undercurrent®

THE PRIVATE, EXCLUSIVE GUIDE FOR SERIOUS DIVERS

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Guadeloupe, French West Indies

Tougher than pulling teeth

There may be no end to potential destinations for traveling divers, but for many possible sites there may also be no reliable source of information. Many Caribbean sites seem exotic and romantic and certain to have good diving, yet getting reliable information about the diving is impossible. Many readers have, for example, queried us about Guadeloupe, in the French West Indies, but none of our staff had dived there, and only two or three of our readers had written us about their experiences. I could find no mention in back issues of Skin Diver nor in the latest edition of the International Divers Guide. Fodor's and Fielding's speak of the island, but not of the diving.

However, the current brochure from the French Tourist Office explained that scuba diving is available at every major hotel on the island. Could it be that Guadeloupe was the best kept secret of the Caribbean? Thanks to Eastern Airlines Unlimited Mileage Fare, we decided to find out for ourselves.

What I learned about Guadeloupe can best be described, if you will pardon me, with a cliche. Diving Guadeloupe is harder than pulling teeth -- and sometimes not much more fun. While there I broke a tooth and within an hour I found a dentist and had the painful culprit yanked for $12. Yet it took me two days to find a dive shop and another day to find a guide.

Guadeloupe, located centrally in the West Indies between Antigua and Martinique, is a butterfly-shaped island. Grand Terre (pronounced "Gran Tare") is the windward (Atlantic) wing; Basse Terre (pronounced "Boss Tare") the leeward (Pacific) wing. All tourist facilities are located near the town of Grosier, on Grand Terre. I checked with every hotel which the tourist brochure claimed offered scuba diving. None did. A water sports director referred me to the Club Caribmer, a private club which offers trips to tourists, but only for free divers. They spear. I decided to look elsewhere.

I at last learned of the single shop on Guadeloupe (Scuba Guadeloupe) at Point-a-Pitre (pronounced "Point-ah-Pete"), 25 minutes from most of the hotels. Owner

Paul Coulon rents the only tanks on the island (3000 psi) and rents regulators and safety vests. He does not offer guided tours, but sold me a map of the island and indicated a number of diving sites. The best diving, I was told, was at Basse Terre, about two and a half hours from the hotels. There is shore diving on Grand Terre from September to January, but the rest of the year strong Atlantic winds keep the surf up and the visibility down. I visited these sites and indeed the conditions were such that we opted for Basse Terre. There, at three different sites, we found easy entry, 25 foot depths and visibility 40 feet or less. There was not much to see. On my first dive at Baile Argent Beach I found a few small coral heads, an octopus, two small parrot fish and a number of wrasses. At Petite Anse I found 20 foot visibility and less to see; at Point de L'Ermitage I found a sand bottom and gave up.

Through Coulon and others I learned of Pigeon Island, a government preserve, and I was told of two guides who could take my buddy and me to Pigeon. I arranged a Sunday morning dive with a Mr. Vincente ("Vincent") by asking for him at Chez Loulouz, a beach restaurant at Malenure beach. Through the Guadeloupe dive club (the president is Bob Severin; call 82-83-56) we arranged an afternoon dive. At last, we thought, the secret of Guadeloupe would reveal itself.

On Sunday, when we arrived, Mr. Vincente, a tall, thin chap, with a total of two thumbs and three fingers, was preparing his small wooden fishing boat for the dive. He spoke French and we spoke English, so after gestures and sand paintings we reached an agreement to dive Pigeon Island, about a mile off shore. We had rented all of our own gear, since Mr. Vincente had none, and proceeded to motor out to Pigeon.

It was a fine dive. The underwater landscape appeared to be rolling hills of stone and coral sloping downward and eventually out of sight. We stayed in about sixty feet of water and watched schools of sixty tuna dart in as close as fifteen feet. Large parrotfish and inquisitive barracuda appeared throughout the dive as did a tiny, perfectly-formed, perfectly-colored queen angelfish, not larger than a saucer. A variety of Caribbean reef fish played about among the huge basket sponges and prolific coral. Visibility ran about 60 feet and above us, Mr. Vincente, in his boat, rowed with our bubbles.

That afternoon we met our dive club guide -- an English-speaking scuba instructor -- who motored us to Pigeon in his Zodiac. The surface circumference of Pigeon really two small islands, can't be much more than a half-a-mile, so the dive sites are identical and limited. What we had seen in the morning was seen this afternoon, but the visibility had now dropped to 40 feet. This trip however, cost us $46.51, the price one has to pay to have an instructor accompany two people below the surface.

My two dives at Pigeon were good, among the best 25 percent I've had in the Caribbean in terms of the terrain and creatures, but surely not in terms of visibility and variety. I must say, however, that Guadeloupe diving and prices are in no way worth a trip by the serious diver hell- bent on good diving. In addition to boat costs, the rental of six filled tanks plus two additional air fills, no packs and two weight belts, was $67.44 for three days. Of course we could have rented two tanks and returned for fills, but gasoline was $3/gallon and to that one must add rental car mileage. The cost would be astronomical.

I should also note that some of the tanks require an adaptor to fix American

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regulators to French valves. Adaptors can be ordered through most dive shops. Also, electrical current is 220 volts; a transformer is needed to recharge strobes or to operate shavers and hair dryers.

What else about Guadeloupe? Most cuisine is continental and well prepared, not unlike the meals found in fine restaurants in all major U.S. cities. We enjoyed native creole at Chez Rosettes in Grosier, excellent lobster (really crayfish similar to Pacific Lobster) at Honore Athanage in St. Francois, and an excellent mixed grill (steak, pork chops, and blood sausage) at La Parilla, a South American restaurant in Grosier. The tab always ran about $30 for two, with wine extra. I enjoyed the local beer, SAGBA, but did not partake of the red wine offered with restaurant breakfasts, surely a French staple.

Touring is interesting. In rural areas oxen pull carts along the road. At Deshaier Bay, fisherman work as they did in the 19th century. The volcano L' Soufrier, located on Basse Terre, last erupted in the 1950's. A visit there takes you into chill and fog, a nice retreat from the tropical climate below. Pt. de Chateau on Grand Terre, the furthermost tip of Guadeloupe, has an exciting, rugged coast. On the way is one of the two nude beaches where, if you stop to look, you are encouraged to conform.

Oh yes. If you should need a dentist, I recommend Dr. R. Lavau in Gosier. Call 84-17-22.

(C.N., 6/78)

And a word about Fort Royal Club Med

Six weeks before we visited Guadeloupe, our New Jersey correspondant visited the Club Med at Fort Royal, Guadeloupe. Here is her report:

"Both Guadeloupe Club Meds (The Fort Royal on Basse Terre and The Caravelle on Grand Terre) dive Pigeon Island exclusively. Although I enjoyed the dives and the terrain, I did not see some of the larger fish including the tuna which the Undercurrent staffer was lucky to observe.

Worldwide, the Club Med is an organized, standardized, routinized vacation which allows no room for choice outside the procedures established by the Club. That's fine for dining, sunning, volleyball and evening carousing, but it's not so fine for scuba diving.

We began by presenting C-cards (I'm an instructor) and then proceeded to an open water checkout, where we were required to buddy breathe, swim without our masks, and perform other reasonable feats. After we proved we could dive, we were required to take 30 deep knee bends, with our blood pressure and heart rate checked before and after. Several certified divers who passed the checkout were disqualified from diving by their physical condition.

Once aboard the dive boat, our guide questioned each of us about the signals. He asked me for the out-of-air signal. I "slashed my throat." "Wrong," he said. Other divers protested. He became annoyed and insisted that his signal -- waving his hand vertically across his face -- was correct. He was our guide, so we conformed with this and other Club Med signals.

The Club uses French tanks and does not provide adaptors. I did not bring an adaptor so I had to use Club gear which came without a submersible pressure

gauge. The regulators, I noticed, were washed only in ocean water and there was no dust cover protecting the first stage. They seemed poorly maintained.

Our guide wore two tanks, each with a separate regulator. When the first member of our group ran low of air, he signalled the guide that he was pulling his j-valve. We were too far from the boat for him to return, so when he eventually ran out of air he began breathing off the guide's second tank. Then another diver ran out of air and began buddy breathing with the guide. Then a third diver ran out and because the guide was already tethered twice, this diver began buddy breathing with another member of our group. Then a fourth diver ran out ... At the end of the dive, we were all required to decompress, many while buddy breathing, although we were well within no decompression limits. Several of our dives ended the same way. It seems that the Club Med dives are so structured that some divers will always run out of air.

All the effort the Club Med puts into determining the qualifications of a diver is erased by the lack of safe gear and inconsistent below-surface safety procedures. They break rules no novice American certified diver would consider breaking. It makes no sense.

And, our guides leadership was often inconsiderate and the guides were sometimes surly. They raced through the water like seals, keeping us huddled together like a school of grunts. On one dive I signalled I was going on reserve. The guide shook his head and glared, then purposely ignored me. When I finally ran out of air, I swam hard to catch him. Only during the last few days did the ambience change when new guides came to the club for the first time.

For hedonists, the Club Med offers a great deal: fine food, plenty of wine, people and song, a wide range of activities, and moderate prices. At Fort Royal, they even provided excellent child care and organized activities for my young son.

For serious scuba divers however, the Club Med offers little. And apparently, that applies worldwide.

Fourteen Caribbean Islands For $299

But Watch Those Extra Costs

Almost weekly, a reader writes us requesting information about that special Eastern Airlines fare which for $299 plus tax, permits a traveler to visit as many of the 101 Eastern destinations as he can fit into a 21-day trip. Most inquirers not only wish to visit every Caribbean island during the 21-day period, but also expect to dive every day. Their question to us is "how do I do it?"

Our answer to them is, "don't even try."

Eastern's *Unlimited Mileage Fare* has great possibilities for some travelers, but for others it can waste both time and money. Before discussing what it can mean to the traveling diver, here's a bit about its requirements.

★ At least two adults (or one adult and two children) must travel together for the entire trip.

★ The trip must last at least 7 days and not more than 21.

★ At least two stop-overs, in addition to the final destination, are required. You may make as many stop-overs as you choose, but you may not stop-over in the same city twice except to change planes. (Many travel agents and even Eastern Airlines personnel, we have discovered, attempt to require *three* stops prior to your destination, but we are told by Eastern that is an incorrect interpretation of the requirements of the fare.)

★ You must predetermine all destinations, reserve your flights and pay for your tickets 14 days prior to your departure. No open ticketing is permitted.

★ This fare will be available until mid-December, 1979. During July and August, and from mid-December to the end of April the fare is $369, plus tax.

Throughout the Caribbean Eastern planes are flying full, so reservations must be made well-in-advance of departure. Eastern's commission to travel agents is low, so some agents charge an additional fee to set up the trips; the Eastern route is complicated, scheduling is difficult and a simple change in plans by a traveler usually requires the entire trip to be rescheduled.

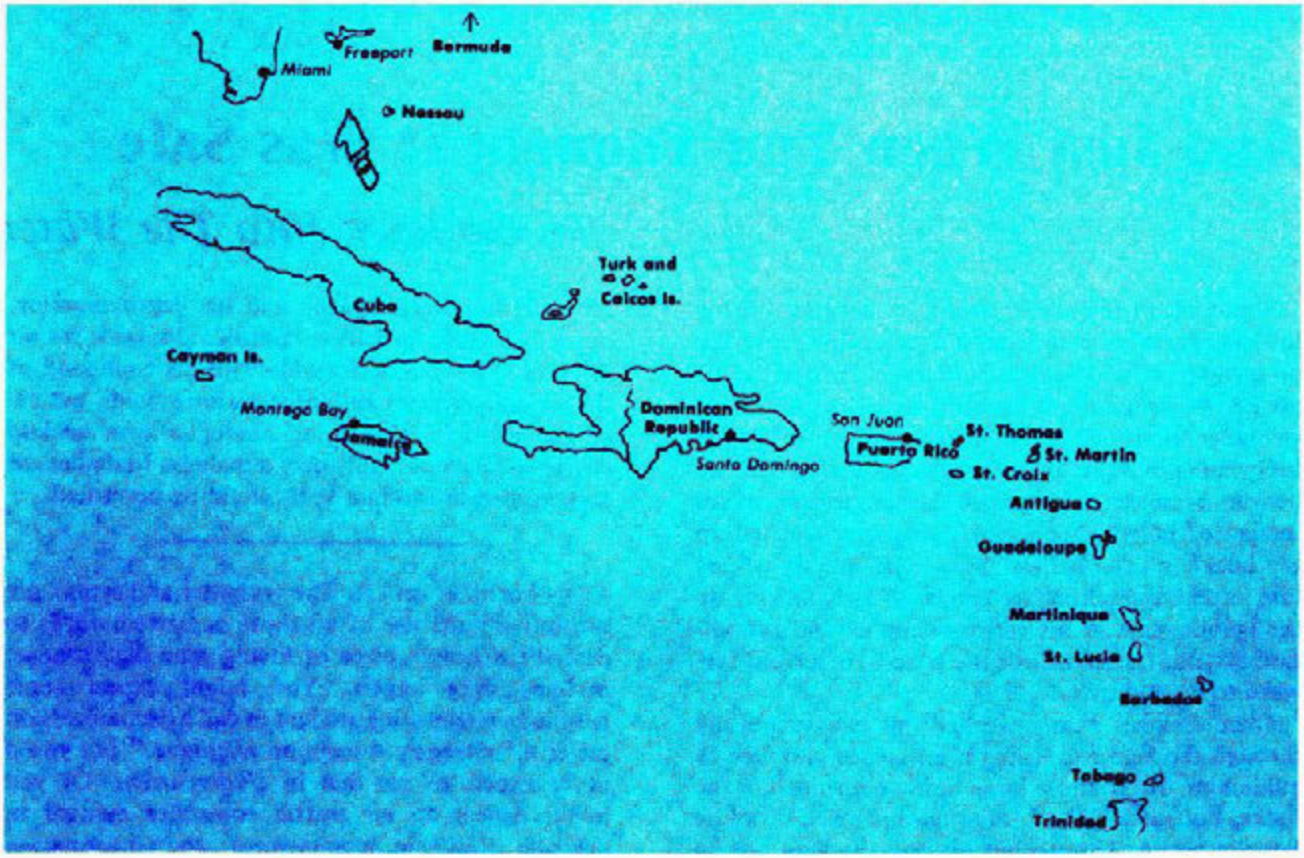
Can you, a diver, use this fare to your advantage? First, look at the dive destinations to which Eastern travels: Acapulco, Antigua, Barbados, Dominican Republic, Freeport(Bahamas), Guadeloupe, Martinique, Miami, Jamaica, Nassau (Bahamas), Puerto Rico, St. Croix, St. Lucia, St. Maarten, St. Thomas, and Trinidad. Of these, the U.S. Virgin Islands probably offer the best diving, but of course one need not use the special Eastern fare to go only there. Surely there is respectable diving at many other destinations, but for the serious diver none seems to merit a trip just for diving, unless you can find a boatman to take you beyond tourist sites. One technique to use this fare successfully, then, is to exploit it to get to other spots not on the itinerary. For example, from Nassau one could arrange a supplemental flight to other islands in the Bahamas or to the Turks and Caicos Islands. From Miami or Jamaica one can get to Grand Cayman. From the U.S. Virgins one can get to the British Virgins. From Trinidad one can get to Tobago.

"Three destinations for divers on the Eastern route seems the maximum for preserving sanity."

This is not to say that the Eastern destinations are poor choices for a vacation. Each has great appeal for tourists wanting more out of a vacation than only diving. But if the best diving is your purpose, then supplementing the itinerary is the key.

Developing a trip on the Eastern route requires restraint in determining the number of destinations. The Eastern schedule is itself limiting. From many islands there may only be two or three flights a week and their connections with other destinations may require a layover where you don't wish to layover, or may require trips back and forth through the Miami airport. Also, you won't be diving the day you land at or the day you depart from a destination. There's never time the first day, and diving during the day you depart is dangerous. If you do not know why, go back to your manual.

Many people have asked *Undercurrent's* opinion of proposed trips covering half a dozen islands. To us, those trips make no sense. Nondivers might enjoy a whirlwind tour of several islands, but for divers at



least five days on any island is required. Considering arrival and departure days, flying time, scheduling, etc., three destinations for divers on the Eastern route seems the maximum for preserving sanity.

One of our staffers recently made the Eastern trip from Los Angeles to review St. John, Guadeloupe, and Negril, Jamaica. He had this to say:

> I took Eastern's *Unlimited Mileage Fare* to save money. I don't think I came out ahead. I planned the trip more than a month in advance but full flights required me to alter the plan substantially. During the trip, I spent 37 hours in-and-around airports and 28 hours in the air. That's 2½ full days. Because of scheduling I did not have enough time on St. John to enjoy it; having to rush about was frustrating. Unless one is careful to reconfirm his reservations, he may not be permitted to board his flight and may spend several extra days waiting for the next available space. If a flight is missed one may travel on another carrier between destinations, if there is a carrier, but for an additional charge.
>
> Once at my destination it took at least a day to get oriented and to find the dive shops. For me, five or six days — it takes me that long to pack my diver gear — is barely enough at one destination, so running to cover many islands proved unsatisfactory.
>
> I took the trip to save money, but the expenses of moving between destinations meant greater costs than I had planned. Two of us spent $2,700. We did not spend unnecessarily. By traveling to islands without bona-fide dive resorts we had to pay the high, two-tank/day dive rates (about $40 each). We frequently needed to rent a car. In most respects, trips to dive resorts are more economical and the diving is bound to be better.
>
> On this trip, St. John diving was enjoyable, Guadeloupe was poor, and Negril average. We enjoyed the vacation, the visits to new islands, and the experiences along the way. But we're first and foremost divers. Where we want to go, Eastern does not. The Eastern fare may be a boon for nondiving tourists, but was a doggerel for me.

There you have it. These busy trips may have been suitable to Eastern President Frank Boorman who, as an ex-astronaut, covered plenty of destinations himself in 7-21 days, but they may not work well for serious divers. However, if you have a reason to use the Eastern domestic routing for other purposes — visiting a relative, attending a convention, conducting business — then adding a dive destination to your itinerary may make great sense. For example, if you live in Seattle and must travel to Washington D.C. on business, then other stops along the way come at no additional charge. For you, it makes sense to use the Eastern *Unlimited Mileage Fare*. But others, considering total expenses and the overall quality of diving available along the Eastern itinerary, may be far ahead paying the higher fares in the air to get the lower costs on the ground and better diving below.

And Just When You Thought It Was Safe

To Go Back Into The Water

Standing on the shore, Jason looked out on the low energy waves and decided once again to embark on an underwater learning experience. He opened his diving system carrying bag and reached for his environmental suit, which he struggled into. He slipped his cylinder into the support pack and attached his air delivery regulator. He donned the components of his integrated buoyancy control system and cinched up the buckle on the ballast system. His buddy helped him into his air delivery system, and, after picking up the components of his surface support and propulsion system, he headed for the water. He looked forward to a good dive.

Once below, Jason worked his way carefully through the kelp bed, using his direction monitor to guide him. He found a large bottle embedded in the rocks, but since he had forgotten his diver's tool he left the bottle. Throughout his dive, he kept his eye on both his time monitor and his depth monitor, housed in his information console, alongside his air monitor. He felt comfortable with his command of the air management and information system, but used the nitrogen absorption analogue as a backup device so he would not suffer a malady. Maladies, he had learned in Module VIII, could be prevented.

It's horrible, isn't it. The grammar and syntax are ok, but it's the use of all those contrived words to describe a simple piece of diving gear that annoys, perhaps even angers. You might expect some freshman engineering student to call a decompression meter a "nitrogen absorption analogue," but you'd never expect to see that in *Undercurrent*. Or you might expect an air traffic controller manual to describe "an air management and information

Continued on P.9.

Undercurrent Reader Survey

Response requested

PLEASE COMPLETE THE SURVEY AND RETURN IT TO UNDERCURRENT BY OCTOBER 1, 1978. The results will be published in a forthcoming issue.

		Yes	No
1.	Did your power inflator and buoyancy compensator come as an integral unit and did you purchase it as one unit?	____	____
2.	If *yes,* what is your BC and inflator brand and model?	_____	
	What month and year did you purchase it?	_____	
3.	If *no,* what is the brand and model of your inflator?	_____	
	What month and year did your purchase it?	_____	
4.	How do you use your power inflator:		
	to inflate BC before entering water	always___ sometimes ___	never ___
	to inflate BC under water for buoyancy control	always___ sometimes ___	never ___
	to inflate BC on the surface after a dive	always___ sometimes ___	never ___
5.	With bare hands is the inflator hose easy to attach to the BC?	____	____
	With bare hands is the inflator hose easy to detach from the BC?	____	____
6.	With gloves is the inflator hose easy attach to the BC?	____	____
7.	On your model have your found it easy to confuse the button for inflation and the button for deflation?	____	____
	Have your ever caused a problem for yourself while diving by confusing the buttons *(If yes, please explain on the reverse side)*	____	____
8.	Have you had any of these problems with your power inflator?		
	fell apart during a dive	____	____
	fell apart when not diving	____	____
	leaked air	____	____
	unable to keep connected when diving	____	____
	failed to operate when you pushed button	____	____
	operated unexpectedly during a dive causing BC to inflate	____	____
	If so, were you able to disconnect the inflator or quickly turn it off	____	____
9.	Would you purchase this power inflator again	____	____

IF YOUR ANSWER IS YES TO ANY OF THESE QUESTIONS, PLEASE PROVIDE THE DETAILS ON THE REVERSE SIDE OR ON AN ADDITIONAL SHEET OF PAPER. AISO, PLEASE DRAW A SKETCH OF YOUR INFLATOR IF YOUR HAVE IT HANDY

PLEASE COMMENT HERE ABOUT YOUR POWER INFLATOR AND ANY PROBLEMS YOU MIGHT HAVE EXPERIENCED.

Name _____ Address _____

City _____ State _____ Zip _____ Telephone Number: _____

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An Easy Way for You to Save Money

With inflation continuing to jack up the price of almost everything you buy these days, here's a welcome opportunity to reduce the cost of one of your investments — your subscription to *Undercurrent.*

Just send in the names of friends or dive buddies you think might benefit from reading *Undercurrent.* Then we'll send them a personalized invitation to subscribe as well as a free sample issue to examine at their leisure. If they subscribe, you will benefit. We'll credit you with a four months addition to your subscription or renewal to *Undercurrent* (that's equivalent to $3.75) for each person you recommend who actually subscribes.

Use this form or your own stationery to list those who you think will be interested in receiving *Undercurrent* below. Be sure you entr your own name at the bottom of the form so we'll know who to credit for getting the new subscriptions.

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system" or a computer operator to write about an "information counsel." But in *Undercurrent?* Or would *Undercurrent* call a weight belt a "ballast system," or mask, fins and snorkel a "surface support and propulsion system?" It would have to be low level-science fiction or a high-level put-on.

"To pass the final exam, one must not only be proficient in the water, one must also be proficient at reading and writing pompous jargon."

But the folks at NASDS would think that piece makes sense, because the new NASDS basic training manual — *Safe Scuba* (which all their new students use) — not only employs these words, but also uses a raft of other equally ridiculous terms. And so do some of the NASDS instructors, who ought to be embarrassed by such twaddle. A recent advertisement for the Oregon Diving School offers the basic certification course of three components, one of which is the "Air Delivery Training" component where "professionals teach with complete air delivery systems for your safety and convenience, not just with a regulator." Obviously, they're more skilled at obfuscation than at syntax.

Why the small minds of the world have to devote their limited talents to muddling simple concepts is beyond us. We have come to expect such gobbledygook from bureaucrats who refer to file cabinets as "four-tiered retrieval systems." Or politicians such as Senator Brook who recently tried to make us believe that his lies in the courtroom were only "misstatements." But, must we be forced to swallow these tongue-thickeners from NASDS?

A lot of not-so bright people use big words to cover their mental liabilities. The words may sound impressive to other not-so-bright people, but they mean nothing. Idiots who want to sound like engineers enjoy saying "direction monitor" rather than "compass." We don't enjoy hearing it. There are a lot of suckers in the world who might be impressed by people who call wet suits "environmental protection suits," but anyone level-headed enough to become a diver ought to be embarrassed to utter such a silly phrase.

If there is a better way to turn off people interested in learning to dive, we can't think of it. But now to become an NASDS-certified diver, one must not only learn to keep his eye on his pressure gauge, but he must also refer to it as an "air monitor." To pass the final exam, one must not only be proficient in the water, one must also be proficient at reading and writing pompous jargon. We once thought that government regulation posed the greatest threat to the health of the diving industry. No longer. Beware of diving instructors with typewriters.

Safe Scuba is an otherwise well-designed and attractive book (although the binding in our edition is so weak the pages fell out on our third thumb-through). But even by ignoring the purple prose, one still faces a clumsy primer-like style certain to cure insomnia. People forced to read passages like these will either doze off or become candidates for dimwit of the year.

"The fins you buy should be made of different sizes and provide an adjustable heel strap for proper fit." (We prefer our fins made of rubber.)

"The term, 'professional,' has become a highly over used concept; however the application of the term to NASDS dive store/schools still has considerable relevance in the most positive connotation of the term." (We think it's still over used.)

"The truth of the matter is that you will never have the problems outlined here because you will know what causes the problems and you will overcome them before they come up by avoiding the problem and thus will avoid the results." (When we read this something beside our problems came up.)

"We have often used the term 'Scuba' as though everyone knows what it means. It may be worthwhile to briefly discuss its derivation. S-C-U-B-A is actually a mnemonic for Self Contained Underwater Breathing Apparatus. It describes a total diving system in which a diver carries his (her) own environment or life support system into inner space free of restrictive ties to the surface." (Don't run to the dictionary to look up "mnemonic" since it's the wrong word anyhow.)

"The Air Management and Information System is designed to provide the diver to formulate (sic) a precise pre-dive air use plan. It must also provide a diver with a constant readout as to air pressure and provide a reliable low air alert systems to avoid insufficient or no air situations." (We have new evidence that too much diving produces malfunctions in certain components of the human system — above the neck ... "The Accessory and Special Purpose Diving Equipment Systems provide the diver with spare parts and tools for the operational diving system lubricants and cleaners, and specially designed equipment components to extend the range of the TOTAL DIVING SYSTEM into the entire variety of possible diving purposes." (Wow, d'you MEAN with a kit for my WRENCH and silicon spray I CAN BECOME A FROGMAN?)

By training counterfeit diving systems engineers who chatter in newspeak, they are creating a cadre of diving Moonies....

So, while other training agencies are striving to simplify diving instruction by eliminating unnecessary mathematical computations and useless medical terminology, NASDS is rushing to fill the void with its own patented clutter. By training counterfeit diving systems engineers who chatter in newspeak, they are creating a cadre of diving Moonies who will quickly become *persona non grata* in all but NASDS dive shops. No one will talk to them, no one will understand them, no one will sell to them. They'll have to return to NASDS shops to buy air, which guarantees generations of future customers — unless someone decides to go into the deprogramming business.

This is the second edition of *Safe Scuba*. It was published in February, 1978. The first edition of this basic training manual earned a few titters for the recipes in the back. If you were an early critic, be ashamed. Diving never had it so good.

The AMF Swimmaster MR12-II Regulator

The Navy Nods Its Approval

During the last year, *Undercurrent* has published regulator tests performed by the United States Navy Experimental Diving Unit. The Scubapro Pilot Regulator, the Poseidon Cyklon Super 300, and the Sherwood Selpac 4100, were approved for U.S. Navy use. The Sherwood Selpac 300 was not approved. How the Navy tests its regulators was discussed in the October, 1977 issue and one should refer to that issue for more information about the testing program.

In May, 1977, the U.S. Navy published the results of its test of the AMF Swimmaster MR12-II regulator. This is a synopsis of that test, which required 200 man hours to complete.

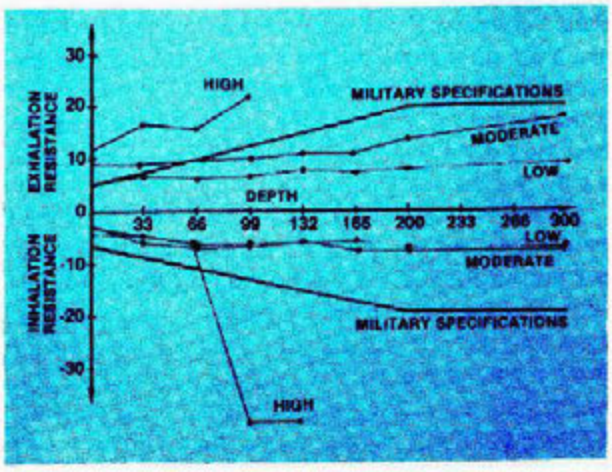
The MR12-II: Description

The MR12-II regulator has a balanced, diaphragm-type first stage with low-pressure ports and one high-pressure port for a submersible pressure gauge. The second stage has a unique bypass tube that differentiates it from its predecessor, the MR12. The bypass tube directs the air from the valve seat directly to the mouthpiece, completely bypassing the diaphragm. The bypass tube and deflector baffle mounted in the mouthpiece create a high-velocity, low-pressure area in the mouthpiece tube which assists the movement of the second-stage diaphragm. Diaphragm movement, in turn, actuates the valve mechanism. Theoretically, the harder a diver works, the more he is assisted.

Breathing Resistance Tests

Breathing resistance was measured to simulate light, moderate, and heavy diver work rates.

The breathing resistances plotted in the figures are the maximum resistances measured (except for cracking pressure) during one complete exhalation-inhalation cycle at the specified depth and work rate. Air supply pressure to the first stage was 1,000 psi. Resistance was measured at 500 psi and 200 psi supply pressures on the surface, and at 200 feet at each work level.



BREATHING RESISTANCE AT INCREASING DEPTH AND VARYING WORKLOAD FOR MR12-11 REGULATOR

Inhalation Characteristics

Inhalation resistances plotted are the maximum pressures recorded at all work rates. In most cases, the maximum pressures occurred just after the air flow was initiated. As the inhalation cycle continued, resistance dropped to almost zero and often a positive pressure was recorded. This indicates that the by-pass tube assistance device reduces average inhalation resistance at all work rates.

Inhalation resistance at low and moderate work levels was well within military specifications. The first part of the inhalation cycle is slightly unstable but this was expected and presents no problem to divers. At heavy work rate, resistance was within military specification to 66 feet but did not meet specifications at greater depths.

At all work rates, cracking pressure required to initiate air flow was high compared to many other regulators, but not so high as to require a significant increase in breathing work.

At low work rates, inhalation resistance was not affected by the supply pressure, but at moderate workload, resistance exceeded military specification at 200 psi supply at a 200 foot depth.

Exhalation Characteristics

Exhalation resistance at low and moderate workloads is within military specifications except at shallow depths. This characteristic is common to most regulators and does not affect regulator performance for sport divers. Exhalation pressure was smooth, but greater than that of many late model regulators. At high work rate, resistance exceeded military specifications at all depths.

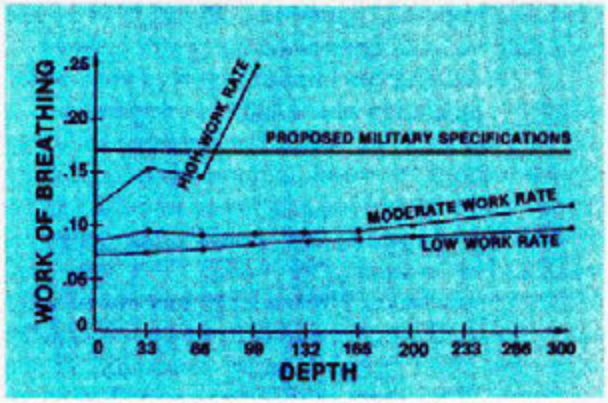
First Stage Performance

Intermediate pressure drop when air was flowing between the first and second stages was monitored to evaluate regulator performance at a given work rate and depth. By correlating pressure drop with breathing resistance, poor regulator performance can be traced to the first stage, the second stage, or both stages. Our tests discovered that the first stage was not designed to operate at heavy work rates except in shallow water.

Work Of Breathing

The specification governing testing of all breathing apparatuses cites peak inhalation and peak exhalation pressures as the standards for evaluation. However, recent research has shown that measurement of a diver's external respiratory work in operating his breathing apparatus during one complete breathing cycle yields useful data for evaluating equipment performance.

Breathing work is low for both low and moderate workloads. At a high workload, the required breathing work stayed below the proposed standard to 75 feet. It is significant to note that although breathing resistance at a high workload is outside military specifications at all depths, the *work of breathing* required of the diver is acceptable to 75 fsw.



BREATHING WORK AT INCREASED DEPTHS. DEPTH FOR MR12-11 REGULATOR AT 1000 PSI SUPPLY PRESSURE

Conclusions And Recommendations

The Swimmaster MR12-II regulator meets military requirements and is recommended for Navy use. Under normal conditions, the MR12-II regulator is an easily operated breathing apparatus with exceptionally low work rates. As specified by the manufacturer, the vortex-assist mechanism is effective in reducing inhalation resistance.

Although overall performance and diver safety are not affected, the following improvements are recommended.

Exhalation Resistance: Tests revealed that exhalation resistance was high under all test conditions, especially when compared with inhalation resistance. Enlarging the exhaust port to 1 inch diameter is recommended. (The MR12-II exhaust port is identical to that of the MR12.)

Cracking Pressure: Cracking pressure on inhalation is much higher than required with most other late model regulators. Changes to the second-stage diaphragm and linkage assembly are recommended to correct the problem.

Undercurrent Comments: The AMF MK 12-II regulator, according to the Navy tests, seems to be a fine regulator for sport divers and instructors. Bill Oliver, AMF engineer, told *Undercurrent* that no changes have been made in the regulator since the Navy tests, so the regulator on the market today is the same regulator that the Navy approved.

The MK 12-II sells in the neighborhood of $150, but is often discounted. The cost to dive shops is $75.

And some thoughts about regulator testing and purchasing

A few years ago, Roly Nyman and J.G. Van Der Walt performed an extensive study of regulators for the South African Underwater Union. Nyman sent us his study, which has been published in England, and commented about the U.S. Navy tests of regulators and our continuing series on regulators. We have taken the liberty to paraphrase Nyman's letter and trust that we have maintained his position fairly:

Undercurrent has implied that regulator performance — inhalation and exhalation resistance — is the only criterion on which the purchase of a new regulator should be based. In our study of regulators, fifteen divers of varying experience tested a number of different regulators and found other subjective criteria. For example, we found "wet and dry" breathing regulators. When a small amount of water enters the regulator, the degree to which it is expelled when the diver exhales varies according to the regulator. Regulators with side-mounted exhausts seem to be "wetter" than others. When our divers tested regulators, they found the "dry" breathers preferable to the "wet" breathers, all other factors being equal.

We found that the noise of in-rushing air varies from regulator to regulator. Our divers seemed to prefer the higher, smooth-pitched hiss to the harsh low pitch, which seemed to suggest to them that a regulator was battling to serve the diver's demand. Anything approaching a musical note or other noise was rejected outright.

Finally, weight, fit, and feel should obviously have a bearing on one's choice. Each diver has his own preferences.

Undercurrent recommended that the diver purchase the most expensive regulator he can afford (if he doesn't have performance data) but the top-of-the-line regulator is often cluttered up with features of no interest to the average diver. Number two or number three models are frequently the same as the top-of-the-line, but without these unnecessary features.

It is not quite accurate to say, as *Undercurrent* has, that regulators "fail" when overloaded. Rather, they have exceeded their design capabilities. When a regulator is overloaded, it doesn't deliver air, but if the divers demand is reduced to what the regulator can supply, then the regulator will work once again. If the regulator does not deliver air when it is overloaded, from the manufacturers point of view the diver has simply abused his equipment. Of course regulator performance data is not generally available to the purchaser of a regulator. My suspicions of why are probably libelous under the law.

Finally, I would like to add that the statistics developed in our study clearly show that the U.S. Navy is justly criticized for testing only one of a model. What is worse, they compound their error by having the "bad" samples tuned if necessary, but they never recheck the "good" samples.

No wonder U.S. Navy Divers are tough guys.

You May Not Be Insured...

If you are a NAUI, PADI or NASDS instructor divemaster leading tours purely for pleasure. NAUI Executive Director, calling in response to our June article on dive tours, explained the agencies' instructor liability coverage applies only to tours which provide some contribution to the divers' training. Of course, instructors and tour leaders may have other forms of applicable liability coverage.

Corrections, corrections, corrections...

In our June issue, the diver in the Seatec Bluefin compensator was pictured 90° out of whack, implying that the Bluefin would plunge him downward, rather than float him. *Sorry 'bout that. . .*And if you read Lou Fead's article in July you may have wondered what happened to Fead's rule. We found it on the type room floor. It should read: *Dive with a buddy, unless you accept the risk of diving alone....*And if you didn't understand the Freeflow squib about Jackie Bissett, don't fret. There should have been more, something about because she learned to dive she became less timorous and more confident but who cares now . . . and, if you were unaware that *Undercurrent* tried to rewrite Boyle's Law in the 5000 PSI tank article last month, then go back to freshman physics. When we talked about a 40 cubic foot tank delivering about the same air as a 72 cubic foot tank, editor's scalpel obviously took out one word too many. "sized." You should have read "40 cubic foot-sized tank." In an effort to bring good grammar to our readers, we instead brought bad physics! Did you catch it?

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