

## VIRTUAL HEARINGS WITHOUT TEARS

1. This Note seeks to provide some pointers, so that you can have virtual hearings (and meetings generally) without tears. If products are mentioned by name, you should treat these as suggestions and not endorsements. Do look at product reviews and speak with friends or colleagues before you decide, especially on expensive purchases. If you do not have the time to read through this entire document, you can refer to the [cheatsheet](#) at the end of this Note.

### Physical and Technical Set-Up

2. Although Zoom, Webex, LifeSize, Blue Jeans and many other similar platforms claim to work with all sorts of hardware including mobile phones, you really should use a proper desktop or notebook computer in order to participate in a virtual hearing. For one thing, using a mobile phone, you cannot easily see shared documents. Also, the image that you can see when you use a mobile phone is so small that you will put yourself at a disadvantage if you use a mobile phone and others are using large monitors or at least notebook computer screens. Having said that, it does not take much to find an appropriate stand to set up your mobile phone (whether Android or Apple) to serve as a **backup device**, if your primary device fails. If you connect to a hearing with *both* your primary *and* your secondary device at the same time, you *must* mute both the microphone and speaker of that secondary device. Otherwise there will most definitely be “feedback” issues when one microphone picks up the output from the other device’s speaker.

**Takeaway #1** – wherever possible, use a computer rather than a mobile phone. Your mobile phone can be a backup device. Because redundancy is good.

3. Moving beyond the computer itself, it is helpful to have a good external video camera with a good microphone. There are cameras for every budget – they can range from under \$100 to about \$350 for one that can zoom and be remotely raised/lowered.<sup>1</sup> There are some extremely sophisticated models (with matching price tag) that will capture a 360-degree view of the room, and automatically focus on the active speaker. Search for “360 degree conference camera” if you would like to find these products.

**Takeaway #2** – consider using an external video camera so that you can have greater flexibility in positioning and possibly better quality video.

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<sup>1</sup> See various lists of webcams, at <https://bit.ly/webcamlist1>; <https://bit.ly/webcamlist2>; <https://bit.ly/webcamlist3>; and <https://bit.ly/webcamlist4>. In Singapore, retailers like <http://Lazada.sg>, <http://Amazon.sg>, <http://www.hachi.tech> may sell the model that you find interesting.

4. If the audio coming out of your notebook computer sounds “tinny” you may wish to invest in an external speaker. This can help make sure that you can hear what is going on properly.<sup>2</sup> These can connect to computers via the normal audio headphone cable connection, or USB. Some have microphones so that you can have more sensitive pick-up of your voice than the built-in microphone on your computer (desktop computers may not have built-in microphones or speakers, anyway). Some users can get wireless Bluetooth speakers to work well, but it is possible that these add a very short but still perceptible “delay”, that may make it better to tolerate a cable from your computer to the speakers. Take the time to understand the equipment you do get – it is important that you carry out test calls well in advance of hearings, so that you can confirm that everything sounds fine both to you as well as the remote parties. In particular, watch out for echoes which may happen with some microphone-speaker pairings. Also, note that some microphones may be very sensitive and may transmit the rustling of papers, and typing on keyboards.

**Takeaway #3** – consider using an external speaker and/or microphone. However, Bluetooth selections may add complications.

**Takeaway #4** – a headset with headphone and microphone built in may work well for you too. But again, check carefully before you decide on Bluetooth.

5. If you are going to work in a crowded or noisy environment, you may instead need to have a headset. Consider a headset with an integrated microphone, like those used in call-centres. Try to avoid large and “clunky” ones and choose one that is as discreet as possible. Again, be careful about the apparently attractive Bluetooth options. Some do add a delay, and the occasional dropped connections between your headset and your computer may add a further complication to your entire workflow.<sup>3</sup>

6. When using your webcam, you want to be a decent distance away so that you fill up about two-thirds to four-fifths of the image height. Any larger than that and you may loom too huge for those you are e-meeting with. This is another reason why an external webcam is useful. You should also try to have the camera at your eye-level. The camera should not be so high that it is looking down at the top of your head, or so low that it becomes what is sometimes called a Nostril-Cam.<sup>4</sup>

**Takeaway #5** – positioning your video camera at eye-level is best and try to keep it at a distance that makes the size of your face about two-thirds to four-fifths of the screen height.

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<sup>2</sup> See a selection of speakerphone solutions at <https://cnet.co/30wKdzG>.

<sup>3</sup> For one list of options, see <https://bit.ly/headsetslist>.

<sup>4</sup> <https://bit.ly/vctips1> and <https://bit.ly/vctips2> have some interesting tips that you may find useful.

**Takeaway #6** – multiple monitors are great and some lawyers think that a minimum of three are necessary.

7. Related to this is the value of a larger screen. Even if your notebook computer has a decently sized 13-15 inch screen, you may find that to be quite limiting. With the price of 27-inch and even 34-inch screens being very affordable, you may benefit from having two (or even three) of these monitors arrayed in front of you.<sup>5</sup> One lawyer mused that the bare minimum is three screens. One to show the other participants or the main speaker, another to show exhibits or documents relevant for the moment, and a third to show either a live transcription service and/or to allow for a private chat screen between the lawyer and other members of her team or her client. Whatever it is, get used to handling multiple monitors and the dual-screen mode of your video conferencing software (if there is one). You need to be able to navigate between the different screens with a practiced hand or you will end up being confused and disorientated when your mouse disappears from one screen. Many notebook computers can support two external monitors but, if yours does not, you can look for a docking station or a special adapter that will allow you to output to an external monitor with just a USB connection, or even wirelessly.

### Other Accessories

8. Zoom and Microsoft Teams have “virtual backgrounds” which can mask the background at the user’s workstation, by using “Hollywood” style technology to automatically superimpose a professional or standardised background.

**Takeaway #7** – a green screen will make virtual backgrounds much better, but you must be prepared for the physical space that a green screen will take up.

Green-screen technology allows computers to easily replace backgrounds with virtual imagery, as seen in this photo of a weather presenter on TV News.



A physical “green screen” makes it a lot easier for this feature to work well. Without a “green screen” there will be frequent “gaps” in the images, and mis-recognised edges. A “green screen” requires a fair amount of physical space. A decent width for a green screen is about 2 metres, otherwise it will not cover the entire field of

<sup>5</sup> <https://bit.ly/monitorsreviewed> reviews some monitors, but the main things to look out for is that the monitor is compatible with your computer (e.g., does your computer use HDMI or DisplayLink for external monitors). If your computer does *not* have built-in capability to connect to extra monitors, you may need monitors like these, which work with just a USB connection - <https://bit.ly/portablemonitors>.

view of the camera. If you cannot deploy a green screen, try to find a clean, plain wall to sit in front of.<sup>6</sup> Also, a fairly powerful computer is essential for good quality virtual backgrounds and some devices like mobile phones and tablets may simply not be able to do this well, or at all.

**Takeaway #8** – consider getting video lights to get uniform and sufficient lighting on your face.

9. Lighting is also important. It can make a big difference between being seen clearly, or being kept in the shadows or cast in an unnatural glow because of curtains, or reflections off coloured walls. Try not to sit behind a window or other light source behind you, which may either give you a halo, or make you very severely backlit and you end up being in the shadows. Relatively inexpensive LED lights can be purchased and placed behind the video conferencing camera. Battery powered “selfie” lights are of a surprisingly decent quality. Such lights can be placed slightly above your eye or face, to illuminate your face evenly. The light should not be placed behind you or facing the webcam.<sup>7</sup>

## Connectivity

10. It is extremely important that you have a reliable and high-speed Internet connection. While most households in Singapore have good quality fibre-optic broadband connections, there is often one weak link in the chain. This is the connection between the fibre connection point (called the Optical Network

**Takeaway #9** – try to get a wired connection from your broadband supplier, all the way to your computer instead of relying on WiFi.

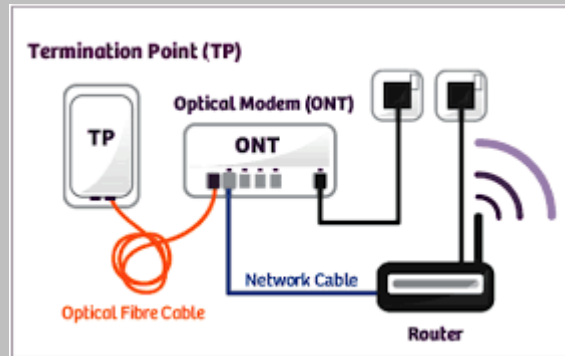
Terminal (“ONT”), sometimes inaccurately called a “modem”) and the user’s computer. This connection relies on a router that is often used to broadcast a WiFi signal to users’ computers. The problem is that if the distance is too far or there are too many walls or heavy pieces of furniture or solid wood doors along the way, the signal strength can be reduced significantly. There may also be a lot of interference from neighbours’ WiFi networks (there are limited frequency bands for WiFi networks). These problems can all result in weak signals or even dropped calls. There may be jittering or audio drop-outs that can be extremely disruptive and unprofessional.

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<sup>6</sup> See <https://bit.ly/usegreenscreen> for some tips on how to use a Green Screen with Zoom.

<sup>7</sup> For some general tips on how to use lighting in your video conference set-up, take a look at this page, which is from a webcam vendor. However, the ideas are universally applicable for different types of webcams or even if you use your computer’s built in camera - <https://bit.ly/howtoringlight>.

11. The best solution is to have a *wired* connection, from the router to the computer that you are using for video conference. Not many households are geared up for this. Network cables, even extremely long network cables, are now available as very discreet, flat and thin cables (like “kway teow”) that can be easily attached near floor skirtings and fit under doors easily. Cables can be 30m long without any significant signal loss.<sup>8</sup>



Homes in Singapore have Fibre Optic lines that end in the Termination Point. From the TP, a fibre optic cable brings the signal to the Optical Network Terminal. The ONT provides *one* network connection. The router will in turn make this one connection available to all computers connected to it, whether via wired or wireless connections. Some homes have multiple routers.

12. If you cannot put together a wired connection in your house, then there are two options that you could consider. Instead of a single traditional router, ask your telco or a network specialist to put together a “Mesh” network (preferably using the latest “ax” or WiFi6 technology).<sup>9</sup> A “Mesh” network will allow one router’s base station to send signals to be picked up by the next member of the “Mesh”

**Takeaway #10** – if a WiFi connection is unavoidable, ask for a Mesh network to be set up, preferably using the latest WiFi 6 standards.

thereby extending the overall reach of the WiFi network. It helps if you can achieve a wired connection as between the various Mesh units but even if you cannot, Mesh units, especially those that are “tri-band”, can provide much better coverage and reach than a standard “normal” router.

13. The second option is to have an entirely separate backup network based on 4G mobile technology. A mobile 4G router can take a SIM card and provide data services via WiFi to nearby computers. The mobile routers cost from \$70-270 each; the mobile data SIM card can be obtained for \$10-20 per month (look

**Takeaway #11** – a 4G Mobile Router that can provide a totally separate network as a “backup” for your fibre optic broadband service.

<sup>8</sup> One Internet broadband provider has set up this page to explain the connectivity options within houses - <https://bit.ly/extendormesh>. Many of the ideas are applicable regardless of which Internet provider you use.

<sup>9</sup> <https://bit.ly/meshreviews1> lists some Mesh solutions available in Singapore. However, only one of these is a WiFi 6 option. The comparison table at <https://bit.ly/meshreviews2> has more WiFi 6 options.

for at least 50GB to 100GB of data at 4G speeds per month and see if your employer is listed on telcos' "CIS" offers that are often provided to employees of mid- or large-sized organisations). You can put this mobile router near your workstation, and so long as you can get good mobile reception there, you will be able to have a good WiFi connection that your video-conference computer can latch on to, if you have problems with your main broadband connection.<sup>10</sup> This approach works separate from the fibre connection so even if there is failure in the national fibre-network, you may still be able to use the 4G connectivity!

14. As a "reality check" there are useful online services to check whether your Internet-connected computer is getting credible network speed. These services will let you try out different settings – wired versus wireless, from your study versus your dining room etc. These can help you assess the "real world" performance, taking into account the physical set-up, distances and obstructions that may exist between your computers and the router in your house.<sup>11</sup>

### Putting it all together

14. Having done all this preparatory work, how should you actually conduct yourself during a virtual hearing?

15. There is significant concern about security these days, so make sure that you are all ready to go about 15 minutes before your scheduled hearing or meeting. Take the time to ensure that you are running the latest version of the video conferencing software that you are using. If you are not running the latest version, you may be *denied entry* into the virtual hearing or meeting.

16. Next, do check your microphone, video camera and speaker settings. If you have multiple microphones, cameras and speakers, it is important that you go through the relevant settings to make sure that you have chosen the correct ones.

**Takeaway #12** – make sure you update your video conferencing software so that you are always using the latest version.

**Takeaway #13** – check (and double-check) your camera, microphone and speakers.

**Takeaway #14** – check in advance that you have the correct Meeting entry credentials and can get in so that you can seek assistance if necessary. Do not wait until just a few minutes before the hearing!

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<sup>10</sup> Two retailers have pages set up for these products. See <https://bit.ly/mobilerouters1> and <https://bit.ly/mobilerouters2>. Do shop around and look for the best feature set for your needs and budget.

<sup>11</sup> The most commonly used service is <http://www.speedtest.net>. It is free to use and will give you a number in Mbps (megabit per second). Generally it would be safe to say that at least 30 Mbps would be credible. Home broadband in Singapore is typically at least 512 Mbps, commonly 1 Gbps (gigabit per second) and sometimes even 2 Gbps. But actual performance is constrained by many factors.

17. Most “hosts” will impose a “waiting room” or “lobby” into which all participants will be placed and vetted before entry into the meeting proper. Do make sure that you put in the appropriate “name” to announce your case details and credentials, in accordance with whatever rules are in place for the precise hearing that you are attending. Do this early so that you can also test that you have the correct “join” codes and passwords for the meeting.

18. During the hearing proper, make sure that you speak clearly, and try to minimise distractions and intrusions (e.g., by children or other pets). It is also quite important not to engage in cross-talk, or to interrupt others. Nobody will be heard properly, instead, all participants will be disadvantaged.

**Takeaway #15** – try to minimise disruptions and interruptions and don’t indulge in cross-talk or unnecessary interjections.

**Takeaway #16** – consider muting yourself when you are not speaking so that you do not inadvertently transmit any unintended audio.

**Takeaway #17** – make sure you are complying with the relevant dress-code requirements.

19. As a “best practice” when you are not speaking, set your microphone to “mute” so that you do not inadvertently transmit distracting sounds to the hearing.

This could include typing if you are the type of user who would take notes and type while the hearing is going on.

Learn the keyboard shortcut sequence so that you can quickly mute and “unmute” yourself without having to move your mouse. It is really a lot more efficient.

20. The courts expect that parties before the court will be appropriately attired. Some lawyers have taken this to mean that an abbreviated form of court dress can be used. Best called “top-formal” this typically means that they can only be safely filmed above the waist up. This is fine and well if the lawyer is never seen below the waist but all sorts of situations may conspire to embarrass the lawyer *e.g.*, when he stands up to reach for something, or needs to walk away from his desk to deal with a household situation or to answer the call of nature.

21. Finally, it bears repeating that all participants must be careful about the microphone or camera that is unknowingly left “live” or “hot”. In addition to being potentially embarrassing, it may also lead to breach of client confidentiality.

22. It goes without saying that all conduct rules pertaining to unlawful recording of court proceedings must be complied with.

23. COVID-19 has accelerated the pace of adoption of remote-hearing technologies. It is our hope that with these simple tips and reminders, the quality of online advocacy is enhanced, professionalism

is maintained, and no tears are shed. Do comment on this document if you have observations or suggestions as to how this Note can be improved, by emailing to [enquiries@sal.org.sg](mailto:enquiries@sal.org.sg).

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## Notes

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Various hyperlinks have been abbreviated in the article, and are collectively listed here for easy reference. They were checked on 10 Jun 2020 and are all working at this time. If they should stop working, remember that Google is your friend.

<i>Shortcut</i>	<i>Actual Site</i>
<a href="https://bit.ly/webcamlist1">https://bit.ly/webcamlist1</a>	<a href="https://www.wired.co.uk/article/best-webcam">https://www.wired.co.uk/article/best-webcam</a>
<a href="https://bit.ly/webcamlist2">https://bit.ly/webcamlist2</a>	<a href="https://www.tomsguide.com/best-picks/best-webcams">https://www.tomsguide.com/best-picks/best-webcams</a>
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<a href="https://cnet.co/30wKdzG">https://cnet.co/30wKdzG</a>	<a href="https://www.cnet.com/news/best-speakerphone-of-2020-for-working-from-home">https://www.cnet.com/news/best-speakerphone-of-2020-for-working-from-home</a> .
<a href="https://bit.ly/headsetslist">https://bit.ly/headsetslist</a>	<a href="https://sea.pcmag.com/headphones/36551/the-best-headsets-and-headphones-for-your-home-office">https://sea.pcmag.com/headphones/36551/the-best-headsets-and-headphones-for-your-home-office</a>
<a href="https://bit.ly/vctips1">https://bit.ly/vctips1</a>	<a href="https://youtu.be/FMex-9FyljU">https://youtu.be/FMex-9FyljU</a>
<a href="https://bit.ly/vctips2">https://bit.ly/vctips2</a>	<a href="https://youtu.be/ACNGhPKnmok">https://youtu.be/ACNGhPKnmok</a>
<a href="https://bit.ly/monitorsreviewed">https://bit.ly/monitorsreviewed</a>	<a href="https://www.techradar.com/sg/news/best-business-monitor">https://www.techradar.com/sg/news/best-business-monitor</a>
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<a href="https://bit.ly/howtoringlight">https://bit.ly/howtoringlight</a>	<a href="https://www.logitech.com/en-us/promo/streaming-content-creation-tips/use-ring-light-with-your-setup.html">https://www.logitech.com/en-us/promo/streaming-content-creation-tips/use-ring-light-with-your-setup.html</a>
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<a href="https://bit.ly/meshreviews1">https://bit.ly/meshreviews1</a>	<a href="https://www.t3.com/features/best-mesh-network">https://www.t3.com/features/best-mesh-network</a>
<a href="https://bit.ly/meshreviews2">https://bit.ly/meshreviews2</a>	<a href="https://sea.pcmag.com/first-looks/13302/the-best-wi-fi-mesh-network-systems-for-2020">https://sea.pcmag.com/first-looks/13302/the-best-wi-fi-mesh-network-systems-for-2020</a>
<a href="https://bit.ly/mobilerouters1">https://bit.ly/mobilerouters1</a>	<a href="https://www.lazada.sg/shop-mobile-wi-fi-hotspots">https://www.lazada.sg/shop-mobile-wi-fi-hotspots</a>
<a href="https://bit.ly/mobilerouters2">https://bit.ly/mobilerouters2</a>	<a href="https://www.hachi.tech/biz-solutions/networking-wireless/mobile-routers">https://www.hachi.tech/biz-solutions/networking-wireless/mobile-routers</a>

The mention of specific technologies, products, service providers and websites should not be taken as endorsements by the authors/contributors. Do research products and look for independent reviews. Remember, Google is your friend!

Edited by [Tan Ken Hwee](#), Legal Technology Cluster Committee



## **VIRTUAL HEARINGS WITHOUT TEARS: THE CHEATSHEET**

### **Physical and Tech Set-Up**

1. Use a computer instead of a mobile phone. Your mobile phone can be a backup device. Because redundancy is good.
2. Consider using an external video camera so that you can have greater flexibility in positioning and possibly better quality video.
3. Consider using an external speaker and/or microphone if your built-in speaker and microphone do not seem to put you right in the hearing room.
4. Alternatively, a headset with headphone and microphone built in may work well for you, too.
5. Positioning your video camera at eye-level is best and try to keep it at a distance that makes the size of your face about two-thirds to four-fifths of the screen height.
6. Multiple monitors are great, and some lawyers think that a minimum of three are necessary.
7. A green screen will make virtual backgrounds much better, but you must be prepared for the physical space that a green screen will take up.
8. Consider getting video lights to get uniform and sufficient lighting on your face.
9. Try to get a wired connection for your broadband connection, all the way from where the fibre enters into your house, until your computer, instead of relying on WiFi.
10. If a WiFi connection is unavoidable, ask for a Mesh network to be set up, preferably using the latest WiFi 6 standards.
11. You can also deploy a 4G Mobile Router that can provide a totally separate network as a “backup” for your fibre optic broadband service.

### **Before the Hearing**

12. Make sure you update your video conferencing software so that you are always using the latest version.
13. Check (and double-check) your camera, microphone and speakers.
14. Check in advance that you have the correct meeting entry credentials and can get in, so that you can seek assistance if necessary. Do not wait until just a few minutes before the hearing!

### **During the Hearing**

15. Try to minimise disruptions and interruptions and don't indulge in cross-talk or unnecessary interjections.
16. Consider muting yourself when you are not speaking so that you do not inadvertently transmit any unintended audio.
17. Make sure you are complying with the relevant dress-code requirements.