



**FIG1** Insignia NASA en Swedish Space Corporation (SSC), ex estación de monitoreo de satélites NASA, Peldehue, Chile. Pieza elaborada a inicios de los años sesenta, plancha redonda de hormigón, cubierta por mosaicos. / *NASA insignia at Swedish Space Corporation (SSC), former NASA satellite tracking station, Peldehue, Chile. Built in early 1960's, round concrete slab, covered in tiles.* © Hugo Palmarola, 2015.

## **NASA'S IMAGINARY IN CHILE: BETWEEN DESIGN AND INVISIBLE NETWORKS**

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**Abandoned today in a satellite tracking station located 41 km north of Santiago, the handmade ceramic mosaic showing the NASA insignia – an image that sought to represent the most advanced technology on the planet – is the departing point for this research where graphic symbols are related not only to geopolitical issues, but also to scientific, technological and military imaginaries along the Cold War.**

KEYWORDS · design, insignia, satellites, Cold War, Chile

With the NASA acronym on its surface, a round concrete slab remains abandoned in a site about 41 km northeast of Santiago, Chile. An object 16 cm thick and 207 cm in diameter, with a 3 cm extra layer formed by the combination of mortar and little tiles making up the icon, in fact, a mosaic (FIG. 1). Scattered around the derelict insignia are fragments of both concrete and tiling, remnants of the red chevron representing aeronautics, the stars symbolizing space, the orbit referring to space travel, and the sphere representing a planet. The colors are Pantone 185 (red) and Pantone 286 (blue). Since in the design the chevron goes beyond the emblem's circular geometry, it broke into pieces when the slab was removed from its original location at what used to be a U.S. satellite tracking station in the rural site of Peldehue (33° 08' South, 70° 40' West) (FIG. 2).

According to the NASA History Program Office, this logo dates back to 1959, when the National Advisory Committee on Aeronautics (NACA) became the National Aeronautics and Space Administration. It was designed by James Modarelli as a simplified version of an official seal coming from the Lewis Research Center (Chambers et al., 2015). According to Steve Garber (NASA History Web Curator), it was officially known as the insignia, but was later dubbed the 'meatball.'

Nonetheless, prior to the creation of NASA, the site in Peldehue – a name that in native *Mapudungún* language means 'The Fly Place' (*Pülüwe*) – was chosen by the U.S. Naval Research Laboratory (NRL), and granted as an agreement signed in 1956 between the United States and the Chilean Government (throughout the agency of the University of Chile), to be the second of two satellite tracking stations that the U.S. Army installed in Chile in 1957 (FIG. 3). The other facility was built at the Salar del Carmen in the Atacama Desert, and was soon dismantled (1963) when the increased

capacities of the Peldehue station and of new satellites proved it redundant. In fact, Peldehue soon became the largest base in South America with a support staff of over 300 people, including 100 resident engineers, occupying a completely enclosed and self-sustained site of over 100 hectares. Together with different types of antennas on the field, equipment and computers were set inside one-story buildings prefabricated in the U.S. by the ARMCO International Corporation. The station was also fitted with its own electricity generator, medical facilities, ambulance, fuel supply and fire station (FIG. 4). Lasting for over 30 years, it was finally discarded in 1989 when, for strategic reasons, satellite-tracking needs would start to be commercially outsourced, or became possible without the aid of earth-bound facilities. It was then donated to the University of Chile, becoming the *Centro de Estudios Espaciales* (Center for Space Studies) until 2008, when it was sold to the Swedish Space Corporation (SSC) (FIG. 5).

Back in the late 1950s, however, this station was part of the first U.S. satellite-tracking network called the Minitrack: a chain of nine stations strewn along the 75<sup>th</sup> meridian west, with a tenth one at Woomera, Australia (Corliss, 1974:22-24) (FIG. 6). Cutting across South America, this initial north-south line was nicknamed 'the fence.' Consequently, the location in Chile was fundamental, as it was the final station in the making of this transcontinental line.

#### **BECOMING NASA**

The chronology of events tells that by October 1957 this network was fully operative, one year before the establishment of NASA (on October 1, 1958). As a project, it dates from March and April 1955 when under the direction of Captain Winfred Berg – the Navy Senior Project Officer assigned to the Vanguard project – “a team which included NRL and Army personnel, toured South America, locating sites and drawing up the requisite agreements with the countries concerned” (Corliss, 1974:23). The site selection team picked six locations: Havana, Panama, Quito, Lima, Antofagasta, and Santiago. In the context of the Cold War, the date and scope of this touring resonates with a report by the Technological Capabilities Panel (TCP) called “Meeting the threat of Surprise Attack,” also known as the ‘Killian report’ (after James F. Killian, President of MIT). The document was issued in Washington D.C. on February 14, 1955 – a month before Berg’s trip – advising that “if continuous surveillance of Soviet installation and exact targeting of Soviet bases were to be assured, the solution was to spy from outer space. Camera-toting satellites, circling the earth south to north in polar orbit [...] and do it all under the legal cover of freedom of space – if such legal cover could be established” (McDougall, 1985:116). And it was. On October 4, 1954, the Special Committee for the International Geophysical Year (CSAGI) led by Fred Whipple had “recommended that governments try to launch earth satellites in the interest of global science” (McDougall, 1985:118). By July 28, 1955, the White House Press Secretary James C. Hagerty announced



**FIG 2** Insignia NASA en Swedish Space Corporation (SSC), ex estación de monitoreo de satélites NASA, Peldehue, Chile. Fotografía conmemorativa de la celebración del día de la independencia de los Estados Unidos, 4 de julio de 1980. / *NASA insignia at Swedish Space Corporation (SSC), former NASA satellite tracking station, Peldehue, Chile. Commemorative photograph of the United States' Independence Day celebration, July 4, 1980.* Fuente / Source: Swedish Space Corporation.



**FIG 3** Vista aérea de la estación de monitoreo de satélites NASA, hoy Swedish Space Corporation (SSC), Peldehue, Chile. Posiblemente hacia la década de 1980. / *Aerial view of NASA satellite tracking station, current Swedish Space Corporation (SSC), Peldehue, Chile.* Fuente / Source: Swedish Space Corporation.

that the President Dwight D. Eisenhower had approved plans for going ahead with the launching of small, earth-circling satellites as part of the United States participation in the International Geophysical Year: “The president expressed personal gratification that the American program will provide scientists of all nations this important and unique opportunity for the advancement of science” (McDougall, 1985:121). This announcement comes not as a surprise given Eisenhower’s hesitation about the use of manned high-altitude reconnaissance aircrafts like the U-2 and OXCART planes (concern that was ultimately proved correct when the Soviet Union shot down Gary Powers’ U-2 in 1960).

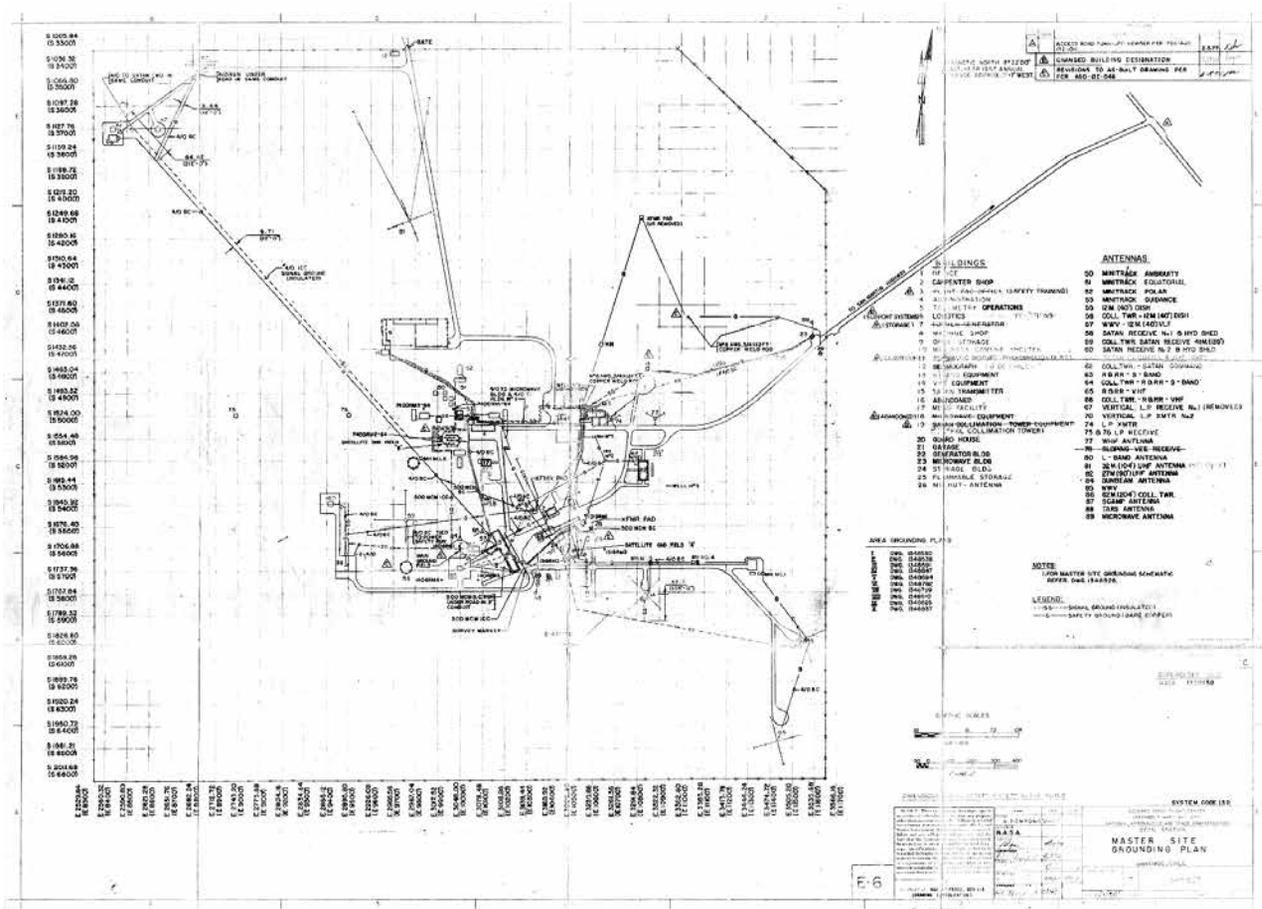
Thus, on September 9, 1955, the Secretary of the Navy assigned the NRL the task of setting up the Minitrack stations. One year later, in September 1956, the U.S. Army Chief of Engineers initiated construction at the six sites at the request of the NRL. More specifically, the task fell to the specially created Project Vanguard Task Force (McDougall, 1985:20-23). And, while the whole operation belonged to the U.S. military space program, with Eisenhower’s creation of NASA, “aerospace executives and engineers were able to eschew the public rhetoric of war in favor of the language of scientific planning and management” (Light, 2003:96). As pointed out by Jennifer S. Light, despite the fact that the U.S. civilian space program under NASA was rhetorically distinguished from national security needs in the context of the Cold War, “the two cannot entirely be disentangled” (Light, 2003:106). According to Light, in March 1967, Lyndon Johnson (who while Vice President to John F. Kennedy had chaired the National Aeronautics and Space Council) would confess to a Nashville group of local government officials that investments in civilian space exploration had yielded much military-relevant information. In his words, “if nothing had come out of the space program beyond the knowledge that spacecraft surveillance provided, it still would be worth ten times what

the whole program has cost. Because tonight we know how many missiles the enemy has and, it turned out, our guesses were way off” (Light, 2003:106). And the expenditure was high. Between 1958 and 1972, the U.S. government, through the agency of NASA, invested roughly one billion dollars in tracking and data acquisition facilities (Corliss, 1974:3).

And, even if based on a truism, it should not come as a surprise that the Peldehue station was imagined as a scientific realm, “diverting attention from the nation’s other growing space program dominated by military and intelligence data-gathering concerns” (Light, 2003:102) (FIG. 7). But together with the actual scientific breakthroughs achieved by satellite tracking networks (i.e. the study of climate or LANDSAT’s accurate updating of cartographic records), both the actual and rhetorical transition from the military-industrial-academic complex to NASA reveals a more ambivalent status for its insignia: an integral component in the production of such imagery, and a well-staged U.S. strategy deploying design to accomplish the task of shaping a desired image for mass-consumption.

### **INVISIBLE HEROES**

It was not by chance that the first signal ever to be tracked down by the Peldehue station was that of Sputnik 1, successfully launched by the Soviet Union on October 4, 1957 (the same month the station was set in operation). And this caused a major impact in military circles: “Did the Russians have other satellites already in orbit that did not advertise their presence via a tracking beacon?” (Corliss, 1974:33). The billion-dollar investment, then, quickly prompted an expanded network with a varying number of stations in five continents, and which were added and subtracted as the program required (Corliss, 1974; Tsiao, 2008). From 1956 to 1989, more than 22 stations were placed around the world, from the 75<sup>th</sup> meridian ‘fence’ to its global dissemination in the enlarged STADAN, SATAN and NASCOM networks. As pointed out by William Corliss, the stations were not static things (Corliss, 1974:24). They were constantly installed and closed, dismantled or transferred from one site to another according to strategic needs and improvements in technology. Because of this, a full and accurate counting of U.S. satellite tracking stations becomes elusive, and to a certain extent, pointless (to say nothing of the fact that they had changing names, and were often called differently depending on the source literature). Their rationality was less that of permanent urban or architectural layouts than that of fluid strategic logics of military occupation and control. Something that Gilles Deleuze (in reading Paul Virilio’s take on Foucault’s disciplinary societies) comes to refer as the organization of “major sites of confinement” (Deleuze, 1995:177). The world, that until 1957 could still be considered vast and open, was finally transformed by satellites into an enclosed environment defined by “ultra-rapid forms of free-floating control.” These are mechanisms forming a system of variable geometry whose nature as moving objects is linked to a changing earth-bound network of tracking stations “like a self-deforming cast that will continuously change



**FIG 4** Master Site Grounding Plan of la estación de monitoreo de satélites NASA Chile, hoy Swedish Space Corporation (SSC), Peldehue, Chile, 1975. / *Master Site Grounding Plan of NASA's satellite tracking station in Chile, current Swedish Space Corporation (SSC), Peldehue, Chile, 1975.*  
 Fuente / Source: Swedish Space Corporation.

from one moment to the other, or like a sieve whose mesh will transmute from point to point.” Considered instruments of surveillance, satellites would belong to the progressive and disperse installation of a new system of domination (Deleuze, 1995:178). Under this light, the tracking stations should be considered as rather archaic objects, the architecturally unappealing remnants of the first earth-bound installation of such large technological systems.

This is why they have been proudly described by Charles T. Force (NASA's former Associate Administrator for the Office of Space Communications) as “invisible,”<sup>1</sup> and by Congressman Olin E. Teague as “heroes” of the U.S. space program.<sup>2</sup> In Peldehue, this heroic invisibility was achieved in tandem with the installation of a NASA insignia that was meant to provide a visible shield to disguise to the public opinion other political and strategic concerns.

1 Foreword by Charles T. Force, in Tsiao, 2008:xvii.

2 Statement to the House of Representatives by Congressman Olin E. Teague on June 3, 1971. See: Foreword by Gerald M. Truszynski, in Corliss, 1974:iii



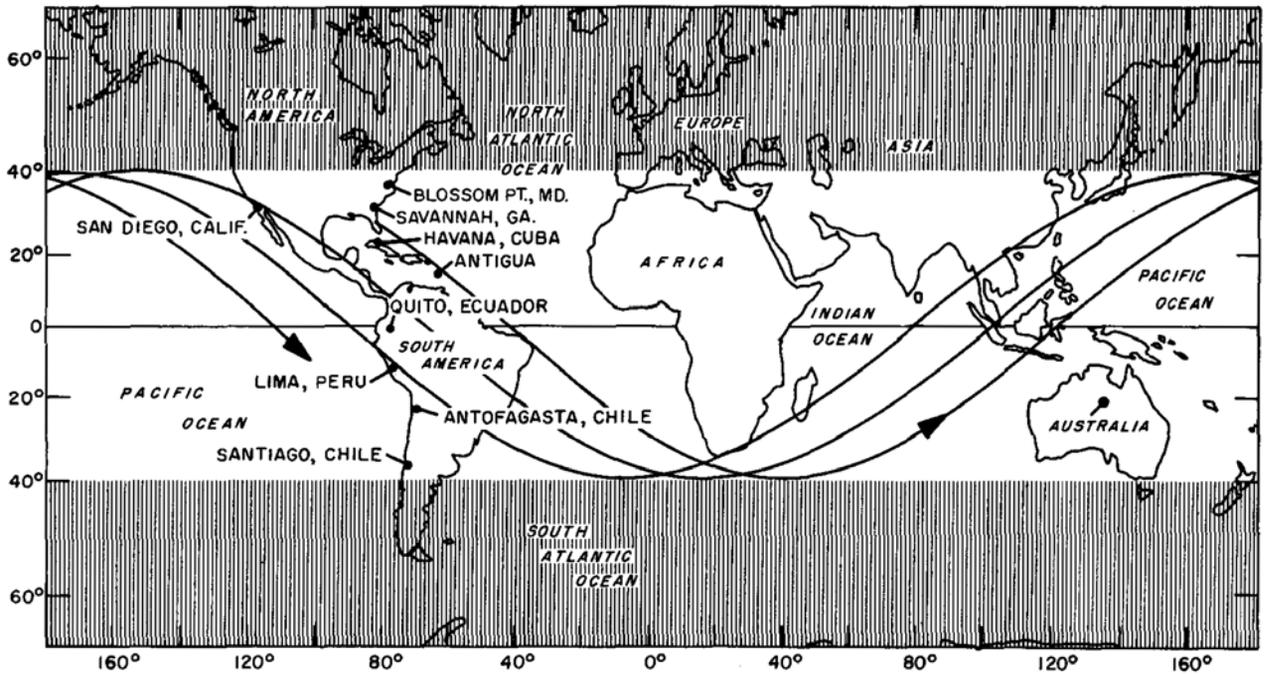
**FIG 5** Grupo de directivos de NASA Chile con grandes logotipos de metal de la Universidad de Chile (a la izquierda), la NASA (centro), y NASA-Chile (derecha), en la estación de monitoreo de satélites NASA, hoy Swedish Space Corporation (SSC), Peldehue, Chile. Hacia la década de 1980. / NASA Chile managers team with large metal logos belonging to the Universidad de Chile (left), NASA (center), and NASA-Chile (right), at NASA's satellite tracking station in Chile, current Swedish Space Corporation (SSC), Peldehue, Chile. Circa 1980. Fuente / Source: Swedish Space Corporation.

## MATTER OF DESIGN

James Modarelli's 1959 logo came as the result of a process of revision by the U.S. Heraldic Branch and the Commission of Fine Arts, which had "reluctantly" approved it, stating that it was primarily a pictorial conception and very reminiscent of designs appearing in current commercial advertising.<sup>3</sup> This reception, in fact, proves Modarelli's intention to place NASA under a more contemporary and marketable vein than that of the traditional U.S. heraldic institutions. Therefore, when Dr. T. Keith Glennan, the first Director of NASA, asked him for an insignia, from the very beginning he was asking for something aimed at becoming a widely distributed picture by the mass media. Since then, the logo has always been a matter of controversy. In 1961, it was strongly criticized by *Time* magazine as lackluster, childish and appalling when featured in the medal awarded by President John F. Kennedy to the first astronaut Alan B. Shepard.<sup>4</sup> And, on a different level, it has been proposed that something like the red chevron is, in reality, not only a stylized version of an aerodynamic and supersonic form, but also a futuristic and powerful Cold War weapon. In 1958, the Ames Research Center held NACA's triennial inspection exhibition. As pointed out by Joseph R. and Mark A. Chambers, Modarelli saw there a wind tunnel with a supersonic aircraft "featuring a cambered and twisted arrow wing with an upturned nose" (Chambers et al., 2015:58-59). "The sleek model deeply impressed him as a symbol of the leading-edge aeronautical efforts of the NACA." By the mid 1950s, "the growing interest for high-speed flight triggered both theoretical and experimental research aimed at maximizing the aerodynamic efficiency of wings at such supersonic speeds." The results of these studies brought new arrow-shaped wings (Chambers et al., 2015:67). In the context of the growing tensions during the Cold War, such military needs were the main reason behind the search for new and supersonic wings for flight at Mach 3 speed. In this way, NACA at the Langley Research Center ran a classified study for the supersonic upgrade of the U.S. Air Force's WS-110 bomber aircraft, characterized by a one arrow-shaped wing in 75 degrees, both twisted and curved, and which primary form, highly theoretical and experimental, was "one of the highest priority projects for the U.S. Air Force" in search of "developing an intercontinental supersonic bomber with an unrefuelled combat radius of 4,000 nautical miles and the capability to deliver nuclear weapons to the Soviet Union" (Chambers et al., 2015:70). Since 1958, the NACA laboratories in Langley started to internally exhibit these kinds of wings made of red plastic, molded out from the wind-tunnel model. Seen by Modarelli, they were thus included in a NASA insignia that acquired high popularity in the U.S. and abroad because of their implementation during the height of the space program, ending with the successful moon landing in 1969. At that point,

<sup>3</sup> L. R. Wilson, Secretary of the Commission of Fine Arts, letter to Lt. Col. James S. Cook, Jr., Chief, Heraldic Branch of the Army Office of the Quartermaster Corps, 25 February, 1959. Files of the Institute of Heraldry, Department of the Army, Fort Belvoir, VA, to be deposited in the NASA HRC. Quoted in Chambers et al., 2015:63.

<sup>4</sup> "Lackluster Medals," *Time* magazine, May 19, 1961, 84. Quoted in Chambers et al., 2015:77



*The network of primary Minitrack stations, as of 25 January 1957.*

**FIG 6** Diagrama de la Red Minitrack en 1957, con la cadena de estaciones esparcidas a lo largo del meridiano 75°. / *Diagram of the Minitrack network in 1957, with the station's chain strewn along the 75<sup>th</sup> meridian.* Fuente / *Source:* Constance McLaughlin Green y Milton Lomask, *Vanguard: A History, National Aeronautic and Space Administration.* Washington D.C., 1970, p. 157.

NASA seemed to achieve the impossible, the total support from the Americans (Chambers et al., 2015:75). The insignia, in particular, “served its mission well as a centerpiece during both formal and informal media events ranging from the introduction of astronauts to press conferences and the visits of important stakeholders. It appeared on NASA buildings and equipment, the flight suits of pilots and astronauts, research aircraft and facilities, and correspondence and reports. Visitors to the gift shops at NASA installations searched and scrambled for any souvenirs that displayed the insignia” (Chambers et al., 2015:78). The insignia was used in important manned missions such as the projects Mercury and Gemini, the Apollo Program, the Space Shuttles, and the International Space Station.

But in 1975, NASA decided that a more ‘modern’ logo was needed, and switched to a design by the firm Danne & Blackburn, which came to be known as the ‘worm,’ with a red stylized rendering of the letters N-A-S-A (Garber, 1997) (FIG. 8). This shift was connected with the bicentennial celebrations of 1976, when the U.S. government initiated a Federal Program for Improvement in Graphics, instance in which between 1971 and 1981 more than 45 government agencies renewed their logos in search of a more contemporary image. Coincidentally, in 1974 the same firm responsible for designing a new logo for NASA developed the actual logo for the bicentennial celebrations (Chambers et al., 2015:89).



**FIG 7** Equipos radio receptores y control de antenas (en primer plano) y antena de 12 m de diámetro (al fondo) en la estación de monitoreo de satélites NASA-Chile, hoy Swedish Space Corporation (SSC), Peldehue, Chile. Hacia la década de 1960. / *Radio receivers and antenna control equipment (foreground) and 12 m diameter antenna (background) at NASA-Chile satellite tracking station, current Swedish Space Corporation (SSC), Peldehue, Chile. Towards 1960's.* Fuente / *Source: Swedish Space Corporation.*

The Space Shuttle program had the new NASA logo on its fuselage. It was also attached to the astronauts' suits, together with the STS mission logo. But while many younger staff members appreciated the new design, the NASA veterans strongly resisted it because the change was seen as an imposition from the central NASA headquarters (Chambers et al., 2015:92). This resistance to the implementation of the new NASA logo was evident in many of the NASA centers, especially in Langley. According to Joseph R. and Mark A. Chambers, during the process to recover the old icon, a stalk took place to hunt the 'worm' that had infected NASA's original image. After the Challenger disaster in 1986, things started to change. And while the Enterprise and the Challenger used the 'worm' logo on their wings, since 1988, Endeavour, Discovery, Columbia and Atlantis changed back to the old 'meatball.' With the re-launch of the space shuttle Discovery in 1988, the old logo was again at the center of an event of immense media coverage. In addition, the other flagship, specific to the mission, included within it a segment of the red wing from the NASA insignia: a nod to stress upon the recovery of NASA's past successes as well as a new beginning (Chambers et al., 2015:98-99). Hence, when administrator Daniel S. Goldin officially brought the 'meatball' back in 1992, it seems he did so "to invoke memories

**FIG 8** Credenciales abandonadas de identificación de NASA-Chile y del Centro de Estudios Espaciales de la Universidad de Chile, en Swedish Space Corporation (SSC), ex estación de monitoreo de satélites NASA, Peldehue, Chile. Credenciales emitidas hacia fines de la década de 1980. / *Abandoned ID credentials belonging to NASA-Chile and the Center for Space Studies, Universidad de Chile, at the Swedish Space Corporation (SSC), former NASA satellite tracking station, Peldehue, Chile. Credentials printed towards the end of the 1980s.* © Hugo Palmarola, 2015.

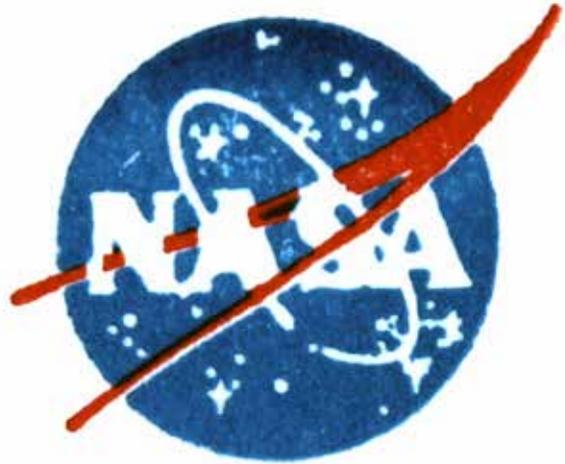


of the one-giant-leap-for-mankind glory days of Apollo.” This comeback was made, even if the ‘meatball’ was still to be considered a design nightmare: “It doesn’t print well on laser printers because of the gradations on the airfoil, and it can’t be used at less than 5/8 inch because the stars disappear and the type becomes illegible” (Patt in Garber, 1997) (FIG. 9). Likewise, it is hard to match its blue background on color copiers, and the lettering and airfoil do not contrast enough on black & white copiers. In addition, its round shape makes it difficult to artfully place type around or near it (Garber, 1997). Obviously, the ‘worm’ designers, Richard Danne and Bruce Blackburn, disapproved the ‘meatball’s’ return, and raged against a design that they considered to be “all the way back to Buck Rogers in terms of its sophistication.” Simply, “it didn’t look like a modern space agency.”<sup>5</sup>

#### **THE EXPENDED ICON**

The ‘meatball’ certainly looked even less modern in Chile, as it was turned into a mosaic. Not only because the logo was not following the rules of a supposedly higher technology linked to automation (like printing), or mass-production, but because it was made using craftsmanship in the least-modern possible way. In so doing, it “betrayed something not quite consistent with the aspirations for the new technology” (Forty, in Alonso and Palmarola, 2014:93-94). It seems as if the whole setting, and the careful distribution of little blue tiles, had the purpose of suppressing the orderly modern features of satellite tracking and data acquisition networks, making it into a convincingly ‘unmodern’ substance.

<sup>5</sup> Chang, Kenneth. “\$79 for an Out-of-Date Book About a Modern NASA Logo”, *The New York Times*, September 1, 2015.



**FIG 9** Error de impresión de una pequeña insignia NASA en papelería oficial de la NASA-Chile, en Swedish Space Corporation (SSC), ex estación de monitoreo de satélites NASA, Peldehue, Chile. Hacia la década de 1980. / *Misprint of a small NASA logo on official NASA-Chile stationery, at the Swedish Space Corporation (SSC), former NASA satellite tracking station, Peldehue, Chile. Circa 1980s.* Fuente / Source: Swedish Space Corporation.

And while architecture is full with examples and discussion about the ruination of buildings, the NASA mosaic in Chile confronts us with the ruination of a planned imagery, whose strength does not entirely come from its concrete materiality, but from being symbolically powerful. It can neither be kept (as the station now belongs to a different corporation), nor can it be destroyed (as it remains, ultimately, holding the NASA insignia on its surface). It consequently stays, as it were, in a sort of limbo (both real and conceptual), forgotten in the backyard of a Swedish space agency. This reminds the 'iconoclash debates' addressed by Bruno Latour and Peter Weibel, particularly in what they call "innocent vandals": breaking images unwittingly, destroying them out of neglect (Latour and Weibel, 2002:21). But the NASA insignia, dismissed to its own fate, seems less the site for a 'war on images' (in reference to the subtitle of their book) than an earthly bounded waste from the Space Age: a symbolically charged residue of a highly technological operation in South America that gets close to what John McHale famously described as 'the expendable ikon' – as a sign and a symbol, it is a 'loaded image' within a more complex communication system (McHale, 1959:82). We may not forget that the NASA logo does not belong to space but to a fully visible communication system here on earth, in sharp contrast with the invisibility of the Minitrack Network (and the secrecy of the transmitted information). **ARQ**

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