ROTA, SPANISH NAVAL EXQUISITE

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In the south-western part of Spain near the town of El Puerto de Santa Maria and located at the Gulf of Cadiz the strategically situated naval base of Rota plays an important role in the Spanish naval aviation. Rota is the home base of all flying naval units of Spain which are partly also embarking the flagship of the Spanish navy; the aircraft carrier the 'Principe de Asturias or Spanish LPH's and frigates. The base is used jointly by Spain and the United States under the command of a Spanish vice Admiral.

NAVSTA ROTA Structure

NAVSTA(Naval Station) Rota is located near the Straits of Gibraltar and comprises beside the airfield a main harbour facility altogether within 6.100 acres (25 square kilometres) area. Spain and the USA are working together under the agreement for defense cooperation and share many facilities. The harbour area provides support for US and NATO ships, especially the US Sixth Fleet from the Mediterranean, the Spanish Navy and often units of NATO Rapid Reaction Forces. Rota is headquarters for Commander, U.S. naval activities Spain (Comnavact Spain) and a primary gateway to Europe for Air Mobility Command. The U.S. Navy has the responsibility for maintaining the stations infrastructure including a 670 acre (2.7 square kilometres) airfield, three active piers and 426 facilities. Rota also supports amphibious readiness group turnover and is without doubt the ideal place to support combined aircraft and ship deployments into the Mediterranean and Atlantic Ocean. Rota earned itself thanks to the hosting of allied ships and the crucial support and protecting of the Sixth Fleets the title "Gate keepers of the Mediterranean". The harbour offers secured pier side maintenance and reloading facilities. A very sophisticated state-of-the art STARS radar is in use for a high level of awareness in the area with provision for training modes for controllers up to 200 aircraft. On the airfield substantial expansions and upgrades of the ramp resulted in a large apron for wide bodies with a capacity up to 16 C-5 cargo aircraft. Air Mobility Command uses the base for transit to Germany and South West Asia but runs in addition also regular transport flights on Moron and Torrejon Air Base elsewhere in Spain. Transport aircraft of the USAF belongs to the 625th AMMS (Air Mobility Support Squadron) which was activated at Rota in 01-04-1994, but also visiting aircraft of other units are seen. Located near the big apron is a smaller one with several hangars housing the Spanish own Armada with some 64 aircraft and organised in six squadrons. The authors were treated with a visit of each squadron.

Spanish Armada Squadrons:	Aircraft:	Number:
3e Escuadrilla	Agusta Bell 212 ASW	10
4e Escuadrilla	Cessna CE 550 Citation II	3
5e Escuadrilla	Sikorsky SH-3H/AEW	8/3

6e Escuadrilla	Hughes H369M (500M)	7
9e Escuadrilla	MD EAV-8B/8B+/TAV-8B	17 (Harrier II)
10e Escuadrilla	Sikorsky SH-60B Seahawk	12
On order:	NH-90	28

Aircraft of the 3e, 5e, 9e & 10e Escuadrilla are assigned to the fleet such as the aircraft carrier 'Principe de Asturias' (R11), also to the Galicia class LPD's SPS Galicia (L-51) & SPS Castilla (L-52), the some older Newport Class LST's Hernan Cortes (L-41) & Pizarro (L-42) and on four F-100 class frigates or six Santa Maria class frigates. Galicia can embark four Sea King's or four AB-212's and in future 6 NH-90 helicopters or a mix of them for amphibious assault missions. The Hernan Cortes and Pizarro take three AB-212 helicopters each and the Frigates operate mostly a SH-60B Seahawk for anti submarine warfare. The replenish ship Patino (A-14) has also a capability to receive two helicopters and this ship, together with the F-100 class frigates are the only ones based at Ferrol while all other mentioned ships have their home-base in Rota. The Principe de Asturias operates most of the times within a battle group where it is permanently assigned to. This Battle group is called GRUFLOT (Grupo de Proyeccion de la Flota) and its composition differs but comprises always a few frigates to defend the high valuable asset against multiple threats and to make a fist in attack operations. The Principe de Asturias is joined by a second aircraft carrier, the Juan Carlos which is still under construction in final stage and is expected to be commissioned in 2011. The new ship will be mainly used as an aircraft carrier or helicopter carrier in over-the-horizon amphibious operations and will be equipped with a dock and designated as a LHD.The idea is to accept even on this ship the heavy Chinook helicopter of the Spanish Army.

Embarking aircraft of the Principe de Asturias shows the following picture.

EAV-8B Harrier II+	12
Sikorsky SH-3H	6
Agusta-Bell 212 ASW	4
Sikorsky SH-3 AEW	2

This option above is an operational full setting. In many occasions the average is more like 6-8 EAV-8B, 2-4 SH-3H, 1-2 Bell 212ASW and 2 SH-3AEW helicopters.

Strike element at sea

The Harriers from 9 Escuadrilla, which are actually called Matador in Spain, are intent to operate from the Principe de Asturias to provide defence for this ship but also for combined fleet elements which include this aircraft carrier such as the battle group in different on-going sea operations. The multi role capability of this aircraft provides the capability for attack missions too. To reach a truly air superiority some essential characteristics were obligatory. Since 1987 the American built Harrier, the McDonnell Douglas EAV-8B Matador II entered service alongside older AV-8S examples which were later sold to Thailand. Additional to the 12 operational EAV-8B a new batch of EAV-8B+ entered service of which the first of eight examples arrived in 1996 and the last delivered by Boeing in St. Louis in 2003. This version met the requiring for air

superiority. It was co-developed in a joint project with the USMC and Italian Navy as partners. The most important improvement next to a new Roll Royce F402-RR-408 with 10 % more thrust was the upgrade of avionics in a night visions goggles compatible cockpit, such as digital moving maps, INS/GPS, Have Quick radio and the main new feature a Hughes AN/APG-65 multimode radar enabling the EAV-8B+ to operate AIM-120 AMRAAM missiles. These missiles give the aircraft a Beyond Visual Range (BVR) capability and so air superiority is achieved. Simultaneously strike capability was also improved thanks to the AN/APG-65 radar in combination with new Forward Infra Looking Red Radar (NAVFLIR) and the use of the Litening II Targeting Pod enabling the Harrier to attack at night or in adverse weather. The EAV-8B+ is recognized by the lengthened nose to house the new radar. New wiring and software employ 1760 bus based smart weapons and precision-guided munitions including Joint Direct Attack Munitions (JDAM) while the seven

hard points can also carry laser guided weapon systems such as GBU-10, -12 and -16 Laser Guided Bombs (LGB) AGM-65 Maverick/AGM-84 Harpoon rockets or standard IR-homing rockets such as AIM-9 Sidewinders. Of the original EAV-8B which was called the ‘day-attack’ version three jets were lost and of the other nine examples, five were upgraded to Harrier II + standard by CASA in Spain.

Sea Control Concept

In 2008 a contract was signed between the U.S. governmental authority Navair acting on behalf of the Spanish Navy and Military Air Systems, an integrated business unit of EADS Defence & Security (DS) for the upgrade of the remaining four EAV-8B, which contract will be executed throughout the coming years until 2011. The new configuration will be very similar to the Harrier II +. The avionics enhancement includes a NVG-compatible cockpit, a wide-field-of-view Head-UP display, new computers, digital Video Mapping System, new ARC-210 Have Quick communication system, Automatic Target Handoff System (ATHS) and an advanced Global Positioning System (GPS)/navigation system MINITACAN. MAS will be responsible for implementing the modifications, testing the upgrade, supporting the reintroduction into service of the aircraft and also the certification process. MAS is also responsible for the third maintenance level of the fixed-wing aircraft of the Spanish Navy.
The Principe de Asturias was designed in the concept of the US navy Sea Control Ship (SCS) and offers a cheaper alternative for a traditional aircraft carrier. The concept operates a mix of helicopters combined with Harrier short take of and vertical landing (STOVL) fighters. There is much similarity in the way sister ships are operated like the British Invincible class ships, the Italian Giuseppe Garibaldi or US Navy Iwo Jima class ships operated by the USMC. The Harriers are taking off with help of a 12 degrees ‘ski-jump’ ramp and landing vertically by rotating the 4 nozzles on the aft deck. The approaching technique is hovering on the side of the carrier first and jumping on the deck at very low level to minimize the thrust on the deck surface. Special spots are more or les reserved for the Harrier while others are being used by the ships helicopters. The pilots receive their training in primary stage in Pensacola, Florida with the U.S. Navy on the T-6 Texan 2 (before T-34C Mentor) and in secondary stage they go to Meridian in Mississippi to fly on the T-45A Goshawk, including a deck landing on an U.S. Carrier. The Armada has its own TAV-8B trainer

which they call the T-bird stationed at Rota while Italy has to go to MCAS Cherry point, North Carolina for this which procedure was similar for Spain before the acquisition of the T-bird in 2001. Spain has also a simulator to train their pilots on the Harrier. Exchange officers fly with the Spanish Air force or USMC. The Spanish Harriers were never deployed to Iraq or Afghanistan but took over duties from U.S. fleet elements in the Mediterranean temporarily after the U.S. Navy ships were directed to the Middle East.

The Flying Cows

In the next hangar is the residence of the 5e Escuadrilla Sea Kings which are also a permanent deployment on the Principe de Asturias, however assault operations could also be launched from other ships with the use of Sea King helicopters. Currently 11 Sea Kings are in service including eight SH-3H examples in the transport role and three SH-3AEW with external radar providing Airborne Early Warning. The Sea King needs replacement and this will be in de form of 28 NH-90 navalised TTH helicopters. Several reasons delayed the introduction of this type in the Armada and while the project is behind schedule the first Spanish example is not expected to enter service before 2012. However the country is not one of the designers or developers in the project the choice to start manufacturing of the helicopter in the Eurocopter/EADS facility in Albacete was very welcomed. The Sea Kings were originally acquired as ASW helicopters but are now attached to the transport role, especially to support assault and amphibious operations including para dropping and CSAR operations. In the commando concept the Sea King can transport up to 27 soldiers. Next to this the Sea King can be used in extended SAR operations. Anti Surface Warfare (ASuW) could be performed in secondary role, but there are no ASuW weapons and when during surveillance targets are discovered it is better to scramble Harriers or armed AB-212ASW and direct to the target. The Armada tried to extend the operational life of its Sea Kings with many updates resulting in changes of airframe, the turbines and rotor head. The installation of anti FOD systems in front of the turbines helps the engine to extend its life cycle. Important avionics were installed like FLIR, Night Vision Goggles and GPS/Cartographic navigator. All modifications were done by Eurocopter/EADS. Three SH-3H's were converted to AEW versions in the CASA factory by installing a Searchwater radar System/Thales 2000 AEW high performance radar w just like on Royal Navy Sea King AEW Mk.7. This system provides long range warning against both ships and aircraft using high resolution active scan modes and passive modes as well. The sophisticated maritime surveillance system is able to detect even very small objects like periscopes and communicates by data-link with real time images. The SH-3H AEW patrols ahead the carrier or fleet and is therefore an obligatory asset in the concept. 5 Escuadrilla is nicknamed 'The Flying Cows'.

Cats for sure

Brothers in arms are the helicopters of 3e Escuadrilla using Agusta-Bell AB-212ASW helicopters which are to find in the next hangar and listen to the nickname 'the cat squadron'. Although the designation implicates that the main task of the AB-212 has to be anti submarine operations, however this is not the case. Since ASW is

dedicated to SH-60B Seahawks from frigates the main task of the AB-212 is SAR around the ship which they are embarked on and with his capability to carry arms also a main asset in assault operations especially as armed escort for the accompanying Sea Kings in troop delivery ashore. 3 Escuadrilla provides close air support for the Spanish marines armed with machineguns and rocket pods for 19 unguided 2.75 inches rockets with high explosive head and the AB-212 can transport 14 soldiers or internal/external load. The AB-212 is equipped with a hoist, basic instrument radio navigation aid and GPS and makes use of ILS and TACAN. In daylight operations the SAR crew is stand bye while in night operations the AB-212 is airborne during all operations. An AB-212 or Sea King provides continuously surveillance and SAR when needed during the time the Harriers are in the air. Originally the helicopters were delivered with special radar on top for ASW but these has been removed since focussing on (armed) transport missions. The designation AB-212ASW remained in use. The helicopters were originally just like the Sea Kings wearing a dark blue scheme before turning to grey.

Truly multi role

In another hangar we find the SH-60B Seahawk helicopter which is by far the most advanced helicopter in the Armada. It fits perfect in the AEGIS combat system concept of the Spanish navy aboard F-100 frigates. AEGIS is an advanced Command & Control and Weapon Control System using powerful computers and radars to track and destroy enemy targets. The Seahawk performed originally only the Anti Submarine Warfare (ASW) task but adopted later also the Anti Surface Warfare (ASuW) task. For ASW the SH-60B takes three Mk.46 torpedoes and is equipped with a launcher for 25 Sono Buoys active or passive. For targets on the sea surface its weapon is the AGM-119 Penguin fire and forget rocket. The Penguin has an autonomous search, acquisition and track during terminal phase and is resistant against IR countermeasures. The helicopters do have a Light Airborne Multipurpose System (LAMPS) feature.

The LAMPS Mk.III datalink provide full duplex, secure and highly reliable communications between airborne and ship borne platforms. Because of the over-the-horizon (OTH) communications capability with high frequency radio and the data link real time information the Seahawks functions as extended eyes for the AEGIS by discovering surrounding ships on greater distance. Originally the first six Seahawks acquired in 1989-1990 were block 0 versions but were upgraded to block 1 core B with LAMPS capability, the same used on US. Navy examples while another six examples were newly bought during 2002 in the block 1 core B version which were the last SH-60B's produced by Sikorsky. The Penguin fire system is integrated with FLIR and Laser designation but instead of one large Penguin also there is option to take four Hellfire rockets. On the right side a turret is mounted to protect the helicopter The Seahawk is manned with a pilot, an Airborne Tactical Officer (ATO) which is also a pilot and a sensor operator in the back for the sonar, radar and sensor controls. The SH-60B is a multi role asset with its main tasks; SAR, Medevac, surveillance, transport, reconnaissance, ASW and ASuW. The SH-60B is frequently seen on the Principe de Asturias for hit and run flights between the carrier and frigates.

Other airplanes on the base

On the base you can find several other airplanes which are not directly involved in front-line tasks. Three Cessna C-550 Citation II aircraft are in service with 4 Escuadrilla and sharing the hangar with the front-line aircraft. Very important to Spain is the surveillance over the Gibraltar strait to discover illegal immigration, illegal fishing, oil contamination, drugs traffic, ships with problems and also the Citations are in use for liaison tasks and logistic transports such as moving spares to ships or submarines abroad. Once there were standard digital cameras fitted in the camera ports but now these are obsolete and out of service and the work is done with hand digital cameras. The C-550 takes seven passengers apart from the crew consisting of two pilots and a mechanic. The maximum range is 1200 miles with only the crew aboard and with full charge 900 miles. One Cessna C-650 Citation VII is used in the VIP role for eight passengers. The last hangar is reserved for Hughes H-500M's (seven still active out of ten delivered) of 6e Escuadrilla forming the naval training squadron. A wing licence is only needed for the 9e Escudrilla while the other squadrons just require a helicopter licence. The naval training first starts after an initial basic helicopter flying course at the air force academy in Granada to learn basic helicopter handling. With 9e Escuadrilla more skills will be learned in the naval environment and take offs from ships like frigates or the Principe de Asturias are regularly exercised. After 40 hrs of naval training the cadet receives the naval operations licence. The flight instructors are very happy with this helicopter which is easily to operate and quickly reacting and therefore ideal to learn skills to young pilots. In this way some similarity in the good experience with the NH-500E training helicopters of the Italian Air force is shown. According a flight instructor; it is a happy helicopter for manoeuvring, you can land on almost every spot you want very easily. After 1000 flying hours the career of a basic flight instructor may come in sight. Only Spanish cadets are able to receive training with 6e Escuadrilla of which 20-25 a year receives the licence. Since 1982 the torpedo is not carried anymore but all the examples still wearing the old dark blue colours, which looks very cool.

To summarize the information one could say the Armada of Spain is a well equipped naval flying force with sophisticated weapon systems enabling power projection on see when needed and fully NATO compatibility makes it a core element in many NATO fleet movements. Rota is a crucial spot for the defence of Spanish national waters, the Mediterranean and Atlantic and a vital base for air mobility between continents.

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