

ENCODER AUTOMATION TABLE

Tanner Sloan, Jake Metter, Mark Jennings



OBJECTIVE

- Design and create an attractive, interactive display that educates individuals on EPC's lineup of products.
- Demonstrate the programmable encoder's functionality.
- Demonstrate the linear encoder's functionality.
- Demonstrate an industry application ("cut to length")

BACKGROUND & VALUE PROPOSITION

Encoders are extremely powerful devices used in countless applications like:

- Printing
- Heavy Equipment
- Food & Beverage Industry



However, they lack eye-catching flair. Our design will allow our client to:

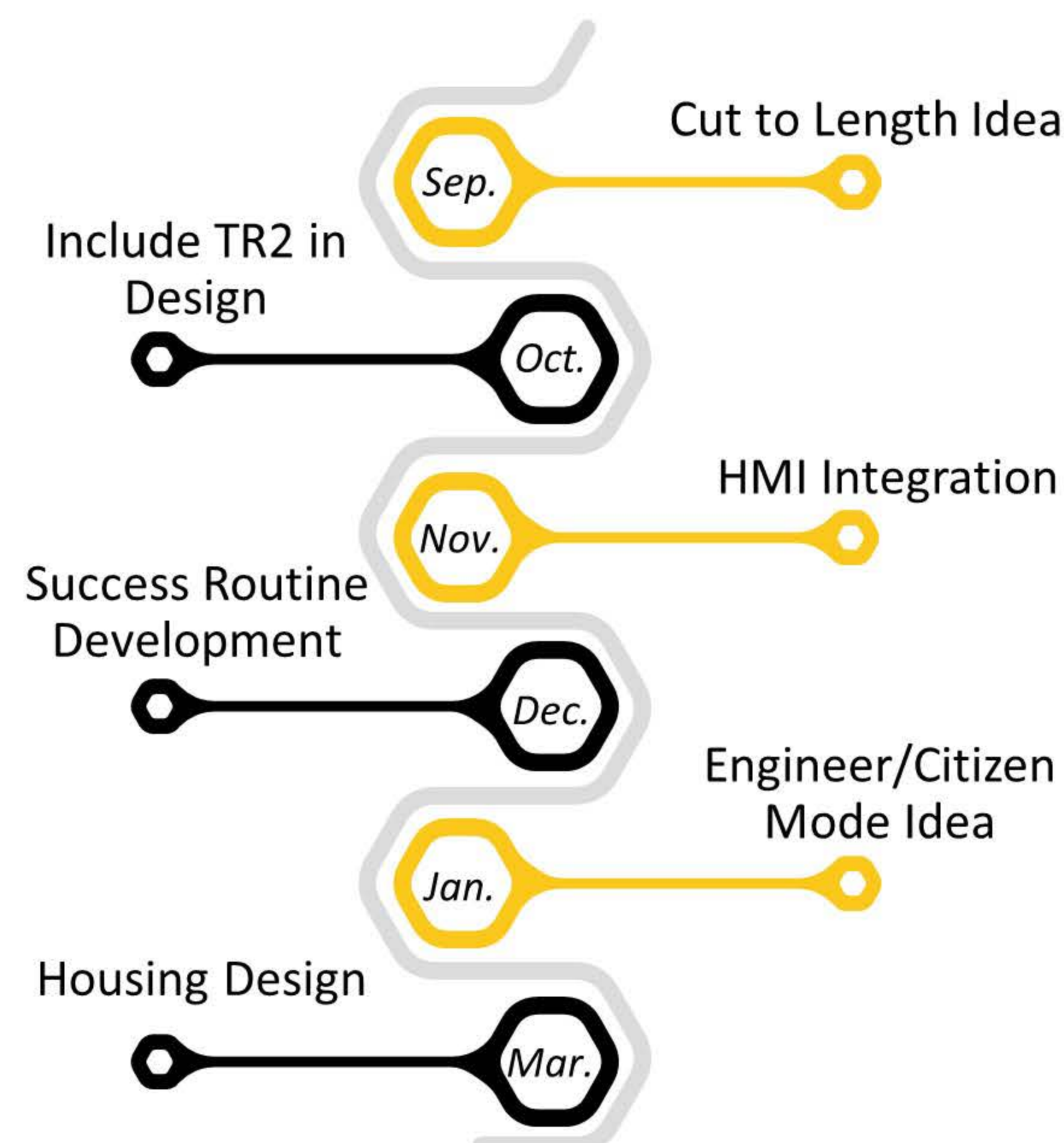
- Showcase the functionality of encoders
- Attract individuals at tradeshow
- Inform the public
- Train new employees
- Increase income and efficiency

The specific models of encoders we are highlighting are the 58TP (programmable resolution) and the TR2 (linear encoder), pictured above.

KEY REQUIREMENTS

Description	Measure	Target
Operation Time	EPC Staff	8 hours per day
Easy Set-Up	EPC Staff	< 15 minutes for 2 people
Engages Audience	Attractive, interesting user-friendly	Finished (painted, anodized, no wires showing)

CONCEPT DEVELOPMENT TIMELINE



FINAL DESIGN



USER EXPERIENCE

1. Users will approach the table and the HMI screen will prompt them to move the linear actuator to a specified distance. The user may choose between two degrees of difficulty: Engineer or Citizen.

Engineer Mode	Citizen Mode
Designed for engineers or more technical clients	Designed for the general public
More challenging	Less challenging
Higher accuracy required for success: +/- .01 in	Less accuracy required for success: +/- 0.1 in
Calculator provided for math	Calculator and pre-determined tables provided for math
User may have to modify the resolution of the encoder to achieve success	Encoder resolution does not need to be modified for success

2. The user will input the number of revolutions required to move the linear actuator to the required distance (can get very precise with the programmable encoder).

3. The linear encoder will provide feedback to the PLC, determining if the distance traveled was accurate enough to achieve "success."

4a. Upon *failure*, the linear actuator returns home, and steps 2-4 may be repeated. The user will be informed how many inches they were off from the target with their calculations.

4b. Upon *success*, the HMI will read "SUCCESS!" or "WINNER!". Lights will flash, a sound will play, and/or candy will be dispensed. Any combination of the above is possible, to make it a unique "success routine" for each user.

RECOMMENDATIONS

To finish the design, Encoder Products Company must:

- Purchase 80/20 components from drawing package and assemble the Unitronics HMI/PLC frame.
- Familiarize with ladder logic used within PLC.
- Install motor for candy dispenser and implement code within the PLC to run success routines.

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