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INTRODUCTION

Congratulations! You have just purchased the most sophisticated underwater communication system on the market.

The DIVELINK Diver Unit is a voice-operated or push-to-talk wireless transceiver for underwater communication on multiple channels between two or more divers. It allows the divers to talk "hands free" to one another. The unit can be converted to a surface unit by attaching the headset and transducer supplied in the DIVELINK Surface Conversion kit.

The unit can also be used to communicate with personnel on the surface, who are using a DIVELINK Surface Unit. (For details of the Surface Unit, see the DIVELINK manual entitled *SURFACE UNIT, MODEL COM-S...*)

Employing the latest in micro-electronics technology, the Diver Unit has been engineered to be as simple to use as possible. All adjustments for sound quality are fully automatic. The operator need only adjust channel setting and volume and choose between hands-free or push-to-talk modes.

Determining the Options and Capabilities of your Model

There are many Options that the COM-UC belt pack diver communicator may be ordered with. The MODEL NUMBER contains a sequence of letters that describe in short form the exact Options that the communicator contains. The Model Number is shown on the label affixed to the case.

The Model Number with Options are listed in full detail on the next page.

DIVELINK® Ordering Information

Commercial and Military DIVER Communicator

Part Number Class

DIVELINK Communicator Unit Type

COM - **UC** - ☐ - ☐

COM-UC-4AICE-20

EAR-MIC Harness**

Comes with
XDR-08
and Charger

Power Output	
-3	3 watt
-10	10 watt
-20	20 watt

Optional:
Adapters to
Allow Use as
Surface Unit

Surface Conversion Kit:
Consists of 2 components:
EAR-MIC-S
XDR-S08-S - (Cable Length)
- 33 ft
- 55 ft
- 100 ft

Converts DIVER to Surface Unit
Comes with PTT switch,
detachable Boom Mic MIC-S01

Frequency Code	
A*	31250 Upper
C	32768 Upper
D	28500 Upper
E	25000 Upper
F	31250 Lower
G	32768 Lower
H	28500 Lower
I	25000 Lower

Number of Channels and Frequency Code

-1A	* DIVELINK Standard Frequency.
-1C	Special Order - To match another manufacturer's existing equipment.
-4AICE	Special Order - To match another manufacturer's existing equipment. This provides 3 separate channels A, I, E plus one to match another manufacturer's equipment C

Other channel lineups are available upon ordering.

** All DIVER models require an EAR-MIC Harness

PRODUCT DESCRIPTION

Diver Unit

The Diver Unit consists of a Communicator Pack with integral rechargeable batteries, a battery charger, and a removable transducer.

Diver Unit

Communicator Pack

The Communicator Pack is worn on the diver's weight belt. The top of the pack contains a transducer/charge port, an earphone/microphone connector, charge-indicator lights, and a power/test/channel switch.

Power/Test/Channel Switch

The power/test/channel switch on the Communicator Pack has up to 10 positions, depending on the number of Channels ordered.

Table 1: Power/Test/Channel Switch Positions

Pos	Function	Pos	Function
1	OFF	6	Channel selection 4
2	TEST (Battery Check)	7	Channel selection 5
3	Channel selection 1	8	Channel selection 6
4	Channel selection 2	9	Channel selection 7
5	Channel selection 3	10	Channel selection 8

See the sections entitled *OPERATION* for more information about Channel selection.

Ear/Mic Harness Options for Underwater Use

To enable a diver wearing a Communicator Pack to speak to and hear other underwater divers or surface personnel, a separately purchased Earphone/Microphone Harness is required and also a microphone MPC-xxx to suit the full face mask being used.

DIVELINK® Ordering Information
Commercial and Military Communicator EAR-MIC Harnesses

Part Number Class

EAR-MIC

Standard Earphone Microphone Harness with:

- Push to Talk Lever
- Voice Activation Lever Select
- Volume Control

Order Microphone separately, MPC-xxx see below.

Diver Microphone to suit Mask	
MPC-AGA	for Interspiro AGA
MPC-DRAGER	for Drager FFM
MPC-EXO	for EXO FFM
MPC-KM48	for Kirby Morgan Super Mask M48
MPC-MANTIS	for Mantis FFM
MPC-POSEIDON	for POSEIDON FFM
MPC-REEF	for Ocean Reef Neptune Nira FFM
MPC-SCUBAPRO	for SCUBAPRO FFM

All connectors are GOLD PLATED
for maximum corrosion protection.

The Earphone/Microphone Harness connects to the earphone/microphone connector on the Communicator Pack and also to a microphone MPC-xxx to suit the mask being used.

Earphone/Microphone Harness with Microphone and Full Face Mask

Surface Conversion Kit Option for Surface Use

The Diver Unit can also be adapted for use on the surface by means of a separately purchased Surface Conversion Kit. This kit enables a person on the surface to communicate with divers or with personnel on other vessels.

The Surface Controller Kit consists of a Surface Controller Unit and a Surface Transducer on an Extension. The headset connects to the earphone/microphone connector on the Communicator Pack and is used as a normal headset with push to talk button and microphone. The transducer extension is ordered in one of three length options.

Surface Conversion Kit

(Shown plugged into the Communicator Pack)

Assembling the Equipment

Caution: The transducer contains a sensitive ceramic element. Although the element is encased in a protective housing, it is susceptible to mechanical impact. Great care must be taken to prevent the transducer from being dropped or bumped against a hard object.

Important!: Before making a dive, ensure that connectors with O-rings are securely in place, then the associated connectors mated and locked. This mating/locking procedure must be performed in a **dry** environment to ensure that there is no water in the connections. Failure to comply with this requirement may result in a flooded and damaged unit and voids warranty.

Earphone/Microphone Harness Connection

The standard model has an underwater mateable connector. Clean and lubricate the connector rubber areas lightly with O-Ring grease and press together after aligning the pins correctly. Do NOT use excessive grease in the socket or on the gold pins as this may build up and hydraulically prevent a proper connection.

The gold pins may be cleaned with a rubber eraser if necessary. Bear in mind that the gold-plated surface on the pins can be damaged by grit or harsh cleaning or scraping. Do not use sandpaper.

The socket may be cleaned by removing foreign material with a wooden toothpick or a Q-tip. Do not use sharp metal tools.

Operating the Earphone/Microphone Harness

The Earphone/Microphone Harness contains a volume control knob, a Push-To-Talk (PTT) button, and a Voice-Activation (VOX) lever.

1. To increase volume, turn the knob clockwise. To lower volume, turn the knob counter-clockwise.

2. The Communicator pack has a Voice Activation mode. The EAR-MIC harness has a lever that may be turned to the horizontal position (see Figure 1). In this position, the PTT button is locked in the activated state. After 30 seconds, the VOX circuit is activated and the microphone will cause transmission when the diver speaks.

3. To use the Ear/Mic in PTT mode, the VOX lever must be flipped to the vertical position (see Figure 2), releasing the button. Once this occurs, the diver must manually depress the PTT button to activate transmission in the unit.

Figure 1

Figure 2

Earphone Capabilities and Placement

Earphones are manufactured with a solid rubber compound, and are pressure compensated. This means depth is not an issue as both sides of the earphone have equal pressure during diver descent in the water column.

The concave shape prevents damage from impact on the top or on the side of the round earphone. Internal metal reinforcement prevents damage by twisting stress.

The earphone is a loudspeaker as well as a bone conductor. Either side is suitable and will emit sound.

> Important! When listening underwater the diver must equalize the ears to maximize hearing.

Earphones may be placed over the ear canal, the mastoid or cheek bone. Ideally they should be placed inside a dive hood for easy adjustment. In warm waters a **Lycra hood** may be used for this purpose.

Lycra Hood

Over Ear Canal

On the Mastoid Bone

On the Cheek Bone

Alternately the earphone holders (supplied) locate earphones between the full face mask straps over the ear canal.

The straps on a typical full face mask are used to mount the earphone over each ear, using the part EAR-HOLDER-1 which has both a pocket to install the earphone inside, and locations for the full face mask straps to be captivated.

Instructions to mount the earphones with the earphone holders:

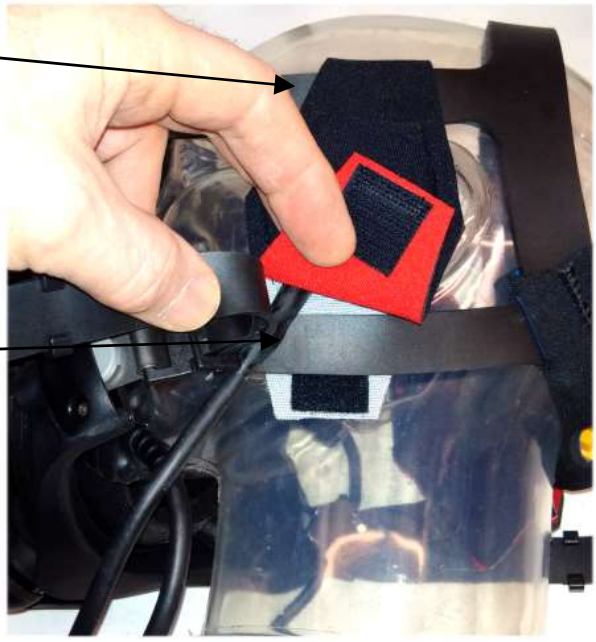
There are two earphones and two earphone holders. The procedure is the same for both sides of the head.

Capture the upper strap into the upper channel of the earphone holder, then press together the Velcro® tabs.

Insert the earphone into the holder.

Capture the lower strap and the earphone cable with the lower flaps of the earphone holder.

Press together the Velcro® tabs.



Charging the Communicator Pack

The Communicator Pack contains a fast-charge, matched cell NiMH battery pack. It also contains a digital battery management system that manages charging provides a “gas gauge” display of charge at all times during active use.

Charge with quick charger CHG-U04-UNIV (included). This charger is shipped with adapters for different countries and mains voltages.

Universal Charger with Adapters
- Japan
- North America
- European Plug
- UK & Protectorates Plug
- Australia / China Plug

Communicator Pack with Fast Charger connected

An internal energy manager monitors the amount of charge and discharge activity, and will display the percentage of charge. It also cuts off the charge current automatically when at 100% charge.

When the unit is turned on, colored lights will light up to indicate how much charge is in the battery pack. When the red (bottom) light is the only one lit, or if it is flashing, then it is time to recharge the battery pack using the supplied charger. When the first five lights are lit, (red to green) the battery pack is fully charged and ready for use. The battery pack does not have to be fully charged before it can be used, but the DIVELINK unit won't get as much operation time out of partially charged pack.

The sixth light indicates the charge status. If it is off, the energy management system is allowing a full rate charge to the battery. When this light is on, or on and flashing occasionally, it means that the battery is fully charged and no further charge will be accepted if plugged into a charger. When the switch is turned OFF, a fully charged pack will continue to indicate 100% full charge by this light remaining lit continually while the other lights turn off.

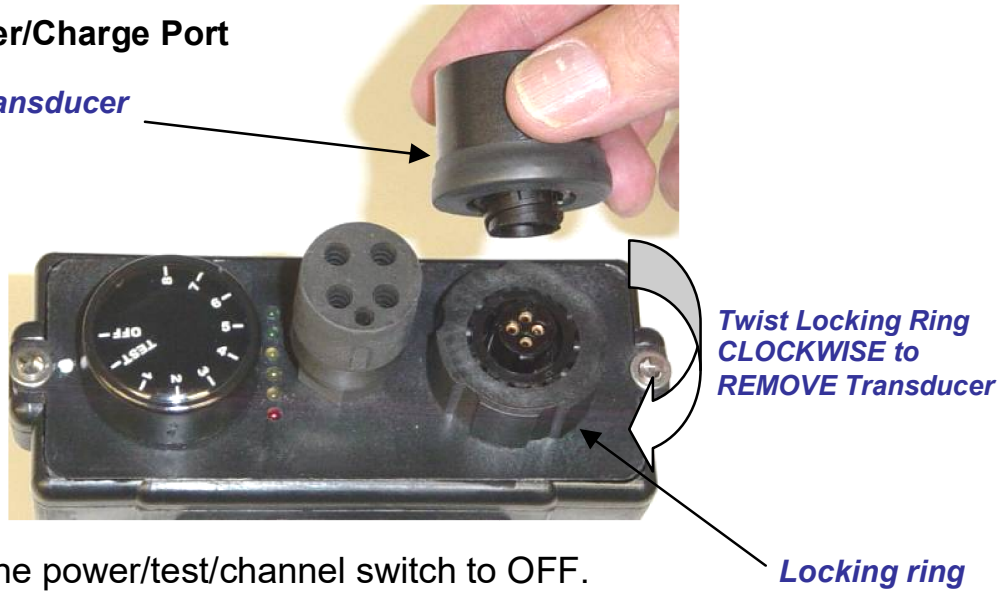
You may notice that the battery pack reacts slightly to temperature changes. The EM system monitors the temperature of the battery pack. If the battery is in a warm environment when fully charged, it will indicate less than full charge when placed in a cool environment for a few hours. This is typical of rechargeable batteries, which will accept more charge when cooler. Optimum charge is obtained by charging the battery between 10 to 20 degrees centigrade.

Charge Status	
GREEN	Charged
GREEN	80-100%
YELLOW	60-80%
YELLOW	40-60%
YELLOW	20-40%
RED	0-20%

Charge the Communicator Pack before each day of diving. To charge the pack:

Caution: When removing the transducer from, or attaching it to, the Communicator Pack, DO NOT TWIST THE TRANSDUCER ITSELF. Instead, rotate the locking ring on the transducer/charge port CLOCKWISE by ½ turn, and then lift the transducer out.

Transducer/Charge Port



1. Turn the power/test/channel switch to OFF.
2. Remove the transducer from the transducer/charge port.
3. Plug the battery charger connector into the transducer/charge port and rotate the locking ring anti-clockwise to lock the connector. Then, plug the battery charger unit into an electrical outlet.
4. Charge the Communicator Pack until full charge is indicated.

Note: When charging the Communicator Pack, the switch must be set to OFF. The indicator light turns will indicate charge status.

5. When charging is complete, unplug the battery charger connector by rotating the locking ring clockwise and then lifting the battery charger connector out. In addition, unplug the battery charger unit from the electrical outlet.
6. Inspect the O-ring seal inside the transducer/charge port for dirt, fiber or cuts (see the section entitled *O-Rings*). **Well maintained O-rings are essential for maintaining a water-tight seal**.

7. Replace the transducer into the transducer/charge port, rotating the locking ring anti-clockwise by ½ turn until tight. (The transducer must be fully seated on, and locked to, the base.)

Battery Conditioning

Every 3 to 6 months it is important to fully discharge and then fully recharge the battery in the belt pack. **This is done by removing the transducer, then turning ON the belt pack for 36 hours.** The transducer is removed so that the belt pack will turn on properly if the pack is already close to full discharge.

If this procedure is not followed then according to the battery manufacturer, it is possible that the battery can develop a shorter operating time as it will be undergoing partial charge/discharge conditioning.

WHAT TO EXPECT WHEN COMMUNICATING UNDERWATER

Barriers to Transmission

Several factors can be barriers to sound transmission in the water.

Water density. Sound transmission can be interrupted by a change in water density, most typically by the *thermocline*. (The thermocline is a layer of water located typically within ten feet of the ocean surface; it has a markedly different temperature than the water below ten feet.)

Important!: It must be understood that it is not always possible for a diver **over** the thermocline to communicate with divers **under** the thermocline. The solution, of course, is for the first diver to move below the thermocline; only then can reliable communications be expected.

In the same way, the Surface Transducer Extension should be lowered below the thermocline, but not to the ocean floor.

Wave action or sea floor. Sound transmission can be reduced by wave action at the surface, or by the sea floor.

Background noise. Sound transmission range can be reduced by “background” noise, which is generated by a rough sea, by rain, by

biological noise such as a snapping shrimp, or by man-made noises such as engines and high-speed propellers.

Body shadow. Long-range sound transmission can be affected by the position of the diver's body in relation to the DIVELINK equipment. A range reduction can occur if the diver is in the line of sight between his/her Communication Pack and that of another diver.

This effect is known as *body shadow*. It is caused by the absorption of sound by air inside the diver's dry suit, or by air in the diver's lungs. To prevent body shadow, the diver should turn 45° so that the line of sight between the DIVELINK equipment is restored.

Factors not affecting sound transmission. On the positive side, underwater sound transmission is **not** affected by muddy or turbid water, and is equally good in fresh and salt water.

Range Considerations

In consideration of the barriers to sound transmission underwater (see the section entitled *Barriers to Transmission*), use the following guidelines for optimal range:

- Dive below the thermocline.
- Report the position of the thermocline to other divers and surface personnel.
- Stay away from the surface and away from the ocean floor for best range.
- Avoid trying to transmit through a solid object, such as a ship's hull or an underwater cliff. Attempting to do so causes the sound transmission to be a product of reflections from the surface, the ocean floor, or underwater objects.
- Keep the Surface Transducer Extension away from the ocean floor, and well under the thermocline (i.e., at least 20 feet [6 meters] down).

OPERATION

Turning the Unit On

To turn the unit on, turn the Power/Test/Channel switch from OFF, past TEST, to a channel that matches the same channel of another DIVELINK unit that will be communicated with.

Channels

Eight Channel Standard Model

The Channel Code will show:

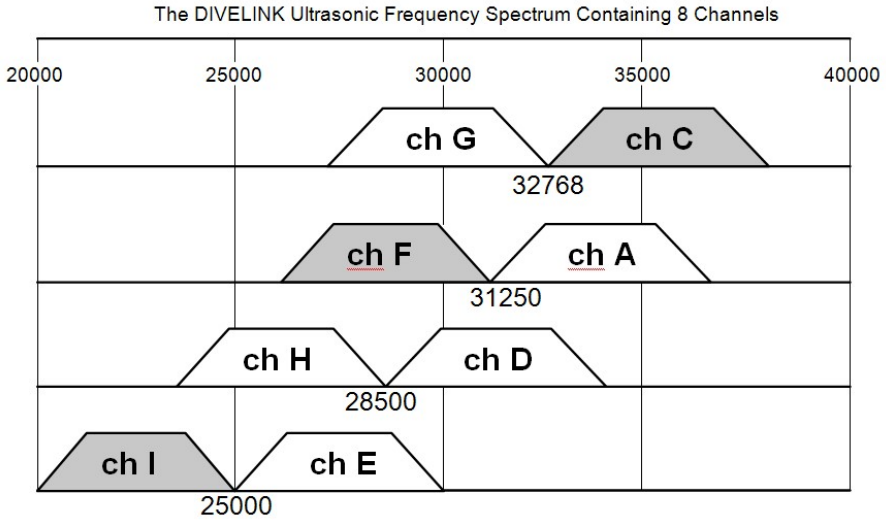
COM - UC - 8

The 8 channel model is comprised of a predetermined set of frequencies.

Switch Position	Channel Code	Detail
1	C	32768 Hz Upper Sideband
2	G	32768 Hz Lower Sideband
3	A	31250 Hz Upper Sideband
4	F	31250 Hz Lower Sideband
5	D	28500 Hz Upper Sideband
6	H	28500 Hz Lower Sideband
7	E	25000 Hz Upper Sideband
8	I	25000 Hz Lower Sideband

Important! Eight channel selections are available for the purpose of being compatible with other common frequencies in commercial use. Although there are up to eight selections, they all cannot be used simultaneously as eight separate channels. Doing so can cause interference among channels.

The eight standard channels are distributed across the frequency spectrum as follows:



As can be deduced from the chart above, for example, channel C will overlap and interfere with channel A. If communication is desired on separate channels without interference, then non-overlapping channels must be selected. Three channels are available (for three independently communicating groups of divers) at any one time. The best combination is channel C, F and I; Channel 1, 4 and 8.

Receiving Transmissions

A signal from a diver or surface unit can be heard from the earphones of the Earphone/Microphone Harness.

Sending Transmissions to Divers

A transmission can be sent by speaking into the microphone of the Earphone/Microphone Harness, which has a lever that selects Voice-Operated mode or Push-To-Talk mode. For operation of the Earphone/Microphone Harness, see the previous section entitled *Earphone/Microphone Harness*.

Talking and Receiving Protocol

When operating in Voice-Operated Mode, it is important to start the transmission by speaking a short “throw away word” such as “aaah”. This alerts the listener that a transmission is beginning.
This also ensures that the voice activation occurs at the right time, since words beginning with “sh”, “p” or “t” will not activate a transmission as these sounds are noise only. When replying to a Voice-Operated transmission, wait one second before speaking to allow the previous transmission to complete.

MAINTENANCE

Opening the Communicator Pack

Important!: Opening the Communicator Pack is a factory service procedure only. See the section entitled *SERVICING*. Any attempt to open the pack by yourself voids warranty.

O-Rings

All O-rings should be inspected before reassembling any component to which they are attached. Inspect for dirt, fiber, hair or any other foreign material, as well as cuts. Failure to properly maintain O-rings may result in a flooded/damaged unit and voids warranty.

Caution: If the O-ring is damaged and requires replacement, do not remove it using a sharp metal instrument; doing so will scratch the O-ring seating surface. Instead, use a softer instrument, such as a wooden toothpick.

If you remove an O-ring, inspect the seating surface on which it rests for foreign material, and clean if necessary. Note that for each O-ring, there are two seating surfaces, which are joined by the O-ring connection. Before inserting a new O-ring, apply a suitable grease to it, such as *Dow Corning® 4 Electrical Insulating Compound*.

When ordering O-rings, specify Part Number ORG-06.

Cables

All cables should be kept free of cuts. If damaged, the assembly or cable should be replaced. Use of plastic strapping ("Quick-Tie", Zap-Strap") can damage cables and cause leakage/corrosion and failure. Use of these ties voids warranty.

Regular Maintenance of the Battery

Every 3 to 6 months it is important to fully discharge and then fully recharge the battery in the belt pack. **This is done by removing the transducer, then turning ON the belt pack for 36 hours.** The transducer is removed so that the belt pack will turn on and remain in receive mode if the pack is already close to full discharge.

If this procedure is not followed then according to the battery manufacturer, it is possible that the battery can develop a shorter operating time as it will be undergoing partial charge/discharge conditioning.

It is also important to be aware that Nickel type batteries lose charge over time. This is a phenomenon called "self discharge". After a full charge, after one day the pack will lose 10% charge, and every month thereafter an additional 10% to 15% charge.

SPECIFICATIONS

DIVELINK Model COM-UC-8CGAFDHEI-20 Diver Unit

Transmission type: Wireless ultrasonic. Upper or Lower Side Band.

Switch Label	Channel Code	Detail
1	C	32768 Hz Upper Sideband
2	G	32768 Hz Lower Sideband
3	A	31250 Hz Upper Sideband
4	F	31250 Hz Lower Sideband
5	D	28500 Hz Upper Sideband
6	H	28500 Hz Lower Sideband
7	E	25000 Hz Upper Sideband
8	I	25000 Hz Lower Sideband

Transmission: 20 watts peak acoustic output power.

Nominal Range: Calm Sea – up to 2000 Meters at 20 watts and channel I (lowest channel frequency). Less range depending on local environmental conditions and greater sea state.

Reception: Automatic squelch and automatic gain over full operating range.

Audio: 5000Hz bandwidth, 120 dB dynamic range.

Replaceable Parts: Model COM-UC comes with the following

- CHG-U04 charger.
- XDR-08 piezoelectric transducer.
- ORG-06 replacement O-Ring for connectors.

Batteries: Matched cell rechargeable NiMH battery pack.

Options available:

- EAR-MIC Diver Earphone/Microphone Harness.
- MPC-xxx Microphone to suit Full Face Mask xxx
- EAR-MIC-S Surface Controller Unit.
- XDR-S08-S Surface Transducer Extension.

Operation: 20 Watts, over 5 hours operation after full charge (with 5% overall transmit time).

Warranty: One year warranty.

Dimensions: Max. 8.5in L x 5.5in W x 2in D

Weight: Approx. 4 lbs with batteries and accessories.

Specifications subject to change without notice.

WARRANTY

Validation

The validity of your warranty is conditional upon the completion of a warranty card, which is supplied with this manual. Mail the warranty card, along with a copy of your purchase receipt, to the factory **within 15 days of purchase**. The warranty card and purchase receipt are kept on file at the DIVELINK factory, in order for you to be eligible for the one-year coverage and any warranty service.

Period and Coverage

The manufacturer warrants the Diver Unit for a period of one year from the original date of purchase, to be free of defects arising from material or craftsmanship used or provided by the manufacturer, provided that:

- The unit is used under conditions of normal SCUBA use, and in compliance with the operating instructions set out in this manual (see the *OPERATION* and *MAINTENANCE* sections), by the original owner.
- The unit is not used for purposes other than those for which it was designed, or otherwise is not abused, misused, or subjected to unusual conditions.
- No unauthorized attachments or modifications are made to the unit.

Should the unit prove to be defective within the warranty period, it will be repaired or replaced free of charge, at the election of the manufacturer, excluding shipping and handling charges.

Transferability

This warranty is non-transferable and is solely for the benefit of the original purchaser.

Limitations

This warranty is voided in the event that service or repairs to the unit are not performed by the DIVELINK factory.

This warranty specifically does not extend to damage to face masks, regulators or hoses arising from their usage, or to damage to the unit caused by improper maintenance, modification or tampering.

DISCLAIMER

The unit is intended for use only by certified SCUBA divers who are aware of and trained to deal with the risks and hazards associated with diving. The unit is not proclaimed or intended to be used as a substitute for safe diving practices. It is the personal responsibility of every diver to ensure that they and their partner(s) observe all rules of their certification training.

The manufacturer, its distributors and retailers make no warranties, either expressed or implied, with respect to the unit, or this owner's manual, except for those stated earlier.

It is expressly understood that in purchasing or using the unit, the purchaser or any other person who uses it accepts it "as is", with the entire risk as to its quality, performance, merchantability, or fitness for any particular purpose resting with the user. These conditions exclude replacement of defective parts as required by the original purchaser in the first year after purchase, as described in the *Period and Coverage* section.

Important!: By purchasing the unit, it is agreed and understood that in no event will the manufacturer, its distributors or retailers be held liable for any personal injuries arising from its operation, or for any damages whether direct, indirect, incidental, or consequential, even if the manufacturer, distributor or retailer have been advised of such damages.

SERVICING

Contact Information

Mailing Address: Please contact DIVELINK for the service center nearest you:
Telephone: 1-250-479-4868
E-mail: sales@divelink.net
Internet Web Page: www.divelink.net

Warranty/Repair Conditions

Any defect of the unit in workmanship or material, as covered in the *WARRANTY* and *DISCLAIMER* sections of this manual, and discovered within one year from the date of purchase, must be promptly reported to the DIVELINK factory. No product returns will be accepted by the factory without a Returned Merchandise Authorization (RMA). The factory provides the RMA number and shipping instructions to the owner, who returns the defective part, freight prepaid, to the factory (see the section entitled *Sending Procedure*). DIVELINK will repair or replace the defective part at no charge, within a reasonable time, as it deems necessary.

Sending Procedure

Inside the box in which you are sending the defective part, provide the following on a single sheet of paper:

- RMA number
- Your complete shipping address (no Post Office [P.O.] box numbers)
- Your phone number (with area code)
- Description of the problem for each part being returned (as detailed as possible)