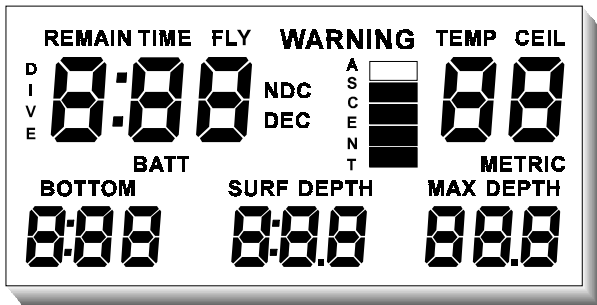


COMMANDER™



Owner's Manual

IMPERIAL



Cochran

UNDERSEA TECHNOLOGY
A Division of Cochran Consulting, Inc.

Diving Into The 21st Century

pn 13112
revised 070195

LIMITED TWO YEAR WARRANTY

To the original owner only, Cochran Undersea Technology, a division of Cochran Consulting, Inc., guarantees the COMMANDER™ to be free of defects in both materials and craftsmanship under normal SCUBA use for two years from the date of purchase. Failing to provide proper care, which includes having an Annual Maintenance performed, 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 transferrable. All correspondence concerning this warranty MUST be accompanied by a photocopy of the original sales receipt and proof of an Annual Maintenance, if applicable.

Your warranty registration card must be returned to the Cochran Undersea Technology Warranty Center within 15 days of the purchase date. Failing to do so will cause this warranty to be null and void. The purchase date recorded on your warranty registration form and the date on the original sales receipt must also match. Charges for the Annual Maintenance are not covered under this warranty. The Annual Maintenance includes accuracy verification of the depth sensor, overall calibration and overall performance. You may return your COMMANDER™ to the place of purchase to have this maintenance performed, or you may ship your unit directly to the Cochran Undersea Technology Warranty Center.

LIMITATIONS

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 performed to this unit 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 LIABILITY

A mathematical model is used by the COMMANDER™ 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. The COMMANDER™

should be used solely as a guide, providing the trained and certified diver the information needed to make a safe diving decision. It is expressly understood that by buying and/or using the COMMANDER™, 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 fully supports recognized certification agencies that set the maximum limit for recreational SCUBA diving at 130 feet. Cochran Undersea Technology in no way encourages diving deeper than this limit. Also, the COMMANDER™ should NEVER BE USED when diving with any mixed gases other than pure, dry, filtered compressed air. You should always adhere to safe diving practices which includes, but are not limited to, always using the buddy system, diving within your own limitations, and making only dives that do not require decompression.

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FCC LABEL

FCC ID: LYP744556-03

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 the limits for a Class B digital device. 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.

USER INFORMATION

For your records, Cochran Undersea Technology recommends that you fill in the following information.

SERIAL NUMBER OF UNIT: _____

DATE OF PURCHASE: _____

PLACE OF PURCHASE: _____

Activation

The COMMANDER™ automatically turns on when it is submerged in water. The COMMANDER™ may also be powered up by wetting two fingers and touching the middle and lower metal contacts on its side. Once turned on, the COMMANDER™ will remain on for 30 minutes . If a dive is not initiated within this 30 minutes, the COMMANDER™ automatically shuts off.

NOTE: The COMMANDER™ will not turn on if the altitude is greater than 15,000 feet or if the depth is greater than three feet.

After a dive, the COMMANDER™ remains on for 30 minutes or until all twelve half-time compartments reach their normal levels, depending on which takes longer.

NOTE: The 30 minute period will be renewed with each touching of the middle and lower metal contacts.

The COMMANDER™ has seven main modes; the Self-Diagnostic Mode, the Pre-dive Prediction Mode, the Surface Mode, the Subsurface Mode, the Decompression Mode, the Logbook Mode, and the Gauge Mode.

Self-Diagnostic Mode

During the activation sequence, the COMMANDER™ will complete its Self-Diagnostic Mode. During this mode, all segments of the LCD display will illuminate. (FIG-1)

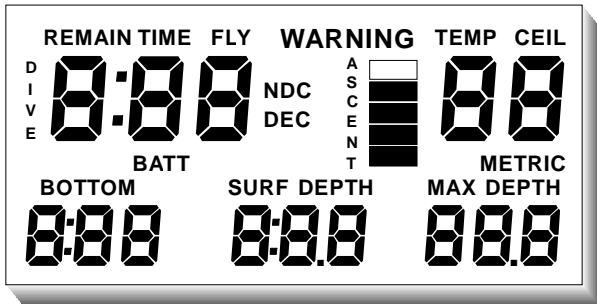


FIG-1 Self-Diagnostic Display

Altitude Adaptation

Your COMMANDER™ will provide you with the adaptation time required to eliminate additional residual nitrogen that becomes present due to a significant change in altitude. If no dive is initiated, the display will appear as in FIG-2.

After a dive, the normal Surface Mode Display will be shown. Any significant change in altitude that occurs after a dive will be indicated by a change in the Time-To-Fly information. As you increase altitude, your Time-To-Fly will also increase.

FIG-2 Illustrates:

Dive Number	0
Time-To-Fly	5 hours
Air Temperature	69 degrees
Previous Dive Bottom Time	30 minutes
Current Surface Interval	08 minutes
Previous Dive Maximum Depth	62 feet

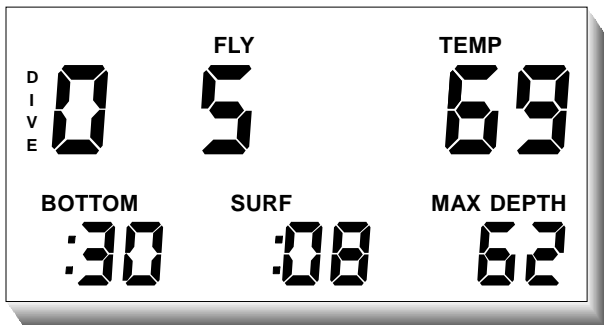


FIG-2 Altitude Adaptation Display

Surface Mode

The Surface Mode is entered after the COMMANDER™ successfully completes its Self-Diagnostic Mode. In this mode, current Surface Time, the previous dive's Maximum Depth, and the previous dive's Bottom Time are displayed.

FIG-3 illustrates:

Dive Number	0
Time-To-Fly	0 hours
Temperature	69 degrees
Bottom Time	39 minutes
Surface Interval	08 minutes
Maximum Depth	62 feet

Post Dive Interval

During the first ten minutes after a dive, the COMMANDER™ is in the Post Dive Interval. This is indicated by the "SURF" legend flashing. Should another dive be commenced before the completion of the Post Dive Interval, that dive will be considered an extension of the previous dive.

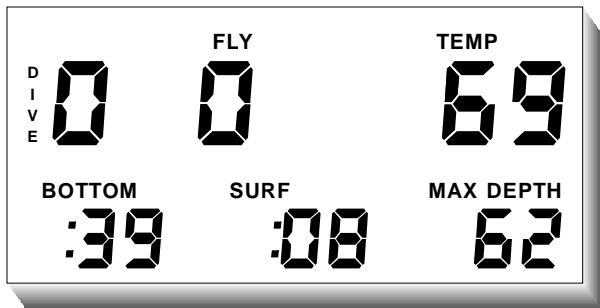


FIG-3 Surface Mode

Predive Prediction Mode

After one minute of surface time has elapsed, the COMMANDER™ will automatically enter the Predive Prediction Mode. During this mode, predictions of no-decompression limits will be made in ten foot increments beginning with 30 feet and continuing to 160 feet or to a depth at which a minimum of two minutes of no-decompression time is allowed. Current Surface Temperature and Battery Voltage are also displayed. Altitude is indicated in five ranges via the Ascent Rate Bar Graph as follows:

0 Bars	sea level	to	2000 feet
1 Bar	2000	to	4000 feet
2 Bars	4000	to	6000 feet
3 Bars	6000	to	8000 feet
4 Bars	8000	to	10000 feet
5 Bars	greater than		10000 feet

NOTE: Altitude compensation is seamless from sea level to 15,000 feet above sea level. The five ranges are for display purposes only. FIG-4 illustrates:

NDC Time	1 hour 18 minutes
Temperature	74 degrees
Depth	50 feet
Battery Voltage	32 (3.2 Volts)

NOTE: If a low battery condition is detected, then the word "BATT" will be illuminated. Also, the optional ANALYST interface will allow the user to set the maximum limit for which Predive Planning will be made.

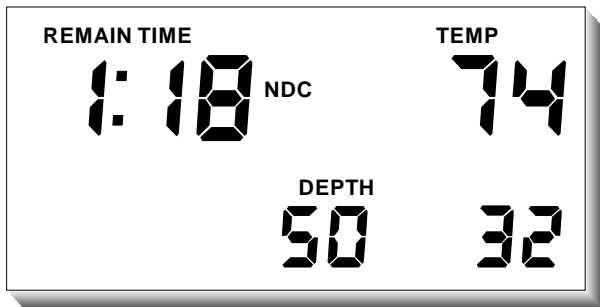


FIG-4 Prediver Prediction Mode

Logbook Mode

To enter the Logbook Mode, the COMMANDER™ must be in the Surface Mode. Touching the middle and lower contact will cause your unit to enter the Logbook Mode. During this mode, the diver will be able to view the past 100 dives. The most recent dive will be displayed first. Information contained on each log will include Overall Dive Number, Minimum Water Temperature for that particular dive, Maximum Depth, Bottom Time, Surface Interval between dives, and Fastest Rate of Ascent. Each log will be displayed for 30 seconds before returning to the Surface Mode. To see the next dive, hold the contacts for three seconds which will cause the unit to display the next dive log. Via the optional ANALYST Personal Computer Interface, you can set the Logbook Mode "time-out" timer from 10 to 60 seconds in one-second increments.

FIG-5 illustrates:

Dive Number	215
Fastest Rate of Ascent	20 to 29 feet per minute
Minimum Water Temperature	69 degrees
Bottom Time	39 minutes
Surface Interval	1 hour 8 minutes
Maximum Depth	62 feet

NOTE: The overall Dive Number allows you to immediately identify the total number of dives you have made with your COMMANDER™ . If the logbook example shown in FIG-5 was the most recent dive made, you would be able to identify that you had made 215 dives with your COMMANDER™ plus be able to view an additional 99 dive summaries.

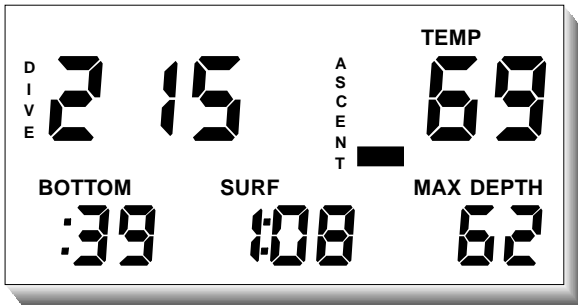


FIG-5 Logbook Mode

Subsurface Mode

Whether in the Surface Mode, Pre-dive Prediction Mode, or the Logbook Mode, the COMMANDER™ will automatically enter the Subsurface Mode whenever the unit determines that it is in water deeper than five feet.

The Surface Time will be replaced with Current Depth.

The Current Depth while in the Subsurface Mode will be displayed in one foot increments up to a maximum depth of 328 feet.*

Bottom Time will begin once the COMMANDER™ senses that the diver has descended below five feet and continue until the diver has ascended above three feet. The maximum Bottom Time displayed will be 9 hours 59 minutes.

FIG-6 illustrates:

Remaining NDC Time	18 minutes
Ascent Rate	less than 10 feet per minute
Water Temperature	49 degrees
Bottom Time	16 minutes
Current Depth	30 feet
Maximum Depth	131 feet*

***While the COMMANDER™ is capable of operating at depths down to 328 feet,** Cochran Undersea Technology fully supports recognized certification agencies that set the maximum limit for recreational SCUBA diving at 130 feet. Cochran Undersea Technology in no way encourages diving deeper than this limit.

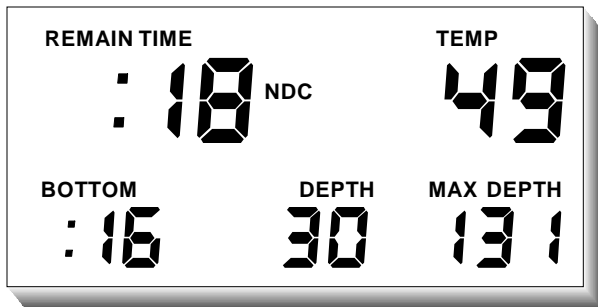


FIG-6 Subsurface Mode Display

Ascent Rate Bar Graph







This graph displays the diver's rate of ascent. This rate of ascent is a "moving" average of the preceding four seconds' change in depth.

If the diver has an ascent rate of less than 10 feet per minute, no bars will be illuminated. If the diver has an ascent rate of more than 60 feet per minute, the entire Ascent Rate Bar Graph will flash and the WARNING LEGEND will illuminate.

The Ascent Rate Bar Graph illustration shows the ascent rates and the number of bars shown for that rate.

**GREATER THAN 60 FEET
PER MINUTE WARNING AND
TOP BAR OF GRAPH WILL FLASH**

WARNING

A		50 TO 60 FEET PER MINUTE
S		40 TO 49 FEET PER MINUTE
C		30 TO 39 FEET PER MINUTE
E		20 TO 29 FEET PER MINUTE
N		10 TO 19 FEET PER MINUTE
T		10 TO 19 FEET PER MINUTE

Ascent Rate Bar Graph Display

Decompression Mode

Should a diver mistakenly overstay a no-decompression limit, the COMMANDER™ will enter the Decompression Mode. In this mode, the CEILING digits will display the depth at which the diver must stop and not ascend above during final ascent. The first ceiling will be at 10 feet and continue in ten foot increments to a maximum of 60 feet.

The remaining no-decompression time will be replaced with decompression time. Both **STOP** time and **TOTAL** time are displayed using the same set of digits. **STOP** and **TOTAL** time will alternate at the rate of once every two seconds. In this way, you will be able to view not only the time you must spend at a particular **STOP** depth, but also the **TOTAL** time it will take for you to complete all **STOPs** and surface.

Should a diver be at a depth shallower than the required decompression ceiling, the depth and ceiling digits will flash as a visual warning. This warning will continue until the diver has corrected the depth.

FIG-7 illustrates:

Remaining Time at Stop	12	minutes
Ceiling Stop	20	feet
Bottom Time	28	minutes
Depth	20	feet
Maximum Depth	126	feet

NOTE: COCHRAN UNDERSEA TECHNOLOGY DOES NOT INTEND THAT THIS INSTRUMENT BE USED FOR DELIBERATE DECOMPRESSION DIVING.

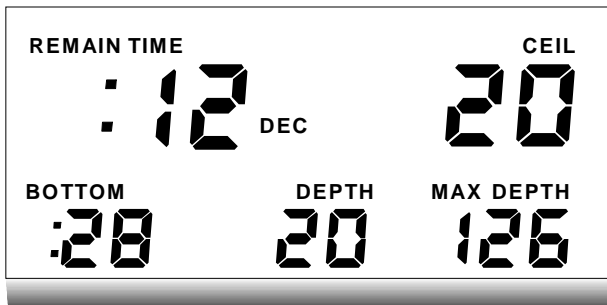


FIG-7 Decompression Mode Display

Gauge Mode

Should the diver violate the design limitations of the the COMMANDER™, the unit will enter Gauge Mode. While in this mode, the only data that will be displayed is Depth, Max Depth, Ascent Rate, Temperature, and Bottom Time.

The conditions which will **violate** the COMMANDER™ are:

A dive deeper than 328 feet is performed.

An emergency decompression ceiling of greater than 90 feet is calculated.

A diver is above a required ceiling depth for more than five minutes.

Once the COMMANDER™ has entered Gauge Mode, it will remain in that mode for 24 hours. After the diver has been on the surface for one hour, the COMMANDER™ will enter a "sleep" condition. To see how much time is remaining before the COMMANDER™ exits Gauge Mode, turn the COMMANDER™ back on and look at the Time to Fly digits.

FIG-8 illustrates:

Ascent Rate	40 to 49 feet per minute
Temperature	38 degrees
Bottom Time	58 minutes
Current Depth	126 feet
Maximum depth	328 feet

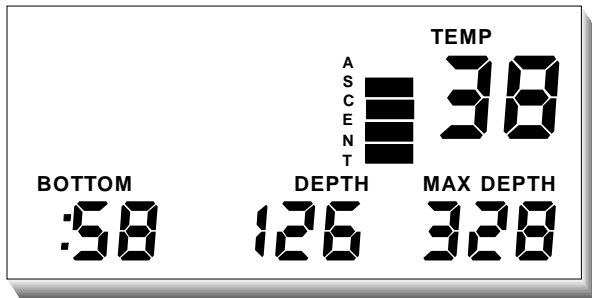


FIG-8 Gauge Mode Display

CARE AND MAINTENANCE

Rinsing and Cleaning

Your dive computer is designed to require minimum care and maintenance. The computer's case is molded from fiberglass reinforced resins that are extremely resistant to salt, chlorine, and exposure to ultraviolet light. However, the computer contains sophisticated electronic components and therefore, require reasonable care and treatment.

- Avoid sharp impacts to the unit.

- Do not exposure the unit to extreme heat or cold.

- Replace batteries when they become discharged, or once a year, whichever occurs first.

- Rinse the unit with fresh water and allow it to air-dry after each use. Take special care when rinsing the opening for the low pressure transducer. **DO NOT** attempt to clean this area with a pointed object. Doing so will cause severe damage to your computer, renering it Inoperable.

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. Care should be taken to prevent your lens from becoming scratched or damaged. Minor scratches will become invisible underwater. However, severe gouges or cracks in the lens will require that it be replaced.

Battery Life and Replacement

Your dive computer operates on two alkaline 'N' batteries. We recommend using only high quality alkaline batteries. Other types of batteries (such as Lithium and Nickel Cadmium) may permanently damage the unit and void the warranty. Use of old, off-brand, incorrect, and/or visibly corroded batteries will also affect performance, damage the unit, and void the warranty.

Two fresh 'N' alkaline batteries should provide over 800 hours of normal sport diving use, or one year, whichever occurs first. However, there are factors which can significantly vary battery operating life. These include:

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

Fresh batteries installed in the unit will read 3 volts. At 2.4 volts, the low battery indicator is shown. At 2.2 volts, your unit will not turn on.

You will have approximately 30 seconds to replace the batteries in your unit without losing your current and historical dive data. Prior to removing the battery cap, you should have the replacement batteries at hand and note the correct polarity for insertion.

WARNING: If for some reason you are unable to install the replacement batteries within in 30 seconds, you will lose current nitrogen loading values as well as ALL PREVIOUSLY LOGGED DIVES.

CAUTION: When re-insatlling the battery cap, care should be taken to ensure that there is no dirt or debris on the o-rings and that the o-rings are properly installed. As you seat the battery cap, you should also take care that the double o-rings install correctly.

Repair

Should your COMMANDER™ require maintenance, you will need to return it to the place of purchase, or you may send it directly to Cochran Undersea Technology.

If you elect to return your COMMANDER™ directly to Cochran Undersea Technology please follow the following steps.

1. Call 214.644.6284 to obtain a Return Material Authorization (RMA) number.
2. Carefully pack and return your unit freight prepaid including all associated fees for customs and duties to:

COCHRAN UNDERSEA TECHNOLOGY
WARRANTY REPAIR CENTER
1758 FIRMAN DRIVE
RICHARDSON, TEXAS 75081 U.S.A.

3. Indicate the RMA number on the outside of the shipping box.

SPECIFICATIONS

Activation	Water
Maximum depth	328 feet 1 foot increments 0 to 99.9 meters 1/10 meter increments
Altitude	0 to 15,000 feet seamlessly
Temperature	0 to 99 degrees Fahrenheit 1 degree increments 0 to 37 degrees Centigrade 1 degree increments
Surface Time	0 to 9:59 hours/minutes 1 minute increments
Bottom Time	0 to 9:59 hours/minutes 1 minute increments
Time To Fly	0 to 48 hours 1 hour increments
Ceiling	0 to 60 feet 10 foot increments
Battery Life	Over 800 dive hours or 1 year

REPLACEMENT PARTS

BATTERIES

O-RING

1.5 VDC ALKALINE 'N' CELLS (2)

PART NUMBER 19930

USER CONFIGURABLE ITEMS

By using the optional ANALYST Personal Computer Interface, the user has the ability to change the following items:

TEMPERATURE DEPENDENT NDC COMPUTATIONS (OFF/ON):

This feature will compensate the decompression algorithm proportional to the ambient water temperature if the water temperature is below 75 degrees F (24.9 degrees C).

SELECTABLE NDC CONSERVATISM (0 to 50%): This feature will allow the diver to input an added degree of conservatism to the decompression algorithm from 0 to 50 percent in one-percent increments.

SELECTABLE ASCENT RATE: This option gives the diver the ability to utilize a fixed ascent rate warning or a warning based on depth. Should the diver utilize the fixed ascent rate warning, the diver can select the maximum ascent rate limit in one-foot increments from 20 to 60 feet per minute. If the VARIABLE rate is selected then the warning will illuminate based on the following table:

DEPTH	AVERAGE ASCENT RATE (Feet per Minute)
61 feet or more	60
31 ft to 60 feet	45
0 to 30 feet	30

SELECTABLE LOGBOOK DWELL TIME (10 to 60 seconds): This feature allows the diver to determine how long (in seconds) a particular dive's logbook is displayed.

ASCENT RATE RESPONSIVENESS (0 to 7): This option determines the responsiveness of the Ascent Rate Bar Graph.

REMAINING TIME RESPONSIVENESS (0 to 7): This determines the responsiveness of the Remaining Time information that is displayed.

METRIC or IMPERIAL DISPLAY: The diver may select whether the depth information is displayed in Meters (metric) or Feet (Imperial).

DEPTH ALARM: This option allows the diver to enable the warning to inform a diver when the depth the diver selected has been reached. If this option is selected ON, the diver may select a maximum depth (in 10 foot increments) below which the diver does not wish to descend. This is accomplished only through the Analyst Personal Computer Interface.

PROFILE STORAGE PERIOD (1 to 30 Seconds): This option allows the diver to select the sample rate that data is stored for later recall by the Analyst. This option does not affect how often the computer **performs** its calculations, but only how often data of the dive in progress is stored for later use. The faster (lower the number) the profile storage period, the more precise the recreation of the dive will be however, this will also limit the number of dives retained in memory for later recall. For each one-second sampling rate, the COMMANDER™ will store six hours of profiles.

WARNING INDICATIONS

The following are considered Warning Indications:

1. If the Depth is less than the CEILING, then the Depth digits will flash. The audible sweep alarm will continue to sound once per second until the situation is corrected.
2. If in a decompression situation and the CEILING is computed to be greater than 90 feet, the system will immediately go into the Gauge Mode. The audible sweep alarm will sound once per second for five consecutive seconds.
3. The audible sweep alarm will sound whenever the system is violated and enters the Decompression Mode or the Gauge Mode.
4. If the diver is ascending faster than the selected maximum ascent rate, then the hollow bar of the ascent bargraph will flash and the WARNING LEGEND will illuminate. The audible sweep alarm will continue to sound once per second until the situation is corrected.
5. If the diver comes within two minutes of a NO DECOMPRESSION limit, a one-time, five-second audible alarm will sound.
6. If the diver enters the Decompression Mode, a one-time, five-second audible alarm will sound.
7. If a CEILING greater than 60 feet is required, a one-time audible alarm will sound and the depth digits will flash once-per-second.

NDC PREDICTION TIMES

The times displayed are based on the unit being at sea level and having no residual nitrogen levels stored away that would need to be considered.

DEPTH FEET	NO-DECO TIME hrs min
30	4 : 22
40	2 : 17
50	1 : 18
60	: 56
70	: 40
80	: 31
90	: 25
100	: 19
110	: 16
120	: 13
130	: 11
140	: 09
150	: 08
160	: 07

ASSISTANCE/TECHNICAL SUPPORT

Should you have any questions about your COMMANDER™, or require technical assistance, our support staff of certified divers is only a phone call or fax message away. Our Technical Support staff is available from 9:00 am until 5:00 pm Central Time Monday through Friday.

Our telephone numbers are:

voice	<u>214.644.6284</u>
fax	214.644.6286



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