National Defense Industrial Association
Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance Division

Common UAV Architecture Study

(a standard for command, control and data link integration of UAV platforms and ground stations)

Terms of Reference

for the

Air Force DCS/Warfighting Integration (AF/XI)

Pentagon, Washington DC

General:

Unmanned Aerial Vehicles (UAVs) are being used more and more in military operations. Operation Enduring Freedom, Operation Northern Watch, the unstable situation in the Middle East, and the brinkmanship on the India-Pakistan border are the latest in a continuing series of military operations where UAVs may be able to improve the effects of reconnaissance, shorten the kill chain, and enhance the value of the Global Strike Task Force.

In addition to the well-known benefits of UAVs, their use in military operations also brings a number costs. One of the costs is the stovepipe nature of UAV operations. Each UAV has to be controlled by a separate mission control station. As more and more UAVs are designed to satisfy different military requirements, the Air Operations Center (AOC) is becoming inundated with a proliferation of "tribal" stovepipes requiring "tribal"-unique training, configuration-unique electronics and software, and an ever-increasing AOC bandwidth load and ground station logistics footprint. The logistical burden of an AOC in an expeditionary force environment needs to be considered and minimized.

One solution to this growing problem is to establish a standard architecture for UAV operations. The intent would be to agree upon an operational consensus as early as possible so as to avoid the replication of "VHS vs BETA" incompatibilities that erode the attainment of DoD's interoperability and integration goals. Specifically, the sought-after architecture standard would enable all UAVs to operate from all mission control stations, regardless of the platform developer, the mission control station developer, or the payload developer.

The NDIA C4ISR Division proposes to initially convene the major UAV platform companies to determine basis of a "plug and play architecture" that could accommodate

the evolving nature of platforms, mission control and ground station requirements. The objective would be to reach consensus on an industry architecture to be utilized by DoD as a standard and thus afford greater platform flexibility with minimal "logistics" embodied by stovepipe data links and ground station requirements. The ultimate goal will be to share information across industry participants, to include platform, sensor and control system developers as well as operators, and to establish a common architecture for UAV mission control, data link spectrum management and Tactical Operations Centers.

Terms:

In order to provide a useful architecture, the study will be conducted in accordance with the terms defined below.

1. The study will seek industry consensus upon a set of recommendations for a UAV architecture that would provide universal interoperability between UAV platforms/sensors and UAV mission control stations.

2. The study will explore the full range of UAV architectural requirements for operational interfaces, conversion standards, backward-compatibility, security, software, and training requirements, and the process by which those requirements are determined.

3. The study will concentrate on eliminating UAV stovepipes but will also recognize and anticipate external interfaces with MC2A, AWACS, Joint Stars, SBR, allied and other systems.

4. The study will address corporate buy-in and the level of industry commitment sufficient to share what may be considered proprietary or company confidential information in order to develop a one-size-fits-all architecture. The introduction of a new UAV into a theater of operations should not require a new, separate mission control station.

5. At a minimum, at the conclusion of the Study effort, outbriefs will be coordinated with and briefed to the following:
   a. AF/XI……LtGen Kenne
   b. ASD/C3I……...HON Stenbit
   c. AFMC/CC……Gen Lyles
   d. ESC/CC…….. .LtGen Looney
   e. ASC/CC……. ..LtGen Reynolds
   f. OSD-Transformation……ADM (ret) Cebrowski
   g. USD (A,T & L)…….....HON Aldridge

6. AF/XI will assist the Study effort via briefings, documentation, and points of contact in accordance with the TOR objectives.

7. The study effort will be undertaken at no cost to the government.

8. It is expected that 6-10 NDIA C4ISR Division industry members will be assigned to the Study Group and that the Study effort will be completed within 3-6 months.

9. The expected output of the study will be an architecture that addresses the requirements cited above.

10. This TOR may be modified at any time by mutual agreement.

AGREED TO:

_____	_____
NDIA Representative	AF/XI Representative
Date	Date: