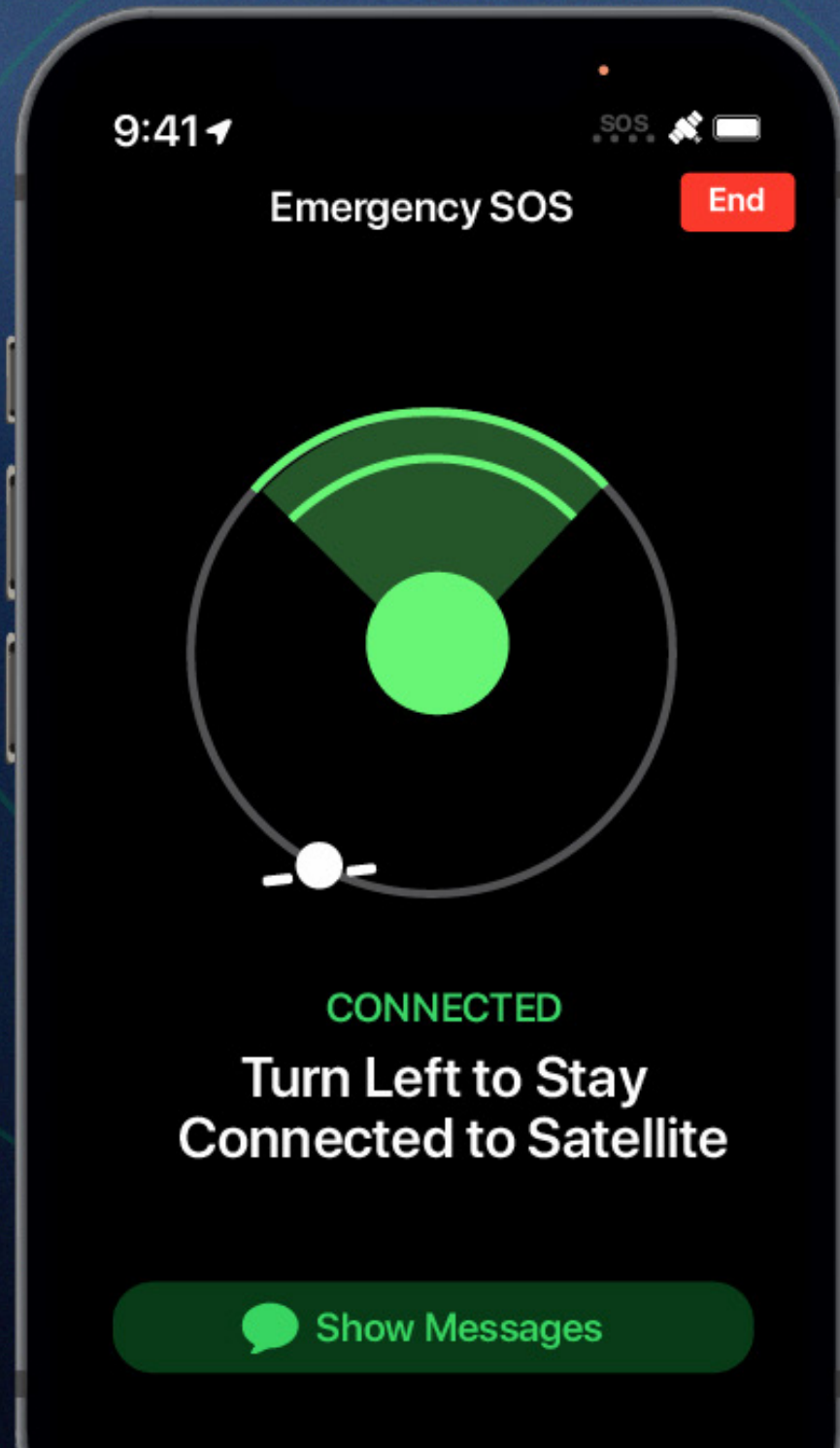


Peter Nguyen

A Score to Satellite

Understanding the use of Emergency SOS via Satellite on the iPhone 14



A Score to Satellite

Peter Nguyen

Apple has recently unveiled its new iPhone 14, and while the phone mainly features the standard camera improvements, this year's models bring some exciting and valuable personal safety features.

Perhaps the most interesting of these is Emergency SOS via satellite, a new feature that could allow iPhone owners to summon help from just about any location on the planet – even when traditional cellular networks are unavailable.

This fallback emergency system is only activated in exceptional circumstances and when reaching other services are unavailable. If these conditions are met, the iPhone 14 will attempt to connect to the nearest satellite to seek help. It is important to look at satellite communications and why they are a new revolutionary approach to how we can reach emergency services.

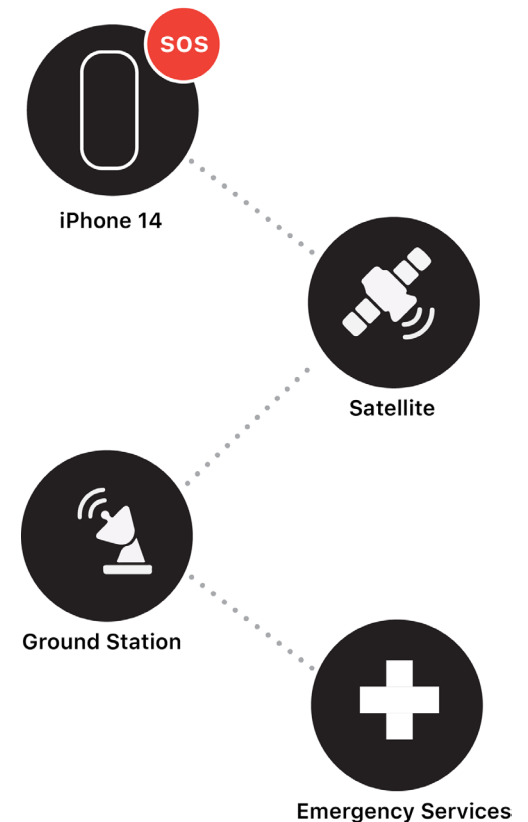
Apple has explained that the iPhone 14 includes a Qualcomm x65 modem chip with additional custom-made proprietary hardware and software to allow emergency SOS via

satellite on the new models. This device modulates signals in a way that encodes data to be received by another modem. This includes custom radio frequency components and new software developed by apple to send data orbiting satellites and 5G cellular towers to communicate for emergency services. This means that the chip can communicate with these satellites to send emergency messages when there is no Wi-Fi or cellular data connection.

The phone connects using radio waves, bands that are already supported by terrestrial networks. However, as you are connecting to a satellite, the bandwidth is much narrower, meaning that there are limits on what you can do with it. Essentially, you'll transmit that information to the satellite, and will be relayed back to a ground station which will be passed on to the destination – in this case, to emergency services.

Apple has claimed that this process can take anywhere between 15 seconds to a minute to send the information to emergency services.

Contacting emergency services via Satellite on the iPhone 14



You can't send it in a quick burst due to bandwidth limitations, but however, makes it possible to update your location via the Find My network via satellite so that friends and family can keep track of you when you're out in the wilds.

Apple formally announced its long-anticipated partnership with Globalstar on September 7th to provide satellite messaging services for the new iPhone models. Apple has significantly emphasized the difficulty of providing connectivity via satellite for its phones. "The bandwidth is so limited that even sending a text message is a technical challenge", said Ashley Williams, manager of satellite modelling and simulation at Apple.

The phone features customised hardware and software to allow it to connect via satellite. "That connection is only possible when the phone is pointing directly at a satellite", she said, offering a special interface to instruct the user where to point and maintain a connection. This eliminates the need for a special external

antenna like those on conventional satellite phones.

The Qualcomm chip supports 5G cellular networks, but can also use band 53, the frequency band used by Global star satellites.

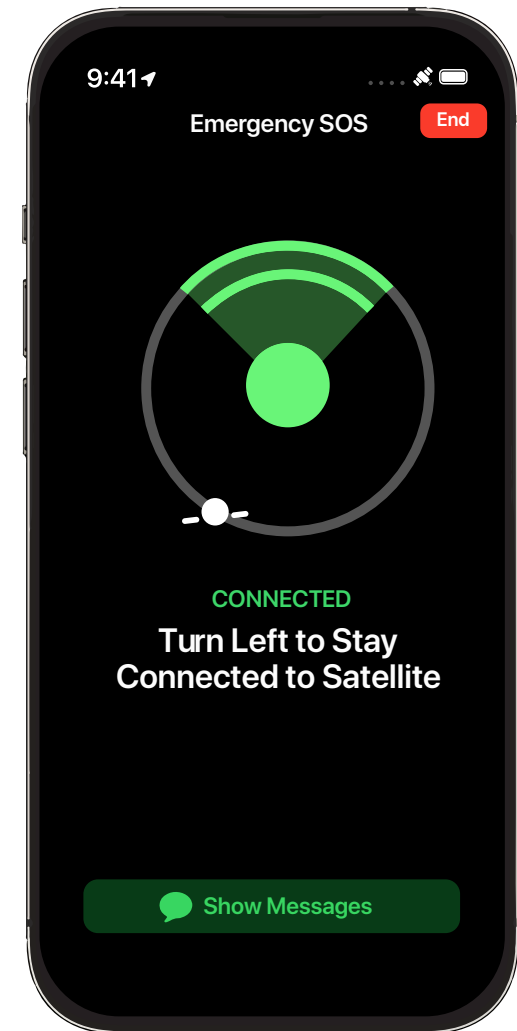
As of now, Emergency SOS via satellite is only available in the U.S (including Puerto Rico and the U.S. Virgin Islands) and Canada. However, it is expected for Globalstar to cover more countries over the distant future including Europe, Northern Asia, Russia, and Australia. Apple has already stated that countries such as Mainland China, Hong Kong, Macao, Guam, and American Samoa will not be available.

With being a new technology, Apple reveals that there is a huge potential in the development of the SOS emergency feature to save individuals who are unable to connect to cellular towers. This can be a game changer for the future of the digital phone device era as we could potentially see newer features that can assist individuals under excruciating circumstances without internet services.

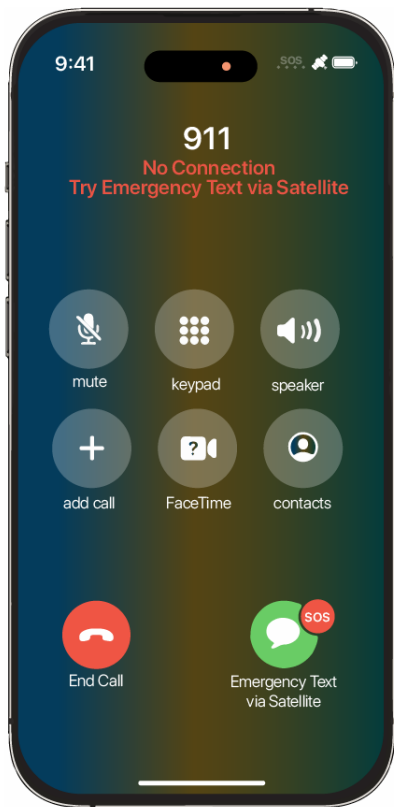
References:

- Apple. (2022, September 8). Use Emergency SOS via satellite on your iPhone 14. Apple Support. Retrieved October 10, 2022, from <https://support.apple.com/en-us/HT213426>
- Hollington, J. (2022, September 9). iPhone 14 satellite connectivity: how it works, what it costs, and more. Digital Trends. Retrieved October 10, 2022, from <https://www.digitaltrends.com/mobile/apple-iphone-14-emergency-sos-satellite-how-work-cost-availability/>
- Nellis, S. (2022, September 17). New iPhones have Qualcomm satellite modem, new Apple radio

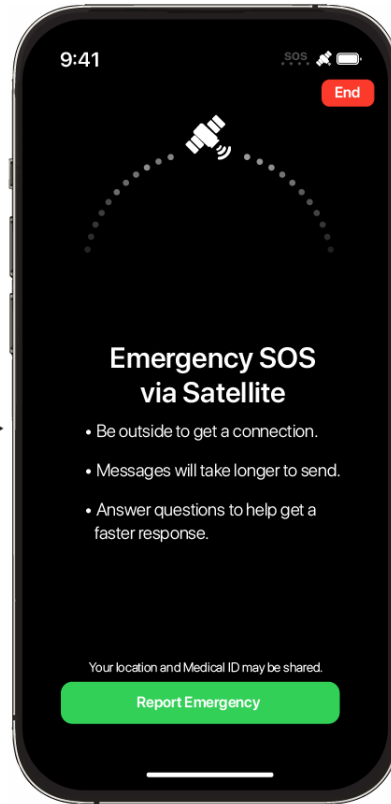
- chips. Reuters. Retrieved October 13, 2022, from <https://www.reuters.com/technology/new-iphones-have-qualcomm-satellite-modem-new-apple-radio-chips-2022-09-17/>
- Lim, J. Klein, R., & Thatcher, J. (2005). Journal of Information Technology Management. Good Technology, Bad Management: A Case Study of the Satellite Phone Industry, XVI(2). <http://jitm.ubalt.edu/XVI-2/article5.pdf>
- Wong, A., & Chow, Y. T. (2020). Solar-Supplied Satellite Internet Access Point for the internet of Things in Remote Areas. Sensors, 20(5), 1-2 <https://doi.org/10.3390/s20051409>



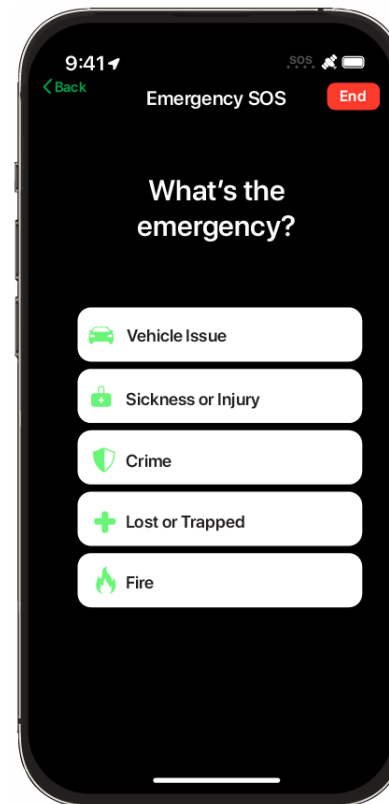
How to use Emergency SOS via satellite on your iPhone 14



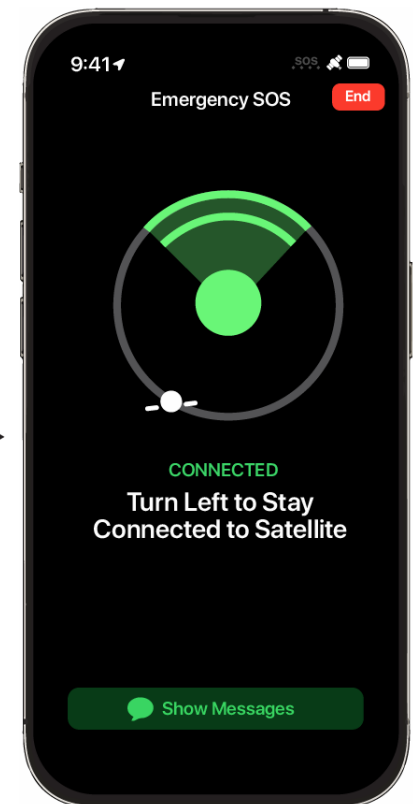
Tap Emergency Text via Satellite



Tap Report Emergency

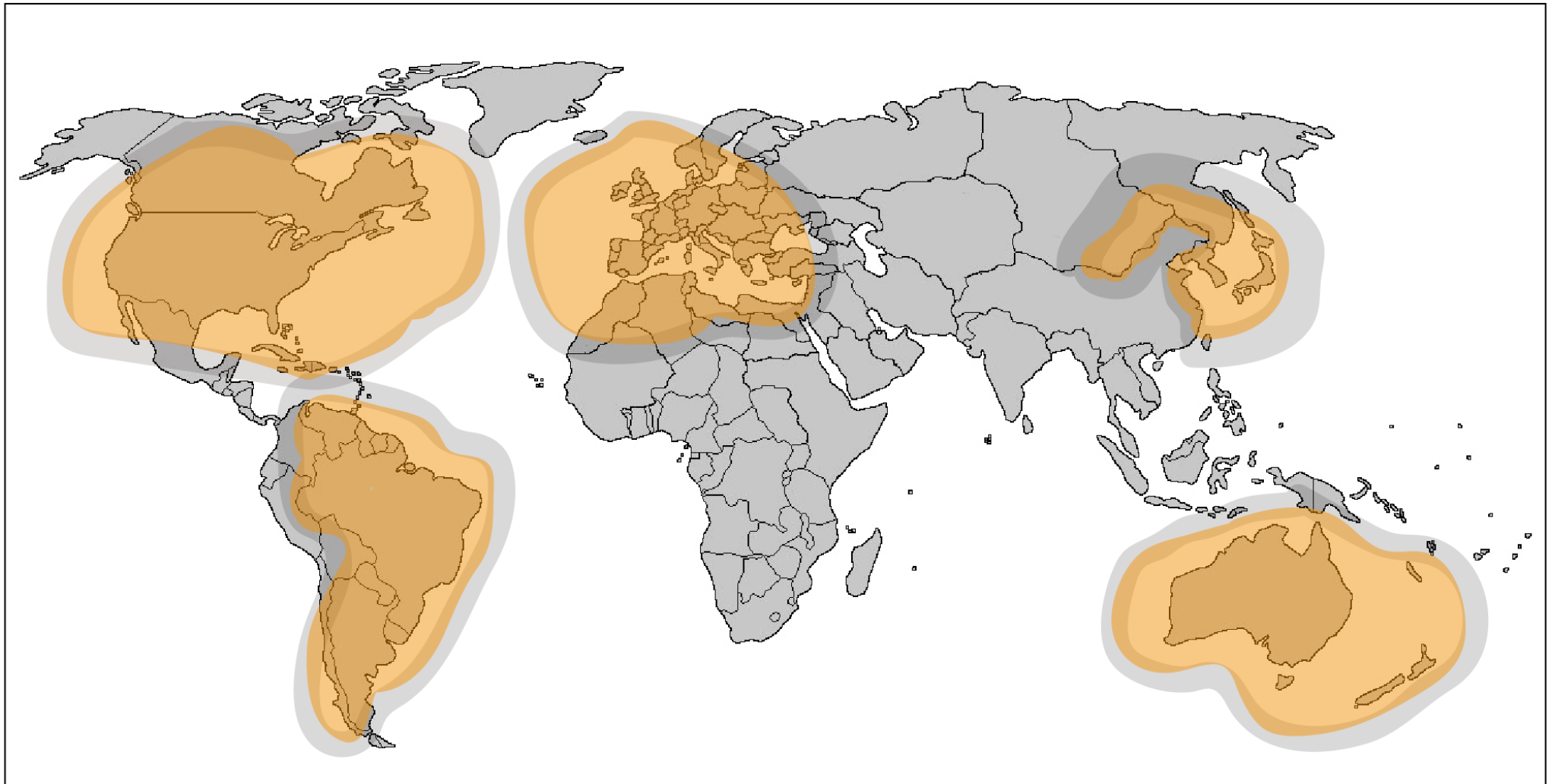


Answer the emergency questions to best describe your situation



Move your phone around to connect to a satellite and send your message to emergency services

Coverage map of Globalstars satellites for iPhone 14 Emergency SOS



Primary Coverage



Fringe Coverage
(Customers should expect to experience weak signal)