COMM 393: Assignment 5
Barry Matheney, 23 June 1999

DARMS Initialization Checklist

The Data Annotation, Recording and Mapping System (DARMS) must be initialized prior to sensor operations on the OC-135B Open Skies aircraft. Initialization, in other words, is the application of power to the DARMS hardware components, and the configuration of the DARMS software.

Without a properly operating DARMS, the sensors can still be operated. However, the usability of sensor output will be greatly reduced.

As an example of how Open Skies imagery is used as a confidence and security-building measure, let's consider an aerial photograph of a large convoy of tanks, troops and support equipment. If the photograph had been taken 1000 kilometers east of Moscow, this military movement would be of little concern to other countries. Military maneuvers are commonplace. However, if the Russian convoy were westbound and only 50 kilometers from the border of the Republic of Georgia or Ukraine, it could understandably be a concern for us and for our Treaty partners. As you can see, knowing when and where a photograph was taken is just as important and what the photograph shows.

DARMS output is crucial for in-flight monitoring by Linguist/Sensor Operators (LSO) and foreign observers, and for post-flight analysis by film processors and intelligence specialists.

A fully functional DARMS provides the following types of critical data:

- Aircraft Flight Characteristics- course, altitude, airspeed, pitch, roll, and drift.
- Weather Conditions- cloud coverage below the aircraft and between the sun and site.
- Navigation Data- date, time, latitude, longitude, direction of flight
- Sensor Status Information- on/off status, failure indications, and film footage remaining for each sensor.

This set of instruction is provided for the LSO, the mission crew member responsible for DARMS and sensor operations. It is assumed that the LSO is familiar with the location of all DARMS components.

The orderly application of power to DARMS and adherence to this checklist will ensure the proper functioning of the DARMS hardware and software.

Additional information on DARMS operation can be found in U.S. Air Force Technical Order T.O. 1C-135(O)B-43-1-1, System Operations Manual, and the DARMS Users Manual, produced by Northrop-Grumman Corporation.

DARMS Initialization

1. INS/GPS, On/Aligned – Verify

NOTE: Coordinate alignment of the Inertial Navigation System/Global Positioning System with the Sensor Maintenance Technician (SMT). Corruption of data may occur if DARMS is initialized without proper INS/GPS alignment.

2. OPEN SKIES POWER Switch – Check ON, guard closed

CAUTION: The OPEN SKIES POWER Switch is intended only for the immediate termination of sensor operations in the case of an in-flight emergency, or as a result of Treaty violation. Power to all mission equipment will be removed. DO NOT turn this switch off unless directed by the mission commander.

3. Project Power Distribution Box Circuit Breakers – Closed, All

4. DARMS J-Box Circuit Breakers – Closed, All

Project Power Distribution Box and J-Box are located on the top of the DARMS hardware rack, facing aft.

5. DARMS Power
    a. UPS AC Input – ON
    b. UPS BATTERY Input – ON
    c. Alarm Silence Switch – Press
6. Camera Control Panel (CCP)
    a. SELECT Switch – REMOTE
    b. POWER Switch – STANDBY
    c. Camera Switches – Verify all framing and panoramic cameras are OFF
7. Video Power
    a. Video Control Unit (VCU) Power – ON
    b. VCU NORMAL/DECODED Switch – DECODED
8. 1924ROS Data Annotator Power

a. 1924 Circuit Breaker – Verify, Closed

b. 1924 POWER Switch – ON

c. Built In Test (BIT) – ON

The BIT takes approximately 10 seconds. All hardware components will indicate a 'P' or 'F' for Pass or Fail. If a failure is indicated on any component, perform a second BIT. Shut off the above components in reverse order and perform a restart following a second failure. Coordinate further troubleshooting with the SMT.

9. DARMS Computer Power

a. DARMS Circuit Breaker – ON (up)

b. DARMS Power – ON, Verify the green power light is illuminated.

10. DARMS Software Program

a. DARMS Login – Enter 'DARMS'

b. Password – Enter password, Press Enter

c. DARMS Background Screen

The DARMS Background Screen is a gray screen with the Open Skies, Defense Threat Reduction Agency, and Northrop-Grumman corporate logos.

d. Right Trackball Key – Press and hold for access to the DARMS Menu

e. DARMS Menu – Select StartUp

NOTE: DARMS will automatically load the mission data files from the previous mission. If the current flight segment is a continuation of the previous mission DO NOT import the previous mission disks again. The software will automatically number the flight segment in one-up sequencing. Proceed to item 11b.

11. Mission Data

a. Mission Menu

(1) Select IMPORT to load new mission data files from Floppy

(2) Insert mission diskette in to floppy drive

(3) Press Enter

If the prompt "Import was unsuccessful" is displayed, retry.

(4) Remove diskette when Import is complete.

(5) SELECT- select

b. Configure Menu – Select

This menu allows the LSO to confirm the mission configuration.

(1) Mission Setup – Select

This selection calls up the Mission Setup graphical user interface (GUI).

A. Verify Mission number, segment number, and correct time from the INS/GPS.

The INS/GPS is located behind the LSO at the deputy team chief console.

B. Ok – Select to close GUI.

(2) Set Cloud Cover – Select 0, 25, or 50%, as required.

Set to 0 under clear atmospheric conditions. If the ground is 50% obscured by clouds, a setting of 25% will decrease the camera shutter speed by one half f-stop. If the ground is 75-100% obscured a setting of 50% will reduce shutter speed by one full f-stop.

NOTE: Improper selection can result in overexposure or underexposure of the film.

(3) Set Nav Rate – Select 10 seconds

The Nav Rate allows the LSO to determine how often the current navigation data is recorded in the navigation file (*.nav) for post-mission analysis. Default is 10 seconds.

(4) Set Overlap – Select 33%, 56%, or MAX, as required.

Overlap determines the time interval between consecutive frames during camera operation. The program automatically determines the required interval, taking the speed and altitude of the aircraft into consideration, to produce imagery with 33,56, MAX (Approx. 92.6%) overlap.

(5) Set Weather – Select

Weather data is obtained based on the pilot's weather call from the cockpit.

A. Visibility – Select Good, Fair, or Poor, as required.

B. Cloud- Select Clear, Scattered, Overcast, or Broken, as required.

c. Sensor Menu – Select

Enter sensor data for each sensor that will be operated during the mission. Select APPLY

d. Mission Menu – Select

START – Select

e. DARMS – Initialized

12. Inform Deputy – “DARMS is mission ready.”