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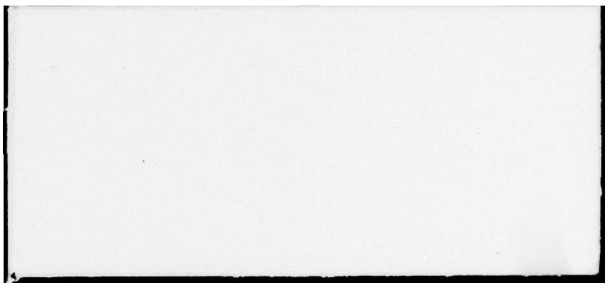

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(14) VALIDATION NUMBER CCVS74-VSR175

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16. Abstracts

This Validation Summary Report (VSR) for the Information Processing Incorporated COBOL Compiler Version 2.0 provides a consolidated summary of the results obtained from the validation of the subject compiler against the 1974 COBOL Standard (X3.23-1974/FIPS PUB 21-1). The compiler was validated at the Low level of FIPS PUB 21-1. The VSR is made up of several sections showing the discrepancies found. These include an overview of the validation which lists all categories of discrepancies by level/module within X3.23-1974, a section relating the categories of discrepancies to each of the Federal levels of the language; and a detailed listing of discrepancies together with the tests which were failed.

17. Key Words and Document Analysis. 17a. Descriptors

Programming Languages
Standards
COBOL
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Verifying
Proving Program Correctness
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FIPS PUB 21-1

17b. Identifiers/Open-Ended Terms

CCVS
CVS

17c. COSATI Field/Group 09/02

18. Availability Statement	19. Security Class (This Report)	21. No. of Pages
Release Unlimited.	UNCLASSIFIED	50
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CCVS74-VSR175

COBOL COMPILER VALIDATION

1.	Validation Number	CCVS74-VSR175
2.	Hardware Vendor	Data General Corp.
3.	Software Vendor	Information Processing Inc. (IPI)
4.	Mainframe	MM1 NOVA 1200 Compatible
5.	Compiler Identification	IPI BLIS/COBOL - Version 2.0
6.	Operating System Identification	IPI BLIS/COBOL - Version 2.0
7.	Compiler Validation System Version Number	CCVS74 1.0
8.	Federal Information Processing Standard Publication	21-1

*PLEASE NOTE. The Federal COBOL Compiler Testing Service may make full and free public disclosure of the Validation Summary Report (VSR) in accordance with the "Freedom of Information Act" (5 U.S.C. #552). The results of this validation are only for the purpose of satisfying United States Government requirements, and apply only to the Computer System, Operating System release, and compiler version identified in the VSR. The COBOL Compiler Validation System is used to determine, insofar as is practical, the degree to which the subject compiler conforms to the Federal COBOL Standard. Thus, the VSR is necessarily discretionary and judgmental. The United States Government does not represent or warrant that the statements, or any one of them, set forth in the VSR are accurate or complete. The VSR is not meant to be used for the purpose of publicizing the findings summarized therein.

For information concerning this compiler you can contact the vendor's designated representative named below:

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Orlando, Florida 32810

TABLE OF CONTENTS

SECTION 1. INTRODUCTION

1.1 Purpose of the Validation Summary Report

The purpose of the Validation Summary Report (VSR) is to identify individual COBOL language elements whose implementation does not conform to Federal Standard COBOL as adopted from American National Standard Programming Language COBOL, X3.23-1974, by Federal Information Processing Standard 21-1 (FIPS PUB 21-1).

1.2 Preparation of the VSR

The Validation Summary Report is prepared by analyzing the results of running the COBOL Compiler Validation System (CCVS). The COBOL Compiler Validation System consists of audit routines containing features of Federal Standard COBOL, their related data, and an executive routine (VP-routine) which prepares the audit routines for compilation. Each audit routine is a COBOL program which includes many tests and supporting procedures indicating the result of the tests.

The testing of a compiler in a particular hardware/operating system environment is accomplished by compiling and executing each audit routine. The report produced by each routine tells whether the compiler passed or failed the tests in the routine. If the compiler rejects some language elements by terminating compilation, giving fatal diagnostic messages, or terminating execution abnormally, then the test containing the code the compiler was unable to process is deleted and the audit routine compilation and execution repeated.

The compilation listings and the output reports of the audit routines constitute the raw data from which the members of the Federal COBOL Compiler Testing Service produce a Validation Summary Report.

1.3 Organization of the VSR

The Validation Summary Report is made up of several sections the contents of which are described below.

a. Section 2 summarizes the results of the compilation and execution of the programs comprising the COBOL Compiler Validation System. Section 2 is subdivided into a subsection representing each level of each module defined in American National Standard Programming Language COBOL, X3.23-1974. Each subsection contains a list of all of the language elements which must be implemented in order to claim support of that level/module. The list of language elements will be annotated to include a description of both syntax and semantic errors detected during the validation.

b. Section 3 - FIPS PUB 21-1 defines four Federal levels of the COBOL Standard. Section 3 of the VSR lists the discrepancies described in Section 2 by the Federal level in which the problem occurs.

c. Section 4 contains information which describes the software environment in which the compiler was tested. This includes the name and version of the operating system; the implementor-names which were used in the Environment Division of the programs comprising the CCVS; the options used with the compiler; and if applicable, information regarding the use of compiler optimization features.

d. Appendix A is the Validation Summary Working Document, a working paper resulting from the compilation and execution of the CCVS, and from which the VSR is derived.

1.4 Abstract Covering Compliance to American National Standard Programming Language COBOL

Definition of an Implementation of American National Standard Programming Language COBOL (excerpts from X3.23-1974, Chapter 1, Section 1.5).

An implementation is defined to meet the requirements of the American National Standard COBOL specification if that implementation includes a fully implemented specified level of each of the functional processing modules and of the Nucleus as defined in this Standard. It follows from this that, in order to meet the requirements of this Standard, an implementation must:

a. Not require the inclusion of substitute or additional language elements in the source program, in order to accomplish any part of the function of any of the standard language elements.

b. Accept all standard language elements contained in a given level of a module which is specified as being included in the implementation, except as specifically exempted (as pertaining to specific hardware components for which support is not claimed). See "Elements that Pertain to Specific Hardware Components" below.

These points are of particular pertinence in two areas:

(1) There are throughout the American National Standard COBOL specification certain language elements whose syntax, or effect, is specified to be, in part, implementor-defined. While the implementor specifies the constraints on that portion of each element's syntax or rules that is indicated in this Standard to be implementor-defined, such constraints may not include any requirement for the inclusion in the source program of substitute or additional language elements.

(2) When a function is provided outside the source program that accomplishes a function specified by any particular standard COBOL element, then the implementation must not require, except for Environment Division elements, the specification of that external function in place of or in addition to that standard language element:

The following qualifications apply to the American National Standard COBOL specification:

a. There are certain language elements which pertain to specific types of hardware components. In order for an implementation to meet the requirements of this standard, the implementor must specify the minimum hardware configuration required for that implementation and the hardware components that it supports. Further, when support is thus claimed for a specific hardware component, all standard language elements that pertain to that component must be implemented if the module in which they appear is included in the implementation. Language elements that pertain to specific hardware components for which support is not claimed, need not be implemented. However, the absence of such elements from an implementation of American National Standard COBOL must be specified.

b. An implementation of American National Standard COBOL may include the ENTER statement or not, at the option of the implementor.

c. An implementation that includes, in addition to a specified level of each of the functional processing modules and of the Nucleus, elements or functions that either are not defined in the American National Standard COBOL specification or are defined in a given level of a standard module not otherwise included in the implementation, meets the requirements of this Standard. This is true even though it may imply the extension of the list of reserved words by the implementor, and prevent proper compilation of some programs that meet the requirements of this Standard. The implementor must specify any optional language (language not defined in a specified level but defined elsewhere in the Standard) or extensions (language elements or functions not defined in this Standard) that are included in the implementation.

d. In general, the American National Standard COBOL specification specifies no upper limit on such things as the number of statements in a program, the number of operands permitted in certain statements, etc. It is recognized that these limits will vary from one implementation of American National Standard COBOL to another and may prevent the proper compilation of some programs that meet the requirements of this standard.

IMPLEMENTOR-DEFINED LANGUAGE SPECIFICATIONS

The language elements in the following lists depend on implementor definitions to complete the specificaton of the syntax or rules for the elements.

The elements whose syntax is partly implementor-defined are:

Element	Implementor-Defined Aspect
SOURCE-COMPUTER paragraph	computer-name
OBJECT-COMPUTER paragraph	computer-name
MEMORY SIZE clause	integer
alphabet-name	implementor-name; whether imple-

	mentor-names are provided.
SPECIAL-NAMES paragraph	implementor-name
ASSIGN clause	implementor-name
VALUE OF clause	implementor-name; whether implementor-names are provided.
RERUN clause	implementor-name and the form; the implementor provides at least one of seven specified forms.
CALL and CANCEL statements	relationship between operand and the referenced program.
COPY statement	relationship between library-name text-name, and the library.
ENTER statement	language-name
Margin R	The location.
Area B	The number of character positions.
Qualification	The number of qualifiers; at least five must be supported.

The elements whose effect is partly implementor-defined are:

Element	Implementor-Defined Aspect
alphabet-name	The correspondence between native and foreign character sets.
implementor-name switches	Whether setting can change during execution.
USAGE IS COMPUTATIONAL clause	Representation and whether automatic alignment occurs.
USAGE IS INDEX clause	Representation and whether automatic alignment occurs.
SYNCHRONIZED clause	Whether implicit FILLER positions are generated; their effect on the size of group items and redefining items.
ACCEPT statement	Maximum size of one transfer of data in Level 1 Nucleus.

DISPLAY statement	Maximum size of one transfer of data in Level 1 Nucleus.
Numeric test	Representation of valid sign in the absence of the SIGN IS SEPARATE clause.
Comparison of nonnumeric items	Collating sequence, where NATIVE or implementor-name collating sequence is implicitly or explicitly specified.
Arithmetic expressions	Number of places carried for intermediate results.

Elements That Pertain to Specific Hardware Components

The standard language elements in the list that follows pertain to specific types of hardware components. These language elements must be implemented in an implementation of American National Standard COBOL when support is claimed, by the implementor, for the specific types of hardware components to which they pertain, and the module in which they are defined is included in that implementation.

Element	Hardware Component
CODE-SET clause	Device capable of supporting the specified code.
MULTIPLE FILE TAPE clause	Reel
CLOSE...REEL/UNIT statement	Reel or mass storage
CLOSE...NO REWIND statement	Reel or mass storage
OPEN...REVERSED statement	Reel with the capability of making records available in the reversed order; mass-storage with the capability of making records available in the reversed order.
OPEN...NO REWIND statement	Reel or mass storage
OPEN...I-O statement (Sequential I-O only)	Mass storage
OPEN EXTEND statement	Reel or mass storage
REWRITE statement (Sequential I-O only)	Mass storage

SEND...BEFORE/AFTER ADVANCING statement	Devices capable of vertical positioning; devices capable of action based on *mnemonic-names*.
USE...I-O (Sequential I-O only)	Mass storage
WRITE...BEFORE/AFTER ADVANCING	Devices capable of vertical positioning; devices capable of action based on mnemonic-name.

1.5 The Federal COBOL Standard

The COBOL compiler validation results enclosed in this document reflect the degree to which the subject COBOL compiler implements the Federal COBOL Standard. The Federal COBOL Standard is essentially the same as the American National Standard Programming Language COBOL, X3.23-1974, with two exceptions:

> The Federal COBOL Standard defines 4 levels and the ANSI Standard defines only the minimum COBOL implementation and the full standard. Low and High levels of the Federal COBOL Standard (see 1.5.1) correspond to the above two ANSI levels (minus the Report Writer module). Two additional levels, low-intermediate and high-intermediate have been included in the Federal Standard between the highest and lowest subsets. These additional levels accommodate hardware which cannot support the full standard, but which is capable of implementing more than the minimum standard.
>
> The Report Writer Module is not contained in the Federal COBOL Standard.

The Federal COBOL Standard requires that a compiler contain as a minimum the elements specified in at least one of the Federal levels. No restrictions are imposed on the inclusion of selected features from higher levels or even unique vendor extensions. Compatibility among various implementations of a given level containing additional features must be controlled by management imposed standards and restrictions.

1.5.1 Federal Standard COBOL levels

a. Federal Standard COBOL specifications are the language specifications contained in American National Standard Programming Language COBOL, X3.23-1974. For purposes of the Federal Standard, the modules defined in X3.23-1974 are combined into four levels. Not all computers are large enough to accommodate a COBOL compiler containing the full ANSI Standard. Therefore, the Federal Government requires that all compilers acquired by its agencies contain as a minimum one of the four Federal levels, depending on machine size, configuration and user needs. The knowledge that all computers will support at least one of these four subsets simplifies the task of developing machine-independent COBOL programs.

b. The four levels of Federal Standard COBOL are identified as: Low, Low-Intermediate, High-Intermediate, and High. Each Federal Standard COBOL level is composed of either the high or low levels of the nucleus and ten of the eleven Functional Processing Modules (FPMs) defined in X3.23-1974. The four Federal Standard COBOL levels are reflected in the following table. The numbers in the table refer to the level within the FPM or nucleus as designated in X3.23-1974, and a dash in the table denotes that the corresponding FPM is omitted.

	Low Level	Low Inter-mediate Level	High Inter-mediate Level	High Level
NUCLEUS	1	1	2	2
FPMs				
TABLE HANDLING	1	1	2	2
SEQUENTIAL I-O	1	1	2	2
RELATIVE I-O	-	1	2	2
INDEXED I-O	-	-	-	2
SORT-MERGE	-	-	1	2
REPORT WRITER	-	-	-	-
SEGMENTATION	-	1	1	2
LIBRARY	-	1	1	2
DEBUG	-	1	2	2
INTER-PROGRAM COMMUNICATION	-	1	2	2
COMMUNICATION	-	-	2	2

1.5.2 Conformance to Federal Standard COBOL

A compiler implemented in conformance to Federal Standard COBOL must meet at least the following requirements.

a. The implementation must include all of the language elements of at least one of the levels of Federal Standard COBOL.

b. The implementation must meet all of the requirements defined in American National Standard COBOL, X3.23-1974, Section I, paragraph 1.5, Definition of An Implementation of American National Standard COBOL which is provided in section 1.4 of this VSR.

c. The implementation must provide a facility for the user to optionally specify a level of Federal Standard COBOL for monitoring his source program at compile time. The monitoring will be an analysis of the syntax used in a source program against the syntax included in the specified level of Federal Standard COBOL. Any syntax used in the source program that does not conform to that allowed by the user selected level of Federal Standard COBOL will be diagnosed. The syntax diagnosed as not conforming to the specified level will be identified to the user through a diagnostic message on the source program listing. The diagnostic message will contain, at least: (1) The identification of the source program line number in which the nonconforming syntax occurs, (2) the identification of the level of Federal Standard COBOL that supports

the syntax or that the syntax is nonstandard COBOL.

1.6. Use of the VSR

The Federal COBOL Compiler Testing Service may make full and free public disclosure of the Validation Summary Report (VSR) in accordance with the "Freedom of Information Act" (5 U.S.C. #552). The results of the validation are only for the purpose of satisfying United States Government requirements, and apply only to the computer system, operating system release, and compiler version identified in the VSR.

The COBOL Compiler Validation System is used to determine, insofar as is practical, the degree to which the subject compiler conforms to the COBOL Standard. Thus, the VSR is necessarily discretionary and judgmental. The United States Government does not represent or warrant that the statements, or any one of them, set forth in the VSR are accurate or complete. The VSR is not meant to be used for the purpose of publicizing the findings summarized therein.

1.7 Sources of Additional Information

FIPS PUB 21-1 defines the Federal COBOL Language Standard. This publication is available from the Office of ADP Standards Management, National Bureau of Standards, Washington, D. C., 20234.

The detailed COBOL language specifications are given in the publication "American National Standard Programming Language COBOL, X3.23-1974", available from the American National Standards Institute, 1430 Broadway, New York, New York 10018.

An explanation of the COBOL Compiler Validation System is contained in the CCVS User's Guide. This document explains how to run the compiler validation system. The User's Guide and a magnetic tape containing a copy of the CCVS programs are available from the National Technical Information Service, Springfield, Virginia, 22151. (Ordering information can be obtained from the Federal COBOL Compiler Testing Service.)

1.8. Requests for Interpretation

Questions regarding this VSR or the CCVS in general should be forwarded to the FCCTS. If any problem cannot be adequately resolved through the FCCTS, the request for interpretation will be forwarded to the Federal COBOL Interpretation Committee for final resolution.

A brochure describing the Validation process including the procedures for requesting a validation and resolution of questions involving interpretation of the current Federal Standard is available from the Department of the Navy, Federal COBOL Compiler Testing Service, Washington, D.C. 20376.

SECTION 2. DETAILED EVALUATION OF ERRORS.

This section summarizes the results of the compilation and execution of the programs comprising the COBOL Compiler Validation System (CCVS). The version of the CCVS used during this validation is shown inside the front cover of the VSR.

Section 2 is made up of a variable number of subsections. The number of subsections is dependent on the level of Federal COBOL being validated. There will be a subsection for each level of each module which is validated. If the high level of a module is validated then there will be two subsections for that module; one for the low level and one for the high level.

A validation of the low level of Federal Standard COBOL would result in three subsections being present. One for Nucleus level 1, one for Sequential I-O level 1, and one for Table Handling level 1.

Each error or deviation noted in this section makes reference to a program or functional COBOL module contained in Appendix A (Validation Summary Working Document). This reference provides the documented results of an occurrence of errors/deviataions detected during the running of the CCVS using the compiler within the environment identified within this document. The Validation Summary Working Document is presented in sequence by functional module, functional module level and program number as defined below.

Each program in the COBOL Compiler Validation System is identified by a 5-character program name. The name associates the routine with the functional processing module and level of American National Standard Programming Language COBOL tested within the program.

The five character name has the general format XXNMM. The first two characters are alphabetic and identify the functional module tested by the program. The permissable values are:

CM - Communication
DB - Debug
IC - Inter-Program Communication
IX - Indexed I-O
LB - Library
NC - Nucleus
RL - Relative I-O
RP - Report Writer
SG - Segmentation
SQ - Sequential I-O
ST - Sort-Merge
TH - Table Handling

The third character of the audit routine name is either a 1 or 2, and identifies the level of the functional module being tested. Each module and level is represented by several programs. The fourth and fifth characters of the program name are sequence numbers for programs which test features in the

same level of the same functional processing module.

As an example, the program name NC210 is the tenth program in the series of routines which test the second level of the Nucleus module.

Description of Section 2.

Each error/deviation is noted by number in the left hand margin opposite the language element in question. This number is used in section 3 to categorize errors by Federal level (See 1.5.1). Inserted directly below the language element is a brief description of the error. To the right of the langauge element is a page reference to X3.23-1974, American National Standard Programming Language COBOL. The reference at the end of the description of the error is to Appendix A which contains the detailed information collected during the validation. The reference is made up of the routine name followed by an A or B (A for compile time or syntax error and B for execution time or semantic error) and a number which makes the error unique in Appendix A.

Example:

```
  2.1 Nucleus level 1

      .
      .
      .
        Operational symbols: S V P                          II-21
2.1.9   ------------------------------------------------------
        * The scaling character 'P' is not permitted in a
        * PICTURE character-string.
        *                                        (NC101.4.2)
        ------------------------------------------------------

      .
      .
      .
    2.2  Sequential I-O Level 1
```

2.1.9 represents the ninth error for Nucleus Level 1

II-21 represents the page in X3.23-1974 where the language element is defined

* Boxes the description of the error/deviation

NC101.A.2 represents:

Program name - NC101
Syntax error - A
second error - 2

2.1 NUCLEUS LEVEL 1

Language Concepts I-75
Characters used for words I-76
0, 1, ..., 9
A, B, ..., Z
- (hyphen or minus)
Characters used for punctuation I-65
" quotation mark
(left parenthesis
) right parenthesis
. period
space
= equal sign
Characters used in editing. I-58
B space
0 zero
+ plus
- minus
CR credit
DB debit
Z zero suppress
* check protect
$ currency sign
, comma
. period
/ stroke
Separators. I-75
The separators, semicolon and comma, are not allowed II-1
Character-strings I-76
COBOL words I-76
Not more than 30 characters

2.1.1 ----------

* Only the first 12 positions of procedure-names and
* data-names are used by this compiler; therefore, these
* names must be unique within the first 12 characters.
* (Refer to Nucleus Module paragraph 5.3.2.2.1 on page
* I-76.)
* (NC104 B.3)

User-defined words. I-76
data-name
Must begin with an alphabetic character II-1
Must be unique; may not be qualified. . II-1
level-number
mnemonic-name
paragraph-name

2.1.2 ----------

* The compiler does not accept procedure-names composed
* entirely of the numeric characters (0-9). (Refer to
* Nucleus Module paragraph 5.3.2.2.1.1.3 Paragraph-name

```
*    on page I-78.)
*                                        (NC107 A.6 and NC107 A.8)
-----------------------------------------------------------------
```


2.1.3

```
*    The compiler does not accept the syntax of other than
*    01 level Data Division entries which begin in Area A.
*    (Refer to Reference Format paragraph 5.8.4 on page
*    I-108.)
*                                              (NC113 A)
-----------------------------------------------------------------
```


2.1.4

```
*    The compiler does not accept the syntax of certain
*    procedural statements which either end in column 72
*    of the current COBOL source image or the statement
*    is completed on the next line.  (Refer to paragraph
*    5.8.3.3 on page I-107.)
*                                   (NC107 A.7 and IH105 A.3)
-----------------------------------------------------------------
```

2.1.5

* The compiler does not accept mnemonic-names and
* condition-names for switches in the SPECIAL-NAMES
* paragraph. (Refer to Nucleus Module paragraph 3.1.3.2
* on page II-8.)
* (NC105 A)

alphabet-name clause

2.1.6

* The compiler does not accept the syntax of the alphabet-
* name clause in the SPECIAL-NAMES paragraph. (Refer to
* Nucleus Module paragraph 3.1.3.2 on page II-8.)
* (NC114 A.1)

CURRENCY SIGN clause

2.1.7

* The compiler does not accept PICTURE character-string
* symbols in the Data Division that were defined in the
* CURRENCY SIGN clause of the SPECIAL-NAMES paragraph.
* (Refer to Nucleus Module paragraph 3.1.3.4(6) on page
* II-10.)
* (NC107 A.1)

DECIMAL-POINT clause

2.1.8

* The compiler does not accept the reversal of decimal

```
*    point and commas for PICTURE character-string symbols
*    in the Data Division as defined in the DECIMAL-POINT
*    IS COMMA clause of the SPECIAL-NAMES paragraph.  (Refer
*    to Nucleus Module paragraph 3.1.3.4(7) on page II-10.)
*                                                  (NC107 A.2)
-----------------------------------------------------------------

Data Division . . . . . . . . . . . . . . . . . .  I-97
  Working-Storage Section . . . . . . . . . . . .  II-11
  The data description entry. . . . . . . . . . .  II-12
  The BLANK WHEN ZERO clause. . . . . . . . . . .  II-14
2.1.9 ------------------------------------------------------------
*    The compiler rejected an alphanumeric literal used to
*    initialize a data item described with a BLANK WHEN
*    ZERO clause.  (Refer to Nucleus Module paragraph
*    4.3.3(2) on page II-14.)
*                                        (NC107 A.3)
-----------------------------------------------------------------
  The data-name or FILLER clause. . . . . . . . .  II-15
  The JUSTIFIED clause (may be abbreviated JUST).  II-16
  Level-number. . . . . . . . . . . . . . . . . .  II-17
    01 through 10 (level numbers must be 2 digits) II-13
    77. . . . . . . . . . . . . . . . . . . . . .  II-11
  The PICTURE clause (may be abbreviated PIC) . .  II-18
    Character-string may contain 30 characters. .  II-18
2.1.10 -----------------------------------------------------------
*    The compiler does not accept the syntax for the PICTURE
*    character-string X(20)BX(12)0X(10) indicating the
*    character-string exceeded 30 characters.  (Refer to
*    Nucleus Module paragraph 4.7.2(3) on page II-19.)
*                                                  (NC105 A.1)
-----------------------------------------------------------------
    Data characters:  A X 9 . . . . . . . . . . .  II-18
    Operational symbols:  S  V  P . . . . . . . .  II-21
2.1.11 -----------------------------------------------------------
*    The compiler does not recognize the scaling position
*    character "P" in the PICTURE character-string.  (Refer
*    to Nucleus Module paragraph 4.7.4(8) on page II-20.)
*                                        (NC101 A.3)
-----------------------------------------------------------------
    Fixed insertion characters. . . . . . . . . .  II-21
      0       (may be used only in edited items)
      ,
      B       (may be used only in edited items)
      .
      $       (currency sign)
      + and -
      DB and CR
      /
    Replacement or floating characters. . . . . .  II-21
      $       (currency sign)
      + and -
```

```
                Z
                *
              Currency sign substitution. . . . . .  II-21
              Decimal point substitution. . . . . .  II-21
            The REDEFINES clause (may not be nested). . .  II-27
2.1.12      ----------------------------------------------------------
            *    Redefinition of 77 level entries is not permitted.
            *    (Refer to Nucleus Module paragraph 4.8.3(2); 4.8.4(2)
            *    on page II-27.)
            *                                          (NC101 A.1)
            ----------------------------------------------------------
            The SIGN clause . . . . . .  II-31
2.1.13      ----------------------------------------------------------
            *    The only option of the SIGN clause supported by the
            *    compiler is SIGN IS TRAILING SEPARATE CHARACTER.
            *    (Refer to Nucleus Module paragraph 4.10 on page II-31.)
            *                    (NC114 A.2, NC116 B.2 and NC116 B.3)
            ----------------------------------------------------------
            The SYNCHRONIZED clause (may be abbreviated SYNC) II-33
2.1.14      ----------------------------------------------------------
            *    The compiler does not accept the RIGHT option of the
            *    SYNCHRONIZED clause.  (Refer to Nucleus Module paragraph
            *    4.11.1 on page II-33.)
            *                                          (NC105 A.2)
            ----------------------------------------------------------
            The USAGE clause. . . . . .  II-35
              COMPUTATIONAL (may be abbreviated COMP)
              DISPLAY
            The VALUE clause. . . . . .  II-36
              literal
2.1.15      ----------------------------------------------------------
            *    A decimal point used as part of a numeric literal to
            *    represent noninteger values in a VALUE clause is not
            *    recognized by the compiler.  (Refer to Nucleus Module
            *    paragraph 4.13.4(1) on page II-36.)
            *                                          (NC101 A.2)
            ----------------------------------------------------------

          Procedure Division. . . . . .  I-99
            Conditional expressions . . . . . .  II-41
              Simple condition. . . . . .  II-41
                Relation condition. . . . . .  II-41
                  Relational operators
                    [NOT] GREATER THAN
                    [NOT] LESS THAN
                    [NOT] EQUAL TO
                  Comparison of numeric operands. . . . . .  II-42
                  Comparison of nonnumeric operands (oper-
                      ands must be of equal size) . . . . .  II-42
                Class condition . . . . . .  II-43
                  NOT option
                Switch-status condition . . . . . .  II-44
```

2.1.16 ----------

* An incorrect answer was produced by an ADD identifer/
* literal series which included a mixture of integer and
* noninteger values. (Refer to Nucleus Module paragraph
* 5.5.4(2) on page II-56.)
* (NC106 B.2)

TO identifier
GIVING identifier
ROUNDED phrase
SIZE ERROR phrase

2.1.17 ----------

* The ON SIZE ERROR path was not taken and the resultant
* identifier was modified when a size error condition
* occurred on the ADD statement. (Refer to Nucleus Module
* paragraph 5.3.2 on page II-50.)
* (NC106 B.1)

2.1.18 ----------

* The compiler does not support the ALTER statement.
* (Refer to Nucleus Module paragraph 5.6 on page II-57.)
* (NC102 A.1)

2.1.19 ----------

* The compiler rejected the ROUNDED phrase of the DIVIDE
* statement and produced incorrect results when the
* composite of operands equaled 18 digits.
* (NC117 A.3 and NC117 B.5

SIZE ERROR phrase

2.1.20 ----------

* The ON SIZE ERROR path was not taken and the resultant-
* identifier was modified when a size error condition
* occurred on the DIVIDE statement. (Refer to Nucleus
* Module paragraph 5.3.2 on page II-50.)
* (NC117 B.1, 2, & 3)

The GO TO statement (procedure-name is required) II-65
DEPENDING ON phrase
The IF statement (statements must be imperative) II-66
ELSE phrase
The INSPECT statement (only single character
data item) II-68

2.1.21 ---

* The compiler does not support the INSPECT statement.
* (Refer to Nucleus Module paragraph 5.14 on page II-68.)
* (NC115 A)

TALLYING phrase
ALL
LEADING
CHARACTERS
REPLACING phrase
ALL
LEADING
FIRST
CHARACTERS
TALLYING and REPLACING phrases
The MOVE statement II-74
TO identifier

2.1.22 ---

* The move of an alphanumeric elementary item to a numeric
* elementary item did not follow the rules for an elementary
* MOVE. (Refer to Nucleus Module paragraph 5.14.4(4)b and
* 5.14.4(6) on page II-75 and II-76.)
* (NC104 B.2)

---

identifier series
The MULTIPLY statement II-77

2.1.23 ---

* The execution of a test of the MULTIPLY statement caused
* the audit routine to abnormally terminate. (Refer to
* Nucleus Module paragraph 5.16 on page II-77.)
* (NC101 B)

BY identifier
GIVING identifier
ROUNDED phrase
SIZE ERROR phrase

2.1.24 ---

* The ON SIZE ERROR path was not taken and the resultant
* identifier was modified when a size error condition
* occurred on the MULTIPLY statement. (Refer to Nucleus
* Module paragraph 5.3.2 on page II-50.)
* (NC120 B.1)

The PERFORM statement. II-78

2.1.25 ---

* A PERFORM statement nested 20 levels deep failed to

```
        *    complete execution.  (Refer to the Nucleus Module
        *    paragraph 5.17.4(7) on page II-84.)
        *                                              (NC102 B.2)
        ------------------------------------------------------------
          procedure-name
          THRU phrase
          TIMES phrase
2.1.26  ------------------------------------------------------------
        *    The compiler does not accept the syntax for the
        *    "identifier TIMES" phrase when the data description
        *    entry for the identifier includes a "S" symbol (sign)
        *    in the PICTURE character string.  (Refer to Nucleus
        *    Module paragraph 5.17.4(6)b on page II-80.)
        *                                              (NC102 A.2)
        ------------------------------------------------------------
        The STOP statement . . . . . . . . . . . . . . . .  II-85
          literal
          RUN
        The SUBTRACT statement . . . . . . . . . . . . . .  II-89
          identifier/literal series
2.1.27  ------------------------------------------------------------
        *    An incorrect answer was produced by a SUBTRACT
        *    identifier/literal series which included a mixture of
        *    integer and noninteger values.  (Refer to Nucleus
        *    Module paragraph 5.20.4(2) on page II-90.)
        *                                              (NC106 B.5)
        ------------------------------------------------------------
          FROM identifier
          GIVING identifier
          ROUNDED phrase
          SIZE ERROR phrase
2.1.28  ------------------------------------------------------------
        *    Several syntax messages were produced on SUBTRACT
        *    statements which included both the ROUNDED and ON SIZE
        *    ERROR phrases.
        *                                              (NC106 A.2)
2.1.29  ------------------------------------------------------------
        *    The ON SIZE ERROR path was not taken and the resultant-
        *    identifier was modified when a size error condition
        *    occurred on the SUBTRACT statement.  (Refer to Nucleus
        *    Module paragraph 5.3.2 on page II-50.)
        *                                              (NC106 B.4)
        ------------------------------------------------------------
```

2.2 SEQUENTIAL I-O LEVEL 1

2.2.1

```
*    The compiler does not support the RERUN clause in the
*    I-O-CONTROL paragraph.  (Refer to Sequential Module
*    paragraph 2.1.3.1 on page IV-6.)
*                                                (SQ113 A)
```


2.2.2

```
*    The compiler does not support the CODE-SET clause when
*    alphabet-name is defined in the SPECIAL-NAMES paragraph
*    (Refer to Sequential Module paragraph 3.5 on page IV-12.)
*                                                (SQ111 A)
```


2.2.3

```
*    The compiler does not support the STANDARD option of
*    the LABEL RECORDS clause.  (Refer to Sequential Module
*    paragraph 3.7 on page IV-14.)
*                                                (SQ102 A)
```

2.2.4 ----------

* A program terminated execution in a test exercising
* the REWRITE statement. (Refer to Sequential Module
* paragraph 4.4 on page IV-31.)
* (SQ115 B)

2.2.5 ----------

* The compiler does not support the DECLARATIVE section
* or USE statement. (Refer to Procedure Division para-
* graph 5.7.1.1 on page I-99 and Nucleus Module paragraph
* 4.5 on page IV-32.)
* (SQ105 A)

2.2.6 ----------

* Line overprinting did not occur for the statement
* WRITE ... AFTER 0 LINE. (Refer to Sequential Module
* paragraph 4.6.4(9)b on page IV-35.)
* (SQ101 B)

2.3 TABLE HANDLING LEVEL 1

Language Concepts
- User-defined words. I-76
  - index-name
- Subscripting - 3 levels I-89

2.3.1
```
*    A syntax message was issued for a subscript that was
*    signed.  (Refer to Subscripting paragraph 5.3.3.8.2
*    on page I-89.)
*                                          (TH105 A.1)
```

- Indexing - 3 levels I-89

2.3.2
```
*    The compiler does not support the Indexing features
*    USAGE IS INDEX, INDEXED BY or SET statement.
*                                          (TH101 A)
```

Data Division
- The OCCURS clause III-2
  - integer TIMES
  - INDEXED BY index-name series
- The USAGE IS INDEX clause III-5

Procedure Division
- Relation conditions III-6
  - Comparisons involving index-names and/or index data items
- Overlapping operands. III-6
- The SET statement III-11
  - index-name/identifier series
  - index-name
  - UP BY identifier/integer
  - DOWN BY identifier/integer
  - index-name series

SECTION 3. COMPILER STATUS

Section 1.5 explains the four levels of Federal Standard COBOL. This section lists the discrepancies described in Section 2 by the Federal level in which the problem occurs. All errors listed for a lower level are also errors in any higher level, even though they are listed only in the lower level. The paragraph number from Section 2 is used to reference the errors in each Federal level.

3.1. Low level

2.1.1 - Names are limited to 12 characters.
2.1.2 - Procedure-names must not be entirely numeric characters.
2.1.3 - Entries other than 01 level are not accepted in Area A.
2.1.4 - Procedure statements ending in column 72 are not accepted.
2.1.5 - Switches are not supported.
2.1.6 - Alphabet-name clause is not supported.
2.1.7 - CURRENCY SIGN clause does not function correctly.
2.1.8 - DECIMAL-POINT clause does not function correctly.
2.1.9 - Data item described with BLANK WHEN ZERO could not be initialized with VALUE clause.
2.1.10 - PICTURES with large character strings are not accepted.
2.1.11 - PICTURE scaling position character "P" is not supported.
2.1.12 - Redefinition of 77 level entries is not permitted.
2.1.13 - SIGN IS TRAILING SEPARATE CHARACTER is only option implemented.
2.1.14 - RIGHT option of SYNCHRONIZED clause is not accepted.
2.1.15 - Decimal point in VALUE IS clause is not recognized.
2.1.16 - ADD identifier/literal series produced an incorrect answer.
2.1.17 - ON SIZE ERROR of ADD statement did not function correctly.
2.1.18 - ALTER statement is not supported
2.1.19 - ROUNDED phrase on a DIVIDE statement was rejected.
2.1.20 - ON SIZE ERROR of DIVIDE did not function correctly.
2.1.21 - INSPECT statement is not supported.
2.1.22 - Move of Alphanumeric to numeric data item was incorrect.
2.1.23 - Program abnormally terminated when testing the MULTIPLY.
2.1.24 - ON SIZE ERROR of MULTIPLY statement functioned incorrectly.
2.1.25 - PERFORM nested 20 levels failed to complete execution.
2.1.26 - Sign in identifier of PERFORM is not permitted.
2.1.27 - SUBTRACT identifier/literal series produced an incorrect answer.
2.1.28 - SUBTRACT statement with ON SIZE and ROUNDED was not accepted.
2.1.29 - ON SIZE ERROR of DIVIDE statement functioned incorrectly.
2.2.1 - RERUN clause is not supported.
2.2.2 - CODE-SET clause with alphabet-name phrase is not supported.
2.2.3 - LABEL RECORD STANDARD is not supported.
2.2.4 - Program terminated when testing the REWRITE.
2.2.5 - DECLARATIVE and USE features are not supported.
2.2.6 - Overprinting did not occur for WRITE .. AFTER 0 LINES.
2.3.1 - Subscripts cannot be signed.
2.3.2 - Indexing feature of the TABLE HANDLING Module is not

implemented.

3.2. Low-Intermediate Level

Not tested.

3.3. High-Intermediate

Not tested.

3.4. High Level

Not tested.

SECTION 4 SOFTWARE ENVIRONMENT.

The compiler referenced in this document was validated using the software environment described in this section. When using a modification of the described environment, the compiler may or may not continue to conform to the Standard. It should be noted that during the validation process, an attempt is made to validate as many different options as possible.

The use of compiler options, implementor-names in the Environment Division and any form of optimization which is not described in this report could cause the compiler to produce a program that does not perform according to the specifications of Standard COBOL. Only the environment described in this document has been used with this compiler to satisfy the requirements of FIPS PUB 21-1 and FMR 101-32.1305.1a. (Any deviations which must be corrected as per the referenced FMR are described in Sections 2 and 3 of this report.)

1. Options or parameters used on the processor call statement for the compiler: The following options/parameters were used during the validation.

Options specified: None.

Options defaulted: None.

2. Environment Division implementor-names.

Printer destined files

PRINTER

Tape files

XXXXXNNN. Implementor-name was defined at execution-time.

Sequential Mass-storage files

XXXXXNNN. Implementor-name was defined at execution-time.

Random Access files

N/A

Sort files (SD)

N/A

Switch names

Not supported by the compiler.

Source Computer names

XXXXXC82. (No name indicated by BLIS/COBOL Programmer's Manual)

Object Computer names

XXXXXC83. (No name indicated by BLIS/COBOL Programmer's Manual)

3. Optimization. The compiler may or may not have optimization features. If there was an optimization feature available, it was used during the validation process (during a separate execution of the Compiler Validation System) to determine if its use causes the compiler to produce a program which does not give the expected results. If the optimization is invoked through the compiler call statement then it is mentioned in paragraph 1 above. If it is invoked through the introduction of syntax in other than the Data and Procedure Divisions of the source program it is shown below. Optimization which would require modification to the Data and Procedure Divisions is not considered in this report in that it is beyond the scope of the use of standard COBOL and the validation process.

N/A

4. Compiler.

IPI BLIS/COBOL Version 2.0

5. Operating system.

IPI BLIS/COBOL Verson 2.0

6. COBOL reference manual.

BLIS/COBOL Programmer's Manual - Dated 11/20/75

APPENDIX A

VALIDATION SUMMARY WORKING DOCUMENT

A-1 This appendix is a working paper produced during the validation and documents the results of the compilation and execution of each of the programs comprising the CCVS. The results contained herein are based on the use of the compiler within the Validation Environment identified in this appendix. This appendix (Validation Summary Working Document) is not part of the official Validation Summary Report (VSR) and is not intended to reflect in any way the compiler's usefulness or degree of conformance to the language specifications.

The reader of this appendix should keep in mind that the same problem area may appear in more than one program, but is considered only as one single discrepancy and as such is reflected only once in the body of the VSR. (The VSR will in turn only reference the first occurrence of the problem in the appendix.)

This appendix is divided into two parts. The first part describes the Validation Environment. The second part of the document is divided into categories of information: compilation and execution results.

The reference document for COBOL is FIPS PUB 21-1 (X3.23-1974).

VALIDATION ENVIRONMENT

COMPILER IDENTIFICATION: IPI BLIS/COBOL - Version 2.0

COMPUTER SYSTEM: MMI NOVA 1200 Compatible

OPERATING SYSTEM: IPI BLIS/COBOL - Version 2.0

NUCLEUS MODULE LEVEL 1

NC101

A. Compilation

1. Compiler messages of the type

244C WRK-DS-06V06 REDEFINES ONLY PERMITTED FOR LEVELS 01-49

were produced by the compiler on 77 level WORKING-STORAGE entries which specified the REDEFINES phrase.

2. Compiler messages of the type

210C 11111 ILLEGAL AREA ENTRY OR MISSING PREVIOUS PERIOD

were produced when noninteger numeric literals were the object of the VALUE IS clause.

3. Compiler messages were produced indicating that the PICTURE character-string symbol "P" is ignored. The BLIS/COBOL Programmers Manual states that this feature is not supported.

4. Compiler messages of the type

107W COMPUTATIONA THIS CLAUSE IS IGNORED BY BLIS/COBOL VERSION 1.8

were produced by the compiler on all Data Division entries which included USAGE COMPUTATIONAL or USAGE COMP in their data descriptions. The BLIS/COBOL Programmers Manual states that this feature is not supported.

B. Execution

The program stopped during execution following the printing of the results of MPY-TEST-1. When the program was terminated at the operator's console the following message was displayed

3760 SUSPEND #2 USER REQ.

This program tests the different forms of the level 1 MULTIPLY and DIVIDE statement.

NC102

A. Compilation

1. Compiler messages were produced by the compiler on all references to the ALTER verb. The BLIS/COBOL Programmers Manual states that the ALTER statement is not supported.

2. Compiler messages were produced on all PERFORM ... identifier TIMES where the data description of the identifier included a "S" symbol in the PICTURE character-string.

B. Execution

1. All ALTER tests failed due to A.1 above.

2. Program execution stopped with the following system message

11350 SUSPEND #16.

The test was testing a PERFORM statement which was nested 20 levels deep.

NC103

A. Compilation

All references to switches in the SPECIAL-NAMES paragraph were flagged by the compiler. The BLIS/COBOL Programmers Manual states that the mnemonic-name and condition-name of the SPECIAL-NAMES paragraph are not supported.

B. Execution

The size of the object program was too large to execute on this system. This program tests the different options of the IF statement.

NC104

A. Compilation

Same as NC101 A.3 the PICTURE symbol "P".

B. Execution

1. MOVE-TEST-6 and MOVE-TEST-25 failed due to NC104 A above. The MOVE statement operands specified the scaling symbol "P".

2. The following tests failed to give the correct answer when the sending item was an alphanumeric elementary item and the receiving item was a numeric elementary item.

MOVE-TEST-36. MOVE PIC X(5) TO PIC 999V99

Computed 123.45
Expected 345.00

MOVE-TEST-37. MOVE PIC X(5) TO PIC 9(5)V99

Computed 123.45
Expected 12345.00

3. Although no compile-time or execution-time messages were issued for data-names and procedure-names which were greater than 12 characters, only the first 12 characters of the name are used by this compiler.

NC105

A. Compilation

1. The compiler produced a message on the PICTURE character-string X(20)BX(12)0X(10). The message stated that "EDITED PIC CHAR-STRINGS MAY NOT EXCEED 30 CHARS".

2. The compiler produced messages indicating that the RIGHT option of the SYNCHRONIZE clause was ignored by BLIS/COBOL Version 2.0. The BLIS/COBOL Programmers Manual states that the word RIGHT of the SYNCHRONIZED clause is not supported.

3. The compiler produced a message indicating that the COMP clause was ignored by BLIS/COBOL Version 1.8. The BLIS/COBOL Programmers Manual states that USAGE IS COMPUTATIONAL is not supported.

B. Execution

The size of the object program was too large to execute on this system. This program tests different options of the MOVE statement.

NC106

A. Compilation

1. Same as NC101 A.1 thru A.4.

2. Between SUB-TEST-6 and SUB-TEST-10 of the source program the compiler produced several messages such as

13960 461C S6-FAIL-6 COBOL WORD CHARS MUST BE A-Z, 0-9, HYPHEN

14040 317C FRO UNDEFINE DATA-NAME
14070 442C . FROM MUST TERMINATE SUMMED SERIES (SUBTRACT VERB)
14510 144C DO NOT A VERB (VERB EXPECTED)

The words identified in the messages were parts words from the COBOL statement and new words not present in the programs. The COBOL source lines were testing the SUBTRACT statement which included the ROUNDED and ON SIZE ERROR phrases.

3. Compiler messages were produced stating that "PROCEDURE-NAME TABLE IS FULL IN COMPILER".

B. Execution

1. ADD-TEST-3 thru ADD-TEST-5, ADD-TEST-8 thru ADD-TEST-10, ADD-TEST-20 thru ADD-TEST-23, ADD-TEST-26 thru ADD-TEST-27, ADD-TEST-39 thru ADD-TEST-42, and ADD-TEST-52 test the ON SIZE ERROR phrase of the ADD statement. In each test the ON SIZE ERROR path was not taken when a size error condition occurred. Also in each case the contents of the resultant-identifier(s) which should not be affected when a size error occurs was altered.

2. ADD statements of the type ADD operand-1, operand-2 ... GIVING identifier in which the operands were a mixture of integer and noninteger values did not produce the expected answers.

	Computed	Expected
ADD-TEST-15	355888.666333	344777.777443
ADD-TEST-17	355555.000000	333334.000000

3. ADD-TEST-30 thru ADD-TEST-32 and ADD-TEST-38 failed because the ADD statement operands specified the scaling symbol "P" in the PICTURE character-string. The symbol "P" is not supported by the compiler.

4. SUB-TEST-3, SUB-TEST-17 thru SUB-TEST-20 and SUB-TEST-23 thru SUB-TEST-24 test the ON SIZE ERROR phrase of the SUBTRACT statement. In each test the ON SIZE ERROR path was not taken when a size error condition occurred. Also in each case the contents of the resultant-identifer(s) which should not be affected when a size error occurs was altered.

5. SUBTRACT statements of the type SUBTRACT operand-1, operand-2, ... FROM operand-n GIVING ... in which the operands were a mixture of integer and noninteger values did not produce the expected answer.

	Computed	Expected
SUB-TEST-10	311000.222333	322111.111223
SUB-TEST-12	-355888.666333	-344777.777443

6. SUB-TEST-13 and SUB-TEST-27 thru SUB-TEST-29 failed because the SUBTRACT statement operands specified the scaling symbol "P" in the PICTURE character-string.

7. SUB-TEST-36 thru SUB-TEST-53 were not executed due to NC106 A.3 above.

NC107

A. Compilation

1. Data Division entries of the type

   77 DATA-J PICTURE IS WWWWW.

   were flagged by the compiler as containing an "ILLEGAL PIC CHAR STRING". The character W was defined as an operand of the CURRENCY SIGN IS literal clause in the SPECIAL-NAMES paragraph.

2. Compiler messages were produced on numeric literals of the type 9.999.999,9. The clause DECIMAL POINT IS COMMA was specified in the SPECIAL-NAMES paragraph of the program.

3. The compiler message

   1630 261C 000 NUMERIC ITEMS REQUIRE VALUE LITERAL TO BE NUMERIC

   was issued by the compiler on the following Data Division entry

   77 DATA-P PICTURE 999 VALUE "000" BLANK WHEN ZERO.

4. Compiler messages were produced on 77 level entries which included the REDEFINE phrase. See NC101 A.1.

5. The ALTER statement is not supported by this compiler. See NC102 A.1.

6. For procedure-names composed only of numeric digits and greater than 18 characters in length the compiler produced the message "NUMERIC LITERALS MUST BE 1-18 DIGITS IN SIZE".

7. The message

```
06490  415W  SEP-WRITE-1.  REFERENCE TO AN UNDEFINED
                          PROCEDURE-NAME
```

was produced by the compiler on a GO TO statement in which the statement ended in column 72 of the COBOL source line.

8. The message

```
12580  415W  50  REFERENCE TO AN UNDEFINED PROCEDURE-NAME
```

was produced by the compiler for the following procedures:

```
02.
      GO TO 50.
50.   PERFORM FAIL.
      GO TO NUM-WRITE-1.
```

B. Execution

The program stopped execution when encountering a paragraph in which all the statements were Right Justified to margin R (column 72).

NC108

A. Compilation

1. The mnemonic-name and switch-condition names in the SPECIAL-NAMES paragraph are not supported by this compiler.

2. Same as NC105 A.2 - RIGHT option of the SYNCHRONIZED clause.

3. A compiler message was produced for the Data Division entry:

```
02  MORE-COMPLETE-FORMAT
    BLANK WHEN ZERO
    PICTURE IS 9
    SYNCHRONIZED RIGHT
    DISPLAY
        VALUE IS "5".
```

The message stated that "NUMERIC ITEMS REQUIRE VALUE LITERAL TO BE NUMERIC" even though the data content of the alpha-numeric literal was numeric.

4. Same as NC105 A.3 - USAGE IS COMPUTATIONAL clause.

5. Same as NC107 A.1 - CURRENCY SIGN IS literal.

6. Program compilation terminated with the system message

```
WORKING-STORAGE
103.644  SUSPEND #3 INVALID OBJECT MODULE FORMAT.
```

B. Execution

Execution of this program was not attempted due to A.6 above. This program tests the GO TO and PERFORM statements.

NC109

A. Compilation

Program compilation terminated with the system message

```
PROCEDURE DIVSN
127.464  SUSPEND #6 OUT OF RANGE SUBSCRIPT
```

B. Execution

Execution was not attempted due to NC109 A above. This program tests the ACCEPT, STOP, and DISPLAY statements.

NC110

A. Compilation

Same as NC102 A.1 - The ALTER Statement.

B. Execution

No errors.

NC111

A. Compilation

Same as NC101 A.3 - PICTURE character-string symbol "P".

B. Execution

The system issued the message

SUSPEND #3 INVALID OBJECT MODULE FORMAT

when an attempt was made to execute the program. This program tests various options of the ADD and SUBTRACT statements.

NC112

A. Compilation

No errors.

B. Execution

No errors.

NC113

A. Compilation

The compiler produced the message

210C FILLER ILLEGAL AREA-A ENTRY OR MISSING PREVIOUS PERIOD

on the following Data Division entry

02 FILLER PICTURE X(42) VALUE ...

where the word FILLER started in column 11 of the source line.

B. Execution

The program terminated with the system message

1170 SUSPEND #16 MAX PERFORM NESTING EXCEEDED.

NC114

A. Compilation

1. The compiler message

00590 112W AMERICAN-IND IMPLEMENTOR-NAME/ALPHABET-NAME IS UNDEFINED

was produced on the entry AMERICAN-INDIAN IS NATIVE in the SPECIAL-NAMES paragraph. The BLIS/COBOL Programmers Manual states that the alphabet-name clause is not supported.

2. Compiler messages were produced on Data Division entries specifying the LEADING option of the SIGN clause. The BLIS/COBOL Programmers Manual states that the LEADING clause is not supported. This compiler uses only the SIGN IS TRAILING SEPARATE CHARACTER form of the SIGN clause for the position and mode of representation of the operational SIGN.

3. Same as NC101 A.3 - The PICTURE character-string symbol "P".

4. Program compilation terminated with the system message

6.060 SUSPEND #3 INVALID OBJECT MODULE FORMAT

B. Execution

Program execution was not attempted due to NC114 A.4 above. This program tests the various options of the SIGN and REDEFINES.

NC115

A. Compilation

All references to the COBOL INSPECT verb were flagged by the compiler as not supported.

B. Execution

Due to NC115 A above execution of this program was not attempted.

NC116

A. Compilation

This program contains data descriptions which use the LEADING option of the SIGN clause in its definition. See NC114 A.2.

B. Execution

1. Tests SIGN-TEST-01.01 thru SIGN-TEST-01.04, MOVE-TEST-03.01 MOVE-TEST-03.03, MOVE-TEST-05.01, MOVE-TEST-05.02, and MOVE-TEST-07.01 thru MOVE-TEST-07.06 failed due to NC116 A above.

2. In IF-TEST-02.01 and IF-TEST-02.03 the comparison of a data item described as S9(8) SIGN TRAILING VALUE - 01234567 with a data item described as S9(7) COMPUTATIONAL VALUE - 1234567 and S9(7) DISPLAY VALUE -1234567 respectively did not give an equal condition when used in an IF statement. The only form of the SIGN clause supported by this compiler is SIGN IS TRAILING SEPARATE CHARACTER.

3. In MOVE-TEST-05.04 a data item described as S9(4) SIGN IS TRAILING is moved to a data item described as S9(5) SIGN IS TRAILING SEPARATE.

   Computed 036210
   Expected 03621-

NC117

A. Compilation

1. The same type of compiler message on the REDEFINES of 77 level entries, noninteger literals in the VALUE clause, PICTURE symbol P and USAGE COMPUTATIONAL clause resulted from compilation of the program as was noted in NC101 A above.

2. The same type of compiler messages on the SIGN clause resulted from compilation of this program as was noted in NC114 A.2 above.

3. The compiler message

   373C DIVIDE 18 DIGIT ACCUM DOES NOT PERMIT ROUNDING INDICATED

   was produced on the following statement

   DIVIDE A18ONES-DS-09V09 INTO WRK-DS-09V09 ROUNDED ON SIZE ERROR ...

B. Execution

1. DIV-TEST-9 checked the resultant-identifier (DIV7) following execution of the statement

   DIVIDE 0.097 INTO DIV7 ROUNDED ON SIZE ERROR ...

   where a size error condition was expected. The ON SIZE ERROR path was taken as expected, but the contents of DIV7 which should not be altered when a size error condition occurs was altered.

   Computed Data 9.0
   Expected Data 9.6

2. Tests DIV-TEST-11 thru DIV-TEST-13 checked the ON SIZE ERROR path and contents of the resultant-identifier resulting from execution of the statement

   DIVIDE DIV4 INTO DIV2 GIVING DIV10 ON SIZE ERROR...

   and

   DIVIDE 1.0051 INTO 100.50 GIVING DIV8 ROUNDED ON SIZE ERROR...

   The ON SIZE ERROR path was not taken where a size error condition was expected and the data contents of the resultant-identifiers were altered.

3. In DIV-TEST-17 and DIV-TEST-18 the ON SIZE ERROR path was not taken on a size error condition for the following

statements

DIVIDE DIV2 BY DIV4 GIVING DIV10 ON SIZE ERROR...
DIVIDE 100.50 BY 1.0051 GIVING ROUNDED ON SIZE ERROR...

4. Tests DIV-TEST-21 thru DIV-TEST-24, DIV-TEST-30, DIV-TEST-35, DIV-TEST-40, DIV-TEST-45, and DIV-TEST-50 all failed. The above tests used a combination of identifiers in the DIVIDE statement which specified the PICTURE character symbol "P" and the SIGN IS LEADING in their Data Descriptions. See NC117 A above.

5. DIV-TEST-27 failed due to NC117 A.3 above.

NC118

A. Compilation

Program compilation terminated with the system message

124.350 SUSPEND #3 INVALID OBJECT MODULE FORMAT

B. Execution

Due to NC118 A above program execution was not attempted.

NC119

A. Compilation

1. The same type of compiler message on the REDEFINES OF 77 level entries, noninteger literals in the VALUE clause, PICTURE symbol P and USAGE COMPUTATIONAL clause resulted from compilation of this program as was noted in NC101 A above.

2. The same type of compiler message on the SIGN clause resulted from compilation of this program as was noted in NC114 A.2 above.

B. Execution

1. In SUB-TEST-3, SUB-TEST-7 and SUB-TEST-53 the SUBTRACT statement

SUBTRACT N-10 FROM N-13 ON SIZE ERROR ...

and

SUBTRACT N-25 FROM -99999 GIVING N-26 ON SIZE ERROR ...

and

SUBTRACT 1 FROM WRK-CS-03V00 ON SIZE ERROR ...

fail to take the ON SIZE ERROR path when a size error condition occurred.

2. SUB-TEST-10, SUB-TEST-12, SUB-TEST-13, SUB-TEST-17 thru SUB-TEST-20, SUB-TEST-23, SUB-TEST-24, SUB-TEST-27 thru SUB-TEST-29, SUB-TEST-36, SUB-TEST-37, and SUB-TEST-39 thru SUB-TEST-46 failed due to A above.

NC120

A. Compilation

Same as NC119 A above.

B. Execution

1. MPY-TEST-19 and MPY-TEST-20 tested the use of the ON SIZE ERROR clause with the MULTIPLY statement. The ON SIZE ERROR path was not taken when a size error condition occurred. Also the contents of the resultant-identifier which should not be affected when a size error condition occurs was altered.

2. Tests MPY-TEST-9 thru MPY-TEST-12, MPY-TEST-14, MPY-TEST-23, MPY-TEST-24, MPY-TEST-27, MPY-TEST-29 thru MPY-TEST-31, MPY-TEST-33 thru MPY-TEST-35 failed due to A above.

SEQUENTIAL ACCESS LEVEL 1

GENERAL: (1) Because there was only one magnetic tape drive on the system the files which were to be placed on magnetic tape were assigned to disk.

(2) All references to CLOSE UNIT and CLOSE REEL were deleted from the test programs. The BLIS/COBOL Programmers Manual states that the REEL and UNIT phrases of the CLOSE statement are not supported.

SQ101

A. Compilation

No errors.

B. Execution

In paragraph WRI-TEST-008 and WRI-TEST-016 the statement WRITE ... AFTER 0 LINE is tested. Line overprinting was expected by virtue of the fact that no line advancing (0) was indicated. However, on this system line advancing did occur before the line was printed.

SQ102

A. Compilation

The STANDARD option of the LABEL RECORD clause was flagged by the compiler. The BLIS/COBOL Programmers Manual states that the STANDARD form of this clause is not supported.

B. Execution

No errors.

SQ103

The procedure and data names were not unique within the first 12 positions as required by this compiler, therefore the program was not run.

SQ104

A. Compilation

The maximum physical record size and logical record size is 512 characters (bytes) for this system.

B. Execution

No errors.

SQ105

A. Compilation

The compiler flagged the word DECLARATIVES in the Procedure Division. The BLIS/COBOL Programmers Manual states that DECLARATIVE and USE statements are not supported.

B. Execution

When an attempt was made to execute the program the following system message was displayed

SUSPEND #3 INVALID OBJECT MODULE FORMAT

The program creates and processes a file with fixed length records.

SQ106 and SQ107

The procedure and data names were not unique within the first 12 positions as required by this compiler, therefore this program was not run.

SQ108

A. Compilation

No errors were noted on initial program compilation. Subsequent attempts to compile the program resulted in the system message

611.720 SUSPEND #3 INVALID OBJECT MODULE FORMAT

being displayed at the terminal. The program was testing use of the READ ... INTO statement.

B. Execution

Due to A above this program was not run.

SQ109

A. Compilation

No errors.

B. Execution

This program creates a file with 750 records and then uses

different forms of the READ statement to read the file. An unexpected end-of-file occurred when reading the file with the statement READ ... RECORD AT END ... . A similar test in program SQ104 passed.

SQ110

A. Compilation

No errors.

B. Execution

No errors.

SQ111

A. Compilation

This compiler did not accept the CODE-SET IS alphabet-name where alphabet-name is defined in the SPECIAL-NAMES paragraph as required by the language specifications. Support of the STANDARD-1 (ASCII) code set is claimed however the word STANDARD-1 must be the object of the CODE-SET clause.

B. Execution

Due to A above the CODE-SET test failed.

SQ112

A. Compilation

No errors.

B. Execution

Program execution terminated before normal completion with the system message

3630 SUSPEND #55 VIOLATION, END EXTENT 02 SOURCE 1

SQ113

A. Compilation

This compiler does not support the RERUN clause.

B. Execution

This program uses as input the file produced in SQ112. Due to SQ112 B and SQ113 A above this program was not executed.

SQ114

A. Compilation

No errors.

B. Execution

All the tests in this program failed. The program was testing use of the SAME AREA clause.

SQ115

A. Compilation

No errors.

B. Execution

Program execution terminated while executing test REWRITE-TEST-01. This test was testing the REWRITE record-name form of the REWRITE clause.

SQ116

A. Compilation

Program compilation terminated before normal completion with the system message

611.720 SUSPEND #3 INVALID OBJECT MODULE FORMAT.

This program tests use of the REWRITE ... FROM option of the REWRITE statement.

B. Execution

Due to A above this program was not executed.

SQ117

A. Compilation

No errors.

B. Execution

Program execution terminated before normal completion with the system message

4640 SUSPEND #55 BOUNDARD VIOLATION END EXTENT 02 SOURCE 2

The program was in the process of creating the 51st to 100th record of the file with the statement WRITE record-name FROM identifier. The record size of the identifier was larger than that of the record-name record.

S3118

A. Compilation

Same as S0111 A above.

B. Execution

No errors.

TABLE HANDLING LEVEL 1

TH101

A. Compilation

This compiler does not support the indexing feature of the COBOL Table Handling module. All uses of the elements

USAGE IS INDEX
INDEXED BY
SET statement
relative indexing

were flagged by the compiler.

B. Execution

The program was not executed due to A above.

TH102 and TH103

A. Compilation

No errors.

B. Execution

No errors.

TH104

A. Compilation

Same as TH101 A above.

B. Execution

Same as TH101 B above.

TH105

A. Compilaton

1. Compiler messages of the type

05110 33W 10+ SUSCRIPT LIT'RL MUST BE UNSIGNED, NON-ZERO INTGR

were produced on subscripts which were composed of a numeric integer preceeded by a plus sign.

2. The compiler message

```
05900  073E TO ILLEGAL SYNTAX ROUTINE # IN COMPILER *****
```

was produced on the following source code.

```
058000       MOVE 1 TO SUBSCRIPT-3
059000       MOVE 1 TO SUBSCRIPT-2.
```

3. The message

```
04270  415W  TIST-41.M  REFFRENCE TO AN UNDEFINED PROCEDURE-
             NAME.
```

was produced by the compiler. The line 04270 in the above message is a source line which contains only a procedure-name which is the object of a GO TO statement. The source code sequence was

```
042600       IF ... ELSE GO TO
042700       TIST-41.
042800       GO TO ...
042900  TIST-41.
```

B. Execution

The system message

```
0  SUSPEND #76 NON CURRENT PROG MODULE LOADED
```

was displayed at the console when an attempt was made to execute the program.

TH106 thru TH110

A. Compilation

Same as TH101 A above.

B. Execution

Same as TH101 B above.