

Hunt the Wumpus on the HP-12C

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Someone had to put those 12 pentagons on the HP-12C! Back in 1972 "Hunt the Wumpus" was created by Gregory Yob (1945-2005), and *12CWumpus* uses the **same vertex numbering** as the original. Here the neighbours of each vertex are called R_1 , R_2 and R_3 . Once started you press *only* 1,2,3 & $\boxed{R/S}$ to play. Wumpus is symbolised here by "0", and you by "." & no "." in the display implies a loss<G>.

Initialisation: Put a seed in \boxed{i} , your starting room in \boxed{PV} and initialise $R_4 - R_6$ & \boxed{FV} as shown below. $\boxed{R/S} \rightarrow R_1.R_2R_3$. **Repeat:** i ($i=1,2,3$ *indirectly* choosing R_i), $\boxed{R/S} \rightarrow$ "0." (if Wumpus is *next door*), $R_1.R_2R_3$. "0.0000" signifies a win and "Error 0" a loss. **Restart after win:** just $\boxed{R/S}$, after **loss:** $\boxed{f} \boxed{f} \text{CLEAR} \boxed{PRGM} \boxed{R/S}$. Tunnel transits show 8 "running" displays and take 5 seconds. Each index $i=1-2-3$ corresponds to a *direction* with respect to a special twisty passage through the maze. $i=1$ =backward, $i=2$ =forward and $i=3$ =up/down. **Beware the "poles"**- rooms 1 and 20 - normally at the start there is a 5% chance of "meeting" Wumpus in one of them, and here there is an additional 10% chance of losing when visiting them! Wumpus can remotely activate polar trap doors as shown. Invalid moves *quickly*

52.5° N			Z=Wumpus→X=pit			52.5° S		
	01			X			20	
02	np	05	Y	pole	Y	16	sp	19
03	---	04	Z	----	Z	17	---	18

result in "Error 0" or "Error 6". Your position number x is *usually* between R_1 and R_2 (like the "." in $R_1.R_2R_3$) as $R_1=x-1$ (for $x>1$) and $R_2=x+1$ (for $x<20$). R_3 uses the

constants stored in R_4-R_6 & \boxed{FV} . Think of a dodecahedron circumscribed by the Earth with rooms 6-15 zigzagging $\pm 10.5^\circ$ around the equator, outlining the other 10 pentagons & enclosing regions as shown below. Straight tunnels joining the rooms would be about 2,825 miles long! The numbers in bold relate to the example.

Numbering of the 20 Dodecahedron Vertices										One-off Initialisation			
52.5 N	01	---	02	---	03	---	04	---	05	---	01	8.10121401	$\boxed{STO} \boxed{4}$
10.5 N	08	eu	10	as	12	pa	14	na	06	at	08	15.17011802	$\boxed{STO} \boxed{5}$
07	af	09	in	11	oc	13	pa	15	sa	07	10.5 S	19.03200406	$\boxed{STO} \boxed{6}$
17	---	18	---	19	---	20	---	16	---	17	52.5 S	20.07091113	\boxed{FV}

Example: .5284163 \boxed{i} 2 $\boxed{PV} \boxed{R/S} \rightarrow$ 1.03**10**. Jump to **10**: 3 $\boxed{R/S} \rightarrow$ 9.1102, 2 $\boxed{R/S} \rightarrow$ 10.12**19**, 3 $\boxed{R/S} \rightarrow$ "2.",**18**.2011. "2." means Wumpus snores ($Z \approx 2 < G >$) *nearby*. You are close! *Don't do:* 2 $\boxed{R/S}$ (room 20!) here else a Hollow Voice says "Error 0" as you fall<G>. *Instead:* 1 $\boxed{R/S} \rightarrow$ "0.", "0.", **17**.1909. **Now** the move is interpreted as a shot. 1 $\boxed{R/S} \rightarrow$ 0.0000 (instantly). Finished! Wumpus is shot to 5 points of a pentagon<G>. If you miss, having seen *two* "0.", you have a only a 10% chance of surviving the next move (try 3 $\boxed{EEX} \boxed{7} \boxed{CHS} \boxed{i}$ 1 $\boxed{PV} \boxed{R/S}$ and see if you can find him). With *one* "0." seen then Wumpus *moves* if missed, and bats shift you to his old position and you live only to hunt again. Replay: $\boxed{R/S} \rightarrow$ 16.1807, 2 $\boxed{R/S} \rightarrow$ 17.1909, 2 $\boxed{R/S} \rightarrow$ 18.2011, 3 $\boxed{R/S} \rightarrow$ "0.", "0.", 10.1219 - a 50:50 choice!

Keystrokes	Display	Keystrokes	Display	Keystrokes	Display
f P/R		STO ÷ 0	33-44 10 0	STO - 1	67-44 30 1
f CLEAR PRGM	00-	g x≤y	34-43 34	STO - 2	68-44 30 2
RCL PV	01-45 13	STO - 2	35-44 30 2	STO - 3	69-44 30 3
2	02- 2	EEX	36- 26	2	70- 2
0	03- 0	2	37- 2	RCL 1	71-45 1
RCL i	04-45 12	STO 3	38-44 3	RCL 2	72-45 2
9	05- 9	1/x	39- 22	X	73- 20
9	06- 9	RCL 0	40-45 0	PMT	74- 14
7	07- 7	g INTG	41-43 25	g √x	75-43 21
X	08- 20	g LSTx	42-43 36	g x≤y	76-43 34
g FRAC	09-43 24	g FRAC	43-43 24	g PSE	77-43 31
i	10- 12	1	44- 1	RCL 3	78-45 3
X	11- 20	0	45- 0	X	79- 20
1	12- 1	X	46- 20	g x=0	80-43 35
+	13- 40	g LSTx	47-43 36	g PSE	81-43 31
g INTG	14-43 25	x≥y	48- 34	f 4	82-42 4
PV	15- 13	y ^x	49- 21	RCL 0	83-45 0
-	16- 30	x≥y	50- 34	R/S	84- 31
RCL PV	17-45 13	4	51- 4	n	85- 11
+	18- 40	+	52- 40	RCL g CF _i	86-45,43 14
STO 2	19-44 2	n	53- 11	g x=0	87-43 35
1	20- 1	RCL g CF _i	54-45,43 14	g GTO 00	88-43,33 00
STO + 2	21-44 40 2	X	55- 20	RCL PMT	89-45 14
-	22- 30	g INTG	56-43 25	g x=0	90-43 35
STO 0	23-44 0	X	57- 20	g GTO 17	91-43,33 17
g x=0	24-43 35	g FRAC	58-43 24	RCL 3	92-45 3
5	25- 5	STO X 3	59-44 20 3	g x=0	93-43 35
STO 1	26-44 1	RCL 2	60-45 2	g GTO 01	94-43,33 01
g n!	27-43 3	+	61- 40	R↓	95- 33
RCL 2	28-45 2	X	62- 20	R↓	96- 33
g √x	29-43 21	RCL 1	63-45 1	g GTO 17	97-43,33 17
f 0	30-42 0	+	64- 40	f P/R	
f RND	31-42 14	STO 0	65-44 0	New 12cpa: R↓ must be inserted after line 53.	
5	32- 5	RCL PV	66-45 13		

All 12cp: put the 4th constant in R₇ (not FV!). For louder snoring: use 3 in line 70.

Lines	Comments	Lines	Comments	Line(s)	Comments
01-16	Set up. 12C RNG*	17-26	R ₁ updated	27	Error trap
28-35	R ₂ updated	36-59	R ₃ updated	60-65	form R ₁ .R ₂ R ₃
66-81	"2." & "0." tests	82-84	show R ₁ .R ₂ R ₃	85-97	New move...have fun!

*RNG=Random Number Generator (refer 12C Solutions Handbook, p114).