



American Welding Society®
DETROIT SECTION



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Check out the latest videos published by the American Welding Society on its YouTube page.

AWS Technical Nights are open to everyone! We encourage that members bring students and non-members to learn more about our organization and industry.



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THE ENGINEERING SOCIETY

AWS-Detroit Technical Meeting

Thursday, March 14, 2024 • 5:30 - 8:30pm

RAM & Bluewrist

MIG Welding Vision Inspection

LOCATION: RAM SOLUTIONS, LLC

1904 Woodslee Dr, Troy, MI 48083

Click here for [Google Maps](#)

SPEAKERS: **John Macdonald**, Director, RAM Solutions INC

Tom Thompson, US Business Development Mgr, Bluewrist (USA) Inc.

RSVP by March 12th to:
Susann DeRosia
susann@ramsolutions.com

5:30 Dinner
6:00 Speakers

MEETING OVERVIEW:

- 1) Manual MIG inspection vs vision inspection
- 2) How camera and software vision technology works
- 3) Quality comparison and reporting
- 4) Coupon testing results vision and cross section data
- 5) Statistical data

Please join us for the March AWS Technical meeting at RAM Solutions, distributor of robot automation equipment at the Troy, Michigan location.



RAM Solutions provides robot automation products, technical services, training, and development for the past 25 years. RAM Solutions is a technical partner with Bluewrist 3D vision systems supplier. Bluewrist offers innovative industrial automation solutions and products in the areas of robot and vision solutions. John and Tom will speak on the use of MIG welding vision inspection systems. Vision based MIG welding inspection employs automated systems using cameras and software. Vision inspection assesses weld quality by analyzing parameters such as bead size, shape, and alignment. They can detect defects like porosity, spatter and/or lack of fusion. The advantage lies in the quick and precise evaluations, improving efficiency in the inspection process. Includes a description of the camera, software system, statistical data, and the human machine interface. Demonstration of robot vision inspection on weld coupons to identify MIG welds that are inside and outside of quality limits.

JOHN MACDONALD BIO: With over 28 years experience in automotive manufacturing, John Macdonald has held numerous positions in joining engineering roles at direct OEM automotive, equipment supplier, and Tier 1. John has launched many joining assembly systems at integrators and plant level installations. Lab development work on advanced joining techniques for high volume production and with developing equipment and process specifications. At RAM Solutions, John's experience helps companies with new equipment development and equipment product launch.
www.linkedin.com/in/john-macdonald-595028154

TOM THOMPSON BIO: With over 35 years experience in 3D vision inspection and quality measurement systems, Tom Thompson has held positions in sales engineering, sales management, and business development at vision equipment OEM's and distributors. Tom has worked with OEM's, Tier suppliers, and integrators to supply automated 3D vision and robot guidance solutions used in automotive, aerospace, agricultural, consumer, and defense. At Bluewrist, Tom's experiences help companies develop and implement 3D automated vision inspection and robot guidance solutions that improve efficiency, product quality, and cost reductions to the production process.

2024 Ladies Night Scholarship Gala Detroit Section



WHERE: The Atheneum ***NEW VENUE***

WHEN: Saturday, April 13th, 2024 ***SAVE THE DATE***

LINK FOR REGISTRATION: <https://awssection.com/detroit/event-calendar/>



For more information, contact awsdetroitregistration@awsdetroit.org

Cocktails	6:00 pm - 7:00 pm
Dinner and Program	7:00 pm - 9:30 pm
Afterglow Dancing	9:30 pm - 12:00 am

**FOR OVERNIGHT RESERVATIONS
AT THE ATHENEUM:**
call (313) 962-2323 or online:
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Upcoming Events

Thurs., March 14 • 5:30 - 8:30pm

SPEAKERS:

John Macdonald, RAM SOLUTIONS
Tom Thompson, Bluewrist

LOCATION:

RAM SOLUTIONS LLC
1904 Woodslee Dr., Troy, MI

2024 Ladies' Night

April 13, 2024

May Technical Meeting

TBD

CWI Seminar: May 5 - 10, 2024

Exam: May 11, 2024

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Questions? Contact: Ryan Cooper, Great Lakes Regional Sales Manager
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Chairman's Message

John Pippin

Hello AWS family and friends.

How did you do on Valentines Day? Hope the reminder was helpful!

I hope you had a chance to take part in the AWS Tech Night on Feb. 8. We visited the Gestamp R&D

North America Location and were treated to an impressive plant tour. As well Dr. Jerry Gould from EWI presented "Development of a Next Generation Resistance Spot Welding Cell Employing Medium Frequency – Frequency Converter Technology" to a standing room only crowd. I would like to thank Warren Peterson for setting this up and the folks at Gestamp for hosting as well as Dr. Gould for his presentation.

The AWS Tech meeting for this month will be held at Ram Solutions, Inc in Troy on March 14th. The Topic is Vision Inspection for Mig welding and more. This will also be our Section Awards and Patrons night so please come out and thank our patrons. Watch the e-Bulletins and check our [WEBSITE](#) often for the latest information.

Did I mention Ladies Night? It will be here before you know it! Hosted by Russel Webster, Ladies' Night chairperson and committee. Ladies' Night will be April 13th at The Atheneum Hotel in Detroit. [CLICK HERE](#) to register.

The AWS National Scholarship Season is open! [CLICK HERE for more scholarship details](#). I would like to remind all students that the scholarship application deadline (April 1) is coming up quickly This is the last reminder. Don't let free money slip through your fingers. In the words of our Scholarship chair – Donald F. Maatz, Jr. "Unless you are privately wealthy, you should be applying for these scholarships."

Sheet Metal Welding Conference (SMWC) will be happening October 22-24. The SMWC committee is looking for abstracts. Abstracts are due by March 1st. Watch for more information on the SMWC XX in the E-bulletin and your email. If you have questions, want to submit a paper or want to help out, please [CLICK HERE](#).

The Detroit Section Welding Education Series is coming March 21-28, 5 to 8 pm. This year's topic is "Laser Welding" to register [CLICK THIS LINK](#).

As always, you can find more information about our local events, both past and upcoming [HERE](#).

Please visit our site often as it is always being updated with new content. Thank you greatly for the many ways you support our AWS-Detroit Section and the industry we serve. Look for us on Facebook and Instagram.



Thanks, *John Pippin AWS - Detroit Section Chairman 2023-24*

Our Mission is to advance the science, technology and application of welding and allied joining and cutting processes worldwide, including brazing, soldering and thermal spraying. AWS Detroit provides support for the industry in many ways, including:

- Institutional Grants (endowment based);
- Scholarships through Application (endowment based);
- Scholarships through aptitude (HSWC);
- Vocational Support (case by case but budgeted each year), Institution (e.g. supply gas and materials), Local Contest (e.g. travel expense), International Contest (e.g. travel expense);
- Student Memberships (evaluated each year); • Student Chapter (evaluated each year);
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Thank you for your support!

ONE HUNDRED PERCENT of the Patron's Fund Donations are directed to scholarships for students who are pursuing careers in Welding Engineering and Welding Technology. To become a Patron, contact Steve Gucciardo, AWS Detroit Section-Patron's Committee Chair, 810-623-6508 or email gucciardos@shapecorp.com



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ANNOUNCEMENT FOR ALL SCHOOLS

Two Separate Grant Opportunities for Your School!

#1 DUE DATE: March 15, 2024

AWS Foundation Welder Workforce Grant – National

The AWS Foundation is committed to securing the future of the welding industry by positively impacting welding education.

The Welder Workforce Grant is the latest effort to ensure a skilled workforce is ready when industry calls.

This year, the AWS Foundation will award up to \$300,000 to improve and expand training programs and institutions to increase the number of welding graduates across the country. Please note that starting in 2019 Applicants must be both an AWS Educational Institution Member and SENSE Registered to apply for the Welder Workforce Grant.

You must visit this website and follow the instructions for applying:
aws.org/Career-Resources/Students/Grants/



#2 DUE DATE: March 15, 2024

Detroit Section Welder Workforce Grant

Eligible School Geographic Locations

The AWS Detroit Section Welder Workforce Grant eligible schools reside in our Section boundaries which include the Lapeer, Macomb, Oakland, St. Clair, and Wayne counties in the state of Michigan; and Essex, Chatham-Kent, and Sarnia-Lambton counties in the province of Ontario. Schools are also eligible if they reside in Livingston, Monroe or Washtenaw counties in the State of Michigan.

The AWS Detroit Section Welder Workforce Grant is a \$15,000 grant open to any training program or institution within the boundaries of the Detroit Section. Applicants for the Detroit Section Welder Workforce Grant do not need to meet the requirements of being SENSE Registered and an Education Institution Member. The AWS Detroit Section in its commitment to local schools and educators established this endowed grant in partnership with the AWS Foundation. The grant is awarded in parallel to the AWS Foundation national funds.

Schools in the Detroit Section boundaries are eligible for these monies as well as the monies from the Foundation.

It is recommended that schools applying contact the AWS Detroit Section Grant committee and request a letter of recommendation.

The contact is Wesley Doneth – 810-844-2800 or doneth.wesley@fronius.com. The grant was made possible thru the AWS Detroit Section due to our members and the commitment of supporting companies.

You must visit this website to see the requirements and instructions for applying:
aws.org/Career-Resources/Students/Grants/Section-Grants/

Grants up to \$25,000 are available for secondary and post-secondary education/training institutions to enhance and improve welding programs resulting in an increase in the number of welding graduates and/or the number of graduates successfully placed in welding or welding-related jobs. Please see the rules online when applying but typically:

FUNDS MAY BE USED FOR: Welding or metalworking equipment purchases or upgrades; facility improvements; capital items; computers, computer-based training systems.

FUNDS CANNOT BE USED FOR: Any program or area not related to welding education/training; travel expenses; personnel or to expand teaching staff; student tuition or scholarships; textbooks or teaching materials; classroom or lab materials and/or supplies; personal protective equipment; indirect costs. *No grants will be given to individuals.*

Ask the Welding Engineer

By Donald F. Maatz, Jr.

Q: "Do you know of a strategy one can use in an attempt to reduce resistance spot welding expulsion? We have been fighting this issue for a while, with varying degrees of success, and are looking for some fresh ideas. Our shop utilizes predominantly robot mounted welding guns, but have some fixture tools as well."

A: "In our previous columns regarding expulsion (ATWE Dec-23, Jan-24 & Feb-24) we initiated a discussion as the phenomenon pertains to the Resistance Spot Welding (RSW) process. The items discussed included relevant definitions, a possible path towards expulsion reduction/elimination and the outlining of a generic welding condition, to include the function of both weld force and current on a robust spot weld without expulsion. We now continue and explore some of the elements actually leading to expulsion.

One approach to thinking about expulsion in the Resistance Spot Welding (RSW) process is to start with a robust condition, and then make it less so. In other words, make a known unacceptable weld. As it turns out, there are more than a few ways to accomplish this (ahem) goal. And the first place to start is with the most basic fundamentals associated with a spot weld: Current, Time and Force. And if we are going to talk about the basics of a RSW schedule, we should also bring in the rules tying these fundamental elements together with regard to the total

heat input of the weld - the Rules of 2-1-1/2*.

From ATWE Dec-20, we touched on the idea of bulk resistivity, and how it relates to Joule's first law (also known as the Joule-Lenz law). Specifically, the total heat into a weld can be described as follows: $Q = I^2Rt$. We now have to relate this equation to the three fundamental elements of a weld schedule. The following summarizes these relationships:

The Rule of 2**

- 10% increase in current
- 19% increase in effective heat

The Rule of 1

- 10% increase in time
- 10% increase in effective heat

The Rule of 1/2

- 10% increase in force
- 5% decrease in effective heat

Weld Current: It almost goes without saying the amount of secondary welding current required to make a robust RSW is important. And based on the relationship of current to effective heat, it is by far the most important and powerful scheduling element at our disposal. From our earlier discussion on current (ATWE Feb-24), we saw how a programmed value that is too

ASK THE WELDING ENGINEER continued on page 10

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March Hotline

The AWS Foundation proudly awards over 1,500 scholarships annually, ranging from \$1,000 to \$6,000 to students at technical schools, two-year colleges, and four-year universities.

Educator Scholarships Now Open - AWS

The AWS Educator Professional Development Scholarships provide up to \$5,000 for welding educators to advance their skills and impact in teaching. Deadline to apply is April 1, 2024. [CLICK HERE TO APPLY](#)



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**Application Postmark Deadline:
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An on-line application form (with supplemental instructions) is now available on the AWS Detroit Section website, under the ‘Scholarships’ tab.
Click Here.

Application deadline for the 2024-25 academic year is April 1, 2024.*



For 2023/24 the Section was able to award 33 scholarships totaling \$64,000 to students from 7 different schools.

**Please reach out directly if you have a paper application to send in (dmatz@reautomated.com)*

**2024-2025 SCHOOL YEAR
RULES and APPLICATION INSTRUCTIONS**

Completion of this application automatically considers the student for the “Amos and Marilyn Winsand Scholarship” and the “Robert P and Mardell D Wilcox Vocational and Engineering Scholarships.” These are AWS Foundation endowed scholarships.

- 1) Applicant must be enrolled in a Welding Engineering Program, a Welding Engineering Technology Program, a Post-Secondary Technical Program (Welding Certification targeted program), or a related field of study with a strong welding content.
- 2) Students are eligible to apply for Detroit Section scholarships if they are permanent residents of the state of Michigan or the following Ontario counties: Essex, Chatham-Kent, and Sarnia-Lambton. Students who are temporary residents attending school in the state of Michigan or the following Ontario counties: Essex, Chatham-Kent, and Sarnia Lambton are eligible for non-named scholarships. Preference will be given to students who are permanent residents of the Detroit Section territory, including Ontario counties: Essex, Chatham-Kent, and Sarnia-Lambton.
- 3) The Detroit Section Scholarship Committee administers the AWS Detroit Section Scholarship program, with the assistance of the AWS Foundation. The Committee also selects the recipient of the Amos and Marilyn Winsand Foundation Endowed scholarship as part of this scholarship application.
- 4) AWS Detroit Section Scholarships are paid in varying amounts based on individual awards. If an applicant is awarded a scholarship, the payments are made directly to their qualifying educational institution. Payments are made through the AWS Foundation.

Application Instructions

The information requested on the application form is self-explanatory. Please fill out the form completely.

The AWS Foundation inter-active application is available either at awssection.com/detroit under the Scholarships tab or by going directly to the AWS Foundation scholarship page: scholarship.aws.org/

For additional information about the scholarship program, please see aws.org/foundation/page/scholarships

AWS membership is encouraged of all welding aspirants.

In addition to the application form, you must enclose or attach the following:

- **Transcript(s)**
Official scholastic records or grade transcripts from the high school, college or university you attended during the recent school year.
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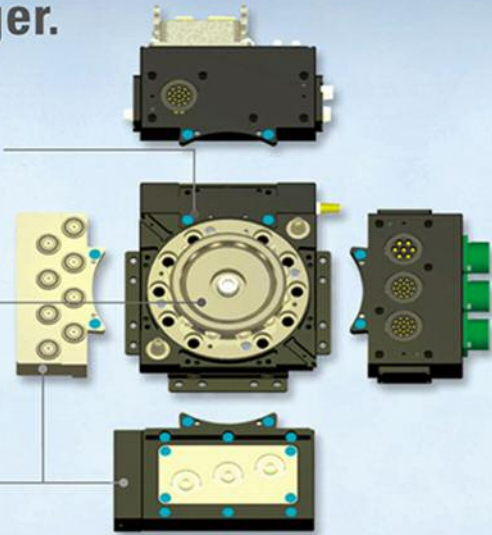
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Thank You

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Devon Macdonald
White Lake, MI
Ferris State University
Welding Engineering Technology
Detroit Section Scholarship
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I am very honored to be chosen for the Detroit Section Scholarship for the Fall 2023 semester. The scholarship has allowed me to focus on my classes and help me continue to achieve my future goals. Thank you for supporting the students, it is a big help to my education.

With gratitude,
Devon Macdonald

ASK THE WELDING ENGINEER *cont'd from pg 5*

high can quickly lead to an overheating condition. And it does not take much imagination to think about the reaction should one have a cold or undersized welding condition – one just needs to turn up the heat. All other things being where they need to be, a little may be all one needs, more than a little can be detrimental.

Weld Time: The relationship of time to effective heat is the next most important of the three. However, almost contrary to conventional thinking, while a weld time that is too long for the application is not good (think expulsion due to overheating, or possible thermal issues), it is the weld time value programmed too short for the condition that really can give one fits. One principal reason is a short weld time has little to no tolerance for any sort of process variation. Be it changes (even subtle ones) to force, material gauge or coating, fit-up, contact face geometry, you name it - when the weld time is too short, one will quickly find themselves in a finicky, and most likely, unhappy place.

Weld Force: Lastly, the relationship of force to effective heat reveals its unique nature with regard to the RSW process. From our earlier discussion on force (ATWE Jan-24) we detailed how the surface of a material changes when under a load. Specifically, more force has the net effect of reducing the effective heat since this leads to more contact and a net reduction in the surface resistance. Also, due to the smaller net effect on total heat, weld force can have a bit of a go/no-go characteristic to it. In other words, one often finds they either have *enough*, or *not enough*, force for the weld in question.

But how can one practically apply these relationships? A few examples of the Rules of 2-1-1/2 are shown below:

20c / 7.0 kA / 1000# converts to 16c / 7.7 kA / 1000#

- The 10% increase in current (7.0 to 7.7) requires us to reduce the weld time ~20% (20 to 16) to maintain the same effective heat

20c / 7.0 kA / 1000# converts to 20c / 6.6 kA / 900#

- The 10% reduction in force (1000 to 900) requires us to also reduce the weld current by ~5% (7.0 to 6.6) to maintain the same effective heat

The process of actually seeing these relationships work does bring up one interesting question: Why not decrease all the values but maintain the same effective heat? It does seem if one applies the conversions enough times, you should be able to spot weld boiler plate with only 50#. This would work if the only requirement for a good weld was effective heat. However, a robust spot weld MUST have the correct pressure to maintain good weld morphology.

With the aforementioned in mind, we now need to take a look at other aspects of the RSW process and see how they relate to the fundamental variables, and to expulsion. And that will be the point where we continue this discussion in our next column.”

**See ATWE Jan-21 for a variation of these rules that relate the RSW process for steel to aluminum.*

***It is acknowledged there is a small amount of rounding required to bring the 19% change up to a full value of 2. I just think the rule of 2 is easier to remember and talk about than the rule of 1.9.*

If you have more questions about this topic, contact Don Maatz at:

R&E Automated Systems
70701 Powell Road, Bruce Township, MI 48065
Office: (586) 228-1900; Direct: (734) 793-2304
dmaatz@reautomated.com

Donald F. Maatz, Jr. is with R&E Automated Systems and serves in the capacity of Laboratory Manager. He is past-chairman of the AWS-Detroit Section, serves on the D8 and D8.9 Automotive Welding Committees, is chair of the D8D, and an advisor to the C1 Resistance Welding Committee, is an AWS endorsed CWI and an instructor for the RWMA School. He is a graduate of Ohio State with a BS in Welding Engineering.

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Mardell D. Wilcox Scholarship (Detroit Section)
District 11 - 011-Detroit

I just want to express my appreciation for this scholarship! I am honored to have been selected as a recipient of this award. It is a definite asset to help me continue my welding education so that I can be the best welder that I can be. I am so deeply grateful to those who participated in my selection and consideration for this scholarship. You are a huge supporter of my welding achievements.

Thank you! Gabrielle Lulis

To whom it may concern: the Marvel D. Wilcox Scholarship,

I would like to express my gratitude and appreciation for being chosen for this scholarship! I'm excited and feeling very blessed to be able to put this gift towards becoming the best welder that I can be! My classes resume in August! In the meantime, I'm working full time at a small local shop where I tig weld stainless steel. Thank you so much for investing in my welding education!

Forever grateful, Gabrielle Lulis

Reflecting On Days Gone By...

1988 Executive Committee!



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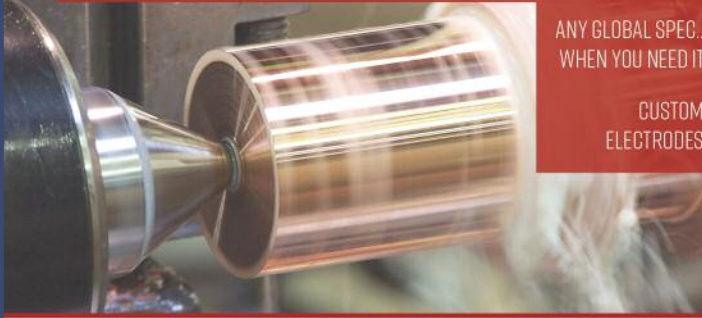



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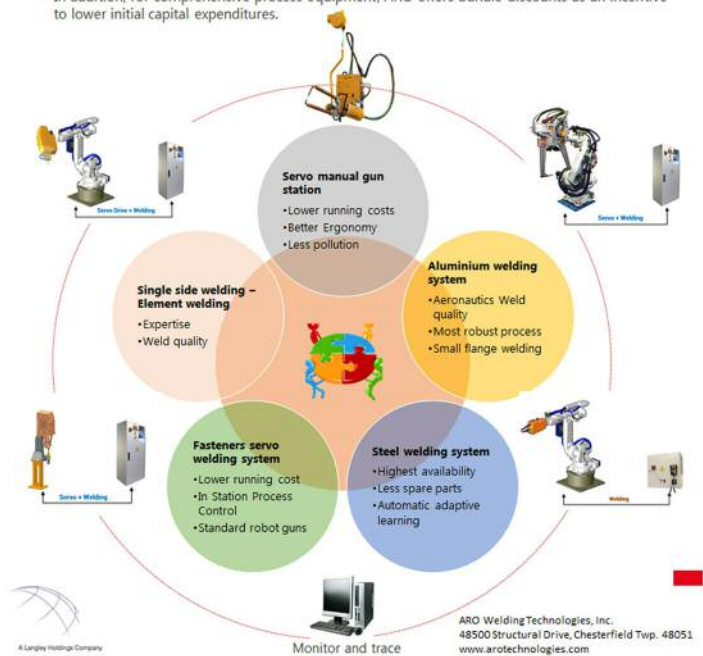
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Thank You

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Abigail Markel
Midland, MI
Ferris State University
Welding Engineering Technology
Detroit Section Scholarship
District 11 - 061-Saginaw Valley

Dear Detroit Section Donors,
Thank you very much for your contribution to my education. I can honestly say that when I opened the notification that I received your scholarship, I was overwhelmed with excitement. A scholarship of this magnitude makes a huge difference in being able to afford the wonderful education I'm getting at Ferris State University.
I am from Midland, MI and fell in love with welding when I started taking classes in high school. Since being accepted to Ferris, I have been heavily involved with the AWS Student Chapter. My freshman year I was a student representative, and this past year I was the Community Service Chairperson. I will continue to fill that role this upcoming year. I am also one of the top students in my class regarding welding skills and academics. Because of my dedication to my studies, I was able to earn an internship at John Deere for the summer. I'm not only involved in welding. This past spring semester I joined the Equestrian Club at Ferris. Being involved with horses is a big part of who I am. I have earned the position of Treasurer in the club next year.
Your contribution to my education allows me to continue to be involved

with clubs and activities and be focused on my studies without worrying about being able to afford it.

Thank you again,
Abigail Markel

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