	2	40							0D		130
106	121	1	1	0	0	1	0	1	1	1	D		131
106	0	0	2	40							0D		132
216	123	1	1	0	0	1	0	0	0	1	D		133
216	0	0	1	0							0D		134
212	124	1	1	0	0	1	0	0	1	1	D		135
212	0	0	2	0							0D		136
214	126	1	1	0	0	1	0	0	1	1	D		137
214	0	0	2	3							0D		138
214	128	1	1	0	0	1	0	0	1	1	D		139
214	0	0	2	3							0D		140
106	130	1	1	0	0	1	0	0	1	1	D		141
106	0	0	2	40							0D		142
106	132	1	1	0	0	1	0	1	1	1	D		143
106	0	0	2	40							0D		144
216	134	1	1	0	0	1	0	0	0	1	D		145
216	0	0	1	0							0D		146
212	135	1	1	0	0	1	0	0	1	1	D		147
212	0	0	2	0							0D		148
214	137	1	1	0	0	1	0	0	1	1	D		149
214	0	0	2	3							0D		150
214	139	1	1	0	0	1	0	0	1	1	D		151
214	0	0	2	3							0D		152
106	141	1	1	0	0	1	0	1	1	1	D		153

106	0	0	2	40							0D		154
106	143	1	1	0	0	1	0	1	1	1	D		155
106	0	0	2	40							0D		156
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216	0	0	1	0							0D		158
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212	0	0	2	0							0D		160
214	148	1	1	0	0	1	0	0	1	1	D		161
214	0	0	2	3							0D		162
214	150	1	1	0	0	1	0	0	1	1	D		163
214	0	0	2	3							0D		164
106	152	1	1	0	0	1	0	1	1	1	D		165
106	0	0	2	40							0D		166
106	154	1	1	0	0	1	0	1	1	1	D		167
106	0	0	2	40							0D		168
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216	0	0	1	0							0D		170
212	157	1	1	0	0	1	0	0	1	1	D		171
212	0	0	2	0							0D		172
214	159	1	1	0	0	1	0	0	1	1	D		173
214	0	0	2	3							0D		174
214	161	1	1	0	0	1	0	0	1	1	D		175
214	0	0	2	3							0D		176
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106	0	0	2	40							0D		178
106	165	1	1	0	0	1	0	1	1	1	D		179
106	0	0	2	40							0D		180
216	167	1	1	0	0	1	0	0	0	1	D		181
216	0	0	1	0							0D		182
212	168	1	1	0	0	1	0	0	1	1	D		183
212	0	0	2	0							0D		184
214	170	1	1	0	0	1	0	0	1	1	D		185
214	0	0	2	3							0D		186
214	172	1	1	0	0	1	0	0	1	1	D		187
214	0	0	2	3							0D		188
106	174	1	1	0	0	1	0	1	1	1	D		189
106	0	0	2	40							0D		190
106	176	1	1	0	0	1	0	1	1	1	D		191
106	0	0	2	40							0D		192
216	178	1	1	0	0	1	0	0	0	1	D		193
216	0	0	1	0							0D		194
212	179	1	1	0	0	1	0	0	1	1	D		195
212	0	0	2	0							0D		196
214	181	1	1	0	0	1	0	0	1	1	D		197
214	0	0	2	3							0D		198
214	183	1	1	0	0	1	0	0	1	1	D		199
214	0	0	2	3							0D		200
106	185	1	1	0	0	1	0	0	1	1	D		201
106	0	0	2	40							0D		202
106	187	1	1	0	0	1	0	0	1	1	D		203
106	0	0	2	40							0D		204
216	189	1	1	0	0	1	0	0	0	1	D		205

216	0	0	1	0							0D	206
212	190	1	1	0	0	1	0	0	1	1	D	207
212	0	0	2	0							0D	208
214	192	1	1	0	0	1	0	0	1	1	D	209
214	0	0	2	3							0D	210
214	194	1	1	0	0	1	0	0	1	1	D	211
214	0	0	2	3							0D	212
106	196	1	1	0	0	1	0	0	1	1	D	213
106	0	0	2	40							0D	214
106	198	1	1	0	0	1	0	0	1	1	D	215
106	0	0	2	40							0D	216
216	200	1	1	0	0	1	0	0	0	1	D	217
216	0	0	1	0							0D	218
212	201	1	1	0	0	1	0	0	1	1	D	219
212	0	0	2	0							0D	220
214	203	1	1	0	0	1	0	0	1	1	D	221
214	0	0	2	3							0D	222
214	205	1	1	0	0	1	0	0	1	1	D	223
214	0	0	2	3							0D	224
106	207	1	1	0	0	1	0	0	1	1	D	225
106	0	0	2	40							0D	226
106	209	1	1	0	0	1	0	0	1	1	D	227
106	0	0	2	40							0D	228
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216	0	0	1	0							0D	230
212	212	1	1	0	0	1	0	0	1	1	D	231
212	0	0	2	0							0D	232
214	214	1	1	0	0	1	0	0	1	1	D	233
214	0	0	2	3							0D	234
214	216	1	1	0	0	1	0	0	1	1	D	235
214	0	0	2	3							0D	236
106	218	1	1	0	0	1	0	0	1	1	D	237
106	0	0	2	40							0D	238
106	220	1	1	0	0	1	0	0	1	1	D	239
106	0	0	2	40							0D	240
216	222	1	1	0	0	1	0	0	0	1	D	241
216	0	0	1	0							0D	242
212	223	1	1	0	0	1	0	0	1	1	D	243
212	0	0	2	0							0D	244
214	225	1	1	0	0	1	0	0	1	1	D	245
214	0	0	2	3							0D	246
214	227	1	1	0	0	1	0	0	1	1	D	247
214	0	0	2	3							0D	248
106	229	1	1	0	0	1	0	1	1	1	D	249
106	0	0	2	40							0D	250
106	231	1	1	0	0	1	0	0	1	1	D	251
106	0	0	2	40							0D	252
216	233	1	1	0	0	1	0	0	0	1	D	253
216	0	0	1	0							0D	254
212	234	1	1	0	0	1	0	0	1	1	D	255
212	0	0	2	0							0D	256
214	236	1	1	0	0	1	0	0	1	1	D	257

214	0	0	2	3							0D		258
214	238	1	1	0	0	1	0	0	1	1	D		259
214	0	0	2	3							0D		260
106	240	1	1	0	0	1	0	1	1	1	D		261
106	0	0	2	40							0D		262
106	242	1	1	0	0	1	0	0	1	1	D		263
106	0	0	2	40							0D		264
216	244	1	1	0	0	1	0	0	0	1	D		265
216	0	0	1	0							0D		266
212	245	1	1	0	0	1	0	0	1	1	D		267
212	0	0	2	0							0D		268
214	247	1	1	0	0	1	0	0	1	1	D		269
214	0	0	2	3							0D		270
214	249	1	1	0	0	1	0	0	1	1	D		271
214	0	0	2	3							0D		272
106	251	1	1	0	0	1	0	1	1	1	D		273
106	0	0	2	40							0D		274
106	253	1	1	0	0	1	0	0	1	1	D		275
106	0	0	2	40							0D		276
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216	0	0	1	0							0D		278
212	256	1	1	0	0	1	0	0	1	1	D		279
212	0	0	2	0							0D		280
214	258	1	1	0	0	1	0	0	1	1	D		281
214	0	0	2	3							0D		282
214	260	1	1	0	0	1	0	0	1	1	D		283
214	0	0	2	3							0D		284
106	262	1	1	0	0	1	0	1	1	1	D		285
106	0	0	2	40							0D		286
106	264	1	1	0	0	1	0	0	1	1	D		287
106	0	0	2	40							0D		288
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216	0	0	1	0							0D		290
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212	0	0	2	0							0D		292
214	269	1	1	0	0	1	0	0	1	1	D		293
214	0	0	2	3							0D		294
214	271	1	1	0	0	1	0	0	1	1	D		295
214	0	0	2	3							0D		296
106	273	1	1	0	0	1	0	0	1	1	D		297
106	0	0	2	40							0D		298
106	275	1	1	0	0	1	0	1	1	1	D		299
106	0	0	2	40							0D		300
216	277	1	1	0	0	1	0	0	0	1	D		301
216	0	0	1	0							0D		302
212	278	1	1	0	0	1	0	0	1	1	D		303
212	0	0	2	0							0D		304
214	280	1	1	0	0	1	0	0	1	1	D		305
214	0	0	2	3							0D		306
214	282	1	1	0	0	1	0	0	1	1	D		307
214	0	0	2	3							0D		308
106	284	1	1	0	0	1	0	0	1	1	D		309

106	0	0	2	40							0D	310
106	286	1	1	0	0	1	0	1	1	1	D	311
106	0	0	2	40							0D	312
216	288	1	1	0	0	1	0	0	0	1	D	313
216	0	0	1	0							0D	314
212	289	1	1	0	0	1	0	0	1	1	D	315
212	0	0	2	0							0D	316
214	291	1	1	0	0	1	0	0	1	1	D	317
214	0	0	2	3							0D	318
214	293	1	1	0	0	1	0	0	1	1	D	319
214	0	0	2	3							0D	320
106	295	1	1	0	0	1	0	0	1	1	D	321
106	0	0	2	40							0D	322
106	297	1	1	0	0	1	0	1	1	1	D	323
106	0	0	2	40							0D	324
216	299	1	1	0	0	1	0	0	0	1	D	325
216	0	0	1	0							0D	326
212	300	1	1	0	0	1	0	0	1	1	D	327
212	0	0	2	0							0D	328
214	302	1	1	0	0	1	0	0	1	1	D	329
214	0	0	2	3							0D	330
214	304	1	1	0	0	1	0	0	1	1	D	331
214	0	0	2	3							0D	332
106	306	1	1	0	0	1	0	0	1	1	D	333
106	0	0	2	40							0D	334
106	308	1	1	0	0	1	0	1	1	1	D	335
106	0	0	2	40							0D	336
216	310	1	1	0	0	1	0	0	0	1	D	337
216	0	0	1	0							0D	338
212	311	1	1	0	0	1	0	0	1	1	D	339
212	0	0	2	0							0D	340
214	313	1	1	0	0	1	0	0	1	1	D	341
214	0	0	2	3							0D	342
214	315	1	1	0	0	1	0	0	1	1	D	343
214	0	0	2	3							0D	344
106	317	1	1	0	0	1	0	1	1	1	D	345
106	0	0	2	40							0D	346
106	319	1	1	0	0	1	0	1	1	1	D	347
106	0	0	2	40							0D	348
216	321	1	1	0	0	1	0	0	0	1	D	349
216	0	0	1	0							0D	350
212	322	1	1	0	0	1	0	0	1	1	D	351
212	0	0	2	0							0D	352
214	324	1	1	0	0	1	0	0	1	1	D	353
214	0	0	2	3							0D	354
214	326	1	1	0	0	1	0	0	1	1	D	355
214	0	0	2	3							0D	356
106	328	1	1	0	0	1	0	1	1	1	D	357
106	0	0	2	40							0D	358
106	330	1	1	0	0	1	0	1	1	1	D	359
106	0	0	2	40							0D	360
216	332	1	1	0	0	1	0	0	0	1	D	361

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     212       0       0       2       0                                    0D      364
     214     335       1       1       0       0       1       0 0 1 1  D   365
     214       0       0       2       3                                    0D      366
     214     337       1       1       0       0       1       0 0 1 1  D   367
     214       0       0       2       3                                    0D      368
     106     339       1       1       0       0       1       0 1 1 1  D   369
     106       0       0       2      40                                    0D      370
     106     341       1       1       0       0       1       0 1 1 1  D   371
     106       0       0       2      40                                    0D      372
     216     343       1       1       0       0       1       0 0 0 1  D   373
     216       0       0       1       0                                    0D      374
     212     344       1       1       0       0       1       0 0 1 1  D   375
     212       0       0       2       0                                    0D      376
     214     346       1       1       0       0       1       0 0 1 1  D   377
     214       0       0       2       3                                    0D      378
     214     348       1       1       0       0       1       0 0 1 1  D   379
     214       0       0       2       3                                    0D      380
     106     350       1       1       0       0       1       0 1 1 1  D   381
     106       0       0       2      40                                    0D      382
     106     352       1       1       0       0       1       0 1 1 1  D   383
     106       0       0       2      40                                    0D      384
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     216       0       0       1       0                                    0D      386
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2.9316869,0.0,5H.7971,0,0;                                          279P    257
214,3,.1500000,.0500000,0.0,8.4261093,1.9852574,8.4261093,          281P    258
2.3837985,8.4261093,2.9588370,8.5347090,2.9588370,0,0;              281P    259
214,1,.1500000,.0500000,0.0,8.4261093,2.7823396,8.4261093,          283P    260
2.3837985,0,0;                                                      283P    261
106,1,3,0.0,8.2559586,1.9852574,8.2559586,1.9852574,8.5511093,      285P    262
1.9852574,0,0;                                                      285P    263
106,1,3,0.0,8.2559586,2.7823396,8.2559586,2.7823396,8.5511093,      287P    264
2.7823396,0,0;                                                      287P    265
216,279,281,283,285,287,0,0;                                        289P    266
212,1,5,.1226300,.0543000,1,1.5707963,0.0,0,0,.6334534,             291P    267
-.1283128,0.0,5H.7971,0,0;                                          291P    268
214,1,.1500000,.0500000,0.0,.7909234,-.5467421,.7909234,            293P    269
-.1826127,0,0;                                                      293P    270
214,1,.1500000,.0500000,0.0,.7909234,.2503400,.7909234,             295P    271
-.0197127,0,0;                                                      295P    272
106,1,3,0.0,.3656907,-.5467421,.3656907,-.5467421,.9159234,         297P    273
-.5467421,0,0;                                                      297P    274
106,1,3,0.0,.3656907,.2503400,.3656907,.2503400,.9159234,           299P    275
.2503400,0,0;                                                       299P    276
216,291,293,295,297,299,0,0;                                        301P    277
212,1,5,.1226300,.0543000,1,1.5707963,0.0,0,0,3.3890090,            303P    278
-.1283129,0.0,5H.7971,0,0;                                          303P    279
214,1,.1500000,.0500000,0.0,3.5464792,-.4907423,3.5464792,          305P    280
-.7988717,0,0;                                                      305P    281
214,1,.1500000,.0500000,0.0,3.5464792,.3063399,3.5464792,           307P    282
.6323927,0,0;                                                       307P    283
106,1,3,0.0,3.1016908,-.4907423,3.1016908,-.4907423,3.6714792,      309P    284
-.4907423,0,0;                                                      309P    285
106,1,3,0.0,3.1016908,.3063399,3.1016908,.3063399,3.6714792,        311P    286
.3063399,0,0;                                                       311P    287
```

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216,303,305,307,309,311,0,0;                                                313P    288
212,1,5,.1226300,.0543000,1,1.5707963,0.0,0,0,5.8578987,                    315P    289
.5027984,0.0,SH.7971,0,0;                                                   315P    290
214,1,.1500000,.0500000,0.0,5.6949987,-.4827421,5.6949987,                  317P    291
-.6100077,0,0;                                                              317P    292
214,2,.1500000,.0500000,0.0,5.6949987,.3143407,5.6949987,                   319P    293
.5299483,5.8035984,.5299483,0,0;                                            319P    294
106,1,3,0.0,5.6816912,-.4827421,5.6816912,-.4827421,5.8199987,              321P    295
-.4827421,0,0;                                                              321P    296
106,1,3,0.0,5.6816912,.3143407,5.6816912,.3143407,5.8199987,                323P    297
.3143407,0,0;                                                               323P    298
216,315,317,319,321,323,0,0;                                                325P    299
212,1,5,.1226300,.0543000,1,1.5707963,0.0,0,0,8.8045654,                    327P    300
.4672429,0.0,SH.7971,0,0;                                                   327P    301
214,3,.1500000,.0500000,0.0,8.6416655,-.4587413,8.6416655,                  329P    302
-.0601999,8.6416655,.4943928,8.7502651,.4943928,0,0;                        329P    303
214,1,.1500000,.0500000,0.0,8.6416655,.3383414,8.6416655,                   331P    304
-.0601999,0,0;                                                              331P    305
106,1,3,0.0,8.4016895,-.4587413,8.4016895,-.4587413,8.7666655,              333P    306
-.4587413,0,0;                                                              333P    307
106,1,3,0.0,8.4016895,.3383414,8.4016895,.3383414,8.7666655,                335P    308
.3383414,0,0;                                                               335P    309
216,327,329,331,333,335,0,0;                                                337P    310
212,1,5,.1226300,.0543000,1,1.5707963,0.0,0,0,.5245647,                     339P    311
-2.0283127,0.0,SH.7971,0,0;                                                 339P    312
214,1,.1500000,.0500000,0.0,.6820347,-2.3987420,.6820347,                   341P    313
-2.0826126,0,0;                                                             341P    314
214,1,.1500000,.0500000,0.0,.6820347,-1.6016597,.6820347,                   343P    315
-1.9197126,0,0;                                                             343P    316
106,1,3,0.0,.1507847,-2.3987420,.1507847,-2.3987420,.8070347,               345P    317
-2.3987420,0,0;                                                             345P    318
106,1,3,0.0,.1507847,-1.6016597,.1507847,-1.6016597,.8070347,               347P    319
-1.6016597,0,0;                                                             347P    320
216,339,341,343,345,347,0,0;                                                349P    321
212,1,5,.1226300,.0543000,1,1.5707963,0.0,0,0,3.2267876,                    351P    322
-1.9833684,0.0,SH.7971,0,0;                                                 351P    323
214,1,.1500000,.0500000,0.0,3.3842578,-2.3427420,3.3842578,                 353P    324
-2.6473156,0,0;                                                             353P    325
214,1,.1500000,.0500000,0.0,3.3842578,-1.5456599,3.3842578,                 355P    326
-1.2160515,0,0;                                                             355P    327
106,1,3,0.0,2.8530078,-2.3427420,2.8530078,-2.3427420,3.5092578,            357P    328
-2.3427420,0,0;                                                             357P    329
106,1,3,0.0,2.8530078,-1.5456599,2.8530078,-1.5456599,3.5092578,            359P    330
-1.5456599,0,0;                                                             359P    331
216,351,353,355,357,359,0,0;                                                361P    332
212,1,5,.1226300,.0543000,1,1.5707963,0.0,0,0,5.7845654,                    363P    333
-1.4505347,0.0,SH.7971,0,0;                                                 363P    334
214,1,.1500000,.0500000,0.0,5.6216655,-2.3347421,5.6216655,                 365P    335
-2.4620077,0,0;                                                             365P    336
214,2,.1500000,.0500000,0.0,5.6216655,-1.5376594,5.6216655,                 367P    337
-1.4233847,5.7302651,-1.4233847,0,0;                                        367P    338
106,1,3,0.0,5.0904155,-2.3347421,5.0904155,-2.3347421,5.7466655,            369P    339
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-2.3347421,0,0;                                                          369P    340
106,1,3,0.0,5.0904155,-1.5376594,5.0904155,-1.5376594,5.7466655,         371P    341
-1.5376594,0,0;                                                          371P    342
216,363,365,367,369,371,0,0;                                             373P    343
212,1,5,.1226300,.0543000,1,1.5707963,0.0,0,0,8.6067867,                 375P    344
-1.3972015,0.0,5H.7971,0,0;                                              375P    345
214,3,.1500000,.0500000,0.0,8.4438868,-2.3107412,8.4438868,              377P    346
-1.9121998,8.4438868,-1.3700516,8.5524864,-1.3700516,0,0;                377P    347
214,1,.1500000,.0500000,0.0,8.4438868,-1.5136584,8.4438868,              379P    348
-1.9121998,0,0;                                                          379P    349
106,1,3,0.0,7.9126368,-2.3107412,7.9126368,-2.3107412,8.5688868,         381P    350
-2.3107412,0,0;                                                          381P    351
106,1,3,0.0,7.9126368,-1.5136584,7.9126368,-1.5136584,8.5688868,         383P    352
-1.5136584,0,0;                                                          383P    353
216,375,377,379,381,383,0,0;                                             385P    354
S       1G      2D    386P    354                                          T      1
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LDIM TEST CASE 2                                                                S       1
1H,,1H;,,5HLDIM2,4HCIIN,6H2.1.3 ,16,8,24,8,56,,1.0000000,1,4HINCH,0,,13HG       1
810827.123027,,,,;                                                              G       2
     124        1        1        1        0        0        0        0 0 0 0  D       1
     124        0        0        2        0                                  0D       2
     212        3        1        1        0        0        1        0 0 1 1  D       3
     212        0        0        2        0                                  0D       4
     214        5        1        1        0        0        1        0 0 1 1  D       5
     214        0        0        2        3                                  0D       6
     214        7        1        1        0        0        1        0 0 1 1  D       7
     214        0        0        2        3                                  0D       8
     106        9        1        1        0        0        1        0 0 1 1  D       9
     106        0        0        2       40                                  0D      10
     106       11        1        1        0        0        1        0 0 1 1  D      11
     106        0        0        2       40                                  0D      12
     216       13        1        1        0        0        1        0 0 0 1  D      13
     216        0        0        1        0                                  0D      14
     212       14        1        1        0        0        1        0 0 1 1  D      15
     212        0        0        2        0                                  0D      16
     214       16        1        1        0        0        1        0 0 1 1  D      17
     214        0        0        2        3                                  0D      18
     214       18        1        1        0        0        1        0 0 1 1  D      19
     214        0        0        2        3                                  0D      20
     106       20        1        1        0        0        1        0 0 1 1  D      21
     106        0        0        2       40                                  0D      22
     106       22        1        1        0        0        1        0 0 1 1  D      23
     106        0        0        2       40                                  0D      24
     216       24        1        1        0        0        1        0 0 0 1  D      25
     216        0        0        1        0                                  0D      26
     212       25        1        1        0        0        1        0 0 1 1  D      27
     212        0        0        2        0                                  0D      28
     214       27        1        1        0        0        1        0 0 1 1  D      29
     214        0        0        2        3                                  0D      30
     214       29        1        1        0        0        1        0 0 1 1  D      31
     214        0        0        2        3                                  0D      32
     106       31        1        1        0        0        1        0 0 1 1  D      33
     106        0        0        2       40                                  0D      34
     106       33        1        1        0        0        1        0 0 1 1  D      35
     106        0        0        2       40                                  0D      36
     216       35        1        1        0        0        1        0 0 0 1  D      37
     216        0        0        1        0                                  0D      38
     212       36        1        1        0        0        1        0 0 1 1  D      39
     212        0        0        2        0                                  0D      40
     214       38        1        1        0        0        1        0 0 1 1  D      41
     214        0        0        2        3                                  0D      42
     214       40        1        1        0        0        1        0 0 1 1  D      43
     214        0        0        2        3                                  0D      44
     106       42        1        1        0        0        1        0 0 1 1  D      45
     106        0        0        2       40                                  0D      46
     106       44        1        1        0        0        1        0 0 1 1  D      47
     106        0        0        2       40                                  0D      48
     216       46        1        1        0        0        1        0 0 0 1  D      49
```

216	0	0	1	0						0D		50
212	47	1	1	0	0	1	0	0	1	1	D	51
212	0	0	2	0						0D		52
214	49	1	1	0	0	1	0	0	1	1	D	53
214	0	0	2	3						0D		54
214	51	1	1	0	0	1	0	0	1	1	D	55
214	0	0	2	3						0D		56
106	53	1	1	0	0	1	0	1	1	1	D	57
106	0	0	2	40						0D		58
106	55	1	1	0	0	1	0	0	1	1	D	59
106	0	0	2	40						0D		60
216	57	1	1	0	0	1	0	0	0	1	D	61
216	0	0	1	0						0D		62
212	58	1	1	0	0	1	0	0	1	1	D	63
212	0	0	2	0						0D		64
214	60	1	1	0	0	1	0	0	1	1	D	65
214	0	0	2	3						0D		66
214	62	1	1	0	0	1	0	0	1	1	D	67
214	0	0	2	3						0D		68
106	64	1	1	0	0	1	0	1	1	1	D	69
106	0	0	2	40						0D		70
106	66	1	1	0	0	1	0	0	1	1	D	71
106	0	0	2	40						0D		72
216	68	1	1	0	0	1	0	0	0	1	D	73
216	0	0	1	0						0D		74
212	69	1	1	0	0	1	0	0	1	1	D	75
212	0	0	2	0						0D		76
214	71	1	1	0	0	1	0	0	1	1	D	77
214	0	0	2	3						0D		78
214	73	1	1	0	0	1	0	0	1	1	D	79
214	0	0	2	3						0D		80
106	75	1	1	0	0	1	0	1	1	1	D	81
106	0	0	2	40						0D		82
106	77	1	1	0	0	1	0	0	1	1	D	83
106	0	0	2	40						0D		84
216	79	1	1	0	0	1	0	0	0	1	D	85
216	0	0	1	0						0D		86
212	80	1	1	0	0	1	0	0	1	1	D	87
212	0	0	2	0						0D		88
214	82	1	1	0	0	1	0	0	1	1	D	89
214	0	0	2	3						0D		90
214	84	1	1	0	0	1	0	0	1	1	D	91
214	0	0	2	3						0D		92
106	86	1	1	0	0	1	0	1	1	1	D	93
106	0	0	2	40						0D		94
106	88	1	1	0	0	1	0	0	1	1	D	95
106	0	0	2	40						0D		96
216	90	1	1	0	0	1	0	0	0	1	D	97
216	0	0	1	0						0D		98
212	91	1	1	0	0	1	0	0	1	1	D	99
212	0	0	2	0						0D		100
214	93	1	1	0	0	1	0	0	1	1	D	101

214	0	0	2	3							0D	102
214	95	1	1	0	0	1	0	0	1	1	D	103
214	0	0	2	3							0D	104
106	97	1	1	0	0	1	0	0	1	1	D	105
106	0	0	2	40							0D	106
106	99	1	1	0	0	1	0	1	1	1	D	107
106	0	0	2	40							0D	108
216	101	1	1	0	0	1	0	0	0	1	D	109
216	0	0	1	0							0D	110
212	102	1	1	0	0	1	0	0	1	1	D	111
212	0	0	2	0							0D	112
214	104	1	1	0	0	1	0	0	1	1	D	113
214	0	0	2	3							0D	114
214	106	1	1	0	0	1	0	0	1	1	D	115
214	0	0	2	3							0D	116
106	108	1	1	0	0	1	0	0	1	1	D	117
106	0	0	2	40							0D	118
106	110	1	1	0	0	1	0	1	1	1	D	119
106	0	0	2	40							0D	120
216	112	1	1	0	0	1	0	0	0	1	D	121
216	0	0	1	0							0D	122
212	113	1	1	0	0	1	0	0	1	1	D	123
212	0	0	2	0							0D	124
214	115	1	1	0	0	1	0	0	1	1	D	125
214	0	0	2	3							0D	126
214	117	1	1	0	0	1	0	0	1	1	D	127
214	0	0	2	3							0D	128
106	119	1	1	0	0	1	0	0	1	1	D	129
106	0	0	2	40							0D	130
106	121	1	1	0	0	1	0	1	1	1	D	131
106	0	0	2	40							0D	132
216	123	1	1	0	0	1	0	0	0	1	D	133
216	0	0	1	0							0D	134
212	124	1	1	0	0	1	0	0	1	1	D	135
212	0	0	2	0							0D	136
214	126	1	1	0	0	1	0	0	1	1	D	137
214	0	0	2	3							0D	138
214	128	1	1	0	0	1	0	0	1	1	D	139
214	0	0	2	3							0D	140
106	130	1	1	0	0	1	0	0	1	1	D	141
106	0	0	2	40							0D	142
106	132	1	1	0	0	1	0	1	1	1	D	143
106	0	0	2	40							0D	144
216	134	1	1	0	0	1	0	0	0	1	D	145
216	0	0	1	0							0D	146
212	135	1	1	0	0	1	0	0	1	1	D	147
212	0	0	2	0							0D	148
214	137	1	1	0	0	1	0	0	1	1	D	149
214	0	0	2	3							0D	150
214	139	1	1	0	0	1	0	0	1	1	D	151
214	0	0	2	3							0D	152
106	141	1	1	0	0	1	0	1	1	1	D	153

106	0	0	2	40							0D	154
106	143	1	1	0	0	1	0	1	1	1	D	155
106	0	0	2	40							0D	156
216	145	1	1	0	0	1	0	0	0	1	D	157
216	0	0	1	0							0D	158
212	146	1	1	0	0	1	0	0	1	1	D	159
212	0	0	2	0							0D	160
214	148	1	1	0	0	1	0	0	1	1	D	161
214	0	0	2	3							0D	162
214	150	1	1	0	0	1	0	0	1	1	D	163
214	0	0	2	3							0D	164
106	152	1	1	0	0	1	0	1	1	1	D	165
106	0	0	2	40							0D	166
106	154	1	1	0	0	1	0	1	1	1	D	167
106	0	0	2	40							0D	168
216	156	1	1	0	0	1	0	0	0	1	D	169
216	0	0	1	0							0D	170
212	157	1	1	0	0	1	0	0	1	1	D	171
212	0	0	2	0							0D	172
214	159	1	1	0	0	1	0	0	1	1	D	173
214	0	0	2	3							0D	174
214	161	1	1	0	0	1	0	0	1	1	D	175
214	0	0	2	3							0D	176
106	163	1	1	0	0	1	0	1	1	1	D	177
106	0	0	2	40							0D	178
106	165	1	1	0	0	1	0	1	1	1	D	179
106	0	0	2	40							0D	180
216	167	1	1	0	0	1	0	0	0	1	D	181
216	0	0	1	0							0D	182
212	168	1	1	0	0	1	0	0	1	1	D	183
212	0	0	2	0							0D	184
214	170	1	1	0	0	1	0	0	1	1	D	185
214	0	0	2	3							0D	186
214	172	1	1	0	0	1	0	0	1	1	D	187
214	0	0	2	3							0D	188
106	174	1	1	0	0	1	0	1	1	1	D	189
106	0	0	2	40							0D	190
106	176	1	1	0	0	1	0	1	1	1	D	191
106	0	0	2	40							0D	192
216	178	1	1	0	0	1	0	0	0	1	D	193
216	0	0	1	0							0D	194
212	179	1	1	0	0	1	0	0	1	1	D	195
212	0	0	2	0							0D	196
214	181	1	1	0	0	1	0	0	1	1	D	197
214	0	0	2	3							0D	198
214	183	1	1	0	0	1	0	0	1	1	D	199
214	0	0	2	3							0D	200
106	185	1	1	0	0	1	0	0	1	1	D	201
106	0	0	2	40							0D	202
106	187	1	1	0	0	1	0	0	1	1	D	203
106	0	0	2	40							0D	204
216	189	1	1	0	0	1	0	0	0	1	D	205

216	0	0	1	0							0D	206
212	190	1	1	0	0	1	0	0	1	1	D	207
212	0	0	2	0							0D	208
214	192	1	1	0	0	1	0	0	1	1	D	209
214	0	0	2	3							0D	210
214	194	1	1	0	0	1	0	0	1	1	D	211
214	0	0	2	3							0D	212
106	196	1	1	0	0	1	0	0	1	1	D	213
106	0	0	2	40							0D	214
106	198	1	1	0	0	1	0	0	1	1	D	215
106	0	0	2	40							0D	216
216	200	1	1	0	0	1	0	0	0	1	D	217
216	0	0	1	0							0D	218
212	201	1	1	0	0	1	0	0	1	1	D	219
212	0	0	2	0							0D	220
214	203	1	1	0	0	1	0	0	1	1	D	221
214	0	0	2	3							0D	222
214	205	1	1	0	0	1	0	0	1	1	D	223
214	0	0	2	3							0D	224
106	207	1	1	0	0	1	0	0	1	1	D	225
106	0	0	2	40							0D	226
106	209	1	1	0	0	1	0	0	1	1	D	227
106	0	0	2	40							0D	228
216	211	1	1	0	0	1	0	0	0	1	D	229
216	0	0	1	0							0D	230
212	212	1	1	0	0	1	0	0	1	1	D	231
212	0	0	2	0							0D	232
214	214	1	1	0	0	1	0	0	1	1	D	233
214	0	0	2	3							0D	234
214	216	1	1	0	0	1	0	0	1	1	D	235
214	0	0	2	3							0D	236
106	218	1	1	0	0	1	0	0	1	1	D	237
106	0	0	2	40							0D	238
106	220	1	1	0	0	1	0	0	1	1	D	239
106	0	0	2	40							0D	240
216	222	1	1	0	0	1	0	0	0	1	D	241
216	0	0	1	0							0D	242
212	223	1	1	0	0	1	0	0	1	1	D	243
212	0	0	2	0							0D	244
214	225	1	1	0	0	1	0	0	1	1	D	245
214	0	0	2	3							0D	246
214	227	1	1	0	0	1	0	0	1	1	D	247
214	0	0	2	3							0D	248
106	229	1	1	0	0	1	0	1	1	1	D	249
106	0	0	2	40							0D	250
106	231	1	1	0	0	1	0	0	1	1	D	251
106	0	0	2	40							0D	252
216	233	1	1	0	0	1	0	0	0	1	D	253
216	0	0	1	0							0D	254
212	234	1	1	0	0	1	0	0	1	1	D	255
212	0	0	2	0							0D	256
214	236	1	1	0	0	1	0	0	1	1	D	257

214	0	0	2	3							0D	258
214	238	1	1	0	0	1	0	0	1	1	D	259
214	0	0	2	3							0D	260
106	240	1	1	0	0	1	0	1	1	1	D	261
106	0	0	2	40							0D	262
106	242	1	1	0	0	1	0	0	1	1	D	263
106	0	0	2	40							0D	264
216	244	1	1	0	0	1	0	0	0	1	D	265
216	0	0	1	0							0D	266
212	246	1	1	0	0	1	0	0	1	1	D	267
212	0	0	2	0							0D	268
214	247	1	1	0	0	1	0	0	1	1	D	269
214	0	0	2	3							0D	270
214	249	1	1	0	0	1	0	0	1	1	D	271
214	0	0	2	3							0D	272
106	251	1	1	0	0	1	0	1	1	1	D	273
106	0	0	2	40							0D	274
106	253	1	1	0	0	1	0	0	1	1	D	275
106	0	0	2	40							0D	276
216	255	1	1	0	0	1	0	0	0	1	D	277
216	0	0	1	0							0D	278
212	256	1	1	0	0	1	0	0	1	1	D	279
212	0	0	2	0							0D	280
214	258	1	1	0	0	1	0	0	1	1	D	281
214	0	0	2	3							0D	282
214	260	1	1	0	0	1	0	0	1	1	D	283
214	0	0	2	3							0D	284
106	262	1	1	0	0	1	0	1	1	1	D	285
106	0	0	2	40							0D	286
106	264	1	1	0	0	1	0	0	1	1	D	287
106	0	0	2	40							0D	288
216	266	1	1	0	0	1	0	0	0	1	D	289
216	0	0	1	0							0D	290
212	267	1	1	0	0	1	0	0	1	1	D	291
212	0	0	2	0							0D	292
214	269	1	1	0	0	1	0	0	1	1	D	293
214	0	0	2	3							0D	294
214	271	1	1	0	0	1	0	0	1	1	D	295
214	0	0	2	3							0D	296
106	273	1	1	0	0	1	0	0	1	1	D	297
106	0	0	2	40							0D	298
106	275	1	1	0	0	1	0	1	1	1	D	299
106	0	0	2	40							0D	300
216	277	1	1	0	0	1	0	0	0	1	D	301
216	0	0	1	0							0D	302
212	278	1	1	0	0	1	0	0	1	1	D	303
212	0	0	2	0							0D	304
214	280	1	1	0	0	1	0	0	1	1	D	305
214	0	0	2	3							0D	306
214	282	1	1	0	0	1	0	0	1	1	D	307
214	0	0	2	3							0D	308
106	284	1	1	0	0	1	0	0	1	1	D	309

106	0	0	2	40							0D	310
106	286	1	1	0	0	1	0	1	1	1	D	311
106	0	0	2	40							0D	312
216	288	1	1	0	0	1	0	0	0	1	D	313
216	0	0	1	0							0D	314
212	289	1	1	0	0	1	0	0	1	1	D	315
212	0	0	2	0							0D	316
214	291	1	1	0	0	1	0	0	1	1	D	317
214	0	0	2	3							0D	318
214	293	1	1	0	0	1	0	0	1	1	D	319
214	0	0	2	3							0D	320
106	295	1	1	0	0	1	0	0	1	1	D	321
106	0	0	2	40							0D	322
106	297	1	1	0	0	1	0	1	1	1	D	323
106	0	0	2	40							0D	324
216	299	1	1	0	0	1	0	0	0	1	D	325
216	0	0	1	0							0D	326
212	300	1	1	0	0	1	0	0	1	1	D	327
212	0	0	2	0							0D	328
214	302	1	1	0	0	1	0	0	1	1	D	329
214	0	0	2	3							0D	330
214	304	1	1	0	0	1	0	0	1	1	D	331
214	0	0	2	3							0D	332
106	306	1	1	0	0	1	0	0	1	1	D	333
106	0	0	2	40							0D	334
106	308	1	1	0	0	1	0	1	1	1	D	335
106	0	0	2	40							0D	336
216	310	1	1	0	0	1	0	0	0	1	D	337
216	0	0	1	0							0D	338
212	311	1	1	0	0	1	0	0	1	1	D	339
212	0	0	2	0							0D	340
214	313	1	1	0	0	1	0	0	1	1	D	341
214	0	0	2	3							0D	342
214	315	1	1	0	0	1	0	0	1	1	D	343
214	0	0	2	3							0D	344
106	317	1	1	0	0	1	0	1	1	1	D	345
106	0	0	2	40							0D	346
106	319	1	1	0	0	1	0	1	1	1	D	347
106	0	0	2	40							0D	348
216	321	1	1	0	0	1	0	0	0	1	D	349
216	0	0	1	0							0D	350
212	322	1	1	0	0	1	0	0	1	1	D	351
212	0	0	2	0							0D	352
214	324	1	1	0	0	1	0	0	1	1	D	353
214	0	0	2	3							0D	354
214	326	1	1	0	0	1	0	0	1	1	D	355
214	0	0	2	3							0D	356
106	328	1	1	0	0	1	0	1	1	1	D	357
106	0	0	2	40							0D	358
106	330	1	1	0	0	1	0	1	1	1	D	359
106	0	0	2	40							0D	360
216	332	1	1	0	0	1	0	0	0	1	D	361

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      216       0       0       1       0                                       0D      362
      212     333       1       1       0       0       1       0 0 1 1  D      363
      212       0       0       2       0                                       0D      364
      214     335       1       1       0       0       1       0 0 1 1  D      365
      214       0       0       2       3                                       0D      366
      214     337       1       1       0       0       1       0 0 1 1  D      367
      214       0       0       2       3                                       0D      368
      106     339       1       1       0       0       1       0 1 1 1  D      369
      106       0       0       2      40                                       0D      370
      106     341       1       1       0       0       1       0 1 1 1  D      371
      106       0       0       2      40                                       0D      372
      216     343       1       1       0       0       1       0 0 0 1  D      373
      216       0       0       1       0                                       0D      374
      212     344       1       1       0       0       1       0 0 1 1  D      375
      212       0       0       2       0                                       0D      376
      214     346       1       1       0       0       1       0 0 1 1  D      377
      214       0       0       2       3                                       0D      378
      214     348       1       1       0       0       1       0 0 1 1  D      379
      214       0       0       2       3                                       0D      380
      106     350       1       1       0       0       1       0 1 1 1  D      381
      106       0       0       2      40                                       0D      382
      106     352       1       1       0       0       1       0 1 1 1  D      383
      106       0       0       2      40                                       0D      384
      216     354       1       1       0       0       1       0 0 0 1  D      385
      216       0       0       1       0                                       0D      386
124,.9816048,-.1433713,.1260818,0.0,.1909240,.7371206,-.6482291,                  1P        1
0.0,0.0,.6603768,.7509344,0.0,0,0;                                                1P        2
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214,1,.1500000,.0500000,0.0,-.6234555,3.7370737,-.3853501,                        5P        5
3.7370736,0,0;                                                                    5P        6
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3.7370735,0,0;                                                                    7P        8
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3.6120737,0,0;                                                                    9P       10
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3.6120734,0,0;                                                                   11P       12
216,3,5,7,9,11,0,0;                                                              13P       13
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3.7739236,0.0,5H.8434,0,0;                                                       15P       15
214,1,.1500000,.0500000,0.0,2.1125445,3.8010736,1.9064388,                       17P       16
3.8010736,0,0;                                                                   17P       17
214,1,.1500000,.0500000,0.0,2.9559417,3.8010736,3.1696933,                       19P       18
3.8010736,0,0;                                                                   19P       19
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3.6760736,0,0;                                                                   21P       21
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3.6760736,0,0;                                                                   23P       23
216,15,17,19,21,23,0,0;                                                          25P       24
212,1,5,.1606400,.0543000,1,1.5707963,0.0,0,0,5.7529502,                         27P       25
3.9499242,0.0,5H.8434,0,0;                                                       27P       26
214,1,.1500000,.0500000,0.0,4.6925449,3.9770741,4.5652793,                       29P       27
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216,27,29,31,33,35,0,0;                                                 37P     35
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214,3,.1500000,.0500000,0.0,7.4125433,3.9930739,7.8342419,              41P     38
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216,39,41,43,45,47,0,0;                                                 49P     46
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1.5440743,0,0;                                                          69P     65
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216,63,65,67,69,71,0,0;                                                 73P     68
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1.6320742,0,0;                                                          83P     78
216,75,77,79,81,83,0,0;                                                 85P     79
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216,111,113,115,117,119,0,0;                                           121P    112
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216,123,125,127,129,131,0,0;                                           133P    123
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216,147,149,151,153,155,0,0;                                          157P    145
212,1,5,.1606400,.0543000,1,1.5707963,0.0,0,0,2.3489499,              159P    146
-2.5020752,0.0,5H.8434,0,0;                                           159P    147
214,1,.1500000,.0500000,0.0,2.0885434,-2.4749253,1.8824368,           161P    148
-2.4749253,0,0;                                                       161P    149
214,1,.1500000,.0500000,0.0,2.9319401,-2.4749253,3.1456903,           163P    150
-2.4749253,0,0;                                                       163P    151
106,1,3,0.0,2.0885434,-1.9436753,2.0885434,-1.9436753,2.0885434,      165P    152
-2.5999253,0,0;                                                       165P    153
106,1,3,0.0,2.9319401,-1.9436753,2.9319401,-1.9436753,2.9319401,      167P    154
-2.5999253,0,0;                                                       167P    155
216,159,161,163,165,167,0,0;                                          169P    156
212,1,5,.1606400,.0543000,1,1.5707963,0.0,0,0,5.6409497,              171P    157
-2.4700751,0.0,5H.8434,0,0;                                           171P    158
214,1,.1500000,.0500000,0.0,4.6685438,-2.4429251,4.5412782,           173P    159
-2.4429251,0,0;                                                       173P    160
214,2,.1500000,.0500000,0.0,5.5119405,-2.4429251,5.5458312,           175P    161
-2.4429251,5.5866494,-2.4429252,0,0;                                  175P    162
106,1,3,0.0,4.6685438,-1.9116751,4.6685438,-1.9116751,4.6685438,      177P    163
-2.5679251,0,0;                                                       177P    164
106,1,3,0.0,5.5119405,-1.9116751,5.5119405,-1.9116751,5.5119405,      179P    165
-2.5679251,0,0;                                                       179P    166
216,171,173,175,177,179,0,0;                                          181P    167
212,1,5,.1606400,.0543000,1,1.5707963,0.0,0,0,8.4459953,              183P    168
-2.4373329,0.0,5H.8434,0,0;                                           183P    169
214,3,.1500000,.0500000,0.0,7.3885422,-2.4101831,7.8102407,           185P    170
-2.4101831,7.8102407,-2.4101830,8.3916950,-2.4101830,0,0;             185P    171
214,1,.1500000,.0500000,0.0,8.2319393,-2.4101831,7.8102407,           187P    172
-2.4101831,0,0;                                                       187P    173
106,1,3,0.0,7.3885422,-1.8789331,7.3885422,-1.8789331,7.3885422,      189P    174
-2.5351831,0,0;                                                       189P    175
106,1,3,0.0,8.2319393,-1.8789331,8.2319393,-1.8789331,8.2319393,      191P    176
-2.5351831,0,0;                                                       191P    177
216,183,185,187,189,191,0,0;                                          193P    178
212,1,5,.1226300,.0543000,1,1.5707963,0.0,0,0,.5227866,               195P    179
4.4041305,0.0,5H.7971,0,0;                                            195P    180
214,1,.1500000,.0500000,0.0,.6802565,4.0372548,.6802565,              197P    181
4.3498306,0,0;                                                        197P    182
214,1,.1500000,.0500000,0.0,.6802565,4.8343368,.6802565,              199P    183
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4.5127311,0,0;                                                          199P    184
106,1,3,0.0,.3136918,4.0372548,.3136918,4.0372548,.8052565,             201P    185
4.0372548,0,0;                                                          201P    186
106,1,3,0.0,.2759593,4.8343368,.2759593,4.8343368,.8052565,             203P    187
4.8343368,0,0;                                                          203P    188
216,195,197,199,201,203,0,0;                                            205P    189
212,1,5,.1226300,.0543000,1,1.5707963,0.0,0,0,3.2907867,                207P    190
4.4521308,0.0,5H.7971,0,0;                                              207P    191
214,1,.1500000,.0500000,0.0,3.4482570,4.0932550,3.4482570,              209P    192
3.7886791,0,0;                                                          209P    193
214,1,.1500000,.0500000,0.0,3.4482570,4.8903365,3.4482570,              211P    194
5.2199416,0,0;                                                          211P    195
106,1,3,0.0,3.0496922,4.0932550,3.0496922,4.0932550,3.5732570,          213P    196
4.0932550,0,0;                                                          213P    197
106,1,3,0.0,3.0119591,4.8903365,3.0119591,4.8903365,3.5732570,          215P    198
4.8903365,0,0;                                                          215P    199
216,207,209,211,213,215,0,0;                                            217P    200
212,1,5,.1226300,.0543000,1,1.5707963,0.0,0,0,5.8556762,                219P    201
5.0316863,0.0,5H.7971,0,0;                                              219P    202
214,1,.1500000,.0500000,0.0,5.6927762,4.1012545,5.6927762,              221P    203
3.9739889,0,0;                                                          221P    204
214,2,.1500000,.0500000,0.0,5.6927762,4.8983369,5.6927762,              223P    205
5.0588365,5.8013759,5.0588365,0,0;                                      223P    206
106,1,3,0.0,5.6296926,4.1012545,5.6296926,4.1012545,5.8177762,          225P    207
4.1012545,0,0;                                                          225P    208
106,1,3,0.0,5.5919585,4.8983369,5.5919585,4.8983369,5.8177762,          227P    209
4.8983369,0,0;                                                          227P    210
216,219,221,223,225,227,0,0;                                            229P    211
212,1,5,.1226300,.0543000,1,1.5707963,0.0,0,0,8.6423426,                231P    212
5.0227971,0.0,5H.7971,0,0;                                              231P    213
214,3,.1500000,.0500000,0.0,8.4794426,4.1252561,8.4794426,              233P    214
4.5237970,8.4794426,5.0499473,8.5880423,5.0499473,0,0;                  233P    215
214,1,.1500000,.0500000,0.0,8.4794426,4.9223380,8.4794426,              235P    216
4.5237970,0,0;                                                          235P    217
106,1,3,0.0,8.3496914,4.1252561,8.3496914,4.1252561,8.6044426,          237P    218
4.1252561,0,0;                                                          237P    219
106,1,3,0.0,8.3119574,4.9223380,8.3119574,4.9223380,8.6044426,          239P    220
4.9223380,0,0;                                                          239P    221
216,231,233,235,237,239,0,0;                                            241P    222
212,1,5,.1226300,.0543000,1,1.5707963,0.0,0,0,.5067868,                 243P    223
2.2739091,0.0,5H.7971,0,0;                                              243P    224
214,1,.1500000,.0500000,0.0,.6642568,1.8972565,.6642568,                245P    225
2.2196094,0,0;                                                          245P    226
214,1,.1500000,.0500000,0.0,.6642568,2.6943388,.6642568,                247P    227
2.3825092,0,0;                                                          247P    228
106,1,3,0.0,.2199603,1.8972565,.2199603,1.8972565,.7892568,             249P    229
1.8972565,0,0;                                                          249P    230
106,1,3,0.0,.2199603,2.6943388,.2199603,2.6943388,.7892568,             251P    231
2.6943388,0,0;                                                          251P    232
216,243,245,247,249,251,0,0;                                            253P    233
212,1,5,.1226300,.0543000,1,1.5707963,0.0,0,0,3.1734543,                255P    234
2.3183541,0.0,5H.7971,0,0;                                              255P    235
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214,1,.1500000,.0500000,0.0,3.3309245,1.9532561,3.3309245,          257P    236
1.6424580,0,0;                                                      257P    237
214,1,.1500000,.0500000,0.0,3.3309245,2.7503386,3.3309245,          259P    238
3.0737228,0,0;                                                      259P    239
106,1,3,0.0,2.9559598,1.9532561,2.9559598,1.9532561,3.4559245,      261P    240
1.9532561,0,0;                                                      261P    241
106,1,3,0.0,2.9559598,2.7503386,2.9559598,2.7503386,3.4559245,      263P    242
2.7503386,0,0;                                                      263P    243
216,255,257,259,261,263,0,0;                                        265P    244
212,1,5,.1226300,.0543000,1,1.5707963,0.0,0,0,5.7490096,            267P    245
2.9850202,0.0,5H.7971,0,0;                                          267P    246
214,1,.1500000,.0500000,0.0,5.5861096,1.9612564,5.5861096,          269P    247
1.8339908,0,0;                                                      269P    248
214,2,.1500000,.0500000,0.0,5.5861096,2.7583389,5.5861096,          271P    249
3.0121703,5.6947093,3.0121703,0,0;                                  271P    250
106,1,3,0.0,5.5359597,1.9612564,5.5359597,1.9612564,5.7111096,      273P    251
1.9612564,0,0;                                                      273P    252
106,1,3,0.0,5.5359597,2.7583389,5.5359597,2.7583389,5.7111096,      275P    253
2.7583389,0,0;                                                      275P    254
216,267,269,271,273,275,0,0;                                        277P    255
212,1,5,.1226300,.0543000,1,1.5707963,0.0,0,0,8.5890093,            279P    256
2.9316869,0.0,5H.7971,0,0;                                          279P    257
214,3,.1500000,.0500000,0.0,8.4261093,1.9852574,8.4261093,          281P    258
2.3837985,8.4261093,2.9588370,8.5347090,2.9588370,0,0;              281P    259
214,1,.1500000,.0500000,0.0,8.4261093,2.7823396,8.4261093,          283P    260
2.3837985,0,0;                                                      283P    261
106,1,3,0.0,8.2559586,1.9852574,8.2559586,1.9852574,8.5511093,      285P    262
1.9852574,0,0;                                                      285P    263
106,1,3,0.0,8.2559586,2.7823396,8.2559586,2.7823396,8.5511093,      287P    264
2.7823396,0,0;                                                      287P    265
216,279,281,283,285,287,0,0;                                        289P    266
212,1,5,.1226300,.0543000,1,1.5707963,0.0,0,0,.6334534,             291P    267
-.1283128,0.0,5H.7971,0,0;                                          291P    268
214,1,.1500000,.0500000,0.0,.7909234,-.5467421,.7909234,            293P    269
-.1826127,0,0;                                                      293P    270
214,1,.1500000,.0500000,0.0,.7909234,.2503400,.7909234,             295P    271
-.0197127,0,0;                                                      295P    272
106,1,3,0.0,.3656907,-.5467421,.3656907,-.5467421,.9159234,         297P    273
-.5467421,0,0;                                                      297P    274
106,1,3,0.0,.3656907,.2503400,.3656907,.2503400,.9159234,           299P    275
.2503400,0,0;                                                       299P    276
216,291,293,295,297,299,0,0;                                        301P    277
212,1,5,.1226300,.0543000,1,1.5707963,0.0,0,0,3.3890090,            303P    278
-.1283129,0.0,5H.7971,0,0;                                          303P    279
214,1,.1500000,.0500000,0.0,3.5464792,-.4907423,3.5464792,          305P    280
-.7988717,0,0;                                                      305P    281
214,1,.1500000,.0500000,0.0,3.5464792,.3063399,3.5464792,           307P    282
.6223937,0,0;                                                       307P    283
106,1,3,0.0,3.1016908,-.4907423,3.1016908,-.4907423,3.6714792,      309P    284
-.4907423,0,0;                                                      309P    285
106,1,3,0.0,3.1016908,.3063399,3.1016908,.3063399,3.6714792,        311P    286
.3063399,0,0;                                                       311P    287
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216,303,305,307,309,311,0,0;                                                    313P    288
212,1,5,.1226300,.0543000,1,1.5707963,0.0,0,0,5.8578987,                        315P    289
.5027984,0.0,5H.7971,0,0;                                                       315P    290
214,1,.1500000,.0500000,0.0,5.6949987,-.4827421,5.6949987,                      317P    291
-.6100077,0,0;                                                                  317P    292
214,2,.1500000,.0500000,0.0,5.6949987,.3143407,5.6949987,                       319P    293
.5299483,5.8035984,.5299483,0,0;                                                319P    294
106,1,3,0.0,5.6816912,-.4827421,5.6816912,-.4827421,5.8199987,                  321P    295
-.4827421,0,0;                                                                  321P    296
106,1,3,0.0,5.6816912,.3143407,5.6816912,.3143407,5.8199987,                    323P    297
.3143407,0,0;                                                                   323P    298
216,315,317,319,321,323,0,0;                                                    325P    299
212,1,5,.1226300,.0543000,1,1.5707963,0.0,0,0,8.8045654,                        327P    300
.4672429,0.0,5H.7971,0,0;                                                       327P    301
214,3,.1500000,.0500000,0.0,8.6416655,-.4587413,8.6416655,                      329P    302
-.0601999,8.6416655,.4943928,8.7502651,.4943928,0,0;                            329P    303
214,1,.1500000,.0500000,0.0,8.6416655,.3383414,8.6416655,                       331P    304
-.0601999,0,0;                                                                  331P    305
106,1,3,0.0,8.4016895,-.4587413,8.4016895,-.4587413,8.7666655,                  333P    306
-.4587413,0,0;                                                                  333P    307
106,1,3,0.0,8.4016895,.3383414,8.4016895,.3383414,8.7666655,                    335P    308
.3383414,0,0;                                                                   335P    309
216,327,329,331,333,335,0,0;                                                    337P    310
212,1,5,.1226300,.0543000,1,1.5707963,0.0,0,0,.5245647,                         339P    311
-2.0283127,0.0,5H.7971,0,0;                                                     339P    312
214,1,.1500000,.0500000,0.0,.6820347,-2.3987420,.6820347,                       341P    313
-2.0826126,0,0;                                                                 341P    314
214,1,.1500000,.0500000,0.0,.6820347,-1.6016597,.6820347,                       343P    315
-1.9197126,0,0;                                                                 343P    316
106,1,3,0.0,.1507847,-2.3987420,.1507847,-2.3987420,.8070347,                   345P    317
-2.3987420,0,0;                                                                 345P    318
106,1,3,0.0,.1507847,-1.6016597,.1507847,-1.6016597,.8070347,                   347P    319
-1.6016597,0,0;                                                                 347P    320
216,339,341,343,345,347,0,0;                                                    349P    321
212,1,5,.1226300,.0543000,1,1.5707963,0.0,0,0,3.2267876,                        351P    322
-1.9838684,0.0,5H.7971,0,0;                                                     351P    323
214,1,.1500000,.0500000,0.0,3.3842578,-2.3427420,3.3842578,                     353P    324
-2.6473156,0,0;                                                                 353P    325
214,1,.1500000,.0500000,0.0,3.3842578,-1.5456599,3.3842578,                     355P    326
-1.2160515,0,0;                                                                 355P    327
106,1,3,0.0,2.8530078,-2.3427420,2.8530078,-2.3427420,3.5092578,                357P    328
-2.3427420,0,0;                                                                 357P    329
106,1,3,0.0,2.8530078,-1.5456599,2.8530078,-1.5456599,3.5092578,                359P    330
-1.5456599,0,0;                                                                 359P    331
216,351,353,355,357,359,0,0;                                                    361P    332
212,1,5,.1226300,.0543000,1,1.5707963,0.0,0,0,5.7845654,                        363P    333
-1.4505347,0.0,5H.7971,0,0;                                                     363P    334
214,1,.1500000,.0500000,0.0,5.6216655,-2.3347421,5.6216655,                     365P    335
-2.4620077,0,0;                                                                 365P    336
214,2,.1500000,.0500000,0.0,5.6216655,-1.5376594,5.6216655,                     367P    337
-1.4233847,5.7302651,-1.4233847,0,0;                                            367P    338
106,1,3,0.0,5.0904155,-2.3347421,5.0904155,-2.3347421,5.7466655,                369P    339
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-2.3347421,0,0;                                                          369P    340
106,1,3,0.0,5.0904155,-1.5376594,5.0904155,-1.5376594,5.7466655,         371P    341
-1.5376594,0,0;                                                          371P    342
216,363,365,367,369,371,0,0;                                             373P    343
212,1,5,.1226300,.0543000,1,1.5707963,0.0,0,0,8.6067867,                 375P    344
-1.3972015,0.0,SH.7971,0,0;                                              375P    345
214,3,.1500000,.0500000,0.0,8.4438868,-2.3107412,8.4438868,              377P    346
-1.9121998,8.4438868,-1.3700516,8.5524864,-1.3700516,0,0;                377P    347
214,1,.1500000,.0500000,0.0,8.4438868,-1.5136584,8.4438868,              379P    348
-1.9121998,0,0;                                                          379P    349
106,1,3,0.0,7.9126368,-2.3107412,7.9126368,-2.3107412,8.5688868,         381P    350
-2.3107412,0,0;                                                          381P    351
106,1,3,0.0,7.9126368,-1.5136584,7.9126368,-1.5136584,8.5688868,         383P    352
-1.5136584,0,0;                                                          383P    353
216,375,377,379,381,383,0,0;                                             385P    354
S       1G      2D     386P    354                                         T      1
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3.3.14 Radius Dimension

The radius dimensions contain subentities which include leaders, arc center points and general notes.

The following conventions were followed:

- general note sub-entities to be single text string with no box rotation
- leaders to have two or three segments

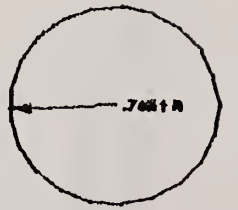
Case 1 (Figures 3.3.14-1 and 3.3.14-2) tests the following:

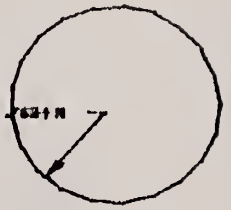
- text in, arrows in configuration
- text out, arrows in configuration
- variable length horizontal leader segments
- leader originating from head of text
- leader originating from tail of text

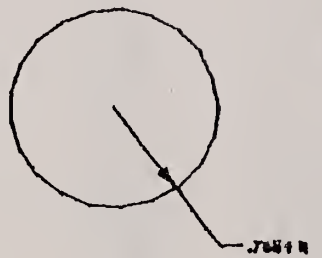
Case 2

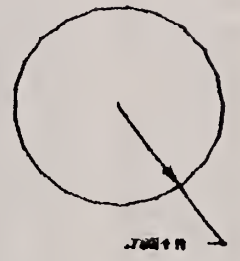
- This is identical to Case 1 except non-model space with rotation (-60.34°, 3.63°, 2.06°) is used per section 3.0

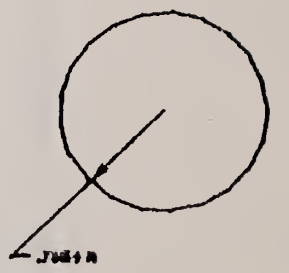
TEXT IN/
ARROWS IN



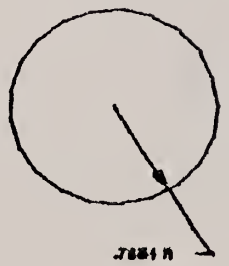


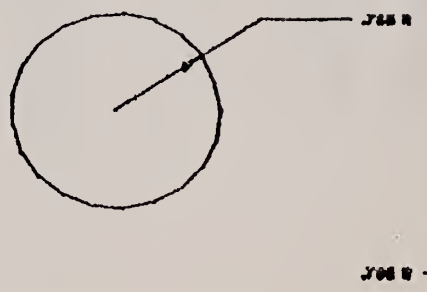






TEXT OUT/
ARROWS IN





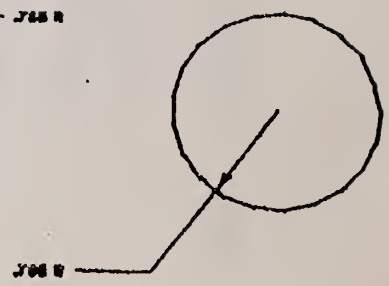


Figure 3.3.14-1 Radius Dimension Cases 1 and 2 (with annotation)
Case 1: Rotation (0^{o}, 0^{o}, 0^{o})
Case 2: Rotation (-60.34^{o}, 3.63^{o}, 2.06^{o})

Case 2: Rotation (-60.34°, 3.63°, 2.06°)

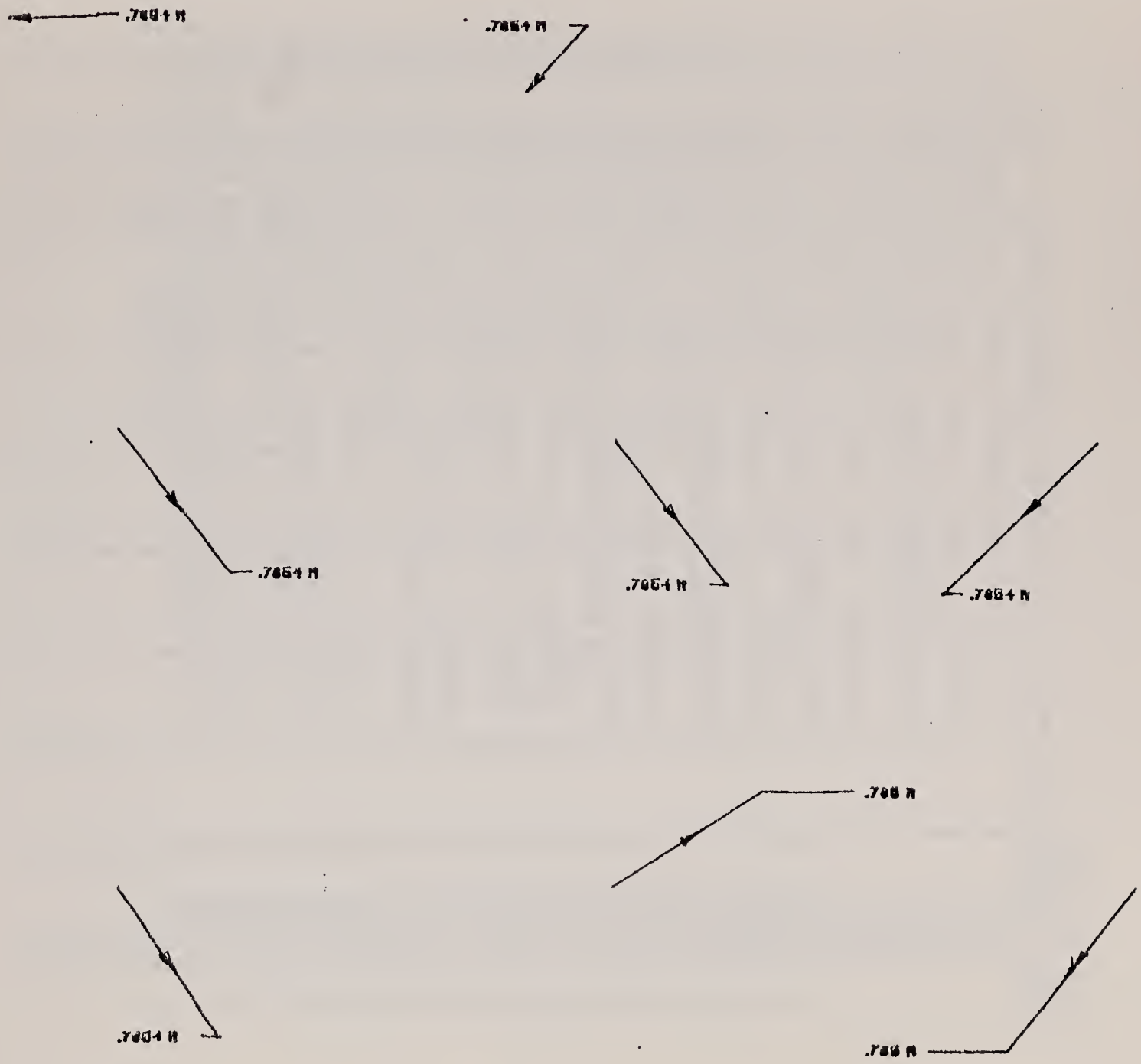


Figure 3.3.14-2 Radius Dimension Cases 1 and 2 (actual part)

```
RDIM TEST CASE 1                                                                S       1
1H,,1H;,,5HRDIM1,4HCIIN,6H2.1.3 ,16,8,24,8,56,,1.0000000,1,4HINCH,0,,13HG       1
810827.123148,,,,;                                                              G       2
     124       1       1       1       0       0       0       0 0 0 0  D      1
     124       0       0       2       0                                0D      2
     212       3       1       1       0       0       1       0 0 1 1  D      3
     212       0       0       2       0                                0D      4
     214       5       1       1       0       0       1       0 0 1 1  D      5
     214       0       0       2       3                                0D      6
     222       7       1       1       0       0       1       0 0 0 1  D      7
     222       0       0       1       0                                0D      8
     212       8       1       1       0       0       1       0 0 1 1  D      9
     212       0       0       2       0                                0D     10
     214      10       1       1       0       0       1       0 0 1 1  D     11
     214       0       0       2       3                                0D     12
     222      12       1       1       0       0       1       0 0 0 1  D     13
     222       0       0       1       0                                0D     14
     212      13       1       1       0       0       1       0 0 1 1  D     15
     212       0       0       2       0                                0D     16
     214      15       1       1       0       0       1       0 0 1 1  D     17
     214       0       0       2       3                                0D     18
     222      17       1       1       0       0       1       0 0 0 1  D     19
     222       0       0       1       0                                0D     20
     212      18       1       1       0       0       1       0 0 1 1  D     21
     212       0       0       2       0                                0D     22
     214      20       1       1       0       0       1       0 0 1 1  D     23
     214       0       0       2       3                                0D     24
     222      22       1       1       0       0       1       0 0 0 1  D     25
     222       0       0       1       0                                0D     26
     212      23       1       1       0       0       1       0 0 1 1  D     27
     212       0       0       2       0                                0D     28
     214      25       1       1       0       0       1       0 0 1 1  D     29
     214       0       0       2       3                                0D     30
     222      27       1       1       0       0       1       0 0 0 1  D     31
     222       0       0       1       0                                0D     32
     212      28       1       1       0       0       1       0 0 1 1  D     33
     212       0       0       2       0                                0D     34
     214      30       1       1       0       0       1       0 0 1 1  D     35
     214       0       0       2       3                                0D     36
     222      32       1       1       0       0       1       0 0 0 1  D     37
     222       0       0       1       0                                0D     38
     212      33       1       1       0       0       1       0 0 1 1  D     39
     212       0       0       2       0                                0D     40
     214      35       1       1       0       0       1       0 0 1 1  D     41
     214       0       0       2       3                                0D     42
     222      37       1       1       0       0       1       0 0 0 1  D     43
     222       0       0       1       0                                0D     44
     212      38       1       1       0       0       1       0 0 1 1  D     45
     212       0       0       2       0                                0D     46
     214      40       1       1       0       0       1       0 0 1 1  D     47
     214       0       0       2       3                                0D     48
     222      42       1       1       0       0       1       0 0 0 1  D     49
```

```
     222       0       0       1       0                                  0D      50
124,1.0000000,0.0,0.0,0.0,0.0,1.0000000,0.0,0.0,0.0,0.0,                  1P       1
1.0000000,0.0,0,0;                                                        1P       2
212,1,7,.3185600,.0654000,1,1.5707963,0.0,0,0,2.1867423,                  3P       3
5.1707363,0.0,7H.7654 R,0,0;                                              3P       4
214,3,.1500000,.0500000,0.0,1.6395237,5.6704168,1.1796277,                5P       5
6.2822447,1.9905422,5.2034359,2.1213422,5.2034359,0,0;                    5P       6
222,3,5,1.1796277,6.2822447,0,0;                                          7P       7
212,1,7,.3185600,.0654000,1,1.5707963,0.0,0,0,4.8446350,                  9P       8
5.0808229,0.0,7H.7654 R,0,0;                                              9P       9
214,3,.1500000,.0500000,0.0,5.2303839,5.5779562,4.7724924,               11P      10
6.1912851,5.5771151,5.1135225,5.4463148,5.1135225,0,0;                   11P      11
222,9,11,4.7724924,6.1912851,0,0;                                        13P      12
212,1,7,.3185600,.0654000,1,1.5707963,0.0,0,0,7.3218365,                 15P      13
5.0108891,0.0,7H.7654 R,0,0;                                             15P      14
214,3,.1500000,.0500000,0.0,7.7043066,5.6335106,8.2402897,               17P      15
6.1799164,7.1256361,5.0435886,7.2564363,5.0435886,0,0;                   17P      16
222,15,17,8.2402897,6.1799164,0,0;                                       19P      17
212,1,7,.3185600,.0654000,1,1.5707963,0.0,0,0,1.1881292,                 21P      18
1.6041441,0.0,7H.7654 R,0,0;                                             21P      19
214,3,.1500000,.0500000,0.0,1.5900917,2.1570463,1.1796277,               23P      20
2.8030782,1.9206092,1.6368442,1.7898092,1.6368442,0,0;                   23P      21
222,21,23,1.1796277,2.8030782,0,0;                                       25P      22
212,1,7,.3185600,.0654000,1,1.5707963,0.0,0,0,1.2453539,                 27P      23
9.4113960,0.0,7H.7654 R,0,0;                                             27P      24
214,2,.1500000,.0500000,0.0,.4092200,9.4117279,1.0491536,                29P      25
9.4440956,1.1799538,9.4440956,0,0;                                       29P      26
222,27,29,1.1736424,9.4503927,0,0;                                       31P      27
212,1,7,.3185600,.0654000,1,1.5707963,0.0,0,0,3.8433030,                 33P      28
9.3314724,0.0,7H.7654 R,0,0;                                             33P      29
214,2,.1500000,.0500000,0.0,4.1367135,8.8636198,4.5757833,               35P      30
9.3641720,4.4449830,9.3641720,0,0;                                       35P      31
222,33,35,4.6414399,9.4390230,0,0;                                       37P      32
212,1,6,.2466200,.0654000,1,1.5707963,0.0,0,0,6.5733256,                 39P      33
3.4967549,0.0,6H.765 R,0,0;                                              39P      34
214,3,.1500000,.0500000,0.0,5.3853970,3.2309401,4.7529535,               41P      35
2.7998343,5.8233256,3.5294549,6.4733257,3.5294549,0,0;                   41P      36
222,39,41,4.7529535,2.7998343,0,0;                                       43P      37
212,1,6,.2466200,.0654000,1,1.5707963,0.0,0,0,6.5733256,                 45P      38
1.4967549,0.0,6H.765 R,0,0;                                              45P      39
214,3,.1500000,.0500000,0.0,8.0509501,2.1821518,8.5029516,               47P      40
2.7998343,7.5733261,1.5294548,7.0317178,1.5294548,0,0;                   47P      41
222,45,47,8.5029516,2.7998343,0,0;                                       49P      42
S       1G      2D     50P     42                                          T       1
```

```
RDIM TEST CASE 2                                                                S       1
1H,,1H;,,5HRDIM2,4HCIIN,6H2.1.3 ,16,8,24,8,56,,1.0000000,1,4HINCH,0,,13HG       1
810827.123218,,,,;                                                              G       2
     124       1       1       1       0       0       0       0 0 0 0  D      1
     124       0       0       2       0                                0D     2
     212       3       1       1       0       0       1       0 0 1 1  D      3
     212       0       0       2       0                                0D     4
     214       5       1       1       0       0       1       0 0 1 1  D      5
     214       0       0       2       3                                0D     6
     222       7       1       1       0       0       1       0 0 0 1  D      7
     222       0       0       1       0                                0D     8
     212       8       1       1       0       0       1       0 0 1 1  D      9
     212       0       0       2       0                                0D    10
     214      10       1       1       0       0       1       0 0 1 1  D     11
     214       0       0       2       3                                0D    12
     222      12       1       1       0       0       1       0 0 0 1  D     13
     222       0       0       1       0                                0D    14
     212      13       1       1       0       0       1       0 0 1 1  D     15
     212       0       0       2       0                                0D    16
     214      15       1       1       0       0       1       0 0 1 1  D     17
     214       0       0       2       3                                0D    18
     222      17       1       1       0       0       1       0 0 0 1  D     19
     222       0       0       1       0                                0D    20
     212      18       1       1       0       0       1       0 0 1 1  D     21
     212       0       0       2       0                                0D    22
     214      20       1       1       0       0       1       0 0 1 1  D     23
     214       0       0       2       3                                0D    24
     222      22       1       1       0       0       1       0 0 0 1  D     25
     222       0       0       1       0                                0D    26
     212      23       1       1       0       0       1       0 0 1 1  D     27
     212       0       0       2       0                                0D    28
     214      25       1       1       0       0       1       0 0 1 1  D     29
     214       0       0       2       3                                0D    30
     222      27       1       1       0       0       1       0 0 0 1  D     31
     222       0       0       1       0                                0D    32
     212      28       1       1       0       0       1       0 0 1 1  D     33
     212       0       0       2       0                                0D    34
     214      30       1       1       0       0       1       0 0 1 1  D     35
     214       0       0       2       3                                0D    36
     222      32       1       1       0       0       1       0 0 0 1  D     37
     222       0       0       1       0                                0D    38
     212      33       1       1       0       0       1       0 0 1 1  D     39
     212       0       0       2       0                                0D    40
     214      35       1       1       0       0       1       0 0 1 1  D     41
     214       0       0       2       3                                0D    42
     222      37       1       1       0       0       1       0 0 0 1  D     43
     222       0       0       1       0                                0D    44
     212      38       1       1       0       0       1       0 0 1 1  D     45
     212       0       0       2       0                                0D    46
     214      40       1       1       0       0       1       0 0 1 1  D     47
     214       0       0       2       3                                0D    48
     222      42       1       1       0       0       1       0 0 0 1  D     49
```

```
     222       0       0       1       0                                  0D      50
124,.9973390,.0360059,-.0633904,0.0,-.0729025,.4925772,                   1P       1
-.8672098,0.0,0.0,.8695235,.4938914,0.0,0,0;                              1P       2
212,1,7,.3185600,.0654000,1,1.5707963,0.0,0,0,2.1867423,                  3P       3
5.1707363,0.0,7H.7654 R,0,0;                                              3P       4
214,3,.1500000,.0500000,0.0,1.6395237,5.6704168,1.1796277,                5P       5
6.2822447,1.9905422,5.2034359,2.1213422,5.2034359,0,0;                    5P       6
222,3,5,1.1796277,6.2822447,0,0;                                          7P       7
212,1,7,.3185600,.0654000,1,1.5707963,0.0,0,0,4.8446350,                  9P       8
5.0808229,0.0,7H.7654 R,0,0;                                              9P       9
214,3,.1500000,.0500000,0.0,5.2303839,5.5779562,4.7724924,               11P      10
6.1912851,5.5771151,5.1135225,5.4463148,5.1135225,0,0;                   11P      11
222,9,11,4.7724924,6.1912851,0,0;                                        13P      12
212,1,7,.3185600,.0654000,1,1.5707963,0.0,0,0,7.3218365,                 15P      13
5.0108891,0.0,7H.7654 R,0,0;                                             15P      14
214,3,.1500000,.0500000,0.0,7.7043066,5.6335106,8.2402897,               17P      15
6.1799164,7.1256361,5.0435886,7.2564363,5.0435886,0,0;                   17P      16
222,15,17,8.2402897;6.1799164,0,0;                                       19P      17
212,1,7,.3185600,.0654000,1,1.5707963,0.0,0,0,1.1881292,                 21P      18
1.6041441,0.0,7H.7654 R,0,0;                                             21P      19
214,3,.1500000,.0500000,0.0,1.5900917,2.1570468,1.1796277,               23P      20
2.8030782,1.9206092,1.6368442,1.7898092,1.6368442,0,0;                   23P      21
222,21,23,1.1796277,2.8030782,0,0;                                       25P      22
212,1,7,.3185600,.0654000,1,1.5707963,0.0,0,0,1.2453539,                 27P      23
9.4113960,0.0,7H.7654 R,0,0;                                             27P      24
214,2,.1500000,.0500000,0.0,.4092200,9.4117279,1.0491536,                29P      25
9.4440956,1.1799538,9.4440956,0,0;                                       29P      26
222,27,29,1.1736424,9.4503927,0,0;                                       31P      27
212,1,7,.3185600,.0654000,1,1.5707963,0.0,0,0,3.8433030,                 33P      28
9.3314724,0.0,7H.7654 R,0,0;                                             33P      29
214,2,.1500000,.0500000,0.0,4.1367135,8.8636198,4.5757833,               35P      30
9.3641720,4.4449830,9.3641720,0,0;                                       35P      31
222,33,35,4.6414399,9.4390230,0,0;                                       37P      32
212,1,6,.2466200,.0654000,1,1.5707963,0.0,0,0,6.5733256,                 39P      33
3.4967549,0.0,6H.765 R,0,0;                                              39P      34
214,3,.1500000,.0500000,0.0,5.3853970,3.2309401,4.7529535,               41P      35
2.7998343,5.8233256,3.5294549,6.4733257,3.5294549,0,0;                   41P      36
222,39,41,4.7529535,2.7998343,0,0;                                       43P      37
212,1,6,.2466200,.0654000,1,1.5707963,0.0,0,0,6.5733256,                 45P      38
1.4967549,0.0,6H.765 R,0,0;                                              45P      39
214,3,.1500000,.0500000,0.0,8.0509501,2.1821518,8.5029516,               47P      40
2.7998343,7.5733261,1.5294548,7.0317178,1.5294548,0,0;                   47P      41
222,45,47,8.5029516,2.7998343,0,0;                                       49P      42
S       1G      2D      50P     42                                         T       1
```

3.3.15 Leader

The following conventions were followed:

- solid font
- arrowhead FORM=3
- Z displacement set to 0

Case 1 (Figure 3.3.15-1) tests the following:

- independent leaders with variable lengths

Subordinate leaders are also tested in the label and angular, diameter, linear, and radius dimension cases.

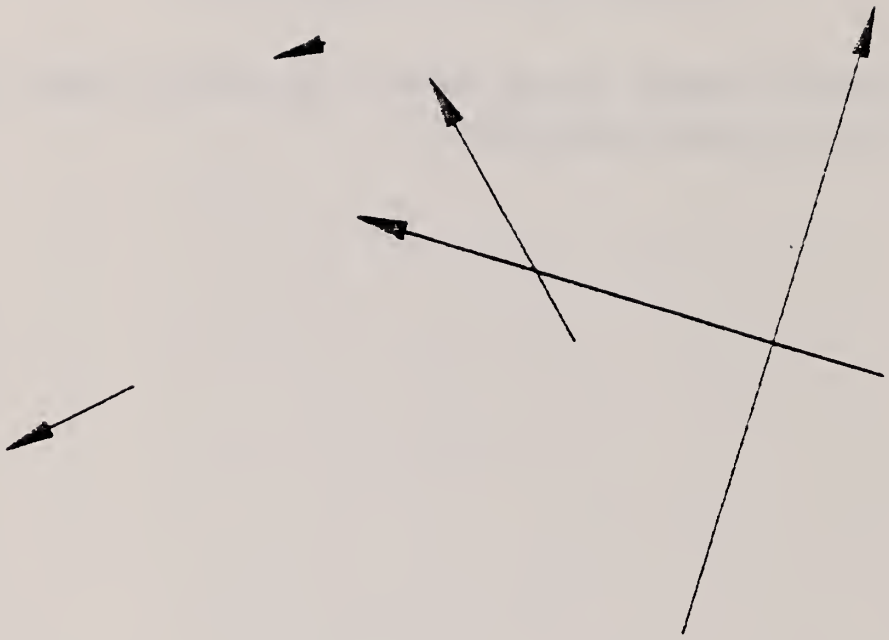


Figure 3.3.15-1 Leader Case 1 (actual part)
Case 1: Rotation (0°, 0°, 0°)

```
LEADER TEST CASE 1                                                              S       1
1H,,1H;,,7HLEADER1,4HCIIN,6H2.1.2 ,16,8,24,8,56,,1.0000000,1,4HINCH,            G       1
0,,13H810714.085817,,,,;                                                        G       2
     124       1       1       1       0       0       0      0 0 0 0  D       1
     124       0       0       2       0       0       0    MTX1       0D      2
     214       3       1       1       0       0       1      0 0 0 1  D       3
     214       0       0       2       3       0       0                0D      4
     214       5       1       1       0       0       1      0 0 0 1  D       5
     214       0       0       2       3       0       0                0D      6
     214       7       1       1       0       0       1      0 0 0 1  D       7
     214       0       0       2       3       0       0                CD      8
     214       9       1       1       0       0       1      0 0 0 1  D       9
     214       0       0       2       3       0       0                0D     10
     214      11       1       1       0       0       1      0 0 0 1  D      11
     214       0       0       2       3       0       0                CD     12
124,1.0000000,0.0,0.0,0.0,0.0,1.0000000,0.0,0.0,0.0,0.0,                        1P      1
1.0000000,0.0,0,0;                                                              1P      2
214,2,.1600000,.1280000,0.0,1.5519998,2.3839998,2.1759996,                      3P      3
2.7039995,2.1759996,2.7039995,0,0;                                              3P      4
214,2,.1600000,.1280000,0.0,2.8319998,4.2799997,3.0799994,                      5P      5
4.3520002,3.0799994,4.3520002,0,0;                                              5P      6
214,2,.1600000,.1280000,0.0,3.5999994,4.1920004,4.3280001,                      7P      7
2.9519997,4.3280001,2.9519997,0,0;                                              7P      8
214,2,.1600000,.1280000,0.0,5.7760000,4.5679998,4.8959999,                      9P      9
1.5599999,4.8959999,1.5599999,0,0;                                              9P     10
214,2,.1600000,.1280000,0.0,3.2559996,3.5279994,5.8479996,                     11P     11
2.8079996,5.8479996,2.8079996,0,0;                                             11P     12
S      1G      2D     12P     12                                                T       1
```

3.3.16 Section

Data case not available.

3.3.17 Witness Line

The witness line contains one or more line segments associated with drafting entities (angular dimension and linear dimension). The test for witness lines is part of the tests for angular and linear dimensions.

The following conventions were followed:

- IF parameter set to 1
- N parameter set to 3
- solid font
- witness line is subordinate only

3.3.18 Associativity Instance

Case 1 (Figure 3.3.18-1) tests the following:

- a single group composed of 10 points

Case 2 (Figure 3.3.18-2) tests the following:

- grouping (association) of line and point entities
- 7 levels of nesting

Each subtree in the figure represents a grouping with the level of the subtree representing the level of group nesting.

Figure 3.3.18-1 Associativity Instance Case 1 (actual part)
Case 1: Rotation (0°, 0°, 0°)

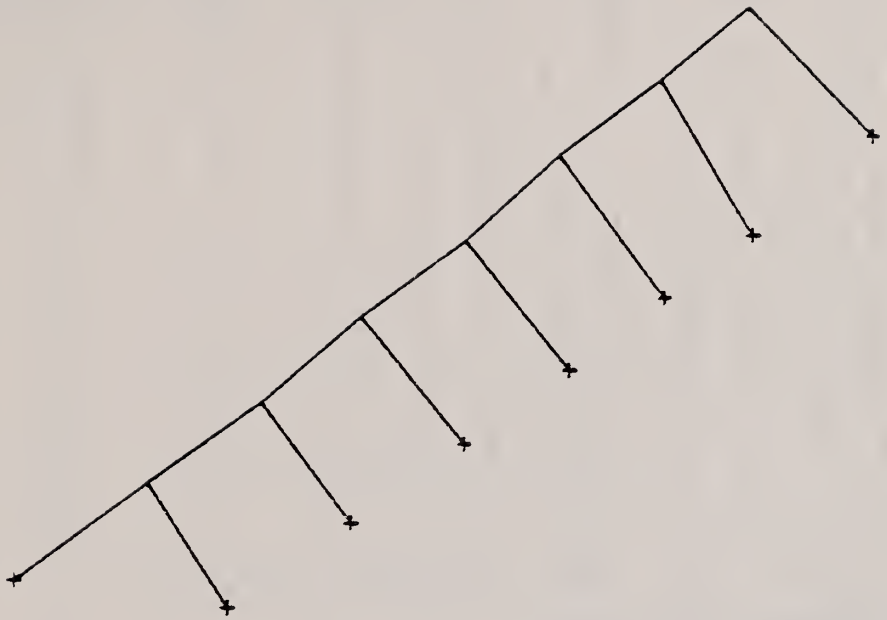


Figure 3.3.18-2 Associativity Instance Case 2 (actual part)
Case 1: Rotation (0^{o}, 0^{o}, 0^{o})

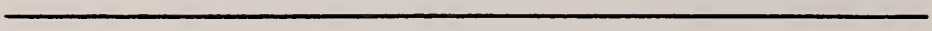
```
GROUP TEST CASE 1                                                                                                    S       1
1H,,1H;,,6HGROUP1,4HCIIN,6H2.1.2 ,16,8,24,8,56,,1.0000000,1,4HINCH,0,,13G       1
H810713.191823,,,,;                                                                                                  G       2
     402       1       1       1       0       0       0       0 0 0 0  D       1
     402       0       0       2       1       0       0                0D       2
     116       3       1       1       0       0       0       0 0 1 0  D       3
     116       0       0       1       0       0       0       P        1D       4
     116       4       1       1       0       0       0       0 0 1 0  D       5
     116       0       0       1       0       0       0       P        2D       6
     116       5       1       1       0       0       0       0 0 1 0  D       7
     116       0       0       1       0       0       0       P        3D       8
     116       6       1       1       0       0       0       0 0 1 0  D       9
     116       0       0       1       0       0       0       P        4D      10
     116       7       1       1       0       0       0       0 0 1 0  D      11
     116       0       0       1       0       0       0       P        5D      12
     116       8       1       1       0       0       0       0 0 1 0  D      13
     116       0       0       1       0       0       0       P        6D      14
     116       9       1       1       0       0       0       0 0 1 0  D      15
     116       0       0       1       0       0       0       P        7D      16
     116      10       1       1       0       0       0       0 0 1 0  D      17
     116       0       0       1       0       0       0       P        8D      18
     116      11       1       1       0       0       0       0 0 1 0  D      19
     116       0       0       1       0       0       0       P        9D      20
     116      12       1       1       0       0       0       0 0 1 0  D      21
     116       0       0       1       0       0       0       P       10D      22
402,10,     3,     5,     7,     9,     11,    13,    15,    17,          1P       1
    19,    21,0,0;                                                       1P       2
116,2.2159996,3.5919995,0.0,0,1,1,0;                                     3P       3
116,3.0639997,3.6239996,0.0,0,1,1,0;                                     5P       4
116,3.7279997,3.6159997,0.0,0,1,1,0;                                     7P       5
116,4.4480000,3.5839996,0.0,0,1,1,0;                                     9P       6
116,5.1359997,3.5839996,0.0,0,1,1,0;                                    11P       7
116,2.1999998,2.7759995,0.0,0,1,1,0;                                    13P       8
116,3.0479994,2.7759995,0.0,0,1,1,0;                                    15P       9
116,3.7119994,2.7759995,0.0,0,1,1,0;                                    17P      10
116,4.4080000,2.7839994,0.0,0,1,1,0;                                    19P      11
116,5.2720003,2.7839994,0.0,0,1,1,0;                                    21P      12
S       1G      2D     22P     12                                        T       1
```

```
GROUP TEST CASE 2                                                                S      1
1H,,1H;,,6HGROUP2,4HCIIN,6H2.1.2 ,16,8,24,8,56,,1.0000000,1,4HINCH,0,,13G      1
H810714.101934,,,,;                                                              G      2
     402        1        1        1        0        0        0       0 0 0 0  D      1
     402        0        0        1        1        0        0                0D      2
     116        2        1        1        0        0        0       0 0 1 0  D      3
     116        0        0        1        0        0        0       P        1D      4
     110        3        1        1        0        0        0       0 0 1 0  D      5
     110        0        0        1        0        0        0      L1        0D      6
     110        4        1        1        0        0        0       0 0 1 0  D      7
     110        0        0        1        0        0        0      L2        0D      8
     402        5        1        1        0        0        0       0 0 1 0  D      9
     402        0        0        1        1        0        0                0D     10
     116        6        1        1        0        0        0       0 0 1 0  D     11
     116        0        0        1        0        0        0       P        2D     12
     110        7        1        1        0        0        0       0 0 1 0  D     13
     110        0        0        1        0        0        0      L3        0D     14
     110        8        1        1        0        0        0       0 0 1 0  D     15
     110        0        0        1        0        0        0      L4        0D     16
     402        9        1        1        0        0        0       0 0 1 0  D     17
     402        0        0        1        1        0        0                0D     18
     116       10        1        1        0        0        0       0 0 1 0  D     19
     116        0        0        1        0        0        0       P        3D     20
     110       11        1        1        0        0        0       0 0 1 0  D     21
     110        0        0        1        0        0        0      L5        0D     22
     110       12        1        1        0        0        0       0 0 1 0  D     23
     110        0        0        1        0        0        0      L6        0D     24
     402       13        1        1        0        0        0       0 0 1 0  D     25
     402        0        0        1        1        0        0                0D     26
     116       14        1        1        0        0        0       0 0 1 0  D     27
     116        0        0        1        0        0        0       P        4D     28
     110       15        1        1        0        0        0       0 0 1 0  D     29
     110        0        0        1        0        0        0      L7        0D     30
     110       16        1        1        0        0        0       0 0 1 0  D     31
     110        0        0        1        0        0        0      L8        0D     32
     402       17        1        1        0        0        0       0 0 1 0  D     33
     402        0        0        1        1        0        0                0D     34
     116       18        1        1        0        0        0       0 0 1 0  D     35
     116        0        0        1        0        0        0       P        5D     36
     110       19        1        1        0        0        0       0 0 1 0  D     37
     110        0        0        1        0        0        0      L9        0D     38
     110       20        1        1        0        0        0       0 0 1 0  D     39
     110        0        0        1        0        0        0     L10        0D     40
     402       21        1        1        0        0        0       0 0 1 0  D     41
     402        0        0        1        1        0        0                0D     42
     116       22        1        1        0        0        0       0 0 1 0  D     43
     116        0        0        1        0        0        0       P        6D     44
     110       23        1        1        0        0        0       0 0 1 0  D     45
     110        0        0        1        0        0        0     L11        0D     46
     110       24        1        1        0        0        0       0 0 1 0  D     47
     110        0        0        1        0        0        0     L12        0D     48
     402       25        1        1        0        0        0       0 0 1 0  D     49
```

```
     402       0       0       1       1       0       0                   0D      50
     116      26       1       1       0       0       0     0 0 1 0  D    51
     116       0       0       1       0       0       0     P          7D    52
     116      27       1       1       0       0       0     0 0 1 0  D    53
     116       0       0       1       0       0       0     P          8D    54
     110      28       1       1       0       0       0     0 0 1 0  D    55
     110       0       0       1       0       0       0   L13          0D    56
     110      29       1       1       0       0       0     0 0 1 0  D    57
     110       0       0       1       0       0       0   L14          0D    58
402,4,     3,     5,     7,     9,0,0;                                   1P     1
116,5.7119999,4.1840000,0.0,0,1,1,0;                                    3P     2
110,4.6960001,4.4480000,0.0,5.1199999,4.7919998,0.0,1,1,0;              5P     3
110,5.1199999,4.7919998,0.0,5.7119999,4.1840000,0.0,1,1,0;              7P     4
402,4,    11,    13,    15,    17,1,1,0;                                9P     5
116,5.1359997,3.7199993,0.0,0,1,9,0;                                   11P     6
110,4.2080002,4.0959997,0.0,4.6960001,4.4480000,0.0,1,9,0;             13P     7
110,4.6960001,4.4480000,0.0,5.1359997,3.7199993,0.0,1,9,0;             15P     8
402,4,    19,    21,    23,    25,1,9,0;                               17P     9
116,4.7119999,3.4239993,0.0,0,1,17,0;                                  19P    10
110,3.7599993,3.6959996,0.0,4.2080002,4.0959997,0.0,1,17,0;            21P    11
110,4.2080002,4.0959997,0.0,4.7119999,3.4239993,0.0,1,17,0;            23P    12
402,4,    27,    29,    31,    33,1,17,0;                              25P    13
116,4.2559996,3.0799994,0.0,0,1,25,0;                                  27P    14
110,3.2559996,3.3359995,0.0,3.7599993,3.6959996,0.0,1,25,0;            29P    15
110,3.7599993,3.6959996,0.0,4.2559996,3.0799994,0.0,1,25,0;            31P    16
402,4,    35,    37,    39,    41,1,25,0;                              33P    17
116,3.7519994,2.7279997,0.0,0,1,33,0;                                  35P    18
110,2.7759995,2.9279995,0.0,3.2559996,3.3359995,0.0,1,33,0;            37P    19
110,3.2559996,3.3359995,0.0,3.7519994,2.7279997,0.0,1,33,0;            39P    20
402,4,    43,    45,    47,    49,1,33,0;                              41P    21
116,3.2079997,2.3519998,0.0,0,1,41,0;                                  43P    22
110,2.7759995,2.9279995,0.0,2.2319994,2.5439997,0.0,1,41,0;            45P    23
110,2.7759995,2.9279995,0.0,3.2079997,2.3519998,0.0,1,41,0;            47P    24
402,4,    51,    53,    55,    57,1,41,0;                              49P    25
116,2.6159997,1.9519999,0.0,0,1,49,0;                                  51P    26
116,1.5920000,2.0799994,0.0,0,1,49,0;                                  53P    27
110,1.5920000,2.0799994,0.0,2.2319994,2.5439997,0.0,1,49,0;            55P    28
110,2.2319994,2.5439997,0.0,2.6159997,1.9519999,0.0,1,49,0;            57P    29
S      1G      2D     58P     29                                        T      1
```

3.3.19 Line Fonts

The four line fonts of solid, dashed, phantom, and centerline are tested in various entity tests incuding those for lines, arcs, and conics. The fonts are defined qualitatively only and no data concerning exact dash and gap lengths is included. Thus the display of these fonts on different systems may appear differently. Examples of the different fonts are shown in Figure 3.3.19-1.



SOLID

DASHED

PHANTOM

CENTERLINE

Figure 3.3.19-1 Examples of Line Fonts

3.3.20 Levels

Case 1 (Figures 3.3.20-1 and 3.3.20-2) tests the following:

- levels 0-15 contain one point on each level (point label/subscript corresponds to the level it resides on)

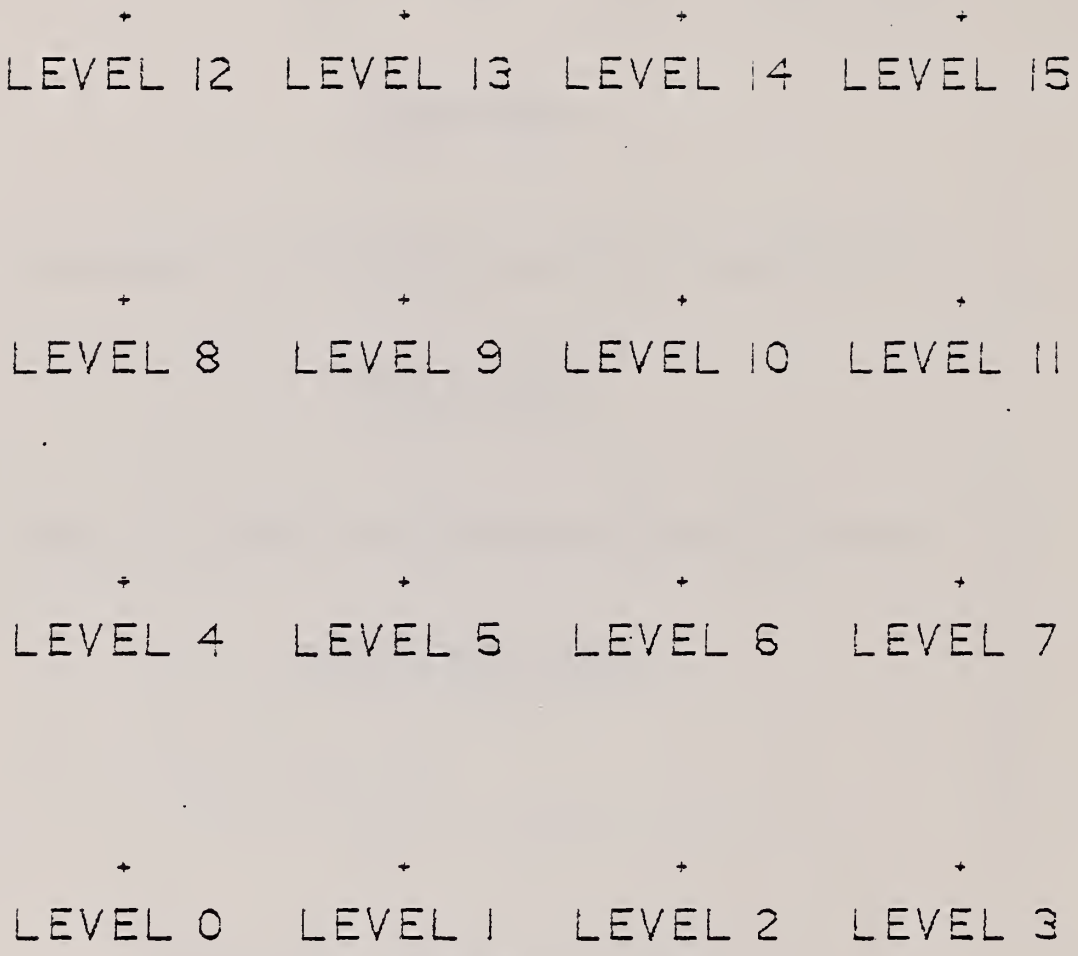


Figure 3.3.20-1 Level Case 1 (with annotation and all levels visible)
Case 1: Rotation (0^{o}, 0^{o}, 0^{o})

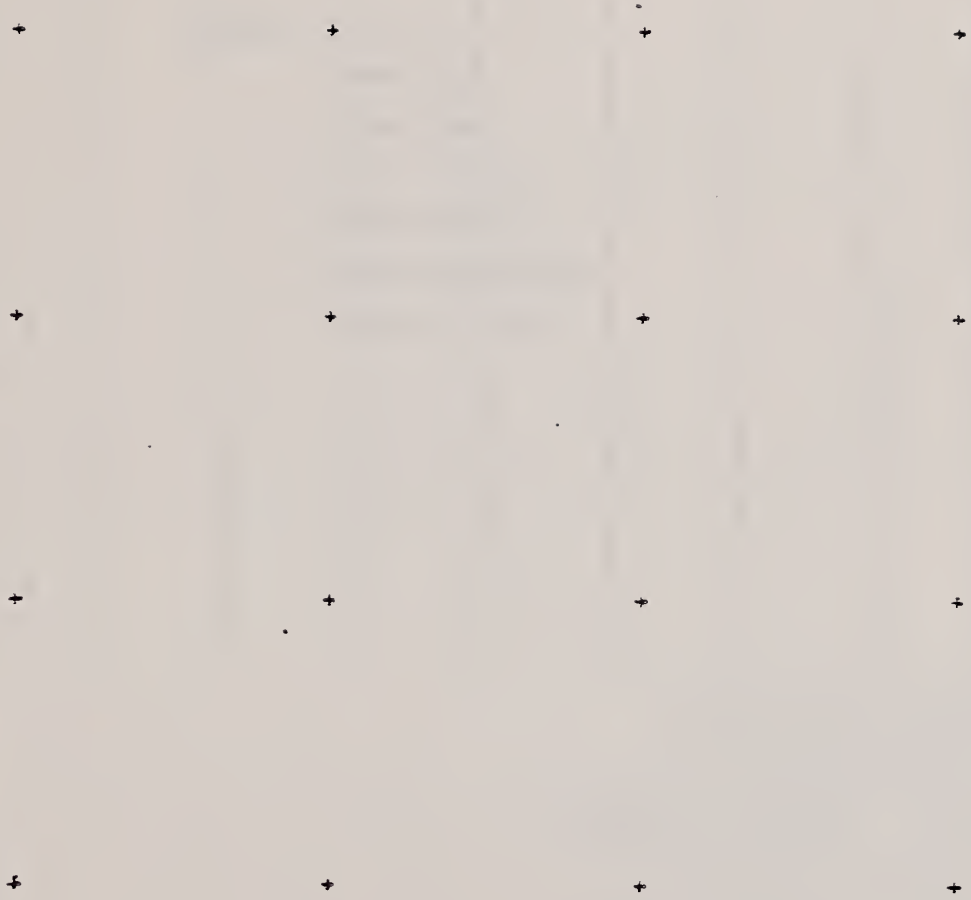


Figure 3.3.20-2 Level Case 1 (actual part with all levels visible)

```
LEVEL TEST CASE 1                                                                                                   S       1
1H,,1H;,,6HLEVEL1,4HCIIN,6H2.1.2 ,16,8,24,8,56,,1.0000000,1,4HINCH,0,,13G       1
H810713.191719,,,,;                                                                                                 G       2
     116       1       1       1       1       0       0       0 0 0 0  D      1
     116       0       0       1       0       0       0       P       1D      2
     116       2       1       1       2       0       0       0 0 0 0  D      3
     116       0       0       1       0       0       0       P       2D      4
     116       3       1       1       3       0       0       0 0 0 0  D      5
     116       0       0       1       0       0       0       P       3D      6
     116       4       1       1       4       0       0       0 0 0 0  D      7
     116       0       0       1       0       0       0       P       4D      8
     116       5       1       1       5       0       0       0 0 0 0  D      9
     116       0       0       1       0       0       0       P       5D     10
     116       6       1       1       6       0       0       0 0 0 0  D     11
     116       0       0       1       0       0       0       P       6D     12
     116       7       1       1       7       0       0       0 0 0 0  D     13
     116       0       0       1       0       0       0       P       7D     14
     116       8       1       1       8       0       0       0 0 0 0  D     15
     116       0       0       1       0       0       0       P       8D     16
     116       9       1       1       9       0       0       0 0 0 0  D     17
     116       0       0       1       0       0       0       P       9D     18
     116      10       1       1      10       0       0       0 0 0 0  D     19
     116       0       0       1       0       0       0       P      10D     20
     116      11       1       1      11       0       0       0 0 0 0  D     21
     116       0       0       1       0       0       0       P      11D     22
     116      12       1       1      12       0       0       0 0 0 0  D     23
     116       0       0       1       0       0       0       P      12D     24
     116      13       1       1      13       0       0       0 0 0 0  D     25
     116       0       0       1       0       0       0       P      13D     26
     116      14       1       1      14       0       0       0 0 0 0  D     27
     116       0       0       1       0       0       0       P      14D     28
     116      15       1       1      15       0       0       0 0 0 0  D     29
     116       0       0       1       0       0       0       P      15D     30
     116      16       1       1       0       0       0       0 0 0 0  D     31
     116       0       0       1       0       0       0       P       0D     32
116,1.0000000,0.0,0.0,0,0,0;                                                                        1P      1
116,2.0000000,0.0,0.0,0,0,0;                                                                        3P      2
116,3.0000000,0.0,0.0,0,0,0;                                                                        5P      3
116,0.0,1.0000000,0.0,0,0,0;                                                                        7P      4
116,1.0000000,1.0000000,0.0,0,0,0;                                                                  9P      5
116,2.0000000,1.0000000,0.0,0,0,0;                                                                 11P      6
116,3.0000000,1.0000000,0.0,0,0,0;                                                                 13P      7
116,0.0,2.0000000,0.0,0,0,0;                                                                       15P      8
116,1.0000000,2.0000000,0.0,0,0,0;                                                                 17P      9
116,2.0000000,2.0000000,0.0,0,0,0;                                                                 19P     10
116,3.0000000,2.0000000,0.0,0,0,0;                                                                 21P     11
116,0.0,3.0000000,0.0,0,0,0;                                                                       23P     12
116,1.0000000,3.0000000,0.0,0,0,0;                                                                 25P     13
116,2.0000000,3.0000000,0.0,0,0,0;                                                                 27P     14
116,3.0000000,3.0000000,0.0,0,0,0;                                                                 29P     15
116,0.0,0.0,0.0,0,0,0;                                                                             31P     16
S       1G       2D      32P      16                                                                  T       1
```

3.3.21 BLANK Status

Case 1 (Figure 3.3.21-1) tests the following:

- Blanked geometry
  - points
  - lines
  - conics

- Blanked annotation
  - general note
  - general label
  - linear dimension
  - radius dimension
  - diameter dimension
  - angular dimension

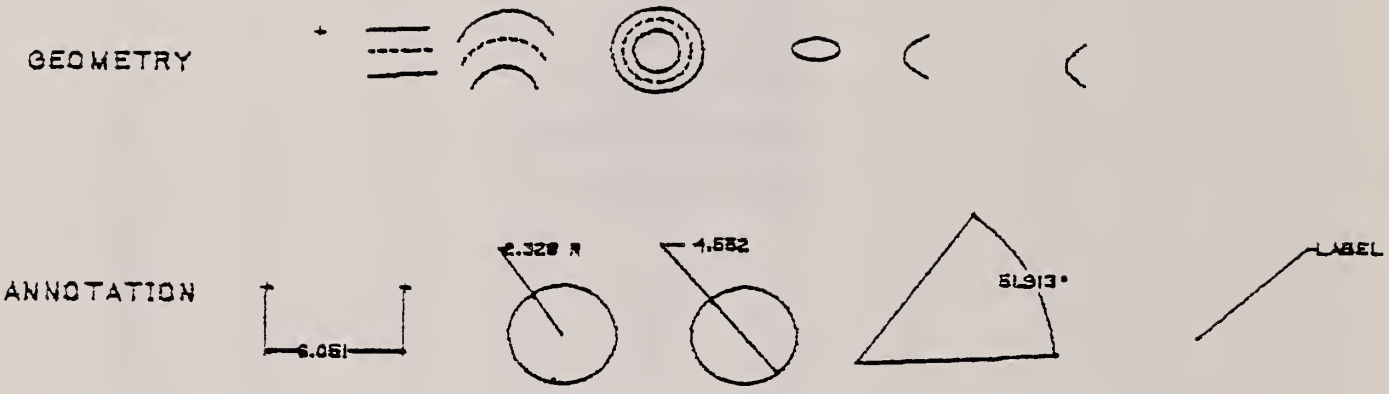


Figure 3.3.21-1 Blank Status Case 1 (actual entities are blanked)
Case 1: Rotation 0^{o}, 0^{o}, 0^{o})

```
BLANK TEST CASE 1                                                                                                    S       1
1H,,1H;,,6HBLANK1,4HCIIN,6H2.1.3 ,16,8,24,8,56,,1.0000000,1,4HINCH,0,,13G       1
H810827.122534,,,,;                                                                                                  G       2
     116       1       1       1       0       0       0       0 1 0 0  D       1
     116       0       0       1       0                       P        1D      2
     110       2       1       1       0       0       0       0 1 0 0  D       3
     110       0       0       1       0                     L1         0D      4
     110       3       1       2       0       0       0       0 1 0 0  D       5
     110       0       0       1       0                     L2         0D      6
     110       4       1       3       0       0       0       0 1 0 0  D       7
     110       0       0       1       0                     L3         0D      8
     124       5       1       1       0       0       0       0 0 0 0  D       9
     124       0       0       2       0                                0D      10
     100       7       1       3       0       0       9       0 1 0 0  D       11
     100       0       0       2       0                     A1         0D      12
     100       9       1       2       0       0       9       0 1 0 0  D       13
     100       0       0       2       0                     A2         0D      14
     100      11       1       1       0       0       9       0 1 0 0  D       15
     100       0       0       2       0                     A3         0D      16
     100      13       1       1       0       0       9       0 1 0 0  D       17
     100       0       0       2       0                     C1         0D      18
     100      15       1       2       0       0       9       0 1 0 0  D       19
     100       0       0       2       0                     C2         0D      20
     100      17       1       3       0       0       9       0 1 0 0  D       21
     100       0       0       2       0                     C3         0D      22
     104      19       1       3       0       0       9       0 1 0 0  D       23
     104       0       0       2       1                   ELP1         0D      24
     104      21       1       3       0       0       9       0 1 0 0  D       25
     104       0       0       2       3                   PRB1         0D      26
     104      23       1       3       0       0       9       0 1 0 0  D       27
     104       0       0       2       2                   HYP1         0D      28
     212      25       1       3       0       0       9       0 1 0 1  D       29
     212       0       0       2       0                     TX1        0D      30
     212      27       1       3       0       0       9       0 1 0 1  D       31
     212       0       0       2       0                     TX2        0D      32
     116      29       1       3       0       0       0       0 1 0 0  D       33
     116       0       0       1       0                     P          2D      34
     116      30       1       3       0       0       0       0 1 0 0  D       35
     116       0       0       1       0                     P          3D      36
     212      31       1       3       0       0       9       0 0 1 1  D       37
     212       0       0       2       0                                0D      38
     214      33       1       3       0       0       9       0 1 1 1  D       39
     214       0       0       2       3                                0D      40
     214      35       1       3       0       0       9       0 1 1 1  D       41
     214       0       0       2       3                                0D      42
     106      37       1       3       0       0       9       0 0 1 1  D       43
     106       0       0       2      40                                0D      44
     106      39       1       3       0       0       9       0 0 1 1  D       45
     106       0       0       2      40                                0D      46
     216      41       1       3       0       0       9       0 1 0 1  D       47
     216       0       0       1       0                                0D      48
     100      42       1       1       0       0       9       0 1 0 0  D       49
```

```
      100        0        0        2        0                          C4              0D       50
      212       44        1        3        0        0        9        0 1 1 1  D       51
      212        0        0        2        0                         RD1              0D       52
      214       46        1        3        0        0        9        0 1 1 1  D       53
      214        0        0        2        3                         RD1              0D       54
      222       48        1        3        0        0        9        0 1 0 1  D       55
      222        0        0        1        0                         RD1              0D       56
      100       49        1        1        0        0        9        0 1 0 0  D       57
      100        0        0        2        0                          C5              0D       58
      212       51        1        1        0        0        9        0 1 1 1  D       59
      212        0        0        2        0                         DD1              0D       60
      214       53        1        1        0        0        9        0 1 1 1  D       61
      214        0        0        2        3                         DD1              0D       62
      214       55        1        1        0        0        9        0 1 1 1  D       63
      214        0        0        2        3                         DD1              0D       64
      206       57        1        1        0        0        9        0 1 0 1  D       65
      206        0        0        1        0                         DD1              0D       66
      110       58        1        1        0        0        0        0 1 0 0  D       67
      110        0        0        1        0                          L4              0D       68
      110       59        1        1        0        0        0        0 1 0 0  D       69
      110        0        0        1        0                          L5              0D       70
      212       60        1        1        0        0        9        0 0 1 1  D       71
      212        0        0        2        0                                        0D       72
      214       62        1        1        0        0        9        0 0 1 1  D       73
      214        0        0        2        3                                        0D       74
      214       64        1        1        0        0        9        0 0 1 1  D       75
      214        0        0        2        3                                        0D       76
      106       66        1        1        0        0        9        0 0 1 1  D       77
      106        0        0        2       40                                        0D       78
      106       68        1        1        0        0        9        0 0 1 1  D       79
      106        0        0        2       40                                        0D       80
      202       70        1        1        0        0        9        0 0 0 1  D       81
      202        0        0        1        0                                        0D       82
      212       71        1        1        0        0        9        0 1 1 1  D       83
      212        0        0        2        0                         LA1              0D       84
      214       73        1        1        0        0        9        0 1 1 1  D       85
      214        0        0        2        3                         LA1              0D       86
      210       75        1        1        0        0        9        0 1 0 1  D       87
      210        0        0        1        0                         LA1              0D       88
116,-10.6025648,5.8974361,0.0,0,0,0;                                                    1P        1
110,-8.4743595,5.9487181,0.0,-5.9102569,6.0512824,0.0,0,0;                              3P        2
110,-8.4230776,4.9487181,0.0,-5.7307696,5.0256410,0.0,0,0;                              5P        3
110,-8.4487181,3.7435899,0.0,-5.5256414,3.9487181,0.0,0,0;                              7P        4
124,1.0000000,0.0,0.0,0.0,0.0,1.0000000,0.0,0.0,0.0,0.0,                                9P        5
1.0000000,0.0,0,0;                                                                      9P        6
100,0.0,-2.5169556,2.7672675,-1.1153853,3.2051289,-3.9102570,                          11P        7
3.2307684,0,0;                                                                         11P        8
100,0.0,-2.4836469,3.5267518,-.7307704,4.6153851,-4.3717956,                           13P        9
4.3589732,0,0;                                                                         13P       10
100,0.0,-2.4062176,4.6114097,-.4230777,5.7435904,-4.5256414,                           15P       11
5.4615389,0,0;                                                                         15P       12
100,0.0,4.1410255,5.0769234,6.1410255,5.0769234,6.1410255,                             17P       13
```

```
5.0769218,0,0;                                                          17P     14
100,0.0,4.1410255,5.0769234,5.6410255,5.0769234,5.6410255,              19P     15
5.0769222,0,0;                                                          19P     16
100,0.0,4.1410255,5.0769234,5.1410255,5.0769234,5.1410255,              21P     17
5.0769226,0,0;                                                          21P     18
104,1.0000000,.1430511E-05,4.0000000,-22.2051351,-41.4359137,           23P     19
229.5753583,0.0,12.1025639,5.1794868,12.1025639,5.1794863,0,0;          23P     20
104,.4706643E-28,-.1372100E-13,1.0000000,-1.0000000,-9.7435904,         25P     21
38.6831063,0.0,15.9487181,3.8717952,15.9487181,5.8717952,0,0;           25P     22
104,.2500000,0.0,-1.0000000,-10.0128202,8.9230776,79.3512408,           27P     23
0.0,22.8540688,3.4615381,22.8540668,5.4615378,0,0;                      27P     24
212,1,8,6.9750006,.7500001,1,1.5707963,0.0,0,0,-19.5641041,             29P     25
4.1025643,0.0,8HGEOMETRY,0,0;                                           29P     26
212,1,10,8.1750006,.7500001,1,1.5707963,0.0,0,0,-20.0256424,            31P     27
-6.9743590,0.0,10HANNOTATION,0,0;                                       31P     28
116,-12.8974361,-6.3589745,0.0,0,0,0;                                   33P     29
116,-6.8461547,-6.3076921,0.0,0,0,0;                                    35P     30
212,1,5,2.0500000,.5000000,1,1.5707963,0.0,0,0,-11.4615393,             37P     31
-9.5897436,0.0,5H6.051,0,0;                                             37P     32
214,1,.1500000,.0500000,0.0,-12.8974361,-9.3397436,-11.5615396,         39P     33
-9.3397436,0,0;                                                         39P     34
214,1,.1500000,.0500000,0.0,-6.8461547,-9.3397436,-9.2215395,           41P     35
-9.3397436,0,0;                                                         41P     36
106,1,3,0.0,-12.8974361,-6.4527245,-12.8974361,-6.4527245,              43P     37
-12.8974361,-9.4647436,0,0;                                             43P     38
106,1,3,0.0,-6.8461547,-6.4014421,-6.8461547,-6.4014421,                45P     39
-6.8461547,-9.4647436,0,0;                                              45P     40
216,37,39,41,43,45,0,0;                                                 47P     41
100,0.0,.0568982,-8.4683762,2.3846251,-8.4683762,2.3846251,             49P     42
-8.4683780,0,0;                                                         49P     43
212,1,7,3.1500000,.5000000,1,1.5707963,0.0,0,0,-2.3846159,              51P     44
-4.6666665,0.0,7H2.328 R,0,0;                                           51P     45
214,3,.1500000,.0500000,0.0,-1.2475616,-6.5405025,.0568982,             53P     46
-8.4683762,-2.6846156,-4.4166665,-2.3846159,-4.4166665,0,0;             53P     47
222,51,53,.0568982,-8.4683762,0,0;                                      55P     48
100,0.0,8.0008917,-8.5078821,10.2770360,-8.5078821,10.2770360,          57P     49
-8.5078839,0,0;                                                         57P     50
212,1,5,2.2500000,.5000000,1,1.5707963,0.0,0,0,5.8717942,               59P     51
-4.4102564,0.0,5H4.552,0,0;                                             59P     52
214,3,.1500000,.0500000,0.0,6.5423788,-6.7605034,8.0010023,             61P     53
-8.5078583,4.3717942,-4.1602564,5.3717942,-4.1602564,0,0;               61P     54
214,1,.1500000,.0500000,0.0,9.4596258,-10.2552131,8.0010023,            63P     55
-8.5078583,0,0;                                                         63P     56
206,59,61,63,8.0010023,-8.5078583,0,0;                                  65P     57
110,19.2051277,-9.4871798,0.0,12.9487171,-9.7435894,0.0,0,0;            67P     58
110,12.9487171,-9.7435894,0.0,16.8974361,-4.2564101,0.0,0,0;            69P     59
212,1,6,2.4500000,.5000000,1,1.5707963,0.0,0,0,19.1538467,              71P     60
-6.1025639,0.0,6H51.913,0,0;                                            71P     61
214.1,.1500000,.0500000,0.0,21.6179676,-9.3882931,20.9768944,           73P     62
-6.4526159,0,0;                                                         73P     63
214,1,.1500000,.0500000,0.0,18.0167206,-2.7010416,20.3860303,           75P     64
-5.2749754,0,0;                                                         75P     65
```

```
106,1,3,0.0,19.2987991,-9.4833408,19.2987991,-9.4833408,                77P      66
21.7428628,-9.3831745,0,0;                                              77P      67
106,1,3,0.0,16.9521960,-4.1803153,16.9521960,-4.1803153,                79P      68
18.0897337,-2.5995818,0,0;                                              79P      69
202,71,77,79,12.9487171,-9.7435894,8.6765280,73,75,0,0;                 81P      70
212,1,5,2.6500000,.5000000,1,1.5707963,0.0,0,0,33.0091972,              83P      71
-4.4573960,0.0,5HLABEL,0,0;                                             83P      72
214,2,.1500000,.0500000,0.0,27.8572350,-8.5579443,32.6091995,           85P      73
-4.2073960,32.9091988,-4.2073960,0,0;                                   85P      74
210,83,1,85,0,0;                                                        87P      75
S      1G      2D     88P     75                                         T        1
```

3.3.22 Labels/Subscripts

Case 1 (Figures 3.3.22-1 and 3.3.22-2) tests the following

- Points with label/subscripts with the following conditions:
  - Label/subscripts with one through six characters
  - Label/subscripts with all alphabetic characters
  - Label/subscripts with all numeric characters

Other test cases also contain entities with label/subscripts.

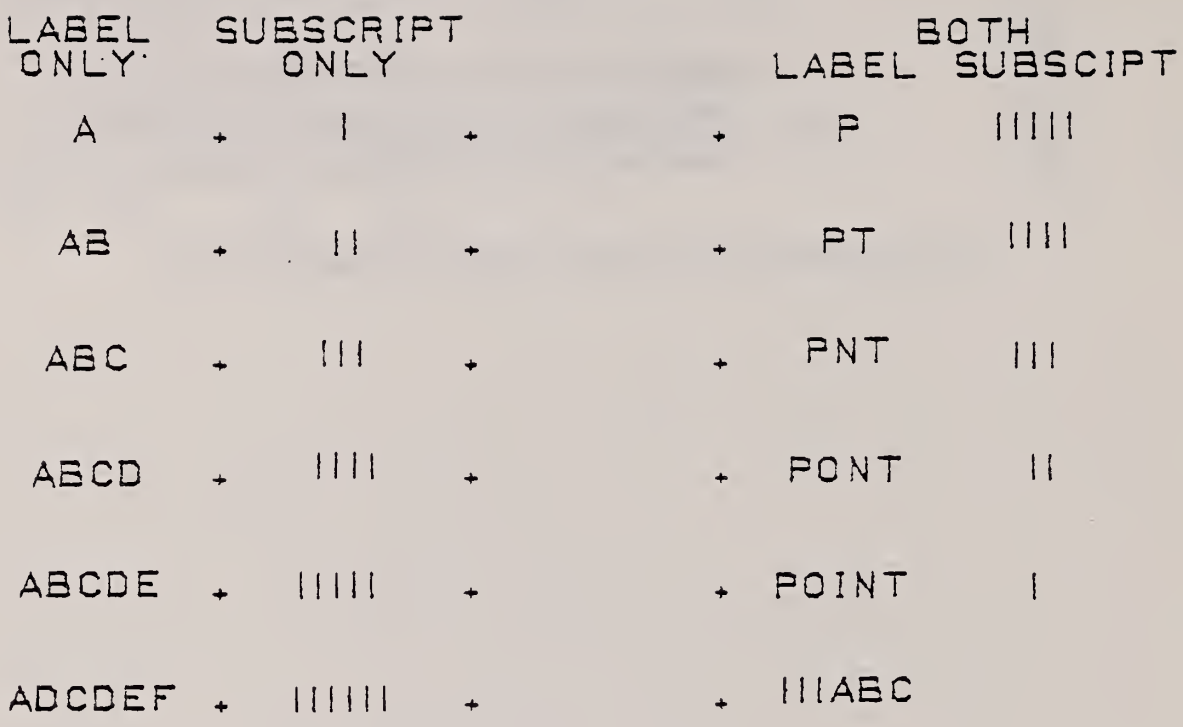


Figure 3.3.22-1 Label/Subscript Case 1 (with annotation)

Case 1: Rotation (0^{o}, 0^{o}, 0^{o})

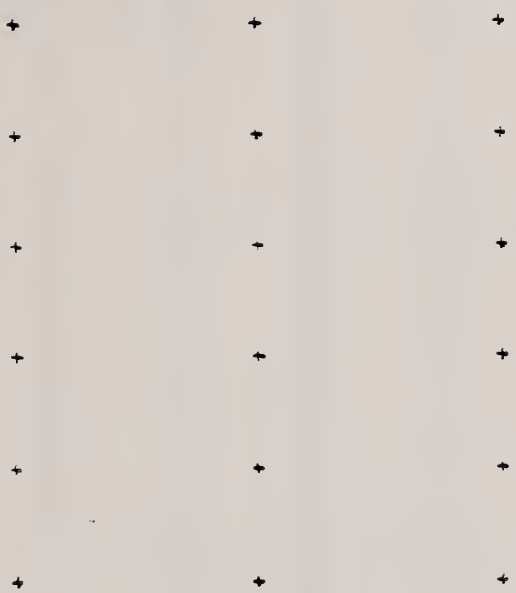


Figure 3.3.22-2 Label/Subscript Case 1 (actual part)

```
LABEL/SUBSCRIPT TEST CASE 1                                                        S      1
1H,,1H;,,9HLABELSUB1,4HCIIN,6H2.1.2 ,16,8,24,8,56,,1.0000000,1,4HINCH,0,G      1
,13H810806.092106,,,,;                                                         G      2
     116       1       1       1       3       0       0       0 0 0 0 D      1
     116       0       0       1       0       0       0       A      0D      2
     116       2       1       1       3       0       0       0 0 0 0 D      3
     116       0       0       1       0       0       0      AB      0D      4
     116       3       1       1       3       0       0       0 0 0 0 D      5
     116       0       0       1       0       0       0     ABC      0D      6
     116       4       1       1       3       0       0       0 0 0 0 D      7
     116       0       0       1       0       0       0    ABCD      0D      8
     116       5       1       1       3       0       0       0 0 0 0 D      9
     116       0       0       1       0       0       0   ABCDE      0D     10
     116       6       1       1       3       0       0       0 0 0 0 D     11
     116       0       0       1       0       0       0  ABCDEF      0D     12
     116       7       1       1       3       0       0       0 0 0 0 D     13
     116       0       0       1       0       0       0              1D     14
     116       8       1       1       3       0       0       0 0 0 0 D     15
     116       0       0       1       0       0       0             11D     16
     116       9       1       1       3       0       0       0 0 0 0 D     17
     116       0       0       1       0       0       0            111D     18
     116      10       1       1       3       0       0       0 0 0 0 D     19
     116       0       0       1       0       0       0           1111D     20
     116      11       1       1       3       0       0       0 0 0 0 D     21
     116       0       0       1       0       0       0          11111D     22
     116      12       1       1       3       0       0       0 0 0 0 D     23
     116       0       0       1       0       0       0         111111D     24
     116      13       1       1       3       0       0       0 0 0 0 D     25
     116       0       0       1       0       0       0  111ABC      0D     26
     116      14       1       1       3       0       0       0 0 0 0 D     27
     116       0       0       1       0       0       0   POINT      1D     28
     116      15       1       1       3       0       0       0 0 0 0 D     29
     116       0       0       1       0       0       0    PONT     11D     30
     116      16       1       1       3       0       0       0 0 0 0 D     31
     116       0       0       1       0       0       0     PNT    111D     32
     116      17       1       1       3       0       0       0 0 0 0 D     33
     116       0       0       1       0       0       0      PT   1111D     34
     116      18       1       1       3       0       0       0 0 0 0 D     35
     116       0       0       1       0       0       0       P  11111D     36
116,-6.0000000,5.0000000,0.0,0,0,0;                                           1P      1
116,-6.0000000,4.0000000,0.0,0,0,0;                                           3P      2
116,-6.0000000,3.0000000,0.0,0,0,0;                                           5P      3
116,-6.0000000,2.0000000,0.0,0,0,0;                                           7P      4
116,-6.0000000,1.0000000,0.0,0,0,0;                                           9P      5
116,-6.0000000,0.0,0.0,0,0,0;                                                11P      6
116,-4.0000000,5.0000000,0.0,0,0,0;                                          13P      7
116,-4.0000000,4.0000000,0.0,0,0,0;                                          15P      8
116,-4.0000000,3.0000000,0.0,0,0,0;                                          17P      9
116,-4.0000000,2.0000000,0.0,0,0,0;                                          19P     10
116,-4.0000000,1.0000000,0.0,0,0,0;                                          21P     11
116,-4.0000000,0.0,0.0,0,0,0;                                                23P     12
116,-2.0000000,0.0,0.0,0,0,0;                                                25P     13
```

```
116,-2.0000000,1.0000000,0.0,0,0,0;                                  27P      14
116,-2.0000000,2.0000000,0.0,0,0,0;                                  29P      15
116,-2.0000000,3.0000000,0.0,0,0,0;                                  31P      16
116,-2.0000000,4.0000000,0.0,0,0,0;                                  33P      17
116,-2.0000000,5.0000000,0.0,0,0,0;                                  35P      18
S       1G       2D      36P      18                                    T       1
```

REFERENCES

A. Y14.26M-1981 — American National Standard Engineering Drawing and Related Documentation Practices (sections 2 through 4 of this document were derived from the Initial Graphics Exchange Specification Version 1.0.)

B. Boeing Document D6-42705-210 — Geometric Data Base File and Entity Format Standard

C. 79-1847 — Boeing's CAD/CAM Integrated Information Network
AIAA Aircraft System and Technology Meeting, August 1979

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☐ Document describes a computer program; SF-185, FIPS Software Summary, is attached.

11. ABSTRACT (A 200-word or less factual summary of most significant information. If document includes a significant bibliography or literature survey, mention it here)

This document contains a library of benchmark tests to be used to verify the interface capability possible with the Initial Graphics Exchange Specification (IGES) (Reference A). IGES provides a common data format to facilitate the exchange of data between different Computer Aided Design/Computer Aided Manufacturing (CAD/CAM) systems.

The test cases outlined in this document provide data for software modules which translate IGES format to and from the format of a particular CAD/CAM system. The geometric and drafting entities contained in these parts comprise only a limited portion of all IGES entities and are intended to demonstrate some capabilities of an IGES translator on an individual entity basis. This set of tests does not constitute a test of compliance with any existing or proposed standardization of IGES. Subsequent tests with more complex parts should be made to insure the suitability of the processors for a user's production environment.

12. KEY WORDS (Six to twelve entries; alphabetical order; capitalize only proper names; and separate key words by semicolons)

ANSI Standard; computer aided design/computer aided manufacturing; computer graphics; interface standard

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