

Attachment 2. The Rocket program code was rearranged to change the loops into loops compatible with the HP Prime calculator, and eliminate the GOTO statements and Conditional IF GOTO statements highlighted in yellow.

The Rocket program code was also uncompressed, and variable names were replaced with descriptive names.

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10 PRINT TAB(30); "ROCKET"
20 PRINT TAB(15); "CREATIVE COMPUTING MORRISTOWN, NEW JERSEY"
30 PRINT
PRINT
PRINT
70 PRINT "LUNAR LANDING SIMULATION"
80 PRINT "-----"
PRINT
100 INPUT "DO YOU WANT INSTRUCTIONS (YES OR NO)"; A$
110 IF A$ = "NO" THEN 390
160 PRINT
200 PRINT "YOU ARE LANDING ON THE MOON AND AND HAVE TAKEN OVER MANUAL"
210 PRINT "CONTROL 1000 FEET ABOVE A GOOD LANDING SPOT. YOU HAVE A DOWN-"
220 PRINT "WARD VELOCITY OF 50 FEET/SEC. 150 UNITS OF FUEL REMAIN."
225 PRINT
230 PRINT "HERE ARE THE RULES THAT GOVERN YOUR APOLLO SPACE-CRAFT:"
PRINT
240 PRINT "(1) AFTER EACH SECOND THE HEIGHT, VELOCITY, AND REMAINING FUEL"
250 PRINT " WILL BE REPORTED VIA DIGBY YOUR ON-BOARD COMPUTER."
260 PRINT "(2) AFTER THE REPORT A '?' WILL APPEAR. ENTER THE NUMBER"
270 PRINT " OF UNITS OF FUEL YOU WISH TO BURN DURING THE NEXT"
280 PRINT " SECOND. EACH UNIT OF FUEL WILL SLOW YOUR DESCENT BY"
290 PRINT " 1 FOOT/SEC."
310 PRINT "(3) THE MAXIMUM THRUST OF YOUR ENGINE IS 30 FEET/SEC/SEC"
320 PRINT " OR 30 UNITS OF FUEL PER SECOND."
330 PRINT "(4) WHEN YOU CONTACT THE LUNAR SURFACE. YOUR DESCENT ENGINE"
340 PRINT " WILL AUTOMATICALLY SHUT DOWN AND YOU WILL BE GIVEN A"
350 PRINT " REPORT OF YOUR LANDING SPEED AND REMAINING FUEL."
360 PRINT "(5) IF YOU RUN OUT OF FUEL THE '?' WILL NO LONGER APPEAR"
370 PRINT " BUT YOUR SECOND BY SECOND REPORT WILL CONTINUE UNTIL"
380 PRINT " YOU CONTACT THE LUNAR SURFACE."
PRINT
390 PRINT "BEGINNING LANDING PROCEDURE....."
PRINT
400 PRINT "G O O D L U C K ! ! !"
420 PRINT
PRINT
430 PRINT "SEC FEET SPEED FUEL PLOT OF DISTANCE"
450 PRINT

455 Time = 0
Height = 1000
VelBeforeBurn = 50
Fuel = 150

WHILE FuelBurn > 0 DO
490 PRINT Time; TAB(6); Height; TAB(16); VelBeforeBurn; TAB(26); Fuel; TAB(35);
"DistPlot"; TAB (Height / 15); "*"
500 INPUT FuelBurn
510 IF FuelBurn < 0 THEN 650 650 FuelBurn = 0
520 IF FuelBurn > 30 THEN FuelBurn = 30
530 IF FuelBurn > Fuel THEN FuelBurn = Fuel
540 VelAfterBurn = VelBeforeBurn - FuelBurn + 5
560 Fuel = Fuel - FuelBurn
570 Height = Height - .5 * (VelBeforeBurn + VelAfterBurn)
580 IF Height <= 0 THEN 670
BREAK //because height <= 0, the program execution will skip over 2nd loop
END
590 Time = Time + 1
600 VelBeforeBurn = VelAfterBurn
610 IF Fuel > 0 THEN 490
END //WHILE FuelBurn > 0

```

Loop 2

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WHILE Height > 0 DO
  615 IF FuelBurn = 0 THEN 640
  620 PRINT "***** OUT OF FUEL *****"
  640 PRINT Time; TAB(4); Height; TAB(12); VelBeforeBurn; TAB(20); Fuel; TAB(29);
    "DistPlot"; TAB(Height / 12 + 29); "*"
  650 FuelBurn = 0
  660 GOTO 540

  // Note. Lines 540 through 600 are duplicates of the line in the first loop
  540 VelAfterBurn = VelBeforeBurn - FuelBurn + 5
  560 Fuel = Fuel - FuelBurn
  570 Height = Height - .5 * (VelBeforeBurn + VelAfterBurn)
  580 IF Height <= 0 THEN 670
    BREAK
  END
  590 Time = Time + 1
  600 VelBeforeBurn = VelAfterBurn
END //WHILE Height > 0

670 PRINT "***** CONTACT *****"
680 Height = Height + .5 * (VelAfterBurn + VelBeforeBurn)

690 IF FuelBurn = 5 THEN 720
  720 ActualTimeToContact = Height / VelBeforeBurn
ELSE
  700 ActualTimeToContact = (-VelBeforeBurn + SQR(VelBeforeBurn * VelBeforeBurn + Height
    * (10 - 2 * FuelBurn))) / (5 - FuelBurn)
  710 GOTO 730
END

730 VelAfterBurn = VelBeforeBurn + (5 - FuelBurn) * ActualTimeToContact
760 PRINT "TOUCHDOWN AT"; Time + ActualTimeToContact; "SECONDS."
770 PRINT "LANDING VELOCITY="; VelAfterBurn; "FEET/SEC."
780 PRINT Fuel; "UNITS OF FUEL REMAINING."

IF VelAfterBurn = 0 THEN
  790 IF VelAfterBurn <> 0 THEN 810
    800 PRINT "CONGRATULATIONS! A PERFECT LANDING!!"
    805 PRINT "YOUR LICENSE WILL BE RENEWED.....LATER."
  END

IF ABS(VelAfterBurn) > 2 THEN
  810 IF ABS(VelAfterBurn) < 2 THEN 840
    820 PRINT "***** SORRY, BUT YOU BLEW IT!!!"
    830 PRINT "APPROPRIATE CONDOLENCES WILL BE SENT TO YOUR NEXT OF KIN."
  END

840 PRINT
  PRINT
  PRINT
850 INPUT "ANOTHER MISSION"; A$
860 IF A$ = "YES" THEN 390
870 PRINT
  PRINT "CONTROL OUT."
  PRINT
999 END

```