

## **Forward or side looking cameras**

Aircraft may be fitted with up to three cameras for visual orientation. Video cameras will be Sony or Panasonic single chip color CCD cameras or equivalent. Forward looking, Pilots Point of View (PPV) video may be mounted on a tilt mechanism to allow up/down movement as required by the PIC. Black and white, near IR cameras may be substituted in the PPV position but will have as a minimum 400 TV lines of resolution. Focal length shall be selected to produce at least 53 degrees field of view minimum in telephoto mode, and 100 degrees in wide angle mode. A side mounted camera of the same designation or type may be optionally placed in the aircraft as required. Mission requirements will determine port or starboard placement. The third camera may be a digital still camera with video out capabilities and in most instances be pointed straight down for orthogonal image gathering. All video will be transmitted via 2.4 Ghz or 5.8 Ghz on board transmitters using dipole or polarized circular patched antennae. Video ground stations shall consist of microprocessor controlled "diversity" type receivers with the appropriate antenna to maximize video reception. PIC shall have the ability to view the output via a small dedicated LCD monitor attached to the control station. Additionally, the command/control vehicle may have large, shielded LCD monitors for flight use. Video ground stations shall be powered by a redundant battery system and a backup video ground receiver station shall be on standby in the event of complete video system failure. Video configurations used shall have output to reasonably and reliably operate at 2-1/2 times the expected operating range.

## **Visual Observation from multiple ground sites**

All aircraft operation shall include as a minimum the PIC and one observer. The observer will assist the PIC in deconfliction with any other aviation in the area. The observer shall have as a minimum, 20/20 corrected visual acuity and normal hearing. Since most all operations will be in Class G airspace, observers shall be briefed on the number and type of other aircraft that could be in the area. The ground observer will have a slightly better edge than an observer in the cockpit because of the auditory signals that can be used to determine aircraft direction and distance. Observers shall be no more than 1/2 mile from the PIC and the aircraft shall be at no more than 2000 feet above the observer. Observers may use binoculars to better track and detect air traffic but shall not rely on visual enhancements as a primary means of observation. An observer shall have instantaneous communications to the PIC via cell phone or TAC radio as required. The flight crew of PIC and observer shall only monitor and control one UA at a time. The PIC and the observer may switch rolls in the course of the mission as long as the observer meets the minimum requirements for assuming command of the aircraft. The ground observer may be a county employee, or a contractor's employee as designated by the county for the express purpose of mission operations.