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Definitions of Signal Words
Used in this Manual

**DANGER:** This word indicates an imminently hazardous situation, which if not avoided, will result in death or serious injury.

**WARNING:** This word indicates an potentially hazardous situation, which if not avoided, could result in death or serious injury.

**CAUTION:** This word indicates an potentially hazardous situation, which if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.
DSI warrants every new mask, helmet, SCUBA regulator or diving control system (DCS) (each, a Product) to be free from defects in workmanship for a period of ninety (90) days from the date of purchase from a DSI authorized dealer. This warranty covers all metal, fiberglass, and plastic parts, but does NOT cover rubber parts, communications components, or head cushions.

Any defect of the product in workmanship or material covered by this warranty discovered within ninety (90) days from the date of purchase must be promptly communicated in writing to the nearest authorized DSI dealer or (if no such dealer in the buyer’s country) contact DSI directly at (805) 965-8538. No Product returns will be accepted by DSI without a returned merchandise authorization (RMA) number from DSI. Upon receipt of the RMA from DSI, the buyer should return the defective Product or part, freight prepaid, to an authorized DSI dealer or the DSI plant, as directed by the RMA. DSI will repair or replace the Product at no charge, within a reasonable time, as it deems necessary.

This warranty is null and void if:

1) The Product is not registered with DSI within ten (10) days of purchase, or
2) The Product has not been properly serviced and/or maintained according to DSI factory recommended procedures described in the manual or Product updates have not been performed as recommended by DSI, or
3) Unauthorized attachments or modifications have been made to the Product, or
4) The Product has been used for purposes other than those for which it was designed, or otherwise has been abused, misused, or subjected to unusual conditions, or the Product’s intended service has been exceeded.

EXCEPT AS SPECIFICALLY PROVIDED HEREIN, THERE ARE NO OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTIES FOR MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. THE PRODUCT COVERED BY THIS WARRANTY IS MARKETED AND SOLD BY DSI SOLELY FOR COMMERCIAL OR INDUSTRIAL USE AND IS NOT A CONSUMER PRODUCT INTENDED FOR PERSONAL, FAMILY, OR HOUSEHOLD USE.

In purchasing any Product subject to this warranty, the buyer agrees that its sole and exclusive remedy and DSI’s entire obligation in contract, tort, or otherwise under this contract will be repair or replacement at DSI’s option of the Product or any parts which DSI determines during the applicable warranty period are defective in workmanship or material covered by this warranty. All exchanged parts are the property of DSI. The buyer’s exclusive remedy and the DSI’s entire liability in contract, tort, or otherwise is the payment by DSI of the buyer’s actual damages up to but not to exceed the amount paid by the buyer for the Product.

In no event shall DSI be liable to the buyer for indirect, special, incidental or consequential damages (including, but not limited to, damages for lost profits, lost sales, loss of business opportunity, or for injury to persons or property arising out of the use of the Products). Any claim or action for breach of warranty must be commenced within one year following delivery of the Product to the buyer.

Buyer acknowledges that this warranty is the sole and exclusive warranty of the Product and that it supersedes any and all oral or written representations and undertakings between DSI, its dealers, and the buyer relating to the Products. This warranty allocates the risks of product failure between DSI and the buyer, which allocation is recognized by both parties and is reflected in the price of the goods. The buyer acknowledges that it has read this agreement, understands it, and is bound by its terms.
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Dive Control System 2A with no communications.

Dive Control System 2A with communications.
Section 1.0
GENERAL INFORMATION

1.1 DEFINITIONS

The following terms may be unfamiliar to the reader. They are defined as they relate to this manual and diving.
All parts locations are referenced by LETTER on the diagram, Figure 5, Page 8.

DCS-2A: Dive Control System-2A. The Trademark name of the device this manual describes. The DCS-2A contains all of the components necessary to properly control and monitor surface supplied air dives. Included in the DCS-2A is a two-way voice communicator for talking between the DCS-2A operator and the diver(s), or diver-to-diver. The communicator operates in both the two wire and four wire mode. The DCS-2A will supply plenty of air for two surface supplied divers.

High Pressure (H.P.) Hose: A flexible hose designed to carry a working pressure of gas (or air) of more than 300 pounds (20.7 bars) per square inch. The rated working pressure is usually indicated on the hose and must not be exceeded. The working pressure of the high pressure hose on the DCS-2A is 5000 psi (345 bars).

Whip: A hose complete with fittings at each end for use in hooking up two pieces of deck equipment for gas (or air) flow. For instances, the hoses and fittings used to connect the DCS-2A to the high pressure tanks are called "high pressure whips."

H.P.: High pressure. Usually any pressure over 300 psi. (20.7 bars).

L.P.: Low pressure. Usually any pressure under 300 psi. (20.7 bars).

Pneumofathometer: (pronounced "new-mofathometer") This device measures the diver's depth. A small hose, which is part of the diver's umbilical from the surface. Usually the source of the breathing air is a compressor, but compressed air tanks on the surface can also be used.

Pneumo: Short for pneumofathometer. Used such as "pneumo-gauge," "pneumo-valve", "pneumo-hose", to describe the parts that make up the pneumofathometer subsystem.

Offshore Rig: A ship or platform equipped with a drilling tower (rig) used in drilling for petroleum.

Scuba: Self contained underwater breathing apparatus.

SSAir Diving: Surface Supplied Air Diving. Diving operation where the diver is supplied breathing air by way of a hose which is part of the diver's umbilical from the surface. Usually the source of the breathing air is a compressor, but compressed air tanks on the surface can also be used.

Diver’s Umbilical: Several components run together from the DCS-2A, (Dive Control System 2A) to the diver. These components are joined together, usually by tape, forming the umbilical. The most common components used in the diver's umbilical are: (A) a hose through which the breathing air flows to the diver; (B) a multiconductor wire for communications transmission; (C) another (smaller) hose which is used to show the diver's depth on the pneumofathometer (see below); (4) a strong line used as a strength member to prevent strain on the other components of the umbilical. The umbilical should be taped every 10 feet with colored tape to indicate the length of the hose.
**Dressed-in:** A commercial diver's suit was originally called a "dress." Although the name changed to "suit" the term "dressed-in" has remained to describe putting the suit on. A diver who is "dressed-in" has a suit on. The term is also used to describe a diver who, in addition to his suit, has more, or all of his/her equipment on.

**Bailout Bottle:** This is the emergency tank of breathing gas. "Bailout" which is the familiar term for parachuting from an airplane, also applies to the shallow water diver who ditches part of his diving gear and swims to the surface. The "bailout" bottle term came from this use.

The bailout bottle is an independent air source connected directly to the diver's mask or helmet via a first stage scuba regulator and hose. The first stage regulator must be equipped with an overpressure relief valve (DSI Part #200-015). The overpressure relief valve will vent pressure in the event of a first stage leak and prevent the low pressure hose from rupturing, causing a complete loss of the diver's bailout supply.

The bailout bottle is worn on the diver's back, mounted to a harness. The diver's umbilical should be attached to this harness to prevent a direct pull on the diver's mask.

The size/volume of the bailout bottle should be determined by the diver's depth, or the distance required for a direct ascent to the surface. For deeper dives, or penetration dives inside wrecks or pipelines, a larger capacity bailout bottle should be used.

---

1.2 **DESIGN PURPOSE**

The Dive Control System-2A (DCS-2A) is designed to provide a central control center for the operator/dive supervisor during a surface-supplied air dive. Provisions for the control of the breathing air supply, diver depth monitoring, and voice communications are all located on a simple panel. The DCS-2A is full service control system for all SSAir diving operations.

The DCS-2A can be fitted with optional shut off valves on the diver's air supply. The optional shut off valves are designed to allow air to be shut off on either or both of the diver's umbilicals. When the handles of the valves are vertical the valves are open and air is flowing to the divers. When the valve handles are horizontal the valves are shut and the air to the divers umbilicals is off.

By having total control located at one panel, the DCS-2A operator can rapidly respond to the diver's needs without leaving the control station. In a standard commercial SSAir diving operation the DCS-2A provides a backup air supply system which the operator can activate in the event of the main air supply failure (such as compressor malfunction). This can be accomplished without leaving the control panel, which allows the operator to inform the diver and continuously monitor umbilical supply pressure and depth at the same time.

The compact size of the DCS-2A usually makes it possible to locate it at the water entry site, allowing the operator to tend the diver's umbilical while maintaining control of the DCS-2A.

In addition to its compact size, the ability of the DCS-2A to use high pressure air allows SSAir diving from small boats or remote locations where transportation and setup of a compressor would be impractical. Two or more standard scuba bottles can be used as the breathing air supply.

For example, when commercial divers are working on an offshore rig, a common SSAir diving job is the inspection and cleaning of a propeller on a crew boat. This job can be performed easily and simply with the DCS-2A, a couple of scuba bottles, a full face mask or helmet, and an umbilical. Transporta-
tion to the job site is simple and a large surface support vessel is not needed. At the dive site, full communications, backup breathing supply, pressure readouts, and depth monitoring are provided by the DCS-2A.

This is one of many situations where the DCS-2A can be used to provide the safe and efficient operation of SSAir diving.

1.3 SPECIFICATIONS

Use: For SSAir diving only. Pure oxygen MUST NOT be used. Compressed air from high pressure tanks (scuba or other types of compressed air tanks), or from a compressor should be the only supply to the DCS-2A.

CAUTION: Pure oxygen is a potential fire hazard, its use can lead to explosion of the DCS-2A. Pure oxygen also presents a physiological hazard to the diver.

Outer Dimensions: Length = 21 inches
Width = 10 1/2 inches
Height= 17 1/2 inches

Weight: 54 pounds. (24.5 kilos)

Shipping Weight: 60 pounds. (27 kilos)

Maximum Life Support Depth: 240 fsw (feet of sea water) (73 meters).

CAUTION: Although the DCS-2A is capable of supporting AIR DIVING to a MAXIMUM DEPTH of 240 feet (73 meters) of sea water, human limits restrict air diving to 190 fsw in the U.S. Navy and 50 meters in most European operations.

CAUTION: Decompression and other human limits must be observed. Decompression diving should not be conducted with the DCS-2A unless a properly equipped recompression chamber facility with oxygen is immediately available at the dive site. In-water decompression is not recommended.

High Pressure Supply Pressure Maximum: 3000 pounds per square inch. (207 bars)

Low Pressure Supply Pressure Maximum: 225 pounds per square inch. (15.5 bars)

CAUTION: Although the high pressure gauges on the DCS-2A are rated to 5000 psi (345 bars), this is a safety precaution only. The regulator on the DCS-2A is not designed to operate at pressures greater than 3000 psi (207 bars).

Umbilical Pressure Range: 115-225 pounds per square inch. (8-15.5 bars)

Regulator Output: 40 SCFM at 2500 psi (172 bars) supply pressure with 150 psi (10.3 bars) delivery pressure.

Relief Valve: Set at 300 psi (20.7 bars).

Pneumofathometer Range: 0-250 FSW (feet of sea water) (0-76 meters).

Communicator: 4 wire system. Can also be used in 2 wire mode.

Battery Type: Rechargeable, 12 volt system.

Battery Performance: 20 hours of continuous use between charges in 4 wire mode.

Charger: Will accept external 12 volt source.

Communicator Power Output: 8 watts.

Communicator Frequency Response: 600 to 12,000 HZ.

Remote Operation Capability: Yes, with optional unit.

Direct Recording Capability: Yes.

1.4 GENERAL DESCRIPTION

The DCS-2A components are housed in a durable polyethylene case. However, caution should be used in transporting the DCS-2A. Rough handling will rarely cause damage to the case, but it is possible to damage the calibrated pneumo gauges and/or the electronic components. The DCS-2A should be treated as you would any expensive life support equipment.
1.4.1 BREATHING AIR SUBSYSTEM

The diver's breathing air subsystem starts with the supply tank yokes (K) and connect to the diver's supply manifold. The high pressure hoses with the yokes are stored for transit by connecting them to the posts on the panel inside the lid of the DCS-2A. The knurled knobs on the yokes should be tightened until just snug. Excessive force should not be applied.

1.4.2 PRINCIPLE OPERATING FEATURES OF THE DCS-2A

1. DIVE CONTROL PANEL (A)

The panel is the main frame to which the functional components are mounted. In addition, the component names and some instructions are on the panel. The blue and orange lines (K, Q) on the panel represent the flow paths of supply air from the two high pressure hoses/yokes (S).

2. RED DIVER DEPTH GAUGE (C) (PNEUMOFATHOMETER)

This gauge indicates the "red" diver depth. The red diver pneumo valve knob (D), is turned to supply a small volume of air to the small pneumo hose that is part of the diver's umbilical. The gauge reads the pressure of the air in the pneumo hose. This pressure, measured in feet (or meters) of sea water, equals the water pressure at the diver's depth.

3. UMBILICAL PRESSURE GAUGE (B)

This gauge (B) is connected to the low pressure air supply system that supplies both umbilical fittings. It indicates the breathing air pressure that is in both the "red" and "white" diver umbilicals. When the air supply is from high pressure tanks (such as scuba tanks) the umbilical hose pressure can be varied by turning the regulator adjustment knob (H).

4. WHITE DIVER DEPTH GAUGE (P) (PNEUMOFATHOMETER)

This gauge indicates the "white" diver depth. The white diver pneumo valve knob (O), is turned to supply a small volume of air to the small pneumo hose that is part of the diver's umbilical. The gauge reads the pressure of the air in the pneumo hose. This pressure, measured in feet (or meters) of sea water, equals the water pressure at the diver's depth.

5. BLUE AIR SUPPLY FLOW INDICATOR LINE

The "BLUE" air supply flow indicator line (Q) indicates the flow path of breathing air from entry into the DCS-2A to exit to the diver's umbilical(s) at the fittings on the manifold (G). There are two high pressure whips which are color coded BLUE and ORANGE.

Starting from the high pressure air tank, the BLUE air supply flows through the whip into the DCS-2A. Following the BLUE flow indicator line (Q) it shows the flow to the BLUE Breathing Air Supply Pressure Gauge (M), then to the Breathing Air Supply Selector Valve which is controlled by the Breathing Air Selector Valve Handle (I). The Selector Handle (I) must be turned all the way "UP" until it stops for the BLUE supply. This places the selector handle in line with the flow path indicating the "BLUE" air supply (Q). The ORANGE supply is off when the Selector Handle is in the up position.

CAUTION: When using H.P. air, the selector handle must be turned up until it stops for BLUE supply or down until it stops for Orange supply. Never allow the selector handle to stay in the marked “H.P. OFF ZONE”. Both high pressure air supplies are off in the yellow striped H.P. OFF ZONE”.

After flowing though the Selector Valve the BLUE air supply enters the Breathing Air Supply Regulator (H) which reduces the high pressure breathing air to an adjustable range between 115-225 pounds per square inch (psi) (8-15.5 bars). The BLUE air supply then goes to both diver's umbilicals through the fittings on the manifold (G).
6. ORANGE AIR SUPPLY FLOW INDICATOR LINES

The "ORANGE" air supply flow indicator line indicates the flow path of breathing air from entry into the DCS-2A to exit to the diver's umbilical(s) at the fittings on the manifold (G). The second high pressure whip is color coded ORANGE.

Starting from the high pressure air tank, the ORANGE air supply flows through the whip into the DCS-2A. Following the ORANGE flow indicator line (K) it shows the flow to the ORANGE Breathing Air Supply Pressure Gauge (L), then to the Breathing Air Supply Selector Valve which is controlled by the Breathing Air Selector Valve Handle (H). The Selector Handle must be all the way "DOWN" until it stops for the ORANGE supply. The BLUE supply is off when the Selector Handle is in the down position.

CAUTION: When using H.P. air, the selector handle must be turned up until it stops for BLUE supply or down until it stops for ORANGE supply. Never allow the selector handle to stay in the marked “H.P. OFF ZONE”. Both high pressure air supplies are off in the yellow striped H.P. OFF ZONE.

After flowing through the Selector Valve the ORANGE air supply enters the Breathing Air Supply Regulator (H) which reduces the high pressure breathing air to an adjustable range between 115-225 psi (8-15.5 bars). Then the ORANGE air supply goes to both diver's umbilicals through the fittings on the manifold (G).

7. LOW PRESSURE INLET FITTING (N)

The low pressure inlet fitting is positioned between the connections for the two H.P. supply hoses. It is marked by the arrow containing the words "L.P. Supply". Low pressure supply breathing air, usually from a compressor (with volume tank) is supplied through a whip (low pressure hose and fittings) that attach here. When the low pressure supply is the only air source, the supply pressure will be indicated on the umbilical pressure gauge (B). In the low pressure supply mode, the selector/valve handle will be positioned in the H.P. OFF ZONE.
8. BLUE BREATHING AIR SUPPLY PRESSURE GAUGE (M)

The Blue pressure gauge (M) indicates the pressure remaining in the "BLUE" high pressure tank. (NOTE: If two divers are supplied by the DCS-2A both divers will be breathing from the same selected high pressure supply).

9. ORANGE BREATHING AIR SUPPLY PRESSURE GAUGE (L)

The Orange pressure gauge (L) indicates the pressure remaining in the "ORANGE" high pressure tank. (NOTE: If two divers are supplied by the DCS-2A, both divers will be breathing from the same selected high pressure supply).

10. YOKES FOR HIGH PRESSURE CYLINDER ATTACHMENT (S)

The yoke fittings (S) provided have standard U.S. scuba cylinder attachments. Each yoke has a bleeder valve to vent the remainder of the pressure in the whip when changing out scuba bottles. The yokes attach to posts mounted on the panel in the lid of the DCS-2A for storage and transport.

11. CASE (J)

The Dive Control panel (A) is attached to the bottom half of the case (J). The top half of the case contains the communicator panel with the yoke blocks and the communicator if there are communications. If there are no communications there are only the yoke blocks. (see picture in front of manual). The top is not designed to be removed.

12. BREATHING AIR SUPPLY SELECTOR VALVE HANDLE (I)

This handle (I) controls the two position Breathing Air Supply Selector Valve and allows uninterrupted diving operations while full air supply tanks replace expended tanks. The selector valve controls ONLY the high pressure air supply. It is NOT possible to shut off any low pressure supply connected to the low pressure inlet fitting (N), at the DCS-2A itself.

**CAUTION: When using H.P. air, the selector handle must be turned up until it stops for BLUE supply or down until it stops for ORANGE supply. Never allow the selector handle to stay in the marked “H.P. OFF ZONE”. Both high pressure air supplies are off in the yellow striped H.P. OFF ZONE”.

When changing out the H.P. air supply cylinders, always observe the diver’s umbilical pressure gauge (B) for any sudden fall in pressure. Should this occur, it indicates that the cylinder in use has mistakenly been turned off. If so, immediately turn the cylinder back on and move the selector valve handle to select the full cylinder and change out bottles.

Due to the construction of the selector valve, it is impossible for gas to back-flow from one cylinder to the other.

13. REGULATOR ADJUSTMENT KNOB FOR UMBILICAL PRESSURE (H)

The regulator Adjustment Knob (H) allows the operator to adjust the umbilical pressure within a range of 115 psi to 225 psi (8-15.5 bars). Incoming high pressure air from the 'ORANGE" or "BLUE" supplies are reduced by the internal regulator. The Adjustment Knob controls the regulator. Turning the Knob clockwise decreases the umbilical pressure; counterclockwise increases it.
14. OUTLET MANIFOLD INCLUDING DIVER’S UMBILICAL FITTINGS (G)

The "WHITE DIVER" and "RED DIVER" air supply hoses are connected to the DCS-2A at the manifold (G). The fittings coming out of the DCS-2A are male #6 JIC (3/8", 37°) flared fittings. The diver's pneumofathometer hoses must have matching female #6 JIC flared fittings with swivel nuts.

The "WHITE DIVER" and "RED DIVER" pneumofathometer hoses are also connected to the DCS-2A at the manifold (G). The fittings coming out of the DCS-2A are male #4 JIC (1/4", 37°) flared fittings. The diver's pneumofathometer hoses must have matching female #4 JIC (1/4", 37°) flared fittings with swivel nuts.

15. PNEUMO VALVE KNOB, WHITE DIVER (O)
The Pneumo Valve Knob, White Diver turns on and off the air supply to the "WHITE" pneumofathometer system.

16. PNEUMO VALVE KNOB, RED DIVER (D)
The Pneumo Valve Knob, Red Diver turns on and off the air supply to the "RED" pneumofathometer system.

17. O-RING SEAL (U)
The O-ring seal helps keep dust and moisture out of the DCS-2A when the case is closed. The O-ring seal is not pressure proof, however, and the DCS-2A case will flood if the box is submerged.

18. COMMUNICATOR PANEL (V)
The diver's electronic communicator (R) is attached to the communicator panel. The battery for the communicator is located behind this panel.

19. COMMUNICATOR (R)
The communicator is a standard open circuit/round robin diver's communicator, which functions like a telephone. It can also be used as a 2 wire, "push-to-talk" system. It is connected to the diver's umbilicals by "banana plug" fittings on the communicator. The communicator is mounted on the communicator panel (V).

Depending on the configuration of your DCS, you will have either a Model EM-013 Radio or an MK3-DSI radio. While the basic operations of these two radios are the same, they each have a different panel set up and function switches. You should read and understand the accompanying radio operations manual supplied with the unit before using the unit. Improper use or connections could damage the radio.

CAUTION: Never connect the charger during a dive or when anyone is in contact with connected equipment. Although electrical shock danger is remote, connection of the recharging cord should only be done when the DCS-2A is not in use.
Section 2.0
OPERATING INSTRUCTIONS

2.1 UNPACKING THE DCS-2A

When you first receive your DCS-2A, carefully unpack it and examine it for any damage that may have occurred during shipment. Be sure to complete the enclosed warranty card and return it to DSI immediately. No warranty claims will be honored without a satisfactorily completed warranty card on file at DSI.

Visually check the DCS-2A to ensure that it has not been damaged in transport.

Fig. 5 Note the line which passes through the handle of the DCS-2A and is secured to the rail to prevent the DCS-2A from moving about.

2.2 FIRST USE OF THE DCS-2A

Place the Dive Control System on a firm surface. The DSI logo should be right side up. Release the latches and lift up the lid to expose the panels.

When using the DCS-2A aboard a vessel subject to waves or swell be sure to tie the DCS-2A securely in position so that it doesn't fall. Thread a piece of line through the handles and fasten the ends to fittings on the boat. Tie back the lid of the DCS-2A as well to prevent damage or injury.

2.3 CONNECTING THE AIR SUPPLY

Loosen the knurled knobs which connect the yokes to their storage posts in the DCS-2A and remove the yokes (S) from the blocks. Attach each yoke to a high pressure cylinder as you would connect a scuba regulator to a tank. The knobs on the yoke

Fig. 6 Connecting a scuba air supply to the DCS-2A.
should be screwed down finger tight. Do not apply excessive force to the knobs; air pressure from the tanks will create a good seal. Be sure the bleed valve on each yoke is in the closed position. Do not turn the cylinders on at this time.

Prior to connecting the low pressure hose to the DCS-2A, the deck whip should be flushed with air to make sure no foreign matter is in the hose. Connect the deck whip to the low pressure compressor and while firmly holding the end of the hose start the compressor and flow air through the deck whip for at least one minute. Attach the low pressure hose to the low pressure inlet fitting (N) and screw the fitting down finger tight. While using one wrench to hold the low pressure inlet fitting tighten the hose fitting with a second wrench. Do not use excessive force as this will only damage the fitting and cause it to leak.

2.4 CONNECTING DIVER'S HOSES TO THE DCS-2A

Each diver's umbilical should be color coded with plastic tape to identify each individual hose. This action will not only serve to make it easier to connect the hoses, but will also serve to differentiate between hoses for purposes of inspection or repair.

A standby diver should always be equipped and ready to go to the diver's aid whenever a surface supplied diver is working in the water. Generally, it is not necessary for more than one diver to be in the water at a given time when using surface supplied gear. However, a standby diver is considered essential for safe, surface supplied operations. The standby diver can be either a scuba diver or another hose supplied diver since the DCS-2A provides enough air for two hose supplied divers. In contaminated water diving operations, however, both divers must be equally equipped with a vulcanized rubber dry suit, dry gloves, and a SuperLite-17, SuperLite 17-C, or a SuperLite-27 helmet equipped with a double exhaust system.

CAUTION: Contaminated water diving operations are very hazardous. They should not be attempted without specialized training, procedures, and equipment.

Remove the protective caps from the outlets of the manifold (G) on the console. Connect the diver's umbilical hose fittings (air supply hose and pneumo) to the DCS-2A. Remove the end caps from the hoses themselves and while firmly holding the end of the hose, blow out the lines before connecting the hoses.
to the mask or helmet, (refer to the manual for the mask or helmet for the proper connection procedures for your life support equipment). This action will prevent any foreign matter from entering the helmet or mask breathing system. Once the hose is blown out, immediately connect the fitting on the hose to the fitting on the mask or helmet.

Connect the communications portion of the diver's umbilical to the electrical fittings on the communicator (R) and to the mask or helmet. Be sure the proper connection is made with the right communications line for each diver. The wires in the diver's umbilical should be marked so it is easy to identify which plug connects to the earphone terminals and which plug connects to the microphone terminals.

### 2.5 PRE-DIVE CHECK

Prior to EVERY dive, the following should be checked:

With the free flow and demand regulator on the mask/helmet(s) shut off, turn on the air supply at each of the air cylinders. During operation with scuba bottles as the main supply, the selector valve handle must be FULLY up or FULLY down. Fully up turns the "BLUE" supply on and the "ORANGE" supply off. Fully down turns the "ORANGE" supply on and the "BLUE" supply off.

Note the air pressure in each cylinder by reading the gauges (L,M). The low pressure supply should be switched "OFF" at the source at this time. A check valve in the low pressure system will prevent any back flow to the compressor.

Both cylinders should be full prior to diving. Load the regulator on the DCS-2A using the regulator adjustment knob (H). Observe the umbilical hose pressure (B) which should be set at 150 psi (10.3 bars) over top side pressure, or 165 psi (11.5 bars) The regulator used in the DCS-2A is a non-venting regulator. If the regulator has been left set at a higher pressure setting than is presently desired, the operator must turn the regulator adjustment knob (H) clockwise and vent air from the system by bleeding either the pneumo system or diver's breathing apparatus.

As the diver descends, the DCS-2A operator should increase the regulator setting so that the umbilical pressure is always 150 psi (10.3 bars) over the pressure at the diver's depth. Consult the table below for approximate pressure settings.

| TABLE 1 | Suggested Regulator settings for the DCS-2A |
|-----------------|---------------------|---------------------|
| Depth - fsw | Pressure (psia) | Optimal (psig) | Minimum (psig) |
| 0'          | 14.7        | 150          | 150          |
| 33'         | 29.4        | 165          | 150          |
| 66'         | 44.1        | 180          | 150          |
| 99'         | 58.8        | 195          | 160          |
| 132'        | 73.5        | 210          | 175          |
| 165'        | 88.2        | 225          | 190          |
| 198'        | 102.9       | 225          | 205          |

| TABLE 1, Metric | Suggested Regulator settings for the DCS-2A |
|-----------------|---------------------|---------------------|
| Depth - Meters | Pressure (bars) | Optimal (bars) | Minimum (bars) |
| 0               | 1                | 10.3          | 10.3          |
| 10              | 2                | 11.4          | 10.3          |
| 20              | 3                | 12.4          | 10.3          |
| 30              | 4                | 13.4          | 11.0          |
| 40              | 5                | 14.5          | 12.1          |
| 50              | 6                | 15.5          | 13.1          |
| 60              | 7                | 15.5          | 14.1          |

### 2.5.1 TESTING L.P. SUPPLY

With the air on at the bottles and the communications switched on, check the mask regulator function. The diver should insert his face in the mask/helmet and take several breaths to test the demand regulator in his mask.

To test the low pressure supply, place the selector valve handle (I) in the "H.P. OFF" zone and the console will be running off the low pressure supply only. Observe the umbilical pressure gauge (B). As the compressor cycles, the gauge will rise and fall as the compressor's volume tank fills and empties. The minimum pressure for most low pressure compressors will be approximately 175 psi (12 bars) Again, check the mask/helmet function which will also confirm the low pressure supply routing.
2.5.2 TESTING COMMUNICATIONS

Test the communications between the diver and the DCS-2A. With the communicator (R) switched on, turn the speaker switch to “on” and adjust the volume to a comfortable level for both the diver and the DCS-2A operator. In the 2 wire mode, the communicator functions similarly to a citizens band radio; i.e., the DCS-2A operator must depress the push to talk switch to speak to the diver. In the 4 wire mode, the communicator functions like a telephone conference call; i.e., everyone on the line can hear and speak to everyone else. In either mode, for the diver to talk top side, it is only necessary for him to speak into the oral/nasal microphone in his mask or helmet. If two divers will be working together, test the cross-talk functions at this time as well.

To extend the life of the battery, it is recommended that the communications be used in the 4 wire mode. Operation as a 2 wire system uses relays inside the unit which will cause a higher battery drain.

**CAUTION: In the 2 wire mode, when the push-to-talk switch is depressed, the DCS-2A operator should keep all of his communications short (10-15 seconds) at any one time. This allows the diver to call for assistance if necessary.**

Plug the earphone connectors on the diver’s umbilical into the earphone jacks on the communicator. Plug the microphone connectors on the umbilical into the microphone jacks on the communicator. This will create a 4 wire system/round robin system. Test the system and adjust all volume controls.

Unplug the earphone connectors on the diver’s umbilical from the communicator and reinstall them in the connectors attached to the plugs for the microphone. This will change the communicator to a 2 wire system. Test this system and adjust volumes.

If there are no communications, recheck all of the connections to ensure they are tight at each junction. If the DCS-2A has been operating in a coastal environment, look for corrosion on the top side connectors which may interfere with the communications. If corrosion is evident, disassemble the connectors, clean, and retest. If corrosion is heavy, replace the top side connectors.

Substitute other masks or umbilicals to test for failures in the microphones or umbilical. Substitute one piece of new gear at a time to track the fault down. If the fault is in the mask or helmet, replace the earphones or microphones as needed.

If the fault is in the umbilical, disconnect the umbilical and carefully inspect its length for damage. Look for obvious nicks or cuts.

If there is physical damage to the outside of the communications wire there probably is a break on the inside, too. Test the continuity of the wire end-to-end with a volt-ohmmeter.

Uncoil the umbilical and lay it out flat with the two ends close to each other. Set the volt-ohmmeter to resistance (ohms) and hold one probe to one prong on an umbilical connector plug and touch the other probe from the meter to the wires (or connector) at the opposite end of the diver’s umbilical. Upon locating the other end of the same wire, the meter should indicate zero resistance, i.e., there is a complete, uninterrupted circuit. If touching none of the wires at the other end of the umbilical produces a zero reading and all readings are infinity (∞), this indicates a complete break in the wire. If the reading is somewhere between zero and infinity, and changes as the umbilical is moved, this indicates a partial break, and communications will be intermittent. In either case, a waterproof splice must be made in the wire.
2.5.3 TESTING THE PNEUMO

The pneumo supply may be tested in either the high pressure supply mode or the low pressure supply mode. To test the pneumo, select either mode and pinch the open end (diver's end) of the red diver pneumo hose. With the hose crimped tightly shut, slowly open the red pneumo valve (D) momentarily, 1/4 turn, and observe the needle’s response on the red diver depth gauge (C).

2.6 PREPARING THE DIVER

The diver should be dressed in with the appropriate exposure suit for the local water temperature. The diver should be equipped with a harness to provide an attachment point for his umbilical. By attaching the umbilical to the harness, the possibility of a direct pull on the diver's helmet or mask will be eliminated.

A bailout bottle should be mounted on the diver's harness. Always dive with a bailout bottle, no matter how shallow the dive. The danger of entanglement is always present and a bailout bottle will give the diver that few extra minutes to free himself in the event he becomes hung up on fishing line, wire, or other submerged objects.

The bailout regulator should be equipped with a quick disconnect whip to make it easier to dress the diver in and out. In addition, the bailout regulator should also be equipped with an over pressure relief valve (DSI Part #200-015). This will permit the regulator to bleed off and not rupture the low pressure hose connecting it to the diver's bailout or emergency valve, should the first stage develop a leak.

With the hose attached to the harness, tuck the pneumo hose under the harness at the diver's chest. This serves two purposes: 1) it provides instant access in the event the pneumo is to be used as an alternative air supply; 2) gas absorption and elimination of nitrogen is considered to occur at the diver's chest level.

When diving under a potential decompression situation, a depth gauge or dive computer should be worn by the diver as a backup system. If decompression is anticipated there must be enough air on hand for the diver to complete the dive and the decompression obligation.

2.7 THE DIVE SUPERVISOR AND THE DCS-2A OPERATOR

During the diving operation, one person should always be in charge to avoid confusion. Generally, this should be the most senior diver, by virtue of his diving experience.
The dive supervisor may not always be the DCS-2A operator. The dive supervisor may want or need the freedom to direct the entire operation including the tenders and other personnel. As such, he is responsible for making decisions regarding diving conditions and safety. However, the DCS-2A operator must always be an experienced diver who understands the diver’s needs and has the diver’s best interests always in mind.

**CAUTION: The DCS-2A operator must not leave the dive control system unattended while the diver is in the water. The DCS-2A operator is directly responsible for the diver’s safety and well being.**

The diver must follow the DCS-2A operator's directions in regards to depth and time. The diver can NOT run the dive from the bottom. Thus, when the dive supervisor himself is required to dive he should relinquish control to the next most senior diver remaining top side.

### 2.8 DESCENT

Upon entering the water, the diver should immediately recheck communications with top side and ensure that his mask or helmet is working correctly. When he/she is ready to descend he should notify the DCS-2A operator that he is, "Leaving the surface."

Both the diver and tender should communicate in a normal tone of voice. It should not be necessary for either person to shout to be heard. Although the quality of the communications will usually be excellent, not all divers speak clearly. The DCS-2A operator should listen carefully at all times to what the diver is saying.

Once the diver has entered the water, monitor his descent rate using the pneumo valve (D,O) and gauge (C,P). The diver's descent rate should not exceed 75 feet (23 meters) per minute.

As the diver descends, the DCS-2A operator should adjust the regulator (H) on the DCS-2A to provide 150 psi (10.3 bars) over the pressure at the diver's depth at all times. This provides the best breathing performance from the diver's demand regulator.

It is essential that the DCS-2A operator keep pace with the diver’s descent and not lag behind in his depth monitoring. If this occurs, it is possible for the diver to exceed his maximum planned depth without the DCS-2A operator being aware this has occurred.

To operate the pneumo, turn the knob for the appropriate diver, counter clockwise, until the indicator needle on the depth gauge starts moving. When the depth gauge for the individual diver indicates a depth that is known to be deeper than the diver, the knob is turned clockwise until it is off. The indicator needle on the depth gauge will move shallower as the air bubbles leave the open end of the pneumo hose at the diver. When the needle stops, that is the diver's actual depth.

Most umbilicals are made up with the diver end of the pneumo hose having about two feet (.6 meters) of loose hose. The diver can use this hose as an air supply for inflating lift bags or for taking an exact...
The DCS-2A manuals manual contains instructions on how to use the DCS-2A. It is important to follow these instructions carefully to ensure the safety of the diver. The manual provides detailed information on how to use the DCS-2A, including how to use the pneumo purge valve, the pneumo hose, and the umbilical pressure gauge. The DCS-2A operator should continuously monitor the diver's air supply at the two high pressure gauges (L,M) when diving with high pressure air as the primary supply. When the initial supply source pressure drops to between 300 and 500 psi (20.7 and 34.5 bars), depending upon depth, the diver should be switched over to the second air source using the selector valve handle (I). While the diver is breathing off the secondary source a fresh cylinder should be put on line immediately.

To change out high pressure cylinders, first close the cylinder valve on the tank which is low. Once the valve is closed, open the bleeder valve on the yoke (S) and allow the pressure to bleed from the line. The high pressure whips are color coded to help the DCS-2A operator to ensure the correct one.

When the high pressure whip is empty, unscrew the knurled knob on the yoke (S) and attach the yoke to a fresh cylinder. Tighten the yoke knob finger tight, close the bleeder valve, and slowly open the cylinder tank valve. Read the new pressure on the appropriate gauge (L,M).
The DCS-2A operator should carefully note the time in the dive log. The DCS-2A operator must monitor the diver's rate of ascent carefully, observing his watch and the pneumo gauge (C,P). There is no need to pneumo the diver as he ascends because the air in the pneumo hose will automatically expand and vent the hose as the diver approaches the surface.

2.12 DECOMPRESSION

If the diver has decompression stop(s) required as a result of his dive, slow the diver's ascent as he approaches his first stop. Upon reaching his first stop, the diver should assume a relaxed and comfortable position in the water. A weighted line or some other apparatus should be provided to the diver to assist him in maintaining a proper depth. Decompression in mid-water, without a line or other method of fixing the diver's depth, is NOT acceptable as it is impossible to maintain an exact depth without something to hang onto.

An accurate pneumo should be taken at the diver's decompression stop. There should be no unnecessary slack in the diver's hose, i.e., no part of the umbilical should be lower than the diver, as this will give a false reading (deeper) of the diver's depth. Make sure the end of the pneumo hose is held at the diver's chest with the open end pointing down.

2.13 COMPLETION OF DIVING OPERATIONS

Immediately following the completion of diving operations the dive station should be disassembled and the DCS-2A protected from the weather.

Both high pressure and low pressure air supplies should be turned off at their source. Bleed the air from the diver's umbilical(s) by opening the free flow valve(s) on the diver's mask/helmet(s). Disconnect the mask/helmet(s) from the umbilical and the umbilical from the DCS-2A. Unplug the communications connectors and turn off the communicator (R). Plug both ends of the hose and cap the outlet manifold (G) nipples on the DCS-2A to prevent foreign matter from entering either.

Open the bleed valves on the HP yokes (S) to allow any remaining air to vent and replace the yokes on their storage posts. Disconnect the low pressure air source if used and cap the low pressure inlet (N) to prevent foreign substances from entering the DCS-2A.

If the DCS-2A has been used on the ocean the panels should be wiped down with a clean rag dampened with fresh water. The O-ring seal (U) on the case may be periodically treated with Armor-All or other rubber protection.

Place the DCS-2A in a dry area and recharge the communications.

Refill any high pressure cylinders (scuba) used during diving operations and store them in a secure location.

Fig. 11  All of the outlet fittings on the DCS-2A must be capped prior to storage.
Section 3.0  
DCS-2A Maintenance

3.1 RECOMMENDED MAINTENANCE OF THE DCS-2A

The DCS-2A requires very little user maintenance. With proper care, the DCS-2A should last for years and give excellent service.

On a daily basis, the DCS-2A operator should inspect the high pressure whips attached to the yokes (S) for signs of wear.

After each use the case, interior panels and high pressure hoses should be wiped down with a rag which has a small amount of Armor-All. Never spray cleaners directly on the DCS-2A.

Approximately every six months, the high pressure hoses should be treated with Armor-All or similar protection.

Once a year, the DCS-2A should be returned to your authorized dealer, or Diving Systems International, to service the regulator, selector valve, and calibrate the diver's depth gauges. This is especially important if the unit is used for deep, decompression, or repetitive dives.

3.2 REPLACING THE BATTERY

The battery used with the DCS-2A communicator is very reliable and will offer many years of service. However, storing the DCS-2A with the battery drained can cause the battery to fail. **The battery should be completely charged before storage.** Gel cell batteries have an excellent shelf life if properly charged prior to storage.

To replace the battery, remove the screws which hold the communicator panel (V) into the top of the DCS-2A box. Do not remove the screws which secure the communicator to the larger panel. Tilt the panel out but do not remove it from the lid. The battery is held in place by brackets and “Velcro” strips on the back of the large panel. Reach behind the panel and support the battery. Lift the panel and battery out as a unit.

Replace the old battery with a new unit. Position the new battery on the back of the large panel using the “Velcro” strips to hold it in place. Connect the leads back to the battery and push the communicator panel (V) back into its normal position. Install the screws which hold the large panel in place and tighten them in a staggered pattern.
Section 4.0

Trouble Shooting the DCS-2A System

4.1 GENERAL

The DCS-2A is an extremely simple system which should not malfunction if the instructions in this manual are followed. Most problems encountered in using the system can be easily remedied. The following information covers the common operating difficulties.

4.2 NO COMMUNICATIONS

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Probable Cause(s)</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) No sound at either DCS-2A or diver’s mask.</td>
<td>a) Communication power not on. b) Communications incorrectly hooked up. c) Communications not hooked up.</td>
<td>Activate switch and adjust volume. Switch terminal wires. Plug into terminals.</td>
</tr>
<tr>
<td>2) Battery indicator does not respond.</td>
<td>Battery low or dead.</td>
<td>Charge or replace battery, or bypass battery with external power.</td>
</tr>
<tr>
<td>3) Communications weak or broken up.</td>
<td>Terminals covered with corrosion.</td>
<td>Clean Terminals with wire brush to bright shiny metal.</td>
</tr>
<tr>
<td>4) Communications will not work with headset but works otherwise.</td>
<td>Headset not working Short in internal wiring.</td>
<td>Replace headset. Return to factory for repair</td>
</tr>
<tr>
<td>5) Communications interrupted when umbilical is moved.</td>
<td>Break in diver’s communication wire.</td>
<td>Splice wire if damage is minor. Replace wire if damage is major.</td>
</tr>
<tr>
<td>6) Communications interrupted when waterproof connector is moved.</td>
<td>Break in splice at waterproof connector or failure of connector. Test with VOM.</td>
<td>Replace splice or connector.</td>
</tr>
<tr>
<td>7) Satisfactory communications through one earphone or microphone only (4 wire mode).</td>
<td>a) One wire in cable is broken b) Microphone/earphones dead.</td>
<td>Stack connectors in microphone terminals. Communications works in two wire mode. Replace microphone/earphones.</td>
</tr>
<tr>
<td>8) No sound at either DCS-2A or mask.</td>
<td>Communicator not functional.</td>
<td>Return to factory for repair after verifying no cure by following above procedures.</td>
</tr>
</tbody>
</table>
### 4.3 NO PNEUMO READING

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Probable Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) No air to diver’s end of pneumo</td>
<td>Pnuemo hose not connected</td>
<td>Attach fittings to DCS-2A</td>
</tr>
<tr>
<td>2) Gauge reads sustained pressure at surface.</td>
<td>Pneumo crimped or plugged.</td>
<td>Check entire length of hose. Relieve any restrictions.</td>
</tr>
<tr>
<td>3) Hose will not hold pressure and gauge needle will not rise.</td>
<td>Pneumo fitting cracked or loose.</td>
<td>Check fittings at console with soap and water solution. If fittings bubble, either tighten or replace as necessary.</td>
</tr>
<tr>
<td>4) Needle will not respond properly to flow.</td>
<td>a) Hole in pneumo hose.</td>
<td>Check hose; replace or splice as necessary.</td>
</tr>
<tr>
<td></td>
<td>b) Gauge mechanism damaged.</td>
<td>Replace or repair gauge. Return to factory.</td>
</tr>
<tr>
<td>5) Air can be heard escaping into console interior.</td>
<td>DCS-2A internal plumbing may be cracked or broken.</td>
<td>Return to factory for service.</td>
</tr>
</tbody>
</table>

### 4.4 NO AIR TO DIVER

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Probable Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) No hose pressure in diver’s umbilical</td>
<td>a) primary air source not connected.</td>
<td>Connect proper hose to console.</td>
</tr>
<tr>
<td></td>
<td>b) Valve closed at low pressure source</td>
<td>Open valve at low pressure compressor.</td>
</tr>
<tr>
<td></td>
<td>c) Selector valve in “H.P. OFF” zone.</td>
<td>Move selector valve handle in line with flow from either high pressure source.</td>
</tr>
<tr>
<td>2) No gauge reading on high pressure gauge.</td>
<td>Valve closed at high pressure source</td>
<td>Open valve at high pressure source.</td>
</tr>
<tr>
<td>3) Low hose pressure in diver’s umbilical.</td>
<td>Regulator not properly loaded.</td>
<td>Rotate adjustment wheel in appropriate direction.</td>
</tr>
<tr>
<td>4) Air can be heard escaping from hose.</td>
<td>Fitting loose on diver's hose, or fittings damaged.</td>
<td>Tighten fittings until snug. Do not over tighten. Replace fittings if damaged.</td>
</tr>
<tr>
<td>5) Umbilical registers pressure at console gauge, but no flow at mask.</td>
<td>Mask improperly serviced.</td>
<td>Clean and adjust mask.</td>
</tr>
</tbody>
</table>
6) Air can be heard escaping into console interior.

Probable Cause: Leakage in DCS plumbing.
Remedy: Return DCS-2A to factory for service.

7) Umbilical hose pressure and supply pressure drops rapidly.

Probable Cause: Diver’s Umbilical cut or severed.
Remedy: Replace diver’s hose.

8) With high pressure air on and regulator loaded, no umbilical pressure.

Probable Cause: Regulator malfunction.
Remedy: Return DCS-2A to factory for service.

### 5.0 APPENDIX

#### 5.1 EMERGENCY PROCEDURES

The following are general recommended emergency procedures. However, it is up to the individual diver and dive supervisor to make judgements under specific conditions on how to best cope with particular situations.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Action</th>
</tr>
</thead>
</table>
| 1) Loss of communications | a) Abort dive if operations are not absolutely necessary.  
b) Use line pull signals as per this appendix section. |
| 2) Loss of primary air supply. | Switch to emergency backup system and abort dive. |
| 3) Diver’s umbilical severed. | a) Diver switches to bailout bottle and aborts dive.  
b) Standby diver enters water and supplies first diver with air from pneumo. |
| 4) Pneumo will not operate. | a) Dive hose should be marked with colored tape every 10 feet. Take depth readings from this. (will only be approximate)  
b) Diver’s personal depth gauge can provide backup. |

#### 5.2 DIVER LINE PULL SIGNALS

<table>
<thead>
<tr>
<th># of Pulls</th>
<th>From Tender to Diver</th>
<th>From Diver to Tender</th>
</tr>
</thead>
</table>
| 1 | “Are you all right?”  
  When diver is descending, one pull means "Stop!" | “I am all right”, or ...  
  “I am on the bottom” |
| 2 | "Going down"  
  During ascent, this means,  
  "You have come up too far, go back down until we stop you." | "Lower me down", or  
  "Give me slack" |
5.3 COMMUNICATIONS WIRING SCHEMATIC

If your DCS has communications, refer to the radio manual.

5.4 EXPLODED VIEWS & PARTS LISTS

The following parts are not shown on the blow apart drawing and are listed reference only.

<table>
<thead>
<tr>
<th>Location</th>
<th>Part #</th>
<th>Description</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Shown</td>
<td>420-100</td>
<td>Case, Dive Control System-2A</td>
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</tr>
<tr>
<td>Not Shown</td>
<td>405-039</td>
<td>Battery Charger Assembly</td>
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</tbody>
</table>

* The following parts in the interior plumbing require the use of Conical Seals, # 455-135. The conical seals are provided with the items listed below.

<table>
<thead>
<tr>
<th>Location</th>
<th>Part #</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>29</td>
<td>405-105</td>
<td>Inlet Tube, H.P. (blue)</td>
</tr>
<tr>
<td>31</td>
<td>405-105</td>
<td>Inlet Tube, H.P. (orange)</td>
</tr>
<tr>
<td>40</td>
<td>405-106</td>
<td>S .S. Tube Assembly, H. P.</td>
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</tbody>
</table>
Communications Panel

<table>
<thead>
<tr>
<th>Key#</th>
<th>Part #</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>530-017</td>
<td>Screw</td>
</tr>
<tr>
<td>2</td>
<td>415-104</td>
<td>Communicator</td>
</tr>
<tr>
<td>3</td>
<td>530-035</td>
<td>Screw</td>
</tr>
<tr>
<td>4</td>
<td>430-075</td>
<td>Washer</td>
</tr>
<tr>
<td>5</td>
<td>410-003</td>
<td>Gasket, Foam</td>
</tr>
<tr>
<td>6</td>
<td>445-105</td>
<td>Panel, Auxiliary</td>
</tr>
<tr>
<td>7</td>
<td>450-106</td>
<td>Yoke Retainer</td>
</tr>
<tr>
<td>8</td>
<td>420-125</td>
<td>Arrow, Orange</td>
</tr>
<tr>
<td>9</td>
<td>420-120</td>
<td>Arrow, Blue</td>
</tr>
<tr>
<td>10</td>
<td>445-115</td>
<td>Door, Storage Compartment</td>
</tr>
<tr>
<td>11</td>
<td>420-160</td>
<td>Slide Latch</td>
</tr>
<tr>
<td>12</td>
<td>330-405</td>
<td>Lock washer</td>
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<tr>
<td>13</td>
<td>530-070</td>
<td>Screw</td>
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<tr>
<td>14</td>
<td>420-105</td>
<td>Box, Plastic</td>
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<td>15</td>
<td>410-145</td>
<td>Grommet</td>
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<tr>
<td>16</td>
<td>415-110</td>
<td>Cable, Battery</td>
</tr>
<tr>
<td>17</td>
<td>415-056</td>
<td>Battery, Gel Cell 12V</td>
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<tr>
<td>18</td>
<td>430-064</td>
<td>DSI Small Knob</td>
</tr>
<tr>
<td>19</td>
<td>455-050</td>
<td>Yoke &amp; Bleeder Valve Assem.</td>
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<tr>
<td>20</td>
<td>430-060</td>
<td>Retainer Ring</td>
</tr>
<tr>
<td>21</td>
<td>455-065</td>
<td>Filter</td>
</tr>
<tr>
<td>22</td>
<td>455-054</td>
<td>Hose, H.P. Supply</td>
</tr>
<tr>
<td>23</td>
<td>410-006</td>
<td>Hose Protector, Orange</td>
</tr>
<tr>
<td>24</td>
<td>410-007</td>
<td>Hose Protector, Blue</td>
</tr>
<tr>
<td>25</td>
<td>405-029</td>
<td>Hose, Yoke Assem., Blue</td>
</tr>
<tr>
<td></td>
<td>405-030</td>
<td>Hose, Yoke Assem., Orange</td>
</tr>
<tr>
<td></td>
<td>455-135</td>
<td>Conical Seal</td>
</tr>
</tbody>
</table>
Panel Mounted
Plumbing and Gauges

Optional Shut Off Valve

Key# | Part # | Description
--- | --- | ---
1 | 430-111 | Screw
2 | 430-134 | Washer
3 | 430-134 | Washer
4 | 430-111 | Screw
5 | 430-075 | Washer
6 | 530-035 | Screw
7 | 430-134 | Washer
8 | 430-145 | Socket Head Screw
9 | 450-144 | Pneumo Block
10 | 455-032 | SS Elbow
11 | 455-007 | Cap, Pneumo
12 | 455-006 | Cap, Umbilical Outlet
13 | 455-177 | 45° Elbow
14 | 450-185 | Flange
15 | 510-014 | O-Ring
16 | 530-070 | Screw
17 | 440-010 | Pneumo Gauge, Red
18 | 440-130 | Gauge, L.P.
19 | 440-011 | Pneumo Gauge, White
20 | 440-115 | Hose Holder
21 | 430-130 | Washer
22 | 420-012 | Knob, Pneumo
23 | 420-135 | Decal
24 | 450-170 | Knob, Regulator Adjustment
25 | 430-110 | Set Screw
26 | 450-125 | Mount Nut, Regulator
27 | 430-126 | Washer, Regulator Mount
28 | 450-120 | Stem, Regulator Adjustment
29 | 420-225 | Selector Handle
30 | 430-240 | Nut
31 | 430-205 | Washer
32 | 430-140 | Set Screw, Selector Handle
33 | 440-135 | Gauge, H.P.
34 | 455-185 | H.P. Inlet Elbow
35 | 455-111 | L.P. Inlet Elbow
36 | 450-116 | Washer
37 | 430-136 | Washer
38 | 455-152 | Nut
39 | 455-190 | Nut, H.P. Inlet Mount
40 | 430-115 | Washer
41 | 455-005 | Cap, L.P. Inlet
42 | 445-100 | Main Panel
43 | 445-020 | Gauge Bracket
44 | 455-157 | Valve Body
45 | 455-144 | Valve flange
46 | 455-143 | SS Elbow
47 | 430-141 | Socket Head Screw
48 | 430-134 | Washer
49 | 440-210 | Handle Stop
50 | 440-212 | Valve Handle

Optional Shut Off Valve
### Key# | Part # | Description
--- | --- | ---
1 | 455-024 | Connector, L.P.
2 | 455-049 | Check Valve, L.P.
3 | 455-026 | Male Elbow
4 | 405-155 | Tube, Regulator Sensor
5 | 455-120 | Elbow
6 | 455-122 | 3/8” NPT Nipple
7 | 455-180 | Male Run Tee
8 | 455-149 | Straight Tube Connector
9 | 350-062 | L.P. Plug
10 | 510-013 | O-Ring
11 | 450-142 | Manifold Block
12 | 455-123 | 1/4” NPT Nipple
13 | 455-121 | 1/4” NPT Street Tee
14 | 455-051 | Pneumo Valve
15 | 455-040 | Female Elbow
16 | 455-160 | Outlet Tube, Red Pneumo
17 | 455-180 | Male Run Tee
18 | 455-040 | Female Elbow
19 | 455-051 | Pneumo Valve
20 | 455-121 | 1/4” NPT Street Tee
21 | 455-149 | Straight Tube Connector
22 | 455-180 | Male Run Tee
23 | 455-180 | Male Run Tee
24 | 455-040 | Female Elbow
25 | 455-051 | Pneumo Valve
26 | 455-123 | 1/4” NPT Nipple
27 | 455-121 | 1/4” NPT Street Tee
28 | 455-149 | Straight Tube Connector
29 | 455-180 | Male Run Tee
30 | 455-040 | Female Elbow
31 | 455-160 | Outlet Tube, White Pneumo
32 | 455-105 | Inlet Tube, H.P. Orange
33 | 455-104 | Inlet Tube, H.P. Gauge
34 | 455-030 | Connector H.P.
35 | 455-038 | Street Elbow
36 | 455-135 | Conical Seal
37 | 455-196 | Male Run Tee, H.P.
38 | 455-032 | Male Elbow
39 | 455-140 | Selector Valve
40 | 430-120 | Washer
41 | 405-106 | SS Tube Assy., H.P.
42 | 455-105 | Male Elbow
43 | 405-120 | Regulator Assembly
44 | 455-145 | Tube, Main Pneumo Supply
45 | 455-047 | Relief Valve
46 | 455-130 | 1/2” Check Valve L.P.

### Interior Plumbing Arrangement

**CAUTION - WARNING**

Use only Diving Systems International Kirby Morgan original replacement parts. The use of other manufacturer’s parts will interfere with the performance characteristics of your life support equipment and may jeopardize your safety. Additionally, any substitutions will void any warranties offered by DSI. When ordering spares, always insist on Kirby Morgan Genuine Parts.
DCS-2A DIVE LOG

Diver: ____________________________  Date: ____________

DCS-2A Operator: ____________________________

Dive Location: ____________________________

Weather Conditions: ____________________________

Purpose of Dive: ____________________________

Low Pressure Air Source Pressure: ____________________________

High Pressure Air Source Pressure: ____________________________

<table>
<thead>
<tr>
<th>Cylinder #</th>
<th>Start</th>
<th>Finish</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Dive Times:*
Diver Left Surface: ____________

Diver Reached Bottom: ____________

Diver Left Bottom: ____________  Maximum Depth: ____________

Diver Reached Surface: ____________  Total Bottom Time: ____________

Repetitive Group: ____________  Decompression Required?: Y N

Decompression Schedule:________________________________________________
______________________________________________________________________

Diver’s Signature_________________________  DCS-2A Operator _________________