

Guardian Full Face Mask

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South Carolina
Aquarium

South Carolina Aquarium Dive Operations

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It is the mission of the South Carolina Aquarium (SCA) Dive Team to provide excellence in animal care and husbandry, to actively support both the educational and conservation endeavors of the SCA, and to provide a memorable, positive guest experience to all those who visit our facility.

Training Schedule

- PowerPoint Presentation
- Quiz
- OTS Training Videos
 - > Guardian Overview
 - > Doff & Don Underwater
- GOT: 2 dives minimum
 - > Dive One: Topside Donning & Doffing and Equalizing UW
 - > Dive Two: Underwater Bailout & Replacement of FFM

Introduction

- The Guardian Full Face Mask (GFFM) permits GOT divers to talk with the guests during our Dive Show or presentations.
- At other times, it can be used to talk to surface support
- All GOT divers must receive training in the GFFM before use*
- Prior to this training the diver must have at least a cumulative of 10 dives in the GOT **and** 5 days of volunteering*

** SCA Diver Handbook*



Reasons to Dive FFM

- Communications
- Environmental Protection
- Security of Air Source (*ie. for unconscious diver*)
- Comfort
- Fun

Guardian Full Face Mask

Manufactured by Ocean Technology Systems



SCA FFM Regulator

- There are specific “FFM capable” regulators for use with Full Face Masks
 - > These can be identified by a Quick Disconnect in lieu of the primary regulator
 - > The Quick Disconnect has an rotating collar to prevent accidental disconnect
- Guardian Regs are equipped with an Alternate Air Source or Octo



Ambient Breathing Valve

- The Guardian is equipped with an Ambient Breathing Valve (ABV)
- The ABV allows the diver to conserve air while on the surface.
- Ensure that the ABV is closed prior to diving by turning clockwise until it is finger tight
 - > *Diving with the ABV open will siphon water into the FFM, across the divers eyes*



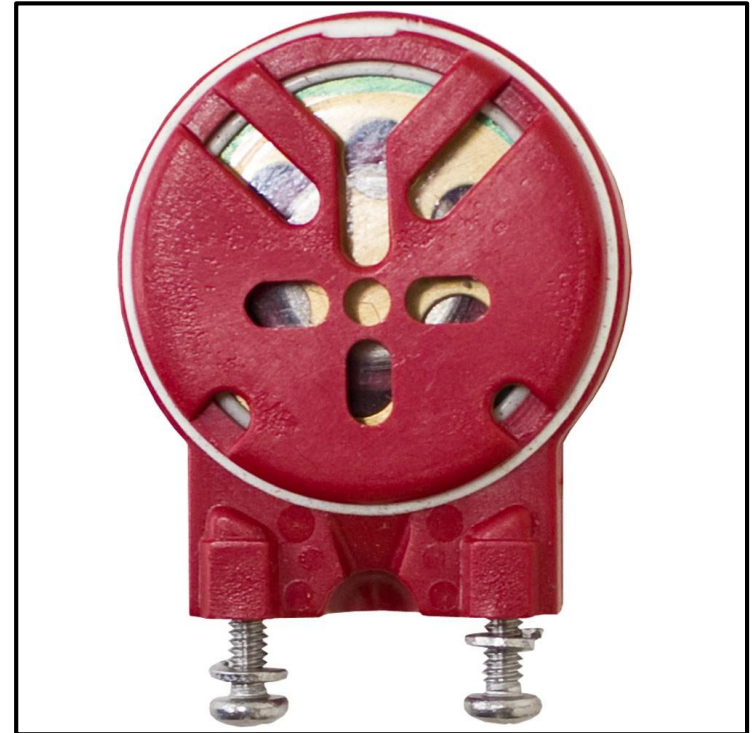
Microphone – OTS Hot Mic

- For sound quality, the microphone should be positioned no farther than $\frac{1}{4}$ " off the right corner of the divers mouth
 - > It is ideal to have the microphone barely touching at the corner of diver's mouth
 - > *Diver's do not need to adjust the microphone once set by the service technician*
- Ensure the microphone isn't tucked behind the skirt
 - > The microphone receiver is the flat side
 - > Orientation however is intended to be parallel to diver's voice projection



Microphone – OTS Hot Mic(*cont.*)

- The Hot Mic is water resistant up to approx. 12'
- Water pressure will damage the protective membrane
 - > ie. Rinsing under garden hose
 - > ie. Removal of FFM at depth
- Wet Microphones also drastically degrade sound quality
 - > *Divers should keep microphones as dry as possible until after final use in a Dive Show for that day's shift*



Equalizing

- There are a combination of nose block pieces that should allow equalization of ears
- You will need to experiment to find the right fit for you
- Depending on preference, the nose blocks may be off, or barley touching the diver's nostrils



Equalizing(*cont.*)

- Regardless, to equalize, grab reg as shown and push FFM up and into face
 - > Ideally you'll want a good seal of the nose blocks on your nostrils
- Because the FFM allows all nasal and sinus passages to be connected, you may find other equalization techniques to work now



Earphones

- The earphones should be slid toward the back of the harness strap when starting to don the mask to prevent binding in the buckles
 - > You will have to repeat this motion several times as you tighten the straps fully
- Once the harness is secured, slide the earphones forward to rest directly over the divers ear.



Diver Inspection

Perform a quick Inspection prior to use:

- **Color Variants**

(choose appropriate variant for the dive task)

- > **Blue** Skirt/**Black** Frame – GOT Comm FFM
- > **Blue** Skirt/**Blue** Frame – GOT No-Comm FFM

The following variants should be returned to Dive Compressor Room if found:

- > White Numbering on Reg – Surface Supply *(not for GOT; Cross Contamination)*
- > Any other color variants are Wireless Comms and require DPIC permission to use

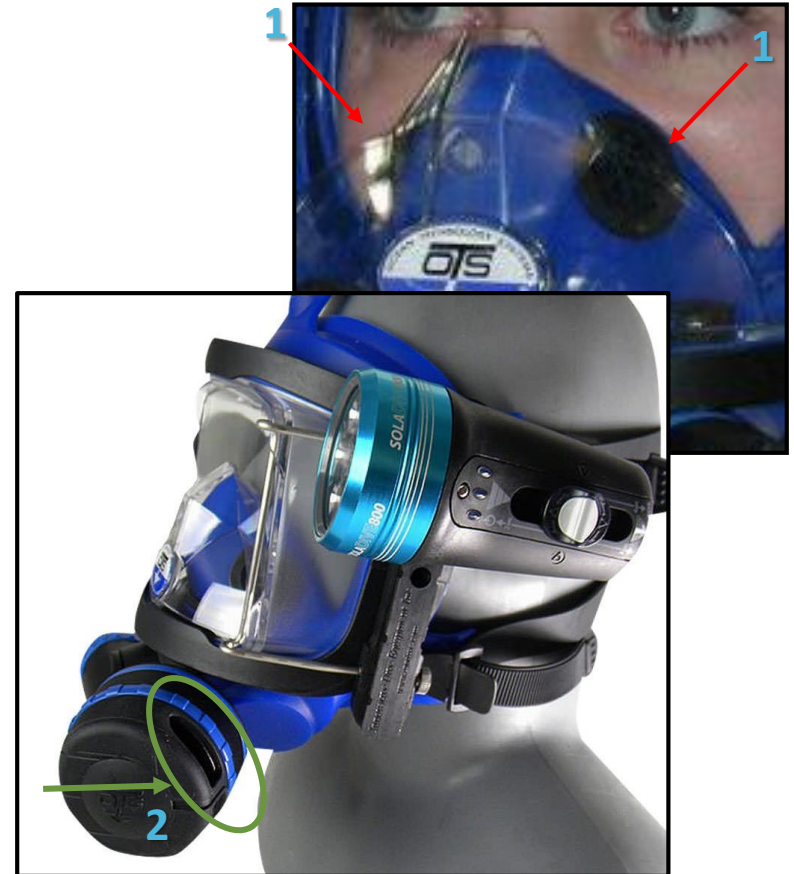


Diver Inspection(cont.)

- Mask Condition

- > Ensure both One-Way Valves are present [1]
- > Ensure Exhaust Valve is orientated to the rear of mask [2]
- > Look for any prolapsing of the silicone Skirt from the colored Frame, especially near the reg housing

If any of these are incorrect, turn FFM in to DPIC for repair



Donning the Mask

- Fully extend all straps
- Pull mask and straps over your head, seating the mask so your chin cups into the bottom of mask skirt
- Traditional order, to tighten the straps should be:
 1. Bottom
 2. Middle
 3. Top (only if necessary)
 - > *Short-faced divers may need to modify the order: Middle, Bottom, then Top*



Donning(cont.)

- Tighten Straps by pulling straight back, parallel to side of head
- The harness should be centered on the back of your head; straps should be evenly tightened



Position straps approximately as follows:

- > Bottom Strap **[1]** should ride along where your skull and fleshy neck meet
- > Middle Strap **[2]** should be over your temple, roughly parallel with bottom of your chin
- > Top Strap **[3]** should only be tightened to keep your chin at the bottom of mask skirt (ie. if the mask sags)

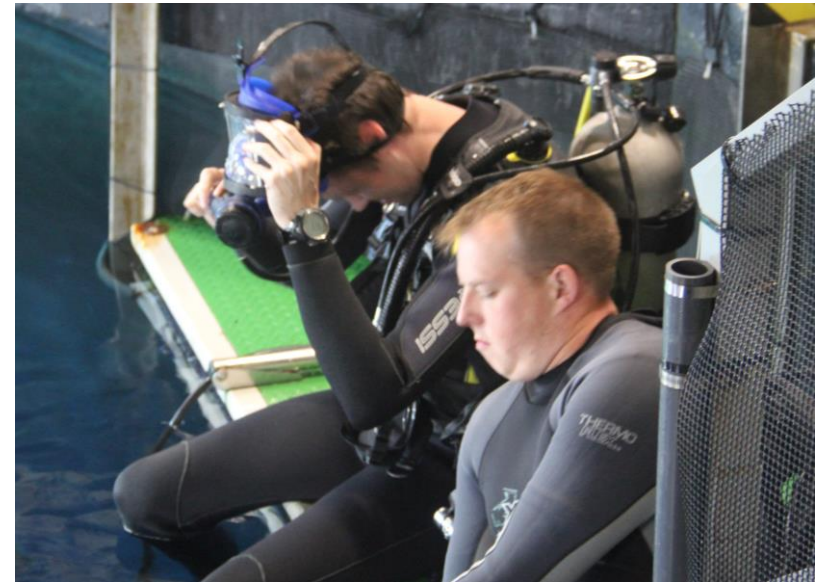


Donning(cont.)

- Troubleshooting: *It is safer to perform these actions above the water until thoroughly experienced with FFM emergency procedures.*
 - > **Jaw fatigue or aching**
 - *Harness is too high; straps are tensioning the mask up and back into jaw*
 - *Solution: loosen Top strap, tug back of harness lower on head*
 - > **Neck aching**
 - *Harness is too low; lower straps are tightened into neck*
 - *Solution: loosen Bottom straps, slide back of harness higher on head, tighten Top strap snug*
 - > **Bubbling from Top of skirt**
 - *Bottom straps are tightened/tensioned more than the Middle straps*
 - *Solution: loosen Bottom straps, tighten Middle straps*
 - > **Leaking at chin when inverted or looking up**
 - *Top strap may not be tight enough*
 - *Solution: cup chin into bottom of mask and tighten Top strap snug*
 - *Some divers with very small faces may always experience this problem*

Before entering the water

- Safety Checks:
 - > Verify ABV is snugged closed
 - > Verify Air is ON
 - *Watch SPG for needle movement when purging or breathing*
- If conducting dive on Comms
 - > Verify the Comm Box is ON
 - > Verify Audio works for
 - *Box to Diver*
 - *Diver to Box*
 - > Verify Comm Line is:
 - *Plugged securely together*
 - *Secured to Diver*
 - *Not snagged on Dive Platform or Buddy's gear*



Communications: Wireless vs. Hardwired

- **Wireless**
 - > **Freedom of movement – will not snag on objects**
 - > **Interference by**
 - *Physical Obstructions*
 - *Depth*
 - *Thermoclines/Haloclines*
- **Hardwired**
 - > **You are always tendered (safety)**
 - > **Improved communications – less interference, better quality**
 - > *GOT used Hardwire Comms for Dive Show*

Communications Line Connection

- SCA uses OTS Hi-Use Connector Plugs
 - > Plugs should always be capped with either a Dummy Plug or Connected to a Comm line.
- Ensure there is a snug fit between mask & comm line plug.
- Situational awareness of your swim pattern is required to prevent looping or entangling on rockwork, animals, or other divers.
- When plugged in, **ALWAYS** assume you are live to public
- *Do not tie knots or treat the Comm line as a dockline*; this kinks the wires under the sheath and permanently degrades audio quality



Communications Box Procedure

1. Turn ON 2x Power Switches [1] to Diver microphone and earphones
2. Transfer Switch [2] to connect to Public/Education Comm Box on 1st Floor
3. Red Push-to-Talk [3] from Comm Box to Diver; Speak into Microphone[4]
 - > **Note diver speaking back will broadcast to Public if Transfer Switch [2] is ON**
 - > **Aging wires and corrosion can cause Comm Box Push-to-Talk to broadcast to Public**
 - > **Always assume Public can hear Topside & Diver transmissions**



Loss of Hardwire Communications

- Possible problems
 - > Education/Public Comm Box not ON
 - > GOT Comm Box not ON
 - > Diver Snagged & Unplugged FFM from Comm line
 - > Water on the microphone contacts
- Continue with show (if possible)
- React to educator's directions, particularly if you can hear educator

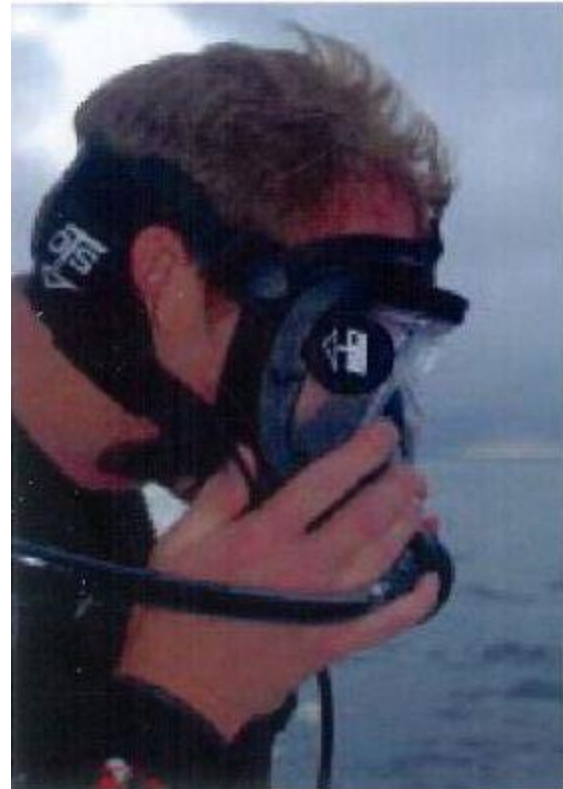
Diving Procedures

Very few modifications are required from normal diving procedures, when diving FFM

- A backup Half-Mask (ie. normal scuba mask) should be stowed and accessible to diver, in case of FFM Bailout
 - > **Stow in BC Pocket or on BC Clip**
- FFM diver should maintain contact with their team as normal
 - > *This is still a required “close contact” dive team*
- Always assume microphone is live to public, even when unplugged (*this is a safe habit*)

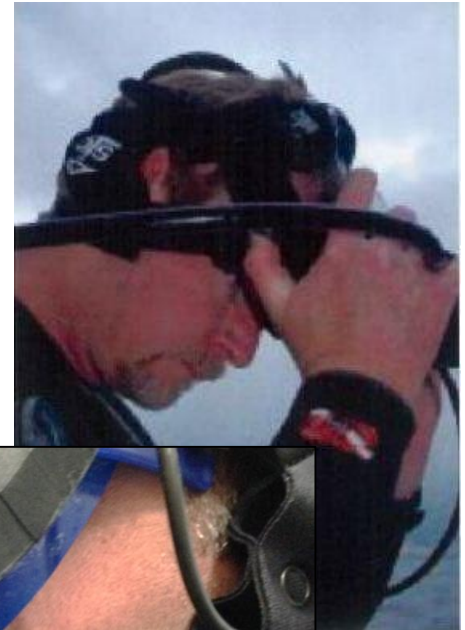
Removing The Mask

1. To remove the mask, place both hands on the base of the mask with thumbs on the tabs of both lower buckles
2. Push forward gently



Removing the Mask(*cont.*)

3. Keep Thumbs on tabs until mask straps are fully extended away your face
 - > Not doing so causes skirt tearing and shortens overall service life
4. Rotate the mask off of the chin, up and over your face.
5. Extend & reset Middle & Top straps



Clearing of the Mask

- Flooding is rare; more commonly air will leak out rather than water leaking in
- The Guardian is quick & easy to clear
 1. Grasp reg with Right Hand as if equalizing
 2. Tilt Mask to put pressure at top of skirt
 3. With Left Hand start purging mask, then tilt head back 45 degrees until clear
 - > *You can breath normally while clearing*
 4. When clear, take a full breath & stop purging
 - > *Approximately 1-2 shot glasses of water will always be left in reg barrel; further clearing will be necessary in Step 5*
 5. Tilt head Down & Left 45 degrees and exhale a forceful **half-breath**, to clear the remaining water
 6. Cautiously inhale & repeat Step 5 as needed

Emergency Bailout Training

Running out of air or more rarely, loss of FFM structural integrity will require Bailing out to RASS

SCA Procedure:

1. Activate, Deploy, & Stage RASS in hand
2. Remove FFM
3. Purge-Clear then Breath from RASS
4. Deploy, Don, & Clear Spare Mask
 - > *In a real-world scenario, diver would collect FFM & Comm line to avoid entrapment and surface their dive, skipping the Safety Stop*
5. Replacement of FFM underwater (for training purposes & evaluating Diver comfort)

FFM Exit Procedures

Diver

1. Remove FFM; *avoid dunking in water*
2. Disconnect FFM from Reg & Unclip Comm Line from BC
3. Hand up FFM & Comm line
4. Finish Exit as normal

Topside Support

1. Receive FFM & Comm line
2. Overlay Comm Line neatly over GOT rail
3. Turn OFF Comm Box
4. Dummy Plug both FFM & Comm line

Disinfect Procedure

1. Quick Rinse in freshwater bucket
2. Spray mouthpocket with Birex
3. Wait 10 Minutes
4. Rinse again with freshwater
5. Drain all water from FFM
6. Stow in FFM closet



Draining & Drying the Mask

Draining Procedure

All water must be manually drained from the skirt before you hang it. This will help to control mold growth in the masks.

1. Tilt the mask left and right to empty the reg barrel.
2. Hold mask upside down and peel mouth pocket back.
3. Rotate mask then orientate it to drain the rest of the water from the double skirt via it's inner corner.



Drying the Mask

- The mask should be hung right side up, by the straps
- Avoid scratching inside lens on hanging pegs
 - > **DO NOT** hang mask by it's skirt or press the lens to the hanging pegs
- Please pair FFM with a FFM reg



Hints for a Successful Dive Show

- Be familiar with scripts
- Be familiar with interesting/unusual facts about animals in GOT
- Coordinate with educator doing the show
- Pre-Check communications before entering exhibit
- Stand vertical, firmly on stage or Hover neutral 3-5ft above the stage with the Window Suction Cup
- Watch Air Consumption
- *Remember ... while on the full face mask assume that all of your comments will be heard by guests*

Be professional ... You are !

OTS - Video Supplement

- Please follow the link provided and view the 2 supplemental videos on use of the Guardian FFM
 - > [OTS Guardian FFM Training](#)
 - > [Doff & Don a Guardian FFM Underwater](#)
- Further instruction will be given by DSO's prior to Checkout Dive 1 & Dive 2

