Decompression Tables Workshop

Gregory Barefoot, PA-C

Decompression Tables Workshop

G. Barefoot, PA-C

Why are the tables important?



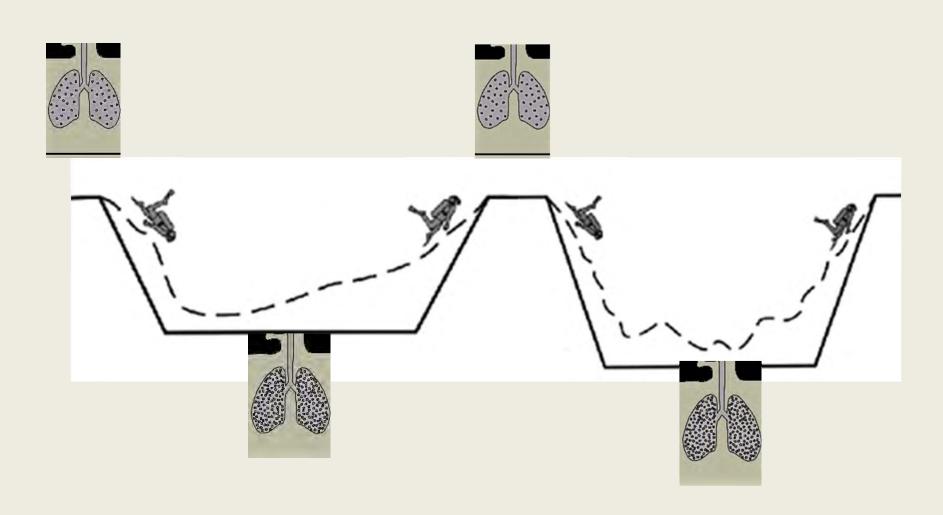
NATIONAL BOARD OF DIVING & HYPERBARIC MEDICAL TECHNOLOGY



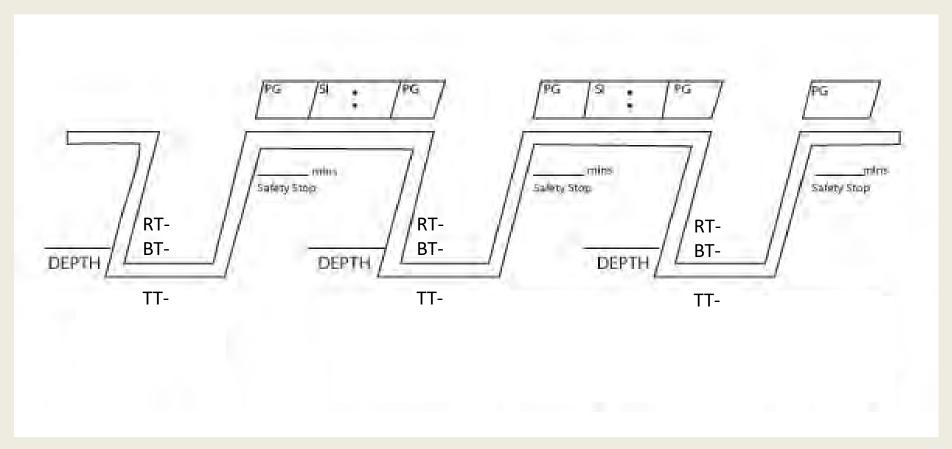


Nitrogen Absorption

-Nitrogen absorption is depth (i.e., pressure)/time dependent



Dive Profile Template



Key

- RT Residual Time- theoretical amount of nitrogen remaining in the body prior to starting a dive expressed in minutes.
- BT Bottom Time- the amount of time that begins when the diver leaves the surface and ends when the diver begins ascent expressed in minutes.
 - TT- RT+BT, this time should not exceed the No Decompression Limits for that depth as per Table 9-7.

Decompression Theory in Practice

 Dive tables and computers are used to predict the amount of inert gas that is absorbed for any given time/depth profile and to regulate the desaturation process on ascent

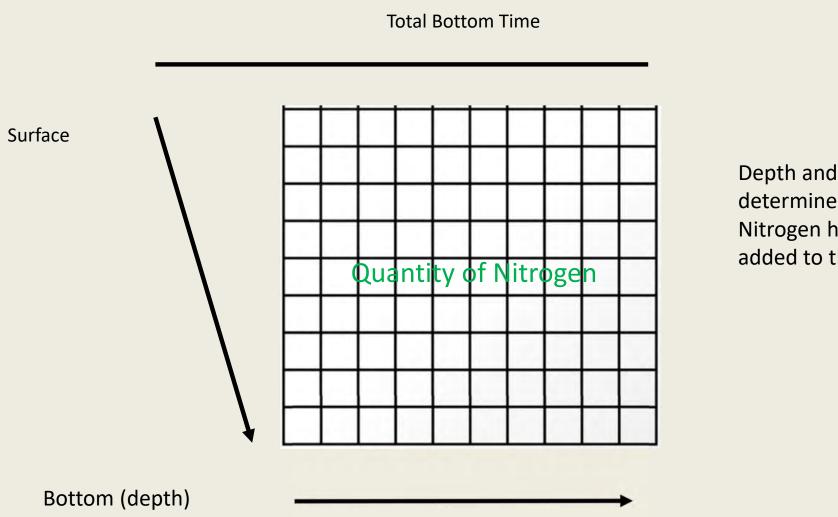


What really matters

 How does a diver get back to the surface without decompression sickness?

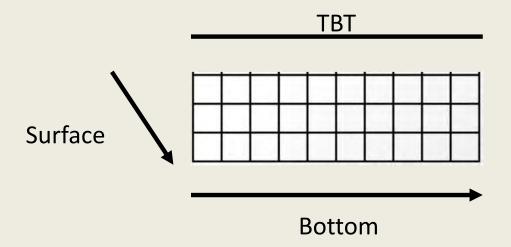
How much nitrogen is in the body?

How much Nitrogen is there?

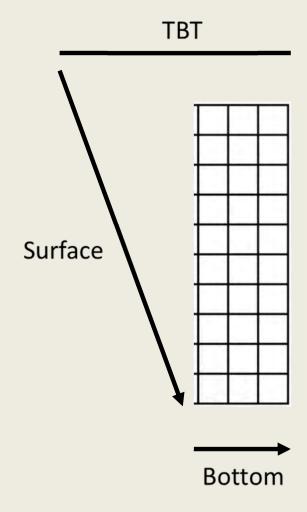


Depth and TBT determine how much Nitrogen has been added to the body

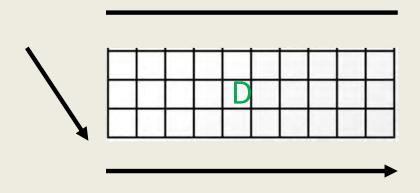
How much Nitrogen is there?



Same amount in both examples



How is Nitrogen measured?



- A letter (A-Z) is assigned to a specific amount of Nitrogen
- The letter is determined by the depth and TBT
- It is referred to as a "Repetitive Group Designator"

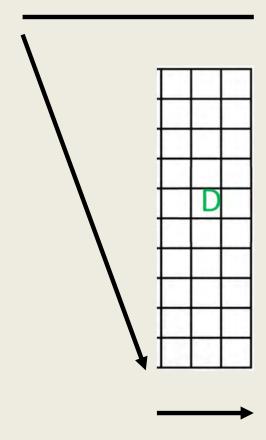


Table 9-7. No-Decompression Limits and Repetitive Group Designators for No-Decompression Air Dives.

No-Stop						F	tepetiti	ve Gro	oup De	signat	ion					
Limit	Α	В	С	D	E	F	G	н	- 1	J	K	L	М	N	0	Z
Unlimited	57	101	158	245	426	*										
Unlimited	36	60	88	121	163	217	297	449	*							
Unlimited	26	43	61	82	106	133	165	205	256	330	461	*				
1102	20	33	47	62	78	97	117	140	166	198	236	285	354	469	992	1102
371	17	27	38	50	62	76	91	107	125	145	167	193	223	260	307	371
232	14	23	32	42	52	63	74	87	100	115	131	148	168	190	215	232
163	12	20	27	36	44	53	63	73	84	95	108	121	135	151	163	
125	11	17	24	31	39	46	55	63	72	82	92	102	114	125		
92	9	15	21	28	34	41	48	56	63	71	80	89	92			
74	8	14	19	25	31	37	43	50	56	63	71	74				
63	7	12	17	22	28	33	39	45	51	57	63					
48	6	10	14	19	23	28	32	37	42	47	48					
39	5	9	12	16	20	24	28	32	36	39						
33	4	7	11	14	17	21	24	28	31	33						
25	4	6	9	12	15	18	21	25								
20	3	6	8	11	14	16	19	20								
15	3	5	7	10	12	15										
12	2	4	6	9	11	12										
10	2	4	6	8	10					,	Т	R	Τ			
8		3	5	7	8											
7		3	5	6	7											
6			4	6												
6			4	5	6											
5			3	5												
	Limit Unlimited Unlimited Unlimited 1102 371 232 163 125 92 74 63 48 39 33 25 20 15 12 10 8 7 6 6	Limit A Unlimited 57 Unlimited 36 Unlimited 26 1102 20 371 17 232 14 163 12 125 11 92 9 74 8 63 7 48 6 39 5 33 4 25 4 20 3 15 3 12 2 10 2 8 7 6 6	Limit A B Unlimited 57 101 Unlimited 36 60 Unlimited 26 43 1102 20 33 371 17 27 232 14 23 163 12 20 125 11 17 92 9 15 74 8 14 63 7 12 48 6 10 39 5 9 33 4 7 25 4 6 20 3 6 15 3 5 12 2 4 10 2 4 8 3 3 7 3 6 6 6 6	Limit A B C Unlimited 57 101 158 Unlimited 36 60 88 Unlimited 26 43 61 1102 20 33 47 371 17 27 38 232 14 23 32 163 12 20 27 125 11 17 24 92 9 15 21 74 8 14 19 63 7 12 17 48 6 10 14 39 5 9 12 33 4 7 11 25 4 6 9 20 3 6 8 15 3 5 7 12 2 4 6 10 2 4 6 10 2 <t< td=""><td>Limit A B C D Unlimited 57 101 158 245 Unlimited 36 60 88 121 Unlimited 26 43 61 82 1102 20 33 47 62 371 17 27 38 50 232 14 23 32 42 163 12 20 27 36 125 11 17 24 31 92 9 15 21 28 74 8 14 19 25 63 7 12 17 22 48 6 10 14 19 39 5 9 12 16 33 4 7 11 14 25 4 6 9 12 20 3 6 8 11 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217 297 449 Unlimited 26 43 61 82 106 133 165 205 1102 20 33 47 62 78 97 117 140 371 17 27 38 50 62 76 91 107 232 14 23 32 42 52 63 74 87 163 12 20 27 36 44 53 63 73 125 11 17 24 31 39 46 55 63 92 9 15 21 28 34 41 48 56 74 8 <t< td=""><td>Limit A B C D E F G H I Unlimited 57 101 158 245 426 * * Unlimited 36 60 88 121 163 217 297 449 * Unlimited 26 43 61 82 106 133 165 205 256 1102 20 33 47 62 78 97 117 140 166 371 17 27 38 50 62 76 91 107 125 232 14 23 32 42 52 63 74 87 100 163 12 20 27 36 44 53 63 73 84 125 11 17 24 31 39 46 55 63 72 92 9 15</td><td>Limit A B C D E F G H I J Unlimited 57 101 158 245 426 * * Unlimited 36 60 88 121 163 217 297 449 * Unlimited 26 43 61 82 106 133 165 205 256 330 1102 20 33 47 62 78 97 117 140 166 198 371 17 27 38 50 62 76 91 107 125 145 232 14 23 32 42 52 63 74 87 100 115 163 12 20 27 36 44 53 63 73 84 95 125 11 17 24 31 39 46 55</td><td>Limit A B C D E F G H I J K Unlimited 57 101 158 245 426 " " " " " Unlimited 36 60 88 121 163 217 297 449 " " Unlimited 26 43 61 82 106 133 165 205 256 330 461 1102 20 33 47 62 78 97 117 140 166 198 236 371 17 27 38 50 62 76 91 107 125 145 167 232 14 23 32 42 52 63 74 87 100 115 131 163 12 20 27 36 44 53 63 72 82 92 92</td><td>Limit A B C D E F G H I J K L Unlimited 57 101 158 245 426 * * Unlimited 36 60 88 121 163 217 297 449 * * Unlimited 26 43 61 82 106 133 165 205 256 330 461 * 1102 20 33 47 62 78 97 117 140 166 198 236 285 371 17 27 38 50 62 76 91 107 125 145 167 <t>193 232 14 23 32 42 52 63 74 87 100 115 131 148 163 12 20 27 36 44 53 63 73 84</t></td><td> Limit</td><td> Limit</td><td> Limit</td></t<></td></td></t<>	Limit A B C D Unlimited 57 101 158 245 Unlimited 36 60 88 121 Unlimited 26 43 61 82 1102 20 33 47 62 371 17 27 38 50 232 14 23 32 42 163 12 20 27 36 125 11 17 24 31 92 9 15 21 28 74 8 14 19 25 63 7 12 17 22 48 6 10 14 19 39 5 9 12 16 33 4 7 11 14 25 4 6 9 12 20 3 6 8 11 <	Limit A B C D E Unlimited 57 101 158 245 426 Unlimited 36 60 88 121 163 Unlimited 26 43 61 82 106 1102 20 33 47 62 78 371 17 27 38 50 62 232 14 23 32 42 52 163 12 20 27 36 44 125 11 17 24 31 39 92 9 15 21 28 34 74 8 14 19 25 31 63 7 12 17 22 28 48 6 10 14 19 23 39 5 9 12 16 20 33 4 7	Limit A B C D E F Unlimited 57 101 158 245 426 * Unlimited 36 60 88 121 163 217 Unlimited 26 43 61 82 106 133 1102 20 33 47 62 78 97 371 17 27 38 50 62 76 232 14 23 32 42 52 63 163 12 20 27 36 44 53 125 11 17 24 31 39 46 92 9 15 21 28 34 41 74 8 14 19 25 31 37 63 7 12 17 22 28 33 48 6 10 14 19	Limit A B C D E F G Unlimited 57 101 158 245 426 * Unlimited 36 60 88 121 163 217 297 Unlimited 26 43 61 82 106 133 165 1102 20 33 47 62 78 97 117 371 17 27 38 50 62 76 91 232 14 23 32 42 52 63 74 163 12 20 27 36 44 53 63 125 11 17 24 31 39 46 55 92 9 15 21 28 34 41 48 74 8 14 19 23 28 32 39 5 9 12 </td <td>Limit A B C D E F G H Unlimited 57 101 158 245 426 * Unlimited 36 60 88 121 163 217 297 449 Unlimited 26 43 61 82 106 133 165 205 1102 20 33 47 62 78 97 117 140 371 17 27 38 50 62 76 91 107 232 14 23 32 42 52 63 74 87 163 12 20 27 36 44 53 63 73 125 11 17 24 31 39 46 55 63 92 9 15 21 28 34 41 48 56 74 8 <t< td=""><td>Limit A B C D E F G H I Unlimited 57 101 158 245 426 * * Unlimited 36 60 88 121 163 217 297 449 * Unlimited 26 43 61 82 106 133 165 205 256 1102 20 33 47 62 78 97 117 140 166 371 17 27 38 50 62 76 91 107 125 232 14 23 32 42 52 63 74 87 100 163 12 20 27 36 44 53 63 73 84 125 11 17 24 31 39 46 55 63 72 92 9 15</td><td>Limit A B C D E F G H I J Unlimited 57 101 158 245 426 * * Unlimited 36 60 88 121 163 217 297 449 * Unlimited 26 43 61 82 106 133 165 205 256 330 1102 20 33 47 62 78 97 117 140 166 198 371 17 27 38 50 62 76 91 107 125 145 232 14 23 32 42 52 63 74 87 100 115 163 12 20 27 36 44 53 63 73 84 95 125 11 17 24 31 39 46 55</td><td>Limit A B C D E F G H I J K Unlimited 57 101 158 245 426 " " " " " Unlimited 36 60 88 121 163 217 297 449 " " Unlimited 26 43 61 82 106 133 165 205 256 330 461 1102 20 33 47 62 78 97 117 140 166 198 236 371 17 27 38 50 62 76 91 107 125 145 167 232 14 23 32 42 52 63 74 87 100 115 131 163 12 20 27 36 44 53 63 72 82 92 92</td><td>Limit A B C D E F G H I J K L Unlimited 57 101 158 245 426 * * Unlimited 36 60 88 121 163 217 297 449 * * Unlimited 26 43 61 82 106 133 165 205 256 330 461 * 1102 20 33 47 62 78 97 117 140 166 198 236 285 371 17 27 38 50 62 76 91 107 125 145 167 <t>193 232 14 23 32 42 52 63 74 87 100 115 131 148 163 12 20 27 36 44 53 63 73 84</t></td><td> Limit</td><td> Limit</td><td> Limit</td></t<></td>	Limit A B C D E F G H Unlimited 57 101 158 245 426 * Unlimited 36 60 88 121 163 217 297 449 Unlimited 26 43 61 82 106 133 165 205 1102 20 33 47 62 78 97 117 140 371 17 27 38 50 62 76 91 107 232 14 23 32 42 52 63 74 87 163 12 20 27 36 44 53 63 73 125 11 17 24 31 39 46 55 63 92 9 15 21 28 34 41 48 56 74 8 <t< td=""><td>Limit A B C D E F G H I Unlimited 57 101 158 245 426 * * Unlimited 36 60 88 121 163 217 297 449 * Unlimited 26 43 61 82 106 133 165 205 256 1102 20 33 47 62 78 97 117 140 166 371 17 27 38 50 62 76 91 107 125 232 14 23 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<t>193 232 14 23 32 42 52 63 74 87 100 115 131 148 163 12 20 27 36 44 53 63 73 84</t></td><td> Limit</td><td> Limit</td><td> Limit</td></t<>	Limit A B C D E F G H I Unlimited 57 101 158 245 426 * * Unlimited 36 60 88 121 163 217 297 449 * Unlimited 26 43 61 82 106 133 165 205 256 1102 20 33 47 62 78 97 117 140 166 371 17 27 38 50 62 76 91 107 125 232 14 23 32 42 52 63 74 87 100 163 12 20 27 36 44 53 63 73 84 125 11 17 24 31 39 46 55 63 72 92 9 15	Limit A B C D E F G H I J Unlimited 57 101 158 245 426 * * Unlimited 36 60 88 121 163 217 297 449 * Unlimited 26 43 61 82 106 133 165 205 256 330 1102 20 33 47 62 78 97 117 140 166 198 371 17 27 38 50 62 76 91 107 125 145 232 14 23 32 42 52 63 74 87 100 115 163 12 20 27 36 44 53 63 73 84 95 125 11 17 24 31 39 46 55	Limit A B C D E F G H I J K Unlimited 57 101 158 245 426 " " " " " Unlimited 36 60 88 121 163 217 297 449 " " Unlimited 26 43 61 82 106 133 165 205 256 330 461 1102 20 33 47 62 78 97 117 140 166 198 236 371 17 27 38 50 62 76 91 107 125 145 167 232 14 23 32 42 52 63 74 87 100 115 131 163 12 20 27 36 44 53 63 72 82 92 92	Limit A B C D E F G H I J K L Unlimited 57 101 158 245 426 * * Unlimited 36 60 88 121 163 217 297 449 * * Unlimited 26 43 61 82 106 133 165 205 256 330 461 * 1102 20 33 47 62 78 97 117 140 166 198 236 285 371 17 27 38 50 62 76 91 107 125 145 167 <t>193 232 14 23 32 42 52 63 74 87 100 115 131 148 163 12 20 27 36 44 53 63 73 84</t>	Limit	Limit	Limit

^{*} Highest repetitive group that can be achieved at this depth regardless of bottom time.

What does "D" mean?

Table 9-7. No-Decompression Limits and Repetitive Group Designators for No-Decompression Air Dives.

Depth	No-Stop						F	Repetit	ive Gro	oup De	signati	ion					
(fsw)	Limit	Α	В	C	D	Ε	F	G	Н	-1	J	K	L	M	N	0	Z
10	Unlimited	57	101	158	245	426											
15	Unlimited	36	60	88	121	163	217	297	449								
20	Unlimited	26	43	61	82	106	133	165	205	256	330	461	*				
25	1102	20	33	47	62	78	97	117	140	166	198	236	285	354	469	992	1102
30	371	17	27	38	50	62	76	91	107	125	145	167	193	223	260	307	371
35	232	11	23	-	42	52	63	74	87	100	115	131	148	168	190	215	232
40	163	12	20	27	36	44	53	63	73	84	95	108	121	135	151	163	
45	125	11	17	24	31	39	46	55	63	72	82	92	102	114	125		
50	92	9	15	21	28	34	41	48	56	63	71	80	89	92			
55	74	8	14	19	25	31	37	43	50	56	63	71	74				
60	63	7	12	17	22	28	33	39	45	51	57	63					
70	40	0	10	-	19	23	28	32	37	42	47	48					
80	39	5	9	12	16	20	24	28	32	36	39						
90	33	4	7	11	14	17	21	24	28	31	33						
100	25	4	6	9	12	15	18	21	25								
110	20	3	6	8	11	14	16	19	20								
120	15	3	5	7	10	12	15										
130	12	2	4	6	9	11	12										
140	10	2	4	6	8	10											
150	8		3	5	7	8											
160	7		3	5	6	7											
170	6			4	6												
180	6			4	5	6											
190	5			3	5												

^{*} Highest repetitive group that can be achieved at this depth regardless of bottom time.

What if I stay at 35 fsw longer?

Table 9-7. No-Decompression Limits and Repetitive Group Designators for No-Decompression Air Dives.

Depth	No-Stop						P	epetiti	ve Gro	oup De	signat	ion					
(fsw)	Limit	Α	В	С	D	E	F	G	Н	- 1	J	K	L	M	N	0	Z
10	Unlimited	57	101	158	245	426											
15	Unlimited	36	60	88	121	163	217	297	449								
20	Unlimited	26	43	61	82	106	133	165	205	256	330	461					
25	1102	20	33	47	62	78	97	117	140	166	198	236	285	354	469	992	1102
30	371	17	27	38	50	62	76	91	107	125	145	167	193	223	260	307	371
35	232	14	23	32	42	52	63	74	87	100	115	131	148	168	190	215	232
40	163	12	20	27	36	44	53	63	73	84	95	108	121	135	151	163	
45	125	11	17	24	31	39	46	55	63	72	82	92	102	114	125		
50	92	9	15	21	28	34	41	48	56	63	71	80	89	92			
55	74	8	14	19	25	31	37	43	50	56	63	71	74				
60	63	7	12	17	22	28	33	39	45	51	57	63					
70	48	6	10	14	19	23	28	32	37	42	47	48					
80	39	5	9	12	16	20	24	28	32	36	39						
90	33	4	7	11	14	17	21	24	28	31	33						
100	25	4	6	9	12	15	18	21	25								
110	20	3	6	8	11	14	16	19	20								
120	15	3	5	7	10	12	15										
130	12	2	4	6	9	11	12										
140	10	2	4	6	8	10											
150	8		3	5	7	8											
160	7		3	5	6	7											
170	6			4	6												
180	6			4	5	6											
190	5			3	5												

^{*} Highest repetitive group that can be achieved at this depth regardless of bottom time.

How do I get back to the surface and limit my risk of developing DCS?

Table 9-7. No-Decompression Limits and Repetitive Group Designators for No-Decompression Air Dives.

Depth	No-Stop						F	tepetit	ve Gro	oup De	signat	ion					
(fsw)	Limit	Α	В	C	D	E	F	G	Н	1	J	K	L	M	N	0	Z
10	Unlimited	57	101	158	245	426											
15	Unlimited	36	60	88	121	163	217	297	449	*							
20	Unlimited	26	43	61	82	106	133	165	205	256	330	461	*				
25	1102	20	33	47	62	78	97	117	140	166	198	236	285	354	469	992	1102
30	371	17	27	38	50	62	76	91	107	125	145	167	193	223	260	307	371
35	232	14	23	32	42	52	63	74	87	100	115	131	148	168	190	215	232
40	163	12	20	27	36	44	53	63	73	84	95	108	121	135	151	163	
45	125	11	17	24	31	39	46	55	63	72	82	92	102	114	125		
50	92	9	15	21	28	34	41	48	56	63	71	80	89	92			
55	74	8	14	19	25	31	37	43	50	56	63	71	74				
60	63	7	12	17	22	28	33	39	45	51	57	63					
70	48	-	10	**	10	20	20	02	07	12	7	48					
80	39	5	9	12	16	20	24	28	32	36	39		-				
90	33	4	7	11	14	17	21	24	28	31	33						
100	25	4	6	9	12	15	18	21	25								
110	20	3	6	8	11	14	16	19	20								
120	15	3	5	7	10	12	15										
130	12	2	4	6	9	11	12										
140	10	2	4	6	8	10			Δς	^er	nt r	ate	3 (ን fo	ont	:/ n	nin
150	8		3	5	7	8		•	~3 (JC1	10 1	acc		<i>)</i> (./ ''	
160	7		3	5	6	7											
170	6			4	6												
180	6			4	5	6											
190	5			3	5												

^{*} Highest repetitive group that can be achieved at this depth regardless of bottom time.

Single Dive Problem I

Diver makes a single dive to a depth of 85 fsw for 20 minutes. What is the pressure group after the dive?

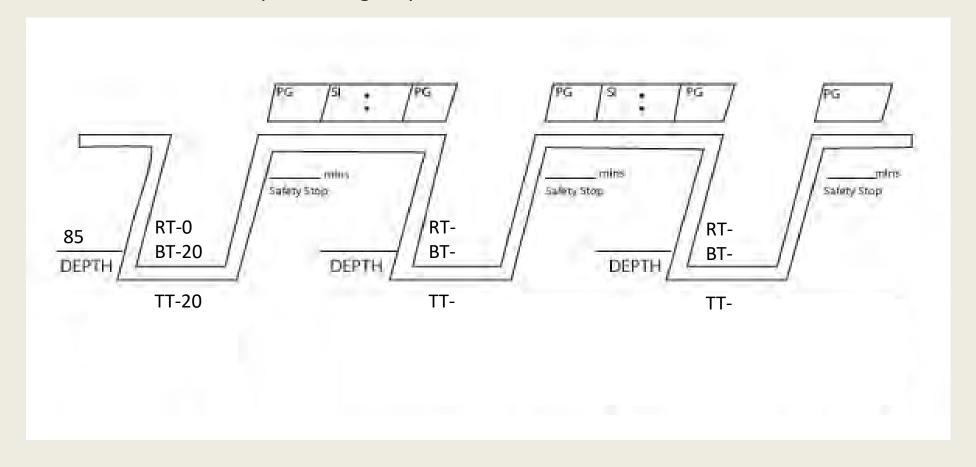
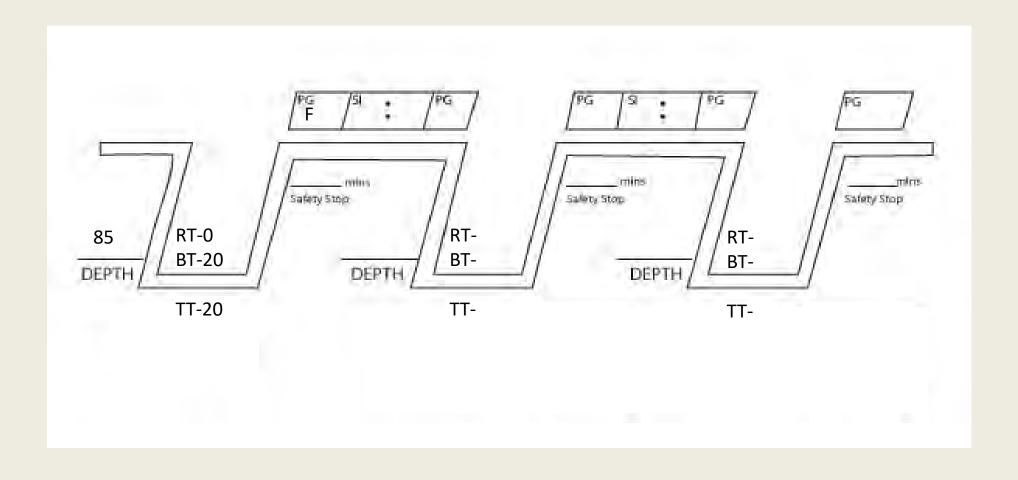


Table 9-7. No-Decompression Limits and Repetitive Group Designators for No-Decompression Air Dives.

Depth	No-Stop						F	Repetiti	ve Gro	oup De	signat	ion					
(fsw)	Limit	Α	В	C	D	E (F	G	н	. 1	J	K	L	M	N	0	Z
10	Unlimited	57	101	158	245	426	4										
15	Unlimited	36	60	88	121	163	2 7	297	449	*							
20	Unlimited	26	43	61	82	106	1 3	165	205	256	330	461	*				
25	1102	20	33	47	62	78	7	117	140	166	198	236	285	354	469	992	1102
30	371	17	27	38	50	62	6	91	107	125	145	167	193	223	260	307	371
35	232	14	23	32	42	52	3	74	87	100	115	131	148	168	190	215	232
40	163	12	20	27	36	44	3	63	73	84	95	108	121	135	151	163	
45	125	11	17	24	31	39	6	55	63	72	82	92	102	114	125		
50	92	9	15	21	28	34	1	48	56	63	71	80	89	92			
55	74	8	14	19	25	31	7	43	50	56	63	71	74				
60	63	7	12	17	22	28	3	39	45	51	57	63					
70	48	6	10	14	19	23	8	32	37	42	47	48					
80	39	5	9	12	16	20	4	28	32	36	39						
90	22	-	7	44	.,	47	21	24	28	31	33						
100	25	4	6	9	12	15	18	21	25								
110	20	3	6	8	11	14	16	19	20								
120	15	3	5	7	10	12	15										
130	12	2	4	6	9	11	12										
140	10	2	4	6	8	10											
150	8		3	5	7	8											
160	7		3	5	6	7											
170	6			4	6												
180	6			4	5	6											
190	5			3	5												

^{*} Highest repetitive group that can be achieved at this depth regardless of bottom time.

Single Dive Problem I



Single Dive Problem II

Diver makes a single dive to 47 fsw for 60 minutes. What is the pressure group after the dive?

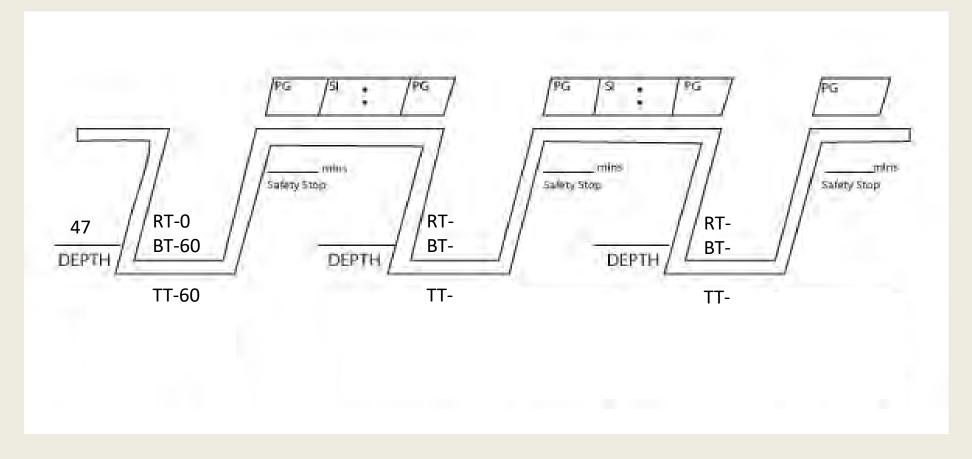
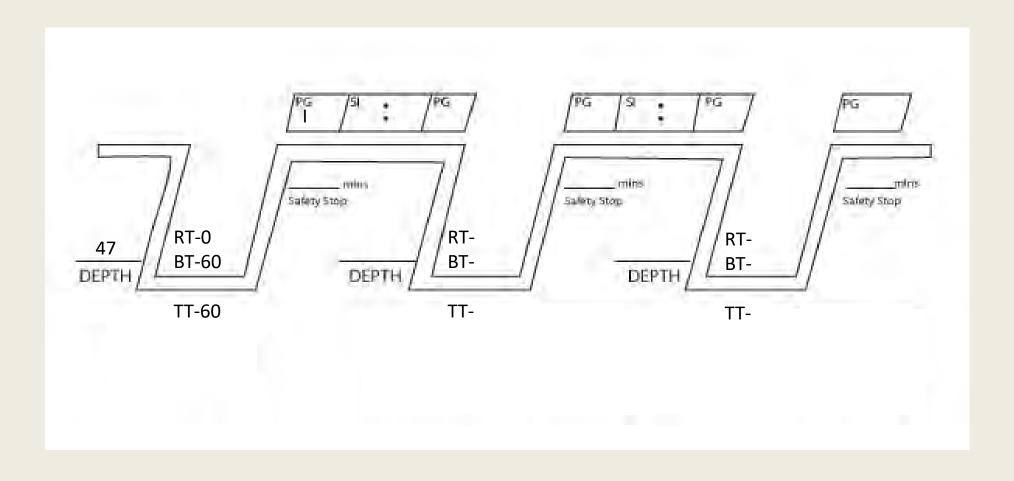


Table 9-7. No-Decompression Limits and Repetitive Group Designators for No-Decompression Air Dives.

Depth	No-Stop	_					R	epetiti	ve Gre	up De	signat	ion					
(fsw)	Limit	Α	В	С	D	E	F	G	H	-1	J	K	L	M	N	0	Z
10	Unlimited	57	101	158	245	426	*			~							
15	Unlimited	36	60	88	121	163	217	297	449								
20	Unlimited	26	43	61	82	106	133	165	205	2 6	330	461	*				
25	1102	20	33	47	62	78	97	117	140	1 6	198	236	285	354	469	992	1102
30	371	17	27	38	50	62	76	91	107	1 5	145	167	193	223	260	307	371
35	232	14	23	32	42	52	63	74	87	1 0	115	131	148	168	190	215	232
40	163	12	20	27	36	44	53	63	73	4	95	108	121	135	151	163	
45	125	11	17	24	31	39	46	55	63	,	82	92	102	114	125		
50	32	9	15	21	20	34	41	40	D6	63	71	80	89	92			
55	74	8	14	19	25	31	37	43	50	50	63	71	74				
60	63	7	12	17	22	28	33	39	45	51	57	63					
70	48	6	10	14	19	23	28	32	37	42	47	48					
80	39	5	9	12	16	20	24	28	32	36	39						
90	33	4	7	11	14	17	21	24	28	31	33						
100	25	4	6	9	12	15	18	21	25								
110	20	3	6	8	11	14	16	19	20								
120	15	3	5	7	10	12	15										
130	12	2	4	6	9	11	12										
140	10	2	4	6	8	10											
150	8		3	5	7	8											
160	7		3	5	6	7											
170	6			4	6												
180	6			4	5	6											
190	5			3	5												

^{*} Highest repetitive group that can be achieved at this depth regardless of bottom time.

Sample Dive Problem II



Single Dive Problem III

Diver makes a single dive to 115 fsw for 11 minutes. What is the pressure group after the dive?

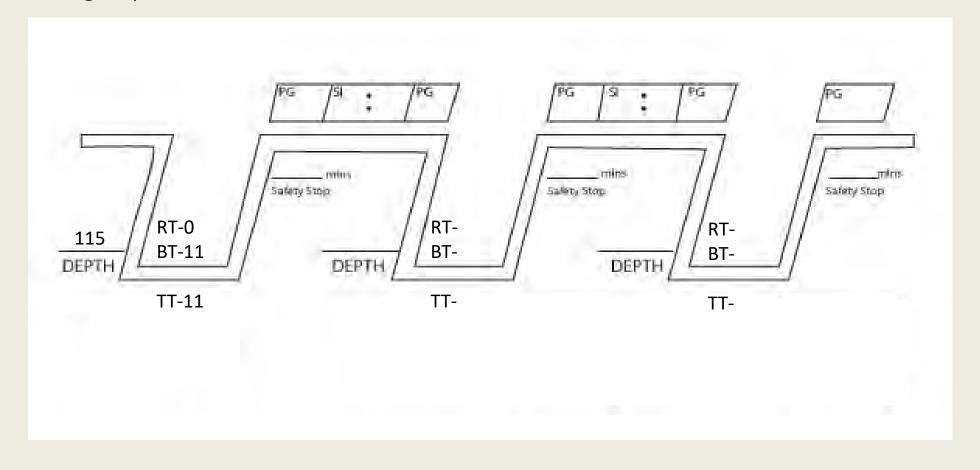
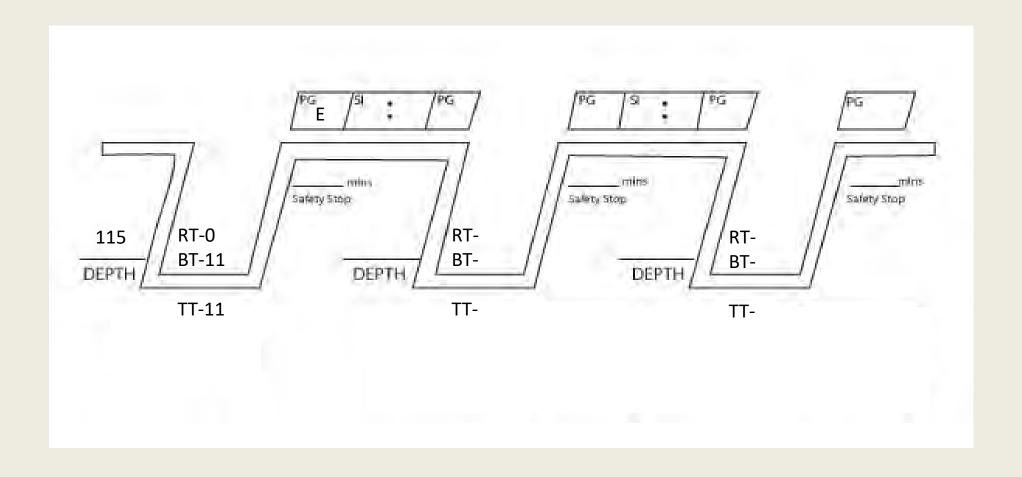


Table 9-7. No-Decompression Limits and Repetitive Group Designators for No-Decompression Air Dives.

Depth	No-Stop						F	epetiti	ive Gro	oup De	signat	ion					
(fsw)	Limit	Α	В	С	D	E	F	G	Н	-1	J	K	L	M	N	0	Z
10	Unlimited	57	101	158	245	100											
15	Unlimited	36	60	88	121	3	217	297	449								
20	Unlimited	26	43	61	82	6	133	165	205	256	330	461	*				
25	1102	20	33	47	62	8	97	117	140	166	198	236	285	354	469	992	1102
30	371	17	27	38	50	2	76	91	107	125	145	167	193	223	260	307	371
35	232	14	23	32	42	2	63	74	87	100	115	131	148	168	190	215	232
40	163	12	20	27	36	4	53	63	73	84	95	108	121	135	151	163	
45	125	11	17	24	31	Э	46	55	63	72	82	92	102	114	125		
50	92	9	15	21	28	4	41	48	56	63	71	80	89	92			
55	74	8	14	19	25		37	43	50	56	63	71	74				
60	63	7	12	17	22	3	33	39	45	51	57	63					
70	48	6	10	14	19	3	28	32	37	42	47	48					
80	39	5	9	12	16	b	24	28	32	36	39						
90	33	4	7	11	14	H	21	24	28	31	33						
100	25	4	6	9	12	k	18	21	25								
110	20	3	6	8	11	1	16	19	20								
120	15	-	0	-	-10	12	15										
130	12	2	4	6	9	11	12										
140	10	2	4	6	8	10											
150	8		3	5	7	8											
160	7		3	5	6	7											
170	6			4	6												
180	6			4	5	6											
190	5			3	5												

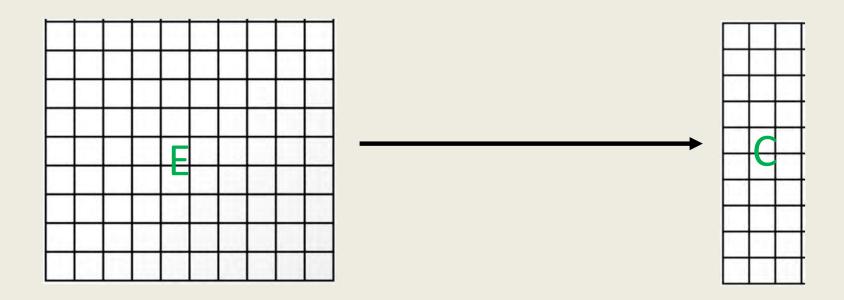
^{*} Highest repetitive group that can be achieved at this depth regardless of bottom time.

Single Dive Problem III



What happens to the Nitrogen at the end of the dive?

- The amount of excess Nitrogen left at the end of the dive is called "Residual Nitrogen"
- Residual Nitrogen is off-gassed (breathed off) over time



Single Dive Problem III

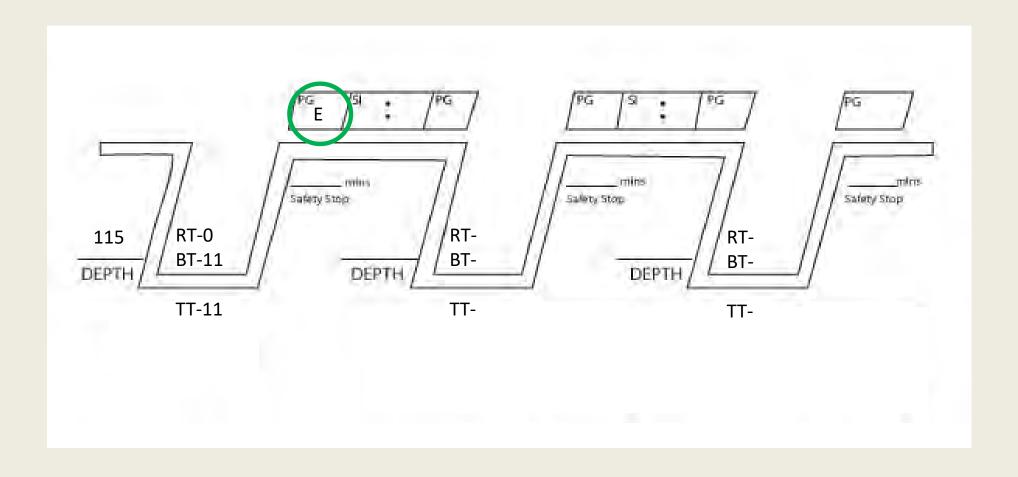


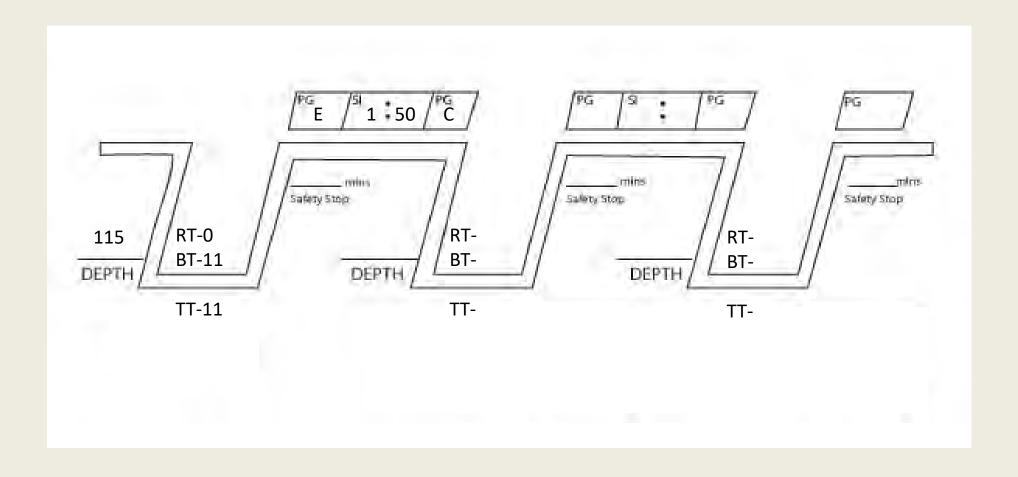
Table 9-8. Residual Nitrogen Time Table for Repetitive Air Dives.

bove th	he diver ne table.		_				-			_	ai iii re				_A>	2:20
25.														_B>	1:16	3:3
evt re	ad vertic	ally dow	mward to	n the ne	w renet	itive are	un desi	anation					C>	:10	:56	2:12
	e downw	any don	nis same	column	to the	now that	renres	ents			_		_	:55	2:11	4:3
	h of the	repetitiv	e dive. T	he time	given a	t the in	tersection	on.		*eNº		D>	:10	:53	1:48	3:04 5:2
	al nitrog	en time.	in minu	tes, to b	e applie	ed to the	2		0	ne		:10	:53	1:45	2:40	3:5
epetitive	_								Age		E	:02	1.99	2:39	3:55	6:1
								, SV	, L	-	.10	:53	1:45	2.20	3:32	4:4
Dives f	following	surface	interval	s longe	r than			01			:52	1:44	2:37	3 31	4:48	7:0
	not repe	titive div	es. Use	actual			nin	, _	G	:10	:53	1:45	2:38	3 30	4:24	5:4
	imes in t	he Air D	ecompr	ession			Jin.			:52	1:44	2:37	3:29	4 23	5:40	8:0
	compu	te decor	mpressio	on		Be	" [H>	:10	:53	1:45	2:38	3:30	4 22	5:17	6:3
or such	dives.				.0	30		:10	:52	1:44	2:37	3:29	4:21	5 16 5 14	6:32	8:5: 7:2
					CLOUR		1>	-52	1:44	2-37	3:29	4:21	5:13	6 08	7:24	9:4
				10	_		:10	:53	1:45	2:38	3:30	4:22	5:14	6 07	7:01	8:1
				title			:52	1:44	2:37	3:29	4:21	5:13	6:06	7 00		10:3
			rnward tr nis same e dive. T in minu e interval es. Use ecompression		K	:10	:53	1:45	2:38	3:30	4:22	5:14	6:07	6 59	7:53	9:1
			1			:52	1:44	2:37	3:29	4:21	5:13	6:06	6:58	7 52	9:09	
				L	:10	:53	1:45	2:38	3:30	4:22	5:14	6:07	6:59	7 51	8:45	
		_		_	:52	1:44	2:37	3:28	4:21	5:13	6:06	6:58	7:50	8 44	10:01	
			M	:10	:53	1:45	2:38 3:29	3:30 4:21	4:22 5:13	5:14	6:07	6:59 7:50	7:51 8:42	8 43 8 37	9:38	
			:10	:53	1:45	2:38	3:30	4:22	5:14	6:07	6:59	7:51	8:43	35	10:30	
		N>	:52	1:44	2:37	3:29	4:21	5:13	6:06	6:58	7:50	8:42	9:34	10 29	11:45	
		:10	:53	1:45	2:38	3:30	4:22	5:14	6:07	6:59	7:51	8:43	9:35	10 28	11:22	
L		:52	1:44	2:37	3:29	4:21	5:13	6:06	6:58	7:50	8:42	9:34	10:27	1 21	12:37	14:5
z>	:10	:53	1:45	2:38	3:30	4:22	5:14	6:07	6:59	7:51	8:43	9:35	10:28	1 :20	12:14	
	:52	1:44	2:37	3:29	4:21	5:13	6:06	6:58	7:50	8:42	9:34	10:27	11:19	11:13	13:30	15:5
Dive	Z	0	N	М	L Res	K	J Group a	III	H d of the	G	F e Interv	E	D (C	В	A
Depth	\vee	\vee	\vee	\vee	V	V	V	V	V	V	V		\vee	Y	\vee	
10		**	***		***	**	***		***	***	***	427	246	159	101	5
15	**	**	**	**		**	**	**	450	298	218	164	122	89	61	3
20						462	331	257	206	166	134	106	83	62	44	2
25	t	t	470	354	286	237	198	167	141	118	98	79	63	48	34	2
30	372	308	261	224	194	168	146	126	108	92	77	63	51	39	28	- 1
35	245	216	191	169	149	132	116	101	88	75	64	53	43	33	24	1
40	188	169	152	136	122	109	97	85	74	64	55	45	37	29	21	1
45 50	154	140	127	115	104	93	83 73	73 65	64 57	56 49	48	40 35	32 29	25 23	18	1
55	114	105	96	88	80	72	65	58	51	44	38	32	26	20	15	1
60	101	93	86	79	72	65	58	52	46	40	35	29	24	19	14	
70	83	77	71	65	59	54	49	44	39	34	29	25	20	16	12	
80	70	65	60	55	51	46	42	38	33	29	25	22	18	14	10	
90	61	57	52	48	44	41	37	33	29	26	22	19	16	12	9	
100	54	50	47	43	40	36	33	30	26	23	20	17	14	11	8	
110	48	45	42	39	36	33	30	27	24	21	18	16	13	10	8	
120	44	41	38	35	32	30	27	24	22	19	17	14	12	9	7	
130	40	37	35	32	30	27	25	22	20	18	15	13	11	9	6	-
140	37	34	32	30	27	25	23	21	19	16	14	12	10	8	6	
150	34	32	30	28	26	23	21	19	17	15	13	11	9	8	6	
160	32	30	28	26	24	22	20	18	16	14	13	11	9	7	5	
	30	28	26	24	22	21	19	17	15	14	12	10	8	7	5	
170		26	25	23	21	19	18	16	14	13	11	10	8	6	5	
170 180 190	28 26	25	23	22	20	18	17	15	14	12	11	9	8	6	5	

^{**} Residual Nitrogen Time cannot be determined using this table (see paragraph 9-9.1 subparagraph 8 for instructions).

† Read vertically downward to the 30 fsw repetitive dive depth. Use the corresponding residual nitrogen times to compute the equivalent single dive time. Decompress using the 30 fsw air decompression table.

Single Dive Problem III

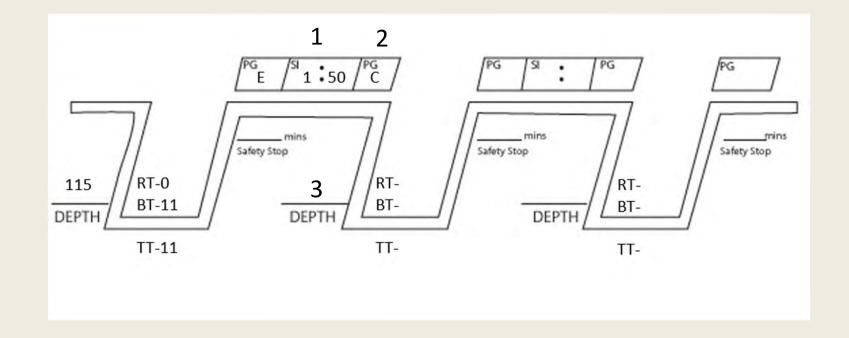


Why do we care about Residual Nitrogen?

- If another dive is made before all the nitrogen is gone, then it must be accounted for
- How do we account for Residual Nitrogen?
 - It must be added to the TBT in order to select the appropriate ascent procedure
 - TBT is measured in minutes so the residual nitrogen time must be in minutes as well
 - This is called "Residual Nitrogen Time"

What is needed to determine RNT?

- 1-Surface interval time (hrs:min)
- 2-RGD from previous dive
- 3- Depth of repetitive dive



Diver makes a dive to 75 fsw for 30 minutes. Then surfaces and plans the next dive to a depth of 55 fsw. The diver is on the surface for 2 hours and makes the second dive for 36 minutes. What is the pressure group after the second dive?

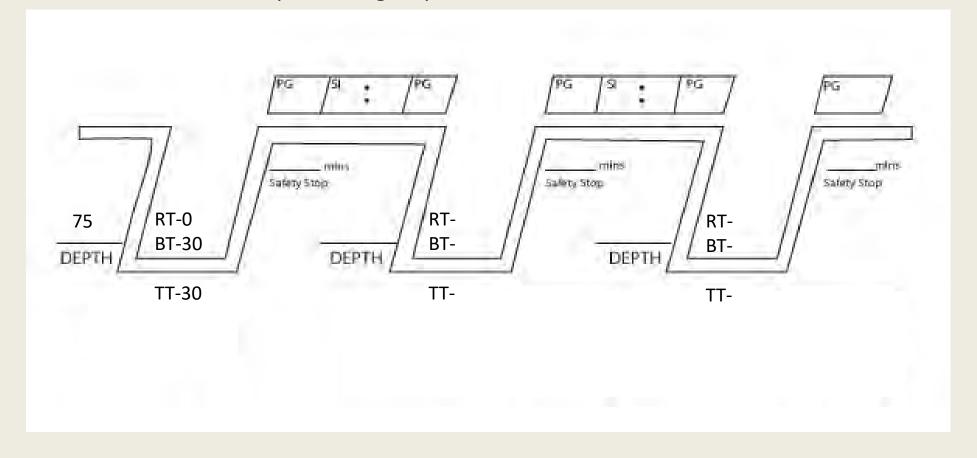


Table 9-7. No-Decompression Limits and Repetitive Group Designators for No-Decompression Air Dives.

Depth	No-Stop						F	epetit	ve G	oup De	signat	ion					
(fsw)	Limit	Α	В	C	D	E	F	G	Н	1	J	K	L	M	N	0	Z
10	Unlimited	57	101	158	245	426	*	'									
15	Unlimited	36	60	88	121	163	217	297	44								
20	Unlimited	26	43	61	82	106	133	165	20	256	330	461	*				
25	1102	20	33	47	62	78	97	117	14	166	198	236	285	354	469	992	1102
30	371	17	27	38	50	62	76	91	10	125	145	167	193	223	260	307	371
35	232	14	23	32	42	52	63	74	8	100	115	131	148	168	190	215	232
40	163	12	20	27	36	44	53	63	7	84	95	108	121	135	151	163	
45	125	11	17	24	31	39	46	55	•	72	82	92	102	114	125		
50	92	9	15	21	28	34	41	48		63	71	80	89	92			
55	74	8	14	19	25	31	37	43	. 5	56	63	71	74				
60	63	7	12	17	22	28	33	39	4	51	57	63					
70	48	6	10	14	19	23	28	32	37	42	47	48					
80		-	-	-10	-10	22	^*	-00	32	36	39						
90	33	4	7	11	14	17	21	24	20	31	33						
100	25	4	6	9	12	15	18	21	25								
110	20	3	6	8	11	14	16	19	20								
120	15	3	5	7	10	12	15										
130	12	2	4	6	9	11	12										
140	10	2	4	6	8	10											
150	8		3	5	7	8											
160	7		3	5	6	7											
170	6			4	6												
180	6			4	5	6											
190	5			3	5												

^{*} Highest repetitive group that can be achieved at this depth regardless of bottom time.

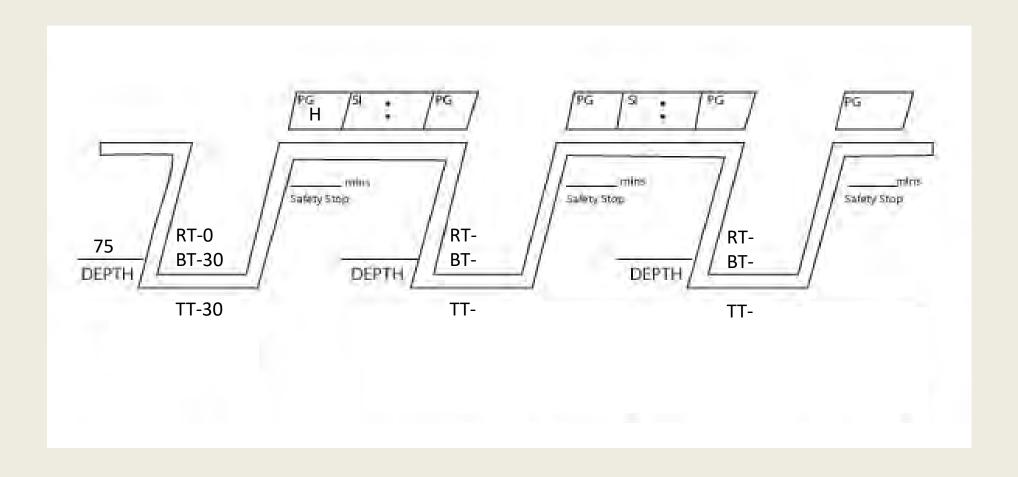


Table 9-8. Residual Nitrogen Time Table for Repetitive Air Dives.

Locate ti											al line				A	:10 2:20 *
above th	e table.	Read n	onzonta	ily to the	einterva	ii in whi	on the d	iver's su	лтасе п	itervai				B	:10	1:17
												_		:10	1:16	3:36 *
Next, rea	ad vertic	ally dow	vnward t	to the ne	w repet	titive gro	up desi	gnation.					c>	:55	2:11	4:31 *
Continue			his same	e column	to the	row that	represe	ents		23	· _		:10	:53	1:48	3:04
the dept			e dive.	The time	given a	at the in	tersection	on		ntel		_D>	:52	1:47	3:03	5:23 *
is residu	_	en time	, in minu	ites, to b	e applie	ed to the	9		· ce	" L	E	:10	:53	1:45	2:40	3:56
repetitive	e dive.							- 1	430			:52	1:44	2:39	3:55	6:15 *
* Dives f	ollowing	surface	interva	ls longe	rthan			of S.		F>	:10	:53	1:45	2:38	3:32	4:49 7:08 *
this are	_		es Use	actual	· citaii		in	3° -		-10	:53	1:45	2:38	3:30	4:24	5:41
bottom t			ecompr	ression			innii		G>	:52	1-44	2:37	3:29	4:23	5:40	8:00 *
Tables to			mpressi	on		. 89	2	- LI	:10	:58	1:45	2:38	3:30	4:22	5:17	6:33
for such	dives.					36	_		:52	1:4	2:37	8:29	4:21	5:16	6:32	8:52 *
					COUL	' [-10	:53	1:45	7 38	3:30	4:22	5:14	6:09	7:25
				.0.	O, _		-10	:52	1:44	2:37	30	4:21	5:13	6:08	7:24	9:44 *
				titive		1>	:52	1:44	2:37	3:29	21	5:13	6:06	7:00		10:36 *
			200		_	:10	:53	1:45	2:38	:10 :52 :52 1:45 1:45 2:37 2:38 3:29 3:30 4:21 4:22	4 22	5:14	6:07	6:59	7:53	9:10
			tra.		_K>	:52	1:44	2:37	3:29	4:21	13	6:06	6:58	7:52	9:09	11:29 *
				L	:10	:53	1:45	2:38	3:30	4:22	14	6:07	6:59	7:51		10:02
		100		_	.02	1.44	2.31	3.28	4.21	5.13	00	6:58	7:50	8:44		12:21 *
			M	:10	:53	1:45	2:38	3:30 4:21	4:22 5:13	5:14 6:06	07 58	6:59 7:50	7:51 8:42	8:43 9:37	9:38	10:54
			:10	:53	1:45	2:38	3:30	4:21	5:14	6:07	59	7:50	8:43	9:35	10:30	11:46
		N	:52	1:44	2:37	3:29	4:21	5:13	6:06	6:58	50	8:42	9:34	10:29	11:45	14:05
	0	:10	:53	1:45	2:38	3:30	4:22	5:14	6:07	6:59	51	8:43	9:35	10:28	11:22	12:38
	_	:52	1:44	2:37	3:29	4:21	5:13	6:06	6:58	7:50	42	9:34	10:27	11:21		14:58 *
Z	:10	:53	1:45	2:38	3:30	4:22	5:14	6:07	6:59	7:51	43	9:35	10:28	11:20		13:31
	:52	1:44	2:37	3:29	4:21	5:13	6:06	6:58	7:50	8:42	34	10:27	11:19	12:13	13:30	15:50 *
	z	0	N	M	L	K	J	1	н	G	F	E	D	C	В	A
Dive					Re	petitive	Group a	t the Er	nd of the	e Surface	Interv					
Depth	\vee	V	\vee	\vee	\vee	\vee	\vee	\vee	\vee	V		\vee	V	\vee	V	\vee
10				**	**				**		"	427	246	159	101	58
15 20						462	331	257	450 206	298 166	218	164	122	89 62	61	37 27
25	t	t	470	354	286	237	198	167	141	118	98	79	63	48	34	21
30	372	308	261	224	194	168	146	126	108	92	77	63	51	39	28	18
35	245	216	191	169	149	132	116	101	88	75	64	53	43	33	24	15
40	188	169	152	136	122	109	97	85	74	64	55	45	37	29	21	13
45	154	140	127	115	104	93	83	73	64	56	48	40	32	25	18	12
50	131	120	109	99	90	81	73	65	57	49	42	35	29	23	17	11
55	114	105	96	88	80	72 65	65	58 52	51	44	38	32 29	26	20 19	15	10
60 70	101	77	86 71	79 65	72 59	54	58 49	44	46 39	34	35 29	25	20	16	14	8
80	70	85	60	55	51	46	42	38	33	29	25	22	18	14	10	7
90	61	57	52	48	44	41	37	33	29	26	22	19	16	12	9	6
100	54	50	47	43	40	36	33	30	26	23	20	17	14	11	8	5
110	48	45	42	39	36	33	30	27	24	21	18	16	13	10	8	5
120	44	41	38	35	32	30	27	24	22	19	17	14	12	9	7	5
130	40	37	35	32	30	27	25	22	20	18	15	13	11	9	6	4
140	37	34	32	30	27	25	23	21	19	16	14	12	10	8	6	4
150	34	32	30	28	26	23	21	19	17	15	13	11	9	8	6	4
160 170	32	30 28	28 26	26 24	24	22	20 19	18	16	14	13	11	9	7	5	4
180	28	26	25	23	21	19	18	16	14	13	11	10	8	6	5	3
190	26	25	23	22	20	18	17	15	14	12	11	9	8	6	5	3
	_	_			_		al Nitrog				-				-	

^{**} Residual Nitrogen Time cannot be determined using this table (see paragraph 9-9.1 subparagraph 8 for instructions).

[†] Read vertically downward to the 30 fsw repetitive dive depth. Use the corresponding residual nitrogen times to compute the equivalent single dive time. Decompress using the 30 fsw air decompression table.

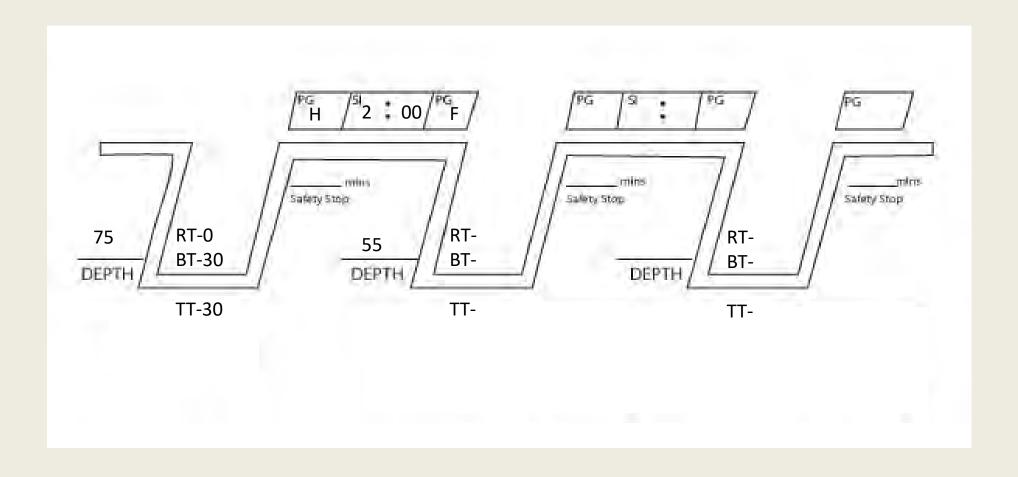


Table 9-8. Residual Nitrogen Time Table for Repetitive Air Dives. :10 Locate the diver's repetitive group designation from his previous dive along the diagonal line 2:20 * above the table. Read horizontally to the interval in which the diver's surface interval :10 1:17 В 1:16 3:36 Repetitive Group at Reginning of Surface Interval :10 :56 2:12 C Next, read vertically downward to the new repetitive group designation. :55 2:11 4:31 Continue downward in this same column to the row that represents :53 :10 1:48 3:04 D the depth of the repetitive dive. The time given at the intersection :52 1:47 3:03 5:23 is residual nitrogen time, in minutes, to be applied to the :10 :53 1:45 2:40 3:56 repetitive dive. :52 1:44 2:39 3:55 6:15 :53 1:45 2:38 3:32 4:49 * Dives following surface intervals longer than :52 1:44 2:37 4:48 7:08 3:31 this are not repetitive dives. Use actual :53 1:45 2:38 3:30 4:24 5:41 1:44 2:37 3:29 4:23 5:40 8:00 * bottom times in the Air Decompression 1:45 2:38 3:30 4:22 Tables to compute decompression 2:37 3:29 4:21 6:32 8:52 * for such dives. 2:38 3:30 4:22 5:14 6:09 7:25 3:29 6:08 4:21 5:13 7:24 9:44 3:30 4:22 5:14 6:07 7:01 8-17 4:21 5:13 6:06 7:00 8:16 10:36 4:22 5:14 6:07 6:59 7:53 9:10 5:13 6:06 6:58 7:52 9:09 11:29 1 :53 1:45 2:38 3:30 4:22 5-14 6:07 6:59 7:51 8:45 10:02 :52 1:44 2:37 3:29 4:21 5:13 6:06 6:58 7:50 8:44 10:01 12:21 * :53 1:45 2:38 3:30 4:22 5:14 6:07 6:59 7:51 8:43 9:38 10:54 M :52 1:44 2:37 3:29 4:21 7:50 8:42 10:53 13:13 5:13 6:06 6:58 9:37 :10 -53 1:45 3:30 4-22 7:51 8:43 10:30 11:46 2-38 5:14 6:07 6:59 9:35 :52 2:37 3:29 7:50 8:42 9:34 11:45 14:05 * 4:21 5:13 6:06 10:29 :10 :53 1:45 2:38 3:30 4:22 5:14 6:07 6:59 7:51 8:43 9:35 10:28 11:22 12:38 0 :52 1:44 2:37 3:29 4:21 5:13 6:06 6:58 7:50 8:42 9:34 10:27 11:21 12:37 14:58 :10 :53 1:45 6:59 2:38 3:30 4:22 5:14 6:07 7:51 8:43 9:35 10:28 11:20 12:14 13:31 Z :52 1:44 2:37 3:29 4:21 5:13 6:06 6:58 7:50 8:42 9:34 10:27 11:19 12:13 13:30 15:50 K н G F E D 0 N J C В A Dive Repetitive Group at the End of the Surface Depth 427 246 101 10 159 15 .. 450 298 164 122 89 61 20 462 257 206 106 83 62 27 331 166 25 354 79 63 48 21 470 286 237 198 167 141 118 30 224 194 108 63 51 28 18 372 308 261 168 146 126 92 35 245 216 191 169 149 132 116 101 88 53 43 33 24 15 40 188 169 152 136 122 109 97 85 74 29 21 13 45 154 140 127 115 104 93 83 73 64 32 25 18 12 131 120 90 65 57 17 109 99 81 73 29 23 11 55 32 26 20 15 10 29 24 19 101 93 86 79 65 58 52 46 14 9 44 70 83 77 71 65 59 54 49 39 29 20 16 12 8 80 70 65 60 55 51 46 42 38 33 29 22 18 14 10 90 61 57 52 48 44 41 37 33 29 26 22 19 16 12 9 100 54 50 47 43 40 36 33 30 26 23 20 17 14 11 8 5 16 13 10 48 45 42 39 36 27 24 18 8 110 33 30 21 120 44 41 38 35 32 30 27 24 22 19 17 14 12 9 5 130 40 37 35 32 30 27 25 22 20 18 15 13 11 140 37 34 32 30 27 25 23 21 19 16 14 12 10 150 34 32 28 17 15 13 30 26 23 21 19 11 9 8 6 32 30 18 16 160 28 26 24 22 14 13 11 20 170 30 28 26 24 22 21 19 17 15 14 12 10 8 5 180 28 26 25 23 21 19 18 16 14 13 11 10 5 3 190 26 25 23 22 20 18 17 15 14 12 Residual Nitrogen Times (Minutes)

Residual Nitrogen Time (RT) in minutes

^{**} Residual Nitrogen Time cannot be determined using this table (see paragraph 9-9.1 subparagraph 8 for instructions).

[†] Read vertically downward to the 30 fsw repetitive dive depth. Use the corresponding residual nitrogen times to compute the equivalent single dive time. Decompress using the 30 fsw air decompression table.

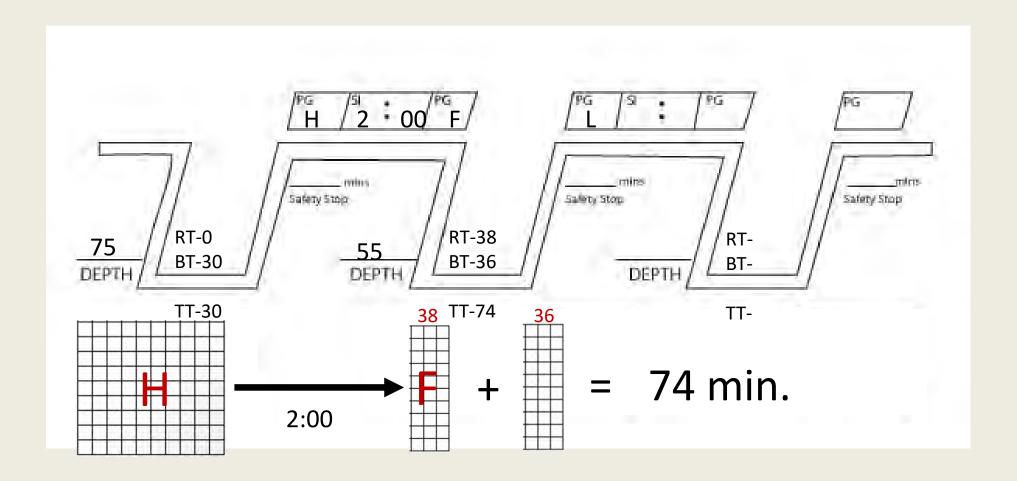
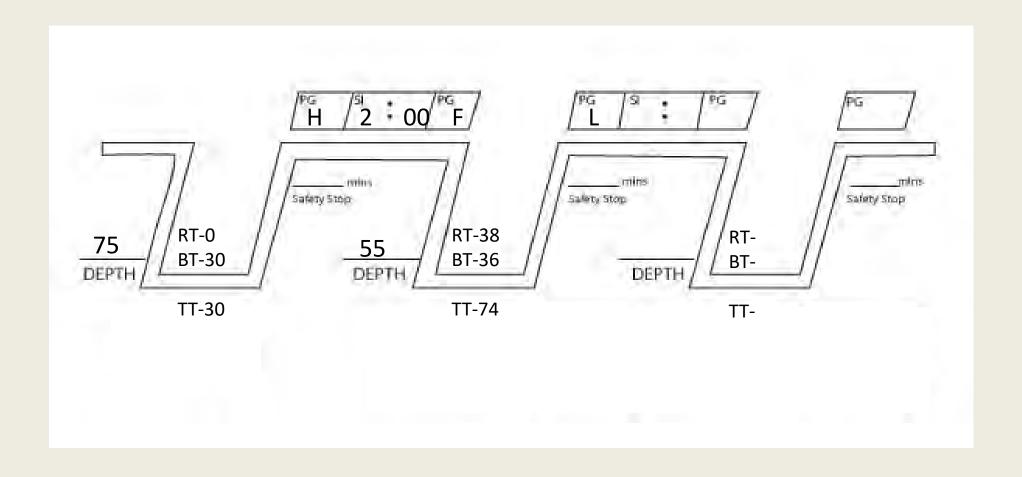


Table 9-7. No-Decompression Limits and Repetitive Group Designators for No-Decompression Air Dives.

Depth	No-Stop	Repetitive Group Designation															
(fsw)	Limit	Α	В	С	D	E	F	G	Н	-1	J	K(L	M	N	0	Z
10	Unlimited	57	101	158	245	426						'	4				
15	Unlimited	36	60	88	121	163	217	297	449								
20	Unlimited	26	43	61	82	106	133	165	205	256	330	461					
25	1102	20	33	47	62	78	97	117	140	166	198	236	2 5	354	469	992	1102
30	371	17	27	38	50	62	76	91	107	125	145	167	1 3	223	260	307	371
35	232	14	23	32	42	52	63	74	87	100	115	131	1 8	168	190	215	232
40	163	12	20	27	36	44	53	63	73	84	95	108	1 1	135	151	163	
45	125	11	17	24	31	39	46	55	63	72	82	92	1 2	114	125		
50	92	9	15	21	28	34	41	48	56	63	71	80	9	92			
55			••	**	^5	~	^~	40			^^	-1	74)			
60	63	7	12	17	22	28	33	39	45	51	57	63	$\overline{}$				
70	48	6	10	14	19	23	28	32	37	42	47	48					
80	39	5	9	12	16	20	24	28	32	36	39						
90	33	4	7	11	14	17	21	24	28	31	33						
100	25	4	6	9	12	15	18	21	25								
110	20	3	6	8	11	14	16	19	20								
120	15	3	5	7	10	12	15										
130	12	2	4	6	9	11	12										
140	10	2	4	6	8	10											
150	8		3	5	7	8											
160	7		3	5	6	7											
170	6			4	6												
180	6			4	5	6											
190	5			3	5												

^{*} Highest repetitive group that can be achieved at this depth regardless of bottom time.

Repetitive Dive Problem I



Dive Profile: Fill in the template for Dive 1- 125 fsw for 9 minutes, Dive 2- 88 fsw for 20 minutes following a 3 hour 25-minute (3:25) Surface Interval. What is your pressure group at the end of the second dive?

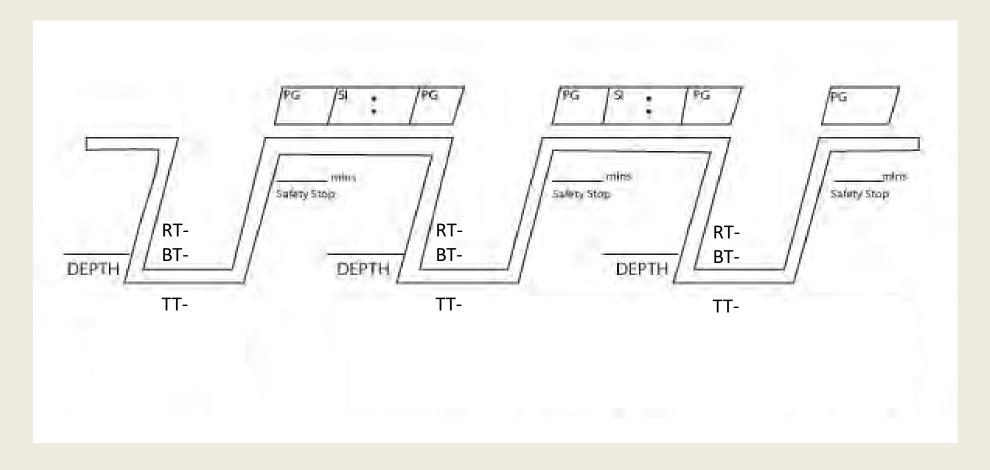


Table 9-7. No-Decompression Limits and Repetitive Group Designators for No-Decompression Air Dives.

Depth	No-Stop						F	Repetit	ive Gro	up De	signat	ion					
(fsw)	Limit	Α	В	С	D	E	F	G	Н	-1	J	K	L	M	N	0	Z
10	Unlimited	57	101	158	245	426	*										
15	Unlimited	36	60	88	121	163	217	297	449								
20	Unlimited	26	43	61	32	106	133	165	205	256	330	461	*				
25	1102	20	33	47	32	78	97	117	140	166	198	236	285	354	469	992	1102
30	371	17	27	38	0	62	76	91	107	125	145	167	193	223	260	307	371
35	232	14	23	32	2	52	63	74	87	100	115	131	148	168	190	215	232
40	163	12	20	27	6	44	53	63	73	84	95	108	121	135	151	163	
45	125	11	17	24	1	39	46	55	63	72	82	92	102	114	125		
50	92	9	15	21	8	34	41	48	56	63	71	80	89	92			
55	74	8	14	19	5	31	37	43	50	56	63	71	74				
60	63	7	12	17	2	28	33	39	45	51	57	63					
70	48	6	10	14	9	23	28	32	37	42	47	48					
80	39	5	9	12	6	20	24	28	32	36	39						
90	33	4	7	11	4	17	21	24	28	31	33						
100	25	4	6	9	2	15	18	21	25								
110	20	3	6	8	1	14	16	19	20								
128	15	3	5	7	0	12	15										
130	12	2	-	-	9	11	12										
140	10	2	4	6	8	10											
150	8		3	5	7	8											
160	7		3	5	6	7											
170	6			4	6												
180	6			4	5	6											
190	5			3	5												

^{*} Highest repetitive group that can be achieved at this depth regardless of bottom time.

Table 9-8. Residual Nitrogen Time Table for Repetitive Air Dives.

bove the	e table.	Read h	orizontal	lly to the	e interva	l in which	ch the d	iver's su	ırface in	terval				B>	:10	1:17
														:10	1:16	3:36
lext, rea	ad vertic	ally dow	vnward t	o the ne	w repet	itive gro	up desi	gnation.					c>	:55	2:11	4:31
	e downw		nis same	e columi	n to the	row that	represe	ents		23			:10	:53	1.48	3:04
	h of the		e dive. 7	The time	given a	at the int	tersection	n		nte.		D	:52	1:47	3.00	5:23
	al nitrog	en time,	in minu	ites, to i	be applie	ed to the	2		.ce	, [E>	.10	:53	1:45	2:40	0.0
epetitive	e dive.							- 1	490			:52	1:44	2:39	3:55	6: 5
Dives f	following	surface	interval	is longe	r than			of S.		F>	:10	:53	1:45	3:31	3:32 4:48	4: 9 7: 8
	not repe		es Use	actual			in	3 ັ ⊢	$\overline{}$:10	:53	1:45	2:38	3:30	4:24	5 1
	imes in t		ecompr	ession			inni		G >	:52	1:44	2:37	3:29	4:23	5:40	8: 10
ables to	compu	te deco	mpressio	on		Be	ð. L	- L	:10	:53	1:45	2:38	3:30	4:22	5:17	6: 3
or such	dives.				_	31			:52	1:44	2:37	3:29	4:21	5:16	6:32	8: 12
					Out	, L		:10	:53	1:45	2:38	3:30	4:22	5:14	6:09	7:25
					Gr_			:52	1:44	2:37	3:29	4:21	5:13	6:08	7:24	9:14
				HITIVE		1>	:50	1:44	2:27	2:38	3:30 4:21	4:22 5:13	5:14	6:07 7:00	7:01 8:16	8: 17 10: 18
			-00	er _		:10	:53	1:45	2:38	3:30	4:22	5:14	6:07	6:59	7:53	9 0
			Se.		K>	:52	1:44	2:37	3:29	:10 :52 :53 1:44 1:45 2:37 2:38 3:29 3:30 4:21 4:22	5:13	6:06	6:58	7:52	9:09	11 9
				1	:10	:53	1:45	2:38	3:30	4:22	5:14	6:07	6:59	7:51	8:45	10:12
				_	:52	1:44	2:31	3:28	4:21	5:13	0:00	6:58	7:50	8:44	10:01	12:21
			M	:10	:53	1:45	2:38	3:30	4:22	5:14	6:07	6:59	7:51	8:43		10: 4
			_	:52	1:44	2:37	3:29	4:21	5:13	6:06	6:58	7:50	8:42	9:37		13: 3
		N	:10	:53	1:45	2:38	3:30 4:21	4:22 5:13	5:14	6:07 6:58	6:59 7:50	7:51 8:42	8:43 9:34	9:35	10:30	11 6 14 5
_	$\overline{}$:10	:53	1:45	2:38	3:30	4:22	5:14	6:07	6:59	7:51	8:43	9:35	10:28	11:22	12 8
	0>	:52	1:44	2:37	3:29	4:21	5:13	6:06	6:58	7:50	8:42	9:34	10:27	11:21	12:37	14 8
Z	:10	:53	1:45	2:38	3:30	4:22	5:14	6:07	6:59	7:51	8:43	9:35	10:28	11:20	12:14	13:31
	:52	1:44	2:37	3:29	4:21	5:13	6:06	6:58	7:50	8:42	9:34	10:27	11:19	12:13	13:30	15: 0
	Z	0	N	М		K	J		н	G	F	E	D	С	В	
Dive	-		1	"			Group a	1 1	1		1 1		1		1	1^1
Depth	V	V	V	V	V	V	V	V	V	V	V	\vee	V	V	V	
10		**		**	**	**	***		***	***	***	427	246	159	101	8
15	**	**	**	**	**	**		**	450	298	218	164	122	89	61	
20		"				462	331	257	206	166	134	106	83	62	44	7
25	†	†	470	354	286	237	198	167	141	118	98	79	63	48	34	_ 1
30	372	308	261	224	194	168	146	126	108	92	77	63	51	39	28	5
35 40	245 188	216 169	191	169	149	132	116 97	101	88 74	75 64	64 55	53 45	43 37	33 29	24	3
45	154	140	127	115	104	93	83	73	64	56	48	40	32	25	18	2
50	131	120	109	99	90	81	73	65	57	49	42	35	29	23	17	1
	114	105	96	88	80	72	65	58	51	44	38	32	26	20	15	b
55	101	93	86	79	72	65	58	52	46	40	35	29	24	19	14	
	83	77	71	65	59	54	49	44	39	34	29	25	20	16	12	9
55		65	60	55	51	46	42	38	33	29	25	22	18	14	10	-
55 60 70 80	70			- 10	- 11					- 11						6
55 60 70 80 90) <u>^</u>			42	40	36	33	30	26	23	20	17	14	11	8	0
55 60 70 80 90	54	50	47	43			30	27	24	21	18	16	13	10	8	5
55 60 70 80 90 100 110	54 48	45	42	39	36	33	27		22	19	17	14	12	9	7	5
55 60 70 80 90 100 110 120	54 48 44	45 41	42 38	39 35	32	30	27	24	20	40	4.5					
55 60 70 80 90 100 110 120 130	54 48 44 40	45 41 37	42 38 35	39 35 32	32 30	30 27	25	22	20	18	15	13	11	9	6	4
55 60 70 80 90 108 110 120 130 140	54 48 44 40 37	45 41 37 34	42 38 35 32	39 35 32 30	32 30 27	30 27 25	25 23	22 21	19	16	14	12	10	8	6	4
55 60 70 80 90 100 110 120 130 140 150	54 48 44 40 37 34	45 41 37 34 32	42 38 35 32 30	39 35 32 30 28	32 30 27 26	30 27 25 23	25 23 21	22 21 19	19 17	16 15	14	12 11	10	8	6	4
55 60 70 80 90 110 120 130 140 150 160	54 48 44 40 37 34 32	45 41 37 34 32 30	42 38 35 32 30 28	39 35 32 30 28 26	32 30 27 26 24	30 27 25 23 22	25 23 21 20	22 21 19 18	19 17 16	16 15 14	14 13 13	12 11 11	10 9 9	8 8 7	6 6 5	4 4
55 60 70 80 90 100 110 120 130 140 150	54 48 44 40 37 34	45 41 37 34 32	42 38 35 32 30	39 35 32 30 28	32 30 27 26	30 27 25 23	25 23 21	22 21 19	19 17	16 15	14	12 11	10	8	6	4

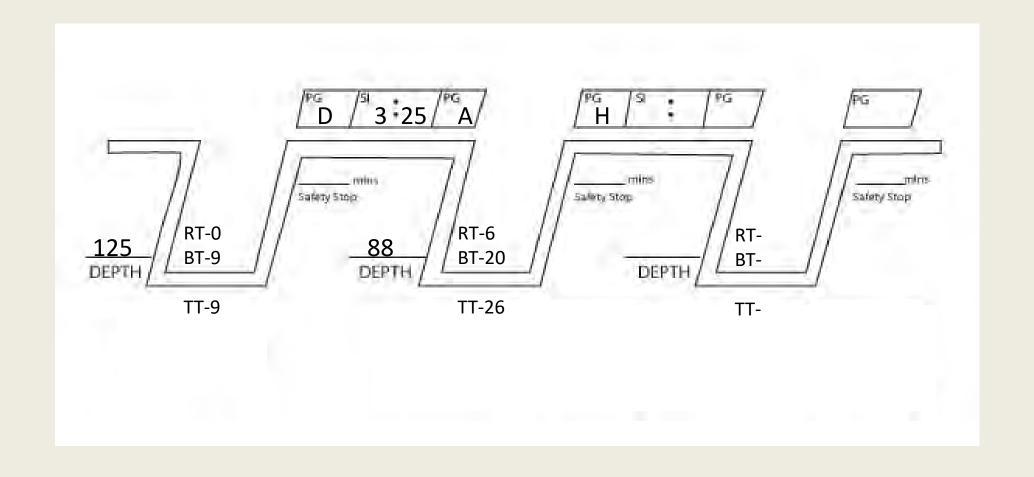
^{**} Residual Nitrogen Time cannot be determined using this table (see paragraph 9-9.1 subparagraph 8 for instructions).

[†] Read vertically downward to the 30 fsw repetitive dive depth. Use the corresponding residual nitrogen times to compute the equivalent single dive time. Decompress using the 30 fsw air decompression table.

Table 9-7. No-Decompression Limits and Repetitive Group Designators for No-Decompression Air Dives.

Depth	No-Stop						F	epetit	ve G	oup De	signat	ion					
(fsw)	Limit	Α	В	С	D	E	F	G	Н) I	J	K	L	M	N	0	Z
10	Unlimited	57	101	158	245	426		1	_								
15	Unlimited	36	60	88	121	163	217	297	44								
20	Unlimited	26	43	61	82	106	133	165	20	256	330	461	*				
25	1102	20	33	47	62	78	97	117	14	166	198	236	285	354	469	992	1102
30	371	17	27	38	50	62	76	91	10	125	145	167	193	223	260	307	371
35	232	14	23	32	42	52	63	74	8	100	115	131	148	168	190	215	232
40	163	12	20	27	36	44	53	63	7	84	95	108	121	135	151	163	
45	125	11	17	24	31	39	46	55	6	72	82	92	102	114	125		
50	92	9	15	21	28	34	41	48		63	71	80	89	92			
55	74	8	14	19	25	31	37	43	. (56	63	71	74				
60	63	7	12	17	22	28	33	39	4	51	57	63					
70	48	6	10	14	19	23	28	32	4	42	47	48					
80	39	5	9	12	16	20	24	28	,	36	39						
90	55	-	-			-	- 21	21	28	31	33						
188	25	4	6	9	12	15	18	21	25								
110	20	3	6	8	11	14	16	19	20								
120	15	3	5	7	10	12	15										
130	12	2	4	6	9	11	12										
140	10	2	4	6	8	10											
150	8		3	5	7	8											
160	7		3	5	6	7											
170	6			4	6												
180	6			4	5	6											
190	5			3	5												

^{*} Highest repetitive group that can be achieved at this depth regardless of bottom time.



Dive Profile- Dive 1- 125 fsw for 9 minutes, after a 3 hour and 25 minute surface interval a dive to 110 fsw for 20 minutes is completed. What is the pressure group after the second dive?

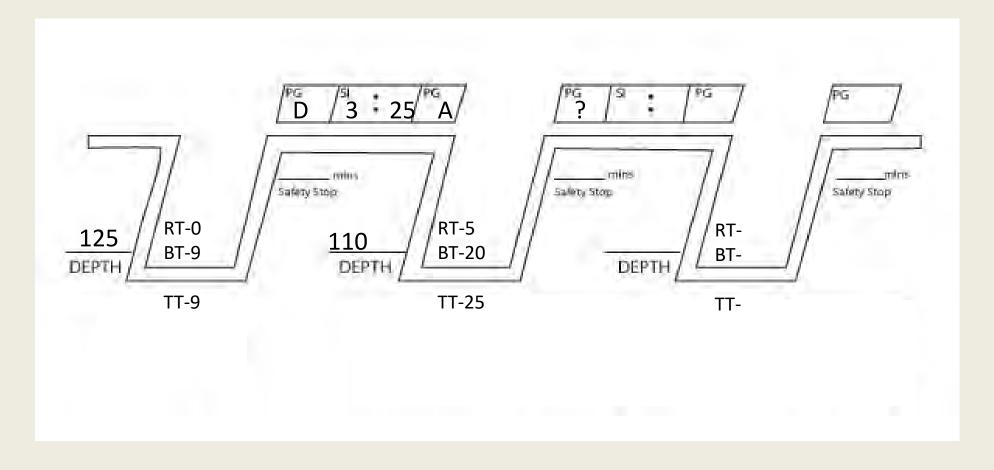


Table 9-7. No-Decompression Limits and Repetitive Group Designators for No-Decompression Air Dives.

Depth	No-Stop						F	Repetit	ive Gro	up De	signat	ion					
(fsw)	Limit	Α	В	С	D	E	F	G	Н	-1	J	K	L	M	N	0	Z
10	Unlimited	57	101	158	245	426	*										
15	Unlimited	36	60	88	121	163	217	297	449								
20	Unlimited	26	43	61	32	106	133	165	205	256	330	461	*				
25	1102	20	33	47	32	78	97	117	140	166	198	236	285	354	469	992	1102
30	371	17	27	38	0	62	76	91	107	125	145	167	193	223	260	307	371
35	232	14	23	32	2	52	63	74	87	100	115	131	148	168	190	215	232
40	163	12	20	27	6	44	53	63	73	84	95	108	121	135	151	163	
45	125	11	17	24	1	39	46	55	63	72	82	92	102	114	125		
50	92	9	15	21	8	34	41	48	56	63	71	80	89	92			
55	74	8	14	19	5	31	37	43	50	56	63	71	74				
60	63	7	12	17	2	28	33	39	45	51	57	63					
70	48	6	10	14	9	23	28	32	37	42	47	48					
80	39	5	9	12	6	20	24	28	32	36	39						
90	33	4	7	11	4	17	21	24	28	31	33						
100	25	4	6	9	2	15	18	21	25								
110	20	3	6	8	1	14	16	19	20								
128	15	3	5	7	0	12	15										
130	12	2	-	-	9	11	12										
140	10	2	4	6	8	10											
150	8		3	5	7	8											
160	7		3	5	6	7											
170	6			4	6												
180	6			4	5	6											
190	5			3	5												

^{*} Highest repetitive group that can be achieved at this depth regardless of bottom time.

Table 9-8. Residual Nitrogen Time Table for Repetitive Air Dives. Locate the diver's repetitive group designation from his previous dive along the diagonal line A 2:20 * above the table. Read horizontally to the interval in which the diver's surface interval :10 1:17 В 1:16 3:36 Repetitive Group at Beginning of Surface Interval :10 :56 2:12 C Next, read vertically downward to the new repetitive group designation. :55 2:11 4:31 1 Continue downward in this same column to the row that represents :10 :53 3:04 D the depth of the repetitive dive. The time given at the intersection is residual nitrogen time, in minutes, to be applied to the :53 1:45 2:40 E 1:44 repetitive dive. :52 2:39 3:55 :53 1:45 :10 2:38 3:32 * Dives following surface intervals longer than :52 1:44 2:37 4:48 3:31 this are not repetitive dives. Use actual :53 1:45 2:38 3:30 4:24 bottom times in the Air Decompression 1:44 2:37 3:29 4:23 5:40 Tables to compute decompression 1:45 2:38 3:30 4:22 5:17 2:37 3:29 4:21 5:16 6:32 for such dives. 2:38 3:30 4:22 5:14 6:09 3:29 4:21 5:13 6:08 7:24 3:30 4:22 6:07 7:01 4:21 5:13 6:06 7:00 8:16 10: 6:59 7:53 4:22 5:14 6:07 6:06 6:58 7:52 9:09 11: 5:13 :53 1:45 6:59 :10 2:38 3:30 4:22 6:07 7:51 8:45 10: 5:14 L :52 1:44 2:37 4:21 7:50 10:01 12: 3:29 5:13 6:06 6:58 8:44 :53 1:45 3:30 4:22 5:14 6:59 :10 2:38 6:07 7:51 8:43 9:38 10: M 10:53 13: :52 1:44 2:37 3:29 4:21 5:13 6:06 6:58 7:50 8:42 9:37 :10 :53 1:45 2:38 3:30 4:22 5:14 6:07 6:59 7:51 8:43 9:35 10:30 11 N :52 1:44 2:37 3:29 4:21 5:13 6:06 6:58 7:50 8:42 9:34 10:29 11:45 14 :10 :53 1:45 2:38 3:30 4:22 5:14 6:07 6:59 7:51 8:43 9:35 10:28 11:22 12 0 :52 1:44 11:21 12:37 2:37 3:29 4:21 5:13 6:06 6:58 7:50 8:42 9:34 10:27 :10 :53 1:45 2:38 3:30 4:22 5:14 6:07 6:59 7:51 8:43 9:35 10:28 11:20 12:14 Z :52 1:44 2:37 3:29 4:21 5:13 6:06 6:58 7:50 8:42 9:34 10:27 11:19 12:13 13:30 E Z 0 N M K J н G F D C В Dive Repetitive Group at the End of the Surface Interval Depth 10 427 246 159 101 .. ** ** 450 15 298 218 164 122 89 61 ** ** ** 20 257 206 134 83 44 462 331 166 106 62 25 470 354 286 237 198 167 141 118 98 79 63 48 34 30 372 261 224 194 168 146 126 108 92 77 63 51 39 28 308 35 149 33 245 216 191 189 132 116 101 88 75 84 53 43 24 40 188 169 152 136 122 109 97 85 74 64 55 45 37 29 21 45 154 140 48 40 25 127 115 104 93 73 56 32 18 83 64 50 131 120 65 57 49 42 35 23 17 109 99 90 81 73 29 55 105 88 58 44 32 114 96 80 72 65 51 38 26 20 15 60 101 93 86 79 72 52 46 40 35 29 19 65 58 24 14 70 83 77 71 65 59 54 49 44 39 34 29 25 20 16 12 80 70 65 60 55 51 46 42 38 33 29 25 22 18 14 10 90 61 57 52 48 44 41 37 33 29 26 22 19 16 12 0 54 50 47 43 40 36 33 30 26 23 20 17 14 11 8 110 44 120 41 38 35 32 30 27 24 22 19 17 14 12

** Residual Nitrogen Time cannot be determined using this table (see paragraph 9-9.1 subparagraph 8 for instructions).

25

23

21

20

19

18

17

22

21

19

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17

16

15

Residual Nitrogen Times (Minutes)

20

19

17

16

15

14

14

40

37

34

32

30

28

26

130

140

150

160

170

180

190

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32

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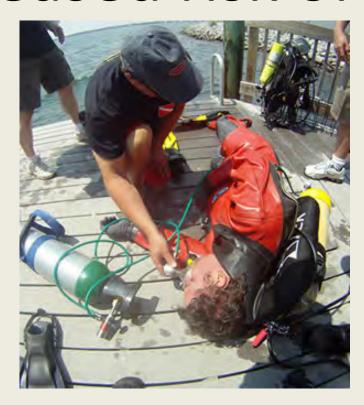
[†] Read vertically downward to the 30 fsw repetitive dive depth. Use the corresponding residual nitrogen times to compute the equivalent single dive time. Decompress using the 30 fsw air decompression table.

Table 9-7. No-Decompression Limits and Repetitive Group Designators for No-Decompression Air Dives.

Depth	No-Stop						F	tepetiti	ve Gro	oup De	signat	ion					
(fsw)	Limit	Α	В	С	D	E	F	G	Н	-1	J	K	L	M	N	0	Z
10	Unlimited	57	101	158	245	426	*										
15	Unlimited	36	60	88	121	163	217	297	449	*							
20	Unlimited	26	43	61	82	106	133	165	205	256	330	461	*				
25	1102	20	33	47	62	78	97	117	140	166	198	236	285	354	469	992	1102
30	371	17	27	38	50	62	76	91	107	125	145	167	193	223	260	307	371
35	232	14	23	32	42	52	63	74	87	100	115	131	148	168	190	215	232
40	163	12	20	27	36	44	53	63	73	84	95	108	121	135	151	163	
45	125	11	17	24	31	39	46	55	63	72	82	92	102	114	125		
50	92	9	15	21	28	34	41	48	56	63	71	80	89	92			
55	74	8	14	19	25	31	37	43	50	56	63	71	74				
60	63	7	12	17	22	28	33	39	45	51	57	63					
70	48	6	10	14	19	23	28	32	37	42	47	48					
80	39	5	9	12	16	20	24	28	32	36	39						
90	33	4	7	11	14	17	21	24	28	31	33						
100	25	4	6	9	12	15	18	21	25								
110	20	-	^	0	"		40	40	20	-()		W	ait,	W	hat	t?
120	15	3	5	7	10	12	15			-				-			
130	12	2	4	6	9	11	12										
140	10	2	4	6	8	10											
150	8		3	5	7	8											
160	7		3	5	6	7											
170	6			4	6												
180	6			4	5	6											

^{*} Highest repetitive group that can be achieved at this depth regardless of bottom time.

Violation of the table = increased risk of DCI



The Diver can either decompress on :

- 1. Air
- 2. Air/O2
- 3. SurDO2





Table 9-9. Air Decompression Table (Continued). (DESCENT RATE 75 FPM—ASCENT RATE 30 FPM)

	Time to First				Stop tir	nes (mi	n) inclu	STOPS ude trav	el time			Total Ascent	Chamber	
Bottom Time (min)	(M:S)	Gas Mix	100	90	80	70	60	first O ₂	stop 40	30	20	Time (M:S)	O ₂ Periods	Repet
130 FSW														
12	4:20	AIR									0	4:20	0	F
		AIR/O ₂									0	4:20		
15	3:40	AIR									3	7:20	0.5	G
		AIR/O ₂									2	6:20		
20	3:40	AIR									8	12:20	0.5	- 1
		AIR/O ₂									5	9:20		
In-Water Air/O ₂	Decompres	sion or Surf	00 ₂ Re	comm	ended -									
25	3:40	AIR									17	21:20	0.5	- /-
		AIR/O ₂									9	13:20		
30	3:20	AIR								2	32	38:00	1	M
		AIR/O ₂								1	17	22:00		
35	3:20	AIR								5	44	53:00	(1)	0
		AIR/O ₂								3	23	30:00		
40	3:20	AIR								6	66	76:00	1.5	Z
		AIR/O ₂								3	30	37:00		
Exceptional Exp	osure: In-W	later Air Dec	compre	ssion -		In-Wa	ater Air	O ₂ Dec	compre	s ion or	SurD	2 Required		
45	3:00	AIR							1	11	84	99:40	1.5	Z
		AIR/O ₂							1	6	33	49:00		
50	3:00	AIR							2	20	118	143:40	2	Z
		AIR/O ₂							2	10	36	57:00		
55	3:00	AIR							4	28	146	181:40	2	Z
		AIR/O ₂							4	14	40	67:00		
60	3:00	AIR							12	28	170	213:40	2.5	Z
		AIR/O ₂							12	14	46	81:00		
Exceptional Exp	osure: In-W	later Air/0 ₂ (Decomp	pressio	n	Su	rDO ₂ l	Require	d					
70	2:40	AIR						1	26	28	235	293:20	3	
		AIR/O ₂						1	26	14	63	117:40		
80	2:40	AIR						12	26	28	297	366:20	3.5	
		AIR/O ₂						12	26	14	79	144:40		
90	2:40	AIR						22	25	28	375	453:20	4	
		AIR/O ₂						22	25	14	95	174:40		
Exceptional Exp	osure: Surl	002												
100	2:20	AIR					6	23	26	38	444	540:00	5	
		AIR/O ₂					6	23	26	20	106	204:20		
120	2:20	AIR					17	24	27	57	534	662:00	6	
		AIR/O ₂					17	24	27	29	130	255:20		
180	2:00	AIR				13	21	45	57	94	658	890:40	9	
		AIR/O ₂				13	21	45	57	46	198	418:00		

SurDO2- O2
chamber periods
is another way
to decrease time
in water. Each
period is
30minutes. The
first 15 minutes
is spent at 50
fsw, the
remainder is
either at 40 fsw
or 30 fsw.



DECOMPRESSION TABLE WORKSHOP DEFINITIONS

The following terms are frequently used when conducting compressed gas operations and hyperbaric oxygen therapy.

1. Decompression table: A structured set of depth and time limits that the

diver follows to reduce the risk of decompression

sickness while SCUBA diving.

2. Bottom time: Bottom time begins when the diver leaves

the surface and ends when he leaves the bottom for his ascent to the surface. Bottom time is measured

in minutes.

3. No decompression limit: The maximum amount of time that a diver can

spend at a given depth and still ascend directly to the surface without taking decompression stops.

4. Decompression stop: A specified depth at which the diver stops for a

specified amount of time during ascent to allow elimination of excess nitrogen from a dive that

exceeds the no decompression limit.

5. Residual nitrogen: Excess nitrogen that remains dissolved in the divers

tissues after surfacing from a dive.

6. Repetitive group designator: A letter used to indicate the amount of residual

nitrogen that remains dissolved in a divers tissues

after surfacing from a dive

7. Surface interval: The time a diver spends on the surface

between dives. The time begins as soon as he surfaces and ends when he begins his next descent.

8. Repetitive dive Any dive conducted while the divers tissues still

contain residual nitrogen from a previous dive.

9. Residual nitrogen time: The time in minutes that must be added to the actual

bottom time of a repetitive dive to compensate for the residual nitrogen that remains dissolved in the

divers tissues from a previous dive.

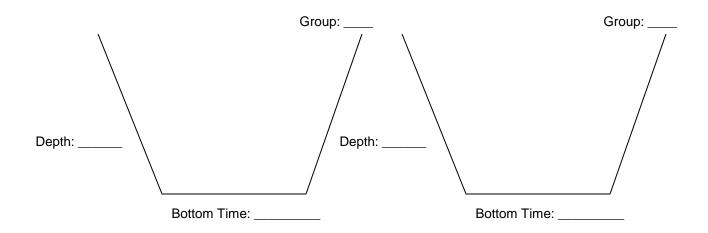
10. Equivalent single dive time: A physiologic bottom time that is the sum of the

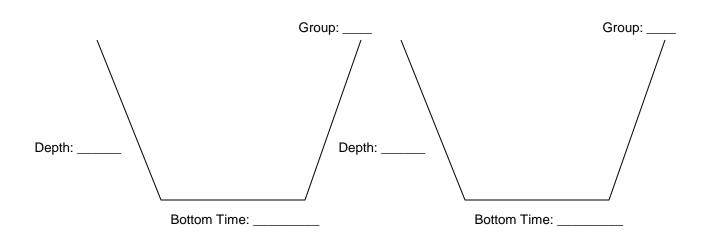
residual nitrogen time plus the actual bottom time

of a repetitive dive.

Dive-Decompression Profiles

1. No Stage Decompression Dive





Dive-Decompression Profiles

2. Repetitive Dive: No Staged Decompression

