

Using a Projector with a Computer

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Setting Up Connections

The standard rule of thumb for setting up your projector and computer is to start to do so at least 2 hours in advance. The following outline of computer related issues underscores the need for such a timeline.

Why is there not just ONE cable that could be used to connect a computer with a projector? Instead there seem to be so many, and as Murphy's Law would dictate, when you are getting ready for a presentation the cable you need - the cable that both the laptop and the projector can connect to is NOT anywhere to be had.

Also, when you do finally get the two machines connected, the projector won't show what is on the computer.

The following is a guide to help. It is no substitute for on-site help of a real and savvy human being, but it can help. There will soon also be a guide available to print out and carry with you.

Step One: Look at the ports of Each Machine. What are your options?

Step Two: Choose the Best Quality options available to you.

Step Three: Be familiar with Computer and Projector Issues

Step One: Look at the Ports. What are your options?

Please find below two pictures.

The first is the back of a notebook computer. (Some of these connections (i.e. ports) may be located on the side of the laptop/notebook computer.)



The second shows the ports of a data/video projector.



When connecting a computer and a projector you have two basic options.

1. Find the same type of port (connection) on each. This is the simplest method. Remember that projectors have many ports of different types to allow the user to connect several "feeds" at once so that during a more complex presentation the operator only needs to use a switch on the projector to "toggle" between "feeds" (i.e. notebook, dvd, camera, vcr, etc)
2. Use a third device to convert the signal coming from one port to be compatible with a different type of port. This is not only more complex, but also requires a third digital device that will cost at least \$40.

The connections available to you may include the following. Most, *but not all*, computers and projectors will have each of these.

VGA

SVIDEO

Composite (RCA)

Next: Choose the best quality available to you.

Projection Quality

At least three factors influence the quality of your projection.

1. Type of Connection between devices

Best: VGA

Good: S-Video

Fair: Composite

2. Quality of Graphics and Video you have embedded into your presentation.

Save graphics and images in 72 dpi (Finer resolution cannot be seen in digital projection.)

This will allow for quicker loads of images/slides, especially using older computers.

Use Quicktime or MPG for video. These will be smaller files lessening, if not eliminating the “jerkiness” that comes from overloading video card/cpu memory.

3. Brightness of Projector (higher the lumen rating the better)

Check out <http://www.abc-grr.org/tech/projectors.htm> for links to most major manufacturers of projectors.

Minimum for smallish meeting room: 900 Lumen (with lights dimmed)

Minimum for larger meeting room: 1400 Lumen, best 2000 lumen or better.

Next: Composite Connections: Description, Advantages, Disadvantages

Connections: Composite

Composite ports and cables are the most common, but have the least quality - especially for video signal feed. This type of connection is also referred to as RCA composite or just RCA.

Composite cables are used for both AUDIO and VIDEO, unlike S-Video and VGA which are used only for VIDEO signal feed. Most all vcrs have these ports, but not all computers have these ports built in.



Composite ports and cable ends for **VIDEO** are **YELLOW**. This is to help prevent them being plugged into the composite Audio ports.



Composite **AUDIO** connections have two ports. These two ports carry the two signals that make up Stereo audio feed. One port is usually WHITE, the other RED.



Composite cables many times include both the video and the two audio cables in one combined cable:



Advantages of Composite:

1. Most devices have these ports.
2. Cables can be of almost any length. One way of having greater length (100 feet or more) is to acquire coax cable (the type that cable tv is fed through). Get a length or reel of this (Radio Shack, Lowes, etc) and put coax cable threaded ends on each end. You can then acquire composite male and female ends to screw on the end of these cables.

Disadvantages of Composite:

1. Less quality, especially for video, than VGA and S-Video. (To deal with this, manufacturers have increased the quality of the connections by plating the ports and cables with high conductivity metals such as gold. These will cost you. However, the fact that a composite cable has only two leads (represented by the collar and the prong; s-video has four, and VGA has many more than that) would show why quality suffers for video.
2. Most of the time the two audio feeds must use a special stereo two lead to one lead or converter from composite to pin to connect to the ports and maintain stereo (left and right channels).

Connections: S-Video

This connection is second in quality only to that of VGA connections. S-Video Connections have been available on higher-end Video Tape Recorders (VCRs). They are even more common on DVD players and recorder players.



S Video Port



S-Video Cable. These can be confused with extension cables for keyboards, mice, and other round end serial cables.

Video cameras, especially digital video, also have these s-video ports. More and more televisions are being built with this port.

Following this trend more recent notebook computers are equipped with these ports.

The Advantages of S-Video:

1. More portable cable. VGA cables are much more bulky.
2. S-Video has more uses. You could have a couple of these cables in your accessory bag and use one for computer-projector connection and another to hook a high end vcr, a dvd, or a video camera (for live feed) to your projector. Many late-model televisions, especially larger screen have these ports so that if a projector is not really needed, the presenter could (if there is an s-video port on the computer) run an s-video cable from the notebook to the television. VGA would have to be converted to S-Video to accomplish the same feat.
3. In more complex presentations, s-video is simpler to configure with a video switch between output devices (that is, what will generate the image to be fed to the projector; e.g. computer, dvd, vcr, camera, etc.

Disadvantages of S-Video:

1. Cable extensions are limited to 25 feet without the use of an amplifier to boost the signal.
2. Some notebooks and many middle to lower end vcrs do not have this port built in.
3. Older televisions do not have this port.

Next: VGA Connections

Connections: VGA



VGA Ports. Many projectors will have two of these ports. Notebooks will have one.



VGA Cable. A cable with two male ends (with pins) will plug into both the projector and the notebook computer.

A VGA Cable with one male end and one female end is available as an extension cable to be used in combination with the two-male-ended cable when the distance between notebook computer and projector is more than what the cable that comes with the projector can reach. Extension VGA cables are available in 6, 10, 25, and 50 feet.

Advantages of VGA Connections:

1. Best Quality for non-professional videographer.
2. Notebooks and Projectors have VGA outputs.
3. VGA Splitters (with power inputs) are available in 2:1, 4:1 and more configurations

Disadvantages of VGA Connections:

1. Bulky
2. More expensive to use with a switch.

Next: Issues with the computer that you may confront once you have physically connected the computer with the projector

Computer Issues

You have been able to connect the computer that will play your PowerPoint presentation to the projector.

- The VGA or Svideo or Composite cable is connected to both machines
- The composite audio cables are connected from computer to external speakers or to the audio imports for the speakers onboard the projector.

Ready to Go!

But, When you look at the screen, there is no "feed" from the computer. All the connections are solid, but there is no output.

Your computer and / or projector has got issues. One or more of the following is true:

- The computer has not been told by you to forward a signal to the external vga port to which you have so carefully connected a vga cable. (**Signal Feed**)
- The computer has not been told which "desktop" to display the PowerPoint on. (When you look at what the projector is projecting you can only see the nice background of your computer's main screen (desktop). (**Clone or Extended Desktop**))
- You have a signal, but the projector is projecting only part of the screen you see on your notebook screen. (**Screen Resolution**)

Next: Adjusting the signal feed: Getting the computer screen output to the projector.

Computer Signal Feed

On your keyboard, find the Fn key. Usually this is located on the bottom row of keys at each side of the keyboard. Many times the label on this key is in green or another color that is different from the color of your main keys.

Second, find the LCD/CRT key. (LCD = laptop/notebook computer screen) This may also be labeled LCD or CRT. (CRT=Cathode Ray Tube: the television – like monitor used with desktop computers).

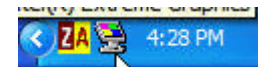
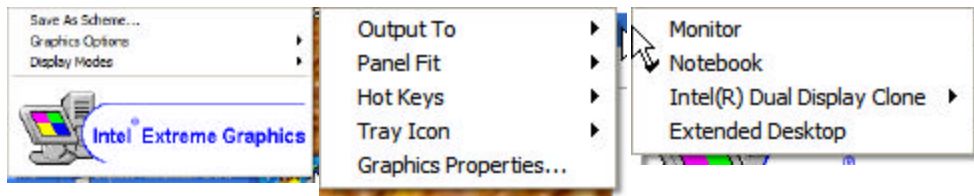
Hold down the Fn key and press the LCD/CRT key.

Your main screen on the notebook computer may go blank. If it does and your projector starts to show what was on the notebook's screen, repeat this combination of keys once. You hopefully will then will see a projection on the projection screen and the same on your notebook screen.

If this does not happen: (The graphics for the following assume a Gateway with an Intel Graphics Card.)

Look carefully at your projector to make sure that the output signal choice is VGA or whichever feed you have connected to between computer and projector. If the feed is correct, go back to your computer.

If you have an icon in the task bar on the lower righthand side of our computer that may look like a monitor and/or is labeled with your video card's maker's name, right click on this icon. Look for "properties." Find "Graphics" Properties, then "Output Options." Display mode is one of the list, but refers to the

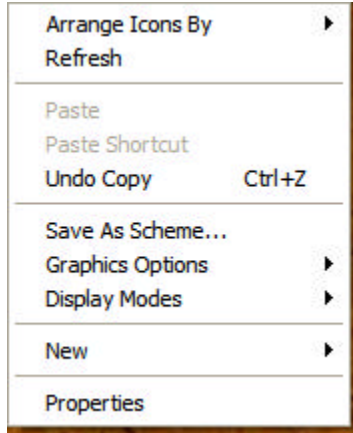


resolution (e.g. 800 x 600), not the feed.

If you still cannot get the signal from the computer to the projector, try the method on the following page.

Getting the Signal from the Computer to the Projector

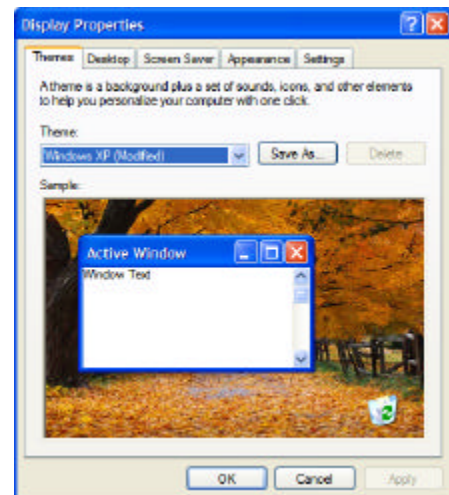
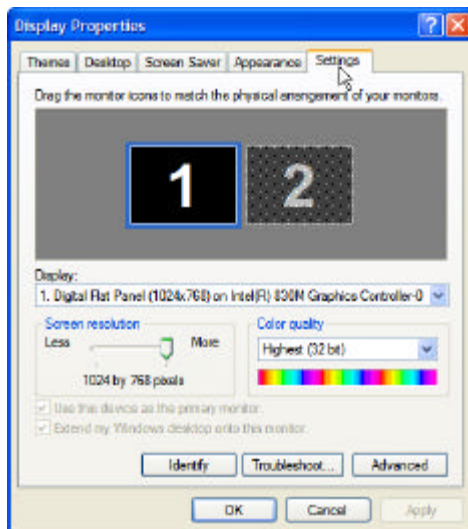
Accessing Your Signal Feed Options from the Computer's Main Screen (i.e. "Desktop")



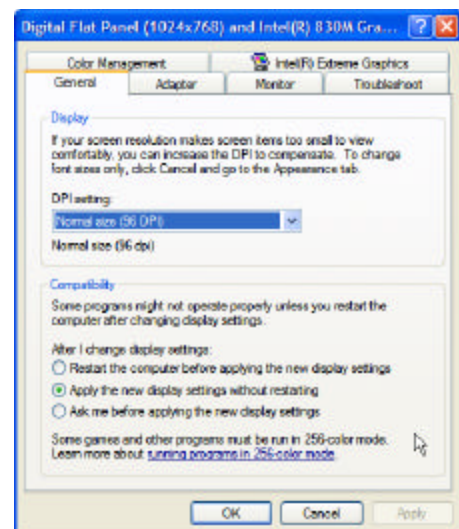
Minimize all computer program windows until you get back to your desktop (the screen that is on the computer monitor before you open programs). Click the right mouse button once on any unoccupied place on the desktop (a place other than near an icon).

Choose "Properties" from the drop down menu that appears.

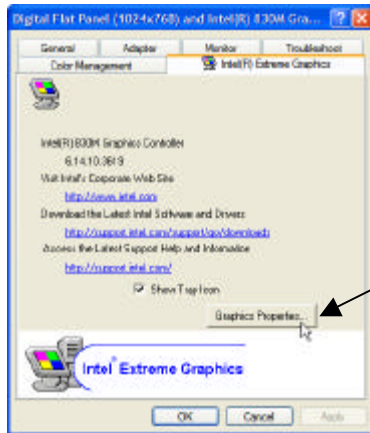
Choose the "settings" tab in the Properties window.



In the Settings window choose "Advanced." This will open a window that will give you several choices in the form of tabs.



You will want to choose one that is not General, Troubleshoot, or Monitor. The exact label will depend upon your computer's video card. Look for a tab that is labeled with your video card's maker's name.



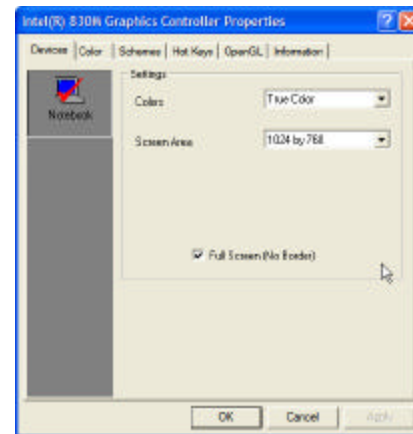
Then under this tab look for properties.

On many notebooks, especially late models, you will have two options:

Clone your desktop

Extended Desktop

Choose "Clone" if you want the screen on your notebook to be the screen that you are projecting. This is the most often used choice.



have

This

Choose "Extended Desktop" if you want to have a screen available that is not being projected. This is a good choice if you want to do some work that you do not want projected while the projection is running. When you open the PowerPoint Program you would size its window and putting the cursor on the blue program bar at the top, keep the left mouse button down and drag the program window right and watch it appear on the projection. Whatever program is on the original desktop will not be projected.

If you do not find the option for clone, you will need to restart your notebook computer with the vga cable connected to the projector. Make sure also that the projector is turned on and the vga feed has been selected. When your notebook boots up, these options will appear. Choose the one best for you.

Next: Projector Issues

Projector Issues

Setting up well in advance of your presentation is not just in case you have computer problems. The projector itself could have issues.

Possible Projector Issues:

- Missing Cable or Power Cord - Always check before leaving the office
- Burned out projector lamp - not as common as it once was, but still may happen. At \$500 or more per replacement lamp, it may be best not to carry a spare, but to pre-arrange the use of a back up projector.
- Menu Challenges - When menus are used by many users, sometimes what one sets is not good for another. Sometimes features necessary for simple setup are turned off by a previous user. (Such as having the automatic "toggle" button that toggles through types of video feeds turned off). Keystone correction is necessary. Mirror or "rear projection" can frustrate you if the setting has been left on but you are not using a rear projection screen.

If you still need help, call Richard Ricks (309) 698 – 4027 or someone from a local school, college, or business whose staff uses projection. There is probably someone in your church who does this as part of her/his job.

Connecting for Sound

If your video projection presentation has sound you will also need to hook up your computer and/or other devices (cd, dvd, video camera, vcr) to speakers. This can be done in one of two ways:

1. Directly to the speakers.

Such a connection is sufficient only if the device being hooked-up generates an amplified signal. Otherwise, the sound will not be loud enough to be heard by your audience. Most decks and cameras need to have their audio output boosted through an amplifier.

Connecting the audio of the computer to the projector's onboard speakers is really only sufficient for smaller rooms. Though most projectors have speakers, turning them up to maximum will distort the sound and/or even then not be sufficient to "fill" the room.

Your better choice is to acquire and use portable speakers with a built in amplifier. (Speakers that have such an amplifier will have need to be plugged into an electrical outlet.) Or **best** - especially in all but smaller meeting rooms - connect your computer audio output to your own mixer/amp board or the "house" system. (Conference and convention centers may charge you for the use of the "house" system on two levels: rental charges and technical staff time.

There are smaller, portable speakers available that have a built in "pre-amp" that will allow these speakers to generate good sound, but the output is not sufficient for a large room such as a sanctuary let alone for a convention center. For that you will need to hook into either the "house" system or a portable mixer/amp feeding large floor/tripod speakers.

2. To and Through an Amplifier/Mixer then to the speakers.

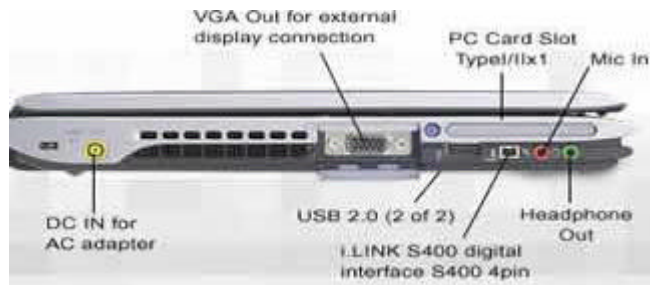
Connecting the output of your device (computer, cd, dvd, video camera, vcr) to the "house" system or a mobile "board" (Amp/Mixer) is necessary for sanctuaries and larger assembly areas such as convention/conference rooms.

The options you have will depend upon the following:

- Size of meeting space used (i.e. small room, sanctuary, etc)
- Type of speakers to be used.
- Availability of mixer/amp that you have either brought in or is resident (the "house" system)
- Connecting cables and adapters you have on hand

Again, preparation is a must. You cannot hookup what you have not packed to take with you. If you do this often acquire an accessories bag and stock it with the most common cables and adapters. Your investment will pay for itself in the amount of anti-acid tablets you will not have to purchase.

What audio ports do you have?



Computer: Most notebook computers will have two ports for audio:

1. Headphone (output);
2. Microphone: (input).

Use the output for connecting the audio portion of your presentation to speakers or amp/mixer.

The type of connector you need is most probably an 1/8 inch audio plug (plug, more precisely "telephone plug," is terminology that began with this type of cable end being used when telephone operators connected phone calls by hand by quickly plugging and unplugging the telephone lines in the early switchboards).

"Telephone plugs" come in at least three sizes. You will work with two of these: 1/4" and



1/8".



Connect with your computer audio output using an 1/8

inch plug-ended audio cable, inserting it into the "Headphone" port.

The other end of the cable may have an end that can be plugged directly into the projector, speaker or mixer/amp; however, if it doesn't DO NOT WORRY. There are adapters available that came with your equipment (or can be purchased at Radio Shack and similar outlets). More on this in "Connecting to the Mixer/Amp."

VCR: The back of a VCR player or recorder/player will have **composite audio connections.**



Higher-priced vcrs, such as the one in the picture at the left, will have two audio outputs (color-coded red and white; one of these for each of two channel "stereo"). Lower-priced vcrs will have only one audio output port (often white in color). The yellow port is for Video.

CD: The CD Deck will have the same audio outputs as the VCR.

DVD: The DVD deck will have the same audio outputs as the VCR.



Camera: Consumer level cameras will have either a composite audio output or a plug connection at the end that connects to the camera with three composite-type plugs at the other end. (Audio connections are red and white; video is yellow).

Professional level cameras will have multiple audio outputs. The best will be the balanced outputs (XLR) more commonly seen on microphone cables

and mixer/amp boards.



Which Path to the Speaker?

What will you connect your computer (or, other device) audio out to?

1. Directly to the projector? Best use: Smaller meeting rooms.

As you set up, well before the time of your presentation, test the audio volume. Remember, the presence of people - even if completely silent - will absorb the sound. Be sure that the onboard speakers have enough umph!

First:

Determine the type of cable end needed to fit into your computer's [HEADPHONE port](#).

or

Into your other [device's outputs](#).

Second:

Choose the correct audio input on the projector. There are a number of audio inputs. Composite, and "phone plug" connections are the most common. There may even be an 1/8" plug port!



Your options:

If there is an 1/8" plug input on the projector, then you need an audio cable with two ends (1/8") that are the same.

If there is an 1/8" plug input on the projector, but the projector has only composite audio inputs, then find a cable with one end with 1/8" plug and the other end a composite. These are available at outlets such as radio shack. This is a good basic cable to carry with you.

If there is an 1/8" plug input on the projector, but the projector has only composite audio inputs AND you DO NOT HAVE a cable like that, find an adapter. There are adapters available to convert almost any cable end into almost any other cable end. Some of the common ones to carry with you are:



2. Directly to external speakers? **Best use: Mid-sized rooms; Small rooms, too!**



If you are often making presentations in mid-sized rooms, invest in a pair of external speakers. Their onboard amp will greatly improve the quality of your presentation.

The speakers come with either plug connections or composite connections.

The power "brick" (adapter) needs to be plugged in so that the onboard amplifier that drives the speaker will function.

Connecting the Audio to an Audio Mixer/Amp Your System or the House System

Best use: Larger Rooms / Convention & Expo Rooms



A first look at a Sound Board/Mixer/Amp is intimidating. That is the reason this author has preferred video - AND professionals will tell you audio and video are two different animals!

You can do this! Take this one step at a time!

You first look to see what type of inputs this device has. Notice the bottom two rows of inputs. The larger round three-hole receptacles are XLR connections. The silver looking jacks directly above each of these are 1/4" plug receptacles. Each pair supports one input device: either using the XLR or the 1/4" plug.

The knobs in vertical line over each set of inputs adjust the quality of the input.

You will also see in the lower right-hand corner, composite inputs. These would be the most likely place to plug in the audio from your computer or other device. The XLR and 1/4 would be mostly used for the microphones attached to this board.



At left: Cable with XLR at one end and 1/4" plug on the other end. XLR has three wires. The third wire is to allow the sound engineer to adjust the various qualities and otherwise filter the audio signal before it is sent out to the speakers.

You may need an adapter to make sure you can make your connections. Yes, there is a composite to XLR adapter! There are also 1/4" plug at one end and XLR at the other end cables. There are even adapters that you can plug your 1/8" cable end into and oila it becomes a 1/4" cable.

If you prepare well enough ahead of time you can have great connections.

If you are using your own board and cables, make all connections and practice the projection including audio output.

If you are using the "house's" make sure you know how much you are paying for the electronic devices and/or the technician's fee.

When you will use the "house's" equipment, make sure that your devices (computer(s), projectors, speakers, etc.) will have connections that will adequately connect the devices for best output. Though a microphone laid next to the onboard speaker of a projector will work to get the sound into the "house" system, it will not be the best quality. I know, I have had to do it.