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DECUS NO.	FOCAL8-81
TITLE	FOCAL LUNAR LANDING SIMULATION (APOLLO)
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SOURCE LANGUAGE	FOCAL

FOCAL LUNAR LANDING SIMULATION (APOLLO)

ABSTRACT

This program realistically simulates an Apollo moon landing using NASA figures. It begins with module at Ø seconds, 120 miles above the moon, carrying 16000 pounds of fuel, with a velocity of 2600 miles per hour. Upon radar checks of velocity, altitude, remaining fuel, and time each 10 seconds, you may decide upon fuel rate for next time interval. The object is to land safely on the moon.

RESTRICTIONS

You cannot retain FOCAL's extended functions (LOG, EXP, etc).

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*W
C-FOCAL,1969

01.04 T "CONTROL CALLING LUNAR MODULE. MANUAL CONTROL IS NECESSARY"!
01.06 T "YOU MAY RESET FUEL RATE K EACH 10 SECS TO 0 OR ANY VALUE"!
01.08 T "BETWEEN 8 & 200 LBS/SEC. YOU'VE 16000 LBS FUEL. ESTIMATED"!
01.11 T "FREE FALL IMPACT TIME-120 SECS. CAPSULE WEIGHT-32500 LBS"!
01.20 T "FIRST RADAR CHECK COMING UP"!!!;E
01.30 T "COMMENCE LANDING PROCEDURE"!"TIME,SECS    ALTITUDE,"
01.40 T "MILES+FEET    VELOCITY,MPH    FUEL,LBS    FUEL RATE"!
01.50 S L=0;S A=120;S V=1;S M=32500;S N=16500;S G=.001;S Z=1.8

02.10 T "    ",%3,L,"            ",FITR(A),"  ",%4,5280*(A-FITR(A))
02.20 T %6.02,"        ",3600*V,"      ",%6.01,M-N,"        K=";A K;S T=10
02.70 T %7.02;I (K)2.72;I (200-K)2.72;I (K-8)2.71,3.1,3.1
02.71 I (K-0)2.72,3.1,2.72
02.72 T "NOT POSSIBLE";F X=1,51;T "."
02.73 T "K=";A K;G 2.7

03.10 I ((M-N)-.001)4.1;I (T-.001)2.1;S S=T
03.40 I ((N+S*K)-M)3.5,3.5;S S=(M-N)/K
03.50 D 9;I (I)7.1,7.1;I (V)3.8,3.8;I (J)8.1
03.80 D 6;G 3.1

04.10 T "FUEL OUT AT",L," SECS"!
04.40 S S=(-V+FSQT(V*V+2*A*G))/G;S V=V+G*S;S L=L+S

05.10 T "ON THE MOON AT",L," SECS"!;S W=3600*V
05.20 T "IMPACT VELOCITY OF",W," M.P.H."!,"FUEL LEFT:"
05.30 T M-N," LBS."!;I (-W+1)5.5,5.5
05.40 T "PERFECT LANDING !-(LUCKY)"!;G 5.9
05.50 I (-W+10)5.6,5.6;T "GOOD LANDING-(COULD BE BETTER)"!;G 5.9
05.60 I (-W+25)5.7,5.7;T "CONGRATULATIONS ON A POOR LANDING"!;G 5.9
05.70 I (-W+60)5.8,5.8;T "CRAFT DAMAGE. GOOD LUCK"!;G 5.9
05.80 T "SORRY,BUT THERE WERE NO SURVIVORS-YOU BLEW IT!"!"IN "
05.81 T "FACT YOU BLASTED A NEW LUNAR CRATER",W*.277777," FT. DEEP"!
05.90 T !!!"TRY AGAIN?"!
05.92 A "(ANS. YES OR NO)"P;I (P-0NO)5.94,5.98
05.94 I (P-0YES)5.92,1.2,5.92
05.98 T "CONTROL OUT";Q

06.10 S L=L+S;S T=T-S;S M=M-S*K;S A=I;S V=J

07.10 I (S-.005)5.1;S S=2*A/(V+FSQT(V*V+2*A*(G-Z*K/M)))
07.30 D 9;D 6;G 7.1

08.10 S W=(1-M*G/(Z*K))/2;S S=M*V/(Z*K*(W+FSQT(W*W+V/Z)))+.05;D 9
08.30 I (I)7.1,7.1;D 6;I (-J)3.1,3.1;I (V)3.1,3.1,8.1

09.10 S Q=S*K/M;S J=V+G*S+Z*(-Q-Q+2/2-Q+3/3-Q+4/4-Q+5/5)
09.40 S I=A-G*S*S/2-V*S+Z*S*(Q/2+Q+2/6+Q+3/12+Q+4/20+Q+5/30)

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