

Portfolio



samples of work by
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Memwäs: Product Planning

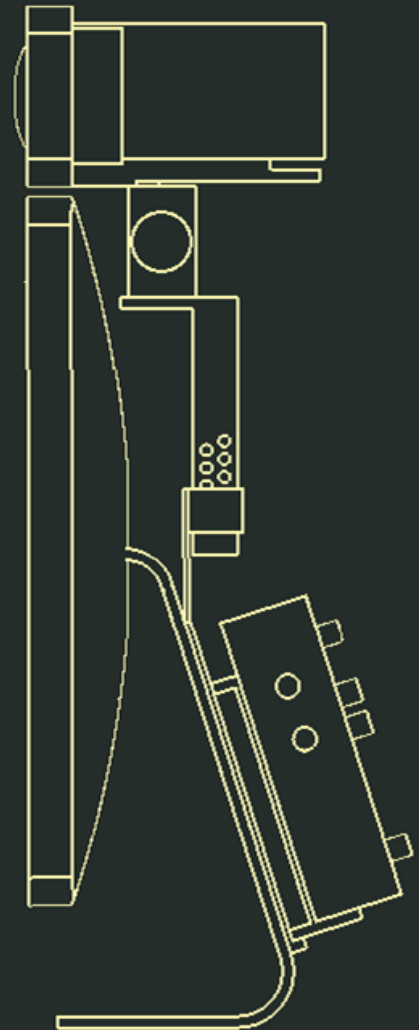
Memwäs is a start up company which designs and sells the services of video guest books. They hired me as the design lead of hardware development to not only upgrade their current product but to create a concept for their next generation. The task was quite challenging, as both projects had to be completed in under three months.

Both upgrades to the current product and concepts for the next generation were created.

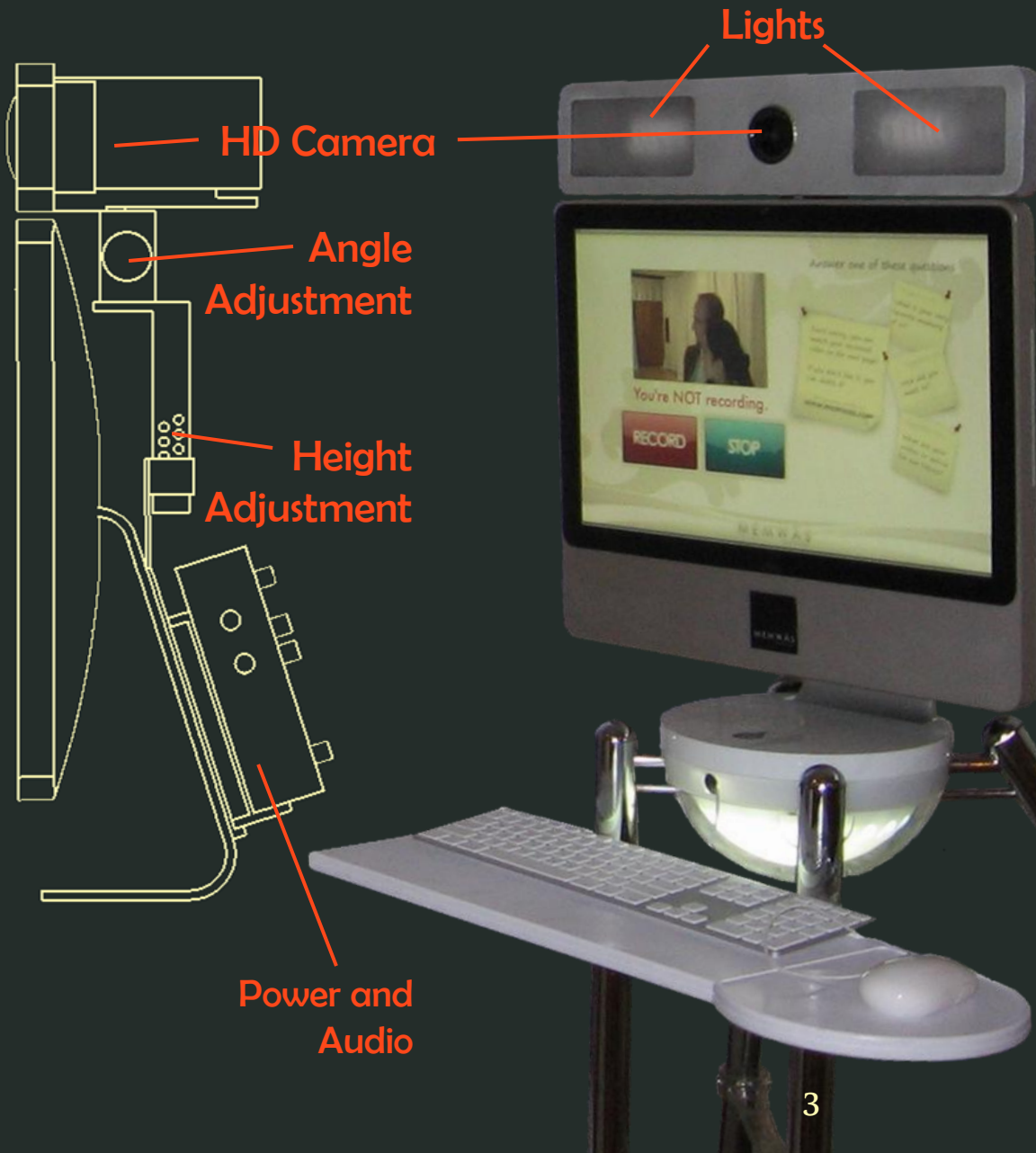
Next Generation



Product Upgrade



Memwäs: Product Upgrade



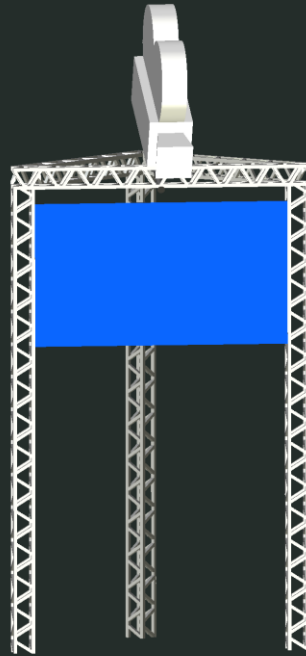
My challenge in updating their touch screen iMac was to design hardware that would hold an HD video camera, power supplies, and lighting, while fitting in with the sleek Mac aesthetics. This was done by building a support structure and aluminum housing, with a similar thickness, surface finish and rounded edges as the iMac. I also modified the kiosk stand for better wire management and portability. To keep it within Memwäs's budget, I had to get my hands dirty and build it in a machine shop.



Memwäs: Product Concept

Memwäs also wanted to create and finalize concepts for their next generation of product line. While the appearance of the design was open-ended, there were key customer requirements of incorporating lighting, HD video recording, and sound recording. Also, Memwäs wanted to implement a display system which used rear projection technology on a glass-like substance allowing the image to be displayed on a screen seamlessly bordered by glass.

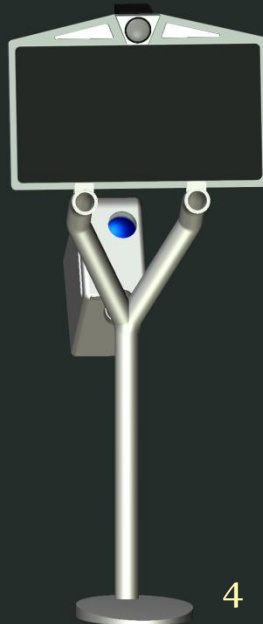
Four initial concepts were created, based off of QFD results.



Concept A



Concept D



Concept B

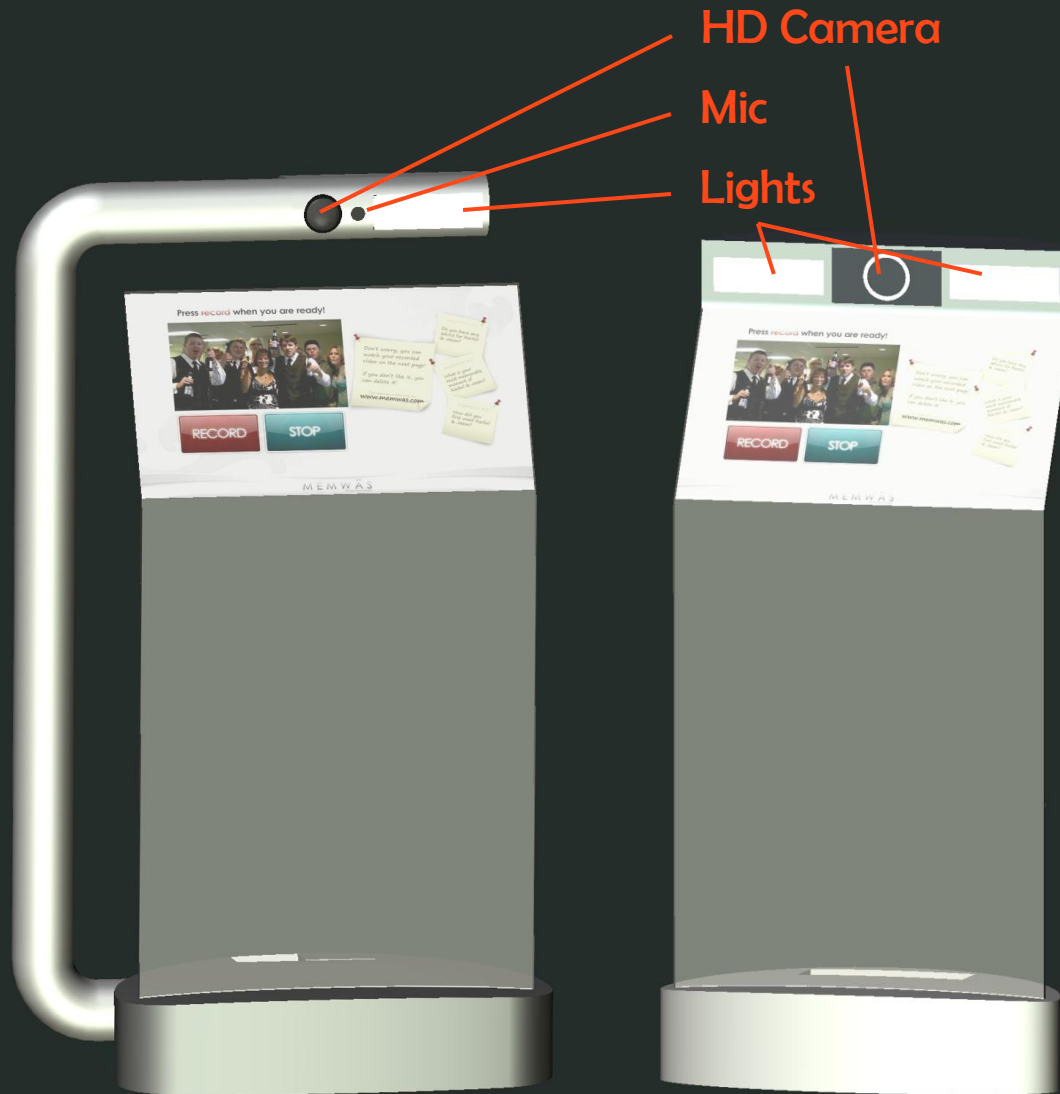


Concept C

Memwäs:

Product Concept

Initially four different concepts were created based on the results from a Quality Function Deployment (QFD). Ultimately design C was chosen, as it consisted of the fewest parts, had the lowest chance of failure, and evoked the modern sleekness Memwäs desired. From this design, several variations were created and consumers were surveyed. The final concept design chosen was C2, for its unique appearance and allowance for great adjustability of the camera, microphone and light.



Concept C2

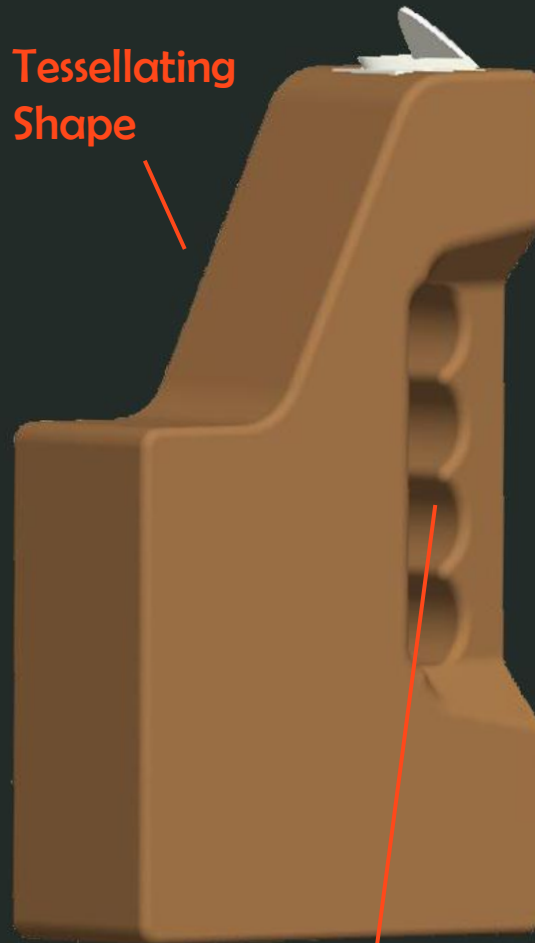
Concept C1



Bradley University: Redesign of a Milk Jug

For a class project my teammate and I redesigned the half-gallon milk jug. We created a jug that required less shipping space, was easier to hold, and prevented milk from running down the side when pouring. These were accomplished by the new shape, handle size and location, and lid geometry. For example, by making the lid opening V-shaped we increased the milk's velocity, which prevented it from running down the side.

The new design made the jug easier to hold, used space more efficiently, and poured without dripping.

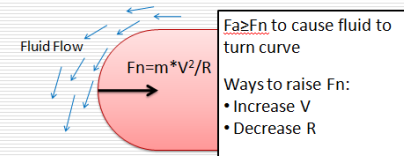


Tessellating Shape

Larger Centered Handle

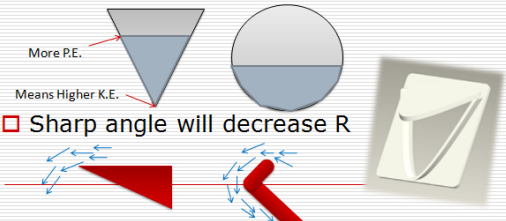
Flow Considerations

Flow running down the side of the jug



Changes to Lid

- ❑ Surface adhesion decreased
- ❑ Cross-sectional area encourages faster flow at bottom



V-shape Lid

Bradley University: Eye Menu



The Eye Menu involved both product and interface development.

The Eye Menu was a touch screen menu which allowed consumers to view food, place orders, and request service. The biggest challenge on this project was that I had three weeks to develop the product and create a mock-up of multiple user interface screens. The product was designed to slide the length of the table on ceiling mounted rails and pivot side to side so it could be used by all. The result was a great success, as the design won second place in the Springboard Business Plan Competition.



Out of the Way



In use by Customer



Precision Planting: 20/20 Display Case

20/20 SeedSense is a planting monitoring system used in agriculture. A display unit is mounted in a tractor cab and relays information to the operator. When Precision Planting decided to increase their screen size from six inches to eight inches, I was to create new concepts for the display case. Four different concepts were designed, shown to the right, and submitted to the director of marketing.

**Four different
concepts for the
new case design.**



Concept 1



Concept 2



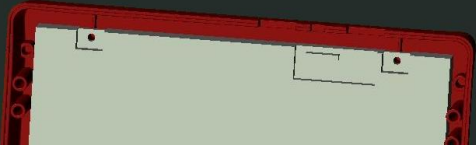
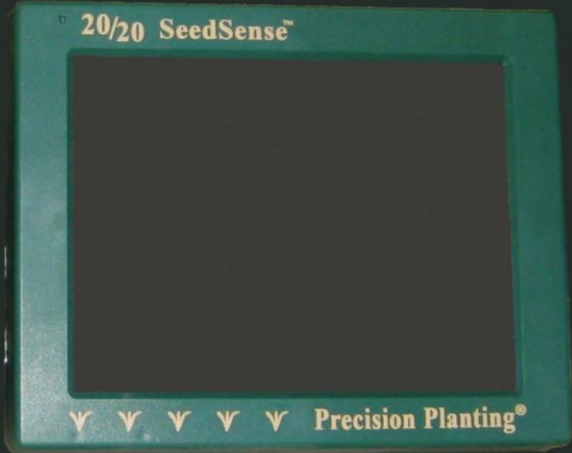
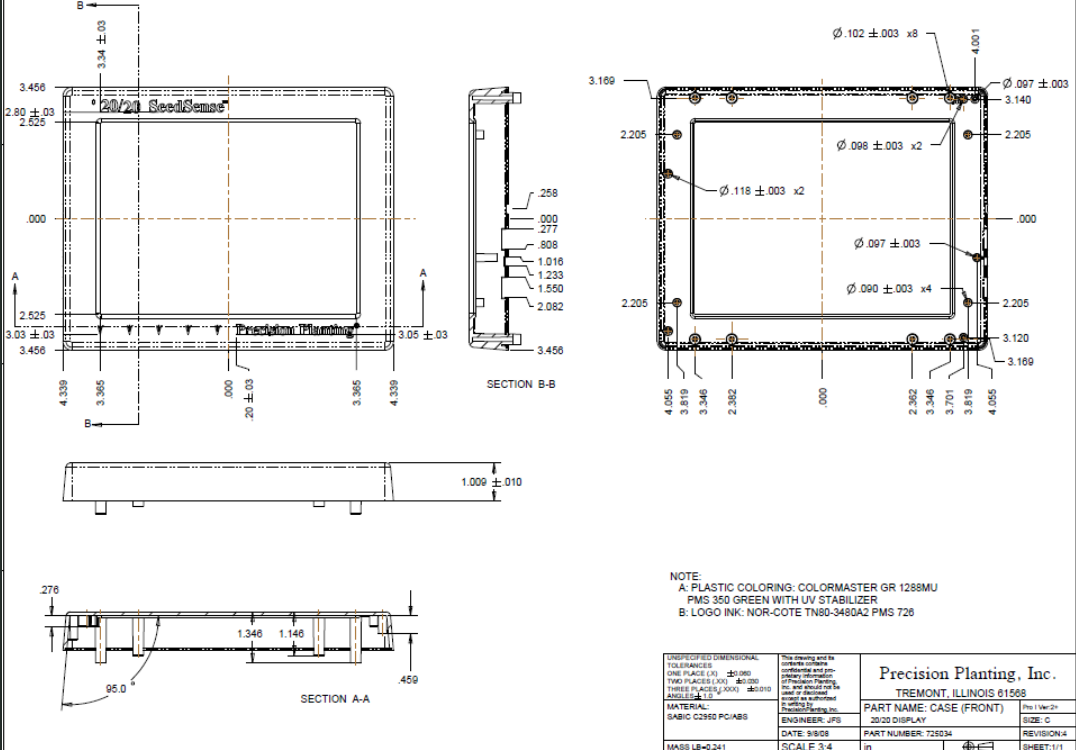
Concept 3



Concept 4

Precision Planting: 20/20 Display Case

Concept 3 was chosen and refined. The refined final product is shown on the left. It should be noted that the case had to be designed to support two different types of display screens by inserting a pair of brackets to hold the second type of display. The case was manufactured by injection molding, so the proper rounds and drafts were included in the design.



Display Type 1



Display Type 2

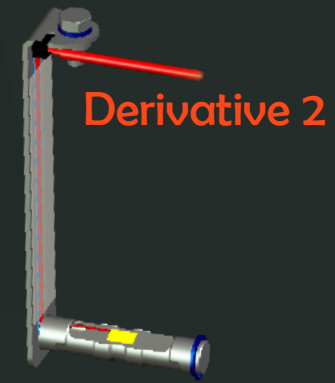
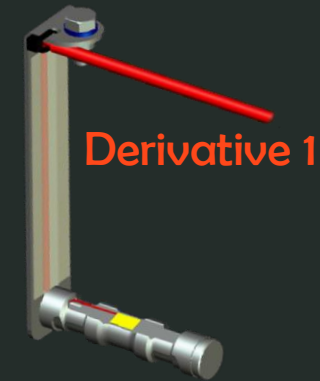
A pair of brackets allows the case to service more than one display type.

Bracket

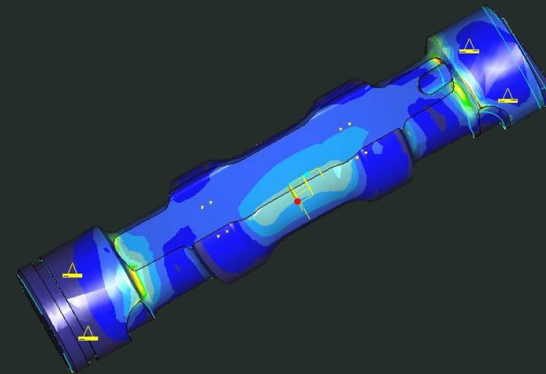
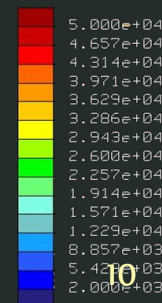
Precision Planting: Force Measuring Smart Pin

The Smart Pin, part of the 20/20 system, is a load sensor which tells farmers the appropriate force to apply while planting to increase crop yields. It was designed to replace a holding pin on the planter, demanding strict size and strength requirements. As an added challenge, the pin was designed to fit multiple types of planters. During the design process, Pro/Mechanica was used to determine stresses. Prototypes were then created and tested. The same method was applied to create six derivatives of the pin, serving eight additional types of planters.

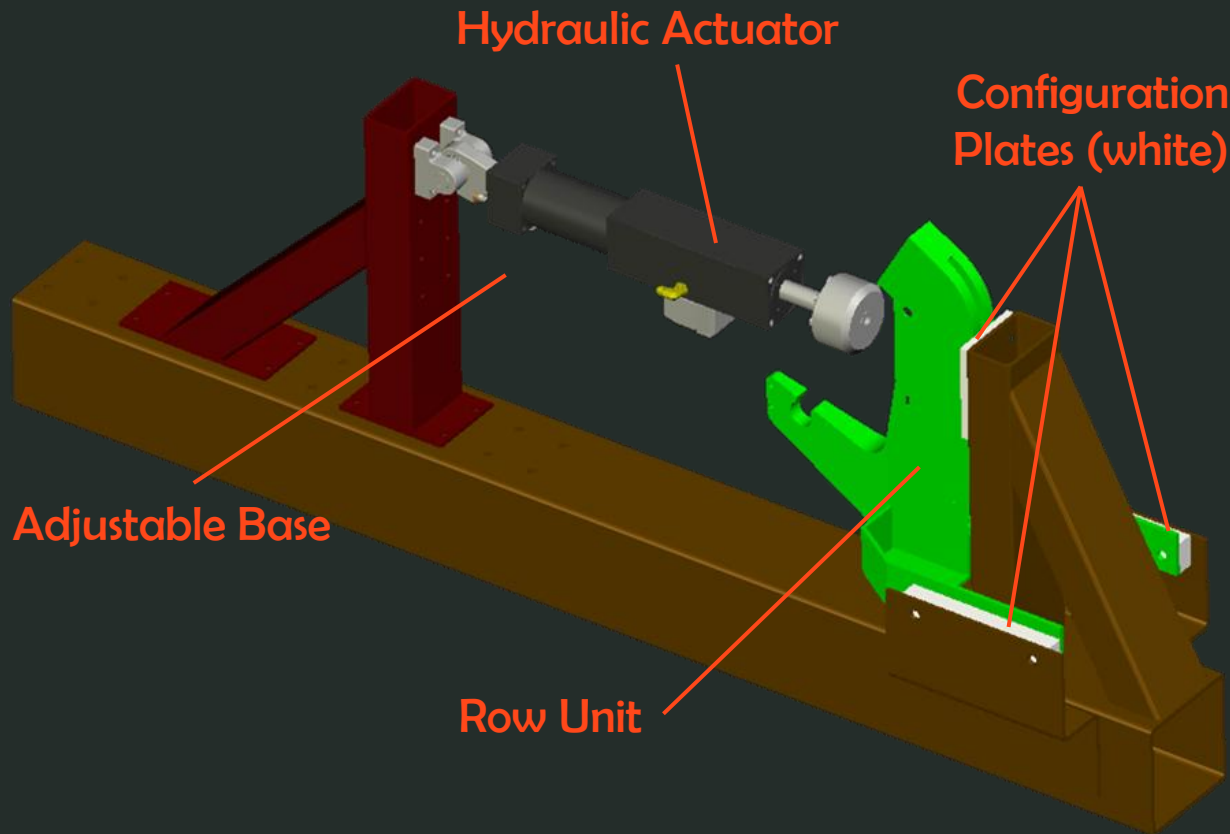
The pin measures force and then interfaces with the 20/20 system to help the user optimize planting.



Frame 5 of 8
Stress von Mises (WCS)
(lbm / (in sec^2))
Deformed
Scale 1.3626E+05
Loadset:LoadSet1



Precision Planting: Smart Pin Test Stand



A test stand was needed to evaluate the Smart Pin and its derivatives. The experiments provided data for both the calibration and the endurance of the pins. The test stand had to be adjustable, as many different models of row units were to be tested. The final design allowed for the testing of eight different row units by changing configuration plates. As the hydraulic actuator produced high loads during testing, the design required careful analysis of all the loads involved.

The configuration plates can be changed to allow for different types of row units to be mounted for testing.



