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Coldwarweaponsystemcosts.com

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MISSILES

M120 -- Historical Summary

1957 Guided Missiles
Costs – as follows, by type of missile, 1957 dollars per Unit
Discussion –

Type	Airframe	Installed Engines	Electronics	Other Incl. Armament	Total
SM-62	$1,188,461	$302,025	$1,035,142	$1,149,999	$3,675,627
SM-64-A	6,928,230	1,132,000	650,000	1,033,775	9,744,005
IM-99	1,413,738	276,174	495,826	869,565	3,055,303
TM-61-B	117,300	26,116	104,536	83,500	331,452
GAM-63A	3,231,222	3,617,263	3,028,795	1,750,000	11,807,280
GAR-1,2,3,4	3,414	498	7,453	1,986	13,351

If you need data for missiles not listed, please contact us.
Source – Unit Costs of Aircraft, Guided Missiles, and Engines, T. O. 00-25-30, 10 September 1957, Published Under Authority of the Secretary of the Air Force.
Recorded – August 1962.

ICBMs

M127 – ICBMs

Cost – Development Budget Estimates ($million) 4 year cost = $1,501.8 million
Discussion – by fiscal years 1955 through 1958

Fiscal Year	55	56	57	58
Research & Dev. Code 600	20.0	20.0	20.0	20.0
Procurement 150	7.7	233.0	450.0	500.00
Facilities 131	46.2	50.0	13.0	--
Public Works 300	7.1	26.3	8.5	--
Total $	161.0	329.3	491.5	520.0
Missiles Proc.	13	80	116	140

Source -- The Development of Ballistic Missiles in the U.S. Air Force, Air Force Historical Studies Office – Bolling AFB, January 1, 1990, p 130, DTIC ADA439957.

Recorded – Updated June 2009.

M130 –ICBMs

Cost – Total 4 Year System Cost = about $2.5 billion.
Discussion – Program time estimate = 1954 – 1961
Direct R & D = $0.4 billion (up to the acceptance of the 1st production vehicle
Procurement of 1000 missiles = $1 billion
Base Construction = $1.2 billion
4 year Operating Cost = $0.7 billion for manning the bases and training personnel
Total 4 Year System Cost = about $2.5 billion.
Probably 0.3 billion is already spent on development of motors, radar equipment, computers, and test facilities for past projects. The warhead costs must be estimated separately.
Source – A Revised Development Program for Ballistic Missiles of Intercontinental Range, Special Memorandum No. 21, RAND, 8 February 1954.
Recorded – Updated June 2009.

M40 – Atlas Squadron Change Orders

Cost -- $15M for 3 squadrons
Description – Three early Atlas squadrons had an average of 200 change orders a piece.
Source – Missiles & Rockets, March 9, 1964, p 15.
Recorded – May 28, 1964.

M99 – Atlas, ICBM System

Cost -- $1 billion in 1952 collars to develop the Atlas.
Would cost an additional $1 billion dollars to buy a force of 800 birds. This was equipment only and not a total system costs.
Source – Beginning of Military Cost Analysis, 1950-1961, RAND P-7425, March 1988.
Recorded – Updated, April 22, 2009.

M98 – Titan III

Cost – See below
Discussion – RDT&E = $758x10 to the 6th (excluding flight test firings and associated costs)
Procurement: (average cost for 125 units) and launch

	Production/Unit	Launch Operations/Unit
Titan III Core	$3.5 x 10 to the 6th	$1.2 x 10 to the 6th
2 Solids	$3.3	$.9
Core & 2 Solids	$6.8	$2.1

Source – Relation of Titan III to the National Launch Vehicle Program & Alternative Courses of Action, 4 March 1963, Aerospace Corp., Appendix F, Cost Analysis.
Recorded – February 4, 1966.

M121 – Titan III Program

Cost -- $955 million

Discussion – Total cost of the Titan III program through FY 67, including $84 million in construction.

Titan III will account for a $66 million request in FY 67 with

$26 million of this going for completion of the development of a seven segment 120 in solid motor strap-on and an improved first-stage liquid engine required for the MOL program.

Source – Missiles & Rockets, February 28, 1966, p 15

Recorded – March 14, 1966.

M122 – Titan III Per Pound

Costs -- $506 per pound of payload

Discussion – In order to achieve the $500 per pound of payload we would have to procure 12 or more of the Titan III's during each year – Mr. Vance.

The cost that are included here are the costs of the vehicle hardware and the launch costs.

By dividing the total cost of say $12 million by the payload weight in low earth orbit of 25,000 pounds, the result is about $500 per pound to deliver the payload to orbit – Dr. Brown.

Source – Hearings before Committee on A&SS, Senate, 89th Congress, 1st Session, January 26, 27, 1965. p 64.

Recorded – June 19, 1965.

M123 – Titan III-3X

Cost – Development = $44.7 million

Discussion – Our estimate based upon the preliminary work done with the contractors, however, is $44.7 million. This includes fabrication and launch of the first vehicle.

It does not include the modifications to launch facilities and ground equipment. Our estimate for these alternations, including installation and checkout of all the equipment, comes to $26.8 million.

This adds up to $71.5 million, which is the amount programmed for fiscal years 1965-1966.

Source – Hearings, Committee On Aeronautics & Space Science, Senate, 89th Congress, 1st Session, January 26, 27, 1965, p 128.

Recorded – January 4, 1966.

M124 – Titan III-C

Cost -- $500 per pound in orbit

Discussion – Mr. Gehrig --- Sec. Vance stated that the Titan III-C could put up payloads for $500 a pound.

Dr. Flax – a 100 percent reliability was used to compute the $500 a pound on orbit for Titan III-C.

Source – Hearings, Comm. On Aeron. and Sp. Sc., Senate, 89th Congress, 1st Session, January 26, 1965, p 106.
Recorded – January 4, 1966.

M125 -- Titan III-C
Cost – between $13 and $20 million, each including launch costs
Discussion – the new launch vehicle will be in addition to the remaining 10 titan III-C R&D boosters still in the AF inventory and already committed to launch assignments. All launched from ETR.
Source – Missiles & Rockets, April 18, 1966, p 14.
Recorded – May 3, 1966.

M67 – T-III Checkout
Cost -- $3.5 million
Discussion – will be used to check out the T-111M booster both at Martin Company Denver plant and at the WTR prior to launch of MOL.
The system will be moved to WTR following launch vehicle checkout at Denver.
Source – Technology Week, March 13, 1967, p 13.
Recorded – May 14, 1967.

M42 – Minuteman Launch
Cost -- $1.8 million.
Discussion – Number of launchings in sample = 20
Number of launchings prior to sample = 5.
Period covered by sample (incl. dates) = 1/18/61 – 12/20/62.
Period covered by sample (months) = 12.0
Source – RAND RM-3913-PR, Efficiency in Space Rocket Launching Operations, Recent Advances & Future Opportunities, Lewis & Schubert, December 1963.
Recorded – June 23, 1964.

M49 – Minuteman
Cost – 200 Additional Minuteman Weapons -- $1.3 billion = 5 year costs
Discussion –
Source – Astronautics & Aeronautics, April 1965, p 99
Recorded – April 26, 1965.

M81 – Minuteman II, LGM – 30 F, MM II.
Cost -- $4.544 Annual Operating Cost in millions (Primary Program El. Only) for 50 U.E.
Discussion – Recurring Invest $13.048 m
Procurement, 3010 = .095
3080 = .077
O & M 3400 = 2.237
Mil. Personnel 3500 = 2.135
Share of BOS = 2.424.
Source – AFM 172-3, 15 June 1965, p 6.

Recorded – June 13, 1966.

M1 – Minuteman II Missile
Cost – Risen from $3.3 billion to $7 billion
Source – Weekly News Summary, June 13 1965, p 4, Washington Post, June 13 1969.
Recorded – July 15, 1969.

M5 – Air Force/Boeing Minuteman 2
Cost – Estimate of $4.7 billion
Discussion – Representing an escalation of $208.4 million
Source – Aviation Week, Dec 8, 1969, p 25
Recorded – January 28, 1970.

M26 – Minuteman 3, Air Force/Boeing
Cost -- Current estimate of $5.1 billion
Discussion -- Reflecting a price increase of $760.7 million.
Source – Aviation Week, December 8, 1969, p 25
Recorded – January 28, 1969.

M33 – Minuteman
Cost – Modernization of Boeing/USAF Minuteman strategic missiles & silos
Approximately, $166 million in FY 1971.
Discussion – AF plans to spend $55.8 million to procure avionics systems and ground equipment to convert Minuteman 1 sites to accommodate Minuteman 2 and 3 missiles. Another $96.3 million will go to reduce in-flight susceptibility of the guidance system to shock or radiation.
Source – Aviation Week, March 23, 1970.
Recorded – May 29, 1970.

M36 – Minuteman, Boeing Minuteman Strategic Missile Program
Cost – Will cost another $4 billion to complete.
Discussion – Present timetable calls for 500 Minuteman 3 missiles to replace the Existing 500 Minuteman 1 by Jan 1, 1975.
Total of $13 billion has been spent on the Minuteman program since its inception In the late 1950's.
Source – Aviation Week, April 6, 1970, p 15.
Recorded – May 29, 1970.

M71 – Minuteman III
Cost -- $10 million
Discussion – five year expenses associate with keeping it in service.
Source – Technology Week, April 10, 1967, p 3.
Recorded – May 2, 1967.

M47 – ICBM Retrofit

Cost – Surplus ICBM's Retrofit for Space Boosters
Discussion – See below
"We have found that such a retrofit approach is not appropriate except in such limited applications as our ABRES re-entry vehicle test program."
"The cost to rework an ICBM into a space booster capable of meeting the characteristics and reliability required for space payload programs is approximately the same as the cost of one of our standardized space boosters. Therefore we have discarded this approach, with a few exceptions." Quote of Mr. Vance.
Source – Hearing before Committee on A & SS, US Senate, 89th Congress, 1st Session, January 26-27, 1965, p 44.
Recorded – September 16, 1965.

M80 -- Minuteman Microcircuit, Semiconductor
Cost – Average price is $15.04
Discussion – being purchased for Minuteman ICBMK guidance system
Dropped from $52.60 level early in the program
According to Autonetics Division of N.A.A.
Source – Aviation Week, May 7, 1966. p 86.
Recorded --

M114 – Minuteman
Cost -- $738,000, Ordinance, March-April 1963.
Discussion –1st stage $300,000, or about 6.00/lb.
Standardized Launch Evaluation Study, Aerospace.
Conforms closely with cost/lb of the Sergeant type booster used on the Thrust Augmented Thor which at a stock list price of $53,000 for the TX 33-52 motor weighing 8,796 lbs, = $6.03/lb. Both manufactured by Thiokol and utilize PBAA prop. Applying this to 11,677 lbs/2nd stage + 4,169/3rd stage = $395,000. SRI claims prop = airframe = 50% of total missile = $791,800 complete.
Source – Douglas ARPA Study No 2, Sat. Intercept System (Command), Vol. III, Cost Summary, SM-45746, October 1963, p 13.
Recorded – November 5, 1963.

M90 – ICBM, Improved Capability Missile
Cost – The program is expected to cost a couple of billion dollars.
Discussion – larger than new Minuteman III.
Carry at least twice the Minuteman payload, over roughly the same distance – estimated to be about 7,000 miles.
The payload will include both an improved array of penetration aids and a larger warhead.
Source – Missiles and Rockets, April 11, 1966, p 12
Recorded – May 2, 1966.

M51 – Minuteman Flyaway Cost (WS133A)
Costs – See below

Discussion --

Initial Investment				$x10 to the 3
	Major Equipment			1819
		RV	42	
		Interstages	62	
		Ass'cy	18	
		Stage I	431	
		Stage II	139	
		Stage III	122	
		G & C	840	
		Spares	165	
	Support Equipment			1667
		Guidance GSE		
		LCC Equip = 750/10	75	
		Maintenance Area Equip	154	
		Silo Equipment	756	
		Communications Equipment	280	
		Spares	217	
	Personnel Transitional Training			82
	Initial Fuel & Supplies			9
	Site Acquisition & Base Construct			690
	Total Initial Investment			4,267
Annual Operations Costs				
	Personnel Pay & Allowances		41	
	Replacement Personnel Training		54	
	Replacement & Maint. Of Equip (Depot)		229	

	Replacement & Maint of Facil.		25	
	Replenishment of Fuel & Supp.		5	
	Base Support		15	
	Total			369

Source – M2 Program Office, October 1963.
Recorded – October 1963.

M97 – PACCS-Minuteman

Cost -- $18.6 million, Airborne Launch Control Capability for all of the Minuteman force.

Discussion – The development costs of the necessary equipment through FY 67 is estimated at $18.6 million. We now propose to begin procurement of the airborne portion of this equipment in FY 66 at a cost of approximately $22 million. The ground portion of the airborne launch control capability is included as an integral element of the Minutemen program.

Source – Statement of Sec of Def McNamara before Senate Subcom on DoD Approp, FY 67-71, 67 Budget
Recorded – March 21, 1966

M13 – Polaris Development & Vehicles

Subsystem Weights of Vehicles (thousands) (Weighted average)

Total Weight (lbs)	28406	32334	35734
Re-entry	878	878	08081
Guidance Reg	225	225	
Vehicle	27304	31231	34593

Source: Lockheed (MSFC), December 1963
Recorded – December 1963.

M14 – Polaris R&D

Costs, Summary (millions)

Discussion – R&D Non Hardware (FY 57-62)	$829.05
(FY 63)	247.33
R&D Hardware Costs	
AIX Development Hardware	$209.34
A2X	56.85
A2M/6	9.48
A3X	134.08
STV-1A Vehicle	0.14
Other Equipment	1.76
Subtotal	411.65
Total R&D	1488.03

R&D Vehicles	Number
A-1 (AX & A1X)	65
A-2 (A-2X)	24
A-3 (A-3X & A3Y)	50

Development AA& RDware (millions)

	Cost/Vehicle*	Weight**	Cost/lb
A-1	3.22	28,406	113
A-2	2.76	32,334`	86
A-3	2.68	35,754	7.5

- Assumed to include R&D cost re-entry Vehicle

** All body weights include re-entry

Source – Lockheed, Burbank (via MSFC), December 1963
Recorded – December 1963.

M45 – Polaris I and II Launch

Cost -- I = $0.4 million, II = $0.4 million.
Discussion – Number of launchings in sample = I – 21, II – 20
Number of launching prior to sample = I – 34, II – 87
Period covered by sample (inclusive dates) I – 10/12/59 – 6/23/60
II – 10/23/61 – 10/5/62
Period covered by sample (months) I – 8.5, II – 11.9
Source – RAND RM-3913-PR, Efficiency in Space Rocket Launching Operations, Recent Advances & Future Opportunities, Lewis & Shubert, December 1963
Recorded June 16, 1964.

M24 – Polaris Sub -- Navy

Costs -- $18.7 million for first overhaul
Discussion – Adm Sylvester – for this appropriation
Source – Senate Subcom. Of Appropriations Committee Hearing, 88th Congress, 1st Session, HR 7179, p 869.
Recorded – November 12, 1963.

M18 – Poseidon Navy Missile

Cost -- $900 million for development
Discussion – Hercules Power and Thiacol Chem. Corp. as subcontractors for development of motors.
Development effort for Poseidon has been pegged by McNamara at about $900 million, and Navy sources say that the project is within cost estimates thus far. An additional $1.1 billion has been estimated for the cost of retro-fitting 19 submarines to handle Poseidon.
Source – Missiles and Rockets, October 25, 1965, p 16.
Recorded – December 2, 1965.

M22 -- Ballistic Missile Launch Summary

Cost: -- No Costs Reported – Number of Launches

Discussion:

Type	Total Launches R&D - Operat	Successes R&D – Oper	Partial Success R&D - Oper	Failures R&D - Oper
Atlas D	58 – 34	41 – 20	13 – 2	4 - 12
Atlas E	24 – 5	12 – 3	10 – 0	2 - 2
Atlas F	15 – 2	9 – 1	4 – 0	2 - 1
Titan 1	47 – 17	34 – 13	9 – 1	4 - 3
Titan 2	19 – 7	12 – 6	6 – 1	1 - 0
Minuteman	43 – 26	28 – 23	8 – 2	7 - 1
Polaris A1	42 – 26	28 – 23	10 – 0	1 - 13
Polaris A2	24 – 31	15 – 36	5 – 0	4 - 5
Polaris A3	30 – 2	18 – 2	18 – 2	0 - 0

Source: Aviation Week, February 3, 1964

Recorded: May 11, 1964.

M50 – Poseidon Underwater Ballistic Missile

Cost -- $900 million development program

Discussion – twice payload and accuracy of the A-3

Source – Astronautics & Aeronautics, April 1965, p 99

Recorded – April 26, 1965.

M58 – Poseidon C-3 Program

Cost -- Expected to reach $3.5 billion, including about $1.3 billion for development.

Discussion – Present plans call for the deployment of the Poseidon in 22 submarines of the Lafayette class – the latest of the three basic Fleet Ballistic Missile classes.

Source – Technology Week, September 5, 1966, p 24.

Recorded – September 15, 1966.

M69 – New U.S. ICBM, advanced.

Cost -- $1 billion to development over the next 5 years.

Production of a few hundred of these missiles plus the ten year operating costs associated with keeping them in readiness, would push the total value of the program to about $10 billion.

About half of the total cost would reflect actual hardware purchases by DoD.

The cost of the ABM protection is included in the $10 billion program cost for the fixed base system.

Source – Technology Week, April 3, 1967.

Recorded – May 1, 1967.

M112 – Polaris – Merchant Ship Configuration

Cost – Initial - $885 million, 5 year Operating Costs - $385million
Discussion – Figures for Polaris in a merchant ship configuration are given in a NATO document MCM 73-62.
The calculations were made for a 200 missile force in 25 ships.
Source – Factors Affecting the Choice of Medium Range Ballistic Missile Deployments, G. D. Kaye, Defense Research Board, April 1963, p D-2.
Recorded – May 19, 1964.

M116 – Polaris Procurement

Cost -- $1,230,000
Discussion – A-2 unit flyaway cost of operational missiles -- $1,230,000
Fleet support, includes an extra guidance package for every 4th missile, FY 62.
Source – Navy, San Pedro, 1964,
Recorded – February 16, 1964.

M65 – Lockheed Poseidon

Cost – Development costs - $2 billion
Description – an advanced version of the Polaris with greater range and complex countermeasures designed to baffle the Soviet anti-missile defense units now being deployed.
Source – Aviation Week, November 21, 1966, p 25.
Recorded – December 15, 1966.

M70 – Poseidon

Cost – Total cost - $3.3 billion
Discussion – with $1.115 billion included in FY 68 program.
$303 million for the missile
$326 million for the conversion
$23 million for the construction
$463 million for the RDT&E.
Source – DMS Special Report, DoD Budget in FY 68.
Recorded – May 1, 1967.

M77 – P-20-A, Solo deployed advanced ICBM

Costs --$2 billion to bring missile to operational status.
Discussion – The advance missile may be about 100 inches in diameter.
It has a BSD designation, P-20-A.
Funding to bring missile to operational status in late 1972 is estimated to be about $2 billion.
Source – Aviation Week, May 30, 1966, p 23.
Recorded – June 20, 1966.

M83 – Poseidon

Cost – total cost = $3.5 billion.

Discussion – including $1.3 billion is development and in excess of $2 billion for production and retrofit of Polaris carrying submarine.
Navy reports operational availability date of the missile has been advanced.
Source – Missiles and Rockets, May 9, 1966, p 7.
Recorded – June 10, 1966.

M87 – Poseidon fleet ballistic missile
Cost – Development estimate at $1.3 billion
Discussion – Formerly the Polaris B-3, but re-designed for purposes of the FY 66 budget presentations
Poseidon also will use the Sabre guidance system.
Development is being accelerated by 20% in the FY 67 budget above that originally planned.
Funding in this budget now stands at $300 million.
No discussion has been made as to the number of Polaris submarines that will be retrofitted with the Poseidon.
Source – Aviation Week, March 7, 1966, p 79
Recorded – March 17, 1966.

M96 – Telemetry Transmitter, S-band, on the Poseidon Missile
Cost -- $6,000 each
Conic Corp of San Diego, has just received its first production order
Poseidon's prime contractor Lockheed Missile and Space Co. bought 125 transmitters at nearly $6,000 each for a total of more than $700,000
4 or 5 transmitters planned for each missile and up to 28 submarines carrying 16 missiles each
5 watt transmitter operates around 2,200 MHz and weighs less than 3 lbs each
Source – Aerospace Technology, November 6, 1967, p 11
Recorded – November 11, 1967.

M110 – Polaris A-1 – 50 Missile Polaris A-1 Force
Cost – Initial costs as follows;
Discussion – Configuration

Configuration	Initial Cost (million $)
Fixed Soft Sites	138
Fixed Hard Sites	245
Road or Rail Mobile	127
Canal Barge (2 missiles each)	203
River Rage (8 million each)	134

Source – Factors Affecting the Choice of Medium Range Ballistic Missile Deployments, G. D. Kaye, Defense Research Board, April 1963, p D-2.
Recorded – May 7, 1964

IRBMs

M2 – S-1, IRBM
Cost – Over $800 million when completed.

Discussion – France's first S-1 operational SSBS intermediate range ballistic missile. The research and development for both missiles (2 stage solid propellant SSBS land-based missile and a two-stage MSBS submarine launched missile will cost slight over $800 mission, when completed. This cost is divided about evenly between the SSBS and MSBS projects, and includes development of 3 solid propellant stages which are combined to make the land and submarine based versions, the inertial guidance and computer systems, the nose cone structure re-entry bodies and related test equipment.
Source – Aviation Week, August 4, 1969, p 103,
Recorded -- August 26 1969.

M3 – Hawk Aero Commander (**Error**-Incorrect File Category)
Cost – Will sell for $369,500 at the company's factory.
Discussion – With an added $40,000 for avionics
$17,000 for radar
$10,000 for de-icing
Total $440,000 complete
Engine: Garrett AI Research TPE 331-43-BL
Source – American Aviation, June 9, 1969, p. 42,
Recorded – September 30, 1969.

M27 – MMRBM
Cost -- $600 – 700 million
Discussion – Development
Source – House Hearings, Subc of Approp comm., 88th Congress, 1st Session, Part 6, p.15
Recorded – November 13, 1963

M28 – MMRBM
Cost -- $1.3 - $1.5 million per unit when procured in amounts required for our current force planning.
Mr. Sheppard – procurement cost for a missile, truck, and launch equipment.
Source – DOD-64 – House Hearing, Subc of Approp Comm, 88th Congress, 1st Session, Part 6, p 563.
Recorded – November 14, 1963

Anti-Aircraft

M4 – Hawk Low Level Anti Aircraft Missile
Cost -- $31,000 each.
Discussion -- Total expenditure on the Hawk … since 1958 will reach $1,420 million with a $88.6 million funding. (The Marine Corps has decided to purchase 2,856 Hawks between FY 1970 and FY 1973 at a cost of $89.6 million).
Source – Interavia, August 1968, p 1118.
Recorded -- November 20, 1968.

M9 - Nike Battery Site (construction cost)

Cost -- $1,400,000

Discussion – A typical …. In exceptional cases, terrain features may cause the costs to raise as high as $2,100,000.

Source – Common Funding in NATO, Brig. Gen, E. Vandevater, RAND RM – 5282, January 67, p 47.

Recorded, -- October 5, 1970.

M10 – Japanese Nike Hercules

Cost -- $28 million for hardware for each of 3 battalions.

Discussion – Japan is planning production of Nike Hercules surface-to-air missiles under U. S. license.

The Japanese Defense Agency had planned to purchase the weapons as a part of the latest defense buildup. But after talks with visiting DOD officials early in Feb. the decision was made to build the missiles locally.

Source – Missiles and Rockets, March 14, 1966

Recorded -- March18, 1962.

M54 – Nike-X Anti-Missile System

Cost – Under development since 1955 at a cost of over $2 billion.

Discussion -- Composed of Zeus and Sprint.

Source – Missiles and rockets, October 4, 1965, p. 14.

Recorded – December 20, 1965

M55 – Nike-X

Cost -- $16 billion to develop and deploy.

Discussion – One type of Nike X Anti-Ballistic Missile system under study. McNamara told House Armed Services Committee.

Source – Aviation Week, Feb 3, 1964, p 25.

Recorded – May 11, 1964.

M56 – Nike-X

Cost -- $3 to $4 billion.

Discussion – Less than half of an earlier estimate.

Source – Aviation Week, July 4, 1966, p. 77.

Recorded – August 15, 1966.

M60 – Air Defense System

Cost -- $3 to $4 billion

Discussion – meeting the Chinese threat.

Thin air defense over the entire U.S.

It would be built around perhaps a dozen long-range Nike-Zeus batteries, missile site radars, and probably a small number of long range acquisition radars – either of the new longer-wave length variety or of the TACMAR design already developed.

Source – Technology Week, November 7, 1966, p. 14

Recorded – December 1, 1966.

M62 – Nike-Zeus
Cost – individual missiles, about $1.25 million – including warhead.
Discussion –
Source – Technology Week, November 7, 1966. p 14
Recorded – December 1, 1966.

M63 – Nike-X, Sprint Missile
Cost – Each $1 million, including warhead.
Discussion –
Source – Technology Week, November 7, 1966.
Recorded – December 1, 1966.

M64 – Nike-X
Cost -- $$3-$4 billion
Discussion – Defense officials say that if a decision is made to deploy Nike-X, the first step clearly involves installation of an area defense.
This defense, which would be designed around perhaps a dozen Nike-Zeus batteries, could be installed for a bout $3-$4 billion, according to DoD.
This type of defense has normally been associated with the light attack, or "N-th" country system.
Source – Technology Week, November 21, 1966, p 11
Recorded – December 14, 1966.

M72 – Nike – X
Cost -- $3.5 billion
Discussion – Brown said the area defense would cost about $3.5 billion with another $0.5 to $1 billion for the ICBM defense.
Source – Technology Week, May 8, 1967.
Recorded – May 15, 1967.

M78 – Sprint Development
Cost -- $30 million funding increment.
Discussion – Martin Co. has been awarded a $30 million contract from Bell Tel. for continued development of the Sprint anti-ballistic missile.
The money is another funding increment for the 3rd year of the Sprint development program. Total funding to Martin since the inception of the program is $233 million.
Source – Missiles and Rockets, May 30, 1966, p 12.
Recorded – June 21, 1966.

M79 – Nike-Zeus
Cost -- $20 to $30 billion
Discussion – Two or three years ago we used to talk about $20 billion to $40 billion Nike-Zeus system.

We then moved to Nike-X Sprint. The presence of the Sprint missile permitted us to reduce the total costs of the system to something like $9 billion to $12 billion.
Source – Aviation Week, May 8, 1966, p 28.
Recorded – May 26, 1966.

M91 – Nike-X, Sophisticated version
Cost – will in be in excess of $20 billion
Discussion – including a shelter program
Capable of dealing with the Soviet threat.
Source – Aviation Week, March 7, 1966
Recorded – March 17, 1966

M76 – Redeye, Shoulder fired anti aircraft missile
Cost -- $60 million,
Discussion -- Development costs approaching $60 million are double the initial estimate.
Source – Missiles and Rockets, June 6, 1966, p 9
Recorded – June 28, 1966.

M84 – Nike-X
Cost -- $20 billion.
Discussion – McNamara has tagged the Nike-X at about $20 billion, the fallout shelter program t $5 billion, the F-12 interceptor program at about $6.5 billion and the cost of the SAM-D's at $2-3 billion.
Source – Missiles and Rockets, May 9, 1966, p 12.
Recorded – June 19, 1966.

M85 – Light Attack Version of Nike-X
Cost – $8-10.5 billion. Could be deployed for an estimate ---.
Discussion – spread over 5 years and including R%D.
Deployed against a relatively unsophisticated threat, small in numbers, such as could be mounted by the Chinese possible in 1975.
Source – Missiles and rockets, May 2, 1966, p 13
Recorded – May 9, 1966.

M86 – New Nike-X
Cost -- $10 billion, Total cost is estimated at approximately
Discussion – Scaled-down version of the Army's Nike-X Anti-ballistic Missile
To counter a future threat from Communist China.
Source – Aviation Week, March 7, 1966, p 75.
Recorded – March 17, 1966.

M88 – Nike-X
Cost -- $20-30 billion.
Discussion – The Secretary of Defense has stated clearly his view that any defense directed against the Soviet ICBM threat would have to be considered

within the total context of damage limitations (incl. fallout shelters, new bomber defenses, and other elements), that any system deployed could not reduce U. S. fatalities below 50 million persons, and that the variety of postures possible would range in price between $20 - $30 billion. The sum of this has resulted in his continuing decision against signally deployment for Nike X against the Soviets.
Source – Missiles & Rockets, May 2, 1966, p 14.
Recorded – May 9, 1966

Anti-Ballistic Missile

M6 – Safeguard
Cost -- $10 billion, if given widest deployment currently contemplated by DOD.
Discussion – Safeguard anti-ballistic missile system. Phase 1 of the program Involves construction of 2 terminal defense anti-missile sites and several long-range missile intercept installations. They would cost $2.1 billion according to Packard. This figure would cover only the investment cost, which includes procurement, construction, installation and checkout of the hardware. Research costs would add approximately $2.1 billion more to that figure, giving a total Phase I cost of $2.4 billion. A typical expansion would involve Sprint installations at two more Minuteman bases and at Washington D.C. at an additional cost of $1.3 billion. This would bring the total investment cost to $3.4 billion and the overall cost to $5.6 billion, including R&D.
Source – Aviation Week, March 31, 1969, p 18.
Recorded – June 5, 1969.

M11 – Sentinel Anti Ballistic Missile (ABM) System
Cost -- $5 billion.
Discussion – More difficulties lie ahead before FY 69 congressional approval is final.
Source – Aviation Week, July 1, 1968, p. 15.
Recorded -- July 4, 1968.

M12 – Sky Bolt Missile GAM 87A
Cost -- $101.681 x 10 to the 6th.
Discussion – Development, Design & Integr. Engineering of Dev. Hardware Prime Mission Equipment

Table of Costs by Subsystems may be requested by using our Contact Box
Source – MacDonald Douglas, Santa Monica.
Recorded – unknown. Probably 1963 after cancellation.

M32 – ABM, Expanded Safeguard Anti-ballistic Missile (ABM) system.
Cost – Total cost of the 3 hard point defense sites, $5.9 billion at completion.
Discussion – Latest estimated operation costs are $100 million annually for a two-site deployment and $350 million annually for a full Phase 2. None of the estimates include nuclear warhead costs, which would total approximately $1.2

billion for full Phase 2 deployment, excusive of costs for improved Spartan warheads.
Source – Aviation Week, March 2, 1970
Recorded – April 1, 1970.

M34 – Safeguard Anti-Ballistic Missile System
Cost – Total projected cost is $6.5 billion.
Discussion – Cuts total projected costs from $10.7 billion for a 12 site deployment to a four site deployment protecting on the Minuteman deterrent.
Source – Aviation Week, July 20, 1970, p. 17.
Recorded – September 29, 1970.

M37 – Safeguard
Cost -- $15.3 billion
Discussion – has risen more than $2 billion since last summer.
Cost growth for Phase 1, which involves deployment at 2 sites, has been $409 million, bringing the latest total estimate for that segment to $4.6 billion.
Phase 2 estimated total cost now stands at $10.7 billion, up from $9.1 billion.
Deployment at 12 sites is envisioned under Phase 2.
Source – Aviation Week, May 25, 1970, p 25.
Recorded – July 2, 1970.

M53 – Light Anti-Ballistic Missile System
Cost -- $8 to $10.5 billion
Discussion – Initial Investment and 5 year operating costs, including R&D.
Depending upon number of cities protected
Using exo-atmospheric interceptors and terminal defense at a small number of cities offers promise of a highly effective defense against the type of attack the Chinese Communists might be capable of launching within the next decade.
Source – Missiles and Rockets, January 31, 1966, p 10.
Recorded – January 14, 1966.

M61 – Minuteman Protection
Cost – $2 billion development.
Discussion -- Anti-ICBM Protection for the 150 Minuteman II missiles of Wing VI.
Source – Technology Week, November 7, 1966, p 14
Recorded – December 1, 1966.

M74 – Spartan 2
Cost -- $200 million
Discussion – Spartan 2, advanced version of the Nike-X-Spartan Anti-Ballistic Missile.
Development and test cost for the new upper stage is expected to exceed $200 million.
The stage would generate total impulse of more than 1 million per sec.

Source – Aviation Week, October 2, 1967, p 13.
Recorded – October 25, 1967.

M75 – Posture "A," "B," and "C." Anti-BM
Costs – as follows
Discussion – Posture A – a heavier, but still relatively light system that would have some area-defense capability against a Soviet nuclear strike directed against U.S. cities. In addition, 25 of the larger cities would be ringed by Sprint missiles to provide a last-ditch defense against warheads that had escaped interception by long range Spartan. Investment cost of the system itself is estimated at a minimum of $9.9 billion, excluding research and development. Annual operating cost would be approximately $380 million. Designation is Model 267.
Posture B – same as A. The number of cities to be protected by Spring would be boosted to 50. Cost after research and development is estimated at &19.4 billion, the annual operating cost at $720 million.
Posture C – still heavier with additional Sprint cities. Cost after research and development is estimated at roughly $30 billion.
Source – Aviation Week, October 23, 1967, p 62.
Recorded – November 10, 1969.

Air to Ground

M7 – Condor Air To Ground Standoff Missile
Cost -- $130 million, exceeds, RDT&E.
Discussion – The cost in quantities of 5,000 missiles is believed to exceed $120,000 per missile. The missile is 20 ft long and 25-30 feet in diameter.
Source – Aviation Week, Feb 17, 1969, p 19.
Recorded – April 10, 1969.

M8 – SRAM – Air to Surface Short Range Attack Missile
Cost -- $142.3 million target price for RDT&E.
Discussion – Agreed to by Boeing and USAF on Oct 31, 1966.
Are estimated by the Air Force at between $55-60 million.
Other sources believe the overruns may go as high as $70-80 million before this portion of the program is completed.
Technical problems in development of the SRAM's advanced LPC-415 restorable solid propellant pulse rocket motor by the Lockheed Propulsion Co. pacing item.
Source – Aviation Week, Jan 27, 1969, p 16.
Recorded – April 3, 1969.

M23 – Anti-Radar Missile (ARM)
Costs: $250 million development and testing
Discussion: To extend usefulness of SAC B-52's
Firms producing currently operational missiles are analyzing the extent of modifications required to adopt these weapons to the refurbished B-52's.
Source: Aviation Week, February 10, 1964, p 19

Recorded – February 14, 1964.

M59 – SRAM, Air Force's Short Range Attack Missile
Cost – Total Value of the Program between $800 million to $1 billion.
Discussion – Selection last week of Boeing Co. to develop and produce SRAM under a $235.8 million fixed price incentive contract ended a hotly contested year-long definition phase development between Boeing and the Martin Co.
The contract for Boeing includes $142.3 million to complete development of the missile, officially designated AGM-69A, and $93.5 million for the production quantity approved thus far.
…to be used on the FB-111 bomber version of the F-111.
The $93.5 million is described as a "target price" by the Air Force, and informed sources say it probably does not fully account for the total number of missiles which will eventually be produced for the FB-111.
The DoD has announced plans to create a force of 210 FB-111's; however, actual procurement of the aircraft is believed to total 263 planes.
It is expected that each FB-111 will carry 5 or 6 SRAMS.
The first operational version of the FB-111 is currently scheduled for delivery in Dec. 1968 with the first wing to become operational in 1969.
…First missiles entering the inventory in mid or late 1969.
The SRAM will also be adaptable to the B-52 (about 8 per B-52).
Missiles range about 100 miles.
Probably be powered by a pulse, type, solid fueled motor and will be inertial guided.
Source – Technology Week, November 7, 1966, p 12
Recorded – December 1, 1966

Miscellaneous Missile Systems

M16 – Lance XMGM-52A, Missile System Vendors
Cost -- $31 million
Discussion – Major subcontractors and other Vendors and suppliers are detailed in a listing on page 83 showing types of contract, Dollar Value, and Item Supplied.
Source – Aviation Week, November 30, 1964, p 63.
Recorded – November 1964.

M17 – Tartar Missile System
Cost -- $27.3 million for each ship
Discussion – The Opposition has raised the question in the Australian Parliament of the cost of Tartar missile system to be installed aboard three Charles F. Adams class destroyers being built in the U.S. for the Australian Navy. Cost of the system was put at $273 million for each ship, twice the cost of the destroyer itself.
The Opposition leader raised the question of whether, in view of Australia's experience with the Ferrate Co. over the Bloodhound missile, it was being similarly overcharged for the Tartar missile. It was later stated by govt. sources

that Australia was buying the missile from U.S. Navy directly and not from the manufacturers.
Source – Missiles and Rockets, November 8, 1965, p 9
Recorded – December 2, 1965

M19 – Talos Missiles
Cost -- $37 million for production of 470 Talos missiles.
Discussion – the Navy has awarded a three year contract to Bendix Corp's Mishawaka Div. Average of $.79 million per missile
Source – Missiles and Rocket, November 15, 1965, p 12
Recorded – December 21, 1965.

M20 – SRAM Short Range Attack Missile
Cost -- $170 million for development program.
Discussion – Originally planned for the AMSA Advanced Manned Strategic. A/C Costs include related avionics.
Approximately $8 million has been provided thus far, and $40 million is being requested in the FY 1967 budget.
Source – Aviation Week, January 31, 1966, p 20.
Recorded – January 1966.

M21 – Mark 11A Re-entry System Modification
Cost -- $32 million
Discussion – Avco Corp. modifying a number of its Mk 11A re-entry systems, developed for the Minuteman ICBM, for use in determining the vulnerability of missile re-entry systems to nuclear assault.
The modified systems will be flight tested under a program designated Sleigh Ride. Avco for AFRSD.
Source – Aviation Week, November 25, 1963, p 23.
Recorded March 16, 1964

M25 – Bull Pup Missile -- Navy
Cost -- $4,076 procurement
Discussion – Mr. BeLieu – were buying these at $4,076 a piece and by setting a second source up on the commercial side we came down to something like $3,212 in fiscal year 1961 and $2,113 in fiscal year 1963.
Source – Senate Subc of Approp. Comm. Hearings, 88th Congress, 1st Session, HR 7179, p 1093.
Recorded – November 12, 1963

M29 – RIFT Missile
Cost -- $180 million for development of 10 vehicles.
One boiler plate model, 5 will be used for static test, 4 flight tests.
Source – Missile and Rockets, May 28, 1962, p 15.
Recorded – November 25, 1963

M30 – Navy Cruise Missile

Cost -- $500,000, Estimated unit cost of a US Naval Cruise Missile.
Discussion – Navy is preparing for possible development of a cruise missile of substantially greater capability than the Soviet Styx. Initial approach involves modification of exiting target drones to integrate them with fire control systems.
Source – Aviation Week, October 5, 1979, p 11
Recorded – November 20, 1970.

M31 – AIM – 82A Missile

Cost -- $209.8 million., AIM – 82A short range dog fight missile for F-15 air superiority fighter. Estimated cost of developing the missile had risen to $209.1.
Discussion – Air Force has cancelled planned development.
Source – Aviation Week, September 7, 1970, p 21.
Recorded – October 20, 1970.

M35 – AF Close Air Support Missile

Cost – USAF hopeful of keeping the missile price as low as $5000 per unit.
Discussion – A relatively simple electro-optical guided missile capable of delivering a 150-lb warhead against ground targets day or night. The weapon would lock before launch onto coded laser signals reflected from ground targets. Illumination would be provided by a forward air controller.
Source – Aviation Week, May 25, 1970, p 15.
Recorded – July 2, 1970.

M38 – Phoenix Fire Control System

Cost – total RDT&E of $414 million.
Discussion – Under development at Hughes since late 1962.
Estimated to be $414 million, plus $129 million for adopting it from the F-111B to the F-14.
Although estimates of the per missile cost of the weapon are complicated by uncertain size of production orders and cost allocations, Capt. L. E. Ames, Navy project manager for the F-14 and Phoenix, says escalation will be “significantly less than $250,000.”
Source – Aviation Week, May 25, 1970, p 57
Recorded – July 2, 1970.

M41 – Redstone Launching costs

Cost -- $0.4 million
Description – Number of launchings in sample = 2.0
Prior to sample = 21
Period covered by sample (inclusive dates0 5/17/57 – 3/21/60
Period covered by sample (months) 34.7
Average launch cost includes salaries of engineers, technical, and other personnel working on the pad and in the hangers, the cost of vehicle transportation from factory to launch site, and the cost of liquid fuel. Salaries, including overhead (and overtime where appropriate) were

assumed to be about $1800 per month on the average for contractor personnel, and about $900 for military personnel.
Summary of Missile-Test Launchings Examined in the Two Studies, with Average Launch Cost, p. 7.

Source – RM-3913-PR, Efficiency in Space Rocket Launching Operations, Recent Advances and Future Opportunities, D. E. Lewis and Gill Shubert, December 1967,
Recorded June 16, 1964
.

M43 – Thor Launch

Cost -- $0.6 million
Discussion – Number of launchings in sample = 19
Number of launchings prior to sample = 30
Period covered by sample (inclusive dates) 5/25/59 – 2/29/60
Period covered by sample (months) = 8.0
Source – RAND RM-3913-PR, Efficiency in Space Rocket Launching Operations, Recent Advances & Future Opportunities, Lewis & Shubert, December 1963.
Recorded – June 16, 1964

M44 – Jupiter Launch

Cost -- $0.5 million
Discussion – Number of launchings in sample = 18
Number of launchings prior to sample = 20
Period covered by sample (inclusive dates) 12/8/58 3/23/60.
Source – RAND RM-3913-PR, Efficiency in Space Rocket Launching Operations, Recent Advances & Future Opportunities, Lewis & Shubert, December 1963.
Recorded – June 16, 1964

M52 – Chaparral Weapon System

Cost – exclusive of missiles, is $65,000.
Discussion – Mobile tracked system carries 4 infrared Sidewinder Missiles ready for launch, with 4 more stowed for loading.
Time for loading is 4 minutes.
Cost of each missile adopted for launching from the vehicle is $12,000.
The Army's first buy of the system is for 39 units
The second buy is for 115 running through 1969.
Source – Aerospace Technology, April 8, 1968, p 3.
Recorded – May 3, 1968

M57 – Maverick

Cost – Total program = $100 million.
Discussion – Competition for a contract-definition-phase award.
Hughes, Columbus Division of North American Aviation, LTV, Philco, & Goodyear.

Source – Technology Week, August 29, 1966, p 3.
Recorded – September14, 1966.

M66 – Sidewinder Retrofit
Cost -- $500 to $1000 per unit
Discussion – 30,000 of Sidewinder A versions
Source – Missiles and Space Daily, March 13, 1967, p 41
Recorded – April 5, 1967.

M68 – SRAM
Cost -- $113.9 million, RDT&E budget
Discussion – AF Short Range Attack Missile by Boeing.
Source – Technology Week, March 27, 1967
Recorded – April 17, 1967

M73 – ASMS, Navy's Advanced Surface Missile System.
Cost -- $500 million, 5 year development effort
Discussion – The radar, computer and system integration will take up the bulk of the $500 million development money.
Source – Missiles/Space Daily, June 9, 1967, p 141.
Recorded – June 20, 1967

M82 – Phoenix
Cost – Hughes Phoenix air-to-air missile to be carried by the F-111B.
Discussion – Total development cost will be $352.4 million
Nitze said this increase over the FY 64 estimate of $229.4 million finances more development and testing.
Source – Aviation Week, May 9, 1966, p 25.
Recorded – May 27, 1966.

M89 – SRAM, Short Range Attack Missile
Cost -- $170 million.
Discussion – Some $8 million has been provided in prior years, and $40 million is being requested in FY 67.
Recorded – Aviation Week, March 7, 1966, p 81.
Recorded – March 17, 1966

M92 – Condor, Navy's new Condor long range electro optically guided air to surface
Cost -- $100 million, development and production contract.
Discussion – 1st years increment $30-35 million
Source – Missiles and Rockets, April 4, 1966, p 7
Recorded – May 6, 1966

M93 – Penetration Aids for long range missiles
Cost – DoD says it has spent $1.2 billion on research and development

Discussion – such as decoys, Jammers, and other countermeasures and intends to accelerate the effort.
Source – Aviation Week, March 7, 1966, p 235
Recorded – March 18, 1966

M94 – Hound Dog, New Terminal Guidance System
Cost -- $20.5 million
Discussion – We also propose to undertake engineering development and test of a new terminal guidance system for Hound Dog which gives promise of achieving a better overall system reliability.
Total development cost is estimated at $20.5 million of which $6.6 million would be obtained by re-programming presently available funds and $8/1 million is included in the FY 67 budget.
Source – Statement of the Sec of Def McNamara before Sent Subcomm on DoD Approp. FY 67-71, 67 Budget., p 62
Recorded – March 21, 1966.

M95 – SRAM
Cost -- $170 million to complete development program
Discussion – including the related B-52 and FB-111 avionics.
Some $8 million was provided in prior years, about $40 million will be needed in FY 67.
Source – Statement of Sec of Def, McNamara before Senate Subcom on DoD Approp, FY67-71, 67 Budget,
Recorded – March 21, 1966.

M100 – Sparrow III
Cost – Procurement $28,534
Discussion – Unit flyaway cost of operational missiles -- $25,735

Fleet Support	2,799
Total	28,534

6 lbs.
Guided Missile Procurement Costs FY 62 Budget
Source – Navy, San Pedro, CA
Recorded – February 20, 1964

M101 – Sidewinder Procurement
Cost – Irah - $8,781; Sarah $11,815
Discussion – Irah

Unit flyaway cost of operational missiles --	$8,573
Fleet Support	208
Total 1C	8,781

Sarah
Unit flyaway cost of operational missiles -- $11.607

Fleet Support 208
Total 1C 11,815
Guided Missile Proocurement Cost FY62 Budget
Source – Navy, San Pedro, CA
Recorded – February 2, 1964

M102 – Terrier Procurement
Cost -- $90,328
Discussion --
A – BT – 3A
Unit flyaway cost of operational missile -- $80,760
Fleet Support 9,568
Total 90,324

B – HT -- #
Unit flyaway cost of operational missile -- $100,809
Fleet Support 9,568
Total 110,377

Source – Navy, San Pedro, CA
Recorded – February 20, 1964

M103 – Tartar Procurement
Cost -- $99,835
Discussion – Unit flyaway cost of operational missiles -- $87,075
Fleet Support 12.760
Total 99,835
Source – Navy, San Pedro, CA
Recorded – February 21, 1964

M104 – Talos Procurement
Cost -- $246,108
Discussion – Unit flyaway cost of operational missiles -- $238,595
Fleet Support 7,513
Total 246,108
Source – Navy, San Pedro, CA
Recorded – February 21, 1964

M105 – Talos Cruiser Guided Missile system
Cost -- $24,358
Discussion – Fire Control System -- $17,711
Launching System 3,995
Test, Checkout & Tel. Eq. 1,323
Weapon Dir. Eq. 1,329
Total 24,538
FY 62

Production Costs of Major Comp. of Missile Systems
Aboard Selected Ships
Source – Navy, San Pedro, CA
Recorded – February 26, 1964

M106 – Terrier Frigate Guided Missile System
Cost -- $9,529 million
Discussion – Fire Control System $5,533
Launching system 2,533
Test and Checkout Eq. 413
Weapons Dir. Eq. 1,050
Total 9,529
FY 62
Production cost of major components of missile systems
Aboard selected ships.
Source – Navy, San Pedro, CA
Recorded – February 26, 1964

M107 – Terrier Cruiser Guided Missile System
Cost -- $13,556 million
Discussion – Fire Control $5,533
Launching System 6,480
Test, Checkout & Tel. Eq. 493
Weapons Dir. Eq. 1,050
Total 13,556
FY62
Production costs of major components of missile systems
Aboard selected ships.
Source – Navy, San Pedro, CA
Recorded – February 26, 1964

M108 – Redeye
Cost – Approx. $3000/round
Discussion – R&D Cost $58 million
Source -- Missiles & Rockets, April 20, 1964, p. 16
Recorded – October 20, 1964

M109 – MMRBM – Alternative for NATO
Cost – as follows
Discussion --

Type	Configuration	Cost (mil. $	Per Missile	Mil. Per Site
		Deployed	Deliv at Target	Or Vehicles
Polaris A-1	Fixed Soft Site	4.1	6.9	1
	Fixed Hard Site	6.3	10.5	1
	Road Mobile	5.1	8.5	1
	Rail Mobile	5.1	8.5	3

	Small Barge	6.6	11.0	2
	Large Barge	4.4	7.3	8
Polaris A-2	Merchant Ship	^.4	11.3	8
	Submarine	10.0	20.0	16
Missile "X"	Road Mobile	4.4	7.4	1
	Rail Mobile	4.4	7.4	3
	Fixed Hard Site	5.5	9.2	1
	Merchant Ship	6.6	10.7	8

Source – Factors Affecting the Choice of Medium Range Ballistic Missile Deployment, G. D. Kaye, Defense Research Board, April 1963, p 13.
Recorded – May 18, 1064.

M111 – Missile "X" MMRBM – Road Mobile MMRBM
Cost – 1765 million for a force of 400 missiles
Given in NATO document MCM 73-62

Research and Development	500 million
Other Initial Costs	588
5 Yr Operating Costs	687

Source – Factors Affecting the Choice of Medium Range Ballistic Missile Deployments, G. D. Kaye, Defense Research Board, April 1963, D-3.
Recorded – May 19, 1964.

M113 – Thor Launch at AMR
Cost – as follows
Discussion --

Number of Pads	10 to the 6^{th}/yr
1	6.472
2	9.336
3	12.226
4	15.120
5	18.014

- labor and material only
- telemetry and missiles excluded
- costs based upon 54 launches in 25.7 months for 3 pads, an average of 7/pads/ms.

Source – Douglas ARPA Study No. 2, Vol. III, SM-45746, October 63, p 26.
Recorded – November 5, 1963.

M115 – Hawk Procurement
Cost -- $40,000
Discussion – Marine Corps., Unit flyaway cost of operational missiles -- $40,000 Fleet support, FY 62.
Source – Unknown Table, Navy,
Recorded – February 26, 1964.

M117 – Thrust-Augmented Thor

Cost -- $7000,000 per booster
Discussion – complete with government furnished equipment.
6 for initial test, 30 for operations
Source – Douglas ARPA Study No. 2, Vol. III, SM-45746, October 1963, p 14.
Recorded – November 5, 1963.

M118 – Titan III-X/Agena
Cost – Unit Procurement 1st stage = 1.5; 2nd stage = 1.0, 3rd stage = 1.3, Total = 3.8
Discussion – in millions of 1965 dollars.
Rel. (pt. est. 1970-1985) = 0.88
Source – Prop. To Study Near Term Launch Vehicle Concepts, Vol. 1 – Eng. Prop., January 1966, Douglas Report SM-51938
Recorded – March 28, 1966.

M119 –Atlas SLV-3X/Centaur
Cost – Unit Procurement. 1st stage = 2.5, 2nd stage = 2.8, 3rd stage = 0, Total = 5.3
Discussion – in millions of 1965 dollars.
Rel (pt. est., 1970-1985) = 0.86.
Source – Prop to Study Near Term Launch Vehicle Concepts, Vol. 1-- Eng. Prop., January 1966, Douglas Report SM-51938,
Recorded – March 28, 1966.

M126 – AGM-69A, Air Force/Boeing Short Range Attack Missile (SRAM)
Cost -- $430,000
Discussion – Projected USAF unit cost based on the total planned buy through 1975, without these addition,
And, including all development costs, it totals about $68,000.
Source – Aviation Week, June 21, 1971, p 22.
December 28, 1972.