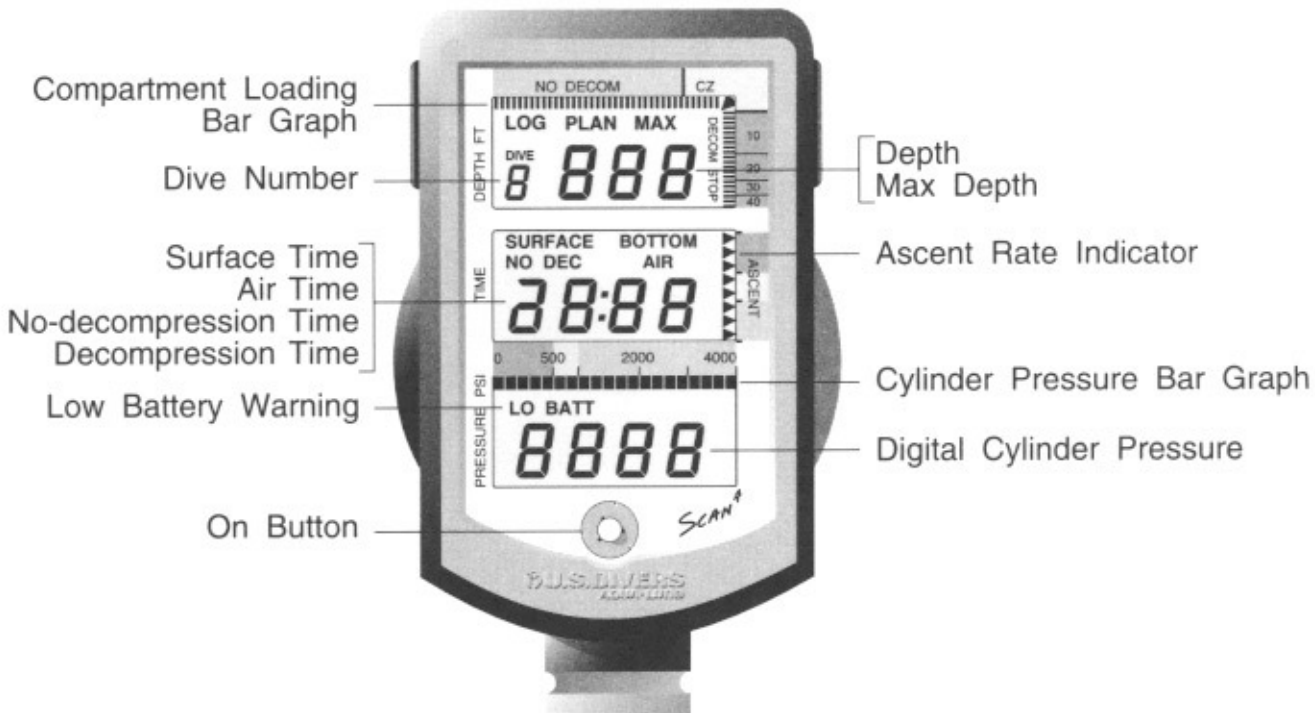


 **U.S. DIVERS**
AQUA-LUNG

SCAN⁴

**OWNER'S
MANUAL**

Quick Reference Guide



SCAN⁴
Dive Computer

OWNER'S MANUAL

U.S. Divers Co., Inc.

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Scan 4 Owner's Manual, Part Number 7413-96

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Definition of Warnings, Cautions and Notes

A warning is used before a procedure or situation that may result in serious injury or death. Warnings are accompanied by the STOP sign.

A caution is used prior to any situation or technique that will result in damage to the product. Cautions are accompanied by the black triangle with a white exclamation point "!"

A note is used to emphasize important points. Notes are accompanied by the black circle with the white letter "N."



The stop sign is used before warnings



The triangle is used before cautions



The circle is used before notes



WARNING: Read this entire owner's manual thoroughly so you understand how the computer works. The information contained within this manual is important to your personal safety. Improper use, or misuse, of this product can cause serious injury or death.



WARNING: The SCAN 4 is intended for use only by trained and qualified sport divers who are fully aware of the risks and hazards connected with sport diving. It is not intended to be used during professional diving activities, or any dives involving underwater work.

Using the SCAN 4 will not prevent the possibility of decompression sickness, but using it sensibly greatly reduces this risk. Any sport diver, however, must accept that there is no device, or procedure which will totally prevent the possibility of a decompression accident.

U.S. Divers Co. recommends that the following rules of safe diving be adhered to at all times:

1. Never push the limits of NO STOP dives. Ascend early and enjoy more time on your future dives.
2. Always plan your deepest dive as the first dive of your diving day.
3. Plan to avoid more than one dive requiring decompression stops in any 24 hour period.
4. Avoid dives which involve more than one ascent during the course of the dive (Yo-Yo dives). Re-descending after even a partial ascent involves greater risk than a dive which has only one gradual, or direct ascent.
5. Be aware that if you carry out frequent dives within a limited period you will increase your risk of decompression sickness.
6. Diving at altitude involves additional risk due to the effect of altitude on the diver's metabolism. Diving at altitudes in excess of 8,200 feet (2500m) should only be undertaken by experienced altitude divers, and after a suitable period of adaptation at the diving altitude.
7. When ascending from a NO STOP dive to a depth greater than 66 feet (20m) it is beneficial to carry out a short, precautionary decompression stop between 10 ft. and 20 ft. (3m and 6m).

Table of Contents

Introduction	vi
What is a “Dive Computer”?	vii

Chapter 1

Special Features

Compartment Loading Bar Graph	3
Ascent Rate Indicator	5
Cylinder Pressure Bar Graph	6
Dive Time Remaining	7

Chapter 2

Operating the Scan 4

Attaching the Scan 4 to Your Regulator	10
---	----

Display Modes and Functions	11
Startup/Diagnostic Mode	13
Surface Mode	16
No-Decompression Dive Mode	22
Decompression Mode	24
Dive Log Recall Mode (Memory Mode)	26
Audible Alarm Access Mode	28
Secondary Wait-to-fly Mode	29
Summary of Audible Alarms	30
Potential Danger	30
Immediate Danger	30
Permanent Violations	31
Transition	31

Chapter 3

Extreme Situations

Exceeding the Maximum Depth	34
Effects on Other Displays	35
Emergency Decompression	36

Decompression Stop Violations	37
Conditional Violation	38
Delayed Violation	39
Immediate Violation	42
Gauge Mode	43
Compartment Loading Bar Graph	43
Surface Display	44
Dive Display	44

<i>Reference</i>	
Specifications	64
Glossary	66
Index	70

Chapter 4

Care and Maintenance

General Care and Maintenance	46
Operating Temperature	49
Replacing the Battery	50
Battery Change Troubleshooting ..	55
Warranty	57

Introduction

Congratulations on the purchase of your Scan 4 dive computer. You will be pleased to know that our engineers and designers have condensed all the crucial dive information into a user friendly dive instrument. By combining a color coding system, graphs, bold alphanumerics and an audible alarm system, we have created an easy to read unit that provides dive data at a glance.

As with all life support diving equipment it is crucial to understand the features and functions of the Scan 4. Before using the Scan 4, it is essential that you read this manual in its entirety. Contained within this easy to read manual are illustrations to aid you in the complete understanding of the computer.

In Chapter one we will discuss some of the unique and special features of the Scan 4, such as, the Compartment Loading Bar Graph and Ascent Rate Indicator. The operating instructions are contained in Chapter two. It covers the different operating modes of the Scan 4, including how the Scan 4 works and safety checks before you start your dives.

Chapter three is dedicated to diving conditions that are considered extreme or, are past the operational limits of the Scan 4. To keep your computer in top condition, Chapter four offers advice on care and maintenance, instructions on how to change the battery, and warranty information. Lastly, the reference section contains the technical specifications, index and glossary.

What is a “Dive Computer”?

■ Definition of compartments

A dive computer is an instrument that mathematically simulates the absorption and release of nitrogen by hypothetical tissue types of the human body. These hypothetical tissues are commonly referred to as “*compartments*.” Each compartment absorbs and releases nitrogen at different rates. The Scan 4 uses a twelve-compartment model. The computer tracks these compartments constantly, providing you with up-to-date decompression information.

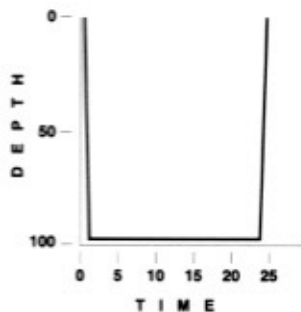


Figure 1a
Rectangular dive profile

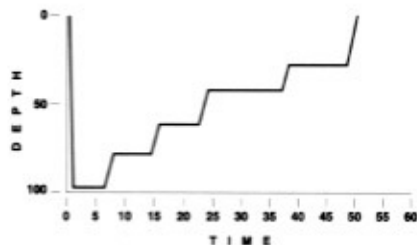


Figure 1b
Multi-level dive profile

■ Multi-Level Diving

If you use, or have used, dive tables you know the total amount of time you can stay under water is based on the maximum depth you reach during the dive. Dive tables, such as the U.S. Navy dive tables, assume you immediately descend to a single depth, stay at the depth for the duration of the dive, then immediately surface from that depth. This type of dive profile is referred to as a *rectangular dive profile* (figure 1a). In reality, however, most recreational divers go to the deepest depth first and make a gradual ascent to the surface. This type of dive profile is referred to as a *multi-level dive profile* (figure 1b).

Multi-level diving is where the Scan 4 excels. By continuously calculating the nitrogen absorption/release of the twelve tissue compartments, the computer updates the amount of no-decompression time (NDT) you have left. As you ascend to shallower depths, the computer credits you with more allowable NDT; if you go deeper, it reduces the NDT available.

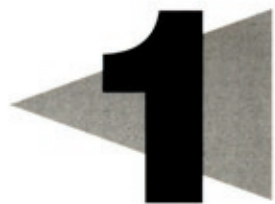
■ Computers are safe

Even though the Scan 4 can double, or even triple your dive time compared to dive tables, computers have been proven to be extremely safe. In fact, for a single-depth dive (rectangular dive profile), the Scan 4 is more conservative than the U.S. Navy dive tables. According to the U.S. Navy dive tables, you can stay at 100 feet for 25 minutes on the first dive without making a decompression stop. With the Scan 4, you can only stay for 20 minutes.

Years of research and thousands of dives have gone into the mathematical formulas used by the Scan 4 that make it a very safe diving instrument. However, the computer does not have special sensors attached to your body; it does not know if you are tired, dehydrated, overweight, or out of shape. For this reason, U.S. Divers recommends that you do not push the no-decompression limits of the computer. Always leave a comfortable safety margin in respect to no-decompression time, ascent speed and tank pressure. Let the computer assist you in making a safe dive, do not let it control your dive.



WARNING: Using the Scan 4 will not prevent the possibility of decompression sickness, but using it sensibly greatly reduces this risk. Any sport diver, however, must accept that there is no device or procedure which will totally prevent the possibility of a decompression accident.



SPECIAL FEATURES

Special Features

Most of the computers on the market today perform the same functions. They give you depth, dive time, no-decompression time, decompression information, dive memory functions, etc. What makes the Scan 4 different from other computers is that it provides all the information just mentioned plus four unique features that set it apart from most other computers: the Compartment Loading Bar Graph, Ascent Rate Indicator, Cylinder Pressure Bar Graph, and Remaining Air Time. Each of these four special features are explained in detail on the following pages.

Compartment Loading Bar Graph

■ Green No-decompression Zone (figure 2a)

The compartment loading bar graph is a visual representation of the absorption and release of nitrogen. As your body absorbs more nitrogen, more segments start to appear; as nitrogen is released, the segments disappear. When all the segments are within the green no-decompression zone, you are safely within the no-decompression limits of the computer. U.S. Divers recommends that you always keep the segments in the green no-decompression zone.

■ Yellow Caution Zone (figure 2b)

As the segments start to appear in the yellow caution zone (“CZ”), you are getting very close to the no-decompression limits. At this point, you should start a safe ascent towards the surface. As you ascend, the segments will recede into the green no-decompression zone.



Figure 2a

Compartment Loading Bar Graph in the green no-decompression zone



Figure 2b

Compartment Loading Bar Graph in the yellow caution zone



Figure 2c

Compartment Loading Bar Graph in the red decompression zone

■ Red Decompression Zone (figure 2c)

When the bar graph segments start to appear in the red zone, the Scan 4 goes into “Decompression Mode;” which means you have exceeded the limits of no-decompression diving and must make a decompression stop.

The red zone is sectioned into 10, 20, 30, and 40-foot decompression stop depths. When the last segment is in the 40-foot stop range, you must ascend to, or close to, 40 feet. You then stay at 40 feet until the bar graph recedes back into the 30-foot region. You then ascend to thirty feet and wait until the bar graph recedes into the 20-foot zone, and so on. Once the bar graph recedes into the yellow caution zone, continue to decompress until the bar graph recedes into the green no-decompression zone.



WARNING: Decompression diving is beyond the limits of sport diving. U.S. Divers recommends that you DO NOT MAKE ANY DIVE THAT REQUIRES A DECOMPRESSION STOP. Doing so greatly increases the chance of getting decompression sickness.

Ascent Rate Indicator

Along the right side of the middle window is the Ascent Rate Indicator (figure 3a). The ascent rate indicator consists of eight triangles that appear (from bottom to top) as your ascent rate increases. Figure 3b shows each triangle with its corresponding ascent rate.

While you are making an ascent to the surface, always try to keep the ascent rate indicator in the green zone. If it enters the yellow caution zone slow down or stop until the triangles recede into the green zone then continue to make your ascent.

If the ascent rate indicator enters the red zone, you are making an unsafe ascent and risk the possibility of decompression sickness. The ascent rate indicator will start flashing and you will hear a continuous beep-per-second audible warning. Always make an ascent such that the ascent rate indicator never enters the red zone.



Figure 3a
Ascent Rate Indicator

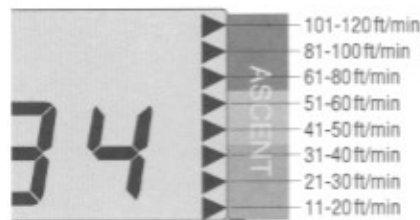


Figure 3b
Value assignments for ascent rate segments



Figure 4
Cylinder Pressure Bar Graph

Cylinder Pressure Bar Graph

After attaching your regulator to your cylinder and pressurizing the regulator, you will notice the Cylinder Pressure Bar Graph (figure 4) along the top edge of the bottom window. The bar graph consists of 20 segments that indicate pressures up to 4000 psi. The Cylinder Pressure Bar Graph is accompanied by a digital read-out of the cylinder pressure.

Just like the Compartment Loading Bar Graph and Ascent Rate Indicator, the Cylinder Pressure Bar Graph is color coded. When the bar graph is in the green zone, you have plenty of air left. When the bar graph enters the yellow zone, you should start your return to the surface. When the bar graph is in the red zone, you must immediately return to the surface to avoid an out-of-air situation.

Dive Time Remaining

One of the unique features of the Scan 4 is Dive Time Remaining (DTR). DTR consists of two elements: Air Time Remaining and No-decompression Time Remaining. While you are diving, the Scan 4 displays either Air Time or No-decompression Time, whichever is less.

When you dive deep you usually have plenty of air, but a short amount of no-decompression time. When this is the case, the **NO DEC** label appears in the middle window along with the remaining no-decompression time (figure 5a). When you dive at shallower depths, you usually have plenty of no-decompression time remaining, but just minutes of air time remaining. In this case, the **AIR** label replaces the **NO DEC** label and air time remaining is displayed (figure 5b).

■ Audible Warnings

There are four audible warnings in respects to Air Time.

- When you reach 5 minutes of Air Time, you are alerted with a warning that consists of one double-beep.



Figure 5a
No-decompression Time Remaining display



Figure 5b
Air Time Remaining display

surface from the dive or your Air Time increases to greater than five minutes.

- When the Air Time is within five minutes of required decompression time, you are alerted with one double-beep warning. At this point, the cylinder pressure display will start to flash until you complete the required decompression stops or, your Air Time increases to more than five minutes over the required decompression time.
- When your Air Time is zero, you are alerted with a continuous beep-per-second warning.
- When your Air Time equals your required decompression time, you are alerted with a continuous beep-per-second warning.



NOTE: The Scan 4 Air Time Remaining feature has a 300 psi safety buffer. This means that at 0 ATR, there will be 300 psi left in your cylinder if you start your ascent to the surface at a rate of 60 feet per minute.



***OPERATING THE
SCAN 4***

Attaching the Scan 4 to Your Regulator

Upon purchasing the Scan 4 have your authorized U.S. Divers dealer attach the computer to your first-stage regulator. If this is not possible, follow the simple steps listed below to do it yourself:

- Remove the high pressure (HP) port plug from your first-stage regulator using the appropriate size wrench. The HP port on all U.S. Divers regulators is clearly marked with the letters "HP".



NOTE: The end-fitting of the Scan 4's high pressure hose has 7/16" threads. On some early model first-stages the HP port is only 3/8". If this is the case with your regulator, you need to get a 7/16" female to 3/8" male adapter (U.S. Divers' part number 1017-85) from your U.S. Divers dealer.

-
- Thread the end of the HP hose into the HP port of the first-stage until finger tight. Using a 5/8" open-end wrench, tighten the hose fitting until snug. **DO NOT** over-tighten.

- Attach the first-stage to a charged SCUBA cylinder. Slowly turn the cylinder valve on-off handwheel counterclockwise until the valve is completely open. Submerge the first-stage in water and check for any leaks. If you detect leaks, take your regulator and computer to your U.S. Divers dealer and have the O-ring inspected and/or replaced. Then have the U.S. Divers dealer attach the Scan 4 to your regulator.

Display Modes and Functions

The Scan 4 has 7 basic modes of operation. Each mode of operation may consist of multiple display screens. Below is an outline of the 7 major operational modes with their various screen displays.

1. Startup/Diagnostic Mode
2. Surface Mode
 - Standard Surface information display
 - Wait-to-fly time information display
 - Pre-Dive Planning Sequence
3. Dive Mode
 - Standard display
 - Alternate display

4. Decompression Mode
 - Standard display
 - Alternate display
5. Dive Log Recall (memory) Mode
 - Standard display
 - Alternate display
6. Secondary Wait-to-fly Mode
7. Audible Alarm Access Mode

This section will explain each mode, with all its special features, in detail.

Startup/Diagnostic Mode

■ Starting the Scan 4

To activate the Scan 4, simply press the neon-yellow button (figure 7). After the button is pressed, the Scan 4 displays all “8”s followed by dashes. All the digits (except for the left most time digit - see Quick Reference Guide on the backside of the front cover) will count down from 9 to 0. During this countdown the gauge checks all of its functions, battery power and determines the barometric pressure (altitude).



CAUTION: DO NOT turn on the Scan 4 or turn on your cylinder valve while under water. Doing this will cause the gauge to miscalibrate, giving you erroneous readings and incorrect decompression information. The computer will not turn on if you are at a depth greater than 10 feet.

After turning on your air and pressurizing your regulator, The Scan 4 is ready to make a dive. If you do not make a dive within two hours after

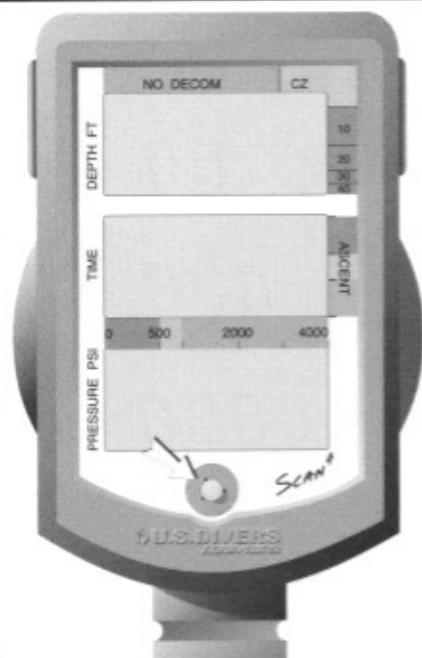


Figure 7

Press the neon-yellow button to activate the computer



Figure 8

LO BATT label appears when battery power is low

turning on the Scan 4, the computer will turn off automatically. Always be sure to check to see if the unit is activated before entering the water.

Once the Scan 4 is on you cannot turn it off manually. This prevents anyone from accidentally turning off your computer, resulting in the loss of all your no-decompression information.

■ Low Battery Warning

If the computer detects low battery power, the **LO BATT** label (see figure 8) will appear in the lower window (tank pressure window). If the **LO BATT** remains on the screen after the Startup/Diagnostic, you have enough battery power to complete one day of diving. If you intend to do multi-day diving, replace the battery immediately. The low battery warning will flash continuously while the computer is in operation. For more information on changing the battery, see chapter 4, "Care and Maintenance."



WARNING: DO NOT change the battery between dives or between days of diving. Once the battery is removed, ALL residual nitrogen information is erased. When a new battery is installed, the Scan 4 assumes you are on the first dive of the first day of a multi-day trip. This means that the computer may allow you more no-decompression time than you really have, resulting in a greater chance of decompression sickness.

■ Altitude diving

The Scan 4 may be used to altitudes up to 14,000 feet. If the altitude is between 0 and 4000 feet, the computer uses a sea-level algorithm; between 4000 and 14,000 feet, the Scan 4 uses an adjusted altitude algorithm. If the computer is turned on above 14,000 feet, it will automatically shut off after completing its diagnostic check.



Figure 9

Surface interval display. The **SURFACE** label flashes during the first 10 minutes

Surface Mode

The Scan 4 goes into surface mode (1) after the computer completes the startup and diagnostic procedures, or (2) ten minutes after completing a dive (deeper than 5 feet).

■ Primary Display (screen 1)

The first screen (figure 9) displays: (a) the mode indicator, (b) dive number, (c) Compartment Loading Bar Graph, (d) depth, (e) surface time, (f) Cylinder Pressure Bar Graph, and (g) digital cylinder pressure.

(a) Mode indicator

To indicate that the Scan 4 is in surface mode, the **SURFACE** label appears in the middle window. The **SURFACE** label will flash during the first 10 minutes of the surface interval.

(b) Dive number

The Scan 4 counts up to 9 dives. When you first start the computer, the dive number will be 0. As soon as you make a dive, it will switch to dive 1.

(c) Compartment Loading Bar Graph (CLBG)

The CLBG only displays after making a dive. During the surface interval, the CLBG starts to recede, indicating that you are off-gassing nitrogen. When you first turn on the Scan 4, you will not see the CLBG. For more detailed information on the CLBG, see chapter 1, “Special Features.”

(d) Depth

Depth is displayed in the top window. During the surface interval, the depth displayed will be 00.

(e) Surface time

Surface time is displayed in the middle window. It is displayed in the form of hours and minutes (HH:MM); surface interval counts from 0:00 to 11:59. While surface time is counting, the colon flashes once per second.

(f) Cylinder Pressure Bar Graph

After turning on your air and pressurizing your regulator, the Scan 4 displays the cylinder pressure bar graph across the top edge of the bottom window. (For more explanation of the cylinder pressure bar graph, see chapter 1, “Special Features”)

**Figure 10**

Wait-to-fly screen (surface mode screen 2)

(g) Cylinder pressure - digital reading

After turning on your air and pressurizing your regulator, the computer displays the cylinder pressure in a digital format in the bottom window. The Scan 4 displays cylinder pressure from 0 to 4090 psig in 10-psig increments. If no cylinder pressure is sensed, the computer will display 0000.

■ **Wait-to-fly time (Screen 2)**

10 minutes after surfacing from a dive, the SCAN 4 displays your wait-to-fly time (figure 10).. The word "FLY" will display in the top window and the wait-to-fly time will display, in hours and minutes, in the middle window. Wait-to-fly time starts counting down from 23:50 (24 hours less the first 10 minutes of surface interval). When wait-to-fly time reaches 12 hours the computer shuts down but the wait-to-fly continues to countdown from 12 hours to zero (Secondary Wait-to-fly Mode). When the computer goes into surface mode immediately after the Startup/Diagnostic procedure, the wait-to-fly does not display and the computer skips directly to the pre-dive-planning sequence (screen 3).

Wait-to-fly guidelines

In 1990, the Undersea and Hyperbaric Medical Society (UHMS) published a set of guidelines for lowering the chance of decompression sickness due to flying too soon after diving. The UHMS suggests divers using standard air tanks and exhibiting no symptoms of decompression sickness wait 24 hours after the last dive to fly in an aircraft with an internal cabin pressure of 8,000 feet or less. The only two exceptions to this recommendation are:

1. If a diver had less than 2 hours total accumulated dive time in the last 48 hours, then a 12 hour surface interval before flying is recommended.
2. Following any dive that requires a decompression stop, flying should be delayed for at least 24 hours, and if possible, for 48 hours.

Since the introduction of the 1990 UHMS guidelines, the Diver's Alert Network (DAN) has introduced data that resulted in DAN's position that:

“A minimum surface interval of only 12 hours would be required in order to be reasonably assured a diver will remain symptom free upon ascent to altitude in a commercial jetliner (altitude up to 8,000

feet). Divers who plan to make daily, multiple dives for several days, or make dives that require decompression stops, should take special precautions and wait for an extended surface interval beyond 12 hours before flight.”

Both the UHMS and DAN agree that:

“There can never be a flying after diving rule that is guaranteed to prevent decompression sickness completely. Rather, there can be a guideline that represents the best estimate for a conservative surface interval for the vast majority of divers. There will always be an occasional diver whose physiological makeup or special diving circumstances will result in the bends.”

■ Pre-Dive Planning Sequence

One minute after activation, or ten minutes after surfacing from a dive, the Scan 4 displays the Pre-Dive Planning Sequence (figure 11), as well as, the cylinder pressure (digital and bar graph).

When the Scan 4 switches to the pre-dive planning screen, it does the following:

- Displays the **PLAN** label (a) in the top window denoting that you are in the pre-dive planning sequence
- Displays the current dive number (b).
- Scrolls from 30 to 160 feet (c) in 10-foot increments, giving the estimated no-decompression stop times (d) for each depth. On the first dive after the computer is turned on, you get the maximum allowable no-decompression time for each depth. The maximum allowable no-decompression time gets shorter with each successive dive.
- If your cylinder valve is on and your regulator is pressurized, the Cylinder Pressure Bar Graph and the digital cylinder pressure will be displayed in the bottom window.

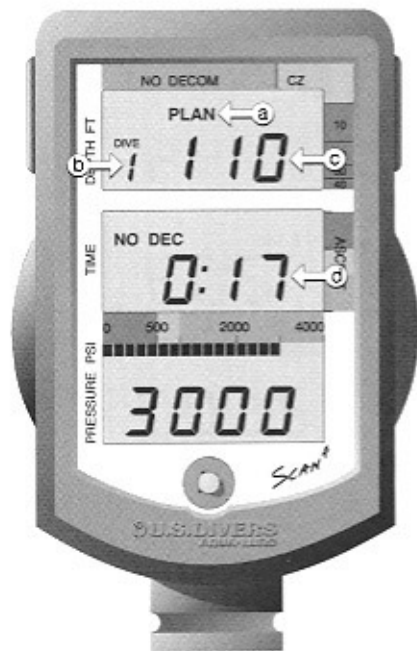


Figure 11
Pre-Dive Planning Sequence



Figure 12
No-Decompression Dive Mode's
primary display

No-Decompression Dive Mode

■ Primary display

When the Scan 4 descends below five feet, it switches from Surface Mode to Dive Mode. At this point, the **SURFACE** label is replaced with the **NO DEC** label. In dive mode, the computer alternates between two different screen displays. The primary display (figure 12) gives the following information:

- (a) Dive number
- (b) Compartment Loading Bar Graph
- (c) Current depth
- (d) Dive Time Remaining
- (e) Ascent Rate Indicator
- (f) Cylinder Pressure Bar Graph
- (g) Digital cylinder pressure reading

This screen displays for 13 seconds before switching to the alternate display.

■ Alternate display

The alternate display (figure 13) will show your maximum depth and bottom time, as well as, your ascent rate information. The maximum depth (b) is displayed in the top window with the **MAX** label (a) above it. The total bottom time (d) is displayed in the middle window with the **BOTTOM** label (c) just above it. If you are making an ascent, the Ascent Rate Indicator (e) will also display.

The alternate screen displays for 2 seconds, then returns to the primary display.

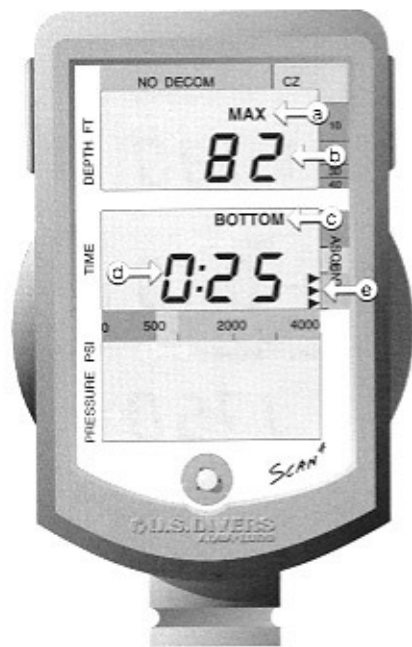


Figure 13

*No-decompression Dive Mode
alternate display*

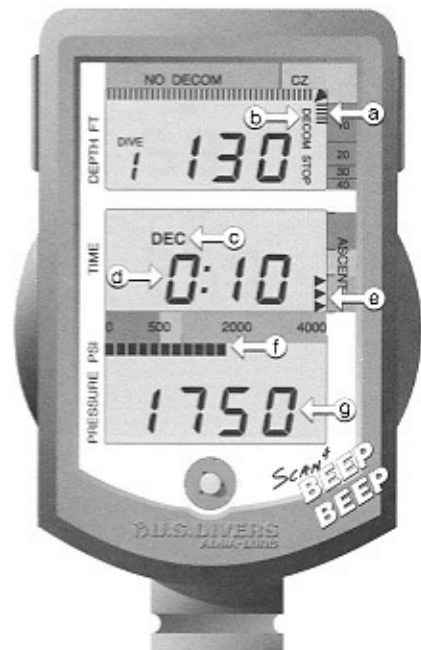


Figure 14
Decompression Mode

Decompression Mode



WARNING: Avoid making decompression dives. Decompression dives are beyond the limits of sport diving and increase the chance of decompression sickness.

When the leading segment of the Compartment Loading Bar Graph enters the red zone (figure 14, a), the Scan 4 switches into Decompression Mode and does the following:

- Emits one double-beep warning.
- Replaces the **NO DEC** or **AIR** label with the **DEC** label (c) indicating that you are now in decompression mode.



NOTE: Once you are in decompression mode, the **AIR** label will not display, even if you are low on air. When your Air Time comes within 5 minutes of your decompression time, you will be alerted with one double-beep warning. When your Air Time Remaining equals your decompression time, you will be warned with a continuous single-beep warning.

- Displays the **DECOM STOP** label (b) along the right side of the top window.
- Displays the *total ascent time* to the surface (d) in the middle window. The total ascent time equals all decompression stop times plus the time it takes to ascend from the current depth at a rate of 60 feet per minute. Example: If the Scan 4 calculates a 5 minute decompression stop at 10 feet and your present depth is 130 feet, your total ascent time would be 7 minutes. It takes 2 minutes to ascend from 130 feet to 10 feet. Those 2 minutes plus the 5 minute decompression stop add up to 7 minutes.
- Displays the Ascent Rate Indicator (e)
- Displays the Cylinder Pressure Bar Graph (f)
- Displays the digital cylinder pressure (g)

This screen displays for 13 seconds before switching to the alternate display that shows maximum depth and bottom time. This screen is identical to the alternate screen in Dive Mode (see page 23).



Figure 15
Dive Log Recall Mode - Primary
Display

Dive Log Recall Mode (Memory Mode)

■ Accessing the Dive Log Recall Mode

Once you have surfaced from a dive and 10 minutes of surface interval has elapsed, you can access the Dive Log Recall Mode (figure 15) by pressing the neon-yellow button at any time.

After entering the Dive Log, the Scan 4 will scroll through all dives in memory, beginning with the most recent dive. If you need the Dive Log scrolling to pause, press the neon-yellow button anytime during the scroll to freeze the screen display. When you release the button, the scrolling will continue.

■ Memory Capacity and Limitations

The Scan 4 can retain the information of up to nine dives of your most recent day of diving. For each dive over the nine dive limit, the first dive is dropped out of memory. Dive information will stay in memory until:

- You make a dive (deeper than 5 feet) on your next day of diving. The “next day of diving” is defined as any time after the computer shuts down (12 hours after the last dive).
- The battery is removed.

■ Primary Display

When you first enter the Dive Log Recall Mode, you will see the primary display (figure 15, opposite page). You will notice the **LOG** label (a) in the upper left hand corner indicating that the Scan 4 is in Dive Log Recall Mode. The primary display gives you the following information:

- (a) **LOG** label, indicating that the Scan 4 is in Dive Log Recall Mode;
- (b) dive number;
- (c) Compartment Loading Bar Graph at the end of the dive;
- (d) **MAX** label, indicating that the depth shown is the maximum depth;
- (e) maximum depth;
- (f) **BOTTOM** label, indicating that the time shown is the bottom time;
- (g) bottom time;
- (h) Ascent Rate Indicator, which shows the fastest ascent rate during the dive. The primary display will switch to the alternate display after 4 seconds.

■ Alternate Display

The alternate display (figure 16) gives you the surface interval before the dive was made. In figure 16, the diver had a 1 hour and 23 minute surface interval before making dive 2.

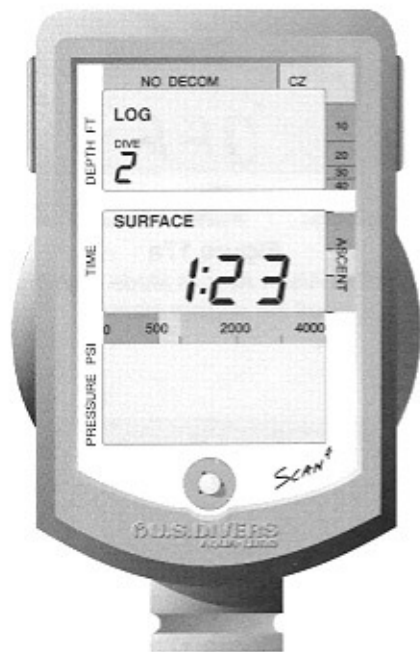


Figure 16
Dive Log Recall Mode -Alternate
Display



Figure 17a

Audible Alarm Access Mode - turning off the audible alarm



Figure 17b

Audible Alarm Access Mode - turning on the audible alarm

Audible Alarm Access Mode

The Scan 4 has a special access mode that lets you turn the audible alarm on or off. To access this mode, you must first go into Dive Log Recall Mode.



NOTE: The Scan 4 is shipped with the Audible Alarm turned on. You must have at least one dive in memory before you can enter the Audible Alarm Access Mode.

When you see the alternate Dive Log screen of your most recent dive (the first dive displayed), press and hold the neon-yellow button until you see the “OFF” command located in the bottom window (figure 17a). The “OFF” command is also accompanied by one double-beep. If you release the button at this point, you will turn the audible alarm off. If you continue to hold the button down for three more seconds, the “ON” command will display accompanied by a single beep (figure 17b). If you release the button at this point, you will turn the audible alarm on. If you continue to press down the button, the computer scrolls between the “ON” and “OFF” every three seconds.

If you enter the Audible Alarm Access Mode 10 minutes after completing a dive, the External Access command - “EA” - is displayed accompanied by a single beep. If you release the button during the “EA” command, the Scan 4

goes into a calibration mode that is accessible by the manufacturer to calibrate the computer. The “EA” mode is not user accessible.

Once you release the button, the Scan 4 returns to Dive Log Recall Mode.

Secondary Wait-To-Fly Mode

After you complete your last dive of the day, the Scan 4 starts counting down from 24 hours to 12 hours. At the 12 hour mark, the Scan 4 turns off. However, the wait-to-fly time will continue to display, counting down from 12 hours to 0 hours. This secondary wait-to-fly time allows you to add an extra safety margin before you get on a commercial airliner that is pressurized to 8000 feet.

Figure 18 shows the secondary wait-to-fly screen. The word “FLY” is displayed in the top window and the wait-to-fly time is displayed in the middle window.



NOTE: Be aware that the Scan 4 is “OFF” while in the Secondary Wait-to-Fly Mode. If you want to make a dive, you must restart the computer by pressing the neon-yellow button and wait for the Startup/Diagnostic procedure to finish.

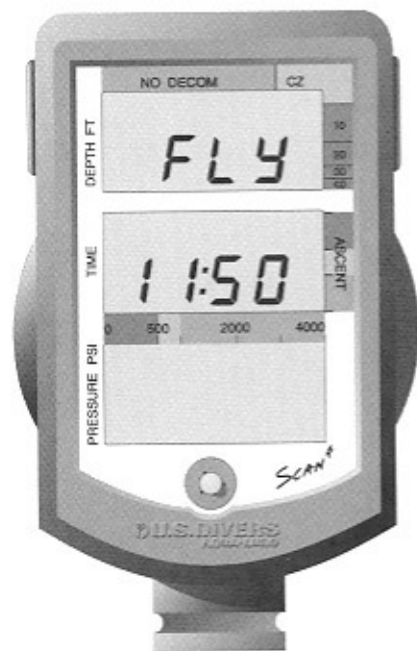


Figure 18
Secondary Wait-To-Fly Mode

Summary of Audible Alarms

The Scan 4 has four different audible alarms for four different situations: potential danger, immediate danger, permanent violations and transitions.

Potential Danger - One Double-Beep

When the Scan 4 determines that there is potential danger, it gives off one double-beep alarm. The following situations are considered potentially dangerous:

- Entering decompression mode
- Reaching five minutes of Air Time Remaining
- Air Time Remaining is within five minutes of required decompression time

Immediate Danger - Continuous Beep-Per-Second

When the Scan 4 determines you are in immediate danger, it will emit a

continuous beep-per-second until the situation is corrected. These situations are:

- Conditional violation (explained in next chapter)
- Ascent rate faster than 60 feet per minute
- Air Time Remaining equals required decompression time
- Air Time Remaining equals zero

Permanent Violations - One Long-Beep

If you enter Delayed or Immediate Violation Mode (explained in detail in the next chapter), the Scan 4 emits a single long-beep. This only happens when one of the following Violation Rules are broken:

- Your current depth is shallower than the required decompression stop depth for more than 5 minutes
- The calculated decompression stop depth is greater than 40 feet

Transition - One Short-Beep

The Scan 4 emits one short-beep when it makes the following transitions:

- During initial activation - the transition from being off to on
- Recalling the Dive Log - the transition from Surface Mode to Dive Log

Recall Mode

- Turning the Audible Alarm on or off - the transitions of the audible alarm from being on to off or vice versa



EXTREME SITUATIONS



Figure 19

Depth display deeper than 249 feet

This chapter explains what the Scan 4 does when taken to the extreme limits of depth and decompression. Even though this information is important, U.S. Divers recommends that you never make a dive in which you enter these extreme situations.

Exceeding the Maximum Depth



WARNING: The Scan 4 is designed for the sport diver. A sport diver should limit his/her diving depth to no deeper than 130 feet. Deep diving requires special training and equipment. U.S. Divers does not advocate diving to depths below 130 feet.

The Scan 4 operates normally down to 249 feet. If you exceed 249 feet, the following events occur (refer to figure 19):

- A single long-beep is emitted.
- The Compartment Loading Bar Graph starts to flash.
- The depth display changes to three dashes

Items a & b are the result of the computer entering into a state of *Delayed Violation*. Delayed Violation is the second of three Decompression Violations. The other two are Conditional Violation (less serious) and Immediate Violation (more serious). Exceeding the maximum depth is considered a decompression violation because the algorithm continues to calculate as though you were at 249 feet even if you're at 280 feet. For more details on Decompression Violations see page 37.

Once you ascend shallower than 249 feet, the display returns to normal and the computer will give you all the necessary information to make a safe ascent to the surface. Five minutes after returning to the surface, the Scan 4 will enter into a state of *Immediate Violation* (see page 42 for an explanation of Immediate Violation).

Effects on Other Displays

When you exceed the maximum depth of 249 feet, three dashes will display in the maximum depth screen position (figure 20) of the alternate dive mode display. Also, when you are in Dive Log Mode and recall the information of a dive in which the maximum depth was exceeded, three dashes will appear in the maximum depth screen position (figure 21).

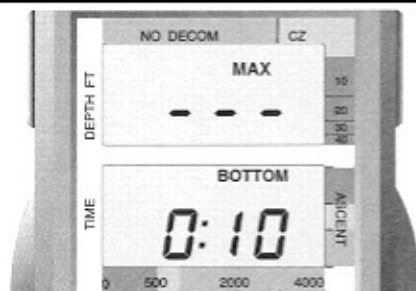


Figure 20

Alternate display after exceeding 249 ft. depth limit



Figure 21

Dive Log display for dive exceeding 249 ft. depth limit

Emergency Decompression

After entering decompression, the Compartment Loading Bar Graph may fill the 10, 20, 30 and 40-foot zones quickly. Once you have entered decompression, it is imperative that you ascend toward the required decompression stop depth immediately. If you continue the dive at a greater depth, you risk violating the gauge and losing the information needed to get back to the surface safely.



WARNING: The deeper you are, the faster the Compartment Loading Bar Graph (CLBG) will enter the decompression region. Once in the decompression zone, the CLBG may exceed the 40-foot stop limit rather quickly and put the Scan 4 into an Immediate Violation. In Immediate Violation, the Scan 4 does not give any information on completing a safe ascent. Without this decompression information, you greatly increase the possibility of getting decompression sickness.

Decompression diving requires special training and equipment. For these reasons, sport divers should not attempt decompression diving. Making a dive that requires decompression stops should be avoided because you cannot ascend directly to the surface without risking personal harm. If your equipment failed requiring you to surface immediately, you risk decompression sickness. Your buddy would be unable to lend assistance without also risking decompression sickness.

Decompression Violations

If you do not correctly carry out required decompression stops or exceed decompression stop limits, you will put the Scan 4 in a state of violation. There are three different states of violation which vary in seriousness: “Conditional Violation,” “Delayed Violation,” and “Immediate Violation.” It is important to understand each of these violations, and their affect on the computer's functions.

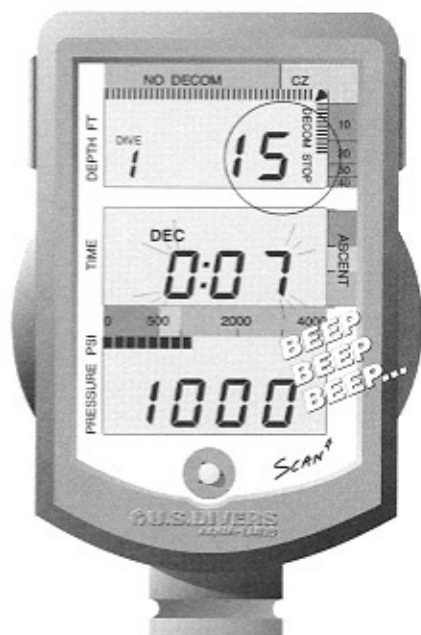


Figure 22
Conditional Violation

Conditional Violation

The least serious violation is the Conditional Violation. The Scan 4 goes into a state of Conditional Violation when you ascend shallower than the required decompression stop for less than 5 minutes. Figure 22 shows an example of a diver at a depth of 15 feet when his decompression stop depth is 20 feet. This can easily happen if you temporarily lose control of your buoyancy or get caught in a surge up-swell. Immediately after breaching the decompression stop depth, you will hear a beep-per-second audible alarm and the *total ascent time* will flash.

While in a state of Conditional Violation, the Scan 4 stops calculating decompression information (nitrogen off-gassing). In fact, the computer penalizes you with 1.5 minutes of additional decompression time for every minute above the decompression stop depth. For example, if you have 10 minutes of decompression time and ascend above the stop depth for 4 minutes, you will now have 16 minutes of decompression time ($10 + (4 \times 1.5) = 16$).

If you descend to, or slightly deeper than, the decompression stop depth within 5 minutes, the computer will resume normal operation and

allow you to successfully complete the decompression stop(s) *and allow you to keep diving for the rest of the day*. If you stay above the decompression stop depth for more than 5 minutes, the Scan 4 will go into Delayed Violation Mode (explained below.)

Delayed Violation

A more serious violation is the Delayed Violation. The difference between Conditional and Delayed violation is that in Conditional violation, the Scan 4 allows you to keep diving for the rest of the day; in Delayed Violation, the Scan 4 goes into Immediate Violation after completing the dive. (Immediate Violation is explained on page 42.) There are three situations that put the Scan 4 in a state of Delayed Violation:

- **Spending more than 5 minutes above decompression stop depth.**

If you stay above the decompression stop depth for more than 5 minutes, the Scan 4 will enter a state of Delayed Violation. When the computer enters Delayed Violation, a single long-beep is emitted and the Compartment Loading Bar Graph starts to flash (figure 23). The



Figure 23

Delayed Violation - above the stop depth for more than 5 minutes



Figure 24
Delayed Violation - Deco stop greater than 40 feet

total ascent time time continues to flash (continued from conditional violation). If you descend below the decompression stop depth after five minutes, the Scan 4 can still assist you in getting back to the surface. Always remain at, or slightly below, the specified decompression stop depth until the CLBG recedes into the yellow caution zone. Continue decompressing until the CLBG is near, or into, the green zone.

After five minutes of surface time, the Scan 4 will enter a state of Immediate Violation for 24 hours. Immediate Violation is explained on page 42.

■ Decompression stop greater than 40 feet

The maximum decompression stop depth for the Scan 4 is 40 feet. As soon as the computer calculates a decompression stop depth slightly greater than 40 feet, the computer goes into a state of Delayed Violation (Figure 24). Once the gauge is in Delayed Violation, an audible alarm of one long beep will be sounded and the Compartment Loading Bar Graph (CLBG) will flash. In this situation, the *total*

ascent time will still be displayed.

To get back to the surface safely, you must immediately ascend to, or slightly deeper than, 40 feet until the CLBG stops flashing and eventually recedes into the 30 foot zone. Continue to make your decompression stops as indicated by the CLBG. After your decompression time reaches zero and the CLBG recedes into the yellow zone, continue decompressing until the leading segment is near, or into, the green NO DECOM zone. After 5 minutes of surface time, the Scan 4 will enter a state of Immediate Violation for 24 hours.

If you do not make an immediate descent to the 40-foot decompression stop after entering Delayed Violation, the decompression calculation limits will be exceeded and the computer will enter a state of Immediate Violation for 24 hours. Immediate Violation is explained on page 42.

■ Exceeding the maximum depth limit of 249 feet

(See "Exceeding the Maximum Depth" on page 34.)

Immediate Violation

The Scan 4 enters a state of Immediate Violation when a situation totally exceeds the computer's capacity to predict a safe decompression ascent procedure. These dives represent gross excursions into decompression that are beyond the boundaries of the Scan 4's computer model. If you frequently make these types of decompression dives, you should not be using the Scan 4.

Two situations will cause the Scan 4 to go into Immediate Violation:

- Five minutes after surfacing from a dive in which you entered delayed violation.
- A calculated decompression stop much greater than 40 feet.

While in a state of Immediate Violation, the following things happen:

- The Scan 4 will operate only in Gauge Mode (explained in the next section).
- Pre-Dive Planning Sequence and Wait-to-fly (24 to 12 hrs.) displays are disabled.
- In the Secondary Wait-to-fly Mode (12 to 0 hrs.), the word "FLY" is replaced by three dashes. This is a reminder to you that

the Scan 4 is still in a state of Immediate Violation and if you turn on the computer, it will operate in Gauge Mode.

Gauge Mode

After the Scan 4 has experienced an Immediate Violation, the computer only operates in Gauge Mode. In Gauge Mode, the computer does not calculate anything pertaining to no-decompression, decompression, or Dive Time Remaining. In Gauge Mode, the Scan 4 operates as follows:

Compartment Loading Bar Graph

All the segments of the Compartment Loading Bar Graph (CLBG) will flash continuously while the computer is in Gauge Mode. So, if you are diving, or on the surface, you will always see the CLBG flashing. In fact, when you recall the memory of a Gauge Mode dive, the CLBG will flash in the Dive Log Recall display.

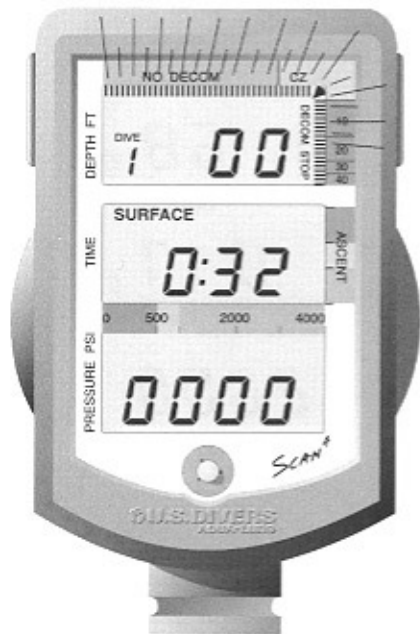


Figure 25
Surface display while in Gauge Mode

**Figure 26**

Display during a dive while in Gauge Mode

Surface Display

On the surface, the Scan 4 gives you the dive number, depth (zero reading), surface time, and cylinder pressure (figure 25, previous page). The Wait-to-fly display and the Pre-Dive Planning Sequence are disabled. The Dive Log Recall Mode is not affected and can be accessed as described in the previous chapter.

Dive Display

Gauge Mode has two different screen displays while making a dive. The first screen (figure 26) gives you the dive number, depth, bottom time, ascent rate information, and cylinder pressure. What it *does not give you*, however, is Dive Time Remaining (**NO DEC** time, or **AIR** time.) This first screen displays for 13 seconds before switching to the alternate screen.

The alternate screen is identical to the alternate screen in Dive Mode (see page 23). It tells you the maximum depth achieved during the dive, total bottom time, and ascent rate information. This screen displays for 2 seconds before switching back to the first screen.

4

CARE & MAINTENANCE

General Care and Maintenance

The Scan 4 is a robust instrument designed to withstand the rigors of SCUBA diving. However, you still need to protect it from shock, extreme heat, chemical attack, and tampering.

Even though the Scan 4's material is tough and durable, it is susceptible to chemical attack. Chemical attack can be in the form of spray propellants, gasoline fumes in your garage or boat, and alcohol.



CAUTION: Never use aerosol sprays, including silicone sprays, on or near the Scan 4. The propellants may chemically attack the plastic, causing the plastic case to crack.

■ Before the dive

The Scan 4's plastic housing is made of a shock resistant resin. This housing, combined with the rubber console boot, protects the

Scan 4 from the normal bumps that occur when diving. However, the computer cannot withstand the impact of heavy objects, such as, weight belts or SCUBA cylinders, which is the most common cause of computer damage. When you set up your dive gear on a boat or the beach, tuck the Scan 4 into your BC pocket or between the BC and cummerbund. Never leave it exposed where someone could accidentally step on it or drop something on it.

■ During the dive

The most common damage inflicted on a computer underwater is scratches to the computer face. Scratches occur when a dangling computer gets dragged over coral or rocks. Most BCs have gauge hose retainers that keep the computer close to your body for easy access and reduce the possibility of scratching the computer face.



NOTE: Dangling gauges are a major cause of damage to delicate marine life, such as corals. Always keep secondary hoses, such as your octopus and gauge, retained close to your body.

■ After the dive



CAUTION: If the Scan 4 is not attached to a first-stage regulator while soaking (explained below), make sure that water is not allowed to enter the high pressure hose. Water entering the Scan 4 via the high pressure hose may cause damage to the internal components.

After each day of diving, soak the Scan 4 in a warm, fresh water bath to dissolve salt crystals. U.S. Divers recommends that, along with the Scan 4, you soak the entire regulator system. The recom-

mended procedure for soaking a regulator is to first attach the first-stage to a charged SCUBA cylinder and pressurize the regulator system. Then, soak the system in a warm water bath. This "pressurized method" prevents any water entering the regulator hoses, which can lead to internal corrosion.

To dissolve heavy salt build-up, use a slightly acidic vinegar/water bath. After removing the computer from the bath, rinse thoroughly with fresh water. Towel dry the computer before final storage. Place the Scan 4 in a cool, dry and protective case to transport.

Operating Temperature

The Scan 4 will operate normally between 32°F to 140°F (0°C to 60°C). You may notice the liquid crystal display (LCD) becoming sluggish at extremely low temperatures. This is normal and will not affect the computer's accuracy.

It is possible to damage the electronics if left exposed to direct sunlight, or in a hot confined space (like a car trunk). After the dive, cover the computer and keep it out of the sun. If inadvertently left in direct view

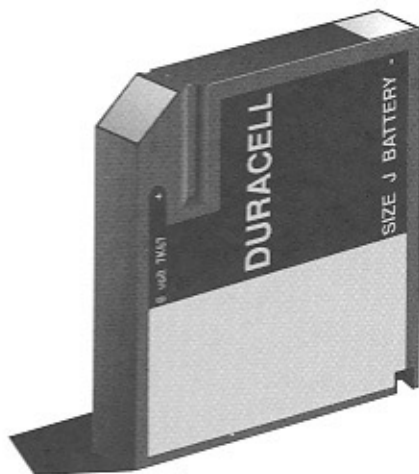


Figure 27
"J"-size battery used in the Scan 4

of the sun, the LCD may become totally black. If this occurs, immediately immerse the Scan 4 in water. The display should recover its normal appearance after a few minutes. Damage from excess heat, or cold, is not covered under the Scan 4 Two-Year Limited Warranty.

Replacing the Battery

One feature of the Scan 4 is that you can replace the battery yourself. If the **LO BATT** warning remains displayed after the computer goes through its startup/diagnostic check, you have enough battery power to complete one day of diving. So, it is a wise idea to always have a spare battery, especially if you are on a live-aboard boat or in some remote dive destination.

The Scan 4 uses a Duracell® "J" size battery (figure 27). Eveready® also makes a "J" size battery that may be used (Eveready® no. 539). This type of battery can be found at camera stores, electronic stores, and drug stores. You will notice that one corner of the battery is angled, making it impossible for the battery to be put in the wrong way.

To change the battery follow these steps:

■ Remove the battery

1. If the Scan 4 is hooked up to a SCUBA cylinder, turn off the cylinder valve and purge your second-stage regulator.
2. With your two thumbs, carefully stretch the top two corners of the boot over the top of the computer module while, at the same time, pressing in on the back of the boot (figure 28).
3. Slide the boot down (but not off) the hose.
4. Using your hand only, remove the knurled ring by turning it counterclockwise (figure 29).
5. Lift off the battery cover plate (figure 30)
6. On each side of the battery is a recess for your fingers. Gently lift out the battery (figure 31).



Figure 28

Slide boot over top of module



Figure 29

Remove knurled ring



Figure 30

Remove battery cover plate



Figure 31

Lift out battery

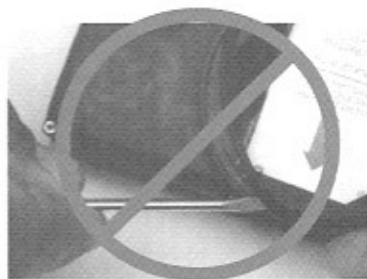


Figure 32

DO NOT use a screwdriver to remove O-ring



Figure 33

Lift out O-ring

■ Parts cleaning and inspection



CAUTION: DO NOT use sharp metal objects to lift out the O-ring. Doing so may scratch the O-ring sealing surface. This will create a leak path causing the battery compartment to flood.

1. Using your fingernail, gently pry out the O-ring.
2. Clean the O-ring, battery cover, and knurled ring with warm soapy water to remove any sand, silt, or salt build-up. Rinse these parts with fresh water and dry with a lint free cloth.
3. Examine the O-ring for any scratches or nicks. If the O-ring is slightly damaged in any way, replace it. Replacement O-rings are available from your U.S. Divers® Dealer.
4. If the O-ring is free of defects, lightly lubricate the O-ring with pure, food-grade silicone grease. U.S. Divers recommends Dow Corning 111. If you are not sure your silicone grease meets food-grade standards, see your U.S. Divers® dealer for advice.



NOTE: You only need to use a tiny amount of silicone grease. The O-ring should be covered with a light film of grease. No “globs” of grease should be visible. Too much grease acts as a trap for sand, salt and silt which will eventually cause leaks.

Final Reassembly

1. Replace the O-ring back in its groove.
2. Insert the angled end of the battery into its compartment and slide the battery up against the contacts (figure 34). Then, press the bottom of the battery into place.
3. Install the battery compartment cover, making sure to align the key pins with the corresponding key holes (figure 35).
4. Place the knurled ring on top of the threads around the batter cover plate. Turn the ring counterclockwise a half turn so the threads align correctly. Then, turn the ring clockwise until hand-tight. Make sure the cover is snug, but do not over-tighten.

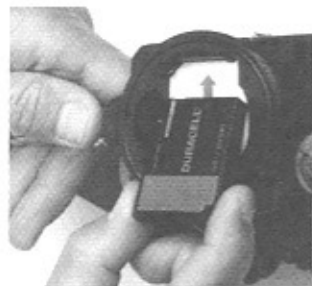


Figure 34

Insert angled end of battery first then slide into place

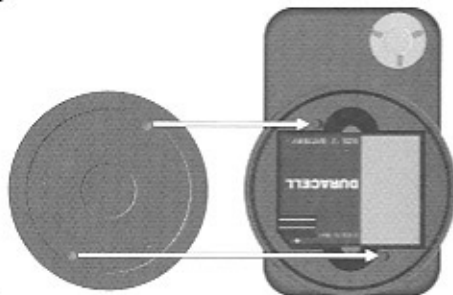


Figure 35

Align cover pins with holes

■ Testing

1. Attach the Scan 4/Regulator system to a charged cylinder and open the cylinder on-off valve.
2. Press the neon-yellow button and submerge the computer in a tray of water so the battery compartment is completely underwater. The computer should go through the Startup/Diagnostic procedure as described in chapter 3. After the computer clears the Startup/Diagnostic mode, it should go into Surface Mode.
3. If the computer works properly, reinstall the boot. If it does not work, see the next section "Battery Change Troubleshooting."

■ Reinstalling the boot

1. Slide the boot back up the hose and press the hose end of the computer all the way into the boot. Carefully stretch the boot over the top of the computer until it snaps into position. Check around the perimeter of the computer face with your finger to make sure the unit is completely inside the boot.

Battery Change Troubleshooting

If the Scan 4 does not work correctly after installing the battery, there are two likely causes: a dead battery or a flooded battery compartment.

■ Flooded battery compartment

Remove the knurled ring, lift off the battery cover plate and remove the battery. Check to see if there is any moisture in the battery compartment. If there is moisture, wipe the battery compartment area dry with a lint free cloth. Remove the O-ring from its groove and check for any nicks or cuts. If the O-ring is damaged, replace it with a new O-ring. Lightly lubricate the O-ring with pure, food-grade silicone grease (Dow Corning 111) and place the O-ring back in its groove. Dry in and around the battery compartment with lint-free cloth and dry off the battery. Re-install the battery, battery cover plate and knurled ring. Submerge the unit in a tray of water and press the neon yellow button and check to see if the Scan 4 goes through its Startup/Diagnostics correctly. If the Scan 4 enters Surface Mode, the computer is ready to dive.

■ Dead battery

If, after opening the battery compartment, there is no moisture present, then the battery is dead. Replace the battery with a new, fresh battery. Reinstall the battery cover plate and knurled ring. Submerge the unit in a tray of water and press the neon yellow button and check to see if the Scan 4 goes through its Startup/Diagnostics correctly. If the Scan 4 enters Surface Mode, the computer is ready to dive.

If neither of these two troubleshooting procedures work, then the computer must be returned to your Authorized U.S. Divers® Aqua-Lung® Dealer for evaluation.

Warranty

U.S. Divers Co., Inc. guarantees the Scan 4 under the U.S. Divers 30 Day Satisfaction Guarantee and makes available the Two Year Warranty.

■ 30 Day Satisfaction Guarantee

If you are not completely satisfied with the performance of this product for the first 30 days after purchase, it may be returned to your U.S. Divers Pro-Line Dealer for an exchange of equal U.S. Divers Co. computer products. It does require proof of purchase receipt to be returned with the product.

■ 2 Year Limited Warranty

After receipt of a completed warranty card, U.S. Divers will extend a Two Year Limited Warranty. U.S. Divers Co., Inc. warrants this product to be free of material defects and/or craftsmanship under normal, recreational SCUBA use (non-commercial or non-military use) and with annual maintenance described within this manual.

Should the Scan 4 prove to be defective, it will be repaired or replaced at U.S. Divers' discretion free of charge excluding shipping and handling charges.

■ Limitations

- This warranty specifically does not extend to the plastic computer face, rubber boot, high pressure hose, hose O-rings, hose fitting corrosion, chrome loss, air spool, battery, accidental damage, abuse, modification, or tampering.
- The original warranty card must be on file at U.S. Divers Co. to be eligible for the Two Year coverage and any warranty service. This card is supplied on the back page of this manual and must be mailed within 15 days of purchase.
- Warranty is non-transferable and applies to the original owner only.
- Warranty service does not include the price of labor. It covers replacement, or repair of parts only.

■ Warranty conditions

- Product must have been purchased from an Authorized U.S. Divers Pro-Line Dealer. If this product is obtained from any other source, you are considered the second owner, in which case the warranty is void.
- This warranty only applies to non-commercial use. Warranty does not apply to commercial, military, or rental use.
- The manufacturer will replace or repair any unit containing a manufacturing or materials defect if notified within 24 months from the date of purchase by the original owner.
- It is the buyer's responsibility to establish with U.S. Divers or an Authorized U.S. Divers Pro-Line Dealer that the unit has such a defect, and for returning it to the service center post-paid and well protected against damage in transit, accompanied by proof of the original purchase date and details of the fault noted.
- Servicing or tampering by any unauthorized parties will invalidate the warranty.

- The buyer shall not subject the unit to “dry” pressure testing. Any such testing must be carried out with the unit submersed in water.
- Repair under warranty will not apply to any unit which has been subjected to severe shock or abuse, and not maintained in accordance with the care instructions.

■ **Disclaimer of liability**

U.S. Divers Co., its distributors, and retailers MAKE NO WARRANTIES, either expressed or implied, with respect to the Scan 4, the programs contained therein, or this instruction manual except for those stated in the preceding paragraph. IT IS EXPRESSLY UNDERSTOOD that by buying or using the Scan 4, the owner, or any other person who may use it, accepts it "AS IS" with the entire risk as to its quality, performance, merchantability, or fitness for any particular purpose being with the buyer or user. This excludes replacement of defective parts to the original owner, in the first two years after purchase under the conditions set forth in the preceding limited warranty section.

BY PURCHASING THE SCAN 4, IT IS AGREED AND UNDERSTOOD THAT IN NO EVENT WILL U.S. DIVERS CO., ITS DISTRIBUTORS, OR RETAILERS BE HELD LIABLE FOR ANY PERSONAL INJURIES FROM ITS OPERATION, OR FOR ANY OTHER DAMAGES WHETHER DIRECT, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL, EVEN IF U.S. DIVERS HAS BEEN ADVISED OF SUCH DAMAGES.

Some states do not allow the exclusion or limitation of implied warranties or liabilities for incidental damages, so the above limitation or exclusion may apply to you.

REFERENCE

Specifications

No-Decompression Model

Basis

- Modified Haldanean Algorithm
- 12 tissue compartments

Data Base

- Diving Science and Technology (DSAT) - Rogers/Powell

Performance

- Tissue compartment half-times (in mins.) Spencer's "M"-values 5, 10, 20, 40, 80, 120, 160, 200, 240, 320, 400, 480
- Reciprocal subsurface elimination
- 60 minute surface credit control for compartments faster than 60 minutes
- Tissue compartments tracked up to 24 hours after last dive

Decompression Capabilities

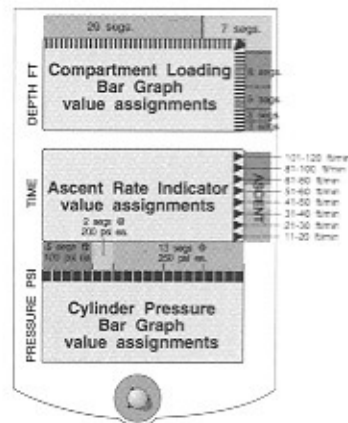
- Decompression stop depths at 10, 20, 30 and 40 feet (3,6,9 and 12 meters)

Altitude Algorithm

- Based on NOAA Tables

Displays

Graphic displays



Numeric display

- Dive Number
- Depth
- Maximum Depth
- No-decompression time
- Dive Time Remaining

Range

- 0-9 dives
- 0-249 feet
- 249 feet
- 0-9 hrs. 59 mins.
- 0-9 hrs. 59 mins.

Resolution

- 1 dive
- 1 foot
- 1 foot
- 1 minute
- 1 minute

• Decompression time	0-9 hrs. 59 mins.	1 minute
• Surface Time	0-11 hrs 59 mins.	1 minute
• Dive Log Surface Interval	0-11 hrs 59 mins.	1 minute
• Wait-to-fly time (unit on)	24-12:01 hours	1 minute
• Wait-to-fly time (unit off)	12-0 hours	1 minute
• Tank pressure	0-4090 psig	10 psig

Operational Performance

Function

• Depth	+/- 1% of full scale
• Cylinder Pressure	+/- 1% of full scale
• Timers	1 second per day

Materials

• Housing	Glass-filled nylon resin
• Gauge Face	Polycarbonate resin
• Boot	Natural rubber/EPDM blend
• Hose	Kevlar® braid, rubber coated
• Fittings	Triple chrome plated brass
• Electronics	Silicon Metal Oxide semiconductors
• Weight	21.7 ounces
• Length	7 inches

• Width	3.125 inches
• Depth	1.875 inches

Power

• Battery	One 6 volt "J"-cell
• Life expectancy	150 1-hr. dives w/ 12-hr. surf. int.
• Shelflife	3 years minimum
• Replacement	User replaceable
• LO BATT warning	Replace immediately

Temperature Range

- 32°F to 140°F
- 0°C to 60°C

Display Specifications

Display type	High contrast, custom liquid crystal
--------------	--------------------------------------

Glossary

Algorithm - A step-by-step mathematical formula designed to accomplish a particular result.

Altitude Dive - A dive made at an elevation above sea-level where a different set of no-decompression tables is used (4000+ feet with the Scan 4).

Air Time Remaining - The amount of dive time remaining based on a calculation of cylinder pressure, breathing rate and depth.

Ascent Rate- The speed at which the diver ascends toward the surface.

Audible Alarm - A tone emitted by the computer to alert the diver to potential danger.

Boot - The protective rubber cover the surrounds the computer module.

Bottom Time - The total amount of time spent underwater during a dive between 5 feet on initial descent to 3 feet on final ascent.

CZ - Abbreviation for Caution Zone.

Caution Zone - The yellow section of the Compartment Loading Bar Graph that alerts the diver that he/she is approaching decompression.

Compartment - A hypothetical tissue group that absorbs and releases nitrogen according to a mathematical formula.

Decompression Sickness - Also known as DCS or the "Bends". Occurs when nitrogen gas bubbles accumulate in the blood stream due to a rapid ascent.

DEC - Display label denoting that the computer is decompression mode and that the time displayed is total ascent time (which includes decompression time).

Decompression Stop - The depth(s) at which a diver must pause during ascent to allow absorbed nitrogen to escape naturally from the tissues.

Depth Sensor - An electro-mechanical device that converts water pressure into an electrical signal, that is converted into a visual display.

Dive Log Recall Mode - The display of previous dive information.

Dive Time Remaining - The lesser of Air Time Remaining or No-decompression Time Remaining.

Green Zone - The area on the Compartment Loading Bar Graph, Ascent Rate Indicator, and Cylinder Pressure Bar Graph that indicates the diver is within safe limits.

“J”-size battery - The user replaceable 6 volt alkaline battery used in the Scan 4.

LCD - Abbreviation for liquid crystal display, which is the type of display used in the Scan 4.

Maximum Depth - The deepest depth reached at any point during a dive.

Mode - A specific set of computer functions for various conditions during operation.

Multi-level Dive - A dive profile where the diver goes to the deepest point of the dive first and gradually ascends toward the surface.

NDT - Abbreviation for no-decompression time.

NO DEC - Abbreviation for no-decompression.

Pre-Dive Planning Sequence - A display of available dive times at 10-foot intervals from 30 to 160 feet used when planning future dives.

Pressure Sensor - an electro-mechanical device that converts cylinder pressure into an electrical signal that the Scan 4 converts into cylinder pressure and Air Time Remaining displays.

Rectangular Dive Profile - A type of dive profile where the entire dive is spent at one depth between descent and ascent.

Red Zone - The area on the Compartment Loading Bar Graph, Ascent Rate Indicator, and Cylinder Pressure Bar Graph that indicates the diver is in a dangerous situation.

Repetitive Dive - Any dive that takes place within 12 hours of a previous dive.

Tissue - See Compartment.

Yellow Zone - The area on the Compartment Loading Bar Graph, Ascent Rate Indicator, and Cylinder Pressure Bar Graph that indicates the diver is approaching a dangerous situation.

Index

A

AIR label 7

in Decompression Mode 24

Air Time Remaining 7

safety buffer, 7

Altitude Algorithm 64

Altitude diving. *See* Startup/Diagnostic Mode

Ascent Rate Indicator 5

in Decompression Dive Mode 25

in Dive Log Recall Mode 27

in No-Decompression Dive Mode 22

triangle value assignments 5

Audible Alarms

Summary of 30

immediate danger 30

permanent violations 31

potential danger 30

transition 31

turning on and off 28

Audible warnings 5

for Air Time Remaining 7

B

Battery

replacing 50

troubleshooting 55

type 50

BOTTOM label 23

Bottom time 23

in Dive Log Recall Mode 27

C

Care and Maintenance 46

After the dive, 48

Before the dive, 46

During the dive, 47

Chemical attack 46

Compartment Loading Bar Graph

- at deep depths 36
- Green No-decompression Zone 3
- in Delayed Violation 39
- in Dive Log Recall Mode 27
- in Gauge Mode 43
- in No-decompression Dive Mode 22
- in Surface Mode, 17
- Red Decompression Zone 4
- Yellow Caution Zone 3

Compartments

- definition of, vii

Conditional Violation. See Decompression Stop Violations

- in Surface Mode, 18

Cylinder Pressure Bar Graph 6

- in No-Decompression Dive Mode 22
- in Surface Mode, 17

Cylinder pressure, digital 6

- in Decompression Mode 25
- in No-decompression Dive Mode 22
- in Surface Mode 18

CZ 3**D****Dead battery 56****DEC label 24****DECOM STOP label 25****Decompression Mode 24****Decompression Stop Violations 37**

- Conditional Violation 38
- Delayed Violation 39
- Immediate Violation 42

Delayed Violation. See Decompression Stop Violations.**Depth 17****Dive Log Recall Mode 26**

- accessing 26
- memory capacity and limitations 26
- primary display 27
- secondary display 27

Dive number 16

- in Dive Log Recall Mode 27
- in Surface Mode 16

- Dive Time Remaining 7
 - in No-decompression Dive Mode 22
- Diver's Alert Network (DAN) 19
- Diving Science and Technology (DSAT) 64
- Dow Corning 111 52

E

- Emergency Decompression 36
- Eveready® 50
- Exceeding the Maximum Depth 34
 - effects on other displays 35
- External Access command 28

G

- Gauge Mode 43
 - Dive display, 44
 - Surface display, 44
- Green No-decompression Zone. See Compartment Loading Bar Graph

H

- Haldanean Algorithm 64

I

- Immediate Violation. See Decompression Stop Violations

J

- J-size battery 50

L

- LO BATT label 14
- LOG label 27
- Low Battery Warning 14

M

- MAX label 23, 27
- Maximum Depth 23
 - limits 34
 - in Dive Log Recall Mode 27

Multi-level dive profile viii
Multi-Level Diving viii

N

NO DEC label 7
 in Decompression Mode 24
 in No-decompression dive mode 22
No-Decompression Dive mode 22
 alternate display 23
 Primary display 22
No-decompression Time Remaining 7
NOAA Tables. *See* Altitude Algorithm

P

PLAN label 21
Pre-Dive Planning Sequence 21
 during Immediate Violation, 42

R

Rectangular dive profile viii
Regulator Attachment 10

S

Secondary Wait-To-Fly Mode 29
Silicone sprays 46
Spencer's "M"-values 64
Starting the Scan 4. *See* Startup/Diagnostic Mode
Startup/Diagnostic Mode 13
 Altitude diving 15
 Low battery warning 14
 Starting the Scan 4 13
SURFACE label 16
Surface mode 16
Surface time 17

T

Temperature
 operational limits 49
Total ascent time 25
Troubleshooting
 Battery change 55

U

U.S. Navy dive tables viii

**Undersea and Hyperbaric Medical Society
(UHMS)** 19

W

Wait-to-fly time 18

during Immediate Violation 42

guidelines, 19

Warranty 57

2 Year Limited Warranty 57

30 Day Satisfaction Guarantee 57

Limitations 58

Warranty Conditions 59

Y

Yellow Caution Zone. See **Compartment
Loading Bar Graph**

**Mail this warranty registration form along with
a copy of your receipt to the address below:**

**U.S. DIVERS CO., INC.
Dive Computer Warranty**

**2340 Cousteau Court
Vista, California 92081**