COMPUTER TECHNOLOGY

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# 1620 USERS GROUP PROGRAM REVIEW AND EVALUATION

Program No. _____ Date _____

Program Name: _____

1. Does the abstract adequately describe what the program is and what it does? Yes___ No___
   Comment _____

2. Does the program do what the abstract says? Yes___ No___
   Comment _____

3. Is the Description clear, understandable, and adequate? Yes___ No___
   Comment _____

4. Are the Operating Instructions understandable and in sufficient detail? Yes___ No___
   Comment _____
   Are the Sense Switch options adequately described (if applicable)? Yes___ No___
   Are the mnemonic labels identified or sufficiently understandable? Yes___ No___
   Comment _____

5. Does the source program compile satisfactorily (if applicable)? Yes___ No___
   Comment _____

6. Does the object program run satisfactorily? Yes___ No___
   Comment _____

7. Number of test cases run _____
   Are any restrictions as to data, size, range, etc. covered adequately in description? Yes___ No___
   Comment _____

8. Does the Program meet the minimal standards of the 1620 Users Group? Yes___ No___
   Comment _____

9. Please list any suggestions to improve the usefulness of the program. These will be passed on to the author for his consideration.
   Comment _____

Please return to:

Mr. Robert J. Robinson (PREP)
Marquette University
Computing Center
1515 W. Wisconsin Avenue
Milwaukee 3, Wisconsin

Your Name _____

Company _____

Address _____

User Group Code _____

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# FORTRAN MARK SENSE

# CARD DECODER

# PROGRAM

by

H. B. Kerr
Director, Computer Center

TENNESSEE POLYTECHNIC INSTITUTE
Cookeville, Tennessee

1620 Users Group Membership Code--3114
September 7, 1964

Modifications or revisions to this program, as they occur, will be announced in the appropriate Catalog of Programs for IBM Data Processing Systems. When such an announcement occurs, users should order a complete new program from the Program Information Department.

DECK KEY

1. Source Deck
2. Object Deck

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Program Abstract

Title (If subroutine state in Title) FORTRAN MARK SENSE CARD DECODER PROGRAM
Subject Classification 1.3.

Author:Organization: H. B. Kerr, Tennessee Polytechnic Institute, Cookeville, Tennessee (3114)

Direct Inquiries to:
Name H. B. Kerr, Director, Computer Center Address Box 21A Tennessee Tech
Tennessee Polytechnic Institute, Cookeville, Tenn Phone 526-2181 Ex. 123

Purpose/Description: Allows a Fortran Program to be made up from special mark sense cards, eliminating the necessity for using a key punch, i.e., programmer can make up his own Fortran cards without access to key punch.

Mathematical Method: N/A

Restrictions, Range: There is no limit to either the size of the Fortran statement or the Fortran program.

Storage Requirements: < 20,000

Equipment Specifications:
Memory 20K x 40K 60K K Automatic Divide: Yes No x
Indirect Addressing: Yes x No Other Special Features Required TNS, TNF

Additional Remarks (Include at author's discretion: Language;Fixed/Float;Relocatability) (Optional: Running time; Approximate number of times run successfully; Programming Hours) Program written in SPS with fixed point aritimetic. The running time depends upon the size of the Fortran source program being punched. Approximately fifty Fortran source programs have been assembled using this program.

FORTRAN MARK SENSE CARD DECODER PROGRAM

DESCRIPTION - THIS PROGRAM WAS DEVELOPED TO OPERATE IN CONJUNCTION WITH MARK SENSE CARDS OF A FORMAT SIMILAR TO THE ... CADETRAN ... FORTRAN MARK SENSE CARDS DEVELOPED BY THE U. S. MILITARY ACADEMY. IT WAS DECIDED TO MODIFY THE CARD FORMAT OF CADETRAN TO MAKE IT SUITABLE FOR USE WITH FORTRAN II D FOR THE IBM 1311 DISK FILE.

BY MARKING THE SPECIAL CARDS WITH A PENCIL CONTAINING A HIGH GRAPHITE CONTENT (SEE APPENDIX), IT IS POSSIBLE FOR A BEGINNING (OR EXPERIENCED) FORTRAN PROGRAMMER TO PREPARE HIS FORTRAN STATEMENT CARDS INDEPENDENT OF A KEY PUNCH. THE PROGRAMMER SIMPLY FORMULATES HIS FORTRAN STATEMENT CARDS BY MARKING THE APPROPRIATE SLOTS ON THE SPECIALLY PRINTED CARDS. PROVISION IS MADE FOR CONTINUING THE STATEMENT FROM ONE MARK SENSE CARD TO THE NEXT AND FOR DENOTING AND PUNCHING CONTINUATION CARDS. THE MARKED CARDS ARE THEN PASSED THROUGH A REPRODUCING PUNCH EQUIPPED WITH 27 POSITIONS OF MARK SENSE BRUSHES. THE CARDS ARE THEN DECODED BY THE SUBJECT PROGRAM, INTERPRETED (IF DESIRED), AND THEN PROCESSED AS WITH ANY OTHER FORTRAN PROGRAM. A THREE DIGIT SEQUENCE NUMBER IS PLACED IN CARD COLUMNS 78 THROUGH 80 OF THE FORTRAN STATEMENT CARDS.

MARKING THE FORTRAN CARDS -

1. STATEMENT NUMBER - IF IT IS DESIRED TO USE A STATEMENT NUMBER, MARK THE INDICATED SLOTS (USING A FIRM PRESSURE WITH A SHARP POINTED, HIGH GRAPHITE CONTENT PENCIL). ONLY A TWO DIGIT STATEMENT IS PERMITTED (WHICH SHOULD BE SUFFICIENT FOR MOST PROGRAMS).

2. CONTINUATION - IF THE CARD IS A CONTINUATION OF A PREVIOUS CARD, THE ... CONTINUATION ... SLOT SHOULD BE MARKED. IF IT IS NOT MARKED, THE SUBJECT PROGRAM ASSUMES THAT THIS IS A NEW STATEMENT.

3. COMMENTS - MARKING OF THE ... COMMENTS ... SLOT CALLS FOR A LETTER C TO BE PLACED IN CARD COLUMN 1, THEREBY MAKING THE FORTRAN STATEMENT A COMMENTS STATEMENT.

4. I/O, FORMATS, CALL, DO, ETC. - MARKING ANY ONE OF THESE SLOTS CALLS FOR THE APPROPRIATE WORD OR WORDS TO BE PLACED IN THE OUTPUT CARD. A BLANK USUALLY FOLLOWS THE WORD OR WORDS. ONLY ONE OF THE SLOTS IN THE THREE SPECIAL COMMAND COLUMNS MAY BE MARKED. FAILURE TO MARK ONE OF THESE SLOTS WILL CALL FOR NO CHARACTERS OR BLANKS TO BE TRANSFERRED TO THE OUTPUT FORTRAN CARD.

5. FIELDS - IN THE TWO MARK SENSE COLUMNS OF EACH FIELD ARE ALL NUMBERS AND CHARACTERS ORDINARILY USED IN FORTRAN STATEMENTS.

   LEFT HAND FIELD - ALL PUNCTUATION ORDINARILY USED IN FORTRAN AND MOST OPERATORS, AS WELL AS CERTAIN FREQUENTLY USED SUBROUTINES ARE AVAILABLE IN THESE COLUMNS. IF NO MARK IS MADE IN THESE COLUMNS, NO CHARACTERS, PUNCTUATION OR BLANKS ARE TRANSFERRED TO THE OUTPUT FORTRAN CARD.



   RIGHT HAND FIELD - ALL NUMBERS, ALPHABETICAL CHARACTERS (AS WELL AS THE SLASH, INDICATING DIVISION) ARE AVAILABLE IN THESE COLUMNS. IF NO SLOTS ARE MARKED, A BLANK WILL BE PLACED INTO THE OUTPUT FORTRAN CARD. IF A BLANK IS NOT DESIRED, THE 12 ZONE PUNCH ONLY (PRINTED A THROUGH I ON THE CARD) SHOULD BE MARKED. IF THERE IS NO MORE INFORMATION TO BE PLACED ON THE CARD, ONLY THE 11 ZONE PUNCH (PRINTED J THROUGH R ON THE CARD) SHOULD BE MARKED. MARKING THIS SLOT ALONE WILL CAUSE THE SUBJECT PROGRAM TO IGNORE THE REMAINDER OF THE CARD.

OUTPUT - THE OUTPUT CARDS WILL BE IN THE PROPER FORTRAN FORMAT AS DESCRIBED IN THE IBM FORTRAN II D LITERATURE, WITH THE EXCEPTION THAT ONLY A TWO DIGIT STATEMENT NUMBER IS PERMITTED. IF DESIRED, THE OUTPUT CARDS MAY BE INTERPRETED FOR EASE IN DEBUGGING.

OPERATING INSTRUCTIONS -

1. MARK THE PRINTED CARDS AS DESCRIBED ABOVE AND PUNCH ON A 27-27 PANEL ON THE REPRODUCING PUNCH WITH 27 POSITIONS OF MARK SENSE BRUSHES.

2. CLEAR THE MEMORY OF THE COMPUTER.

3. PLACE THE SUBJECT PROGRAM, FOLLOWED BY THE PUNCHED MARK SENSE CARDS INTO THE READ HOPPER OF THE 1622.

4. PRESS RESET (1620),

5. PRESS LOAD (1622)

6. WHEN THE MANUAL LIGHT COMES ON, PRESS START (1620)

7. PRESS PUNCH START (1622)

8. WHEN THE READ-NO-FEED LIGHT COMES ON, PRESS READ START (1622)

9. CLEAR THE OUTPUT FORTRAN CARDS FROM THE PUNCH STACKER

NOTE ... SINCE THE LAST CARD INDICATOR IS CONSULTED IN THE SUBJECT PROGRAM, DO NOT ATTEMPT TO BATCH PROCESS PROGRAM BY STACKING MULTIPLE PROGRAM IN THE READ HOPPER (SEQUENCE NUMBERS WILL BE CONTINUOUS INSTEAD OF STARTING WITH 001 AS IS USUALLY DESIRED)

10. PLACE THE NEXT PROGRAM IN THE READ HOPPER, PRESS START (1620), READ START (1622), AND GO BACK TO STEP 7.



COMPUTER TECHNOLOGY

```
TOP    TFM CNTR,0,9
       TDM K2,1
       TDM KEY,1
       TDM K1,1
START  RACDINPUT
       TFM FLAG+6,INPUT+3*2-3
FLAG   SF  INPUT+3*2-3
       AM  FLAG+6,2
       CM  FLAG+6,INPUT+28*2-3
       BNE FLAG
       TFM LEFT+6,INPUT+6*2-2
       TFM RIGHT+11,INPUT+7*2-2
       SF  INPUT+3*2-3
       CM  INPUT+3*2-2,10,10
       BE  LEFT
BD     BD  WRITE,KEY
       TD  *+23,NUM
       TFM OUTPUT+6*2-2,70,10
       CM  NUM,4,10
       BNH *+60
       RCTY
       WATYER3
       H
       B   START
WRITE  BD  *+60,K1
       TDM KEY,1
       AM  CNTR,1,9
       TNF OUTPUT+80*2-2,CNTR
       WACDOUTPUT
       BD  *+36,K2
       TDM K2,1
       B   TOP
       TDM K1,0
       TDM KEY,1
       TFM NUM,0,10
       TF  OUTPUT+80*2-2,CLEAR
       TFM LOCATE,OUTPUT+6*2-2
       SF  INPUT+1*2-3
       CM  INPUT+2*2-2,0,8
       BE  *+24
       TF  OUTPUT+5*2-2,INPUT+2*2-2
TYPE   CM  INPUT+3*2-2,72,10
       BNE *+60
       TFM COUNT,12,10
       TF  WORD,PCH
       BT  TRANS,COUNT
       B   LEFT
       CM  TYPE+6,70,610
       BNE *+60
       TFM COUNT,8,10
       TF  WORD,END
       BT  TRANS,COUNT
       B   LEFT
```



```
       CM  TYPE+6,20,610
       BNE *+24
       TFM OUTPUT,43,10
       CM  TYPE+6,73,610
       BNE *+60
       TFM COUNT,14,10
       TF  WORD,ACCEPT
       BT  TRANS,COUNT
       B   LEFT
       CM  TYPE+6,74,610
       BNE *+60
       TFM COUNT,14,10
       TF  WORD,FORMAT
       BT  TRANS,COUNT
       B   LEFT
       CM  TYPE+6,75,610
       BNE *+60
       TFM COUNT,10,10
       TF  WORD,READ
       BT  TRANS,COUNT
       B   LEFT
       CM  TYPE+6,76,610
       BNE *+60
       TFM COUNT,12,10
       TF  WORD,PRINT
       BT  TRANS,COUNT
       B   LEFT
       CM  TYPE+6,77,610
       BNE *+60
       TFM COUNT,20,10
       TF  WORD,DIMEN
       BT  TRANS,COUNT
       B   LEFT
       CM  TYPE+6,78,610
       BNE *+60
       TFM COUNT,14,10
       TF  WORD,COMMON
       BT  TRANS,COUNT
       B   LEFT
       CM  TYPE+6,79,610
       BNE *+60
       TFM COUNT,12,10
       TF  WORD,PAUSE
       BT  TRANS,COUNT
       B   LEFT
       CM  TYPE+6,71,610
       BNE *+48
       TFM COUNT,10,10
       TF  WORD,STOP
       BT  TRANS,COUNT
TYPE1  CM  INPUT+4*2-2,10,10
       BNE *+60
```

```
      TFM  COUNT,12,10
      TF   WORD,GOTO
      BT   TRANS,COUNT
      B    LEFT
      CM   TYPE1+6,20,610
      BNE  *+60
      TFM  COUNT,4,10
      TF   WORD,IF
      BT   TRANS,COUNT
      B    LEFT
      CM   TYPE1+6,70,610
      BNE  *+60
      TFM  COUNT,6,10
      TF   WORD,DO
      BT   TRANS,COUNT
      B    LEFT
      CM   TYPE1+6,71,610
      BNE  *+60
      TFM  COUNT,32,10
      TF   WORD,IFSS
      BT   TRANS,COUNT
      B    LEFT
      CM   TYPE1+6,72,610
      BNE  *+60
      TFM  COUNT,16,10
      TF   WORD,CONTIN
      BT   TRANS,COUNT
      B    LEFT
      CM   TYPE1+6,73,610
      BNE  *+60
      TFM  COUNT,12,10
      TF   WORD,FETCH
      BT   TRANS,COUNT
      B    LEFT
      CM   TYPE1+6,74,610
      BNE  *+60
      TFM  COUNT,14,10
      TF   WORD,RECORD
      BT   TRANS,COUNT
      B    LEFT
      CM   TYPE1+6,75,610
      BNE  *+60
      TFM  COUNT,24,10
      TF   WORD,DD
      BT   TRANS,COUNT
      B    LEFT
      CM   TYPE1+6,76,610
      BNE  *+60
      TFM  COUNT,24,10
      TF   WORD,EQUI
      BT   TRANS,COUNT
      B    LEFT
```



```
      CM   TYPE1+6,77,610
      BNE  *+60
      TFM  COUNT,18,10
      TF   WORD,FUNCT
      BT   TRANS,COUNT
      B    LEFT
      CM   TYPE1+6,78,610
      BNE  *+60
      TFM  COUNT,22,10
      TF   WORD,SR
      BT   TRANS,COUNT
      B    LEFT
      CM   TYPE1+6,79,610
      BNE  *+60
      TFM  COUNT,10,10
      TF   WORD,CALL
      BT   TRANS,COUNT
      B    LEFT
TYPE2 CM   INPUT+5*2-2,10,10
      BNE  *+60
      TFM  COUNT,14,10
      TF   WORD,RETURN
      BT   TRANS,COUNT
      B    LEFT
      CM   TYPE2+6,20,610
      BNE  *+60
      TFM  COUNT,20,10
      TF   WORD,CLINK
      BT   TRANS,COUNT
      B    LEFT
      CM   TYPE2+6,70,610
      BNE  *+60
      TFM  COUNT,10,10
      TF   WORD,ATANF
      BT   TRANS,COUNT
      B    LEFT
      CM   TYPE2+6,71,610
      BNE  *+60
      TFM  COUNT,8,10
      TF   WORD,ABSF
      BT   TRANS,COUNT
      B    LEFT
      CM   TYPE2+6,72,610
      BNE  *+60
      TFM  COUNT,8,10
      TF   WORD,LOGF
      BT   TRANS,COUNT
      B    LEFT
      CM   TYPE2+6,73,610
      BNE  *+60
      TFM  COUNT,8,10
      TF   WORD,EXPF
```

```
        BT   TRANS,COUNT
        B    LEFT
        CM   TYPE2+6,74,610
        BNE  *+60
        TFM  COUNT,10,10
        TF   WORD,FIND
        BT   TRANS,COUNT
        B    LEFT
        CM   TYPE2+6,75,610
        BNE  *+60
        TFM  COUNT,20,10
        TF   WORD,CEXIT
        BT   TRANS,COUNT
        B    LEFT
LEFT    CM   INPUT+6*2-2,10,10
        BNE  *+60
        TFM  COUNT,2,10
        TF   WORD,PLUS1
        BT   TRANS,COUNT
        B    RIGHT
        CM   LEFT+6,20,610
        BNE  *+60
        TFM  COUNT,2,10
        TF   WORD,NEG1
        BT   TRANS,COUNT
        B    RIGHT
        CM   LEFT+6,70,610
        BNE  *+60
        TFM  COUNT,2,10
        TF   WORD,STAR
        BT   TRANS,COUNT
        B    RIGHT
        CM   LEFT+6,71,610
        BNE  *+60
        TFM  COUNT,4,10
        TF   WORD,EXP
        BT   TRANS,COUNT
        B    RIGHT
        CM   LEFT+6,72,610
        BNE  *+60
        TFM  COUNT,2,10
        TF   WORD,EQUAL1
        BT   TRANS,COUNT
        B    RIGHT
        CM   LEFT+6,73,610
        BNE  *+60
        TFM  COUNT,2,10
        TF   WORD,OPEN
        BT   TRANS,COUNT
        B    RIGHT
        CM   LEFT+6,74,610
        BNE  *+60
```

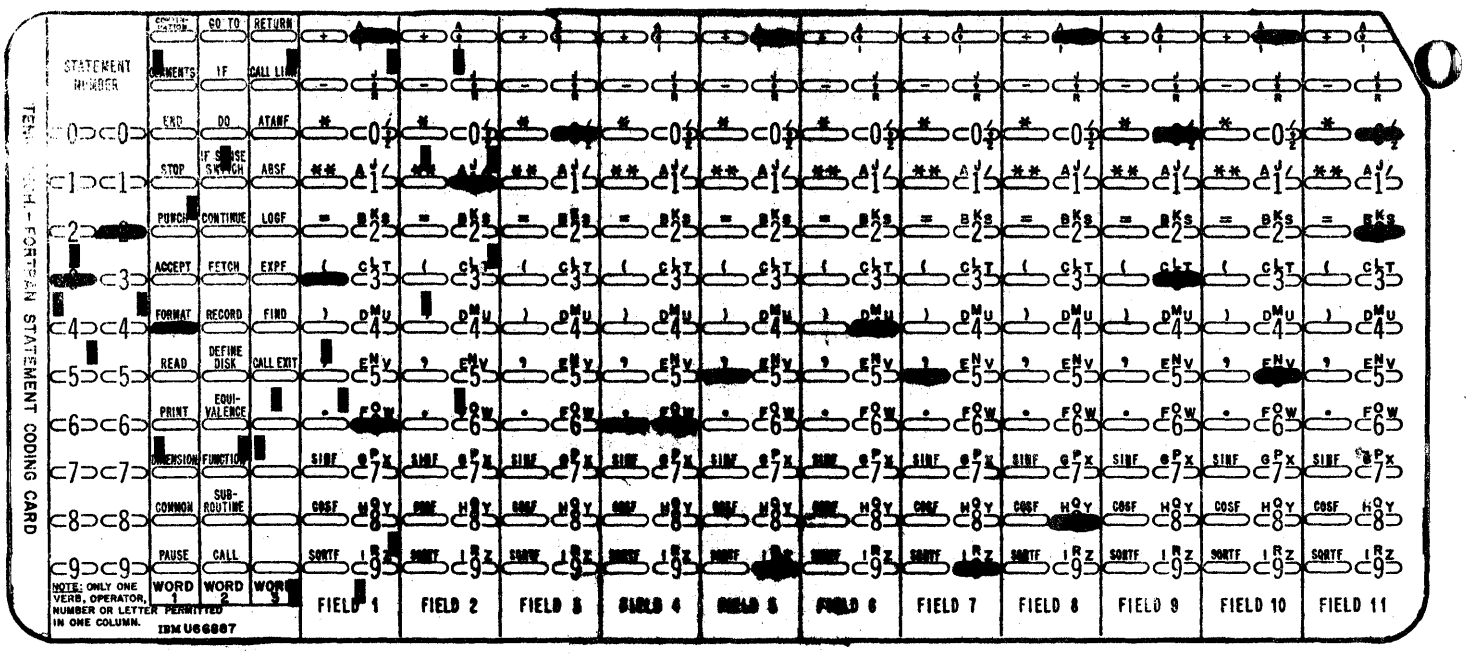


```
        TFM  COUNT,2,10
        TF   WORD,CLOSE
        BT   TRANS,COUNT
        B    RIGHT
        CM   LEFT+6,75,610
        BNE  *+60
        TFM  COUNT,2,10
        TF   WORD,COMMA
        BT   TRANS,COUNT
        B    RIGHT
        CM   LEFT+6,76,610
        BNE  *+60
        TFM  COUNT,2,10
        TF   WORD,DECIML
        BT   TRANS,COUNT
        B    RIGHT
        CM   LEFT+6,77,610
        BNE  *+60
        TFM  COUNT,8,10
        TF   WORD,SINF
        BT   TRANS,COUNT
        B    RIGHT
        CM   LEFT+6,78,610
        BNE  *+60
        TFM  COUNT,8,10
        TF   WORD,COSF
        BT   TRANS,COUNT
        B    RIGHT
        CM   LEFT+6,79,610
        BNE  *+48
        TFM  COUNT,10,10
        TF   WORD,SQRTF
        BT   TRANS,COUNT
RIGHT   TF   WORD,INPUT+7*2-2
        CM   RIGHT+11,20,610
        BE   START
        CM   RIGHT+11,10,610
        BE   IN
        TFM  COUNT,2,10
        BT   TRANS,COUNT
IN      CM   RIGHT+11,INPUT+27*2-2
        BE   OUT
        AM   LEFT+6,4
        AM   RIGHT+11,4
        B    LEFT
OUT     TF   INPUT+80*2-2,CLEAR
        BNLCSTART
        TDM  K2,0
        B    BD
TRANS   A    LOCATE,COUNT
        CM   LOCATE,OUTPUT+72*2-2
        BNH  ONE
```

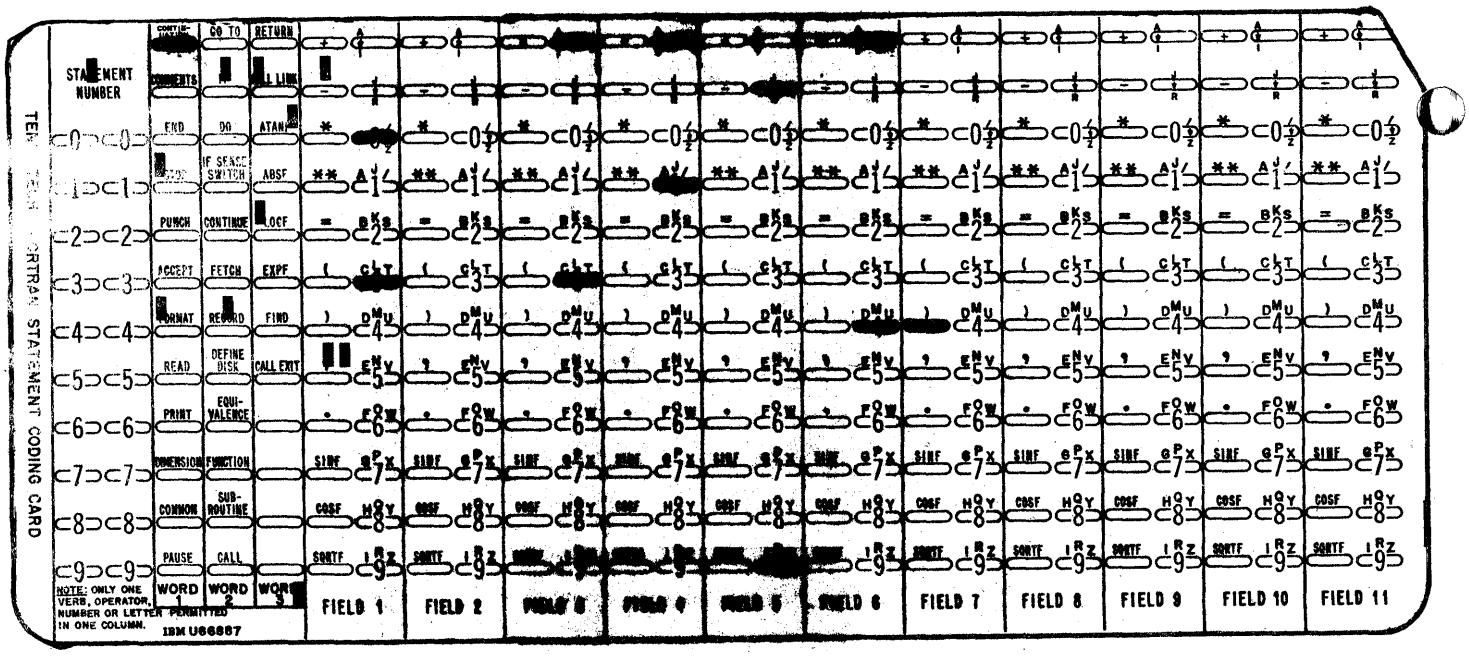
```
WD      TF   LOCATE,WORD,6
        CM   NUM,4,10
        BNH  *+60
        RCTY
        WATYER3
        H
        B    START
        TD   *+23,NUM
        TFM  OUTPUT+6*2-2,70,10
        TDM  KEY,0
        AM   NUM,1,10
        TF   ADDR,LOCATE
        SM   ADDR,OUTPUT+72*2-2
        SF   ADDR-1
        TF   COUNT,ADDR
        SF   OUTPUT+73*2-3
        TF   WORD,LOCATE,11
        TF   OUTPUT+80*2-2,CL1
        AM   CNTR,1,9
        TNF  OUTPUT+80*2-2,CNTR
        WACDOUTPUT
        TF   OUTPUT+80*2-2,CLEAR
        TFM  LOCATE,OUTPUT+6*2-2
        A    LOCATE,COUNT
ONE     TF   LOCATE,WORD,6
        BB
READ    DC   10,5945414400
PRINT   DC   12,575949556300
DIMEN   DC   20,44495445556249565500
COMMONDC     14,43565454565500
PAUSE   DC   12,574164624500
STOP    DC   10,6263565700
KEY     DS   1
NUM     DC   2,0
ADDR    DC   5,0
ADDR1   DC   5,0
FIND    DC   10,4649554400
EXPF    DC   8,45675746
SINF    DC   8,62495546
COSF    DC   8,43566246
SQRTF   DC   10,6258596346
ATANF   DC   10,4163415546
IFSS    DC   32,4946246245556245006266496343480O
CONTINDC     16,4356556349556445
FETCH   DC   12,464563434800
RECORDDC     14,59454356594400
DD      DC   24,4445464955450044496252OO
EQUI    DC   24,4558644965415345554345OO
FUNCT   DC   18,466455436349565500
SR      DC   22,62644259566463495545OO
CALL    DC   10,4341535300
RETURNDC     14,59456364595500
```

```
CLINK   DC   20,43413535300534955520O
ABSF    DC   8,41426246
LOGF    DC   8,53564746
WORD    DS   40
CEXIT   DC   20,43413535300456749630O
GOTO    DC   12,475600635600
IF      DC   4,4946
DO      DC   6,445600
EXP     DC   4,1414
CLOSE   DC   2,04
COMMA   DC   2,23
        DC   1,0
CLEAR   DS   159
FORMATDC     14,46565954416300
DECIMLDC     2,03
END     DC   8,45554400
ER3     DAC  28,TOO MANY CONTINUATION CARDS-
PLUS1   DC   2,10
NEG1    DC   2,20
STAR    DC   2,14
EQUAL1DC     2,33
OPEN    DC   2,24
INPUT   DAS  80
STNO    DC   2,0
OUTPUTDAS    90
K2      DS   1
COUNT   DS   2
PCH     DC   12,576455434800
ACCEPTDC     14,41434345576300
CNTR    DC   3,0
LOCATEDC     5,0
CL1     DC   16,0
K1      DS   1
        DENDTOP
```

SAMPLE FORTRAN STATEMENT:




Card No. 1

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32 Format (F10.6,I4,9HTEST CARD)