

Airborne Digital Reconnaissance System (ADRS)

Nikon D7100 Camera Kit

-Checklist and Operations Manual-



V4.2

October 21, 2014

National Headquarters, Civil Air Patrol

1.0 Equipment Pre-Mission Check



1.1 Open the ruggedized camera case and verify the following items are enclosed:

Nikon D7100 camera with attached Sigma 18-200 mm stabilized lens, Nikon MB-D15 Multi-Power Battery Pack with battery fixture for rechargeable battery, Tiffen UV optical filter/lens protector (or equivalent), camera strap, and lens cap.

2 Sandisk (or equivalent) 16 GB SDHC memory cards (stored in camera).

Nikon MH-25 battery charger

2 – Rechargeable camera batteries (one stored in camera, one in kit)

6 AA battery fixture for use with the D15 Multi-Power Battery Pack (back-up camera power module) in fabric carrying case.

Solmeta Geotagger Pro 2 GPS Receiver

Cable-D for ten-pin remote terminals

Cable- E for Nikon D90

Cable- F for accessory terminals

Nikon GP-1A to D7100 camera cable

Camera to computer cable

Camera to TV video cable (used to view photos on a television set)

Instruction manuals for the camera and attachments, GP-1A GPS, cleaning kit, and spare AA and AAA batteries in large Ziplock bag

Miscellaneous Ziplock bag of parts, covers, etc. which may be of use on other missions.

A cable may be enclosed that is used to connect the Solmeta Geotagger Pro2 GPS Receiver to other Nikon cameras. This cable is not for use with the D7100 system.

Photos on next two pages help with identification of components.

Photos of equipment located in the D7100 System Case



D7100 camera with attachments



Battery pack



note: lens shield not used



Geotagger Pro 2 GPS receiver



Photos of equipment located in the D7100 System Case



AA batteries



Spare Parts in Small Ziplock Bag



AMOD Data Logger with USB cable

An inexpensive camera mount is not currently included in the kit provided by National Headquarters, but one is being tested from RAM Mounts that will allow cameras to be mounted to the camera port window. Personnel should be careful when installing, especially in flight, to not drop the camera; the airborne photographer should attach the camera to the mount and then use the camera strap accordingly to avoid accidental dropping of the camera.



1.2 Charge Camera Batteries



Plug in each battery pack, one at a time, and bring the batteries to full charge. The indicator light will flash during charging. When fully charged, the light will illuminate continuously.

1.3 Nikon D7100 Camera Pre-mission Initiation

Verify the camera is turned off



Verify memory card installations by opening the door located on the right side of the camera and visually confirming their presence. A light located on the back-right of the camera will briefly illuminate to confirm the cards are seated. The cards can be removed by pushing the cards in and they will pop out. Two 16 GB (or larger) cards are furnished with the system. Local purchase of additional cards is recommended.

Note: Page 301-31 in the instruction manual D7100

Set the autofocus switches on the camera and lens to AF

Just above the lens AF switch is a switch marked “lock”. It is used to lock the zoom function in the 18mm position. Make sure this switch is set to the unlock position (towards the front of the lens).

Note: Page 41 and 55 in the instruction manual D7100



Rotate mode switch to “auto-no-flash”. The Mode switch is located on the top-left side of the camera. “auto-no-flash” is reached by setting the Mode dial to “Auto” (green camera symbol) and then moving the



Mode dial one notch counter-clockwise. To move the notch in the direction needed, you must push and hold the button while turning. Auto-no-flash assures the flash will not automatically pop up and contact the hot-shoe mounted GP-1 GPS module if a low light condition is encountered.

Set the focus selector switch to L

Note: Page 76 in the instruction manual D7100



Install the Solmeta Geotagger Pro 2 GPS receiver

If the Geotagger Pro 2 (cable f) is not attached to the GPS, do so by selecting the larger of the two connector ends (the end that has the Solmeta emblem on it) and pushing it into the side of the Geotagger Pro 2 (opposite of the function buttons). Push it in. The emblem on the cable will still be visible.

Plug the other end of the cable into the camera GPS port. The emblem on this cable end should be located so that it is visible from the back of the camera. This connection does not snap into place; just slide it in all the way.



It is recommended the Geotagger Pro 2 cable be left attached to the GPS unit while in storage but not necessary.

Note: Page 152 in the instruction manual D7100

Install Camera Batteries

The Nikon MB-D15 Multi-Power Battery Pack is capable of holding one rechargeable battery or six AA batteries in two different inserts. The camera will work properly with one rechargeable battery installed. The insert w/six AA batteries is used if both rechargeable batteries are discharged and there is no electrical power available to operate the charger, or if time is limited to allow for recharge.



The camera battery door is located on the left side of the camera battery pack. Flip out the latch and rotate it counter clockwise to unlock the insert. Pull the re-chargeable battery pack insert out and depress the black tab to the bottom of the insert and then slide the battery in as shown. To remove a battery, depress the black tab to the bottom of the pack and the battery will slide out to the left. Re-install the battery pack insert as shown.

If the AA battery insert accessory is used, install the six batteries while observing proper polarity. The insert will slide into the battery pack in the same manner as the rechargeable battery insert.

Turn on the camera



Check Batteries



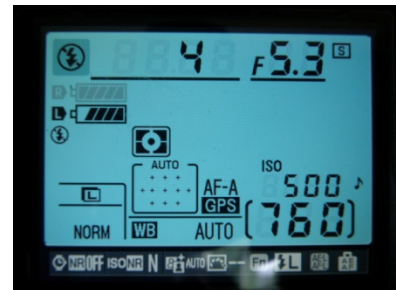
Note: the battery symbol above shows the status of the battery in use.

Press the “Info” button to turn on the Monitor.

The following will show on the Monitor. Both batteries are shown; the active battery (chosen by the camera) and the standby battery.

Note: Page 13 in the instruction manual D7100

Reset the Camera



Press the +/- and AF buttons. Hold them pressed for four seconds. The two buttons have green dots next to them. The Control Panel Display will flash to confirm reset has been completed.

Control Panel Display

Clear the memory card

Press the Menu button to bring up the Menu Display on the Monitor.

The Menu Display is navigated by pressing the up, down, left and right arrows on the Multi selector. The Multi Selector also has an “OK” button located in its center.

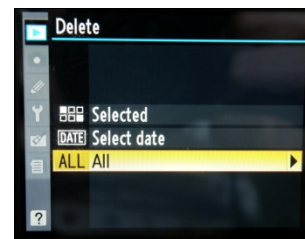
Note: Page 197 in the instruction manual D7100



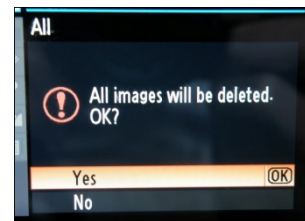
Press the left arrow key on the Multi Selector in order to



to navigate the various Menu screens. Press the up and down keys to find the “Play Back” menu. Press the right key and then the up and/or down keys to select the Delete Menu. Press the right key to select the Delete Page and then move the up and/or



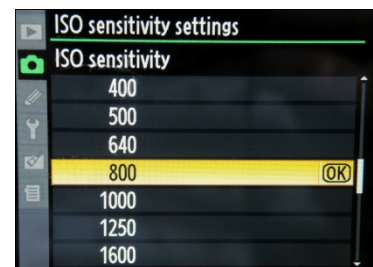
down keys to select All All. Push the right key and then the up and/or down key to select “Yes” on the Delete All screen and then push the OK button. All images on the memory card will be erased.



Set the sensitivity of the imaging receptor by adjusting its ISO value.



Press the Menu Button to bring up the Menu Screen. Press the left arrow key on the Multi-Selector in order to navigate the various Menu screens. Press the up and down keys to find the “Shooting Menu”. Press the right key and then the up and/or down

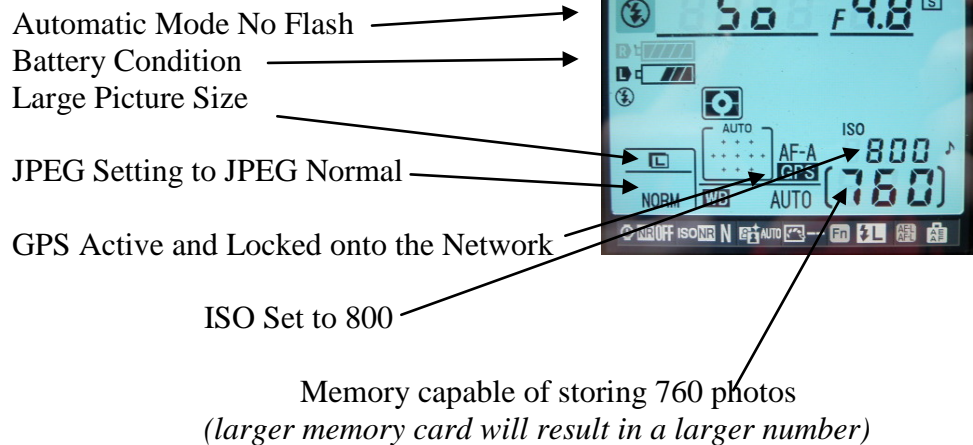


keys to select ISO sensitivity setting. Press the right key to go to the ISO selection screen. Press the up and/or down keys to select the ISO value; a setting of 800 is suggested for aerial photography. Click OK.

GPS Setup: Go to the settings menu. Scroll down to Setup Menu. Highlight the GPS tab. Move to the right.

Check Camera Settings

Press the Info button to bring up the Monitor Screen. The screen should look similar the one shown here.



1.4 Photo Check

The following is best done outside. Take the camera and the Geotagger Pro 2 GPS receiver.

Take a photo of anything; scenery, airplane, automobile, people...etc. Hold the shutter button down half way for a second to allow the lens to auto-focus. Press the shutter button all the way down to take the photo.

Note: Page 185 in the instruction manual D7100

Check the results.

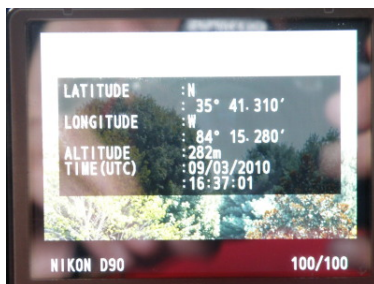
Press the Playback button.

The picture will appear on the Monitor.

The photo should be sharp and properly exposed.

Note: Page 185 in the instruction manual D7100

Push the Multi Selector “up” button to see the shooting data display. The display shows the f-stop, shutter speed, ISO value, lens focal length and an icon confirming the camera is set to the auto mode with no flash.



Press the Multi Selector “up” button one more time to view the latitude, longitude, altitude, and time and date. Presence of this data shows that the GP-1A GPS is working correctly. Note that altitude is in meters.

Delete the Photo

Press the Delete Button twice to delete the photo just taken.



Note: Page 197 in the instruction manual D7100

1.5 Set the Camera Clock

The track log recorded by the AMOD Data Logger (assuming one is in the kit or available) may be coordinated with the photographs during post-processing of mission data. The coordination is done by matching photo time and Data Logger time.

Confirm the D7100 camera is set to Coordinated Universal Time in London, England (UTC 0).

Push the camera menu button. Press the Multi Selector left button and then press the up and/or down buttons until the “Time Zone and Date” appears. Press the right button. Press the up and/or down buttons until “World Time” is highlighted. Press the right button to bring up the “Time Zone and Date” screen. Make sure daylight savings time is off and UTC 0 is selected. Now select “Date and Time”. Press the right button to bring up the “Time Zone and Date, Date and Time” screen. Use the right button to scroll through the settings while using the up and down buttons to set Year, Month and Day and then Hour, Minutes and Seconds. Set the time (hours) to that currently in London, England. The hour offset will depend upon where you are.



Daylight Savings Time Off and UTC 0 selected

1.6 AMOD Data Tracker (if provided in kit or available from other source)



Either regular or rechargeable batteries can be used.



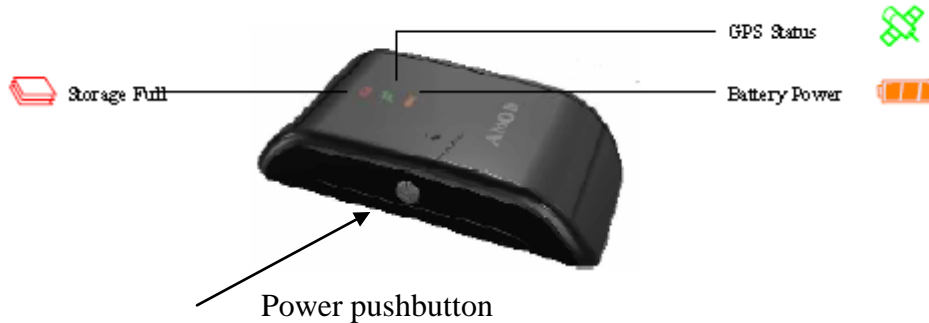
Install fresh batteries as follows:

1. Remove the back cover
2. Install three AAA batteries as shown.

The AMOD Tracker can use either rechargeable or non-rechargeable batteries. Re-chargeable batteries can be charged through the unit, but often times will charge faster using external chargers.

Fresh batteries will provide approximately 15 hours of use.

There are three status LED's on AGL3080 – Red (Storage Full), Green (GPS Status), and Amber (Battery



Take the Data Tracker outside to a place with a clear view overhead. Turn the device on by depressing the power pushbutton for one second. The three status lights will illuminate briefly then turn off. The green GPS status light will light continuously until a fix is obtained. The GPS status light will then blink continuously. GPS acquisition may take several minutes or more.

The amber Battery Power light will blink when the battery has less than 20% capacity left. The red Storage light comes on when the memory is full. When that happens, no further data logging is possible. At this point the log must be downloaded to a computer and the memory cleared. It is recommended that the memory be cleared before each flight but only after the data logs for previous flights have been downloaded or considered no longer required. See the following for how to clear the memory.



Clear the memory by holding the Mark button down for 5 seconds. All three status lights will illuminate sequentially. After all three lights have blinked in sequence, release the mark button. The track memory should now be erased.

Mark Button

It is also possible to erase the memory when the device is connected to a computer via its USB cable. See the AMOD manual for more detail.

Power Button

1.7 The Camera and associated equipment are now ready for an aerial photo mission.

Turn off the camera, AMOD Data Logger and the Remote Timer Control now that the Equipment Pre-Mission Check has been completed!
Put the lens cap back on the camera!

2.0 Training Materials

2.1 Airborne Photographer training materials are available online at:
<http://nesa.cap.gov/mas-curriculum-2>

2.2 Personnel should review the following:

Mission Aircrew Reference Text Volume 3: Airborne Photographer

Airborne Photographer Slide Presentation

Operational Mission Inflight Guide