Board Specifications:

Software	Required Version
Burt-util	devel (3.5.0 or greater)

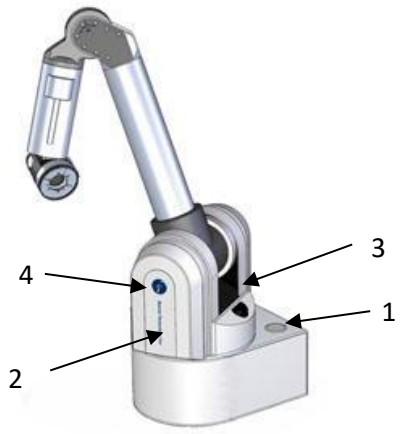
Required Tools:

- **Burt-Util**
- **Computer with CAN Connection**
- **USB PEAK CAN Adapter (or similar)**
- **Configurations and Scripts - https://web.barrett.com/support/WAM_ControlLibrary/PuckConfiguration/**

Procedure:

Section 1 – Puck Replacement

1. Turn off WAM and verify the power supply is shut down.
2. Remove both shoulder covers from the WAM to access the inside of the robot.
3. Use the following guideline to locate the correct Puck.



4. Carefully remove the damaged Puck. Grab the Puck by the top and bottom and pull directly off to avoid damaging the MIB connectors.
5. Set aside the damaged Puck.
6. Carefully insert the new Puck. Align the Puck with both connectors on the MIB and apply light pressure. **Caution:** The Puck does not require significant force to mount. If the Puck does not go on smoothly do not apply extra force. Doing so will damage the MIB and require more serious repairs. Realign the Puck with the MIB and try again. Please contact Barrett Support for any questions or help if required during the process.
7. Replace the shoulder covers.

Section 1.5 – Puck Configuration (follow this step if the replacement Puck is not configured for the node in use)

Power ON the WAM but do not shift-idle.

Configure the P3-35 Motor Controller for use on the WAM.

1. Run the command:
   `burt-util enumerate`

The output should show the CAN ID [1] (for a new inspected Puck). If the Puck has previously been configured for another node, this ID may change.

Note: If the new Puck does not appear in the enumeration, remove all Pucks from the WAM leaving just the new Puck. The replacement Puck may share a node with one of the existing Pucks in the WAM. Continue with Puck Configuration with only the replacement Puck connected.

2. Run canopen_runner.py to configure each Puck for the proper motor:
   canopen_runner.py <Start ID><New ID><File> Set the CAN ID and configure object dictionary:
   `python3 canopen_runner.py 1 1 "File-Name.csv"`

Note: <Start ID> and <New ID> will vary based on the system / replacement Puck. Please update values accordingly.

"File-Name.csv" for Various WAM Configurations:

Puck ID			
Input	**1-4**	**5/6**	**7**
48V	P335-Allied-4DOF-48V.csv	P335-Allied-Wrist-48V.csv	P335-Allied-M7-48V.csv
80V	P335-Allied-4DOF-80V.csv	P335-Allied-Wrist-80V.csv	P335-Allied-M7-80V.csv
160V	P335-Allied-4DOF-160V.csv	P335-Allied-Wrist-160V.csv	P335-Allied-M7-160V.csv

3. Power cycle the WAM to allow changes to take effect.
4. Configure the Puck for BarrettCAN:
   configure_barrettcan.sh <ID> Configure the BarrettCAN properties:
   `./configure_barrettcan.sh 1`

Note: <ID> will vary based on the node being replaced. Please update this value to match.

5. The Puck is now ready for use on the WAM.

Section 2 – Calibration

1. Turn the WAM on.
2. Shift Idle the WAM and verify the robot behaves properly and the display pendant shows an Idle state.
3. Raise the WAM arm so straight up to aid in the calibration process. Ensure that the WAM is static and not moving due to gravity. If the WAM moves during the calibration process the motor offsets may be incorrect.
4. Run the following commands on the computer (if Burt-Util is not installed follow the procedure below):
   Reset the Puck – replace * with the CAN ID of the Puck being replaced.
   `burt-util reset *`
   Calibrate the Puck – replace * with the CAN ID of the Puck being replaced.
   Note: Do not touch the WAM during calibration as this may affect accuracy.
   `burt-util p3 calibrate *`
5. Power cycle the WAM.
6. The new Puck is now calibrated and ready for use.
7. Run ex04 to verify the Puck is now fully functional. The WAM should move smoothly without cogging.

Troubleshooting:

Issue	**Solution**
While testing the WAM after installation: ● Motor cogging / roughness ● Torque Fault after Shift Activate	Repeat calibration process. Verify the reset command runs successfully, and the WAM twitches slightly during calibration. The WAM must be restarted after calibration for changes to take effect.
WAM not Shift Idling.	The Puck may need to be reconfigured. Contact Barrett Support for help with reconfiguration.

(Optional) – Burt-Util Installation

1. Navigate to git.barrett.com/burt/software/burt-util
2. Follow the installation procedure outlined in the README.md file located at the bottom of the repository.

Revision History

Rev	**Date**	**Engineer**	**Description**
AA	2/17/2023	B. Noack	Initial release.
AB	1/15/2026	B. Noack	Added Puck Configuration step.