

Sony A7C and Nauticam NA-A7C housing

by Phil Rudin

During September 2020 Sony launched the A7C - a camera that combines the advantages of an advanced full frame sensor with the size advantages of a mirrorless APS-C or M4/3 camera body.

The Sony A7C is almost identical in size and weight to the Sony A6600 APS-C camera with many of the same features and noticeably smaller and lighter than the Olympus EM1-III.

The big difference is the much larger A7C sensor size of 35.6mm X 23.8mm v. 23.6mm X 15.6mm for A6600 and 17.4mm X 13mm for EM1 III. The updated 24.2 megapixel A7C sensor has the same 6000 X 4000 maximum resolution found on Sony's A7 III, Nikon's Z6 II and more than on Canon's EOS R6 20.1 megapixel 5472 X 3648 resolution bodies. Sony has also managed to incorporate its sensor based in-body image-stabilization with a CIPA rating of 5.0 stops of stabilization into this very small package.

The latest 24.2 MP Exmor R BSI CMOS sensor offers up to 15 stops of dynamic range along with UHD 4K/30 video recording using the BIONZ X image processor. The A7C shoots up to 10 FPS with mechanical shutter but has two lower speeds in around the three FPS and 5 FPS range. Set at ten FPS my Nauticam manual flash trigger was able to keep up without missing a frame. To do the same the flashes will need to be set to manual at about 1/4 power in the case of Inon Z330's to keep up.

At 10FPS the camera can buffer about 115 RAW captures and 223 JPEG captures. ISO sensitively ranges from 100 to 51200 and is

expandable to 50 and 24800. I frequently use the 50, 64 and 80 ISO end of the range but never the high end. These three low end ISO settings become most useful helping to counter the low 1/160th second maximum shutter sync speed of the A7C when shooting for dark backgrounds or in bright ambient lighting.

During my testing I found that with the Nauticam mini flash trigger I could shoot at 1/200th sec. with no issues. At 1/250th the black bar begins to enter the top of the frame and by 1/500th sec. the sensor is about half covered.

The Sony sensor also includes the fast hybrid auto focus system which uses 693 phase detection points and 425 contrast detection points for very fast and precise auto focus. The A7C has the same Real-time Eye AF, animal eye AF and Real Time Tracking AF technologies found in the Sony A7R IV. This auto focus system works so well that I have locked in a new feature for A7C and the new A-1 coming this month. I have Lock-on AF Expanded Flexible Spot (M) set to the AF-ON button activated with my thumb. This combination allows me to lock focus with a half press of the shutter and then drag the focus point around the frame while maintaining the original focus area. This means I can focus on an animals eye in the center of the frame then drag the eye around the frame for the best composition without losing the tack sharp focus on the eye. I can then trigger the shot by depressing the shutter while locked in.

Auto focus Tracking sensitivity can also be

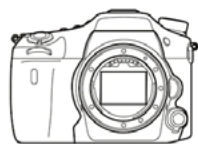


A7c with 28-60mm zoom and A7R IV with Sony FE 28-70mm zoom

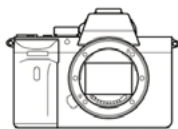
set across five settings from #1 locked on and four levels of responsiveness, I am trying #4 and will tweak as required for best results. I have the focus area array to the shutter trigger in AF-S for more of a point and shoot type of a situation.

Another subtle but very useful update carried over from the A7R IV is that the focus area can be set to white or red for ease of use. For those who have used earlier versions of the A7 cameras and tried to locate the flat gray focus box underwater or in bright light I feel your pain, underwater the RED box stands out much better than the white or gray.

Many readers have ask me about the



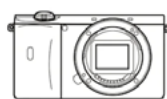
α99 II



α7 III



α7C



α6600

implementation of animal eye autofocus. With a fair amount of testing I have found the animal eye AF is more than a bit hit and miss underwater. At this time it does not work in conjunction with lock-on expanded flexible spot because the idea with eye AF is to find the animal/human eye regardless of where it is in the frame and lock onto the eye.

You can even chose between the right or left eye and select one person's eye out of a group of people in the frame. I have used the human eye AF shooting models both underwater and while doing splits and it is spot on. If you do set the camera for animal eye AF it will also lock focus on human eyes without having to switch back from animal eye AF.

For pets like cats and dogs animal eye AF works very well and bird eye AF is coming in the new Sony Alpha 1. I had great success using animal eye AF for horses, dogs and a cow but it is still not ready for prime time for most marine life. The eye AF has also been added to video and can be used with or without the touch screen.

The newest Canon mirrorless cameras have taken the lead over Sony in the Bird and animal eye AF but also don't work on marine life. For me Sony's Real Time Tracking AF technology and more precisely the Lock-on AF expended flexible spot is still my goto AF setting. I have been using the Medium size focus area box for most precise focus lock-on.

The Sony A7C also has many of the video features most have come to expect in the non-video centric Sony cameras including the rather quick video AF capability. The A7C has 4K30p using 2.4x oversampling with HLG and S-log3 Gammas it also shoots Full HD 1080p up to 120 fps. Since my review is directed to still shooters I will leave the video features for other reviewers.

The A7C uses a less than impressive 0.39"-type XGA OLED electronic viewfinder with a 2.36m-dot resolution and 0.59x magnification offset to the left rear of the camera like the A6000 series bodies. It also features the 3.0" 921.6k-dot rear LCD with the new fully rotating, forward facing design



which You-tubers and video bloggers covet. This allows you the benefit of working from high, low, and front-facing angles. It's also a touchscreen for intuitive control on the fly and quick playback.

The LCD features are great if you are shooting above water but in a housing they are of little use and because the LCD no longer tilts out at the bottom you can't even get that extra little fifteen degree upward slant in some housings like with the older non rotating, tilting screens.

The A7C uses the same large-capacity NP-FZ100 battery found in the newer A7, A9 and now Alpha 1 lines offers approximately 740 shots per charge when working with the rear LCD or 680 shots per charge when working with the EVF. Battery specs for the A7C will far exceed these published numbers and should be better than any other camera in the Sony full frame line.

Another issue which may disturb some is the single SD memory card slot which supports UHS-II cards. While I fully understand the need

for two card slots and the expensive new Sony CF Express type A cards for high end and high speed cameras like the Sony Alpha 1 the current SD cards are more than fast enough for the A7C.

The overlooked things that will actually be more important to underwater photographers are details like the card slot being moved to the side of the camera rather than in the battery compartment. This allows those with long thin fingers to remove and reinstall the card without removing the camera from the housing. You also have the convenience of in-camera battery charging, Bluetooth connectivity for local data acquisition, built-in Wi-Fi enabling image sharing to mobile devices, a Magnesium-alloy chassis with weather sealing, support for the Sony ECM-B1M shotgun Microphone and much more.

This may be a good place to add a disclaimer regarding the use of 35mm full frame cameras both underwater and for terrestrial use. If you are thinking about making the

jump from compact, M4/3 or APS-C cameras be aware of the following.

Among the advantages of full frame cameras are greater control over depth of field, better low light performance, improved dynamic range and color depth, in many cameras higher numbers of megapixels for added ability to crop, larger files for much larger prints and more.

The disadvantages include greater expense in many cases, no crop factor v. sub full frame cameras especially relevant in macro work. Full frame cameras especially high MP ones expose flaws in lenses, focus, shallow depth of field and more. Many of the files are much larger than those from sub full frame taking up more room on computers, hard drives and flash cards. Underwater disadvantages are extended to reduced corner sharpness at like F/numbers especially when using rectilinear wide angle lenses.

Overall system weight and size compared to sub FF adds restrictions in regard to travel and more. Regarding size and weight you can exclude the A7C system if properly equipped.

Retail cost for the Sony A7C is \$1798.00 at release and \$2098.00 with the new “kit” lens. The body is available in black or black with silver trim.

The new Sony FE 28mm to 60mm F4-5.6 zoom lens

At the time Sony A7C was introduced two other new items were released that may have been overlooked by many - the tiny HVL-F28RM flash which runs on two AA-sized batteries and very much fits the small profile of the A7C camera body and the FE 28-60 F/4-5.6 “kit” zoom lens.

I didn't really give the new kit zoom lens a lot of thought other than for its very small size until Nauticam released its first port chart for the A7C. Lets face it, a smaller full frame camera doesn't really add a lot of value if you are using it underwater with the large full frame lenses and ports most of us have been using with the A7 and A9 series cameras.

The Sony mirrorless cameras, lenses, housings and ports tend to be smaller than like DSLR's as are mirrorless M4/3 equipment to the current Sony line. The A7C changes all of that - now not only do you have a smaller camera with a Nauticam housing the size of the Sony A6600 APS-C housing and noticeably smaller than the Olympus EM1 III M4/3 housing but you can also use many of the same accessories.

With the full frame A7C and the tiny 28-60 zoom you can use water contact optics normally reserved for



sub-full frame cameras. Because of the small diameter of the optics in the new 28-60 zoom you can use Nauticam's CMC 1 & 2 closeup lenses rather than needing to go to the larger and more expensive SMC-1 & 2.

With CMC-1 the maximum magnification is 1:1.1 and 1:1.4 with CMC-2 and the CMC lenses can be stacked for greater magnification. One CMC lens does not produce super macro but is not at all bad considering the lenses can be interchanged with the WWL-1 underwater just like on a compact system.

Rather than needing to go to the Nauticam WACP or WACP-2 for a full zoom through lens you can use the WWL-1/1B and get a 130 to 68 degree field of view just as you would get using WACP. If you already own WACP or SMC lenses they also work quite well with the 28-60 zoom both on A7C or on any of the other Sony full frame cameras up to the 61MP A7R IV.

Nauticam NA-A7C Housing and Ports

Like other Nauticam housings the new NA-A7C housing lives up to Nauticam's commitment to “Innovation Underwater” by creating a full frame camera housing the size of the Sony A6000 series housings and noticeably smaller than many Micro 4/3 housings.

The new NA-A7C housing retains the N100 port size used with all of the Sony full frame housings. The ergonomic handle system with stainless steel stiffening brackets and one inch ball mounts is included along with the patented port locking system unveiled on the first Nauticam DSLR housing back in 2009.

Nauticam build quality is well known by underwater photographers around the globe. The NA-A7C housing is machined from a solid block of aluminum, then hard anodized making it impervious to salt water corrosion. Marine grade



stainless and plastic parts are used to complete the housing which is then backed by a two year warranty against manufacturing defects.

The NA-A7C housing is the first Nauticam full frame “Clam Shell” style housing with the clam shell back hinged to the left hand side of the housing. The housing uses the same rotary locking system found on all Nauticam N85 mirrorless camera housing. The NA-A7C housing features a locking camera tray which keeps the camera secure and properly aligned while opening the back plate. The lever locking tray is secured to the bottom of the camera via a tripod screw and two tabs help to protect the bottom of the LCD screen.

To slide the camera tray into place inside the housing move the tray locking lever to the right, unlocked position; once the camera is installed the lever is moved back into the

locked position.

The left hand side of the housing has a rubberized zoom/focus knob which is quite smooth in use and very easy to control while holding the left hand grip.

After installing the camera and aligning all of the control levers the housing can be closed, always keep the camera turned off during the installation process. Once you cycle through this process a few times removing and reinstalling the camera becomes very easy.

The NA-A7C housing also has two fiber optic bulkheads on top for triggering up to four optically triggered flashes. Flashes like the Inon Z-330, Z-240, S-2000, D-2000, Sea & Sea YS-series, Retra, Backscatter MF-1 and more will all fire using these sync ports. Flashes can be fired in manual mode using the Nauticam Mini Flash Trigger for Sony (#26302).



Florida Red-Bellied Turtle, High Springs, Florida, Sony A7C, Sony FE 28-60mm zoom, Nauticam housing and port, at 53mm, Nauticam WWL-1, two Inon Z-330 flashes, ISO-400, F/8, 1/125th sec

After market Sony flash triggers like the S-TurtleSmart TTL trigger for Sony reviewed in back issue #110 can also provide TTL for most mainstream flashes like the Inon’s.

The upside to Nauticam’s \$267.00 US flash trigger is that it uses two CR2450 batteries which will run a very long time with the super small LED lights. The flash trigger will also work at blazing speeds easily keeping up with the 10 frames per second mechanical shutter. Flashes like the Inon Z-330 set to lower manual powers can also recycle in the 6 to

10 FPS range with quality batteries making high speed flash photography possible underwater using fiber optics, think Sailfish.

If you want to hardwire your flashes the NA-A7C housing has M14 bulkhead for Nikonos and other configurations along with the larger-bore M24 bulkhead opening that allows for the use of Nauticam HDMI 2.0 cables for connection to recorders such as the Atomos Ninja V.

The NA-A7C housing accommodates an accessory optical view finder which Nauticam offers

as an option in both 45 degree and 180 degree. The optical finders have the same diopter adjustment as the DSLR finders and the same superior optical quality however they are the MIL housing style so they can't be exchanged with other Sony full frame housings.

The NA-A7c housing also has the optical finder offset to the top left like the Sony A6000 line of housings. The A7C has a small viewfinder and without the accessory viewfinder the image in the pickup finder will be full view but quite small. I use the 45 degree finder for all my macro and super macro work especially with high power closeup lenses like the Nauticam CMC-1.

After years of use I have become spoiled and would not want to go back to the pickup finder which ships with the housing. For those who have never used a 45 degree finder expect a learning curve of 10 to 15 dives. For fast moving subjects and wide angle scenes the 180 degree finder will be the better choice if you are not using very low angles.

Nauticam has updated the optional vacuum valve to version II the new low profile valve II has a red push button to release the vacuum when you remove the cap. The M14 opening on the rear door of the housing has been tilted a few degrees towards the rear of the housing

making it much easier to mount the vacuum pump onto the smaller valve II without needing to move clamps, arms and other accessories.

The NA-A7C housing has a new blue vacuum reset button at the bottom of the port mount which allows you to reset the vacuum system without opening the rear of the housing. Once you have turned the vacuum switch on inside the housing and secured the housing back it does not need to be reopened for reset. This means that if you want to change lenses between dives you can release the vacuum by depressing the valve button, remove the port, reinstall lenses and ports then reset the vacuum system. Once you have install a new lens & port you can draw the vacuum without ever needing to open the housing back.

With housings like the NA-A7C and other full frame housing lenses like the Sony FE 12-24mm zoom, they need to be mounted from the front of the housing due to the lens & gear diameter. Having the reset button at the port opening will expedite this process, kudos Nauticam for making life a little easier.

My review of the original vacuum system is in back issue #76 at UWPMAG.com. One of the major problems with designing a housing for such a small camera is being able to place the control buttons and dials



High Springs, Florida, Sony A7C, Sony FE 28-60mm zoom, Nauticam housing and port, at 32mm, Nauticam WACP-1, A/V light, ISO-640, F/10, 1/125th sec. When the river rises water backs up into the springs and the water level is very high covering trees and plants that are normally well above the water line

far enough apart so that you have fingertip control even while wearing heavy gloves. The button control layout for the NA-A7C housing is quite good - what Nauticam calls "Mission Control Design Philosophy" allows me to effortlessly reach all of the controls without having to look at which buttons I am about to push.

All of the current Nauticam N100 & N120 ports for Sony and after market lenses will fit the new housing along with the some of the

outstanding ZEN Underwater ports.

The Sony A7C has a very simple control layout and you have a verity of choices for customizing your control layout. Once you have customized and mastered the button layout you will not find yourself turning the camera off or hitting the video button by mistake.

I am still assigning functions but find it is a breeze to reach the controls once you have dived the system a few times. If you have ever used a housing

where the control buttons were placed directly over the ones on the camera you will appreciate the time that has been spent ergonomically designing the function buttons for this housing. The only control on the camera I found a bit annoying is the tiny dial used to adjust (+/- diopter) on the EVF which is done once and before the camera is sealed in the housing. I do everything manually in camera and found navigating ISO, shutter speed and aperture settings to be a breeze with this housing.

Field testing the Nauticam NA-A7C

For the purposes of this review I set out to only use the 28-60 “kit” lens with the Nauticam SFE2860-Z zoom gear (\$207.00) and the N100 flat port 45 with focus knob (\$491.00). This configuration allowed me to use the lens behind the flat port from 28-60mm, I was also able to add the CMC-1 and stacked CMC-1. Using two CMC-1’s you get very-very shallow depth of field and a minimum focus distance in the 8 to 10mm range. This is advanced macro work and for those new to macro you are more likely to damage or dislodge your subject than you are to get a well focused image.

With a single CMC-1 the AF worked very well with the kit lens. This lens is one of Sony’s latest lens designs and it can focus up to thirty frames per second with the new Sony A-1.

For wide angle I used Nauticam’s WWL-1 and WACP-1 Water Contact Optics. I used the WWL-1 with the Nauticam bayonet mount which interchanged with the CMC-1 bayonet mount. This makes the system much like many of the consumer compacts being used today where you can shoot from macro to whales on the same dive.



Eel, Salt Springs, Florida, Sony A7C, Sony FE 28-60mm zoom, Nauticam housing and port, at 60mm, Nauticam WWL-1, two Inon Z-330 flashes, ISO-400, F/11, 1/200th sec

I also only used the LCD to compose and focus. Many of the wide angle shots were done like a point and shoot camera where I just let the auto focus do its thing and lock on the nearest subject or central subject in the frame. For macro I



Pan Fish, High Springs, Florida, Sony A7C, Sony FE 28-60mm zoom, Nauticam housing and port, at 28mm, Nauticam WWL-1, two Inon Z-330 flashes, ISO-400, F/10, 1/125th sec

used the tracking and locked onto a subject or area and moved it around in the frame until I got the composition that was most pleasing. For wide angle in landscape and portrait I also locked focus on something in the foreground and chose an F/number

that would give me the depth of field I needed.

The weight difference between WWL-1 and WACP-1 is very noticeable while you are walking the rig to the water but once underwater you hardly notice any difference. If you are a pixel-peeper you will not be able to see the difference between the images taken with both wet lenses in this review. In a followup review I will try to show the differences in corner and overall image quality with a higher MP camera like Sony A7R IV or A1. I also intend to followup with lenses like the Canon 8-15mm fisheye, Rokinon 18mm and Tamron 17-28mm F/2.8 reviewed in this issue. These lenses can be used with smaller ports like the 140mm and 180mm dome port that more fit the size of the A7C housing.

I found this camera system to be very user friendly, easy to travel with and with the proper lens selections a bargain for those wanting to get into full frame. I don't consider this camera to be a gimmick just to show Sony's ability to innovate. I look at it as the beginning of a full line of downsized full frame cameras and lenses. Sony could easily equip an R version of this camera with a 50MP sensor or higher.

With the introduction of the 28-60 zoom Sony has shown that smaller lens designs for full frame

are possible. A small macro and fisheye would be nice but I am sure that will be a long way off. What is unique about this camera is that you can move up from a compact or M43/APS-C cameras or down from a DSLR and get high quality images with just the kit lens and two water contact lenses. This camera also worked very well with the smaller Backscatter MF-1's I used for macro and the Inon Z-330's I used for wide shots.

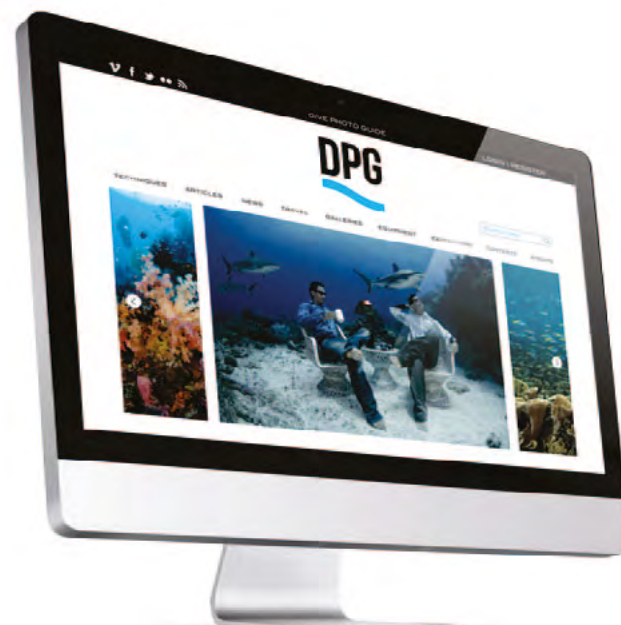
I would once again like to thank Nauticam USA for their assistance with equipment for this review.

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