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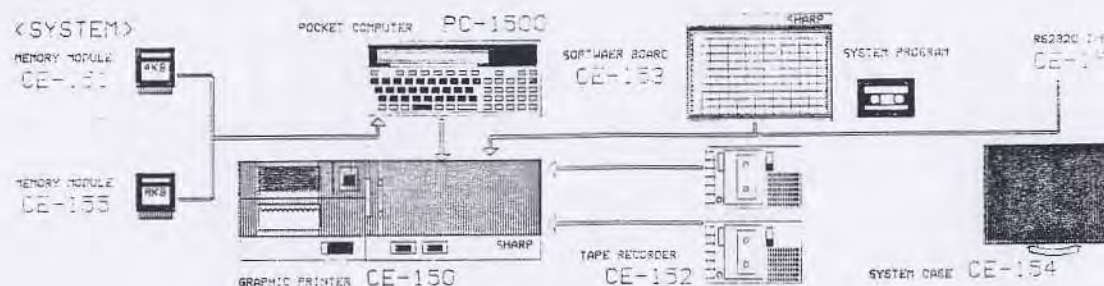
PC-1500
COMPUTER PROGRAM MENU
(PART I)

SHIGEAKI SHINDO

RESEARCH DIVISION

TRAINING DEPARTMENT

SOUTHEAST ASIAN FISHERIES DEVELOPMENT CENTER



INTRODUCTORY NOTES

1. This manual is intended for people who know nothing at all about micro-computers but wish to learn how to generate various kinds of graphs and diagrams. Such a skill may be especially useful to researchers and lecturers, since, according to psychologists, diagrams and graphs are five times easier to understand than tables.

Most of the examples of graphs included in this manual are in Mono (i.e. black color only). The ones which are in color are also given in Mono in order to facilitate photocopying and offset printing.
2. The computer used here is a SHARP-1500, with some accessories (CE-150, CE-155 and CE 152), as shown at the top of this page. Although the computer is a small-sized portable model, its principal mechanism is in no way different from any ordinary micro-computer. A mini-XY-plotter, which can draw graphs, has been added to the printer (CE-150). The present manual gives a simplified procedure for operation of this computer, as well as instruction into the BASIC computer language. Consequently, it can serve as an introductory guide to the use of any ordinary micro-computer.
3. The operation procedure for the computer is simple and a person who has no knowledge about computers can easily learn to use this machine. However, before handling the computer, you should read carefully several pages of "PC-1500 INSTRUCTION MANUAL", namely; p. 1 (trouble-shooting); pp. 101-107 (connecting the computer to the interface CE-150, power source, connecting a tape recorder CE-152 to the interface CE-150, paper loading, pen replacement); pp. 142-143 (battery replacement) and pp. 145-150 (list of error code).
4. The explanations on pages mentioned above are the minimum requirement for operating a computer. It is, however, recommended that you read through the whole "INSTRUCTION MANUAL", even though you may not be able to understand the meaning fully. You should not be discouraged by your initial lack of understanding; many points will become clear as you gain experience in computer work. With computers, practice is as important as the theory. It is rather like learning to swim by using a "Teach Yourself" book on swimming.
5. It is very easy to generate graphs, etc. if you follow the key operation procedure in this book, but if you want to make some modifications in your graphs, you must study the BASIC computer language. "Program List" and sometimes "Flow Chart" are included in this book for easy references when modifications of Program Lists are made.

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ACKNOWLEDGEMENT

NUMERIC, ALPHABETIC (RANKING, LAYOUT)

(PROGRAM No.001)

- 1 -

GENERAL EXPLANATION

OUTLINE : This program can be used to arrange numerical data in the order of large to small or small to large. It can also rearrange alphabetic data (words) in the alphabetic order (A to Z) or the reverse (Z to A). This kind of work is sometimes very necessary in business or research, and it is very tedious and time-consuming to do by hand.

OPERATING GUIDE : First, select the kind of data, that is, numeric (numbers) ? or alphabetic (words)?, then, you key-in "No. of Data". Secondly, select "from large to small" or "small to large" (in the case of numbers) or "from A to Z" or "Z to A" (in the case of words). The computer will then print out the rearranged data. (see Examples of Printout on the next page.) In the case of alphabet, the number of characters (letters) in one word should not exceed 16.

NUMERIC, ALPHABETIC RANKING

SHARP PC-1500
LANGUAGE USED:
EXPANDED BASIC

PROGRAM No.001
CASSETTE=01-A
TAPE COUNTER
001-014

23 JUNE 1982
SHARP CORP.

(Also CASSETTE
No.05-B, 000-013)

KEY OPERATION PROCEDURE

STEP	KEYSTROKE	DISPLAY (Screen)	Remarks
0	ON	>	
1	DEF A	CHARACTER = 1 NUMERAL = 2 ?	Select 1 (alphabet) or 2 (numeric figure). If you select 2 described above, then you push key 2.
2	2 ENTER	No. of DATA = ?	Input No. of data you have. (e.g. No. of data = 12)
3	12 ENTER	A-Z, S-L = 1 Z-A, L-S = 2 ?	Select 1 or 2. A-Z denotes alphabetic order, L-S denotes large number to small number. (e.g. you selected 1)
4	1 ENTER	X = X\$ = 1/	Input first data (e.g. 123). In the case of alphabet, X\$ = appears on screen.
5	123 ENTER	X =	Input second data (e.g. 56).
6	56 ENTER	X =	
		Repeat until all data are input.	When all data are input, then rearranged data are printed out.
7		>	Operation is finished and > mark appears on screen.

1/ In the case of alphabetic data, "X\$" insted of "X=" appears on screen.

EXAMPLES of PRINTOUT

(PROGRAM No.001)

- 2 -

OUTPUT

OUTPUT

INPUT DATA

OILCAN
STUMP
BUTTER
RESOURCE
WHISPER
EXPLANATION
PAINTER
PANEL
JUSTIFICATION
INCOME
ABACUS
APPENDIX
APPLE
MAGNET
INTELLIGENT

<A-Z>



ABC....XYZ

<Z-A>



ZYX....CBA

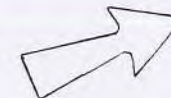
ABACUS
APPENDIX
APPLE
BUTTER
EXPLANATION
INCOME
INTELLIGENT
JUSTIFICATION
MAGNET
OILCAN
PAINTER
PANEL
RESOURCE
STUMP
WHISPER

WHISPER
STUMP
RESOURCE
PANEL
PAINTER
OILCAN
MAGNET
JUSTIFICATION
INTELLIGENT
INCOME
EXPLANATION
BUTTER
APPLE
APPENDIX
ABACUS

INPUT DATA

123
56
4560
300
451
1012
37
41
195
12
6
222

<S-L>



Small to Large

<L-S>



Large to Small

6
12
37
41
56
123
195
222
300
451
1012
4560

4560
1012
451
300
222
195
123
56
41
37
12
6

PROGRAM LIST

FLOW CHART

(PROGRAM No.001)

```

5:REM *****
6:REM *NUMERALS*
7:REM *ALPHABET*
8:REM *RANKINGS*
9:REM *****
10:"A":CLEAR :
  INPUT "CHARACT
  ER=1 NUMERAL=2
  ?";M
15:IF (M=1)+(M=2)
  <>1GOTO 10
20:INPUT "No.of D
  ATA=?";N
30:INPUT "A-Z, S-L
  =1 Z-A, L-S=2 ?
  ";O
35:IF (O=1)+(O=2)
  <>1GOTO 30
40:IF M=2GOTO 230
50:DIM A$(N-1)
60:FOR B=0TO N-1
70:INPUT "X$=";A$(
  B)
80:NEXT B
90:FOR C=0TO N-2
100:J=C+1
110:FOR D=JTO N-1
120:IF O=2GOTO 150
130:IF A$(C)>A$(D)
  GOTO 160
140:GOTO 170
150:IF A$(C)<A$(D)
  GOTO 160
155:GOTO 170
160:P$=A$(C):A$(C)=
  A$(D):A$(D)=P$
170:NEXT D
180:NEXT C
190:FOR E=0TO N-1
200:LPRINT A$(E)
210:NEXT E
220:GOTO 400
230:DIM A(N-1)
240:FOR B=0TO N-1
250:INPUT "X=";A(B)
260:NEXT B
270:FOR C=0TO N-2
280:J=C+1
290:FOR D=JTO N-1
300:IF O=2GOTO 330

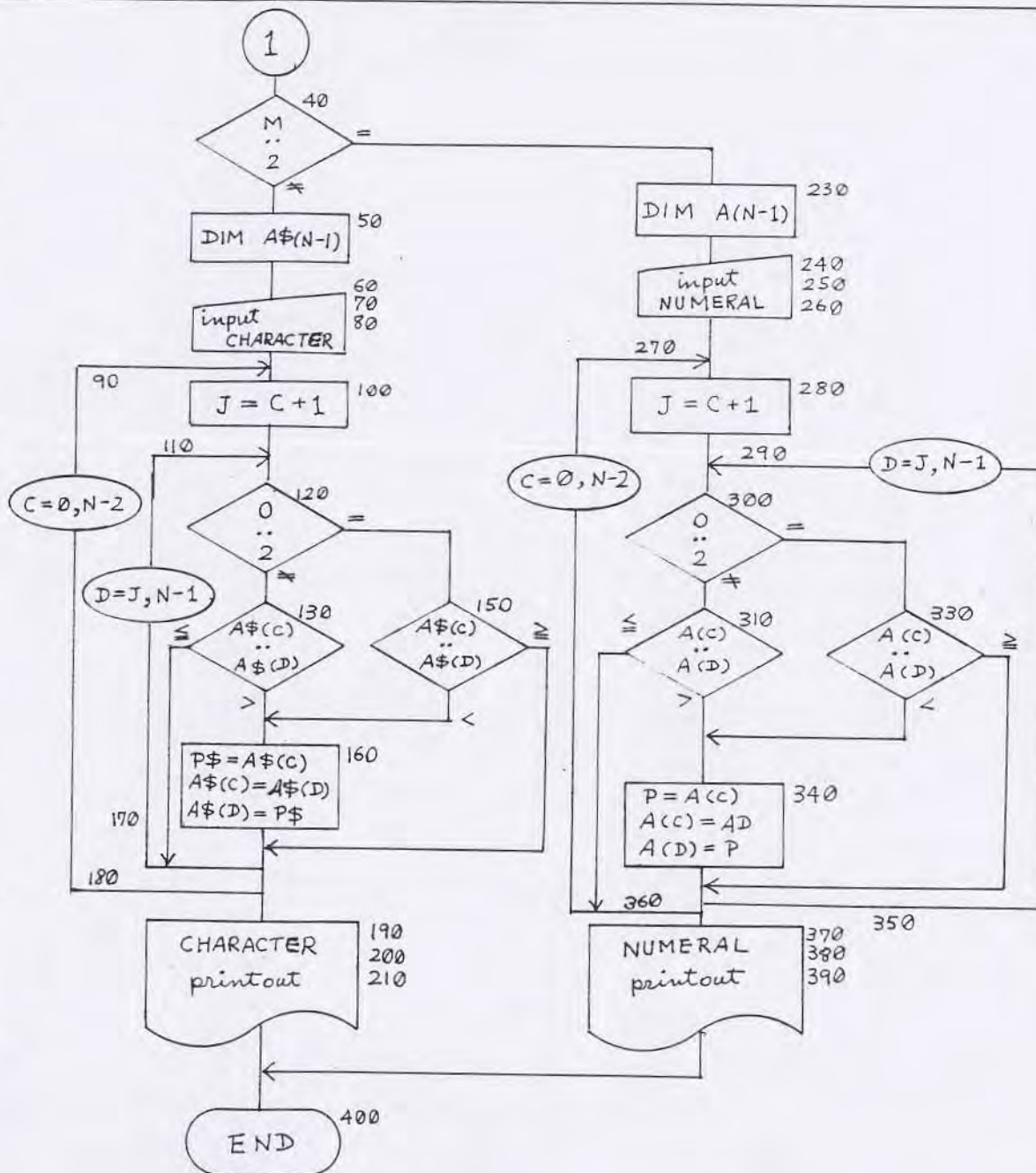
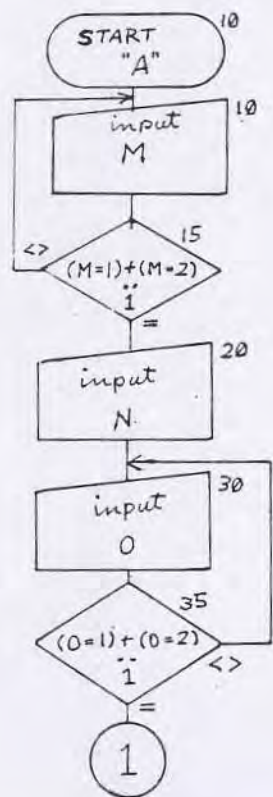
```

```

310:IF A(C)<=A(D)
  GOTO 350
320:GOTO 340
330:IF A(C)>=A(D)
  GOTO 350
340:P=A(C):A(C)=A(
  D):A(D)=P
350:NEXT D
360:NEXT C
370:FOR E=0TO N-1
380:LPRINT A(E)
390:NEXT E
400:END

```

STATUS 1



THREE DIGITAL RANKING and MEDIAN

(PROGRAM No.103)

- 4 -

GENERAL EXPLANATION

- (1) There are several systems of RANKING of digital data.
Three important TYPES (systems) have been selected here (see EXAMPLES of printout on the next page).
- (2) Ranking of character DATA (arrangement in alphabetical order, ABC.....), see Program No.001
(Cassette 01-A, 001-014; S. SHINDO)
- (3) Mean = $\bar{X} = \sum X/N$
- (4) Median: If N is an odd number, median is the mid-value of N; if N is an even number, median is $((n/2) + (n/2+1)/2(n=N))$.

3 DIGITAL RANKING,
MEDIAN

SHARP PC-1500
LANGUAGE USED:
EXPANDED BASIC

PROGRAM No.103
CASSETTE=02-A
TAPE COUNTER
000-033

12 JUNE 1982
S.SHINDO(SEAFDEC)

KEY OPERATION PROCEDURE

STEP	KEYSTROKE	DISPLAY (Screen)	PRINTOUT (Paper)	Remarks
0	ON	>		RUN mode. > denotes start or end (ready).
1	DEF A	No. of DATA = _	Title,....., MEMO:	N, _ denotes cursor. (N = No. of data)
2	2 0	No. of DATA = 20		(for example) N = 20.
3	ENTER	DATA (1) = ? <u>1/</u>		Waiting input DATA (1).
4	6 5 2	DATA (1) = 652		(for example) DATA (1) is 652.
5	ENTER	DATA (2) = ?		
				up to DATA (N).
6	ENTER	TYPE, A=1, B=2, C=3		around 3 seconds display.
		TYPE = 1, 2 or 3 ? _		(for example) you selected 2.
7	2	TYPE = 1, 2 or 3 ? 2		
8	ENTER		Example TYPE - B.	Start computation.
		>		END. > denotes end of operation.

· 1/ If data = 0, input 0 (should not stroke "ENTER" key only "without strike 0 key").

EXAMPLES of OUTPUT

(PROGRAM No.103)

TYPE-A

** 3 KINDS of RANK
ING and MEDIAN ***

MEMO:

No.of DATA= 20

RANK	DATA
1	5689
2	999
3	898
4	898
5	898
6	568
7	456
8	456
9	452
10	400
11	400
12	74
13	35
14	33
15	33
16	25
17	23
18	21
19	7
20	2

MEAN= 618.35
MEDIAN= 400



SIMPL (INTERIM) RANKING.
MEDIAN can be obtained.

TYPE-B

** 3 KINDS of RANK
ING and MEDIAN ***

MEMO:

No.of DATA= 20

INPUT	DATA	RANK
1	400	10
2	452	8
3	456	7
4	568	6
5	898	4
6	898	4
7	898	4
8	999	2
9	5689	1
10	2	20
11	7	19
12	21	18
13	23	17
14	25	16
15	33	14.5
16	33	14.5
17	35	13
18	74	12
19	400	10
20	400	10



TRUE RANK can be obtained by
INPUT order.

TYPE-C

** 3 KINDS of RANK
ING and MEDIAN ***

MEMO:

No.of DATA= 20

RANK	DATA
1	5689
2	999
4	898
4	898
4	898
6	568
7	456
8	452
10	400
10	400
10	400
12	74
13	35
14.5	33
14.5	33
16	25
17	23
18	21
19	7
20	2

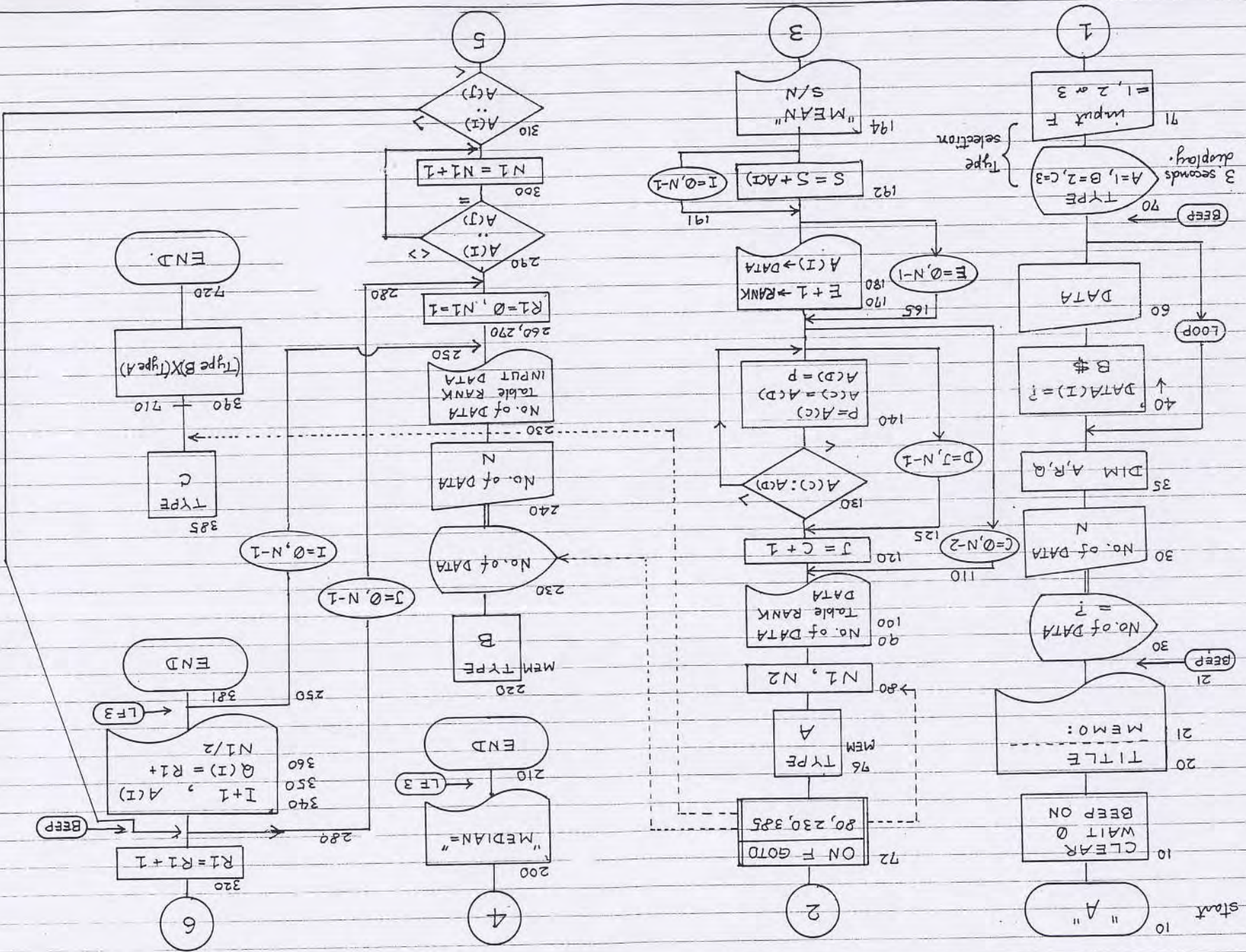
MEAN= 615.55



TRUE RANK can be obtained by
ordinary order.

FLOW CHART

(PROGRAM No. 103)



PROGRAM LIST

(PROGRAM No. 103)

- 7 -

<pre> 10:"A":CLEAR : WAIT 0:BEEP ON 20:LPRINT "** 3 K INDS of RANKIN G and MEDIAN * **" 21:LPRINT "----- -----"; LPRINT "MEMO:" :BEEP 5:LF 3 30:INPUT "No. of D ATA=";N 35:DIM A(N+2), R(N +2), Q(N+2) 40:FOR B=0TO N-1 50:B\$="DATA(" + STR\$ (B+1) + ")= ":PRINT B\$; 55:INPUT A(B):CLS 60:NEXT B 70:BEEP 9:WAIT 15 0:PRINT "**TYP E, A=1, B=2, C=3* *" 71:INPUT "TYPE=1, 2 or 3 ?";F 72:ON FGOTO 80, 23 0, 385 76:REM **TYPE-A** ***** 80:N1=INT ((N+1)/ 2)-1:N2=INT ((N+2)/2)-1 90:LPRINT "No. of DATA=";N:LF 1 100:LPRINT " RANK DATA" 110:FOR C=0TO N-2 120:J=C+1 125:FOR D=JTO N-1 130:IF A(C)>A(D) GOTO 150 140:P=A(C):A(C)=A(D):A(D)=P 150:NEXT D:NEXT C 160:FOR E=0TO N-1 165:IF E=0THEN BEEP 10 </pre>	<pre> 170:LPRINT TAB 2;E +1 180:LF -1:LPRINT A (E) 190:NEXT E:LF 1 191:FOR I=0TO N-1 192:S=S+A(I) 193:NEXT I 194:LPRINT "MEAN=" ;S/N 200:M=(A(N1)+A(N2))/2:LPRINT "ME DIAN=";M:LF 3 210:END 220:REM **TYPE-B** ***** 230:LPRINT "No. of DATA=";N:LF 1 240:LPRINT "INPUT DATA RANK" 250:FOR I=0TO N-1 260:R1=0 270:N1=1 280:FOR J=0TO N-1 290:IF A(I)<>A(J) GOTO 310 300:N1=N1+1 310:IF A(I)>=A(J) GOTO 330 320:R1=R1+1 330:NEXT J 335:IF I=0THEN BEEP 10 340:LPRINT TAB 1;I +1 350:LF -1:LPRINT TAB 6;A(I) 360:LF -1:LPRINT R 1+N1/2:Q(I)=R1 +N1/2 370:NEXT I 380:LF 3 381:END 385:REM **TYPE-C** ***** 390:LPRINT "No. of DATA=";N:LF 1 400:LPRINT " RANK DATA" </pre>	<pre> 420:FOR I=0TO N-1 430:R1=0 440:N1=1 450:FOR J=0TO N-1 455:IF A(I)<>A(J) GOTO 470 460:N1=N1+1 470:IF A(I)>=A(J) GOTO 490 480:R1=R1+1 490:NEXT J 495:Q(I)=R1+N1/2 496:NEXT I 500:N1=INT ((N+1)/ 2)-1:N2=INT ((N+2)/2)-1 510:FOR C=0TO N-2 520:J=C+1 530:FOR D=JTO N-1 540:IF Q(C)>Q(D) GOTO 560 560:IF Q(C)<Q(D) GOTO 580 570:P=Q(C):Q(C)=Q(D):Q(D)=P 580:NEXT D:NEXT C 600:N1=INT ((N+1)/ 2)-1:N2=INT ((N+2)/2)-1 610:FOR C=0TO N-2 620:J=C+1 630:FOR D=JTO N-1 640:IF A(C)>A(D) GOTO 660 650:P=A(C):A(C)=A(D):A(D)=P 660:NEXT D:NEXT C 665:BEEP ON :BEEP 10 669:FOR I=0TO N-1 670:LPRINT TAB 2;Q (I) 680:LF -1:LPRINT A (I) 690:S=S+A(I) 700:NEXT I:LF 1 710:LPRINT "MEAN=" ;S/N:LF 3 </pre>	<pre> 720:END 65279:END STATUS 1 1584 </pre>
--	---	--	---

BAND GRAPH (Mono)

- 8 -

(PROGRAM No.309)

GENERAL EXPLANATION

OUTLINE : A Band Graph is very useful when you want to know the share of each item in the total, as well as when you want to compare the differences with another Band Graph which is composed of the same items. With this program, you can generate Band Graphs by keying in statistical data.

OPERATING GUIDE : Before you use this program, you operate key TEST ENTER by MANUAL, then you will know the condition (color or depth of color) of each pen. Then, you can select a suitable pen, i.e. color or depth of color (in case of black for photocopy or offset printing). After this, you can start the program. First, input (i) number of items (within 8 items); (ii) names of items (within 12 characters) and (iii) data of each item. Then, the computer generates a Band Graph and names of each item, and their rates (in percentage display) are printed out.

BAND GRAPH (Mono)

SHARP PC-1500
LANGUAGE USED:
EXPANDED BASIC

PROGRAM No.309
CASSETTE=03-B
TAPE COUNTER
142-171

12 JAN. 1983
S.SHINDO<SEAFDEC>

KEY OPERATION PROCEDURE

STEP	KEYSTROKE	DISPLAY (Screen)	Remarks
0	ON	>	
1	DEF B	PEN SELECT (0-3) = ?	Select pen number 0 to 3. If you selected 2, then push 2.
2	2 ENTER	No. of ITEM (> = 8) = ?	Input number of items (within 8 items). If 6 items are in your statistics, push key 6.
3	6 ENTER	ITEM (1)	Input name of first item. If name is PHILIPPINES, type PHILIPPINES.
4	PHILIPPINES ENTER	DATA (1)	Input data of first item (Philippines). If data is 13502 type 13502.
5	13502 ENTER	ITEM (2)	Input name of second item. If names is MALAYSIA, type MALAYSIA.
6	MALAYSIA ENTER	DATA (2)	Input data of second item (Malaysia)
repeat until all names of each item and their data are input.			
7		>	Computer generates graph, etc. When finished, symbol > appears on screen.

	PHILIPPINES	13.10%
	MALAYSIA	10.92%
	THAILAND	20.20%
	SINGAPORE	6.55%
	INDONESIA	16.66%
	HONG KONG	9.61%
	TAIWAN	14.27%
	SRI LANKA	8.69%

	PENCIL	14.77%
	BALL-PEN	29.54%
	DESK	22.15%
	CHAIR	13.29%
	PAPER	13.29%
	SECTION PAPE	6.96%

```

5:REM *****BAND G
  GRAPH (MONO)***
  *****
10:"B":WAIT 0:
  CLEAR :Q=8:DIM
  A$(Q)*12,A(Q)
15:INPUT "PEN SEL
  ECT(0-3)=?";C
16:COLOR C
20:WAIT 100:PRINT
  "No. of ITEM(>=
  8)":BEEP 5
30:FOR I=0TO Q
40:C$="ITEM("+
  STR$(I+1)+"")
  :PRINT C$;
50:BEEP 3:INPUT A
  $(I):GOTO 70
60:CLS :I=I-1:
  GOTO 100
70:CLS :C$="DATA(
  "+STR$(I+1)+"
  )=":PRINT C$;
80:BEEP 5:INPUT A
  (I):CLS :H=H+A
  (I)
90:NEXT I
100:I=I+1
300:GRAPH :
  GLCURSOR (0,0)
  :SORGN :ROTATE
  1
312:S=160:U=215
314:L=-1:K=-1
315:FOR J=0TO I-1
316:L=L+1:K=K+1
320:D=INT (A(J)/H*
  100+.5):E=D*4
325:W=T-E
327:IF L>4LET L=0
330:LINE (160,T)-(
  215,W),0,C,B:
  GOSUB 400
331:IF L=4LET L=-1
332:T=W:NEXT J
335:K=-1:L=-1:W=-5
  0:T=0
336:FOR J=0TO I-1
337:L=L+1:K=K+1:Z=
  K
340:F=160/I*(I-J-1
  ):LINE (F,0)-

```

```

(F-5+160/1),-5
0),0,C,B
345:S=F:U=F-5+160/
1:GOSUB 400
349:COLOR C:
GLCURSOR (F,-8
0):LPRINT A$(J
)
351:D=A(J)/H*100:D
=INT ((D+.005
*100)/100
352:IF J=I-1LET D=
100-G:GOTO 355
353:G=G+D
355:GLCURSOR (F,-2
40):LPRINT
USING "###.##"
:D;"%":USING
360:IF L=L-4LET L=-1
368:NEXT J
370:TEXT :LF 10:
BEEP 10
380:END
400:Z=K
499:REM **SUB PROG
.*****
500:IF Z<=4LET Z=1
501:IF Z>=5LET Z=2
510:IF Z=1GOSUB 70
0
520:IF Z=2GOSUB 75
0
530:RETURN
539:REM ***SUB PRO
G.*****
700:P=T:FOR O=1TO
100
705:P=P-3
710:IF P<=0GOTO 74
0
715:IF O=INT (O/2)
*2=0LINE (S,P)
-(U,P),L,C:
GOTO 725
720:LINE (U,P)-(S,
P),L,C
725:NEXT O
740:RETURN
749:REM ***SUB PRO
G.***
750:P=S:FOR O=1TO
50
755:P=P+3

```

```

760: IF P>=UGOTO 79
      0
765: IF Q=INT (Q/2)
      *2=0LINE (P,T)
      -(P,W),L,C:
      GOTO 775
770: LINE (P,W)-(P,
      T),L,C
775: NEXT Q
790: RETURN
800: END
65279: END

```


PERCENTAGE BAND (Mono)

(PROGRAM No.301)

- 10 -

GENERAL EXPLANATION

After selecting a suitable pen number, input TITLE of the graph (within 14 characters including spaces, commas, etc.) and the number of BANDS (the number of BANDS should be 3 or less). After that, the name of each BAND should be input within 8 characters. Then, input number of blocks breakdowned of items in a BAND, number should be 8 or less. The name of each block (within 8 characters) should be input. Next, input all data following the order displayed on screen. Then the computer generates, within two minutes, diagrams and a table of data with their percentage.

PERCENTAGE BANDS
(Mono)

SHARP PC-1500
LANGUAGE USED:
EXPANDED BASIC

PROGRAM No.301
CASSETTE=03-A
TAPE COUNTER
035-067

15 OCT.1982
S.SHINDO(SEAFDEC)

KEY OPERATION PROCEDURE

STEP	KEYSTROKE	DISPLAY (Screen)	Remarks
1	DEF K	> PEN SELECT (0 - 3) = ?	Four small boxes appear on paper for pen selection. Input suitable pen number. If you want pen No.1, press 1.
2	1 ENTER	TITLE = ?	Input title of the graph (within 14 characters; each comma, space, symbol, or digit is also considered as one character)
3	3 ENTER	No. of BANDS (1 - 3) = ?	Input No. of bands (within 3).
4	Type name ENTER	Name of BAND 1 = ?	Type name of the first band.
5	Type name ENTER	Name of BAND 2 = ?	Type name of the second band. This procedure will be repeated up to the last band.
6	5 ENTER	No. of Blocks in a BAND = ?	Input No. of blocks (separate items in a band). If a band is composed of 5 items, press 5. The number of blocks should be within 8 items.
7	Type name ENTER	Name of Block 1 = ? (This procedure is repeated up to the last block)	Type name of the first item.
8	strok data ENTER	Name of BAND-Name of block = ?	Input Data following the order displayed on the screen.
END		>	The computer generates diagrams and a table. Then > mark appears. This means the work is finished.

EXAMPLES of PRINTOUT

(PROGRAM No.301) - 11 -

FISH PRODUCTION

1	2	3	4	5	THAILAND
1	2	3	4	5	MALAYSIA
1	2	3	4	5	HONG KONG

	THAILAND		MALAYSIA		HONG KONG	
1. MARINE-1	789002	48.1%	700112	45.9%	456123	29.3%
2. MARINE-2	456012	27.8%	123045	8.1%	132000	8.5%
3. FRESHWAT	123564	7.5%	236901	15.5%	236950	15.2%
4. AQUACULT	125004	7.6%	345000	22.6%	345000	22.1%
5. OTHERS	145100	9.0%	120023	7.9%	389012	24.9%
TOTAL	1638682	100.0%	1525081	100.0%	1559085	100.0%

BUDGET

1	2	3	4	TD
1	2	3	4	MFRD
1	2	3	4	AQD

	TD		MFRD		AQD	
1. OPERATIO	324	28.5%	204	28.3%	450	28.0%
2. TRAINING	552	48.5%	122	16.9%	325	20.2%
3. RESEARCH	239	21.0%	314	43.6%	683	42.5%
4. OTHERS	23	2.0%	80	11.2%	150	9.3%
TOTAL	1138	100.0%	720	100.0%	1608	100.0%

PROGRAM LIST

- 12 -

(PROGRAM No.301)

```

5:REM *****
* PERCENTAGE *
* BANDS MONO *
*****
10:"K":WAIT 0:
  CLEAR :TEXT :
  CLS
20:INPUT "PEN SEL
  ECT(0-3)=?";K
30:TEXT :COLOR K:
  CSIZE 2
50:COLOR K:IF T=1
  GOTO 195
60:INPUT "TITLE=?
  ";A$
70:INPUT "No.of B
  ANDs(1-3)=?";C
  :IF (C<2)+(C>3
  )=1GOTO 70
80:DIM A$(C-1)*8,
  C$(0)*25
90:FOR I=0TO C-1:
  C$(0)="Name of
  BAND "+STR$ (
  I+1)+"=":PRINT
  C$(0);
100:INPUT A$(I):
  CLS :NEXT I
110:INPUT "No.of B
  locks in a BAN
  D=?";D:IF D>10
  GOTO 110
120:DIM B$(D-1)*8,
  A(C-1,D-1),B(C
  -1),C(D-1,1)
130:FOR I=0TO D-1:
  C$(0)="Name of
  Block "+STR$
  (I+1)+"=":
  PRINT C$(0);
140:INPUT B$(I):
  CLS :NEXT I
150:FOR I=0TO C-1:
  FOR J=0TO D-1
155:C$(0)=A$(I)+"-
  "+B$(J)+"=":
  PRINT C$(0);
160:INPUT A(I,J)
170:CLS :B(I)=B(I)
  +A(I,J):NEXT J
190:NEXT I
195:T=1:GOTO 400

```

```

400:GRAPH :ROTATE
  1:GLCURSOR (20
  3,-50):LPRINT
  A$
405:FOR I=0TO C-1:
  Y=0:N=0:S=300/
  B(I):X=185-1*2
  00/3
410:FOR J=0TO D-1
415:CSIZE 2
433:GOTO 437
437:IF A(I,J)=0LET
  E=0:GOTO 445
440:E=A(I,J)*S:
  LINE (X,Y)-(X-
  45,Y-E+1),0,K,
  B:GLCURSOR (X-
  25,Y-(E/2)+14)
  :LPRINT (J+1)
445:IF I=0GOTO 450
447:IF J=D-1GOTO 4
  50
448:LINE (C(J,0),C
  (J,1))-(X,Y-E-
  1),1,K
450:C(J,0)=X-45:C(
  J,1)=Y-E-1
455:Y=Y-E
460:NEXT J:NEXT I
470:COLOR K:CSIZE
  2:FOR I=0TO C-
  1
480:X=185-(I+1)*20
  0/3+35
490:GLCURSOR (X,-3
  20):LPRINT A$(
  I):NEXT I
495:TEXT :LF 5
500:GRAPH :Y=0:
  ROTATE 1:LINE
  (0,Y)-(215,Y-1
  40),0,K,B
510:LINE (20,Y)-(2
  0,Y-140),2,K:
  LINE (195,Y)-(
  195,Y-140),2,K
520:IF D>5LET X=35
  /2:Z=9:GOTO 54
  0
530:X=35:Z=4
540:COLOR K:FOR I=
  0TO D-1:U=(Z-I

```

```

)*X+25:
  GLCURSOR (U,Y)
550:IF I+1>9LET C$
  =STR$ (I+1)+";
  ":GOTO 560
555:C$=" "+STR$ (I
  +1)+"."
560:C$(0)=C$+B$(I)
565:LPRINT C$(0):
  NEXT I:COLOR K
570:GLCURSOR (5,Y-
  10):LPRINT "TO
  TAL":Y=Y-30
580:FOR I=0TO C-1:
  Y=Y-110:GOSUB
  800:GOSUB 820
590:GLCURSOR (200,
  Y-50):LPRINT A
  $(I):COLOR K
600:FOR J=0TO D-1:
  U=(Z-J)*X+25:
  GLCURSOR (U,Y-
  15):LPRINT
  USING "#####
  #";A(I,J):
  USING :NEXT J
606:GLCURSOR (5,Y-
  15):LPRINT
  USING "#####
  #";B(I):USING
  607:LINE (0,Y-120)
  -(195,Y-120),2
  ,K
608:COLOR K
610:R=0:FOR J=0TO
  D-1:U=(Z-J)*X+
  25:GLCURSOR (U
  ,Y-125):U=INT
  (A(I,J)/B(I)*1
  0^3+.5)/10
612:IF J=D-1LET U=
  100-R:R=100:
  GOTO 614
613:R=R+U
614:LPRINT USING "
  ####.#";U;"%":
  USING
616:NEXT J:
  GLCURSOR (5,Y-
  125):LPRINT
  USING "####.#"
  ;R;"%":Y=Y-100

```

```

:USING
620:NEXT I
630:TEXT :LF 5:ON
  ERROR GOTO 900
640:ON ERROR GOTO
  900
800:LINE (215,Y)-(
  215,Y-210),0,K
  :LINE (215,Y-2
  10)-(0,Y-210),
  0,K
810:LINE (0,Y-210)
  -(0,Y),0,K:
  RETURN
820:LINE (20,Y)-(2
  0,Y-210),2,K:
  LINE (195,Y)-(
  195,Y-210),2,K
  :RETURN
900:END

```

STATUS (1)

1857

PERCENTAGE BAND (Colored)

(PROGRAM No.300)

- 13 -

GENERAL EXPLANATION

This program generates percentage bands and a table using four colors, namely black, blue, green and red. As the key operating procedure is almost the same as for PROG.-301, it is not necessary to explain it again. The differences between PROG.-300 and PROG.-301 are: (1) the former uses four colors, whereas the latter uses only black color. (2) the frame of the table in PROG.-300 is a dotted line, while that of PROG.-301 is a solid line. Generally, colored graphs are easy to see, but they are not suitable for photocopying. Also in offset printing, it is four times more expensive to print color graphs than to print black and white ones.

In PROG.-300 and PROG.-301 there is not much difference in the relative difficulty of reading their respective graphs.

PERCENTAGE BAND
(Colored)

SHARP PC-1500
LANGUAGE USED:
EXPANDED BASIC

PROGRAM No.300
CASSETTE=03-A
TAPE COUNTER
002-032

28 DEC. 1982
SHARP CORP.

EXAMPLE OF PRINTOUT

BLACK

PRODUCTION

1	2	3	4	5	6	JAPAN
1	2	3	4	5	6	KOREA
1	2	3	4	5	6	CHINA

BLUE

GREEN

BLACK

RED

BLUE

GREEN

BLUE

ALL NUMERALS ARE BLACK

	JAPAN		KOREA		CHINA	
1; SPP. -A	5000	23.8%	4100	23.3%	4003	19.4%
2; SPP. -B	2505	11.9%	1400	8.0%	2356	11.4%
3; SPP. -C	4017	19.1%	5269	30.0%	2587	12.5%
4; SPP. -D	2589	12.3%	2354	13.4%	7510	36.4%
5; SPP. -E	4510	21.5%	1234	7.0%	2589	12.5%
6; SPP. -F	2356	11.4%	3214	18.3%	1599	7.8%
TOTAL	20977	100.0%	17571	100.0%	20644	100.0%

BLUE

PROGRAM LIST

(PROGRAM No.300)

- 15 -

```

5:REM *****
* PERCENTAGE *
* BANDS COLOR*
*****
10:"K":WAIT 0:
CLEAR :TEXT :
CLS
30:TEXT :COLOR 0:
CSIZE 2
50:COLOR 0:IF T=1
GOTO 195
60:INPUT "TITLE=?
":A$
70:INPUT "No. of B
ANDs (1-3)=?";C
:IF (C<2)+(C>3
)=1GOTO 70
80:DIM A$(C-1)*8,
C$(0)*25
90:FOR I=0TO C-1:
C$(0)="Name of
BAND "+STR$ (
I+1)+"=":PRINT
C$(0);
100:INPUT A$(I):
CLS :NEXT I
110:INPUT "No. of B
locks in a BAN
D=?";D:IF D>10
GOTO 110
120:DIM B$(D-1)*8,
A(C-1,D-1),B(C
-1),C(D-1,1)
130:FOR I=0TO D-1:
C$(0)="Name of
Block "+STR$
(I+1)+"=":
PRINT C$(0);
140:INPUT B$(I):
CLS :NEXT I
150:FOR I=0TO C-1:
FOR J=0TO D-1
155:C$(0)=A$(I)+"-
"+B$(J)+"=":
PRINT C$(0);
160:INPUT A(I,J)
170:CLS :B(I)=B(I)
+A(I,J):NEXT J
190:NEXT I
195:T=1:GOTO 400
400:GRAPH :ROTATE
1:GLCURSOR (20
3,-50):LPRINT

```

```

A$
405:FOR I=0TO C-1:
Y=0:N=0:S=300/
B(I):X=185-I*2
00/3
410:FOR J=0TO D-1
415:CSIZE 2
430:N=N+1:IF N>4
LET N=1
433:K=N:IF K=3LET
K=0:GOTO 437
435:IF K=4LET K=3
437:IF A(I,J)=0LET
E=0:GOTO 445
440:E=A(I,J)*S:
LINE (X,Y)-(X-
45,Y-E+1),0,K,
B:GLCURSOR (X-
25,Y-(E/2)+14)
:LPRINT (J+1)
445:IF I=0GOTO 450
447:IF J=D-1GOTO 4
50
448:LINE (C(J,0),C
(J,1))-(X,Y-E-
1),1,0
450:C(J,0)=X-45:C(
J,1)=Y-E-1
455:Y=Y-E
460:NEXT J:NEXT I
470:COLOR 0:CSIZE
2:FOR I=0TO C-
1
480:X=185-(I+1)*20
0/3+35
490:GLCURSOR (X,-3
20):LPRINT A$(
I):NEXT I
495:TEXT :LF 5
500:GRAPH :Y=0:
ROTATE 1:LINE
(0,Y)-(215,Y-1
40),2,1,B
510:LINE (20,Y)-(2
0,Y-140),2,1:
LINE (195,Y)-(
195,Y-140),2,1
520:IF D>5LET X=35
/2:Z=9:GOTO 54
0
530:X=35:Z=4
540:COLOR 0:FOR I=

```

```

0TO D-1:U=(Z-I
)*X+25:
GLCURSOR (U,Y)
550:IF I+1>9LET C$
=STR$ (I+1)+";
":GOTO 560
555:C$=" "+STR$ (I
+1)+";";
560:C$(0)=C$+B$(I)
565:LPRINT C$(0):
NEXT I:COLOR 1
570:GLCURSOR (5,Y-
10):LPRINT "TO
TAL":Y=Y-30
580:FOR I=0TO C-1:
Y=Y-110:GOSUB
800:GOSUB 820
590:GLCURSOR (200,
Y-50):LPRINT A
$(I):COLOR 0
600:FOR J=0TO D-1:
U=(Z-J)*X+25:
GLCURSOR (U,Y-
15):LPRINT
USING "#####
#"A(I,J):
USING :NEXT J
606:GLCURSOR (5,Y-
15):LPRINT
USING "#####
#"B(I):USING
607:LINE (0,Y-120)
-(195,Y-120),2
,1
608:COLOR 0
610:R=0:FOR J=0TO
D-1:U=(Z-J)*X+
25:GLCURSOR (U
,Y-125):U=INT-
(A(I,J)/B(I)*1
0^3+.5)/10
612:IF J=D-1LET U=
100-R:R=100:
GOTO 614
613:R=R+U
614:LPRINT USING "
####.#":U;"%":
USING
616:NEXT J:
GLCURSOR (5,Y-
125):LPRINT
USING "####.#"

```

```

:R;"%":Y=Y-100
:USING
620:NEXT I
630:TEXT :LF 5
709:ON ERROR GOTO
900
800:LINE (215,Y)-(
215,Y-210),2,1
:LINE (215,Y-2
10)-(0,Y-210),
2,1.
810:LINE (0,Y-210)
-(0,Y),2,1:
RETURN
820:LINE (20,Y)-(2
0,Y-210),2,1:
LINE (195,Y)-(
195,Y-210),2,1
:RETURN
900:END

```

STATUS (1)

1867

HISTOGRAM in BOX (3 Types, Mono)

- 16 -

(PROGRAM No.105)

GENERAL EXPLANATION

The present program is very useful when we have two or three different groups of data for drawing histograms, because it can generate three slightly different types histograms. Consequently, it is very easy to know that type A histogram belongs to data group A, type B histogram belongs to data group B, etc. Also, if you want to draw a single type of histogram, you can select a suitable one from the three types included in the program.

The computer displays the title of program with BEEP for 2 seconds, and you select a suitable pen number. Input title of the graph (within 18 characters), the names of items (within 18 characters) and the data. The number of items should be 8 or less. The computer will then ask you the type of histogram required (type A=1, type B=2 and type C=3). If you choose type C(=3), press number 3. The computer draws type C histogram and the record of data and percentages in small sized characters. This data table can also be included in your technical paper for reader's information.

HISTOGRAM in BOX
(3, Mono)

SHARP PC-1500
LANGUAGE USED:
EXPANDED BASIC

PROGRAM No.105
CASSETTE=02-A
TAPE COUNTER
106-139

30 JUNE 1982
S.SHINDO(SEAFDEC)

KEY OPERATION PROCEDURE

STEP	KEYSTROKE	DISPLAY (Screen)	REMARKS
1	DEF N	HISTOGRAM IN BOX (3 TYPES) PEN SELECT (0-3)?-	The computer displays the title of the program with BEEP (sound) for 2 seconds. Type in suitable pen number. If the pen number is 2, press 2.
2	2 ENTER	TITLE ?-	Type the histogram title.
3	Type title ENTER	Name of Item (1) = ?-	Type the name of item 1.
4	534 ENTER	DATA (1) = ?	Input first data. If data is 534, press 5, 3 and 4. The procedure of steps 4 and 4 should be repeated until KEY-IN of the last data. After all data are KEY-INed, press key marked ENTER.
5	ENTER	Type A=1; Type B=2; Type C=3	The computer prints the title of the histogram on paper. After this, some words (see left-hand column) are displayed on screen as your reminder. For two seconds with BEEP (sound).
6	3 ENTER	Type = ?	Then the computer asks your choice of histogram type. If you select type C (=3), press 3. (With regard to the type of histogram, refer to the next page).
END		>	The computer generates histogram and data table. When the computer work is finished, > appears on screen.

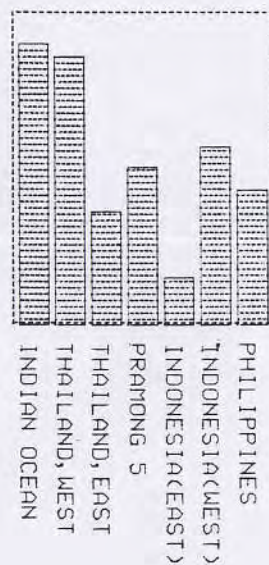
EXAMPLES of PRINTOUT

(PROGRAM No. 105)

- 17 -

(Type-A)

MARINE PRODUCTION

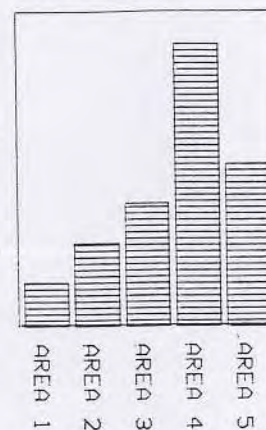


RECORD OF DATA

ITEM	DATA	PERCENT
INDIAN OCEAN	78965	23.63
THAILAND, WEST	68189	22.68
THAILAND, EAST	29195	9.72
PRAMONG 5	48251	13.48
INDONESIA(EAST)	12881	3.89
INDONESIA(WEST)	45283	15.85
PHILIPPINES	34567	11.51
	9	8.88

(Type-B)

TOTAL CATCH

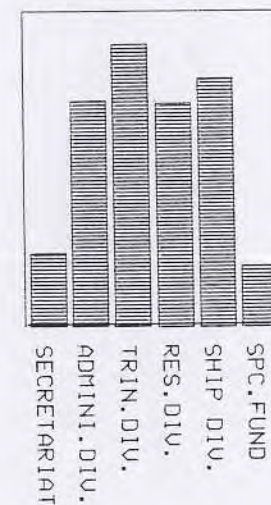


RECORD OF DATA

ITEM	DATA	PERCENT
AREA 1	123	5.31
AREA 2	234	12.81
AREA 3	345	17.71
AREA 4	789	48.52
AREA 5	456	23.42
	8	8.88
	8	8.88
	8	8.88

(Type-C)

SEC. TD. /SEAFDEC



RECORD OF DATA

ITEM	DATA	PERCENT
SECRETARIAT	147896	6.57
ADMINI. DIV.	456782	28.31
TRIN. DIV.	567896	25.25
RES. DIV.	456898	28.13
SHIP DIV.	588888	22.23
SPC. FUND	123456	5.49
	8	8.88
	8	8.88

PROGRAM LIST

(PROGRAM No.105)

- 18 -

```

10:"N":WAIT 0:
  CLEAR :BEEP ON
15:DIM A$(8)*18,A
  (8)
20:PRINT "HISTOGR
  AM IN BOX (3 T
  YPES)":BEEP 20
  :WAIT 0
23:INPUT "PEN SEL
  ECT(0-3)?":P
25:INPUT "TITLE?"
  :A$(0)
30:FOR I=1TO 8
40:B$="Name of It
  em("+STR$ 1+)"
  =":PRINT B$:
45:INPUT A$(1):
  CLS :GOTO 60
50:CLS :I=I-1:
  GOTO 80
60:B$="DATA(+
  STR$ 1+)"=":
  PRINT B$:
65:INPUT A(1):CLS
67:IF D(A(1))LET D
  =A(1)
70:NEXT I
80:LPRINT "
  ";
  A$(0)
90:D=45/D
91:BEEP 5
95:PRINT "Type A=
  1;Type B=2;Typ
  e C=3":BEEP 30
97:INPUT "Type=?"
  :W
100:GRAPH
110:GLCURSOR (0,-2
  50):SORGN
120:IF W=1LET S=2:
  IF W=1LET T=P
121:IF W=2LET S=0:
  IF W=2LET T=P
122:IF W=3LET S=0:
  IF W=3LET T=P
130:LINE (0,0)-(20
  5,250),S,T,B
140:G=5
150:E=(40-I)/I*5
160:FOR J=1TO I
170:H=G+E
180:F=D*A(J)*5

```

```

190:GOSUB 500:G=H+
  5:NEXT J:G=5
200:FOR J=1TO 1:H=
  G+E
240:N=G+E/2-10:
  GOSUB 700
250:G=H+5:NEXT J
260:TEXT :LF 8
265:CSIZE 1
270:LPRINT "*RECOR
  D OF DATA*":LF
  2
285:LPRINT "ITEM":
  LF -1
286:LPRINT TAB 20;
  "DATA":LF -1
287:LPRINT TAB 29;
  "PERCENT":LF 1
288:FOR I=1TO 8:Q=
  0+A(I):NEXT I
290:FOR I=1TO 8
300:LPRINT A$(I)
309:LF -1
310:LPRINT TAB 19;
  A(I)
315:USING "###.##"
319:LF -1
320:LPRINT TAB 30;
  A(I)/Q*100:
  USING
330:NEXT I
340:CSIZE 2:LF 4
350:END
500:GLCURSOR (G,0)
  :LINE (G,0)-(H
  ,F),0,P,B
600:O=0
605:FOR K=1TO 90
606:IF W=1LET O=O+
  5
607:IF W=2LET O=O+
  5
608:IF W=3LET O=O+
  3
610:IF F<=0GOTO 62
  0
611:IF W=1LET S=1:
  IF W=2LET S=0:
  IF W=3LET S=0
612:IF K-INT (K/2)
  *2=1LINE (G,0)
  -(H,0),S,T:
  GOTO 619

```

```

613:ON WGOTO 615,6
  16,616
615:LINE (H,0)-(G,
  0),1,T:GOTO 61
  9
616:LINE (H,0)-(G,
  0),0,T:GOTO 61
  9
619:NEXT K
620:RETURN
700:ROTATE 1
710:GLCURSOR (N,-1
  5):COLOR P
720:LPRINT A$(J)
830:ROTATE 0
840:RETURN

```

STATUS 1

1219

COUPLED HISTOGRAMS and a CURVE (Mono)

(PROGRAM No.107)

- 19 -

GENERAL EXPLANATION

With this program, you can generate one of the five different types of coupled-histograms or one curve. (Ref. EXAMPLES OF PRINTOUT on the following page). The first three types of histogram are unique and especially important. When you have two groups of data (data A and data B), such as, figures for two different years broken down into several items, production of the east coast and the west coast also broken down into several items, etc., these three types of histograms are very useful. In the case of Type A histogram (see EXAMPLES), however, data B should be less than data A. Type A histogram is suitable for comparison between the budget (data A) and expenditure (data B) during a fiscal period. Type D and E are common types of histograms. Type D is a histogram with white bars and Type E has black (shaded) bars.

COUPLED HISTOGRAM
and CURVE(Mono)

SHARP PC-1500
LANGUAGE USED:
EXPANDED BASIC

PROGRAM No.107
CASSETTE=02-B
TAPE COUNTER
021-063

10 OCT. 1982
S.SHINDO(SEAFDEC)

Start by DEF M, and select a suitable pen number. Type the title of the graph (within 16 characters), and select a histogram or curve. Then, the computer asks you to select the SCALE of GRAPH. The SCALE denotes intervals on the Y - axis (horizontal axis) of the graph. Check carefully the maximum value of data in your hand, and input suitable digits of SCALE. Then, input in due order. Names of items (within 16 characters), data A, data B. When all data are input, press key marked ENTER, and select the type of histogram (in the case when a histogram is required). If you input data A only and input zero for data B, then Type D is suitable. If you input data B only and zero for data A, then Type E histogram is suitable. When you select a curve, you input data A, and always input zero for data B.

The computer generates not only the graph, but also "record of data A and B" (in small-sized characters) as well as "ATTACHMENT" (ordinary characters). The names of items in the attachment should be cut out from the printout and glued on to the graph to get the proper layout.

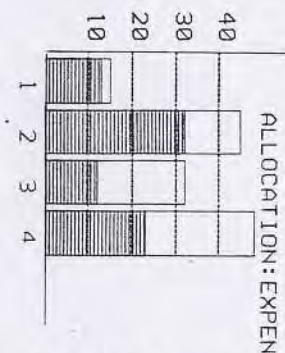
KEY OPERATION PROCEDURE

STEP	KEYSTROKE	DISPLAY (Screen)	REMARKS
0	ON	<	Ready for operation.
1	DEF M	PEN SELECT (0-3) = ? -	Select suitable pen number (No. 0 to No. 3). If your choice is 3, press key 3
2	3 ENTER	TITLE ? -	Type title (within 16 characters) and press the key marked ENTER
3	Type title ENTER	HISTOGRAM = 1 or CURVE = 2 ? -	Select histogram (= 1) or curve (= 2). If you select histogram, press key 1.
4	1 ENTER	SCALE of GRAPH ? -	(see general explanation). If your decision is 20, press keys 2 and 0.
5	20 ENTER	Name of ITEM (1) = ?	Type name of item (within 16 characters) and press key marked ENTER
6	DATA A (1) ENTER	DATA A (1) = ?	Input first data of A, and press key marked ENTER
7		DATA B (1) = ?	Input first data of B, and press key marked ENTER
			After BEEP (sound) the computer asks the name, 2nd data of A and B. The procedure of steps 5 to 7 should be repeated until all data are input. Press ENTER key.
8	ENTER 1 ENTER	Type A = 1; Type B = 2; Type C = 3 ? -	After BEEP, the computer draws the first part of graph, that is, SCALES in Y-axis, and asks Type of histogram. (see EXAMPLES and general explanation). If you select Type A (= 1), press key 1. For histograms D and E see general explanation.
END		<	Then computer generates the graph, record of data and attachment. When finished, < mark appears.

EXAMPLES of PRINTOUT

(PROGRAM No. 107)

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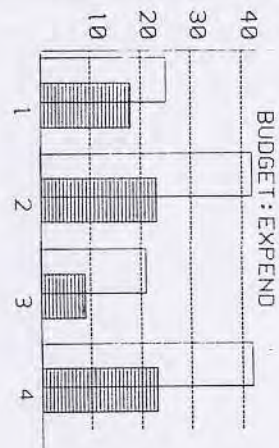
** RECORD OF DATA **

NAME OF ITEMS	DATA-A	DATA-B
Sec.	15	13
TD	45	32
MFRD	32	12
AQD	48	23

*** ATTACHMENT **

Sec.	1
TD	2
MFRD	3
AQD	4

Type-A



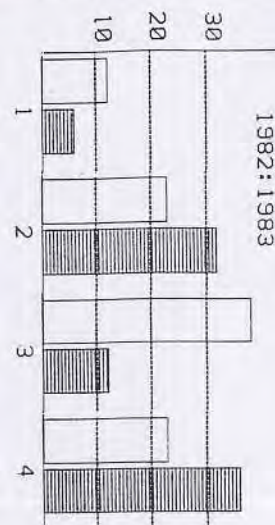
** RECORD OF DATA **

NAME OF ITEMS	DATA-A	DATA-B
SECRETARIAT	25	18
TD	42	23
MFRD	21	9
AQD	42	23

*** ATTACHMENT **

SECRETARIAT	1
TD	2
MFRD	3
AQD	4

Type-C



** RECORD OF DATA **

NAME OF ITEMS	DATA-A	DATA-B
AREA 1	12	6
AREA 2	23	32
AREA 3	38	12
AREA 4	23	38

*** ATTACHMENT **

AREA 1	1
AREA 2	2
AREA 3	3
AREA 4	4

CURVE



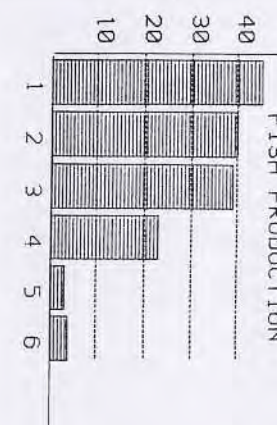
** RECORD OF DATA **

NAME OF ITEMS	DATA-A	DATA-B
MALAYSIA	35	8
SINGAPORE	6	8
PHILIPPINES	38	8
THAILAND	45	8
HONG KONG	22	8
INDONESIA	43	8

*** ATTACHMENT **

MALAYSIA	1
SINGAPORE	2
PHILIPPINES	3
THAILAND	4
HONG KONG	5
INDONESIA	6

Type-D



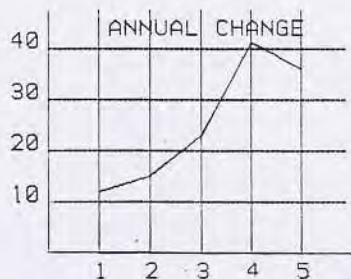
** RECORD OF DATA **

NAME OF ITEMS	DATA-A	DATA-B
THAILAND	8	45
PHILIPPINES	8	48
INDONESIA	8	38
MALAYSIA	8	23
HONG KONG	8	3
SINGAPORE	8	4

*** ATTACHMENT **

THAILAND	1
PHILIPPINES	2
INDONESIA	3
MALAYSIA	4
HONG KONG	5
SINGAPORE	6

Type-E



** RECORD OF DATA **

NAME OF ITEMS	DATA-A	DATA-B
1980	12	8
1981	15	8
1982	23	8
1983	41	8
1984	36	8

*** ATTACHMENT **

1980	1
1981	2
1982	3
1983	4
1984	5

PROGRAM LIST

(PROGRAM No.107)

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```

10:"M":WAIT 0:
  CLEAR :DIM A(4
    4),B(44),A$(44
    )*18
15:INPUT "PEN SEL
  ECT(0-3)=?" ;M:
  COLOR M
20:INPUT "TITLE?"
  ;T$
30:INPUT "HISTOGR
  AM=1 or CURVE=
  2?" ;C
35:IF (C=1)+(C=2)
  <>1GOTO 30
40:INPUT "SCALE o
  f GRAPH?" ;E
50:FOR I=0TO 44
51:A$="Name of IT
  EM("+STR$(I+1
  )+" )=":PRINT A
  $;
52:INPUT A$(I):
  CLS :GOTO 60
53:CLS :I=I+1:
  GOTO 100
60:B$="DATA A("+
  STR$(I+1)+")="
  ":PRINT B$;
65:INPUT A(I):CLS
  :GOTO 80
70:CLS :I=I+1:
  GOTO 100
80:C$="DATA B("+
  STR$(I+1)+")="
  ":PRINT C$;
85:INPUT B(I):CLS
  :GOTO 90
90:IF F<A(I)LET F
  =A(I)
91:IF Q<B(I)LET Q
  =B(I)
92:IF F<QLET F=Q
95:BEEP 3:NEXT I
100:GRAPH :BEEP 10
  :GLCURSOR (25,
  0):SORGN
110:ROTATE 1
120:G=INT (F/E)
130:DIM X(G-1)
140:FOR H=1TO G
150:X(H-1)=33/F*H*
  E*5
160:GLCURSOR (X(H-

```

```

  1),40):IF E*H>
  =100GLCURSOR (
  X(H-1),54)
165:LPRINT E*H
170:NEXT H
190:GLCURSOR (170,
  -50):LPRINT T$
200:LINE (0,0)-(19
  0,0)
210:IF C=2GOTO 400
215:INPUT "TypeA=1
  ;TypeB=2;TypeC
  =3?" ;T
220:FOR H=0TO I
230:LINE (Z,Y)-(Z,
  (Y-95)),0,M
240:GOSUB 600
245:R=165/F
250:LINE (Z,(Y-5))
  -(R*A(H)),(Y-
  40)),0,M,B
251:IF T=0THEN 255
252:IF T=2LET Y=Y-
  20
253:IF T=3LET Y=Y-
  40
255:LINE (Z,(Y-5))
  -(R*B(H)),(Y-
  40)),0,M,B
260:GOSUB 700
261:IF T=3GLCURSOR
  (-20,(Y+10)):
  GOTO 275
265:IF H>8GLCURSOR
  (-20,Y):GOTO 2
  75
270:GLCURSOR (-20,
  (Y-10))
275:LPRINT H+1
280:Y=Y-40
285:IF T=1THEN 290
286:IF T=2LET Y=Y-
  15
287:IF T=3LET Y=Y-
  15
290:NEXT H
300:TEXT :COLOR M:
  LF 5
302:CSIZE 1
305:LPRINT "** REC
  ORD OF DATA **
  ":LF 1
325:LPRINT "NAME O

```

```

  F ITEMS":LF -1
326:LPRINT TAB 20;
  "DATA-A":LF -1
327:LPRINT TAB 28;
  "DATA-B":LF 1
330:FOR H=0TO I:J=
  J+1:LPRINT J:
  LF -1
331:LPRINT A$(H):
  LF -1
332:LPRINT TAB 19;
  A(H):LF -1
333:LPRINT TAB 26;
  B(H)
335:NEXT H
336:CSIZE 2:LF 3
340:LPRINT "*** AT
  TACHIMENT **":
  LF 1
349:J=0
350:FOR H=0TO I
351:LPRINT A$(H):
  LF -1
352:J=J+1:LPRINT J
  :LF 1
355:NEXT H:LF 4
360:END
400:FOR H=0TO I
410:LINE (Z,Y)-(Z,
  (Y-80)),0,M
420:LINE (Z,(Y-40)
  )-(215,(Y-40))
  ,0,M
430:GOSUB 600
435:R=165/F
450:IF H<>0LINE (L
  ,Y)-(R*A(H),(Y
  -40)),0,M
460:IF H>8GLCURSOR
  (-20,(Y-10)):
  GOTO 470
465:GLCURSOR (-20,
  (Y-25))
470:COLOR M:LPRINT
  H+1
480:Y=Y-40:L=U
490:NEXT H
495:GOTO 300
600:FOR N=1TO G
601:IF T=1THEN 610
602:IF T=2GOTO 604
603:IF T=3GOTO 608
604:LINE (X(N-1),Y

```

```

  )-(X(N-1),(Y-7
  5)),1,M
605:GOTO 620
608:LINE (X(N-1),Y
  )-(X(N-1),(Y-9
  5)),1,M
609:GOTO 620
610:LINE (X(N-1),Y
  )-(X(N-1),(Y-4
  0)),1,M
620:NEXT N
630:U=33/F*A(H)*5
640:RETURN
700:Z=0
705:FOR K=1TO 70
708:Z=Z+3
709:W=R*B(H)
710:IF W<=ZGOTO 75
  0
725:IF K=INT (K/2)
  *2=1LINE (Z,(Y
  -40))-(Z,(Y-5)
  ),0,M:GOTO 750
740:LINE (Z,(Y-5))
  -(Z,(Y-40)),0,
  M
750:NEXT K
760:Z=0
770:RETURN

```

STATUS 1=1929

MULTI-LAYER HISTOGRAM (Mono)

(PROGRAM No.306)

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GENERAL EXPLANATION

Start with DEF A, select a suitable pen number, type in the title of your graph (within 16 characters). After that, input the number of blocks (within 8 blocks). A block means an item which is a componet of the column (bar). Input (type) names of each block one by one, then input the number of columns(within 8 columns), then input (type) names of each column (within 8 characters). If you input more than 8, the last parts of characters will not appear. Sometimes, 8 characters are insufficient; in such cases abbreviations of names should be used.

Input data following the instruction desplayed on screen. After all data are input, digits of interval of scale attached to Y-axis of the graph should be input. The computer generate a graph and a table (see EXAMPLE).

MULTI-LAYER
HISTOGRAM (Mono)

SHARP PC-1500
LANGUAGE USED:
EXPANDED BASIC

PROGRAM No.306
CASSETTE=03-B
TAPE COUNTER
038-077

01 JAN. 1982
S.SHINDO(SEAFDEC)

KEY OPERATION PROCEDURE

STEP	KEYSTROKE	DISPLAY (Screen)	REMARKS
0	ON	<	Ready to operate
1	DEF A 3 ENTER	PEN SELECT (0 - 3) = ?-	Select suitable pen number. If you choice is No. 3, press key 3.
2	Type title ENTER	TITLE = ?-	Input (typewrite) title (within 16 characters) of your graph and press key marked ENTER.
3	5 ENTER	No. of Blocks (up to 8)=?-	Input number of blocks. If number of blocks is 5, press key 5 and press ENTER key.
4	Type name ENTER	Name of Block 1 = ?	Input (typewrite) the name of block 1 and press ENTER key. Then the computer asks you the name of block 2. The same procedure will be repeated until the last block. (in the present case, until block 5).
5	4 ENTER	No. of Columns (up to 8)=?-	Input number of columns (bars) of the histogram in the box (see EXAMPLE). If your decision is 4 columns, press key 4 and key marked ENTER.
6		Column Name 1 = ?	Input (typewrite) name of columns (bars) within 8 characters. The same procedure will be repeated until the last column.

KEY OPERATION PROCEDURE (CONT'D)

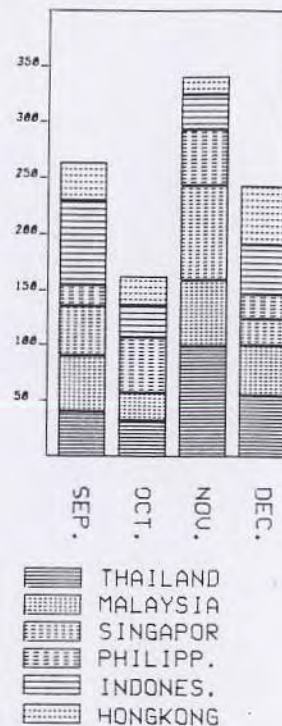
STEP	KEYSTROKE	DISPLAY (Screen)	REMARKS
7	data (1-1) ENTER	Column 1 - Block 1 = ?	Input data of column 1, block 1, then press ENTER Key. The same procedure will be repeated until all data are input. The computer is awaiting input of scale intervals, that is, the numbers attached to Y-axis. If you decide 10, press 1 and 0, then press ENTER Key.
8	10 ENTER		The computer generates a graph and a table. When the work is finished, < appears on screen.
END		>	

EXAMPLE of PRINTOUT

(PROGRAM NO. 306)

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PRODUCTION



	SEP.	OCT.	NOV.	DEC.
THAILAND	40	32	99	55
MALAYSIA	50	25	60	45
SINGAPOR	45	0	84	24
PHILIPP.	20	50	50	23
INDONES.	74	30	32	44
HONGKONG	35	26	15	52
TOTAL	264	163	340	243

PROGRAM LIST

(PROGRAM No.306)

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```

5:REM "MULTI-LAY
ERED HISTOGRAM
(Mono)
10:"A":WAIT 0:
CLEAR:TEXT:
CLS:COLOR 0:
USING
20:INPUT "PEN SEL
ECT(0-3)=?";S
30:COLOR S
60:INPUT "TITLE=?
";A$
65:INPUT "No. of B
locks(upto 8)=
?";C:IF C>8
GOTO 65
66:DIM B$(C-1)*8,
C$(0)*25
68:FOR I=0TO C-1:
B$="Name of Bl
ock "+STR$(I+
1)+"=":PRINT B
$:
70:INPUT B$(I):
CLS:NEXT I
75:INPUT "No. of C
olumns(upto 8)
=?";A:IF A>8
GOTO 75
78:DIM A$(A-1)*8,
A$(A-1,C-1)
80:CLS:FOR I=0TO
A-1:B$="Column
Name "+STR$(
I+1)+"=":PRINT
B$:
85:INPUT A$(I):
CLS:IF T<LEN
A$(I)LET T=LEN
A$(I)
86:NEXT I
87:FOR I=0TO A-1:
E=0
90:FOR J=0TO C-1
93:C$(0)=A$(I)+"-
"+B$(J)+"=":
PRINT C$(0);
94:INPUT A(I,J):
CLS
95:CLS:E=E+A(I,J
):NEXT J:IF E>
FLET F=E
97:NEXT I
100:CLS:INPUT "In
terval of Scal
e=?";D
110:IF D<300/F<7.5
GOTO 100
150:LPRINT " ";A$
:GRAPH:LINE (
25,0)-(215,-35
0),0,S,B
155:GLCURSOR (25,-
350):SORGN:
CSIZE 1:J=1
165:IF 350<D*J*300
/FGOTO 170
167:LINE (-5,D*J*3
00/F)-(0,D*J*3
00/F),0,S:
GLCURSOR (-30,
D*J*300/F):
LPRINT D*J:J=J
+1
168:GOTO 165
170:K=0:FOR J=0TO
A-1:FOR M=0TO
C-1
171:Z=1:IF M=0LET
Z=0:N=N+1
172:N=N+1:IF N=4
LET N=0
173:IF A(J,M)=0
GOTO 178
174:LINE (K+10,L+Z
)-(K+190/A,L+3
00/F*A(J,M)),0
,S,B
175:GOSUB 700:L=L+
300/F*A(J,M)
178:NEXT M:K=K+190
/A:L=0
185:NEXT J:K=0:
ROTATE 1:COLOR
S:CSIZE 2
190:FOR J=0TO A-1:
GLCURSOR (K+95
/A,-25):LPRINT
A$(J):K=K+190/
A:NEXT J
200:T=-(T*12.5)-55
:GLCURSOR (-15
,T):SORGN:N=-
1:R=0:ROTATE 0
205:N=-1
210:FOR J=0TO C-1
230:LINE (0,R)-(45
,R+15),0,S,B
231:N=N+1
232:IF J=4LET N=0:
GOTO 260
233:IF J>=4THEN 26
0
240:FOR H=0TO 3:
LINE (0,R+3)-(
45,R+3),N,S:R=
R+3:NEXT H
250:GLCURSOR (60,R
-10):LPRINT B$
(J):R=R-33:
GOTO 300
260:FOR H=0TO 1:
LINE (0,R+5)-(
45,R+5),N,S:R=
R+5:NEXT H
270:GLCURSOR (60,R
-10):LPRINT B$
(J):R=R-33:
GOTO 300
300:NEXT J
310:TEXT:LF 4'
320:GRAPH:ROTATE
1:LINE (0,Y)-(
215,Y-110),0,S
,B
330:GOSUB 520
340:IF C>5LET X=35
/2:Z=9:GOTO 36
0
350:X=35:Z=4
360:COLOR S:FOR I=
0TO C-1:V=(Z-1
)*X+25:
GLCURSOR (U,Y-
10):LPRINT B$(
I):NEXT I:
COLOR S
370:GLCURSOR (5,Y-
10):LPRINT "TO
TAL"
380:FOR I=0TO A-1:
Y=Y-110:U=0:
GOSUB 500:
GOSUB 520
390:GLCURSOR (200,
Y-10):LPRINT A
$(I):COLOR S
400:FOR J=0TO C-1:
U=(Z-J)*X+25:
GLCURSOR (U,Y-
15):LPRINT
USING "#####
#";A(I,J):
USING
410:U=A(I,J)+U:
NEXT J
420:GLCURSOR (5,Y-
15):LPRINT
USING "#####
#";U:USING:
NEXT I
430:TEXT:LF 3:END
500:LINE (215,Y)-(
215,Y-110),0,S
:LINE (215,Y-1
10)-(0,Y-110),
0,S
510:LINE (0,Y-110)
-(0,Y),0,S:
RETURN
520:LINE (20,Y)-(2
0,Y-110),2,S:
LINE (195,Y)-(
195,Y-110),2,S
:RETURN
700:GOTO 710
710:P=L:Q=1
712:IF 60/F*A(J,M)
<2LINE (K+10,P
+150/F*A(J,M))
-(K+190/A,P+15
0/F*A(J,M)),N,
S:GOTO 750
713:IF M<=3THEN 71
5
714:IF M>=4THEN 73
0
715:IF P+3>=L+300/
F*A(J,M)GOTO 7
50
716:IF Q-INT (Q/2)
<>0LINE (K+10,
P+3)-(K+190/A,
P+3),N,S:GOTO
720
718:LINE (K+190/A,
P+5)-(K+10,P+5
),N,S
720:P=P+3:Q=Q+1:
GOTO 715
730:IF P+5>=L+300/
F*A(J,M)GOTO 7
50
731:IF Q-INT (Q/2)
<>0LINE (K+10,
P+5)-(K+190/A,
P+5),N,S:GOTO
740
733:LINE (K+190/A,
P+10)-(K+10,P+
10)
740:P=P+5:Q=Q+1:
GOTO 730
750:RETURN
900:END
65279:END

```

STATUS(1) = 2272

MULTI-LAYER HISTOGRAM (Colored)

(PROGRAM No. 305)

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GENERAL EXPLANATION

Start with DEF A. This program can draw multi-layered histograms with four colors. The key operation procedure is almost the same as that of PROG.-306 which is black and white. The colored graph of this program is easier to see than a Mono (black and white) graph; however, a colored graph cannot be duplicated by photocopying nor by black and white offset printing, since the identification of blocks would not be possible. Consequently, if duplication of graph is required PROG.-306 should be used.

MULTI-LAYER HIST
OGRAM (Colored)

SHARP PC-1500
LANGUAGE USED:
EXPANDED BASIC

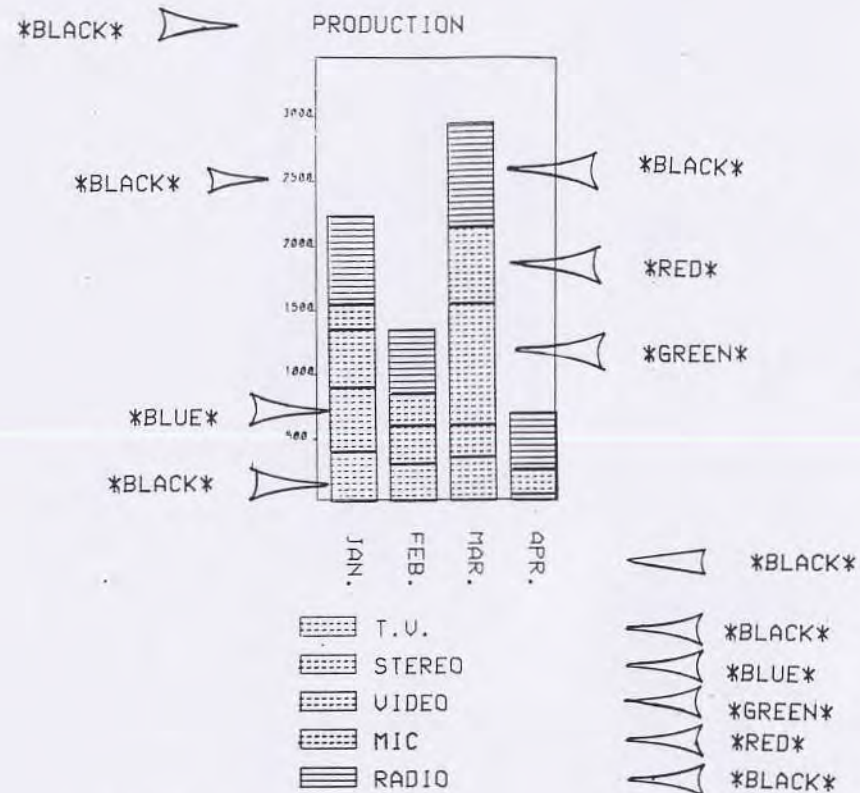
PROGRAM No. 305
CASSETTE=03-B
TAPE COUNTER
002-035

28 DEC. 1982
SHARP CORPORATION

EXAMPLE of PRINTOUT

(PROGRAM No. 305)

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BLUE  *BLUE* 

	JAN.	FEB.	MAR.	APR.
T.U.	400	300	350	50
STEREO	500	300	250	0
VIDEO	450	250	950	0
MIC	200	0	600	200
RADIO	700	500	800	450
TOTAL	2250	1350	2950	700

BLACK  *BLUE* 

ALL NUMERALS ARE BLACK

PROGRAM LIST

(PROGRAM No. 305)

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```

5:REM "POLY-HIST
  OGRAM(Colored)
"
10:"A":WAIT 0:
  CLEAR :TEXT :
  CLS :COLOR 0:
  USING
60:INPUT "TITLE=?
  ";A$
65:INPUT "No. of B
  locks(>10)=?";
  C:IF C>10GOTO
  65
66:DIM B$(C-1)*8,
  C$(0)*25
68:FOR I=0TO C-1:
  B$="Name of Bl
  ock "+STR$(I+
  1)+"=":PRINT B
  $;
70:INPUT B$(I):
  CLS :NEXT I
75:INPUT "No. of C
  olums(>8)=?";
  A:IF A>8GOTO 7
  5
78:DIM A$(A-1)*8,
  A(A-1,C-1)
80:CLS :FOR I=0TO
  A-1:B$="Column
  Name "+STR$(
  I+1)+"=":PRINT
  B$;
85:INPUT A$(I):
  CLS :IF T<LEN
  A$(I)LET T=LEN
  A$(I)
86:NEXT I
87:FOR I=0TO A-1:
  E=0
90:FOR J=0TO C-1
93:C$(0)=A$(I)+"-
  "+B$(J)+"=":
  PRINT C$(0);
94:INPUT A(I,J):
  CLS
95:CLS :E=E+A(I,J
  ):NEXT J:IF E>
  FLET F=E
97:NEXT I
100:CLS :INPUT "In
  terval of Scal
  e=?";D
110:IF D<300/F<7.5
  GOTO 100
150:LPRINT "  ";A$
  :GRAPH :LINE (
  25,0)-(215,-35
  0),0,0,B
155:GLCURSOR (25,-
  350):SORGN :
  CSIZE 1:J=1
165:IF 350<D*J*300
  /FGOTO 170
167:LINE (-5,D*J*3
  00/F)-(0,D*J*3
  00/F):GLCURSOR
  (-30,D*J*300/F
  ):LPRINT D*J:J
  =J+1
168:GOTO 165
170:K=0:FOR J=0TO
  A-1:O=-1:FOR M
  =0TO C-1
171:Z=1:IF M=0LET
  Z=0
172:O=O+1:IF O>3
  LET O=0
173:IF A(J,M)=0
  GOTO 178
174:LINE (K+10,L+Z
  )-(K+190/A,L+3
  00/F*A(J,M)),0
  ,O,B
175:GOSUB 700:L=L+
  300/F*A(J,M)
178:NEXT M:K=K+190
  /A:L=0
185:NEXT J:K=0:
  ROTATE 1:COLOR
  0:CSIZE 2
190:FOR J=0TO A-1:
  GLCURSOR (K+95
  /A,-25):LPRINT
  A$(J):K=K+190/
  A:NEXT J
200:T=-(T*12.5)-55
  :GLCURSOR (-15
  ,T):SORGN :O=-
  1:R=0:ROTATE 0
210:FOR J=0TO C-1:
  O=O+1:IF O>3
  LET O=0
230:IF J<4LET N=2:
  GOTO 260
240:IF J<8LET N=0:
  GOTO 260
250:N=4
260:LINE (0,R)-(45
  ,R+15),0,0,B
270:LINE (0,R+5)-(
  45,R+5),N,0
280:LINE (0,R+10)-
  (45,R+10),N,0:
  GLCURSOR (60,R
  ):LPRINT B$(J)
  :R=R-30
300:NEXT J
310:TEXT :LF 4
320:GRAPH :ROTATE
  1:LINE (0,Y)-(
  215,Y-110),2,1
  ,B
330:GOSUB 520
340:IF C>5LET X=35
  /2:Z=9:GOTO 36
  0
350:X=35:Z=4
360:COLOR 0:FOR I=
  0TO C-1:U=(Z-I
  )*X+25:
  GLCURSOR (U,Y-
  10):LPRINT B$(
  I):NEXT I:
  COLOR 1
370:GLCURSOR (5,Y-
  10):LPRINT "TO
  TAL"
380:FOR I=0TO A-1:
  Y=Y-110:U=0:
  GOSUB 500:
  GOSUB 520
390:GLCURSOR (200,
  Y-10):LPRINT A
  $(I):COLOR 0
400:FOR J=0TO C-1:
  U=(Z-J)*X+25:
  GLCURSOR (U,Y-
  15):LPRINT
  USING "#####
  #";A(I,J):
  USING
410:U=A(I,J)+U:
  NEXT J
420:GLCURSOR (5,Y-
  15):LPRINT
  USING "#####
  #";U:USING :
  NEXT I
430:TEXT :LF 3:END
500:LINE (215,Y)-(
  215,Y-110),2,1
  :LINE (215,Y-1
  10)-(0,Y-110),
  2,1
510:LINE (0,Y-110)
  -(0,Y),2,1:
  RETURN
520:LINE (20,Y)-(2
  0,Y-110),2,1:
  LINE (195,Y)-(
  195,Y-110),2,1
  :RETURN
700:IF M<4LET N=2:
  GOTO 710
705:IF M<8LET N=0:
  GOTO 710
708:N=4
710:P=L:O=1
712:IF 60/F*A(M,J)
  <1LINE (K+10,P
  +150/F*A(J,M)-
  (K+190/A,P+150
  /F*A(J,M),N,0:
  GOTO 750
715:IF P+5>L+300/
  F*A(J,M)GOTO 7
  50
716:IF Q-INT (Q/2)
  <>0LINE (K+10,
  P+5)-(K+190/A,
  P+5),N,0:GOTO
  720
718:LINE (K+190/A,
  P+10)-(K+10,P+
  10)
720:P=P+5:O=O+1:
  GOTO 715
750:RETURN
65279:END

```

STATUS 1

2006

FREQUENCY DISTRIBUTION (Mono)

(PROGRAM No.013)

- 30 -

GENERAL EXPLANATION

OUTLINE : Graphs and tables of frequency distribution are important not only in research, but also in other types of work. With this program, you can generate a graph and a table of frequency distribution without spending much time on troublesome paperwork. The program can also modify the interval of classification of classes when you are not satisfied with the result obtained, without repetition of key-in work. Attention: CLOAD.... "PROG.-13".

MATHEMATICAL FORMULA :

1. MEAN = $\bar{X} = \sum X/N$
2. VARIANCE = $\frac{1}{N} \sum (X_i - \bar{X})^2 = v$
3. S.D. (Standard deviation) = $\sqrt{v}$
4. C.V. (Coefficient of Variability) = $S.D./\bar{X} = v/\bar{X}$

KEY OPERATION PROCEDURE

STEP	KEYSTROKE	DISPLAY (Screen)	Remarks
0	ON	>	Ready to operate
1	DEF A 54 ENTER	No. of DATA = -	The computer prints the title of this program and "MEMO:" with some space on paper for your hand-written comments. Then, you input the number of data available. If the number of your data is 54, press keys 5 and 4, then, press key marked ENTER.
2		DATA (1) = ? Initial scale = ?	Input the first data and press ENTER key. The same procedure will be repeated until DATA (54). When all data are input, the computer prints No. of DATA, MAXimum DATA, MINimum DATA and MAX-MIN (difference between MAX and MIN) for your consideration. The computer asks the initial scale. If you think the initial scale is 1, press key 1 and press ENTER key.
3	0 ENTER	Interval = ?	The computer asks the class interval. If your choice is 20, press keys 2 and 0.
4	20 ENTER	No. of classes = ?	The computer asks you the number of classes. When you think 7 classes are suitable, press key 7 and key marked ENTER.

FREQUENCY DISTRI
BUTION

SHARP PC-1500
LANGUAGE USED:
EXPANDED BASIC

PROGRAM No.013
CASSETTE=01-B
TAPE COUNTER
190-228

05 SEPT. 1983
S.SHINDO(SEAFDEC)

KEY OPERATION PROCEDURE (CONT'D)

STEP	KEYSTROKE	DISPLAY (screen)	Remarks
5	7 ENTER		Then the computer prints INITIAL SCALE = 0, INTERVAL = 20 and No. of CLASSES = 7 on the paper for your reminder. After 1 - 2 seconds, the computer prints Mean, Variance, Standard Deviation and Coefficient of Variability on the paper for your record. After 2 - 3 seconds, the computer prints "Frequency Table ", histogram of frequency distribution and attachment of MID-VALUE for histogram. This attachment can be cut out and attached to the graph (if you want Mid-value insted of class number).
6	1 ENTER	Re-classify (Yes = 1, No = 2) ?	The computer asks if Re-classification in necessary. If you think it is, press key 1, then > mark appears and the work is finished. (If you are not satisfied with the result, press 2, and the program will go back to Initial scale = ? in step 2).
END			
	2 ENTER ENTER	--- Re-classify ---	
END		>	

EXAMPLE 1

FREQUENCY DISTRIBUTION and GRAPH

MEMO:

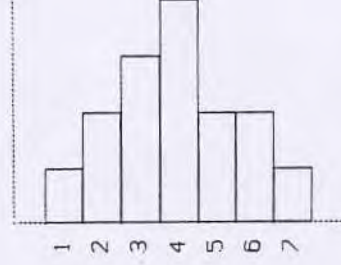
No. of DATA= 15
MAX DATA= 7
MIN DATA= 1
MAX-MIN = 6

INITIAL SCALE= 1
INTERVAL= 1
No. of CLASSES= 7

MEAN= 3.9333
VARIANCE= 2.5955
S.D.= 1.6110
C.U.= 40.9594

FREQUENCY TABLE

Class 1	1
Class 2	2
Class 3	3
Class 4	4
Class 5	2
Class 6	2
Class 7	1



MID-VALUE SCALE for attachment

Class 1	1.5
Class 2	2.5
Class 3	3.5
Class 4	4.5
Class 5	5.5
Class 6	6.5
Class 7	7.5

REPLACE

FREQUENCY DISTRIBUTION and GRAPH

MEMO:

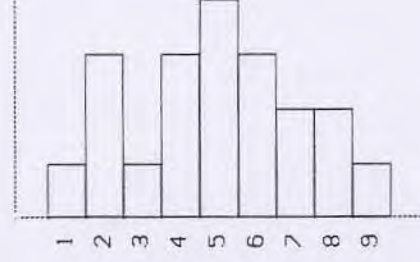
No. of DATA= 20
MAX DATA= 999
MIN DATA= 111
MAX-MIN = 888

INITIAL SCALE= 100
INTERVAL= 100
No. of CLASSES= 9

MEAN= 549.45
VARIANCE= 58493.94
745
S.D.= 241.85522
C.U.= 44.01769406

FREQUENCY TABLE

Class 1	1
Class 2	3
Class 3	1
Class 4	3
Class 5	4
Class 6	3
Class 7	2
Class 8	2
Class 9	1



MID-VALUE SCALE for attachment

Class 1	150.0
Class 2	250.0
Class 3	350.0
Class 4	450.0
Class 5	550.0
Class 6	650.0
Class 7	750.0
Class 8	850.0
Class 9	950.0

RE-CLASSIFY

EXAMPLE 2

▽

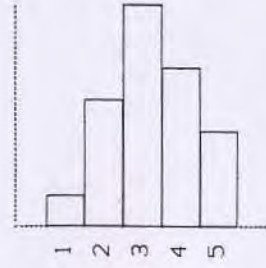
---Re-classify---

INITIAL SCALE= 0
INTERVAL= 200
No. of CLASSES= 5

MEAN= 549.45
VARIANCE= 58493.94
745
S.D.= 241.85522
C.U.= 44.01769406

FREQUENCY TABLE

Class 1	1
Class 2	4
Class 3	7
Class 4	5
Class 5	3



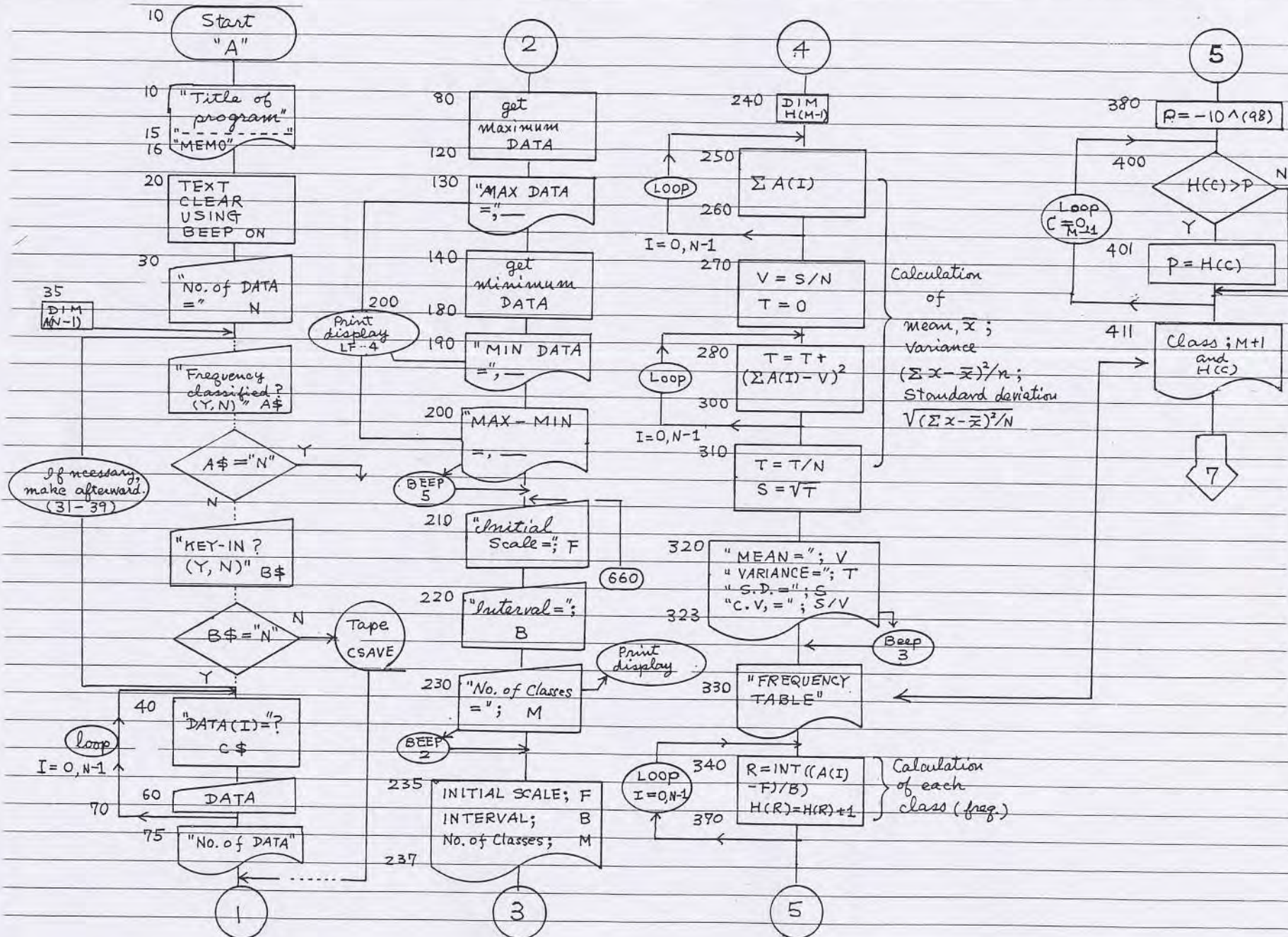
MID-VALUE SCALE for attachment

Class 1	100.0
Class 2	300.0
Class 3	500.0
Class 4	700.0
Class 5	900.0

FLOW CHART

(PROGRAM No. 013)

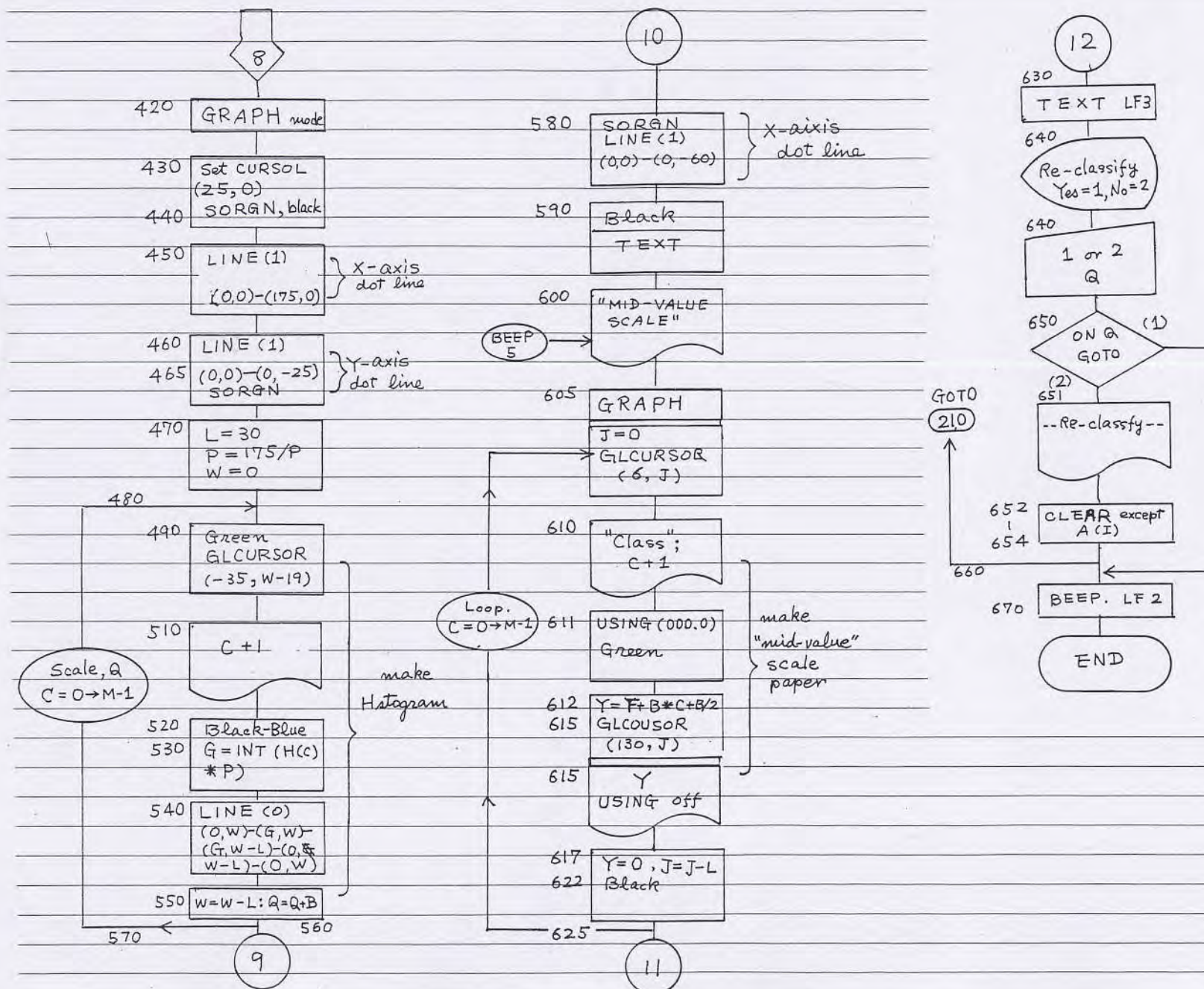
- 33 -



FLOW CHART (CONT.)

(PROGRAM No. 013)

- 34 -



PROGRAM LIST

(PROGRAM No.013)

- 35 -

```

10:"A":COLOR 0:
  LPRINT "**FREQ
  UENCY DISTRIBU
  TION and GRAPH
  **"
15:LPRINT "-----
  -----"
16:LPRINT "MEMO:"
  :LF 3
20:CLEAR :WAIT 0:
  BEEP ON :TEXT
  :USING
30:INPUT "No.of D
  ATA=";N
35:DIM A(N-1),H(1
  00)
40:FOR I=0TO N-1
50:C$="DATA("+
  STR$(I+1)+")=
  ":PRINT C$;
60:INPUT A(I):CLS
70:NEXT I
75:LPRINT "No.of
  DATA=";N
80:D=A(0)
90:FOR I=0TO N-1
100:IF D>A(I)THEN
  120
110:D=A(I)
120:NEXT I
130:LPRINT "MAX DA
  TA=";D
140:E=A(0)
150:FOR I=0TO N-1
160:IF E<A(I)THEN
  180
170:E=A(I)
180:NEXT I
190:LPRINT "MIN DA
  TA=";E
200:LPRINT "MAX-MI
  N=";D-E:BEEP
  5:LF 4
210:INPUT "Initial
  Scale=";F
220:INPUT "Interva
  l Scale=";B
230:INPUT "No.of C
  lasses=";M:
  BEEP 2:LF -3
235:LPRINT "INITIA
  L SCALE=";F
236:LPRINT "INTERU
  AL=";B

```

```

237:LPRINT "No.of
  CLASSES=";M:LF
  1
250:FOR I=0TO N-1:
  S=S+A(I)
260:NEXT I
270:U=S/N:T=0
280:FOR I=0TO N-1
290:T=T+(A(I)-U)^2
300:NEXT I
310:T=T/N:S=JT:
  COLOR 1
320:LPRINT "MEAN="
  ;U
321:LPRINT "VARIAN
  CE=";T
322:LPRINT "S.D.="
  ;S
323:LPRINT "C.U.="
  ;S/U*100:LF 1:
  BEEP 3
330:LPRINT "*FREQU
  ENCY TABLE*":
  LF 1
340:FOR I=0TO N-1
350:R=INT ((A(I)-F
  )/B)
360:H(R)=H(R)+1
370:NEXT I
380:P=-10^(98)
390:FOR C=0TO M-1
400:IF P>H(C)THEN
  402
401:P=H(C)
402:NEXT C
410:FOR C=0TO M-1
411:LPRINT "Class"
  ;C+1:LF -1:
  LPRINT H(C)
412:NEXT C
420:LF 2:GRAPH
430:GLCURSOR (25,0
  ):SORGN
440:COLOR 1
450:LINE (0,0)-(17
  5,0),1
460:LINE (0,0)-(0,
  -25),1:SORGN
465:L=30:P=175/P
470:W=0
480:FOR C=0TO M-1
490:GLCURSOR (-35,
  W-19)
510:LPRINT C+1

```

```

530:G=INT (H(C)*P)
540:LINE (0,W)-(G,
  W)-(G,W-L)-(0,
  W-L)-(0,W)
550:W=W-L
560:Q=Q+B
570:NEXT C
580:SORGN :LINE (0
  ,0)-(0,-60),1
590:TEXT :LF 2
600:LPRINT "**MID-
  VALUE SCALE fo
  r attachment**
  ":LF 1:BEEP 5
605:GRAPH :J=0:FOR
  C=0TO M-1:
  GLCURSOR (6,J)
610:LPRINT "Class"
  ;C+1
611:USING "####.4"
612:Y=F+B*C+B/2
615:GLCURSOR (130,
  J):LPRINT Y:
  USING
617:Y=0
620:J=J-L
625:NEXT C
630:TEXT :BEEP 10:
  LF 3
640:INPUT "Re-clas
  sify(Yes=1,No=
  2)?";Q
650:ON QGOTO 651,6
  70
651:LF 1:LPRINT "
  ---Re-classify
  --- ":LF 3
652:F=0:B=0:M=0:S=
  0:T=0:U=0:J=0:
  R=0:P=0:C=0
653:FOR I=0TO N-1:
  H(I)=0:NEXT I
654:FOR C=0TO M-1:
  H(C)=0:NEXT C
660:GOTO 210
670:BEEP 10:LF 2
680:END

```

STATUS 1

1606