

Good afternoon. Welcome to the Advanced Technology Office Session. Last year in Denver, ATO was introduced as a brand new office by the DARPA Director, Dr. Fernandez.

His rationale was to create a central focus within DARPA for the communications, early entry/special operations, and maritime efforts.

This year ATO still has the same focus areas but our programs and programmatic focus, as well as our personnel, have undergone substantive changes. These changes mean new programs and new opportunities for you to participate in our exciting and challenging efforts. The presentations you will see today attempt to reflect these new directions as well as capture some of the successes of this past year.

Let me begin with the communications area where we have made perhaps most of the major changes in direction. Faced with a commercial communication industry which is essentially a \$100 billion a year business, it was a challenge to decide what DARPA could do that was different and would have a unique impact on the military community.

What we decided was that software definable radios offer an entirely new capability which allows the intersection of Signals Intelligence (SIGINT), Communications (COMMS) and possibly Electronic Warfare (EW), all in a common system. As shown in the block diagram chart from my handout, a COMMS system and a SIGINT system have very similar internal functions. By exploiting both of these capabilities in the same system, we can provide a unique, multi-function capability on the same platform.

These capabilities are synergistic since the SIGINT side might be used to find optimum holes in the spectrum for transmitting and receiving information.

The first embodiment of this line of thinking has been applied to the Airborne Communications Node program (ACN). As you will see from the presentation today, ACN has been completely restructured from last year's presentation to reflect this new approach.

The new ACN will enable unsurpassed capability for the tactical and littoral battlefields.

Another area we have been investigating is how to potentially deny enemy forces the capability to communicate without using massive, high-power jamming platforms.

The Wolfpack presentation will describe a new way to accomplish this using a distributed system of small internetted nodes. These nodes sense the ambient battlefield spectrum and provide appropriate localized jamming to selectively paralyze enemy RF communications.

As we look forward to new communications demand for such military systems as the Army's Future Combat System (FCS), we need to investigate demanding techniques for very high bandwidth, but at the same time we will have to maintain low probability of interception or detection, and resistance to jamming.

In addition we need to think about the aspects of information assurance for RF systems similar to the extensive efforts for fixed/hard wired systems being investigated by ISO and ITO. This presents quite a challenge, however, due to the lack of "firewalls" or large computational infrastructure in RF systems.

The new focus on communications within ATO offers a new set of challenges.

This presents another opportunity for you to contribute.

Let's now move on to the early entry/special ops area. Both the Dog's Nose, which you saw last year, and the Warfighter Visualization programs are ending this year. The Warfighter Visualization Program Manager, Norm Whitaker, features the successes of this latter effort in a presentation this session.

Our interest in Tactical Mobile Robotics (TMR), Unattended Tactical Ground Sensors, Alternatives to Anti-Personnel Landmines (APLA), and novel weapons such as Metal Storm continues.

Note that we have displays for TMR, Tactical Sensors, and APLA which I hope you will take the opportunity to visit.

In addition to these programs we are investigating new ways to tag and track enemy forces.

Turning to the maritime arena, the Submarine Payloads and Sensors program, which you heard about last year, is coming to an end.

The innovative concepts and conceptualization processes derived in this effort are transitioning to the Navy.

Again, there is a display, which depicts this program and its results.

The Fast Logistics study mentioned last year, which was jointly sponsored by ATO and TTO, has been completed.

We are digesting the study results to see if there are new opportunities.

The session this afternoon will feature two new areas of interest for ATO: the Friction Drag Reduction program and the Robust Passive Sonar (RPS) effort. The first effort is going to investigate techniques such as micro-bubble or polymer injection to provide up to a 70% reduction in Friction Drag for surface ships. RPS has the goal of investigating approaches to substantially reduce the background noise of surface ships in the littorals in order to detect quiet submarines.

Quality and innovative people are always critical to DARPA's success.

In the past year ATO has had quite a turnover; we have hired ten new individuals for our office. I have included a chart that lists the office personnel and how they may be contacted in your handouts. Please visit our web page for more information about our office.

Your ideas are important to us (that's what DARPA Tech is all about.)

As a reminder, you heard about four new programs, which already have solicitations out or will advertise in the near future. This past year under BAA-0027 we received almost four hundred white papers with ideas for the three ATO focus areas.

Thus far we have solicited sixty full proposals from that four hundred and made twelve awards. A similar BAA is planned for FY01, so stayed tuned.

In addition to your ideas we are always looking for great people to join our team.

Be sure to talk to our H-R representatives if you are interested in a position at DARPA in the Advanced Technology Office.

Thank you for your attention.