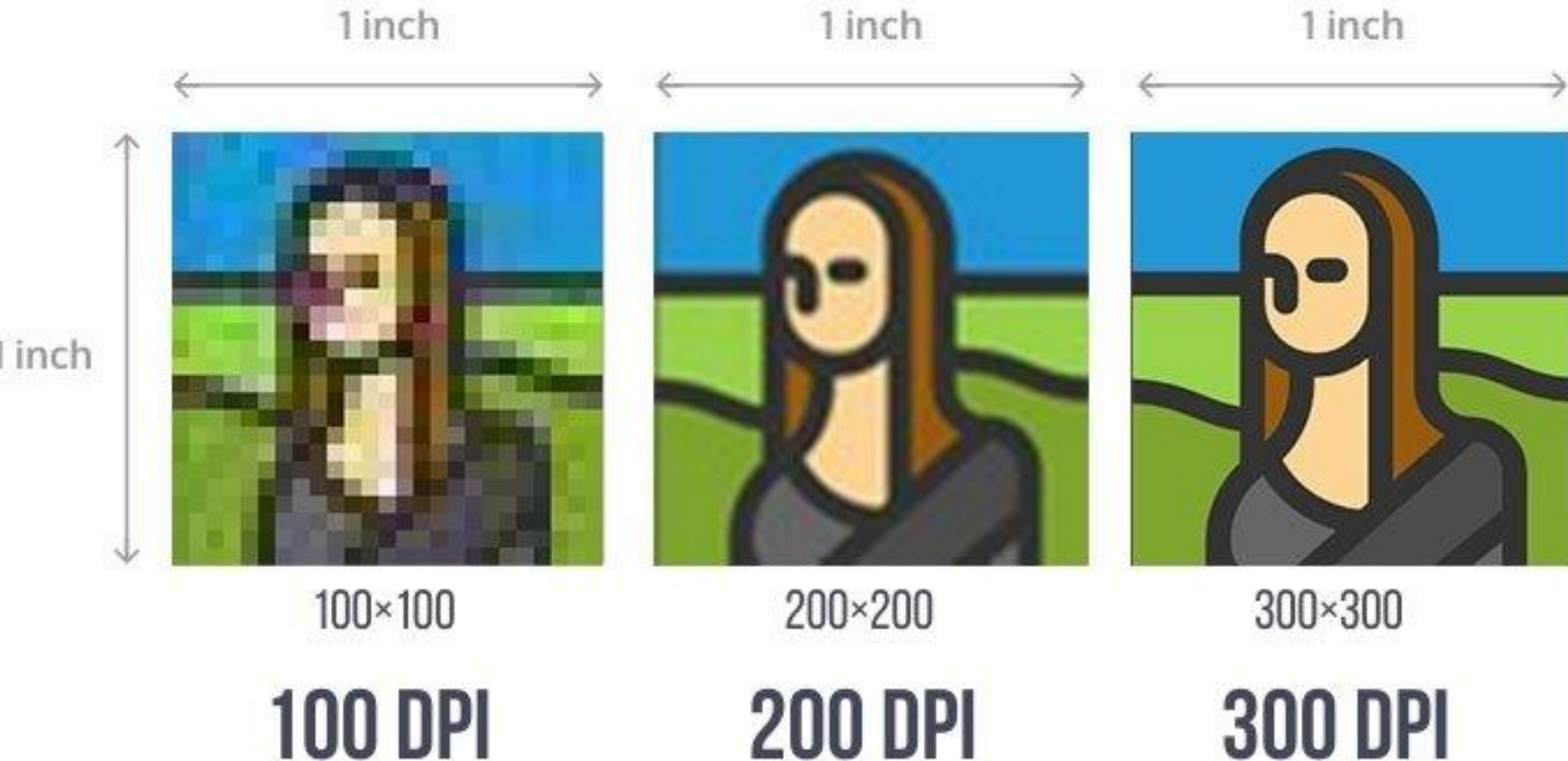




Ballot Image DPI for ES&S DS200 Logic & Accuracy Test



ES&S DS 200

What is a DS200
Specific capabilities



CCDF  **USA**™

Bid Requirements from Michigan

A. Ballot Counter /Tabulator				
1.1.A.1	Bidders must provide a complete description of the proposed voting system, including all components, make/model, covering all functionality and specific abilities of the system to meet all requirements listed in this RFP. Digital optical scan systems are preferred; however, other systems may be considered that meet all other mandatory requirements.	Y		<p>DS200 The proposed DS200 scanner/tabulator uses a high resolution image scanner with state-of-the art, precise ballot sensors to scan both sides of a ballot simultaneously. The DS200 was designed to meet or exceed all EAC Voluntary Voting Systems Guidelines (VVSG) 2005 requirements. Our solution also includes Election Reporting Manager (ERM) software that will provide you instantaneous results that can be printed or displayed on a monitor or your website.</p> <p>The result of more than 36 years of experience designing poll-based scanning technology, the DS200 combines the security, auditability, and voter confidence of paper ballot voting with the increased accuracy and flexibility of a digital image scanner.</p>

<https://www.michigan.gov/-/media/Project/Websites/sos/03holland/ESSBid.pdf?rev=05bead7b344f4301b8fd70db1e8e1b15>



<https://www.michigan.gov/-/media/Project/Websites/sos/03holland/ESSBid.pdf?rev=05bead7b344f4301b8fd70db1e8e1b15>

DS200

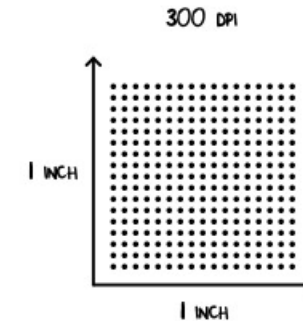
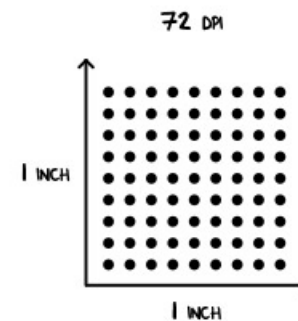
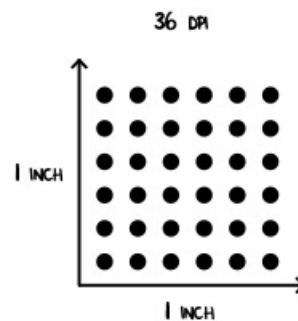
The proposed DS200 scanner/tabulator uses a high resolution image scanner with state-of-the art, precise ballot sensors to scan both sides of a ballot simultaneously. The DS200 was designed to meet or exceed all EAC Voluntary Voting Systems Guidelines (VVSG) 2005 requirements. Our solution also includes Election Reporting Manager (ERM) software that will provide you instantaneous results that can be printed or displayed on a monitor or your website.

The result of more than 36 years of experience designing poll-based scanning technology, the DS200 combines the security, auditability, and voter confidence of paper ballot voting with the increased accuracy and flexibility of a digital image scanner.

What is DPI?

- DPI stands for **dots per inch** and is a measure of **the resolution** of a scanned document or photo. The **higher the DPI, the higher the quality and resolution of your scan** and the resulting image. The maximum DPI of a document scanner depends on the optical scan resolution capabilities of the image sensors.

DPI
VISUALISED



DS 200 Patent

In the preferred embodiment, the CIS is a **high-resolution device that reads at 200 dpi** (200 sensors per inch). When the CIS is scanning a response area **3**, it captures a digital image that may be approximately 0.24" high, and 0.28" wide around the response area **3**, which will be, for this example, an oval

<https://patents.google.com/patent/US6854644B1/en>



Bar Code at 200 DPI



Marketing Brochure from 2015

When the Start-Scan Sensor detects the leading edge of the ballot, it prompts the hardware to power the CIS for image scanning. As the stepper motor on the paper transport mechanism pulls the ballot across the CIS, the system acquires a 200 DPI image of the ballot. The CIS itself has photo-detectors spaced at an interval of .005", to achieve a resolution of 200 DPI across the width of the ballot, and the stepper motor advances the ballot .005" after each scan to produce a 200 DPI image down the length of the ballot.

 ENHANCING THE ELECTION
PROCESS FOR THE STATE OF RHODE
ISLAND



REQUEST FOR PROPOSAL
RFP #RS49934 VOTING
EQUIPMENT SYSTEM

October 30, 2015

ORIGINAL

[Rhode-Island-RFP-7549934-
REDACTED.pdf](#)
(freespeechforpeople.org)

From Michigan ES&S Bid

BALLOT IMAGING SAFEGUARDS

The system captures and retains digital images and cast vote records of every scanned ballot for auditing and adjudication. ES&S does not alter a single retained and captured digital image.

<https://www.michigan.gov/-/media/Project/Websites/sos/03holland/ESSBid.pdf?rev=05bead7b344f4301b8fd70db1e8e1b15>



Marketing Brochure from 2015



After a voter inserts a ballot, precise sensors simultaneously scan both sides of the ballot paper for the voter's selection marks. As the DS200 records ballot choices, the scanner stores a high-resolution image of the entire ballot and cast vote record to the inserted USB flash drive. The cast vote records are both digitally signed and encrypted using FIPS 140-2 level 2 certified algorithms.

Image files can also be exported in a PDF format for archival or public review. During export, the ballots can be filtered, and there are options to include the CVR for the image and to apply a watermark to the PDF file.



[Rhode-Island-RFP-7549934-
REDACTED.pdf](#)
(freespeechforpeople.org)



Analyzing Images

Calculating DPI



$$\begin{aligned} \text{DPI} &= \frac{\text{Total number of pixels per inch}}{\text{Total numbers of pixels per dot}} \\ &= 1800/6 \\ &= 300 \text{ dpi} \end{aligned}$$



Official Ballot Boleta Oficial
General and Special Elections Elecciones General y Especial
 Collin County, TX Condado de Collin, TX
 November 3, 2020 3 de noviembre de 2020

To vote, completely fill in the oval TO THE LEFT OF YOUR CHOICE(S). Use pen or pencil. DO NOT ERASE. If you make a mistake you may request a new ballot. If your vote for a candidate or question is marked in such a manner that your intent is not clearly demonstrated, your vote for that office may not be counted. To protect the secrecy of your vote, do not put your name, initials, or any identifying mark on your official ballot. You may vote for a write-in candidate by writing in the name of the candidate on the line provided and completely filling in the oval provided to the left of the line.
 Para votar rellene completamente el óvalo a la izquierda de su(s) elección(es). Marque solamente utilizando la pluma o lápiz provisto. NO BORRE. Si comete un error, puede solicitar una nueva boleta electoral. Si su voto por un candidato o pregunta está marcado de tal manera que su intención no es claramente demostrable, su voto por ese cargo podría no ser contado. Para proteger el secreto del voto, no escriba su nombre, sus iniciales o cualquier marca distintiva en la boleta electoral oficial. Usted podría votar por inserción escrita escribiendo el nombre del candidato en la línea provista y llenando completamente el espacio ovalado a la izquierda de la línea.

Federal (Federal)	State (Estado)	State (Estado)
President / Vice-President (Presidente / Vice-Presidente) Vote for one or none (Vote por uno o ninguno)	Railroad Commissioner (Comisionado de Ferrocarriles) Vote for one or none (Vote por uno o ninguno)	Judge, Court of Criminal Appeals, Place 4 (Juez, Corte de Apelaciones Criminales, Lugar Núm. 4) Vote for one or none (Vote por uno o ninguno)
<input checked="" type="radio"/> Donald J. Trump REP <input type="radio"/> Michael R. Pence	<input checked="" type="radio"/> James "Jim" Wright REP <input type="radio"/> Chrysta Castañeda DEM <input type="radio"/> Matt Sterett LIB <input type="radio"/> Katija "Kat" Gruene GRN	<input checked="" type="radio"/> Kevin Patrick Yeary REP <input type="radio"/> Tina Clinton DEM
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<input type="radio"/> Jo Jorgensen LIB <input type="radio"/> Jeremy "Spike" Cohen <input type="radio"/> Howie Hawkins GRN <input type="radio"/> Angela Walker	<input checked="" type="radio"/> Nathan Hecht REP <input type="radio"/> Amy Clark Meachum DEM <input type="radio"/> Mark Ash LIB	<input checked="" type="radio"/> David Newell REP <input type="radio"/> Brandon Birmingham DEM
Write-in (Voto escrito)	Justice, Supreme Court, Place 6, Unexpired Term (Juez, Corte Suprema, Lugar Núm. 6, Duración Restante del Cargo) Vote for one or none (Vote por uno o ninguno)	State Representative, District 70 (Representante Estatal, Distrito Núm. 70) Vote for one or none (Vote por uno o ninguno)
United States Senator (Senador de los Estados Unidos) Vote for one or none (Vote por uno o ninguno)	<input checked="" type="radio"/> Jane Bland REP <input type="radio"/> Kathy Cheng DEM	<input checked="" type="radio"/> Scott Sanford REP <input type="radio"/> Angie Bado DEM
<input checked="" type="radio"/> John Cornyn REP <input type="radio"/> Mary "MJ" Hegar DEM <input type="radio"/> Kerry Douglas McKennon LIB <input type="radio"/> David B. Collins GRN	Justice, Supreme Court, Place 7 (Juez, Corte Suprema, Lugar Núm. 7) Vote for one or none (Vote por uno o ninguno)	Justice, 5th Court of Appeals District, Place 3 (Juez, Corte de Apelaciones, Distrito Núm. 5th, Lugar Núm. 3) Vote for one or none (Vote por uno o ninguno)
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United States Representative District 03 (Representante de los Estados Unidos, Distrito Núm. 03) Vote for one or none (Vote por uno o ninguno)	Justice, Supreme Court, Place 8 (Juez, Corte Suprema, Lugar Núm. 8) Vote for one or none (Vote por uno o ninguno)	Justice, 5th Court of Appeals District, Place 6 (Juez, Corte de Apelaciones, Distrito Núm. 5th, Lugar Núm. 6) Vote for one or none (Vote por uno o ninguno)
<input checked="" type="radio"/> Van Taylor REP <input type="radio"/> Lulu Seikaly DEM <input type="radio"/> Christopher J. Claytor LIB	<input checked="" type="radio"/> Brett Busby REP <input type="radio"/> Gisela D. Triana DEM <input type="radio"/> Tom Oxford LIB	<input checked="" type="radio"/> John Browning REP <input type="radio"/> Craig Smith DEM
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		VOTE BOTH SIDES (VOTE AMBOS LADOS)
BS 13	010	Typ:01 Seq:0019 Spl:01

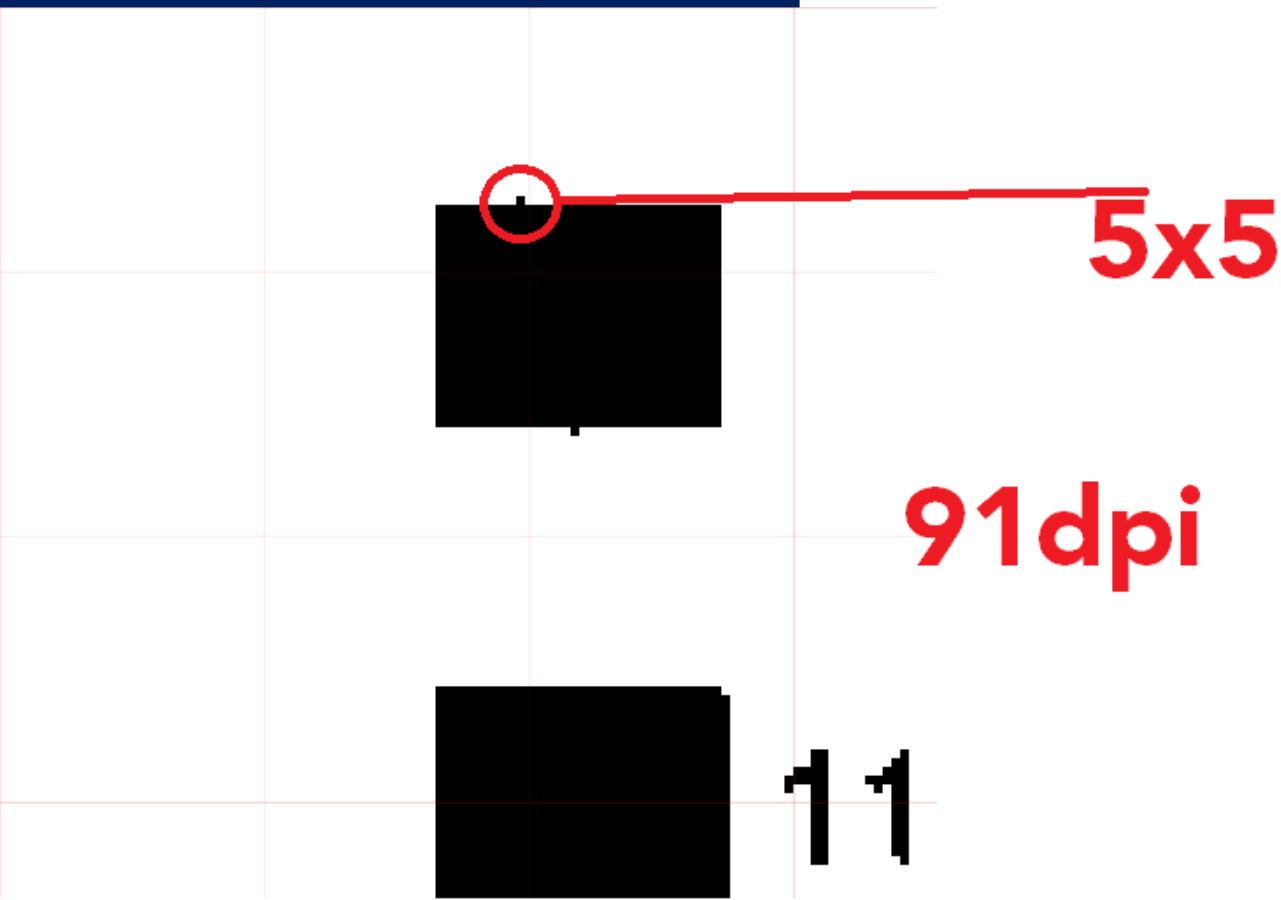




<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> 11							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/> 21	<p>To vote, completely fill in the oval provided to the left of your official ballot. You may request a new ballot if your vote for that office may not be counted. Para votar rellene completamente el óvalo que se encuentra a la izquierda de su papeleta oficial. Si necesita un acta</p>						

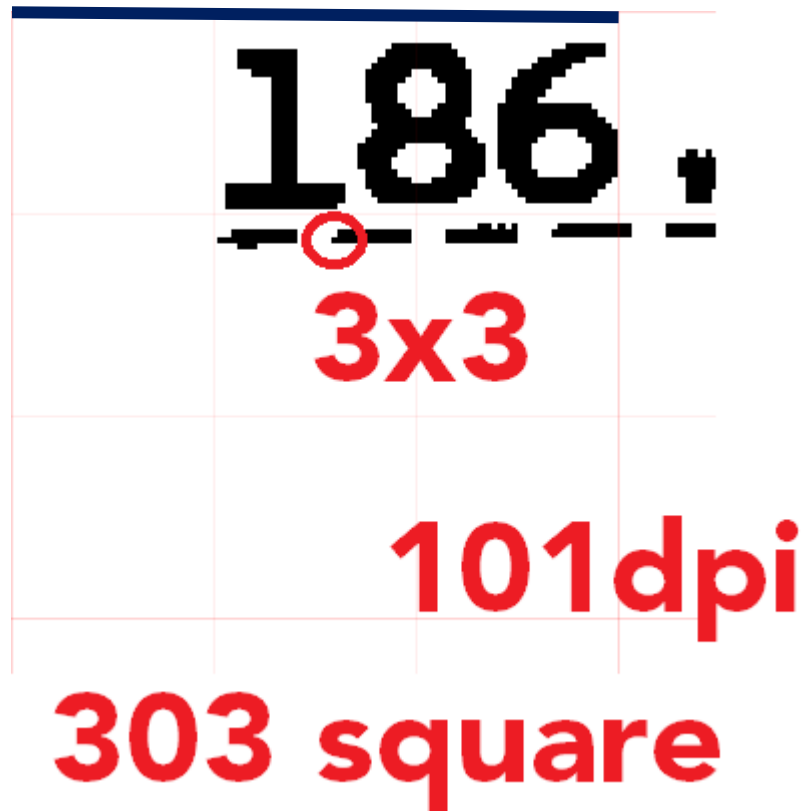
Collin County

Dark bar is 1 inch = 455 pixel



455p wide and high

Williamson County



Official Ballot *Boleta Oficial*
 General and Special Elections *Elecciones General y Especial*
 Collin County, TX *Condado de Collin, TX*
 November 3, 2020 *3 de noviembre de 2020*

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VOTE BOTH SIDES (VOTE AMBOS LADOS)		
BS 13	010	Typ:01 Seq:0019 Spl:01

00000018 AU05928
 COLLIN COUNTY/TEXAS
 GENERAL AND SPECIAL ELECTIONS
 11/03/2020
 010 BS 12, 010 BS 12

PRESIDENT / VICE PRESIDENT REP DONALD J. TRUMP
 UNITED STATES SENATOR REP MICHAEL R. PENCE
 UNITED STATES REPRESENTATIVE DISTRICT 03 DISTRICT 03 REP VAN TAYLOR
 RAILROAD COMMISSIONER REP JAMES "JIM" WRIGHT
 CHIEF JUSTICE, SUPREME COURT REP NATHAN HECHT
 JUSTICE, SUPREME COURT, PLACE 6, UNEXPIRED TERM REP JANE BLAND
 JUSTICE, SUPREME COURT, PLACE 7 REP JEFF BOYD
 JUSTICE, SUPREME COURT, PLACE 8 REP BONNIE LEE GOLDSTEIN
 JUDGE, COURT OF CRIMINAL APPEALS, PLACE 4 REP KEVIN PATRICK YEARY
 JUDGE, COURT OF CRIMINAL APPEALS, PLACE 9 REP BRANDON BIRMINGHAM
 STATE REPRESENTATIVE, DISTRICT 70 DISTRICT 70 REP SCOTT SANFORD
 JUSTICE, 5TH COURT OF APPEALS DISTRICT, PLACE 3 REP DAVID EVANS
 JUSTICE, 5TH COURT OF APPEALS DISTRICT, PLACE 6 REP JOHN BROWNING
 JUSTICE, 5TH COURT OF APPEALS DISTRICT, PLACE 8 REP CRAIG SMITH
 DISTRICT JUDGE, 198TH JUDICIAL DISTRICT REP AMBELA TUCKER
 DISTRICT JUDGE, 20TH JUDICIAL DISTRICT REP TOM MONAHAN
 DISTRICT JUDGE, 20TH JUDICIAL DISTRICT REP BEN SMITH
 DISTRICT JUDGE, 41ST JUDICIAL DISTRICT REP JONAS FLENT
 DISTRICT JUDGE, 46TH JUDICIAL DISTRICT REP ANDREA THOMPSON
 DISTRICT JUDGE, 49TH JUDICIAL DISTRICT REP LINDSEY WYVALE
 DISTRICT JUDGE, 49TH JUDICIAL DISTRICT REP PIPER MCDRAK
 DISTRICT JUDGE, 475TH JUDICIAL DISTRICT REP EMILY HENDEL
 DISTRICT JUDGE, 475TH JUDICIAL DISTRICT REP ANDREA COURTESA
 SHERIFF REP DIR SWANMER
 COUNTY TAX ASSessor-COLLECTOR REP KENNETH L. HAUN
 COUNTY COMMISSIONER, PRECINCT NO. 0 PRECINCT 0 REP DARNELL HALE
 CONSTABLE, PRECINCT NO. 0 PRECINCT 0 REP BARRY EDWARDS

Close up of English

DEM JOSEPH R. BIDEN

REP JOHN CORNYN

REP VAN TAYLOR

DEM CHRISTA CASTAÑEDA

REP NATHAN HECHT

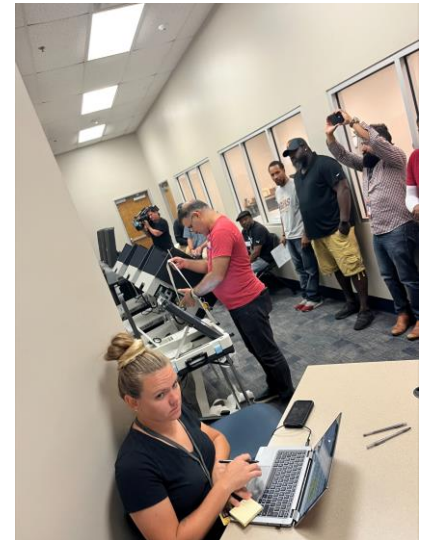
CCDF   USA™

Conclusion

- It appears that the ballot images provided by the Counties are not the original resolution that were scanned.
- The images provided are not readable by an over-the-counter Optical Character Recognition (OCR) program
- The best OTC OCR program is produced by Amazon, and it is not able to read the English on the images provided.
- So, either the machines are not programmed to easily export original data, or they are purposely reducing the quality for some unknown reason.

Call to Action

CCDF★USA™



Logic and Accuracy

Ask	Ask what setting your scanners are set to. Answer should be 200dpi
Ask	Ask at what dpi setting ballot images are stored. Answer should be 200dpi
Ask	Ask what resolution the public should receive the ballot images after the election. Theoretically the answer should be 200 dpi.

Logic and Accuracy

Know	The law. Texas Election Code 129.023 Print and take with you.
Read	SOS Advisories 2022-30 & 2018-30
Question	You should be prepared to ask questions.
Report	Report any problems. Write and collect affidavits.

CCDF★USA™

COUNTY CITIZENS DEFENDING FREEDOM

LOCAL LIGHT. LOCAL ACTION.