Save time driving on the streets of London with this short program from David Lewis.

London by short cuts

The program presented here, *London*, prints out the shortest route between any two points in Greater London.

It is used in conjuction with the Geographers' Master Atlas of Greater London, which covers an area of more than 2,000 square miles bounded by Potters Bar, Grays, Coulsdon and Windsor.

The map references for the squares of origin and of destination are entered as an eight-digit code, *eg* 27K247J1 (Southgate to Heathrow Airport). Ignore page numbers, and if there is no index number after the letter in the map reference use zero.

You may also enter the description or address of origin and destination, which will then be printed out, or you may instead enter Return. London will print out the approximate distance in miles and kilometres between the two points. It will then print the map references for each square of the Atlas (including those for both points) through which you should pass when taking the shortest route.

It is then a relatively simple task to plan your car journey, using the Atlas. The effect is as if you had the pages of the Atlas pinned on the wall as a composite chart measuring some seven feet by eleven feet, for planning the straightest route with map pins and cotton.

If you have a cassette player in the car, it can sometimes save time over a long, unfamiliar journey to record the details of the route and play the tape as you go along.

PCN

Program notes

40-50 Switches control to the subroutine whose name has been assigned to the string variable 'Z'

70 Converts alphanumeric map reference to a number (allowing for non-use of 1 and 0 in Atlas)

90-120 For a series of diagonal 'steps' from origin to destination, calculate distance across (west-east) and down (north-south), *eg* one map square across and .75 map square down, converts resultant numbers to alphanumeric map references, and prints

140-260 Main program procedure

140 Input origin and destination addresses (on 24-column screen to facilitate formatting for microprinter)

150 Input both map references as eight (=4+4) characters

160-180 Converts origin and destination map references to numbers and assigns variables to them

190 Prints origin and destination addresses or place names (unless null strings were entered)

200 Calculates west-east and north-south distances in map squares between origin and destination, and anticipates 'negative' directions (south-north and east-west)

210-220 Uses Pythagoras' theorem to calculate true (diagonal) distance in length equivalent to map squares, converts to and prints miles and kilometres

230 Prints map reference of origin

240 Divides west-east and north-south distances into units of distinct lengths, so that there are the same number of units in each dimension, assigns unity to length of greater unit and the appropriate fraction to that of the lesser unit

250 Negatives values of step units for SN and EW directions.

260 Uses 90-120 subroutine to calculate and print each diagonal step, and feeds paper

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10 'COPYRIGHT (C) A.D. LEWIS 1983
20 GOTO140
30 '*SWITCH*
40 IFZ="ALPHANUM"GOTO70
50 IFZ="NUMERALPH"GOTO90
60 '*ALPHANUM*
70 ATLON$="ABCDEFGHJKLMNPQRSTUVWXYZ":LTR=INSTR(ATLON$,LTR$):NUM=LTR+24*INDEX:RET
URN
80 '*NUMERALPH*
90 FORK=1TOMORE:FLA!=FLA!+SLA!:LPRINTUSING"ÉÉ ";FLA!;:FLO!=FLO!+SLO!:NUM=FLO!
100 INDEX=(NUM-1)\24:NM24=NUM MOD24:LTR=NM24-24*(NM24=0)
110 IFINDEX=0THENINDEX$=""ELSEINDEX$=STR$(INDEX):INDEX$=MID$(INDEX$,2)
120 LTR$=MID$(ATLON$,LTR,1):LPRINTLTR$:INDEX$:NEXTK:RETURN
130 '*MAIN PROC*
140 TITLE"LONDON":WIDTH24,20:PRINT"Use MASTER ATLAS":PRINT"OF GREATER LONDON":PR
INT"From (address)":LINEINPUT"",FROM$:PRINT"To (address)":LINEINPUT"",TU$
150 DEFINTA-Y:DEFSTRZ:PRINT"29F240M2=EXAMPLE":PRINT"FROM  TO":INPUT"",R$:IFLEN(R
$)>8THEN150
160 FLA!=VAL(LEFT$(R$,2)):TLA=VAL(MID$(R$,5,2)):FLOL$=MID$(R$,3,1):TLOL$=MID$(R$
,7,1):FLOI=VAL(MID$(R$,4,1)):TLOI=VAL(RIGHT$(R$,1))
170 LTR$=FLOL$:INDEX=FLOI:Z="ALPHANUM":GOSUB40:FLO!=NUM
180 LTR$=TLOL$:INDEX=TLOI:Z="ALPHANUM":GOSUB40:TLO=NUM
190 LPRINT:IFFROM$+TU$>""THENLPRINT"From":LPRINTFROM$:LPRINT"to":LPRINTTU$:LPRIN
T
200 DLA=TLA-FLA!:DLO=TLO-FLO!:SDLA=SGN(DLA):SDLO=SGN(DLO):ADLA=ABS(DLA):ADLO=ABS
(DLO)
210 DIST2É=ADLA↑2+ADLO↑2:DIST!=SQR(DIST2É):DISTM=DIST!*.5329:DISTK=DIST!*.8576:I
FDISTM>1THENPLURAL$="s"
220 LPRINTDISTM;"mile"+PLURAL$,DISTK;"km"
230 LPRINT:MORE=1:Z="NUMERALPH":GOSUB40
240 MORE=ADLA:LESS=ADLO:SLA!=1:IFADLO>ADLA THENSWAPMORE,LESS:SLO!=1:SLA!=LESS/MO
RE ELSESLO!=LESS/MORE
250 SLA!=SLA!*SDLA:SLO!=SLO!*SDLO
260 Z="NUMERALPH":GOSUB40:FORJ=1TO4:LPRINT:NEXTJ:END
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NOTE THAT THE SYMBOL ↑ IN LINE 210 CORRESPONDS TO ^ ON THE HX20'S KEYBOARD