for consultation. The purpose of this section is to identify the procedures and necessary equipment required of nonmedical personnel.

DCS treatment procedures have emerged from the need to provide medical care during the development of decompression tables. These procedures generally presupposed the rapid availability of a treatment chamber and a high degree of experience on the part of all participants. Because diagnosis under these circumstances occurs soon after the dive, it was satisfactory to merely recompress the diver in order to dissolve the bubbles that were causing the symptoms.

The emergence of sport diving introduced new complications to the treatment of decompression sickness. Unsophisticated divers were often struck with severe DCS because they grossly disobeyed the appropriate decompression schedule. In addition, they were often afflicted for long periods before reaching treatment facilities. These patients present the physician with disseminated gas space and severe tissue damage that occurs because of mechanical distention of tissues or the resulting long-term hypoxia. The symptoms are caused by massive intravascular bubbles, or their sequelae.

Tunnel workers and commercial diving fishermen often present the same kind of complex disease picture when presented for treatment because they are reluctant to miss work, or are long distances from a treatment center. When DCS occurs in divers undergoing a saturation decompression, special procedures are required because they are often struck at depths below the prescribed treatment depths.

1. *Diagnosis and Emergency Action during Transportation to a Recompression Chamber*

Diagnosis of decompression sickness has been already described in this chapter. The goal of the diagnosis is to decide, if at all possible, whether the diver suffers from pain-only bends, severe bends, or other form of pressure-induced trauma (air embolism, barotrauma, bruise, broken bones, etc.). This is not only important in deciding which kind of emergency care to apply, but may be decisive in deciding where to go for treatment. During diagnosis the patient should lie down with the legs higher than the head. Any loss of heart beat or respiration should be immediately dealt with by standard first aid methods. THESE PROCEDURES SHOULD ALWAYS BE CONTINUED, UNLESS A PHYSICIAN CERTIFIES THAT THE PATIENT IS DEAD!

Whenever the patient is moved, the head should be kept lower than the feet to minimize the chance of a brain air embolism occurring as a sequelae to severe DCS. Avoid flying the patient at any substantial altitude, as this lower pressure can adversely affect the patient's condition. In all cases of DCS, recompression therapy is necessary no matter how long it takes to reach a chamber since adverse sequelae may occur from residual tissue damage.

Recompression of a patient by reimmersion in the sea should be avoided. The most minimal treatment schedule available requires 6 hr under pressure and very few divers can stand this exposure.

If oxygen is available, it should be used on the patient (at the very least, it enhances inert gas washout).

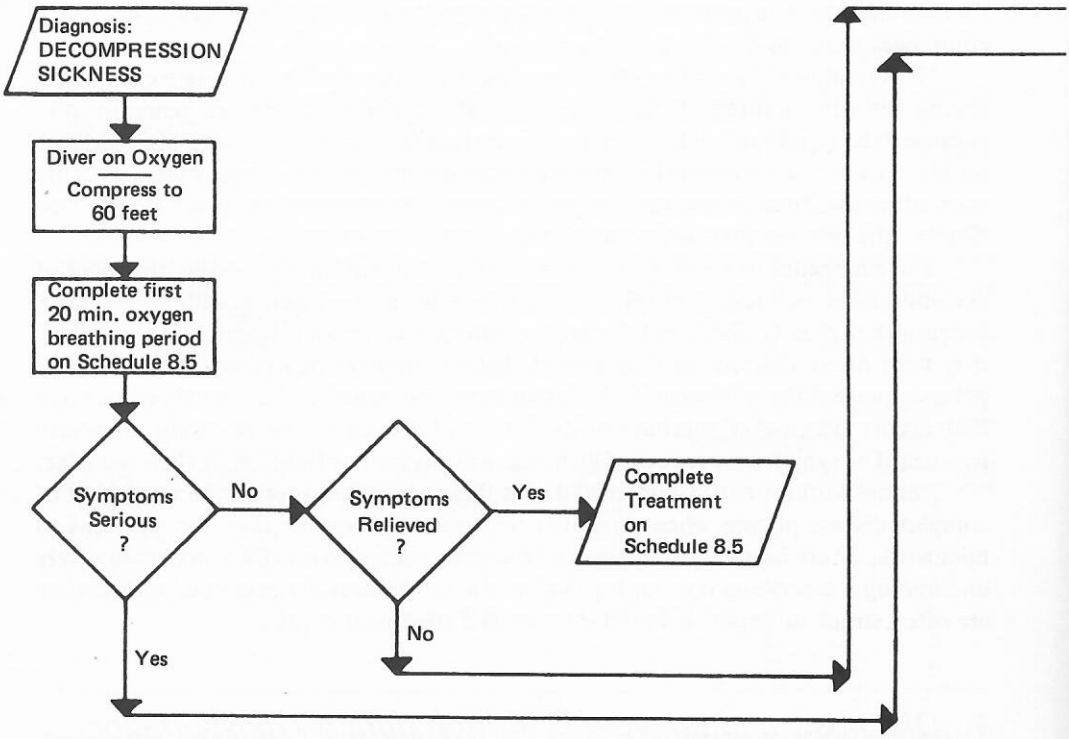


Figure VII-25. Logic chart for patients who are suffering "pain-only" Type I decompression sickness (U. S. Navy 1973).

2. *Recompression Treatment*

While most treatment facilities have their own trained personnel, this section will provide details on the treatment procedures as an aid to designing such facilities and to planning a dive, and in the event sufficient trained personnel are not available.

A family of treatment tables has been designed to accommodate different treatment facilities and the different severities of DCS. All treatments start by compressing the patient (and, if there is room, a tender) to one of two fixed pressures (60 or 165 fsw). If oxygen is available from surface-supplied bottles, tables should be selected to utilize O_2 breathing. Treatment success has improved markedly when oxygen breathing was used. The major benefit of recommended treatment tables is that the subsequent decompression phase has been thoroughly tested.

Figure VII-25 is a logic chart for the treatment of patients suffering from pain-only bends, where a facility for oxygen breathing is available. The treatment schedules noted (Schedules 8.4–8.6) are included at the end of this chapter. Table VII-15 lists the general rules for carrying out such treatments.

If there is a recurrence of symptoms during the decompression, use Figure VII-26 to guide in the subsequent recompression and treatment. If symptoms recur

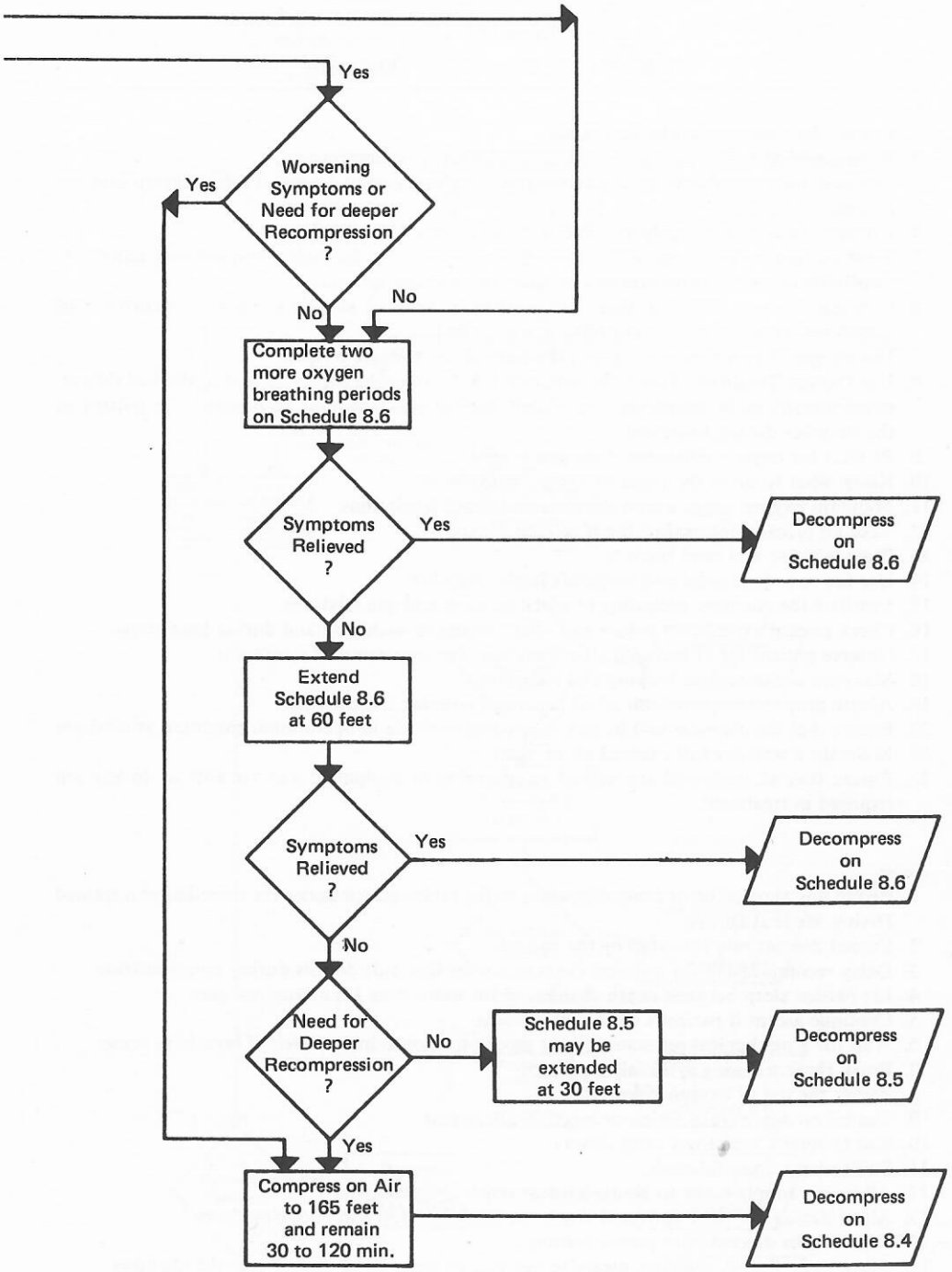


Figure VII–25—*Cont.*

Table VII-15
Rules for Recompression Treatment

Always

1. Follow the treatment tables accurately
2. Have qualified tender in chamber at all times during recompression
3. Maintain the normal descent and ascent rates; maintain rapid descent if serious symptoms are present
4. Examine patient thoroughly at depth of relief or treatment depth
5. Treat an unconscious patient for air embolism or serious decompression sickness unless the possibility of such a condition can be ruled out without question
6. Consider the use of 80% helium–20% oxygen in cases of serious symptoms, recurrence of symptoms, or when patient has difficulty breathing
7. Use oxygen if available; ensure that the patient can tolerate oxygen.
8. Use Oxygen Treatment Tables (Schedules 8.5–8.8) under the supervision of a Medical Officer, either directly or by telephone; a qualified medical assistant must accompany the patient in the chamber during treatment
9. Be alert for oxygen poisoning if oxygen is used
10. Know what to do in the event of oxygen convulsion
11. Maintain oxygen usage within the time and depth limitations
12. Take all precautions against fire if oxygen is used
13. Provide water and sand buckets
14. Use fire-retardant paint and materials in the chamber
15. Ventilate the chamber according to specified rates and gas mixtures
16. Check patient's condition before and after coming to each stop and during long stops
17. Observe patient for at least 6 h after treatment for recurrence of symptoms
18. Maintain accurate time-keeping and recording
19. Assure proper decompression of all personnel entering the chamber
20. Ensure that the chamber and its auxiliary equipment are in operational condition at all times
21. Maintain a well-stocked medical kit at hand
22. Ensure that all personnel are trained in operation of equipment and are able to do any job required in treatment

Never

1. Permit any shortening or other alteration to the tables except under the direction of a trained Diving Medical Officer
2. Exceed descent rate tolerated by the patient
3. Delay recompression for physical examination or first aid; do this during recompression
4. Let patient sleep between depth changes or for more than 1 h at any one stop
5. Continue ascent if patient's condition worsens
6. Wait for a mechanical resuscitator; use mouth-to-mouth immediately if breathing ceases
7. Break rhythm during artificial respiration
8. Permit the use of oxygen below 60 ft
9. Use oil on any oxygen fitting or piece of equipment
10. Fail to report symptoms early (diver)
11. Fail to treat doubtful cases
12. Allow gas supply tanks to be depleted or reach low capacity
13. Allow damage to door seals and dogs; use minimum force in "dogging down"
14. Leave doors dogged after pressurization
15. Allow open flames, matches, cigarette lighters, or pipes to be carried into the chamber
16. Permit electrical appliances to be used during oxygen-breathing or when chamber atmosphere is compressed air

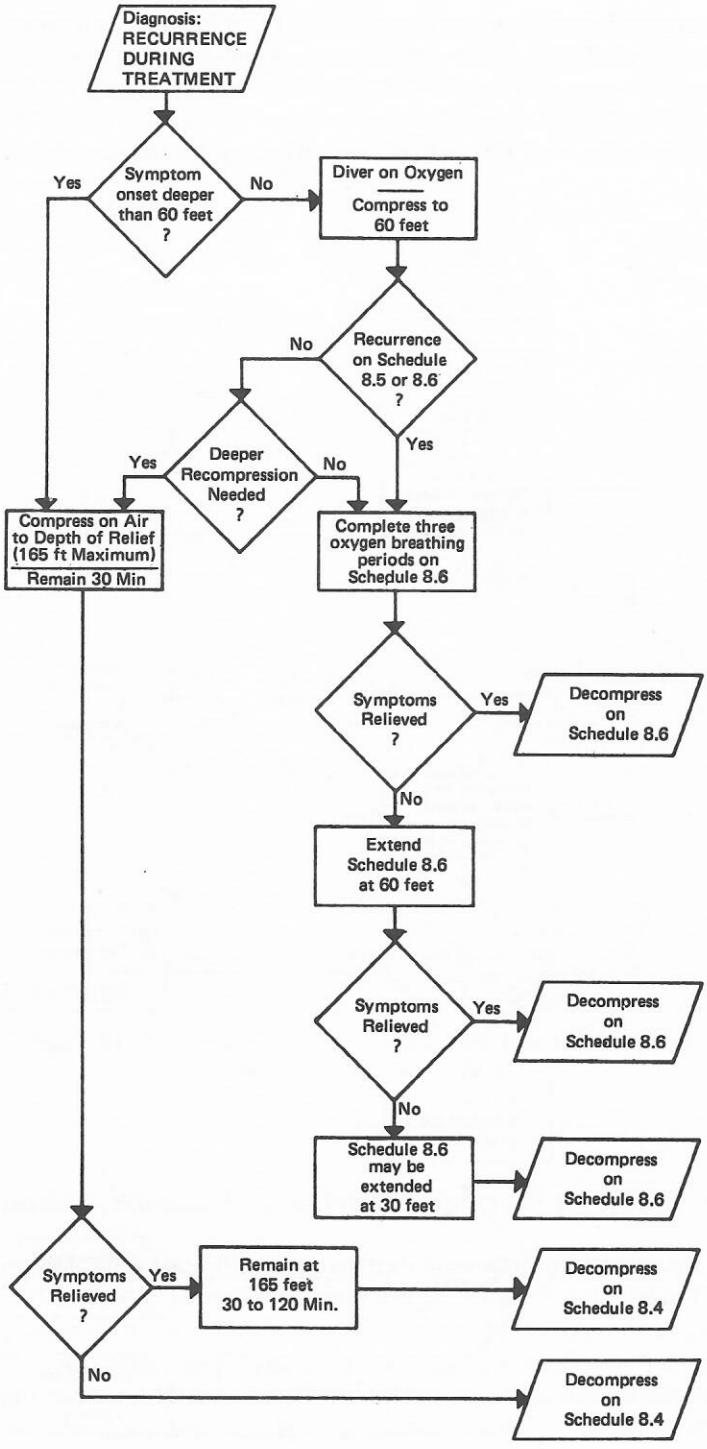


Figure VII-26. Recurrence during treatment (U. S. Navy 1973).

after the treatment is complete, use Figure VII-27 for guiding the subsequent treatment. After treatment, always keep the patient under observation for at least 6 hr.

In the event oxygen is not available for treatment of pain-only decompression sickness, use Schedule 8.1 if symptoms are relieved by the time the patient is at 66 ft. Schedule 8.2 is to be used for such patients when symptoms are relieved at depths

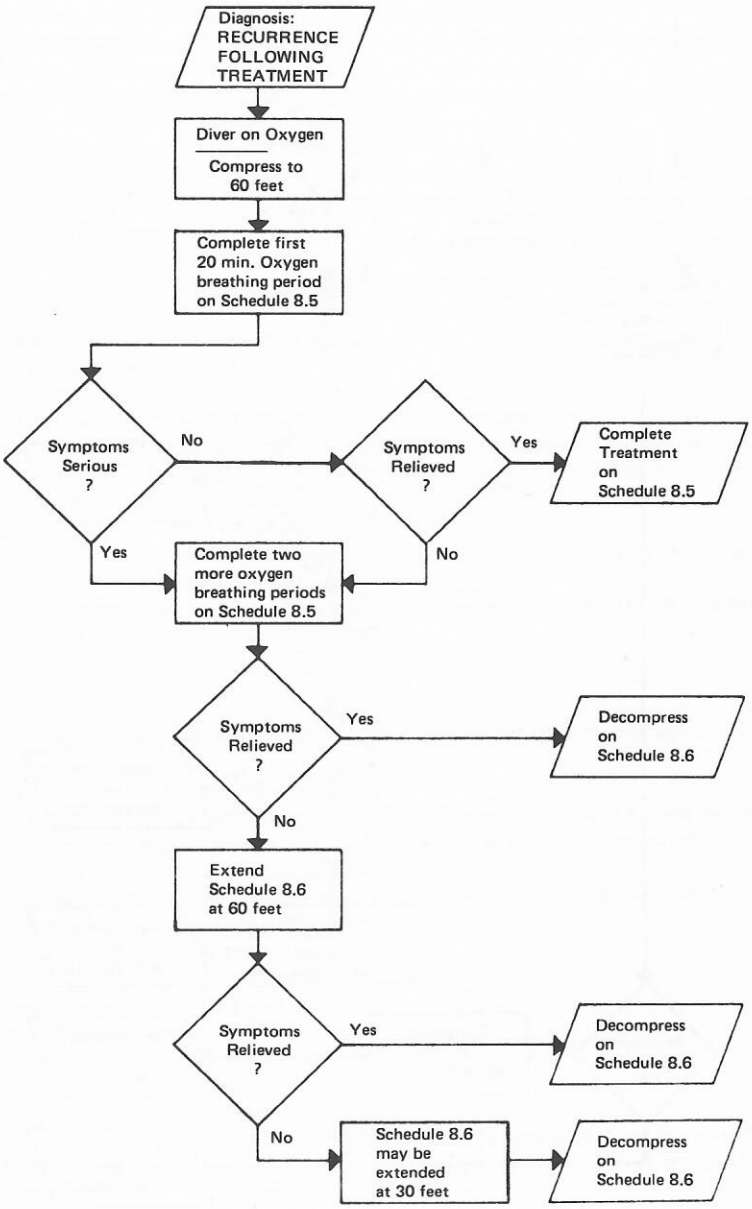


Figure VII-27. Recurrence following treatment (U. S. Navy 1973).

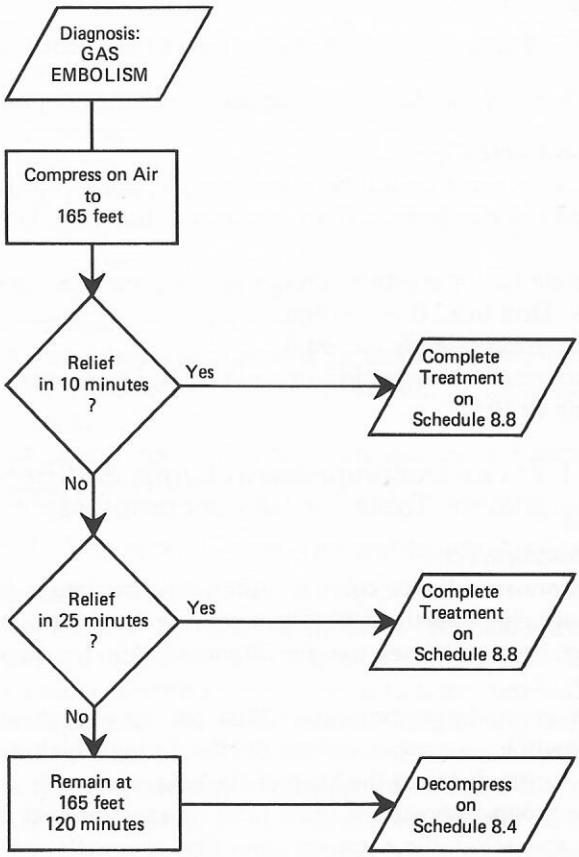


Figure VII-28. Treatment of gas embolism and Type II decompression sickness (U. S. Navy 1973).

greater than 66 ft. Schedule 8.3 is useful when symptoms are relieved within 30 min at 165 ft.

For patients who are suffering severe decompression sickness or are suspected of having an air embolus, the preferred treatment procedure is outlined in Figure VII-28. These schedules all require oxygen breathing at depth. If oxygen is not available, use Schedule 8.4. Any recurrence of symptoms is treated as in Figure VII-26 and VII-27.

Patients suffering severe decompression sickness often experience residual symptoms due to tissue damage and hypoxia. These patients should be attended by a physician.

F. *Decompression Schedules*

1. *U. S. Navy Decompression Schedules for Subsaturation Air Diving*

(See Table VII-9 in text for a guide to the use of these schedules.)

a. Schedule 1.1: U. S. Navy Standard Air Decompression Table

(i) Special Instructions

1. Rate of ascent is not critical between stops for stops of 50 ft or less.
2. If dive was particularly cold or strenuous, use next longer bottom time schedule.
3. See Schedule 1.2 for repetitive groups in no-decompression dives.

(ii) Example. Dive to 82 ft for 36 min.

1. Select next greater depth, i.e., 90 ft.
2. Select next greater bottom time opposite 90 ft, i.e., 40 min.
3. Stop 7 min at 10 ft.

b. Schedule 1.2: No-Decompression Limits and Repetitive Group Designation Table for No-Decompression Air Dives

(i) Special Instructions

1. No-decompression limits column: Allowable maximum bottom time that permits surfacing directly at 60 ft/min with no decompression stops.
2. For longer bottom times use the Standard Air Decompression Schedule (Schedule 1.1).
3. Repetitive group designation table: Time periods in each vertical column are the maximum exposures at various depths during which a diver will remain within the group listed at the head of the column.
4. Repetitive group designation: Enter table on exact or next greater depth than exposure and select the exposure time that is exactly the same as or next greater than the actual exposure time. Read the group designation (letter) at the top of the column for the next dive.
5. Exposure times beyond 5 hr and less than 40-ft depth are beyond field requirements of this table.

(ii) Example. A dive to 32 ft for 45 min.

1. Select next greater depth, i.e., 35 ft.
2. Select next greater exposure time than 45 min, i.e., 50 min.
3. Read designation at top of column, i.e., group E.

c. Schedule 1.3: Surface Interval Credit Table for Air Decompression Dives

(i) Special Instructions.

1. Surface interval time in the schedule is in hours and minutes (7:59 = 7 hr and 59 min).

2. Surface interval must be at least 10 min.
3. Repetitive group designation after surface interval: Enter the schedule on the diagonal slope using the group designation from previous dive. Read horizontally until the actual surface interval is equal to or between the interval shown in the schedule. Read the new group designation at the top of the column.
4. Dives following surface intervals of more than 12 hr are not repetitive dives. Use actual bottom times in the Standard Air Decompression Schedules to compute decompression for such dives.

(ii) Example. Find new group designation after dive to 110 ft for 30 min and a time on the surface of 1 hr and 30 min.

1. The previous repetitive group from the last column of the 110/30 schedule of the Standard Air Decompression Table is J.
2. Locate "J" in the diagonal column.
3. Follow the schedule across horizontally.
4. The 1 hr, 30 min interval lies between the times 1:20 and 1:47.
5. Diver has lost sufficient inert gas to place him in the group at the top of vertical column G.
6. Use this new group designation to determine residual nitrogen time to be credited toward repetitive dive.

d. Schedule 1.4: Repetitive Dive Timetable for Air Dives

(i) Special Instructions

1. Bottom times listed in this schedule are called "residual nitrogen times."
2. Residual nitrogen time is the time a diver is to consider he has already spent on bottom when a repetitive dive is started to a specific depth.
3. Residual nitrogen time: Enter the schedule horizontally with the repetitive group from the surface interval credit table. Read directly the bottom time to be added to the repetitive dive in the depth column for that dive.

(ii) Example. The group designation from the surface interval credit table from a previous dive is H. How much bottom time must be added (residual nitrogen time) for a repetitive dive to 110 ft?

1. Enter the schedule horizontally at H.
2. Read in the 110-ft depth column the residual nitrogen to be added: 27 min.
3. The schedule shows that one must start a dive to 110 ft as though he had already been on the bottom 27 min.
4. Use the Standard Air Decompression Schedule or the No-Decompression Schedule to determine dive schedule for repetitive dive.

e. Schedule 1.5: U. S. Navy Standard Air Decompression Table for Exceptional Exposures

Special Instructions. The schedule includes only schedules of decompression for exceptional or emergency cases. The great demands placed on a diver's endurance by emergencies necessitating the use of this schedule are such that complete assurance of success of the decompression schedules is impossible.

Never follow a dive covered by this schedule with a repetitive dive. The Diving Officer must weigh the need for any dive in this schedule for exceptional exposures against the increased danger and demands on the diver's physical endurance.

f. Schedule 1.6: Surface Decompression Table Using Oxygen

Special Instructions. The use of surface decompression provides the advantages of added comfort and security for the diver. Routine use of this technique requires a recompression chamber equipped with proper oxygen-breathing equipment. Use of this schedule may be indicated in certain emergency situations where a surface interval must come between the dive and the major part of decompression. Although it is possible for the decompression period following the surface interval to be in the water, recompression in a chamber is always preferable.

In the event of oxygen toxicity symptoms or failure of the oxygen supply, decompress according to Schedule 1.8 disregarding time spent on oxygen. Use of this technique exposes the driver to a brief surface interval between his leaving the water and his attaining the scheduled decompression stop depth in the recompression chamber. The interval must be as short as possible.

When surface decompression is to be used, this schedule is employed in place of the standard Air Decompression Schedule (Schedule 1.1).

Column 3: time of ascent to the first stop or to the surface at a rate of 25 ft/min.
Column 4 (water stops): time spent at tabulated stops using air. If no stops are required, ascend to surface at 25 ft/min. When stops are required, use a 25 ft/min ascent rate to first stop. Take an additional minute between stops. Ascend from 30-ft stop to surface at 30 ft/min.
Column 5 (surface interval): Surface interval shall not exceed 5 min and includes 1 min ascent from 30-ft stop, 3 min 30 sec for landing the diver on deck and undressing, and time of descent from surface to 40 ft in recompression chamber (30 secs).
Column 6: During the period of oxygen breathing the chamber should be ventilated unless an oxygen elimination system is used.

g. Schedule 1.7: Surface Decompression Table Using Air for Air Diving

(i) Special Instructions. This schedule may be used for surface decompression from an air dive in the event that oxygen toxicity or failure of the oxygen supply prevents the use of Schedule 1.6. When surface decompression on air is to be used, this schedule is employed in place of the Standard Air Decompression Schedule (Schedule 1.1). If this schedule is used as a result of oxygen toxicity problems with Schedule 1.6, disregard previous time spent on oxygen when decompressing according to this schedule. There is no surface decompression schedule for use following a dive on the Standard Air Decompression Schedule for Exceptional Exposures (Schedule 1.5).

1. All ascent and descent rates are 60 ft/min.

Schedule 1.1
U. S. Navy Standard Decompression Table (U. S. Navy 1971)

Depth	Bottom time, min	Time to first stop, min:sec	Decompression stops, ft					Total ascent, min:sec	Repetitive group
			50	40	30	20	10		
40	200	0:00					0	0:40	(*)
	210	0:30					2	2:40	N
	230	0:30					7	7:40	N
	250	0:30					11	11:40	O
	270	0:30					15	15:40	O
	300	0:30					19	19:40	Z
50	100	0:00					0	0:50	(*)
	110	0:40					3	3:50	L
	120	0:40					5	5:50	M
	140	0:40					10	10:50	M
	160	0:40					21	21:50	N
	180	0:40					29	29:50	O
	200	0:40					35	35:50	O
	220	0:40					40	40:50	Z
	240	0:40					47	47:50	Z
60	60						0	1:00	(*)
	70	0:50					2	3:00	K
	80	0:50					7	8:00	L
	100	0:50					14	15:00	M
	120	0:50					26	27:00	N
	140	0:50					39	40:00	O
	160	0:50					48	49:00	Z
	180	0:50					56	57:00	Z
	200	0:40				1	69	71:00	Z
70	50						0	1:10	(*)
	60	1:00					8	9:10	K
	70	1:00					14	15:10	L
	80	1:00					18	19:10	M

Schedule 1.1—*Cont.*

Depth	Bottom time, min	Time to first stop, min:sec	Decompression stops, ft					Total ascent, min:sec	Repetitive group
			50	40	30	20	10		
	90	1:00					23	24:10	N
	100	1:00					33	34:10	N
	110	0:50				2	41	44:10	O
	120	0:50				4	47	52:10	O
	130	0:50				6	52	59:10	O
	140	0:50				8	56	65:10	Z
	150	0:50				9	61	71:10	Z
	160	0:50				13	72	86:10	Z
	170	0:50				19	79	99:10	Z
80	40						0	1:20	(*)
	50	1:10					10	11:20	K
	60	1:10					17	18:20	L
	70	1:10					23	24:20	M
	80	1:00				2	31	34:20	N
	90	1:00				7	39	47:20	N
	100	1:00				11	46	58:20	O
	110	1:00				13	53	67:20	O
	120	1:00				17	56	74:20	Z
	130	1:00				19	63	83:20	Z
	140	1:00				26	69	96:20	Z
	150	1:00				32	77	110:20	Z
90	30						0	1:30	(*)
	40	1:20					7	8:30	J
	50	1:20					18	19:30	L
	60	1:20					25	26:30	M
	70	1:10				7	30	38:30	N
	80	1:10				13	40	54:30	N
	90	1:10				18	48	67:30	O
	100	1:10				21	54	76:30	Z
	110	1:10				24	61	86:30	Z

	120	1:10		32	68	101:30	Z
	130	1:00	5	36	74	116:30	Z
100	25				0	1:40	(*)
	30	1:30			3	4:40	I
	40	1:30			15	16:40	K
	50	1:20		2	24	27:40	L
	60	1:20		9	28	38:40	N
	70	1:20		17	39	57:40	O
	80	1:20		23	48	72:40	O
	90	1:10	3	23	57	84:40	Z
	100	1:10	7	23	66	97:40	Z
	110	1:10	10	34	72	117:40	Z
	120	1:10	12	41	78	132:40	Z
110	20				0	1:50	(*)
	25	1:40			3	4:50	H
	30	1:40			7	8:50	J
	40	1:30		2	21	24:50	L
	50	1:30		8	26	35:50	M
	60	1:30		18	36	55:50	N
	70	1:20	1	23	48	73:50	O
	80	1:20	7	23	57	88:50	Z
	90	1:20	12	30	64	107:50	Z
	100	1:20	15	37	72	125:50	Z
120	15				0	2:00	(*)
	20	1:50			2	4:00	H
	25	1:50			6	8:00	I
	30	1:50			14	16:00	J
	40	1:40		5	25	32:00	L
	50	1:40		15	31	48:00	N
	60	1:30	2	22	45	71:00	O
	70	1:30	9	23	55	89:00	O
	80	1:30	15	27	63	107:00	Z
	90	1:30	19	37	74	132:00	Z
	100	1:30	23	45	80	150:00	Z
130	10				0	2:10	(*)

Schedule 1.1—*Cont.*

Depth	Bottom time, min	Time to first stop, min:sec	Decompression stops, ft					Total ascent, min:sec	Repetitive group
			50	40	30	20	10		
	15	2:00					1	3:10	F
	20	2:00					4	6:10	H
	25	2:00					10	12:10	J
	30	1:50				3	18	23:10	M
	40	1:50				10	25	37:10	N
	50	1:40			3	21	37	63:10	O
	60	1:40			9	23	52	86:10	Z
	70	1:40			16	24	61	103:10	Z
	80	1:30		3	19	35	72	131:10	Z
	90	1:30		8	19	45	80	154:10	Z
140	10						0	2:20	(*)
	15	2:10					2	4:20	G
	20	2:10					6	8:20	I
	25	2:00				2	14	18:20	J
	30	2:00				5	21	28:20	K
	40	1:50			2	16	26	46:20	N
	50	1:50			6	24	44	76:20	O
	60	1:50			16	23	56	97:20	Z
	70	1:40		4	19	32	68	125:20	Z
	80	1:40		10	23	41	79	155:20	Z
150	5						0	2:30	C
	10	2:20					1	3:30	E
	15	2:20					3	5:30	G
	20	2:10				2	7	11:30	H
	25	2:10				4	17	23:30	K
	30	2:10				8	24	34:30	L
	40	2:00			5	19	33	59:30	N
	50	2:00			12	23	51	88:30	O
	60	1:50		3	19	26	62	112:30	Z
	70	1:50		11	19	39	75	146:30	Z

	80	1:40	1	17	19	50	84	173:30	Z
160	5						0	2:40	D
	10	2:30					1	3:40	F
	15	2:20				1	4	7:40	H
	20	2:20				3	11	16:40	J
	25	2:20				7	20	29:40	K
	30	2:10			2	11	25	40:40	M
	40	2:10			7	23	39	71:40	N
	50	2:00		2	16	23	55	98:40	Z
	60	2:00		9	19	33	69	132:40	Z
170	5						0	2:50	D
	10	2:40					2	4:50	F
	15	2:30				2	5	9:50	H
	20	2:30				4	15	21:50	J
	25	2:20			2	7	23	34:50	L
	30	2:20			4	13	26	45:50	M
	40	2:10		1	10	23	45	81:50	O
	50	2:10		5	18	23	61	109:50	Z
	60	2:00	2	15	22	37	74	152:50	Z
180	5						0	3:00	D
	10	2:50					3	6:00	F
	15	2:40				3	6	12:00	I
	20	2:30			1	5	17	26:00	K
	25	2:30			3	10	24	40:00	L
	30	2:30			6	17	27	53:00	N
	40	2:20		3	14	23	50	93:00	O
	50	2:10	2	9	19	30	65	128:00	Z
190	5						0	3:10	D
	10	2:50				1	3	7:10	G
	15	2:50				4	7	14:10	I
	20	2:40			2	6	20	31:10	K
	25	2:40			5	11	25	44:10	M
	30	2:30		1	8	19	32	63:10	N
	40	2:30		8	14	23	55	103:10	O

Schedule 1.2

No-Decompression Limits and Repetitive Group Designation Table for No-Decompression Air Dives (U. S. Navy 1971)

Depth, ft	No-decompression limit, min	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
10		60	120	210	300											
15		35	70	110	160	225	350									
20		25	50	75	100	135	180	240	325							
25		20	35	55	75	100	125	160	195	245	315					
30		15	30	45	60	75	95	120	145	170	205	250	310			
35	310	5	15	25	40	50	60	80	100	120	140	160	190	220	270	310
40	200	5	15	25	30	40	50	70	80	100	110	130	150	170	200	
50	100		10	15	25	30	40	50	60	70	80	90	100			
60	60		10	15	20	25	30	40	50	55	60					
70	50		5	10	15	20	30	35	40	45	50					
80	40		5	10	15	20	25	30	35	40						
90	30		5	10	12	15	20	25	30							
100	25		5	7	10	15	20	22	25							
110	20			5	10	13	15	20								
120	15			5	10	12	15									
130	10			5	8	10										
140	10			5	7	10										
150	5			5												
160	5				5											
170	5				5											
180	5				5											
190	5				5											

Schedule 1.3

Surface Interval Credit Table for Air Decompression Dives[a] (U. S. Navy 1971)

Z	O	N	M	L	K	J	I	H	G	F	E	D	C	B	A
0:10	0:23	0:35	0:49	1:03	1:19	1:37	1:56	2:18	2:43	3:11	3:46	4:30	5:28	6:57	10:00
0:22	0:34	0:48	1:02	1:18	1:36	1:55	2:17	2:42	3:10	3:45	4:29	5:27	6:56	10:05	12:00[b]
O	0:10	0:24	0:37	0:52	1:08	1:25	1:44	2:05	2:30	3:00	3:34	4:18	5:17	6:45	9:55
	0:23	0:36	0:51	1:07	1:24	1:43	2:04	2:29	2:59	3:33	4:17	5:16	6:44	9:54	12:00[b]
	N	0:10	0:25	0:40	0:55	1:12	1:31	1:54	2:19	2:48	3:23	4:05	5:04	6:33	9:44
		0:24	0:39	0:54	1:11	1:30	1:53	2:18	2:47	3:22	4:04	5:03	6:32	9:43	12:00[b]
		M	0:10	0:26	0:43	1:00	1:19	1:40	2:06	2:35	3:09	3:53	4:50	6:19	9:29
			0:25	0:42	0:59	1:18	1:39	2:05	2:34	3:08	3:52	4:49	6:18	9:28	12:00[b]
			L	0:10	0:27	0:46	1:05	1:26	1:50	2:20	2:54	3:37	4:36	6:03	9:13
				0:26	0:45	1:04	1:25	1:49	2:19	2:53	3:36	4:35	6:02	9:12	12:00[b]
				K	0:10	0:29	0:50	1:12	1:36	2:04	2:39	3:22	4:20	5:49	8:59
					0:28	0:49	1:11	1:35	2:03	2:38	3:21	4:19	5:48	8:58	12:00[b]
					J	0:10	0:32	0:55	1:20	1:48	2:21	3:05	4:03	5:41	8:41
						0:31	0:54	1:19	1:47	2:20	3:04	4:02	5:40	8:40	12:00[b]
						I	0:10	0:34	1:00	1:30	2:03	2:45	3:44	5:13	8:22
							0:33	0:59	1:29	2:02	2:44	3:43	5:12	8:21	12:00[b]
							H	0:10	0:37	1:07	1:42	2:24	3:21	4:50	8:00
								0:36	1:06	1:41	2:23	3:20	4:49	7:59	12:00[b]
								G	0:10	0:41	1:16	2:00	2:59	4:26	7:36
									0:40	1:15	1:59	2:58	4:25	7:35	12:00[b]
									F	0:10	0:46	1:30	2:29	3:58	7:06
										0:45	1:29	2:28	3:57	7:05	12:00[b]
										E	0:10	0:55	1:58	3:23	6:33
											0:54	1:57	3:22	6:32	12.00[b]
											D	0:10	1:10	2:39	5:49
												1:09	2:38	5:48	12:00[b]
												C	0:10	1:40	2:50
													1:39	2:49	12:00[b]
													B	0:10	2:11
														2:10	12:00[b]
														A	0:10
															12:00[b]

[a] The upper set of repetitive groups indicates the group at the end of the surface interval ($He–O_2$ dives). The diagonal set of repetitive groups indicates the group at the beginning of the surface interval from previous dive.

[b] Dives following surface intervals of more than 12 hr are not repetitive dives. Use actual bottom times in the helium–oxygen decompression tables to compute decompression for such dives.

Schedule 1.4
Repetitive Dive Timetable for Air Dives (U. S. Navy 1971)

Repetitive group	Repetitive dive depth (air dives), ft															
	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190
A	7	6	5	4	4	3	3	3	3	3	2	2	2	2	2	2
B	17	13	11	9	8	7	7	6	6	6	5	5	4	4	4	4
C	25	21	17	15	13	11	10	10	9	8	7	7	6	6	6	6
D	37	29	24	20	18	16	14	13	12	11	10	9	9	8	8	8
E	49	38	30	26	23	20	18	16	15	13	12	12	11	10	10	10
F	61	47	36	31	28	24	22	20	18	16	15	14	13	13	12	11
G	73	56	44	37	32	29	26	24	21	19	18	17	16	15	14	13
H	87	66	52	43	38	33	30	27	25	22	20	19	18	17	16	15
I	101	76	61	50	43	38	34	31	28	25	23	22	20	19	18	17
J	116	87	70	57	48	43	38	34	32	28	26	24	23	22	20	19
K	138	99	79	64	54	47	43	38	35	31	29	27	26	24	22	21
L	161	111	88	72	61	53	48	42	39	35	32	30	28	26	25	24
M	187	124	97	80	68	58	52	47	43	38	35	32	31	29	27	26
N	213	142	107	87	73	64	57	51	46	40	38	35	33	31	29	28
O	241	160	117	96	80	70	62	55	50	44	40	38	36	34	31	30
Z	257	169	122	100	84	73	64	57	52	46	42	40	37	35	32	31

Schedule 1.5

U. S. Navy Standard Air Decompression Table for Exceptional Exposures (U. S. Navy 1971)

Depth, ft	Bottom time, min	Time to first stop, min:sec	Decompression stops, ft													Total ascent time, min:sec
			130	120	110	100	90	80	70	60	50	40	30	20	10	
40	360	0:30													23	23:40
	480	0:30													41	41:40
	720	0:30													69	69:40
60	240	0:40												2	79	82:00
	360	0:40												20	119	140:00
	480	0:40												44	148	193:00
	720	0:40												78	187	266:00
80	180	1:00												35	85	121:20
	240	0:50											6	52	120	179:20
	360	0:50											29	90	160	280:20
	480	0:50											59	107	187	354:20
	720	0:40										17	108	142	187	455:20
100	180	1:00										1	29	53	118	202:40
	240	1:00										14	42	84	142	283:40
	360	0:50									2	42	73	111	187	416:40
	480	0:50									21	61	91	142	187	503:40
	720	0:50									55	106	122	142	187	613:40
120	120	1:20										10	19	47	98	176:00
	180	1:10									5	27	37	76	137	284:00
	240	1:10									23	35	60	97	179	396:00
	360	1:00								18	45	64	93	142	187	551:00
	480	0:50							3	41	64	93	122	142	187	654:00
	720	0:50							32	74	100	114	122	142	187	773:00
140	90	1:30									2	14	18	42	88	166:20
	120	1:30									12	14	36	56	120	240:20
	180	1:20								10	26	32	54	94	168	386:20
	240	1:10							8	28	34	50	78	124	187	511:20

Schedule 1.5—*Cont.*

Depth, ft	Bottom time, min	Time to first stop, min:sec	Decompression stops, ft													Total ascent time, min:sec
			130	120	110	100	90	80	70	60	50	40	30	20	10	
	360	1:00						9	32	42	64	84	122	142	187	684:20
	480	1:00						31	44	59	100	114	122	142	187	801:20
	720	0:50					16	56	88	97	100	114	122	142	187	924:20
160	70	1:50									1	17	22	44	80	166:40
170	70										8	17	19	51	98	183:50
	90	1:50								12	12	14	34	52	120	246:50
	120	1:30						2	10	12	18	32	42	82	156	356:50
	180	1:20					4	10	22	28	34	50	78	120	187	535:50
	240	1:20					18	24	30	42	50	70	116	142	187	681:50
	360	1:10				22	34	40	52	60	98	114	122	142	187	873:50
	480	1:00			14	40	42	56	91	97	100	114	122	142	187	1007:50
180	60										5	16	19	44	81	168:00
190	50	2:20									4	13	22	33	72	147:10
	60										10	17	19	50	84	183:10
200	5	3:10													1	4:20
	10	3:00												1	4	8:20
	15	2:50											1	4	10	18:20
	20	2:50											3	7	27	40:20
	25	2:50											7	14	25	49:20
	30	2:40										2	9	22	37	73:20
	40	2:30									2	8	17	23	59	112:20
	50	2:30									6	16	22	39	75	161:20
	60	2:20								2	13	17	24	51	89	199:20
	90	1:50					1	10	10	12	12	30	38	74	134	324:20
	120	1:40				6	10	10	10	24	28	40	64	98	180	473:20
	180	1:20		1	10	10	18	24	24	42	48	70	106	142	187	685:20
	240	1:20	12	22	36	40	44	56	82	98	100	114	122	142	187	1058:20
210	5	3:20													1	4:30
	10	3:10												2	4	9:30

	15	3:00						1	5	13	22:30
	20	3:00						4	10	23	40:30
	25	2:50					2	7	17	27	56:30
	30	2:50					4	9	24	41	81:30
	40	2:40				4	9	19	26	63	124:30
	50	2:30			1	9	17	19	45	80	174:30
220	5	3:30								2	5:40
	10	3:20							2	5	10:40
	15	3:10						2	5	16	26:40
	20	3:00					1	3	11	24	42:40
	25	3:00					3	8	19	33	66:40
	30	2:50				1	7	10	23	47	91:40
	40	2:50				6	12	22	29	68	140:40
	50	2:40			3	12	17	18	51	86	190:40
230	5	3:40								2	5:50
	10	3:20						1	2	6	12:50
	15	3:20						3	6	18	30:50
	20	3:10					2	5	12	26	48:50
	25	3:10					4	8	22	37	74:50
	30	3:00				2	8	12	23	51	99:50
	40	2:50			1	7	15	22	34	74	156:50
	50	2:50			5	14	16	24	51	86	202:50
240	5	3:50								2	6:00
	10	3:30						1	3	6	14:00
	15	3:30						4	6	21	35:00
	20	3:20					3	6	15	25	53:00
	25	3:10				1	4	9	24	40	82:00
	30	3:10				4	8	15	22	56	109:00
	40	3:00			3	7	17	22	39	75	167:00
	50	2:50		1	8	15	16	29	51	94	218:00
250	5	3:50							1	2	7:10
	10	3:40						1	4	7	16:10
	15	3:30					1	4	7	22	38:10
	20	3:30					4	7	17	27	59:10
	25	3:20				2	7	10	24	45	92:10

Schedule 1.5—*Cont.*

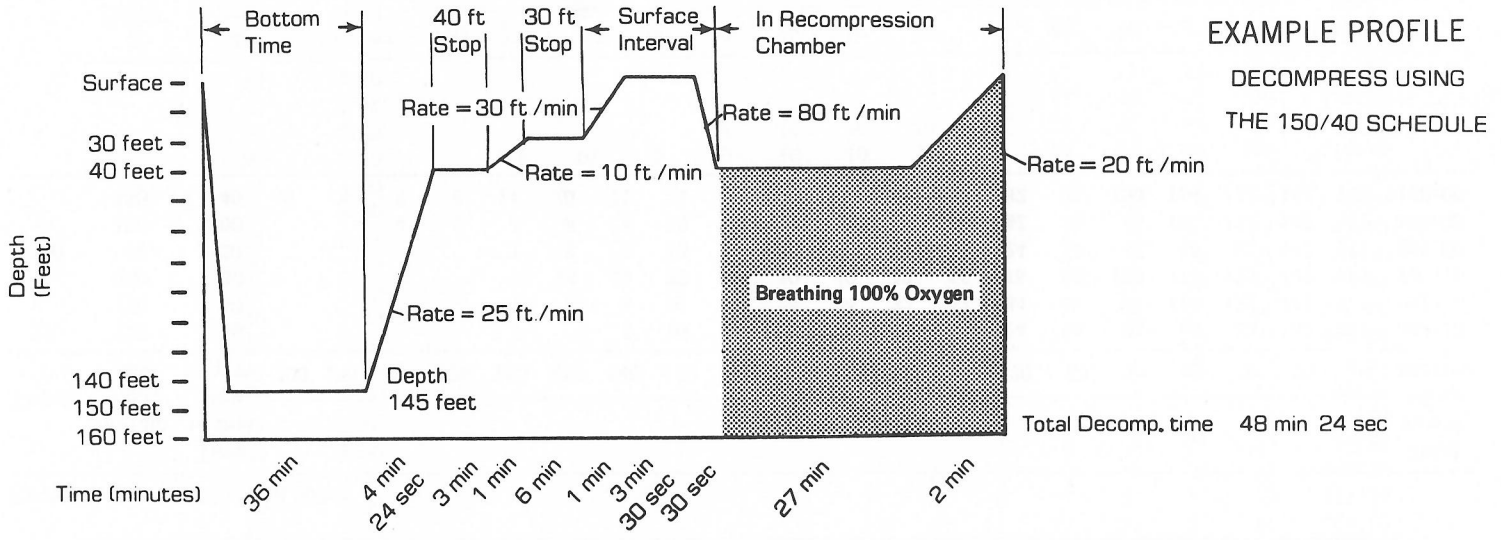
Depth, ft	Bottom time, min	Time to first stop, min:sec	Decompression stops, ft													Total ascent time, min:sec
			130	120	110	100	90	80	70	60	50	40	30	20	10	
	30	3:20									6	7	17	23	59	116:10
	40	3:10								5	9	17	19	45	79	178:10
	60	2:40					4	10	10	10	12	22	36	64	126	298:10
	90	2:10		8	10	10	10	10	10	28	28	44	68	98	186	514:10
260	5	4:00												1	2	7:20
	10	3:50											2	4	9	19:20
	15	3:40										2	4	10	22	42:20
	20	3:30									1	4	7	20	31	67:20
	25	3:30									3	8	11	23	50	99:20
	30	3:20								2	6	8	19	26	61	126:20
	40	3:10							1	6	11	16	19	49	84	190:20
270	5	4:10												1	3	8:30
	10	4:00											2	5	11	22:30
	15	3:50										3	4	11	24	46:30
	20	3:40									2	3	9	21	35	74:30
	25	3:30								2	3	8	13	23	53	106:30
	30	3:30								3	6	12	22	27	64	138:30
	40	3:20							5	6	11	17	22	51	88	204:30
280	5	4:20												2	2	8:40
	10	4:00										1	2	5	13	25:40
	15	3:50									1	3	4	11	26	49:40
	20	3:50									3	4	8	23	39	81:40
	25	3:40								2	5	7	16	23	56	113:40
	30	3:30							1	3	7	13	22	30	70	150:40
	40	3:20						1	6	6	13	17	27	51	93	218:40
290	5	4:30												2	3	9:50
	10	4:10										1	3	5	16	29:50
	15	4:00									1	3	6	12	26	52:50
	20	4:00									3	7	9	23	43	89:50

	25	3:50									3	5	8	17	23	60	120:50
	30	3:40								1	5	6	16	22	36	72	162:50
	40	3:30							3	5	7	15	16	32	51	95	228:50
300	5	4:40													3	3	11:00
	10	4:20											1	3	6	17	32:00
	15	4:10										2	3	6	15	26	57:00
	20	4:00									2	3	7	10	23	47	97:00
	25	3:50								1	3	6	8	19	26	61	129:00
	30	3:50								2	5	7	17	22	39	75	172:00
	40	3:40							4	6	9	15	17	34	51	90	231:00
	60	3:00			4	10	10	10	10	10	14	28	32	50	90	187	460:00

Extreme exposures: 250 and 300 ft

Depth, ft	Bottom time, min	Time to first stop, min:sec	Decompression stops, ft																				Total ascent time, min:sec
			200	190	180	170	160	150	140	130	120	110	100	90	80	70	60	50	40	30	20	10	
250	120	1:50							5	10	10	10	10	16	24	24	36	48	64	94	142	187	684:10
	180	1:30					4	8	8	10	22	24	24	32	42	44	60	84	114	122	142	187	931:10
	240	1:30					9	14	21	22	22	40	40	42	56	76	98	100	114	122	142	187	1109:10
300	90	2:20					3	8	8	10	10	10	10	16	24	24	34	48	64	90	142	187	693:00
	120	2:00			4	8	8	8	8	10	14	24	24	24	34	42	58	66	102	122	142	187	890:00
	180	1:40	6	8	8	8	14	20	21	21	28	40	40	48	56	82	98	100	114	122	142	187	1168:00

Schedule 1.6
Surface Decompression Table Using Oxygen (U. S. Navy 1971)



1	2	3	4				5	6	7	8
Depth, ft	Bottom time, min	Time to first stop or surface, min:sec	Time (min) breathing air at water stops				Surface interval	Time at 40-ft chamber stop on oxygen, min	Surface	Total decompression time, min:sec
			60 ft	50 ft	40 ft	30 ft				
70	52	2:48	0	0	0	0	Surface	0	2-min	2:48
	90	2:48	0	0	0	0	interval	15	ascent	23:48
	120	2:48	0	0	0	0	not to	23	from 40	31:48

	150	2:28	0	0	0	0	exceed 5	31	ft in	39:48
	180	2:48	0	0	0	0	min	39	chamber	47:48
80	40	3:12	0	0	0	0		0	to surface	3:12
	70	3:12	0	0	0	0		14	while	23:12
	85	3:12	0	0	0	0		20	breathing	29:12
	100	3:12	0	0	0	0		26	oxygen	35:12
	115	3:12	0	0	0	0		31		40:12
	130	3:12	0	0	0	0		37		46:12
	150	3:12	0	0	0	0		44		53:12
90	32	3:36	0	0	0	0		0		3:36
	60	3:36	0	0	0	0		14		23:36
	70	3:36	0	0	0	0		20		29:36
	80	3:36	0	0	0	0		25		34:36
	90	3:36	0	0	0	0		30		39:36
	100	3:36	0	0	0	0		34		43:36
	110	3:36	0	0	0	0		39		48:36
	120	3:36	0	0	0	0		43		52:36
	130	3:36	0	0	0	0		48		57:36
100	26	4:00	0	0	0	0		0		4:00
	50	4:00	0	0	0	0		14		24:00
	60	4:00	0	0	0	0		20		30:00
	70	4:00	0	0	0	0		26		36:00
	80	4:00	0	0	0	0		32		42:00
	90	4:00	0	0	0	0		38		48:00
	100	4:00	0	0	0	0		44		54:00
	110	4:00	0	0	0	0		49		59:00
	120	4:00	0	0	0	0		53		63:00
110	22	4:24	0	0	0	0		0		4:24
	40	4:24	0	0	0	0		12		22:24
	50	4:24	0	0	0	0		19		29:24
	60	4:24	0	0	0	0		26		36:24
	70	4:24	0	0	0	0		33		43:24
	80	3:12	0	0	0	1		40		51:12
	90	3:12	0	0	0	2		46		58:12

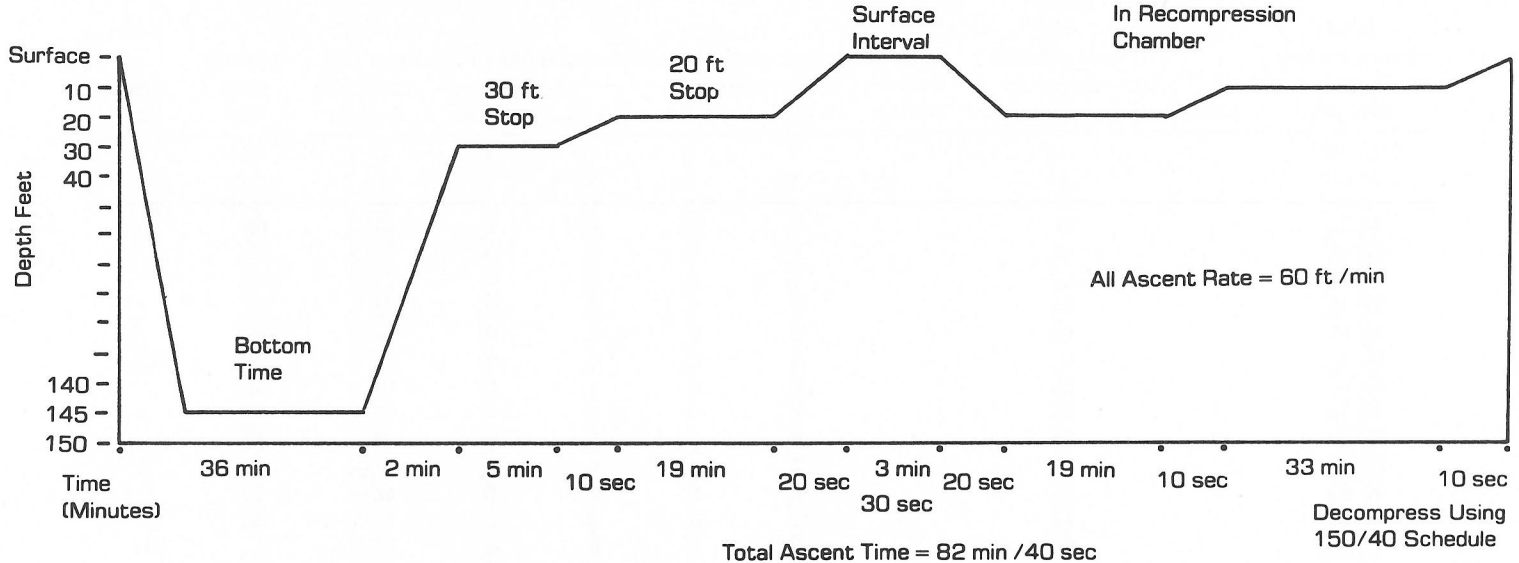
Schedule 1.6—*Cont.*

1	2	3	4				5	6	7	8
Depth, ft	Bottom time, min	Time to first stop or surface, min:sec	Time (min) breathing air at water stops				Surface interval	Time at 40-ft chamber stop on oxygen, min	Surface	Total decompression time, min:sec
			60 ft	50 ft	40 ft	30 ft				
	100	3:12	0	0	0	5		51		66:12
	110	3:12	0	0	0	12		54		76:12
120	18	4:48	0	0	0	0		0		4:48
	30	4:48	0	0	0	0		9		19:48
	40	4:48	0	0	0	0		16		26:48
	50	4:48	0	0	0	0		24		34:48
	60	3:36	0	0	0	2		32		44:36
	70	3:36	0	0	0	4		39		53:36
	80	3:36	0	0	0	5		46		61:36
	90	3:12	0	0	3	7		51		72:12
	100	3:12	0	0	6	15		54		86:12
130	15	5:12	0	0	0	0		0		5:12
	30	5:12	0	0	0	0		12		23:12
	40	5:12	0	0	0	0		21		32:12
	50	4:00	0	0	0	3		29		43:00
	60	4:00	0	0	0	5		37		53:00
	70	4:00	0	0	0	7		45		63:00
	80	3:36	0	0	6	7		51		75:36
	90	3:36	0	0	10	12		56		89:36
140	13	5:36	0	0	0	0		0		5:36
	25	5:36	0	0	0	0		11		22:36
	30	5:36	0	0	0	0		15		26:36
	35	5:36	0	0	0	0		20		31:36
	40	4:24	0	0	0	2		24		37:24
	45	4:24	0	0	0	4		29		44:24
	50	4:24	0	0	0	6		33		50:24

	55	4:24	0	0	0	7	38	56:24
	60	4:24	0	0	0	8	43	62:24
	65	4:00	0	0	3	7	48	70:00
	70	3:36	0	2	7	7	51	79:36
150	11	6:00	0	0	0	0	0	6:00
	25	6:00	0	0	0	0	13	25:00
	30	6:00	0	0	0	0	18	30:00
	35	4:48	0	0	0	4	23	38:48
	40	4:24	0	0	3	6	27	48:24
	45	4:24	0	0	5	7	33	57:24
	50	4:00	0	2	5	8	38	66:00
	55	3:36	2	5	9	4	44	77:36
160	9	6:24	0	0	0	0	0	6:24
	20	6:24	0	0	0	0	11	23:24
	25	6:24	0	0	0	0	16	28.24
	30	5:12	0	0	0	2	21	35:12
	35	4:48	0	0	4	6	26	48:48
	40	4:24	0	3	5	8	32	61:24
	45	4:00	3	4	8	6	38	73:00
170	7	6:48	0	0	0	0	0	6:48
	20	6:48	0	0	0	0	13	25:48
	25	6:48	0	0	0	0	19	31:48
	30	5:12	0	0	3	5	23	44:12
	35	4:48	0	4	4	7	29	57:48
	40	4:24	4	4	8	6	36	72:24

Schedule 1.7

Surface Decompression Table Using Air for Air Diving (U. S. Navy 1971)



Depth, ft	Bottom time, min	Time to first stop, min:sec	Time at water stops, min				Chamber stops (air), min		Total ascent time, min:sec
			30	20	10	Surface	20	10	
40	230	0:30			3	Time on		7	14:30
	250	0:30			3	surface		11	18:30
	270	0:30			3	not to		15	22:30
	300	0:30			3	exceed 3		19	26:30
50	120	0:40			3	min		5	12:40
	140	0:40			3	and 30 sec		10	17:40

	160	0:40		3		21	28:40
	180	0:40		3		29	36:40
	200	0:40		3		35	42:40
	220	0:40		3		40	47:40
	240	0:40		3		47	54:40
60	80	0:50		3		7	14:50
	100	0:50		3		14	21:50
	120	0:50		3		26	33:50
	140	0:50		3		39	46:50
	160	0:50		3		48	55:50
	180	0:50		3		56	63:50
	200	0:40	3		3	69	80:10
70	60	1:00		3		8	16:00
	70	1:00		3		14	22:00
	80	1:00		3		18	26:00
	90	1:00		3		23	31:00
	100	1:00		3		33	41:00
	110	0:50	3		3	41	52:20
	120	0:50	3		4	47	59:20
	130	0:50	3		6	52	66:20
	140	0:50	3		8	56	72:20
	150	0:50	3		9	61	78:20
	160	0:50	3		13	72	93:20
	170	0:50	3		19	79	106:20
80	50	1:10		3		10	18:10
	60	1:10		3		17	25:10
	70	1:10		3		23	31:10
	80	1:00	3		3	31	42:30
	90	1:00	3		7	39	54:30
	100	1:00	3		11	46	65:30
	110	1:00	3		13	53	74:30
	120	1:00	3		17	56	81:30
	130	1:00	3		19	63	90:30
	140	1:00	26		26	69	126:30
	150	1:00	32		32	77	146:30

Schedule 1.7—*Cont.*

Depth, ft	Bottom time, min	Time to first stop, min:sec	Time at water stops, min			Surface	Chamber stops (air), min		Total ascent time, min:sec
			30	20	10		20	10	
90	40	1:20			3			7	15:20
	50	1:20			3			18	26:20
	60	1:20			3			25	33:20
	70	1:10		3			7	30	45:40
	80	1:10		13			13	40	71:40
	90	1:10		18			18	48	89:40
	100	1:10		21			21	54	101:40
	110	1:10		24			24	61	114:40
	120	1:10		32			32	68	137:40
	130	1:00	5	36			36	74	156:40

Depth, ft	Bottom time, min	Time to first stop, min:sec	Time at water stops, min					Surface	Chamber stops (air), min		Total ascent time, min:sec
			50	40	30	20	10		20	10	
100	40	1:30					3	Time on		15	23:30
	50	1:20				3		surface	3	24	35:50
	60	1:20				3		not to	9	28	45:50
	70	1:20				3		exceed 3	17	39	64:50
	80	1:20				23		min	23	48	99:50
	90	1:10			3	23		and 30 sec	23	57	111:50
	100	1:10			7	23			23	66	124:50
	110	1:10			10	34			34	72	155:50
	120	1:10			12	41			41	78	177:50
110	30	1:40					3			7	15:40
	40	1:30				3			3	21	33:00
	50	1:30				3			8	26	43:00
	60	1:30				18			18	36	78:00
	70	1:20			1	23			23	48	101:00

	80	1:20		7	23		23	57	116:00
	90	1:20		12	30		30	64	142:00
	100	1:20		15	37		37	72	167:00
120	25	1:50				3		6	14:50
	30	1:50				3		14	22:50
	40	1:40			3		5	25	39:10
	50	1:40			15		15	31	67:10
	60	1:30		2	22		22	45	97:10
	70	1:30		9	23		23	55	116:10
	80	1:30		15	27		27	63	138:10
	90	1:30		19	37		37	74	173:10
	100	1:30		23	45		45	80	189:10
130	25	2:00				3		10	19:00
	30	1:50			3		3	18	30:20
	40	1:50			10		10	25	51:20
	50	1:40		3	21		21	37	88:20
	60	1:40		9	23		23	52	113:20
	70	1:40		16	24		24	61	131:20
	80	1:30	3	19	35		35	72	170:20
	90	1:30	8	19	45		45	80	203:20
140	20	2:10				3		6	15:10
	25	2:00			3		3	14	26:30
	30	2:00			5		5	21	37:30
	40	1:50		2	16		16	26	66:30
	50	1:50		6	24		24	44	104:30
	60	1:50		16	23		23	56	124:30
	70	1:40	4	19	32		32	68	161:30
	80	1:40	10	23	41		41	79	200:30
150	20	2:10			3		3	7	19:40
	25	2:10			4		4	17	31:40
	30	2:10			8		8	24	46:40
	40	2:00		5	19		19	33	82:40
	50	2:00		12	23		23	51	115:40
	60	1:50	3	19	26		26	62	142:40
	70	1:50	11	19	39		39	75	189:40

Schedule 1.7—*Cont.*

Depth, ft	Bottom time, min	Time to first stop, min:sec	Time at water stops, min						Chamber stops (air), min		Total ascent time, min:sec
			50	40	30	20	10	Surface	20	10	
	80	1:40	1	17	19	50			50	84	227:40
160	20	2:20				3			3	11	23:50
	25	2:20				7			7	20	40:50
	30	2:10			2	11			11	25	55:50
	40	2:10			7	23			23	39	98:50
	50	2:00		2	16	23			23	55	125:50
	60	2:00		9	19	33			33	69	169:50
	70	1:50	1	17	22	44			44	80	214:50
170	15	2:30				3			3	5	18:00
	20	2:30				4			4	15	30:00
	25	2:20			2	7			7	23	46:00
	30	2:20			4	13			13	26	63:00
	40	2:10		1	10	23			23	45	109:00
	50	2:10		5	18	23			23	61	137:00
	60	2:00	2	15	22	37			37	74	194:00
	70	2:00	8	17	19	51			51	86	239:00
180	15	2:40				3			3	6	19:10
	20	2:30			1	5			5	17	35:10
	25	2:30			3	10			10	24	54:10
	30	2:30			6	17			17	27	74:10
	40	2:20		3	14	23			23	50	120:10
	50	2:10	2	9	19	30			30	65	162:10
	60	2:10	5	16	19	44			44	81	216:10
190	15	2:50				4			4	7	22:20
	20	2:40			2	6			6	20	41:20
	25	2:40			5	11			11	25	59:20
	30	2:30		1	8	19			19	32	86:20
	40	2:30		8	14	23			23	55	130:20
	50	2:20	4	13	22	33			33	72	184:20
	60	2:20	10	17	19	50			50	84	237:20

2. Do not exceed the 3 min, 30 sec time limit on the surface.
3. No time saving result from use of this schedule in place of the Standard Air Decompression Schedule; comfort and security of the diver are the only advantages.

(ii) Example. Using the surface decompression technique with air, determine the dive profile for an air dive to 145 ft and a bottom time of 36 min.

2. *Decompression Schedules for Compressed Air Work*

a. Decompression Tables

Explanation. The decompression schedules are computed for working chamber pressures from 0 to 14 lb, and from 14 to 50 psig inclusive by 2-lb increments and for exposure times for each pressure extending from ½ to over 8 hr inclusive. Decompressions will be conducted by two or more stages with a maximum of four stages, the latter for a working chamber pressure of 40 psig or greater.

Stage 1 consists of a reduction in ambient pressure ranging from 10 to a maximum of 16 lb/in.^{2} but in no instance will the pressure be reduced below 4 lb at the end of stage 1. This reduction in pressure in stage 1 will always take place at a rate not greater than 5 lb/min.

Further reduction in pressure will take place during stage 2 and subsequent stages as required at a slower rate, but in no event at a rate greater than 1 lb/min.

Decompression Schedule 2.1 indicates in the body of the schedule the total decompression time in minutes for various combinations of working chamber pressure and exposure time.

Decompression Schedule 2.2 indicates for the same various combinations of working chamber pressure and exposure time the following: (a) the number of stages required; (b) the reduction in pressure and the terminal pressure for each required stage; (c) the time in minutes through which the reduction in pressure is accomplished for each required stage; and (d) the pressure reduction rate in minutes per pound for each required stage.

Example 1. Four-hour working period at 20 lb gauge.

Decompression Schedule 2.1: Twenty pounds for 4 hr. Total decompression time: 43 min.

Decompression Schedule 2.2: Stage 1. Reduce from 20 to 4 lb at the uniform rate of 5 lb/min. Elapsed time, stage 1: 3 min.

Stage 2 (final stage). Reduce pressure at a uniform rate from 4 to 0 lb gauge over a period of 40 min. Rate: 0.10 lb/min or 10.00 min/lb. Stage 2 (final) elapsed time: 40 min.

Total time: 43 min.

Example 2. Five-hour working period at 24 lb gauge.

Decompression Schedule 2.1: 24 lb for 5 hr. Total decompression time: 117 min.

Decompression Schedule 2.2: Stage 1. Reduce pressure from 24 to 8 lb at uniform rate of 5 lb/min. Elapsed time stage 1: 3 min.

Stage 2. Reduce pressure at a uniform rate from 8 to 4 lb over a period of 4 min. Rate: 1 lb/min. Elapsed time, stage 2: 4 min.

Transfer men to Special Decompression Chamber maintaining the 4-lb pressure during the transfer operation.

Stage 3 (final stage). In the Special Decompression Chamber, reduce the pressure at a uniform rate from 4 to 0 lb gauge over a period of 110 min. Rate: 0.037 lb/min or 27.5 min/lb. Stage 3 (final) elapsed time: 110 min.

Total time: 117 min.

b. Repetitive Diving Procedures

The information contained in the following pages is adapted from the U. S. Navy Diving Tables and is to be used when an individual will enter a compressed air environment more than once within a 12-hr period.

The Department of Industry, Labor and Human Relations may accept alternate methods of decompression for repetitive exposures provided the licensed physician submits his proposed procedures to the Department of Industry, Labor and Human Relations for its review and approval.

The Department of the Navy is in no way liable for the use or misuse of Schedules 2.3–2.5.

c. Suggestions for the Guidance of Compressed Air Workers

1. Eat moderately before going on shift.
2. Be temperate. Avoid excessive alcoholic beverages the night before or within 8 hr of going on shift.
3. Sleep at least 7 hr daily.
4. Take extra outer clothing into the tunnel when going on shift and wear it during decompression to avoid chilling during that period.
5. Do not sit or rest in a cramped position during decompression.
6. Do not exercise during decompression. This does not mean you cannot move around to avoid sitting in one position. Decompress according to schedule, for this means safety and freedom from compressed air illness or air pains. It also safeguards against damage to the bones.
7. Do not do hard exercise immediately after decompression.
8. Do not take a hot bath or shower within 6 hr of decompressing. Moderately warm bath or shower is permissible.
9. Do not go to sleep in a cramped position after decompressing.
10. Do not allow yourself to become chilled within 6 hr after decompression.
11. Report at once to the physician in charge if you suspect you are suffering from air pains or decompression sickness. Men suffering from compressed air illness should not be given any intoxicating liquors.
12. IF AFTER DECOMPRESSING YOU DEVELOP "NIGGLES" OR AIR PAINS THAT PERSIST LONGER THAN A HALF-HOUR, CALL THE MEDICAL LOCK *AT ONCE*.

13. If you become ill away from the job site, communicate at once with the physician in charge.

14. Wear your identification bracelet so it will be known what to do with you in an emergency.

15. Stay within a 30-mile radius of the recompression facility for at least 1 hr after locking out.

16. Do not reenter the man lock if suffering from air pains or decompression sickness.

17. Do not engage in scuba diving at depths greater than 33 ft within 12 hr of coming off shift. Do not engage in any scuba diving within 12 hr of going on shift.

18. Do not fly in any aircraft for at least 12 hr after coming off shift.

19. See that you are reexamined as required by the Department of Industry, Labor and Human Relations.

Schedule 2.1

Decompression Schedule for Compressed Air Work (Wisconsin 1971)

Important note: The pressure reduction in each stage is accomplished at a uniform rate. Do not interpolate between values shown on the schedules. Use the next higher value of working chamber pressure or exposure time should the actual working chamber pressure or the actual exposure time, respectively, fall between those for which calculated values are shown in the body of the schedules.

Work pressure, psig	Working period, hr									
	½	1	1½	2	3	4	5	6	7	8
	Total decompression time, min									
0–12	3	3	3	3	3	3	3	3	3	3
14	6	6	6	6	6	6	6	6	16	16
16	7	7	7	7	7	7	17	33	48	48
18	7	7	7	8	11	17	48	63	63	73
20	7	7	8	15	15	43	63	73	83	103
22	9	9	16	24	38	68	93	103	113	128
24	11	12	23	27	52	92	117	122	127	137
26	13	14	29	34	69	104	126	141	142	142
28	15	23	31	41	98	127	143	153	153	165
30	17	28	38	62	105	143	165	168	178	188
32	19	35	43	85	126	163	178	193	203	213
34	21	39	58	98	151	178	195	218	223	233
36	24	44	63	113	170	198	223	233	243	253
38	28	49	73	128	178	203	223	238	253	263
40	31	49	84	143	183	213	233	248	258	268
42	37	56	102	144	189	215	245	260	263	268
44	43	64	118	154	199	234	254	264	269	269
46	44	74	139	171	214	244	269	274	289	299
48	51	89	144	189	229	269	299	309	319	319
50	58	94	164	209	249	279	309	329	—	—

Schedule 2.2

Decompression Schedule for Compressed Air Work (Wisconsin 1971)

Do not interpolate. Use next higher value for conditions not computed.

Working chamber pressure, psig	Working period, hr	Decompression data					
		Stage No.	Pressure reduction, psig		Time in stage, min	Pressure reduction rate, min/lb	Total time decompress, min
			From	To			
14	½	1	14	4	2	0.20	
		2	4	0	4	1.00	6
	1	1	14	4	2	0.20	
		2	4	0	4	1.00	6
	1½	1	14	4	2	0.20	
		2	4	0	4	1.00	6
	2	1	14	4	2	0.20	
		2	4	0	4	1.00	6
	3	1	14	4	2	0.20	
		2	4	0	4	1.00	6
	4	1	14	0	2	0.20	
		2	4	0	4	1.00	6
	5	1	14	4	2	0.20	
		2	4	0	4	1.00	6
	6	1	14	4	2	0.20	
		2	4	0	4	1.00	6
	7	1	14	4	2	0.20	
		2	4	0	14	3.50	16
	8	1	14	4	2	0.20	
		2	4	0	14	3.50	16
	Over 8	1	14	4	2	0.20	
		2	4	0	30	7.50	32
16	½	1	16	4	3	0.20	
		2	4	0	4	1.00	7
	1	1	16	4	3	0.20	
		2	4	0	4	1.00	7
	1½	1	16	4	3	0.20	
		2	4	0	4	1.00	7
	2	1	16	4	3	0.20	
		2	4	0	4	1.00	7
	3	1	16	4	3	0.20	
		2	4	0	4	1.00	7
	4	1	16	4	3	0.20	
		2	4	0	4	1.00	7
	5	1	16	4	3	0.20	
		2	4	0	4	3.50	17
	6	1	16	4	3	0.20	
		2	4	0	30	7.50	33
	7	1	16	4	3	0.20	
		2	4	0	45	11.25	48
	8	1	16	4	3	0.20	
		2	4	0	45	11.25	48
	Over 8	1	16	4	3	0.20	
		2	4	0	60	15.00	63
18	½	1	18	4	3	0.20	
		2	4	0	4	1.00	7

Schedule 2.2—*Cont.*

Working chamber pressure, psig	Working period, hr	Decompression data					
		Stage No.	Pressure reduction, psig		Time in stage, min	Pressure reduction rate, min/lb	Total time decompress, min
			From	To			
	1	1	18	4	3	0.20	
		2	4	0	4	1.00	7
	1½	1	18	4	3	0.20	
		2	4	0	4	1.00	7
	2	1	18	4	3	0.20	
		2	4	0	5	1.25	8
	3	1	18	4	3	0.20	
		2	4	0	8	2.00	11
	4	1	18	4	3	0.20	
		2	4	0	14	3.50	17
	5	1	18	4	3	0.20	
		2	4	0	45	11.25	48
	6	1	18	4	3	0.20	
		2	4	0	60	15.00	63
	7	1	18	4	3	0.20	
		2	4	0	60	15.00	63
	8	1	18	4	3	0.20	
		2	4	0	70	17.50	73
	Over 8	1	18	4	3	0.20	
		2	4	0	84	21.00	87
20	½	1	20	4	3	0.20	
		2	4	0	4	1.00	7
	1	1	20	4	3	0.20	
		2	4	0	4	1.00	7
	1½	1	20	4	3	0.20	
		2	4	0	5	1.25	8
	2	1	20	4	3	0.20	
		2	4	0	12	3.00	15
	3	1	20	4	3	0.20	
		2	4	0	12	3.00	15
	4	1	20	4	3	0.20	
		2	4	0	40	10.00	43
	5	1	20	4	—	0.20	
		2	4	0	60	15.00	63
	6	1	20	4	3	0.20	
		2	4	0	70	17.50	73
	7	1	20	4	3	0.20	
		2	4	0	80	20.00	83
	8	1	20	4	3	0.20	
		2	4	0	100	25.00	103
	Over 8	1	20	4	3	0.20	
		2	4	0	110	27.50	113
22	½	1	22	6	3	0.20	
		2	6	0	6	1.00	9
	1	1	22	6	3	0.20	
		2	6	0	6	1.00	9
	1½	1	22	6	3	0.20	
		2	6	0	13	2.20	16

Schedule 2.2—*Cont.*

Working chamber pressure, psig	Working period, hr	Decompression data					
		Stage No.	Pressure reduction, psig		Time in stage, min	Pressure reduction rate, min/lb	Total time decompress, min
			From	To			
	2	1	22	6	3	0.20	
		2	6	0	21	3.50	24
	3	1	22	6	3	0.20	
		2	6	0	35	5.85	38
	4	1	22	6	3	0.20	
		2	6	0	65	10.83	68
	5	1	22	6	3	0.20	
		2	6	0	90	15.00	93
	6	1	22	6	3	0.20	
		2	6	0	100	16.67	103
	7	1	22	6	3	0.20	
		2	6	0	110	18.35	113
	8	1	22	6	3	0.20	
		2	6	0	125	20.80	128
	Over 8	1	22	6	3	0.20	
		2	6	0	130	21.70	133
24	½	1	24	8	3	0.20	
		2	8	4	4	1.00	
		3	4	0	4	1.00	11
	1	1	24	8	3	0.20	
		2	8	4	4	1.00	
		3	4	0	5	1.25	12
	1½	1	24	8	3	0.20	
		2	8	4	4	1.00	
		3	4	0	16	4.00	23
	2	1	24	8	3	0.20	
		2	8	4	4	1.00	
		3	4	0	20	5.00	27
	3	1	24	8	3	0.20	
		2	8	4	4	1.00	
		3	4	0	45	11.25	52
	4	1	24	8	3	0.20	
		2	8	4	4	1.00	
		3	4	0	85	21.25	92
	5	1	24	8	3	0.20	
		2	8	4	4	1.00	
		3	4	0	110	27.50	117
	6	1	24	8	3	0.20	
		2	8	4	4	1.00	
		3	4	0	115	28.80	122
	7	1	24	8	3	0.20	
		2	8	4	4	1.00	
		3	4	0	120	30.00	127
	8	1	24	8	3	0.20	
		2	8	4	4	1.00	
		3	4	0	130	32.50	137
	Over 8	1	24	8	3	0.20	
		2	8	4	8	2.00	

Schedule 2.2—*Cont.*

Working chamber pressure, psig	Working period, hr	Decompression data					
		Stage No.	Pressure reduction, psig		Time in stage, min	Pressure reduction rate, min/lb	Total time decompress, min
			From	To			
		3	4	0	140	35.00	151
26	½	1	26	10	3	0.20	
		2	10	4	6	1.00	
		3	4	0	4	1.00	13
	1	1	26	10	3	0.20	
		2	10	4	6	1.00	
		3	4	0	5	1.25	14
	1½	1	26	10	3	0.20	
		2	10	4	6	1.00	
		3	4	0	20	5.00	29
	2	1	26	10	3	0.20	
		2	10	4	6	1.00	
		3	4	0	25	6.25	34
	3	1	26	10	3	0.20	
		2	10	4	6	1.00	
		3	4	0	60	15.00	69
	4	1	26	10	3	0.20	
		2	10	4	6	1.00	
		3	4	0	95	23.75	104
	5	1	26	10	3	0.20	
		2	10	4	8	1.33	
		3	4	0	115	28.80	126
	6	1	26	10	3	0.20	
		2	10	4	8	1.33	
		3	4	0	130	32.50	141
	7	1	26	10	3	0.20	
		2	10	4	9	1.50	
		3	4	0	130	32.50	142
	8	1	26	10	3	0.20	
		2	10	4	9	1.50	
		3	4	0	130	32.50	142
	Over 8	1	26	10	3	0.20	
		2	10	4	30	5.00	
		3	4	0	130	32.50	163
28	½	1	28	12	3	0.20	
		2	12	4	8	1.00	
		3	4	0	4	1.00	15
	1	1	28	12	3	0.20	
		2	12	4	8	1.00	
		3	4	0	12	3.00	23
	1½	1	28	12	3	0.20	
		2	12	4	8	1.00	
		3	4	0	20	5.00	31
	2	1	28	12	3	0.20	
		2	12	4	8	1.00	
		3	4	0	30	7.50	41
	3	1	28	12	3	0.20	
		2	12	4	10	1.25	

Schedule 2.2—*Cont.*

Working chamber pressure, psig	Working period, hr	Decompression data					
		Stage No.	Pressure reduction, psig		Time in stage, min	Pressure reduction rate, min/lb	Total time decompress, min
			From	To			
		3	4	0	85	21.20	98
	4	1	28	12	3	0.20	
		2	12	4	14	1.75	
		3	4	0	110	27.50	127
	5	1	28	12	3	0.20	
		2	12	4	20	2.50	
		3	4	0	120	30.00	143
	6	1	28	12	3	0.20	
		2	12	4	20	2.50	
		3	4	0	130	32.50	153
	7	1	28	12	3	0.20	
		2	12	4	20	2.50	
		3	4	0	130	32.50	153
	8	1	28	12	3	0.20	
		2	12	4	32	4.00	
		3	4	0	130	32.50	165
	Over 8	1	28	12	3	0.20	
		2	12	4	50	6.25	
		3	4	0	130	32.50	183
30	½	1	30	14	3	0.20	
		2	14	4	10	1.00	
		3	4	0	4	1.00	17
	1	1	30	14	3	0.20	
		2	14	4	10	1.00	
		3	4	0	15	3.75	28
	1½	1	30	14	3	0.20	
		2	14	4	10	1.00	
		3	4	0	25	6.25	38
	2	1	30	14	3	0.20	
		2	14	4	14	1.40	
		3	4	0	45	11.25	62
	3	1	30	14	3	0.20	
		2	14	4	17	1.70	
		3	4	0	85	21.20	105
	4	1	30	14	3	0.20	
		2	14	4	30	3.00	
		3	4	0	110	27.50	143
	5	1	30	14	3	0.20	
		2	14	4	35	3.50	
		3	4	0	130	32.50	165
	6	1	30	14	3	0.20	
		2	14	4	35	3.50	
		3	4	0	130	32.50	168
	7	1	30	14	3	0.20	
		2	14	4	45	4.50	
		3	4	0	130	32.50	178
	8	1	30	14	3	0.20	
		2	14	4	55	5.50	

Schedule 2.2—*Cont.*

Working chamber pressure, psig	Working period, hr	Decompression data					
		Stage No.	Pressure reduction, psig		Time in stage, min	Pressure reduction rate, min/lb	Total time decompress, min
			From	To			
		3	4	0	130	32.50	188
	Over 8	1	30	14	3	0.20	
		2	14	4	71	7.10	
		3	4	0	130	32.50	204
32	½	1	32	16	3	0.20	
		2	16	4	12	1.00	
		3	4	0	4	1.00	19
	1	1	32	16	3	0.20	
		2	16	4	12	1.00	
		3	4	0	20	5.00	35
	1½	1	32	16	3	0.20	
		2	16	4	15	1.25	
		3	4	0	25	6.25	43
	2	1	32	16	3	0.20	
		2	16	4	22	1.83	
		3	4	0	60	15.00	85
	3	1	32	16	3	0.20	
		2	16	4	28	2.33	
		3	4	0	95	23.75	126
	4	1	32	16	3	0.20	
		2	16	4	40	3.33	
		3	4	0	120	30.00	163
	5	1	32	16	3	0.20	
		2	16	4	45	3.75	
		3	4	0	130	32.50	178
	6	1	32	16	3	0.20	
		2	16	4	60	5.00	
		3	4	0	130	32.50	193
	7	1	32	16	3	0.20	
		2	16	4	70	5.83	
		3	4	0	130	32.50	203
	8	1	32	16	3	0.20	
		2	16	4	80	6.67	
		3	4	0	130	32.50	213
	Over 8	1	32	16	3	0.20	
		2	16	4	93	7.75	
		3	4	0	130	32.50	226
34	½	1	34	18	3	0.20	
		2	18	4	14	1.00	
		3	4	0	4	1.00	21
	1	1	34	18	3	0.20	
		2	18	4	14	1.00	
		3	4	0	22	5.50	39
	1½	1	34	18	3	0.20	
		2	18	4	25	1.80	
		3	4	0	30	7.50	58
	2	1	34	18	3	0.20	
		2	18	4	35	2.50	

Schedule 2.2—*Cont.*

Working chamber pressure, psig	Working period, hr	Decompression data					
		Stage No.	Pressure reduction, psig		Time in stage, min	Pressure reduction rate, min/lb	Total time decompress, min
			From	To			
		3	4	0	60	15.00	98
	3	1	34	18	3	0.20	
		2	18	4	43	3.10	
		3	4	0	105	26.25	151
	4	1	34	18	3	0.20	
		2	18	4	55	3.93	
		3	4	0	120	30.00	178
	5	1	34	18	3	0.20	
		2	18	4	62	4.43	
		3	4	0	130	32.50	195
	6	1	34	18	3	0.20	
		2	18	4	85	6.07	
		3	4	0	130	32.50	218
	7	1	34	18	3	0.20	
		2	18	4	90	6.43	
		3	4	0	130	32.50	223
	8	1	34	18	3	0.20	
		2	18	4	100	7.15	
		3	4	0	130	32.50	233
	Over 8	1	34	18	3	0.20	
		2	18	4	115	8.23	
		3	4	0	130	32.50	248
36	½	1	36	20	3	0.20	
		2	20	4	16	1.00	
		3	4	0	5	1.25	24
	1	1	36	20	3	0.20	
		2	20	4	16	1.00	
		3	4	0	25	6.25	44
	1½	1	36	20	3	0.20	
		2	20	4	30	1.88	
		3	4	0	30	7.50	63
	2	1	36	20	3	0.20	
		2	20	4	40	2.50	
		3	4	0	70	17.50	113
	3	1	36	20	3	0.20	
		2	20	4	52	3.25	
		3	4	0	115	28.75	170
	4	1	36	20	3	0.20	
		2	20	4	65	4.06	
		3	4	0	130	32.50	198
	5	1	36	20	3	0.20	
		2	20	4	90	5.63	
		3	4	0	130	32.50	223
	6	1	36	20	3	0.20	
		2	20	4	100	6.25	
		3	4	0	130	32.50	233
	7	1	36	20	3	0.20	
		2	20	4	110	6.88	

Schedule 2.2—*Cont.*

Working chamber pressure, psig	Working period, hr	Decompression data					
		Stage No.	Pressure reduction, psig		Time in stage, min	Pressure reduction rate, min/lb	Total time decompress, min
			From	To			
		3	4	0	130	32.50	243
	8	1	36	20	3	0.20	
		2	20	4	120	7.50	
		3	4	0	130	32.50	253
	Over 8	1	36	20	3	0.20	
		2	20	4	140	8.75	
		3	4	0	130	32.50	273
38	½	1	38	22	3	0.20	
		2	22	6	16	1.00	
		3	6	0	9	1.50	28
	1	1	38	22	3	0.20	
		2	22	6	16	1.00	
		3	6	0	30	5.00	40
	1½	1	38	22	3	0.20	
		2	22	6	20	1.25	
		3	6	0	50	8.34	73
	2	1	38	22	3	0.20	
		2	22	6	30	1.88	
		3	6	0	95	15.83	128
	3	1	38	22	3	0.20	
		2	22	6	35	2.19	
		3	6	0	140	23.35	178
	4	1	38	22	3	0.20	
		2	22	6	50	3.12	
		3	6	0	150	25.00	203
	5	1	38	22	3	0.20	
		2	22	6	55	3.44	
		3	6	0	165	27.50	223
	6	1	38	22	3	0.20	
		2	22	6	70	4.38	
		3	6	0	165	27.50	238
	7	1	38	22	3	0.20	
		2	22	6	85	5.32	
		3	6	0	165	27.50	253
	8	1	38	22	3	0.20	
		2	22	6	95	5.93	
		3	6	0	165	27.50	263
	Over 8	1	38	22	3	0.20	
		2	22	6	110	6.88	
		3	6	0	165	27.50	278
40	½	1	40	24	3	0.20	
		2	24	8	16	1.00	
		3	8	4	4	1.00	
		4	4	0	8	2.00	31
	1	1	40	24	3	0.20	
		2	24	8	16	1.00	
		3	8	4	5	1.25	
		4	4	0	25	6.25	49

Schedule 2.2—*Cont.*

Working chamber pressure, psig	Working period, hr	Decompression data					
		Stage No.	Pressure reduction, psig		Time in stage, min	Pressure reduction rate, min/lb	Total time decompress, min
			From	To			
	1½	1	40	24	3	0.20	
		2	24	8	16	1.00	
		3	8	4	20	5.00	
		4	4	0	45	11.25	84
	2	1	40	24	3	0.20	
		2	24	8	25	1.56	
		3	8	4	20	5.00	
		4	4	0	95	23.75	143
	3	1	40	24	3	0.20	
		2	24	8	30	1.88	
		3	8	4	30	7.50	
		4	4	0	120	30.00	183
	4	1	40	24	3	0.20	
		2	24	8	45	2.81	
		3	8	4	35	8.75	
		4	4	0	130	32.50	213
	5	1	40	24	3	0.20	
		2	24	8	47	2.94	
		3	8	4	53	13.25	
		4	4	0	130	32.50	233
	6	1	40	24	3	0.20	
		2	24	8	55	3.44	
		3	8	4	60	15.00	
		4	4	0	130	32.50	248
	7	1	40	24	3	0.20	
		2	24	8	65	4.06	
		3	8	4	60	15.00	
		4	4	0	130	32.50	258
	8	1	40	24	3	0.20	
		2	24	8	75	4.70	
		3	8	4	60	15.00	
		4	4	0	130	32.50	268
	Over 8	1	40	24	3	0.20	
		2	24	8	95	5.93	
		3	8	4	60	15.00	
		4	4	0	130	32.50	288
42	½	1	42	26	3	0.20	
		2	26	10	16	1.00	
		3	10	4	6	1.00	
		4	4	0	12	3.00	37
	1	1	42	26	3	0.20	
		2	26	10	16	1.00	
		3	10	4	12	2.00	
		4	4	0	25	6.25	56
	1½	1	42	26	3	0.20	
		2	26	10	16	1.00	
		3	10	4	23	3.83	
		4	4	0	60	15.00	102

Schedule 2.2—*Cont.*

Working chamber pressure, psig	Working period, hr	Decompression data					
		Stage No.	Pressure reduction, psig		Time in stage, min	Pressure reduction rate, min/lb	Total time decompress, min
			From	To			
	2	1	42	26	3	0.20	
		2	26	10	16	1.00	
		3	10	4	30	5.00	
		4	4	0	95	23.75	144
	3	1	42	26	3	0.20	
		2	26	10	16	1.00	
		3	10	4	50	8.34	
		4	4	0	120	30.00	189
	4	1	42	26	3	0.20	
		2	26	10	17	1.06	
		3	10	4	65	10.83	
		4	4	0	130	32.50	215
	5	1	42	26	3	0.20	
		2	26	10	27	1.69	
		3	10	4	85	14.18	
		4	4	0	130	32.50	245
	6	1	42	26	3	0.20	
		2	26	10	27	1.69	
		3	10	4	100	16.67	
		4	4	0	130	32.50	260
	7	1	42	26	3	0.20	
		2	26	10	30	1.88	
		3	10	4	100	16.67	
		4	4	0	130	32.50	263
	8	1	42	26	3	0.20	
		2	26	10	35	2.19	
		3	10	4	100	16.67	
		4	4	0	130	32.50	268
	Over 8	1	42	26	3	0.20	
		2	26	10	60	3.75	
		3	10	4	100	16.67	
		4	4	0	130	32.50	293
44	½	1	44	28	3	0.20	
		2	28	12	16	1.00	
		3	12	4	8	1.00	
		4	4	0	16	4.00	43
	1	1	44	28	3	0.20	
		2	28	12	16	1.00	
		3	12	4	20	2.50	
		4	4	0	25	6.25	64
	1½	1	44	28	3	0.20	
		2	28	12	16	1.00	
		3	12	4	27	3.38	
		4	4	0	72	18.00	118
	2	1	44	28	3	0.20	
		2	28	12	16	1.00	
		3	12	4	40	5.00	
		4	4	0	95	23.75	154

Schedule 2.2—*Cont.*

Working chamber pressure, psig	Working period, hr	Decompression data					
		Stage No.	Pressure reduction, psig		Time in stage, min	Pressure reduction rate, min/lb	Total time decompress, min
			From	To			
	3	1	44	28	3	0.20	
		2	28	12	16	1.00	
		3	12	4	60	7.50	
		4	4	0	120	30.00	199
	4	1	44	28	3	0.20	
		2	28	12	16	1.00	
		3	12	4	85	10.62	
		4	4	0	130	32.50	234
	5	1	44	28	3	0.20	
		2	28	12	16	1.00	
		3	12	4	105	13.13	
		4	4	0	130	32.50	254
	6	1	44	28	3	0.20	
		2	28	12	16	1.00	
		3	12	4	115	14.38	
		4	4	0	130	32.50	264
	7	1	44	28	3	0.20	
		2	28	12	16	1.00	
		3	12	4	120	15.00	
		4	4	0	130	32.50	269
	8	1	44	28	3	0.20	
		2	28	12	16	1.00	
		3	12	4	120	15.00	
		4	4	0	130	32.50	269
	Over 8	1	44	28	3	0.20	
		3	28	12	40	2.50	
		3	12	4	120	15.00	
		4	4	0	130	32.50	293
46	½	1	46	30	3	0.20	
		2	30	14	16	1.00	
		3	14	4	10	1.00	
		4	4	0	15	3.75	44
	1	1	46	30	3	0.20	
		2	30	14	16	1.00	
		3	14	4	25	2.50	
		4	4	0	30	7.50	74
	1½	1	46	30	3	0.20	
		2	30	14	16	1.00	
		3	14	4	35	3.50	
		4	4	0	85	21.20	139
	2	1	46	30	3	0.20	
		2	30	14	16	1.00	
		3	14	4	47	4.70	
		4	4	0	105	26.25	171
	3	1	46	30	3	0.20	
		2	30	14	16	1.00	
		3	14	4	65	6.50	
		4	4	0	130	32.50	214

Schedule 2.2—*Cont.*

Working chamber pressure, psig	Working period, hr	Decompression data					
		Stage No.	Pressure reduction, psig		Time in stage, min	Pressure reduction rate, min/lb	Total time decompress, min
			From	To			
	4	1	46	30	3	0.20	
		2	30	14	16	1.00	
		3	14	4	95	9.50	
		4	4	0	130	32.50	244
	5	1	46	30	3	0.20	
		2	30	14	16	1.00	
		3	14	4	120	12.00	
		4	4	0	130	32.50	269
	6	1	46	30	3	0.20	
		2	30	14	16	1.00	
		3	14	4	125	12.50	
		4	4	0	130	32.50	274
	7	1	46	30	3	0.20	
		2	30	14	16	1.00	
		3	14	4	140	14.00	
		4	4	0	130	32.50	289
	8	1	46	30	3	0.20	
		2	30	14	16	1.00	
		3	14	4	150	15.00	
		4	4	0	130	32.50	299
	Over 8	1	46	30	3	0.20	
		2	30	14	25	1.56	
		3	14	4	160	16.00	
		4	4	0	130	32.50	318
48	½	1	48	32	3	0.20	
		2	32	16	16	1.00	
		3	16	4	12	1.00	
		4	4	0	20	5.00	51
	1	1	48	32	3	0.20	
		2	32	16	16	1.00	
		3	16	4	35	2.92	
		4	4	0	35	8.75	89
	1½	1	48	32	3	0.20	
		2	32	16	16	1.00	
		3	16	4	45	3.75	
		4	4	0	80	20.00	144
	2	1	48	32	3	0.20	
		2	32	16	16	1.00	
		3	16	4	60	5.00	
		4	4	0	110	27.50	189
	3	1	48	32	3	0.20	
		2	32	16	16	1.00	
		3	16	4	90	7.50	
		4	4	0	120	30.00	229
	4	1	48	32	3	0.20	
		2	32	16	16	1.00	
		3	16	4	120	10.00	
		4	4	0	130	32.50	269

Schedule 2.2—*Cont.*

Working chamber pressure, psig	Working period, hr	Decompression data					
		Stage No.	Pressure reduction, psig		Time in stage, min/lb	Pressure reduction rate, min/lb	Total time decompress, min
			From	To			
	5	1	48	32	3	0.20	
		2	32	16	16	1.00	
		3	16	4	140	11.67	
		4	4	0	130	32.50	299
	6	1	48	32	3	0.20	
		2	32	16	16	1.00	
		3	16	4	160	13.33	
		4	4	0	130	32.50	309
	7	1	48	32	3	0.20	
		2	32	16	16	1.00	
		3	16	4	170	14.17	
		4	4	0	130	32.50	319
	8	1	48	32	3	0.20	
		2	32	16	16	1.00	
		3	16	4	170	14.17	
		4	4	0	130	32.50	319
50	½	1	50	34	3	0.20	
		2	34	18	16	1.00	
		3	18	4	14	1.00	
		4	4	0	25	6.25	58
	1	1	50	34	3	0.20	
		2	34	18	16	1.00	
		3	18	4	40	2.86	
		4	4	0	35	8.75	94
	1½	1	50	34	3	0.20	
		2	34	18	16	1.00	
		3	18	4	55	3.93	
		4	4	0	90	22.50	164
	2	1	50	34	3	0.20	
		2	34	18	16	1.00	
		3	18	4	70	5.00	
		4	4	0	120	30.00	209
	3	1	50	34	3	0.20	
		2	34	18	16	1.00	
		3	18	4	100	7.15	
		4	4	0	130	32.50	249
	4	1	50	34	3	0.20	
		2	34	18	16	1.00	
		3	18	4	130	8.58	
		4	4	0	130	32.50	279
	5	1	50	34	3	0.20	
		2	34	18	16	1.00	
		3	18	4	160	11.42	
		4	4	0	130	32.50	309
	6	1	50	34	3	0.20	
		2	34	18	16	1.00	
		3	18	4	180	12.85	
		4	4	0	130	32.50	329

Schedule 2.3

Repetitive Diving Procedures[a] (Wisconsin 1971)

Pressure, psig	Repetitive group															
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	Z
4	60	120	210	300												
7	35	70	110	160	225	350										
9	25	50	75	100	135	180	240	325								
11	20	35	55	75	100	125	160	195	245	315						
13	15	30	45	60	75	95	120	145	170	205	250	310				
16	5	15	25	40	50	60	80	100	120	140	160	190	220	270	310	
18	5	15	25	30	40	50	70	80	100	110	130	150	170	230	270	300
22	—	10	15	25	30	40	50	60	70	80	90	110	140	160	200	240
27	—	10	15	20	25	30	40	50	55	60	70	80	100	120	140	200
31	—	5	10	15	20	30	35	40	45	50	60	70	80	100	130	170
36	—	5	10	15	20	25	30	35	40	—	50	60	70	90	110	150
40	—	5	10	12	15	20	25	30	—	40	—	50	60	80	90	130
45	—	5	7	10	15	20	22	25	30	—	40	50	—	60	80	120
49	—	—	5	10	13	15	20	25	—	30	—	40	50	60	70	100

[a] Instructions for use: The tabulated compressed air exposure times are in minutes. The times at the various pressures in each vertical column are the maximum exposures during which a compressed air worker will remain within the group listed at the head of the column. To find the repetitive group designation enter the table on the exact or next greater working pressure than that to which exposed and select the listed exposure time exact or next greater than the actual exposure time. The repetitive group designation is indicated by the letter at the head of the vertical column where the selected exposure time is listed. For example: An exposure in compressed air was for 45 min at 26 psig. To determine the repetitive group enter the table at 27 psig (the next higher pressure, as 26 psig, is not listed) and move horizontally until 50 min (the next greater tabulated exposure time, as 45 min, is not listed), then move vertically to the top of the column where H is shown as the repetitive group.

Schedule 2.4

Repetitive Diving Procedures: Open Air Interval Credit Table[a,b] (Wisconsin 1971)

	Repetitive group at end of open air interval															
	Z	O	N	M	L	K	J	I	H	G	F	E	D	C	B	A
	0:10	0:23	0:35	0:49	1:03	1:19	1:37	1:56	2:18	2:43	3:11	3:46	4:30	5:28	6:57	10:00
Z	0:22	0:34	0:48	1:02	1:18	1:36	1:55	2:17	2:42	3:10	3:45	4:29	5:27	6:56	10:05	12:00*
	O	0:10	0:24	0:37	0:52	1:08	1:25	1:44	2:05	2:30	3:00	3:34	4:18	5:17	6:45	9:55
		0:23	0:36	0:51	1:07	1:24	1:43	2:04	2:29	2:59	3:33	4:17	5:16	6:44	9:54	12:00*
		N	0:10	0:25	0:40	0:55	1:12	1:31	1:54	2:19	2:48	3:23	4:05	5:04	6:33	9:44
			0:24	0:39	0:54	1:11	1:30	1:53	2:18	2:47	3:22	4:04	5:03	6:32	9:43	12:00*
			M	0:10	0:26	0:43	1:00	1:19	1:40	2:06	2:35	3:09	3:53	4:50	6:19	9:29
				0:25	0:42	0:59	1:18	1:39	2:05	2:34	3:08	3:52	4:49	6:18	9:28	12:00*
				L	0:10	0:27	0:46	1:05	1:26	1:50	2:20	2:54	3:37	4:36	6:03	9:13
					0:26	0:45	1:04	1:25	1:49	2:19	2:53	3:36	4:35	6:02	9:12	12:00*
					K	0:10	0:29	0:50	1:12	1:36	2:04	2:39	3:22	4:20	5:49	8:59
						0:28	0:49	1:11	1:35	2:03	2:38	3:21	4:19	5:48	8:58	12:00*
						J	0:10	0:32	0:55	1:20	1:48	2:21	3:05	4:03	5:41	8:41
							0:31	0:54	1:19	1:47	2:20	3:04	4:02	5:40	8:40	12:00*
							I	0:10	0:34	1:00	1:30	2:03	2:45	3:44	5:13	8:22
								0:33	0:59	1:29	2:02	2:44	3:43	5:12	8:21	12:00*
								H	0:10	0:37	1:07	1:42	2:24	3:21	4:50	8:00
									0:36	1:06	1:41	2:23	3:20	4:49	7:59	12:00*
									G	0:10	0:41	1:16	2:00	2:59	4:26	7:36
										0:40	1:15	1:59	2:58	4:25	7:35	12:00*
										F	0:10	0:46	1:30	2:29	3:58	7:06
											0:45	1:29	2:28	3:57	7:05	12:00*
											E	0:10	0:55	1:58	3:23	6:33
												0:54	1:57	3:22	6:32	12:00*
												D	0:10	1:10	2:39	5:49
													1:09	2:38	5:48	12:00*
													C	0:10	1:40	2:50
														1:39	2:49	12:00*
														B	0:10	2:11
															2:10	12:00*
															A	0:10
																12:00*

[a] Instructions for use: Open air interval time in the table is in hours and minutes (7:59 means 7 hours and 59 minutes). The open air interval must be at least 10 minutes. An open air interval of more than 12 hours does not require additional decompression or the use of this table.

Find the repetitive group designation letter (from the previous shift) on the diagonal slope. Enter the table horizontally to select the open air interval time that in exactly between the actual open air times shown. The repetitive group designation for the end of the open air interval is the head of the vertical column where the selected open air interval time is listed.

For example: A previous shift was at 35 psi for 1 hour. The worker remains in open air for 1 hour and 30 minutes and wishes to find the new repetitive group designation. The repetitive group from the Repetitive Group Designation Table is L. Enter the open air interval credit table along the diagonal line labeled L. The 1 hour and 30 minute open air interval lies between the times 1:26 and 1:49. Therefore the worker is placed in group H (at the head of the vertical column selected).

[b] The asterisks indicate that compressed air exposures following open air intervals of more than 12 hr are not considered multiple exposures. Actual compressed air exposure time will be used for the determination of decompression time for open air intervals greater than 12 hr.

Schedule 2.5
Repetitive Diving Procedure[a] (Wisconsin 1971)

Repetitive group	Repetitive exposure pressure, psig							
	18	22	27	31	36	40	45	49
A	7	6	5	4	4	3	3	3
B	17	13	11	9	8	7	7	6
C	25	21	17	15	13	11	10	10
D	37	29	24	20	18	16	14	13
E	49	38	30	26	23	20	18	16
F	61	47	36	31	28	24	22	20
G	73	56	44	37	32	29	26	24
H	87	66	52	43	38	33	30	27
I	101	76	61	50	43	38	34	31
J	116	87	70	57	48	43	38	34
K	138	99	79	64	54	47	43	38
L	161	111	88	72	61	53	48	42
M	187	124	97	80	68	58	52	47
N	213	142	107	87	73	64	57	51
O	241	160	117	96	80	70	62	55
Z	257	169	122	100	84	73	64	57

[a] Instructions for use: The compressed air exposure times listed in the schedule are called "residual nitrogen times" and are the times a compressed air worker is to consider he has already spent in compressed air when he starts a repetitive exposure to a specific pressure. They are in minutes. Enter the table horizontally with the repetitive group designation from the Open Air Interval Credit Table (Schedule 2.4). The time in each vertical column is the number of minutes that would be required (at a pressure listed at the head of the columns) to saturate to the particular group. For example, the final group designation from the Open Air Interval Credit Table (Schedule 2.4) on the basis of a previous exposure and open air interval is H. It is planned to reenter compressed air at a pressure of 42 psig. What time must be added to the actual time spent in compressed air? Enter Schedule 2.5 on row H. Since 42 psig is greater than 40 psig but less than 45 psig, use the longer time of 33 min. This means that the compressed air worker enters the compressed air environment as though he had already been at 42 psig for 33 min. The exposure time listed in Schedule 2.5 is added to the actual time spent in compressed air. Decompression is carried out based on the sum of the actual exposure time and the time for Schedule 2.5 for the pressure encountered.

3. *Surface Decompression Table for Saturation Diving with Air (Schedule 3.1)*

a. Limits

1. Air: 50 fsw.
2. N_2–O_2: Depths equivalent to 66 ft N_2 tension.

b. Surfacing Instructions

1. The maximum time permitted to surface transfer to the chamber and begin recompression is 15 min. Recompress to 60 fsw, irrespective of the saturation depth.
2. Ascent to the surface at rates up to 20 ft/min is acceptable.

Schedule 3.1
Surface Decompression Table for Saturation Diving with Air (Beckman and Smith 1972)

Depth, fsw	Time, min	Total decompression time, min	Breathing medium
60	20	20	Oxygen
↓	5	25	Oxygen
55	20	45	Air
↓	5	50	Air
50	20	70	Oxygen
↓	5	75	Oxygen
45	20	95	Air
↓	5	100	Air
40	20	120	Oxygen
↓	15	135	Air
25	60	195	Air
↓	5	200	Air
20	90	290	Air
20	30	320	Oxygen
↓	5	325	Oxygen
15	90	415	Air
15	60	475	Oxygen
↓	5	480	Air
10	120	600	Air
10	60	660	Oxygen
↓	5	665	Oxygen
5	150	815	Air
5	60	875	Oxygen
↓	5	880[a]	Air
Surface			

[a] Total decompression time: 880 min, or 14 hr and 40 min. Total 100% oxygen inhalation: 4 hr and 50 min.

4. *Air Excursion Tables for Saturation Diving on Air or N_2–O_2 Mixtures*

NOAA OPS Excursion Instructions. Schedules 4.1 and 4.2.

(*a*) *Criteria.* Habitat gas: oxygen 0.2 atm or greater, balance nitrogen. Excursion gas: air or N_2–O_2 mix having greater than 0.2 atm oxygen.

(*b*) *Descending excursions.* Timing: Begin timing on departure from habitat depth (bottom time includes descent time).

Rates: Descend as fast as desired. A slow descent is preferred, but reduces bottom time.

Schedule

NOAA OPS Table for Descending Excursions: No-Stop

Habitat depth, fsw	Excursion																
	80	85	90	95	100	105	110	115	120	125	130	135	140	145	150	155	160
30	350	267	156	113	91	78	68	60	55	50	45	40	36	32	28	24	22
35	*	*	283	229	143	108	89	77	68	61	54	46	41	37	34	31	28
40	*	*	*	301	240	202	147	112	92	80	70	59	50	44	39	35	32
45	*	*	*	*	323	253	210	181	137	108	91	69	56	48	42	38	34
50	*	*	*	*	*	350	267	219	187	164	140	86	64	53	45	40	36
55	*	*	*	*	*	*	314	245	203	174	153	137	86	63	52	45	40
60	*	*	*	*	*	*	*	284	224	187	161	142	127	85	63	52	45
65	*	*	*	*	*	*	*	315	236	191	162	145	128	111	85	63	51
70	*	*	*	*	*	*	*	*	279	213	174	148	129	114	103	84	62
75	*	*	*	*	*	*	*	*	*	*	*	288	228	191	165	145	95
80		*	*	*	*	*	*	*	*	*	*	*	*	*	317	225	215
85			*	*	*	*	*	*	*	*	*	*	*	*	*	*	328
90				*	*	*	*	*	*	*	*	*	*	*	*	*	*
95					*	*	*	*	*	*	*	*	*	*	*	*	*
100						*	*	*	*	*	*	*	*	*	*	*	*
105							*	*	*	*	*	*	*	*	*	*	*
110								*	*	*	*	*	*	*	*	*	*
115									*	*	*	*	*	*	*	*	*
120										*	*	*	*	*	*	*	*

[a] Asterisk indicates up to 6 hr (360 min). Read instructions before using.

Ascend at any desired rate up to 30 fpm.

(*c*) *Ascending excursions.* Begin timing on arrival at excursion depth ("bottom" time does not include transit times).

Rates: Ascend at 10–30 ft/min.

Descend at 60 ft/min or faster if desired.

If bends symptoms are noted, descend immediately to habitat. If descent to habitat is held up by ear problems, it is preferable to discontinue descent (or even momentarily ascend a bit) and clear the ear, rather than incur ear damage in order to adhere strictly to the schedule.

4.1
Decompression Time (min)[a] (Hamilton *et al.* 1973)

depth, fsw																	
165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240	245	250
18	15	13	12	11	10	9	8	8	7	7	6	6	5	5	5	5	—
25	22	20	16	14	13	11	10	9	9	8	7	7	6	6	6	5	5
30	28	25	23	21	17	15	13	12	11	10	9	8	8	7	7	6	6
31	29	27	25	23	22	21	18	16	14	12	11	10	9	9	8	8	7
33	30	28	26	24	22	21	20	19	18	16	14	13	12	11	10	9	8
36	32	30	27	25	24	22	21	20	19	18	17	15	13	12	11	10	9
39	35	32	29	27	25	23	22	21	19	18	17	17	15	13	12	11	10
44	39	35	32	29	27	25	23	22	20	19	18	17	16	16	14	12	11
51	44	39	35	31	29	26	25	23	21	20	19	18	17	16	15	14	13
66	53	45	40	35	32	29	27	25	23	22	20	19	18	17	16	16	15
122	70	55	47	41	36	32	29	27	25	23	22	20	19	18	17	16	15
265	225	95	66	54	46	40	36	32	29	27	25	23	22	22	19	18	17
*	339	275	168	97	63	55	47	41	37	33	30	28	26	24	23	21	20
*	*	*	306	227	143	113	80	62	52	46	40	37	33	31	28	26	25
*	*	*	*	341	281	193	135	109	93	72	59	50	44	40	36	33	31
*	*	*	*	*	354	308	262	174	129	107	77	62	53	46	41	38	35
*	*	*	*	*	*	*	334	292	257	176	132	83	65	55	48	43	39
*	*	*	*	*	*	*	*	347	303	270	243	163	91	68	57	49	44
*	*	*	*	*	*	*	*	*	*	329	291	261	237	101	72	59	51

Schedule 4.2
NOAA OPS Table for Ascending Excursions (Hamilton *et al.* 1973)

Habitat depth, fsw	Excursion depth, fsw																		
	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
30	36	48	60	*	*	*	*												
35	30	37	48	60	*	*	*	*											
40	24	31	40	52	60	*	*	*	*										
45	17	24	31	40	52	60	*	*	*	*									
50	12	18	25	32	42	60	*	*	*	*	*								
55	7	13	18	25	32	42	60	*	*	*	*	*							
60	—	7	13	18	25	32	42	60	*	*	*	*	*						
65	—	—	8	14	20	27	34	44	60	*	*	*	*	*					
70	—	—	—	8	14	20	27	34	44	60	*	*	*	*	*				
75	—	—	—	—	9	15	21	28	36	47	60	*	*	*	*	*			
80	—	—	—	—	—	9	15	21	28	36	47	60	*	*	*	*	*		
85	—	—	—	—	—	5	10	16	23	30	37	48	60	*	*	*	*	*	
90	—	—	—	—	—	—	5	10	16	23	30	37	48	60	*	*	*	*	*
95	—	—	—	—	—	—	—	6	12	18	24	31	40	52	60	*	*	*	*
100	—	—	—	—	—	—	—	—	6	12	18	24	31	40	52	60	*	*	*
105	—	—	—	—	—	—	—	—	—	7	13	18	25	32	42	60	*	*	*
110	—	—	—	—	—	—	—	—	—	—	7	13	18	25	32	42	60	*	*
115	—	—	—	—	—	—	—	—	—	—	—	7	13	18	25	32	42	60	*
120	—	—	—	—	—	—	—	—	—	—	—	—	7	13	18	25	32	42	60

[a] Asterisk indicates no time limit. Read instructions before using.

5. *Decompression Schedules for Subsaturation He–O_2 Diving*

a. Schedule 5.1: He–O_2 Partial Pressures—40–380 ft

b. Schedule 5.2: Helium–Oxygen Decompression Schedule (Normal and Exceptional Exposures)

Special Instructions on Table Selection. Select proper partial pressure schedules by using one of the following procedures.

(*a*) *In-water decompression.*

1. Rate of ascent to first stop

$$= \frac{\text{bottom depth} - \text{depth of first stop}}{\text{time to first stop}}$$

2. Rate of ascent between stops is 60 ft/min.
3. Switch to O_2 and ventilate 25 scf at 50 ft, or at 40 ft if there is no 50-ft stop. Ventilation time is included in stop time.
4. Remain on O_2 for time of 50- and 40-ft stops.
5. Ascend on O_2 to surface at a uniform rate during the last minute of the 40-ft stop.

(*b*) *Surface decompression.* For schedules in which the first stop is 40 ft:

1. Ventilate with O_2 as above.
2. Remain on O_2 for 10 min at 40 ft.
3. Surface diver in 1 min.
4. Repressurize diver to 40 ft in recompression chamber with air.
5. Diver breathes O_2 by mask for full time of 40-ft stop.
6. During last 5 min of decompression time surface diver at uniform rate while breathing O_2.
7. Maximum allowable time for steps 4 and 5 is 5 min.

For schedules in which the first stop is 50 ft:

1. Ventilate with O_2 and stay at 50 ft for full stop time.
2. Ascend to 40-ft stop and stay at 40 ft for time of 50-ft stop.
3. Surface in 1 min and follow procedure above.

c. Schedule 5.3: Emergency Schedule (He–O_2)

Use this schedule in an emergency when oxygen cannot be used for decompression, owing to failure of the oxygen supply or to symptoms of oxygen poisoning. Use a He–O_2 mix containing a minimum of 16% oxygen. If the impossibility of using oxygen

is known in advance, use the regular schedule up to the first oxygen stop, then shift to the emergency schedule (He–O_2).

d. Schedule 5.4: Emergency Schedule (Air)

Use this schedule in an emergency when neither oxygen nor He–O_2 can be used during decompression. Using this schedule, rate of ascent to the first stop should be the same as listed in the partial pressure tables, but should not exceed 60 ft/min. Rate of ascent on subsequent stops is not critical as long as full decompression is received at each stop.

e. Schedule 5.5: Helium–Oxygen Decompression Schedule for Mixed-Gas Scuba Using 68% Helium–32% Oxygen Supply Mixture

Special Instructions. This schedule is for use only with semiclosed-circuit apparatus. The Standard Supply Mixture (68% He–32% O_2) can be used to a maximum depth of 200 ft for 30 min. The Alternate Gas Mixture (60% He–40% O_2) is limited to a maximum depth of 80 ft and is intended mainly for use at depths less than 50 ft. Rate of descent should not exceed 75 ft/min. Rate of ascent from bottom and between stops should be 60 ft/min.

f. Schedule 5.6: Helium–Oxygen Decompression Table for Mixed-Gas Scuba Using 68% Helium–32% Oxygen Supply Mixture and Oxygen Decompression

Special Information. This schedule allows for oxygen decompression from helium–oxygen mixed-gas dives and provides significant savings in decompression time as compared with Schedule 5.5. This schedule can only be used with semiclosed-circuit apparatus modified with oxygen cylinder and injection system or by supplying the diver on a descending line with surface-supplied oxygen delivered to a demand regulator at the required decompression depth.

1. The first oxygen stop is at 20 or 30 ft.
2. Two minutes are provided in the schedule to secure the helium–oxygen injection system and purge the breathing bag thoroughly three times with oxygen at the first oxygen stop.
3. Decompression time at the first oxygen stop does not start until after the required 2 min for oxygen purging has elapsed.

g. Schedule 5.7: No-Decompression Limits and Repetitive Group Designation Mixed-Gas Scuba No-Decompression Table for Helium–Oxygen Dives

(i) Special Instructions. This schedule for use only with Mixed Gas Scuba (68% He–32% O_2).

1. No-decompression limits column: Allowable maximum bottom time that permits surfacing directly at 60 ft/min with no decompression stops.
2. For longer bottom times use the He–O_2 decompression table for mixed-gas scuba, Schedule 5.5.
3. Repetitive group designation schedule: Time periods in each vertical column are the maximum exposures at various depths during which a diver will remain within the group listed at the head of the column.
4. Repetitive group designation: Enter the schedule on the exact or next greater depth than exposure and select the exposure time that is exactly the same as or next greater than the actual exposure time. Read the group designation (letter) at the top of the column for the next dive.
5. Exposure times for depths less than 40 ft are listed up to 12 hr although this is considered beyond field requirements for this schedule.

(ii) Example. A dive to 42 ft for 45 min.

1. Select next greater depth, i.e., 50 ft.
2. Select next greater exposure time than 45 min, i.e., 55 min.
3. Read the repetitive group designation at the top of the column, i.e., group E.

h. Schedule 5.8: Surface Interval Credit Table for Mixed-Gas Scuba Helium–Oxygen Decompression Dives

(i) Special Instructions. Surface interval time in the schedule is in hours and minutes (1:30 = 1 hr and 30 min).

1. Surface interval must be at least 30 min.
2. Repetitive group designation after surface interval: Enter the table on the diagonal slope using the designation from previous dive. Read horizontally until the actual surface interval is exactly between the intervals shown in schedule 5.5. Read the new group designation at the top of the column.
3. Dives following surface intervals of more than 12 hr are not repetitive dives. Use actual bottom times in the helium–oxygen decompression schedules to compute decompression for such dives.

(ii) Example. Find new group designation after dive to 110 ft for 30 min and a time on the surface of 1 hr and 30 min.

1. The previous repetitive group from the last column of the 110/30 schedule of the helium–oxygen decompression schedules is G.
2. Locate G in the diagonal column.
3. Follow across horizontally.
4. The 1 hr 30 min interval lies between the times 1:01 and 1:40.
5. Diver has lost sufficient inert gas to place him in the group at the top of vertical column E.

i. Schedule 5.9: Repetitive Dive Timetable for Mixed-Gas Scuba Helium–Oxygen Dives

(i) Special Instructions. Bottom times listed in this schedule are called residual helium times. Residual helium time is the time a diver is to consider he has already spent on the bottom when a repetitive dive is started to a specific depth.

To find bottom time to be added to schedule for repetitive dive enter the schedule horizontally with the repetitive group from the Surface Interval Credit Table (Schedule 5.8). Read directly the bottom time to be added to the repetitive dive in the depth column for that dive.

(ii) Example. The group designation from the Surface Interval Credit Table from a previous dive is H. How much bottom time must be added (residual helium time) for a repetitive dive to 110 ft?

1. Enter the schedule horizontally at H.
2. Read in the 110-ft depth column the residual helium time to be added: 39 min.
3. The schedules show that one must start a dive to 110 ft as though he had already been on the bottom 39 min.
4. Use Helium–Oxygen Decompression Schedule 5.5 or 5.6 or the No-Decompression Schedule to determine dive schedule for repetitive dive.

Schedule 5.1

Helium–Oxygen Partial Pressures—40–380 ft (U. S. Navy 1971)

Depth, ft	Oxygen, percent												
	15	16	17	19	21	23	25	30	35	40	45	50	55
40	64	63	63	61	60	58	57	[b]	[b]	[b]	[b]	[b]	[b]
50	73	72	71	69	68	66	64	60	56	[b]	[b]	[b]	[b]
60	81	80	80	78	76	74	72	67	63	58	54	[b]	[b]
70	90	89	88	86	84	82	80	75	70	64	59	54	[b]
80	99	98	97	94	92	90	88	82	76	71	65	59	54
90	108	106	105	103	100	98	95	89	83	77	71	64	
100	116	115	114	111	108	106	103	96	90	83	76		
110	125	123	122	119	116	113	111	103	96	89	82		
120	134	132	131	127	124	121	118	111	103	95			
130	142	141	139	136	133	129	126	118	110	102			
140	151	149	148	144	141	137	134	125	116				
150	160	158	156	152	149	145	141	132	123				
160	168	166	165	161	157	155	149	139					
170	177	175	173	169	165	161	157	147					
180	186	184	182	177	173	169	165	154					
190	195	192	190	186	181	177	172						
200	203	201	199	194	189	185	180						
210	212	209	207	202	197	192	188						
220	221	218	216	210	205	200	195						
230	229	227	224	219	214	203	203						
240	238	235	233	227	222	216							
250	247	244	241	235	230	224							
260	255	252	250	244	238								
270	264	261	258	252	246								
280	273	270	267	260	254								
290	282	278	275	269									
300	290	287	284	277									
310	299	295	292	285									
320	308	304	301										
330	316 [a]	313	309										
340	325	321	318										
350	334	330	326										
360	342	338											
370	351	347											
380	360	356											

[a] Boxed numbers indicate exposures which exceed the limit for a 30-min exposure at 1.6 atm P_{O_2}.

[b] No-decompression cutoff depth for oxygen = (52.8/oxygen percent) − 33. [52.8/(D + 33)] × 100 = maximum oxygen percent. (D + 33 × oxygen percent)/33 = effective atmospheres of oxygen. Partial pressure = (D + 33) × [1.00 − (decimal equivalent of O_2%–0.02)]. 16% is considered the minimum oxygen percentage for surface breathing. The partial pressure tables are not designed for shifting to lower percentages of oxygen during the dive. Therefore, those partial pressure tables requiring a lower percent of oxygen are for emergency use only.

Schedule 5.2

Helium–Oxygen Decompression Table (Normal and Exceptional Exposures) (U. S. Navy 1971)

Partial pressure	Bottom time, min	Time to first stop, min	Decompression stops, ft														Total ascent time, min
			180	170	160	150	140	130	120	110	100	90	80	70	60	50	40	
60	10	4															0	4
	20	4															0	4
	30	4															0	4
	40	4															0	4
	60	4															0	4
	80	4															6	8
	100	2															7	9
	120	2															9	11
	240	2															13	15
70	10																6	9
	20																7	10
	30																9	12
	40																10	13
	60																15	18
	80																17	20
	100																22	25
	120																25	28
	140																27	30
	160																29	32
	180																31	34
	200																31	34
	220																33	36
	240																33	36
80	10																6	9
	20																10	13
	30																13	16
	40																17	20

	60		24	27
	80		32	35
	100		40	43
	120		42	45
	140		45	48
	160		47	50
	180		48	51
	200		48	51
	220		48	51
	240		50	53
90	10		8	11
	20		15	18
	30		18	21
	40		23	26
	60		35	38
	80		45	48
	100		50	53
	120		55	58
	140		58	61
	160		60	63
	180		60	63
	200		62	65
	220		62	65
	240		63	66
100	10	3	10	13
	20		17	20
	30		24	27
	40		31	34
	60		47	50
	80		56	59
	100		63	66
	120		67	70
	140		70	73
	160		72	75

Schedule 5.2—*Cont.*

Partial pressure	Bottom time, min	Time to first stop, min	Decompression stops, ft														Total ascent time, min
			180	170	160	150	140	130	120	110	100	90	80	70	60	50	40	
	180																73	76
	200																73	76
	220																73	76
	240																75	78
110	10	3															12	15
	20																21	24
	30																31	34
	40																39	42
	60																56	59
	80																67	70
	100																75	78
	120																78	81
	140																81	84
	160																83	86
	180																84	87
	200																84	87
	220																85	88
	240																86	89
120	10	3															14	17
	20																25	28
	30																36	39
	40																47	50
	60																66	69
	80																77	80
	100																84	87
	120																87	90
	140																90	93
	160																92	95
	180																93	96

	200				93	96
	220				95	98
	240				97	100
130	10	3		0	16	19
	20			0	29	32
	30			0	42	45
	40			0	53	56
	60			0	73	76
	80			0	86	89
	100			0	92	95
	120			0	96	99
	140			0	99	102
	160			10	92	105
	180			10	93	106
	200			10	94	107
	220			10	95	108
	240			10	96	109
140	10	3		0	19	22
	20			0	34	37
	30			0	49	52
	40			0	62	65
	60			0	82	85
	80			0	94	97
	100			0	99	102
	120			10	97	110
	140			10	98	111
	160			10	99	112
	180			12	99	114
	200			13	99	115
	220			14	99	116
	240			15	99	117
150	10	3	0	10	11	24
	20		0	10	28	41
	30		0	10	45	58
	40		7	10	59	79

Schedule 5.2—*Cont.*

Partial pressure	Bottom time, min	Time to first stop, min	Decompression stops, ft														Total ascent time, min
			180	170	160	150	140	130	120	110	100	90	80	70	60	50	40	
	60														7	10	78	98
	80														7	10	90	110
	100														7	10	96	116
	120														7	11	98	119
	140														7	13	99	122
	160														8	15	99	125
	180														9	15	99	126
	200														10	16	99	128
	220														11	16	99	129
	240														12	16	99	130
160	10	3												0	0	10	12	25
	20													0	7	10	33	53
	30													0	7	10	50	70
	40													0	7	10	65	85
	60													0	7	10	84	104
	80													0	7	10	96	116
	100													0	7	13	99	122
	120													0	9	16	99	127
	140													0	15	16	99	133
	160													0	18	16	99	136
	180													0	20	16	99	138
	200													0	22	16	99	140
	220													0	23	16	99	141
	240													7	19	16	99	144
170	10	3												0	7	10	15	35
	20													0	7	10	36	56
	30													0	7	10	55	75
	40													0	7	10	70	90
	60													7	6	10	83	109

	80			7	9	10	98	127
	100			7	13	14	98	135
	120			7	17	16	99	142
	140			8	21	16	99	147
	160			11	22	16	99	151
	180			11	23	16	99	152
	200			12	23	16	99	153
	220			14	23	16	99	155
	240			16	23	16	99	157
180	10	3	0	7	0	10	17	37
	20		0	7	0	10	41	61
	30		0	7	1	10	62	83
	40		0	7	4	10	77	101
	60		0	7	10	10	92	122
	80		0	9	14	13	98	137
	100		7	5	18	15	99	147
	120		7	9	21	16	99	155
	140		7	11	22	16	99	158
	160		7	15	23	16	99	163
	180		7	17	23	16	99	165
	200		7	19	23	16	99	167
	220		7	21	23	16	99	169
	240		7	23	23	16	99	171
190	10	4	0	7	0	10	20	41
	20		0	7	0	10	44	65
	30		0	7	4	10	67	92
	40		7	0	8	10	81	110
	60		7	5	11	10	96	133
	80		7	9	15	15	99	149
	100		7	13	19	16	99	158
	120		7	17	23	16	99	166
	140		9	19	23	16	99	170
	160		11	20	23	16	99	173
	180		13	21	23	16	99	176
	200		14	22	23	16	99	178

Schedule 5.2—*Cont.*

Partial pressure	Bottom time, min	Time to first stop, min	Decompression stops, ft															Total ascent time, min
			180	170	160	150	140	130	120	110	100	90	80	70	60	50	40	
	220												15	23	23	16	99	180
	240												17	23	23	16	99	182
200	10	4										0	0	7	0	10	22	43
	20											0	7	0	2	10	50	73
	30											0	7	0	7	10	69	97
	40											0	7	4	9	10	84	118
	60											0	7	9	13	12	93	138
	80											7	3	13	18	15	99	159
	100											7	6	16	21	16	99	169
	120											7	8	20	23	16	99	177
	140											7	11	21	23	16	99	181
	160											7	15	23	23	16	99	187
	180											7	17	23	23	16	99	189
	200											7	18	23	23	16	99	190
	220											7	20	23	23	16	99	192
	240											8	20	23	23	16	99	193
210	10	4										0	7	0	0	10	25	46
	20											0	7	0	4	10	53	78
	30											7	0	3	7	10	74	105
	40											7	0	7	10	10	86	124
	60											7	4	10	14	13	98	150
	80											7	8	14	18	16	99	166
	100											7	12	17	23	16	99	178
	120											8	15	21	23	16	99	186
	140											10	17	21	23	16	99	190
	160											12	17	22	23	16	99	193
	180											14	18	22	23	16	99	196
	200											16	18	23	23	16	99	199
	220											17	19	23	23	16	99	201

	240				18	20	23	23	16	99	203
220	10	4		0	0	7	0	0	10	28	49
	20			0	7	0	1	6	10	57	85
	30			0	7	0	6	7	10	79	113
	40			0	7	3	9	10	10	90	133
	60			7	0	9	11	17	13	98	159
	80			7	3	11	15	20	13	99	172
	100			7	6	14	19	23	16	99	188
	120			7	8	18	23	23	16	99	198
	140			7	11	18	23	23	16	99	201
	160			7	14	19	23	23	16	99	205
	180			7	15	20	23	23	16	99	207
	200			7	16	20	23	23	16	99	208
	220			18	17	20	23	23	16	99	210
	240			9	19	20	23	23	16	99	213
230	10	4		0	0	7	0	2	10	30	53
	20			0	7	0	3	7	10	61	92
	30			0	7	2	6	9	10	81	119
	40			7	0	6	9	11	10	93	140
	60			7	4	9	12	18	14	99	167
	80		0	7	8	12	17	21	16	99	184
	100		0	7	12	15	20	23	16	99	196
	120		0	8	14	19	23	23	16	99	206
	140		0	10	16	20	23	23	16	99	211
	160		7	6	18	20	23	23	16	99	216
	180		7	7	19	20	23	23	16	99	218
	200		7	9	19	20	23	23	16	99	220
	220		7	11	19	20	23	23	16	99	222
	240		7	13	19	20	23	23	16	99	224
240	10	4	0	0	7	0	0	3	10	33	57
	20		0	7	0	1	4	7	10	65	98
	30		0	7	0	5	7	10	10	85	128
	40		7	0	3	7	9	13	11	95	149
	60		7	0	8	10	14	18	15	99	175
	80		7	3	10	14	18	23	16	99	194

Schedule 5.2—*Cont.*

Partial pressure	Bottom time, min	Time to first stop, min	Decompression stops, ft														Total ascent time, min
			180	170	160	150	140	130	120	110	100	90	80	70	60	50	40	
	100									7	6	12	17	23	23	16	99	207
	120									7	7	16	19	23	23	16	99	214
	140									7	11	16	20	23	23	16	99	219
	160									7	13	19	20	23	23	16	99	224
	180									8	15	19	20	23	23	16	99	227
	200									8	17	19	20	23	23	16	99	229
	220									9	17	19	20	23	23	16	99	230
	240									11	17	19	20	23	23	16	99	232
250	10	4								0	7	0	0	2	4	10	35	62
	20									0	7	0	2	5	7	10	68	103
	30									7	0	2	6	7	10	10	87	133
	40									7	0	5	8	9	14	12	96	155
	60								0	7	4	8	11	14	19	16	99	182
	80								0	7	7	11	16	18	23	16	99	201
	100								0	7	10	14	19	23	23	16	99	215
	120								7	3	12	17	19	23	23	16	99	223
	140								7	4	15	18	19	23	23	16	99	228
	160								7	7	16	19	19	23	23	16	99	233
	180								7	9	17	19	20	23	23	16	99	237
	200								7	11	17	19	20	23	23	16	99	239
	220								7	12	17	19	20	23	23	16	99	240
	240								7	13	17	19	20	23	23	16	99	241
260	10	4								0	7	0	0	2	4	10	37	64
	20									7	0	0	3	7	7	10	70	108
	30									7	0	4	6	8	10	10	89	138
	40									7	2	5	9	9	14	13	96	159
	60								7	0	7	9	12	16	21	16	99	191
	80								7	3	9	13	15	21	23	16	99	210
	100								7	6	11	14	19	23	23	16	99	222

	120			7	8	13	19	20	23	23	16	99	232
	140			7	11	15	19	20	23	23	16	99	237
	160			8	13	17	19	20	23	23	16	99	242
	180			9	14	17	19	20	23	23	16	99	244
	200			10	16	17	19	20	23	23	16	99	247
	220			11	16	17	19	20	23	23	16	99	248
	240			13	16	17	19	20	23	23	16	99	250
270	10	4		0	7	0	0	0	4	4	10	40	69
	20			0	7	0	2	4	6	7	10	74	114
	30			7	0	2	5	6	9	10	10	92	145
	40			7	0	3	8	9	10	15	14	96	166
	60		0	7	3	7	10	14	16	21	16	99	197
	80		0	7	6	10	13	17	23	23	16	99	218
	100		7	2	9	13	16	20	23	23	16	99	232
	120		7	4	11	14	19	20	23	23	16	99	240
	140		7	5	14	15	19	20	23	23	16	99	245
	160		7	7	15	17	19	20	23	23	16	99	250
	180		7	9	16	17	19	20	23	23	16	99	253
	200		7	11	16	17	19	20	23	23	16	99	255
	220		7	13	16	17	19	20	23	23	16	99	257
	240		7	15	16	17	19	20	23	23	16	99	259
280	10	4		0	7	0	0	2	3	4	10	42	72
	20			7	0	0	2	6	6	8	10	78	121
	30			7	0	3	6	6	9	13	10	93	151
	40		7	0	2	5	8	8	12	16	13	98	173
	60		7	0	6	8	10	14	19	23	16	99	206
	80		7	3	8	11	14	17	23	23	16	99	225
	100		7	5	11	13	16	20	23	23	16	99	237
	120		7	8	12	16	19	20	23	23	16	99	247
	140		7	10	16	17	19	20	23	23	16	99	254
	160		8	13	16	17	19	20	23	23	16	99	258
	180		9	14	16	17	19	20	23	23	16	99	260
	200		10	15	16	17	19	20	23	23	16	99	262
	220		12	15	16	17	19	20	23	23	16	99	264
	240		14	15	16	17	19	20	23	23	16	99	266

Schedule 5.2—*Cont.*

Partial pressure	Bottom time, min	Time to first stop, min	Decompression stops, ft														Total ascent time, min
			180	170	160	150	140	130	120	110	100	90	80	70	60	50	40	
290	10	4						0	0	7	0	0	3	3	4	10	46	77
	20							0	7	0	0	4	6	7	7	10	81	126
	30							7	0	1	5	5	9	9	12	10	96	158
	40						0	7	0	4	6	8	9	12	17	15	98	180
	60						0	7	4	6	8	12	15	18	23	16	99	212
	80						7	0	7	9	11	15	17	23	23	16	99	231
	100						7	2	9	11	15	17	20	23	23	16	99	246
	120						7	4	11	13	16	19	20	23	23	16	99	255
	140						7	5	13	16	17	19	20	23	23	16	99	262
	160						7	8	14	16	17	19	20	23	23	16	99	266
	180						7	10	15	16	17	19	20	23	23	16	99	269
	200						7	12	15	16	17	19	20	23	23	16	99	271
	220						7	13	15	16	17	19	20	23	23	16	99	272
	240						7	14	15	16	17	19	20	23	23	16	99	273
300	10	5				0	0	0	7	0	0	0	4	3	4	10	49	82
	20					0	0	7	0	0	2	6	6	6	9	10	83	134
	30					0	0	7	0	2	5	5	9	9	14	12	94	162
	40					0	0	7	0	5	7	8	11	13	17	15	98	186
	60					0	7	0	6	7	9	12	15	20	23	16	99	219
	80					0	7	2	8	10	12	16	19	23	23	16	99	240
	100					0	7	5	10	12	15	19	20	23	23	16	99	254
	120					0	7	8	11	16	17	19	20	23	23	16	99	264
	140					0	8	9	14	16	17	19	20	23	23	16	99	269
	160					0	8	13	15	16	17	19	20	23	23	16	99	274
	180					7	3	13	15	16	17	19	20	23	23	16	99	276
	200					7	5	14	15	16	17	19	20	23	23	16	99	279
	220					7	6	14	15	16	17	19	20	23	23	16	99	280
	240					7	9	14	15	16	17	19	20	23	23	16	99	283
310	10	5				0	0	0	7	0	0	2	3	3	5	10	52	87

	20			0	0	7	0	0	4	5	6	6	11	10	84	138
	30			0	7	0	0	5	5	7	8	9	14	12	96	168
	40			0	7	0	3	5	8	8	11	13	18	15	99	192
	60			0	7	3	6	7	10	12	18	22	23	16	99	228
	80			7	0	6	9	11	12	16	19	23	23	16	99	246
	100			7	1	9	10	14	17	19	20	23	23	16	99	263
	120			7	4	11	12	14	17	19	20	23	23	16	99	270
	140			7	5	12	15	16	17	19	20	23	23	16	99	277
	160			7	8	14	15	16	17	19	20	23	23	16	99	282
	180			7	10	14	15	16	17	19	20	23	23	16	99	284
	200			7	12	14	15	16	17	19	20	23	23	16	99	286
	220			8	13	14	15	16	17	19	20	23	23	16	99	288
	240			9	13	14	15	16	17	19	20	23	23	16	99	289
320	10	5	0	0	0	7	0	0	0	3	3	3	7	10	54	92
	20		0	0	7	0	0	2	4	5	6	7	10	10	85	141
	30		0	0	7	0	2	4	5	7	8	11	15	13	98	175
	40		0	7	0	1	4	6	7	8	12	15	19	16	99	199
	60		0	7	0	5	6	9	11	13	17	20	23	16	99	231
	80		0	7	3	7	9	11	13	17	20	23	23	16	99	253
	100		0	7	5	9	11	13	17	19	20	23	23	16	99	267
	120		0	7	7	12	13	16	17	19	20	23	23	16	99	277
	140		7	2	9	12	15	16	17	19	20	23	23	16	99	283
	160		7	3	11	14	15	16	17	19	20	23	23	16	99	288
	180		7	5	11	14	15	16	17	19	20	23	23	16	99	290
	200		7	6	13	14	15	16	17	19	20	23	23	16	99	293
	220		7	7	13	14	15	16	17	19	20	23	23	16	99	294
	240		7	9	13	14	15	16	17	19	20	23	23	16	99	296
330	10	5	0	0	0	7	0	0	0	4	3	3	7	10	56	95
	20		0	0	7	0	0	3	5	5	6	8	10	10	88	147
	30		0	7	0	0	4	4	6	7	9	11	17	13	98	181
	40		0	7	0	4	4	6	7	9	12	16	20	16	99	205
	60		7	0	2	6	8	9	11	14	17	23	23	16	99	240
	80		7	0	6	8	8	13	14	19	20	23	23	16	99	261
	100		7	2	7	10	13	16	17	19	20	23	23	16	99	277
	120		7	4	9	12	13	16	17	19	20	23	23	16	99	283

Schedule 5.2—*Cont.*

Partial pressure	Bottom time, min	Time to first stop, min	Decompression stops, ft														Total ascent time, min
			180	170	160	150	140	130	120	110	100	90	80	70	60	50	40	
	140				7	6	11	13	15	16	17	19	20	23	23	16	99	290
	160				7	8	13	14	15	16	17	19	20	23	23	16	99	295
	180				7	10	13	14	15	16	17	19	20	23	23	16	99	297
	200				7	12	13	14	15	16	17	19	20	23	23	16	99	299
	220				9	12	13	14	15	16	17	19	20	23	23	16	99	301
	240				10	12	13	14	15	16	17	19	20	23	23	16	99	302
340	10	5		0	0	0	7	0	0	0	2	3	3	4	7	10	59	100
	20			0	0	7	0	0	2	3	4	6	5	10	10	10	90	152
	30			0	0	7	0	1	4	5	6	8	8	13	17	14	98	186
	40			0	7	0	1	4	5	7	7	10	12	17	22	16	99	212
	60			0	7	0	5	6	8	9	11	15	20	23	23	16	99	247
	80			0	7	2	7	8	10	13	15	19	20	23	23	16	99	267
	100			0	7	5	9	9	13	16	17	19	20	23	23	16	99	281
	120			7	1	7	10	13	15	16	17	19	20	23	23	16	99	291
	140			7	2	9	12	14	15	16	17	19	20	23	23	16	99	297
	160			7	4	10	13	14	15	16	17	19	20	23	23	16	99	301
	180			7	5	12	13	14	15	16	17	19	20	23	23	16	99	304
	200			7	6	12	13	14	15	16	17	19	20	23	23	16	99	305
	220			7	8	12	13	14	15	16	17	19	20	23	23	16	99	307
	240			7	10	12	13	14	15	16	17	19	20	23	23	16	99	309
350	10	5		0	0	0	7	0	0	0	3	3	3	4	7	10	61	103
	20			0	0	7	0	0	2	4	5	7	8	9	10	10	90	157
	30			0	7	0	0	3	5	5	6	8	9	13	18	14	98	191
	40			0	7	0	2	4	6	7	8	10	13	16	22	16	99	215
	60			7	0	3	5	6	9	10	13	16	18	21	23	16	99	251
	80			7	0	7	7	8	11	13	15	19	20	23	23	16	99	273
	100			7	2	8	8	12	13	16	17	19	20	23	23	16	99	288
	120			7	4	9	11	13	15	16	17	19	20	23	23	16	99	297
	140			7	6	11	13	14	15	16	17	19	20	23	23	16	99	304

	160			7	9	11	13	14	15	16	17	19	20	23	23	16	99	307
	180			8	9	12	13	14	15	16	17	19	20	23	23	16	99	309
	200			8	11	12	13	14	15	16	17	19	20	23	23	16	99	311
	220			10	11	12	13	14	15	16	17	19	20	23	23	16	99	313
	240			11	11	12	13	14	15	16	17	19	20	23	23	16	99	314
360	10	5	0	0	0	7	0	0	0	2	2	3	3	5	7	10	64	108
	20		0	0	7	0	0	0	4	4	5	5	7	9	13	10	94	163
	30		0	0	7	0	1	4	4	5	7	8	11	13	18	14	99	196
	40		0	7	0	1	3	5	6	7	8	11	14	17	23	16	99	222
	60		0	7	0	5	5	8	8	11	12	16	19	23	23	16	99	257
	80		0	7	2	7	7	10	11	13	17	19	20	23	23	16	99	279
	100		7	0	6	8	9	11	15	16	17	19	20	23	23	16	99	294
	120		7	1	7	9	12	14	15	16	17	19	20	23	23	16	99	303
	140		7	3	9	11	13	14	15	16	17	19	20	23	23	16	99	310
	160		7	4	10	12	13	14	15	16	17	19	20	23	23	16	99	313
	180		7	5	11	12	13	14	15	16	17	19	20	23	23	16	99	315
	200		7	7	11	12	13	14	15	16	17	19	20	23	23	16	99	317
	220		7	9	11	12	13	14	15	16	17	19	20	23	23	16	99	319
	240		7	11	11	12	13	14	15	16	17	19	20	23	23	16	99	321

Schedule 5.3
Emergency Table for Use in Helium–Oxygen Diving—Emergency Table ($He–O_2$) (U. S. Navy 1971)

Decompression stop depth, ft	Decompression stop time, min
50	26
40	30
30	35
20	42
10	55

Schedule 5.4
Emergency Table for Use in Helium–Oxygen Diving—Emergency Table (Air) (U. S. Navy 1971)

Stops, ft	Depth to:						
	100 ft	150 ft	200 ft	250 ft	300 ft	350 ft	400 ft
190							3
180							11
170							12
160						9	12
150						13	13
140					4	13	14
130					14	15	15
120					16	16	16
110				13	16	17	17
100				18	18	18	18
90			7	19	19	20	20
80			22	22	22	22	22
70			24	24	24	24	24
60		22	26	26	26	27	27
50		30	30	30	30	30	30
40	14	35	35	35	35	35	35
30	42	42	42	42	42	42	42
20	52	52	52	52	52	52	52
10	68	68	68	68	68	68	68

Schedule 5.5

Helium–Oxygen Decompression Table for Mixed-Gas Scuba Using 68% Helium—32% Oxygen Supply Mixture (U. S. Navy 1971)

Depth, ft	Bottom time, min	Time to first stop, min:sec	Decompression stops, ft					Total ascent time, min:sec	Repetitive group
			50	40	30	20	10		
40	260						0	0:40	L
50	180						0	0:50	L
	200	0:40					20	20:50	L
60	130						0	1:00	L
	150	0:50					20	21:00	L
	170	0:50					35	36:00	L
70	85						0	1:10	J
	100	1:00					15	16:10	K
	115	1:00					25	26:10	L
	130	1:00					40	41:10	L
80	60						0	1:20	I
	70	1:00				5	10	16:20	J
	80	1:00				10	15	26:20	K
	90	1:00				10	25	36:20	K
	100	1:00				10	35	46:20	K
90	45						0	1:30	H
	60	1:10				5	10	16:30	J
	70	1:10				5	20	26:30	K
	85	1:10				10	30	41:30	L
100	35						0	1:40	G
	50	1:20				5	15	21:40	J
	60	1:20				10	20	31:40	K
	70	1:10			5	15	25	46:40	K
110	30						0	1:50	G
	40	1:30				5	10	16:50	H
	50	1:30				10	20	31:50	J
	65	1:20			5	15	25	46:50	L
120	25						0	2:00	G

Schedule 5.5—*Cont.*

Depth, ft	Bottom time, min	Time to first stop, min:sec	Decompression stops, ft					Total ascent time, min:sec	Repetitive group
			50	40	30	20	10		
	35	1:40				5	10	17:00	I
	45	1:30			5	10	15	32:00	K
	55	1:30			10	15	20	47:00	L
130	20						0	2:10	F
	30	1:50				5	10	17:10	I
	40	1:40			5	10	15	32:10	J
	50	1:30		5	5	15	20	47:10	L
140	15						0	2:20	E
	25	2:00				5	10	17:20	G
	35	1:50			5	10	20	37:20	J
	45	1:40		5	5	15	25	52:20	K
150	15						0	2:30	E
	20	2:10				5	10	17:30	G
	30	2:00			5	10	15	32:30	J
	40	1:50		5	10	15	20	52:30	K
160	10						0	2:40	E
	20	2:10			5	5	10	22:40	G
	35	2:00		5	10	10	20	47:40	K
170	10						0	2:50	E
	20	2:20			5	5	10	22:50	H
	35	2:10		5	10	15	20	52:50	K
180	5						0	3:00	C
	10	2:40				5	10	18:00	E
	20	2:20		5	5	10	10	33:00	H
	30	2:20		5	10	15	20	53:00	K
190	10	2:50				5	10	18:10	E
	20	2:30		5	5	10	20	43:10	H
	30	2:20	5	5	10	15	25	63:10	K
200	10	3:00				5	15	23:20	F
	20	2:40		4	5	10	20	43:20	I
	30	2:30	5	5	10	15	35	73:20	K

Schedule 5.6
Helium–Oxygen Decompression Table for Mixed-Gas Scuba Using 68% Helium–32% Oxygen Supply Mixture and Oxygen Decompression (U.S. Navy 1971)

		Decompression stops,[a] min				
		$He–O_2$		Oxygen		
Depth, ft	Time, min	50 ft	40 ft	30 ft	20 ft	Repetitive group
60	170				20	L
70	115				15	L
	130				25	L
80	80				15	K
	90				20	K
	100				25	K
90	70				15	K
	85				25	L
100	50				15	J
	60				20	K
	70			5	20	K
110	50				15	J
	65			5	20	L
120	45			5	15	K
	55			10	20	L
130	40			5	15	J
	50		5	5	20	L
140	35			5	15	J
	45		5	5	20	K
150	30			5	15	J
	40		5	10	20	K
160	20			5	10	G
	35		5	10	20	K
170	20			5	10	H
	35		5	10	20	K
180	20		5	5	10	H
	30		5	10	20	K
190	20		5	5	15	H
	30	5	5	10	20	K
200	20		5	5	20	I
	30	5	5	10	25	K

[a]Allow 2 min to complete bag purge to oxygen.

Schedule 5.7

No-Decompression Limits and Repetitive Group Designation Mixed-Gas Scuba No-Decompression Table for Helium–Oxygen Dives (U. S. Navy 1971)

Depth, ft	No-decompression limit, min	Repetitive group ($He–O_2$ dives)											
		A	B	C	D	E	F	G	H	I	J	K	L
10		70	190	720									
20		25	60	95	145	215	335	720					
30		15	35	60	80	110	145	185	245	335	525	720	
40	260	10	25	40	55	70	90	110	140	165	200	245	260
50	180	10	20	30	40	55	70	85	100	120	140	160	180
60	130	5	15	25	35	45	55	65	75	90	105	120	130
70	85	5	10	20	30	35	45	55	65	75	85		
80	60	5	10	15	25	30	40	45	55	60			
90	45	5	10	15	20	30	35	40	45				
100	35	5	10	15	20	25	30	35					
110	30	5	9	12	15	20	25	30					
120	25	5	8	10	15	20	22	25					
130	20		5	10	15	17	20						
140	15		5	10	12	15							
150	15		5	10	12	15							
160	10		5	6	8	10							
170	10		5	6	8	10							
180	5			5									

Schedule 5.8

Surface Interval Credit Table for Mixed-Gas Scuba Helium–Oxygen Decompression Dives[a] (U. S. Navy 1971)

L	K	J	I	H	G	F	E	D	C	B	A
L 0:00	0:31	0:41	0:51	1:21	1:41	2:01	2:31	3:11	4:01	5:11	7:11
0:30	0:40	0:50	1:20	1:40	2:00	2:30	3:10	4:00	5:10	7:10	12:00[b]
	K 0:00	0:31	0:41	1:01	1:21	1:51	2:21	3:01	3:51	5:01	7:01
	0:30	0:40	1:00	1:20	1:50	2:20	3:00	3:50	5:00	7:00	12:00[b]
		J 0:00	0:31	0:41	1:01	1:31	2:01	2:41	3:31	4:41	6:41
		0:30	0:40	1:00	1:30	2:00	2:40	3:30	4:40	6:40	12:00[b]
			I 0:00	0:31	0:51	1:21	1:51	2:21	3:11	4:21	6:21
			0:30	0:50	1:20	1:50	2:20	3:10	4:20	6:20	12:00[b]
				H 0:00	0:31	0:51	1:31	2:01	2:51	4:01	6:01
				0:30	0:50	1:30	2:00	2:50	4:00	6:00	12:00[b]
					G 0:00	0:31	1:01	1:41	2:31	3:41	5:41
					0:30	1:00	1:40	2:30	3:40	5:40	12:00[b]
						F 0:00	0:36	1:11	2:01	3:11	5:11
						0:35	1:10	2:00	3:10	5:10	12:00[b]
							E 0:00	0:41	1:31	2:41	4:41
							0:40	1:30	2:40	4:40	12:00[b]
								D 0:00	0:51	2:01	4:01
								0:50	2:00	4:00	12:00[b]
									C 0:00	1:21	3:11
									1:20	3:10	12:00[b]
										B 0:00	2:01
										2:00	12:00[b]
											A 0:00
											12:00[b]

[a] The upper set of repetitive groups indicates the group at the end of the surface interval ($He–O_2$ dives). The diagonal set of repetitive groups indicates the group at the beginning of the surface interval from previous dive.

[b] Dives following surface intervals of more than 12 hr are not repetitive dives. Use actual bottom times in the helium–oxygen decompression tables to compute decompression for such dives.

Schedule 5.9
Repetitive Dive Timetable for Mixed-Gas Scuba Helium–Oxygen Dives (U. S. Navy 1971)

Repetitive group	Repetitive dive depth ($He–O_2$ dives), ft																
	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200
A	13	10	8	7	6	6	5	5	4	4	4	4	3	3	3	3	3
B	26	21	17	14	13	11	10	9	8	8	7	7	6	6	6	5	5
C	40	32	26	22	19	17	15	14	13	12	11	10	9	9	8	8	8
D	56	44	35	30	26	23	20	19	17	15	14	13	13	12	11	11	10
E	74	57	45	38	33	29	26	23	21	19	18	17	16	15	14	13	13
F	93	71	56	47	40	35	31	28	26	24	22	20	19	18	17	16	15
G	115	86	67	56	47	42	37	33	30	28	26	24	22	21	20	19	18
H	139	102	79	66	55	48	43	39	35	32	29	28	26	24	22	21	20
I	168	120	92	76	64	56	49	44	40	37	33	31	29	27	26	24	23
J	203	141	105	87	72	63	55	49	45	41	37	35	32	31	28	27	25
K	248	165	120	98	80	71	61	55	49	45	42	39	36	34	32	30	28
L	305	191	137	111	91	79	68	61	55	50	46	43	40	37	35	33	31

6. *Decompression Procedures for Excursion Diving from Saturation, While Breathing He–O_2 Gas Mixtures*

If the ascent rate exceeds 60 ft/min, the diver should pause at a pressure 10 ft greater than this saturation depth for the time that should have been taken in an ascent at 60 ft/min.

If the ascent rate is slower than 60 ft/min:

1. If the additional time used in ascent does not take the diver beyond the no-decompression limit for his excursion, then it is only necessary to consider the additional delay as part of the excursion time for subsequent excursions.
2. If the additional time used in ascent takes the diver beyond the no-decompression limit for his excursion, pressurize the habitat to the depth at which the delay occurs. Thereafter, he may safely return to the habitat.

a. Depth Limitations

Schedule 6.1 should be used when the excursion dives are made from a saturation exposure at any depth in the range from 150 to 300 ft of sea water. Schedule 6.2 should be used when the excursion dives are made from a saturation exposure at any depth in the range from 300 to 600 ft of sea water. No schedules are presently approved for excursion diving from saturation exposures less than 150 ft of sea water.

b. Habitat Pressure

The saturation pressure of the habitat will normally be kept constant while the excursion diver is absent. The pressure of the habitat may be increased in an emergency and the excursion diver safely brought back to a saturation depth greater than the one from which he left. *Under no circumstances* should the excursion diver be brought back to a habitat saturation pressure less than the pressure from which he departed.

c. Habitat Atmosphere Control

At any time during the saturation exposure in the habitat deeper than 14 ft sea water the oxygen partial pressure should be maintained at 0.3 ATA (220 mm Hg), the carbon dioxide partial pressure should not be greater than 0.0025 ATA (2 mm Hg), the nitrogen partial pressure should not be greater than 1.2 ATA (900 mm Hg), and the balance of the total pressure should be that of helium.

d. UBA Gas Mixture

The gas mixture supply to the underwater breathing apparatus (UBA) of the diver during the excursion should be helium–oxygen with the proportion and the flow rate adjusted so that the oxygen partial pressure in the diver's inhaled breath (bag level) should generally be between 0.8 and 1.0 ATA (610–760 mm Hg). Fluctuations of the bag level in the range between 0.5 and 1.5 ATA (380–1140 mm Hg) are acceptable.

Positive measures should be taken to prevent the oxygen partial pressure falling below 0.4 ATA (305 mm Hg) or rising above 1.6 ATA (1215 mm Hg).

e. Description of Schedules

1. No-Decompression Schedule. Gives the number of minutes permitted at any excursion depth for a no-decompression excursion.

2. Repetitive Group Designation Schedule. Gives the repetitive group designation for any excursions that may have preceded the repetitive excursion.

3. Repetitive Excursion Timetable. Gives the number of minutes of residual helium time that must be subtracted from the no-decompression limits of the repetitive excursion to give the maximum actual excursion time that will still permit a no-decompression return to the saturation depth.

5. Repetitive Group Designation Schedule. Gives the repetitive group designation for the sum of the residual helium time and the actual excursion time of the repetitive excursion.

5. Habitat Interval Credit Schedule. Gives credit for the release of residual helium from the diver's body during the interval of the saturation pressure of the habitat between excursions.

f. Instructions for Use of Schedules

(i) Schedules 6.1 and 6.2. Schedule 6.1 should be used when the saturation gauge depth is between 150 and 300 fsw. Schedule 6.2 should be used when the saturation gauge depth is between 300 and 600 fsw.

1. Read the exact, or next greater, depth to which the excursion dive is to be made in the depth of excursion column.
2. Read in the no-decompression limits column the maximum allowable excursion time that is permitted without requiring decompression stops.

Example: A 40-ft excursion dive is to be conducted from a saturated depth of 220 ft. What is the allowable excursion time for which no decompression is required?

Use: Schedule 6.1, 150–300 ft.

Enter: Depth of excursion column at "plus 50 ft" (next greater than 40 ft).

Read: 270 min in the no-decompression limits column.

1. The diver may spend up to 270 min at the 40 ft excursion depth before requiring decompression.
2. Read in the repetitive group designation column the repetitive letter group that corresponds to the actual, or next greater than actual, excursion time.

Example: In the above dive, the diver actually spends 70 min at the 40-ft excursion depth. What is his repetitive group designation?

Enter: Depth of excursion column at "plus 50 ft."

Read: Horizontally to the 100-min column (next greater than 70 min).

Read: Vertically to the repetitive group designation C.

(ii) Schedule 6.3. Schedule 6.3 should be used only when the gauge depth of the saturation exposure is between 150 ft and 600 ft of sea water. Habitat interval time in the schedule is in hours and minutes: 5:30 means 5 hr and 30 min. With the repetitive group designation from the previous excursion (from either Schedule 6.1 or 6.2) find that letter on the diagonal slope of the schedule. Enter the schedule horizontally to select the listed habitat interval that is equal to or next greater than the actual habitat interval time. The repetitive group designation for the end of the habitat interval is at the head of the vertical column where the selected habitat interval is listed.

Example: After the above dive, the diver spends 6 hr in the habitat. What is his new repetitive group designation?

Enter: Schedule 6.3 on the diagonal slope at the letter C (group designation from previous dive).

Read: Horizontally to the 6:30 column (next greater than 6 hr).

Read: Vertically to the new repetitive group designation, B.

The diver has lost sufficient inert gas to place him in repetitive group B.

If a repetitive excursion dive is to be conducted, enter the repetitive group designation column (Schedule 6.1 or 6.2) corresponding to the letter group from the habitat interval credit table. Enter the depth of excursion column corresponding to the exact or next greater depth of the repetitive dive. Read the residual helium time at the intersection of these columns.

Example: Following the above dive, a repetitive excursion dive to 60 ft below the saturation depth is planned for the same diver. How much residual helium time does the diver have? How long may the excursion dive be before decompression is required?

Enter: Schedule 6.1, repetitive group designation column under the letter B (group designation from habitat interval credit schedule after 6 hr in habitat).

Enter: Depth of excursion column at the "plus 75 ft" depth (next greater than 60 ft).

Read: At intersections of these two columns, residual helium time is 40 min.

Read: No-decompression limits column corresponding to the "plus 75 ft" depth is 150 min.

Subtract: 150 − 40 (residual helium time) = 110 min.

The diver may remain at the 60-ft excursion depth for 110 min before decompression is required.

Schedule 6.1

Excursion Timetable for Saturation at a Gauge Depth between 150 and 300 fsw (U. S. Navy 1971)

Depth of excursion from saturation exposure	No-decompression limits, min	Repetitive group designation					
		A	B	C	D	E	F
Plus 25 ft	—	60	150	300	600	—	—
50	270	30	60	100	150	210	270
75	150	20	40	65	90	120	150
100	60	10	20	30	40	50	60

Schedule 6.2
Excursion Timetable for Saturation at a Gauge Depth between 300 and 600 fsw (U. S. Navy 1971)

Depth of excursion from saturation exposure	No-decompression limit, min	Repetitive group designation					
		A	B	C	D	E	F
Plus 25 ft	—	60	150	300	600	—	—
50	270	30	60	100	150	210	270
75	150	20	40	65	90	120	150
100	100	15	30	45	60	80	100
125	75	10	20	30	45	60	75
150	60	10	20	30	40	50	60

Schedule 6.3
Chamber Interval Credit Table for Saturation Exposure at a Gauge Depth between 150 and 600 fsw[a]

	F	E	D	C	B	A
F	To 1:00	2:30	4:00	6:30	12:00	24:00
	E	1:30	3:00	5:30	10:00	24:00
		D	2:00	4:00	8:00	24:00
			C	2:30	6:30	24:00
				B	4:00	24:00
					A	24:00

[a] Upper set of repetitive groups indicates repetitive group at the end of the chamber interval (before repetitive excursion). Diagonal set of repetitive groups indicates group at the beginning of the chamber interval.

7. *Emergency Abort Schedule (Schedule 7.1)*

In the event that a scheduled saturation dive must be aborted prior to reaching saturation conditions, a decompression profile must be run. The decompression rates shown have been calculated for use in the event of an emergency occurring under circumstances beyond the scope of the exceptional exposure tables (Schedule 5.2). The decompression rates used were derived by computer using the Workman calculation method. Fifty-foot intervals were used as convenient levels for emergency stops. Each depth interval is further subdivided into three exposure conditions, namely 120, 240, and 360 min. Use the next greater depth and time exposure if the dive is terminated at a level not stated in the schedule. For example, if a 40-ft saturation dive is aborted after 150 min, the abort schedule to be used would be the 50/240 schedule.

Schedule 7.1
Emergency Abort Schedules (U. S. Navy 1971)

50-ft dive		100-ft dive		150-ft dive	
Depth	Rate	Depth	Rate	Depth	Rate
50/120		100/120		150/120	
50–8	10 ft/min	100–48	10 ft/min	150–90	10 ft/min
8–3	2 min/ft	48–35	1.5 min/ft	90–74	1 min/ft
3–0	4 min/ft	35–22	4 min/ft	74–53	3 min/ft
		22–12	6 min/ft	53–49	5 min/ft
		12–0	9 min/ft	49–25	10 min/ft
				25–0	20 min/ft
50/240		100/240		150/240	
50–10	10 ft/min	100–52	10 ft/min	150–95	10 ft/min
10–9	6 min/ft	52–48	1 min/ft	95–90	1 min/ft
9–5	4 min/ft	48–39	4 min/ft	90–74	3 min/ft
5–0	7 min/ft	39–20	6 min/ft	74–44	10 min/ft
		10–0	20 min/ft	44–0	20 min/ft
50/360		100/360		150/360	
50–15	10 ft/min	100–54	10 ft/min	150–95	10 ft/min
15–12	2 min/ft	54–47	3 min/ft	96–90	3 min/ft
12–4	7 min/ft	47–25	10 min/ft	90–60	10 min/ft
4–0	9 min/ft	25–0	20 min/ft	60–0	[a]

200-ft dive		250-ft dive		300-ft dive	
Depth	Rate	Depth	Rate	Depth	Rate
200/120		250/120		300/120	
200–130	10 ft/min	250–170	10 ft/min	300–210	10 ft/min
130–100	1 min/ft	170–155	1 min/ft	210–190	1 min/ft
100–90	3 min/ft	155–135	2 min/ft	190–170	2 min/ft
90–56	10 min/ft	135–130	3 min/ft	170–130	10 min/ft
56–0	[a]	130–90	10 min/ft	130–0	[a]
		90–0	[a]		
200/240		250/240		300/240	
200–135	10 ft/min	250–175	10 ft/min	300–215	10 ft/min
135–130	1 min/ft	175–170	1 min/ft	215–200	2 min/ft
130–115	3 min/ft	170–160	2 min/ft	200–160	10 min/ft
115–80	10 min/ft	160–120	10 min/ft	160–0	[a]
80–0	[a]	120–0	[a]		
200/360		250/360		300/360	
200–136	10 ft/min	250–182	10 ft/min	300–230	10 ft/min
136–134	8 min/ft	182–140	10 min/ft	230–185	10 min/ft
134–98	10 min/ft	140–0	[a]	185–0	[a]
98–0	[a]				

Schedule 7.1—*Cont.*

350-ft dive		400-ft dive		450-ft dive	
Depth	Rate	Depth	Rate	Depth	Rate
350/120		400/120		450/120	
350–250	10 ft/min	400–280	5 ft/min	450–310	5 ft/min
250–220	1 min/ft	280–260	2 min/ft	310–280	12 min/ft
220–170	11 min/ft	260–210	12 min/ft	280–0	[a]
170–0	[a]	210–0	[a]		
350/240		400/240		450/240	
350–250	2 ft/min	400–300	10 ft/min	450–340	1 ft/min
250–200	12 min/ft	300–250	12 min/ft	340–300	12 min/ft
200–0	[a]	250–0	[a]	300–0	[a]
350/360		400/360		450/360	
350–270	1 ft/min	400–330	10 ft/min	450–370	3 ft/min
270–230	12 min/ft	330–280	10 min/ft	370–320	12 min/ft
230–0	[a]	280–0	[a]	320–0	[a]

500-ft dive		550-ft dive		600-ft dive	
Depth	Rate	Depth	Rate	Depth	Rate
500/120		550/120		600/120	
500–360	10 ft/min	550–410	10 ft/min	600–460	30 ft/min
360–300	12 min/ft	410–350	12 min/ft	460–400	12 min/ft
300–0	[a]	350–0	[a]	400–0	[a]
500/240		550/240		600/240	
500–390	2 ft/min	550–440	10 ft/min	600–500	30 ft/min
390–340	12 min/ft	440–390	12 min/ft	500–440	12 min/ft
340–0	[a]	390–0	[a]	440–0	[a]
500/360		550/360		600/360	
500–420	30 ft/min	550–470	30 ft/min	600–520	30 ft/min
420–370	12 min/ft	470–420	12 min/ft	520–470	12 min/ft
370–0	[a]	420–0	[a]	470–0	[a]

Schedule 7.1—*Cont.*

650-ft dive		700-ft dive		750-ft dive	
Depth	Rate	Depth	Rate	Depth	Rate
650/120		700/120		750/120	
650–510	30 ft/min	700–550	30 ft/min	750–600	30 ft/min
510–440	12 min/ft	550–500	12 min/ft	600–540	12 min/ft
440–0	[a]	500–0	[a]	540–0	[a]
650/240		700/240		750/240	
650–550	30 ft/min	700–590	30 ft/min	750–640	30 ft/min
550–490	12 min/ft	590–540	12 min/ft	640–590	12 min/ft
490–0	[a]	540–0	[a]	590–0	[a]
650/360		700/360		750/360	
650–570	30 ft/min	700–620	30 ft/min	750–670	30 ft/min
570–520	12 min/ft	620–570	12 min/ft	670–610	12 min/ft
520–0	[a]	570–0	[a]	610–0	[a]

800-ft dive		850-ft dive	
Depth	Rate	Depth	Rate
800/120		850/120	
800–660	30 ft/min	850–700	30 ft/min
660–590	12 min/ft	700–640	12 min/ft
590–0	[a]	640–0	[a]
800/240		850/240	
800–690	30 ft/min	850–740	30 ft/min
690–640	12 min/ft	740–690	12 min/ft
640–0	[a]	690–0	[a]
800/360		850/360	
800–720	30 ft/min	850–770	30 ft/min
720–670	12 min/ft	770–720	12 min/ft
670–0	[a]	720–0	[a]

[a] Assume standard saturation dive decompression schedule.

8. *U. S. Navy Treatment Schedules for Decompression Sickness*

a. Schedule 8.1: Air Treatment

1. Use. Treatment of pain-only decompression sickness when oxygen cannot be used and pain is relieved at a depth less than 66 ft.
2. Descent rate. 25 ft/min.
3. Ascent rate. One minute between stops.
4. Time at 100 ft. Includes time from the surface.

b. Schedule 8.2: Air Treatment

1. Use. Treatment of pain-only decompression sickness when oxygen cannot be used and pain is relieved at a depth greater than 66 ft.
2. Descent rate. 25 ft/min.
3. Ascent rate. One minute between stops.
4. Time at 165 ft. Includes time from the surface.

c. Schedule 8.3: Air Treatment

1. Use. Treatment of serious symptoms when oxygen cannot be used and symptoms are relieved within 30 min at 165 ft.
2. Descent rate. 25 ft/min.
3. Ascent rate. One minute between stops.
4. Time at 165 ft. Includes time from surface.

d. Schedule 8.4: Air Treatment

1. Use. Treatment of serious symptoms or gas embolism when oxygen cannot be used and when symptoms are not relieved within 30 min at 165 ft.
2. Descent rate. 25 ft/min.
3. Ascent rate. One minute between stops.
4. Time at 165 ft. Includes time from the surface.

e. Schedule 8.5: Oxygen Treatment

1. Use. Treatment of pain-only decompression sickness when oxygen can be used and symptoms are relieved within 10 min at 60 ft. Patient breathes oxygen from the surface.
2. Descent rate. 25 ft/min.
3. Ascent rate. 1 ft/min. Do not compensate for slower ascent rates. Compensate for faster rates by halting the ascent.
4. Time at 60 ft. Begins on arrival at 60 ft.
5. If oxygen breathing must be interrupted, allow 15 min after the reaction has entirely subsided and resume schedule at point of interruption.
6. If oxygen breathing must be interrupted at 60 ft, switch to Schedule 8.6 upon arrival at the 30-ft stop.

7. Tender breathes air throughout. If treatment is a repetitive dive for the tender or the table is lengthened, the tender should breathe oxygen during the last 30 min of ascent to the surface.

f. Schedule 8.6: Oxygen Treatment

1. Use. Treatment of decompression sickness when oxygen can be used and symptoms are not relieved within 10 min at 60 ft. Patient breathes oxygen from the surface.

2. Descent rate. 25 ft/min.

3. Ascent rate. 1 ft/min. Do not compensate for slower ascent rates. Compensate for faster rates by halting the ascent.

4. Time at 60 ft. Begins on arrival at 60 ft.

5. If oxygen breathing must be interrupted, allow 15 min after the reaction has entirely subsided and resume schedule at point of interruption.

6. Tender breathes air throughout. If treatment is a repetitive dive for the tender or the table is lengthened, the tender should breathe oxygen during the last 30 min of ascent to the surface.

g. Schedule 8.7: Oxygen Treatment

1. Use. Treatment of gas embolism when oxygen can be used and symptoms are relieved within 15 min at 165 ft.

2. Descent rate. As fast as possible.

3. Ascent rate. 1 ft/min. Do not compensate for slower ascent rates. Compensate for faster rates by halting the ascent.

4. Time at 165 ft. Includes time from the surface.

5. If oxygen breathing must be interrupted, allow 15 min after the reaction has entirely subsided and resume schedule at point of interruption.

6. Tender breathes air throughout. If treatment is a repetitive dive for the tender or the table is lengthened, the tender should breathe oxygen during the last 30 min of ascent to the surface.

h. Schedule 8.8: Oxygen Treatment

1. Use. Treatment of gas embolism when oxygen can be used and symptoms moderate to a major extent within 30 min at 165 ft.

2. Descent rate. As fast as possible.

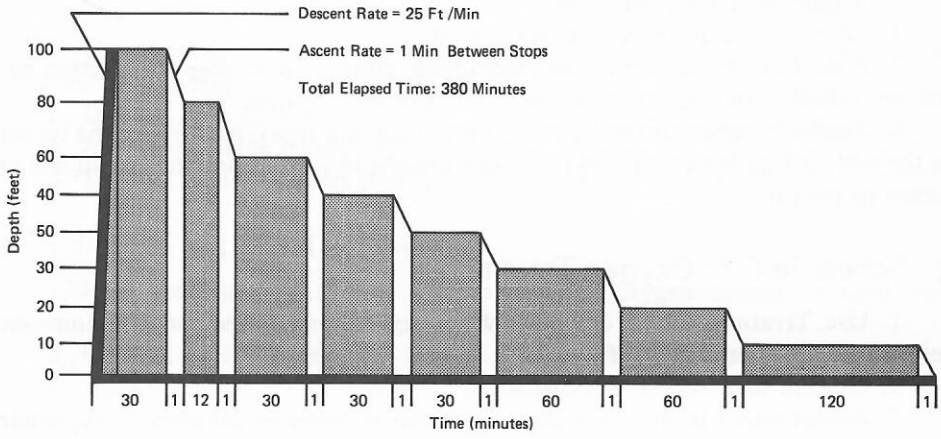
3. Ascent rate. 1 ft/min. Do not compensate for slower ascent rates. Compensate for faster ascent rates by halting the ascent.

4. Time at 165 ft. Includes time from the surface.

5. If oxygen breathing must be interrupted, allow 15 min after the reaction has entirely subsided and resume schedule at point of interruption.

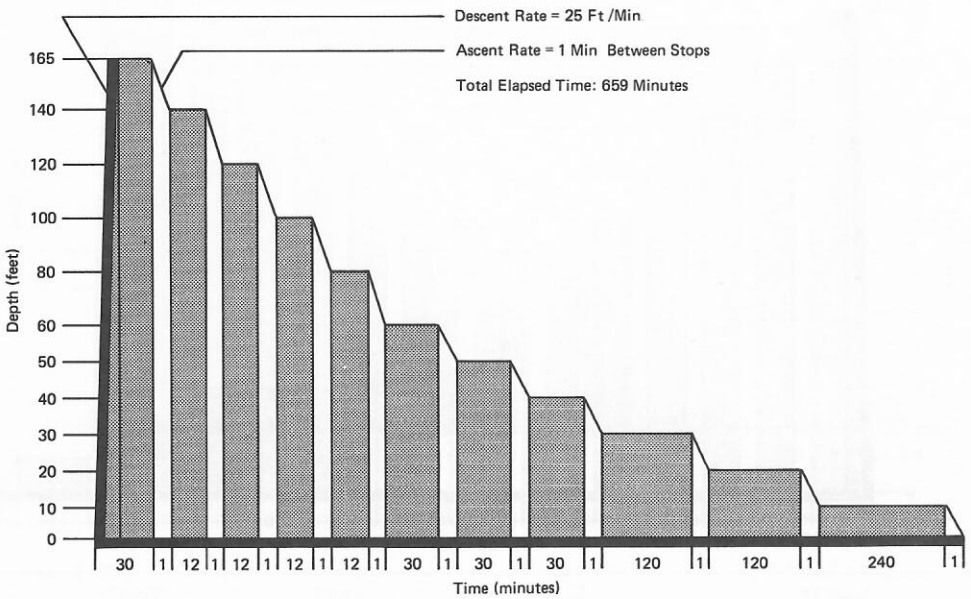
6. Tender breathes air throughout. If treatment is a repetitive dive for the tender or the table is lengthened, the tender should breathe oxygen during the last 30 min of ascent to the surface.

Schedule 8.1
Recompression Treatment Table (Air Treatment)
(U. S. Navy 1973)



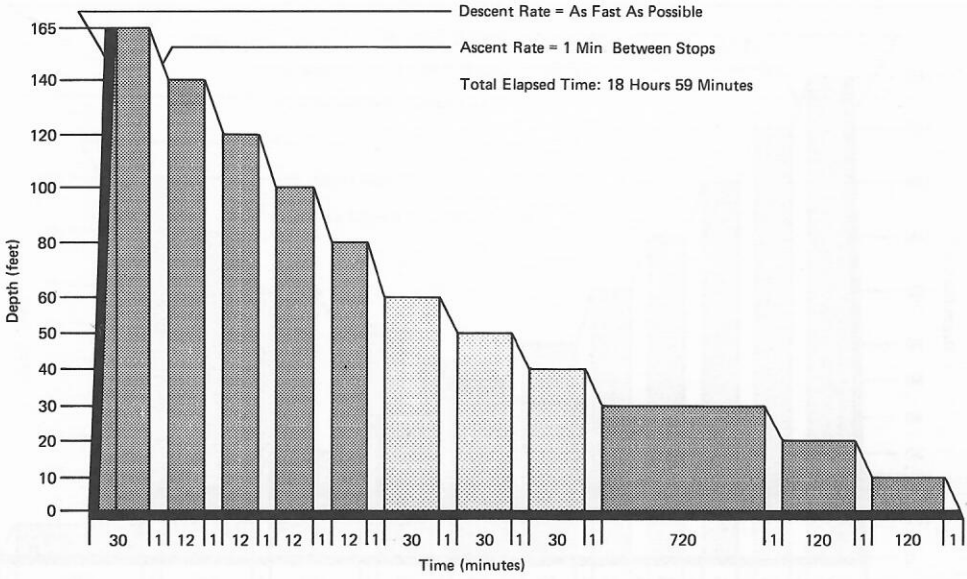
Depth, ft	Time, min	Breathing medium	Total elapsed time, min
100	30	Air	30
80	12	Air	43
60	30	Air	74
50	30	Air	105
40	30	Air	136
30	60	Air	197
20	60	Air	258
10	120	Air	379
0	1	Air	380

Schedule 8.2
Recompression Treatment Table (Air Treatment)
(U. S. Navy 1973)



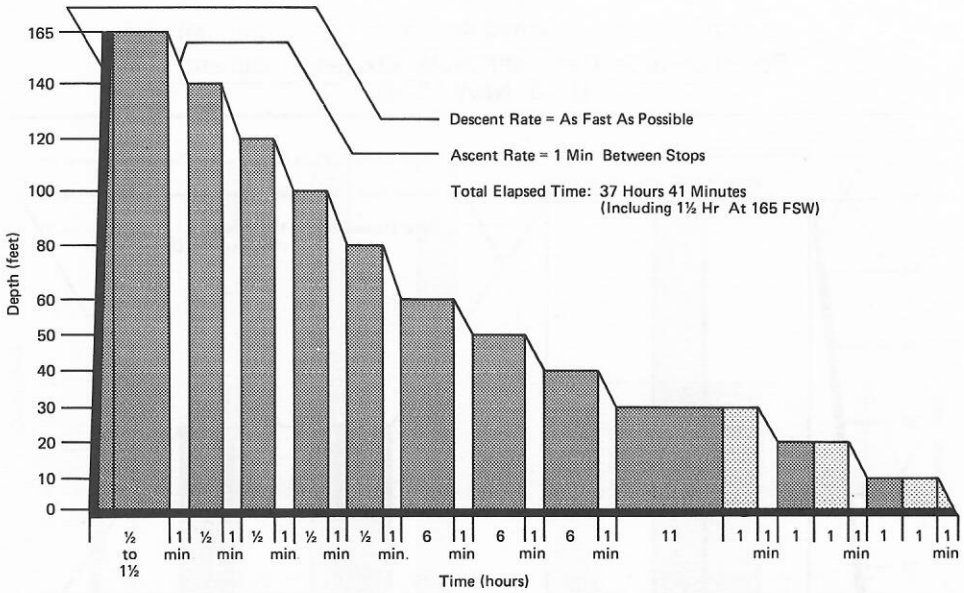
Depth, ft	Time, min	Breathing medium	Total elapsed time, min
165	30	Air	30
140	12	Air	43
120	12	Air	56
100	12	Air	69
80	12	Air	82
60	30	Air	113
50	30	Air	144
40	30	Air	175
30	120	Air	296
20	120	Air	417
10	240	Air	658
10	240	Air	658
0	1	Air	659

Schedule 8.3
Recompression Treatment Table (Air Treatment)
(U. S. Navy 1973)



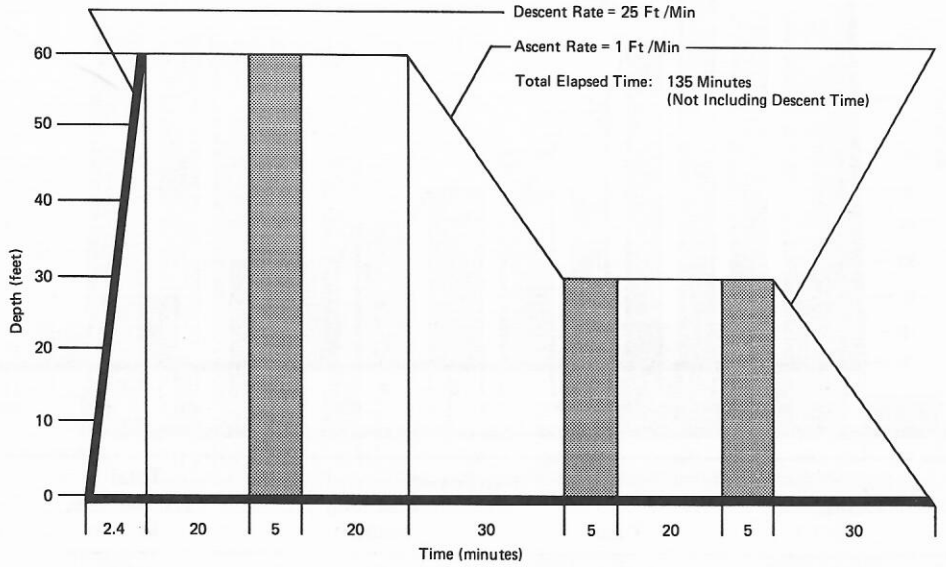
Depth, ft	Time	Breathing medium	Total elapsed time, hr:min
165	30 min	Air	0:30
140	12 min	Air	0:43
120	12 min	Air	0:56
100	12 min	Air	1:09
80	12 min	Air	1:22
60	30 min	Oxygen (or air)	1:53
50	30 min	Oxygen (or air)	2:24
40	30 min	Oxygen (or air)	2:55
30	12 hr	Air	14:56
20	2 hr	Air	16:57
10	2 hr	Air	18:58
0	1 min	Air	18:59

Schedule 8.4
Recompression Treatment Table (Air Treatment)
(U. S. Navy 1973)



Depth, ft	Time	Breathing medium	Total elapsed time, hr:min
165	½–1½ hr	Air	1:30
140	½ hr	Air	2:01
120	½ hr	Air	2:32
100	½ hr	Air	3:03
80	½ hr	Air	3:34
60	6 hr	Air	9:35
50	6 hr	Air	15:36
40	6 hr	Air	21:37
30	11 hr	Air	32:38
30	1 hr	Oxygen (or air)	33:38
20	1 hr	Air	34:39
20	1 hr	Oxygen (or air)	35:39
10	1 hr	Air	36:40
10	1 hr	Oxygen (or air)	37:40
0	1 min	Oxygen	37:41

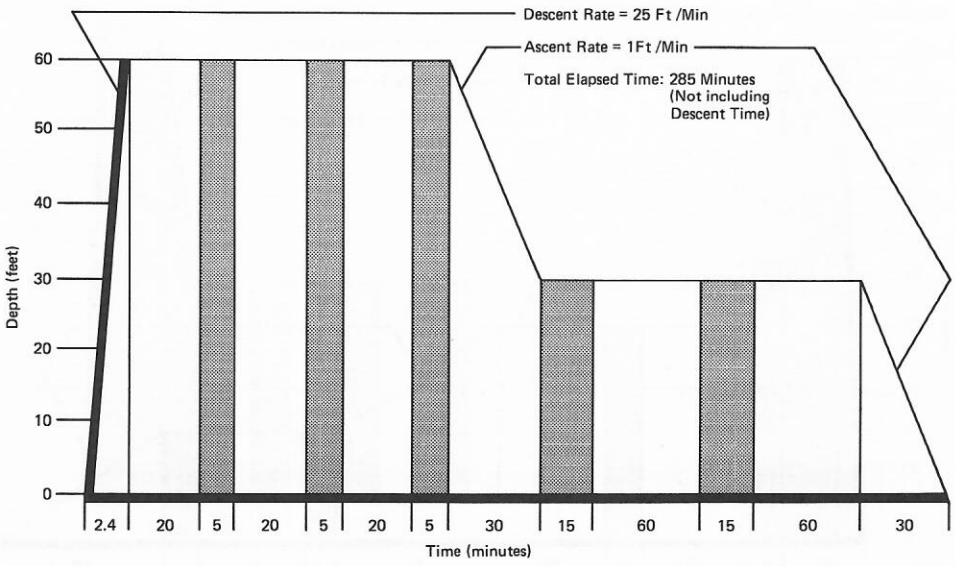
Schedule 8.5
Recompression Treatment Table (Oxygen Treatment)
(U. S. Navy 1973)



Depth, ft	Time, min	Breathing medium	Total elapsed time,[a] min
60	20	Oxygen	20
60	5	Air	25
60	20	Oxygen	45
60–30	30	Oxygen	75
30	5	Air	80
30	20	Oxygen	100
30	5	Air	105
30–0	30	Oxygen	135

[a] Does not include descent time.

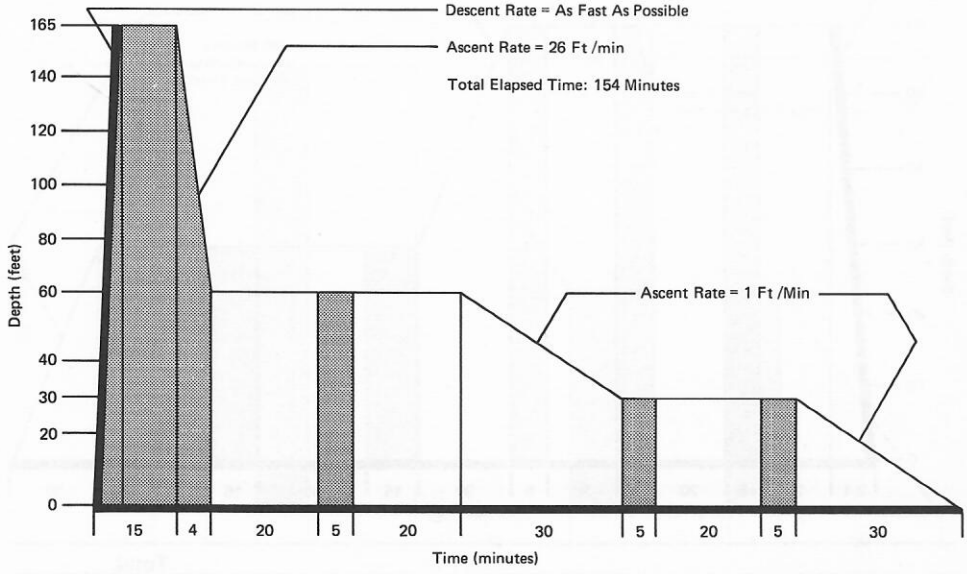
Schedule 8.6
Recompression Treatment Table (Oxygen Treatment)
(U. S. Navy 1973)



Depth, ft	Time, min	Breathing medium	Total elapsed time,[a] min
60	20	Oxygen	20
60	5	Air	25
60	20	Oxygen	45
60	5	Air	50
60	20	Oxygen	70
60	5	Air	75
60–30	30	Oxygen	105
30	15	Air	120
30	60	Oxygen	180
30	15	Air	195
30	60	Oxygen	255
30–0	30	Oxygen	285

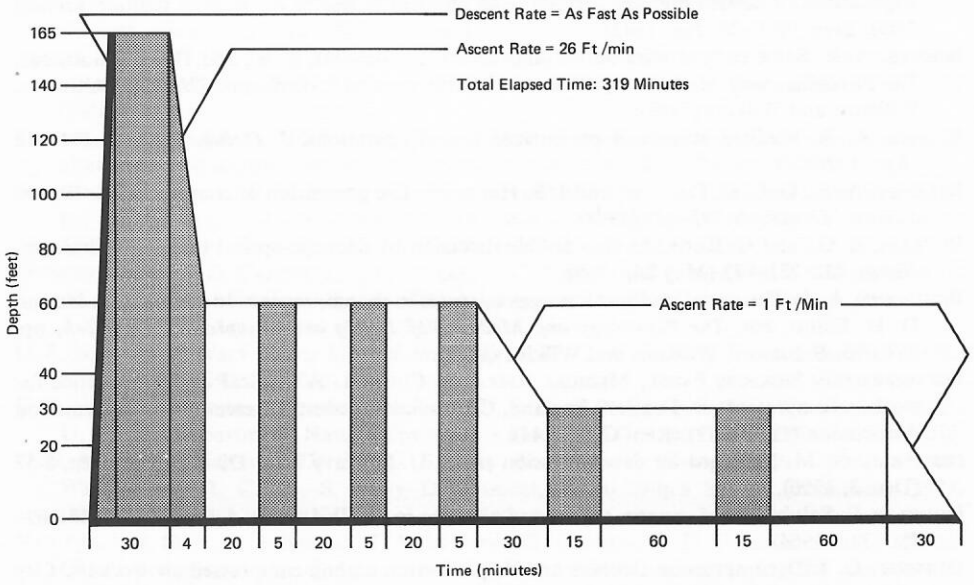
[a] Does not include descent time.

Schedule 8.7
Recompression Treatment Table (Oxygen Treatment)
(U. S. Navy 1973)



Depth, ft	Time, min	Breathing medium	Total elapsed time, min
165	15	Air	15
165–60	4	Air	19
60	20	Oxygen	29
60	5	Air	44
60	20	Oxygen	64
60–30	30	Oxygen	94
30	5	Air	99
30	20	Oxygen	119
30	5	Air	124
30–0	30	Oxygen	154

Schedule 8.8
Recompression Treatment Table (Oxygen Treatment)
(U. S. Navy 1973)



Depth, ft	Time, min	Breathing medium	Total elapsed time, min
165	30	Air	30
165–60	4	Air	34
60	20	Oxygen	54
60	5	Air	50
60	20	Oxygen	79
60	5	Air	84
60	20	Oxygen	104
60	5	Air	109
60–30	30	Oxygen	139
30	15	Air	154
30	60	Oxygen	214
30	15	Air	229
30	60	Oxygen	289
30–0	30	Oxygen	319

References

BARNARD, E. E. P. The treatment of decompression sickness developing at extreme pressures. In: Lambertsen, C. J., ed. *Underwater Physiology. Proceedings of the Third Symposium on Underwater Physiology*, pp. 156–164. Baltimore, Williams and Wilkins (1967).

BECKMAN, E. L., and E. M. SMITH. TEKTITE II. Medical supervision of the Scientists-in-the-Sea. *Texas Rep. Biol. Med.* **30**:1–204 (Fall 1972).

BEHNKE, A. R. Investigations concerned with problems of high altitude flying and deep diving—applications of certain findings pertaining to physical fitness to the general military service. *Milit. Surg.* **90**:9–28 (Jan. 1942).

BEHNKE, A. R. Some early studies on decompression. In: Bennett, P. B., and D. H. Elliott, eds. *The Physiology and Medicine of Diving and Compressed Air Work*, pp. 226–251. Baltimore, Williams and Wilkins (1969).

BEHNKE, A. R. Medical aspects of pressurized tunnel operations. *J. Occup. Med.* **12**:101–112 (Apr. 1970).

BOYCOTT, A. E., G. C. C. DAMANT, and J. S. HALDANE. The prevention of compressed air illness. *J. Hyg.* (*London*) **8**:342–443 (1908).

BUCKLES, R. G., and C. KNOX. In vivo bubble detection by acoustic-optical imaging techniques. *Nature* **222**:771–772 (May 24, 1969).

BÜHLMANN, A. A. The use of multiple inert gas mixtures in decompression. In: Bennett, P. B., and D. H. Elliott, eds. *The Physiology and Medicine of Diving and Compressed Air Work*, pp. 357–385. Baltimore, Williams and Wilkins (1969).

DECOMPRESSION SICKNESS PANEL, MEDICAL RESEARCH COUNCIL. A medical code of practice for work in compressed air. London, England, Construction Industry Research and Information Association (Feb. 1973) (Rep. CIRIA 44).

DES GRANGES, M. Standard air decompression table. U. S. Navy Exp. Diving Unit, Rep. 5-57 (Dec. 3, 1956).

DOUGLAS, E. Solubilities of oxygen, argon, and nitrogen in distilled water. *J. Phys. Chem.* **68**:169–180 (Jan. 1964).

DUFFNER, G. J. Decompression sickness and its prevention among compressed air workers. City of Seattle, Washington (Dec. 20, 1962).

DUFFNER, G. J., J. F. SNYDER, and L. L. SMITH. Adaptation of helium–oxygen to mixed-gas scuba. U. S. Navy Exp. Diving Unit, Rep. 3-59 (1959).

GALLOWAY, W. J. An experimental study of acoustically induced cavitation in liquids. *J. Acoust. Soc. Amer.* **26**:849–857 (Sept. 1954).

HAMILTON, R. W., JR., D. J. KENYON, M. FREITAG, and H. R. SCHREINER. NOAA OPS I and II: Formulation of excursion procedures for shallow undersea habitats. Tarrytown, N. Y., Union Carbide Tech. Cent., Environ. Physiol. Lab., Rep. UCRI 731 (July 31, 1973).

HARVEY, E. N. Physical factors in bubble formation. In: Fulton, J. F., ed. *Decompression Sickness*, pp. 90–114. Philadelphia, W. B. Saunders and Co. (1951).

HAWKINS, J. A., C. W. SHILLING, and R. A. HANSEN. A suggested change in calculating decompression tables for diving. *U. S. Nav. Med. Bull.* **33**:327–338 (July 1935).

HEMPLEMAN, H. V. Decompression procedures for deep, open sea operations. In: Lambertsen, C. J., ed. *Underwater Physiology. Proceedings of the Third Symposium on Underwater Physiology*, pp. 255–266. Baltimore, Williams and Wilkins (1967).

HEMPLEMAN, H. V. British decompression theory and practice. In: Bennett, P. B., and D. H. Elliott, eds. *The Physiology and Medicine of Diving and Compressed Air Work*, pp. 291–318. Baltimore, Williams and Wilkins (1969).

JONES, H. B. Gas exchange and blood-tissue perfusion factors in various body tissues. In: Fulton, J. F., ed. *Decompression Sickness*, pp. 278–321. Philadelphia, W. B. Saunders Co. (1951).

KIDD, D. H., and D. H. ELLIOTT. Clinical manifestations and treatment of decompression sickness in divers. In: Bennett, P. B., and D. H. Elliott, eds. *The Physiology and Medicine of Diving and Compressed Air Work*, pp. 464–490. Baltimore, Williams and Wilkins Co. (1969).

MARTIN, F. E., J. E. HUDGENS, and J. W. WONN. Manned hyperbaric demonstration of incipient bubble detection using nonlinear ultrasonic propagation. Annapolis, Md., Westinghouse Electric Corp., Ocean Res. Eng. Cent., Rep. OER-73-16 (May 31, 1973).

MOLUMPHY, G. G. He–O_2 decompression tables. U. S. Navy Exp. Diving Unit, Rep. 8-50 (Sept. 26, 1950).

MORRISON, J. J. The salting-out of non-electrolytes. Part I. The effect of ionic size, ionic charge, and temperature. *J. Chem. Soc.* (*London*) (Pt. III):3814–3818 (Oct. 1952).

RASHBASS, C. Investigation into the decompression tables. Alverstoke, England, Roy. Nav. Physiol. Lab., Med. Res. Counc., Roy. Nav. Pers. Res. Comm., Rep. UPS 151 (Oct. 1955).

RUBISSOW, G. J., and R. S. MACKAY. Ultrasonic imaging of in vivo bubbles in decompression sickness. *Ultrasonics* 9:225–234 (Oct. 1971).

SAYERS, R. R., W. P. YANT, and J. H. HILDEBRAND. Possibilities in the use of helium–oxygen mixtures as a mitigation of caisson disease. U. S. Dept. Interior, Bur. Mines, Rep. 2670 (Feb. 1925).

SCHIBLI, R. A., and A. A. BÜHLMANN. The influence of physical work upon decompression time after simulated oxygen–helium dives. *Helv. Med. Acta* 36:327–342 (Oct. 1972).

SCHREINER, H. R., and P. L. KELLY. Computation methods for decompression from deep dives. In: Lambertsen, C. J., ed. *Underwater Physiology. Proceedings of the Third Symposium on Underwater Physiology*, pp. 275–299. Baltimore, Williams and Wilkins (1967).

SPENCER, M. P., S. D. CAMPBELL, J. L. SEALEY, F. C. HENRY, and J. LINDBERGH. Experiments on decompression bubbles in the circulation using ultrasonic and electromagnetic flowmeters. *J. Occup. Med.* 11:238–244 (May 1969).

U. S. NAVY. *U. S. Navy Diving Manual.* Washington, D. C., U. S. Navy Department (Mar. 1970) (NAVSHIPS 0994-001-9010).

U. S. NAVY SUPERVISOR OF DIVING. *Handbook: U. S. Navy Diving Operations.* Washington, D. C., U. S. Navy Department, Naval Ships Systems Command (1971) (NAVSHIPS 0994-009-6010).

U. S. NAVY SUPERVISOR OF DIVING. *U. S. Navy Recompression Chamber Operators Handbook.* Washington, D. C., U. S. Navy Department, Naval Ship's System Command (1973) (NAVSHIPS 0994-014-5010).

VAN DER AUE, O. E., R. J. KELLAR, E. S. BRINTON, G. DARRON, H. D. GILLIAM, and R. J. JONES. Calculation and testing of decompression tables for air dives employing the procedure of surface decompression and the use of oxygen. U. S. Navy Exp. Diving Unit, Unit Rep. 1 on Proj. NM002007 (Nov. 1951).

WEBSTER, E. Cavitation. *Ultrasonics* 1:39–48 (Jan./Mar. 1963).

WEISS, R. F. The solubility of nitrogen, oxygen and argon in water and seawater. *Deep Sea Res.* 17:721–735 (1970).

WISCONSIN STATE DEPARTMENT OF INDUSTRY, LABOR AND HUMAN RELATIONS. Work under compressed air, Appendix A. In: *Wisconsin Administrative Code of Rules of the Department of Industry, Labor and Human Relations.* Madison, Wisconsin (Aug. 1971). (No. 188).

WORKMAN, R. D. Calculation of decompression schedules for nitrogen–oxygen and helium–oxygen dives. U. S. Navy Exp. Diving Unit, Rep. 6-65 (May 26, 1965).

WORKMAN, R. D., and J. L. REYNOLDS. Adaptation of helium–oxygen to mixed gas scuba. U. S. Navy Exp. Diving Unit, Rep. 1-65 (Mar. 1, 1965).