MULTILAYER GOLDEN DOME

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"No military plan survives first contact with the enemy."
Prussian Field Marshal Helmuth von Moltke the Elder,1870

"History does not repeat itself,
however it certainly rhymes".
Mark Twain

"Five percent of the people think;
ten percent of the people think they think;
and the other eighty-five percent would rather die than think."
Alexander Graham Bell

"A lie can travel around the world,
before Truth gets his boots on".
Winston Churchill

“Never underestimate the power of stupid people in large groups.”
George Carlin

“The enemy only has to succeed once,
while we have to succeed every time.”

“When someone gets right to the point,
they are called 'outspoken'.
It is always said with a touch of reprimand,
because you must not be outspoken apparently.”

“Stupid people do not know they are stupid because they are stupid.”
The Dunning-Kruger Effect

“Questioning everything wore me out.
Now I just disbelieve everything, and I am fine with that.”

"Ninety percent of the work in any organization is usually done by only ten percent of the workers."
Price’s Law, Physicist and historian of science Derek John de Solla Price

“Twenty percent of the people do eighty percent of the work,
Eighty percent of sales come from twenty percent of the products, etc.”
Peredo Principle. The 80/20 rule.

“The record shows I took the blows and did it my way.”
Frank Sinatra

“I used to think I was smart,
and one day realized that I was average,
and everyone else was dumb.”

“Garbage in, garbage out.”
Gigo programming principle

"Never argue with a stupid person.
They drag you down to their level and beat you with experience."
Abraham Lincoln

“Never approach a bull from the front,
a horse from the rear,
or a fool from any side.”

INTRODUCTION

The "Hemispheric Defense" project suggests that the Golden Dome missile defense system will comprise four layers: one space-based and three ground-based, including eleven short-range batteries positioned across the continental USA, Alaska, and Hawaii.

Figure 1. Space layer of Golden Dome.

GO FAST, THINK BIG

An outline of the project, titled **"**Go Fast, Think Big**!"** was presented to 3,000 defense contractors in Huntsville, Alabama in the summer of 2025. The “Golden Dome” is inspired by Israel's “Iron Dome” on steroids, in complexity and in scale.

The Golden Dome's missile defense shield architecture consists of three reported layers:

1. Space layer: satellites for missile warning, tracking, and boost-phase interception.
2. Upper layer: Next Generation Interceptors (NGI), THAAD, and Aegis systems with a new missile field in the American Midwest.

3. Under layer: Patriot systems, new radars, and a common launcher for current and future interceptors.

The four layered system terminology may suggest that the space layer is in fact composed of two parts: a Low Earth Orbit LEO one dedicated to detection and interception and another upper undisclosed geosynchronous one for communications and targeting.

MISSILE FIELD

A unique feature is the need for a new large missile field in the Midwest USA for Next Generation Interceptors (NGI) made by Lockheed Martin (LMT.N), that would be a part of the "Upper Layer" alongside Terminal High Altitude Area Defense (THAAD) Aegis systems which Lockheed also makes.

The Next Generation Interceptors NGI component is the modernized missile for the Ground-Based Midcourse Defense GMD network of radars, interceptors and other equipment which are currently the primary missile defense shield to protect the USA from Inter Continental Ballistic Missiles ICBMs threats.

The USA operates the GMD launch sites in southern California and Alaska. The new plan would add a third site in the USA's Midwest to counter perceived additional threats.

INTERCEPTION DURING BOOST PHASE, FIRST STRIKE DECAPITATION

The stated goal of the space layer of the system is:

"Space layer: satellites for missile warning, tracking, and boost-phase interception."

Hypersonic glide vehicles are launched using ICBM-type boosters, which are very powerful, very fast right out of the launch gate. The glide vehicle would already be going at Mach 12 at the separation stage. By the time a launch is detected, and an interceptor is dispatched from an orbiting satellite, that booster would already be traveling at Mach 4.

The main problem with any missile-based air defense system is that the projectiles can be easily overwhelmed with decoys and jamming. When one runs out of interceptors, it is difficult to resupply a space-based system.

In addition, it is not possible to achieve "spaced-based boost-phase interception" from geostationary orbits, because geostationary orbits are too far out to be of any use in intercepting missiles at the boost phase.

The only alternative is to use interceptor missiles in Low Earth Orbit LEO, which necessarily means installing satellite-based missiles that are continuously whizzing around the globe.

This implies that these missiles in orbit will be passing directly over the capitals and land masses of world powers several times a day. Which now means that for several times a day a USA President could press a button obliterating world capitals and other nations military and political leaders would be decapitated without any warning before the victims have any time to react or even know they are under attack.

At its core, it will be considered as a fig leaf excuse for placing an intolerable first strike decapitation capability into orbit.

FIRST STRIKE CAPABILITY

It is questionable that this would be considered as a "Defensive shield". It is more like a first strike capability, right from space, with no launch warning.

You can drop a weapon from a satellite just by using compressed air as its main propulsion. No Infrared IR signature is emitted and no warning is initiated, until the missile reaches the upper atmosphere, seconds before hitting its target.

No country will tolerate weapons in orbit above its space, as the primary role of the weapons would be a surprise attack with nuclear warheads.

Obviously, any country with space launching capability will be forced into this new space arms race, despite existing treaties banning the militarization of space, and we could have more nuclear devices in space, over our heads, than in the current arsenals, down here on Earth.

NEW SYSTEM CHALLENGES

New challenges are encountered such as communication latency across the kill chain which is a step by step sequence of actions needed to identify, target, and destroy a threat. Major defense contractors include Lockheed Martin, Northrop Grumman, RTX, L3Harris and Boeing.

Interestingly, SpaceX was absent from the plans.

Space Force General Michael Guetlein is the program leader and is expected to deliver the first designs and a complete roadmap of the project.

The USA deployed its first Helios laser missile defense system on a destroyer in the South China Sea. This proposed Golden Dome system may consider a more plausible laser component added to it. This directed energy component could be clustered with the ground level last line of defense, presumably due to energy and limited range requirements. The whole system is presumed to be plug-and-play, so as directed energy capabilities mature, they can be added to interface with the other components. Surface ship based lasers have been in a testing phase for a decade. They do not reliably work in high humid environments or on cloudy and stormy days.

FIBER OPTIC DRONES

Wireless drones in the Ukraine/Russia conflict are decreasing in use as they are prone to electronic countermeasures. Drones are increasingly controlled via a fiber optic filament. The battle field now looks like a spider web. Soldiers at the front lines are reported as using a new weapon: a pair of scissors. When First Person View FPV drones are connected via a fiberoptic filament, soldiers wait under the grass or brush canopy until the drone passes overhead, then run up to the cable and snip it.

The operational range of fiber optic drones varies significantly based on the specific model and the length of the fiber optic cable spool carried. Many standard fiber optic drones have a range of 10 to 20 kilometers. The 414th unmanned strike systems brigade of Ukraine, has unveiled an FPV drone with a fiber-optic cable claimed to be capable of stretching up to 41 kilometers, which is the farthest operating range declared for such a drone globally.

KAMIKAZE DRONE SWARM TECHNOLOGY

The modern battlefield in Ukraine witnessed a multi-year proliferation of low-cost, First-Person-View FPV drones that cost around $500 per unit and are modified to deliver small explosive payloads to costly $10 to $20 million armored units. Ukrainian and Russian military forces both deploy electronic countermeasures, including radio frequency jamming systems, along the front and secondary lines. These measures have achieved partial success, yet the move by both sides to deploy non-jammable fiber-optic drones has rendered these electronic jammers useless.

Engaging these low-cost FPV drones can involve anything from sticks to 50-cent shotgun shells to $100,000 surface-to-air missiles. It is economically unsustainable for any military force to rely on expensive missiles to counter cheap, Chinese-made FPVs, and this mismatch risks rapidly depleting precision munitions inventories for higher-value targets.

The military authorities witness the new era of FPV kamikaze drones, which will only get faster and more intelligent with Artificial Intelligence. Drone technology is improving. Low-cost drone swarms would target an adversary while working together in an undefeatable tactic that depends on software development. Impressive displays using clouds of small drones witnessed at crowd events such as Olympic opening ceremonies are an example.

Coupled Optical and Audio control is a viable technology that will be fielded for the next conflicts. In the optical information part of the technology, one has the background versus the moving drone outlined over the sky. Any open space can be visualized as a fixed background, like when an owl or a hawk sees a moving mouse from its tree perch on a tree limb or as gliding up in the air. That would be a tiny dot that is moving against a fixed background. The audible part of the new technology would detect the drone's rotor humming for initial detection.

The direction where the drone flies from and then the pattern when the drone turns and accelerates would need a bit extra data. For instance, whether the drone is incoming or receding can be deduced from the acoustic Doppler Effect.

Using shotguns, airburst or throwing a net at a flying drone are probably preferable to a high Rate of Fire RoF or machine or Gatling guns.

Computer Numerical Control or CNC machining in the field of automated control of machine tools by a computer can be adapted to this role. An industrial CNC turn table can spin at 60 rpm or more and tilt up and down quite fast. Accuracy is around 0.001 degree which translates into one inch of accuracy at 800 yards. These turn tables have custom computer codes and could fire a solenoid. The software and electronics would be the extra ingredient added to the existing recipe.

SMALL UNMANNED AERIAL SYSTEMS CUAS MICROWAVE TACTICAL HIGH-POWER OPERATIONAL RESPONDER, THOR

Figure 2. Air Force Research Laboratory's Tactical High-power Operational Responder, or THOR. THOR is a portable counter Unmanned Aircraft Systems UAS system capable of destroying swarms of drones at the speed-of-light, at long range, in its base defense mission. Source: Air Force Research Laboratory.

The USA Air Force is considering the countering of the swarm warfare potential threat with its counter-drone Tactical High-power Operational Responder, THOR. The directed-energy system uses powerful microwaves to take out incoming drones at long range by disrupting their electronics. The weapon discharges in less than a second, and the impact is instantaneous.

The storm god Thor, son of Odin, was the fiercest of Norse myth deities. Thor commanded storms and rain and brought lightning and thunder. It yielded a war hammer named Mjölnir and was thought to have red hair and a red beard. In modern English, Thor's name survives as "Thursday."

Unlike a laser, which can disable only one drone at a time, the THOR approach can defend against groups or swarms. The system looks like a standard Conex box with a satellite dish strapped to it, is housed at Kirtland Air Force Base, New Mexico. The 20-foot container can be transported anywhere via a C-130 Hercules transport airplane. A crew of two personnel can set the system up in three hours. It could be less expensive to use than existing surface-to-air defense systems which are fighting the proverbial "last war".

The USA Army partners with the Air Force on THOR during its development phase with the system referred to as the Tactical High-power Microwave Operational Responder.

Defense against small drones has become a priority for the USA recently. Some bases have already invested in defenses against Small Unmanned Aerial Systems CUAS. For the past several years, combat units overseas have been equipped with drone-disabling systems such as Dedrone's Drone Defender, a shoulder-fired weapon that disables them with radio waves.

The 379th Expeditionary Security Forces Squadron at Al Udeid Air Base in Qatar, are already implementing counter Small Unmanned Aerial Systems CUAS, for security and perimeter defense.

DISCUSSION

As a resurgence of the previous President Ronald Reagan's Star-Wars Strategic Defense Initiative, the nascent Golden Dome's goal is to intercept missiles in their boost phase and deploy relocatable defenses capable of rapid global deployment. This comes amid an emerging and dangerous bipolar world that could only worsen into the 2030s.

The biggest threat is thought not to be Intercontinental Ballistic Missiles ICBMs with nuclear warheads. It is small biological weapons of genetically modified bacteria or viruses disguised as Gain of Function GOF Research as a veil, being smuggled into a country and being deployed within its borders.

The Thaad and Aegis systems which use the S3 missile system with 11 close range batteries to guard the entire USA appear to be insufficient.

Israel's Iron Dome as a blueprint did not prove fully effective against Iran's missile counterattack. Iran first launched over 300 "expendables" slow moving and very loud drones which then caused the Iron Dome to start firing indiscriminately at the decoys depleting its inventory and costing over $3 billion within a few minutes.

It is also difficult to intercept a target that is designed to follow a longer trajectory around the globe and emerges from the back door of the Southern Hemisphere instead of the expected Northern Hemisphere. Both Russia and China have missiles that can overfly Antarctica and attack the USA from the back door of the southern hemisphere.

It does not matter how many layers the project has. It may well intercept ICBMs, in that way fighting the last war and ignoring the new developing technologies. It is difficult to track and hit a hypersonic missile that can dart and swerve-around following the terrain at low altitude. Intercepting drones and drone swarms would be even more difficult. A drone swarm launched within a nation's borders would be a real challenge.

A country could opt to finding increasingly sophisticated ways to kill people and destroy machines, or it can start cooperating, compromising, and doing business with its close as well as distant neighbors in a way that allows both to prosper and civilization to improve.

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