```
 100 Y2 = 2 + 1 / 16 / 12: REM The distance (in feet) the ball travled between the
1st and 2ud light beam
 110 Y3 = 5 + 3 / 16 / 12: REM The distance (in feet) the ball travledbetween the
2nd and 3rd light beam

 300  POKE  - 16296,0: REM Turn off AN0
 310  POKE  - 16294,0: REM Turn off AN1
 320  POKE  - 16292,0: REM Turn off AN2
 330  POKE  - 16290,0: REM Turn off AN3

 400  PRINT  CHR$ (4) + "PR#3": REM Make text small (80 colums)

 3320  PRINT "Press:  0)end  1)do the ball drop  2)clear"
 3330  PRINT "  3)calibrate how many computer ticks in each sec. "
 3340  PRINT "  4) enter computer ticks per sec. "
 3345  PRINT "  5) enter (y2) and (y3) ";: GET Z$: PRINT : PRINT
 3350  IF Z$ = "2" THEN  GOTO 300
 3360  IF Z$ = "0" THEN  CALL 976: END
 3370  IF Z$ = "3" THEN  GOTO 5000
 3380  IF Z$ = "1" THEN  GOTO 5000
 3390  IF Z$ = "4" THEN  GOTO 4000
 3395  IF Z$ = "5" THEN  GOTO 9000
 3400  GOTO 400

 4000  PRINT
 4010  PRINT "Computer ticks per sec (ks) = ";KS
 4020  INPUT "Enter new value for ks:";A$
 4025  IF A$ <  > "" THEN KS =  VAL (A$)
 4030  GOTO 400

 5000  PRINT "DOING THE BALL DROP OR CALIBRATE COMPUTER TICKS PER SEC."
 5002  IF Z$ = "3" THEN  INPUT "How many sec. between BTN press? ";L
 5003  IF Z$ = "3" THEN I% =  - 32767
 5004  IF Z$ = "1" THEN I% = 0
 5005 K1% = I%
 5010  IF  PEEK ( - 16287) < 128 THEN 5010
 5015  POKE  - 16295,0: REM Turn on AN0
 5020 I% = I% + 1
 5030  IF  PEEK ( - 16286) < 128 THEN  GOTO 5020
 5040 K2% = I%
 5045  POKE  - 16293,0: REM Turn on AN1
 5050 I% = I% + 1
 5060  IF  PEEK ( - 16285) < 128 THEN  GOTO 5050
 5070 K3% = I%
 5075  POKE  - 16291,0: REM Turn on AN2
 5999  IF Z$ = "1" THEN 7000

 6000  REM *** Calculating KS using K3% ***
 6030  PRINT "K1=";K1%;" K2=";K2%;" K3=";K3%;" "
 6050 KS = (K3% / 1 - K1% / 1) / L
 6060  PRINT "KS = ";KS
 6070  PRINT "***Please press a key to go on***";: GET A$
 6072  POKE  - 16296,0
 6075  POKE  - 16294,0
 6077  POKE  - 16292,0
 6080  POKE  - 16290,0
 6999  GOTO 8115
```

```
 7000  REM *** Ball Drop Calculations ***
 7010 Y1 = 0: REM The distance (in feet) the ball traveled after breaking the first
beam
 7040 T1 = 0.000: REM the time, in sec., when the ball breaks the 1st beam
 7050 T2 = K2% / KS: REM the time the ball breaks the 2nd beam
 7060 T3 = K3% / KS: REM the time the ball breaks the 3rd beam
 7070 G = 2 * ((Y3 / T3) - (Y2 / T2)) / (T3 - T2): REM accelleration of gravity
 7080 V0 = 0: REM The speed (ie.Velocity), in feet/second, of the ball when you let
go of the ball
 7090 V1 = Y2 / T2 - G * T2 / 2: REM The Velocity of the ball when it breaks the
1st beam
 7100 V2 = V1 + G * T2: REM Velocity of ball at 2nd beam
 7110 V3 = V1 + G * T3: REM Velocity of ball at 3rd beam
 7120 Y0 = 0 - (V1 * V1) / (2 * G): REM how high above 1st beam ball was held
 7130 YI = Y0 * 12: REM distance above 1st beam (in inches)
 7140 T0 = 0 -  SQR (2 * (0 - Y0) / G): REM time when person lets go of the ball

 8000  REM *** Print the Values ***
 8010  PRINT "G="; G; " feet per (sec * sec); gravitational constant"
 8030  PRINT "K1="; K1%; " K2="; K2%; " K3="; K3%; " tick counts"
 8060  PRINT "KS="; KS; " computer ticks per sec."
 8080  PRINT "T0="; T0; " the time (in sec) when the ball is let go"
 8082  PRINT "T1="; T1; " the time in sec when the ball breaks the 1st beam"
 8084  PRINT "T2="; T2; " the time when the ball breaks the 2nd beam"
 8086  PRINT "T3="; T3; " the time in sec the ball breaks the 3rd beam"
 8090  PRINT "V0="; V0; " feet / sec when ball is let go"
 8091  PRINT "V1="; V1; " feet / sec at 1st light beam"
 8092  PRINT "V2="; V2; " feet / sec at 2nd light beam"
 8093  PRINT "V3="; V3; " feet / sec at 3rd light beam"
 8094  PRINT "Y0="; Y0; " the dist. (in ft) the ball traveled before the 1st beam"
 8095  PRINT "YI="; YI; " The dist. in inches"
 8100  PRINT "Y1="; Y1; " Y2="; Y2; " Y3="; Y3; " Dist. (in ft.) to beams"
 8110  POKE  - 16296,0: POKE  - 16294,0: POKE  - 16292,0: POKE 16290,0
 8111  PRINT : PRINT "***Hit any key to go on***"; : GET A$
 8115  CALL  - 936: GOTO 3320

 9000  PRINT
 9005  PRINT "The distance (Y2) is "; Y2; "  (In Feet)"
 9010  INPUT "What do you want (Y2) to be?: "; A$
 9020  PRINT "The distance (Y3) is "; Y3; "  (In Feet)"
 9030  INPUT "What do you want (Y3) to be?: "; B$
 9040  IF A$ <  > "" THEN Y2 =  VAL (A$)
 9050  IF B$ <  > "" THEN Y3 =  VAL (B$)
 9060  GOTO 300

 9999  CALL 976: END
```