UAVs

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THE HISTORY OF AMERICAS UAV PROGRAMS DOT THE LANDSCAPE WITH A SUCCESSION OF STARTING PROGRAMS, TESTING, OPERATIONAL USE, THEN PROGRAM TERMINATION. OUR INVOLVEMENT HAS BEEN ONE OF MIXED SUCCESS AND FAILURES WITH NO LONG TERM COMMITMENT TO UAVS, UNTIL RECENTLY.

WITH THE INTRODUCTION OF THE ADVANCED CONCEPT TECHNOLOGY DEMONSTRATION OR ACTD, DOD HAS TAKEN A QUANTUM STEP IN THE RIGHT DIRECTION FOR LONG TERM PROGRAM SURVIVAL OF UAVS. ACTDS PROVIDE A USEFUL, SHORT TERM ACQUISITION CYCLE, WHICH AT THE END OF A 30 MONTH PROCESS ENABLE DOD TO GO INTO PRODUCTION TO FILL SERVICE AND CINC REQUIREMENTS FOR NEEDED WEAPON SYSTEM.

THIS ARTICLE WILL FOCUS ON THE OUTCOME OF THREE ACTDS CURRENTLY RUNNING: THE MEDIUM ALTITUDE ENDURANCE (MAE) OR PREDATOR AS IT IS POPULARLY KNOWN, THE HIGH ALTITUDE ENDURANCE (HAE) OR GLOBAL HAWK, AND THE LOW OBSERVABLE ALTITUDE ENDURANCE(LO-HAE), OR DARK STAR.

UAV CAPABILITIES(1)

ON 29 OCT 95, THE COMMANDER OF AIR COMBAT COMMAND(ACC), GEN RALSTON, (NOW VICE CJCS) STOOD UP THE 11 RECONNAISSANCE SQUADRON(RS) AT INDIAN SPRINGS AIR FORCE AUXILIARY AIRFIELD (ISAFAF). THE BASE IS LOCATED APPROXIMATELY 60 NORTHWEST OF LAS VEGAS, NEVADA. ISAFAF WAS CHOSEN DUE TO ITS ACCESS TO AIRSPACE AND TRAINING RANGES IN THE SOUTHWEST UNITED STATES, ITS 5000’ STRIP AND LOW VOLUME OF GROUND AND AIR TRAFFIC. ISAFAF PROVIDES EASY TRAINING ACCESS FOR ALL OF USAF’S NELLIS FLAG EXERCISES AND WELL AS ACCESS TO THE NAVY’S RANGES AT CHINA LAKE AND THE ARMY NATIONAL TRAINING CENTER AT FT. IRWIN, THEREBY ENSURING JOINT TRAINING.

TO ENSURE THE BEDDOWN WAS SUCCESSFUL ACC USED ITS SITE ACTIVATION TASK FORCE PROCESS TO IDENTIFY SPECIFIC REQUIREMENTS AND PROGRAM NECESSARY BEDDOWN ACTIONS FOR A SUCCESSFUL TRANSITION FROM THE ACTD TO OPERATIONAL USE. SATAF I & II IDENTIFIED OVER 200 ACTION ITEMS, SOME MINOR AND SOME MAJOR, WHICH NEEDED TO BE ACCOMPLISHED TO GET THE 11RS TO IOC/FOC.

The Tier II MAE (nicknamed "Predator") is the only Endurance UAV flying operational missions. This aircraft is nearing the completion of its ACTD and will enter the USAF inventory starting 1 July 1996. The Predator will be heavily deployed throughout the world in military

operations other than war and low intensity conflicts. Due to its slow speed and low survivability, this aircraft is best suited for these missions. USAF envisions the Predator to be deployed like any other aircraft (RC-135/U-2) in its reconnaissance inventory.

Characteristic	MAE (Tier II)	HAE (Tier II+)	LO-HAE (Tier III-)
Gross Take-off Weight	>1873 lbs	22,914 lbs	8,600 lbs
Wingspan	48.7 feet	116.2 feet	69 feet
Mission Duration **Operating Radius**	24+ hours on station @ 500 NM	24 hours on station @3000 NM	> 8 hours on station @ 500 NM
Maximum Endurance	50+ hours	42+ hours	N/A
Ferry Range	N/A	15,000 NM	N/A
Payload	450 lbs	2,000 lbs	1,000 lbs
True Air Speed	60-110 knots	350 knots	>250 knots
Loiter altitude	25,000 feet max. 15,000 Feet Nominal	65,000 feet	>45,000 feet
Survivability Measures	None	Threat warning and ECM	Very low observable
Command and Control	UHF Milsat/LOS	UHF Milsat/LOS	UHF Milsat/LOS
Sensors	SAR: 1 ft IPR, Swath Width Approx. 3,300 ft EO: NIIRS 6 IR: NIIRS 6 Simultaneous Dual Carriage	SAR: 1 m search; 0.3 m spot EO: NIIRS 6 IR: NIIRS 5 Simultaneous Dual Carriage	SAR: 1 m search 0.3 m spot EO: NIIRS 6 IR: None Single Carriage
Coverage per mission	13,000 sq NM search imagery	40,000 sq. NM. search imagery, or 1,900 spot image frames	14,000 sq. NM search imagery, or 620 spot image frames

Sensor data transmission	Narrow band Comsat: 1.5 Mbits Ku Band & UHF SATCOM LOS: C-band	Wide band Comsat: 20-50 Mbits/sec LOS: X-Band Wide Band (CDL): 137-275 Mbits/sec	Narrow band Comsat: 1.5 Mbits/sec LOS: X-Band Wide band (CDLS): 137-275 Mbits/sec
Deployment	2 C-141s or Multiple C-130s	Self deployable, SE requires airlift	2 C-141s or Multiple C-130s
Ground Control	LOS & OTH	Maximum use of GOTS/COTS (LOS & OTH)	Common with Tier II Plus
Data Exploitation	Existing and Programmed: JSIPS, CARS, MIES, JIC's, NPIC	Existing and Programmed: JSIPS, CARS, MIES, JIC's, NPIC	Existing and Programmed: JSIPS, CARS, MIES, JIC's, NPIC

By far the most popular payload among users has been the real-time video image capability. This system allows the operators of Predator to focus video on any object within line of sight and display in real-time live video footage of selected targets. The Predator can carry a 450 pound payload consisting of EO/IR/SAR, loiter for 24 hours with a radius of 500NM. (see fig 1). The aircraft is operated by a fully trained pilot via UHF LOS or SATCOM. Should the link be severed, the Predator will start a preplanned routine, gaining altitude, trying reestablish the lost link. If this fails the predator will go to its last waypoint and continue back to launch and recovery base.

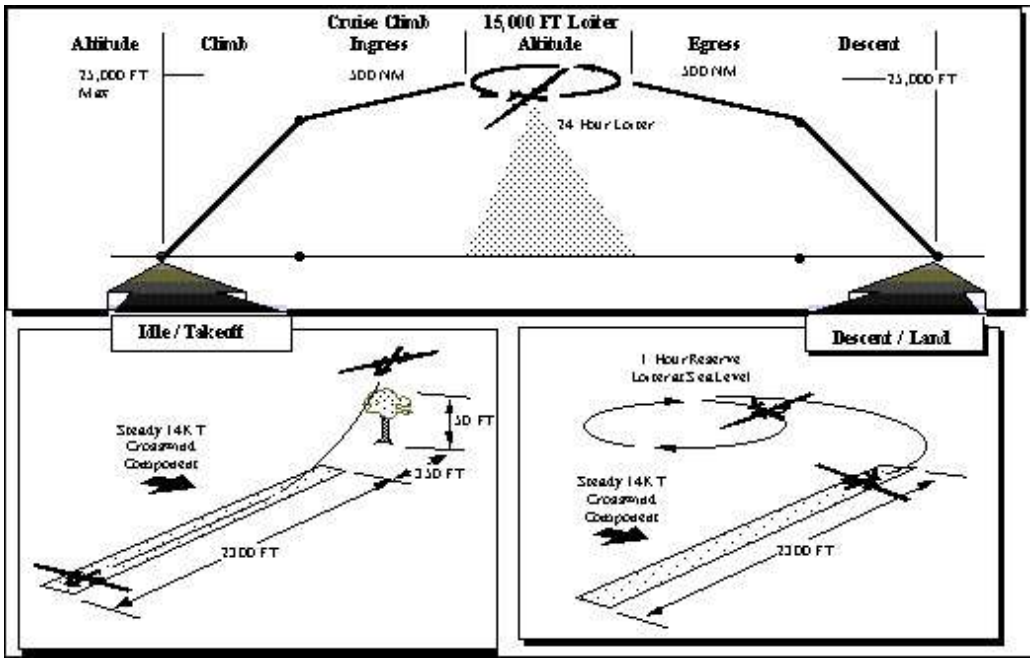


Figure 1: Notional MAE UAV (Tier II) Mission Profile

The Tier II Plus HAE (nicknamed "Global Hawk") is projected to be a long range, long loiter, reconnaissance aircraft. The aircraft is to operate in the low to medium threat envelop and will carry EO/IR/SAR. The aircraft reminds a casual observer that he looking at somekind of new U-2 variant. (see fig 2).

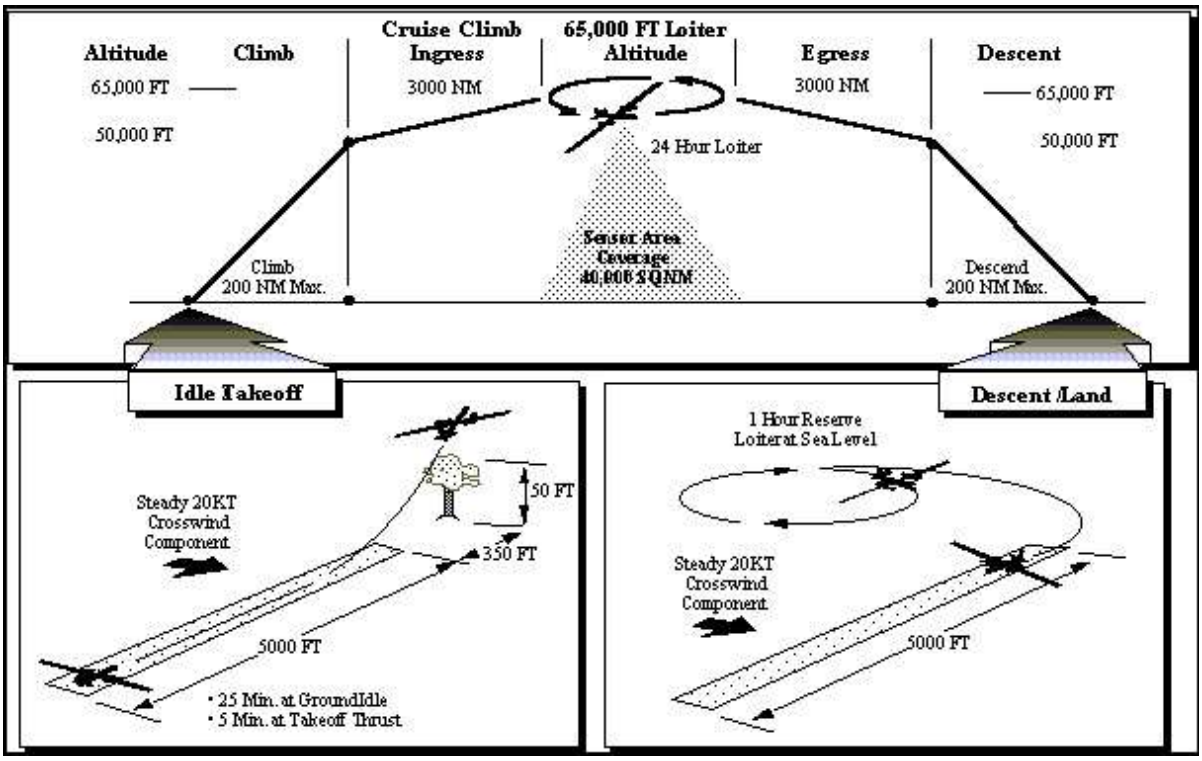


Figure 2: Notional HAE UAV (Tier II+) Mission Profile

This weapon system promises to give warplanners trans-continental, long dwell capability. The 2000 pound payload, 3000 NM on station range, and 24 hour loiter capability is impressive.(see fig #). The aircraft is scheduled to begin its flight testing in 1997 for a flyway price of $10 million.

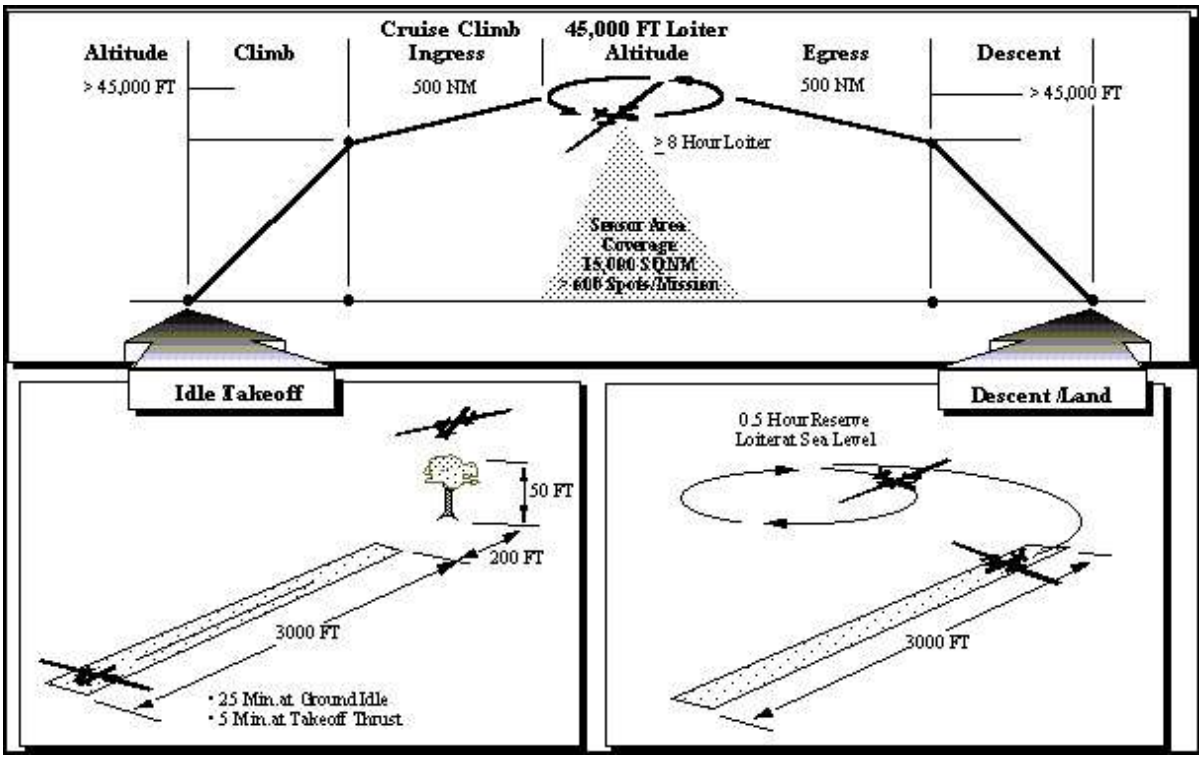
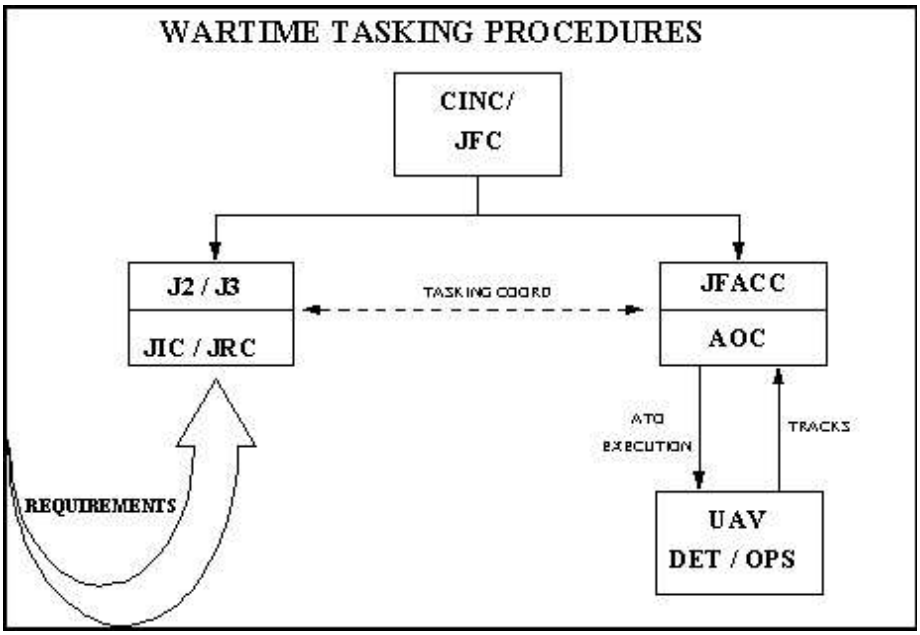
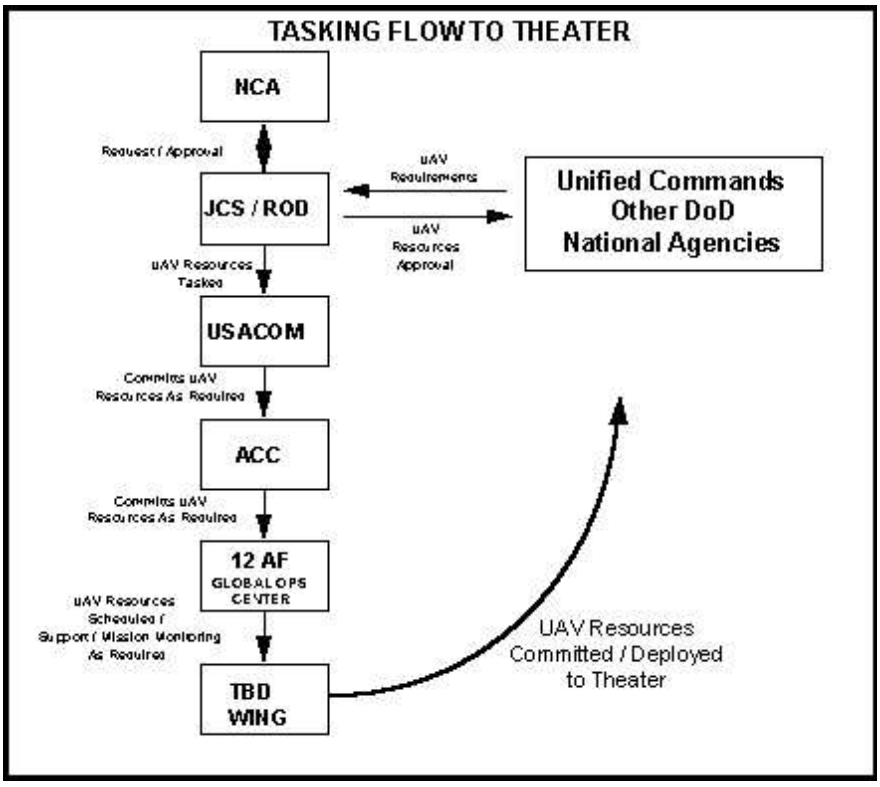


Figure 3: Notional LO-HAE UAV (TIER III-) Mission Profile

The Tier III minus LO-HAE (nicknamed "Darkstar") being built by Lockheed Martin/Boeing is being billed as a threat envelop penetrator. The aircraft uses a single Williams turbofan engine. The aircraft is projected to carry 1000 pound payload with EO/SAR, will have a 500 NM radius and and an 8 hour loiter time. The Darkstars low radar cross section should enable it to keep a watchful eye on more sophisticated adversaries. Darkstar will be able to "capture data at a rate of 1600 square NM per hour at three foot resolution with the capability to perform 1 foot spot imaging." In operations terms this means you or I will be able to see...



The wartime/contingency tasking is envisioned by USAF like all other in theater air assets. The theater CINC or Joint Task Force Commander will decide based, on his commanders requirements at the time who receives UAV support. Once the CINC allocates the UAVs, the Joint Forces Air Component Commander (JFACC) will apportion those assets for use by other theater users. Using this tasking scenario ensures UAVs are not wasted on unnecessary missions until the time is appropriate. It also protects UAVs from flying missions they were not designed to accomplish.



During normal peacetime operations UAVs will be tasked through an operational channel in same manner the RC-135 or U-2 is tasked. The tasking will be based on theater CINC requirements. The tasking flow begins at the JCS. Once approval is obtained from the NCA, the 57 Wing at Nellis will be required to respond to the theater with the most urgent need. UAV tasking will, in the short term, be to complement other theater assets collection capabilities. Long term, UAVs will be able to relieve the load on heavily deployed units performing a variety missions to include but not limited to: treaty monitoring, border enforcement, and drug interdiction. UAVs are projected to heavily deployed themselves. Current documented ACC requirements show the need for manpower build to 800 people to support the Predator.

This large build will enable the Predator to fly four 24 hour continuous orbits, and keep the TDY rate below the Air Force steed goal of 120 days per.