Trial Balloon

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No-one and nothing, not the crew members on the container ship's deck, not the ship's captain, not the long-range ocean-survelliance radars on the U.S. East Coast a hundred miles away, not the nearest U.S. Coast Guard cutter eighty miles away, and certainly none of the optical or radar surveillance satellites in orbit that night above the western hemisphere, noticed when the steel cargo container carrying the blue-and-black logo of a major freight company rolled quietly off the stern of the *Hanjong Maru* and plunged into the black waters of the western Atlantic Ocean. That kind of mishap happens all the time at sea. The shipping companies don't worry because the cargoes are insured. The port authorities don't worry about it, either—they worry about smuggled cargoes, not cargoes lost at sea.

Ordinarily a cargo container will float for hours, days or even longer. This container, however, was rigged to sink. Five minutes after hitting the water and with the ship receding far into the distance on a moonless July night, explosive bolts simultaneously fired inside each of the container's sets of doors, on each end. With the doors blown off their hinges the remaining four-sided, rectangular steel shell of the container plunged straight toward the bottom of the ocean. The container's diminutive cargo, a cylindrical canister ten feet long, four feet in diameter and weighing two thousand pounds, was bolted onto supports near one end of the big shipping box. The asymmetrical position of the load made that end of the container tilt downward while the light end pointed upward.

Four seconds after the container began to sink, as it reached a predetermined depth of one hundred feet as measured by an on-board pressure gauge, a timer inside the upper end of the cylinder set off a gas canister. The canister began to expel dry nitrogen gas into a deflated underwater lifting balloon packed inside the upper end of the cylinder. The rapidly inflating balloon pushed a machine-fitted upper-end cap off the cylinder. As that cap popped off the cylinder, it triggered the four explosive bolts that had until now attached the cylinder to the inside of the container's shell.

The balloon expanded rapidly out of the end of the cylinder, still (but only momentarily) residing inside the cargo container shell. The balloon inflated fully in three seconds. The deployed balloon had an amount of lifting power that exactly balanced the weight of the capsule at a water depth of one hundred feet. As the body of the cargo container plunged downward toward the ocean floor, the lifting balloon and its dangling cylindrical payload emerged from the blown-out upward-pointing end of the container and remained behind in the inky blackness, floating one hundred feet below the ocean's surface. There the cylinder and its balloon hovered in the ocean's depths, not too far from the surface but far too deep to ever be found by chance. They began to drift slowly north by northeast, parallel to the American coast, held in the grip of the Gulf Stream current.

Just after reaching equilibrium in the ocean depth, the canister released a tiny package, a sphere measuring just five inches in diameter. The sphere was buoyant. It rose to the surface in seconds. As soon as it contacted the atmosphere it transmitted an intensely powerful radio burst, a coded signal that lasted just one thousandth of a second. It transmitted the signal ten times over, for a total of ten milliseconds, to ensure that its transmission was picked up. Twenty minutes later a salt plug in its side was dissolved, water flooded into it, and the sphere sank to the ocean floor.

On the cargo container ship's stern stood a lone figure, that of a man carrying identification papers falsely identifying him as John Cunningham and supposedly hailing from the Cook Islands but in reality originating from a trans-national no-man's land that investigators would be unlikely to identify with any certainty, even if they ever managed to connect him with this event. Despite the summer season, he was cold out there in the breeze on the stern. He had been standing out there for the last five minutes wearing only a lightweight jacket, ever since he had broken the container loose from its moorings with covertly installed explosive bolts. The container had itself been loaded onto the ship in prime position to be "lost" at sea when the ship had been loaded in Malaysia, the result of a quick bribe to a loading supervisor in Singapore. The ship had since traversed the Pacific, threaded the Panama Canal, and now was headed for Antwerp.

Cunningham had noted his position with a satellite receiver at the exact moment that he had released the container. Now he shivered as he pulled a small radio receiver from his jacket pocket. The receiver simply beeped and flashed a green light-emitting diode when it picked up the ten-millisecond radio burst from the sinking container. This confirmed that the payload was in position in the ocean, drifting now toward the northeastern American coast.

With the payload status confirmed, he tossed the radio receiver into the ocean. He retreated to his passenger cabin near the ship's stern and went to bed. Nobody ever seemed to pay much attention to passengers like him on cargo ships. They were few and far between, almost always young, single men looking for a taste of world adventure on a budget. The next morning he would visit the ship's radio room and ask the operator to send a brief radio telegram to his mother, in Indonesia: "*Your anak laki-laki doing well. Sends love from mid-Atlantic 76.52 W 31.38 N,*" using the Indonesian phrase for "little boy."

That was all Cunningham needed to do. He did not know what was in the container, at least not with any certainty. He had been well-paid for his efforts, via electronic funds transfers from his 'mother' to his multiple accounts in the Cook Islands. His anonymity and his lack of a criminal record would ensure that the funds, sent in several small transactions, would never be noticed by authorities who were searching for drugs or terrorists.

The submerged payload drifted for a week in the Atlantic. Every twenty-four hours it released a tethered, buoyant sphere that bobbed to the surface. Each sphere, just five inches across, was a satellite antenna that received position signals from ordinary

navigation satellites. The signals were processed by a computer inside the submerged canister, and from one day to the next the computer gradually built a record of where it had drifted and where it was likely to go. As soon as each position was recorded each day, the tether was automatically cut and the satellite receiving antenna drifted away across the ocean, an ordinary piece of flotsam. Within about twenty minutes of being released, a salt plug located in the side of each sphere would dissolve and the antenna would sink into the abysss, trailing its tether behind it.

After exactly one hundred and fourteen hours at sea, at 10:00 PM local time, the final satellite position fix was obtained. This fix put the payload into a predetermined target box. Now the payload's on-board computer sent an activation command to the compressed-nitrogen gas canister.

That gas canister, still attached to the underwater lifting balloon, again vented dry nitrogen into the envelope, this time enough to lift the payload all the way to the ocean's surface. It bobbed into the waves at a location about fifty miles east of Boston.

This was the most vulnerable time for the entire enterprise. If a passing ship happened to hit the payload at this moment, it would be ruined and would sink into the ocean abyss. But the ocean is large and even in a busy shipping lane the chances of such a collision would be small during the few minutes that would be required for the remainder of the operation to be completed.

As soon as the on-board pressure gauge sensed that the payload had reached the surface the explosive bolt that connected the lifting balloon's steel cable to the cylinder was fired. The cylinder began to sink. But before it could drop very far, within another fifty milliseconds a second gas canister began to automatically vent compressed helium gas into a second balloon envelope. This balloon rapidly inflated into a vertically elongated bag that rose out of the ocean like a breaching sperm whale. Remaining elongated as it rose, it yanked the cylinder out of the water and pulled it rapidly skyward.

No-one saw it rise. The moon was only at first quarter by now and had already set in the west hours before this thing broke the surface. For the next thirty minutes it rose, rapidly at first and then more slowly as the air around it became thinner and thinner. The balloon's shape changed, gradually taking on the aspect of a big, white pumpkin. It achieved neutral buoyancy at fifty thousand feet above the ocean. There it hung, drifting northeast with the prevailing winds. An on-board satellite receiver picked up signals from global navigation satellites, confirming that it was in the correct target-box for the next act in the drama. It transmitted an intensely powerful radio signal at a little-used microwave frequency. It was very simple, just a sine wave that announced "*Here I am*" to someone who was listening to that frequency in their little apartment on-shore. Their neighbors had noticed the antenna being placed on the apartment building roof-top, but had thought that the guy who set it up was an amateur radio operator.

That someone made a phone call. "*Junior is ready*." The recipient of that phone call triggered a pre-composed e-mail message that immediately went to all of the major world

news outlets less than a minute later: "*The sky east of America is about to be illuminated by an atomic bomb. Your e-mail server will confirm this message transmission time, and you will know that the bomb went off ten minutes later. By this timing you will know that we are the genuine article. Our code name for future reference is Mangonel. Reveal this code name to no-one except government investigators.*"

The same message was transmitted to the White House web site, but with an additional caveat: "*For you our code name is Trebuchet. Reveal it to no-one and use it to verify future communications that we will encode for you in newspapers with public-key encryption.*" The message was sent via servers in politically unstable and inaccessible areas where investigators would never manage to obtain access for forensic examination of the server transmission records.

Ten minutes after the message was sent, and well before any effort could be mounted to locate the device much less intercept or neutralize it, the device triggered itself. Inside the cylinder that was hanging from beneath the balloon was an artillery gun barrel that contained a slug of isotope-235 uranium. When the gun fired the slug screamed down the barrel, itself only thirty-six inches long, at a speed of thirteen thousand feet per second. Behind it rode another slug of uranium, this one made of isotope-238 with a thin layer of beryllium metal coating its free end. A quarter of a millisecond later the projectiles seated themselves into a precisely cut-out hole in a target at the far end of the barrel. The target was a sphere of U-235 wrapped by an outer spherical shell of U-238 and a very thin outermost layer of beryllium. The entire target assembly was only twenty-one inches across. At the moment of contact a crushable device at the center of the assembly released a flood of energetic neutrons. That neutron flood generated millions of initial neutron fission chain reactions. Each of those chain reactions grew exponentially, two becoming four becoming eight becoming sixteen becoming thirty two becoming sixty-four, the number of reactions and the energy that they released inside the uranium core doubling every ten billionths of a second. Some of the chain reactions died out by random chance, but within a millionth of a second so much energy was released that the assembly had achieved the same temperature as the core of the sun. In a volume the size of a melon, its physical state had changed from solid to plasma. It expanded like the stuff of which the universe had been composed moments after the Big Bang. It flashed into an intense light, like a thousand suns.

The energy release was later determined to have been the equivalent of twenty thousand tons of TNT, twenty kilotons, the same size as the Hiroshima bomb. From the detonation altitude of fifty thousand feet the explosion was directly visible for a distance of two hundred and seventy-five miles. With the coast only fifty miles away, this made the explosion visible to most of the population of the East coast. The detonation time was 10:40 PM on the east coast, ensuring that plenty of people were still up and out. The flash was later estimated to have been seen by three million people that night, from Maine to at least Virginia. Some sightings were reported as far south as Florida.

No-one was hurt. The fallout was slight and the prompt radiation was too short-range. Some windows were broken in Boston. One passenger on a commercial airliner, a mere

twenty miles from the blast and who was looking right at it at the moment of detonation was temporarily blinded but eventually recovered. The plane's skin and flight surfaces were creased but the pilots managed to make a safe landing at Logan Airport.

Airborne samples of the bomb material were duly collected and analyzed. They confirmed the bomb was U-235 with a U-238 tamper wrapped around it. They confirmed the identity of the two additional elements that had been mixed in the neutron initiator. Beyond that not much was forthcoming from the technical people as regarded the bomb's origin. All of the results were classified, not to protect what was known but to hide how little was known. No parts of the lifting balloon or the payload canister were ever found. The delivery method, from the stern of a container ship that had never even called in an American port, was never discovered. Nobody knew to look for John Cunningham. Speculation was rife about the bomb's origin, but nothing could be proven.

The shock was not physical. It was psychological. Because in the days that followed, the bomb's originators sent the following message to the original recipients, for public dissemination: "*We have hidden ten more of these bombs, four in American cities, four in Europe and two in Asia. They are carefully shielded to prevent detection by radiation meters. These bombs will detonate automatically if they do not each receive a specially coded e-mail message on a daily basis. More bombs will continue to be delivered into national ports in coming months. Our demands will follow.*"

Were there really so many bombs planted in so many cities? In coming weeks the various national authorities failed to find any. But since absence of proof is not proof of absence, widespread panic resulted as no devices turned up. People speculated about which cities were most at risk. It was one more unraveling of the fabric that holds the world's societies together, and there was no end in sight.

Two details in the e-mail communiqués stood out: that someone needed to communicate continuously with the planted bombs (if they actually existed) and that more were promised to enter ports worldwide. There were three countries, one Asian and two Middle Eastern, that were currently facing threats of aerial attacks from North American and European forces for alleged sponsorship of terrorist activities. It was immediately understood that all three of these countries would benefit from a suspension of the aerial attack threat, as such attacks might result in the suspension of the critical daily e-mail messages, if indeed any of the three countries were behind the incident at all. The second problem was that international shipping traffic ground almost to a halt overnight, as every cargo container in the world suddenly needed to be screened in detail to eliminate the possibility that any nuclear devices or materials were contained in any of them.

Postscript.

On an outer bank beach of North Carolina, just two days after the bomb blast went off, a nine-year girl found one of the satellite receiver antennas early one morning, as the sun was rising. Its salt plug had melted and it should have sunk, but it had instead snagged in some floating seaweed and had eventually washed up on the beach near a century-old

lighthouse. The long, thin radio cable, one hundred feet long and only one sixteenth of an inch in diameter, was still attached to it and was entwined in the seaweed. Disentangling the sphere and the cable from the seaweed, she ran a hundred yards back down the beach to show it to her father, a geology professor at a local community college. He was baffled by the device. It bore no marks. It seemed to be nothing but a blue plastic sphere with a hole in the side, connected to a long thin wire. Tempted for a moment to throw it away, he instead rolled up the cable and stuffed the entire assembly into his beachcombing backpack, thinking that he would eventually mail it to a friend of his who was an engineer at a radio company in California. The two of them had a running game going, to see if they could stump each other with weird, found objects. One time, his California cohort had stumped him for weeks with an irregularly shaped, fist-sized, dense black chunk of shattered rock-like material that had been found in a desert by hikers who had themselves thought it to be a meteorite fragment. The answer to that riddle, he had discovered after performing a complex spectroscopic analysis in his geology laboratory, had been that someone had used a bowling ball for target practice out in the wilderness with a high-power rifle. The result of perpetually low bowling scores, perhaps? This strange object would be his chance to get even with his Colorado friend.

Meanwhile, another package with a slight modification was being loaded into another cargo container.