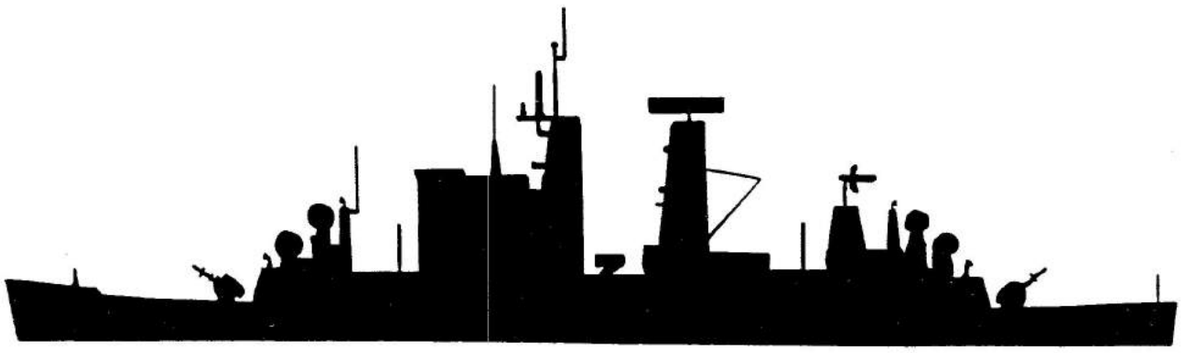
ALBANY CLASS

USS ALBANY
CG-10

USS CHICAGO
CG-11

USS COLUMBUS
CG-12

PREPARED BY:
JIM CONTI
USS ALBANY ASSOCIATION
JULY 1994



ALBANY CLASS

USS ALBANY (CG-10)	USS CHICAGO (CG-11)	USS COLUMBUS (CG-12)
(3NOV62-29AUG80)	(2MAY64-1MAR80)	(1DEC62-31JAN75)

The conversion of two units of the BALTIMORE class (CHICAGO and COLUMBUS) and one of the OREGON CITY class (ALBANY) represented a new peak in warship techology. Although the two heavy cruiser classes differed in appearance, they had the same hull dimensions and machinery. These three missile ships formed a new homogeneaus class. This was a totally new departure from the partial conversions of the BOSTON class, first-generation of guided missile ships. All weapons and superstructures were removed and completely new superstructures, whose design had been fully tested, were fitted. In effect these three ships can be seen as the initial stage in the provision of a new class of guided missile cruisers. They were not to appear in service again until 1962-1964, whereas LONG BEACH (CGN-9), their (nuclear-propelled) single predecessor, had been completed as early as 1961. Each possessing four guided missile systems, they were the most powerful guided-missile ships in the fleet.

The newly designed superstructures were mainly of light metal alloy. The superstructure block extended for more than two-thirds the length of the ship and was almost two decks in height. The box-shaped bridge, rounded in front, was unusually high and carried the missiles' control system. A radar platform was fitted aft, (SPS-30).

Entirely new was the use of two very high mast/exhaust gas funnel combinations, known as 'Mack'. The 'Macks' towered over the very high bridge and carried movable smoke-emission vents, ventilation ducts and radar antennae together with their leads and cables. On each end of the superstructure, forward and aft, was a Mk 12 Talos twin launcher positioned in front of its reload magazine which could accommodate 46 missiles at any one time. Both the Mk 11 Tartar twin launchers were positioned, unusually, on the beam, one on each side of the bridge superstructure. The magazine beneath each of them contained 40 missiles.

The three ships were given an integrated ASW outfit consisting of a SQS-23 hull sonar installation, two triple sets of Mk 32 A/S torpedoes (on the main deck, just aft of the Tartar launchers) and an eight-cell ASROC launcher (between the 'Macks' on the second deck).

USS ALBANY
CG-10
3NOV62-29AUG80
BROKEN UP 1992

The fourth ALBANY (CA-123) was laid down on 6 March 1944 at Quincy, Massachusetts, by the Bethlehem Steel Company; launched on 30 June 1945; and commissioned on 15 June 1946 at the Boston Navy Yard, Captain Harold A. Carlisle in command.

Following outfitting and a shakedown cruise in the vicinity of Casco Bay, Maine, Albany began operations along the east coast of the United States punctuated with cruises to the West Indies. During the ensuing months, the cruiser made a number of voyages for the purpose of training naval reservists and NROTC midshipmen. Albany continued to perform such duty until 11 September 1948 when she stood out of Chesapeake Bay for her first tour of duty with the American naval forces operating in the Mediterranean Sea, recently made a permanent establishment as the 6th Fleet. That deployment set the tone for the next decade. The cruiser alternated five assignments to the 6th Fleet with operations along the east coast of the United States and in the West Indies, and made three cruises to South American ports. During one of the South American voyages, Albany carried the official United States representative to the inauguration of the President of Brazil in January 1951.

On 30 June 1958, Albany was placed out of commission at the Boston Naval Shipyard to begin conversion to a guided missile cruiser. On 1 November 1958, she was redesignated CG-10. The warship spent the next four years at Boston undergoing very extensive modifications as part of the conversion. The ship was recommissioned at Boston on 3 November 1962, Captain Ben B. Pickett in command. On 30 January 1963, while off the Virginia Capes on her maiden voyage, Albany launched two Talos and an ASROC missile, the first warship ever to fire three missiles simultaneously. For the next five years, she again alternated deployments to European waters - both to the Mediterranean Sea and to the North Atlantic - with operations along the east coast and in the West Indies. During that time, the cruiser visited many foreign ports and participated in a number of exercises with units of friendly navies. On 1 March 1967, she was decommissioned at the Boston Naval Shipyard once again to undergo extensive modifications. Some 20 months later, on 9 November 1968, the guided missile cruiser was placed back in commission at Boston, Captain **Allan P. Slaff** in command.

However, the warship did not complete her rehabilitation and modernization overhaul until the summer of 1969. On 1 July, she stood out of Boston on her way - via New York City, and Norfolk, Virginia - to Mayport, Florida, her new home port. After several weeks of preparations, Albany embarked upon her shakedown cruise to the West Indies on 15 September. On 31 October, the guided missile cruiser returned to Mayport to begin operations with the Atlantic Fleet. Late in February 1970, Albany embarked upon her first deployment to European waters since her modernization overhaul. During the next six years, she made three cruises to the Mediterranean and completed one assignment to northern European waters. On 10 August 1976, Albany put to sea from Norfolk, bound for an extended tour of duty with the 6th Fleet in the Mediterranean Sea. Operating from her overseas home port at Gaeta, Italy, she served as flagship for the Commander, 6th Fleet, for almost four years.

Relieved of that duty at Gaeta by Puget Sound (AD-38) on 28 May 1980, the guided missile cruiser embarked upon the voyage back to the United States on 2 June. After stops at Mallorca, Spain, and Lisbon, Portugal, she arrived in New York City on 20 June. From there, the warship moved south to Hampton Roads, Virginia. On 29 August 1980, Albany was placed out of commission at Norfolk, Virginia. She was berthed with the Norfolk Group, Atlantic Reserve Fleet. Her name was struck from the Navy list on 30 June 1985. However, as of the beginning of 1989, the ship was still there.

It is worth mentioning that the ships were originally designed to take eight Polaris ballistic missiles, which were to have been fitted amidships. Later it was intended that Regulus II missiles be fitted in this position. Both ideas were dropped when it became clear that the strategic submarines (SSBN) would be the only Navy ships to carry ballistic missiles. Initially it was not planned to fit these ships in their CG conversion with any kind of gun. It took the intervention of the then President, John F. Kennedy, to have each ship fitted for purposes of self-defence with two antiquated 5 inch/38 cal. singles in open mountings on each side of the after 'Mack', each controlled by a Mk 56. Since these ships were vulnerable to low-flying, subsonic aircraft or torpedo boat attacks; President John F. Kennedy said, "Put guns on the LONG BEACH and the ALBANYs".

Initally the three youngest suitable hulls, the OREGAN CITY, the CHICAGO, and the FALL RIVER were to be converted, only the CHICAGO was converted. The ALBANY was thought to be in better material condition than the OREGAN CITY, which had been laid up since 1947, so she was substituted. The COLUMBUS substituted for the laid-up FALL RIVER; it was less expensive to convert her than to lay her up while pulling the FALL RIVER from reserve. It had been intended to convert additional ships along the same lines, the ROCHESTER (CA-124) was to be (CG-13) and the BREMERTON (CA-130) was to be (CG-14), but only ALBANY (CA-123), CHICAGO (CA-136) and COLUMBUS (CA-74) were so converted.

The ALBANY was converted at the Boston Naval Shipyard between January 1959 and November 1962; the COLUMBUS at the Puget Sound Naval Shipyard, Bremerton, Washington between June 1959 and March 1963; and the CHICAGO at the San Francisco Naval Shipyard between July 1959 and September 1964. The other two ships were dropped, initially for reasons of economy and high conversion costs and improved capbilities of newer missile-armed frigates. The smaller vessels designed from the onset as guided missile ships had a considerable missile capacity.

As no hanger was provided in these conversions, a helicopter could only be carried on the after deck as a temporary measure. The considerable height of the bridge superstructure and the space between this and the forward group of fire control instruments were necessitated by interference from the two Tartar installations. Space was provided in the conversions for command staff so that the ships could be used as fleet flagships.

ALBANY functioned for a year as Flagship Second Fleet and spent its last four years on active duty as Flagship Sixth Fleet. ALBANY in 1979, won the Battenberg Cup as the best ship in the fleet. CHICAGO was Flagship First Fleet and Flagship Third Fleet for both a year.

USS CHICAGO

CG-11

2MAY64-1MAR80
BROKEN UP 1992

The third Chicago (CA-136) was launched on 20 August 1944 by Philadelphia Navy Yard; sponsored by Mrs. E. J. Kelly; and commissioned on 10 January 1945, Captain R. R. Hartung in command.

The heavy cruiser sailed from Philadelphia on 7 May 1945 for Pearl Harbor, arriving on 30 May. On 28 June, after further training in the Hawaiian Islands, Chicago and North Carolina (BB-55) departed Pearl Harbor and steamed to the Far East where they joined the 3d Fleet, on 8 July. Chicago supported carrier air strikes and furnished shore bombardment in the final attacks against the Japanese home islands until the cease-fire of 15 August. Chicago remained in Japan until November 1945 engaged in the demilitarized of Japanese bases. On 7 NOvembe she sailed from Tokyo for San Pedro, California, arriving on 23 November. After overhaul and training, Chicago arrived at Shanghai on 18 February 1946 for occupation duty. She remained there until 28 March as flagship of the Yangtzee Patrol Force and then sailed to Sasebo, Japan, where she became flagship of Naval Support Force, Japanese Empire Waters. She visited several cities in north and south Japan before clearing for the west coast on 14 January 1947.

She was placed out of commission in reserve at Puget Sound naval Shipyard, on 6 June 1947. On 1 November 1958 Chicago was reclassified CG-11 and early in 1959, began conversion to a guided missile cruise, conversion was completed in June 1964.

She conducted shakedown cruises along the west coast until 1965. In January 1966 she operated off the west coast with the 1st Fleet. On 12 May 1966 she left for her first deployment to the Western Pacific. On 1 June she arrived at Yokosuka and COMCRUDESFLOT 11 cam aboard. On 15 June she operated off the coast of Vietnam in particular service as radar relay ship in connection with the PIRAZ concept; intermediate visits to Hong Kong, Bubic Bay, Okinawa, Taiwan, Yokosuka, and Sasebo. On 8 December she arrived in San Diego.

On 11 October 1967 she departed for her second cruise to the Western Pacific via Pearl harbor, Yokosuka, Okinawa, and Subic Bay. On 12 November on PIRAZ control in the Gulf of Tonkin, with intermediate stops at Hong Kong, Subic Bay, and Singapore. On 1 May she sailed for the west coast via Guam and Pearl Harbor, and arrived at San Diego on 15 May, operating off the west coast. On 13 February 1969 she left Long Beach for her third WestPac deployment. On 30 August she left Subic Bay for the west coast via Guam and Pearl Harbor.

Chicago's fourth deployment to the Western Pacific took place on 9 September1970 and she operated in Vietnamese waters; with intermediate stops in Yokosuka, Hong Kong, and Subic Bay. On 24 February 1971 she once again departed for the west coast via Guam and Pearl Harbor, arriving San Diego on 11 March. On her fifth departure for WestPac she had COMCRUDESFLOT 3 aboard, with intermediate stops in Guam and Subic Bay. She arrived in Vietnamese waters on 6 December and operated in the Gulf of Tonkin with stops in Singapore, Subic Bay and Hong Kong. On 9 May 1972 she shot down a MiG aircraft with a Talos missile. On 21 June she left for the west coast to return to her home port of San Diego on 8 July.

On 5 July her home port was transferred to Long Beach. On 25 August she had a refit period at the Long Beach Navy Yard. With her yard period complete she was transferred back to San Diego on 30 June 1973. On 21 May 1975 she departed for her sixth deployment to WestPac with stops at Pearl Harbor, Yokosuka, and Subic Bay. On 25 June she departed for the Indian Ocean and Arabian Sea with visits to Karachi, Mombasa, Mauritius and Singapore. On 30 September she operated with the 7th Fleet including visits to Hong Kong, Manila, and Yokousuka. On 17 November she departed from Subic Bay for the west coast via Guam and Pearl Harbor. On 13 April 1976 she departed for her seventh WestPac cruise and arrived San Diego on 16 October. Her eighth departure to the Western Pacific was on 6 September 1977, and she arrived to her home port on 7 April 1977. Her final WestPac cruise she was in company with Kitty Hawk (CV-63). She returned to San Diego on 17 December 1979 to prepare for decommissioning on 1 March 1980. Chicago was struck from the Navy list on 31 January 1984.

On 30 January 1963, on ALBANYs shake down cruise off the Virginia Capes, launching two Talos and an ASROC, ALBANY became the first warship ever to fire three missiles simultaneously! ALBANYs starboard Tartar missile burned on the rail, it should have been four missiles simultaneously!

In February 1967, ALBANY entered the Boston Naval Shipyard and spent considerable time there while her entire guided missile installation was brought up to date. ALBANY was decommissioned on 1 March 1967. She underwent an extensive anti-air warfare modernisation; conversion began in February 1967 and was completed in August 1969. ALBANY was formally recommissioned on 9 November 1968. There were changes to the upper part of the forward 'Mack', she now has an SPS-48 radar in front of the yard, her SPS-39 just aft of the yard was replaced by the SPS-48; and in the fact that the SPS-30 antenna has been removed from the bridge superstructure, proof that the SPS-48 had taken over many of the height-finding functions of the SPS-30. The height of the bridge superstructure is dictated first by the lateral positioning of the Mk 11 Tartar launcher, together with both SPG-51 radar antenna. The IFF antenna is on the upper edge of the SPS-43A on the after 'Mack'.

During ALBANYs anti-air warfare modernisation, she received an SPS-48, a digital fire control computer, and NTDS, (Navy Tactical Data System) as well as the improved SPG-51B guidance radar for her Tartar secondary batteries. A new SPG-61 fire control radar was proposed to replace the unreliable SPG-49, and the new weapon control system would be an NTDS Mk 11, scaled to Talos requirements. Complete NTDS systems were planned for all three ships under the AAW modernization program. In fact, only ALBANY was modified fully (SCB-002); CHICAGO received NTDS during an later refit, but it was not combined with digital fire control system contemplated in the AAW modernization program.

ALBANY in mid May 1975, was in Boston, where the cruiser, at the time was Flagship of the Commandent of the Second Fleet, acted guest ship for the visit of two Soviet guided missile destroyers; on this occasion the Soviet Ambassador Dobrynin came on board ALBANY. In mid 1976, ALBANYs second SPS-30 was removed and replaced with an satellite communications antenna.

Although CHICAGOs pennant number sequence follows immediately after that of ALBANY, the conversion of CHICAGO (CG-11) - in contrast to that of COLUMBUS - was not completed until eighteen months after that of ALBANY. CHICAGO, in contrast to both ALBANY and COLUMBUS, had from the outset both the 5 inch guns and both Mk 56 fire control systems and both SPS-30s. In March 1971, CHICAGO had her forward SPS-39 radar interchanged with an SPS-52. In June 1975, the SPS-48 radar replaced both the forward SPS-30 and SPS-52.

USS COLUMBUS

CG-12

1DEC62-31JAN75
BROKEN UP 1977

The third Columbus (CA-74) was launched on 30 November 1944 by the Bethlehem Steel Company, Quincy, Massachusetts; sponsored by Mrs. E. G. Meyers; and commissioned on 8 June 1945, Captain A. Hobbs in command.

Joining the Pacific Fleet, Columbus reached Tsingtao, China on 13 January 1946 for occupation duty. On 1 April she helped to sink 24 Japanese submarines, prizes of war, and the next day sailed for San Pedro, California. For the remainder of the year, she operated in west coast waters, then made a second Far Eastern cruise from 15 January to 12 June 1947.

After west coast operations and an overhaul at Puget Sound Naval Shipyard, Columbus cleared Bremerton on 12 April 1948 to join the Atlantic Fleet, arriving at Norfolk, Virginia, on 19 May. Columbus made two cruises as flagship of Commander-in-Chief, Naval Forces Eastern Atlantic and Mediterranean, from 13 September 1948 to 15 December 1949 and from 12 June 1950 to 5 October 1951, and one as flagship of Supreme Allied Commander, Atlantic, During parts of NATO Operation "Mainbrace" from 25 August to 29 September 1952. She cruised in the Mediterranean from October 1952 through January 1953, serving part of that time as flagship of the 6th Fleet. Now flagship of cruiser Division 6, she returned to the Mediterranean from September 1954 to January 1955. Between deployments, Columbus, received necessary overhauls and carried out training operations along the east coast and in the Caribbean.

Reassigned to the Pacific Fleet, Columbus cleared Boston on 8 November 1955 for Long Beach, California, where she arrived on 2 December. Just a month later, on 5 January 1956, she sailed for Yokosuka, Japan, and operated with the 7th Fleet until she returned to Long Beach on 8 July. Columbus made two more cruises to the Far East in 1957 and 1958. During the late summer of 1958, her presence was a reminder of American strength and interest as she patrolled the Taiwan Straits during the crisis brought on by the renewed shelling of the offshore islands by the Chinese Communists. On 8 May 1959, Columbus went out of commission at Puget Sound Naval Shipyard to begin her conversion to a guided missile cruiser, and she was reclassified CG-12 on 30 September 1959.

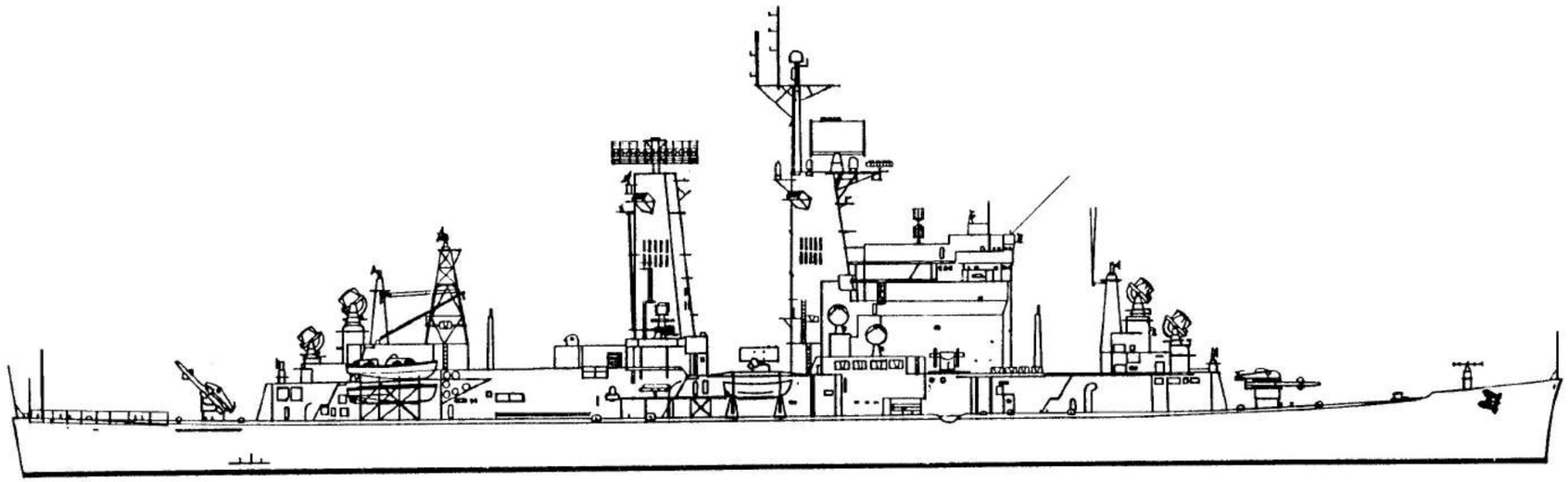
On 1 December 1962 Columbus was recommissioned as CG-12. From March to June 1963 she conducted her shakedown cruises along the west coast. In November after the installation of SPS-30 radar and two 5" guns, she left the Puget Sound Navy Yard to be home ported at San Diego. From December 1963 to March 1964 she operated off the west coast with the 1st Fleet. During the months of April and May 1964 she had a short stay at the Long Beach Naval Shipyard. On 5 August 1964 she departed for a cruise to the Western Pacific and returned home on 6 February 1965. Through the months of March and December 1965 she conducted operations off the west coast.
On 10 January 1966 she was transferred to the Atlantic Fleet, and in February she became flagship for COMCRUDESFLOT 8, operating off the east coast. In March she performed NATO maneuvers in the North Atlantic. On 15 October 1966 Albany was replaced with the 6th Fleet in the Mediterranean. In April 1967 she returned to the east coast. In December she conducted operations on the east coast. On 3 January 1968 she departed for her second Mediterranean deployment and returned to her home port of Norfolk, Virginia on 16 July.

On 2 December she departed for her third cruise to the Mediterranean and returned to Newport in May 1969; COMCRUDESFLOT 10 came aboard. From 13 June to 2 September refit work was done at the Norfolk Navy Yard. On 8 October she departed for her fourth Mediterranean deployment at Flagship for COMCRUDESFLOT 2. On 18 March 1970 she returned to the United States. She once again went to the Norfolk Navy Yard for a refit period from 17 April to 16 July. With this completed she departed for her fifth arrival in the Mediterranean; with COMCRUDESFLOT 8 on board for 9 days. She returned home on 1 March 1971. On 17 may 1972 she departed for her sixth deployment to the Med. and returned home, for one year of operations on the east coast. Her seventh cruise was from 2 November 1973 to 31 May 1974, she then prepared for her decommissioning. She was decommissioned on 31 January 1975 and struck from the Navy list on 9 August 1976.

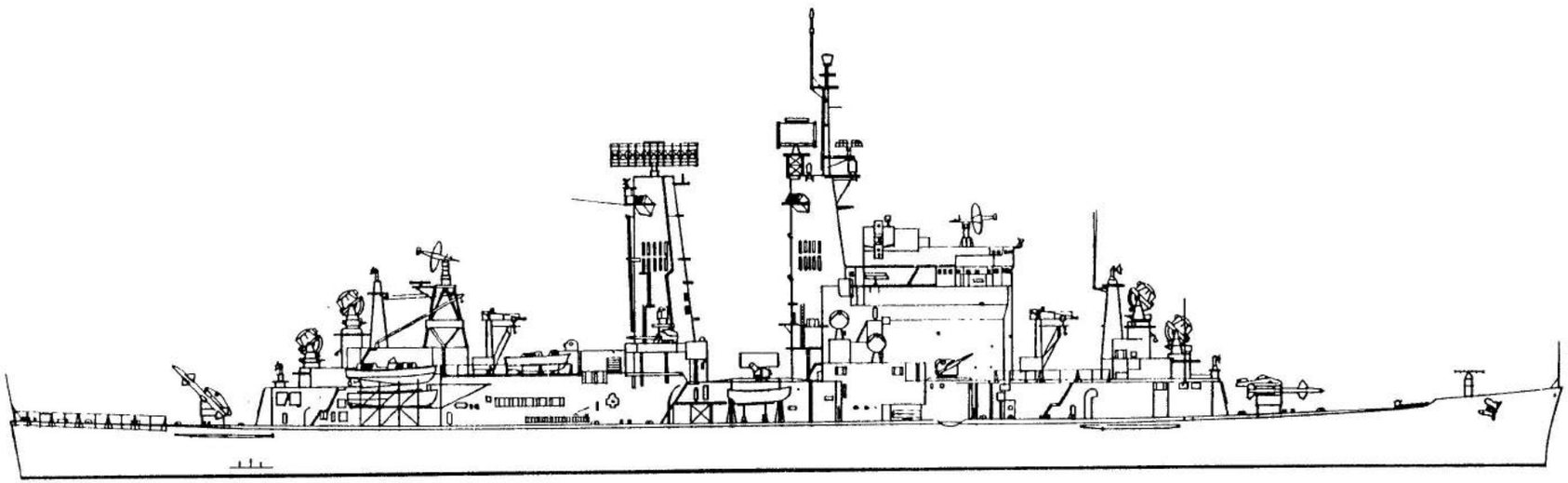
Before CHICAGOs first of nine deployments to the Western Pacific, in May 1966, had a .50-caliber machine gun installed on the 09 level at the aft end of the bridge superstructure. The CHICAGO served extensively in Vietnam, operating as primary AAW protection for the aerial-mining of Hanoi-Haiphong harbor. On 9 May 1972, CHICAGO shot down a MiG aircraft at a range of 48 miles with a Talos missile. Earlier, she served as a PIRAZ (air control) ship in the Tonkin Gulf, using her NTDS and radars to control CAP interceptors. CHICAGO was the first PIRAZ ship (June 1966). A single air controller was credited with twelve kills during one deployment, for which he received a Distinguished Service Medal.

Compared with ALBANY and CHICAGO, COLUMBUS was, to some extent, treated badly. With their installations for flag duties, ALBANY and CHICAGO were frequently and for long periods deployed as Flagships, but COLUMBUS never at any time; nor was any AAW modernization carried out as with ALBANY and CHICAGO. COLUMBUS had both SPS-30 when struck off in 1975, COLUMBUS never had SPS-48 radar and NTDS.

ALBANY and CHICAGO were retired in 1980, with their primary battery, the Talos, out of service. They were to have been refitted for service through about 1985, but the Talos system itself proved too expensive to maintain. However, unlike other cruisers, ALBANY and CHICAGO were not stricken upon decommissioning. It was stated that in view of the international situation they would be retained for a minimum of three years. Major overhauls scheduled for, ALBANY (July 1978-June 1979) and CHICAGO (July 1978-March 1979) were canceled when the decision was made to decommission ALBANY and CHICAGO in 1980. The decision to abandon the relatively heavy and finally obsolete Talos system was the first consideration in the striking off of these ships. No hasty decision was taken to scrap the last two ships, ALBANY and CHICAGO, but COLUMBUS was struck off in 1975 and very quickly broken up in 1977. ALBANY and CHICAGO were struck off in 1980, only to be put back on the reserve again; it having been realized that still-serviceable ships were being sent too quickly to the breaker's yard. ALBANY and CHICAGO were broken up in 1992. Both ALBANY and CHICAGO were slated to become museum ships.



The *Albany* (CG 10), 1976. Note the satellite communications antenna aft and the absence of SPS-30 height finders. (A. D. Baker III)



The *Chicago* (CG 11), 1975. (A. D. Baker III)

ALBANY CLASS CHARACTERISTICS

DISPLACEMENT, TONS: 13,700 STANDARD, 17,500 FULL LOAD

LENGTH, FEET: OA 674'1¼", WL 664'0"

BEAM, FEET: OA 70'0", WL 69'8½"

DRAUGHT, FEET: 27'0"

MAIN BATTERY: 2 TWIN TALOS SURFACE-TO-AIR LAUNCHERS (Mk 12 Mod 1)

SECONDARY BATTERY: 2 TWIN TARTAR SURFACE-TO-AIR LAUNCHERS (Mk 11 Mod 1 and Mod 2)

GUN BATTERY: 2-5 INCH, 38 CALIBER DUEL PURPOSE (OPEN MOUNTS) Mk 24 (SINGLE)

ASW BATTERY: 1 ASROC 8-TUBE LAUNCHER;
2 TRIPLE TORPEDO TUBES (Mk 32)

HELICOPTERS: UTILITY HELICOPTERS CARRIED

MAIN ENGINES: 4 GEARED TURBINES (GENERAL ELECTRIC) 120,000 SHP;
4 SHAFTS

BOILERS: 4 (BABCOCK & WILCOX)

SPEED, KNOTS: 33

ENDURANCE: 7,700 MILES, AT 20 KNOTS

COMPLEMENT: 1,000 (60 OFFICERS, APPROX 940 ENLISTED MEN)

PROTECTION: SAME AS BALTIMORE CLASS, BUT TURRETS, BARBETTES, AND GUNHOUSES WERE ALL REMOVED; SPLINTER PROTECTION WAS APPLIED TO THE TARTAR MAGAZINES. THE TALOS MAGAZINES, WHICH WERE BELOW THE WATERLINE, WERE PROTECTED BY THE ARMOR ORIGINALLY PROVIDED TO PROTECT 8 INCH MAGAZINES.

DETECTION RADAR INSTALLATIONS IN ALBANY CLASS

SPS-10
Was introduced in October 1953 and has proved to be the most reliable surface detection aerial to the present time. After it had been shown that a submarine periscope projecting only 3.28' out of the water could be detected at a range of approximately 10,061 yards, SPS-10B was immediately fitted in warships of all descriptions and later on even in minesweepers and auxiliary ships. The aerial was 10.17' long and up to the present time, versions E, F and G are available. There was no replacement until 1982 when installation SPS-67 succeeded SPS-10, but it retained the antenna that SPS-10 had used.

SPS-30
The last 'height-finder' in US ships, and replaced SPS-8A and 8B from May 1962; it was to remain until the end of the 1970s without replacement-the performance of SPS-48 making this unnecessary. The irregular antenna (12.13' x 15.09') made detection possible at a range of up to 240 miles. A total of 57 installations were delivered and fitted in carriers, cruisers, radar early warning destroyers and amphibious flagships. It was removed from cruisers and aircraft carriers at the end of the 1970s.

SPS-39
Belonged to the three-dimensional FRESCAN detection installations. It was introduced from January 1960 for guided missile cruisers and destroyers; with it was fitted the same antenna as had been given to SPS-26. It was shaped in the form of a slightly inclined cylinder housing and weighted 1.3 tons. This allowed a detection range of approximately 160 miles. The SPS-39 installations remained for quite some time in guided missile cruisers of the USN and other navies, with most of them (roughly from 1963) having the antennae replaced by a rather smaller surface array as was used later automatically with the SPS-52 installation. The detection range was approximately 145 miles. For a long time-and this applies today-it was hardly possible to judge by the antenna alone whether an SPS-39 or SPS-52 was in a ship-a problem which one finds all the time with other electronic installations. Apart from these smaller antenna there was-though only one was produced-SPS-39B, similar to the original aerial of SPS-39, but essentially a larger antenna which allowed detection at approximately 175 miles. It was installed in CLG-3 GALVESTON. In the intervening time most of the old SPS-39 antennae were replaced by SPS-52 or SPS-48. There was an alternative to SPS-39, the SPS-42, an installation using the same aerial, but manfactured to work with Information Representation Installation NTDS ('Naval Tactical Data System'). SPS-42 was found in chiefly in Terrier guided missile cruisers.

DETECTION RADAR INSTALLATIONS IN ALBANY CLASS

SPS-43

A further improvement on SPS-37 which was made more resistant to ECM interference. It uses the smaller antenna as was used in SPS-37 (mainly in those missile cruisers which were formerly designated as DLG/DLGN!) and, in the case of SPS-43A, the prominent 42' long antenna which had been used in SPS-17A and 37A. SPS-43A was used mainly in aircraft carriers where, from the beginning of the 1980s, they began gradually to be replaced by SPS-49. From their introduction in March 1961 a total of 49 installations was delivered.

SPS-48

Of the series of three-dimensional FRESCAN detecting installations, SPS-48 was for a time the most effective variant. The need for its development was apparent in 1959 when it was realized that the performance of SPS-39/42 was unsatisfactory for use in the long range Talos guided missile system. By 1960 an order for the construction of the first two installations had been placed. It required only three years before the first tests took place in USS PREBLE (then DLG-15). The first production model was apparently installed in WORDEN (DLG-18). At that time the range was approximately 230 miles. The antenna is a rectangular shape measuring 17.06' x 17.38', weighing something over 2 tons. When installed its performance was compared with that of ten SPS-8s or with that of two SPS-2s. Certain SPS-48A installations were subsequently upgraded as SPS-48Cs. The most modern version SPS-48E is involved in the programme 'New Threat Upgrade' for Standard SM-2-ER installations. Together with SPS-49, SPS-48 could be considered (at the beginning of the 1980s) one of the best standard installations and this is valid not just for guided missile ships but for other ships as well.

SPS-52

The development of SPS-39 in the chain of 3-D systems which more recently has been fitted not just in guided missile ships but also in amphibious multipurpose ships (LHA). The SPS-52 antenna, which is considerably lighter than the SPS-48, works in conjunction with the old SPS-39 installation. It permits a small aircraft to be detected at 60 miles, and its maximum range is 245 miles. SPS-52C, with its somewhat modified antenna, is the most important sensor for the SYS-1 installation which is part of the LADT System ('Integrated Automatic Detection Tracking System').

TALOS SYSTEM

MARK 12
ALBANY class and LONG BEACH Talos system, utilizing considerable hull depth to stow 52 ready-service rounds including two test rounds. The missile handling rate was ready-service to firing in 57 seconds for the first salvo (one or two missiles) and 46 seconds between salvoes in continuous firing. Train rate was 28.6° per second, elevation 19.3° per second. Total weight was about 800,000 lbs with a crew of one officer and 32 enlisted men. Northern Ordinance.

MARK 77
Talos fire control system, associated with WDS Mk 6 and SPG-49 radar in LONG BEACH and ALBANY class cruisers, and with WDS Mk 2 in CLEVELAND class conversions. WDS Mk 2 employs Designation Equipment Mark 8, capable of handling up to six missile and one gunnery targets simultaneously, with a range of 360,000 yards; WDS Mk 6 could handle tracking of up to 24 targets, designating up to eight (four Talos and four Tartar) in the ALBANY class system (Mod 1) or up to six (two Talos and four Terrier) in the Mod 0 installed aboard the LONG BEACH. All of these systems employed Computer Mark 111, an electmechanical analog device performing four major functions: designation, evaluation, launcher and guidance radar positioning, and guidance programming, operating at up to 400,000 yards. In the late 1960s a modernization program called for replacement of the existing SPG-49B missile control radar by a new and much more reliable SPG-61, with a new modified Mk 11 WDS and an associated Mk 152 digital computer; at the same time the new SPS-48 radar would replace the earlier SPS-39 and one SPS-30 in ALBANY class ships. This program was never fully carried out, however. Total weight of the Mk 77 installation (Mod 1) was 83,700 lbs above decks and 82,400 lbs below.

SPG-49
The control radar for the Talos system. It was introduced in 1962 and functioned always in conjunction with SPW-2 (described in next listing). In exterior appearance the very extensive antennae resembled considerably that of SPQ-5 (the first follow-up radar developed for the Terrier system). Originally, SPG-49 was conceived in 1947 as a combined radar for missile control. The aerial was to be set up on a base of Mk 37. Under certain conditions the overall performance of SPG-49 left much to be desired, and this was the main reason why, as early as 1979, the Talos installations were removed from fleet use. The detection range of an object of 53.82 ft^2 was approximately 168 miles.

SPW-2
The computer guided radar array for Talos. Each Talos installation had two SPG-49 instruments with two associated SPW-2s.

TARTAR SYSTEM

MARK 11
Twin-arm Tartar launcher, virtually automatic because the missiles did not need finning; it was, however, considered unreliable and so was replaced by the single-arm Mk 13. It could accommodate 42 rounds, weighting 201,370 lbs loaded or 148,450 lbs empty, with a crew of 3; rate of fire was one 2-missile salvo every 18 seconds. Magazine diameter was 196 inches and height 209 inches, compared to a width of 360 inches and a length of 395 inches for Terrier Mk 10. Northern Ordinance.

MARK 74
Tartar fire control system, initially for missile destroyers, with SPG-51 radar and Weapon Direction System Mark 4; also in ALBANY class missile cruisers with Tartar/Talos WDS Mk 6. As upgraded with NTDS it became Mk 74 Mod 6 (WDS Mk 13); converted FORREST SHERMAN class destroyers have Mk 74 Mod 2 with WDS Mk 4 Mod 5. CALIFORNIA class cruisers have Mod 4 (WDS Mk 11, SPG-51D or Tartar D digital system); VIRGINIAs, with ASW capability in their Mk 26 launching systems, have Mod 5 (WDS Mk 13); both of the last two include interfaces with NTDS. The DEGs have Mod 2 or 6 with WDS Mk 4.

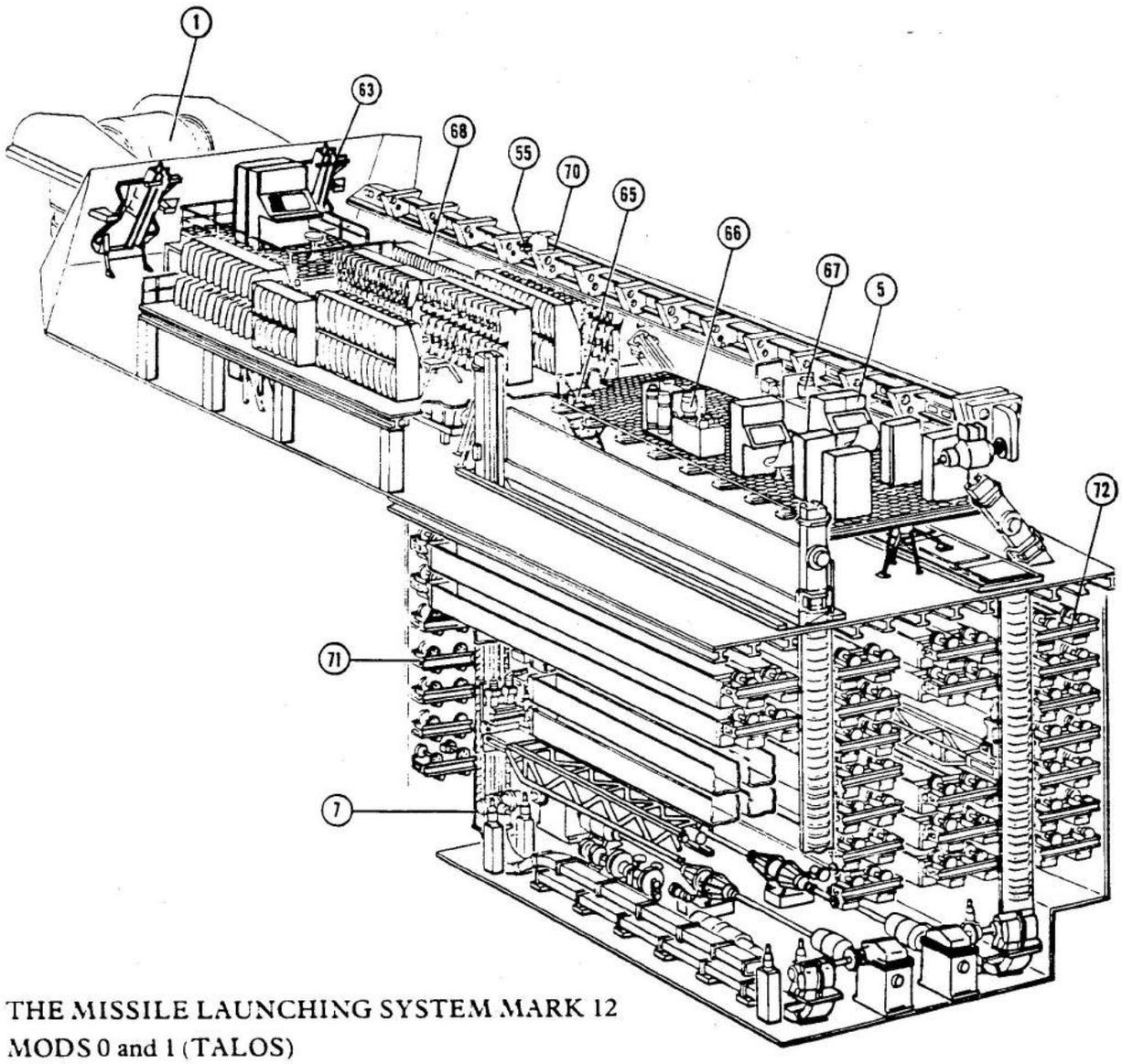
SPG-51
Should be considered in connection with the guided missile installation Mk 74 and is the radar array for Tartar and certain follow-up models of Standard MR types which are found in cruisers of the ALBANY, CALIFORNIA and VIRGINIA classes, and also in many American and foreign guided missile ships (DDG and FFG). There are many versions of SPG-51 in existence and all have a parabolic antenna with a diameter of 7.87'. Development started in 1952 with a series production following a good ten years later in ALBANY and CHARLES F. ADAMS (DDG-2) classes.

TALOS AND TARTAR LAUNCHERS

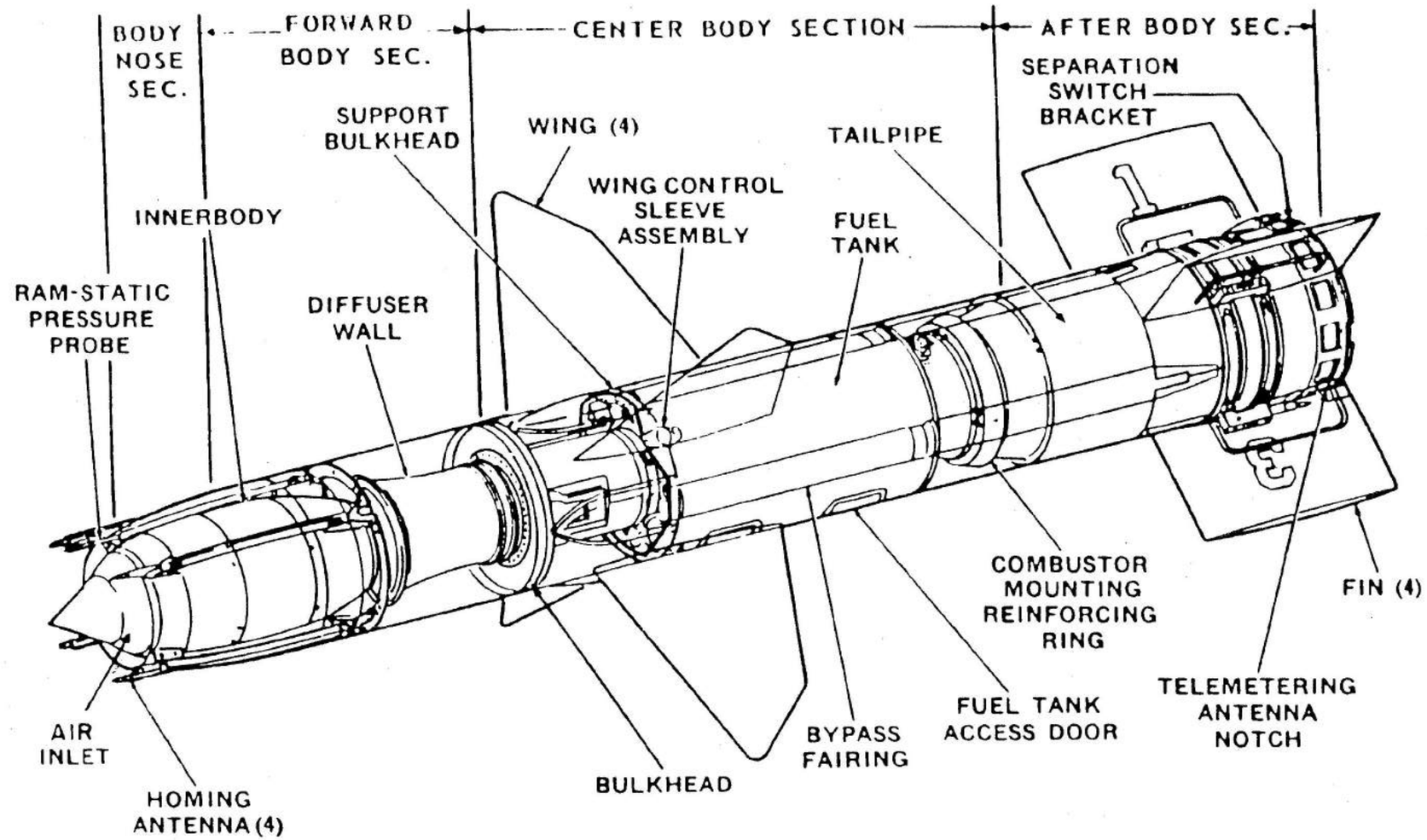
As for Talos, it was always considered much too large for vertical stowage. The Bureau of Ordnance appears to have envisaged from the first horizontal stowage below decks, with rounds held side by side and brought up by elevators through protective deck doors. They would all be ready-service, as in the case of Terrier. In fact only the final Talos cruisers were so arranged. The CLEVELAND conversions carried all of their missiles above deck, and most were not assembled in stowage. Their designs thus accepted the disadvantages of limited sustained fire as well as the topweight associated with the protection of large deck-houses containing the missiles.

All of these systems required relatively large crews, if only for finning. When the Tartar missile system was developed for destroyers, automation was a major consideration. Unlike Terrier, Tartar had relatively small control fins, which could be made to fold for stowage. Again, given its short length, it could be stowed vertically. That was particularly the case since there was no need for a long finning space between magazine and launcher. From a ship design point of view, vertical stowage was attractive because it limited demands on centerline length, always in short supply aboard destroyers. The result was a series of small canister launching systems; the twin-arm Mk 11, the single-arm Mk 13, and the limited-capacity singlr-arm Mk 22. Reportedly the single-arm system was devised to achieve higher reliability than the twin-arm Mk 11 without any loss in rate of fire; typical figures are one salvo of two weapons every 20 seconds in a Mk 11 vs one missile every ten seconds in a Mk 13.

The chief defect of the compact launchers is lack of flexibility in missile size; Mk 13, for example, could not accommodate the slightly larger Typhon (MR) missile which, even so, had been based on Tartar. Moreover, missiles in the automated launchers were difficult to service. This was not too important given the expected (but not always achieved) high reliability, but it did preclude the use of nuclear warheads, as the latter always had to be open to access for release. The nuclear problem was a major reason for the rejection of the Mk 13 launcher in the Aegis System. From a magazine load-out point of view, the Mk 13 can accommodate Harpoon but it cannot accommodate ASROC, which is why the PERRY class frigates do not have the latter capability; there is not enough centerline length to provide both ASROC and a SAM launcher aboard them. In Terrier ships, similar considerations of centerline length made it attractive to develop a three-storage-ring version of Mk 10 (Mods 7 and 8) which accommodates up to 20 ASROCs on alternate positions of the two upper storage rings, for BELKNAP and TRUXTUN class missile cruisers.



THE MISSILE LAUNCHING SYSTEM MARK 12
MODS 0 and 1 (TALOS)



MAJOR SECTIONS AND COMPONENTS OF TALOS MISSILE

ASROC AND SQS-23 SONAR

MARK 16
ASROC 'pepperbox' launcher carrying eight missiles in pairs, vertically, with an above-decks weight of 49,164 lbs and a crew of 2. Maximum rate of fire is 3 rounds per minute, with elevation limits of $-3^{\circ}/+85^{\circ}$ and a train limit of $\pm 177^{\circ}$. This lightweight launcher has often been criticized for its vulnerability to weather damage.

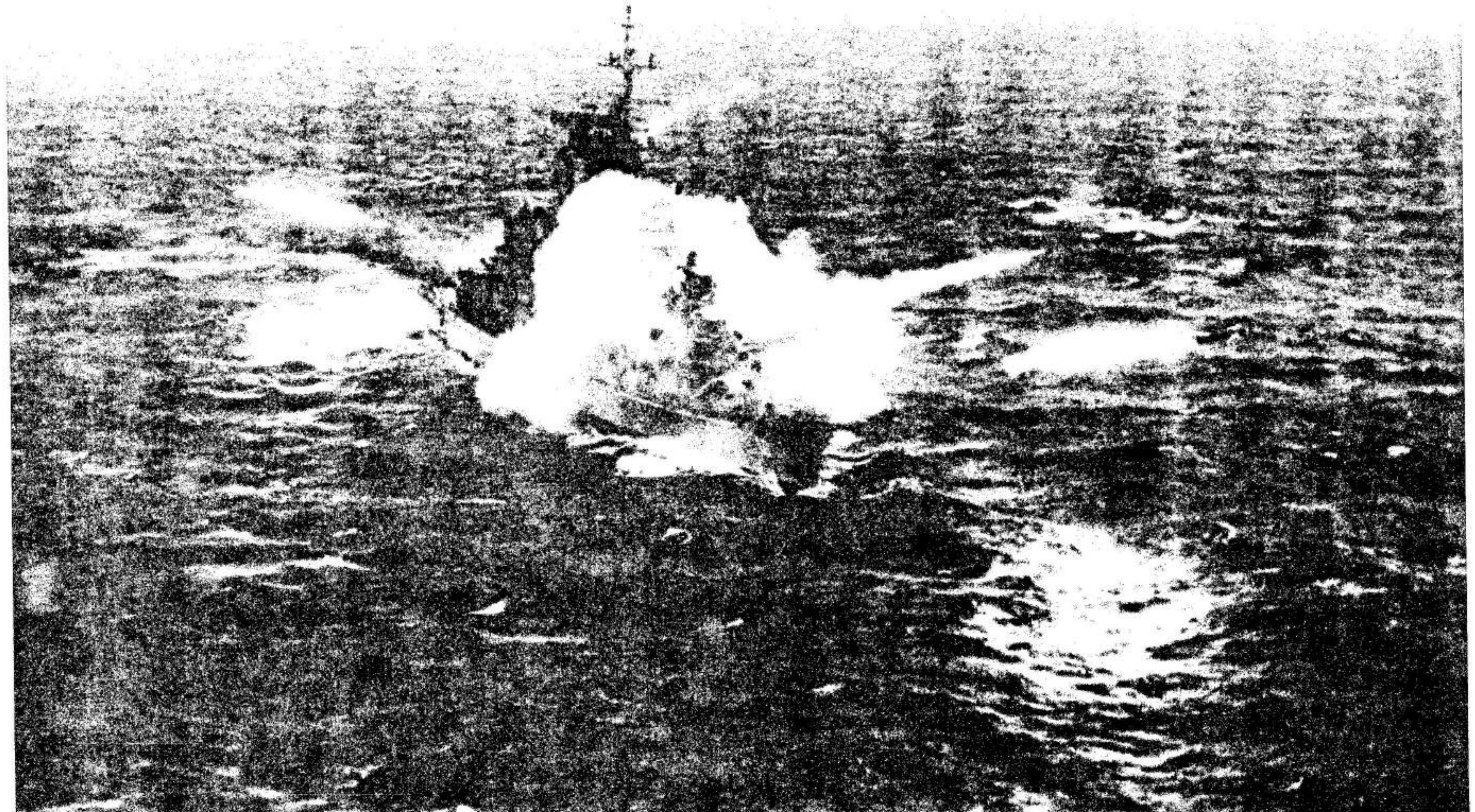
SQS-23
The lower-frequency replacement for the SQS-4 series, in FRAM I ships and new construction; first installed 1958, 197 sets were produced. Base frequencies are 4.5, 5 and 5.5 kc, and frequency can be varied within 380 cycles per second of the base frequency to reduce intership interference. Pulse-lengths are 2 (later versions 5), 30 and 120 ms, with range scales of 1000, 2500, 5000, 10,000, 20,000 and 40,000 yds, and a scan rate of 150 cycles per second. There are 48 staves, each with two transducers, for a total of 96 channels. The sonar beam can be depressed electronically to maintain contact with nearby targets. In the long-pulse, wide-sector, RDT mode, SQS-23H transmits 60 kw for 4.3 seconds. Both fixed-frequency and FM-slide (400-cycle) pulses are employed in current versions. Recent development has focused on reliability and, presumably, noise reduction for longer range (LORS). SQQ-23 is a modification with improved passive detection, SQS-23 was the '10,000-yard sonar' associated with ASROC. A performance estimate (1956, at 15 kts) gave 12,000/3500 yds. However, from time to time in the late 1950s, it was credited with a bottom-bounce capability. SQQ-23 was the active-passive equivalent.

GUNS IN ALBANY CLASS

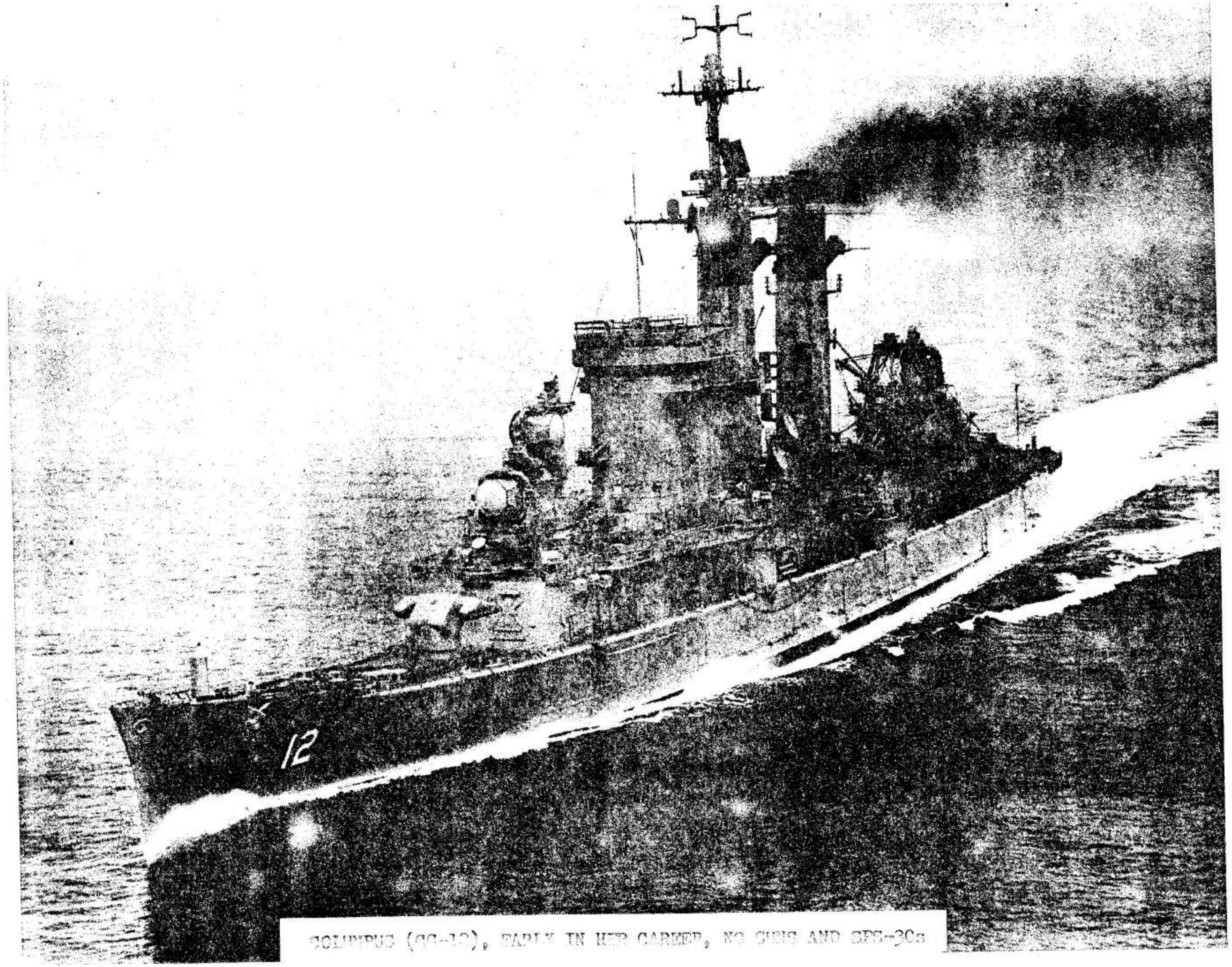
MARK 24
Main battery director for NORTHHAMPTON class cruisers, incorporating a below-decks plotting room; predecessor to modern systems. In 1941 this system generally used Range Keeper Mark 8; wartime replacement was a Mk 34 director with Mk 8 rangekeeper. The fundamental limitation of the earlier unit was that it did not generate in bearing, making it impossible for a ship fitted with it to fire divided indirect short bombardment missions.

MARK 56
Principal postwar 3in/50 director, begun May 1943 at MIT Radiation Laboratory as a radar-equipped director for long-term development suited for blind firing at surface as well as air targets. It was to be suited, too, as the primary director for small ships such as destroyer escorts. Its Mk 35 radar incorporated automatic tracking in range, bearing and elevation, for lead angles up to 30° and range rates up to 630 kts; it could be synchronized in bearing with an incoming designation signal by a control knob. Initially it was to have had a converter allowing simultaneous control of guns of alternative ballistics to those incorporated in its computer; later this was abandoned in favor of two separate complete computing systems for dual ballistics.

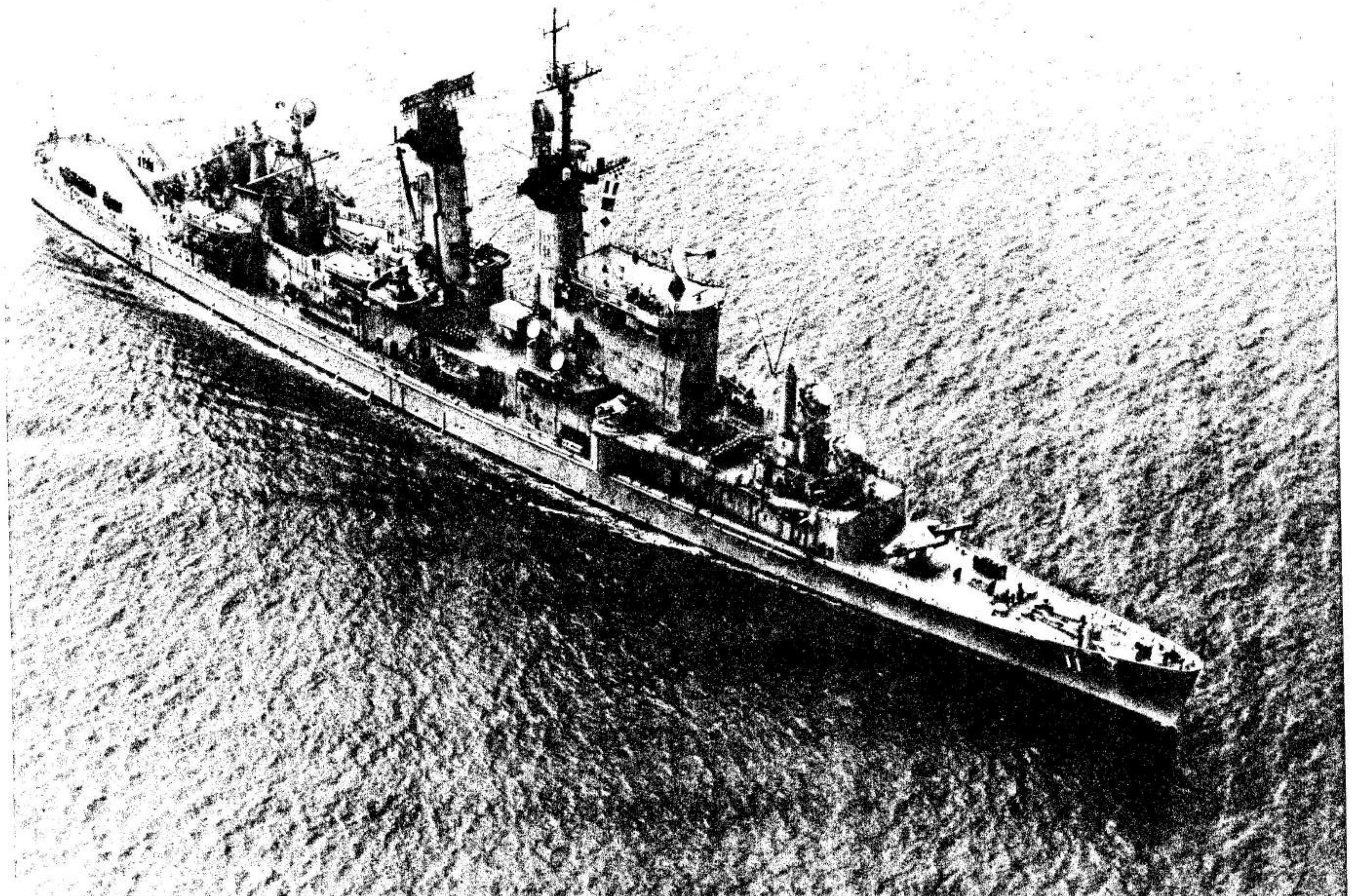
In the spring of 1945 Admiral King intervened in the design; MIT had considered the director no more than a radar mount, with automatic tracking accomplished below decks; tests showed that its automatic radar tracking was equal to optical tracking, but service experience at the time showed that optical tracking was valuable against close-in (eg kamikaze) targets. Nor did any existing search radar promise complete coverage, or full flexibility to deal with rapidly changing close-in situations. A second crew member with a slewing sight was therefore added, and the cockpit and controls rearranged. Moreover, Mk 56 did not have the expected surface capabilities because its stable vertical was inadequate. Tests of a prototype began late in 1945, the first unit going to sea aboard the destroyer WINSLOW. Typical weights were 7655 lbs above and 11,492 lbs below decks, including Computers Marks 42 (primary ballistics and secondary ballistics) and 30 (primary gun orders). Limits were 630 kts, 30° lead angle and 15,000 yds.



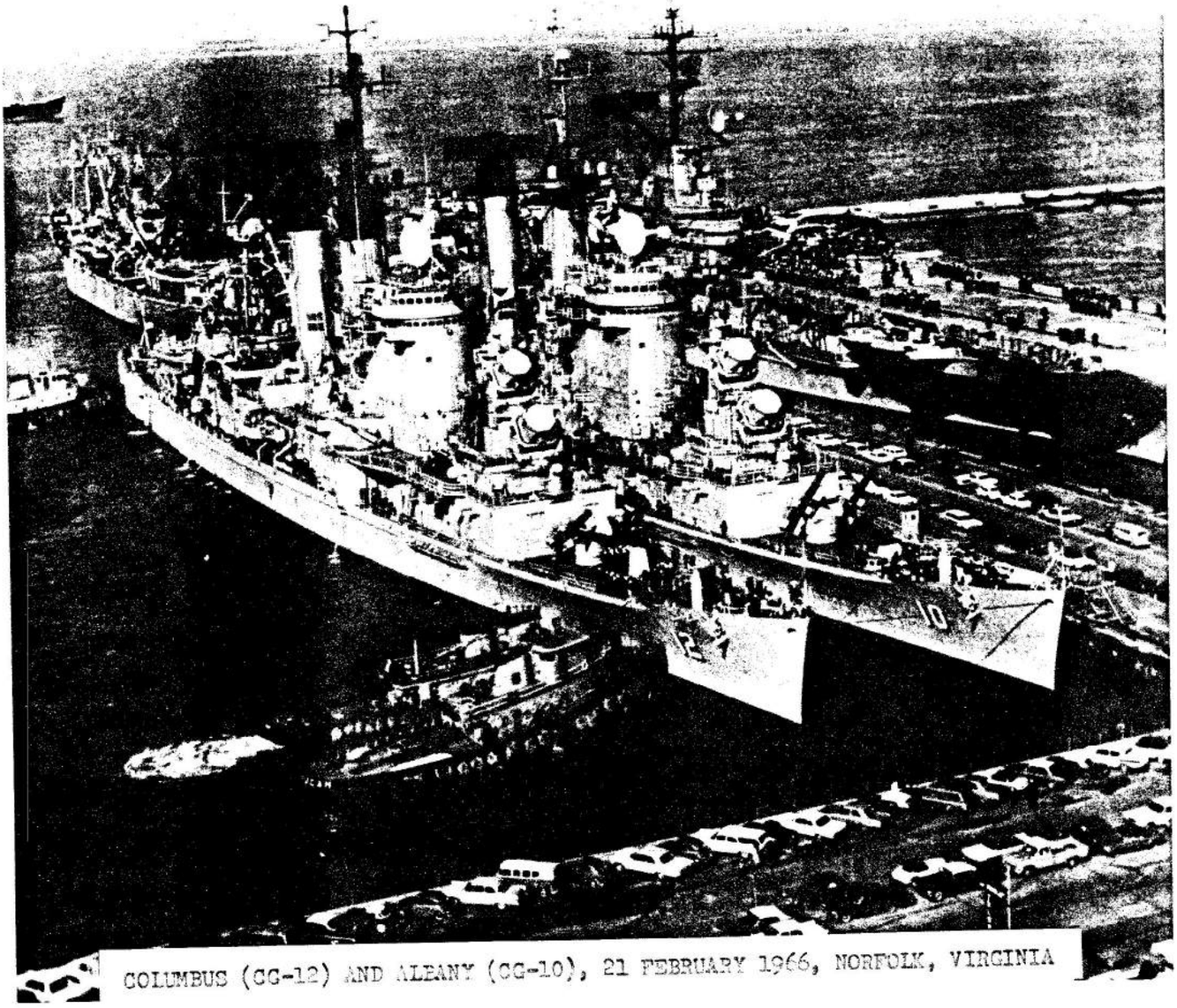
ALBANY (CG-10), 30 JANUARY 1963, FIRING AN ASROC AND TWO TALOS MISSILES



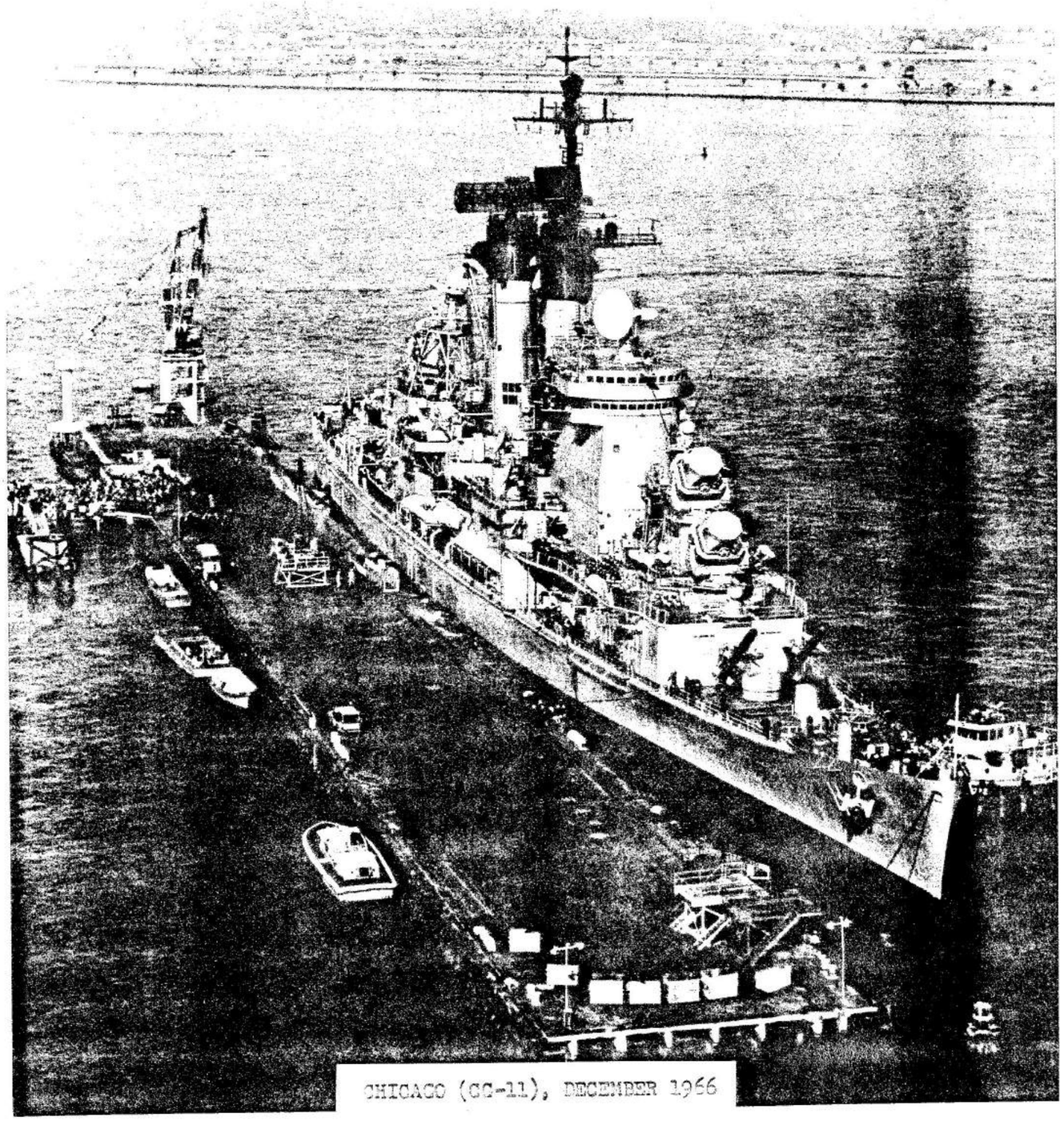
COLUMBUS (CG-12), EARLY IN HER CAREER, NO GUNS AND SPS-30s



CHICAGO (CG-11), SEPTEMBER 1964, SAN FRANCISCO BAY



COLUMBUS (CG-12) AND ALBANY (CG-10), 21 FEBRUARY 1966, NORFOLK, VIRGINIA



CHICAGO (SC-11), DECEMBER 1966


10

ACKNOWLEDGEMENTS

CRUISERS OF THE US NAVY, 1922-1962
by Stefan Terzibaschitsch
Naval Institute Press, Annapolis, Maryland

US CRUISERS, AN ILLUSTRATED DESIGN HISTORY
by Norman Friedman
Naval Institute Press, Annapolis, Maryland

US NAVAL WEAPONS
by Norman Friedman
Naval Institute Press, Annapolis, Maryland

US WARSHIPS SINCE 1945
by Paul H. Silverstone
Naval Institute Press, Annapolis, Maryland

NAVAL HISTORY MAGAZINE, SUMMER 1989, IN CONTACT
by Captain Robert C. Peniston, US NAVY (Retired)
USS ALBANY (CG-10), (1969-1971)
Naval Institute Press, Annapolis, Maryland

NAVAL HISTORY MAGAZINE, WINTER 1989, GOING HOME
by Commander George J. Lappan, US NAVAL RESERVE (Retired)
USS CHICAGO (CG-11), (1964-1966)
Naval Institute Press, Annapolis, Maryland

PHOTOs
by US Naval Institute Photo Library, Annapolis, Maryland

SHIP HISTORYs and PHOTOs
by Seaweeds Ships History, Sisterville, West Virginia

ALBANY CLASS CHARACTERISTICS
by Janes Fighting Ships, London, England