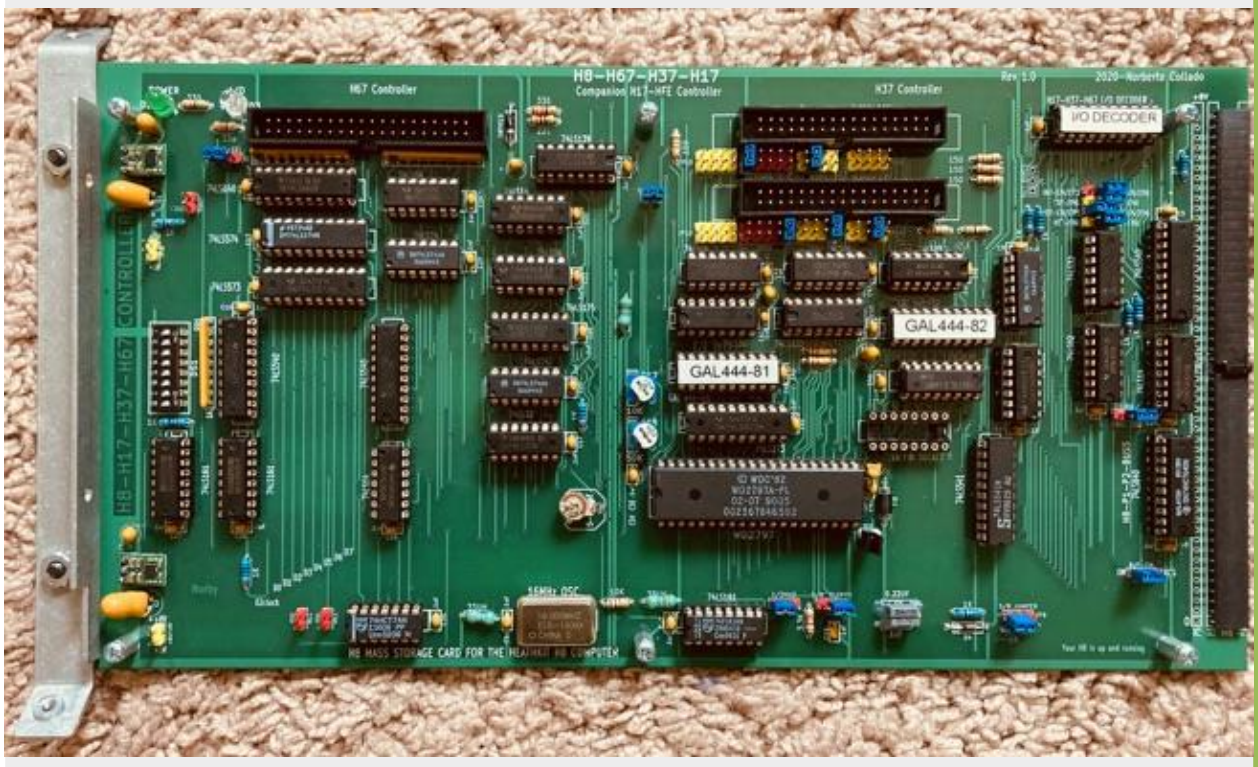
2023

H8-Z37-FLOPPY CONTROLLER CALIBRATION



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Revision History and Disclaimer

Revision History		
Revision	**Date**	**Comments**
1.0	05/20/2023	Initial draft by Norberto Collado

The purpose of this document is to allow the surviving classic computers to continue to function.

Please don't use any of this material for any purpose other than personal hobby/interest without checking with the owner of the material.

Thank you for your understanding and consideration.

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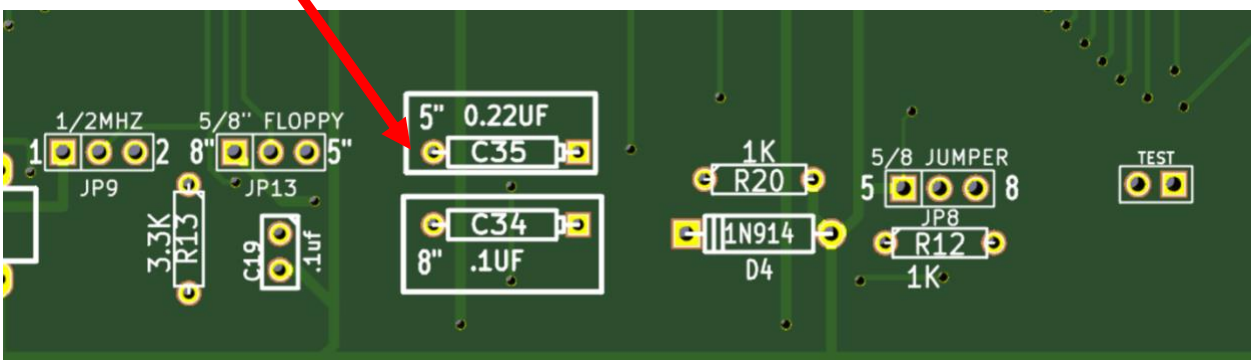
Introduction

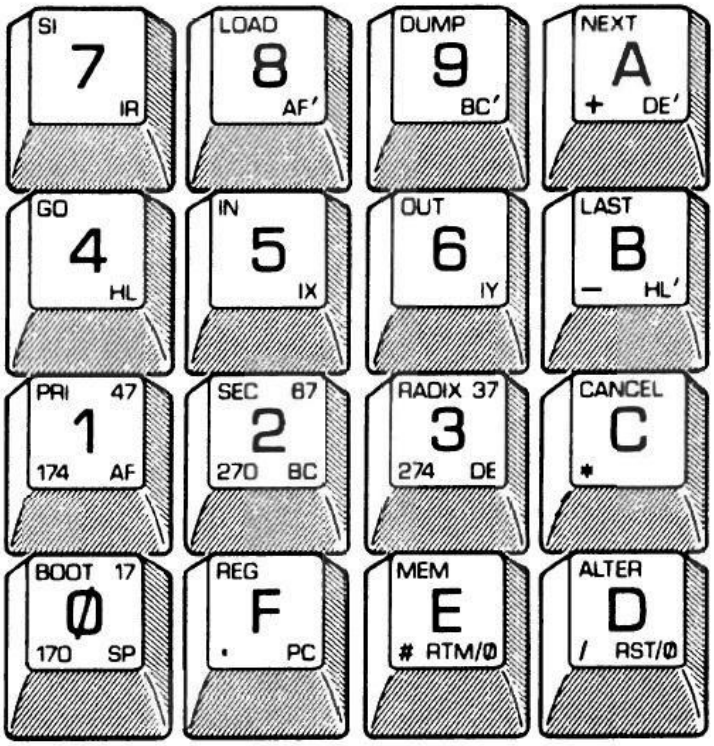
This document provides details on how to calibrate the H8-Z37 floppy controller board design by Norberto Collado for the Heathkit H8 Computer. The calibration assumes that a ***0.22uF*** is used in location ***C35.***



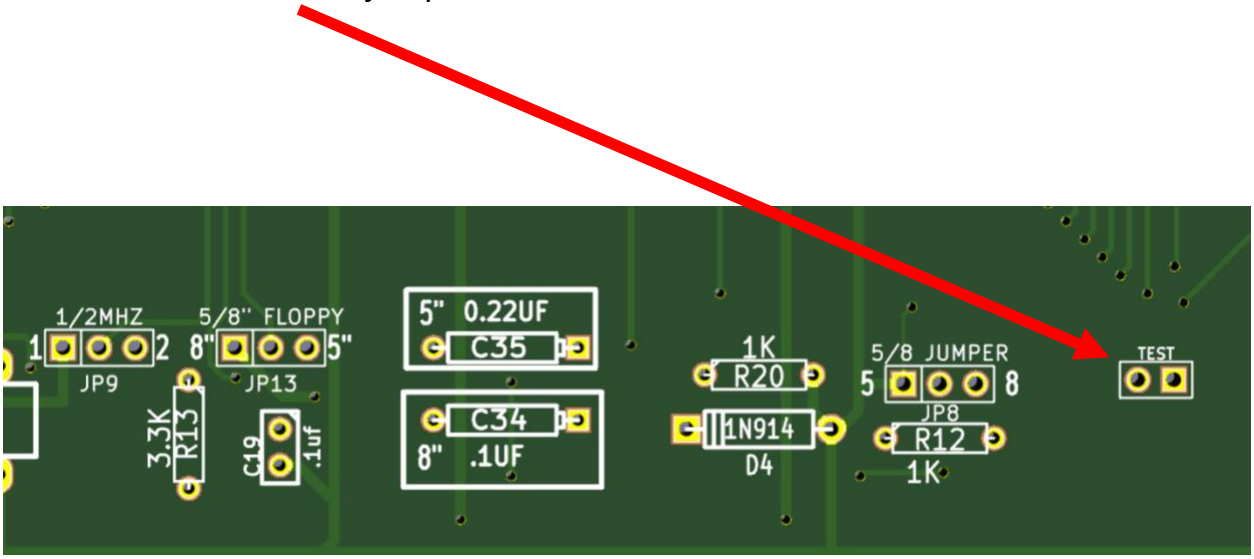
Floppy Disk Controller Alignment with Oscilloscope

Write Pre-compensation Adjustment

1. Power-on H8 computer.
2. Warm up the computer for a minimum of 15 minutes.
3. Press the “D” key simultaneously with the “0” key to initiate a master clear sequence “RST” to strobe the MR pin.

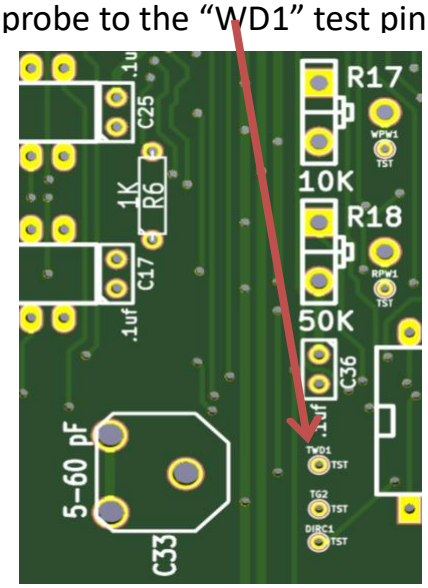


4. Insert the “TEST” jumper as illustrated below.

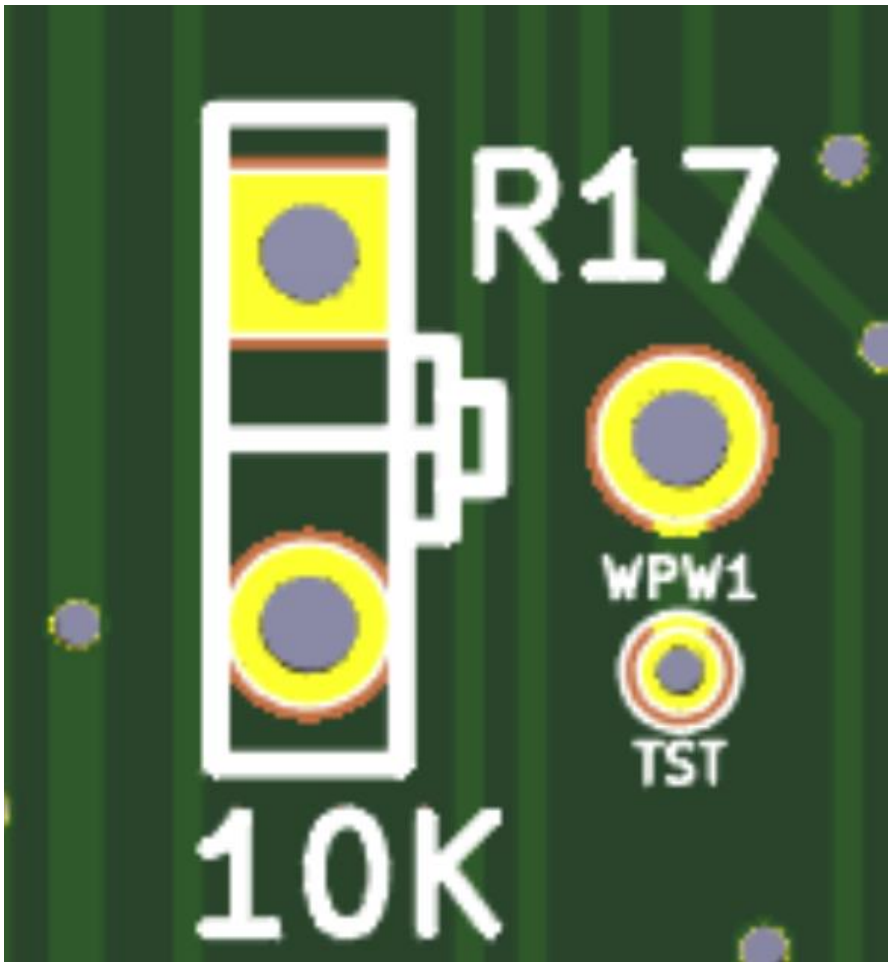


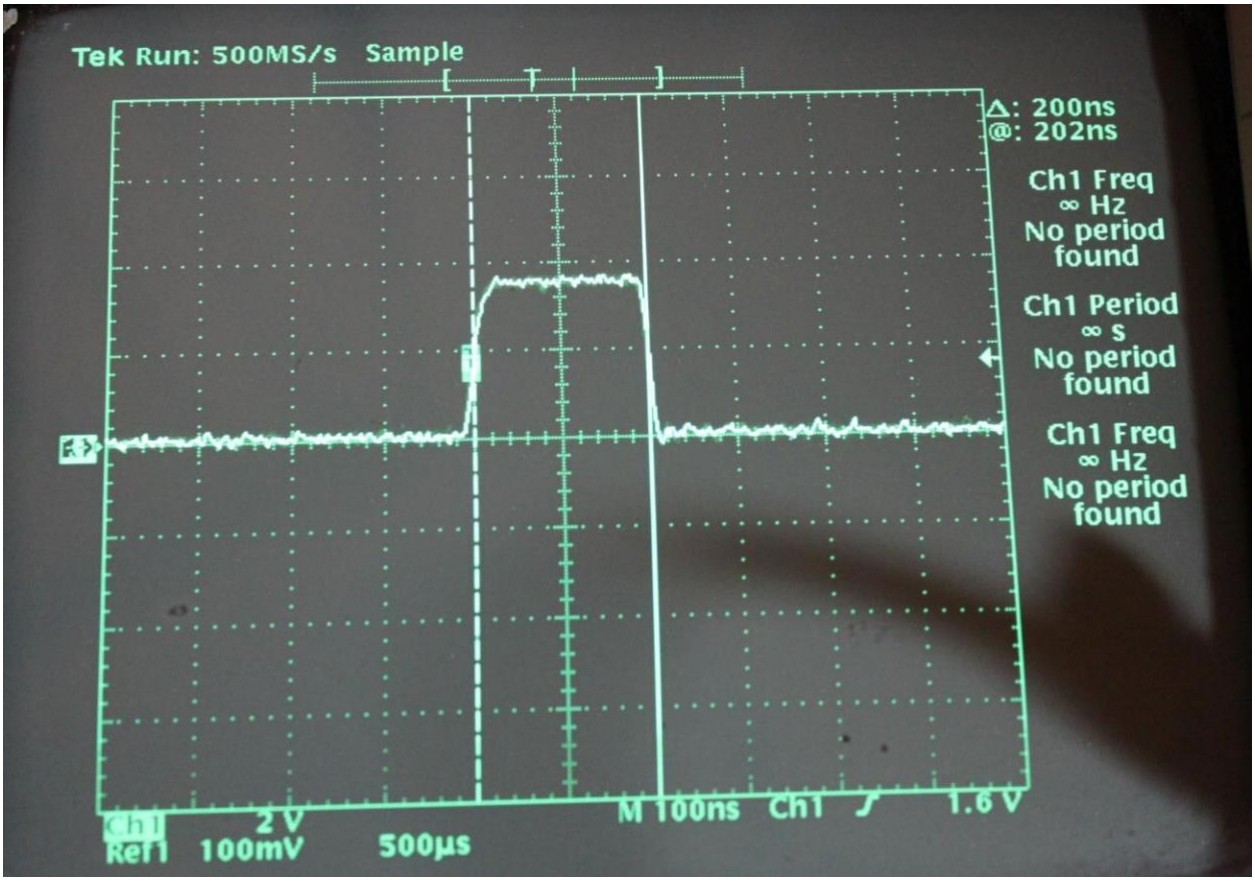
Press the “D” key simultaneously with the “0” key to initiate a master clear sequence “RST” to strobe the MR pin.

5. Connect scope probe to the “WD1” test pin as shown below



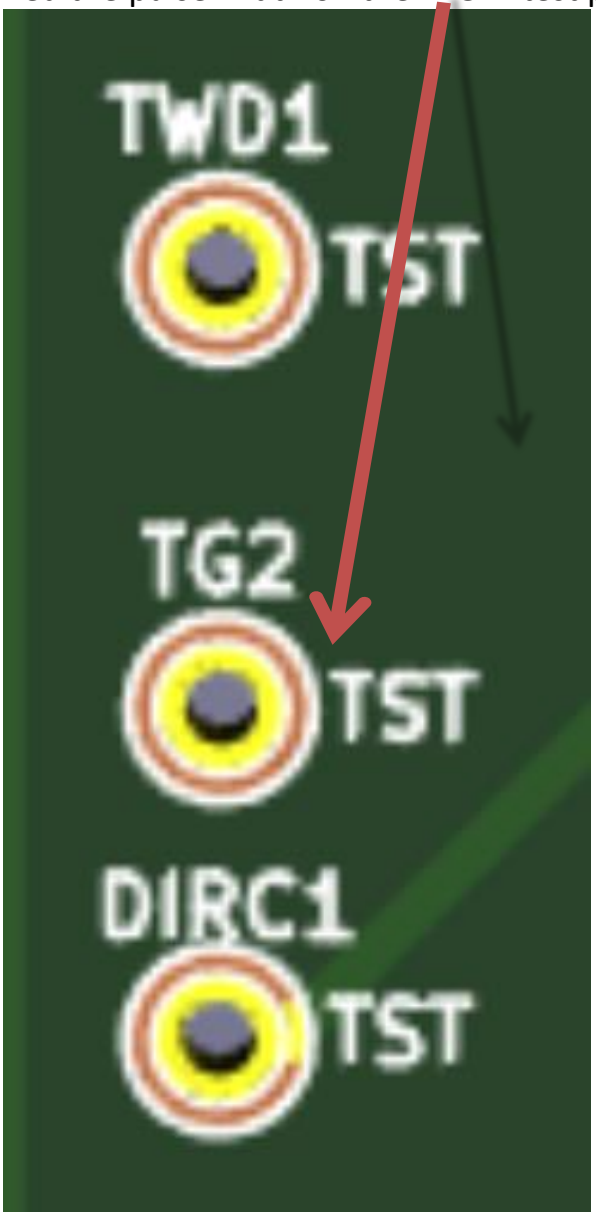
6. Adjust WPW potentiometer (R17) for the desired pulse width of 200ns as shown below



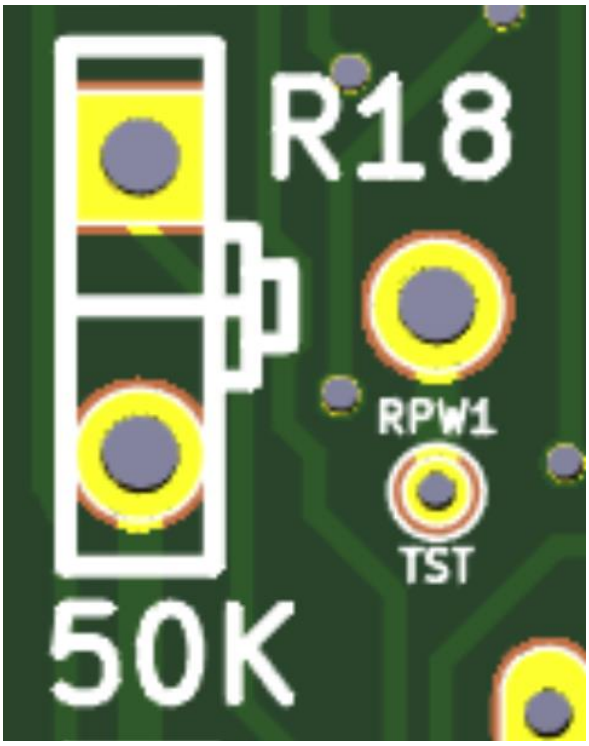

Tek Run: 500MS/s Sample
Δ: 200ns
@: 202ns
Ch1 Freq
∞ Hz
No period
found
Ch1 Period
∞ s
No period
found
Ch1 Freq
∞ Hz
No period
found
Ch1 2 V
Ref1 100mV
500µs
M 100ns Ch1 1.6 V

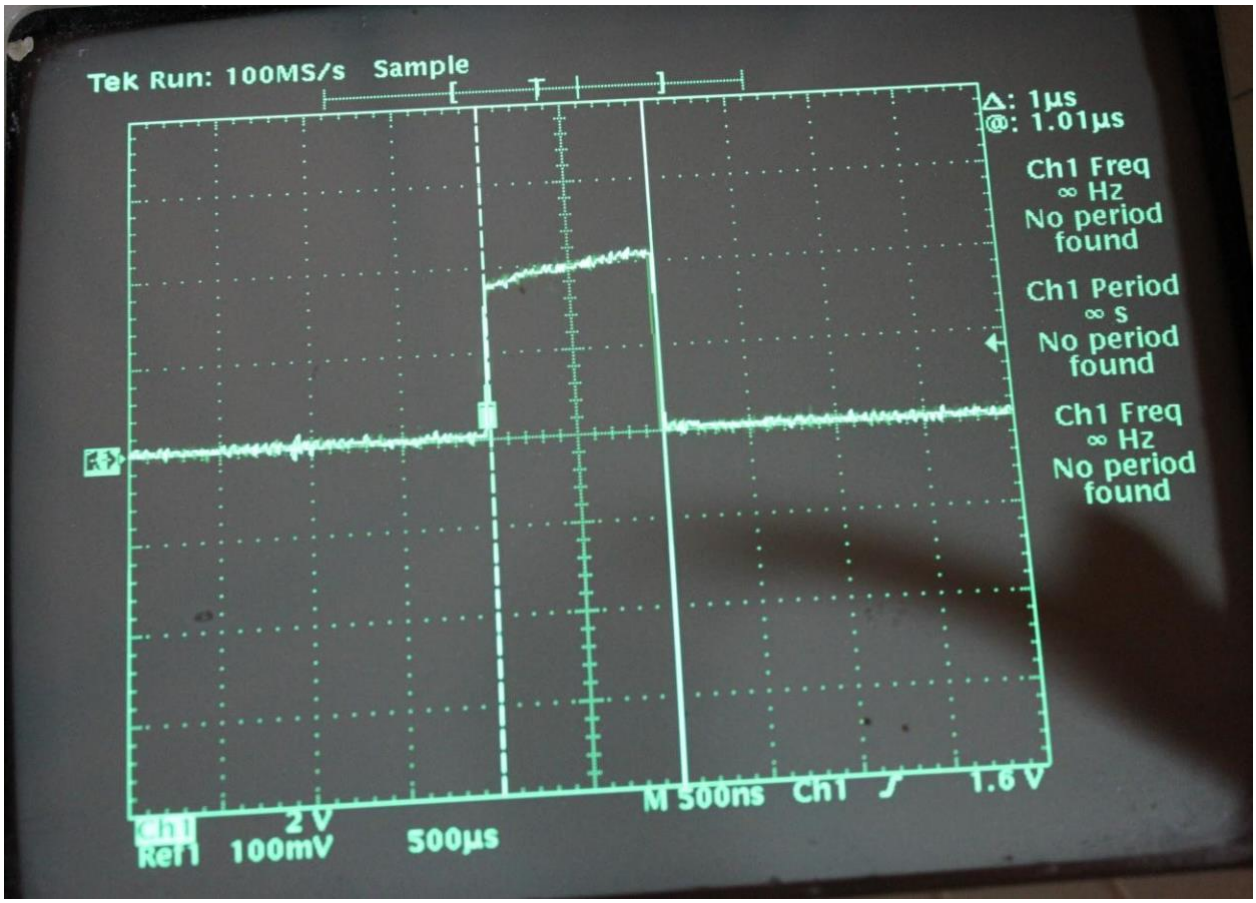
Data Separator Adjustment

1. Observed the pulse width on the “TG2” test pin 1 as shown below



2. Adjust the RPW (R18) potentiometer for “1/8” of the read clock of 1us as shown below

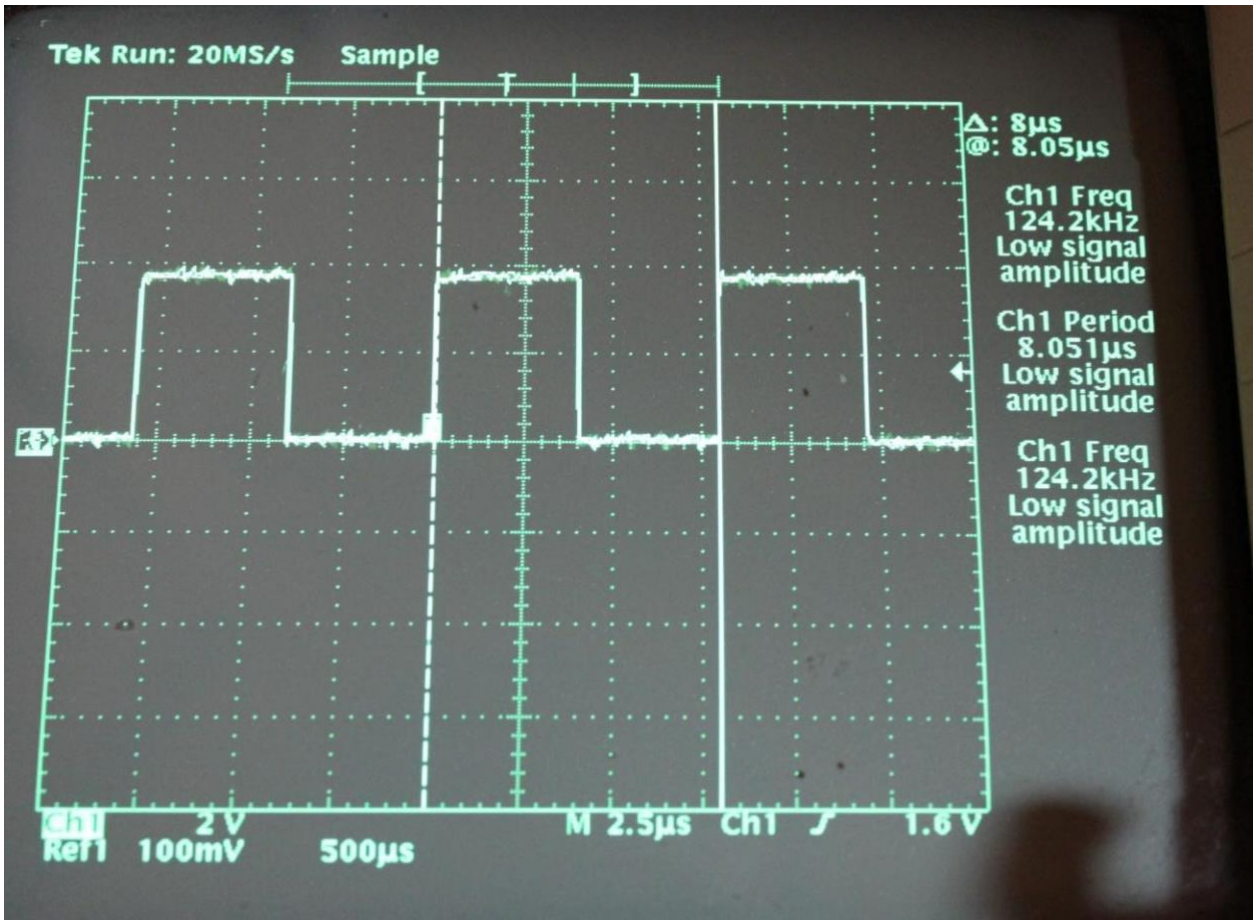



Tek Run: 100MS/s Sample
Δ: 1µs
@: 1.01µs
Ch1 Freq
∞ Hz
No period found
Ch1 Period
∞ s
No period found
Ch1 Freq
∞ Hz
No period found
M 500ns Ch1 1.6 V
Ch1 2 V
Ref1 100mV
500µs

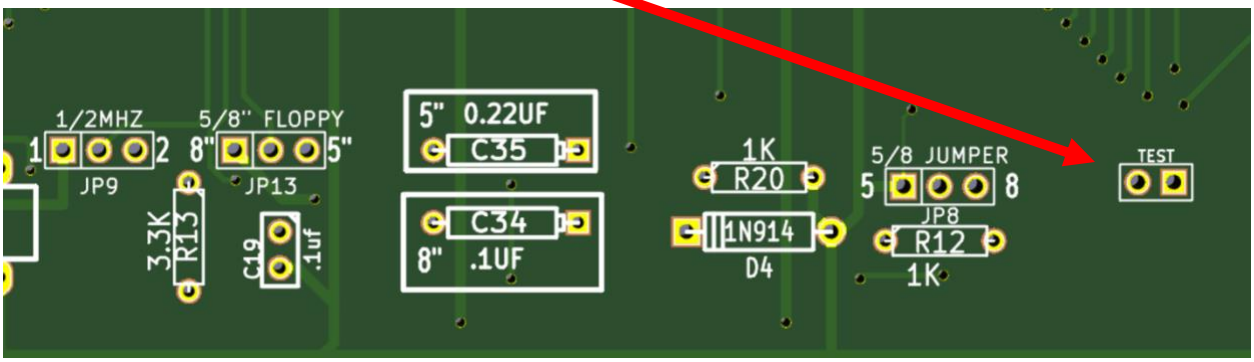
VCO Center Frequency Adjustment

1. Observed the pulse width on the “DIRC1” test pin as shown below

2. Adjust the variable capacitor (C33) for a period of 8us as shown below



3. Remove the “TEST”

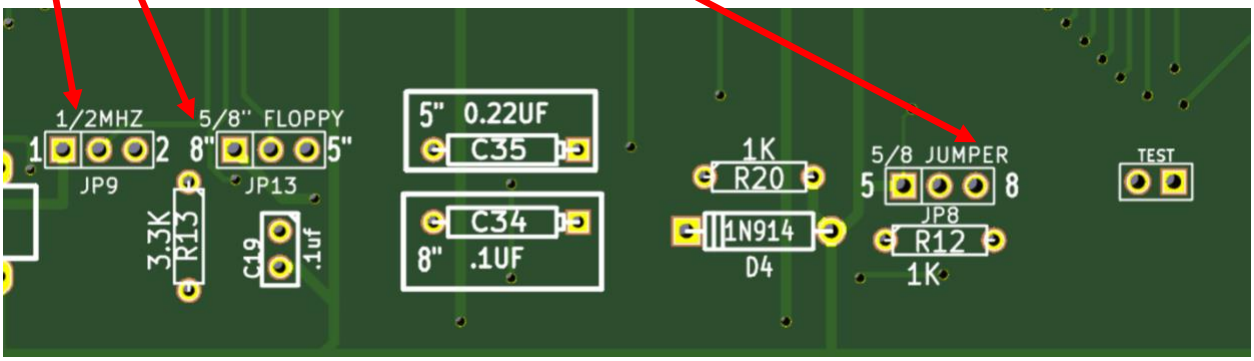


Note: If planning to seal the potentiometers and the variable capacitor, then repeat all the steps above to verify proper calibration.

4. Press the “D” key simultaneously with the “0” key to initiate a master clear sequence “RST” to strobe the MR pin.

8” Floppy Drive Support Selection

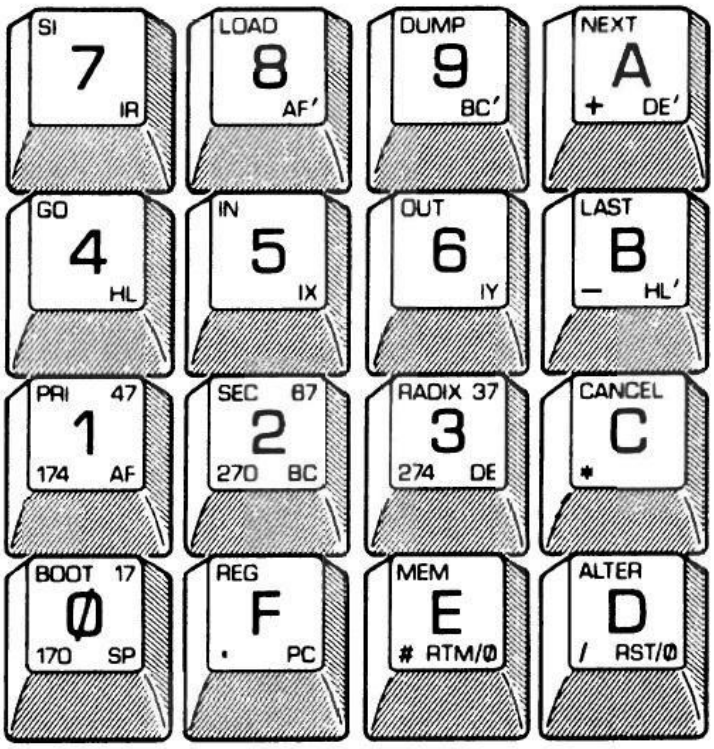
1. After calibrating the board, please change the following jumpers to enable 8” floppy support.
2. Move JP9 to 2-3 position (2 MHz)
3. Move JP13 to “8” position to 1-2
4. Move JP8 to “8” position to 2-3



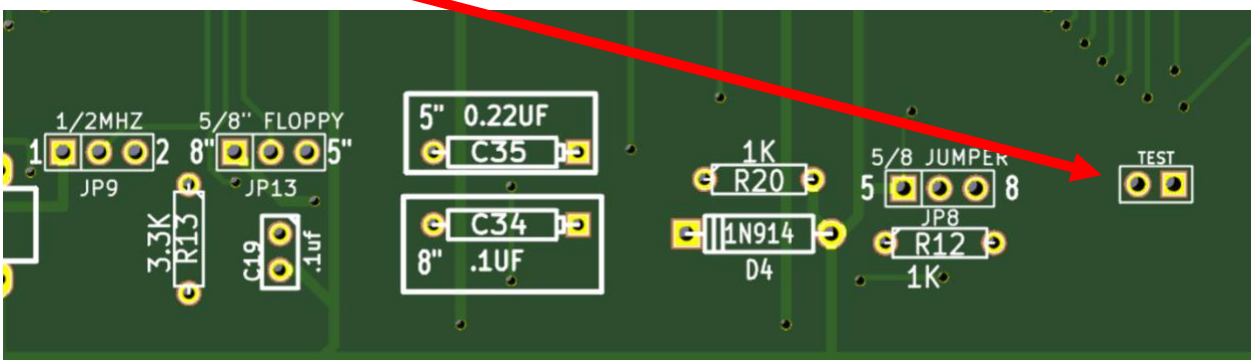
Floppy Disk Controller Alignment with a Digital Voltmeter (DVM)

Write Pre-compensation Adjustment.

1. Power-on H8 computer
2. Warm up the computer for a minimum of 15 minutes.
3. Press the “D” key simultaneously with the “0” key to initiate a master clear sequence “RST” to strobe the MR pin.

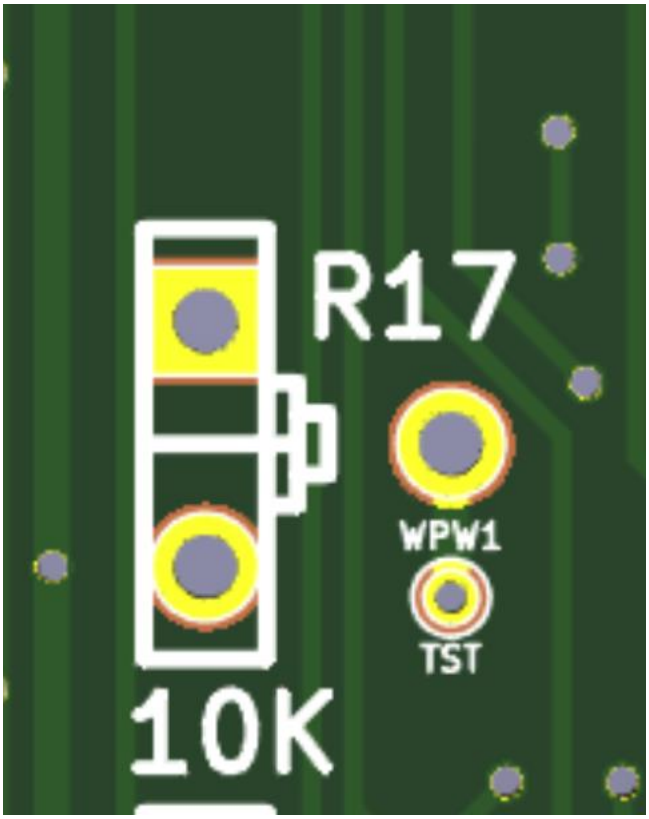


4. Insert the “TEST” jumper as illustrated below.



Press the “D” key simultaneously with the “0” key to initiate a master clear sequence “RST” to strobe the MR pin.

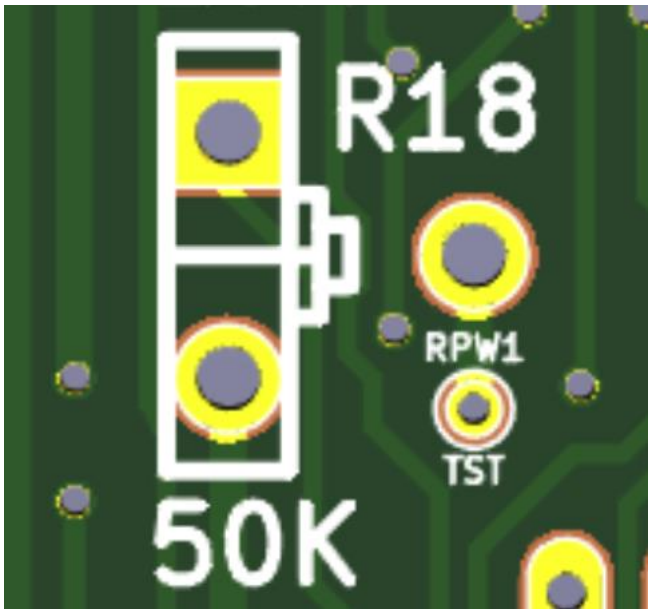
1. Using the DVM observed the voltage on the “WPW1” test point as shown.



2. Adjust WPW potentiometer (R17) for the desired voltage of 1.540 volts

Data Separator Adjustment

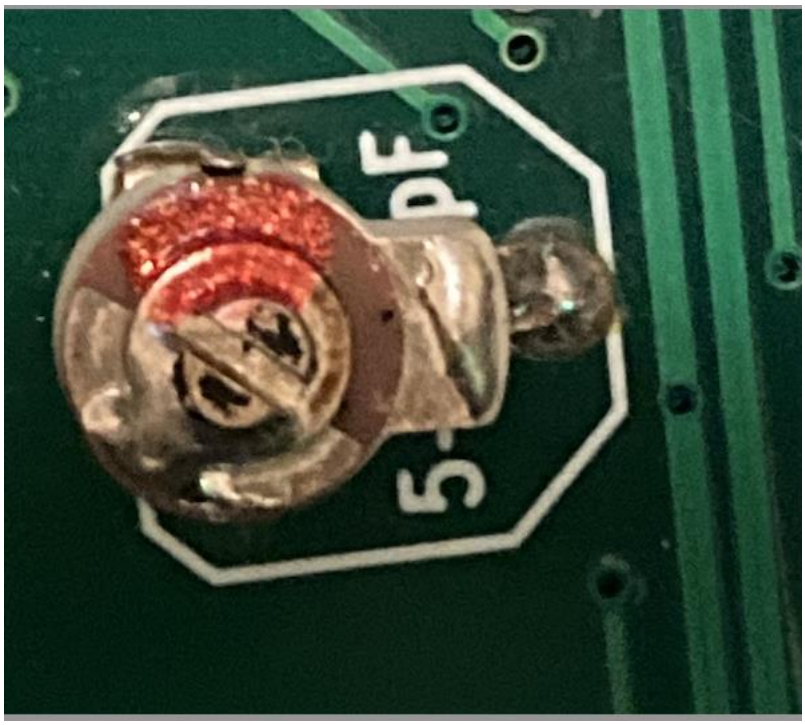
1. Using the DVM observed the voltage on the “RPW1” test point as shown



3. Adjust RPW potentiometer (R18) for the desired voltage value of 1.764 volts

VCO Center Frequency Adjustment

1. Rotate the variable capacitor so that it looks as shown below.



2. Remove the “TEST” jumper.

   Note: If planning to seal the potentiometers and the variable capacitor, then repeat all the steps above to verify proper calibration.

3. Press the “D” key simultaneously with the “0” key to initiate a master clear sequence “RST” to strobe the MR pin.