

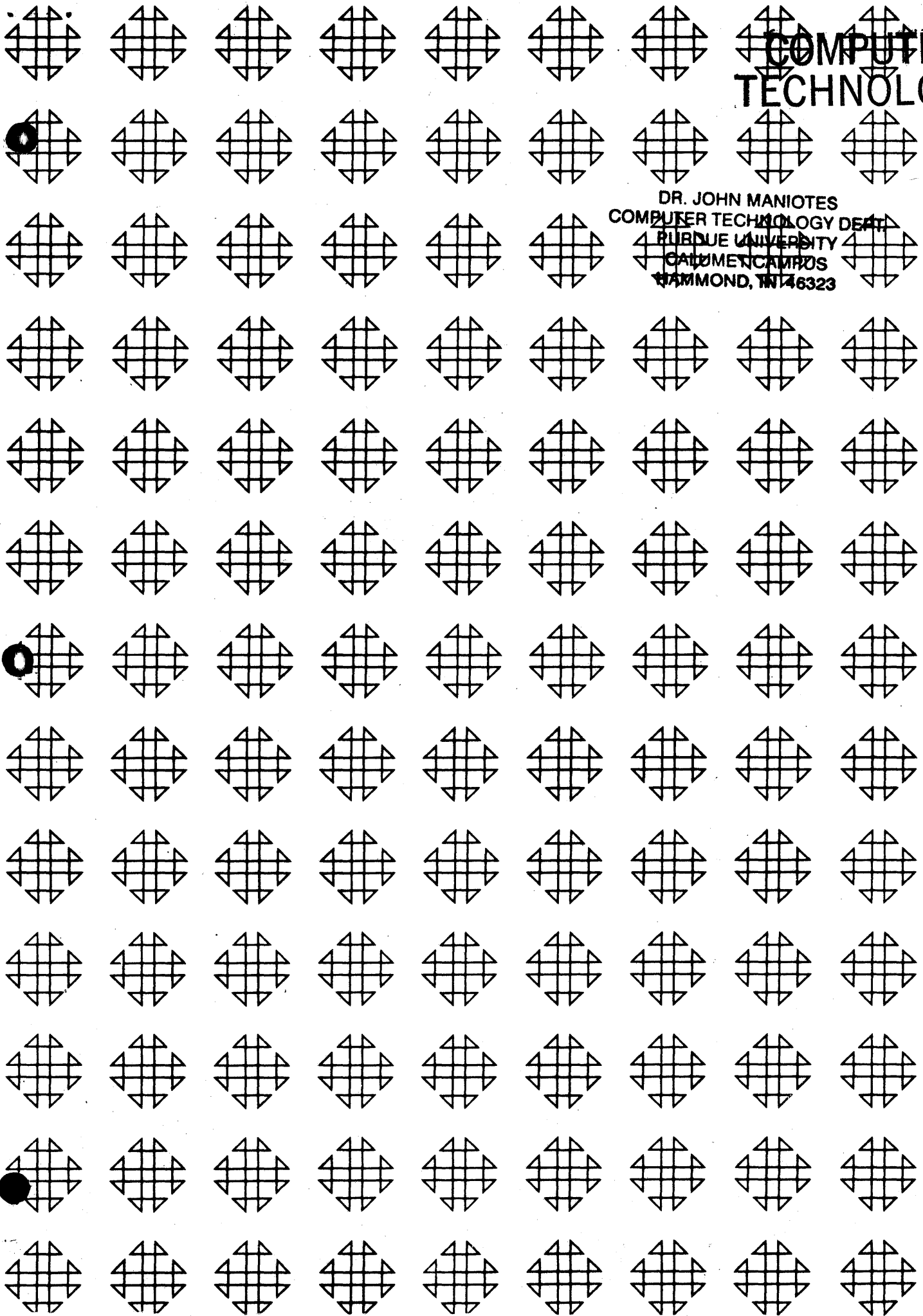
COMPUTER TECHNOLOGY

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Relocatable Plot Subroutine Fortran II-D

File # 1.2.017



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COMMON USERS GROUP PROGRAM REVIEW AND EVALUATION

(fill out in typewriter, ink or pencil)

Program No. _____

Date _____

Program Name: _____

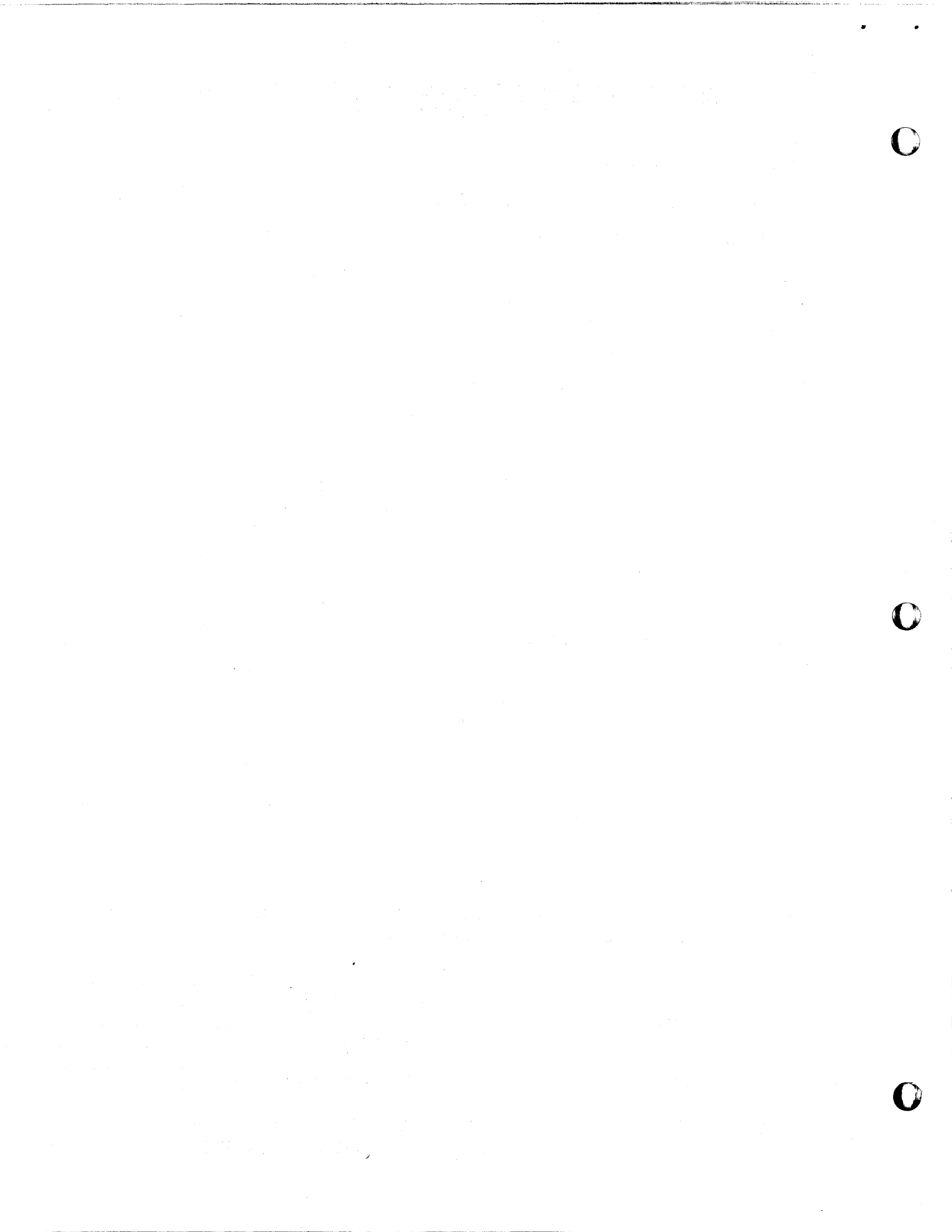
1. Does the abstract adequately describe what the program is and what it does? Yes ___ No ___
Comment _____
2. Does the program do what the abstract says? Yes ___ No ___
Comment _____
3. Is the description clear, understandable, and adequate? Yes ___ No ___
Comment _____
4. Are the Operating Instructions 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 COMMON? Yes ___ No ___
Comment _____
9. Were all necessary parts of the program received? Yes ___ No ___
Comment _____
10. Please list on the back any suggestions to improve the usefulness of the program. These will be passed onto the author for his consideration.

Please return to:

Mr. Richard L. Pratt
Data Corporation
7500 Old Xenia Pike
Dayton, Ohio 45432

Your Name _____
Company _____
Address _____
Users Group Code _____

THIS REVIEW FORM IS PART OF THE COMMON ORGANIZATION'S PROGRAM REVIEW AND EVALUATION PROCEDURE. NONMEMBERS ARE CORDIALLY INVITED TO PARTICIPATE IN THIS EVALUATION.



ABSTRACT

RELOCATABLE PLOT SUBROUTINE

FORTRAN II-D

Lebert R. Alley
Center for Research
and Data Processing
Central Missouri State College
Warrensburg, Missouri

Code: 3249

December 13, 1965

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.

RELOCATABLE PLOT SUBROUTINE--FORTRAN II-D

Lebert R. Alley
Center for Research and Data Processing
Central Missouri State College
Warrensburg, Missouri
December 13, 1965
Users Group Membership Code--3249

Direct Inquiries to above Name and Address.

Description/Purpose: Relocatable Plot Subroutine for Fortran II-D plots arguments of 19 independent n-dimensional arithmetic functions having a range between 1.0 and 80.9. Digits are automatically assigned to each arithmetic statement involving the subroutine call word and then punched into a card column corresponding to the nearest integral value of the argument. All possible argument values are handled by either causing a punch in a card when the argument is between 1.0 and 80.9 or a descriptive error message to be typed. Subroutine applicable to virtually all scaled arithmetic statements and especially suited to harmonic functions.

Storage Used by Program: 580

Equipment: Card, Disk and Drive, Indirect Addressing, 1620 Model 1.

Programmed in: SPS II-D

Type of Program: Subroutine, for use with FORTRAN II-D

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DECK KEY

Source deck including the control records
used for loading.

RELOCATABLE PLOT SUBROUTINE--FORTRAN-II-D

December 13, 1965
Lebert R. Alley
Center for Research and Data Processing
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Phone--747-9571
Users Group Membership Code--3249

Relocatable Plot Subroutine for Fortran II-D graphs an unlimited number of independent n-dimensional floating point arithmetic functions having a range between 1.0 and 80.9.

Identification characters are automatically assigned by the subroutine to each Fortran II-D statement involving the subroutine call words and then punched into a card column corresponding to the nearest integral value of the floating point argument. Identification characters are subroutine-generated by assigning 1 to the first plot statement in a source program or the first statement following the call word PLOTP. Each succeeding plot statement is assigned a character one greater than the preceding character until the next character value would be 11. At that point the character generating portion of the subroutine begins assigning, in sequential order, single flagged digits, 1, 2, 3, ..., 9. These digits are interpreted on the IBM 407 to be $\bar{1}$, \bar{K} , \bar{L} , ..., \bar{R} . Any number of statements from 1 through 18, having the PLOT call word may be used in a single plotting loop.

Equation plotting is carried out by including the call word(s) PLOT and/or PLOTP in a loop in the source program. PLOT is the name regularly used in an arithmetic statement to be plotted. However, the last statement in every plotting loop must have PLOTP rather than PLOT. PLOTP is a second entry point to the subroutine which causes the argument values of all PLOT statements encountered since the first of the program or the last PLOTP statement to be represented on a single punched card. When the source programmer wishes to plot only a single function in a loop, PLOTP is used for that function.

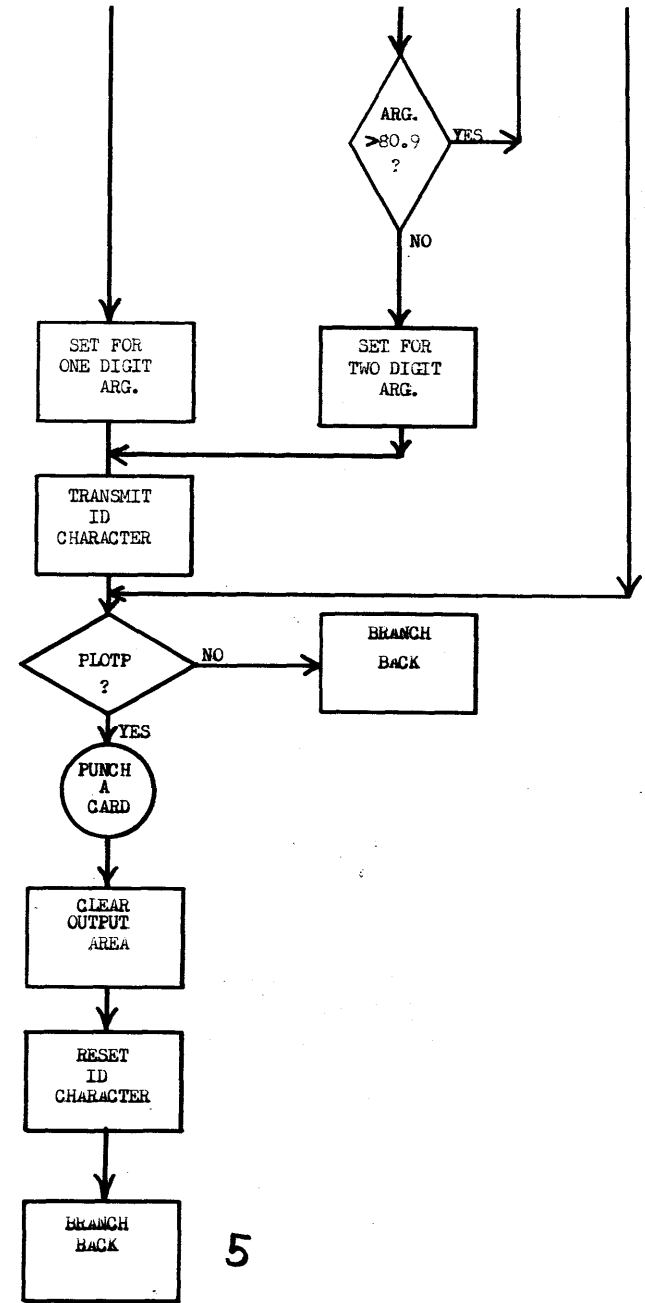
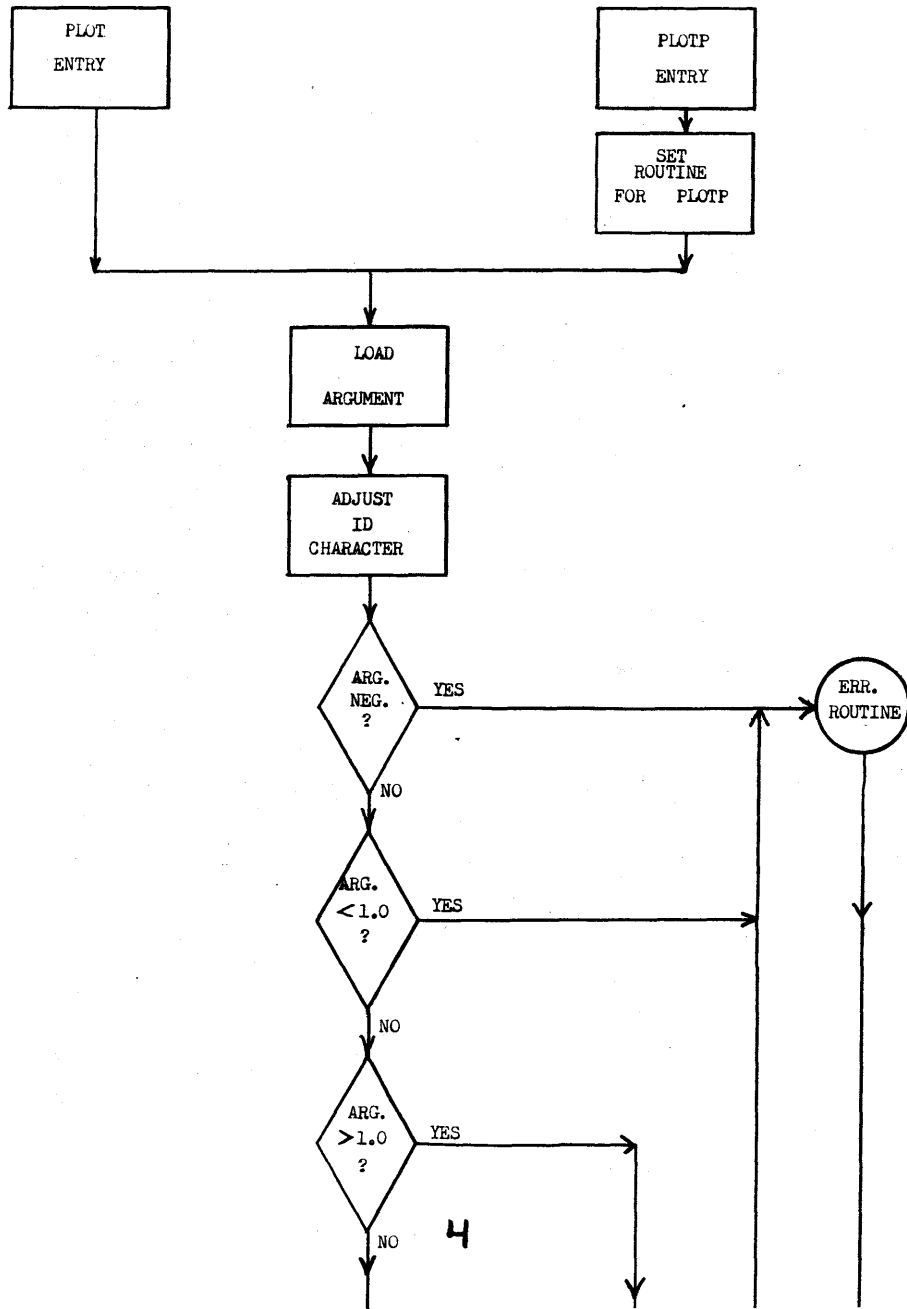
The use of PLOT in an arithmetic statement does not in any way alter the left hand member of that statement.

The argument of a PLOT source statement must be in floating point mode. The value of this argument must be between 1.0 and 80.9. Fractional parts are not rounded off. If the source program attempts to plot any value exclusive of the plotting range, the subroutine will type a message of the form:

X@mmmmmmmmCC.

This means that the function identified by X cannot be plotted at the value which follows in floating point form. All functional values must have an eight digit mantissa.

Whenever the operator wishes to disregard the subroutine error messages, time can be saved by turning on Console Switch 4 to prevent continuation of the message output.



##SPS

*LIBR
*NAME PLOTP
*ASSEMBLE RELOCATABLE
*STORE RELOADABLE
*ID NUMBER 0026
*LIST TYPEWRITER

ERROR TO FAC+1,CHAR+11,1
BC4 *+48,0
WNTY CHAR+9,0
WNTY FAC-9
RCTY
B7 BB1-12,0
DNB 1,CHAR+10
DC 1,@,CHAR+11
BLANKS DNB 41
DNB 41
FAC DS 02492
DEND 2

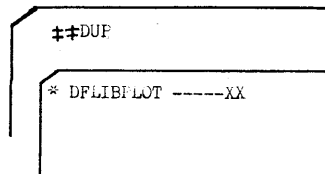
00430 25 02493 00149
00442 56 00490 00400
00454 38 00147 00100
00466 38 02483 00100
00478 34 00000 00102
00490 49 00294 00000
00148 00001
00149 00001 +
00537 00041
00578 00041
02492 00000
00002

SUB	DSA	PLOTP,PLOT	00004	00005	00006
00009	00005	00030			
	DORG	*-4	00005		
PLOTP	TF	PLOT-1,PLOTP-1,01	00006	26	00029 00005
	TDM	RLC+7,7,01	00018	15	00073 00007
PLOT	TF	FAC,PLOT-1,111	00030	26	02492 00029
	SM	PLOT-1,2,010	00042	12	00029 00002
	TF	FAC-2,PLOT-1,111	00054	26	02490 00029
RLC	CM	CHAR+9,09,010	00066	14	00147 00009
ADJUST	BNH	*+36,0	00078	47	00114 01100
	SM	CHAR+9,12,010	00090	12	00147 00012
	TDM	*-23,1,0	00102	15	00079 00001
	AM	CHAR+9,01,010	00114	11	00147 00001
NEGARG	BNF	LOADG,FAC-2,0	00126	44	00150 02490
CHAR	B	ERROR,070	00138	49	00430 00000
LOADG	CM	FAC,01,10	00150	14	02492 00001
	BH	HIARG,0	00162	46	00194 01100
	BE	ONEDIG,0	00174	46	00246 01200
	B7	ERROR,0	00186	49	00430 00000
HIARG	CM	FAC-8,01,10	00194	14	02484 00001
	BL	TWODIG,0	00206	47	00226 01300
	B7	ERROR,0	00218	49	00430 00000
TWODIG	A	SETDIG+6,FAC-8,0	00226	21	00276 02484
	B7	SETDIG,0	00238	49	00270 00000
ONEDIG	TD	*+23,FAC-9,0	00246	25	00269 02483
	SM	SETDIG+6,07	00258	12	00276 00000
SETDIG	TD	BLANKS-40,CHAR+9,012	00270	25	00497 00147
	TFH	SETDIG+6,BLANKS-40,017	00282	16	00276 00497
	BD	FINISH,RLC+7,01	00294	43	00308 00073
BB1	BB2		00306	42	00000 00000
FINISH	TFH	CHAR+9,00,010	00308	16	00147 00000
	WNCB	BLANKS-39,0	00320	38	00490 00400
	TDM	ADJUST+1,7,0	00332	15	00079 00007
	TFH	*+8,00,010	00344	16	00352 00000
CLERAR	TD	BLANKS-39,BLANKS+41,012	00356	25	00490 00578
	AM	CLERAR+6,1,010	00368	11	00362 00001
	SM	CLERAR-4,1,010	00380	12	00352 00001
	BNE	CLERAR,0	00392	47	00356 01200
	TFH	CLERAR+6,BLANKS-39,017	00404	16	00362 00490
	TDM	RLC+7,0,0	00416	15	00073 00000
BB2	BB2		00428	42	00000 00000

END OF ASSEMBLY?
00500 CORE POSITIONS REQUIRED PLUS RELOCATION INCREMENT

LOADING PROCEDURE

1. Check card deck with listing.
2. Determine DIM Numbers of entry points. PLOTP = 0026 and PLOT = 0027 if the user has added none of his own FORTRAN II-D library programs.
3. Load Source deck with control cards shown on following Subroutine listing.
4. Define Second Entry Point, PLOT, with;



5. More detailed information on loading procedures are available directly from the author upon request.

SAMPLE FORTRAN PROGRAM USING PLOT

**FORX5

```

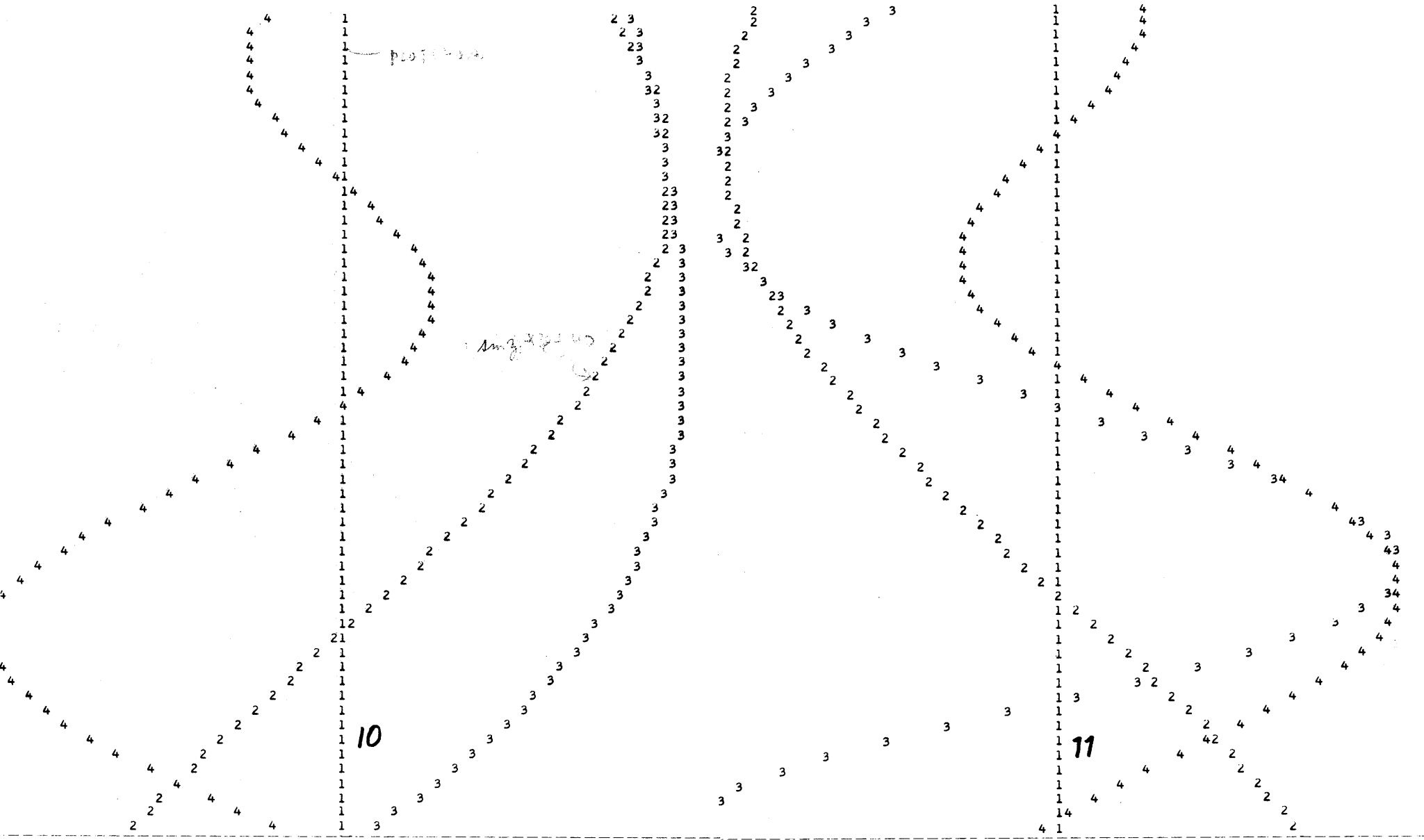
X = 1.0
A = 0.0
Z = 1.0
1 Y = PLOT(40.0)
  Y = PLOT((SIN(Z))*38.+40.)
  Y = PLOT((SIN(X))*40.+40.)
  Y = PLOT((COS(Z)+COS(3.*Z))*20.+40.)
X = X*1.02
Z = Z+.05
A = A+1.
IF(A-252.)1,1,2
2 CONTINUE
END
  
```

00676 CORES USED
 19999 NEXT COMMON
 END OF COMPILATION
 EXECUTION

```

4@8341260000
4@1727920000
4@7070000002
4@3403480000
3@8641840000
3@2789180000
3@1380900001
3@9094400001
3@5304770000
3@4580000002
3@8332980000
3@2631700001
3@8611750000
4@5570420000
4@6137000001
4@6358000001
4@5636520000
3@2046770000
3@7973520000
3@8534820000
  
```

SAMPLE OUTPUT



10

11

15

431

14

