Guardrail Tutorials

for

iPaddlers

- **USB Storage Options**
- **Cables, Connectors and Adaptors**

iPad & iPhone

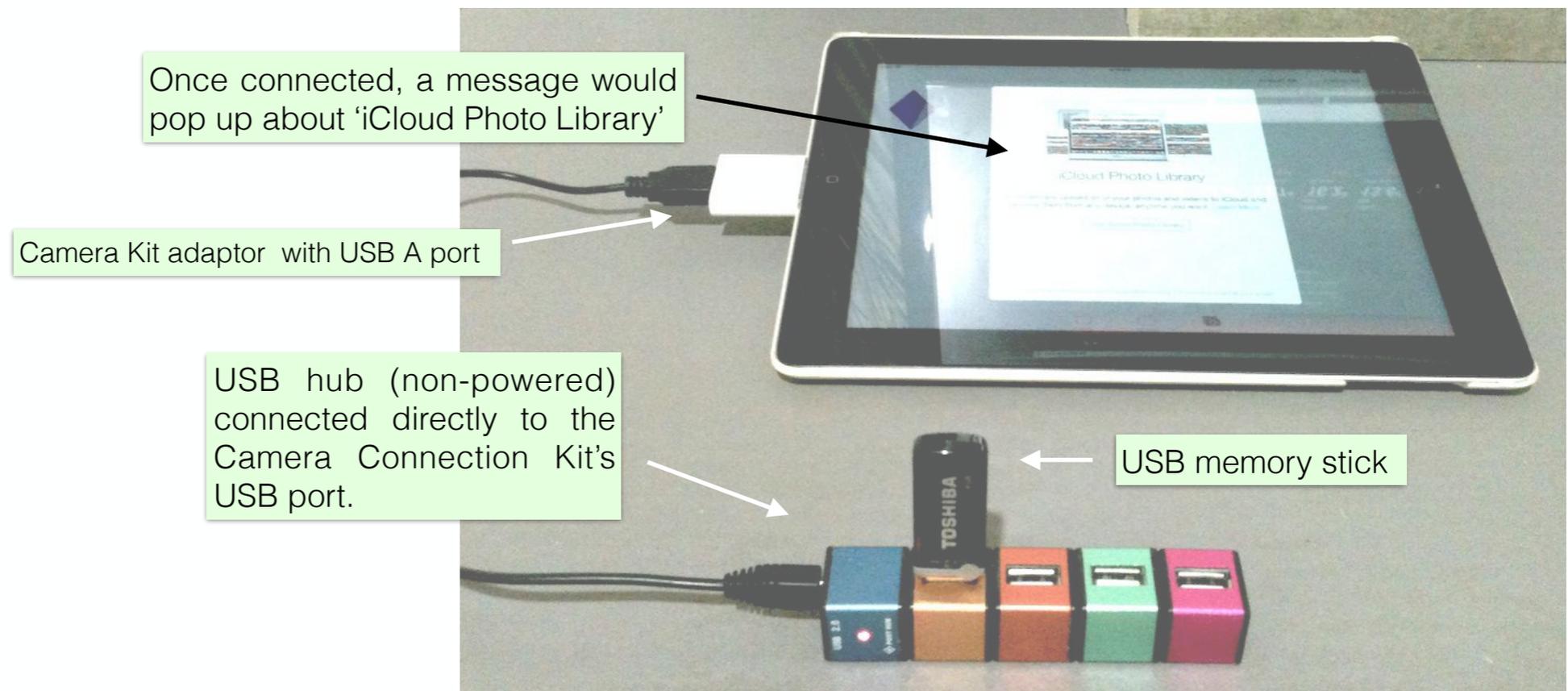USB Storage

Basic Overview

November 2019

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The Old 30pin Connector - 2003 to 2014

Until the **iPad 3**, the 30pin connector continued to be used (after about ten years). The 30 pin **Camera Connection Kit** came with two adaptors, one with the standard **USB port**, and the other with an **SD card reader**. Either adaptor could be used to transfer photos to the iPad from a USB memory stick, or SD camera card (memory card).

Camera Connection Kit

30pin connector

Standard USB A port

Card reader slot

USB Memory Stick: With this setup *(pictured below)*, you had to use a USB hub to connect a USB memory stick. It did not have to be a powered hub as the 30pin connection provided sufficient power. However, you could only transfer photos to the iPad through the **Photos** app (via an **Import** folder).
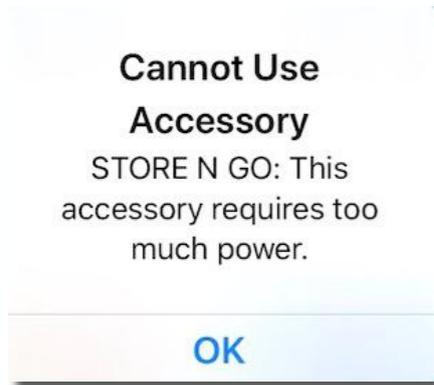
Once connected, a message would pop up about 'iCloud Photo Library'

Camera Kit adaptor with USB A port

USB hub (non-powered) connected directly to the Camera Connection Kit's USB port.

USB memory stick

Lightning Connector - iPad 4 until present
(excluding iPad Pro versions from 2018 which have USB-C)

Many people prefer the manual approach to storing and transferring files, especially when it comes to photos whilst travelling. Cloud storage services, such as **iCloud**, can be confusing and are not much use unless you have reliable and affordable internet access. Sometimes it is just a lot simpler to avoid using the internet for transferring files between devices. However, unless you have one of the newer iPad Pros with USB-C, it may not be so simple. The Lightning port (on the majority of iPads) does not normally provide enough power for a USB storage device. However, it does work for the **Lightning to Card Reader** adaptor and devices such as the **SanDisk iXpand** *(see below)*.

Connecting a USB memory stick, or removable drive, using the normal **Lightning to USB** adaptor will normally result in a message regarding 'insufficient power' *(see below)*.

Cannot Use Accessory
STORE N GO: This accessory requires too much power.

OK

Apple Lightning Connector - REVERSIBLE

SanDisk iXpand Flash Drive

Verbatim STORE N GO memory stick, like other USB storage, requires additional power.

Lightning to SD Card Reader will work as is.

Apple Lightning to USB Cable

Another Solution: The SanDisk iXpand Flash Drive (USB memory stick). This will work plugged directly into the iPad's Lightning port. You will need possibly need to update some software and download the iXpand app to work with the iPad file system.

Lightning Connector *(continued)*
iPads from 4th generation until present
(excluding iPad Pro versions from 2018 which have USB-C)

The Lightning port does not provide enough power to power a USB storage device. Additional power has to be provided from a Power adaptor connected to the Lightning connection on the Camera Adaptor, or otherwise, from a USB power bank.
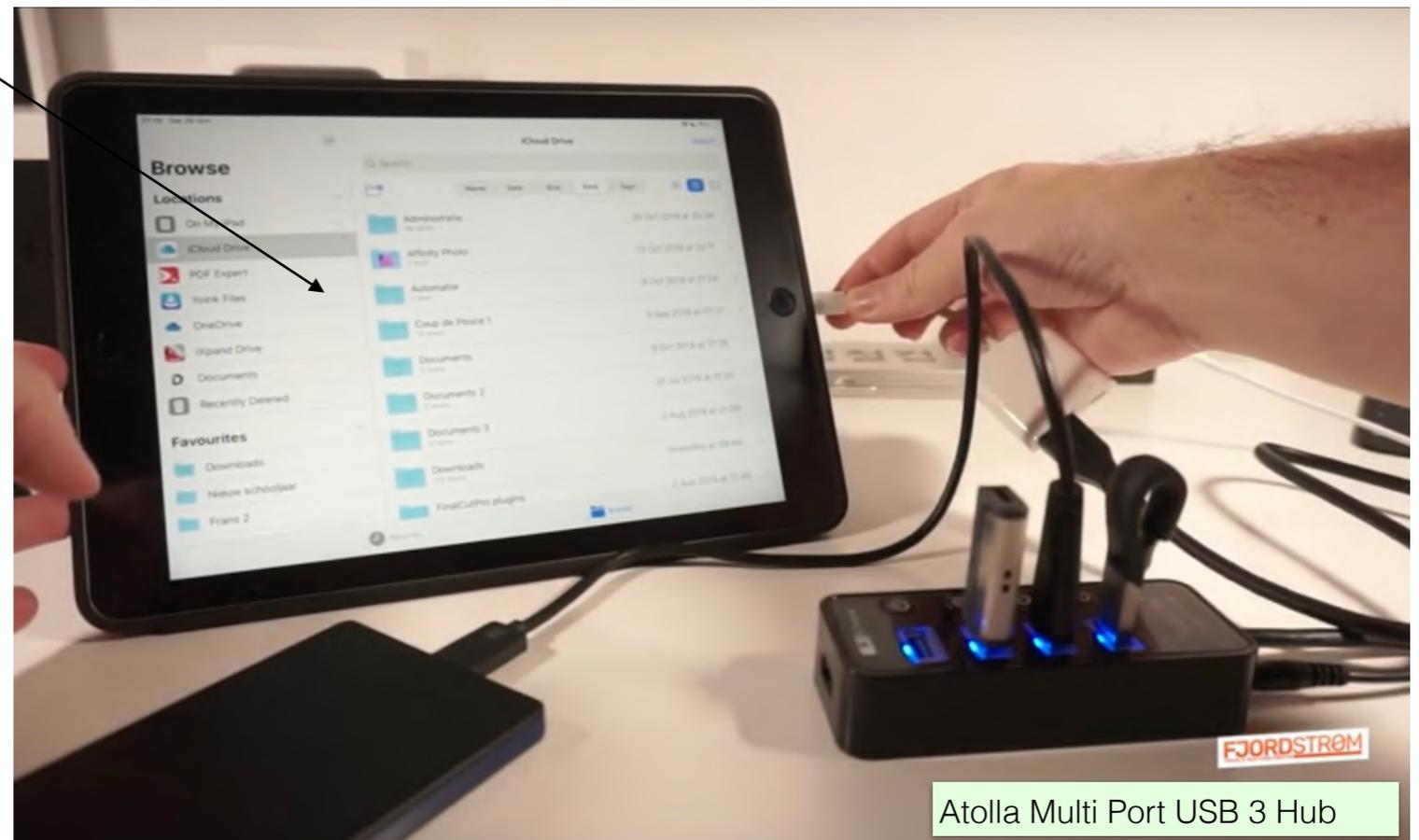
This is an awkward setup, and it is usually best to use the **Lightning to USB 3 Camera Adaptor** for its intended use (ie for camera input). However, there are other more specialised uses for the adaptor, such as digital music input into an app such as Garage Band.

Connecting a file storage device using the **Lightning to USB 3 Camera Adaptor** and a powered USB hub, will open the **Files** app for browsing and managing files.

Lightning
Connector

Lightning

USB 3

Lightning to USB 3 Camera Adaptor

Atolla Multi Port USB 3 Hub

https://www.youtube.com/user/groupXonline

Another Solution: A powered USB hub, which can be used to connect various devices that have a USB interface, including cameras and musical instruments.

The New World of USB-C

Apple's Thunderbolt 3 (USB-C)

If you can afford the new **iPad Pro** (3rd generation) 12.9" or 11", everything becomes a lot easier, because of the USB-C interface. The USB-C connection provides enough power for peripheral devices such as USB memory or SSD storage devices (plus a whole lot more). It also provides high data throughput.
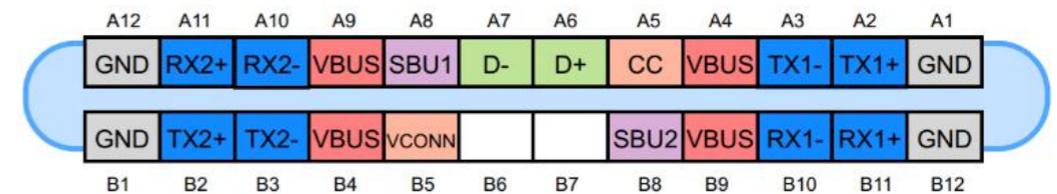
USB-C to USB A Adaptor

USB-C to USB-C Cable

Lightning to USB-C Cable

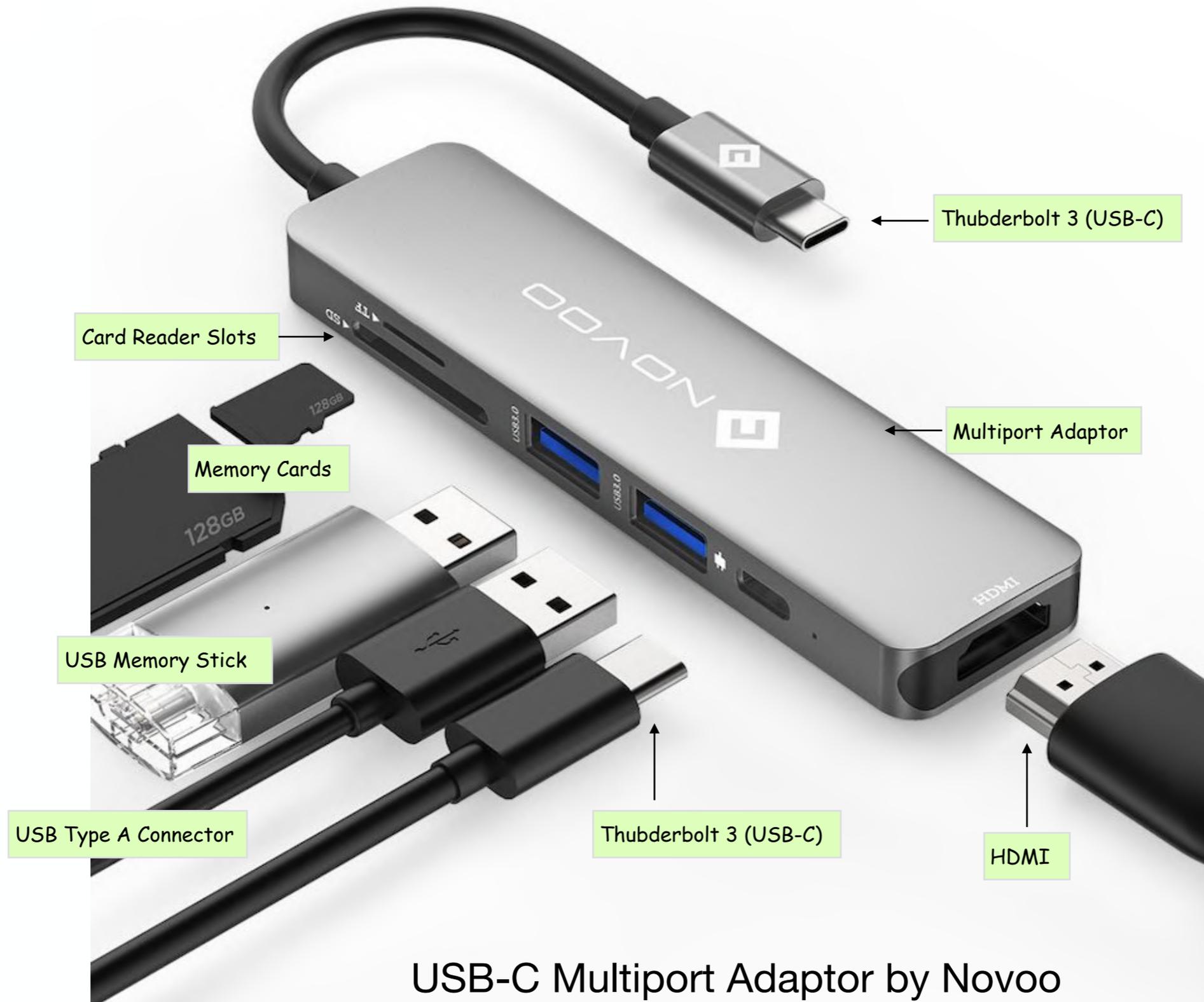| A12	A11	A10	A9	A8	A7	A6	A5	A4	A3	A2	A1
GND	RX2+	RX2-	VBUS	SBU1	D-	D+	CC	VBUS	TX1-	TX1+	GND
GND	TX2+	TX2-	VBUS	VCONN			SBU2	VBUS	RX1-	RX1+	GND
B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12

USB-C Connector - MIRRORED PINS

The **Apple Lightning Connector** is beginning to be replaced by USB-C. Apple's implementation of USB-C is known as **Thunderbolt 3.** Currently it is only available on the iPad Pro 11" and iPad Pro 12.9" (3rd generation).
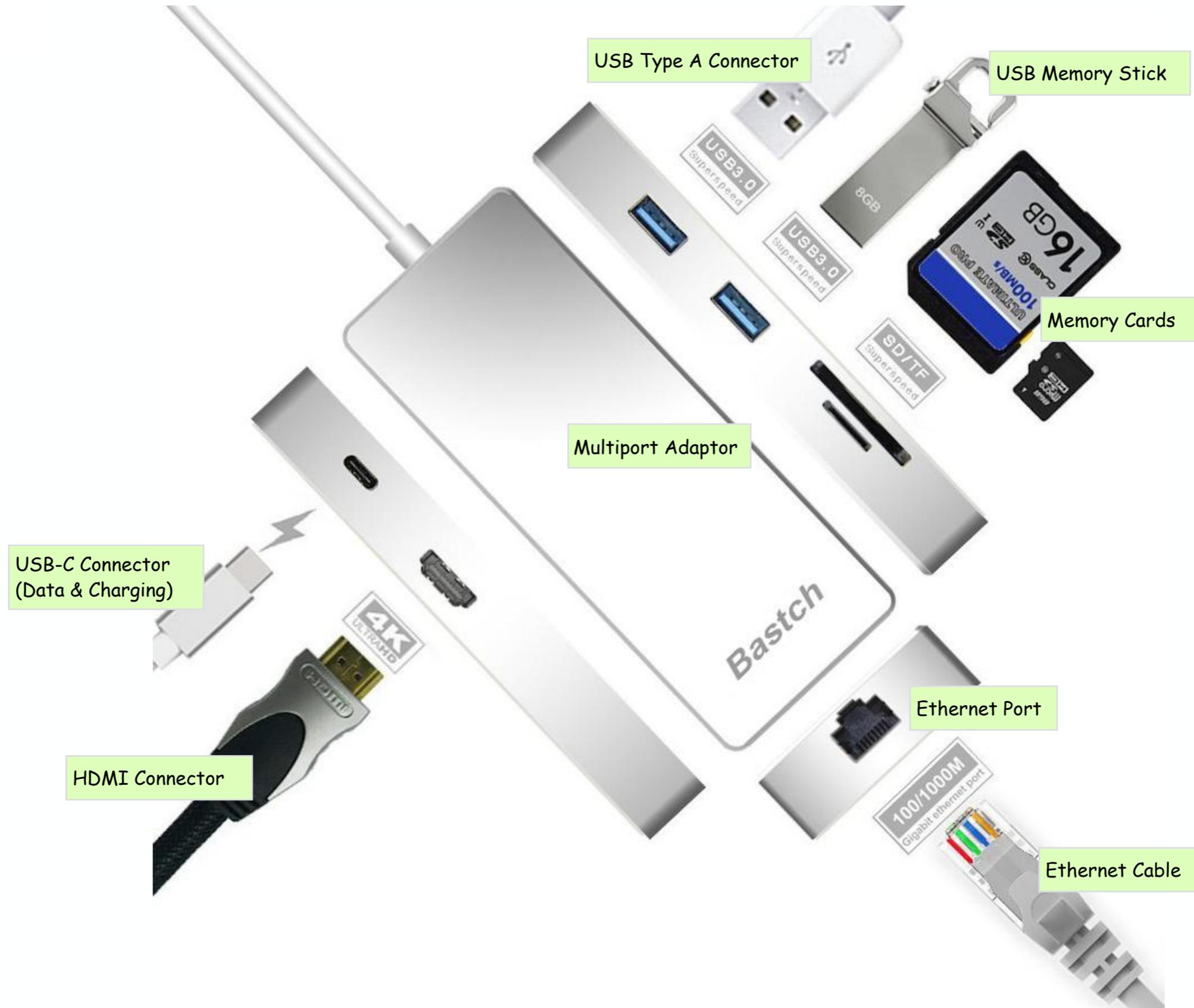
USB-C Multiport Adaptors

Thubderbolt 3 (USB-C)

Card Reader Slots

Memory Cards

Multiport Adaptor

USB Memory Stick

USB Type A Connector

Thubderbolt 3 (USB-C)

HDMI

USB-C Multiport Adaptor by Novoo

USB-C Multiport Adaptors *(continued)*
Bastch

USB Type A Connector

USB Memory Stick

USB3.0 SuperSpeed

USB3.0 SuperSpeed

8GB

16GB

Memory Cards

SD/TF SuperSpeed

Multiport Adaptor

USB-C Connector
(Data & Charging)

Bastch

4K ULTRAHD

HDMI Connector

Ethernet Port

100/1000M
Gigabit ethernet port

Ethernet Cable

http://bastch.com/Multi-port-Adapter.html

Summary
iPad USB Connections

- The 30pin connector had limited connectivity using the Camera Connection Kit and the Photos app

- A non-powered USB hub could be used with the 30pin Camera Connection Kit (to import photos)

- The Lightning port (on iPads and iPhones from 2013) has limited USB storage connectivity

- A powered USB hub can provide file management with an external drive (through the Files app)

- The Apple Thunderbolt 3 (USB-C) interface provides simple and powerful connectivity solutions

- Currently Thunderbolt 3 (USB-C) has only been included in the new iPad Pro (3rd generation) 12.9" and 11" models

- Thunderbolt 3 (USB-C) may soon be used in all iPhone and iPad models (as it is already in all new Apple Mac models)

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