
Spanish Aerospace Participation in International Armaments Cooperation

By

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Today there is a great deal of interest on both sides of the Atlantic concerning international armaments cooperation. In efforts to provide national and alliance defense at the lowest possible cost, nations are looking at cooperative ventures in order to share the skyrocketing R&D and production costs of defense equipment. At the same time, individual companies seek international partners as a way of sharing technology and improving their own technological skills. Spain's principal aerospace company, Construcciones Aeronauticas S.A (CASA), is among the leaders of European aircraft manufacturers in international cooperation.

In the earliest developments in the world of aeronautics sixty years ago, the first work for the newborn CASA was a licensed production for the Army Engineers Flying Corps of the Breguet XIX, a French design which was used by the pioneers of flying in their Madrid-Manila and Madrid-Guinea Coast routes. Later, another licensed product, the Dornier-Wall hydroplane "Plus Ultra," manufactured for the Aeronautica Militar, was used for the first non-stop South Atlantic flight. In a period of deep social instability in Spain, with most national entrepreneurs and investors seeking rapid profits, and without the industrial base required to support indigenous R&D, licensed production was the firm's trademark between WW I and WW II.

International isolationism and sluggish economic recovery after the war left little opportunity for industrial adventures other than the licensed production and the extension of service life for the CASA aircraft built under German license. Production during this period included the re-motoring of the Messerschmitt ME-109 with the Rolls-Royce Merlin II engine, which, because it rotated in the opposite direction of the original Daimler-Benz, induced on the aircraft the most perfect inverted spins ever known.

President Eisenhower's establishment of a base rights agreement with Spain in 1953 brought some hope for the declining industry in the form of a flood of defense work. The maintenance of the North American F-86 "Sabre" and the Douglas DC-3 and DC-4 transports began a new era for CASA. The technology and experience gained from working with the U.S. fostered the commitment to attempt the first autonomous Spanish design, the T-9 "Azor," a twin-engine medium range transport aircraft with 45 seats and 160 knots cruise speed. This first Spanish effort was not a great success. This product was sold only to the Spanish Air Force; even the Spanish national airlines shifted to the Convair Metropolitan instead.

The end of the 1960s is the landmark for the firm's modern activities, for the licensed production of the Northrop F-5 "Freedom Fighter" allowed the technological take-off for the company's most successful manufacturing processes, honeycomb and composite structures.

At this same time, national designs were aimed at the international market, specifically as a low-cost alternative for financially weak buyers or for countries which were politically sensitive to dealing with the major suppliers. The successful production of 345 military and civilian C-212 "Aviocar" aircraft in different versions in a decade of world industry expansion was the first CASA entrant in a major sector of the international market. At the same time, however, the Spanish Air Force bought the De Havilland DHC-7 "Caribou" for the joint light assault role. This purchase reflected insufficient consideration during the design phase of the military requirements which

might be served by the C-212. Later, the CASA 101 "Aviojet," a tandem seat, single jet engine, light trainer for the Spanish Air Force followed as a national design for export.

With the new Spanish political situation following the death of [Francisco] Franco in 1975, and the recovery from the oil crisis of the mid-1970s, CASA was caught in a situation of overcapacity, which was aggravated by the nationalized condition of the firm. The increasing power of the labor unions also prevented the company from easily adjusting to the new situation. Management was left with the fear of quick expansion which is reflected in present backlogs and loss of potential business, which can only be accepted within nationalized companies. Consequently, CASA's present search for international involvement is similar to that of many of the rest of the world's aircraft industries which suffer the same economic conditions.

Today, with over 10,000 people in five factories, CASA is about the same size as the German firm Vereinigte Flugtechnische Werke (VFW) and a tenth the size of Boeing. CASA is a company offering the market efficient, low-priced products, thanks to the labor intensive production processes combined with modern technological output. The company is currently involved in a whole host of cooperative ventures with other aerospace firms throughout the world.

OFFSETS

As a part of the order for 72 F-18A aircraft for the Spanish Air Force, McDonnell Douglas agreed to \$1.8 billion in offsets to Spain's aircraft industry. The components involved are leading edge flaps, horizontal stabilizers, leading edge extensions, speed brackets, rudders, center-line pylons, aft side panels, and dorsal covers. New technology testing procedures by water jet for aerodynamic surfaces were transferred as a result of the offsets, and they represent the most advanced of the firm's processes. Other offset agreements include the contract with France's Dassault-Breguet for manufacturing outer wings for the Falcon-10 and center fuselages for the Mirage F1 aircraft. Offset agreements with the French government have been historically very successful, as the disequilibrium between both countries' balance of payments promotes natural, non-monetary offsets.

LICENSED PRODUCTION

As a result of a licensing agreement with the German firm, Messerschmitt-Bolkow-Blohm (MBB), CASA has completed the assembly of the BO-105 helicopters for the Spanish Army.

In addition, CASA has participated in the assembly of the German-Japanese BK-117. Because of the German legislative prohibition on exporting war materiel, CASA was licensed to assemble armed BO-105s for the government of Iraq. In a reciprocal agreement resulting from the licensed production of the light jet trainer C-101 in Chile, CASA is also producing under license the Chilean "Pillan," a substitute for the Beech Bonanza, for the Spanish Air Force.

COPRODUCTION

CASA is a full member of Airbus Industries and manufactures horizontal tail surfaces, landing gear doors, and forward passenger doors for the A-300 and A-310 aircraft. CASA manufactures glass fibre honeycomb components, including underwing fillets for McDonnell Douglas DC-10s and upper rudder segments for Boeing transports.

Sikorsky and CASA have signed an agreement for the coproduction of major components for the Sikorsky S-70/UH-60 helicopter. The components involved are the tail cone, tail pylon and horizontal stabilizer, in addition to final assembly and testing. The agreement also allows for the collaboration on future joint projects for civil and military helicopters, plus provisions for product

support, research and development, and other future programs. CASA will also be involved in the final assembly and flight testing of the six S-70 helicopters on order for the Spanish Navy.

CODEVELOPMENT

In its early search for expanded defense markets, CASA began a joint venture with the Indonesian firm Nurtanio in order to nominally codevelop, but in fact merely coproduce the C-212 with an eye on the Southeast Asian market. As follow-on programs, both firms shared in the licensed production of MMB-BO-105 and AS-332 "Super Puma" helicopters. After the change in the Indonesian name to IPTN, both industries have formed a new company known as Airtech Industries which will develop a new commercial/military transport designated CN-235. Design and production of the new aircraft is on a 50-50 basis: IPTN is building the wing outer section, rear fuselage, and the complete tail; CASA is producing the inner wing sections, forward fuselage, center wing and engine nacelles. The first CN-235 prototype flew in 1983, received the Spanish Aviation Authority type certification in 1986, and its FAA type certification in December 1986. The aircraft is now a likely contender for filling a Spanish Air Force requirement for a medium transport.

The most significant program in which CASA is currently involved is the European Fighter Aircraft (EFA). Never before has the Spanish company attempted such an ambitious project. The largest commitment of funds and resources ever poured into a single aircraft reflects the company management's determination to profit from the opportunity to develop a first-line fighter aircraft with the latest technology. This program involves four European countries, the United Kingdom, Italy, Spain, and Germany, with a workshare and funds commitment proportional to the intended number of aircraft to be purchased. The U.K. and Germany both with 250 aircraft will share 33 percent of the program; Italy with 165 aircraft will have 21 percent; and Spain with 100 aircraft will get 13 percent.

The EFA program has largely benefitted from the European's previous experience with the PANAIA "Tornado" with respect to the currency exchange problem—a problem which resulted from variability in the relative values of national currencies. No national currency will cross national borders, as each country will pay for the EFA work done in its own territory according to its share of the program. The concept of fixed costs has been applied throughout the contracting process, with the exception of the design of certain high-risk components whose logistics support uncertainties beyond the in-service date will be shared among the respective manufacturers and defense departments through a more flexible contracting device.

However, the project has been plagued from its very beginning by all the traditional problems present in multinational codevelopment projects. Cost overruns were identified even before the blueprints left the design table, as the operational requirements pushed costs above the ceiling. The funding limitations in Germany because of the competing Franco-German PAH helicopter led to the most uncertain period for the program by the end of March 1988, and to the latest strong attempt by foreign firms to break the team. Northrop offered to deliver the "Hornet 2000" at half the unit cost of an EFA aircraft (\$24.5 million vs \$50 million). However, the European nations contend that this advanced version of the F-18 would not be maneuverable enough at supersonic speeds, and that the EFA project will keep jobs in the European aerospace industry and ensure its technological capabilities. Also, the EFA partners were concerned that if a U.S. aircraft were selected, the U.S. would control exports of that aircraft. The Spanish government was the last to sign the EFA Full Development Phase Contract due to funding constraints. The identified cost overruns have anticipated a reduction from the initial intended 800 aircraft to 700, as Germany reduced its option to only 200 and Spain is expected to do the same, down to 85. All the preceding difficulties have produced slippages in the program. Due to the extended development time, the two first prototypes will not be powered by EJ-200 engines as planned. They are expected to be powered by the Turbo Union RB.199 Mk104D engine, which develops 18,000 pounds of thrust

instead of the EH-200's 20,000 pounds. Also the delay in the predicted in-service date has led the Italian government to selected the upgraded version of the "Tornado" for the air-to-air and ECM roles.

While the EFA airframe development is plagued with difficulties, there are still other obstacles to be surmounted in the program. For example, the Spanish factory which will develop the low pressure turbine two stages is not even built. British manufacturers are reluctant to bid on EFA RFPs because of the risks involved in the program, and because of the fear of giving away technology to their competitors through the pool of shared technology which will be established according to the EFA MOU. The choice of the radar shows every contradictory characteristic of the arms trade among military allies which are also economic competitors. The Scottish firm Ferranti leading one bidding team offered the ECR-90, and U.S. counterpart, Hughes, bid with an upgraded version of APG-65, the MSD-2000. Not surprisingly, the companies in the other three countries would be the same regardless of who wins the contract. The competition ended up between Ferranti and Marconi, two British firms.

In spite of the above problems and against so many odds, no major operational trade-offs have been necessary as stated in the unified document, the "European Staff Requirement and Development" (ESR-D). In summary, joint projects can be regarded as "clubs," with nations participating so long as membership is expected to be worthwhile. The benefits are diverse, and the variety of end products makes it difficult to evaluate the performance of joint projects. This also increases the opportunities for discretionary behavior by politicians, bureaucrats, and firms.

CASA'S FUTURE POSSIBILITIES

Now working on a new transonic fighter known as AX to replace the Spanish F-5 in the 1990s, CASA is seeking international partners for the program. The likely models for this fighter are the existing BAe 200 "Hawk" (UK), the "Alpha-Jet (Franco-German), and the JAS 39 "Gripen" (Sweden). Another anticipated project for the company is the Augusta A 129 "Tonal," an anti-tank helicopter for the 1990s. An MOU was signed by Italy, UK, the Netherlands, and Spain, in 1986 for the feasibility and pre-definition stages for this helicopter. The total requirements will be around 225 units, with 70 destined for Spanish forces. In addition, CASA is to assemble 12 of the 18 Aerospatiale "Super Pumas" on order for the army.

Thus, in the future, CASA will look toward increased cooperation in both civilian and military aerospace projects. The worldwide trend in the industry is one that CASA will participate in, and the company's management is confident that it will be a successful partner with other aerospace firms around the globe.

ABOUT THE AUTHOR

Lieutenant Colonel Juan A. del Castillo Masete is currently serving at the Spanish Air Force Headquarters in Madrid. A graduate of the Spanish Air Force Academy, Lt Col del Castillo also holds an M.S. in Logistics Management from the U.S. Air Force Institute of Technology. A rated pilot in both fixed wing fighters and helicopters, he was formerly the head of the Spanish logistics delegation to the European Fighter Aircraft program.