

Limited Warranty

To the original owner only, Cochran Undersea Technology, a division of Cochran Consulting, Inc., guarantees this dive computer to be free of defects in both materials and craftsmanship under normal SCUBA use for 24 months from the date of shipment to your Authorized Dealer. Failing to provide proper care will cause this warranty to be null and void. Any defect not excluded in the limitations section below will be repaired, replaced, or replaced with a refurbished unit, at Cochran Undersea Technology's discretion, free of charge. Purchaser is responsible for shipping the product to the Cochran Undersea Technology Service Department and for all associated freight and insurance costs. This warranty IS NOT transferable. All correspondence concerning this warranty MUST be accompanied by a photocopy of the original sales receipt. The shipment date is recorded on the outside of the product box.

Your warranty registration card must be returned to Cochran Undersea Technology within 15 days of the purchase date. Failing to do so will cause this warranty to be null and void. Charges for the Annual Maintenance are not covered under this warranty. The Annual Maintenance includes accuracy verification of the depth and pressure sensors, overall calibration and overall performance. You should return your dive computer to the place of purchase for this service to be performed.

WARRANTY LIMITATIONS AND EXCLUSIONS

This warranty DOES NOT cover any damages including, but not limited to, those resulting from abuse, tampering, battery leakage, accident, or lack of proper care. Proper care includes having an Annual Maintenance performed. Additionally, any modifications or repairs to this unit performed by anyone other than an authorized Cochran Undersea Technology dealer will void this warranty. All plastics, o-rings, batteries, or damage due to accident, abuse, modification, or tampering are NOT covered.

STATEMENT OF LIMITED LIABILITY

A mathematical model is used by this dive computer to calculate nitrogen absorption into the body as well as nitrogen elimination during a surface interval between dives. While great care and extensive research has gone into the making of this model, variables such as, but not limited to, dehydration, being overweight, age and old injuries may require a more conservative use of this instrument. COCHRAN UNDERSEA TECHNOLOGY DOES NOT GUARANTEE THE PREVENTION OF DECOMPRESSION SICKNESS OR ANY OTHER INJURY THAT MAY REQUIRE TREATMENT IN A RECOMPRESSION CHAMBER. This dive computer should be used solely as a guide, providing the trained and certified diver the information needed to make safe diving decisions. It is expressly understood that by buying and/or using this dive computer, the diver assumes ALL risk as to its quality, performance, and accuracy. Cochran Undersea Technology, its distributors, or retailers will not be held liable for any personal injuries or other damages resulting from its operation, even if Cochran Undersea Technology has been advised of such occurrences and damages.

Cochran Undersea Technology supports and strongly agrees with maximum depth limits of 130 feet for recreational SCUBA diving, as set by recognized certification agencies. Cochran Undersea Technology in no way encourages diving deeper than this limit. You should always adhere to safe diving practices which include, but are not limited to, always using the buddy system, diving within your own limitations, having your tanks filled only by a certified NITROX blending station, and making only dives that do not require decompression.

FCC Label

FCC ID: LYP744556-01

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Interference Statement

NOTE: This equipment has been tested and found to comply with both the limits for a Class B digital device and an intentional radiator, pursuant to Part 15, Subpart B/C of the FCC Rules. This equipment generates, uses, and radiates radio frequency energy. If not installed and used in accordance with the instructions, it may cause interference to radio communications.

The limits are designed to provide reasonable protection against such interference in a residential situation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment on and off, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna of the affected radio or television.
- Increase the separation between the equipment and the affected receiver.
- Connect the equipment and the affected receiver to power outlets on separate circuits.
- Consult the dealer or an experienced radio/TV technician for help.

MODIFICATIONS

Changes or modifications not expressly approved by Cochran Consulting, Inc. could void the user's authority to operate the equipment.

SHIELDED CABLES

This product is designed to be used only with the Analyst interface cable (RS-232) to maintain compliance with FCC Regulations.

Patent Information

Protected under one or more of the following patents:

US	4949072, 4999606
AUS	591804
EUR	0305450

Other patents pending. All specifications subject to change without prior notice. Nemesis is a trademark of Cochran Consulting, Inc. Copyright 1996 Cochran Consulting, Inc.



NORMES EMC 89/336/EEC
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Introduction

Your NEMESIS™ IIa NITROX Dive Computer from Cochran Undersea Technology is one of the most advanced instruments made for this application. It incorporates more user-programmable functions than any other dive computer made, yet is one of the simplest to use. Once your personal preferences and perhaps some dive site or condition-specific settings are entered, its computing power goes to work in the background. What you, the diver, see is all the critical information you need, in an informative and easy to comprehend display, with minimal distraction.

With this manual, the basic operating information is presented first, followed by more technical and detailed sections for reference. Following are the sections you will find as you get acquainted with your NEMESIS™ IIa NITROX. We hope you find this format helpful, informative, and readily absorbed.

- I. OVERVIEW. This section provides a brief look at several of the key functions and features of the NEMESIS™ IIa NITROX.
- II. INSTALLATION AND ACTIVATION. This section details the steps to ensure proper installation of your NEMESIS™ IIa NITROX to your regulator as well as providing information on how to activate your unit.
- III. OPERATING MODES. This section illustrates a typical display in each of the various operating modes of your dive computer, explains what is being shown, then makes reference to appropriate items in SECTION IV for more detailed explanations.
- IV. EXPLANATIONS. This section goes into much more detail on each function, how it relates to other information, and, where appropriate, what choices are available with regard to user programmable functions.

WARNINGS. A number of audible and visual warnings are generated by your NEMESIS™ IIa NITROX when circumstances warrant. Many of these may be set by the user; this section explains their meanings and user choices.

QUESTIONS AND ANSWERS. We answer the most frequently asked questions about the NEMESIS™ IIa NITROX and its operation.

- V. CARE AND MAINTENANCE. This section details the basic maintenance and care necessary to assure optimum useful life from this device.
- VI. TECHNICAL SPECIFICATIONS. This section lists the technical specifications for your NEMESIS™ IIa NITROX.
- VII. ACCESSORIES. This section contains the operational manual for the Field Programmer as well as the Analyst Personal Computer Dive Computer Interface program.

The NEMESIS™ IIa NITROX: Overview

In addition to its standard time/depth-based decompression algorithm, the NEMESIS™ IIa NITROX has incorporated the influence of additional physiological factors such as Altitude, Temperature, Ascent Rate, and Workload. However, the NEMESIS™ IIa NITROX allows the diver, via the optional Analyst PC Interface, to disable the Temperature and/or Workload decompression compensation should the diver deem a particular diving situation would so warrant. Calculation of Central Nervous System Oxygen Toxicity (CNS), Mission Oxygen Tolerance Units (OTU's), and the Partial Pressure of Oxygen (PPO₂) is yet another added feature of this algorithm. Twelve half-time compartments ranging from 5 minute to 480 minute theoretical tissue groups are used. An added degree of conservatism from 0 to 50% may also be added to the base algorithm if the diver should so desire. You will find that this unit is extremely user friendly and can be customized to your individual diving conditions and practices. Some additional factors that influence the decompression algorithm of your NEMESIS™ IIa NITROX are detailed below.

Altitude Adaptation

The NEMESIS™ IIa NITROX continues to monitor changes in barometric pressure that may occur during travel to and/or from diving destinations. Should a significant change in altitude occur due to travel to a higher elevation dive site, your unit will display the time, in hours, that you should wait before diving in order to "off-gas" all residual nitrogen present as a result of this altitude change. This "adaptation" time is displayed as Time-To-Fly. Should you wish to begin diving prior to completing the adaptation time, the NEMESIS™ IIa NITROX will treat your first dive of the day as a repetitive dive with appropriate reductions in no-decompression (NDC) limits.

Intelligent Deep-Dive Compensation

Modern research has suggested that failing to make each repetitive dive profile, in a diving day to a shallower depth (inverted profiles) and/or diving square or "sawtooth" profiles greatly increases your susceptibility to decompression sickness. Your NEMESIS™ IIa NITROX is constantly monitoring the residual nitrogen in all twelve half-time compartments and modifies its algorithm to alert you to this danger. The intelligent deep-dive compensation provides real-time adjustment of this factor based upon residual nitrogen. It is strongly recommended that you always make your first dive of a diving day the deepest dive, with each repetitive dive to a shallower depth than that of the previous dive.

Sea Water/Fresh Water Recognition

As you no doubt learned in your entry-level SCUBA class, there is a difference of approximately three percent between feet of fresh water and feet of sea water. Your NEMESIS™ IIa NITROX automatically "senses" the type of water you are in upon entering the Subsurface Mode and provides depth readings in either feet of fresh water or feet of sea water. With this unique feature, you are assured of extremely accurate depth information for the medium of water in which you are diving.

Enriched Air Nitrox, Three-Blend Capability

Your NEMESIS™ IIa NITROX has the unique ability to provide the diver with the ability to select a single bottom mix and TWO decompression mixes. Using the included Field Programmer, you can set the oxygen percentage for the three different mixes within the following ranges:

- Mix 1: 21.0% to 50.0% in 0.1% increments
- Mix 2: 21.0% to 99.9% in 0.1% increments
- Mix 3: 21.0% to 99.9% in 0.1% increments

In order to obtain the full benefit of this unique feature, you must designate Mix 1 as your bottom mix, Mix 2 as your first (deeper) decompression mix and Mix 3 as your final (shallower) decompression mix. **The TU must be attached to the cylinder containing Mix 1.** Here is how the automatic switching occurs:

1. With the TU attached to Mix 1, it continually "senses" a drop in cylinder pressure until you are prepared to switch to your first decompression mix (Mix 2).
2. Once you have made the switch to Mix 2, the TU no longer senses a drop of cylinder pressure from your Mix 1 cylinder and automatically changes its algorithm to Mix 2.
3. For Mix 3, you will be required to not only have programmed the oxygen percentage for this mix, but also the:

- a) bottom time you will be beyond at which you will begin breathing from Mix 3
- b) the maximum depth at which you will begin breathing from Mix 3

when switching to this final decompression gas. The time and depth do not have to be exact. They are simply used as a benchmark with the necessity of both being met in order to allow the algorithm switching to Mix 3. We find that most divers participating in this type of extreme diving usually have a bottom time of greater than 20 minutes before beginning to decompress on a second decompression gas. Therefore, they leave the bottom time factor set for 20 minutes. The depths at which a switch to Mix 3 is allowed in the algorithm is limited to a maximum of 30 feet.

NOTE: As you will discover in the Subsurface Mode section of this manual, your NEMESIS™ IIa NITROX displays your breathing rate (BP) on the alternate display of the WU. If the BP is displaying 0, Mix 2 is being calculated in the algorithm. Mix 3 is indicated by displaying a BP of 99. Should you switch back to your bottom mix (Mix 1), your TU will sense a drop in cylinder pressure and the Mix 1 algorithm will be calculated. This switching between Mix 1, 2, and 3 is continuous based upon the BP and current depth. Mix 1 BP is displayed between 1 and 98.

The following describes the various factors that determine which mix is being calculated in the algorithm:

Mix 1: TU senses drop in cylinder pressure with BP between 1 and 98 displayed.

Mix 2: TU does not sense a drop in cylinder pressure, BP displays 0; bottom time and depth factors for Mix 3 are not met.

Mix 3: TU does not sense a drop in cylinder pressure, BP displays 99, bottom time and depth factors for Mix 3 are met.

NOTE: For Mix 3, even though no drop in cylinder pressure is detected, BP will display 99 as a means of informing the diver that the Mix 3 algorithm is being

calculated. The ability to switch mixes MUST be enabled via the Analyst. If you do not have this program, your Authorized Dealer can perform this operation.

In addition, Mix 1 is always calculated for the first ten minutes of each dive regardless of the BP. This allows you to "swim" your stage bottles down your ascent line at the beginning of the dive. You can also vary the responsiveness of the Breathing Parameter calculations via the ANALYST. All three mixes are enabled at the factory and set to 21.0% oxygen.

Equivalent Air Depth

Your NEMESIS™ IIa NITROX uses Equivalent Air Depth (EAD) in determining the no-decompression limits for each individual dive. A standard NOAA equation is used to determine the EAD based upon the oxygen percentage entered. This equation is:

$$\text{EAD} = \frac{(1 - \text{O}_2\%) \cdot (\text{D} + 33)}{1.08 \cdot \text{O}_2\% + 0.79} - 33$$

Where O_2 is entered in decimal form and D is the actual depth in feet.

For example, if you were diving with NOAA II (36% oxygen) to 70 feet, the EAD used for determining your no-decompression limit would be:

$$\begin{aligned} \text{EAD} &= \frac{(1 - .36) \cdot (70 + 33)}{1.08 \cdot .36 + 0.79} - 33 \\ &= \frac{.64 \cdot 103}{1.08 \cdot .36 + 0.79} - 33 = 50.44 \text{ feet} \end{aligned}$$

Therefore, the no-decompression time for this example would be calculated to an EAD of 50.44 feet.

Central Nervous System (CNS) Oxygen Toxicity

An additional consideration for the NITROX diver is Oxygen Toxicity. Your NEMESIS™ IIa NITROX will provide audible and visual warnings to alert you to this hazardous condition.

Maximum exposure time for a given depth is calculated based on the Partial Pressure of oxygen (PPO_2). The following standard formula is used to determine the PPO_2 :

$$\text{D} \times \text{O}_2\% = \text{PPO}_2 \text{ level}$$

Where O_2 is entered in decimal form and D is the actual depth in atmospheres absolute.

For example, if you were diving to 86 feet with NOAA II your PPO₂ level would be:

$$3.6 \text{ (or } 86 \text{ , } 33 + 1) \times .36 = 1.296$$

which would be rounded up to PPO₂ = 1.3. PPO₂ levels from 0.5 to 1.6 are calculated. Exceeding a PPO₂ of 1.6 will greatly increase the probability of the immediate onset of CNS Oxygen Toxicity. While various training organizations have established maximum PPO₂ limits, the maximum exposure times and their associated PPO₂ levels used in this dive computer's calculations are shown on the following table:

PPO ₂ LEVEL	Max Bottom Time (minutes)
.5	1304
.6	719
.7	496
.8	379
.9	306
1.0	257
1.1	221
1.2	194
1.3	172
1.4	149
1.5	110
1.6	44

Your dive computer calculates CNS or OTU toxicity percentages and it issues a unique, five double-beep audible alarm once per minute should you reach 75 percent of the associated maximum limit. In addition to this audible warning, the WARNING legend will appear and flash AND the TEMPerature digits will be replaced with the current calculated CNS Oxygen Toxicity percentage. This warning will continue until the calculated toxicity percentage is less than 75 percent. For example, the maximum bottom time exposure for a PPO₂ level of 1.6 is 44 minutes. Once you reached 33 minutes of bottom time with a PPO₂ of 1.6, this alarm would be issued since 33 minutes is 75% of 44 minutes. At a PPO₂ of 1.5, this alarm would be issued at 82.5 minutes, etc.

NOTE: While all other audible alarms of the dive computer consist of five long beeps, the toxicity audible alarm consists of short double-beeps that sound for five seconds.

WARNING: It is possible in certain diving circumstances to reach an Oxygen Toxicity limit well before reaching a no-decompression limit. For this reason, NITROX diving should only be conducted by a diver who has successfully completed a sanctioned NITROX diving course from a recognized certifying agency.

Installation

The Tank Unit (TU) high-pressure sensor installs into a high-pressure port of your first-stage regulator. This should be done by your Authorized Dealer at the time of purchase. Should you choose to install the TU yourself:

1. Remove your current high-pressure hose or the high-pressure plug from your first stage regulator.
2. Lightly lubricate the sensor o-ring only with a lubricant approved for use with Enriched Air Nitrox equipment. **DO NOT USE SILICONE GREASE.**
3. Screw the sensor, **HAND TIGHT**, into the first-stage high-pressure port
4. Using a 9/16" open-end wrench, "snug" the high-pressure transducer connection taking caution to not overtighten.

CAUTION: DO NOT use your hand to tighten the high-pressure connection. This procedure should only be accomplished by using an open-end wrench placed over the metal nut of the high-pressure connection. It must not be overtightened.

With the first stage properly attached to a filled SCUBA cylinder, slowly open the cylinder valve. Once the valve has been opened, listen to the TU's high-pressure connection for any escaping gas. If possible, completely immerse the tank and regulator in water to see if bubbles form around your connection. If any gas leak is seen or heard, immediately turn the gas off by closing the cylinder valve and take the entire regulator system to the place where you purchased your NEMESIS™ IIa NITROX.

The Tank Unit (TU) clips to a low-pressure hose close to the first-stage. When clipping the TU onto the low-pressure hose, a rolling motion will provide better results rather than pushing the TU straight down onto the hose. The Wrist Unit (WU) may be worn on the wrist or attached to your Buoyancy Control Device.

Activation

The TU will automatically activate when it senses a cylinder pressure greater than 200 psi or it may also be manually activated by tapping on the TU case in the circle area that says "PWR" for approximately three seconds. Should you choose this manual method of activation, it must be understood that the tapping should be performed in a manner that produces sound rather than vibration. When tapping, you should use your fingernail, coin, or other hard object that will produce sound when tapped against the TU case. In general, using your fingertip will not provide the necessary sound to successfully complete manual activation. The TU will issue five beeps as it begins its activation sequence.

NOTE: If the TU is in the Altitude Adaptation Mode, four beeps instead of five beeps will be issued.

It is also required that the TU be no deeper than 3 feet of water in order to activate. Should you be deeper than three feet and attempt to activate the TU by using either cylinder pressure or manually via tapping, the TU will not turn on. You must ascend to a depth less than three feet and re-initiate the activation sequence.

You cannot manually turn the TU off. The TU will turn off:

1. After 15 minutes if no tank pressure is sensed and no dive is made.
2. After all 12 half-time compartments are completely "off-gassed" on repetitive dives.

During an extended surface interval, the TU will enter a "sleep" mode to conserve battery life. After a dive, your NEMESIS™ IIa NITROX will enter its sleep mode after a surface interval of 40 minutes. During this sleep mode, all off-gassing calculations continue and current surface interval and time to fly can be viewed by activating the TU. Once awakened from its sleep mode, the TU will remain on for one hour before re-entering the sleep mode. This assumes, of course, that no repetitive dive is initiated between each wake-up.

The WU is activated by rotating tapping on the lower left corner of the face of the unit for approximately five seconds or until the display becomes active. Since care has been taken to reduce the occurrence of the WU being accidentally activated during transport, the WU must be tapped for a longer period of time than is required to manually activate the TU. This same rotating or tapping action is used to select the alternate display. The alternate display is shown for three seconds before returning to the normal display. The optional TACLITE, the active backlighting for the WU display, is also activated whenever the alternate display is selected. TACLITE will remain illuminated for approximately 10 seconds. If your WU does not have TACLITE, you can contact your Authorized Dealer for an upgrade.

Since all diving calculations are made by the TU, it is possible to activate the WU underwater should you mistakenly forget to do so prior to the dive. Once activated, the WU will immediately display the current diving data being calculated by your TU. During the dive, it is not possible to turn the WU off.

Once back on the surface, you can manually turn the WU off. This is recommended as a battery saving measure since all calculations are being performed by the TU. To turn the WU off on the surface, continuously tap the WU, in the same manner as that used to activate the unit, until the display goes blank. With a little practice, you will be able to tell just how many of your "taps" are required to turn the WU off.

OPERATING MODES

Self-Diagnostic Mode

At turn-on, both the TU and WU complete self-diagnostic tests before displaying current information. During these tests, all of the legends and digits on the WU illuminate for approximately five seconds. Upon completion, your computer enters the Surface Mode.

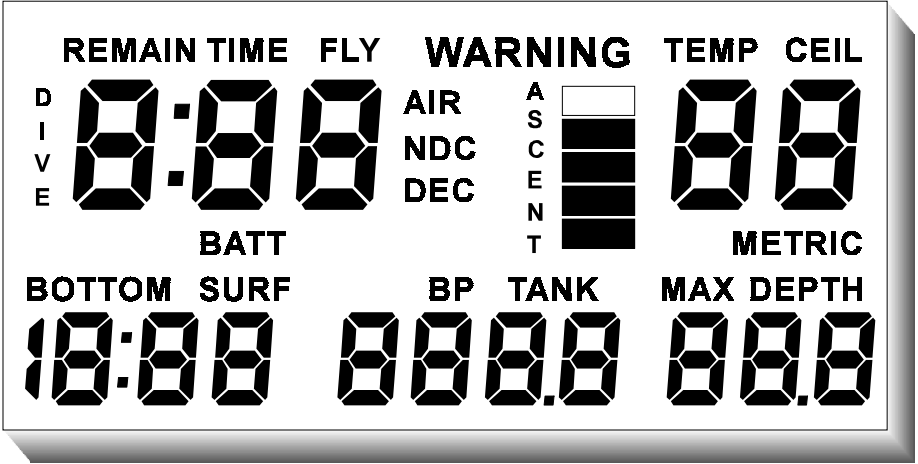


Fig-1
Self-Diagnostic Mode

Explanation of Page Layouts

The following pages provide a "snapshot" of the screen displays for each of the computers various functional modes, showing:

1. An illustration of the WU display
2. The LEGEND displayed
3. The MEANING of that legend
4. The VALUE depicted under that legend
5. The PAGE where you may find more information on that particular function.

Any **WARNINGS** or **NOTES** about that mode will be displayed on this page.

Surface Mode

At the completion of the Self-Diagnostic Mode, the NEMESIS™ IIa NITROX enters the Surface Mode. The Surface Mode has two displays: a Main Display and an Alternate Display. You may switch to the Alternate Display by rotating the wrist quickly or tapping firmly on the face of the WU. The Main Display shows: DIVE number, time-to-FLY, TEMPerature, SURFace time, TANK pressure, and MAXimum DEPTH (of the last dive). The Alternate Display shows the last dives BOTTOM time, and breathing parameter (BP). The following sample displays are of the Surface Mode.

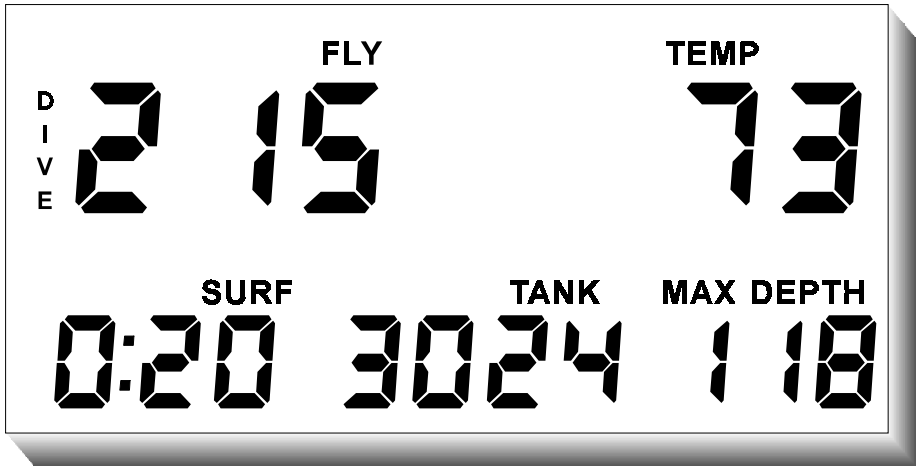


FIG-2
Main Display

Approximately 10 seconds after powering up, your dive computer enters the Surface Mode.

<u>LEGEND</u>	<u>MEANING</u>	<u>VALUE SHOWN</u>	<u>PAGE</u>
DIVE	dive of the day	2	35
FLY	time-to-fly	15 hours	38
TEMP	present air temperature	73 deg. F	37
SURF	present surface time	0:20 minutes	37
TANK	current tank pressure	3024 psi	37
MAX DEPTH	maximum depth of previous dive	118 feet	35

Surface-Mode

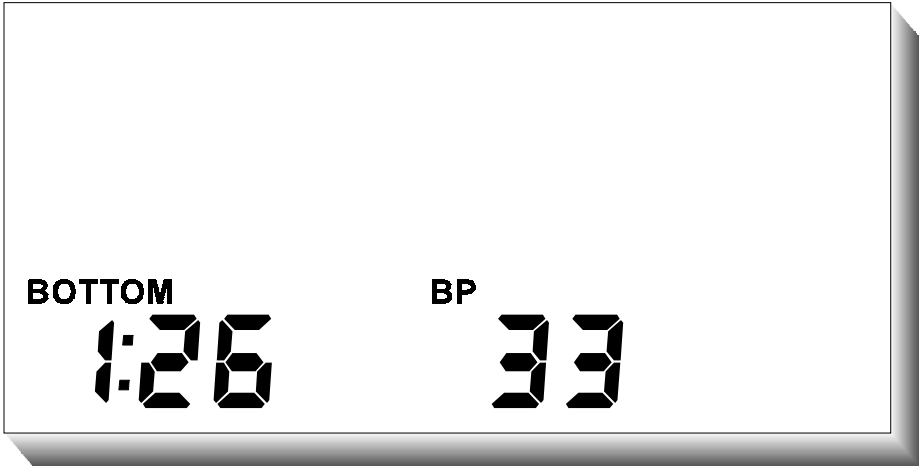


FIG-3
Alternate Display

<u>LEGEND</u>	<u>MEANING</u>	<u>VALUE SHOWN</u>	<u>PAGE</u>
BOTTOM	bottom time of last dive	1:26 (1hour 26 minutes)	33
BP	ending breathing parameter of last dive	33	34

Predive Prediction Mode



FIG-4
Main Display

After one minute of Surface Mode, the dive computer will automatically enter the Predive Prediction Mode. During this mode, predictions of no-decompression limits (NDC) or air time remaining (whichever is the lesser) will be made in ten foot increments beginning at 30 feet and ending at a depth having at least two minutes of NDC time available, up to a maximum predicted depth of 160 feet. The maximum depth predicted can be extended up to 320 feet in 10 foot increments via the optional Analyst PC Interface. There is only a Main Display in this mode. The WU will display the DEPTH, TANK pressure, and the lesser of the NDC (no-decompression time) or AIRtime remaining for that depth.

<u>LEGEND</u>	<u>MEANING</u>	<u>VALUE SHOWN</u>	<u>PAGE</u>
REMAIN TIME NDC	remaining NDC time	2:17(2 hours 17 minutes)	36
TANK	tank pressure	2176 psi	37
DEPTH	predicted depth	40 feet	35

NOTE: If the cylinder pressure is less than 500 psi at the time the predictions are being made, all predictions will reflect NDC times only.

The following chart displays the beginning, sea-level no-decompression times for the depths from 30 to 160 feet for the U.S. Navy, DSAT, and the NEMESIS™ Ila Nitrox based on air as the breathing gas.

Beginning NDC Limits

BEGINNING NO-DECOMPRESSION LIMITS (IN MINUTES)

DEPTH	U.S. NAVY	DSAT	NEMESIS™ II NITROX
30 FEET	—	—	262
40 FEET	200	140	137
50 FEET	100	80	78
60 FEET	60	55	56
70 FEET	50	40	39
80 FEET	40	30	30
90 FEET	30	25	23
100 FEET	25	20	18
110 FEET	20	16	13
120 FEET	15	13	11
130 FEET	10	10	9
140 FEET	10	8	8
150 FEET	5	—	7
160 FEET	5	—	6

CNS/OTU Toxicity Display

At the conclusion of the Pre-dive Prediction Mode, your dive computer will display the current Central Nervous System (CNS) Toxicity and Oxygen Tolerance Unit (OTU) Toxicity levels. The CNS and OTU levels will be displayed in percent. This screen will be displayed for three seconds. There is only a Main Display for this mode.



FIG-5
Main Display

<u>LEGEND</u>	<u>MEANING</u>	<u>VALUE SHOWN</u>	<u>PAGE</u>
REMAIN TIME NDC	used to identify the CNS/OTU Toxicity Display	2:00	36
TANK	indicates the CNS Toxicity percentage.	27%	37
DEPTH	indicates the OTU Toxicity level percentage.	8%	35

O₂ Mix Display

Following the CNS/OTU Toxicity Percentage Display, the current oxygen percentages for Mix 1 and Mix 2 are displayed as a factor of 10. For example, an oxygen percentage of 35.5 would be displayed as 355.

Mix 1 will be displayed under the TANK legend and Mix 2 will be displayed under the DEPTH legend. This mode has only a Main Display and is displayed for three seconds.

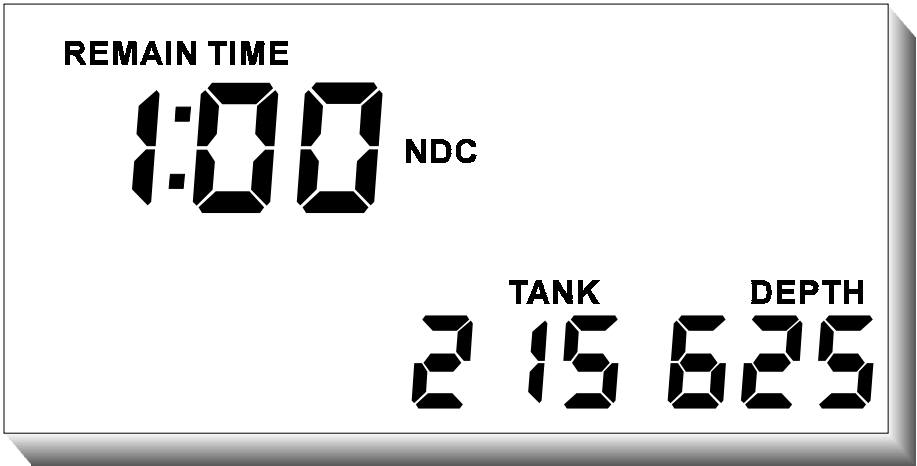


FIG-6
Main Display

<u>LEGEND</u>	<u>MEANING</u>	<u>VALUE SHOWN</u>	<u>PAGE</u>
REMAIN TIME NDC	used to identify the O ₂ Mix Display	1:00	36
TANK	indicates the Mix 1 O ₂ percentage times 10.	21.5%	37
DEPTH	Indicates the Mix 2 O ₂ percentage times 10.	62.5%	35

Your dive computer has the ability to enter O₂ percentages in 1/10 of a percent increments via the Field Programmer, or the optional Analyst Personal Computer Interface. The WU displays these values as whole numbers. Therefore 28.7% O₂ would be displayed as 287 on the WU.

Battery/Altitude Display

The two digits under the DEPTH legend indicate the current TU battery voltage as a factor of 10. For example if the TU's battery voltage is 5.8 volts, the two digits under the DEPTH legend would display 58.

The numbers under the TANK legend display altitude in 1000 foot increments. For example, if under the TANK legend you see 4, the altitude calculated would be 4000 feet above sea level (4 X 1000 = 4000).

At the end of the 3 second display, the unit returns to Surface Mode. There is only a Main Display for this mode.

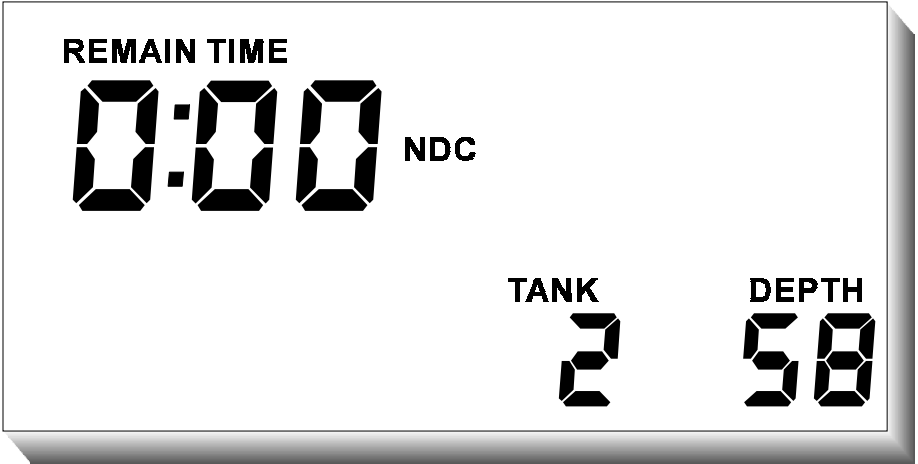


FIG-7
Main Display

<u>LEGEND</u>	<u>MEANING</u>	<u>VALUE SHOWN</u>	<u>PAGE</u>
REMAIN TIME NDC	used to identify the Battery/Altitude Display	0:00	36
TANK	altitude	2000 feet above sea level	37
DEPTH	battery voltage	5.8 volts	35

WARNING: While your NEMESIS™ IIa NITROX will automatically adjust its no-decompression algorithm for altitude, you should NOT attempt to dive at altitudes greater than 1,000 feet above sea level without first completing a sanctioned altitude diving course from a recognized training agency for recreational diving. A NEMESIS™ IIa NITROX should not be used by anyone without this important training.

Logbook Mode

While your NEMESIS™ IIa NITROX is in its normal Surface Mode, you can access the Logbook Mode. To do this, tap the crosshatched area labeled "PWR" on the TU. This will cause the display to change on the WU to the Logbook Mode. A feature of your NEMESIS™ IIa NITROX is its ability to provide diving data to you in this mode for your previous 300 dives beginning with your most recent dive. To move to the next prior dive, tap the PWR area of the TU again. Wait for the new data to be displayed on the WU before tapping again to go to the next prior dive. Access the WU's Alternate Display by rotating the WU until the display appears. It will appear for three seconds before returning to the Logbook Mode's Main Display. Your NEMESIS™ IIa NITROX will return to the Surface Mode thirty seconds after the final selected log has been displayed. The information contained on the Logbook Mode's Main Display include: DIVE number, time-to-FLY, ASCENT rate, TEMPerature, BOTTOM time, TANK pressure, and MAXimum DEPTH. The Alternate Display shows: REMAINING time, CEILING, BP, and DEPTH.



FIG-13

Main Display

<u>LEGEND</u>	<u>MEANING</u>	<u>VALUE SHOWN</u>	<u>PAGE</u>
DIVE	dive of the day number	2	35
FLY	waiting period before flying.	15 hours	38
ASCENT	the maximum ascent rate during the dive.	31-40 feet / minute*	33
TEMP	average water temperature of the dive	63 deg. F	37
BOTTOM	duration of the dive	1:46 (1 hour 46 minutes)	33
TANK	ending tank pressure	546 psi	37
MAX DEPTH	maximum depth of the dive	324 feet	

Logbook Mode

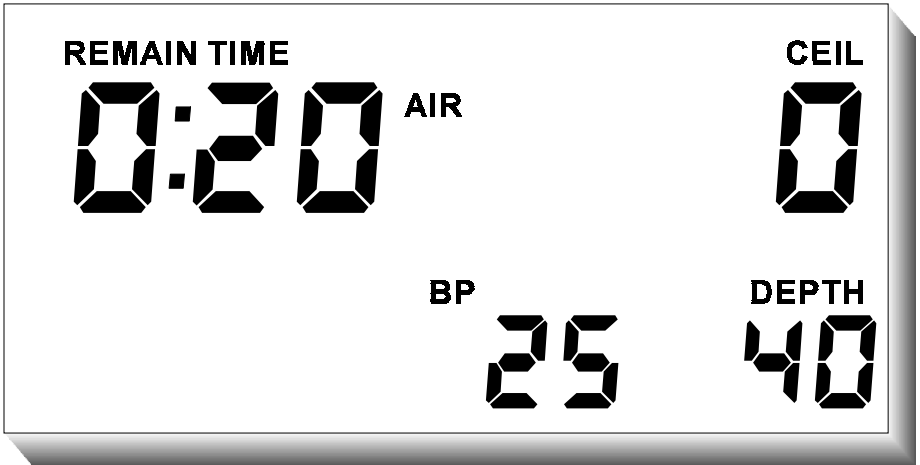


FIG-14
Alternate Display

<u>LEGEND</u>	<u>MEANING</u>	<u>VALUE SHOWN</u>	<u>PAGE</u>
REMAIN TIME AIR	the minimum calculation of either NDC, AIR or the total decompression time recorded for this dive.	0:20 (20 minutes)	36
CEIL	maximum ceiling stop required	0 feet	34
BP	average breathing parameter for dive	25	34
DEPTH	average depth of dive	40 feet	35

Subsurface Mode

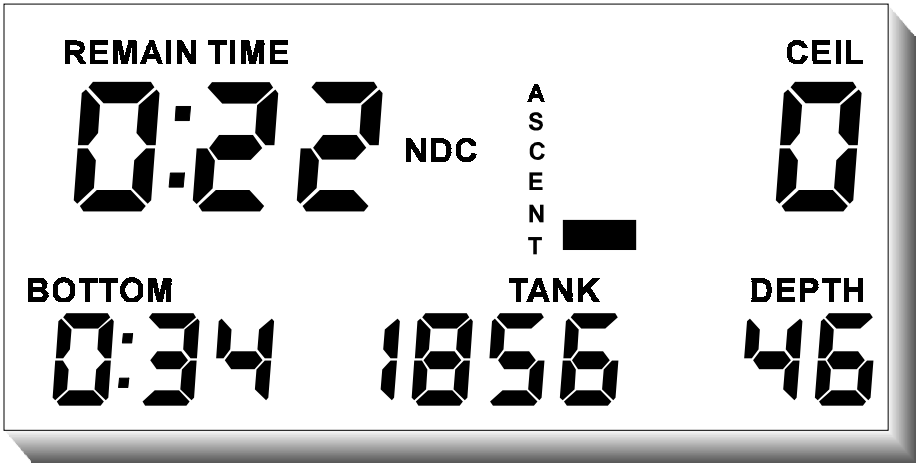


FIG-8
Main Display

The Subsurface Mode activates when the dive computer senses a depth greater than five feet and is exited when the dive computer senses a depth less than three feet.

<u>LEGEND</u>	<u>MEANING</u>	<u>VALUE SHOWN</u>	<u>PAGE</u>
REMAIN TIME AIR or REMAIN TIME NDC	lesser of the two	0:22 (22 minutes of remaining NDC time)	36
ASCENT	rate at which you are ascending	11-20 feet per minute	33
CEIL	ceiling stop required (if any)	0 feet	34
BOTTOM	bottom time	0:34 (34 minutes)	33
TANK	current tank pressure	1856 psi	37
DEPTH	current depth	46 feet	35

The Subsurface Mode has a Main and an Alternate display. The Main Display shows the REMAINING TIME for either AIR or NDC, whichever is less, CEILING, BOTTOM time for this dive, current TANK pressure, current DEPTH, and ASCENT rate.

The Alternate Display shows:REMAINING TIME for either AIR or NDC, whichever is greater; TEMPerature, BP, and MAXimum DEPTH of this dive. The Alternate Display remains for three seconds when accessed.

Subsurface Mode

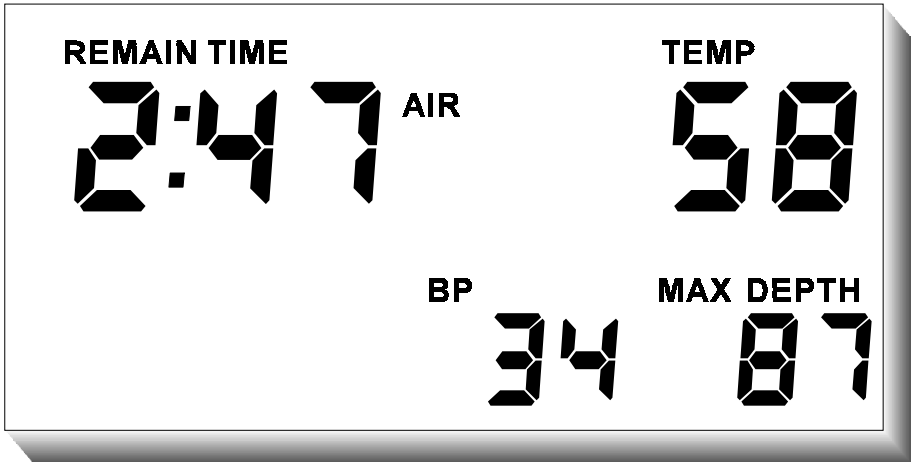


FIG-9
Alternate Display

<u>LEGEND</u>	<u>MEANING</u>	<u>VALUE SHOWN</u>	<u>PAGE</u>
REMAIN TIME AIR or REMAIN TIME NDC	greater of the two	2:47 (2hours 47 minutes of remaining AIR time)	36
TEMP	current temperature	58 deg. F	37
BP	current breathing parameter	34	34
MAX DEPTH	maximum recorded depth	87 feet	35

Emergency Decompression Mode

WARNING: Your NEMESIS™ IIa NITROX should not be used for deliberate decompression diving, but merely as an aid to assist you during ascent should you mistakenly overstay your no-decompression limit. Cochran Undersea Technology in no way encourages deliberate decompression diving.

Should you exceed your NDC time limit, your NEMESIS™ IIa NITROX will enter its Emergency Decompression Mode. Five audible warning chirps will sound and the DEC legend will appear on your WU. Decompression ceilings up to 90 feet are calculated. An additional five chirp audible warning will sound if a decompression ceiling greater than 60 feet is calculated.

WARNING: You should IMMEDIATELY begin your ascent to the proper CEILING depth upon hearing these warnings.

Your NEMESIS™ IIa NITROX is configured at the factory to alternate between total decompression time for three seconds and time at current stop for three seconds. Via the optional Analyst, you can select to have only total decompression time or stop time displayed if you so desire.

CEILING is the depth to which you must ascend, BUT NOT EXCEED, for your first emergency decompression stop. The WU display will indicate the various ceiling stop depths as follows:

Ceiling Calculated	Ceiling Displayed
10 foot	10
20 foot	20
30 foot	30
40 foot	40
50 foot	50
60 foot	60
70 foot	7
80 foot	8
90 foot	9

NOTE: When completing your decompression stops, minor changes in your depth may occur due to swells at the surface. For this reason, you should make your stop slightly deeper than the CEILING depth. Your NEMESIS™ IIa NITROX will continue to give decompression credit when this precaution is taken.

Time spent above a CEILING depth will not be credited to the required decompression obligation. Instead, a 1.5 second penalty will be added to that time for each one second spent above the CEILING.

CAUTION: Ascending above the CEILING depth will cause your NEMESIS™ IIa NITROX to issue a warning chirp. The current depth digits and the WARNING legend will flash. Both the audible alarm and the flashing display will continue until you descend below the CEILING depth.

Your BOTTOM time, TANK pressure, ASCENT rate, and DEPTH gauge will continue to operate normally as if you were in the Subsurface Mode.

Emergency Decompression Mode



FIG-10
Main Display

Should a diver enter the Emergency Decompression Mode, the following information is shown on the Main Display.

<u>LEGEND</u>	<u>MEANING</u>	<u>VALUE SHOWN</u>	<u>PAGE</u>
REMAIN TIME DEC	amount of time remaining at this CEILING. *	0:15 (15 minutes)	37
CEILING	depth which you MUST NOT ascend above.	20 feet	34
BOTTOM	total bottom time	1:56 (1hour 56 minutes)	33
TANK	current tank pressure	1654 psi	37
DEPTH	current depth	25 feet	35

* This value is dependent upon how the dive computer is configured. If BOTH is selected, then this value could mean the total decompression time left. See section regarding REMAIN TIME DEC for more information.

Emergency Decompression Mode

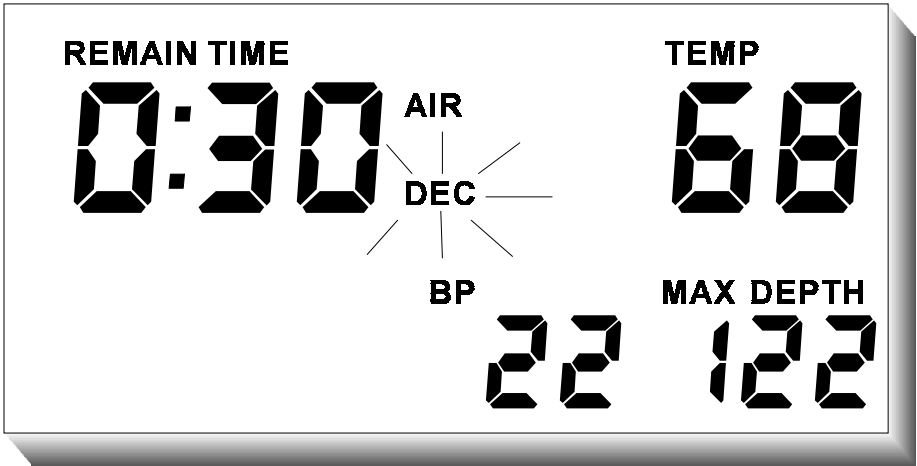


FIG-11
Alternate Display

The following information is provided on the Alternate Display while in Emergency Decompression Mode.

<u>LEGEND</u>	<u>MEANING</u>	<u>VALUE SHOWN</u>	<u>PAGE</u>
REMAIN TIME AIR	remaining air time	0:30 (30 minutes)	36
TEMP	water temperature	68 deg. F	37
BP	breathing parameter	22	34
MAX DEPTH	greatest depth reached on this dive	122 feet	35

Conditions That Will Cause Gauge Mode

Violating certain conditions will cause your dive computer to cease providing remaining time information and stop calculating nitrogen absorption/elimination. When this occurs, your unit has entered its Gauge Mode. **Once in this mode, 24 hours of surface time MUST elapse without a dive being made before the system will resume its normal operation.**

Any one of the following conditions will cause your dive computer to immediately enter Gauge Mode:

- More than five minutes elapsed with the depth less than the CEILING.
- A CEILING depth greater than 90 feet is calculated
- The maximum functional operating depth of 327 feet is exceeded.

EXCEEDING THE CEILING DEPTH:

If you ascend to a depth shallower than the Ceiling depth when in the Emergency Decompression Mode, the dive computer will issue its chirp alarm continuously and flash the WARNING legend and the DEPTH digits once a second until you descend back below the CEILING. If five minutes elapse without this violation being corrected, the dive computer enters its Gauge Mode.

EXCEEDING A 90 FOOT CEILING STOP:

A Ceiling depth of greater than 60 feet will only occur if you grossly overstay your no-decompression limit. The second that your dive computer calculates that a Ceiling of greater than 60 feet is required, it will immediately issue its five second chirp alarm. If the unit determines that you require a ceiling stop greater than 90 feet, the unit will issue five audible warning chirps and enter Gauge Mode.

EXCEEDING THE MAXIMUM OPERATING RANGE:

The dive computer will continue to operate as long as you DO NOT descend below 327 feet. Descending below 327 feet will cause the dive computer to issue its five second chirp alarm and enter Gauge Mode.

In Gauge Mode, your dive computer will continue to display DEPTH (if it is 327 feet or less), TEMPerature, BOTTOM time, ASCENT rate, and TANK pressure.

WARNING: You should wait a minimum of 24 hours before flying or making another dive if your unit has entered Gauge Mode. Failing to do so will greatly increase your risk of Decompression Sickness.

Gauge Mode

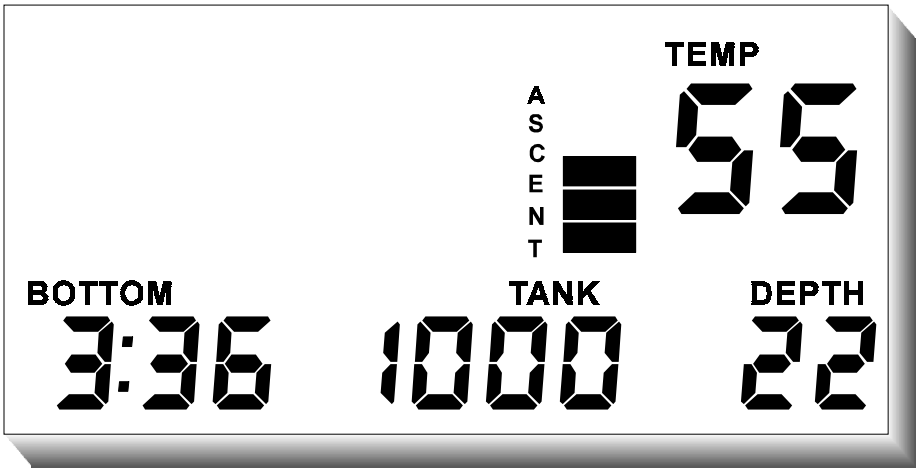


FIG-12
Main Display

NOTE: Only one display is available when in Gauge Mode.

<u>LEGEND</u>	<u>MEANING</u>	<u>VALUE SHOWN</u>	<u>PAGE</u>
TEMP	water temperature	55 degreesF	37
ASCENT	rate at which you are ascending	31-40 feet per minute	32
BOTTOM or SURF	current time either on surface or submerged depending on if you are underwater	3:36 (3 hours 36 minutes)	33 37
TANK	tank pressure	1000 psi	37
DEPTH	current depth	22 feet	35

SECTION III EXPLANATIONS

EXPLANATION OF FUNCTIONS

Altitude Diving

Your NEMESIS™ IIa NITROX senses the barometric pressure for altitudes up to 15,000 feet above sea level. Barometric pressures at a given altitude can change due to high and low-pressure weather systems as well as temperature.

When compared with most analog depth gauges at altitude, the NEMESIS™ IIa NITROX will display a greater depth. This is due to the reduced atmospheric pressure at the surface. Your NEMESIS™ IIa NITROX is no substitute for the completion of a sanctioned altitude diving course from a recognized recreational dive training agency. The NEMESIS™ IIa NITROX will only provide information that will allow the trained altitude diver to make safe diving decisions. Greater care should be taken when diving at altitude to avoid extending no-decompression times to their maximum limits.

WARNING: Diving at altitude requires a slower rate of ascent as well. Your NEMESIS™ IIa NITROX will continue to display your rate of ascent as usual, but rates slower than 60 feet per minute should be used. Your certifying agency in altitude diving will provide you with their current recommended rates.

Ascent Rate:

Subsurface Mode, Emergency Decompression Mode, or Gauge Mode:

Ascent rate is averaged over a running four-second period. For purposes of the description, this manual will just refer to ascent rate with the reader understanding that this is a four-second averaged ascent rate and not an instantaneous ascent rate.

You can also select between a Fixed or Variable Ascent Rate with the optional Analyst Personal Computer Interface.

FIXED: In the fixed mode, the ascent rate will be fixed throughout the entire dive profile regardless of depth. The fixed rate set at the factory is 60 feet per minute. With this default setting, your computer will alarm if you exceed an ascent rate of 60 feet per minute.

The diver may select fixed rates from 20 to 60 feet per minute.

VARIABLE ASCENT RATE: This feature utilizes several different ascent rates that are depth dependent. At depths greater than 60 feet, the maximum allowable ascent rate is set to 60 feet per minute. At depths less than 30 feet, the maximum allowable ascent rate is set to 30 feet per minute. From depths between 30 and 60 feet, the maximum allowable ascent rate will be the same as the current depth. For example, when you are at 43 feet, the maximum allowable ascent rate is 43 feet per minute.

Logbook Mode: The maximum speed of ascent recorded on the dive is displayed.

Note: Ascent rate is only computed and displayed at depths greater than 10 feet.

Ascent Rate Bar Graph:

The Ascent Rate Bar Graph is comprised of a vertical five-segment bar. With the optional Analyst Personal Computer Interface, you can select this bar graph to either represent the speed of your ascent or a percentage of the selected maximum ascent rate.

SPEED: With this option, each bar of the graph represents an additional 10 feet per minute of speed. For example, if you were ascending between 11 and 20 feet per minute, one bar segment would illuminate. If you were ascending between 21 and 30 feet per minute, two bar segments would illuminate, and so on with all five bar segments appearing when ascending between 51 and 60 feet per minute. The performance of this option remains the same regardless of the type or the maximum ascent rate selected.

PERCENTAGE: With this option, each bar of the graph represents an additional 20% of the maximum ascent rate selected. For example, if you had selected a fixed ascent rate limit of 30 feet per minute, each bar segment would represent an additional ascent rate of 6 feet per minute. (6 is 20% of 30) This option is especially useful if a variable ascent rate is selected. Regardless of the depth and associated maximum ascent rate, you will quickly be able to identify if you are approaching 100% maximum limit.

The Ascent Rate Bar Graph is set at the factory to display SPEED.

Batt:

This legend is illuminated when either the battery in the TU or WU is low. If this legend is flashing, then the battery in the TU is low. If the legend is on steady, then the battery in the WU is low.

NOTE: If both batteries are low, then the BATT legend will flash. Upon replacement of the TU's batteries, the BATT legend will then be on steady indicating that the WU's batteries do need to be replaced.

Bottom:

This is the total bottom time (displayed in hours and minutes) calculated for a particular dive. Should a diver ascend to the surface, remain on the surface for less than 10 minutes and then commence another dive, the bottom time will continue to increment as though there was no time spent on the surface.

Surface Mode: The bottom time of your last dive is provided to you on the Alternate Display in hours and minutes. At the start of a new dive day, the bottom time will be 0:00.

Logbook Mode: The bottom time for the profile viewed is displayed on the Main display..

Gauge Mode or Emergency Decompression Mode or Subsurface Mode: Your dive computer begins to count your bottom time when you have descended below five feet. Bottom time continues to be counted until you have ascended above three feet. This time is expressed in hours and minutes.

BP:

Breathing Parameter (BP) is a measure of your breathing efficiency. The more you dive, the more efficient your breathing becomes. With your dive computer, you will be able to monitor and log your progress. The number displayed is the amount of air you breathe per minute in psi normalized to the surface (one atmosphere). This data is sometimes referred to as Surface Air Consumption (SAC). Since Breathing Parameter is a “parameter”, it remains in psi per minute regardless of metric or imperial calculations. Via the optional Analyst, you can also select Breathing Parameter to display liters per minute.

By eliminating the variable of depth, you will easily be able to compare your breathing rate from depth to depth and dive to dive. As you know, the amount of actual air you breathe per minute varies proportionate with depth even if your breathing rate remains unchanged. By normalizing your breathing rate to the surface, an immediate comparison of the rates can be made. For example, let's say that you made two dives, the first to 99 feet and the second to 66 feet. Lets also assume that your breathing rate was the same on both dives; and using the previous example, lets say your BP displayed 23, indicating your breathing rate as 23 psi per minute normalized to the surface. If depth entered the equation, your 99 foot dive would display a BP of 92 ($23 \times 4\text{ATM's} = 92$) while the dive to 66 feet would display a BP of 69 ($23 \times 3\text{ATM's} = 69$). With your dive computer, you can immediately see that your rate remained unchanged from the first to second dive. If the actual psi per minute breathed at depth was displayed, you would have seen two very different numbers, 92 and 69, and you would then have to calculate further to achieve a comparison.

Since BP is computed by monitoring the drop in tank pressure, a larger volume tank will show a more efficient BP while the BP of a smaller tank will be less efficient. For normal, casual sport SCUBA diving on a 10-litre (80 cubic foot tank), a BP of between 18 and 35 is considered normal. Breathing Parameter is computed and updated only at depths below ten feet.

Subsurface Mode: The averaged Breathing Parameter for the dive in progress is displayed.

Logbook Mode: The average BP for the profile view is provided.

Ceiling:

Logbook Mode: This will show whether or not the dive profile viewed was a no-decompression dive. If you entered Emergency Decompression Mode on that particular dive, the CEILING would display the deepest stop that was required.

Emergency Decompression Mode: The depth above which you must not ascend when in the Emergency Decompression Mode.

Subsurface Mode: When making a no-decompression dive, the CEILING should read 0 indicating that you may make a direct ascent to the surface without completing any decompression stops. Should you enter into a decompression situation, the CEILING will indicate, in feet or meters, the depth to which you must ascend and complete a Decompression Stop.

Depth:

The numbers under the DEPTH legend are used to display the current depth.

Subsurface Mode: The numbers under the DEPTH legend are used to display the current depth. Your dive computer has the intelligence to automatically determine if you are diving in fresh or sea water thereby providing you with the actual depth for the type of water in which you are diving.

Emergency Decompression Mode: The numbers under the DEPTH legend are used to display the current depth.

Gauge Mode: The numbers under the DEPTH legend are used to display the current depth.

Pedive Prediction Mode: In this mode, the digits under the DEPTH legend indicate the depth associated with the displayed NDC prediction.

Logbook Mode: The numbers under the DEPTH legend are used to display the average depth of the dive.

CNS/OTU Toxicity Display: On this display, the numbers under the DEPTH legend are used to display the OTU Toxicity percentage.

O2 Mix Display: On this display the number under the DEPTH legend is used to display the percentage of oxygen in mix #2. This value is displayed as a factor of 10. For example if your oxygen percentage in Mix #2 is 61.5 percent, then 615 would be displayed.

Battery/Altitude Display: The two digits under the DEPTH legend will indicate the TU's current battery voltage as a factor of ten. For example, if the TU's battery voltage is 5.8 volts, the two digits under the DEPTH legend would display 58. If the battery voltage was 5.3 volts, the two digits under the DEPTH legend would be 53.

Dive:

Surface Mode: The dive number counts the number of dives made in a single "dive day". This counter begins with 0 and continues through 9, resetting back to 0 each time the TU is powered on.

Logbook Mode: The dive number in the Logbook Mode will identify which dive of that particular "dive day" you are viewing. For example, if you had just made your third dive of the day, the dive number would display 3 for the first profile viewed. The next would display 2, and the next would display 1. The next would display the last dive's DIVE number from the previous day. If you only made two dives on that previous day, the DIVE number would display 2 and so on.

NOTE: A "dive day" is defined as from the time you turn the TU on and lasting until all twelve half-time compartments reach normal levels. For this reason, a you may have more than one "dive day" within a single 24 hour period or a "dive day" may last for more than 24 hours.

Max Depth:

Surface Mode: After your dive, the maximum depth reached on that dive will be displayed up to the maximum gauge depth of 327 feet.

Logbook Mode: The maximum depth recorded on the profile viewed is displayed.

Subsurface Mode: This is the maximum depth recorded during the dive.

Metric:

This legend indicates that the dive computer is set to calculate and display altitude, depth, and tank pressure values in the METRIC mode. Altitude and Depth will be calculated in meters. Tank pressure will be calculated and displayed in either BAR or Kg/cm². You may select the metric display via the optional Analyst Personal Computer Interface.

Mission OTU Clock:

This is a running clock that tracks your long-term risk to Oxygen Toxicity. This clock may run for several weeks. The Mission OTU Clock is reset to 0:00 when the OTU level is also 0.

Remain Time Air:

Predive Prediction Mode: When tank pressure greater than 500 psi is present on the computer's high pressure transducer, the lesser of either remaining airtime or the predicted no-decompression time is displayed for each depth.

Subsurface Mode: The display on which this data appears is dependent on whether the remaining airtime is greater or less than the remaining no-decompression. If the remaining airtime is less than the remaining no-decompression time, it will appear on the Main Display along with the AIR legend. If the remaining airtime is greater than the remaining no-decompression time, it will appear on the Alternate Display along with the AIR legend.

Emergency Decompression Mode: The remaining airtime is always displayed on the Alternate Display.

Logbook Mode: If during the profile being displayed, the minimum recorded remaining time data was remaining airtime, the Alternate Display will display this data under the REMAIN TIME legend.

Remain Time NDC:

Predive Prediction Mode: When tank pressure greater than 500 psi is present on the computer's high pressure transducer, the lesser of either remaining airtime or the predicted no-decompression time is displayed for each depth. If there is less than 500 psi present on the computer's high pressure transducer, all predive predictions will be made using only no-decompression times.

NOTE: If the no-decompression limit for a given depth is less than two minutes, your dive computer will not make a predive prediction for that depth.

Logbook Mode: If during the profile being displayed, the minimum recorded remaining time data was remaining no-decompression time, the Alternate Display will display this data under the REMAIN TIME legend.

Subsurface Mode: This is the amount of no-decompression time remaining displayed in hours and minutes.

CNS/OTU Toxicity Display: The number 2:00 under the REMAIN TIME legend is used to indicate the CNS/OTU Toxicity Display.

O2 Mix Display: The number 1:00 under the REMAIN TIME legend is used to indicate the O2 Mix Display.

Battery/Altitude Display: The number 0:00 under the REMAIN TIME legend is used to indicate the Battery/Altitude Display.

Remain Time DEC:

Emergency Decompression Mode: The time displayed will be dependent upon how the dive computer has been setup. The information displayed will be either:
Total time to complete all required decompression - or -
Time Remaining at each individual stop - or -
Alternating between total and stop time.

If the alternating option is selected, each time is displayed for 2 seconds.

Logbook Mode: If you are viewing an Emergency Decompression dive, the total required decompression time would be displayed followed by the DEC legend.

Surface Time:

Surface Mode or Gauge Mode: Surface time is displayed in hours and minutes from the time the TU is turned on or at the end of a dive when ascending above three feet. Surface times from 0:00 to 17:03 will be displayed.

Tank:

Surface Mode, Subsurface Mode, Emergency Decompression Mode, or Gauge Mode: The numbers under the TANK legend are used to display the current tank pressure in one psi increments.

PreDive Prediction Mode: If the amount of air remaining in your tank allows five minutes or less of bottom time for a given depth during the PreDive Prediction Mode, the tank digits will flash. This flashing will only occur for the predicted depths which apply.

Logbook Mode: During the first three seconds of display, the accumulative dive number is shown, then replaced by the ending tank pressure for the dive profile viewed.

CNS/OTU Toxicity Display: The numbers under the TANK legend indicate the current CNS Toxicity percentage.

O2 Mix Display: On this display the number under the DEPTH legend is used to display the user programmed percentage of oxygen in mix #1. This value is displayed as a factor of 10. For example an oxygen percentage of 21.5 percent would be displayed as 215.

Battery/Altitude Display: In the Battery/Altitude Display, the number under the TANK legend are used to display altitude rounded to the nearest thousands of feet above sea level. For example, if under the TANK legend you see 4, the altitude calculated would be between 3600 feet and 4500 feet

Temp:

Surface Mode: The current temperature that is calculated by the TU will be displayed.

Subsurface Mode: This is the water temperature calculated by the TU.

Logbook Mode: This is the average water temperature recorded for the viewed profile

Time-To-Fly:

Surface Mode: If you plan to fly after diving, you must first allow time for your body to eliminate all of the residual nitrogen it has absorbed from diving. Your dive computer calculates this for you and displays the hours you must wait before safely flying or traveling to altitude after diving. The time calculated includes an additional 12 hour surface time for added safety. For example, if it would take your body three hours to eliminate all residual nitrogen, the time-to-FLY would display 15 hours (three hours plus the 12 hour added safety margin).

Logbook Mode: In the Logbook Mode, the time-to-FLY calculated at the end of that particular dive profile is displayed.

CAUTION: It is always recommended that you wait at least 24 hours before flying after diving.

AUDIBLE & VISUAL WARNINGS

In this chapter you will learn to recognize the audible and visual warnings that your dive computer may issue to alert you of a potentially hazardous condition.

User Defined Maximum Depth:

During the PreDive Prediction Mode, you have the ability to define a maximum depth to which you wish to dive. When the desired maximum depth is displayed during the PreDive Prediction Mode, tap the TU on the circular cross-hatched are identified by "PWR". Three confirmation beeps will be issued. You may also set this depth via the optional Analyst personal computer interface. Should you descend to a depth deeper than your selected maximum depth, the DEPTH digits will flash and once every minute, the five-chirp audible alarm will sound. The factory setting for this warning is 320 feet.

NOTE: The Depth Alarm is disabled during the Emergency Decompression Mode.

1/2 Tank Pressure Alarm:

When you have consumed one-half of the cylinder's "usable" pressure, your dive computer will issue a one time five-chirp audible alarm. If you use all of the "usable" tank pressure, you will still have a safety reserve of 500 psi. The point at which the 1/2 Tank Pressure Alarm will sound is easily determined by using the following formula:

$$TP \quad \text{---} \quad \frac{(TP - 500)}{2} \quad = \quad \text{1/2 Tank Pressure Alarm limit}$$

Where: TP = beginning tank pressure

For example, let us say you started your dive with a tank pressure of 2500 psi.

$$2500 \quad \text{---} \quad \frac{(2500 - 500)}{2} \quad = \quad 1500 \text{ psi}$$

The 1/2 Tank Pressure Alarm would sound at 1500 psi This warning is disabled when shipped from the factory. You can enable this option via the Analyst.

Low On Air:

Should you approach 500 psi of pressure remaining in your SCUBA tank or five minutes or less of remaining air time, your dive computer will:

Issue a one time, five-chirp audible warning - and
Flash both the WARNING legend and the TANK digits

If you should ever have less than five minutes of remaining air time, your dive computer will also illuminate the AIR legend on the WU.

The flashing of the WARNING legend and the digits under the TANK legend will continue until the Air Time Remaining is increased to at least ten minutes. This may be accomplished by ascending to a shallower depth. This is not a settable alarm.

If you are in the Emergency Decompression Mode and the remaining air time is either equal to or is less than the total decompression obligation, both the AIR and DEC legends will appear. Remaining Decompression Time is ALWAYS shown on the Main Display while the Remaining Air Time in this mode is ALWAYS displayed on the Alternate Display. On the Main Display, the AIR legend will flash while on the Alternate Display, the DEC legend will flash.

NOTE: See the section of this manual regarding the Emergency Decompression Mode for more information.

Ceiling Violation:

When in the Emergency Decompression Mode, ascending to a depth shallower than the Ceiling depth will cause your dive computer to:

Flash the WARNING legend and the depth digits and
Continuously sound its audible chirp alarm.

This is not a settable alarm.

NOTE: You will receive a 1.5 second penalty for each second you remain above your CEILING. If you remain in a CEILING violation condition for more than five minutes, your dive computer will enter its Gauge Mode.

Breathing Parameter Alarm:

Using the optional Analyst Personal Computer Interface, you may enter predefined high and low limits for Breathing Parameter. If your Breathing Parameter is greater than your high limit or less than your low limit, your dive computer will issue a five beep alarm once each minute until your Breathing Parameter is back with the decided range. This feature is disabled at the factory and can only be enabled via the Analyst.

Ascent Rate Alarm:

Your dive computer allows the user to select either fixed or variable Ascent Rate warnings. See the description of Ascent Rate under the EXPLANATION OF FUNCTIONS section for a description of fixed and variable ascent rates.

If you exceed the maximum ascent rate, your dive computer will:

Flash both the WARNING legend and
Sound its audible alarm once every second.

The sound of this audible alarm is unique. Rather than a low-to-high "sweep" in sound, the Ascent Rate Alarm is a high-to-low "sweep".

Low Battery Voltage:

Both the TU and WU are powered by standard, user-replaceable batteries. The TU is powered by four, size-AA alkaline batteries and the WU by two size-N alkaline batteries. Should the WU's battery voltage become low, the BATT legend on the WU will illuminate. When the TU's batteries become low, the BATT legend on the WU will flash and the TU will issue a one time five-chirp audible warning. The batteries should be replaced as soon as possible after the low battery indicators appear.

WARNING: Properly replacing the batteries from the TU will not cause your dive computer to lose current nitrogen absorption and elimination data for the most recent dive or dive series. See the section regarding **BATTERY REPLACEMENT** in this manual.

Gauge Mode Alarm:

You will hear your dive computer sound its five-chirp alarm just prior to entering the Gauge Mode. It will re-issue its five-chirp alarm if the TU is powered up within 24 hours after entering Gauge Mode.

Your computer will enter the Gauge Mode if:

- more than five minutes has elapsed with the depth less than the ceiling
- or
- a ceiling depth of 90 feet or greater is required
- or
- the maximum functional operating depth of 327 feet is exceeded.

Two-Minute Warning:

Should you have less than two minutes of remaining no-decompression time, your dive computer will:

- issue a one time, five-chirp audible warning
- and
- flash the WARNING legend on the WU.

60 Foot Decompression Stop Warning:

Should you require a decompression stop greater than 60 feet, the unit will issue a one time five-chirp audible warning.

Entering Emergency Decompression Mode:

Should you enter Emergency Decompression Mode, the TU will issue a one time five-chirp audible alarm.

Oxygen Tolerance Units (OTU) Dose Warning:

Should you reach 75 percent of the allowable Mission OTU dosage, your dive computer will issue a one-time audible warning consisting of short, double-beeps that sound for five seconds. The WARNING legend will appear and flash and the TEMPerature digits will be replaced with the current calculated OTU toxicity percentage. This visual warning will continue until the calculated toxicity percentage is less than 75 percent.

Central Nervous System (CNS) Oxygen Toxicity Warning:

Should you reach 75 percent of the associated maximum limit, your dive computer will issue a one-time audible warning consisting of short, double-beeps that sound for five seconds. The WARNING legend will appear and flash and the TEMPerature digits will be replaced with the current calculated CNS Oxygen Toxicity percentage. This visual warning will continue until the calculated toxicity percentage is less than 75 percent. (See FIG-14 which shows a diver that has reached 92% of the allowable maximum bottom time for any PPO₂).

NOTE: If both CNS and OTU levels are greater than 75 percent, the more critical of the two's percentage will be displayed.

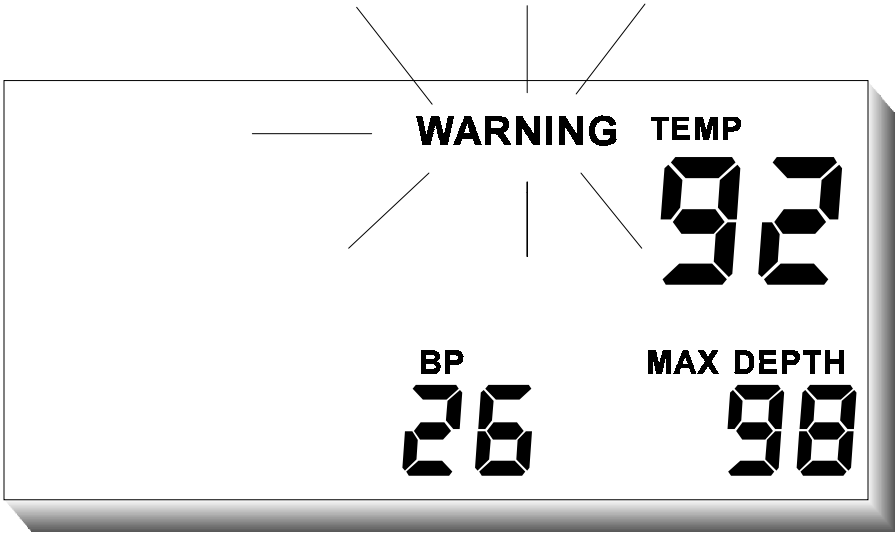


FIG-15
OXYGEN TOXICITY WARNING DISPLAY

Maximum PPO2 Alarm:

This alarm, settable via the optional Analyst interface, allow you to set a desired maximum PPO2 level from 0.5 to 1.6 ATA. Should you exceed this setting, the TU will issue the double chirp toxicity alarm once per minute. The factory setting for this alarm is 1.6 ATA.

QUESTIONS AND ANSWERS

Should I turn my WU off when it is not in use?

Yes. While your WU is powered by two alkaline 'N' batteries that will provide a long battery life, you still should turn the WU off when you are going to be away from the TU for an extended time.

Shouldn't I take the batteries out of the TU when my dive computer is not going to be used for several months?

No. Inside your TU is a small lithium battery that provides power for long-term data storage. Removing the batteries, or leaving fully discharged batteries in the TU, will cause this coin cell to gradually lose its power. Also, the timestamp clock does not operate when the batteries are removed.

Is this coin cell replaceable?

The coin cell can only be replaced by Cochran Undersea Technology since it requires the opening of the TU. By keeping charged batteries in the TU, the battery life of this coin cell is expected to be over ten years.

When I change the batteries in my TU, will my dive computer retain data for the current dive?

Yes, providing you follow the instructions on battery replacement.

When I tapped the TU on, it did not issue the five confirmation beeps, WHY?

The TU may already be on. Turn your WU on to see if the TU is transmitting data. If it is not, check the batteries to see if their voltage is low. In a noisy environment, such as on the boat when it is underway, it may be difficult to hear the confirmation beeps.

At what battery voltage will my TU cease to operate?

Fully charged, the four AA alkaline batteries provide six volts. When they discharge to below 4.5 volts, your TU will not turn on.

Can I turn the TU on underwater?

No. The TU will not turn on if you are underwater. Should you enter the water and begin a descent without turning the TU on, slowly surface, turn the TU on, wait for it to complete its Self-Diagnostic Mode, and then begin your descent once again.

Is the transmitting range affected by the positioning of the TU and WU?

Yes, however, in normal diving situations there is sufficient operating range regardless of orientation.

What is the proper way to tighten the TU and WU battery caps?

The caps should be tightened using the enclosed battery removal tool. The o-rings should not be visible when the caps are properly tightened, but be careful not to over-tighten the caps. Once the o-rings are seated, simply hand-snug each cap.

What happens if the battery compartments flood?

The electronics of both the TU and WU are completely environmentally sealed. The construction of the battery compartments will not allow water to enter the electronics. If you have flooded the battery compartments, first rinse the compartment as soon as possible with fresh water. Then fill each compartment with alcohol and shake the alcohol to ensure complete rinsing. Drain the alcohol and allow the compartment to air-dry 12 hours with the battery caps off. Discard the batteries. Finally, examine the battery cap, replace and lubricate the o-rings, install new batteries and reinstall the battery caps. You may also need to use a clean eraser or a burnishing cloth to completely clean the contacts.

Can I transport my dive computer in a watertight container while traveling at altitude?

No. Your dive computer continuously monitors the altitude to perform nitrogen in-gassing and out-gassing. These nitrogen levels are then used when you arrive at the dive site and intelligently applied to your dive.

What should I do if I have additional questions?

Call us! For your convenience, we are available Monday through Friday, 8:00 a.m. to 5:00 p.m. Central Time. Our staff of certified divers will be glad to assist you by answering any of your questions. Our telephone number is 214.644.6284. You may also FAX questions to 214.644.6286.

SECTION IV CARE AND MAINTENANCE

NORMAL CARE AND MAINTENANCE

Rinsing and Cleaning

Your dive computer is designed to require minimum care and maintenance. Both the TU and WU are molded from fiberglass reinforced resins that are extremely resistant to salt, chlorine, and exposure to ultraviolet light. However, both the TU and WU contain sophisticated electronic components, and therefore, require reasonable care and treatment.

- Avoid sharp impacts to the TU and WU.
- Do not expose units to extreme heat or cold.
- Replace batteries when they become discharged, or once a year, whichever should occur first.
- Rinse both units with fresh water and allow them to air-dry after each use. Take special care when rinsing the opening on the TU that is between the battery caps. DO NOT attempt to clean this area with a pointed object or with blasts of compressed air. Doing so will cause severe damage to your TU, rendering it inoperable and voiding the Warranty

You can extend the service life of your dive computer by simply rinsing it with fresh water. When using a garden hose to rinse your unit, keep the water pressure very low. No chemicals of any type should be used on your dive computer. The WU's rubber strap may be conditioned with silicone spray especially developed for use with SCUBA equipment. You will find this type of silicone spray at your local dive shop. Care should also be taken to prevent your WU's lens from becoming scratched or damaged. Minor scratches will become invisible underwater. However severe gouges or cracks in the lens would require that it be replaced.

High-pressure Transducer Care

When installing your high-pressure transducer, use an open-ended wrench on the transducer's hex nut to tighten. When the TU is not attached to your regulator, replace the dust cap on the high-pressure transducer to prevent contaminants from entering the opening. NEVER insert any object into the high-pressure transducer opening. SEVERE DAMAGE may result.

Battery Type and Replacement

Your dive computer operates on two different sizes of user-replaceable batteries. The TU requires four alkaline 'AA' batteries while the WU requires 2 alkaline 'N' batteries. We recommend using only high quality alkaline batteries for both the TU and the WU. **Other types of batteries (such as Lithium and Nickel Cadmium) may permanently damage the Tank Unit or Wrist Unit and void the warranty.** Use of old, off-brand, incorrect and/or visibly corroded batteries will also affect performance, damage the units, and void the warranty.

There are factors which can significantly vary battery operating life. These include:

- Original quality of battery as manufactured.
- Age of battery prior to installation.
- Length of time batteries have been installed.
- Frequency and cumulative number of WARNINGS issued by the computer.
- Temperature of battery in operation.

Fresh batteries installed in the TU will read about 6 volts. At 5.4 volts the low battery indicator is shown on the WU. At 4.8 volts, your TU will not turn on. If you have the optional TACLITE display, battery life in the WU will be affected depending upon the number of times you activate the TACLITE. On a new, fresh set of N-type batteries in the Wrist Unit, you should get approximately 10,000 TACLITE cycles. See your Authorized Dealer for a demonstration of the TACLITE active backlight display.

To replace batteries:

- a) Prepare four new AA alkaline batteries (NO Lithiums)
- b) Double check the orientation of batteries with the picture on the bottom of the battery tubes
- c) Remove one battery cap, replace batteries, re-install battery cap carefully making sure not to cross-thread the battery cap
- d) **Wait one minute**
- e) Remove other battery cap, replace batteries, re-install battery cap making sure not to cross-thread the battery cap.

NOTE: The one minute delay allows the power circuit responsible for maintaining power to the TU during a battery change, time to recharge.

Battery Care

Two separate, sealed TU battery compartments isolate the alkaline batteries from the main computer. Gases given off by the chemical reaction that produces electricity within batteries react with the metal contacts of the batteries, causing corrosion. Over time, this coating accumulates and lowers the amount of power the battery can deliver. Even though batteries that have been in the dive computer for a period of time may indicate ample voltage, the corrosion interferes with delivery of power from the battery to the dive computer. Preventive maintenance in the form of the periodic burnishing of the battery's contacts and applying a thin film of silicone grease to the battery terminals will greatly minimize this corrosion from forming.

NOTE: It is always advisable to replace older or questionable TU batteries with new, fresh batteries before a long series of dives, especially if your dive computer has been inactive for an extended time.

NOTE: Remember, your TU cannot be manually turned off; and since the TU computes all of the diving data, turning your WU off will not affect your decompression information. Residual nitrogen elimination, as well as time-to-FLY can be viewed by turning the WU back on.

ANNUAL MAINTENANCE

An Annual Maintenance Service is an important part of your dive computer's Care and Maintenance Schedule. Returning your computer to your Authorized Dealer on or about the anniversary of your purchase date will allow you to keep your computer in absolute top diving condition.

Your Annual Maintenance includes the following:

- Tank Pressure Gauge Calibration: The accuracy of this measurement will be verified and calibration performed as necessary.
- Depth Gauge Calibration: The accuracy of this measurement will be verified and calibrated if necessary.
- Temperature Gauge Calibration: The accuracy of this measurement will be verified and calibrated if necessary.
- Tank Unit Transmit Range: The transmit range from the TU to your WU will be verified to be at least three feet, and reset if necessary.
- Battery Voltage: The battery voltage in your TU and WU will be recorded and new batteries installed, if necessary.
- Battery Drain Test: The amount of current drain while in use as well as when dormant will be confirmed to be within specifications, and corrected if necessary.
- O-rings: All o-rings will be inspected, lubricated, and replaced as necessary.
- Visual Inspection: Your entire dive computer will be visually inspected for any cracks or scratches that may lead to potential flooding. Should one be found, we will contact you to discuss the options available for repair.
- Pressure Test: Your dive computer will then complete a pressure test.
- Final System Test: A functional System Test is performed to ensure complete system operation as well as to confirm that all calibration constants are in place and functioning.

Your Authorized Dealer will perform all steps necessary in returning your unit to the factory for this service.

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SECTION V TECHNICAL SPECIFICATIONS

SPECIFICATIONS

(Subject to change without notice)

No-Decompression Model

Algorithm: Modified Haldanean
Number of Half Time Compartments: 12

Decompression Ceilings

Ceiling Depths: 10, 20, 30, 40, 50, 60, 70, 80, 90 feet
3, 6, 9, 12, 15, 18, 21, 23, 27 meters

Altitude Diving Model

Procedure: Altitude adjust is seamless from sea level to 15,000 feet (4600 meters) above sea level.

FUNCTIONAL MODES

Self-Diagnostic Mode

Surface-Mode

- 1) Main Display
- 2) Alternate Display

Subsurface-Mode

- 1) Main Display
- 2) Alternate Display

Pre-dive Prediction Mode

CNS/OTU Toxicity Display

Oxygen Percentage Display

Battery Altitude Display

Emergency Decompression Mode

- 1) Main Display
- 2) Alternate Display

Gauge Mode

Logbook Mode

- 1) Main Display
- 2) Alternate Display

FUNCTIONAL

	RANGE	INCREMENT
Dive Number	0 - 9 dives	1 Dive
Depth	0 - 327 feet	1 Foot
	0 - 99.9 meters	0.1 meter
Temperature	0 - 99 deg F.	1 degree
	0 - 37 deg C	1 degree
Surface Time	0 - 17 hours 03 minutes	1 minute
Maximum Depth	0 - 327 feet	1 foot
	0 - 99.9 meters	0.1 meter
Tank Pressure	0 - 5119 psi	1 psi
	0 - 353 BAR	0.1 BAR
	0 - 360 Kg/cm ²	0.1 Kg/cm ²

OPERATIONAL

Depth/Max Depth	327 feet / 99.9 meters
Depth Gauge Range	327 feet / 99.9 meters
Tank Pressure	5119 psi 353 BAR 360 Kg/cm ²
Clock Timer	17 hours 03 minutes
Logbook	300 dives
Dive Of The Day Counter	9 dives
Altitude	15,000 feet / 4,600 meters
Altitude Functional Range	15,000 feet / 4,600 meters
Breathing Parameter	98 psi per minute
Second-by-second Profiles	13.6 hours

HARDWARE

Casing	Fiberglass reinforced ABS Plastic
Lens Material	Polycarbonate

POWER

	TANK UNIT	WRIST UNIT
Battery	4 'AA'	2 'N'
Battery type	Alkaline	Alkaline

TURN-ON

	TU	WU
Activation	Sonic/Tank Pressure	Inertial Switch

ACCURACY

Temperature	+/- 1.5% full scale
Depth Gauge	+/- 1.0% full scale
Tank Pressure	+/- 1.0% full scale
Bottom/Surface Time	+/- 1.0 sec. /24 hours

REPLACEMENT PARTS

High-pressure O-ring:	90D	EPDM
Tank Unit Battery Cap O-ring:	-207 BUNA N	SILICON
Wrist Unit Battery Cap O-ring:	-038 BUNA N	SILICON

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SECTION V ACCESSORIES

Field Programmer LIMITED 90-DAY WARRANTY

To the original owner only, Cochran Undersea Technology, a division of Cochran Consulting, Inc. guarantees the Field Programmer to be free of defects in both materials and craftsmanship under normal SCUBA use for 90 days from the date of purchase. Failing to provide proper care will cause this warranty to be null and void. Any defect not excluded in the limitations section below will be repaired, replaced, or replaced with a refurbished unit, at Cochran Undersea Technology's discretion, free of charge. This warranty does not include charges for shipping and handling. This warranty IS NOT transferrable. All correspondence concerning this warranty MUST be accompanied by a photocopy of the original sales receipt.

Should repair be required you may return your Field Programmer to the place of purchase.

LIMITATIONS

This warranty DOES NOT cover any damages that occur from abuse, tampering, or accident. Additionally, any modifications or repairs performed by anyone other than an authorized Cochran Undersea Technology Repair Center to this unit will void this warranty. All plastics, rubber or damage due to accident, abuse, modification, or tampering are NOT covered.

STATEMENT OF LIABILITY

It is expressly understood that by buying and/or using the Field Programmer, the diver assumes ALL risk as to its quality, performance, and accuracy. Cochran Undersea Technology, its distributors, or retailers will not be held liable for any personal injuries or other damages resulting from its operation, even if Cochran Undersea Technology has been advised of such occurrences and damages.

Overview

The Field Programmer is designed to be used with the NEMESIS™ IIa NITROX Dive Computer. IT IS NOT COMPATIBLE WITH PREVIOUS NEMESIS SERIES. This device allows the user to program into the dive computer a value representing the percentage of oxygen contained in a given breathing gas mix for all three mixes, the cylinder size which is used in making Workload computations, an added degree of conservatism from 0 to 50%, and a maximum depth alarm.

WARNING: The NEMESIS™ IIa NITROX Dive Computer and the Field Programmer are to be used only by divers trained and certified in the use of Nitrox breathing gas mixes by an accredited certifying agency.

NOTE: The Field Programmer is NOT waterproof.

Installation

1. To install, orient the probe of the Field Programmer so that the wire running to the pushbutton box is running in the same direction as the high-pressure transducer. See Fig. 16.

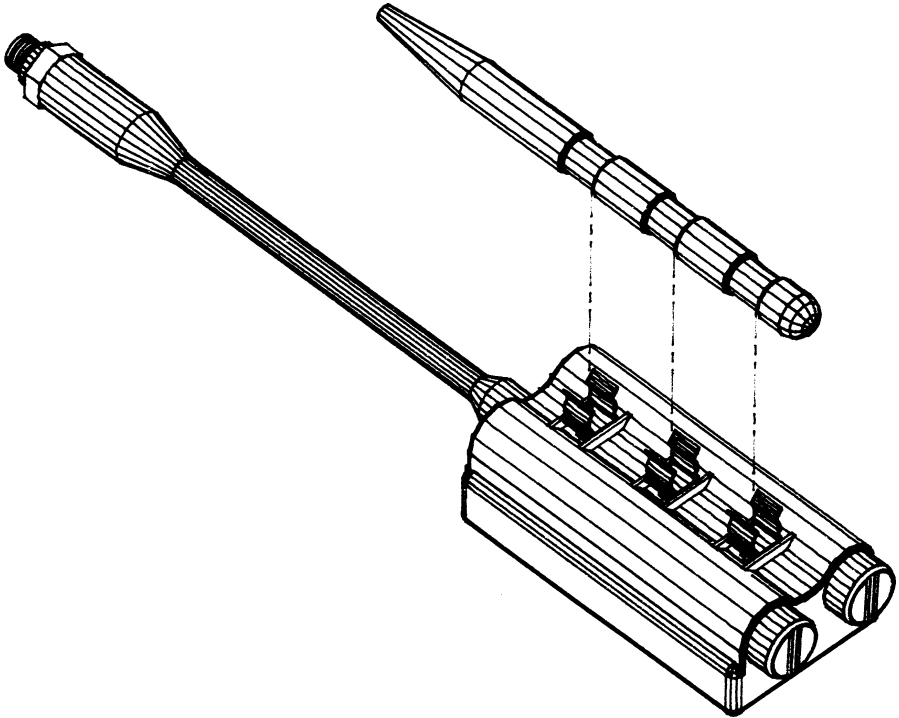


Fig. 16

2. Next, turn the TU on either with cylinder pressure or manually.

NOTE: The sound generated by installing the probe may activate the TU. If this is the case, it is not necessary to perform this step.

3. 56 Turn the WU on and position it to receive the transmissions from the TU.

4. While the Nemesis IIa Nitrox is in the normal Surface Mode, tap the TU on the PWR circle one time. You should see the WU display change to the programming display.
5. Using the INCREMENT button (the one closer to the data probe wire), program the 10's digit. Each push of this button will increment the digit by one. A confirmation chirp will be heard with each increment in value and the upper left corner of the WU display will read 1-3.

NOTE: The maximum 10's digit accepted by the TU for Mix 1 is 5 since the maximum percentage of oxygen allowed for Mix 1 is 50.0 percent. The Field Programmer will increment this digit up to 9 since the decompression mixes are capable of oxygen percentages of up to 99.9 percent but, again, 50.0 percent is the maximum value that can be programmed for Mix 1.

6. Once you have programmed the 10's digit, press the SELECT button (the one farthest from the data probe wire) to move to the 1's digit. The WU will now display 1-2. Using the INCREMENT button, program the 1's digit to the desired setting. Remember, the maximum accepted programming for Mix 1 is 50.0 percent. If you have programmed the 10's digit to a 5, the TU will not accept any other 1's digit except 0.
7. Using the SELECT button, you now move to the 1/10's digit. The WU will display 1-1. Program this value as in the previous two steps.
8. You will repeat this process to program Mix 2 and Mix 3.

NOTE: For Mix 1, the far upper left digit displayed a 1, i.e. 1-3, 1-2, 1-1. For Mix 2, this digit will display a 2 and for Mix 3, the digit will be a 3. The numbers following the dash signify either the 10's, 1's, or 1/10's digit. An x-3 signifies you are programming a 10's digit, an x-2 signifies you are programming a 1's digit, and an x-1 signifies you are programming a 1/10's digit. If you wish to leave a particular digit unchanged, press the SELECT button to move to the next programming step.

9. With all three mixes programmed, you must now determine the two Mix 3 benchmarks that must be met in order for Mix 3 to become active. These two benchmarks are the bottom time that you must be beyond and the depth you must be above in order for this switch to occur. Remember, BOTH of these two benchmarks MUST be met for Mix 3 switching. The first benchmark is the bottom time.
10. The WU will display a lower case b in the far upper left corner. This bottom time benchmark is programmed in minutes with the first digit, b-3, being the 100's digit. Use the SELECT and INCREMENT buttons in the same manner as used to program the three Nitrox mixes, moving next to the 10's digit (b-2) and the 1's digit (b-1). You may wish to leave this benchmark set for 20 to 30 minutes since most decompression dives have a bottom time of greater length. Remember, the depth benchmark must be met as well as this bottom time benchmark before switching to Mix 3 is allowed. Once you have programmed the bottom time benchmark, press the SELECT button to move to the depth benchmark programming.

11. For the depth benchmark programming, the WU display a lower case d. This depth benchmark is set in 1-foot increment down to a maximum of 30 feet. First, you will program the 10's digit (d-2) followed by the 1's digit (d-1)
12. Next, you will program the cylinder size you are using in liters. During this programming step, the WU upper left corner will display an L. Whole liters up to 255 are allowed. The formula to calculate liters is:

Cylinder Size (cu.ft.) divided by Working Pressure (psi) multiplied by 411 = Liters

For example, an 80 cu.ft. cylinder rated at 3000 psi would be calculated as follows:

$$\frac{80}{3000} \times 411 = \text{Liters} \quad 0.0266666 \times 411 = 10.959972 \text{ Liters}$$

This would be rounded to 11 Liters.

13. Next, using the same sequence of SELECT and INCREMENT, you will enter a desired percentage of added conservatism from 00 to 50 percent. This option programming is signified with a C in the upper left corner of the WU display.
14. The last programming option is the maximum depth alarm. This programming is signified with an A in the upper left of the WU display. This alarm is set in one foot increments from 10 to 326 feet. You will first program the 100's digit (A-3) than the 10's digit (A-2) and finally the 1's digit (A-1).

Once you have completed programming, press the SELECT button to review all of your desired settings. You must review the entire programming cycle without making any changes before the TU will automatically exit the programming mode. If you remove the data probe before the TU has automatically exited the programming mode, the setting you have programmed WILL NOT be saved. Only after reviewing ALL of the possible programming fields will the TU save the programming and automatically exit the programming mode.

WU Display	Value Being Set
1 - 3 / 2 / 1	O ₂ % for Mix 1 (nitrox)
2 - 3 / 2 / 1	O ₂ % for Mix 2 (nitrox)
3 - 3 / 2 / 1	O ₂ % for Mix 3 (nitrox)
b - 3 / 2 / 1	Elapsed Bot Time for Mix 3 Activation (nitrox)
d - 2 / 1	Depth Limit for Mix 3 Activation (nitrox)
L - 3 / 2 / 1	Cylinder Size in Liters
C - 2 / 1	% Added Conservatism
A - 3 / 2 / 1	Max. Depth Alarm



Cochran

UNDERSEA TECHNOLOGY

A Division of Cochran Consulting, Inc.

Diving Into The 21st Century

The Analyst Personal Computer Interface

OPERATION OF THE PC INTERFACE

The Analyst Personal Computer Interface is a complete hardware/software system that uploads data from the NEMESIS IIa NITROX dive computer to an IBM or compatible Personal Computer. Along with data that is retrieved from the dive computer, the Analyst allows the diver to customize the dive computer and also to enter and store additional information for each dive in a logbook data base.

Features of the Analyst Software Package

UPLOAD all stored information from the dive computer to the Personal Computer's hard disk drive. Multiple dive computers may be uploaded to the PC. The program automatically stores data on subsequent uploads from each dive computer to its unique file on the PC hard drive.

PRINT all charts and graphs using the **GRAPHICS** function of DOS.

MOVE BETWEEN DIVES instantly by using the **-** and **=** keys to move forward and backward one dive, or the **<PAGE UP>** and **<PAGE DOWN>** keys to move 10 dives at a time. Move to the oldest recorded dive by using the **<HOME>** key, and to the most recent dive by using the **<END>** key. Each dive's detailed statistics screen, graphic profile screen, and logbook screen are grouped together, so you can scan from dive to dive, in any screen type, and instantly recall the other screens for that particular dive.

Minimum Hardware Configuration

For proper operation, your Personal Computer must have the following configuration:

- IBM OR COMPATIBLE, 386 or greater
- 1 MB of RAM
- 1 MB of available storage on hard disk drive
- COM1 OR COM2 (Serial) Port
- DOS Ver. 3.0 or Higher
- VGA Graphics Card or card capable of VGA emulation

It is important that you have at least 560KB of free "low memory" available. To determine this, type MEM at the C:>\ prompt. If the "Largest executable program size" line indicates less than 560 KB of available memory, there may be printer, communication (upload) and other problems. The greater the incremental gain in available RAM above 560K, the smaller the likelihood of problems. There are several ways of accomplishing this, but it should only be attempted by someone with a sufficient skill level in PC operations. It is essential that you access ANALYST directly from DOS, not through a window-type program. Any such programs should be closed before attempting an upload from your dive computer.

NOTE: To obtain maximum usage of the new Analyst program, you will need a 3-button mouse configured into your Personal Computer system.

INSTALLATION OF THE ANALYST SOFTWARE TO THE PC

If you are comfortable with installing software and are familiar with the hardware configuration of your system, follow the instructions in the following section titled "**QUICK START**". Otherwise, please go to the "**DETAILED SOFTWARE INSTALLATION**" section.

QUICK START

1. Place the installation diskette into your Personal Computer's diskette drive.
2. Change to that diskette drive.
3. Type `INSTALL`, then press `<ENTER>`.
4. The installation program will guide you through the different options that need to be selected to properly install your software.

Having completed the installation process you are now ready to proceed to the section titled "**INSTALLATION OF THE DATA PROBE TO PERSONAL COMPUTER**".

DETAILED SOFTWARE INSTALLATION

To install the Analyst software on your Personal Computer (PC):

1. Power up the PC as usual. Most modern computers provide automatic loading of the DOS; however, if you are accustomed to "booting up" your computer before starting any work, you must also do so with the Analyst system.
2. Insert the Analyst software diskette into your diskette drive. (We will assume that this is drive **A**.)

To install the software, type:
A: and press `<ENTER>` Then type:
`INSTALL` and press `<ENTER>`.

The first screen that is displayed will inform you of the minimum hardware configuration required for the Analyst program to run. You also have the ability, by pressing the `<F1>` key to obtain help on how to select the different items on the screen.

When you are ready to continue with the installation select the **CONTINUE** option; otherwise select the **EXIT** option.

Next you are asked for the **Destination Directory** for the Analyst. The screen displays **C:\ANALYST**. The **C:** represents hard drive C. **ANALYST** is the name of the subdirectory which the Analyst program will create and in which the data will be placed. If you wish to use this default, press `<ENTER>`. Otherwise, enter the drive and/or subdirectory name you wish to use.

The next screen asks you to select the serial COM port to which the Analyst probe will be connected. The only options are COM1 and COM2. You can select the help button for more information on the COM port selection. Use the `-` and `=` keys to move between the two choices.

The next screen allows you to select the type of printer that you have attached to your Personal Computer system. Use the **-** and **=** keys to move between the selections until you are at the best match for your type of printer. Press **<ALT>** and **<C>** at the same time to continue to the next screen. If you need more information, press the help button **<F1>**.

The next screen will display the options that you have selected and give you the option of either running the Analyst program, redoing the installation, or exiting the program.

If you are still unsuccessful with the installation, please contact Cochran Undersea Technology at (214) 644.6284

INSTALLATION OF THE DATA PROBE TO THE PC

To install the Data Probe to your Personal Computer (PC), locate the COM (Serial) port on the back of your PC which corresponds to the one you selected during the software installation. Your PC owner's manual can assist you in its identification. Plug the Data Probe directly into the COM port and secure it to the computer.

NOTE: The Analyst interface will only function on COM1 or COM2.

WARNING: Do not attempt to connect the dive computer to any device other than a serial COM1 or COM2 port of a Personal Computer. The data probe has a 25-pin connector. Your Personal Computer COM1 or COM2 port may have a 9-pin connector instead of a 25 pin connector. In this situation, you will need to purchase a 25 to 9 pin adapter. Adapters are available at most computer stores. Many Personal Computers have a printer port with a connector that resembles the connector of the Analyst. Do not connect the Data Probe to the printer port, or any port other than a COM port. If you are not positive of the location of the COM port of your Personal Computer, refer to your PC owner's manual or contact a computer store for help in locating the proper connector. Do not attempt to connect the dive computer to a Personal Computer by any means other than with the Analyst Data Probe. Do not attempt to modify the connector of your Data Probe, other than to install an adapter.

Most NOTEBOOK or LAPTOP computers use a 9-pin sub-D connector. You must use an adapter to interface the Analyst to these computers. Adapters are available at most computer stores.

ATTACHING DATA PROBE TO DIVE COMPUTER

To install the Data Probe on the dive computer's Tank Unit:

1. Position the Tank Unit on a flat surface with its three clips facing upward.
2. With the probe's wire at the same end as the Tank Unit's high-pressure transducer wire, set the Data Probe's three metal sections on the Tank Unit's three clips and press down to "snap" the probe into place.

NOTE: It is important that the Data Probe is installed in the same direction as shown in FIG-21.

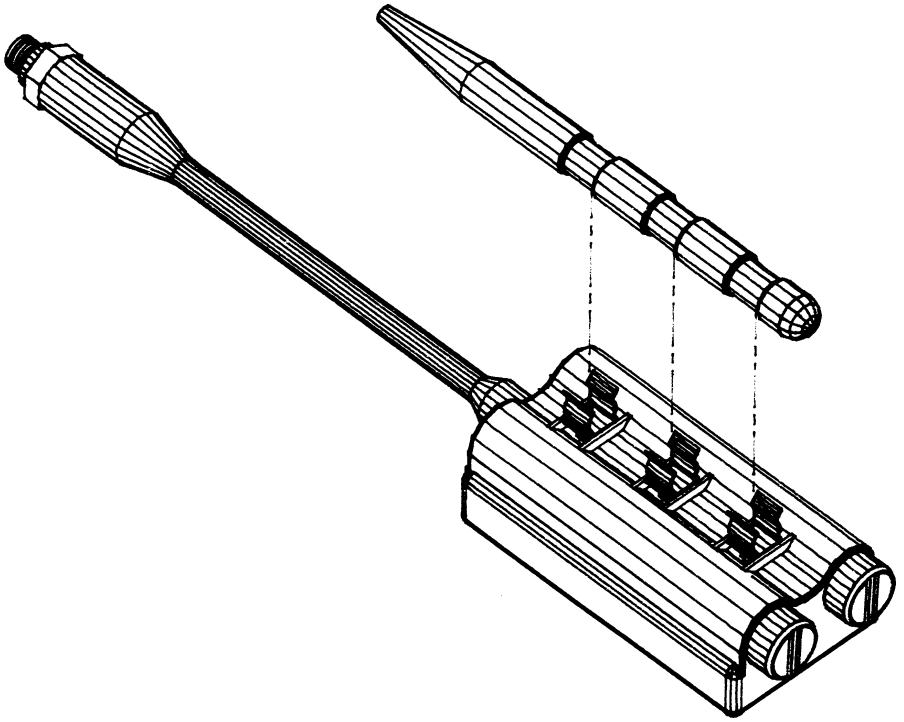


FIG-21

NOTE: Snapping the data probe onto the sport dive computer will often cause the dive computer to turn on, with resulting “beeps”. This is normal. It is NOT necessary for the dive computer to be on for data to be uploaded. However, do not start the upload while the dive computer is “beeping”.

KEYBOARD KEYS AND THEIR USAGE

The following list describes the keyboard key combinations and what function they perform.

- <ALT + B>** Converts the displayed data to METRIC with tank pressure converted to BAR
- <ALT + C>** Selects the CONFIGURATION menu
- <ALT + D>** In the CONFIGURATION mode, this will set the dive computer's date and time to the pc's data and time.
- <ALT + F>** Selects the FILE menu
- <ALT + I>** Converts the displayed data to IMPERIAL with tank pressure converted to p.s.i.
- <ALT + K>** Converts the displayed data to METRIC with tank pressure converted to Kg/cm²
- <ALT + L>** Selects the LOGBOOK menu
- <ALT + M>** Toggles the magnification of the bracketed area on the PROFILES display OFF and ON.
- <ALT + P>** Selects the PROFILES menu.
- <ALT + S>** Selects the STATISTICS menu
- <F9>** Toggles screen between monochrome and color.
- <F11>** Creates a Research File.
- <F12>** Appends to a Research File.
- ← or Ⓚ** Allows you to move left and right across the top bar menu selections. They also move you between fields in divers' logbook screen. On the PROFILE screens, these keys move the left vertical marker bar left or right.
- or -** Allows you to move up and down the top bar menu selections. Depending upon which screen you have displayed, this will also move you between dives, one dive at a time.
- <HOME>** This key takes you to the first dive stored.
- <END>** This key takes you to the last dive stored.
- ** In diverslog screen to delete data from one field only.
- <ENTER>** In diverslog screen to move forward to next field to enter data.
- <TAB>** In diverslog screen to move forward to next field to enter data
- <SHIFT + TAB>** In diverslog screen to move backward one field.
- <PAGE UP>** This key takes you forward ten dives.
- <PAGE DOWN>** This key takes you backward ten dives.
- <BS>** In the diverslog page to erase the previous character.
- <ESC>** Return the program to the previous menu.
- <ALT + ← or Ⓚ>** In the PROFILE screens, these keys move the right vertical marker bar left or right. In the Configuration Menu, this will allow you to select the desired setting.
- <ALT + DEL>** In diverslog page to clear all data from the current page and return the cursor to the first field on the screen.
- <ALT + - or - >** In the Configuration Menu, this allows you to move from option to option.
- <SHFT + PNT SCN>** Sends the displayed page to the printer.
- 0 - 9** Changes the smoothing effect on the profile screens with 0 being no smoothing and 9 being the most smoothing.

UPLOADING DIVE DATA

After the Data Probe is installed on the dive computer and the program is installed on the Personal Computer (PC), you are ready to upload dive data to a file on the PC. To do this from the C:\ANALYST> prompt, type:

ANALYST and press <ENTER>

NOTE: Once you are in the ANALYST program, you may press F1 at anytime for HELP. If you are requesting help for a specific Menu item, highlight the item and then press F1.

FILES

You will now need to open the **FILES** section to allow you to create, upload, or view your data files. .

To access the FILES section you can either use your mouse to select the menu option. When the FILES changes color from blue to red, depress and hold the left mouse button and drag the cursor "down" until the item you want to perform is selected, then release the left mouse button.

You may also access the FILES section by pressing on the keyboard <ALT + F>. Then use the up and down arrow keys to select the item you wish to perform.

Should you desire to **CREATE**, **UPLOAD**, or **VIEW** file information, the Analyst package will display a list of existing files that you may select from. DO NOT include the extension **.ANA** when you enter the filename.

Please enter name of new file to be created:

At this point, if you enter a file name (using up to eight characters or numbers) from the list of files displayed. The file name you create will correspond to one specific dive computer only. If data from more than one dive computer is going to be stored on your PC, you will need a unique name for each dive computer. You might incorporate the name of the dive computer's owner ("**TOMSF**ILE") or the Tank Unit SERIAL NUMBER ("**1234**FILE"). The program will automatically add the file extension of **.ANA**.

NOTE: The dive computer which first uploads data to a given file will be permanently associated with that file. You will not be able to upload from any other dive computer using that specific filename.

If you are uploading a filename which already exists, the PC will prepare to upload data from that dive computer, then prompt you to position the Data Probe on the dive computer and press any key to continue. The Analyst will create a back-up file to protect the previously stored data. This back-up file will be identified by the **.BAK** extension instead of **.ANA**.

While the data is being transferred, a counter will appear and begin rapidly counting upward. If this counter does not appear, or if it appears but does not increment after a few seconds, exit the program using the <ESC> key or you may select the FILES menu option and select EXIT to begin again.

If you have created a file and uploaded data to it for the first time, the program will go immediately to the main menu page after data is uploaded.

Note that once your dive computer's total storage capacity has been reached, the oldest data will be "pushed out" of its memory to make room for the most recent. However, your PC can continue to store new data indefinitely without losing the old.

NOTE: You may initiate an upload to a file, even when there have been no dives logged on the dive computer.

STATISTICS

You may select the STATISTICS section by using the mouse, as described in the FILES section, or you may use the keyboard by depressing **<ALT + S>**. The STATISTICS MENU screen will appear.

There are four different choices that you may choose from the STATISTICS menu. These are:

GENERAL
THIS DIVE
CONFIGURATION
COMPARTMENTS

GENERAL: Here you will find all of the long-term and historical data of your computer. The date of its manufacture, serial numbers, total dives, total decompression dives, total bottom time, total decompression time, etc. In addition, you will also see the current values for such information as battery voltage, time to fly, etc. Current data refers to the values calculated at the time of the uploading. For these reason, current data will change with each upload.

THIS DIVE: A wealth of information is available for each and every individual dives. Standard beginning and ending statistics are given as well as unique information such as displaying the fastest recorded rate of ascent (A/R), the time it occurred, and the depth at which it occurred. Also, the maximum calculated PPO2 level as well as the time and depth it occurred.

CONFIGURATION: The values calculated for the various breathing gases, responsiveness settings, any added conservatism settings, and much more are displayed in this section for each and every dive.

COMPARTMENTS: A three color bar graph is available for each of the twelve half-time compartments. Here you will be able to view at a glance the level of nitrogen loading for each dive. The GREEN bar represents the nitrogen values going into the dive. The PINK bar represents the ending nitrogen levels. The GRAY bar is beneficial for viewing the 'current' nitrogen level. As with the current section of the GENERAL section, this gray bar will change with each upload. This gray bar is extremely beneficial in viewing your relative level of off-gassing during a surface interval.

PROFILES

The PROFILES menu provides you with different profiles relating to your dive. These are:

- DEPTH / TANK PRESSURE
- DEPTH / BREATHING PARAMETER
- DEPTH / ASCENT RATE
- DEPTH / TEMPERATURE
- DEPTH / NITROX PPO2
- DEPTH / NITROX CNS%
- DEPTH / NITROX OTU%

The Depth graph will remain constant regardless of a selected profile screen for a particular dive with its scale displayed on the far left of the graph. This scale is auto-ranging in 25 foot increments. The maximum recorded depth of the dive will determine the scale. The second-by-second average of depth is displayed as a horizontal dark blue line.

The second piece of data, whether it be tank pressure, breathing parameter, etc., will be displayed in a light green with its scale displayed on the far right of the graph. Depending upon what data is being displayed, this scale will change to reflect the proper values. The average value of each of the secondary data profile displays is displayed as a dark green horizontal line.

Each of these graphs may have the jaggedness smoothed out by pressing the number 0 - 9 keys with 0 being no smoothing and 9 being maximum smoothing. You may also magnify a given area of the graph (see section titled MAGNIFICATION OF AN AREA for more information). On the bottom of the profile, you may see very short colored vertical lines. These lines refer to different warnings that the dive computer has posted. Should you move the left marker line over one of these little vertical lines the graphic screen informs you as to what type warning was issued.

At the bottom of each Profile you will see small vertical marks of various colors. Each mark represents either a warning that was issued during a dive or a mix switch that occurred during the dive. By using your mouse, you are able to move a marker into the display area. To do this, position the mouse pointer at the desired location of the graph and press the left mouse button. This marker is identified as the Left Marker. A white, vertical marker will appear. You can move this marker by holding the left mouse button down and moving the mouse to the new desired location. If you do not have a mouse, the arrow left and arrow right keys will accomplish the same task.

Once you have intersected a colored mark, the warning or mix switch will be identified at the bottom center of the screen as well as identifying the depth and secondary data readings calculated at the particular moment.

You also have the ability to move a Right Marker into the graph by pressing and holding down the right mouse button. It is controlled in the same manner as the Left Marker. If you do not have a mouse, the Alt+left arrow and Alt+right arrow will accomplish the same task.

You will note that at the bottom center section of the screen, the values intersected by each marker are identified as well as the difference between the two. LEFT is for the Left Marker, RIGHT is for the Right Marker, and DIFF is the difference between the two markers.

MAGNIFICATION OF AN AREA

To magnify a profile area, first bracket the area to be magnified with the Left and Right Markers. Place the mouse cursor in the vertical area of the graph that you want expanded. Depress and release the center mouse button. The graph will be magnified both horizontally and vertically to preserve the aspect ratio.

By depressing the center mouse button again, you will return the display as it was prior to the expansion selection.

NOTE: If you are using a two-button mouse, use ALT + M on your keyboard to magnify. The magnification feature is not available on the PO₂, CNS%, or OTU% profile screens. You may also use the <← or @> to move the Left Marker and <ALT + → or @> to move the Right Marker.

SMOOTHING

As you view the graphic profiles, you have the ability to view them in extremely fine detail or in a very "smoothed" detail. The greater the desired smoothing, the more generalized the profile. By pressing the numbers 0 through 9, you will be able to change the smoothing of the graph with 0 representing no smoothing, and 9 representing maximum smoothing.

Since Profiles are recorded at the sample rate specified, it is recommended that you use the finest sampling rate possible in order to improve the Profile's resolution. Your unit is set for four-second sampling at the factory. This provides 54 hours of Profile storage allowing you to record up to 54 hours of dive Profiles before the data is overwritten. However, you should view this Profile storage capacity as a "window" of time between uploads. As long as you upload your computer to the Analyst before the "window" of time expires, your data will be appended to the previous upload.

Therefore, we recommend setting the sampling rate for the finest resolution that will accommodate your diving style and preserve your dive Profiles. With 1-second sampling, you are given a "window" of 13.5 hours of storage. With each second you slow down the sampling rate, an additional "window" of 13.5 hours is available. This is the reason for the 54 hour window at four-second sampling. ($4 \times 13.5 = 54$).

You can change the sampling rate in the CONFIGURATION menu under the STANDARD option.

NOTE: Selecting a very rough sampling rate of 15 seconds may cause the warnings and mix switch data on the Profiles graphs to seem inaccurate. This is due to the lack of resolution. It is strongly recommended that you select a sampling rate of no greater than four seconds.

LOGBOOK

You may access this area by using the mouse as described in the FILES section, or you may depress <ALT + L> on the keyboard. This will display the options available on the LOGBOOK menu. Selecting any of the options will cause the logbook data entry screen to appear. You will find various HELP screens for this section available by pressing F1 on your keyboard.

CONFIGURATION

This is the area where you configure your dive computer to your personal preferences.

As in previous sections, you may use the mouse to select the configuration menu, or you may press <ALT + C> on the keyboard.

There are three options that you may select to configure your dive computer. These are:

STANDARD	This is where you configure the basic functions of your dive computer.
NDC COMPS	This is where you configure the NITROX and No-Decompression functions of your dive computer.
DISPLY & ALARM	This is where you configure the DISPLAY and ALARM functions of your dive computer.

Various HELP screens are available for each of these sections by pressing F1 once a selection is highlighted.

To make a change to your dive computer's configuration:

- 1) Move the mouse cursor to the desired option
- 2) Press the middle mouse button to highlight the option
- 3) Make the desired change for that option
- 4) Press ENTER to save the change

NOTE: If you do not have a 3-button mouse, use the <ALT + - or - > to highlight the desired option.

If you select another option prior to pressing ENTER, the change WILL NOT be saved.

There are two different types of data entry in each of the three configuration screens. You will be asked to either 'SELECT' or 'ENTER' the desired data.

If the option asks for you to 'SELECT', use either the right or left mouse button to toggle between the available selections for that particular configuration option.

If the option asks for you to 'ENTER' your choice, use the number pad to make the desired selection. In either case, remember to press ENTER before moving to the next configuration option.

NOTE: If you are not using a mouse, you move to the desired configuration option by using the <ALT + - or ^ > and using the <ALT + ~ or @ > to toggle between the available selections.

PRINTING

This program's BATCH file contains the DOS print command:

GRAPHICS GRAPHICS

During the installation of this program, you were asked to select a compatible printer option. If you changed printers, reinstall the program and make the desired changes.

For optimum printing quality, you should first change your display to black and white prior to printing. You can toggle between black and white or color by pressing the **F10** key on your keypad.

To print a screen, press <SHIFT + PRINT SCREEN>. The displayed screen will be printed. To print additional screens, simply repeat this process.

NOTE: GRAPHICS is a DOS function that is captured by the Analyst batch file.

DAN RESEARCH FILE

This function allows the user to create a file that is compatible with the Diver's Alert Network's Project Dive Safety software package. The interval at which this data is recorded is based upon the selected sampling rate which can be as frequent as once per second. To create these files and store their date, you must:

1. Display any of the Profile screens such as Depth/Tank Pressure
2. Depress the <F11> key of your keyboard.

The filename created will consist of the Tank Unit's serial number with the extension of .NEM. For example, if your Tank Unit contains the serial number 20194, your DAN research filename would be 20194.NEM.

After each series of dives, you can continue to append to the existing .NEM file by pressing <F12>.

By submitting your research files to DAN, you will be assisting in the development of future decompression algorithms. To obtain additional information regarding this program, contact:

Research Dive Team Co-ordinator
Cochran Undersea Technology
1758 Firman Drive
Richardson, Texas 75081
P 214.644.6284
F 214.644.6286

EXPLANATION OF TERMS

GENERAL STATISTICS

Tank Unit Serial Number: This identifies the entire serial number of your Tank Unit.

Wrist Unit Serial Number: This identifies the entire serial number of your Wrist Unit.

File Originated On: This is the creation date of your filename.

File Last Updated On: This is the date of your last upload to this program.

Manufacture Date: This is the date your computer was manufactured.

Calibration Date: This is the date your computer was last calibrated.

Configuration: This information is needed should you request service.

Analyst Com Port: This identifies the selected Serial Port for your data probe.

Total # of Dives: This identifies the total dives recorded by your computer.

Total Dive Hours: This identifies the total bottom time recorded by your computer.

Total Decompr. Dives: This identifies the total number of dives made that entered decompression.

Total Decompr. Time: This identifies the total time spent in decompression.

Total # of Warnings: This identifies the total number of warnings issued to date by your computer.

Total Marginal Dives: This identifies the total number of marginal dives recorded by your computer.

Total Violated Dives: This identifies the total number of violated dives recorded by your computer.

The 'Current' Dive Computer Status data displays the recorded values of your dive computer at the time of the last upload.

BEGINNING STATISTICS

Altitude: This is the surface altitude of the dive rounded to the nearest 1,000 feet above sea level.

Surface Interval: This is the time between dives on a single dive day, show in hours and minutes. On dive number 1 of any particular dive day, the surface interval displays the elapsed time from when you turned-on your dive computer until the dive is initiated.

Tank Pressure: This is the beginning tank pressure

Breathing Parameter: This is the beginning breathing parameter.

Battery Voltage: This is the voltage of the Tank Unit batteries at the beginning of the dive.

Time-To-Fly: This is the remaining wait time before flying, as of the beginning of the dive, shown in hours and minutes.

Dive O2 CNS Dose: This is the beginning percentage of CNS Oxygen Toxicity.

Mission O2 OTU Dose: This is the beginning percentage of Mission OTU Dose Oxygen Toxicity.

OTU Mission Clock: This is the running Mission OTU Clock at the beginning of the dive.

ENDING STATISTICS

Maximum Depth: This is the maximum depth reached during the dive.

Bottom Time: This is the total bottom time of the dive. Bottom time begins once you have descended below five feet and continues until you ascend above three feet.

Tank Pressure: This is the ending tank pressure recorded for the dive.

Breathing Parameter: This is the ending Breathing Parameter for the dive.

Min Battery Voltage: This is the minimum recorded battery voltage of the dive.

Time-To-Fly: This is the wait time before flying, shown in hours and minutes, after the dive.

Dive O2 CNS Dose: This is the ending percentage of CNS Oxygen Toxicity.

Mission O2 OTU Dose: This is the ending percentage of Mission OTU Dose Oxygen Toxicity.

OTU Mission Clock: This is the running Mission OTU Clock at the end of the dive.

ADDITIONAL ENDING DIVE INFORMATION

Min Remain Air Time: This is the minimum remaining air time recorded during the dive, shown in hours and minutes.

Min Remain NDC Time: This is the minimum remaining no-decompression time recorded during the dive, shown in hours and minutes.

Average Depth: This is the true average depth of the dive.

NOTE: Your dive computer derives true average depth, temperature, and breathing parameter by including all depth, temperature, and breathing parameter samples into the calculation, not just the minimum and maximum samples.

Missed Deco. Time: This is the remaining decompression time after the dive, shown in hours and minutes. It should read 0:00 on all no-decompression dives and all emergency decompression dives where the required decompression stops were completed. Should you omit any decompression stop time, the remaining omitted time will be displayed here.

Maximum Deco. Time: This is the maximum amount of time you spent in emergency decompression, shown in hours and minutes.

Missed Ceiling: This is the deepest stop not satisfied while you were in decompression. As with Missed Deco Time, this should be "0" on all decompression dives where the required decompression stops were completed.

Maximum Ceiling: This is the deepest ceiling that was required for decompression during the dive.

This Dive's Warnings: This is the total number of warnings that were issued by the computer during the dive.

Tank Size: This the total volume of the tank(s) that you entered for this dive, to be used in workload calculations.

Sea/Fresh Water: This identifies they type of water in which the dive was made.

Maximum Ascent Rate: This is the fastest ascent rate recorded during the dive.

Maximum A/R Depth: This is the depth at which the maximum ascent rate occurred.

Maximum A/R Bot.Time: This is the bottom time recorded when the maximum ascent rate occurred.

Minimum Temperature: This is the coldest water temperature recorded during the dive.

Average Temperature: This is the true average water temperature calculated for the total dive.

Maximum Temperature: This is the warmest water temperature recorded during the dive.

Avg Breath Parameter: This is the average breathing parameter for the dive.

Max Breath Parameter: This is the maximum breathing parameter calculated during the dive.

O2 Mix Switch Depth: This is the depth recorded at the time of the switching to Mix 2.

O2 Mix Switch B. Time: This is the bottom time recorded at the time of the switching to Mix 2.

Maximum PO2: This is the largest PO2 level recorded during the dive.

CONFIGURATION

STANDARD

Dive Time/date Stamp: This is the internal clock setting that is used to timestamp each individual dive. The time displayed is the recorded time when you began the current uploading of your dive computer. To change the setting of the clock, highlight this option and press <ALT + D>. The program will now set your dive computer's clock to your Personal Computer's internal clock. If you want to change it from this setting, use the <BACKSPACE> key to erase the setting and enter the desired setting. This manual entering of the DATE and TIME STAMP must follow the same format by entering day/month/year and then time in hours/minutes/seconds. Press <ENTER> to save the setting.

Displayed Measurement Units: This identifies whether you dive computer is programmed to display tank pressure, depth and temperature measurements in metric or imperial units. Use the left or right mouse button to toggle between the two choices. When the desired setting is displayed, press <ENTER>.

Tank Pressure Metric Measurement Units: If your computer is set to display in the metric mode, you may select either BAR or kg/cm² to determine the units in which pressure is displayed. Use the left or right mouse button to toggle between the two choices. When the desired setting is displayed, press <ENTER>.

Profile Store Period: This selection determines the resolution in which your dive profiles are created. You may select from 1 second to 30 second resolution. For each 1 second of profile store period, you gain 13 hours of profile storage space (bottom time). As long as you upload to this program within the profile storage space, the Analyst will append or "add" to the previous profiles. It is recommended that you select the highest resolution profile store period that will provide ample time between uploads. To make this entry, highlight this option with the middle mouse button and using the keyboard, enter the desired profile store period and press <ENTER>.

Logbook Viewing Time: This option will allow you to select the number of seconds each logbook display is shown before time-out. To change this "timer", use your PC's numeric keypad to enter the desired number of seconds, from 10 to 60 and press <ENTER>.

PreDive Planning Maximum Depth: This option allows you to enter the maximum depth that will be predicted during the PreDive Prediction Mode. You may enter this maximum depth in 10 foot increments from 30 to 320 feet. To make this entry, highlight this option with the middle mouse button and using the keyboard, enter the desired setting and press <ENTER>.

Enter Wrist Unit Serial Number: This option allows you to program your Tank Unit to communicate with a different Wrist Unit. The Tank Unit can only communicate with one Wrist Unit at a time. Once you have changed this serial number, the previous Wrist Unit will no longer receive the data being transmitted by the Tank Unit.

NCD COMPS

Select Altitude <2000 feet as One Zone: From the factory, your unit is set to sense altitude seamless from sea level to 15,000 feet above sea level. What this provides is the "actual" altitude for any given day at any diving location. With weather movements, it is possible, even expected, to have a different altitude at the same dive site from day to day. While the seamless means of monitoring provides the most accurate decompression schedule, you may select to have all altitudes less than 2000 feet above sea level treated in the algorithm as sea level. With this option OFF, the unit is calculating altitude in a seamless fashion. With this option ON, all altitudes less than 2000 feet above sea level will be treated as sea level. Regardless of the selection, altitudes greater than 2000 feet above sea level will be treated in a seamless manner.

Enter Nitrogen Computation Conservatism: This options allows you to enter an added degree of conservatism to the computer's algorithm. The percentage will affect Equivalent Air Depth. For example, if you select 10% conservatism and make a dive to 100 feet, the no-decompression algorithm will calculate for a depth of 110 feet or 10% deeper than actual depth. To make this entry, highlight this option with the middle mouse button and using the keyboard, enter the desired setting and press <ENTER>.

Select Temperature Dependent Nitrogen: This option allows you to enable or disable the temperature compensation in the computer's algorithm. You may wish to disable this function if you were diving in a dry suit. Use the left or right mouse button to toggle between the two choices. When the desired setting is displayed, press <ENTER>.

Select Workload Dependent Nitrogen: This option allows you to enable or disable the workload compensation in the computer's algorithm. Use the left or right mouse button to toggle between the two choices. When the desired setting is displayed, press <ENTER>.

Select Decompression Time Display: You are given three options for the manner in which your decompression time is displayed. If you select TOTAL, the decompression time displayed will indicate the total time you will spend in decompression. You should watch the Ceiling depth change in order to identify when to ascend to the next stop depth. If you select STOP, the decompression time displayed will indicate the time you must remain at the current Ceiling. When this time is 0:00, the Ceiling depth will decrease and the new stop time will be displayed. If you select BOTH, the TOTAL time and STOP time will alternate at the rate of once every 2 seconds. Use the left or right mouse button to toggle between the two choices. When the desired setting is displayed, press <ENTER>.

Enter Blend #1 Cylinder Size: This is the TOTAL volume of all connected diving cylinders. If you are diving with twin ten-liter tanks, you would enter 20 for this option. If you select zero, the dive computer defaults to a tank size of 10 liters. To make this entry, highlight this option with the middle mouse button and using the keyboard, enter the desired setting and press <ENTER>.

Select NITROX computations: This option enables and disables NITROX computations. If this option is disabled, mixtures greater than 21.0% oxygen will be disallowed. The factory setting for this option is ON.

Select Field Programmer option: This option enables and disables the ability to use your computer with the Field Programmer. Use the left or right mouse button to toggle between the two choices. When the desired setting is displayed, press <ENTER>.

Select NITROX Blend #2 Switching: This option enables your unit to switch to Blend #2. This option is enabled at the factory.

Select NITROX Blend #3 Switching: This option enables your unit to switch to Blend #3. This option is enabled at the factory.

Select Blend Switching back to #1: This option allows the algorithm to switch back to Blend #1 should you begin to breathe off your bottom mix during ascent to the next decompression ceiling. You may choose to disable this option if you will be using your bottom mix cylinder for filling of lift bags at the end of your dive.

Enter Blend #1 Oxygen % in NITROX mixture: This option allows you to enter the desired oxygen percentage for Mix 1 in 0.01 percent increments. To make this entry, highlight this option with the middle mouse button and using the keyboard, enter the desired setting and press <ENTER>.

Enter Blend #2 Oxygen % in NITROX mixture: This option allows you to enter the desired oxygen percentage for Mix 2 in 0.01 percent increments. To make this entry, highlight this option with the middle mouse button and using the keyboard, enter the desired setting and press <ENTER>.

Enter Blend #3 Oxygen % in NITROX mixture: This option allows you to enter the desired oxygen percentage for Mix 3 in 0.01 percent increments. To make this entry, highlight this option with the middle mouse button and using the keyboard, enter the desired setting and press <ENTER>.

Enter Blend #3 BottomTime activation minutes: Here, you will enter the bottom time benchmark for switching to Blend #3.

Enter Blend #3 Ascent Depth activation feet: Here, you will enter the depth benchmark which you will need to be above for switching to Blend #3.

DISPLAY & ALARM

Select One-half Tank Pressure Alarm: This option enables or disables the one-half tank pressure alarm. Use the left or right mouse button to toggle between the two choices. When the desired setting is displayed, press <ENTER>.

Select Breathing Parameter Alarm: This option enables or disables the breathing parameter alarm. Use the left or right mouse button to toggle between the two choices. When the desired setting is displayed, press <ENTER>.

Enter Breathing Parameter Alarm Lower Limit: If you have enabled the breathing parameter alarm, you will need to set the lower limit below which the alarm will sound. To make this entry, highlight this option with the middle mouse button and using the keyboard, enter the desired setting and press <ENTER>.

Enter Breathing Parameter Alarm Upper Limit: This option sets the upper limit above which the breathing parameter alarm will sound. To make this entry, highlight this option with the middle mouse button and using the keyboard, enter the desired setting and press <ENTER>.

Select Depth Alarm: This option enables or disables the depth alarm. Use the left or right mouse button to toggle between the two choices. When the desired setting is displayed, press <ENTER>.

Select Type of Ascent Rate: This option allows you to select either a fixed ascent rate, or a variable ascent rate. The variable selection will allow a maximum ascent rate of 60 feet per minute at depth greater than 60 feet, 30 feet per minute at depths shallower than 30 feet, and allow an ascent rate equal to the depth for depths between 59 to 31 feet.

Enter Fixed Ascent Rate Alarm Limit: This option allows you to enter the maximum ascent rate desired before the ascent rate alarm sounds. To make this entry, highlight this option with the middle mouse button and using the keyboard, enter the desired setting and press <ENTER>.

Select Ascent Rate Bar Graph: This option determines whether you wish the bar graph to indicate the speed of ascent or the percentage of the selected maximum ascent rate. Use the left or right mouse button to toggle between the two choices. When the desired setting is displayed, press <ENTER>.

Max PPO2 Alarm: This option allows you to set a desired maximum PPO2 level from 0.5 to 1.6 ATA. Use the keypad to enter the desired setting and press <ENTER>.

Select Breathing Parameter Units: You may now choose whether you wish to have your breathing parameter displayed in psi per minute or litres per minute.

Enter Ascent Rate Response: This option allows you to tailor the ascent rate responsiveness. You are given eight different levels of responsiveness. If you find that the ascent rate alarms sounds too easily for your style of diving, you can "slow down" the sensitivity by selecting a larger number such as 5 or 6. If you wish for a very responsive ascent rate alarm, you should select 0 to 3. To make this entry, highlight this option with the middle mouse button and using the keyboard, enter the desired setting and press <ENTER>.

Enter Breathing Parameter Response: As with the Ascent Rate Response option, this option relates to the Breathing Parameter Alarm. To make this entry, highlight this option with the middle mouse button and using the keyboard, enter the desired setting and press <ENTER>.

Enter Remaining Time Response: This option determines the responsiveness of the displayed remaining no-decompression time. If you wish to have you data "immediately" updated, you should select a setting from 0 to 3. This setting is suggested for deep, technical diving which usually accompanies fast descent rates. For recreational diving, a slower responsiveness is suggested. This will prevent large changes in the remaining no-decompression times while hovering in open water at very shallow depths. To make this entry, highlight this option with the middle mouse button and using the keyboard, enter the desired setting and press **<ENTER>**.

