

K. Quick Checklist of Camera Settings

1. ___ Before any new sortie, power on, press **INFO** and ensure battery has a full charge. If less than a full charge, replace camera battery with a battery with a full charge then fully recharge replaced battery at earliest possible convenience.
2. ___ Power Switch: **ON**.
3. ___ Press **Menu**.
4. ___ Scroll to **SETUP MENU** (Wrench Icon). -- OK.
5. ___ Scroll to **Format memory card** -- OK.
6. ___ Scroll to **Yes** -- OK.
7. ___ Power Switch: **OFF**.
8. ___ Solmeta Pro2: Power: **OFF**.
9. ___ Attach (SP2) to flash accessory shoe.
10. ___ Connect SP2 cable in correct orientation to camera body.
11. ___ Prior to leaving Base for AP sortie, power up the SP2. Lightly touch SP2 Power Button. Press Menu button until "**ON?**" displays. Gently press **Enter**. Data collection begins. If there is too much metal inside Base ceiling, it may be necessary to go outside for SP2 to gain satellite lock indicated by a steady GPS icon. Leave SP2 on until back inside Base after RTB.

NOTE: SP2 has an internal battery that can run up to 10 hours. When that battery depletes, it automatically runs off the camera battery until the camera battery depletes. Use the supplied USB cable to connect the SP2 to any USB port that provides the standard 5 volts. Takes about 2 hours to recharge.

D7100 DSLR Solmeta Pro 2 Data Logger (SP2)

Advanced Digital Imagery System

AIRBORNE- PHOTOGRAPHER'S- OPERATING HANDBOOK

CIVIL AIR PATROL

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Camera Lens: @ 30mm - Shutter: 1/1000 sec
 Ground Speed: 100 kts (169 ft/sec) 25% overlap

Altitude(AGL)	Lens View	Overlap	Time Interval
1000	800	200	04 sec
1500	1200	300	05 sec
2000	1600	400	07 sec
2500	2000	500	09 sec
3000	2400	600	10 sec
3500	2800	700	13 sec
4000	3200	800	14 sec
4500	3600	900	16 sec
5000	4000	1000	18 sec
5500	4400	1100	20 sec
6000	4800	1200	22 sec
6500	5200	1300	23 sec
7000	5600	1400	25 sec
7500	6000	1500	27 sec
8000	6400	1600	29 sec
8500	6800	1700	31 sec
9000	7200	1800	32 sec
9500	7600	1500	34 sec
10000	8000	2000	36 sec

A. Nikon APOH Checklist Conventions:

1. ___ **The AE-L/AE-L button to the right of the viewfinder is menu set (Page 5, lines 32 – 33). for continuous focusing, it is important to press and hold this button during imaging. Upon release, current focus is saved. No ½ shutter release for pre-focusing needed and is disabled.**
2. ___ To access Main Menu (Playback Menu, Shooting Menu, Custom Setting Menu, Setup Menu, etc. at any time – by pressing the Menu button LCD Monitor will default to MENU options in far left column.
3. ___ For any new sortie, ensure battery has at full charge. Ensure back-up battery with a full charge is available in a/c.
4. ___ Clearly mark all equipment including camera case with a/c tail number. (Use Scotch Blue Painter’s masking tape.)
5. ___ AP eyeball Seat-To-Camera-Port-Height (S-T-C-P-H) is to the top of the camera port. If your eyeball S-T-C-P-H is less than that, obtain cushions to raise your eyeball to the top edge of the camera port.
6. ___ No lens hood **OR** camera lens cap-keeper **shall** be used.
7. ___ The camera strap **SHALL** be used to prevent camera from dropping out of the a/c.
8. ___ The cockpit overhead **WILL ALLOW** GPS satellite acquisition.
9. ___ Lens: Only “**AF**” focus position **SHALL** be used. **NOT “M”**.
10. ___ Ensure that lens filter is secure and tight.
11. ___ Absolutely check batteries at the beginning and end of each sortie. Then check batteries at least once per month at Squadron HQ.
12. ___ Do **NOT** stress or strain SP2 cables especially by resting the camera on the side of the cables. Always rest the camera on its base, never on its backside or on the front of the lens.

I. Save camera settings to an SD Memory Card (D7100 Only)

1. ___ Camera Off. Open SD media door.
 2. ___ Insert SDHC memory card into SD card slot 1. Close door.
 3. ___ Camera On. Scroll to **SETUP MENU** (Wrench Icon) -- -- OK.
 4. ___ Scroll to **Format memory card**. (See **Page 4, steps 4 – 7**).
 5. ___ Press the **Menu** button.
 6. ___ Scroll to **Save/Load settings** -- -- OK.
 7. ___ Select **Save settings** -- -- OK.
 8. ___ Camera -- -- OFF.
 9. ___ Remove **memory card** from SD card slot 1. Lock the Write-Protect notch; store in safe place. (On this chip is a saved file that contains every configuration setting for the Nikon D7100 model only).
- ### **J. Reset camera settings from an SD chip (D7100 Only)**
1. ___ Camera Off.
 2. ___ Insert SD chip saved from the process in **Section J**. above into SD card slot 1.
 3. ___ Close door.
 4. ___ Camera -- -- ON.
 5. ___ Press the **Menu** button.
 6. ___ Scroll to **SETUP MENU** (Wrench Icon) -- -- OK.
 7. ___ Scroll to **Save/Load settings** -- -- OK.
 8. ___ Select **Load settings** -- -- OK..
 9. ___ **ALL** camera configuration settings are reset to the saved settings on your personal SD chip from the file named NCSETUPB.BIN used to completely reset the camera back to the proper APOH standards.
 10. ___ Camera -- -- OFF.
 11. ___ Remove SD "SAVE" card to a safe location. This card can be used to clone any Nikon D7100 to your saved settings.
 12. ___ Check manual settings: Mode Dial: S; Shutter: 1/1000s; focus mode: AF-C; AF (camera body);  selector to camera icon.

B. Solmeta Pro 2 (SP2) Data Logger Preflight Checklist for each sortie.

1. ___ Attach the unit by sliding it into the accessory shoe on top of the camera body.
2. ___ Attach the end of the power cord into the GPS port at the bottom, right side (as viewed from the front). Ensure orientation of cord notch with groove in GPS port in camera body. **GPS** is embossed on door.
3. ___ Gently press power button on side of GPS unit. **GENTLE PRESSURE FOR ALL BUTTON COMMANDS!**
4. ___ Wait until GPS icon in the LCD display is steady indicating a GPS lock. (Blinking icon indicates GPS search mode). Until GPS lock, the SP2 cannot be set nor log data.
5. ___ Briefly press **Power**. Press **Menu** until **ON?** appears. (This enables data logger and GPS to operate together). Press **Enter** to accept. (SP2 now collects metadata and a/c track).
6. ___ When powered up, the SP2 continues to collect data from its own internal 10 hour battery even if the camera is off. To stop track data, power down the SP2.
7. ___ Power down by lightly pressing and holding **Power** button for about 3 seconds until **OFF?** is displayed.
8. ___ Briefly/gently press **Enter** and release. SP2 will power down.

C. ADIS MISSION AP CHECKLIST

Scroll: means use multi-selector. OK: means press OK button.

1. ___ Nikon Model D7100 Power Switch -- -- OFF.
2. ___ Ensure or insert SDHC media chip in **Memory Card Slot**.
3. ___ **D7100** Power Switch -- -- **ON**. Check battery for full charge in top Control Panel (upper left).
4. ___ Press **Menu**. (if necessary, scroll left to Menu column)
5. ___ Scroll to **SETUP MENU** (Wrench Icon). -- -- OK.
6. ___ Scroll to **Format memory card** -- -- OK
7. ___ Scroll to **Yes** -- -- OK.

8. ___ On right front of camera, ensure Focus Mode Selector -- -- **AF**.
9. ___ On the Nikon DX 18- 200mm lens, set Focus mode switch: **M/A**. (Auto-focus with **Manual** override) or **A** in non-18-200 mm lens.
10. ___ On the lens, set Vibration Reduction (VR) switch: **ON**.
11. ___ On the lens, set Vibration Reduction Mode Switch: **ACTIVE**.
12. ___ Press Mode dial lock release, then rotate Mode dial to: **S** (Shutter-priority auto). Mode Release dial set to **S** (single frame) located under the Mode dial.
13. ___ Press **INFO** button, then use **Main Command dial** to set shutter speed: **1/1000 sec**.
14. ___ Use Scotch Blue Painter's Tape over **Main Command Dial**. Prevents inadvertent changes to settings).
15. ___ Set round Diopter Adjustment Control to the right of viewfinder eyepiece.
16. ___ On the back of the camera body, ensure that **Lv** selector is **Live view photography** (camera icon).
17. ___ Reset D7100 camera **Default Settings** by pressing "+/-" button (top of camera body) and "**ISO**" (back of camera) green dot buttons together for more than two seconds. The Control Panel on top of camera body flashes off briefly while default settings are reset.
18. ___ Press **AF-mode** button and simultaneously rotate the **Main Command Dial** until "**AF-C**" in **Control Panel** on top of camera body. Release both.
19. ___ Press **Menu** button.
20. ___ Scroll to **PLAYBACK MENU** (Boxed right arrow) -- -- OK.
21. ___ Scroll to Playback display options -- -- OK.
22. ___ Press Multi selector right arrow to activate **Focus point, None (image only), Shooting data** and **Overview**.
23. ___ Press -- -- OK. (Camera now remembers changes to menu).
24. ___ Scroll to **CUSTOM SETTING MENU**. (Pencil Icon) -- -- OK.

G. The "Golden Hour" (1/2 Hour Before and After Sunset)

1. ___ Press Mode dial lock release rotate Mode dial to -- -- "**A**" (**Aperture-priority auto**).
2. ___ Camera power -- -- ON.
3. ___ Press **Menu** button, then scroll to **SHOOTING MENU**. (Pencil Icon) -- -- OK.
4. ___ Scroll to: **ISO sensitivity settings** -- -- OK.
5. ___ Scroll to **Maximum sensitivity** -- -- OK.
6. ___ Scroll to **3200** -- -- OK.
7. ___ Camera power -- -- OFF.

H. On-camera, In-Cabin Photo/Metadata Viewing/Verification

1. ___ Camera power -- -- ON.
2. ___ Push **playback button** (right pointing boxed arrow: backside, upper left) .
3. ___ Scroll up arrow on **Multi selector** button once until GPS data appears.
4. ___ If GPS metadata is embedded, it will display.
5. ___ Push right arrow to move to next image GPS metadata. . (To check all images for GPS data, scroll right on Multi selector button. Each image will display GPS data or lack of same. Push **OK** return to view image, then delete as necessary.
6. ___ If metadata is NOT embedded or image is unacceptable, push trash can (back, upper left) twice to delete.
7. ___ To check for photo detail, AP may use + magnifying glass or -- magnifying glass left of monitor screen) and use Multi selector to move around in photo. To exit zoom, press -- -- **OK**. Original full size image will appear on screen. If image is unacceptable, push trash can (upper left) twice to delete.
8. ___ If necessary, MP positions a/c for replacement images(s).

F. SAREX Reconnaissance Sortie with a Nadir image and four images 90° apart.

Each target **shall** have at least one nadir (vertical) picture.

1. ___ MP: 1000 Feet AGL – 90 knots – heading towards target.
2. ___ AP adjust focal length of lens appropriately.
3. ___ AP – Camera Power Switch: **ON**. Ensure SP2 data collection active – – SP2 steady GPS icon.
4. ___ AP holds camera at 270° relative; 45° to ground.
5. ___ Ten seconds from target, MP announces count from 1 to 10 seconds. In sync with MS/AP, MP banks left wing momentarily to align camera 90° to ground,
6. ___ AP simultaneously takes image saying, “**SHOT**”.
7. ___ MP returns a/c to straight and level, performs cloverleaf or teardrop to position a/c for first oblique image.
8. ___ When target is 270° relative, camera 45° to the ground, AP takes image and says, “**SHOT**”.
9. ___ MP performs cloverleaf to position a/c for next image 90° left of first track.
10. ___ When target is 270° relative, AP takes image and says, “**SHOT**”.
11. ___ MP performs cloverleaf to position a/c for next image 90° left of second track.
12. ___ When target is 270° relative, AP takes image and says, “**SHOT**”.
13. ___ MP performs cloverleaf to position a/c for next image 90° left of third track.
14. ___ When target is 270° relative, AP takes last image and says, “**SHOT**”.
15. ___ Review each photo and metadata in the target area. (See page 9-10, Section H: Items: 1 – 8). Retake as necessary.

25. ___ Scroll to **Reset custom settings** – – OK.
26. ___ Scroll to **Yes** – – OK.
27. ___ Scroll to **c Timers/AE lock** – – OK.
28. ___ Scroll to **c4 Monitor off delay** – – OK.
29. ___ Scroll to **Menus** – – OK. Scroll to **5 min** – – OK.
30. ___ Scroll to: **d Shooting/display** – – OK.
31. ___ Scroll to **d2 Viewfinder grid display** – – OK Scroll: **On** – – OK.
32. ___ Scroll to **f4** – – OK. At **Press** – – OK Scroll to **AF-ON** – – OK.
33. ___ Scroll to **f9** – – OK. Scroll to **AF-ON** – – OK.
34. ___ Press **Menu** button.
35. ___ Scroll to **SHOOTING MENU**. (Camera Icon) – – OK.
36. ___ Scroll to **Reset shooting menu** – – OK.
37. ___ Scroll to **Yes** – – OK. Scroll to **Image quality** – – OK.
38. ___ Scroll to **JPEG Fine** – – OK.
39. ___ Scroll to **Set Picture Control** – – OK.
40. ___ Scroll to **NL Neutral** – – OK.
41. ___ Scroll to **Color space** – – OK. Scroll to **Adobe RGB** – – OK.
42. ___ Scroll to **ISO sensitivity settings** – – OK.
43. ___ Scroll to **Auto ISO sensitivity control** – – OK.
44. ___ Scroll up to **On** – – OK.
45. ___ Scroll to **Maximum sensitivity** – – OK.
46. ___ Scroll to **1600** – – OK.
44. ___ Scroll to **Minimum shutter speed** – – OK.
45. ___ Scroll to **1/500 s** – – OK. Then Scroll left.
46. ___ Press **Menu** button.
47. ___ Scroll to **SETUP MENU** (Wrench icon) – – OK.
48. ___ Scroll to **Time zone and date** – – OK.
49. ___ At **Time zone** – – OK.
50. ___ Scroll to **Los Angeles, Seattle, Vancouver** (or your current time zone) – – OK.
51. ___ Scroll to **Daylight savings time** (set as appropriate) – – OK.
52. ___ Mount Solmeta Pro 2 (SP2) in flash accessory shoe.
53. ___ Insert SP2 cable into GPS socket in the SP2 device. Observe correct orientation. Insert the other end of the SP2 cable into

camera body by matching arrow on cable end with arrow in camera body. Ensure orientation of cord notch with groove in GPS port in camera body. **GPS** is embossed on door. Cable will orient upward. Do **NOT** force!

54. ___ Gently press power button on side of GPS unit. **GENTLE PRESSURE FOR ALL BUTTON COMMANDS!**
55. ___ Wait until GPS icon in the LCD display is steady indicating a GPS lock. (Blinking icon indicates GPS search mode). Until GPS lock, the SP2 cannot be set nor log data.
56. ___ Briefly press **Power**. Press **Menu** until **ON?** appears.
57. ___ Press **Enter** to accept. SP2 now collects metadata and a/c track. (When powered up, the SP2 continues to collect metadata from its own internal 10 hour battery even if the camera is off).
58. ___ Power down by lightly pressing and holding **Power** button for about 3 seconds until **OFF?** is displayed.
58. ___ Gently press **Enter** and release. SP2 will power down.
60. ___ Camera -- -- **OFF**.

D. Final Pre-flight Camera Preparation

1. ___ Ensure Mode Dial set to: **S**.
2. ___ Ensure Main Command dial: set Shutter Speed: **1/1000 sec**.
3. ___ Blue tape Main Command dial (top, back of camera body). Do **NOT** stress or strain SP2 cables especially by resting the camera on the side of the cables.
4. ___ **Unlock Zoom Lock Switch** (left side of lens).
5. ___ Choose a suitable focal length to compose a **75%** of frame image for target in viewfinder or LCD Monitor screen. Do **NOT** capture a/c parts, i.e. wheel, strut or wing in photo(s).
6. ___ Camera power: **ON**. SP2: **ON**. (Sometimes no GPS signal inside Base). Check GPS icon on top Monitor screen: Flashing: SP2 searching, for satellites: No data recorded.

SP2 GPS icon on Monitor screen steady: GPS lock and can begin data recording) once SP2 is activated. .
7. ___ After sortie, set zoom to 18mm and lock **Zoom Lock Switch**

E. Setting up camera for Interval Timer shooting of Strip Images: 90 kts GS, Camera 45° to ground

1. ___ As per Customer Request, from Page 11, choose focal length and specified time interval. The chart is based upon 30 mm focal length. If the focal length increases by a factor of 2 (to 60mm), 3(to 90mm), 4(to 120mm) etc, the timing interval decreases by multiple of 0.5, 0.3, 0.24, etc.
2. ___ Set lens to approximately 30 mm and apply Scotch Blue Tape to secure zoom ring to lens body. Do **NOT** apply tape to focus ring.
3. ___ Camera -- -- **ON**.
4. ___ Press **Menu** button.
5. ___ Scroll to **SHOOTING MENU** (Camera Icon). -- -- **OK**.
6. ___ Scroll to **Interval timer shooting** -- -- **OK**.
7. ___ At **Now** -- -- Scroll right and set 00 : 00' : 07"
8. ___ Scroll right: Set **Number of times**: 999 X 1
9. ___ Scroll right, scroll up to **On** -- -- **OK** (Begins shooting in **3 sec.**)
10. ___ Shoot only one image. Camera: **OFF**. (This allows the camera to retain interval settings). Delete that image before leaving Base.
11. ___ To stop **Interval Timer Shooting**: Camera -- -- **OFF**.
12. ___ Review images for GPS data and content. (Page 9, Section I)
13. ___ Delete and retake as necessary.
14. ___ To restart: camera **On**, press **Menu** then **OK**. Scroll left.
15. ___ At **Restart** -- -- **OK**.
16. ___ Review each photo and metadata. (See page 9, Section H: Items: 1 – 8). Delete and retake as necessary.