



# **FC-2600**

## **Quick Reference Guide**

Part Number 1000505-01

Rev A

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# Introduction

## The FC-2600 Digital Camera

The FC-2600 is not your everyday digital camera. The same CMOS imaging technology found in many digital cameras is present in this powerful and rugged computer (Figure 1-1).



Figure 1-1. The FC-2600 Hand-Held Computer

## Components of the FC-2600

The following are the components of the FC-2600 (Figure 1-2 on page 1-2):

- The FC-2600 is a 5 megapixel camera (4 megapixel processed).
- The FC-2600 has four illuminators that allows you to take pictures in low light conditions.
- The FC-2600 has two 635 nm red visible lasers that you can use to position objects and to align the FC-2600.

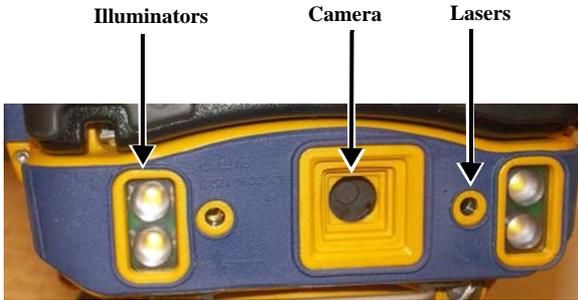


Figure 1-2. Components of the FC-2600 – Back View



Please refer to your *FC-2600 Operator's Manual* for a comprehensive glossary of photography and terms, and detailed instructions on how to change the settings mentioned in this companion guide.

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The key to taking great pictures with the FC-2600 digital camera is learning how to properly use it. Before warming up, take the time to know the FC-2600 to make consistently great quality pictures.



For a detailed description of all FC-2600 components (including indicators and interface connections) please refer to your *FC-2600 Operator's Manual*.

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## Positioning the FC-2600

The main difference between an off-the-shelf digital camera and the FC-2600 is how it is held. Whereas traditional cameras include a viewfinder and sometimes, an LCD display, the FC-2600's display is the viewfinder that operates on a horizontal plane. Instead of holding the FC-2600 up to your eye, you hold it in front of you, about waist high (or whatever is comfortable).

## Settings for the FC-2600

Some settings in the FC-2600 can be changed easily while others are more complex and should be left to the programmer. Depending on your application, things such as resolution, key controls, and options to save may already be set up for you (pre-programmed).

## Getting Started

Unlike conventional digital cameras, the FC-2600 does not have a menu system that allows users to directly change camera options, such as shutter speed and aperture. Because the FC-2600 is a computer capable of taking pictures, camera functionality is integrated into an application via eyeware.

Eyeware is an API that enables an application to communicate with the FC-2600 to take and store pictures. One component of eyeware enables you to do the following:

- Store different camera settings (shutter speed, aperture, etc.)
- Store picture information
- Key press functions in configuration files that you can load from your application to take a picture.

When you start eyeware, a configuration file is loaded. This activates the keys on the FC-2600 or you can use the buttons from your application to activate camera functions.

You don't have to write an application to take pictures just yet. Pre-programmed applications within eyeware Setup allows you to take pictures until you are ready to take your own.



For complete instructions on how to change and save your settings, refer to the *FC-2600 Operator's Manual*.

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## Keypad Controls

When using eyeware with a standard 55-key joystick keypad, use the default control buttons on the **left** when taking pictures.

Table 1-1 describes the keys/button on the FC-2600 and their functions.

**Table 1-1. FC-2600 Button/Key Functions**

Icon	Name	Function
	Camera	Takes a picture
	V	Viewfinder Toggle (Turns the viewfinder on and off)
	L	Lamp Toggle (Turns the lamp on and off)
	S	Shutter Toggle (Changes the shutter cycle)
	A	Aperture Toggle (Changes the aperture setting)
	Colon (:) (FUNC + O)	Manual Focus Forward (Changes the focus setting forward)
	Semicolon (;) (FUNC + P)	Manual Focus Back (Changes the focus setting backward)
	4	Saves the current picture
	1	Deletes the current picture



Create a custom keypad to work intuitively with your application.

# Camera Settings for the FC-2600

Eyesee setup is the part of eyeware that allows you to create configuration files to change camera settings in your application and determine how eyeware works (Figure 1-3).

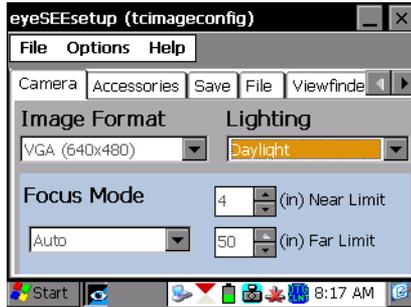


Figure 1-3. Eyesee Camera Configuration Screen

Table 1-2. eyeSetup Menu

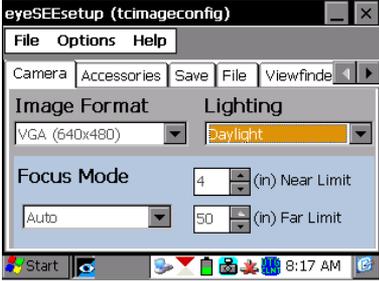
Menu Item	Menu Option/Description
	
Image Format	select either ( <i>HF</i> ) 320x200, ( <i>VGA</i> ) 640x480, ( <i>SXGA</i> ) 1280x960 or ( <i>QSXGA</i> ) 2048x1944 resolution.
Lighting	select either <i>Daylight</i> , <i>Fluorescent</i> , or <i>Tungsten</i> from the drop-down box. Enables you to configure the FC-2600 to compensate for different light conditions and environments.

Table 1-2. eyeSetup Menu

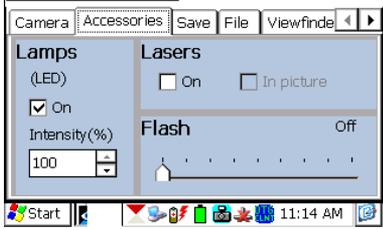
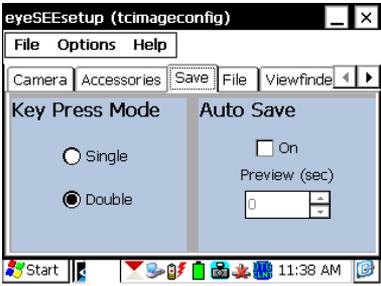
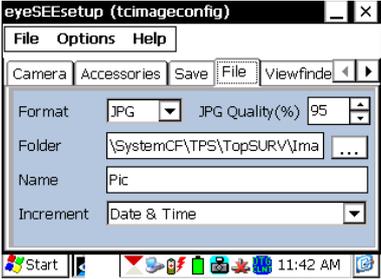
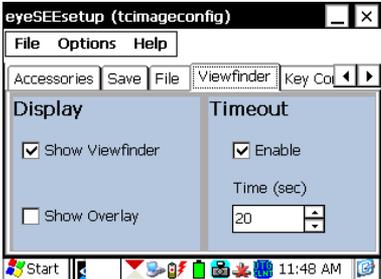
Menu Item	Menu Option/Description
Focus	select either <i>Auto</i> , <i>Laser</i> , <i>Macro</i> , <i>4in (10cm)</i> , <i>9in (20cm)</i> , <i>12in (30 cm)</i> , <i>18in (45cm)</i> , or <i>Infinity</i> from the drop-down box.
	 <p style="text-align: center;"><b>Figure 1-5. Camera Setup – Accessories Tab</b></p>
Lamps	check mark the <b>On</b> box for lamps, then select the desired Intensity in which to display the LEDs.
Lasers	check mark the <b>On</b> /picture box for lasers.
Flash	move the scale to select a level of intensity for the flash.
	 <p style="text-align: center;"><b>Figure 1-6. Camera Setup – Save Tab</b></p>
Key Press Mode	select either Single or Double
Auto Save	check mark the On box to automatically save files.
Preview (sec)	select the amount of time to preview files.

Table 1-2. eyeSetup Menu

Menu Item	Menu Option/Description
	 <p style="text-align: center;"><b>Figure 1-7. Camera Setup – File Tab</b></p>
Format	select either JPG or BMP for graphics
JPG Quality (%)	select the level of quality for your JPG graphics
Folder	press the Browse button to select a folder to save your work.
Name	enter a filename
Increment	select either NOne, Counter, or Date & Time
	 <p style="text-align: center;"><b>Figure 1-8. Camera Setup – Viewfinder Tab</b></p>
Display	<ul style="list-style-type: none"> <li>• Show Viewfinder: check mark this box to display the viewfinder or uncheck mark to hide viewfinder.</li> <li>• Show Overlay: check mark this box to display the overlay or uncheck mark to hide overlay.</li> </ul>
Timeout	<ul style="list-style-type: none"> <li>• Enable: check mark this box to enable the timeout feature.</li> <li>• Time: select the amount of time (in seconds) for the timeout.</li> </ul>

**Table 1-2. eyeSetup Menu**

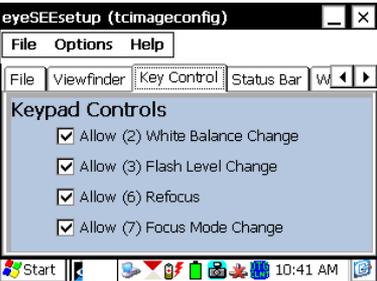
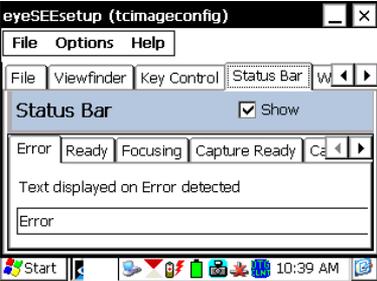
Menu Item	Menu Option/Description
	 <p style="text-align: center;"><b>Figure 1-9. Camera Setup – Key Control Tab</b></p>
<p>Place a check mark next to the following parameters to:</p>	<ul style="list-style-type: none"> <li>• Allow (2) White Balance Change</li> <li>• Allow (3) Flash Level Change</li> <li>• Allow (6) Refocus</li> <li>• Allow (7) Focus Mode Change</li> </ul>
	 <p style="text-align: center;"><b>Figure 1-10. Camera Setup – Status Bar Tab</b></p>
<p>Error</p>	<ul style="list-style-type: none"> <li>• displays when an error is detected.</li> </ul>
<p>Ready</p>	<ul style="list-style-type: none"> <li>• displays when you are ready to start the viewfinder (press camera button to focus)</li> </ul>
<p>Focusing</p>	<ul style="list-style-type: none"> <li>• displays text when focusing</li> </ul>
<p>Capture Ready</p>	<ul style="list-style-type: none"> <li>• displays when your are ready to capture a screen.</li> </ul>
<p>Capturing</p>	<ul style="list-style-type: none"> <li>• displays when taking a picture.</li> </ul>
<p>Save Ready</p>	<ul style="list-style-type: none"> <li>• text that displays when you save or delete something</li> </ul>
<p>Saving</p>	<ul style="list-style-type: none"> <li>• text that displays when you save a file</li> </ul>

Table 1-2. eyeSetup Menu

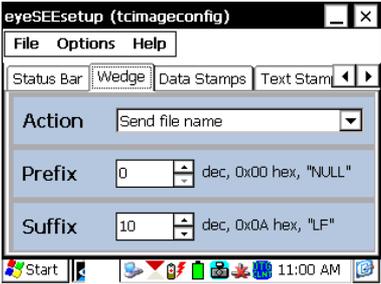
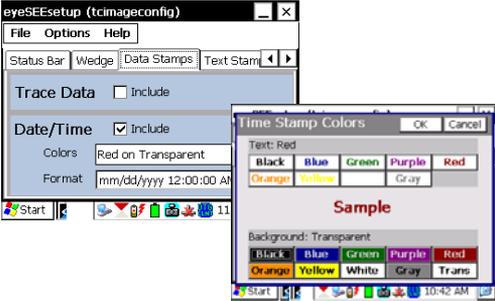
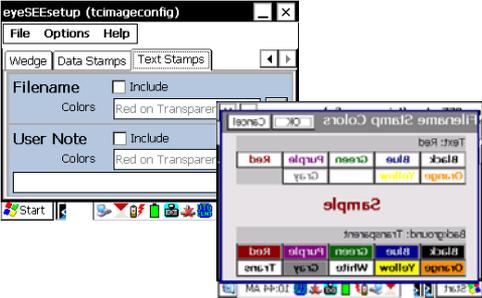
Menu Item	Menu Option/Description
	 <p><b>Figure 1-11. Camera Setup – Wedge Tab</b></p>
Action	Select either None, Send file name, or Send file path
Prefix	enter a prefix
Suffix	enter a suffix
	 <p><b>Figure 1-12. Camera Setup – Data Stamp Parameters</b></p>
Trace Data	check mark the Include box to include trace data.
Date/Time	Check mark this box to include the following parameters: <ul style="list-style-type: none"> <li>• Colors: check mark the <i>color palette</i> icon on the screen to select a time stamp color.</li> <li>• Format: select a <i>time</i> and <i>date</i> format from the drop-down box.</li> </ul>

Table 1-2. eyeSetup Menu

Menu Item	Menu Option/Description
	 <p data-bbox="373 581 870 605"><b>Figure 1-13. Camera Setup – Text Stamps Parameters</b></p>
Filename	Check mark the Include box to select a color combination from the color palette below by pressing the color palette button.
User Note	Check mark the Include box to select a color combination from the color palette below by pressing the color palette button.

## The Viewfinder

Press the **Camera** button for eyeware to:

- Display the viewfinder screen
- Automatically put the camera in focus
- Calculate the exposure setting

By default, a red square or Region of Interest (ROI) displays in the center of the viewfinder and a status bar displays at the top. A blue exposure bar displays on the left side of the viewfinder. As the exposure changes, the blue exposure bar moves up for a brighter exposure or down for a darker exposure. When the correct exposure has been reached, the bar remains still and a green box displays. To readjust the focus, place the center of the subject within the ROI and press **F4**. The viewfinder automatically closes if a picture is not taken within 15 seconds.

When the focusing process completes, a green square displays on the right side of the viewfinder. When the exposure has stabilized, a green square displays on the left side of the viewfinder (Figure 1-14).



**Figure 1-14. The Focusing Process**

If the camera is overexposed, a red square displays in the top left section of the viewfinder. In this case, the mirror finish of the license plate causes a glare (Figure 1-15).



**Figure 1-15. An Overexposed Picture**

If the camera has reached an underexposure limit, a red square appears in the top left section of the viewfinder. In this case, the mirror finish of the license plate is causing a glare (Figure 1-16).



Figure 1-16. An Underexposed Picture

## Taking a Photo Using the FC-2600

If the viewfinder is active and both green squares are visible, press the **Camera** button to take a picture.

If the viewfinder is not active, press the **Camera** button to activate the viewfinder, wait for two green squares to display, then press the **Camera** button again to take a picture. If you are successful in taking the picture, you can expect the following:

- the FC-2600 makes a beeping noise
- the picture displays in the viewfinder
- an update displays in the status bar

Press **4** to save the picture or **1** to delete the picture.



If you are not successful in taking a picture, the FC-2600 makes a buzzing noise.

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By default, the eyeWARE engine saves the pictures as JPEG files in the My Documents folder.

Hold the FC-2600 parallel to the ground to avoid a skewed perspective. The best way to hold the FC-2600 is in front of you, about waist high, with your arms comfortably bent (Figure 1-17).



**Figure 1-17. The Correct Way to Hold the FC-2600**

Holding the FC-2600 out in front of you with one hand may cause your image to blur. Using a stationary object for support helps to reduce the blur (Figure 1-18 on page 1-14).



**Figure 1-18. Reduce Blur by Using a Stationary Support**



**Remember! The Beep is your friend! Don't move until you hear the Beep!**

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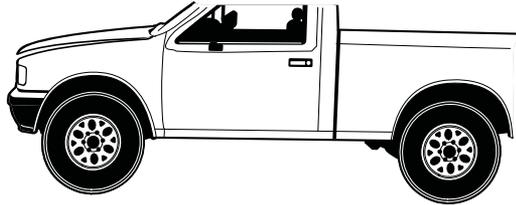
## **Taking Good Photos with the FC-2600**

There are four basic elements to consider to produce good photographs.

- Composition
- Focus
- Exposure
- Color Temperature

## Composition

Composition is how the subject is presented in the frame of the photograph. While basically artistic, composition is important because it affects the focus and exposure of the picture taken.

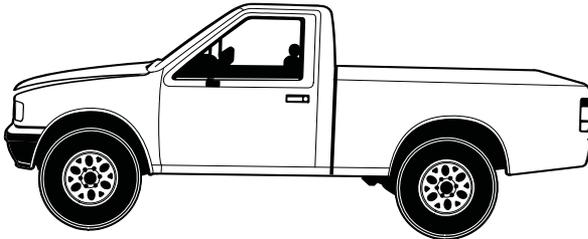


**Figure 1-19. Top Half and Part of Rear is Cut Off**

To avoid the frustration of realizing you have cropped out the important details of a picture (Figure 1-19), do the following:

- Be certain that your main subject is in the center of the viewfinder. There should be about 10% of white space around the subject.
- Use the ROI square as a guide.
- If your ROI square falls on a bright spot or a dark spot, move slightly to find a neutral zone.

Figure 1-20 shows an improved image of Figure 1-19 above.



**Figure 1-20. Full Image of Truck**



Some cropping will occur on the sides of your final image. Make sure that you capture your entire subject, then take a step back.

## Focus

Focus is the sharpness of the photograph. Images that are out of focus lose detail and can appear blurry. Poor focus can be the result of one of the following:

- not waiting for the green focus indicator
- incorrect manual adjustment of the focus
- motion blur

The right focus determines whether your picture comes out blurry or crystal clear.



Things such as muscle fatigue, too much caffeine, and impatience can cause you to lose focus in your picture.

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To avoid blurry pictures do the following:

- Freeze! Do your best to stay completely still until you hear the BEEP!
- Use a tripod or brace your hands on a sturdy object like a table when photographing moving objects.

The photograph shown in Figure 1-21 is out of focus. Details are not visibly clear.

**Out of Focus**



**Figure 1-21. Example of an Out of Focus Picture**

The photograph shown in Figure 1-22 shows motion blur. Chances are that the FC-2600 was not held still while taking the photograph.

**Motion Blur**



**Figure 1-22. Example of Motion Blur**

The photograph in Figure 1-23 is in focus. The edges are sharp. To achieve an excellent photograph you must have a steady hand and stand as still as possible.

**In Focus**



**Figure 1-23. Example of a Photograph That is in Focus**

**Depth of Field** Depth of Field (DOF) is the distance wherein objects are in focus.

To have objects both close and far from you in focus (known as a great depth of field), you need to set up the FC-2600 to use the small aperture setting of F8.0. The focus is equally distributed between foreground and background (Figure 1-24).



Great Depth of Field (DOF)

**Figure 1-24. Great Depth of Field**

To have the subject in sharp focus while keeping the background out of focus (known as a shallow depth of field), you need to set up the FC-2600 to use the large aperture setting of F2.8. The focus is on the background (Figure 1-25 on page 1-19).



Shallow Depth of Field (DOF)

Figure 1-25. Shallow Depth of Field



If you have difficulty achieving the correct Depth of Field, move back from your subject and try again.

## Exposure

Exposure controls the brightness of the photograph. Underexposure is a common problem indoors, and over exposure is a common problem outdoors. This section identifies and corrects any problems you may have with exposure.

As with all cameras, getting the right exposure can be tricky, especially when dealing with bright light sources or a mix of light sources and shadows. Once you become familiar with how the FC-2600 reacts to certain environments, you can fine tune your settings appropriately. Do the following to avoid underexposure or overexposure:

- The main reason for incorrect exposure is using the wrong settings.
- Centering your ROI square on a light bulb, the sun, or any other source of light causes a severe overexposure and in turn, an underexposure in the surrounding areas.

- Centering your ROI square on a very dark area causes the rest of the photo to be overexposed.

Table 1-3 describes what setting you should use depending upon the light conditions of your picture.

**Table 1-3. Light Condition Settings**

Light Setting	Circumstance of Use
Daylight	Parking lots, on the water, extremely bright indoor locations
Fluorescent	Where overhead lights are used in public buildings.
Tungsten	Where regular household lamps are used, by candlelight.

**Indoor** When indoors, select either Tungsten or Fluorescent in your Lighting setting:

- Bright light from a window can make your picture appear too dark. The quality of indoor pictures taken during daylight hours can be greatly improved by providing as much ambient light as possible.
- Placing your subject in front of a bright window will leave them silhouetted against the bright light. In most cases, the light often appears too bright and your subject appears too dark.
- Take advantage of indirect, ambient light from lamps, overhead lights, or candles instead.

**Outdoor** When taking pictures outdoors, select Daylight in the Light Condition setting.

- When working in bright sunlight, avoid taking pictures if glare appears on the viewfinder (such as taking pictures of windshields or windows) by slightly moving the FC-2600 up and down or side to side until you find a good angle that produces little or no glare.
- Pay attention to the sun! If the sun is shining from the side or in front of you, you may end up with extreme dark and light areas.
- Standing with the sun behind you may eliminate extreme light and dark, but could produce glare on shiny objects. Try different locations around your subject to find the ‘sweet spot’.

- In extremely bright sun, you may need to block the screen with your hand for better visibility.

The photograph in Figure 1-26 is overexposed. The detail in the wheel is lost and there are areas where the light is so bright that features are lost. Notice the seam of the door above the wheel. It seems to disappear.

When this picture was taken, the sun was behind the FC-2600.



**Figure 1-26. Example of an Overexposed Photograph**

Figure 1-27 on page 1-22 shows a second example of an overexposed picture. The hood of the vehicle is overexposed and there are several bright spots hiding detail.

When this picture was taken, a red box displayed on the upper left of the viewfinder indicating overexposure. If you examine this photograph, you will see that the sun is in front of the FC-2600.



**Figure 1-27. The Hood is Overexposed**

The photograph in Figure 1-28 is properly exposed. There is a small amount of glare in the tail light lens but the detail of the lens is visible. The wheel detail is visible.



**Figure 1-28. Example of a Photograph with the Right Exposure**



Angling the FC-2600 to avoid glare or bright spots may result in a skewed perspective.

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## Color Temperature

Color temperature deals with the color characteristics of a light source. Not all sources of light are the same in this respect. A light source such as an ordinary light bulb has a low color temperature (more yellow/red light), while sunlight has a higher color temperature (more blue light). As a result, you must adjust the FC-2600 for indoor lighting versus daylight conditions.

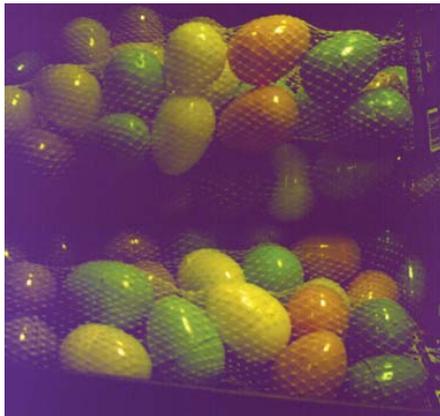
There are three color temperature settings to choose from:

- Daylight
- Tungsten
- Fluorescent

If your photos look similar to the photographs that follow, you should change your current lighting conditions.

Daylight is usually the “whitest” light source. Fluorescent light typically produces a blue or green tint, while Tungsten lamps produce a red or orange tint.

This photograph was taken in fluorescent light with the FC-2600 set to Daylight (Figure 1-29). The highlights on the eggs have a greenish tint to them. Overall, the photograph has a greenish tint.



**Figure 1-29.** Example of FC-2600 Set to Daylight

The photograph in Figure 1-30 is the opposite of the one shown above. It was taken in daylight with the FC-2600 set to Fluorescent. The result is an overall bluish tint.



**Figure 1-30. Example of FC-2600 Set to Fluorescent**

A surrealistic image resulted when taking a daylight photograph with the FC-2600 set to Tungsten in Figure 1-31.



**Figure 1-31. Example of FC-2600 Set to Tungsten**

The photograph in Figure 1-32 was taken with the correct color temperature. Compare the chrome bumper on the vehicle with other photographs.



**Figure 1-32. Example of Photo Taken with the Correct Color Temperature**



Practice makes perfect. The more comfortable you are with the FC-2600, the better your photographs will be.

