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RECENT PHM OPERATIONAL EXPERIENCE

BY

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## THE AUTHOR

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## ABSTRACT

The purpose of this paper is to provide an unclassified overview of the U.S. Navy's only squadron of Patrol Hydrofoil Missile Ship's (PHMs) operational experience. The PHMs utilization as the U.S. Navy's only homogeneous platform squadron (ie. no other all FFG or DD squadrons) also will be explored. In addition to operational and personnel tempo statistics this paper's principal theme will be the squadron's requirement to 'serve two masters'. The U.S. Navy and the U.S. Coast Guard each employ this platform's stunning abilities in both warfare and drug interdiction.

Focal points of PHM operations will consist of the ninety day PHM deployment to Grenada, drug interdiction operations (unclassified), warfare operations (unclassified), and operations at a remote site using the Mobile Logistics Support Group (MLSG). Observations on recent operations will be based on not only statistics gathered on voyage reports but personal experience and detailed interviews with ship's captains, squadron staff personnel, and MLSG.

## INTRODUCTION

The PHM was originally a NATO venture with partners of West Germany, Italy and The United States. When the number of ships to be built was reduced and potential construction cost increased, the Department of Defense attempted to rescind the funds already approved by Congress. USS PEGASUS (PHM 1), the first ship of the class, had already been built in a 'fly before buy' contract. Congress however, refused to honor the rescission and a contract for the next five ships was awarded in October 1977 to filled out the PHM squadron.

Six PHMS make up the squadron of COMMANDER, PATROL COMBATANT MISSILE (HYDROFOIL) SQUADRON TWO (COMPHMRON 2). Unlike most other squadrons in the U.S. Navy COMPHMRON 2 has only one type of ship, the hydrofoil. Another distinctive facet is that COMPHMRON 2 is the only squadron to command an entire ship class. PHMs are fast (over forty knots), heavily armed (8 HARPOONS and 76 MM rapid fire gun), small (133 feet), and all weather capable.<sup>1</sup>

The six PHMS are the U.S. Navy's only operational, alternative, surface platforms. Based in Key West, Florida they are located ninety miles from one of only two communist countries remaining in the world (Cuba). In addition, they are in the 'bull's eye' of most Caribbean drug routes. See Figure 1. As well as centrally located to observe, facilitate, or turn back the desperate immigration attempts by the populations of repressive and/or poor island nations.

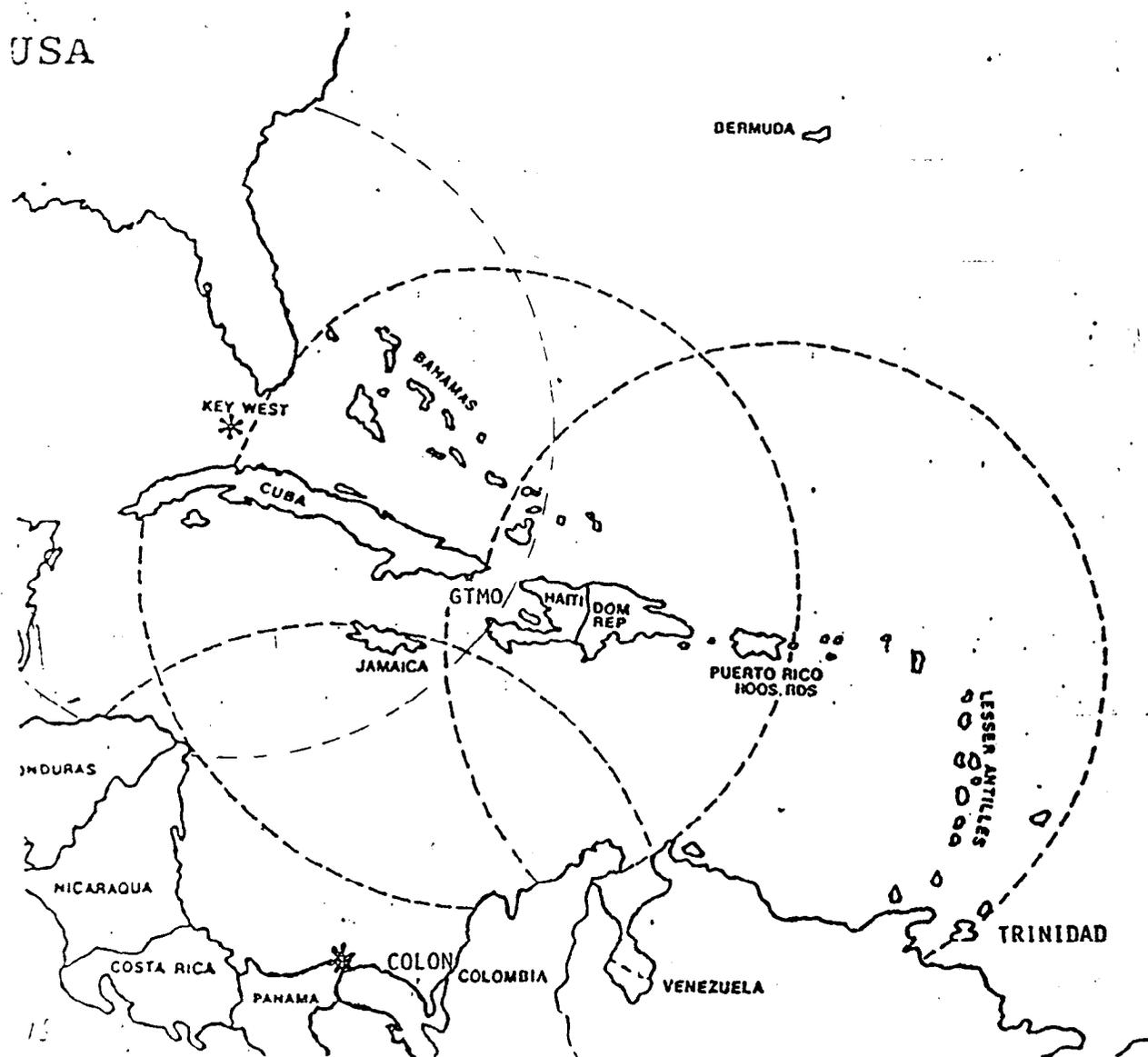


Figure 1 - The PHM's are Well Positioned for Deep Caribbean Operations

#### DEPLOYMENT

Five years have passed since the U.S. Navy's only Fleet Patrol Combatant Hydrofoil Missile Squadron proved its versatility and sustainability at a remote forward base. The Grenada deployment is generally believed to mark the initiation of the hydrofoil as a viable fleet asset. Under the command of Captain Stephen Hamilton, three of the Navy's fastest ships the USS TAURUS (PHM 3), USS ARIES (PHM 5), and USS GEMINI (PHM 6) clearly established that the squadron is an able part of the nation's sea going resources.

'The first forward deployment of the PHM squadron was an exercise in teamwork' said Captain Hamilton. 'It involved many interservice and international considerations.' The first of these began 12 February 1987 when USS LA MOURE COUNTY (LST 1194) berthed at Key West to load up thirty-three (33) of the Mobile Logistics Support Group (MLSG) mobile vans. The PHMs take their maintenance, parts, and technical support with them. USS LA MOURE COUNTY (LST 1194) served as primary support for the PHM squadron. While the USS TAURUS, USS ARIES, and USS GEMINI combed the east Caribbean conducting drug

interdiction operations and showing the flag in diplomatic ports of call, the MLSG was busy setting up base camp in a remote site on the island of Grenada. By 21 February when the PHMs made port in Saint Georges, Grenada, the 60 man detachment was fully ready to support the crew and the hydrofoil.

The PHMs took full advantage of their temporary forward base, according to Captain Hamilton. The ships visited 15 islands in the Leeward and Windward Island chains. They worked with maritime law enforcement agencies and the governments of those islands sharing vital tactical information on enforcement techniques. A 'ship rider' agreement was worked out with the government of Grenada operating within the 12 mile limit of that country. This was a first for the U.S. Navy. In addition, the PHMs operated with and visited the Venezuelan Navy in the nearby port of LA GUARIA. USS NEWPORT (LST 1179) acted as tactical support ship for the squadron during the last six weeks of the deployment. Loading out the MLSG vans for the voyage home with no outside assistance went like clock work. The 1,300 mile trek to Grenada provided a superb opportunity for PHMRON TWO personnel to forge closer links with those most involved in drug interdiction among the island governments in the Caribbean basin.

The PHM squadron from their arrival in Key West in March of 1983 through February of 1987 had amassed over 4400 days underway with a staggering voyage reliability rate of 97 percent. While some didn't believe this rate could be maintained at a forward base, the PHMs answered the question resoundingly with a 100.0 percent availability over the 90 day deployment that ended 12 May 1987<sup>2</sup>.

#### MAINTENANCE AND MANNING CONCEPTS

High Voyage Reliability (VR) rate is a key factor in PHM operations. It is measured by the David Taylor Research Center's (DTRC) Advanced Surface Ship Information System-Technical (ASSIST) program. The criteria is exacting. Any day's voyage that must be aborted, mission discontinued, or mission revised is counted against the PHM voyage reliability. An on-site engineer at Key West monitors each Voyage Report to insure reporting accuracy.

Voyage Reliability equals the (Number of Voyages - Number of aborted voyages, mission discontinued, or mission revised) divided by the number of voyages.

$$VR = (NV - NF) / NV$$

No other ship class has this type of independent scrutiny. The high visibility of PHM utilization is further examined at Ship Class Semi-Annual Program Reviews (SPRs). Representatives from OPNAV, NAVSEA,

TYCOM, COMPHMRON TWO, Planning Yard, NAVSSES, SUPSHIPS, DTRC, PERA(SURFACE) and others examine nearly every aspect of PHM maintainability, reliability, repair, and improvements. SPRs have been held since the development of the ship class. The improvements incorporated into PHMs have been impressive. 'Because of the increasing reliability we no longer feel the need to deploy MLSG vans for short deployments', according to Captain R.C. Berning, COMPHMRON TWO.<sup>3</sup> Two major Ship Alteration (SHIPALT) completions, the Diesel Fuel Marine (DFM) purifier and the Reverse Osmosis (RO) water plant, are partly responsible for increasing the PHMs legs. The combined efforts of a focused support team make these progressions possible. The results are no accident. The PHMs are part of PERA(SURFACE)'s LO/MIX maintenance concept. LOMIX stands for Low Cost, Low Manning Level / High Operational on Line Operational Availability.

A remarkably low number of personnel are required to Command Staff, train, crew, and maintain PHMs. Just over three-hundred personnel for all six PHMs<sup>4</sup>. In fiscal year '92 the number will increase to three-hundred sixty. The breakout is as follows:

#### -- Complement (OFFICER/ENLISTED):

##### Staff & TRADIV

FY91: 6/24      FY92: 7/35

##### MLSG

FY91: 6/168      FY92: 6/207

##### Ships

FY91: 30/120      FY92: 30/120

##### TOTAL

FY91: 42/312      FY92: 43/362

This number is generally equivalent to only the crew aboard single destroyer size ship. One determinant for this low number is the efficiency of quantity. Six can't live as cheaply as one but some expenses are lessened. For instance, PHMs are equipped with the MK 92 Gun Fire Control System the same system employed by FFG 7 class ships. Still, the MLSG has roughly the same number of fire control technicians (FCs) to maintain six MK 92 sets as the number of FC's found aboard a single FFG 7.

'Pride in ownership, that is the difference I believe. The MLSG technicians work only on PHMs. They learn the ships, well. Also, they know that we will see each other the next day and the next. That isn't always the case between ships and larger repair activities,' according to LCDR John Peterson, Commanding Officer USS HERCULES (PHM 2). The MLSG is extremely

close to the PHMs. Located on the same pier they are literally within 30 feet of their work. MLSG is actually an extension of the ships. MLSG provides all supply functions, technical manuals, most repairs, most preventative maintenance, inport emergency teams, and even crew substitutions.

The total operating cost of a PHM when compared to an FFG 7 Class or FF 1052 Class ship is about one-third (i.e. three PHMs for one FF or FFG)<sup>5</sup>. In addition, a PHM costs far less initially.

PHM dependability, geographical location, and mission flexibility all contribute to their high usage numbers. PHMs have been well employed. They consistently operate at or near the Fleet Commander's designated Operations Tempo (OPSTEMP) limit of nominally 30 percent. Personnel Tempo (PERSTEMP), days out of home port can often exceed 50 percent squadron wide<sup>6</sup>. Despite this heavy use PHM VR has been maintained at 97 percent from 1983 to present<sup>7</sup>.

## OPERATIONAL PROFILES

During the last five years PHM operations have been on the front line of primarily three mission areas. As commissioned ships of the line they participate in Fleet exercises, conduct training, and undergo all fleet inspections and competitions. In addition, they participate in the Nation's war on drugs. In this capacity they patrol the Florida Straits, Deep Caribbean, and Gulf of Mexico. They carry Coast Guard Legal Detachment (LEDET) personnel to perform all legal procedure requirements involved in drug captures. Finally, while patrolling these vital areas PHMs often encounter economically and politically displaced refugees. Three brief unclassified operational sketches best describe PHM recent operations.

### Fleet Readiness / Training

The United Nations calls for action. A belligerent nation transgresses the limits of peaceful civilization. An array of U.S. aircraft carriers, battleships, and cruisers are directed into positions. Typically, they will face an enemy's naval counter threat that consists largely of fast, missile laden, patrol ships. Our fleet knows what to expect<sup>8</sup>. Planning, far in advance of the threat, has prepared them. The U.S. Navy's PHMs have routinely conducted high speed raids against battle groups as part of their work up training. See Figure 2. The results of these exercises show the danger of and how to best combat small ships carrying sophisticated weapons. The tactics of attack and defense are

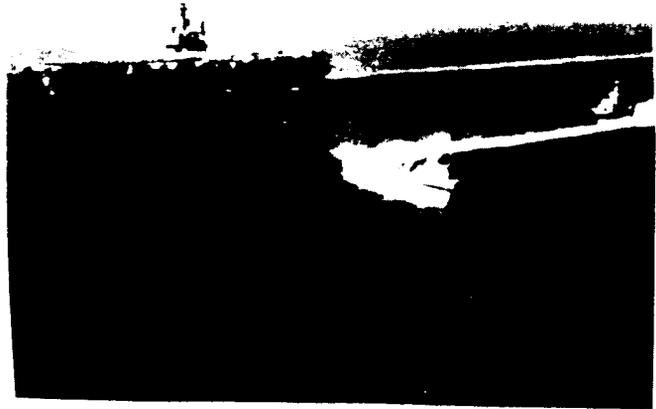


Figure 2 - High Speed Demonstration for USS AMERICA (CV 66)

constantly honed.

Two dozen or so U.S. Naval Academy midshipmen board a PHM for a training demonstration at Annapolis, Maryland. They are always impressed with the bristol cleanliness of a thoroughly modern warship. After a short sea detail the LM2500 gas turbine engine and the wind whistling by announce simultaneously that the ship is 'flying'. The PHM Captain has heard the collective 'Wow!' before. PHMs are often used to lure midshipmen who may otherwise be inclined to choose aviation or submarine service. Some midshipmen may then be allowed to pace the ship through extremely tight turns at speeds over 40 knots. The type of turns used in missile and torpedo evasion. These radical evasions have been dubbed 'square turns' by PHM sailors for the square patterns they leave on the surface of the ocean. PHMs have a remarkably small tactical diameter. The 'middies' may observe that the ship, even during these incredible maneuvers, leaves little wake and that there is no need to hang on. Their feet are anchored by the centrifugal force of the computer guided banked turns. The Automatic Control System (ACS) computer controls the position of control surfaces based upon the concept of feedback control where ship attitude, control surface positions, response rates, accelerations, and operator inputs are sensed and compared automatically with desired values<sup>9</sup>. See Figure 3. It is an extraordinary and distinctive surface sensation. Monohull ships, on the other hand, turning at top speed and standard rudder heel over violently to

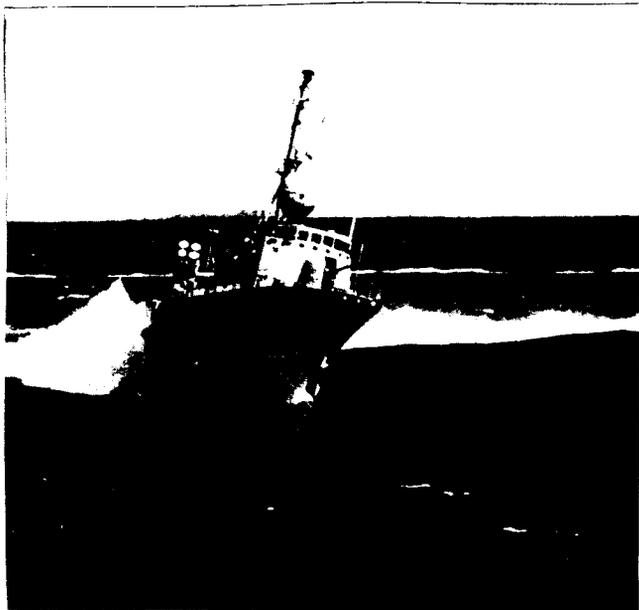


Figure 3 - USS TAURUS (PHM 3) LCDR Larry Dodson Commanding Executes 'Square' Turn. Notice the bank.

the outside. Ship's company is generally warned when such a maneuver is to be attempted. Something sturdy as a hand hold is a must. PHMs are a most impressive incentive for the surface warfare community.

#### Political Goodwill / Intervention

An Officer of the Deck (OOD) on a routine patrol in the Florida Straits spots a small boat on the horizon. Upon closer inspection he notes that the small craft is loaded beyond a good seaman's judgement with people. He observes that their freeboard is constantly being swept over with the rising weather. He summons the Captain to the bridge when he hears and sees their calls for assistance. Seldom during these encounters does anyone on the distressed boat speak English or carry papers of nationality. Often they are beyond their resources of food, water, fuel, and propulsion. The situation taxes the best of diplomatic and seamanship skills. Messages fly to operational commanders and embassies. The fragile craft may be sinking (or scuttled sometimes) making the situation even more critical. Men, women, and children may be rescued from the churning waters. Heroic measures of selfless crews are the norm. This is the PHMs back yard. Based deep in the Caribbean they patrol and make port visits to some of the most politically sensitive and desperately poor areas in the world. Port visits

from a PHM may not be as threatening to small countries as larger platforms. Their shallow draft (with foils raised) allow them to visit many island nations and that could not support other classes of ships. The small crew size never puts pressure on the local resources. On the contrary, PHMs have experienced cases where there weren't enough crew members to attend all the official functions to which they were invited. The PHM's small size tends to match the size of the host country's naval ships inspiring friendship and goodwill.

Many political analysts have predicted the fall of present Cuban government. Few, I believe, would care to predict the exact date or circumstance. Will it be violent? Will we again see a flood of refugees similar to the 'Mariel Boat Lift'? Will the Cuban Navy (small, fast, missile laden patrol ships) be used to turn back their fleeing compatriots? Every outward indication points to desperation. Despite the loss of her allies and ideology the present government clings to its totalitarian past. Twenty-two high ranking officers of her military fled to the U.S. last year ('91).<sup>10</sup> Some with expensive hardware including a MIG 25, a helicopter, a transport plane, and crop dusting planes. Other civilian citizens have attempted the journey in pitiful rafts and even inflatable tubes. Each year brings a new record number of attempts. Recently a group of Cuban nationals were discovered crossing the Gulf Stream in an inflatable 'ZODIAC' dinghy. They were armed with six hand grenades and two automatic pistols. The weapons were reportedly for their self defense (against capture by their countrymen). Two were wearing military uniforms - naval ones<sup>11</sup>. Most relatives of Cuban nationals living in the United States look toward the day of revolution in their mother country. It is not inconceivable that a modern Cuban 'Dunkirk' could result in that case. Already a vast flotilla of small boats has been organized by anti-Castro forces in Miami. On one occasion, embarking from Key West, this flotilla sailed in 'elose' to Cuba to show their 'support'. The PHMs are well positioned for instant reaction to any situation. They are equipped with a full military communication suite and, of course, are highly trained in command and control.

#### Drug Interdiction

An array of sophisticated intelligence has tracked a drug shipment to a small plane heading toward the Continental United States (CONUS). Radars based on U.S. Navy aircraft, aerostat platforms,

and surface ships track the drug carrying plane. It is immune from prosecution while in the air. The problem for the aircraft is landing its cargo. Any attempted landing in CONUS will be met instantly with U.S. federal agents. Instead the delivery will be made by 'air drop' to an awaiting boat or ship. It proves easier for surface craft to 'get lost' in the immense Florida coast line and crowded harbors than for aircraft to avoid our well established air defense systems. Law Enforcement Operations (LEOPS) are real-world training for us in Anti-Surface Warfare (ASUW), according to Captain R.C. Berning. The stakes of the 'Drug War' are high. The Value Added (VA) to drugs (particularly cocaine) successfully landed in the (CONUS) is astronomical. Exact VA figures are, of course, difficult to establish but it is generally considered to be on the order of one-hundred (100) to one (1). In other words if a kilo of cocaine ready to leave a source country sells for \$1000 it is worth approximately \$100,000 in CONUS (street value).<sup>12</sup>

With this VA the drug traffickers are able to and willing to jettison cargo to avoid capture. PHMs have experienced cases in which the pursued vessels have simply opened their sea cocks (scuttled their vessels) in order to dispose of the evidence. PHMs in these instances end up 'saving' the traffickers. The amount of illegal narcotics found floating in the Florida straits may exceed the amount captured. In a recent case, USS HERCULES landed close aboard a suspect vessel. Amazed PHM crew members watched helplessly as the traffickers began to dump their cargo. The Coast Guard Law Enforcement Detachment (LEDET) launched their 'ZODIAC' and raced to make the boarding. Still, before the Coast Guard could reach and secure the vessel an estimated six thousand pounds was sinking into the ocean. Three thousand pounds of Hashish was recovered from the vessel. See Figure 4. Cargo is jettisoned quickly when traffickers realize that they are being pursued and now apparently even after they are 'caught'.

"Defense against traffickers is little different from a major military operation."<sup>13</sup> It is true that defense begins in depth. Intelligence from source countries, radar picket ships, air and sea surveillance, and networks of communication, combine to form a tactical picture. This extremely time consuming and expensive effort is in part wasted if the drugs can be jettisoned during the last possible minutes of pursuit.

The 'end game' phase of the prosecution is one of the most critical. Seasoned Captains in this war widely hold that approximately one hour is all the time needed to completely sanitize or sink a drug carrying vessel. Speed of apprehension in such cases makes all the difference, particularly when the drug traffickers use vessels that can easily match or exceed the U.S. Navy's fastest ships (the PHMs). No shots



Figure 4 - LCDR Ted Dill Executive Officer USS HERCULES (PHM 2), LCDR John Peterson Commanding, Proudly Displays Today's 'Catch'.

have yet been fired. The product at sea holds no real value. Unlike other commonly smuggled items (precious metals for instance) it is apparently not worth the fight. The limited avenues available for prosecution of foreign nationals (especially if apprehended in international waters) may also have made this a bloodless war, so far. The cultivation and production of cocaine is perfectly legal in some countries.

USS HERCULES (PHM 2), however, recently experienced a taste of violence. The PHMs have a deserved reputation as a maritime ghost. The PHMs have a small radar cross section (for a ship) and speeds that often cause them to be mistaken for airplanes or helicopters. Captured smugglers have reported, in post arrest interviews, that they did not even realize they were under surveillance until the PHMs were along side them. USS HERCULES made one such approach in total darkness. When she identified herself and ordered the 70 foot long vessel to lie to, the smuggler suddenly turned into USS HERCULES ramming her broadside. Fortunately there were no injuries and little damage was sustained. This is perhaps the shape of the future as the combined Coast Guard, Customs, and U.S. Navy team make the overseas route more and more difficult and expensive for the traffickers.

Nicknamed 'El Terror Gris'<sup>14</sup> (The Gray Terror) by drug smugglers of the Florida Keys, the PHM's drug interdiction efforts have been most impressive. See Figure 5. The PHMs are



Figure 5 - 'El Terror Gris' Times Six. A Trafficker's Worst Nightmare.

uniquely suited to such 'hand to hand' combat. They're one of the only U.S. ships that can outrun the 'go fast' boats used by drug smugglers. The boat shown in Figure 6 was radar clocked by USS GEMINI (PHM 6) and reached speeds of over 90 MPH. Fortunately after only one hour at those speeds and attempting to 'jump' a shallow reef it broke down and was captured. Aerial surveillance can only track smugglers while at sea, PHMs can bring the business end of a 76mm rapid fire gun (80 rounds per minute) to bear should the situation warrant it. 'The mere presence of this weapon de-fuses most encounters,' according to LCDR. John Peterson. Some experienced Coast Guard law enforcement officers state candidly that drug smugglers fear the PHMs more than any other vessel. They have good reason since 1983, of the 113 U.S. Navy high seas drug seizure cases, PHMs have accounted for 32 captures or about 28 percent of the total. A total Navy assisted capture of two million pounds of marijuana, 152 thousand pounds of hashish, and 41 thousand pounds of cocaine safely off the streets.<sup>15</sup> While these numbers are impressive they don't begin to match the vast quantities of the illicit cargo jettisoned in the Florida Straits.

## CONCLUSIONS

'Ship' is defined as 'a large sea going vessel'<sup>16</sup>. Large has become a relative term in light of super tankers and super lift vessels. 'Sea going' on the other hand is not open for debate. The appealing concept of reducing operating cost by reducing ship size has been attempted often in the past. The most recent example of the USS ANTELOPE (PG) class of the early and mid '70's comes to mind. Fleet Commanders are generally wary of politicians offering small ships as replacements for 'sea going' ones. Unfortunately for the budget plans, the U.S. Navy must operate

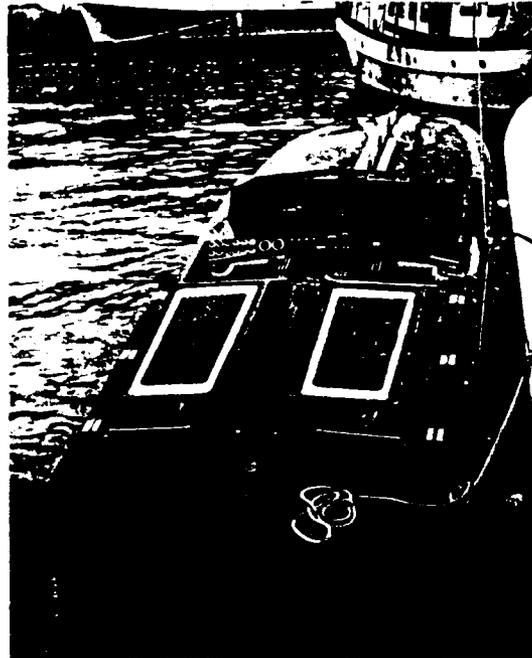


Figure 6 - Twin 1000 Horsepower Big Blocks Pushed This Ex-drug boat over 90 Miles per Hour. Still It Was No Match for USS GEMINI (PHM 6)

in all sea conditions. PHMs have proved themselves a notable exception to the small ship enigma. Being uncoupled from the sea surface by foils the PHMs 'fly' through seas that reduce most other ships to steerage way. PHM helmsmen take pride in being able 'contour' large waves (sea state six) at operating speeds of over forty (40) knots<sup>17</sup>. Few other ships, large or small, can match this performance level.

PHM recent and future operations rely on their strengths. Military and political leaders will continue to include PHMs in their planning. Their unique capabilities are appreciated and explored. Heavy OPTEMPO's will require the full measure of support from technical, repair, training, and operational agencies. Forward location, low cost, sea keeping, and speed advantages make them an invaluable 'tool' in the 'toolbox' of the overall U.S. maritime strategy.

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