

By George Jenkins, IHS Member

The need for a relatively small, fast ship to counter the proliferation of Soviet and Warsaw Pact missile boats, such as this Soviet hydrofoil, BABOCHKA----



---- was articulated in the late 1960s by the NATO Commander-in-Chief of its Southern Command.

This requirement was researched by the appropriate groups within the NATO Naval Armaments Group, ultimately leading to a tripartite agreement between United States, the Federal Republic of Germany and Italy in 1972, for the design, development and acquisition of the NATO PHM. This program was strongly supported by ADM Elmo Zumwalt, who was then the U.S. Navy's Chief of Naval Operations (CNO). This hydrofoil craft was to play a major role in his new "high-low mix" vision for the U.S. Navy's shipbuilding program.

In November 1972, the NATO PHM Project Office and Steering Committee were formed. The USA was the lead nation for design, development, and acquisition and chaired the three-nation steering Committee. The agreed basic operational characteristics for the PHM are shown here----

## PHM Characteristics

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- ❖ **Displacement: 250 Tonnes**
- ❖ **Length: 132.9 ft**
- ❖ **Beam: 28.2 ft (hull) 47.5 ft. (foils)**
- ❖ **Prop. 1-LM-2500 (Foilborne)  
2- MTU diesels (1630 hp) (Hullborne)**
- ❖ **Crew: 4 Officers / 19 Enlisted**
- ❖ **F/B Speed 40+ kt S/S 0; 40 KT S/S 5**
- ❖ **H/B Speed 11 kt**
- ❖ **Range: 750 nm/1200 nm**
- ❖ **Draft: 7.5 ft (foils raised) / 23ft (foils lowered)**

The two production variants were to be very similar, the primary differences being in their combat suites and certain internal arrangements.



The US variant was to be outfitted with the US Harpoon Surface-to –surface missile, mounted on the fantail, as shown here:



The German ship would mount the French Exocet in a similar configuration.



## NATO PHM MILESTONES

- ❖ Nov 72: NATO PHM Program Office and Steering Committee Formed (US, FRG and Italy)
- ❖ Contract Let to Boeing Marine Systems for Two Lead PHMs
- ❖ Nov 74 PEGASUS (PHM-1) Launched
- ❖ 1975: Funds to Build PHM 3-6 Appropriated.
- ❖ 1976/1977: Funds to Complete PHM 2 Appropriated

Later in 1972, the US Navy awarded a contract to Boeing for construction of two “lead ships” (actually prototypes, though the USA avoided use of this term in order to emphasize the maturity of hydrofoil technology to Congress).

The PHM was to be a minimally manned ship, with only minor repairs to be accomplished aboard. For the US, prior experience with the similar Patrol Gunboat (PG) class suggested that a Logistics Support Ship to provide alongside berthing, routine upkeep and maintenance, fuel, and crew rest and messing facilities, should be included in the PHM program. This would be accomplished by conversion of the USS WOOD COUNTY (LST 1178) shown below:



The decade of the 1970s were formative years for this new class of warship. As might be expected, the program experienced early difficulties, all of which were overcome, but not without effort and some cost growth. The initial USA planning figure for acquisition was 30 PHMs; this was reduced to 25 in 1974, and further reduced to 6 in 1975.

Italy announced in 1974 that they would not enter PHM production; they would, however, continue to participate in design/development. That was the same year in which the USA reduced its intended “buy” to 25 ships. Germany remained a full partner in development, as well, but deferred any production decision until the US decision would be made.



In 1972-73 Boeing experienced a variety of manufacturing problems including substandard aluminum welding, foil and propulsor cracking, gearbox design, and outfit sequencing. As a result of cost growth resulting from the reduction in the buy and deficiency correction, the U.S. Navy issued a “stop work” order on *HERCULES* (PHM 2), and applied the funding saved by this action to the successful completion of *PEGASUS* (PHM 1). The first PHM production buy was reduced to an initial procurement of six ships

*PEGASUS* (PHM 1) was launched in November 1974, and shortly afterward began the most extensive technical and operational evaluation (TECHEVAL and OPEVAL) that had been conducted on any US Navy ship at that time. She is shown here in OPEVAL successfully launching a HARPOON missile in Sea State 3.



By the completion of OPEVAL in the summer of 1976, the ship had traveled over 25,000 miles - essentially once around the world.

In 1975 the USA's program was reduced to a total of six ships; *PEGASUS*, plus four ships for which funding had been appropriated in 1975, plus completion of *HERCULES* (to be appropriated in 1976)

In the 1976-1977 time frame PHM acquisition became an extremely contentious topic between the US Navy, which supported the program and its civilian leadership in the Department of Defense (DoD), some of whom vigorously opposed it. The program was initially disapproved by the Defense Acquisition Review Council in December 1976. This decision was overridden by the Undersecretary of Defense in early January 1977. In late January a new Secretary of Defense cancelled funding for the support ship planned to provide logistic support for the six PHMs, and put the PHM program itself in a "hold" status. In April 1977 DoD announced PHM termination. In July 1977 however, the US Congress reinstated the program. Subsequent OSD efforts to circumvent the Congressional decision failed, and the production contract for the remaining five PHMs was finally awarded to Boeing in October 1977, almost 8 months beyond the planning target. As a result of this slippage additional costs were incurred.

In May 1977, two months before the Congress reinstated the program, the FRG announced its decision not to procure PHMs, effectively ending the NATO aspect of the program. Germany maintained that their decision was based on cost. The impact, if any, of the off-again on-again decision process in the US on the FRG, is not known..

## PHM Logistic Concept

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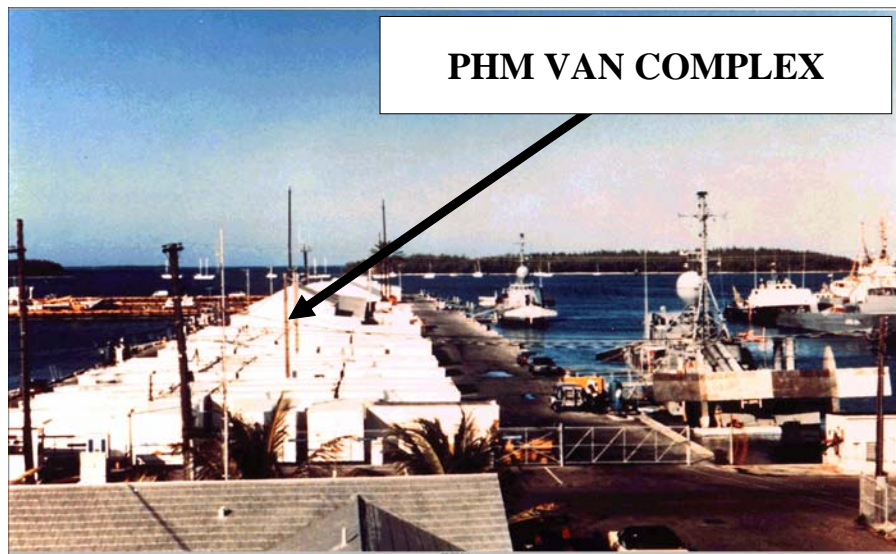
- ❖ **Ships Manned Only To Operator Level (Port & Stbd Watch Sections)**
- ❖ **Clerical, Personnel , Supply, Disbursing, Inport Berthing/ Messing, Training And All O/I Level Maintenance Except Daily PMS, Performed Off-Ship By PHM Mobile Logistic Support Group (MLSG)**
- ❖ **4 Officers/150 Enlisted**
- ❖ **Housed in Transportable Complex of 70 8'x 8' x 20' ISO Vans**
- ❖ **PHM Unique Parts Control (63% of COSAL), Expanded Planning Yard and ISEA, “Privatized” Under Contract to Builder (Boeing)**

The support ship which had been planned to provide logistical support to the squadron was not reinstated with the production PHM buy , and and was replaced with a transportable van complex. This graphic is the revised PHM Logistic support concept as it evolved over the next several years as the production PHMs were being built

Below is a photo of the support complex pierside in the PHM home port.

## PHM Logistic Support

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Some “fixes” to PHM discrepancies noted in OPEVAL were deferred several years.



## PLANNING FOR PHM EMPLOYMENT

With the production program again underway, it became time for the U.S. Navy to begin detailed planning for their employment and homeporting.

## PHM Operations



Since the earliest days of planning, it had been expected that the ships would be utilized in the NATO Areas of Operations, primarily the Mediterranean, with occasional excursions into the North Sea and the Baltic. This planning was consistent with and responsive to the original requirement enunciated by NATO in the early '60s

The absence of a dedicated support ship (among other things) to accompany the PHMs on long open ocean transits, made the concept of overseas homeporting an attractive one compared to relatively frequent transits from the US to the European theater. The US Commander in Europe agreed and plans were made to homeport the ships at Augusta Bay, Sicily, which is centrally located for employment and close to NATO and US national support.. It was the desire of the US Atlantic Fleet Commander, who would retain many support functions for the ships, that a trial deployment be conducted by one or two PHMs prior to full-scale homeporting.. Delays in delivery of the production PHMs and concern about Pegasus' material condition resulted in several cancelled trial deployments. PEGASUS was homeported initially at Little Creek, VA in 1979, awaiting the arrival of her sister ships.



In 1980 her homeport was shifted to Key West Florida where she could participate in the US Navy's contribution to the "War on Drugs" while awaiting delivery of PHMs 2-6. The production ships and the shore-based, but transportable PHM Mobile Logistic Support Group were delivered to Key West over the next three years, with the full squadron (PHMRON TWO) being constituted in Spring of 1983. Following are the five production PHMs----

USS HERCULES (PHM 2)



USS TAURUS (PHM 3)



USS AQUILA (PHM 4)





USS ARIES (PHM 5)



And USS GEMINI (PHM 6)





Concurrently, the Navy put the overseas homeporting plan on indefinite hold, citing the need to refine the PHM logistic concept, to develop tactics and generally gain more experience with the ships. This plan was never revisited, and for the next ten years PHMs operated solely in the Caribbean, western Atlantic and Gulf of Mexico.

In that time the ships' operational employment was similar to other USN ships operating in those areas.:

## PHM Operations

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- ❖ **WAR - Grenada**
- ❖ **Battle Group Workups**
  - ❖ Usually “Orange Force”
- ❖ **Port Visits**
  - ❖ East Coast/Carib/GOM Ports
- ❖ **Developed Fast Ship Tactics**
  - ❖ With USN and Foreign Navies
- ❖ **Trial Deployments**

PHMs provided a two-ship detachment for the invasion of Grenada in Operationn “Urgent Fury:”

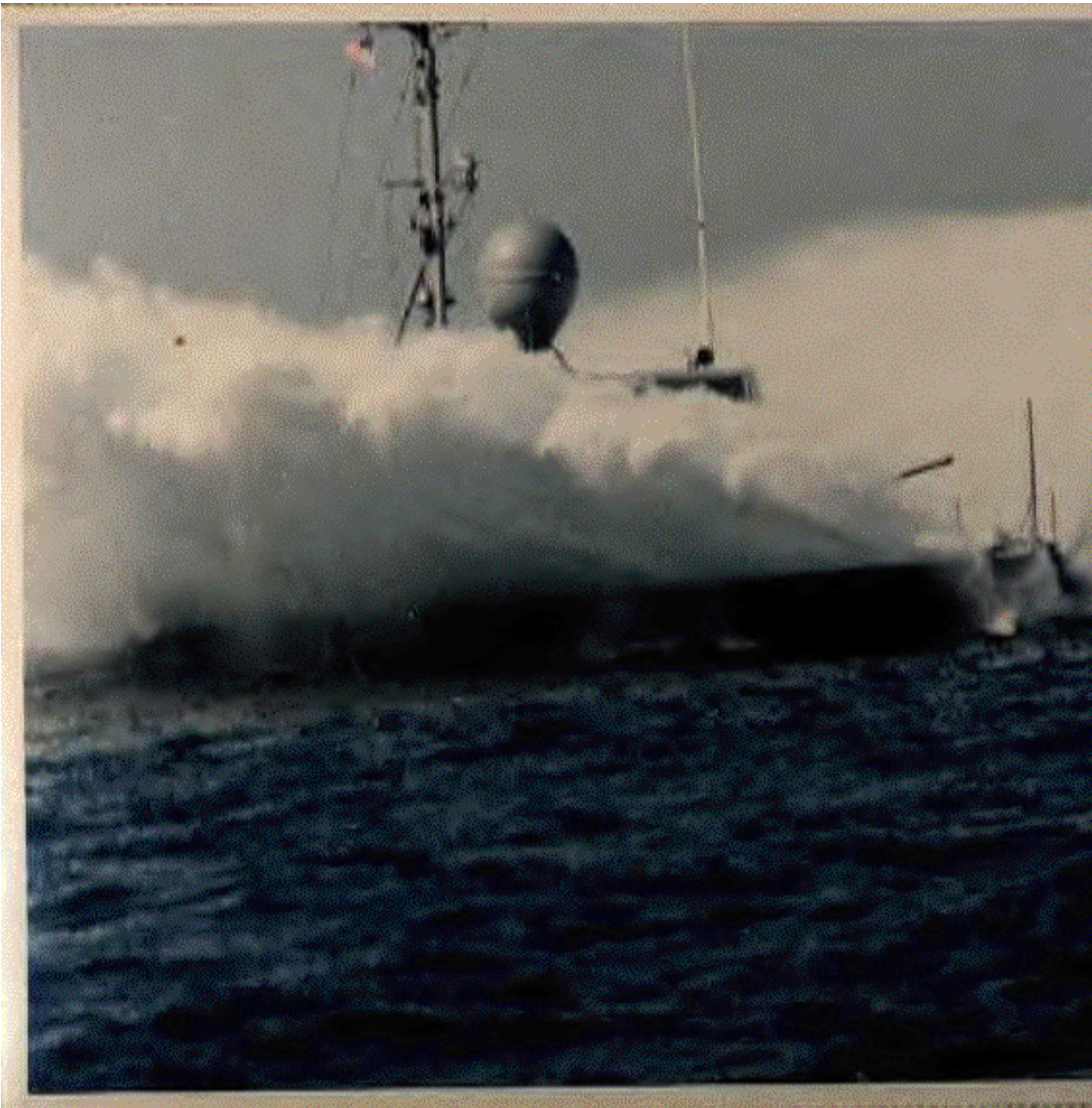
Every deploying Battle Group Trained with PHMs- which were usually simulating opposition forces (e.g., Boghammars in the Persian Gulf.

Port Visits were conducted in the Caribbean and in the US from Texas all the way to Bar Harbor, Maine

They also operated with Latin American navies and with visiting European navies

They developed and practiced fast ship tactics

They conducted three trial deployments, San Diego to Pearl Harbor (one ship) , Puerto Rico (3 ship detachment) and Grenada (entire squadron) but never deployed out of theater.



The operations they excelled in were COUNTER-DRUG OPERATIONS. This PHM has just made a “Crash Landing” next to an intercepted drug runner – dampening his enthusiasm for future evasion.

## **PHM Operations Counter Drug OPS**

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- ❖ **3% of Navy Ships Accounted for 30% of Navy-assisted “Busts”**
- ❖ **225,000 Lb MJ, 12,000 Lb Cocaine**
  - ❖ **Street Value \$1.2 Billion**
- ❖ **Received 22 Unit Awards from USCG**
- ❖ **PHM is: “Superior Platform, . . . The Most Effective Surface Asset . . .” (in Many Counter Drug Scenarios)**
  - Commander USCG District 7 (AUG ‘92)**

It should be understood that that US law does not permit the Army, Navy or Air Force to arrest criminals. However they may assist other agencies in law enforcement operations. All PHM activities discussed here were conducted in support of the United States Coast Guard.

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This chart summarizes their accomplishments.. The reason they were so successful was their speed and their ability to maintain high speed in high sea states. THIS SERIES OF GRAPHICS illustrates the “force multiplier” effect of this characteristic. . .

## Why Was the PHM So Effective?

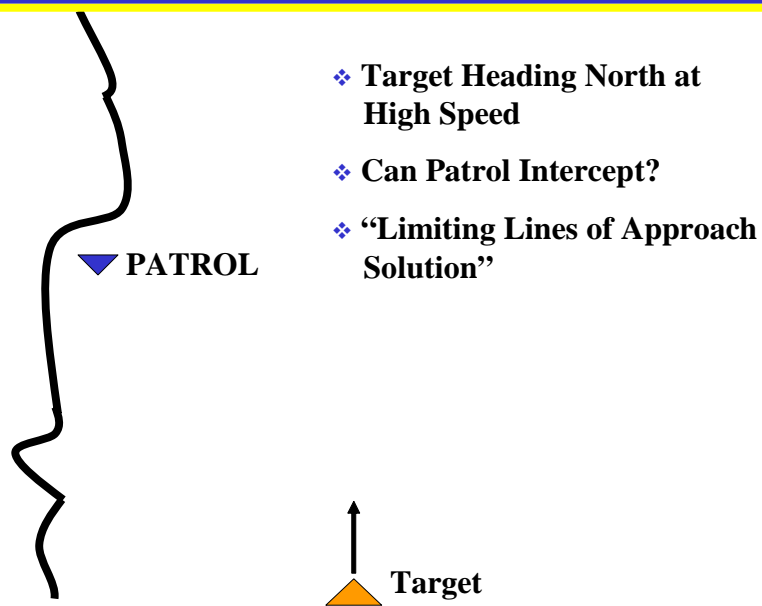
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### SPEED

- ❖ **Could Cover Larger Areas in Shorter time**
- ❖ **Faster Turnaround Between Station and “Home Plate”**
- ❖ **Could Intercept Other High Speed Craft**

### Intercept Problem:

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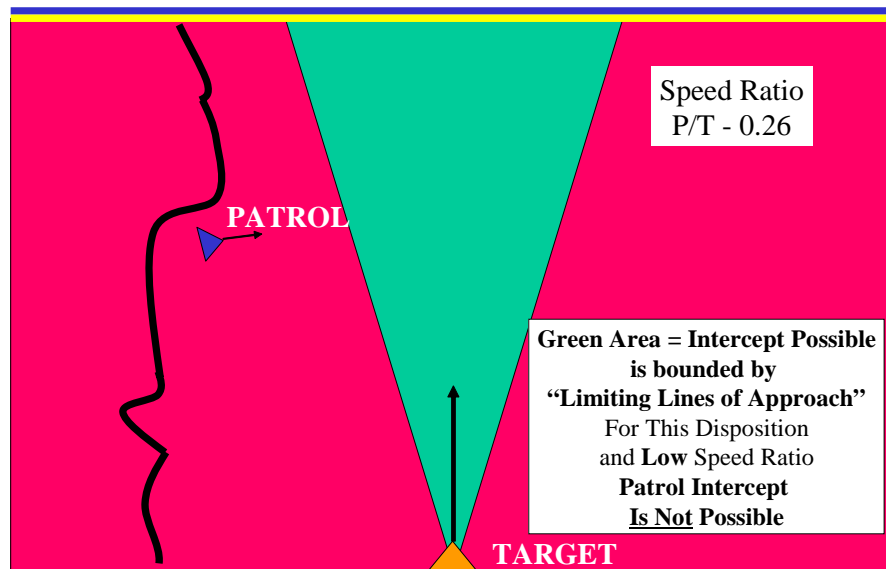
THIS REPRESENTS A PATROL CRAFT (BLACK TRIANGLE ON THE LEFT) OPERATING OFF THE COASTLINE. ON THE LEFT



HE WANTS TO INTERCEPT THE BROWN TARGET AT THE BOTTOM,  
„WHICH IS MOVING NORTH AT HIGH SPEED. CAN HE DO IT?

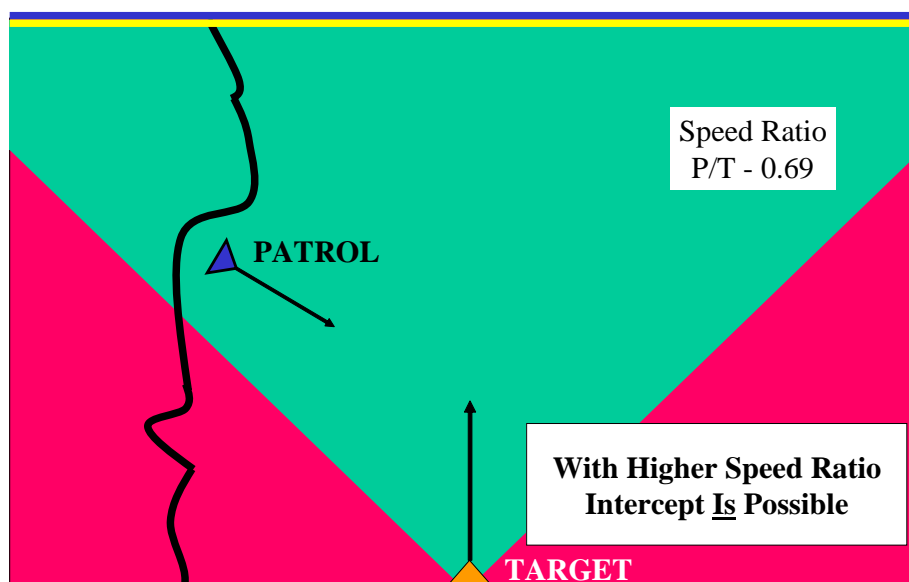
THE ANSWER DEPENGS ON THE **GEOMETRY OF THE PROBLEM** AND THE **RELATIVE SPEEDS** OF THE TWO SHIPS.

### Intercept Problem:



FOR AN 18 KT PATROL SHIP AGAINST A 70 KT CIGARETTE BOAT THE GEOMETRY LOOKS LIKE THIS;  
IF THE PATROL CRAFT IS IN THE GREEN SECTOR HE CAN INTERCEPT, OTHERWISE HE CAN'T. IN THIS CASE THE INTERCEPTOR IS OUT OF POSITION AND HE CAN'T DO IT.

### Intercept Problem:



IF WE SUBSTITUTE A 48 KT PHM FOR THE 18 KT CRAFT, THE GREEN SECTOR EXPANDS BY A FACTOR OF 2.6 ,  
IT'S ALMOST LIKE HAVING ANOTHER 2 OR 3 PATROL CRAFT ON STATION

## **SUSTAINED HIGH SPEED IN SEA STATE**

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- ❖ **Speed Advantage Not Degraded in Bad Weather**
- ❖ **Tailchases Can Succeed, Even Against Faster Ships**

ANOTHER TACTICAL ADVANTAGE IS **SUSTAINED** SPEED IN SEA STATE. IN MANY CASES, THE PATROL CRAFT CAN CHASE DOWN A SHIP NOMINALLY MUCH FASTER, IF THE TARGET IS SLOWED BY SEA STATE. THIS IS THE CASE FOR MOST CONVENTIONAL HIGH SPEED HULLS. THIS IS A VERY IMPORTANT CAPABILITY AND WAS THE “MARGIN OF VICTORY” IN MANY OF THE PHM - ASSISTED ARRESTS.

Despite the remarkable contribution these ships had made to their country's national objectives , the US Navy decided in June 1992 to decommission them., citing their expense to operate. Since PHM operating costs were very modest – only about 1/3 the cost of the next larger combatant ship, many PHM advocates believe that the six PHMs were sacrificed early in the post cold war naval drawdown to avoid loss of an equal number of larger, more capable ships.

## Farewell Flight June 13 -28 1993



Whatever the motivation, the ships were decommissioned a month after this dramatic “Final Flight” photograph was taken, with at least ten years of expected service life remaining.

The Navy made no concerted effort to find other utilization for them, and eventually they were sold for scrap.





Two of the ships have survived , minus their combat suites and propulsion systems. One, ex-USS Gemini (PHM 6), is planned to be sold as a luxury motor yacht as in a configuration as depicted below:



The other, ex-USS ARIES (PHM 5) forms the centerpiece of a privately owned and maintained US Naval Museum. She is shown here at her riverside berth in Brunswick MO.

