

More on Pixels

Lexington Computer and Technology Group

May 26, 2010

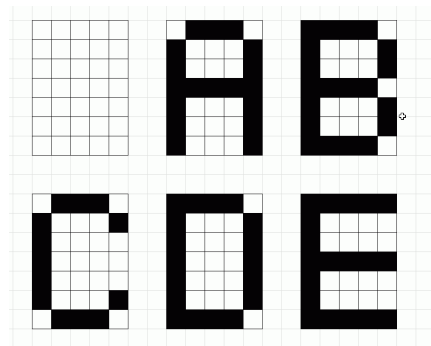
Al Sherman

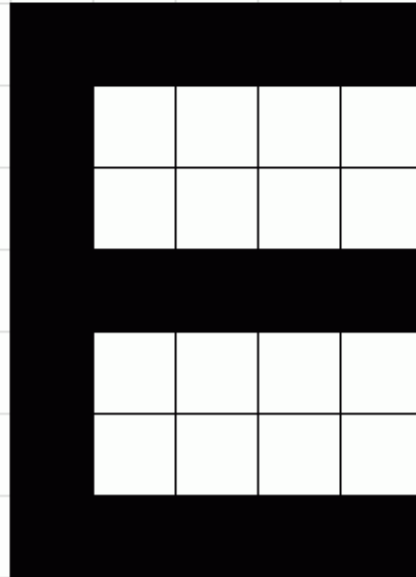
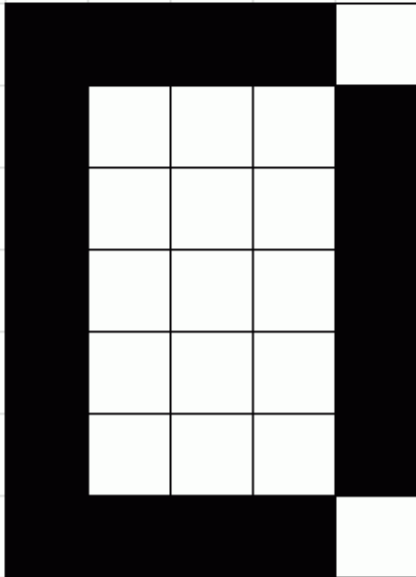
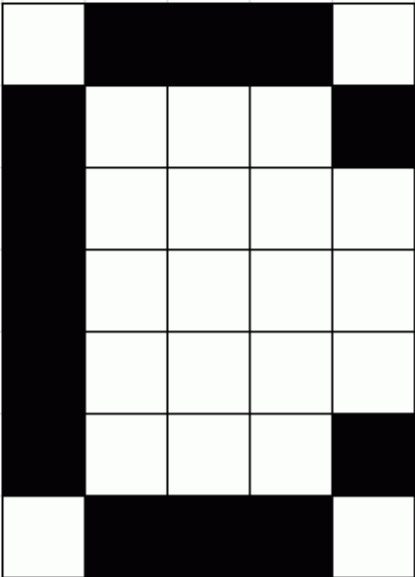
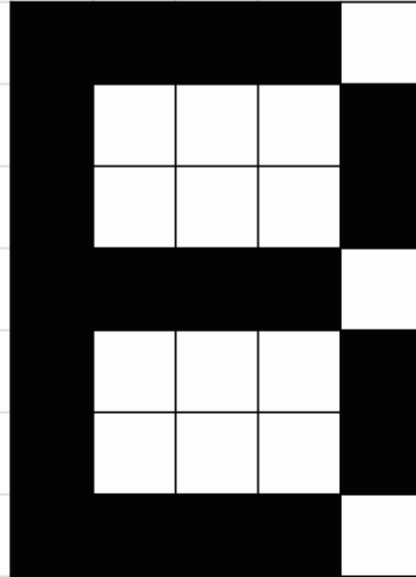
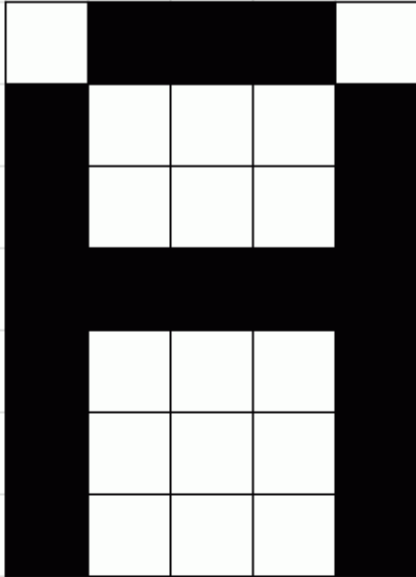
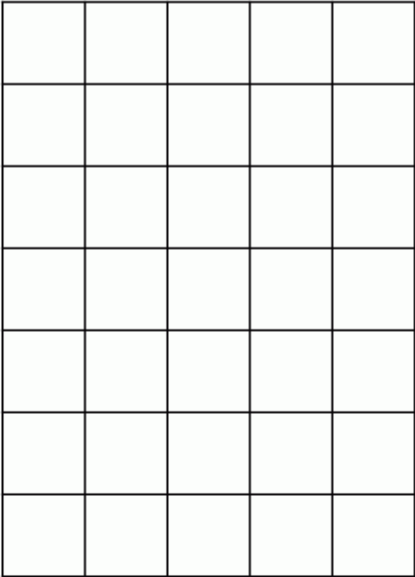
Agenda

- Designing a simple font
- Scanning and OCR.
- Digital photography examples
- Optical vs digital zoom for a camera.
- How pixels relate to printing and viewing
- Examples of computer display settings

Designing a simple font

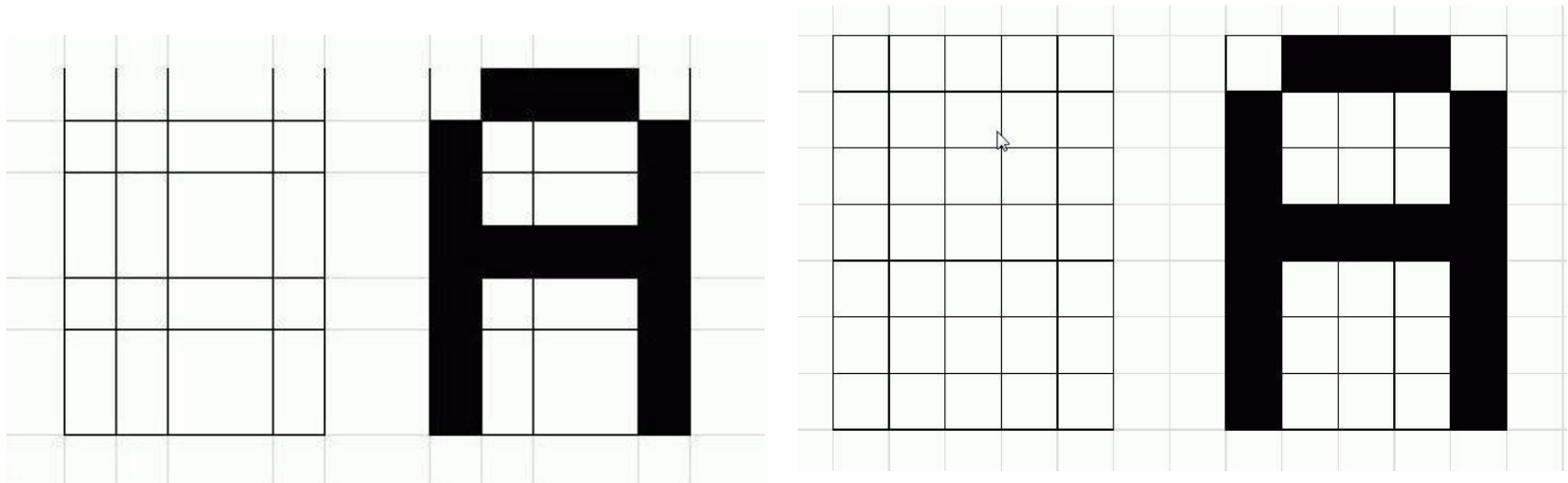
- Designed for a medical computer application in the early '70s
- Dual 8-bit DAC with scan converter or storage 'scope produced 256 x 256 px video display
- Used 5 x 7 character cell (no descenders)





Unexpected disappointment

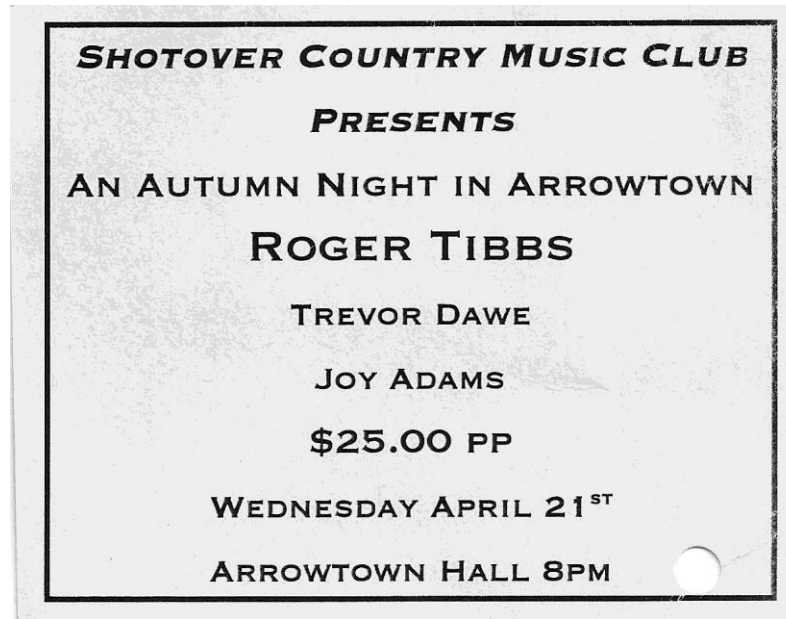
- Irfanview has problems displaying the image
- Missing grid lines or too heavy (aliasing)



- No problem with Paint, Word, etc.

Scanning (and OCR)

- 300 dpi scan of arbitrary item



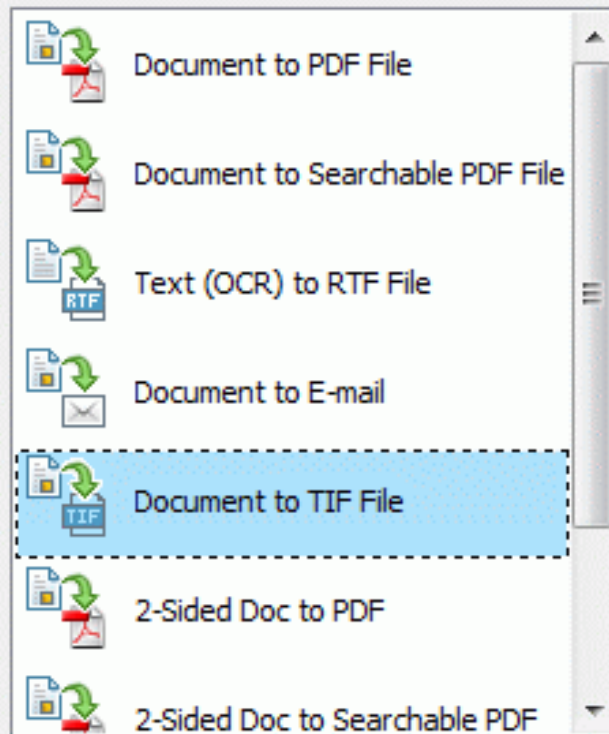
- 8-bit grayscale jpg - 1298x962 px = 151 KB

Scan to TIF @ 300 dpi

The scan shortcut for this button is highlighted below.

To change settings, select a different shortcut or click Change Settings.

Scan Shortcuts:



Scan Settings for selected shortcut



Document to TIF File
Document as Image
GrayScale
Scan To: Save to file
Tiff Image (*.tif)
300 ppi
Simplex (1-sided scan)



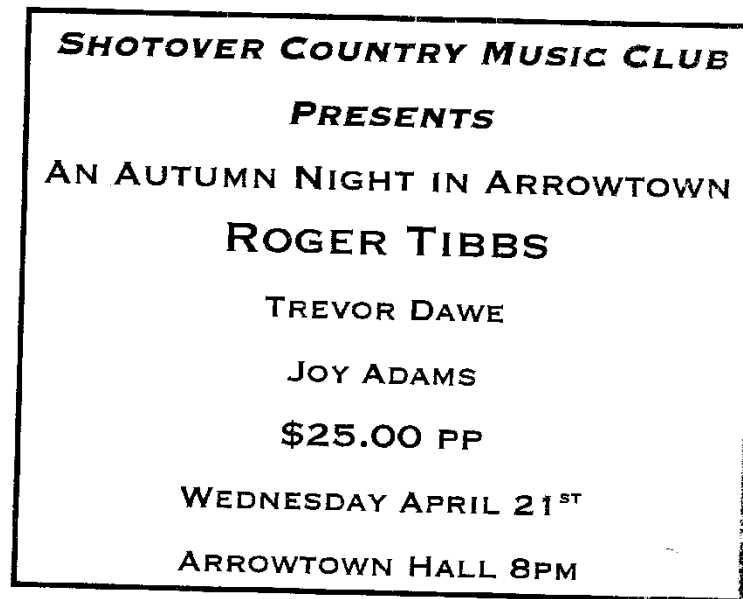
Change Settings...

Help

Scan

Cancel

Less Compression with tif



- 1-bit B+W tif file 1212x982 px = 146 KB

Reset DPI of scan

Current Scan Shortcut: *Document to TIF File

Output Resolution (ppi) for Document as Image:

150 ▼

Note: This resolution setting is NOT used when scanning a document for editable text (OCR).

Sharpen

Automatically crop scanned documents

Automatically remove blank pages (from feeder)

Scan both sides from feeder (Duplex)

Settings for scanning a document for editable text (OCR)

Scan Resolution (ppi) for editable text (OCR) Document: 300

Note: When scanning a document for editable text, a resolution setting to achieve the best optical character recognition (OCR) results will be automatically chosen by the scan software and used to scan.

OCR Language:

English (United States) ▼

Help

OK

Cancel

150 DPI

75 DPI

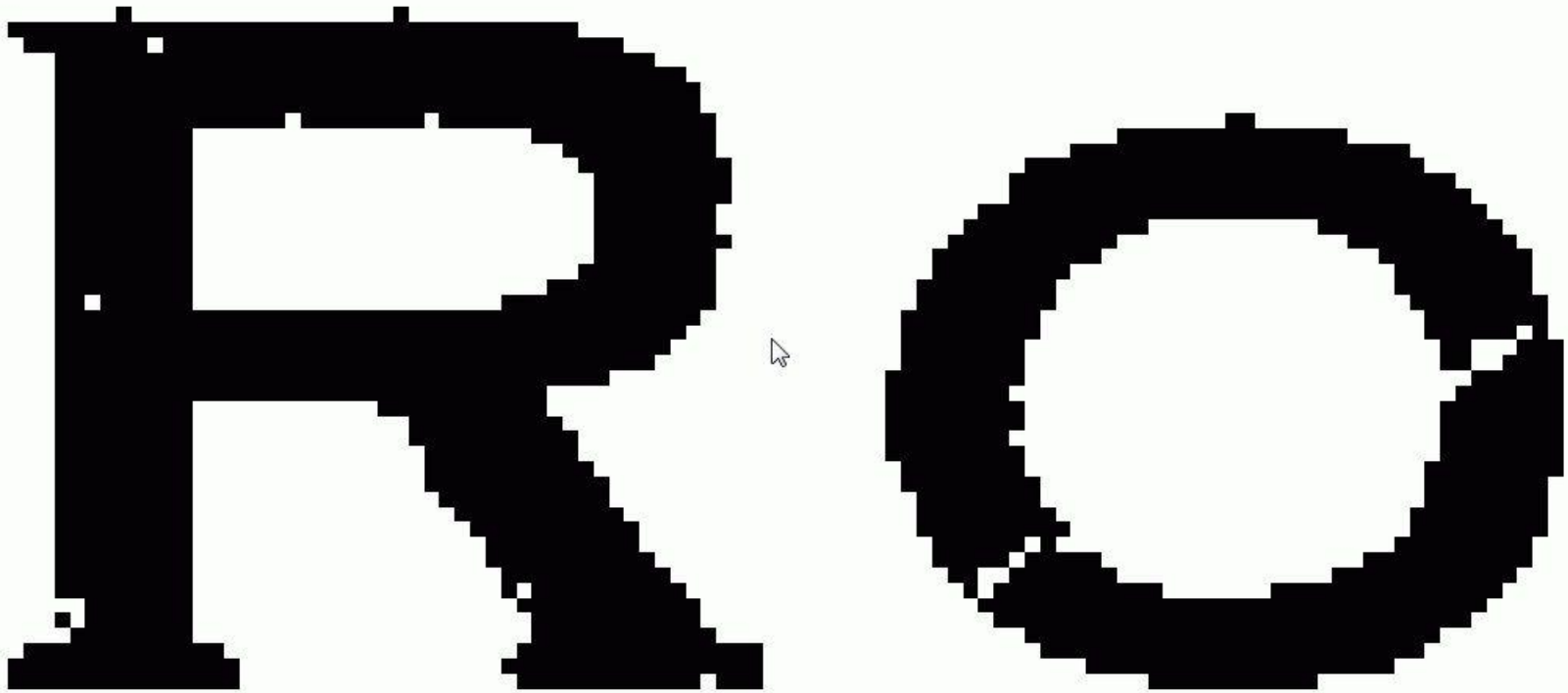
SHOTOVER COUNTRY MUSIC CLUB
PRESENTS
 AN AUTUMN NIGHT IN ARROWTOWN
ROGER TIBBS
 TREVOR DAWE
 JOY ADAMS
 \$25.00 PP
 WEDNESDAY APRIL 21ST
 ARROWTOWN HALL 8PM

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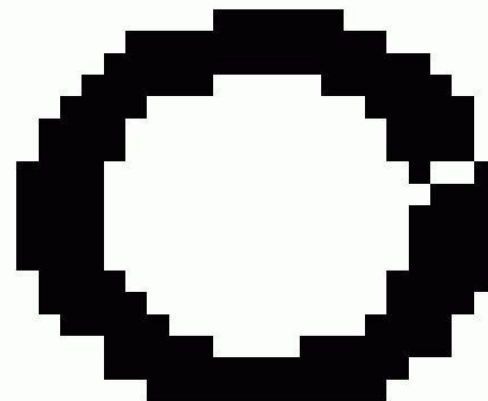
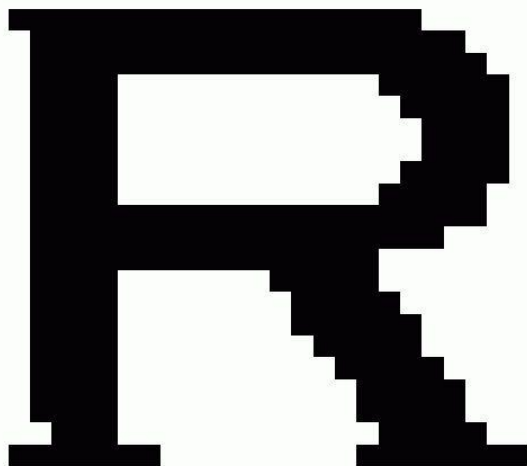
1200 DPI

300 DPI enlarged

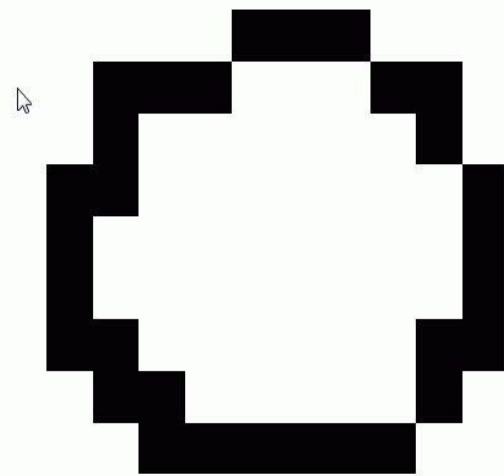
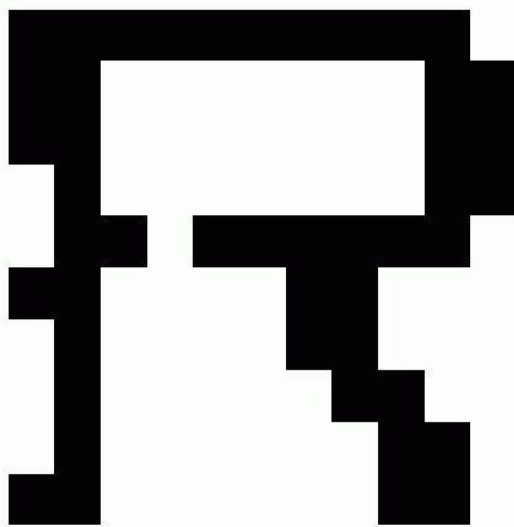


$300 \text{ dpi} * 0.14 \text{ in} = 42 \text{ px}$ expected height

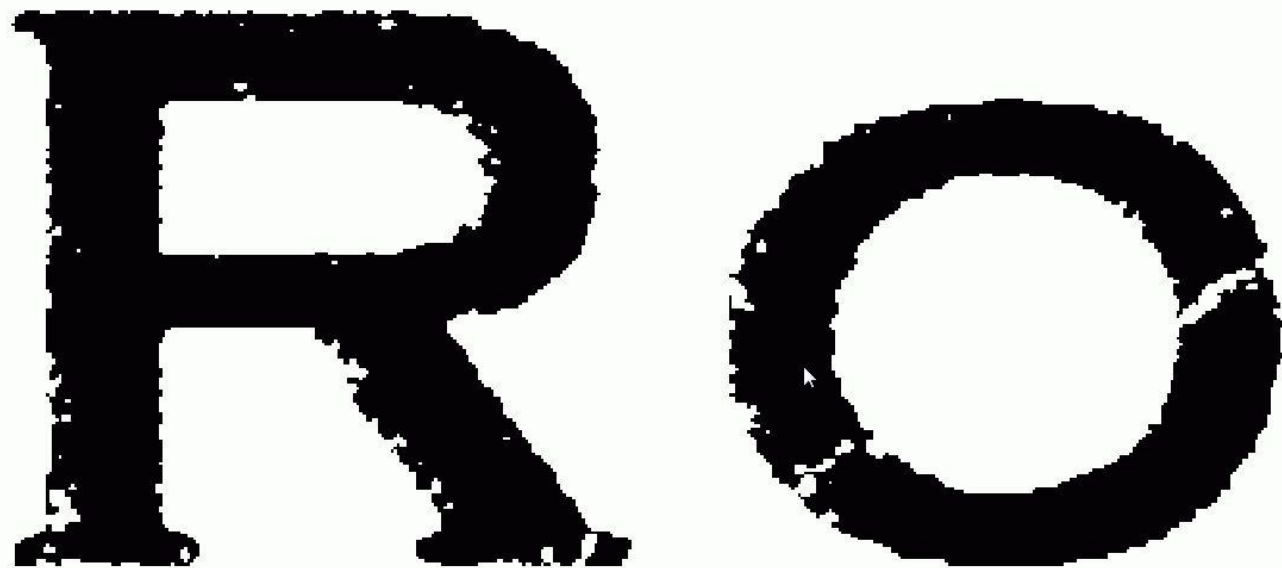
150 px/inch



75 px/inch



1200 DPI



Digital photography examples

- 1/10 MegaPixel (from cell phone camera)



352 x 288 pixels

Compare to 8 Mega Pixel Photo



Optical and digital zoom

- Hardware will be described on the board.
- The following photos will demonstrate some exposure issues and show that digital zoom is equivalent to cropping the image.

Photo Property Information

- This information determined from photo “properties”

file	W	H	Calc M px	KB	f/	sec	ISO	meter	bias	
4432	3264	2448	7,990,272	1,468	5.2	1/13	400	spot	0	best
4433	3264	2448	7,990,272	1,206	5.2	1/8	800	pattern	-0.3	blur
4434	3264	2448	7,990,272	1,438	5.2	1/15	400	spot	-0.3	
4435	2048	1536	3,145,728	903	5.2	1/13	400	spot	-0.3	
4436	2048	1536	3,145,728	1,016	5.2	1/40	400	spot	-0.3	darker
4437(2	3264	2448	7,990,272	1,240	5.2	1/6	400	spot	-0.3	blur

8 Mega pixel 1/13 sec

- Taken from Row Z of theater.



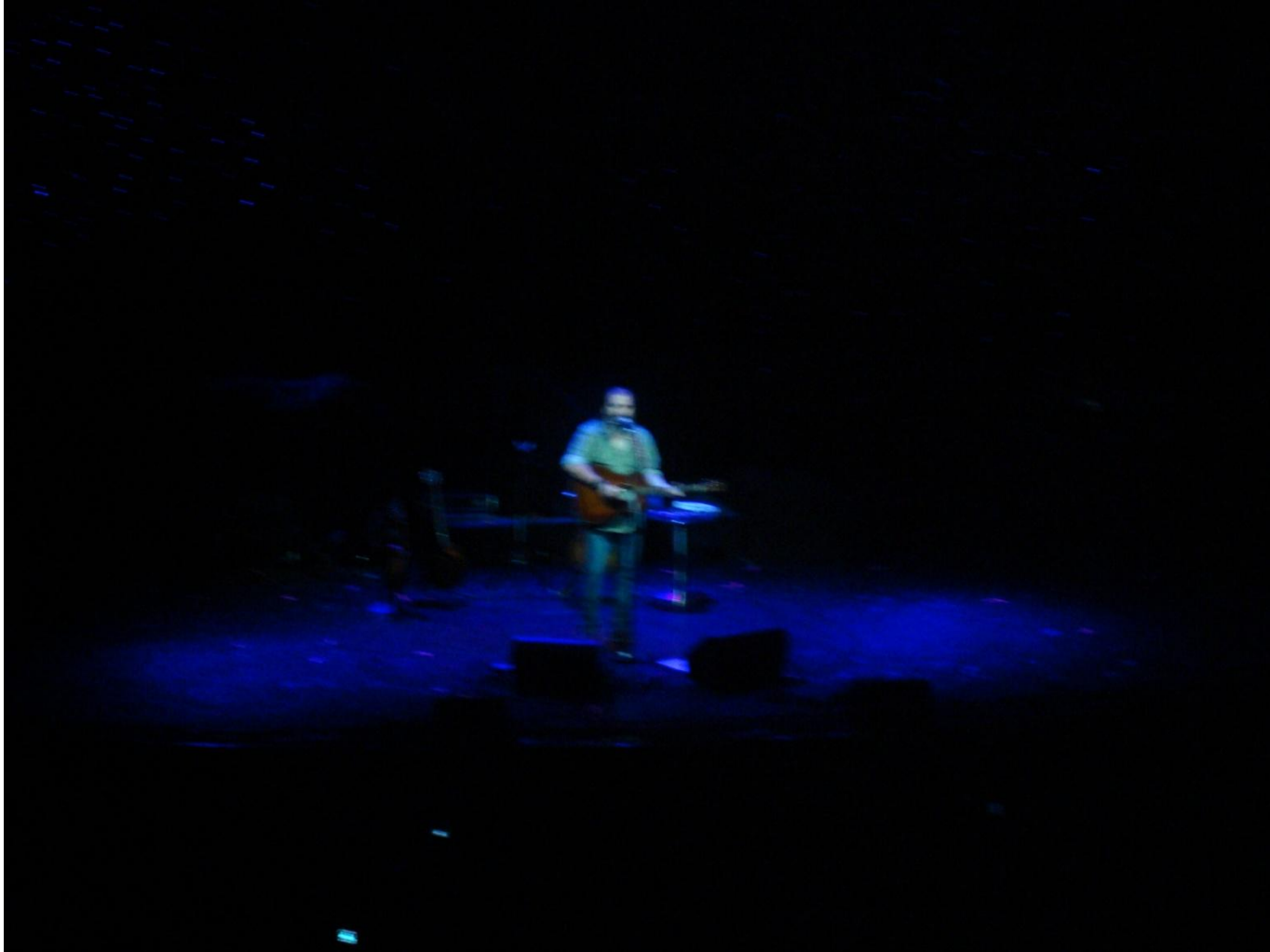
8 M px 1/8 sec

- Pattern metering increased ISO and kept lens open longer to get more light. Caused blur.



8 Mega pixel 1/15 sec

- Probably motion blur



3 M Pix w Dig Zoom 1/15 sec



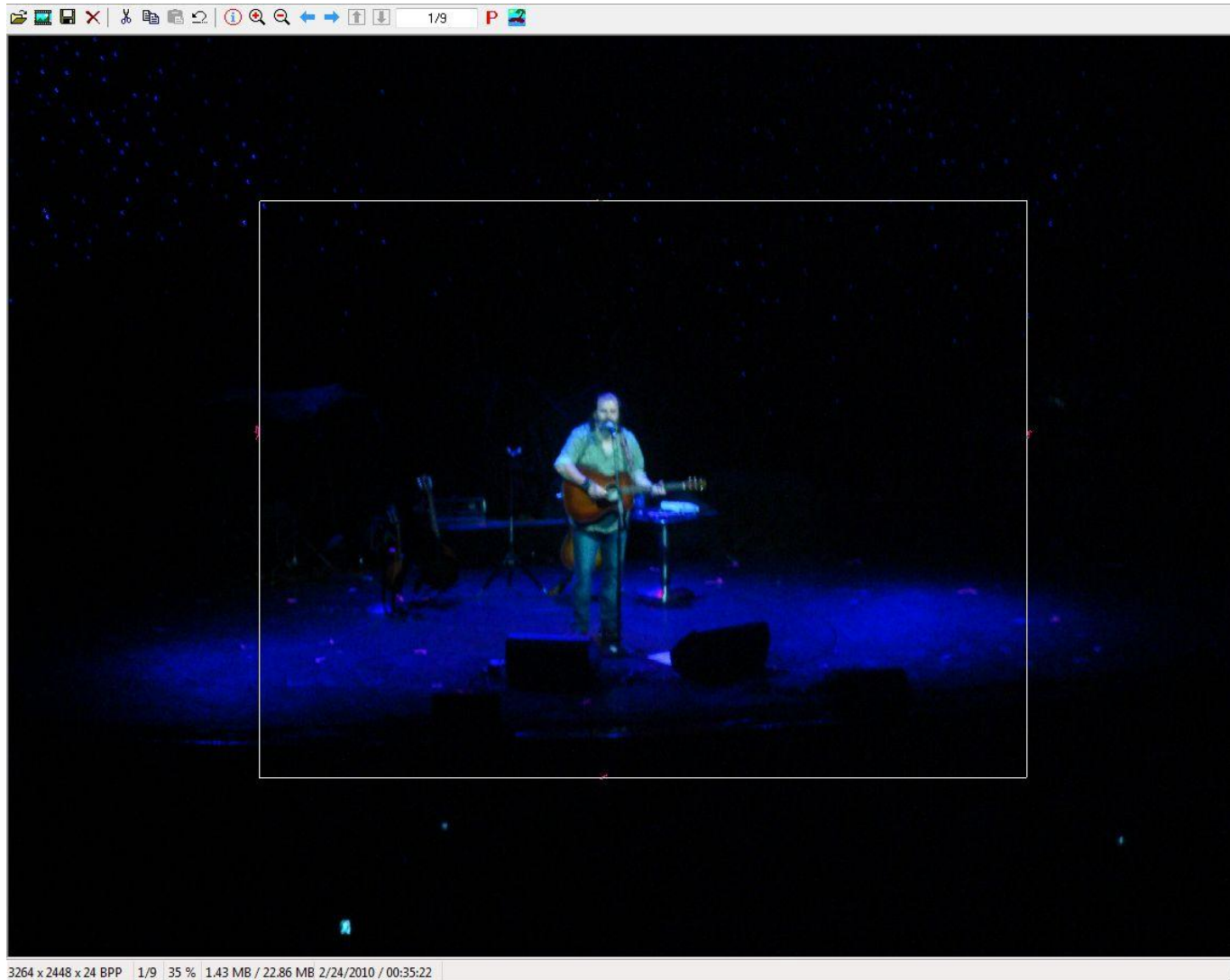
3 M Pix w Dig Zoom 1/13 sec



8 M Pix 1/6 sec



Crop 8 M pix to 3 M pix



Zoom vs

Cropped



Discuss printing, viewing

and

Computer display settings

Thank You!