



บรรณานุกรม

1. Marvin L. De Jong . , Apple II Assembly Language ,
Howard W .Sams & Co., Inc. , Indiana , 1 st ed , 1983
2. Winston D. Gayler , The Apple Circuit Description ,
Howard W. Sams & Co., Inc. , Indiana , 1 st ed , 1983
3. Jonathan A. Titus , David G. Larsen , and Christopher A. Titus
 , Apple Interfacing , Howard W. Sams & Co., Inc ,
Indiana , 1 st ed , 1983
4. Roy E. Myer , Microcomputer Graphics for the Apple Computer ,
Addison - Wesley Publishing Company , Singapore ,
1 st ed , 1982
5. Lone Pool , Martin Mcniff , and Seteven Cook ,
Apple II User' guid , Osborne/Mcgraw-Hill , California
 , 1 st ed , 1981
6. William F. leubbert , What's Where in the Apple , Micro Ink ,
Massachusetts , 1 , st ed , 1983
7. Don Worth , and Pieter Lechner , Beneath Apple Dos ,
Quality Software , Reseda , 1 st ed 1981
8. Pual Bryan , Programming Your Apple II Computer
 , Tab Book Inc , USA , 1 st ed , 1983
9. สมศักดิ์ กীরติวุฒิเศรษฐ์ , "หลักการและการใช้งานเครื่องมือวัดอุตสาหกรรม" ,
สมาคมส่งเสริมเทคโนโลยี (ไทย-ญี่ปุ่น) , เล่มที่ 1 , ปี 2528
10. นเรศร์ จันทน์ขาว , "การตรวจสอบโดยวิธีถ่ายภาพด้วยรังสี" ,
ชมรมการตรวจสอบโดยไม่ทำลาย , เล่มที่ 1 , ปี 2528
11. Ralph T. Overman , Herbert M. Clark , Radioisotope Techniques ,
McGraw-Hill Book Company , Inc. New York , 1 st ed , 1960



ภาคผนวก

ศูนย์วิจัยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

สูตรการคำนวณกำลังขยายของ โอเปอร์เรชันแอมพลิไฟเออร์
ที่คํวแบบนอนอินเวอร์ตติง

$$G = V_{out} / V_{in}$$

เมื่อ

$$G = \text{กำลังขยาย}$$

$$V_{out} = \text{ศักดาไฟฟ้าที่คองการ}$$

$$V_{in} = \text{ศักดาไฟฟ้าที่ให}$$

จากรูปที่ 3.4

$$G = (R_F + R_D) / R_D$$

แทนค่า $G = 50$ เพราะฉนั้น

$$R_F = 49 R_D$$

เมื่อแทน

$$R_D = 100 \text{ โอห์ม} \quad \text{ทำให้} \quad R_F = 4900 \text{ โอห์ม}$$

ศูนย์วิทยพัษากร
จุฬาลงกรณ์มหาวิทยาลัย

```
1  TEXT : HOME : HTAB 15: VTAB 3:
    PRINT "MAIN MENU"
5  HTAB 5: VTAB 6: PRINT "1.CALIB
    RATION"
10  HTAB 5: VTAB 8: PRINT "2.PROC
    ESSING "
20  HTAB 5: VTAB 10: PRINT "3.HIS
    TOGRAME"
25  HTAB 5: VTAB 12: PRINT "4.PRI
    NT DATA"
30  HTAB 5: VTAB 14: PRINT "5.EXI
    T"
35  HTAB 7: VTAB 16: PRINT "PRESS
    KEY": GET M$
40  IF M$ = CHR$ (49) THEN 70
45  IF M$ = CHR$ (50) THEN 80
50  IF M$ = CHR$ (51) THEN 90
55  IF M$ = CHR$ (52) THEN 100
60  IF M$ = CHR$ (53) THEN 110
65  IF M$ < > CHR$ (49) OR M$ <
    > CHR$ (50) OR M$ < > CHR$
    (53) OR M$ < > CHR$ (51) OR
    M$ < > CHR$ (52) THEN 1
70  PRINT CHR$ (4): PRINT CHR$
    (4);"RUN CALIBRATION"
80  PRINT CHR$ (4): PRINT CHR$
    (4);"RUN PROCESSING "
90  PRINT CHR$ (4): PRINT CHR$
    (4);"RUN HISTOGRAME "
100 PRINT CHR$ (4): PRINT CHR$
    (4);"RUN PRINT DATA"
110 PRINT CHR$ (4): PRINT CHR$
    (4);"RUN EXIT"
```

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

```

1 X = 0:Y = 0:N = 0:XY = 0:A = 0:
  B = 0:W = 0:Z = 0
2 HOME : HGR2
5 U = PEEK (28777) / 10
6 IF U = 1 THEN K = 28671
7 IF U = 2 THEN K = 28720
8 IF U < 1 OR U > 2 THEN GOTO 5
  00
10 PRINT CHR$ (4);"BLOAD GRAPH1
  "
13 FOR I = 1 TO 48
15 C = PEEK (K + I):D = .187 - ((
  182 / 255) * C)
20 HPLOT I + 4 * (I - 1),187 TO
  I + 4 * (I - 1),D TO I + 4 *
  I,D TO I + 4 * I,187
25 NEXT I
30 FOR B = 0 TO 6000: NEXT B
35 TEXT : HOME
40 HTAB 5: VTAB 3: PRINT "PRESS
  A KEY TO SEE FIT CURVE"
45 HTAB 5: VTAB 5: PRINT "PRESS
  E KEY TO EXIT": GET A$
50 IF A$ = CHR$ (65) THEN 70
55 IF A$ = CHR$ (69) THEN 65
60 IF A$ < > CHR$ (65) OR A$ <
  > CHR$ (69) THEN 35
65 PRINT CHR$ (4): PRINT CHR$
  (4);"RUN MAIN MENU"
70 HGR2 : PRINT CHR$ (4): PRINT
  CHR$ (4);"BLOAD GRAPH1"
75 FOR I = 1 TO 48:E = PEEK (K +
  I):E1 = LOG (E)
80 Y = Y + E1:Y = X + I:XY = NY +
  (E1 * I):W = W + (I ^ 2)
85 NEXT I
90 Z = X ^ 2:P = ((48 * XY) - (X *
  Y)) / ((48 * W) - Z):A = ((Y
  / 48) - ((X / 48) * B))
100 FOR I = 5 TO 250:K = 81 - (A
  + (B * I))
103 IF K < 0 THEN K = 0
104 IF K > 187 THEN K = 187
105 HPLOT I,K
110 NEXT I
120 FOR K = 0 TO 6000: NEXT K
130 GOTO 35
500 TEXT : HOME : HTAB 5: VTAB 7
  : PRINT " RUN CALIBRATION RO
  UTINE BEFORE"
550 FOR K = 0 TO 2000: NEXT K
600 GOTO 65

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```
25170 POKE 11,59: POKE 12,125:Z =  
      USR (0)  
25200 IF C1 < 20 AND C2 < 20 THEN  
      25210  
25205 GOTO 25130  
25210 POKE 49344,14  
25220 POKE 49344,2  
25230 RETURN  
30000 IF TA < > 30 THEN RETURN  
  
30010 C1 = PEEK (49333):C1 = PEEK  
      (49333)  
30020 C2 = PEEK (49334):C2 = PEEK  
      (49334)  
30030 IF C1 > 150 AND C2 > 150 GOTO  
      30110  
30100 RETURN  
30110 POKE 49344,3  
30115 POKE 49344,14  
30130 C1 = PEEK (49333):C1 = PEEK  
      (49333)  
30150 C2 = PEEK (49334):C2 = PEEK  
      (49334)  
30160 G = PEEK (49328):G = PEEK  
      (49328): POKE 11,04: POKE 12  
      ,118:Z = USR (0)  
30170 POKE 11,59: POKE 12,125:Z =  
      USR (0)  
30200 IF C1 < 20 AND C2 < 20 THEN  
      30210  
30205 GOTO 30130  
30210 POKE 49344,14  
30220 POKE 49344,3  
30230 RETURN  
50000 HOME : HTAB 4: VTAB 7: INPUT  
      "NO OF AUTOMATIC CYCLE =";SI  
  
50010 RETURN
```

ศูนย์วิทยุทรัพยากร

จุฬาลงกรณ์มหาวิทยาลัย

```

760 POKE 11,59: POKE 12,125:Z =
    USR (0): GOSUB 20000: GOTO
    730
800 IF H = 255 AND L = 2 AND J =
    3 THEN GOSUB 10000
850 IF H < > 5 OR J < > 5 OR L
    < > 5 THEN END
900 HTAB 5: VTAB 5: PRINT "PROCE
    SS COMPLETE"
905 FOR I = 0 TO 1000: NEXT I
910 F = PEEK (28672 + 2)
920 G = PEEK (49328):G = PEEK (
    49328): POKE 30209,G: POKE 1
    1,04: POKE 12,118:Z = USR (
    0)
923 POKE 11,92: POKE 12,129:Z =
    USR (0)
925 IF L = 5 AND J = 5 AND H = 5
    THEN GOSUB 10100
930 IF G > F THEN 970
950 POKE 11,04: POKE 12,118:Z =
    USR (0)
955 POKE 11,92: POKE 12,129:Z =
    USR (0)
960 GOTO 920
970 IF H = 5 AND L = 255 AND J =
    5 THEN GOSUB 12000
1000 IF H = 5 AND L = 255 AND J =
    255 THEN GOTO 1002
1001 GOTO 920
1002 SI = SI - 1:J = 0:L = 0:H =
    0
1003 IF SI < 0 THEN SI = 0
1004 IF ASC (Z$) = 89 AND SI >
    0 THEN GOTO 110
1009 TEXT : FOR G = 0 TO 2000: NEXT
    G
1010 PRINT CHR$ (4): PRINT CHR$
    (4);"RUN MAIN MENU"
2000 HOME : HTAB 7: VTAB 7: PRINT
    "INPUT ERROR ": FOR T = 1 TO
    300: NEXT T: GOTO 1
3000 HOME : HTAB 7: VTAB 7: PRINT
    "INPUT ERROR ": FOR T = 1 TO
    300: NEXT T: GOTO 1
4000 HOME : HTAB 5: VTAB 4: PRINT
    " FIND NOT FOUND"
4010 FOR I = 1 TO 2000: NEXT I
4020 GOTO 70
5000 POKE 49344,11
5005 POKE 49344,4
5010 H = 255:J = 255:L = 255: RETURN

6000 POKE 49344,11
6005 POKE 49344,4
6010 L = 255:J = 88: RETURN
7000 POKE 49344,11
7005 POKE 49344,5
7010 J = 5:L = 255:H = 25: RETURN

8000 POKE 49344,11
8005 POKE 49344,5
8010 H = 255: RETURN
9000 POKE 49344,11
9005 POKE 49344,6
9010 H = 255:L = 2:J = 3: RETURN

10000 POKE 49344,11
10005 POKE 49344,6
10010 H = 5:L = 5:J = 5: RETURN
10100 POKE 49344,10
10110 L = 255: RETURN
12000 POKE 49344,10
12100 J = 255: RETURN
20000 TA = PEEK (28776):TA = PEEK
    (28776)
20010 IF TA < > 10 THEN GOTO 2
    5000
20020 C1 = PEEK (49329):C1 = PEEK
    (49329)
20030 C2 = PEEK (49330):C2 = PEEK
    (49330)
20040 IF C1 > 200 AND C2 > 200 THEN
    GOTO 20110
20050 RETURN
20110 POKE 49344,1
20115 POKE 49344,14
20130 C1 = PEEK (49329):C1 = PEEK
    (49329)
20150 C2 = PEEK (49330):C2 = PEEK
    (49330)
20160 G = PEEK (49328):G = PEEK
    (49328): POKE 11,04: POKE 12
    ,118:Z = USR (0)
20170 POKE 11,59: POKE 12,125:Z =
    USR (0)
20200 IF C1 < 20 AND C2 < 20 THEN
    GOTO 20210
20205 GOTO 20130
20210 POKE 49344,14
20220 POKE 49344,1
20230 RETURN
25000 IF TA < > 20 THEN GOTO 3
    0000
25020 C1 = PEEK (49331):C1 = PEEK
    (49331)
25030 C2 = PEEK (49332):C2 = PEEK
    (49332)
25040 IF C1 > 150 AND C2 > 150 THEN
    GOTO 25110
25050 RETURN
25110 POKE 49344,2
25115 POKE 49344,14
25130 C1 = PEEK (49331):C1 = PEEK
    (49331)
25150 C2 = PEEK (49332):C2 = PEEK
    (49332)
25160 G = PEEK (49328):G = PEEK
    (49328): POKE 11,04: POKE 12
    ,118:Z = USR (0)

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1 TEXT : HOME :H = 0:L = 0:J = 0
  :AA = 0:BB = 0:CC = 0
5 HTAB 7: VTAB 5: PRINT "PROCESS
  ING ROUTINE"
7 HTAB 4: VTAB 7: PRINT "AUTO MO
  DE PRESS Y-KEY ": GET Z$
8 IF ASC (Z$) < > 89 THEN GOTO
  10
9 GOSUB 50000
10 HTAB 4: VTAB 7: INPUT "UPPER
  LEVEL OF FIRST MATERIAL ";A
20 HTAB 4: VTAB 9: INPUT "UPPER
  LEVEL OF SECOND MATERIAL ";B
30 HTAB 4: VTAB 11: INPUT "UPPER
  LEVEL OF THIRD MATERIAL ";
  C
40 IF A < 5 OR C > 48 THEN 2000
50 IF A > B OR B > C OR A = B OR
  B = C THEN 2000
60 IF B < (A + 5) OR C < (B + 5)
  THEN 3000
70 HOME : HTAB 2: VTAB 5: INPUT
  "DATABASE FILE "=";A$
80 IF A$ = "" THEN 70
85 PRINT CHR$ (4);"BLOAD ";A$
90 HOME : HTAB 4: VTAB 5: INPUT
  "INPUT MIXER TANK NUMBER";D
100 IF D < 1 OR D > 2 THEN 90
105 D = 10 * D
108 POKE 28771,A: POKE 28772,B: POKE
  28773,C: POKE 28774,D
109 A = PEEK (28771):B = PEEK (
  28772):C = PEEK (28773):D =
  PEEK (28774)
110 POKE 28776,10: POKE 28777,D:
  POKE 28785,A: POKE 28786,2
120 IF D = 10 THEN E = PEEK (28
  671 + A)
125 IF D = 10 THEN F = PEEK (28
  671 + 2)
130 IF D = 20 THEN E = PEEK (28
  720 + A)
135 IF D = 20 THEN F = PEEK (28
  720 + 2)
140 PRINT CHR$ (4): PRINT CHR$
  (4);"BLOAD RRT1"
150 HGR2 : PRINT CHR$ (4): PRINT
  CHR$ (4);"BLOAD CKT.NEW3"
163 POKE 49344,10
164 POKE 10,76: POKE 11,92: POKE
  12,129:Z = USR (0)
165 G = PEEK (49328):G = PEEK (
  49328): POKE 30209,G: POKE 1
  1,04: POKE 12,118:Z = USR (
  0)
167 IF G < 250 THEN 164
169 POKE 49344,10
170 G = PEEK (49328):G = PEEK (
  49328): POKE 30209,G: POKE 1
  1,04: POKE 12,118:Z = USR (
  0)
180 IF G < E THEN 310
190 IF F = G OR G > F THEN 400
195 POKE 10,76: POKE 11,59: POKE
  12,125:Z = USR (0)
197 GOSUB 20000
200 GOTO 170
310 IF H = 0 AND L = 255 AND J =
  88 THEN GOSUB 5000
320 IF L = 255 AND J = 255 AND H
  = 255 THEN GOTO 500
400 IF L = 0 AND J = 0 AND H = 0
  THEN GOSUB 6000
410 POKE 11,59: POKE 12,125:Z =
  USR (0)
415 GOSUB 20000
420 GOTO 170
500 POKE 28785,B: POKE 28786,A: POKE
  28776,20
510 IF D = 10 THEN E = PEEK (28
  671 + B)
520 IF D = 20 THEN E = PEEK (28
  720 + B)
530 G = PEEK (49328):G = PEEK (
  49328): POKE 30209,G: POKE 1
  1,04: POKE 12,118:Z = USR (
  0)
540 IF G < E THEN 600
550 IF L = 255 AND J = 255 AND H
  = 255 THEN GOSUB 7000
560 POKE 11,59: POKE 12,125:Z =
  USR (0): GOSUB 20000: GOTO
  530
600 IF H = 25 AND L = 255 AND J =
  5 THEN GOSUB 8000
630 IF H = 255 AND J = 5 AND L =
  255 THEN GOTO 700
640 GOSUB 20000
650 GOTO 530
700 POKE 28785,C: POKE 28786,B: POKE
  28776,30
710 IF D = 10 THEN E = PEEK (28
  671 + C)
720 IF D = 20 THEN E = PEEK (28
  720 + C)
730 G = PEEK (49328):G = PEEK (
  49328): POKE 30209,G: POKE 1
  1,04: POKE 12,118:Z = USR (
  0)
735 Z = USR (0)
740 IF G < E THEN 800
750 IF L = 255 AND J = 5 AND H =
  255 THEN GOSUB 9000: POKE 1
  1,59: POKE 12,125:Z = USR (
  0)

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2 + 1: POKE 28793 + V,T2:A1 =
PEEK (28776) / 10:Q = Q + 1
: POKE 29697,30
477 IF A1 = 1 THEN 480
478 IF A1 = 2 THEN 490
480 HOME : HTAB 5: VTAB 5: PRINT
"THE STORAGE TANK IS OPENING
": POKE 49344,4: POKE 49344,
5: POKE 49344,6: POKE 49344,
11
481 GOSUB 1200
485 GOTO 470
490 HOME : HTAB 5: VTAB 5: PRINT
"THE STORAGE TANK IS OPENING
": POKE 49344,4: POKE 49344
,5: POKE 49344,6: POKE 49344
,11
492 GOTO 1200
493 GOTO 470
499 IF PEEK (29697) < > 30 OR
P > 48 THEN 470
500 A1 = PEEK (28777) / 10: POKE
29697,20:P = P + 1
501 IF A1 = 2 THEN 520
503 IF A1 = 1 THEN 510
510 HOME : HTAB 5: VTAB 5: PRINT
"THE STORAGE TANK IS CLOSED
": POKE 49344,4: POKE 49344,
5: POKE 49344,6: POKE 49344,
11
512 GOSUB 1200
513 GOTO 560
520 HOME : HTAB 5: VTAB 5: PRINT
"THE STORAGE TANK IS CLOSED"
: POKE 49344,4: POKE 49344,5
: POKE 49344,6: POKE 49344,1
1
522 GOSUB 1200
523 GOTO 560
560 AS = PEEK (49328):AS = PEEK
(49328): POKE 30209,AS
563 HOME : HTAB 8: VTAB 5: PRINT
"CALIBRATION MIXER TANK "; PEEK
(28777) / 10: NORMAL : HTAB
4: VTAB 7: PRINT "CALIBRATIN
G # ";T2: POKE 10,76: POKE 1
1,215: POKE 12,116:Z = USR
(0):C2 = PEEK (28781): HTAB
4: VTAB 9: PRINT "AVERAGE CO
UNT = ";C2
565 GOSUB 1200
570 IF T2 < 48 THEN 470
580 HOME : HTAB 5: VTAB 5: INPUT
"INPUT NAME OF FILE TO SAVE
";JS
620 HTAB 5: VTAB 7: PRINT "DO YO
U WANT TO SAVE DATA ?": GET
G$
630 IF ASC (G$) = 78 GOTO 400
640 IF ASC (G$) = 89 GOTO 680
660 IF ASC (G$) < > 78 OR ASC
(G$) < > 89 THEN 620
680 PRINT CHR$ (4): PRINT CHR$
(4);"BSAVE";JS;"A$7000,L$6A
"
690 GOTO 400
1200 FOR I = 1 TO 2000: NEXT I: RETURN
1300 HOME : HTAB 7: VTAB 12: PRINT
"WAIT FOR A MOMENT ": PRINT
CHR$ (4): PRINT CHR$ (4);"
RUN MAIN MENU"

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1 POKE 29696,255: POKE 29697,255
4 DIM AB$(48): FOR K = 0 TO 10: POKE
  28790 + K,0: NEXT K
7 J = PEEK (30136): IF J = 1 THEN
  GOTO 70
8 HOME : POKE 30136,0
10 VTAB 5: HTAB 11: PRINT "CALIB
  RATION ROUTINE"
20 VTAB 7: HTAB 5: PRINT "THIS R
  OUTINE IS USE TO CALIBRATE T
  HE PROCESSING SUBROUTINE IN
  THIS SYSTEM.IT HAS 48 LEVEL
  S WHICH IS CALIBRATED THEN T
  HE USER MUST SET THE RAW LEV
  ELS ,RUN SET LEVELS ,BEFORE
  YOU RUN CALIBRATION ROUTINE"
30 VTAB 13: HTAB 7: PRINT "WHEN
  YOU RUN CALIBRATION ROUTINE .
  ALEADY.YOU MUST SET THE SECO
  ND RAW LEVEL , AFTER YOU RUN
  THE SECOND CALIBRATION ROUT
  INE ATERNATION.UNTIL IT COMP
  LETE THE FOURTY-EIGHT THE RA
  W LEVELS."
40 VTAB 18: HTAB 7: PRINT "THIS
  IS THE USER MUST SET THE RAW
  LEVELS TOTAL = 48 LEVELS,TH
  E FIRST RAW LEVELS IS THE BO
  TTOM OF TANK,THE SECOND RAW
  LEVELS IS THE UPWARDS RAW LE
  VELS.THE FOURTY-EIGHT LEVELS
  AT THE TOP OF THE TANK."
50 VTAB 24: HTAB 7: PRINT "AFTER
  YOU COULD RUN THE SAVE SUBR
  OUTINE , SAVE ALL DATA.THE C
  ALIBRATION IS COMPLETE."
52 INVERSE : PRINT "PRESS ANY KE
  Y TO CONTINUE": GET V$: NORMAL
54 IF ASC (V$) < > 31 THEN 70
70 POKE 30136,255
180 HOME : HTAB 10: VTAB 14: PRINT
  "PRESS Q TO EXIT": HTAB 10: VTA
  10: PRINT "PRESS X TO SELECT
  STORAGE TANK": HTAB 10: VTAB
  12: PRINT "PRESS S TO SELECT
  MIXER TANK"
185 HTAB 8: VTAB 6: FLASH : PRINT
  "CALIBRATE MENU": NORMAL
190 HTAB 10: VTAB 8: PRINT "PRES
  S ANY KEY": GET B$
191 IF B$ = CHR$ (88) THEN 240
192 IF B$ = CHR$ (83) THEN 400
193 IF B$ = CHR$ (81) THEN 1300
200 IF ASC (B$) < > 88 OR ASC
  (B$) < > 83 OR ASC (B$) <
  > 81 THEN 180
240 HOME : HTAB 10: VTAB 2: PRINT
  "STORAGE TANK": HTAB 5: VTAB
  5: PRINT "PRESS 1 TO SELECT
  STORAGE TANK": HTAB 5: VTAB
  7: PRINT "PRESS 2 TO SET THE
  RAW LEVELS": HTAB 5: VTAB 9
  : PRINT "PRESS 4 TO EXIT"
241 HTAB 5: VTAB 15: PRINT "PRES
  S ANY KEY": PRINT CHR$ (8):
  GET Y$:XX = 10
242 IF Y$ = CHR$ (49) THEN 250
243 IF Y$ = CHR$ (50) THEN 253
244 IF Y$ = CHR$ (52) THEN 180
247 IF ASC (Y$) < > 49 OR ASC
  (Y$) < > 50 OR ASC (Y$) <
  > 52 THEN 240
250 HOME : HTAB 10: VTAB 5: FLASH
  : PRINT "SELECT STORAGE TANK
  ": NORMAL : HTAB 3: VTAB 8: INPUT
  "INPUT NUMBER OF STORAGE TAN
  K (1-> 3)=";D: IF D < 1 OR D
  > 3 THEN 250
251 L = 10 * D: POKE 28776,L: POKE
  29696,20:O = 1:S = 1: GOTO 2
  40
253 HOME : HTAB 10: VTAB 3:F = PEEK
  (28776) / 10: PRINT "STORAGE
  TANK #";F: NORMAL : HTAB 5:
  VTAB 5: PRINT "START SET TH
  E RAW LEVELS": HTAB 10: VTAB
  7: PRINT "IN THE STORAGE TAN
  K (Y/N)": GET E$: IF E$ = CHR$
  (89) THEN 255
254 IF E$ = CHR$ (78) THEN 240:
  IF ASC (E$) < > 89 OR ASC
  (E$) < > 78 THEN 252
255 HOME : HTAB 5: VTAB 3: PRINT
  "THE STORAGE TANK CAN SETTED
  2 LEVELS,THE FIRST IS STA
  RT PUMP AND THE SECOND IS CL
  OSE PUMP,THEN THE USER MUST
  CALIBRATE ANY LEVEL.AFTER T
  HE USER CHOOSE THAT 2 LEVELS
  FROM THEM OK !"
260 HTAB 5: VTAB 9: PRINT "PRESS
  O TO OPEN PUMP": HTAB 5: VTAB
  11: PRINT "PRESS S TO STOP P
  UMP": HTAB 5: VTAB 13: PRINT
  "PRESS Q TO EXIT ": HTAB 5: VTAB
  15: PRINT "PRESS ANY KEY": GET
  C$
261 IF C$ = CHR$ (83) THEN 270
262 IF C$ = CHR$ (81) THEN 240
263 IF C$ = CHR$ (79) THEN 265
264 IF ASC (C$) < > 83 OR ASC
  (C$) < > 81 OR ASC (C$) <
  > 79 THEN 260

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265 IF PEEK (29696) < > 20 OR
O.> 2 THEN 255
266 T = PEEK (28790 + D):T = T +
1: POKE 28790 + D,T: POKE 29
696,30:O = O + 1
267 IF F = 1 THEN 306
268 IF F = 3 THEN 315
269 IF F = 2 THEN 310
270 IF PEEK (29696) < > 30 OR
S > 2 THEN 255
271 S = S + 1: POKE 29696,20: IF
F = 1 THEN 320
272 IF F = 2 THEN 325
273 IF F = 3 THEN 327
274 IF F < 1 OR > 3 THEN 240
275 HOME : HTAB 2: VTAB 7:T = PEEK
(28790 + D): PRINT "CALIBRAT
E THE RAW LEVEL IN STORAGE
TANK #"; PEEK (28776) / 10: HTA!
6: VTAB 11: PRINT "NUMBER OF
CALIBRATION ";T
276 U = T: POKE 30137,U
283 POKE 10,76: POKE 11,05: POKE
12,116:Z =USR (0)
285 HTAB 9: VTAB 16: PRINT "CALI
BRATING": POKE 10,76: POKE 1
1,62: POKE 12,116:Z = USR (
0):J0 = PEEK (28780): HTAB
9: VTAB 13: PRINT "CALIBRATE
THE RAW STORAGE TANK #";D"
AVERAGE COUNT =";J0: GOSUB
1200
286 GOSUB 1200: GOSUB 1200
303 POKE 28782,T * 10: POKE 10,7
6: POKE 11,107: POKE 12,116:
Z = USR (0)
304 IF T < 2 THEN 255
305 HOME : HTAB 5: VTAB 5: PRINT
"CALIBRATION STORAGE TANK #
";D;" COMPLETE ": GOSUB 120
0: GOSUB 1200: GOTO 240
306 HOME : HTAB 5: VTAB 10: PRINT
"THE SECOND VALVE IS OPENING
": POKE 49344,1:
POKE 49344,14: GOSUB 1200
307 GOTO 255
310 HOME : HTAB 5: VTAB 10: PRINT
"THE THIRD VALVE IS OPENING
": POKE
49344,2: POKE 49344,14: GOSUB
1200
311 GOTO 255
315 HOME : HTAB 5: VTAB 10: PRINT
"THE FOURTH VALVE IS OPENIN
G": POKE
49344,3: POKE 49344,14: GOSUB
1200
316 GOTO 255
320 HOME : HTAB 5: VTAB 10: PRINT
"THE SECOND VALVE IS CLOSED
": POKE 49344,1:
POKE 49344,14: GOSUB 1200
GOTO 275
325 HOME : HTAB 5: VTAB 10: PRINT
"THE THIRD VALVE IS CLOSED
": POKE 49344,2: POKE 49344
,14: GOSUB 1200
GOTO 275
326 HOME : HTAB 5: VTAB 10: PRINT
"THE FOURTH VALVE IS CLOSE
D": POKE 49344,3
: POKE 49344,14: GOSUB 1200
GOTO 275
327 HOME : HTAB 10: VTAB 5: PRINT
"MIXER TANK": HTAB 5: VTAB 7
: PRINT "PRESS M TO SELECT M
IXER TANK": HTAB 5: VTAB 9: PRINT
"PRESS N TO SET THE RAW LEVE
L"
401 HTAB 5: VTAB 13: PRINT "PRES
S Q TO EXIT": GET Z$
410 IF Z$ = CHR$ (77) THEN 450
420 IF Z$ = CHR$ (78) THEN 460
431 IF Z$ = CHR$ (81) THEN 180
440 IF ASC (Z$) < > 77 OR ASC
(Z$) < > 78 OR ASC (Z$) <
> 81 OR ASC (Z$) < > 67 THEN
400
450 HOME : HTAB 6: VTAB 10: INPUT
"SELECT MIXER TANK (1 OR 2)"
;V:B = 10 * V: POKE 28777,B
451 IF V < 1 OR V > 2 THEN 450
452 POKE 29697,20:Q = 0:P = 0: GOTO
400
460 HOME : HTAB 9: VTAB 3: FLASH
:D = PEEK (28777) / 10: PRINT
"MIXER TANK #";D: NORMAL : HTAB
5: VTAB 5: PRINT "START SET
THE RAW LEVELS IN THE MIXER
TANK (Y/N)?: GET A$
461 IF A$ = CHR$ (89) THEN 470
462 IF A$ = CHR$ (78) THEN 400
463 IF ASC (A$) < > 78 OR ASC
(A$) < > 89 THEN 460
470 HOME : HTAB 9: VTAB 3: FLASH
: PRINT "PRESS ANY KEY": NORMAL
: HTAB 5: VTAB 5: PRINT "PRE
SS O TO OPEN PUMP": HTAB 5: VTAB
7: PRINT "PRESS S TO CLOSE P
UMP ": HTAB 5: VTAB 9: PRINT
"PRESS Q TO EXIT": GET C$
471 IF C$ = CHR$ (83) THEN 499
472 IF C$ = CHR$ (81) THEN 400
473 IF C$ = CHR$ (79) THEN 475
474 IF ASC (C$) < > 79 OR ASC
(C$) < > 81 OR ASC (C$) <
> 83 THEN 470
475 IF PEEK (29697) < > 20 OR
Q > 48 THEN 470
476 T2 = PEEK (28793 + V):T2 = T

```

```
5 HTAB 15: VTAB 3:- PRINT "PRINT
  DATA"
10 HTAB 5: VTAB 6: PRINT "LEVELS
  COUNT"
13 I = PEEK (28777) / 10: IF J =
  1 THEN M = 28671: IF J = 2 THEN
  M = 28720
15 FOR I = 1 TO 48
20 PR# 1
25 PRINT I, PEEK (M + I)
30 PR# 0
35 NEXT I
40 PRINT CHR$ (4): PRINT CHR$
  (4); "RUN MAIN MENU"
```

ศูนย์วิทยทรัพยากร

จุฬาลงกรณ์มหาวิทยาลัย

7686-	A9 04	LDA	#\$04	7707-	BD D3 7B	LDA	\$7BD3,X
7688-	8D C0 C0	STA	\$C0C0	770A-	85 ED	STA	\$ED
768B-	A9 0B	LDA	#\$0B	770C-	BD A3 7B	LDA	\$7BA3,X
768D-	8D C0 C0	STA	\$C0C0	770F-	85 EE	STA	\$EE
7690-	60	RTS		7711-	A0 00	LDY	#\$00
7691-	E0 14	CPX	#\$14	7713-	A9 7F	LDA	#\$7F
7693-	D0 10	BNE	\$76A5	7715-	91 ED	STA	(\$ED),Y
7695-	A9 08	LDA	#\$08	7717-	C8	INY	
7697-	8D C0 C0	STA	\$C0C0	7718-	C0 06	CPY	#\$06
769A-	A9 05	LDA	#\$05	771A-	D0 F7	BNE	\$7713
769C-	8D C0 C0	STA	\$C0C0	771C-	60	RTS	
769F-	A9 0C	LDA	#\$0C	771D-	00	BRK	
76A1-	8D C0 C0	STA	\$C0C0	771E-	00	BRK	
76A4-	60	RTS		771F-	00	BRK	
76A5-	E0 1E	CPX	#\$1E	7720-	00	BRK	
76A7-	D0 0F	BNE	\$76B8	7721-	00	BRK	
76A9-	A9 07	LDA	#\$07	7722-	00	BRK	
76AB-	8D C0 C0	STA	\$C0C0	7723-	A2 00	LDX	#\$00
76AE-	A9 06	LDA	#\$06	7725-	A9 00	LDA	#\$00
76B0-	8D C0 C0	STA	\$C0C0	7727-	9D 83 42	STA	\$4283,X
76B3-	A9 0D	LDA	#\$0D	772A-	9D 83 46	STA	\$4683,X
76B5-	8D C0 C0	STA	\$C0C0	772D-	9D 83 4A	STA	\$4A83,X
76B8-	60	RTS		7730-	9D 83 4E	STA	\$4E83,X
76B9-	AE 70 70	LDX	\$7070	7733-	9D 83 56	STA	\$5683,X
76BC-	BD 73 7B	LDA	\$7B73,X	7736-	9D 83 5A	STA	\$5A83,X
76BF-	85 EB	STA	\$EB	7739-	9D 83 5E	STA	\$5E83,X
76C1-	BD A3 7B	LDA	\$7BA3,X	773C-	9D 03 43	STA	\$4303,X
76C4-	85 EC	STA	\$EC	773F-	9D 03 47	STA	\$4703,X
76C6-	A0 00	LDY	#\$00	7742-	9D 03 4B	STA	\$4B03,X
76C8-	A9 00	LDA	#\$00	7745-	9D 03 4F	STA	\$4F03,X
76CA-	91 EB	STA	(\$EB),Y	7748-	9D 03 53	STA	\$5303,X
76CC-	C8	INY		774B-	9D 83 52	STA	\$5283,X
76CD-	C0 06	CPY	#\$06	774E-	E8	INY	
76CF-	D0 F7	BNE	\$76C8	774F-	E0 02	CPX	#\$02
76D1-	60	RTS		7751-	D0 D2	BNE	\$7725
76D2-	AE 6F 70	LDX	\$706F	7753-	60	RTS	
76D5-	BD 73 7B	LDA	\$7B73,X	7754-	A2 00	LDX	#\$00
76D8-	85 ED	STA	\$ED	7756-	A9 00	LDA	#\$00
76DA-	BD A3 7B	LDA	\$7BA3,X	7758-	9D AB 41	STA	\$41AB,X
76DD-	85 EE	STA	\$EE	775B-	9D AB 45	STA	\$45AB,X
76DF-	A0 00	LDY	#\$00	775E-	9D AB 49	STA	\$49AB,X
76E1-	A9 7F	LDA	#\$7F	7761-	9D AB 4D	STA	\$4DAB,X
76E3-	91 ED	STA	(\$ED),Y	7764-	9D AB 51	STA	\$51AB,X
76E5-	C8	INY		7767-	9D AB 55	STA	\$55AB,X
76E6-	C0 06	CPY	#\$06	776A-	9D AB 59	STA	\$59AB,X
76E8-	D0 F7	BNE	\$76E1	776D-	9D AB 5D	STA	\$5DAB,X
76EA-	60	RTS		7770-	9D 2B 42	STA	\$422B,X
76EB-	AE 70 70	LDX	\$7070	7773-	9D 2B 46	STA	\$462B,X
76EE-	BD D3 7B	LDA	\$7BD3,X	7776-	9D 2B 4A	STA	\$4A2B,X
76F1-	85 FC	STA	\$FC	7779-	9D 2B 4E	STA	\$4E2B,X
76F3-	BD A3 7B	LDA	\$7BA3,X	777C-	9D 2B 52	STA	\$522B,X
76F6-	85 FD	STA	\$FD	777F-	E8	INY	
76F8-	A0 00	LDY	#\$00	7780-	E0 02	CPX	#\$02
76FA-	A9 00	LDA	#\$00	7782-	D0 D2	BNE	\$7756
76FC-	91 FC	STA	(\$FC),Y	7784-	60	RTS	
76FE-	C8	INY		7785-	A2 00	LDY	#\$00
76FF-	C0 06	CPY	#\$06	7787-	A9 00	LDA	#\$00
7701-	D0 F7	BNE	\$76FA	7789-	9D D3 40	STA	\$40D3,X
7703-	60	RTS		778C-	9D D3 44	STA	\$44D3,X
7704-	AE 6F 70	LDX	\$706F	778F-	9D D3 48	STA	\$48D3,X

7792-	9D D3 4C	STA	\$4CD3,X				
7795-	9D D3 50	STA	\$50D3,X				
7798-	9D D3 54	STA	\$54D3,X				
779B-	9D D3 58	STA	\$58D3,X				
779E-	9D D3 5C	STA	\$5CD3,X				
77A1-	9D 53 41	STA	\$4153,X				
77A4-	9D 53 45	STA	\$4553,X				
77A7-	9D 53 49	STA	\$4953,X				
77AA-	9D 53 4D	STA	\$4D53,X				
77AD-	9D 53 51	STA	\$5153,X				
77B0-	E8	INX					
77B1-	E0 02	CPX	#\$02				
77B3-	D0 D2	BNE	\$7787				
77B5-	60	RTS					
77B6-	A2 00	LDX	#\$00				
77B8-	A9 00	LDA	#\$00				
77BA-	9D 33 41	STA	\$4133,X				
77BD-	9D 33 45	STA	\$4533,X				
77C0-	9D 33 49	STA	\$4933,X				
77C3-	9D 33 4D	STA	\$4D33,X				
77C6-	9D 33 51	STA	\$5133,X				
77C9-	9D 33 55	STA	\$5533,X				
77CC-	9D 33 59	STA	\$5933,X				
77CF-	9D 33 5D	STA	\$5D33,X				
77D2-	9D B3 41	STA	\$41B3,X				
77D5-	9D B3 45	STA	\$45B3,X				
77D8-	9D B3 49	STA	\$49B3,X				
77DB-	9D B3 4D	STA	\$4DB3,X				
77DE-	9D B3 51	STA	\$51B3,X				
77E1-	9D B3 55	STA	\$55B3,X				
77E4-	9D B3 59	STA	\$59B3,X				
77E7-	9D B3 5D	STA	\$5DB3,X				
77EA-	9D 33 42	STA	\$4233,X				
77ED-	E8	INX					
77EE-	E0 03	CPX	#\$03				
77F0-	D0 C6	BNE	\$77B8				
77F2-	60	RTS					
77F3-	A2 00	LDX	#\$00				
77F5-	A9 00	LDA	#\$00				
77F7-	9D 5B 40	STA	\$405B,X				
77FA-	9D 5B 44	STA	\$445B,X				
77FD-	9D 5B 48	STA	\$485B,X				
7800-	9D 5B 4C	STA	\$4C5B,X				
7803-	9D 5B 50	STA	\$505B,X				
7806-	9D 5B 54	STA	\$545B,X				
7809-	9D 5B 58	STA	\$585B,X				
780C-	9D 5B 5C	STA	\$5C5B,X				
780F-	9D DB 40	STA	\$40DB,X				
7812-	9D DB 44	STA	\$44DB,X				
7815-	9D DB 48	STA	\$48DB,X				
7818-	9D DB 4C	STA	\$4CDB,X				
781B-	9D DB 50	STA	\$50DB,X				
781E-	9D DB 54	STA	\$54DB,X				
7821-	9D DB 58	STA	\$58DB,X				
7824-	9D DB 5C	STA	\$5CDB,X				
7827-	9D 5B 41	STA	\$415B,X				
782A-	E8	INX					
782B-	E0 03	CPX	#\$03				
782D-	D0 C6	BNE	\$77F5				
782F-	60	RTS					
7830-	A2 00	LDX	#\$00				
7832-	A9 00	LDA	#\$00				
7834-	9D 5B 43	STA	\$435B,X				
7837-	9D 5B 47	STA	\$475B,X				
783A-	9D 5B 4B	STA	\$4B5B,X				
783D-	9D 5B 4F	STA	\$4F5B,X				
7840-	9D 5B 53	STA	\$535B,X				
7843-	9D 5B 57	STA	\$575B,X				
7846-	9D 5B 5B	STA	\$5B5B,X				
7849-	9D 5B 5F	STA	\$5F5B,X				
784C-	9D DB 43	STA	\$43DB,X				
784F-	9D DB 47	STA	\$47DB,X				
7852-	9D DB 4B	STA	\$4BDB,X				
7855-	9D DB 4F	STA	\$4FDB,X				
7858-	9D DB 53	STA	\$53DB,X				
785B-	9D DB 57	STA	\$57DB,X				
785E-	9D DB 5B	STA	\$5BDB,X				
7861-	9D DB 5F	STA	\$5FDB,X				
7864-	E8	INX					
7865-	E0 02	CPX	#\$02				
7867-	D0 C9	BNE	\$7832				
7869-	60	RTS					
786A-	A2 00	LDX	#\$00				
786C-	A9 00	LDA	#\$00				
786E-	9D 13 41	STA	\$4113,X				
7871-	9D 13 45	STA	\$4513,X				
7874-	9D 13 49	STA	\$4913,X				
7877-	9D 13 4D	STA	\$4D13,X				
787A-	9D 13 51	STA	\$5113,X				
787D-	9D 13 55	STA	\$5513,X				
7880-	9D 13 59	STA	\$5913,X				
7883-	9D 13 5D	STA	\$5D13,X				
7886-	9D 93 41	STA	\$4193,X				
7889-	9D 93 45	STA	\$4593,X				
788C-	9D 93 49	STA	\$4993,X				
788F-	9D 93 4D	STA	\$4D93,X				
7892-	9D 93 51	STA	\$5193,X				
7895-	E8	INX					
7896-	E0 02	CPX	#\$02				
7898-	D0 D2	BNE	\$786C				
789A-	60	RTS					
789B-	A2 00	LDX	#\$00				
789D-	A9 00	LDA	#\$00				
789F-	9D 13 42	STA	\$4213,X				
78A2-	9D 13 46	STA	\$4613,X				
78A5-	9D 13 4A	STA	\$4A13,X				
78A8-	9D 13 4E	STA	\$4E13,X				
78AB-	9D 13 52	STA	\$5213,X				
78AE-	9D 13 56	STA	\$5613,X				
78B1-	9D 13 5A	STA	\$5A13,X				
78B4-	9D 13 5E	STA	\$5E13,X				
78B7-	9D 93 42	STA	\$4293,X				
78BA-	9D 93 46	STA	\$4693,X				
78BD-	9D 93 4A	STA	\$4A93,X				
78C0-	9D 93 4E	STA	\$4E93,X				
78C3-	9D 93 52	STA	\$5293,X				
78C6-	E8	INX					
78C7-	E0 02	CPX	#\$02				
78C9-	D0 D2	BNE	\$789D				
78CB-	60	RTS					

78CC-	A2 00	LDX	#\$00				
78CE-	A9 00	LDA	#\$00				
78D0-	9D 11 43	STA	\$4311,X	7964-	9D BF 40	STA	\$40BF,X
78D3-	9D 11 47	STA	\$4711,X	7967-	E8	INX	
78D6-	9D 11 4B	STA	\$4B11,X	7968-	E0 02	CPX	#\$02
78D9-	9D 11 4F	STA	\$4F11,X	796A-	D0 E1	BNE	\$794D
78DC-	9D 11 53	STA	\$5311,X	796C-	60	RTS	
78DF-	9D 11 57	STA	\$5711,X	796D-	A2 00	LDX	#\$00
78E2-	9D 11 5B	STA	\$5B11,X	796F-	A9 00	LDA	#\$00
78E5-	9D 11 5F	STA	\$5F11,X	7971-	9D 44 40	STA	\$4044,X
78E8-	9D 91 47	STA	\$4791,X	7974-	9D 44 44	STA	\$4444,X
78EB-	9D 91 4B	STA	\$4B91,X	7977-	9D 44 48	STA	\$4844,X
78EE-	9D 91 4F	STA	\$4F91,X	797A-	9D 44 4C	STA	\$4C44,X
78F1-	9D 91 53	STA	\$5391,X	797D-	9D 44 50	STA	\$5044,X
78F4-	E8	INX		7980-	9D 44 54	STA	\$5444,X
78F5-	E0 03	CPX	#\$03	7983-	9D 44 58	STA	\$5844,X
78F7-	D0 D5	BNE	\$78CE	7986-	9D 44 5C	STA	\$5C44,X
78F9-	A9 07	LDA	#\$07	7989-	E8	INX	
78FB-	8D 91 43	STA	\$4391	798A-	E0 02	CPX	#\$02
78FE-	A9 70	LDA	#\$70	798C-	D0 E1	BNE	\$796F
7900-	8D 92 43	STA	\$4392	798E-	60	RTS	
7903-	60	RTS		798F-	A2 00	LDX	#\$00
7904-	A2 00	LDX	#\$00	7991-	A9 00	LDA	#\$00
7906-	A9 00	LDA	#\$00	7993-	9D 46 40	STA	\$4046,X
7908-	9D 3B 40	STA	\$403B,X	7996-	9D 46 44	STA	\$4446,X
790B-	9D 3B 44	STA	\$443B,X	7999-	9D 46 48	STA	\$4846,X
790E-	9D 3B 48	STA	\$483B,X	799C-	9D 46 4C	STA	\$4C46,X
7911-	9D 3B 4C	STA	\$4C3B,X	799F-	9D 46 50	STA	\$5046,X
7914-	9D 3B 50	STA	\$503B,X	79A2-	9D 46 54	STA	\$5446,X
7917-	9D 3B 54	STA	\$543B,X	79A5-	9D 46 58	STA	\$5846,X
791A-	9D 3B 58	STA	\$583B,X	79A8-	9D 46 5C	STA	\$5C46,X
791D-	9D 3B 5C	STA	\$5C3B,X	79AB-	E8	INX	
7920-	9D BB 40	STA	\$40BB,X	79AC-	E0 02	CPX	#\$02
7923-	E8	INX		79AE-	D0 E1	BNE	\$7991
7924-	E0 02	CPX	#\$02	79B0-	60	RTS	
7926-	D0 DE	BNE	\$7906	79B1-	A2 00	LDX	#\$00
7928-	60	RTS		79B3-	A9 00	LDA	#\$00
7929-	A2 00	LDX	#\$00	79B5-	9D 48 40	STA	\$4048,X
792B-	A9 00	LDA	#\$00	79B8-	9D 48 44	STA	\$4448,X
792D-	9D 3D 44	STA	\$443D,X	79BB-	9D 48 48	STA	\$4848,X
7930-	9D 3D 48	STA	\$483D,X	79BE-	9D 48 4C	STA	\$4C48,X
7933-	9D 3D 4C	STA	\$4C3D,X	79C1-	9D 48 50	STA	\$5048,X
7936-	9D 3D 50	STA	\$503D,X	79C4-	9D 48 54	STA	\$5448,X
7939-	9D 3D 54	STA	\$543D,X	79C7-	9D 48 58	STA	\$5848,X
793C-	9D 3D 58	STA	\$583D,X	79CA-	9D 48 5C	STA	\$5C48,X
793F-	9D 3D 5C	STA	\$5C3D,X	79CD-	E8	INX	
7942-	9D BD 40	STA	\$40BD,X	79CE-	E0 02	CPX	#\$02
7945-	E8	INX		79D0-	D0 E1	BNE	\$79B3
7946-	E0 02	CPX	#\$02	79D2-	60	RTS	
7948-	D0 E1	BNE	\$792B	79D3-	A2 00	LDX	#\$00
794A-	60	RTS		79D5-	A9 00	LDA	#\$00
794B-	A2 00	LDX	#\$00	79D7-	9D F0 44	STA	\$44F0,X
794D-	A9 00	LDA	#\$00	79DA-	9D F0 48	STA	\$48F0,X
794F-	9D 3F 44	STA	\$443F,X	79DD-	9D F0 4C	STA	\$4CF0,X
7952-	9D 3F 48	STA	\$483F,X	79E0-	9D F0 50	STA	\$50F0,X
7955-	9D 3F 4C	STA	\$4C3F,X	79E3-	9D F0 54	STA	\$54F0,X
7958-	9D 3F 50	STA	\$503F,X	79E6-	9D F0 58	STA	\$58F0,X
795B-	9D 3F 54	STA	\$543F,X	79E9-	9D F0 5C	STA	\$5CF0,X
795E-	9D 3F 58	STA	\$583F,X	79EC-	9D 70 41	STA	\$4170,X
7961-	9D 3F 5C	STA	\$5C3F,X	79EF-	9D 70 45	STA	\$4570,X
				79F2-	9D 70 49	STA	\$4970,X
				79F5-	9D 70 4D	STA	\$4D70,X

79F8-	9D 70 51	STA	\$5170,X
79FB-	9D F0 40	STA	\$40F0,X
79FE-	E8	INX	
79FF-	E0 02	CFX	#\$02
7A01-	D0 D2	BNE	\$79D5
7A03-	A9 7E	LDA	#\$7E
7A05-	8D 71 41	STA	\$4171
7A08-	60	RTS	
7A09-	A2 00	LDX	#\$00
7A0B-	A9 00	LDA	#\$00
7ACD-	9D 70 42	STA	\$4270,X
7A10-	9D 70 46	STA	\$4670,X
7A13-	9D 70 4A	STA	\$4A70,X
7A16-	9D 70 4E	STA	\$4E70,X
7A19-	9D 70 52	STA	\$5270,X
7A1C-	9D 70 56	STA	\$5670,X
7A1F-	9D 70 5A	STA	\$5A70,X
7A22-	9D 70 5E	STA	\$5E70,X
7A25-	9D F0 42	STA	\$42F0,X
7A28-	9D F0 46	STA	\$46F0,X
7A2B-	9D F0 4A	STA	\$4AF0,X
7A2E-	9D F0 4E	STA	\$4EF0,X
7A31-	9D F0 52	STA	\$52F0,X
7A34-	E8	INX	
7A35-	E0 02	CPX	#\$02
7A37-	D0 D2	BNE	\$7A0B
7A39-	A9 7E	LDA	#\$7E
7A3B-	8D F1 42	STA	\$42F1
7A3E-	60	RTS	
7A3F-	7E 7E 18	ROR	\$187E,X
7A42-	18	CLC	
7A43-	19 5B 3D	ORA	\$3D5B,Y
7A46-	19 19 25	ORA	\$2519,Y
7A49-	43	???	
7A4A-	01 00	ORA	(\$00,X)
7A4C-	00	BRK	
7A4D-	00	BRK	
7A4E-	00	BRK	
7A4F-	01 01	ORA	(\$01,X)
7A51-	01 7F	ORA	(\$7F,X)
7A53-	01 01	ORA	(\$01,X)
7A55-	01 01	ORA	(\$01,X)
7A57-	60	RTS	
7A58-	10 48	BPL	\$7AA2
7A5A-	44	???	
7A5B-	44	???	
7A5C-	47	???	
7A5D-	46 44	LSR	\$44
7A5F-	48	PHA	
7A60-	10 70	BPL	\$7AD2
7A62-	7E 02 7E	ROR	\$7E02,X
7A65-	0F	???	
7A66-	10 23	BPL	\$7A8B
7A68-	44	???	
7A69-	44	???	
7A6A-	43	???	
7A6B-	40	RTI	
7A6C-	40	RTI	
7A6D-	20 10 1F	JSR	\$1F10
7A70-	7F	???	

7A71-	00	BRK	
7A72-	7F	???	
7A73-	00	BRK	
7A74-	00	BRK	
7A75-	00	BRK	
7A76-	00	BRK	
7A77-	00	BRK	
7A78-	7F	???	
7A79-	00	BRK	
7A7A-	00	BRK	
7A7B-	00	BRK	
7A7C-	00	BRK	
7A7D-	00	BRK	
7A7E-	01 01	ORA	(\$01,X)
7A80-	01 70	ORA	(\$70,X)
7A82-	23	???	
7A83-	43	???	
7A84-	7F	???	
7A85-	7F	???	
7A86-	43	???	
7A87-	23	???	
7A88-	70 1F	BVS	\$7AA9
7A8A-	08	PHP	
7A8B-	04	???	
7A8C-	03	???	
7A8D-	03	???	
7A8E-	04	???	
7A8F-	08	PHP	
7A90-	1F	???	
7A91-	A2 00	LDX	#\$00
7A93-	A0 00	LDY	#\$00
7A95-	BD 3F 7A	LDA	\$7A3F,X
7A98-	91 D9	STA	(\$D9),Y
7A9A-	C8	INX	
7A9B-	BD 4B 7A	LDA	\$7A4B,X
7A9E-	91 D9	STA	(\$D9),Y
7AA0-	18	CLC	
7AA1-	A9 04	LDA	#\$04
7AA3-	65 DA	ADC	\$DA
7AA5-	85 DA	STA	\$DA
7AA7-	E8	INX	
7AA8-	E0 07	CPX	#\$07
7AAA-	D0 E7	BNE	\$7A93
7AAC-	38	SEC	
7AAD-	A5 DA	LDA	\$DA
7AAF-	E9 20	SBC	#\$20
7AB1-	85 DA	STA	\$DA
7AB3-	18	CLC	
7AB4-	A5 D9	LDA	\$D9
7AB6-	69 80	ADC	#\$80
7AB8-	85 D9	STA	\$D9
7ABA-	EA	NOP	
7ABB-	A9 00	LDA	#\$00
7ABD-	65 DA	ADC	\$DA
7ABF-	85 DA	STA	\$DA
7AC1-	A0 00	LDY	#\$00
7AC3-	ED 3F 7A	LDA	\$7A3F,X
7AC6-	91 D9	STA	(\$D9),Y
7AC8-	C8	INX	
7AC9-	BD 4B 7A	LDA	\$7A4B,X

7ACC-	91 D9	STA	(\$D9),Y	7B3D-	91 D9	STA	(\$D9),Y
7ACE-	18	CLC		7B3F-	18	CLC	
7ACF-	A5 DA	LDA	\$DA	7B40-	A5 DA	LDA	\$DA
7AD1-	69 04	ADC	#\$04	7B42-	69 04	ADC	#\$04
7AD3-	85 DA	STA	\$DA	7B44-	85 DA	STA	\$DA
7AD5-	E8	INX		7B46-	E8	INX	
7AD6-	E0 0C	CPX	#\$0C	7B47-	E0 0D	CPX	#\$0D
7AD8-	D0 E7	BNE	\$7AC1	7B49-	D0 E1	BNE	\$7B2C
7ADA-	60	RTS		7B4B-	38	SEC	
7ADB-	A2 00	LDX	#\$00	7B4C-	A5 DA	LDA	\$DA
7ADD-	BD 81 7A	LDA	\$7A81,X	7B4E-	E9 20	SBC	#\$20
7AE0-	A0 00	LDY	#\$00	7B50-	85 DA	STA	\$DA
7AE2-	91 D9	STA	(\$D9),Y	7B52-	18	CLC	
7AE4-	C8	INX		7B53-	A5 D9	LDA	\$D9
7AE5-	BD 89 7A	LDA	\$7A89,X	7B55-	69 80	ADC	#\$80
7AE8-	91 D9	STA	(\$D9),Y	7B57-	85 D9	STA	\$D9
7AEA-	18	CLC		7B59-	A0 00	LDY	#\$00
7AEB-	A9 04	LDA	#\$04	7B5B-	A9 00	LDA	#\$00
7AED-	65 DA	ADC	\$DA	7B5D-	65 DA	ADC	\$DA
7AEF-	85 DA	STA	\$DA	7B5F-	85 DA	STA	\$DA
7AF1-	E8	INX		7B61-	BD 57 7A	LDA	\$7A57,X
7AF2-	E0 08	CPX	#\$08	7B64-	91 D9	STA	(\$D9),Y
7AF4-	D0 E7	BNE	\$7ADD	7B66-	C8	INX	
7AF6-	60	RTS		7B67-	BD 65 7A	LDA	\$7A65,X
7AF7-	A2 00	LDX	#\$00	7B6A-	91 D9	STA	(\$D9),Y
7AF9-	A0 00	LDY	#\$00	7B6C-	C8	INX	
7AFB-	BD 57 7A	LDA	\$7A57,X	7B6D-	BD 73 7A	LDA	\$7A73,X
7AFE-	91 D9	STA	(\$D9),Y	7B70-	91 D9	STA	(\$D9),Y
7B00-	C8	INX		7B72-	60	RTS	
7B01-	BD 65 7A	LDA	\$7A65,X	7B73-	BB	???	
7B04-	91 D9	STA	(\$D9),Y	7B74-	BB	???	
7B06-	C8	INX		7B75-	BB	???	
7B07-	BD 73 7A	LDA	\$7A73,X	7B76-	BB	???	
7B0A-	91 D9	STA	(\$D9),Y	7B77-	BB	???	
7B0C-	18	CLC		7B78-	BB	???	
7B0D-	A5 DA	LDA	\$DA	7B79-	BB	???	
7B0F-	69 04	ADC	#\$04	7B7A-	BB	???	
7B11-	85 DA	STA	\$DA	7B7B-	3B	???	
7B13-	E8	INX		7B7C-	3B	???	
7B14-	E0 05	CPX	#\$05	7B7D-	3B	???	
7B16-	D0 E1	BNE	\$7AF9	7B7E-	3B	???	
7B18-	38	SEC		7B7F-	3B	???	
7B19-	A5 DA	LDA	\$DA	7B80-	3B	???	
7B1B-	E9 20	SBC	#\$20	7B81-	3B	???	
7B1D-	85 DA	STA	\$DA	7B82-	3B	???	
7B1F-	18	CLC		7B83-	BB	???	
7B20-	A5 D9	LDA	\$D9	7B84-	BB	???	
7B22-	69 80	ADC	#\$80	7B85-	BB	???	
7B24-	85 D9	STA	\$D9	7B86-	BB	???	
7B26-	A9 00	LDA	#\$00	7B87-	BB	???	
7B28-	65 DA	ADC	\$DA	7B88-	BB	???	
7B2A-	85 DA	STA	\$DA	7B89-	BB	???	
7B2C-	A0 00	LDY	#\$00	7B8A-	BB	???	
7B2E-	BD 57 7A	LDA	\$7A57,X	7B8B-	3B	???	
7B31-	91 D9	STA	(\$D9),Y	7B8C-	3B	???	
7B33-	C8	INX		7B8D-	3B	???	
7B34-	BD 65 7A	LDA	\$7A65,X	7B8E-	3E	???	
7B37-	91 D9	STA	(\$D9),Y	7B8F-	3B	???	
7B39-	C8	INX		7B90-	3B	???	
7B3A-	BD 73 7A	LDA	\$7A73,X	7B91-	3B	???	

7B92-	3B	???							
7B93-	BB	???							
7B94-	BB	???							
7B95-	BB	???							
7B96-	BB	???							
7B97-	BB	???							
7B98-	BB	???							
7B99-	BB	???							
7B9A-	BB	???							
7B9B-	3B	???							
7B9C-	3B	???							
7B9D-	3B	???							
7B9E-	3B	???							
7B9F-	3B	???							
7BA0-	3B	???							
7BA1-	3B	???							
7BA2-	3B	???							
7BA3-	5F	???							
7BA4-	5B	???							
7BA5-	57	???							
7BA6-	53	???							
7BA7-	4F	???							
7BA8-	4B	???							
7BA9-	47	???							
7BAA-	43	???							
7BAB-	5F	???							
7BAC-	5B	???							
7BAD-	57	???							
7BAE-	53	???							
7BAF-	4F	???							
7BB0-	4B	???							
7BB1-	47	???							
7BB2-	43	???							
7BB3-	5E 5A 56	LSR		\$565A,X					
7BB6-	52	???							
7BB7-	4E 4A 46	LSR		\$464A					
7BBA-	42	???							
7BBB-	5E 5A 56	LSR		\$565A,X					
7BBE-	52	???							
7BBF-	4E 4A 46	LSR		\$464A					
7BC2-	42	???							
7BC3-	5D 59 55	EOR		\$5559,X					
7BC6-	51 4D	EOR		(\$4D),Y					
7BC8-	49 45	EOR		=\$45					
7BCA-	41 5D	EOR		(\$5D,X)					
7BCC-	59 55 51	EOR		\$5155,Y					
7BCF-	4D 49 45	EOR		\$4549					
7BD2-	41 C4	EOR		(\$C4,X)					
7BD4-	C4 C4	CPY		\$C4					
7BD6-	C4 C4	CPY		\$C4					
7BD8-	C4 C4	CPY		\$C4					
7BDA-	C4 44	CPY		\$44					
7BDC-	44	???							
7BDD-	44	???							
7BDE-	44	???							
7BDF-	44	???							
7BEO-	44	???							
7BE1-	44	???							
7BE2-	44	???							
7BE3-	C4 C4	CPY		\$C4					
7BE5-	C4 C4	CPY		\$C4					
7BE7-	C4 C4	CPY		\$C4					
7BE9-	C4 C4	CPY		\$C4					
7BEB-	44	???							
7BEC-	44	???							
7BED-	44	???							
7BEE-	44	???							
7BEF-	44	???							
7BF0-	44	???							
7BF1-	44	???							
7BF2-	44	???							
7BF3-	C4 C4	CPY		\$C4					
7BF5-	C4 C4	CPY		\$C4					
7BF7-	C4 C4	CPY		\$C4					
7BF9-	C4 C4	CPY		\$C4					
7BFB-	44	???							
7BFC-	44	???							
7BFD-	44	???							
7BFE-	44	???							
7BFF-	44	???							
7C00-	44	???							
7C01-	44	???							
7C02-	44	???							
7C03-	AE 68 70	LDX		\$7068					
7C06-	EO 0A	CPX		=\$0A					
7C08-	DO 1A	BNE		\$7C24					
7C0A-	AD B1 C0	LDA		\$C0B1					
7C0D-	C9 00	CMP		=\$00					
7C0F-	F0 F9	BEQ		\$7C0A					
7C11-	CD 61 70	CMP		\$7061					
7C14-	90 0D	BCC		\$7C23					
7C16-	A9 01	LDA		=\$01					
7C18-	8D C0 C0	STA		\$C0C0					
7C1B-	A9 00	LDA		=\$00					
7C1D-	8D C0 C0	STA		\$C0C0					
7C20-	20 20 20	JSR		\$2020					
7C23-	60	RTS							
7C24-	EO 14	CPX		=\$14					
7C26-	DO 1A	BNE		\$7C42					
7C28-	AD B1 C0	LDA		\$C0B1					
7C2B-	C9 00	CMP		=\$00					
7C2D-	DO F9	BNE		\$7C28					
7C2F-	CD 63 70	CMP		\$7063					
7C32-	90 0D	BCC		\$7C41					
7C34-	A9 02	LDA		=\$02					
7C36-	8D C0 C0	STA		\$C0C0					
7C39-	A9 00	LDA		=\$00					
7C3B-	8D C0 C0	STA		\$C0C0					
7C3E-	20 20 20	JSR		\$2020					
7C41-	60	RTS							
7C42-	EO 1E	CPX		=\$1E					
7C44-	DO 19	BNE		\$7C5F					
7C46-	AD B1 C0	LDA		\$C0B1					
7C49-	C9 00	CMP		=\$00					
7C4B-	F0 F9	BEQ		\$7C46					
7C4D-	CD 65 70	CMP		\$7065					
7C50-	90 0D	BCC		\$7C5F					
7C52-	A9 03	LDA		=\$03					
7C54-	8D C0 C0	STA		\$C0C0					
7C57-	A9 00	LDA		=\$00					

7C59-	8D C0 C0	STA	\$C0C0	7CDE-	85 DA	STA	\$DA
7C5C-	20 20 20	JSR	\$2020	7CE0-	20 98 7A	JSR	\$7A98
7C5F-	60	RTS		7CE3-	E8	INX	
7C60-	AE 68 C0	LDX	\$C066	7CE4-	E0 0A	CFX	=\$0A
7C63-	E0 0A	CPX	=\$0A	7CE6-	D0 ED	ENE	\$7CD5
7C65-	D0 13	BNE	\$7C7A	7CE8-	60	RTS	
7C67-	AD B1 C0	LDA	\$C0B1	7CE9-	01 01	ORA	(\$01,X)
7C6A-	C9 00	CMP	=\$00	7CEB-	01 01	ORA	(\$01,X)
7C6C-	F0 F9	BEQ	\$7C67	7CED-	01 01	ORA	(\$01,X)
7C6E-	CD 62 70	CMP	\$7062	7CEF-	01 01	ORA	(\$01,X)
7C71-	B0 06	BCS	\$7C79	7CF1-	01 01	ORA	(\$01,X)
7C73-	20 16 7C	JSR	\$7C16	7CF3-	01 01	ORA	(\$01,X)
7C76-	20 20 20	JSR	\$2020	7CF5-	01 01	ORA	(\$01,X)
7C79-	60	RTS		7CF7-	01 01	ORA	(\$01,X)
7C7A-	E0 14	CPX	=\$14	7CF9-	01 01	ORA	(\$01,X)
7C7C-	D0 13	BNE	\$7C91	7CFB-	01 01	ORA	(\$01,X)
7C7E-	AD B1 C0	LDA	\$C0B1	7CFD-	01 01	ORA	(\$01,X)
7C81-	C9 00	CMP	=\$00	7CFF-	01 01	ORA	(\$01,X)
7C83-	F0 F9	BEQ	\$7C7E	7D01-	01 01	ORA	(\$01,X)
7C85-	CD 64 70	CMP	\$7064	7D03-	00	BRK	
7C88-	B0 06	BCS	\$7C90	7D04-	A2 00	LDX	=\$00
7C8A-	20 34 7C	JSR	\$7C34	7D06-	BD 81 7A	LDA	\$7A81,X
7C8D-	20 20 20	JSR	\$2020	7D09-	A0 00	LDY	=\$00
7C90-	60	RTS		7D0B-	91 D9	STA	(\$D9),Y
7C91-	E0 1E	CPX	=\$1E	7D0D-	C8	INX	
7C93-	D0 12	BNE	\$7CA7	7D0E-	BD 89 7A	LDA	\$7A89,X
7C95-	AD B1 C0	LDA	\$C0B1	7D11-	91 D9	STA	(\$D9),Y
7C98-	C9 00	CMP	=\$00	7D13-	18	CLC	
7C9A-	F0 F9	BEQ	\$7C95	7D14-	A5 DA	LDA	\$DA
7C9C-	CD 65 70	CMP	\$7065	7D16-	69 04	ADC	=\$04
7C9F-	B0 06	BCS	\$7CA7	7D18-	85 DA	STA	\$DA
7CA1-	20 52 7C	JSR	\$7C52	7D1A-	E8	INX	
7CA4-	20 20 20	JSR	\$2020	7D1B-	E0 07	CPX	=\$07
7CA7-	60	RTS		7D1D-	D0 E7	BNE	\$7D06
7CA8-	A2 00	LDX	=\$00	7D1F-	38	SEC	
7CAA-	20 23 77	JSR	\$7723	7D20-	A5 DA	LDA	\$DA
7CAD-	A9 83	LDA	=\$83	7D22-	E9 20	SBC	=\$20
7CAF-	85 D9	STA	\$D9	7D24-	85 DA	STA	\$DA
7CB1-	A9 46	LDA	=\$46	7D26-	18	CLC	
7CB3-	85 DA	STA	\$DA	7D27-	A5 D9	LDA	\$D9
7CB5-	20 98 7A	JSR	\$7A98	7D29-	69 80	ADC	=\$80
7CB8-	E8	INX		7D2B-	85 D9	STA	\$D9
7CB9-	E0 0A	CPX	=\$0A	7D2D-	BD 81 7A	LDA	\$7A81,X
7CBB-	D0 ED	BNE	\$7CAA	7D30-	A0 00	LDY	=\$00
7CBD-	60	RTS		7D32-	91 D9	STA	(\$D9),Y
7CBE-	A2 00	LDX	=\$00	7D34-	ED 89 7A	LDA	\$7A89,X
7CC0-	20 54 77	JSR	\$7754	7D37-	C8	INX	
7CC3-	A9 AB	LDA	=\$AB	7D38-	91 D9	STA	(\$D9),Y
7CC5-	85 D9	STA	\$D9	7D3A-	60	RTS	
7CC7-	A9 45	LDA	=\$45	7D3B-	A9 01	LDA	=\$01
7CC9-	85 DA	STA	\$DA	7D3D-	8D EA 7C	STA	\$7CEA
7CCB-	20 98 7A	JSR	\$7A98	7D40-	AD 69 70	LDA	\$7069
7CCE-	E8	INX		7D43-	C9 0A	CMP	=\$0A
7CCF-	E0 0A	CPX	=\$0A	7D45-	F0 03	BEQ	\$7D4A
7CD1-	D0 ED	BNE	\$7CC0	7D47-	4C 18 7E	JMP	\$7E18
7CD3-	A2 00	LDX	=\$00	7D4A-	AD 6F 70	LDA	\$7068
7CD5-	20 85 77	JSR	\$7785	7D4D-	C9 0A	CMP	=\$0A
7CD8-	A9 D3	LDA	=\$D3	7D4F-	D0 35	ENE	\$7D86
7CDA-	85 D9	STA	\$D9	7D51-	20 4B 79	JSR	\$794B
7CDC-	A5 44	LDA	\$44	7D54-	20 6A 7E	JSR	\$786A

7D57-	20 B6 77	JSR	\$77B6	7DE1-	85 DA	STA	SDA
7D5A-	A9 3F	LDA	=\$3F	7DE3-	20 DB 7A	JSR	\$7ADB
7D5C-	85 D9	STA	\$D9	7DE6-	20 A7 7F	JSR	\$7FA7
7D5E-	A9 44	LDA	=\$44	7DE9-	A9 06	LDA	=\$06
7D60-	85 DA	STA	SDA	7DEB-	8D 15 7B	STA	\$7B15
7D62-	20 04 7D	JSR	\$7D04	7DEE-	A9 0E	LDA	=\$0E
7D65-	A9 13	LDA	=\$13	7DF0-	8D 48 7B	STA	\$7B48
7D67-	85 D9	STA	\$D9	7DF3-	A9 5B	LDA	=\$5B
7D69-	A9 45	LDA	=\$45	7DF5-	85 D9	STA	\$D9
7D6B-	85 DA	STA	SDA	7DF7-	A9 4B	LDA	=\$4B
7D6D-	20 91 7A	JSR	\$7A91	7DF9-	85 DA	STA	SDA
7D70-	A9 33	LDA	=\$33	7DFB-	20 17 80	JSR	\$8017
7D72-	85 D9	STA	\$D9	7DFE-	EE EC 7C	INC	\$7CEC
7D74-	A9 4D	LDA	=\$4D	7E01-	AD EC 7C	LDA	\$7CEC
7D76-	85 DA	STA	SDA	7E04-	C9 FF	CMP	=\$FF
7D78-	20 F7 7A	JSR	\$7AF7	7E06-	D0 C0	BNE	\$7DC8
7D7B-	EE EA 7C	INC	\$7CEA	7E08-	A9 05	LDA	=\$05
7D7E-	AD EA 7C	LDA	\$7CEA	7E0A-	8D 15 7B	STA	\$7B15
7D81-	C9 FF	CMP	=\$FF	7E0D-	A9 0D	LDA	=\$0D
7D83-	D0 CC	BNE	\$7D51	7E0F-	8D 48 7B	STA	\$7B48
7D85-	60	RTS		7E12-	A9 01	LDA	=\$01
7D86-	C9 14	CMP	=\$14	7E14-	8D EC 7C	STA	\$7CEC
7D88-	D0 3A	BNE	\$7DC4	7E17-	60	RTS	
7D8A-	20 29 79	JSR	\$7929	7E18-	C9 14	CMP	=\$14
7D8D-	20 9B 78	JSR	\$789B	7E1A-	D0 FB	BNE	\$7E17
7D90-	20 F3 77	JSR	\$77F3	7E1C-	AD 68 70	LDA	\$7068
7D93-	A9 3D	LDA	=\$3D	7E1F-	C9 0A	CMP	=\$0A
7D95-	85 D9	STA	\$D9	7E21-	D0 3A	BNE	\$7E5D
7D97-	A9 44	LDA	=\$44	7E23-	20 B1 79	JSR	\$79B1
7D99-	85 DA	STA	SDA	7E26-	20 6A 78	JSR	\$786A
7D9B-	20 04 7D	JSR	\$7D04	7E29-	20 B6 77	JSR	\$77B6
7D9E-	A9 13	LDA	=\$13	7E2C-	A9 48	LDA	=\$48
7DA0-	85 D9	STA	\$D9	7E2E-	85 D9	STA	\$D9
7DA2-	A9 46	LDA	=\$46	7E30-	A9 40	LDA	=\$40
7DA4-	85 DA	STA	SDA	7E32-	85 DA	STA	SDA
7DA6-	20 91 7A	JSR	\$7A91	7E34-	20 DB 7A	JSR	\$7ADB
7DA9-	A9 5B	LDA	=\$5B	7E37-	A9 13	LDA	=\$13
7DAB-	85 D9	STA	\$D9	7E39-	85 D9	STA	\$D9
7DAD-	A9 4C	LDA	=\$4C	7E3B-	A9 45	LDA	=\$45
7DAF-	85 DA	STA	SDA	7E3D-	85 DA	STA	SDA
7DB1-	20 F7 7A	JSR	\$7AF7	7E3F-	20 91 7A	JSR	\$7A91
7DB4-	EE EB 7C	INC	\$7CEB	7E42-	A9 33	LDA	=\$33
7DB7-	AD EB 7C	LDA	\$7CEB	7E44-	85 D9	STA	\$D9
7DBA-	C9 FF	CMP	=\$FF	7E46-	A9 4D	LDA	=\$4D
7DBC-	D0 CC	BNE	\$7D8A	7E48-	85 DA	STA	SDA
7DBE-	A9 01	LDA	=\$01	7E4A-	20 F7 7A	JSR	\$7AF7
7DC0-	8D EB 7C	STA	\$7CEB	7E4D-	EE ED 7C	INC	\$7CED
7DC3-	60	RTS		7E50-	AD ED 7C	LDA	\$7CED
7DC4-	C9 1E	CMP	=\$1E	7E53-	C9 FF	CMP	=\$FF
7DC6-	D0 FB	BNE	\$7DC3	7E55-	D0 CC	BNE	\$7E23
7DC8-	20 04 79	JSR	\$7904	7E57-	A9 01	LDA	=\$01
7DCB-	A9 07	LDA	=\$07	7E59-	8D ED 7C	STA	\$7CED
7DCD-	8D 91 43	STA	\$4391	7E5C-	60	RTS	
7DD0-	A5 70	LDA	\$70	7E5D-	C9 14	CMP	=\$14
7DD2-	8D 92 43	STA	\$4392	7E5F-	D0 3C	BNE	\$7E9D
7DD5-	20 CC 78	JSR	\$78CC	7E61-	A2 00	LDX	=\$00
7DD8-	20 30 78	JSR	\$7830	7E63-	20 8F 79	JSR	\$798F
7DDB-	A9 3B	LDA	=\$3B	7E66-	20 9B 78	JSR	\$789B
7DDD-	85 D9	STA	\$D9	7E69-	20 F3 77	JSR	\$77F3
7DDF-	A9 40	LDA	=\$40	7E6C-	A9 46	LDA	=\$46

7E6E-	85 D9	STA	\$D9	7EF9-	A9 01	LDA	=\$01
7E70-	A9 40	LDA	=\$40	7EFB-	8D C0 C0	STA	\$C0C0
7E72-	85 DA	STA	\$DA	7EFE-	A9 02	LDA	=\$02
7E74-	20 DB 7A	JSR	\$7ADB	7F00-	8D C0 C0	STA	\$C0C0
7E77-	A9 13	LDA	=\$13	7F03-	A9 03	LDA	=\$03
7E79-	85 D9	STA	\$D9	7F05-	8D C0 C0	STA	\$C0C0
7E7B-	A9 46	LDA	=\$46	7F08-	AD B1 C0	LDA	\$C0B1
7E7D-	85 DA	STA	\$DA	7F0B-	CD 62 70	CMP	\$7062
7E7F-	20 91 7A	JSR	\$7A91	7F0E-	B0 0A	ECS	\$7F1A
7E82-	A9 5B	LDA	=\$5B	7F10-	A9 01	LDA	=\$01
7E84-	85 D9	STA	\$D9	7F12-	8D C0 C0	STA	\$C0C0
7E86-	A9 4C	LDA	=\$4C	7F15-	18	CLC	
7E88-	85 DA	STA	\$DA	7F16-	65 D9	ADC	\$D9
7E8A-	20 F7 7A	JSR	\$7AF7	7F18-	85 D9	STA	\$D9
7E8D-	EE EE 7C	INC	\$7CEE	7F1A-	CD 61 70	CMP	\$7061
7E90-	AD EE 7C	LDA	\$7CEE	7F1D-	90 05	BCC	\$7F24
7E93-	C9 FF	CMP	=\$FF	7F1F-	A9 01	LDA	=\$01
7E95-	D0 CC	BNE	\$7E63	7F21-	8D C0 C0	STA	\$C0C0
7E97-	A9 01	LDA	=\$01	7F24-	CD 63 70	CMP	\$7063
7E99-	8D EE 7C	STA	\$7CEE	7F27-	B0 0C	BCS	\$7F35
7E9C-	60	RTS		7F29-	A9 02	LDA	=\$02
7E9D-	C9 1E	CMP	=\$1E	7F2B-	8D C0 C0	STA	\$C0C0
7E9F-	D0 4F	BNE	\$7EF0	7F2E-	18	CLC	
7EA1-	20 6D 79	JSR	\$796D	7F2F-	A9 01	LDA	=\$01
7EA4-	20 CC 78	JSR	\$78CC	7F31-	65 D9	ADC	\$D9
7EA7-	A9 07	LDA	=\$07	7F33-	85 D9	STA	\$D9
7EA9-	8D 91 43	STA	\$4391	7F35-	CD 64 70	CMP	\$7064
7EAC-	A9 70	LDA	=\$70	7F38-	90 05	BCC	\$7F3F
7EAE-	8D 92 43	STA	\$4392	7F3A-	A9 02	LDA	=\$02
7EB1-	20 30 72	JSR	\$7830	7F3C-	8D C0 C0	STA	\$C0C0
7EB4-	A9 44	LDA	=\$44	7F3F-	CD 65 70	CMP	\$7065
7EB6-	85 D9	STA	\$D9	7F42-	B0 0C	BCS	\$7F50
7EB8-	A9 40	LDA	=\$40	7F44-	A5 03	LDA	\$03
7EBA-	85 DA	STA	\$DA	7F46-	8D C0 C0	STA	\$C0C0
7EBC-	20 DB 7A	JSR	\$7ADB	7F49-	18	CLC	
7EBF-	20 A7 7F	JSR	\$7FA7	7F4A-	A9 01	LDA	=\$01
7EC2-	A9 06	LDA	=\$06	7F4C-	65 D9	ADC	\$D9
7EC4-	8D 15 7B	STA	\$7B15	7F4E-	85 D9	STA	\$D9
7EC7-	A9 0E	LDA	=\$0E	7F50-	CD 66 70	CMP	\$7066
7EC9-	8D 48 7B	STA	\$7B48	7F53-	90 0B	ECC	\$7F60
7ECC-	A9 5B	LDA	=\$5B	7F55-	A5 03	LDA	\$03
7ECE-	85 D9	STA	\$D9	7F57-	8D C0 C0	STA	\$C0C0
7ED0-	A9 4B	LDA	=\$4B	7F5A-	A6 D9	LDX	\$D9
7ED2-	85 DA	STA	\$DA	7F5C-	E0 03	CPX	=\$03
7ED4-	20 17 80	JSR	\$8017	7F5E-	D0 A8	ENE	\$7F08
7ED7-	EE EF 7C	INC	\$7CEF	7F60-	60	RTS	
7EDA-	AD EF 7C	LDA	\$7CEF	7F61-	A2 00	LDX	=\$00
7EDD-	C9 FF	CMP	=\$FF	7F63-	AD 68 70	LDA	\$7068
7EDF-	D0 BA	BNE	\$7E9B	7F66-	DD 9A 76	CMP	\$769A,X
7EE1-	A9 01	LDA	=\$01	7F69-	F0 06	BEQ	\$7F71
7EE3-	8D EF 7C	STA	\$7CEF	7F6B-	E8	INX	
7EE6-	A9 05	LDA	=\$05	7F6C-	E0 03	CPX	=\$03
7EE8-	8D 15 7B	STA	\$7B15	7F6E-	D0 F3	BNE	\$7F63
7EEB-	A9 0D	LDA	=\$0D	7F70-	60	RTS	
7EED-	8D 48 7B	STA	\$7B48	7F71-	E0 01	CPX	=\$01
7EF0-	60	RTS		7F73-	D0 0E	BNE	\$7F83
7EF1-	00	BRK		7F75-	A2 00	LDX	=\$00
7EF2-	A9 00	LDA	=\$00	7F77-	BD 9D 76	LDA	\$769D,X
7EF4-	85 D9	STA	\$D9	7F7A-	8D C0 C0	STA	\$C0C0
7EF6-	8D C0 C0	STA	\$C0C0	7F7D-	E8	INX	

7604-	AE 69 70	LDX	\$7069
7607-	EO 0A	CPX	=\$0A
7609-	DO 34	BNE	\$763F
760B-	A2 00	LDX	=\$00
760D-	AD 01 76	LDA	\$7601
7610-	C9 00	CMP	=\$00
7612-	90 F9	BCC	\$760D
7614-	DD 00 70	CMP	\$7009,X
7617-	B0 06	BCS	\$761F
7619-	E8	INX	
761A-	EO 30	CPX	=\$30
761C-	DO EF	BNE	\$760D
761E-	CA	DEX	
761F-	8E 6F 70	STX	\$706F
7622-	AE 70 70	LDX	\$7070
7625-	20 B9 76	JSR	\$76B9
7628-	AE 6F 70	LDX	\$706F
762B-	20 D2 76	JSR	\$76D2
762E-	AD 6F 70	LDA	\$706F
7631-	8D 70 70	STA	\$7070
7634-	60	RTS	
7635-	70 90	BVS	\$75C7
7637-	B8	CLV	
7638-	20 B8 75	JSR	\$75B8
763B-	60	RTS	
763C-	4C F7 75	JMP	\$75F7
763F-	AE 69 70	LDX	\$7069
7642-	EO 14	CPX	=\$14
7644-	DO 30	BNE	\$7676
7646-	A2 00	LDX	=\$00
7648-	AD 01 76	LDA	\$7601
764B-	C9 00	CMP	=\$00
764D-	90 F9	BCC	\$7648
764F-	DD 31 70	CMP	\$7031,X
7652-	B0 06	BCS	\$765A
7654-	E8	INX	
7655-	EO 30	CPX	=\$30
7657-	DO EF	BNE	\$7648
7659-	CA	DEX	
765A-	8E 6F 70	STX	\$706F
765D-	AE 70 70	LDX	\$7070
7660-	20 EB 76	JSR	\$76EB
7663-	AE 6F 70	LDX	\$706F
7666-	20 04 77	JSR	\$7704
7669-	AD 6F 70	LDA	\$706F
766C-	8D 70 70	STA	\$7070
766F-	60	RTS	
7670-	70 90	BVS	\$7602
7672-	04	???	
7673-	20 B8 75	JSR	\$75B8
7676-	60	RTS	
7677-	4C F0 75	JMP	\$75F0
767A-	AE 68 70	LDX	\$706E
767D-	EO 0A	CPX	=\$0A
767F-	DO 10	BNE	\$7691
7681-	A9 01	LDA	=\$01
7683-	8D C0 C0	STA	\$C0C0

7F7E-	E0 03	CPX	#\$03	800C-	A9 79	LDA	#\$79
7F80-	D0 F5	BNE	\$7F77	800E-	8D 92 43	STA	\$4392
7F82-	60	RTS		8011-	A9 7F	LDA	#\$7F
7F83-	E0 02	CPX	#\$02	8013-	8D 93 43	STA	\$4393
7F85-	D0 0E	BNE	\$7F95	8016-	60	RTS	
7F87-	A2 00	LDX	#\$00	8017-	A9 60	LDA	#\$60
7F89-	8D A0 76	LDA	\$76A0,3	8019-	8D 4B 7B	STA	\$7B4B
7F8C-	8D C0 C0	STA	\$C0C0	801C-	20 F7 7A	JSR	\$7AF7
7F8F-	E8	INX		801F-	A9 38	LDA	#\$38
7F90-	E0 03	CPX	#\$03	8021-	8D 4B 7B	STA	\$7B4B
7F92-	D0 F5	BNE	\$7F89	8024-	60	RTS	
7F94-	60	RTS		8025-	00	BRK	
7F95-	E0 03	CPX	#\$03	8026-	00	BRK	
7F97-	D0 0D	BNE	\$7FA6	8027-	00	BRK	
7F99-	A2 00	LDX	#\$00	8028-	00	BRK	
7F9B-	8D A3 76	LDA	\$76A3,3	8029-	00	BRK	
7F9E-	8D C0 C0	STA	\$C0C0	802A-	00	BRK	
7FA1-	E8	INX		802B-	00	BRK	
7FA2-	E0 03	CPX	#\$03	802C-	00	BRK	
7FA4-	D0 F5	BNE	\$7F9B	802D-	00	BRK	
7FA6-	60	RTS		802E-	00	BRK	
7FA7-	A9 70	LDA	#\$70	802F-	00	BRK	
7FA9-	8D 11 43	STA	\$4311	8030-	AD 68 70	LDA	\$7068
7FAC-	8D 11 47	STA	\$4711	8033-	C9 0A	CMP	#\$0A
7FAF-	A9 40	LDA	#\$40	8035-	D0 5F	BNE	\$8096
7FB1-	8D 11 4B	STA	\$4B11	8037-	A0 00	LDY	#\$00
7FB4-	8D 11 4F	STA	\$4F11	8039-	20 23 77	JSR	\$7723
7FB7-	A9 07	LDA	#\$07	803C-	A9 7E	LDA	#\$7E
7FB9-	8D 12 43	STA	\$4312	803E-	8D 83 46	STA	\$4683
7FBC-	8D 12 47	STA	\$4712	8041-	8D 83 4A	STA	\$4A83
7FBF-	A9 01	LDA	#\$01	8044-	A9 18	LDA	#\$18
7FC1-	8D 12 4B	STA	\$4B12	8046-	8D 83 4E	STA	\$4E83
7FC4-	8D 12 4F	STA	\$4F12	8049-	8D 83 52	STA	\$5283
7FC7-	A9 48	LDA	#\$48	804C-	A9 19	LDA	#\$19
7FC9-	8D 11 53	STA	\$5311	804E-	8D 83 56	STA	\$5683
7FCC-	8D 11 5F	STA	\$5F11	8051-	8D 03 43	STA	\$4303
7FCF-	A9 58	LDA	#\$58	8054-	8D 03 47	STA	\$4703
7FD1-	8D 11 57	STA	\$5711	8057-	A9 5B	LDA	#\$5B
7FD4-	A9 68	LDA	#\$68	8059-	8D 83 5A	STA	\$5A83
7FD6-	8D 11 5B	STA	\$5B11	805C-	A9 3D	LDA	#\$3D
7FD9-	A9 4F	LDA	#\$4F	805E-	8D 83 5E	STA	\$5E83
7FDB-	8D 91 43	STA	\$4391	8061-	A9 7F	LDA	#\$7F
7FDE-	A9 28	LDA	#\$28	8063-	8D 04 43	STA	\$4304
7FE0-	8D 91 47	STA	\$4791	8066-	A9 25	LDA	#\$25
7FE3-	A9 18	LDA	#\$18	8068-	8D 03 4B	STA	\$4B03
7FE5-	8D 91 4B	STA	\$4E91	806B-	A9 43	LDA	#\$43
7FE8-	A9 08	LDA	#\$08	806D-	8D 03 4F	STA	\$4F03
7FEA-	8D 91 4F	STA	\$4F91	8070-	A9 01	LDA	#\$01
7FED-	8D 92 4F	STA	\$4F92	8072-	8D 84 56	STA	\$5684
7FF0-	A9 09	LDA	#\$09	8075-	8D 84 5A	STA	\$5A84
7FF2-	8D 12 53	STA	\$5312	8078-	8D 84 5E	STA	\$5E84
7FF5-	8D 12 5F	STA	\$5F12	807B-	8D 04 47	STA	\$4704
7FF8-	A9 0D	LDA	#\$0D	807E-	8D 04 4B	STA	\$4B04
7FFA-	8D 12 57	STA	\$5712	8081-	8D 04 4F	STA	\$4F04
7FFD-	A9 0B	LDA	#\$0B	8084-	8D 03 53	STA	\$5303
7FFF-	8D 12 5B	STA	\$5B12	8087-	8D 04 53	STA	\$5304
8002-	A9 0A	LDA	#\$0A	808A-	EA	NOP	
8004-	8D 92 47	STA	\$4792	808B-	EA	NOP	
8007-	A9 0C	LDA	#\$0C	808C-	EA	NOP	
8009-	8D 92 4B	STA	\$4B92	808D-	EA	NOP	

808E-	EA	NOP	
808F-	EA	NOP	
8090-	C8	INY	
8091-	C0 FF	CPY	#\$FF
8093-	D0 A4	BNE	\$8039
8095-	60	RTS	
8096-	C9 14	CMP	#\$14
8098-	D0 5F	BNE	\$80F9
809A-	A0 00	LDY	=\$00
809C-	20 54 77	JSR	\$7754
809F-	A9 7E	LDA	#\$7E
80A1-	8D AB 45	STA	\$45AB
80A4-	8D AB 49	STA	\$49AB
80A7-	A9 18	LDA	#\$18
80A9-	8D AB 4D	STA	\$4DAB
80AC-	8D AB 51	STA	\$51AB
80AF-	A9 19	LDA	#\$19
80B1-	8D AB 55	STA	\$55AB
80B4-	8D 2B 42	STA	\$422B
80B7-	8D 2B 46	STA	\$462B
80BA-	A9 5B	LDA	#\$5B
80BC-	8D AB 59	STA	\$59AB
80BF-	A9 3D	LDA	#\$3D
80C1-	8D AB 5D	STA	\$5DAB
80C4-	A9 7F	LDA	#\$7F
80C6-	8D 2C 42	STA	\$422C
80C9-	A9 25	LDA	#\$25
80CB-	8D 2B 4A	STA	\$4A2B
80CE-	A9 43	LDA	#\$43
80D0-	8D 2B 4E	STA	\$4E2B
80D3-	A9 01	LDA	#\$01
80D5-	8D AC 55	STA	\$55AC
80D8-	8D AC 59	STA	\$59AC
80DB-	8D AC 5D	STA	\$5DAC
80DE-	8D 2C 46	STA	\$462C
80E1-	8D 2C 4A	STA	\$4A2C
80E4-	8D 2C 4E	STA	\$4E2C
80E7-	8D 2B 52	STA	\$522B
80EA-	8D 2C 52	STA	\$522C
80ED-	EA	NOP	
80EE-	EA	NOP	
80EF-	EA	NOP	
80F0-	EA	NOP	
80F1-	EA	NOP	
80F2-	EA	NOP	
80F3-	C8	INY	
80F4-	C0 FF	CPY	#\$FF
80F6-	D0 A4	BNE	\$809C
80F8-	60	RTS	
80F9-	C9 1E	CMP	#\$1E
80FB-	D0 FB	BNE	\$80F8
80FD-	A0 00	LDY	=\$00
80FF-	20 85 77	JSR	\$7785
8102-	A9 7E	LDA	#\$7E
8104-	8D D3 44	STA	\$44D3
8107-	8D D3 48	STA	\$48D3
810A-	A9 18	LDA	#\$18
810C-	8D D3 4C	STA	\$4CD3
810F-	8D D3 50	STA	\$50D3
8112-	A9 19	LDA	#\$19

8114-	8D D3 54	STA	\$54D3
8117-	8D 53 41	STA	\$4153
811A-	8D 53 45	STA	\$4553
811D-	A9 5B	LDA	#\$5B
811F-	8D D3 58	STA	\$58D3
8122-	A9 3D	LDA	#\$3D
8124-	8D D3 5C	STA	\$5CD3
8127-	A9 7F	LDA	#\$7F
8129-	8D 54 41	STA	\$4154
812C-	A9 25	LDA	#\$25
812E-	8D 53 49	STA	\$4953
8131-	A9 43	LDA	#\$43
8133-	8D 53 4D	STA	\$4D53
8136-	A9 01	LDA	#\$01
8138-	8D D4 54	STA	\$54D4
813B-	8D D4 58	STA	\$58D4
813E-	8D D4 5C	STA	\$5CD4
8141-	8D 54 45	STA	\$4554
8144-	8D 54 49	STA	\$4954
8147-	8D 54 4D	STA	\$4D54
814A-	8D 53 51	STA	\$5153
814D-	8D 54 51	STA	\$5154
8150-	EA	NOP	
8151-	EA	NOP	
8152-	EA	NOP	
8153-	EA	NOP	
8154-	EA	NOP	
8155-	EA	NOP	
8156-	C8	INY	
8157-	C0 FF	CPY	#\$FF
8159-	D0 A4	BNE	\$80FF
815B-	60	RTS	
815C-	AD 69 70	LDA	\$7069
815F-	C9 0A	CMP	#\$0A
8161-	D0 5F	BNE	\$81C2
8163-	A0 00	LDY	=\$00
8165-	20 09 7A	JSR	\$7A09
8168-	A9 7E	LDA	#\$7E
816A-	8D 70 46	STA	\$4670
816D-	8D 70 4A	STA	\$4A70
8170-	A9 18	LDA	#\$18
8172-	8D 70 4E	STA	\$4E70
8175-	8D 70 52	STA	\$5270
8178-	A9 19	LDA	#\$19
817A-	8D 70 56	STA	\$5670
817D-	8D F0 42	STA	\$42F0
8180-	8D F0 46	STA	\$46F0
8183-	A9 5B	LDA	#\$5B
8185-	8D 70 5A	STA	\$5A70
8188-	A9 3D	LDA	#\$3D
818A-	8D 70 5E	STA	\$5E70
818D-	A9 7F	LDA	#\$7F
818F-	8D F1 42	STA	\$42F1
8192-	A9 25	LDA	#\$25
8194-	8D F0 4A	STA	\$4AF0
8197-	A9 43	LDA	#\$43
8199-	8D F0 4E	STA	\$4EF0
819C-	A9 01	LDA	#\$01
819E-	8D 71 56	STA	\$5671
81A1-	8D 71 5A	STA	\$5A71

81A4-	8D 71 5E	STA	\$5E71
81A7-	8D F1 46	STA	\$46F1
81AA-	8D F1 4A	STA	\$4AF1
81AD-	8D F1 4E	STA	\$4EF1
81B0-	8D F0 52	STA	\$52F0
81B3-	8D F1 52	STA	\$52F1
81B6-	EA	NOP	
81B7-	EA	NOP	
81B8-	EA	NOP	
81B9-	EA	NOP	
81BA-	EA	NOP	
81BB-	EA	NOP	
81BC-	C8	INY	
81BD-	C0 FF	CPY	=\$FF
81BF-	D0 A4	BNE	\$8165
81C1-	60	RTS	
81C2-	C9 14	CMP	=\$14
81C4-	D0 5B	BNE	\$8221
81C6-	A0 00	LDY	=\$00
81C8-	20 D3 79	JSR	\$79D3
81CB-	A9 7E	LDA	=\$7E
81CD-	8D F0 44	STA	\$44F0
81D0-	8D F0 48	STA	\$48F0
81D3-	A9 18	LDA	=\$18
81D5-	8D F0 4C	STA	\$4CF0
81D8-	8D F0 50	STA	\$50F0
81DE-	A9 19	LDA	=\$19
81DD-	8D F0 54	STA	\$54F0
81E0-	8D 70 41	STA	\$4170
81E3-	8D 70 45	STA	\$4570
81E6-	A9 5B	LDA	=\$5B
81E8-	8D F0 58	STA	\$58F0
81EB-	A9 3D	LDA	=\$3D
81ED-	8D F0 5C	STA	\$5CF0
81F0-	A9 7F	LDA	=\$7F
81F2-	8D 71 41	STA	\$4171
81F5-	A9 25	LDA	=\$25
81F7-	8D 70 49	STA	\$4970
81FA-	A9 43	LDA	=\$43
81FC-	8D 70 4D	STA	\$4D70
81FF-	A9 01	LDA	=\$01
8201-	8D F1 58	STA	\$58F1
8204-	8D F1 5C	STA	\$5CF1
8207-	8D 71 45	STA	\$4571
820A-	8D 71 49	STA	\$4971
820D-	8D 71 4D	STA	\$4D71
8210-	8D 70 51	STA	\$5170
8213-	8D 71 51	STA	\$5171
8216-	EA	NOP	
8217-	EA	NOP	
8218-	EA	NOP	
8219-	EA	NOP	
821A-	EA	NOP	
821B-	EA	NOP	
821C-	C8	INY	
821D-	C0 FF	CPY	=\$FF
821F-	D0 A7	BNE	\$81C8
8221-	60	RTS	
8222-	00	BRK	
8223-	00	BRK	

Nuclide index

Nuclide and half-life	Type of decay	Particle energies and transition probabilities		Electromagnetic transitions		Products	Pages
		energy MeV	transition probability	photon energy MeV	photons emitted		
Americium-241 (433y)	α	5.387	1.6%	0.026	2.5%	low energy photon sources n-sources	12 40
		5.442	12.5%	0.033	0.1%		
		5.484	85.2%	0.043	0.1%		
		5.511	0.20%	0.0595	35.3%		
		5.543	0.34%	0.099	0.02%		
		others	low	0.103	0.02%		
				0.125	0.004%		
		others	low				
		Np L X-rays	~40%				
		(0.012-0.022)					
Barium-133 (10.8y)	e.c.	100%		0.053	2.2%	γ -sources	23
				0.080	2.6%		
				0.081	33.9%		
				0.161	0.7%		
				0.223	0.4%		
				0.276	7.1%		
				0.303	18.4%		
				0.356	62.2%		
				0.384	8.9%		
				Cs K X-rays	~120%		
		(0.030-0.036)					
Cadmium-109 (462d)	e.c.	100%		Ag K X-rays	67.7%	low energy photon sources	15
				(0.022-0.026)			
		via ^{109m}Ag (40s)		0.088	3.8%		
				Ag K X-ray	~34.5%		
				(0.022-0.026)			
Caesium-137 (30.17y)	β^-	0.512	94.6%			γ -sources	24
		1.174	5.4%				
		via ^{137m}Ba (2.6min):		0.662	85.1%		
				Ba K X-rays	~7%		
				(0.032-0.038)			
Californium-252 (2.65y)	α	5.974	0.3%	up to ~9MeV		spontaneous fission n-sources	42
		6.075	15%	(see below)			
		6.118	81.6%				
		others	low				
		s.f.	3.1%				
<p>γ-radiation associated with the α-transitions is of low intensity. The spontaneous fission events and the subsequent decay of fission products produce approximately 20 γ-rays per fission. This γ-radiation covers an energy range to ~9MeV. Each fission also produces on average ~4 fast neutrons.</p>							
Cobalt-57 (271.7d)	e.c.	100%		0.014	9.5%	low energy photon sources ^{57}Fe (^{67}Co) Mössbauer sources	16 45
				0.122	85.5%		
				0.136	10.8%		
				0.570	0.01%		
				0.692	0.16%		
				others	low		
				Fe K X-rays	~55%		
				(0.006-0.007)			
Cobalt-60 (5.27y)	β^-	0.318	99.9%	1.173	99.86%	γ -sources	28
		1.491	0.1%	1.333	99.98%		
				others	<0.01%		
Curium-244 (17.8y)	α	5.763	23.6%	0.043	0.02%	low energy photon sources	17
		5.806	76.4%	0.099	0.0013%		
		others	low	0.152	0.0014%		
				others	low		
				(up to ~0.8)			
				Pu L X-rays	~8%		
		(0.012-0.023)					



ประวัติผู้เขียน

นาย พิระพงษ์ เจริญศรี เกิดเมื่อวันที่ 29 พฤศจิกายน พ.ศ. 2504 ที่จังหวัด
อุบลราชธานี สำเร็จการศึกษาระดับปริญญาบัณฑิตสาขาวิชารัฐศาสตร์-ประยุกต์ จากมหาวิทยาลัย
เกษตรศาสตร์ เมื่อ พ.ศ. 2527 ได้เข้าศึกษาต่อในระดับปริญญาโทสาขานิติศาสตร์เทคโนโลยี เทคโนโลยี
โลยี จุฬาลงกรณ์มหาวิทยาลัย เมื่อ พ.ศ. 2529 ปัจจุบันเป็นวิศวกรฝ่ายวิจัยและพัฒนาบริษัท
สยามอิเล็กทรอนิกส์ จำกัด

ศูนย์วิทยพัชยากร
จุฬาลงกรณ์มหาวิทยาลัย