

Courtroom 21

*A Joint Project of the William & Mary School of Law
and the National Center for State Courts
www.courtroom21.net*

Manual for Jury Room Deliberation Technology*



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§ 1-10.00 Introduction

§ 1-11.00 Scope

This Manual is intended to supply judges, court administrators, and court technologists with the information necessary to easily install and successfully use technology, including portable technology, to assist jurors in their deliberations. It primarily concentrates on using display technology to give jurors the ability to view evidentiary exhibits together as a jury, quickly and easily. *This Manual applies both to traditional trials in which no technology is used* and to technology-enhanced trials in which evidence is presented electronically.

Research proves conclusively that it is not enough to just give jurors technology. For them to use it, and use it properly, they must comply with a given procedure. That procedure, the Deliberation Technology Protocol, is set forth the below.

§ 1-12.00 Why Use Technology in Deliberations?

A trial is conducted so that we can settle a dispute, whether civil or criminal. In jury trials, the jurors settle that dispute with their verdict. Everything rests on the quality of the jury's deliberations and its verdict. During trial, lawyers present the evidence to the jury so that the jury will be able to decide what happened in the case and then, following the judge's explanation of the law, reach a verdict. During deliberations, jurors customarily exchange their memories and interpretations of the key pieces of evidence. Most jurisdictions supply the jurors with at least a substantial amount of the evidence that was formally received during trial, especially documents. Jurors can then review the evidence and argue its meaning to one another in order to decide the facts of the case. At present, jurors ordinarily must either pass the exhibits around or consult individual copies in jury notebooks or similar collections of materials.

Deliberation room display technology lets all the jurors look at a single exhibit at the same time and discuss its meaning. When the same technology is used to display jury instructions, jurors make special efforts to comply with the court's explanation of the law. Research tells us that jurors appreciate modern display technology and believe that it is a major help. In fact, the jurors have been incredibly positive in reporting how much they appreciate this help. At the same time, the research tells us that deliberation room technology does not appear to adversely affect the verdict or have any other disadvantage. Although more research needs to be conducted, deliberation room technology does not appear to make deliberations any longer, and it may make them shorter.

When a trial includes electronically displayed evidence - e.g., the lawyers show evidence with VCR's, document cameras, or computers - using deliberation display technology may be the best, or sometimes the only, feasible way of allowing the jury to review evidence.

Non-display technologies can also be important. Assistive technologies help jurors who may have difficulties in hearing or seeing, in particular.

Happily, deliberation room technology can be easily operated by jurors without any assistance other than a brief demonstration by a bailiff or other member of the court staff.

§ 1-13.00 **Background - the Courtroom 21 Study, *The Use of Technology in the Jury Room to Enhance Deliberations***

With the financial assistance of the State Justice Institute, during 2001-2002 the Courtroom 21 Project conducted a major study of deliberation room technology. The study had five parts:

- i Legal research to determine the law that governs the use of admitted evidence during deliberations;

- i A review of potential jury room technologies;

- i A survey of the state courts, and, through the kind assistance of the Federal Judicial Center, the federal district courts, to find out what exhibits went to the jury, the degree to which display or other technology was in use for deliberations, the process by which technology-presented evidence was reviewed by the jury, and related questions;

- i Scientifically controlled studies at William & Mary Law School involving 15 jury trials of the same case to determine how useful different types of deliberation room technology could be; and

- i Field tests in real trials in real cases of the protocol developed by the earlier experiments (in Florida’s 9th Judicial Circuit and the United States District Court for the District of Oregon).

The report of that year-long study, *The Use of Technology in the Jury Room to Enhance Deliberations*, conducted under Grant SJI-01-N-062, is available through the Courtroom 21 web site, www.courtroom21.net. This Manual incorporates what was learned as a result of that study. Readers interested in learning more about what was done and learned should consult the detailed report. This Manual is primarily a “how-to” guide. The Report details the research that was done to reach the conclusions presented in this Manual.

§ 2-10.00 **A Short Legal Note about Jury Exhibits**

In order to help a jury look at trial exhibits, it is important to know what those exhibits may be. Ordinarily, the jury may receive an exhibit during deliberations only if it has been received into evidence at trial *and* is also sent to the jury during deliberations. The types of evidentiary exhibits that are usually sent to the jury room include documents and photographs. Physical evidence, video, or audio tapes may be sent or available.

Many courts will not allow jurors in the jury room to review videotaped depositions or their equivalent. Similarly, at least some courts will not let the jurors see what is often called

“demonstrative evidence” (information used at trial to help explain testimony or other evidence). This can include information summaries, charts, and time-lines, and computer animations showing expert views of how or why an incident took place.

Whether jurors will automatically be given exhibits when they go into the deliberation room, may ask the court for them, or may even be prohibited from reviewing them, depends on the court. In most jurisdictions, what happens is controlled by local custom. Different judges in the same court may have different practices.

Before a court technologist can properly assist a jury with deliberation room technology, the technologist must know what types of exhibits may be reviewed by the jury during deliberations.

§ 3-10.00 Giving the Jury the Ability To Look At Exhibits Together

§ 3-11.00 The Goal

The goal is to give the jurors the ability to look at exhibits quickly and easily by projecting them electronically so that all the jurors can see them clearly. One or more jurors must also have the ability to enlarge (zoom in) or decrease (zoom out) the image and also point to part of it. The ability to zoom in and out is **essential**.

§ 3-12.00 Equipment Types¹

§ 3-12.10 Traditional Trials

In a traditional trial, the evidence will consist primarily of witness testimony, documents, photographs, charts, and, possibly, audio or video tapes. Jurors most often will review documents in the jury room.

§ 3-12.11 What to Use to Show Exhibits

The type of technology that will most easily permit the presentation of documentary evidence to jurors is the document camera. Most document cameras consist of a vertically mounted color television camera aimed downwards at a horizontal base upon which a document or object can be placed. Most document cameras have at least a manual or autofocus control as well as the ability to zoom in or out so as to enlarge or diminish the area of the document or object to be displayed. Sophisticated document cameras increasingly tend to have hand-held remote controls.

¹ The equipment used in the experiments upon which these recommendations are based was loaned to the Courtroom 21 Project by its Participating Companies. Other vendors often supply similar equipment. This Manual, however, reflects the equipment with which the Project has first-hand familiarity.

Many document cameras provide overhead lighting of the base in order to enhance the visibility of the item to be displayed. In some cases this lighting is provided by bulbs that are mounted on moveable arms; the arms may take up significant vertical space.

Nearly all document cameras are designed so that they can show transparencies, x-rays, and slides. Some cameras come equipped with internally illuminated bases for this purpose; others have optional light boxes that can be placed on the base to provide similar functionality.

Document cameras must be connected to some form of display device. Ordinarily this would be one or more televisions, monitors, or projection units.²



Portable WolfVision Visualizer

Document cameras are relatively simple to operate. The most basic provide zoom-in, zoom-out, and autofocus capabilities. All that a juror need do is place a document, photo, chart, etc. on the base, and an image immediately appears on the display device. Document cameras used in the jury room should be **VERY** simple to operate. ***Jurors will not use equipment that they do not easily understand.*** Equipment with multiple features may discourage juror use.

Court staff should always check the focus of a document camera or display device or the tracking on a VCR just before the jurors are due to deliberate. That will minimize the risk of accidental equipment failure through “human error” on the part of someone who wandered in.

Other input devices of potential application to deliberations are audio tape players and video tape players. As law enforcement increasingly shifts to CD-recordings, CD players will be necessary for wiretaps and the like. We can anticipate a similar move from tape to DVD in the years to come; we have already moved some video footage to CD's. For traditional trials, these technology needs will best be met by using basic equipment such as a VCR and TV to play back a videotape.

² Leigh Kades, *Document Cameras*, COURTROOM 21 COURT AFFILIATES TECHNOLOGY WHITE PAPER 2002-06-01 (Draft June, 2002).

§ 3-12.12 What To Use To Display Exhibits

The primary display means available are:

- i traditional televisions
- i television monitors³
- i computer monitors capable of displaying traditional video
- i LCD or plasma displays
- i rear projection devices
- i front projection devices

Most courts will have traditional televisions or television monitors available.⁴ Unfortunately, these ordinarily are the least desirable display devices for the deliberation room. Even when large enough, they tend to be hard to see from the sides and are usually susceptible to glare. Courtroom 21 experimentation indicates that televisions should be used to display documents only when there are no other reasonable alternatives. Very large high-end monitors likely would prove useful if available, however. Subject to glare from room lighting or outside windows, televisions can be highly effective for showing photographs or videotapes.

At present, most LCD screens are designed for personal use, and those that are reasonably priced will range up to 18 inches in diagonal measurement. Use of these monitors is customary in high-tech courtrooms where jurors often use them either on a one-juror-to-one-screen basis or two jurors to a single screen. So long as these monitors are linked to equipment that could also show traditional video,⁵ they are highly desirable. Given the need for multiple monitors ordinarily they would best be used in a permanent or semi-permanent installation. This is not a probable deliberation room use for most courts.

Plasma screens are large, high-resolution screens usually with diagonal measurements ranging from 40 to 61 inches. Customarily they can display any usual video image. They can be wall-mounted or placed on any large flat surface via an optional stand. When image



³ Capable of displaying computer output as well as traditional video.

⁴ Ordinarily these cannot display computer output unless a scan converter is used. Such converters are easily available and inexpensive; some notebook computers can output composite the type of signal that every television should handle, or even or S video, a higher quality signal that some televisions can use.

⁵ It is easily possible to design a deliberation room in which all display images are digital in nature. However, this would entail sufficient expense or complexity that we believe that most courts would *for the moment* prefer the ability to show document camera or VCR images more easily, especially as equipment must often be moved from one jury room to another.

clarity, viewing angle, and room size are considered, plasma screens ordinarily are the display means of choice. Unfortunately, although they are fairly common in high-technology courtrooms, they are rare in most state courtrooms. Their chief (perhaps sole) disadvantage is their cost; high resolution units frequently cost \$ 15,000 or more apiece. They are becoming cheaper, however, as manufacturers position them for home TV use.

Projection units are simply units that display images on a flat surface. They range in size from small models the size of a large hard-cover book to the enormous desk-sized units often used in rock concerts; most are highly portable. Projection units can display images from either the rear or the front. Most can display any type of video signal, including computer output. Rear projection is highly desirable because viewers do not see the projection unit - only the screen. Unfortunately, rear projection is not ordinarily possible



40 inch SMART Board in corner

except in large rooms where the projector can be located far enough to the rear of the screen. The critical exception to this statement takes place when manufacturers install projection units in special enclosures with mirrors that eliminate the need for a large physical distance between projector and screen. Although a number of



3000i SMART Board in Courtroom 21 jury room

manufacturers produce these products, SMART Technologies is best known in the legal world for its rear projection SMART Boards. These single-unit rear-projection displays are especially useful in conference/jury room sized spaces. Although technically portable, their size makes significant movement difficult, and they range in price from \$10,000 to about \$20,000. Given enough space, a large rear projection system such as SMART's 67-inch diagonal 3000i might be ideal.

images onto screens or, if need be, walls.⁶ They can cost from about \$5,000 to \$15,000 for units of potential interest in jury rooms. Critical concerns include resolution (cheaper ones may not handle all customary computer outputs) and brightness. Those units that cannot cope with bright

Front-projection units are usually placed on stands or tables and project their

⁶ A recent advance by NEC is a projector, the DT 100, with a top that is a scanner. A juror could place a paper exhibit on top of the unit and press a button, and an image of the paper will be displayed without the need of a document camera.



indoor lights or the results of windows will require dimming room light or using drapes, or both. Their noise and often the need to put them on the jury room table where they may disturb jurors and interfere with people and paper are problematic. However, inasmuch as many high-technology courtrooms were equipped with such projectors and many courts are now replacing those units either with more capable devices or alternative display

devices, a number of courts are likely to find themselves with available projectors that could be used in jury deliberation rooms.

Assuming normal deliberation room sizes, for display purposes in declining order of utility, we recommend plasma screens, rear-projection units, front-projection units and televisions. We assume that individual LCD monitors are not a viable alternative for most courts.



Document "call-out" displayed by computer using TrialPro software.

§ 3-12.20 Technology-Augmented Trials

Technology augmented litigation usually means the electronic display in court of evidentiary exhibits. Although there are a wide range of possible courtroom technologies, the core function is the display of documents, photographs, charts, and similar exhibits. These trials are much faster than are traditionally presented cases, and the federal courts are moving rapidly to wholesale adoption of evidence presentation technology, an adoption that will spur state court adoption. It is at least desirable to enable courts to make digitally presented exhibits available to the jurors during deliberation in the same way in which they were presented at trial. Further, some computerized exhibits have never had a physical form, and jury review of them in an altered nature seems questionable.

Providing jurors with a meaningful opportunity to review electronically presented evidence is not a simple matter. Not only must the deliberation room be equipped with the technology to review computer-based exhibits, but from a practical perspective the jurors must be supplied with a way to operate that equipment that does not require any computer literacy or expertise.

If a trial has generated any written exhibits or written jury instructions, the court should place a document camera as well as a computer and display device in the deliberation room.

§ 3-12.21 Showing Computer-Based information

The key piece of equipment for technology-augmented trial jury deliberations is a computer. Either a desktop or notebook computer can be used, but a desktop may be preferable if a keyboard is used.

The evidence must be loaded into the computer by a member of the court staff, and the jurors must be able to operate the computer easily. We accomplished this in our experiments by using a high-end litigation software package, TrialPro by IDEA, Inc., to enable access to the exhibits. We supplied the jurors with a list of the exhibits and simple codes with which to recall them. For example, in our experimental trial, “X1” brought up an image of the case’s contract.⁷ The software gives lawyers many different ways to mark up the evidence during trial. We were concerned that the user menu would be too complicated for jury use. As a result, we then modified the usual TrialPro menu to eliminate nearly all of the user options except the ability to enlarge text (to make call-outs). Our jurors had no problem using the software to retrieve, display, and enlarge pieces of the documents and images stored in the computer.



“Front” of jury room with document camera, computer keyboard, and plasma screen.

When showing information from a computer, the computer must be connected to a display. Technologists must be sure that the display device’s resolution capabilities match those of the computer. Otherwise, the computer’s resolution must be lowered, or a better display obtained. Courtroom 21 experiments showed that low computer resolution, (640 x 480) ordinarily was sufficient to display documents. Higher resolution gave only a slight improvement.

§ 3-20.00 Annotation Technology

Many courts supply jurors with chalk boards or flip charts; nearly all supply them with paper and pencil/pen. Giving jurors the ability to communicate with each other through writing would seem to be an important need - especially when jurors are attempting to present their views of physical relationships, create visible calculations, or visually argue their points. Annotation technology permits this electronically though what are usually called, “whiteboards.” Speaking generally, there have been four “generations” of electronic⁸ whiteboards. The first

⁷ The software also permits the use of a barcode reader which would be even more effective.

⁸ The original white board, of course, was exactly that - a flat white surface usually wall-mounted- that could be written on with erasable colored markers.

generation permitted a person to write on the board and the writing was then subject to either being printed out electronically or displayed electronically, or both. The second generation added a separate front-projection unit so that the writer could also mark or annotate on a displayed image, such as a street intersection.⁹ Third-generation whiteboards are rear-projection display units that provide the writer with the ability to write on the display screen, with or without an underlying image. Fourth-generation whiteboards are large plasma display screens fitted with overlays that turn the screen into a touchscreen. Coupled with the proper software this permits the writer to mark or annotate on the screen, with or without an underlying image. Both third- and fourth-generation whiteboards may be capable, as are SMART Boards, of controlling a remote computer via the writer's use of a finger or lightpen. All generations of whiteboards are commercially available, and all have potential use in a jury deliberation room. A number of firms now market inexpensive products that can be placed on or over flat surfaces to convert them into first-generation whiteboards.¹⁰

Where electronic whiteboards are especially useful is in their ability to permit a juror to display a video or computer image and then write on the image. One can easily imagine, for example, jurors debating how an intersection collision could have occurred, with differing jurors drawing electronically on a still photograph of the intersection.

Courts should consider installing electronic whiteboards in deliberation rooms. However, Courtroom 21 experimental work suggests that this is of lesser importance than giving the jurors the ability to see documents electronically.

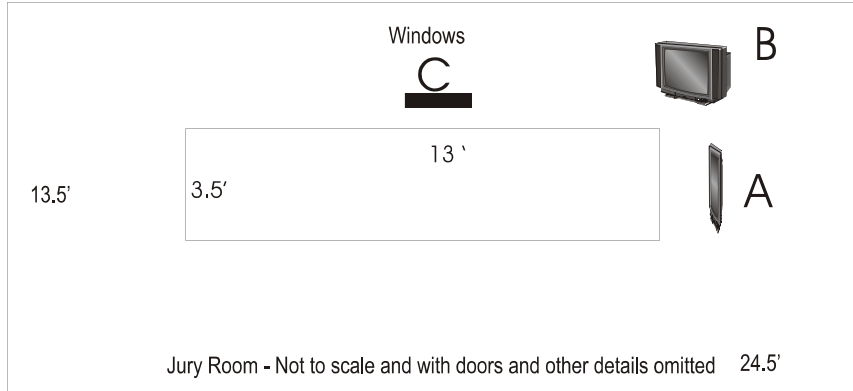
§ 3-30.00 Where to Put the Equipment

§ 3-31.00 Displays

If a court uses a traditional rectangular jury deliberation room, there are only a few primary locations in which to put a television, plasma screen, or projection device. The diagram that follows shows the Courtroom 21 jury room. Primary display equipment locations are at Points A, B, and C.

⁹ This requires careful projector location to keep the writer from stepping between the projector and the whiteboard. The Courtroom 21 Project has considered these boards relatively undesirable because of that concern.

¹⁰ Polyvision, for example, has a "CopyCam" that "is an image capturing system that uses NASA-level optical technology in a wall-mounted arm to snap pictures of everything written on an ordinary whiteboard or chalkboard. . . . [U]sers can send the contents of the board to a diskette, a Web site, or a wireless color printer. . . ." I The Insider News, # 1, Summer, 2002 at 4 (Infocomm promotional materials). The Courtroom 21 Project will install and test a copycam to be loaned by Polyvision in the Courtroom 21 jury room.

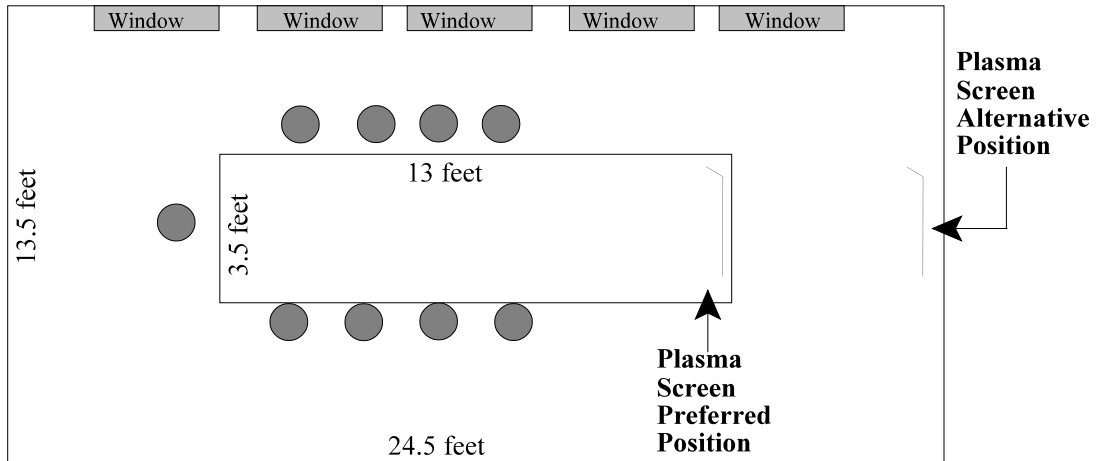


Room lighting is critical. Overhead lighting or bright outside lighting may cause crippling glare problems. Outside light in particular may wash out front projection images, which must be displayed on screens.

Because of the individual variations of each room and its lighting as well as that of the equipment to be used, it is not possible to predict in advance how well any piece of display equipment will work without actually trying it. However, experimental work shows that with jurors seated along the table, Point A in the diagram above is nearly always the best place to put the display device. Point B, a corner, is often at least adequate but may cause readability problems for those viewing the screen from the side. Point C ordinarily is a very distant third. Among other problems, Point C requires jurors on one side of the table to either turn their backs to the other jurors or to sit next to a display they cannot read.

When using a plasma screen, the best location at to put it on top of the table in the Point A location.

The alternative location for a plasma screen is to wall-mount it or stand it in front of the wall facing the end of the table, as shown below:.



When using a large rear projection unit that cannot be placed at Point A, a corner (Point B) location, usually will be adequate.

When using a television, Point C is likely to be especially difficult; jurors at the far ends of the table may not be able to read it at all.

§ 3-32.00 Document Cameras and Computers

The location of a plasma screen or projection unit may affect where to put other equipment. However, we found that a highly effective place to put the document camera was on a small table adjoining the jury room conference table near Point A. By keeping the camera off the main table the table is uncluttered and does not interrupt the sight line to the display screen. We found that the document camera would be operated either by the jurors who happened to sit closest to it or by the juror most interested in doing so.

In a high-technology trial deliberation, we recommend placing the keyboard and mouse (and bar code reader, if any) near the document camera. The same juror can operate both.

§ 4-10.00 How to Do It - The Deliberation Technology Protocol

Assuming that the equipment is installed in the jury deliberation room as discussed above, jurors will use jury room technology easily and efficiently, but only if the following procedure is followed:

1. Jurors *should be told* as part of the concluding jury instructions in substance that:

We have installed in the jury deliberation room equipment that you may wish to use so that you can all see the trial exhibits at the same time. The [bailiff] will show you how to operate it.

The wording is not critical; the substance is. The judge should *not* instruct:

We have installed in the jury deliberation room equipment that you may wish to use, *if you think it necessary*, so that you can all see the trial exhibits at the same time.

2. The jurors should be given an index of the exhibits with sufficient detail to enable them to identify the specific exhibits. This is especially important if the exhibits are stored on a jury room computer.
3. A simple set of written directions for the use of the deliberation room technology should be placed in a highly visible location in the room, preferably under the document camera's camera, and *displayed* on the screen
4. A member of the court staff *must* show the jurors on arrival in the jury room how to operate the equipment, hands-on. In the case of a document camera, the staff member must demonstrate how to use the camera controls to zoom in and out. With a computer-based system, the staff member must show how to retrieve an exhibit from the index and how to use the software to enlarge portions of a page.

Step 4 is the most important. Courtroom 21 experiments show that most jurors ordinarily will not use equipment that they feel is unnecessary. However, they are both highly sensitive to what they perceive as the judge's desires and reluctant to do anything that might be inappropriate. Without the demonstration in Step 4, many jurors either will not use the equipment or will not understand how to use it properly. Perhaps due to the stress of deliberations and having to reach a verdict, they can also be oblivious to the obvious. During the Courtroom 21 study, numerous jurors ignored electronically displayed (and very large) written instructions as to how to use the document camera. In at least one trial, one or more jurors failed to use a chalkboard because the orienting staff member hadn't pointed it out.

§ 5-10.00 Helping Those with Difficulties Hearing and Seeing - Assistive Technology

In modern times we have worked to ensure that all members of our nation are available for jury service.¹¹ Accordingly, we are increasingly faced with jurors who are in need of special assistance to assure their ability to function properly as jurors. In most circumstances, this means assisting the hard-of-hearing, although it may refer to the visually challenged as well.

In addition to sign language interpretation, there are two general approaches for helping the hard of hearing. Those who can hear to some degree can be assisted through infrared headphones. One or more microphones conveys sound to the infrared emitter which transmits it to individual headphones worn by jurors via infra-red. Each headphone-wearing juror then hears a personally amplified version of what is occurring.¹² This approach has the added advantage that it can be used to convey foreign language interpretation. Indeed, systems capable of multiple frequencies permit transmission of multiple languages. A substantial number of state and federal courts have access to infrared hearing assistance devices.

Those who cannot benefit from these devices but who can read can use the services of a realtime court reporter. Communication Access Realtime Translation (CART) is a service provided by a court reporter to assist persons who are deaf, late-deafened or hard of hearing (HOH) in any proceeding. During a trial or deliberations, CART requires a separate reporter other than the reporter taking down the trial to provide CART services to the HOH juror or trial participant. The CART reporter ordinarily will use his or her own equipment, including, but not limited to, a steno machine with laptop computer with appropriate software or voicewriting enabled computer. The CART reporter ordinarily sets up next to the person needing assistance during the trial and/or during deliberations. The CART court reporter's output would be displayed on a computer monitor screen in realtime. The screen would face the person so that he or she could read along during trial or deliberations. The difference between court record realtime and CART reporting is that CART is not necessarily verbatim. It enables the HOH person to understand the proceedings. Therefore, paraphrasing by the reporter is commonplace in order to get the meaning across to the juror.

Assistance to the visually challenged can also be of importance. Those who can see with assistance may benefit from using computer software that displays images which are substantially enlarged on the monitor. In the event that a blind juror who can read braille is part

¹¹ See, e.g., *Standard 1: Opportunity for Service*, ABA STANDARDS RELATING TO JUROR USE AND MANAGEMENT (1993). "Among the suggested steps for implementation" is:

9. Examine the need for communications technology and services so that persons with hearing and sensory disabilities can serve on juries.

¹² This same technology can work with hearing aids as well.

of a jury panel, documents can be scanned to a computer and then sent to handheld braille devices which will permit the juror to read the document in braille. This was done successfully for a blind witness in the 2001 Courtroom 21 Laboratory Trial, *United States v. Linsor*.

§ 6-10.00 Conclusion

A juror in a criminal trial tried in the United States District Court for the District of Oregon using deliberation room technology conducted under the protocol set forth in this Manual volunteered that:

It cut *way* back on paper & I believe it made the time more effectively used. (Emphasis in original).

[The jury] viewed several items multiple times & it aided in our discussion.

Without the technology the jurors “wouldn’t have been able to track specifics together otherwise.”

All of the responding jurors in that trial enthusiastically endorsed the use of jury deliberation room technology. All reported the perception that deliberations were faster due to the technology than they would have been without it.

It is rare to determine a way in which we can assist our hard-working jurors so easily. Of course, cost is always a factor. As courts increasingly acquire courtroom technology, they will have the opportunity as they upgrade to move some of it into deliberation rooms permanently. As courts acquire portable equipment, much of that will be able to be moved from the courtroom to the deliberation room. And happily, of course, technology prices for this type of equipment keep dropping so that equipment can be purchased directly to assist the jury.

As one perceptive American jurist long ago noted,

*Jury service honorably performed is as important in the defense of our country, its Constitution and laws, and the ideals and standards for which they stand, as the service that is rendered by the soldier on the field of battle in time of war.*¹³

Jury room deliberation technology provides an additional tool with which to equip our jurors and make their difficult and often arduous service easier. We ought to proceed to do so as rapidly as may be reasonable. We trust that this Manual may be of assistance in doing so.

¹³ELIZABETH FROST-KNAPPMAN & DAVID S. SHRAGER, *THE QUOTABLE LAWYER* 171-72 (1998 rev. ed.) quoting the Honorable George H. Boldt.