

## ■ [Table 3] How to use No-decompression Dive Limit - Residual Nitrogen Time Table?

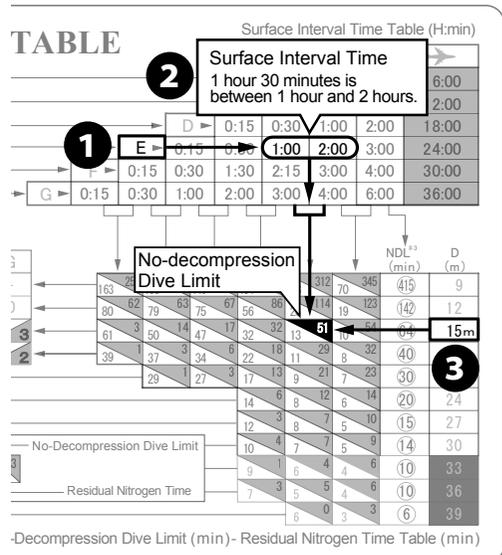
You can examine No-decompression Dive Limit and Residual Nitrogen Time after Surface Interval Time in [Table 3] No-decompression Dive Limit - Residual Nitrogen Time Table.

### ● You can examine the No-decompression Dive Limit for the second diving

🕒 A diver of Residual Group E at the time of the first diving end plans the second diving of 15 m after 1 hour 30 minutes Surface Interval Time.

What is the new no-decompression dive time?

- (1) Residual Group at the time of the first diving end is E in [Table 2] Surface Interval Time Table.
- (2) You just trace aside from E and look for Surface Interval Time that is 1 hour 30 minutes or over 1 hour 30 minutes and closer to 1 hour 30 minutes. 1 hour 30 minutes is between 1 hour and 2 hours. You just trace the line between 1 hour and 2 hours below.
- (3) You can look for the contact of the point traced 15 m aside and the point traced the (2) line in [Table 3] No-decompression Dive Limit - Residual Nitrogen Time Table.



If Surface Interval Time is 1 hour, you should use the line between 30 minutes and 1 hour for your safety.

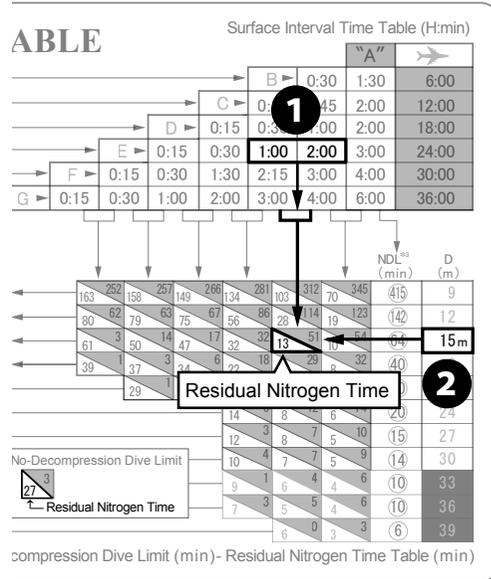
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## ● How to examine Residual Nitrogen Time

🕒 A diver of Residual Group E at the time of the first diving end plans the second diving of 15 m after 1 hour 30 minutes Surface Interval Time. How long is Residual Nitrogen Time?

You can look for the contact of (1) and (2) as you have learned before. A number of the lower left corner is the Residual Nitrogen Time at 15m.

You can understand that the quantity of residual nitrogen at the beginning of next diving is the same as the one that is accumulated in your body at 13 minutes at 15 m.



Residual Nitrogen Time is added to the second real Bottom Time.

**[The Dive Table term]**

■ **Residual nitrogen**

The nitrogen that is left in the body after diving

■ **Residual Nitrogen Time**

The time that is rearranged the quantity of the residual nitrogen.

■ **Residual Nitrogen Time Table**

This Table displays the quantity of residual nitrogen from a previous dive.

## ● How to examine Residual Group of the second diving end

🕒 A diver of Residual Group E at the time of the first diving end plans the second diving of 35 minutes at 15 m after 1 hour 30 minutes Surface Interval Time.

Which is Residual Group?

Residual Nitrogen Time for the second diving of 15 m deep is 13 minutes in [Table 3] No-decompression Dive Limit- Residual Nitrogen Time Table.

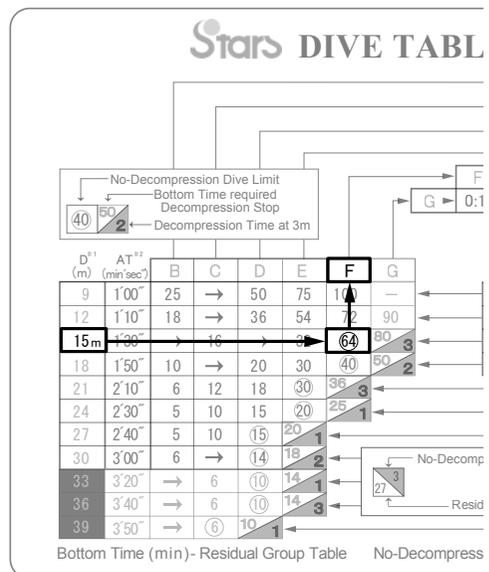
The second diving is 35 minutes at 15m in real Bottom Time.

Residual Nitrogen Time    13 min.  
 + The second Bottom Time    35 min.  
 -----  
 Calculated new bottom time 48 min.

The Bottom Time of the second diving should be regard as 48 minutes.

You can examine Residual Group by using 48 minutes in [Table 1] Bottom Time – Residual Group Table.

The Residual Group at the time of the second diving end is F.



**[The Dive Table term]**

■ **Calculated new bottom time**

This is the time that is equal to the total of Bottom Time and Residual Nitrogen Time. As you should take Residual Nitrogen Time into consideration, this time is used to plan the next diving

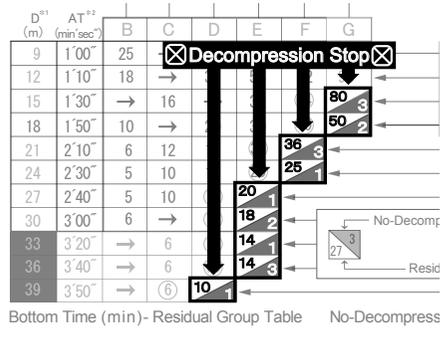
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## ● Decompression Stop

The Bottom Time of sports diving should be shorter than No-decompression Dive Limit.

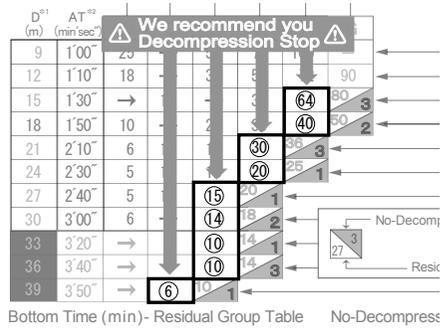
In case of the Bottom Time is longer than No-decompression Dive Limit by unavoidable reasons, you need Decompression Stop.

You should surface at speed equal to or less than 10m per minute to 3m deep and stop for the required time. This stop means you drain your excessive nitrogen.

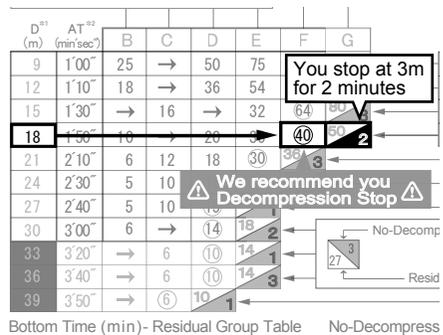


STARS Dive Table should be used for no-decompression diving. Unless you have unavoidable reason, you should not plan a diving required Decompression Stop.

In case of the Bottom Time is immediately left place of the place needed Decompression Stop in the Table, you need Decompression Stop for your safety.



In case of the Bottom Time is immediately left place of the place needed Decompression Stop for 18m deep, you should surface at speed equal to or less than 10m per minute to 3m and stop for 2 minutes Decompression Time.



## ● Safety Stop

More drain of nitrogen during surfacing leads to the prevention of Decompression Sickness.

Safety Stop is recommended even if Bottom Time is shorter than No-decompression Dive Limit.

You should surface at speed equal to or less than 10m per minute to 5m and stop for 3 minutes.

In case of there is a descent rope, hold it and relax while watching a fish or underwater scenery for 3 minutes.

Safety stop is recommended for any kind of diving.



Decompression Stop Time and Safety Stop Time is not included in Bottom Time.



### [The Dive Table term]

#### ■Decompression Stop

In case of the Bottom Time is longer than No-decompression Dive Limit by unavoidable reasons, you need to stop at the required deep for the required time.

#### ■Safety stop

In case of the Bottom Time is shorter than No-decompression Dive Limit, you need to stop at 5m for 3 minutes.

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## ● How to examine Time Until Safe To Fly after diving?

In case of you board an airplane just after diving in the state that nitrogen is left in your body, bubble that is made by internal nitrogen causes Decompression Sickness so that pressure of the atmosphere decreases in an airplane

Therefore, you cannot board an airplane just after diving.

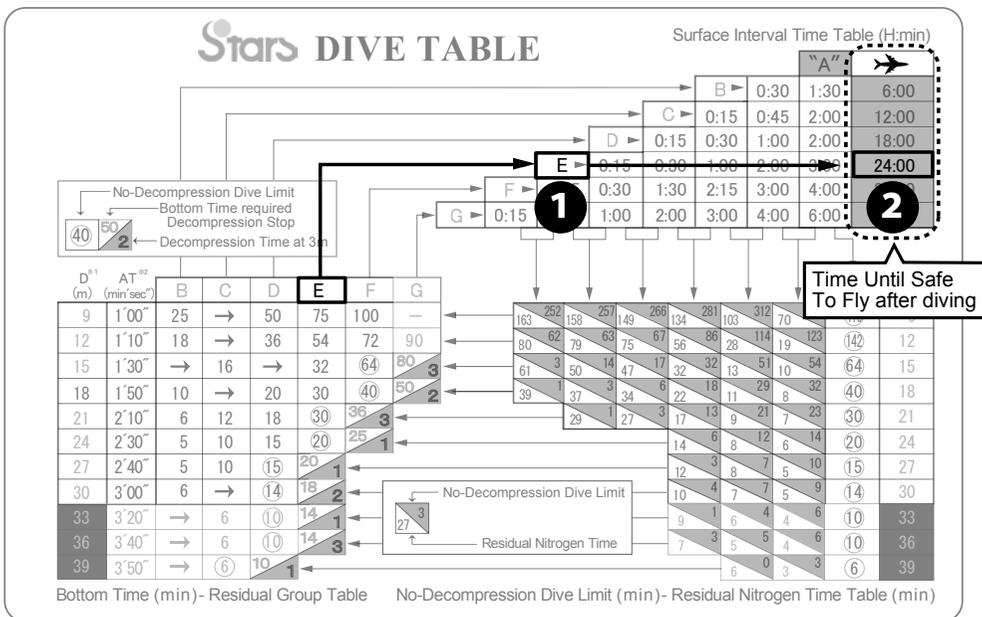
For boarding an airplane, you should know the safety time by using [Table 2] Surface Interval Time Table.

🕒 How long does it takes to board an airplane safely for Residual Group E diver?

(1) The Residual Group at the time of the diving end was E.

You should trace the line and look at [Table 2] Surface Interval Time Table.

(2) Time Until Safe To Fly after diving 🛩️ is 24 hours.



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In case of you have dived several times within 36 hours, you should compare Time Until Safe To Fly after diving of each diving end and adopt the longest Time Until Safe To Fly after diving.

🕒 Time Until Safe To Fly after diving is 24 hours after the first diving.

You dived again after 1 hour 30 minutes Surface Interval Time.

How long does it takes to board an airplane safely in case of your Residual Group is F?

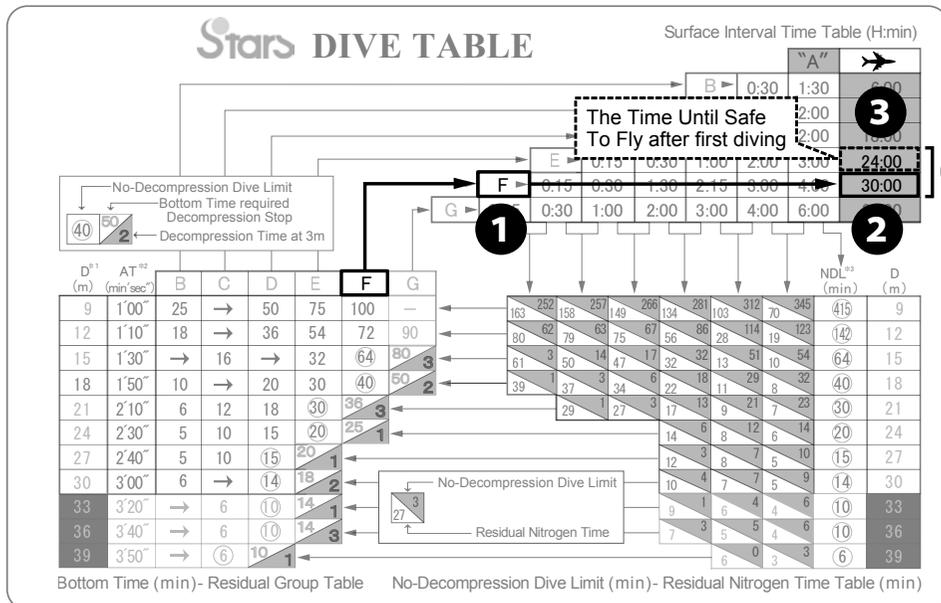
(1) The Residual Group at the time of the diving end was F.

You should trace the line and look at [Table 2] Surface Interval Time Table.

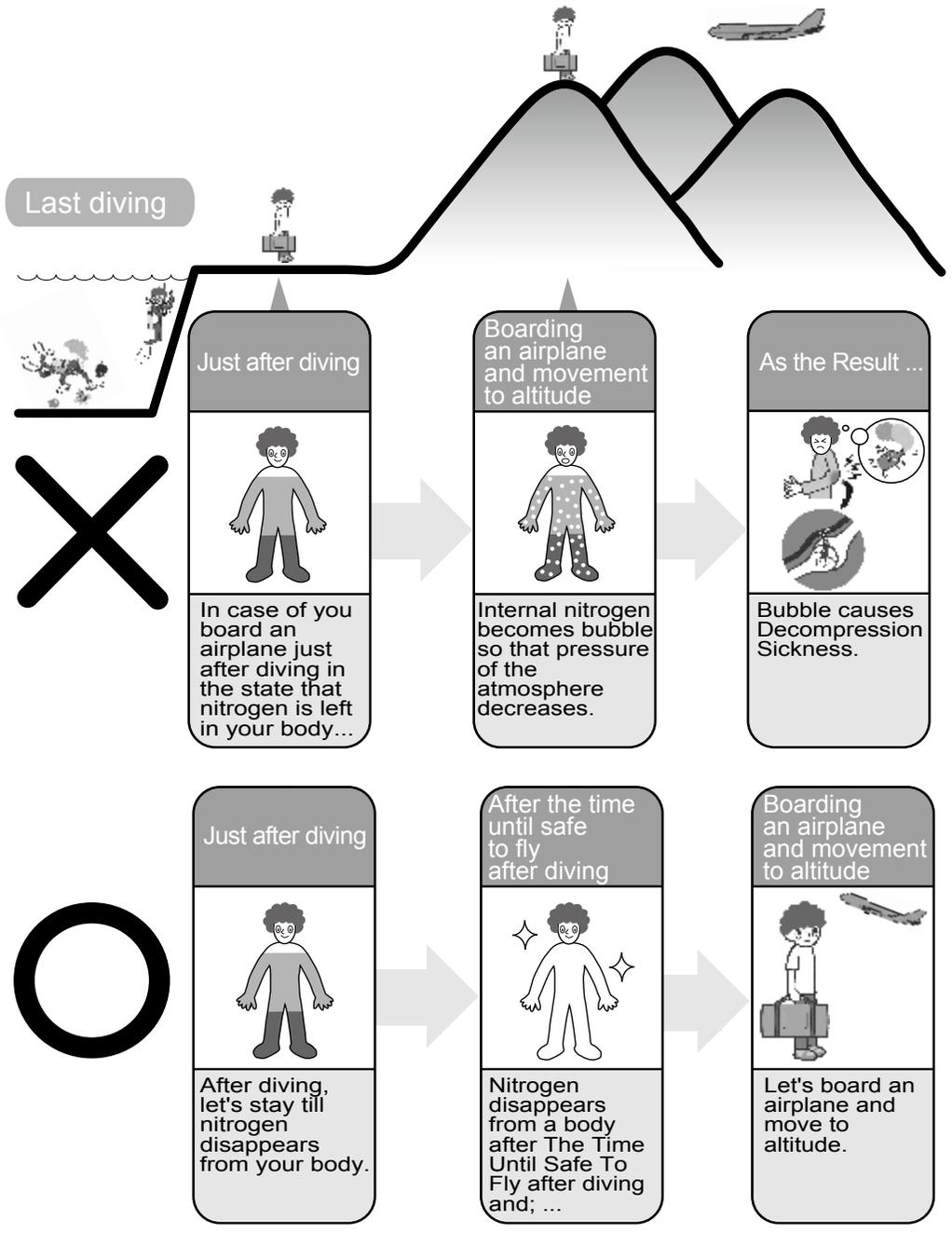
(2) The Time Until Safe To Fly after diving ➡ is 30 hours.

(3) By the way, The Time Until Safe To Fly after diving is 24 hours for first diving.

(4) As the second diving is performed within 36 hours from the first diving, you can board an airplane after 30 hours from the time at that you have finished second diving.



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**[The Dive Table term]**

■ **The Time Until Safe To Fly after diving**

This is the time  that is written in [Table 2] Surface Interval Time Table. After this time, you can board an airplane.



**In case of you board an airplane or move to altitude without enough rest after diving, bubble that is made by internal nitrogen causes Decompression Sickness.**

**I recommend that boarding an airplane and movement to altitude should be done after long time rest regardless of the theoretical result from the dive table so that there is individual difference.**

In addition, the Japanese researcher recommends that you should not board an airplane and move to altitude within 24 hours from the last diving.

In addition, The Time Until Safe To Fly after diving may be set in a rule for a diving point and an area.

When it is set, let's use it.

For example, the guideline of The Time Until Safe To Fly after diving that is announced by International diving Specialized Agencies is below.

- (1) 12 hours for diving once a day
- (2) 18 hours for a few diving once a day or diving for a few day
- (3) More than 18 hours for a diving to need decompression



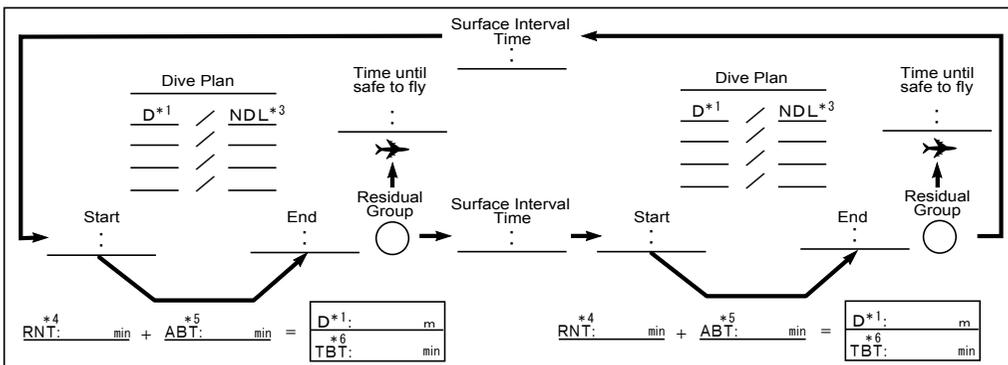
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## ● Other caution on Use of Dive Table

- \* Go deep area first and move to shallow area gradually.
- \* Because atmospheric pressure is low, Use a high elevation dive table for any dives at +700m above sea level.
- \* Use the next longer bottom time period level for cold or demanding dives. Or, you can multiply your bottom time by 1.5.
- \* STARS dive table is designed for repetitive diving to a maximum of 3 dives. Therefore, you must not perform next diving after third diving till Surface Interval Time exceeds Nitrogen Disappearance Time "A".



## ● Work Sheet



[The Dive Table term]

### ■ Worksheet

You can use it for planning of your repetitive diving. Your repetitive diving is shown in a diagram.

Q Answer the next question by using a dive table and complete a worksheet.

1. I am going to start diving at 11:00 a.m. (1)

The diving depth is (2)18m, the bottom time is (3) 30 minutes.

Which is the Residual Group?

Correct answer E(4)

2. I am going to start the second diving (6) at 13:00 after (5) 1 hour 30 minutes Surface Interval Time.

The diving depth is (7) 15 m, the bottom time is (8) 35 minutes.

How long is Residual Nitrogen Time?

Correct answer 13 minutes(9)

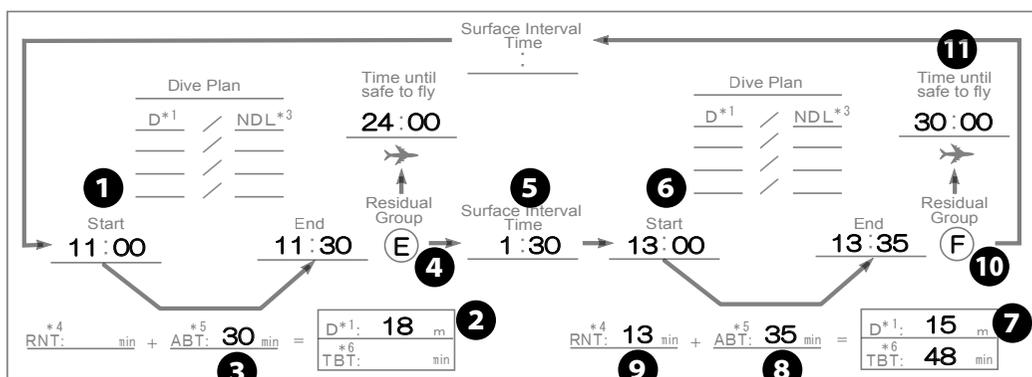
3. Which is the Residual Group after the second diving?

Correct answer F(10)

4. Time Until Safe To Fly after the second diving?

Correct answer 30 hours(11)

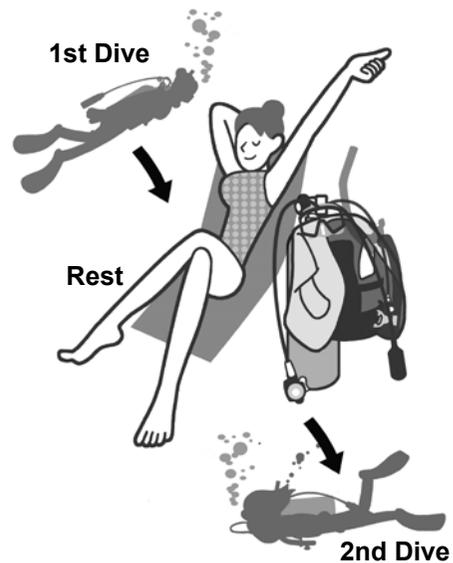
A The example of Worksheet completion



## Making a Dive Plan

To ensure safe diving, we always make a dive plan, including:

- \* planned maximum depth and time
- \* tank reserve of 50bar at exit
- \* at least a 1-hour surface interval between dives
- \* no-decompression required
- \* "3 at 5" - safety stop of three minutes at five metres
- \* dive the deepest dive first if repetitive dives are planned
- \* use a map to outline the area's details, including entry/exit and planned course



**Allow yourself to dive again!**

## Multi-Level Diving

When diving, there is a method for calculating for the constantly changing conditions, including water depth and no-decompression times - we use a dive computer.

### [Dive Computers]

Dive tables generally calculate a dive profile's no-decompression limits in which the diver goes down to the planned maximum depth for a certain period and then ascends. However, most dives vary from that to some degree. A dive computer uses real-time calculations to take into account changes in depth when displaying remaining no-decompression time. As well, they flash or beep alarm if your rate of ascent is too fast. Once back above water, your dive profile and time until safe to fly are also displayed. The information your dive computer will display is indispensable for logging your dives in your log book.

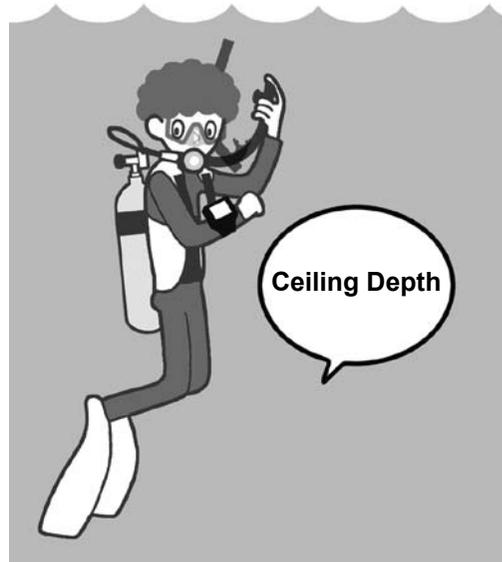


**Carefully use your dive computer when ascending.**

## [Dive Computer Terms]

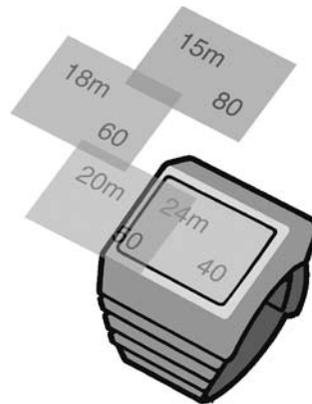
### ■ Ceiling Depth

If, by chance, you should need to make a decompression stop, this is the most efficient and maximum shallow depth. It is at the prescribed time and depth that the diver must maintain the decompression stop.



### ■ Scroll

During your surface interval, the computer will calculate and display real-time estimations for non-decompression times and depths for a repetitive dive.



### ■ Time Until Safe To Fly

Once at surface interval setting, this indicator on a dive computer displays the remaining time until you can safely fly. (Generally, 24 hours is considered safe, and 12-18 hours the absolute minimum.)



## [Cautions on Use of Dive Computers]

- \* Never lend your dive computer to another person
  - \* Dive deepest at the beginning of your dive and then gradually dive at shallower depths.
  - \* Always carry your dive computer as carry-on luggage to protect it.
  - \* Use of a dive computer does not excuse divers from making a dive plan.
- Always be thorough by planning your dives and diving your plans.



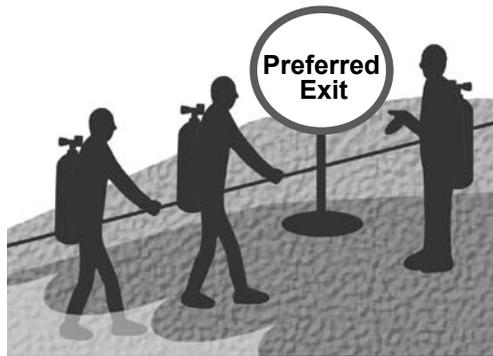
**A Dive Computer for Each Diver**



## Manners

To safely and comfortably dive, divers follow the rules and manners outlined below. It is a good practice to re-confirm with the dive group's members their understanding and agreement of these key points:

- \* decide on the leader, and cooperate.
- \* since fishing rights are clearly established and enforced in Japan, do not take or catch any sea life.
- \* since the ocean does not exist just for divers, always try to minimize your impact.
- \* please enter/exit at pre-decided locations and in the preferred way when possible.
- \* use good buoyancy and fin control to avoid contact with coral.
- \* don't throw cigarette stubs into the ocean - bring a portable ashtray if you smoke.
- \* bring your garbage back with you.



## Work Sheet

