

Course Title:	Electronic Circuits II
Course Number:	ELE-504
Semester/Year (e.g. F2017)	F2022

Instructor	Professor Mike Kassam
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Assignment/Lab Number:	Major Project #3
Assignment/Lab Title:	Voltage Controlled Waveform generator

Submission Date:	Oct 26, 2022
Due Date:	Oct 26, 2022

Student LAST Name	Student FIRST Name	Student Number	Section	Signature*
El-kadri	Hashem	501039817	2	HE
Al-Islam	Safwan	500956866	2	SA

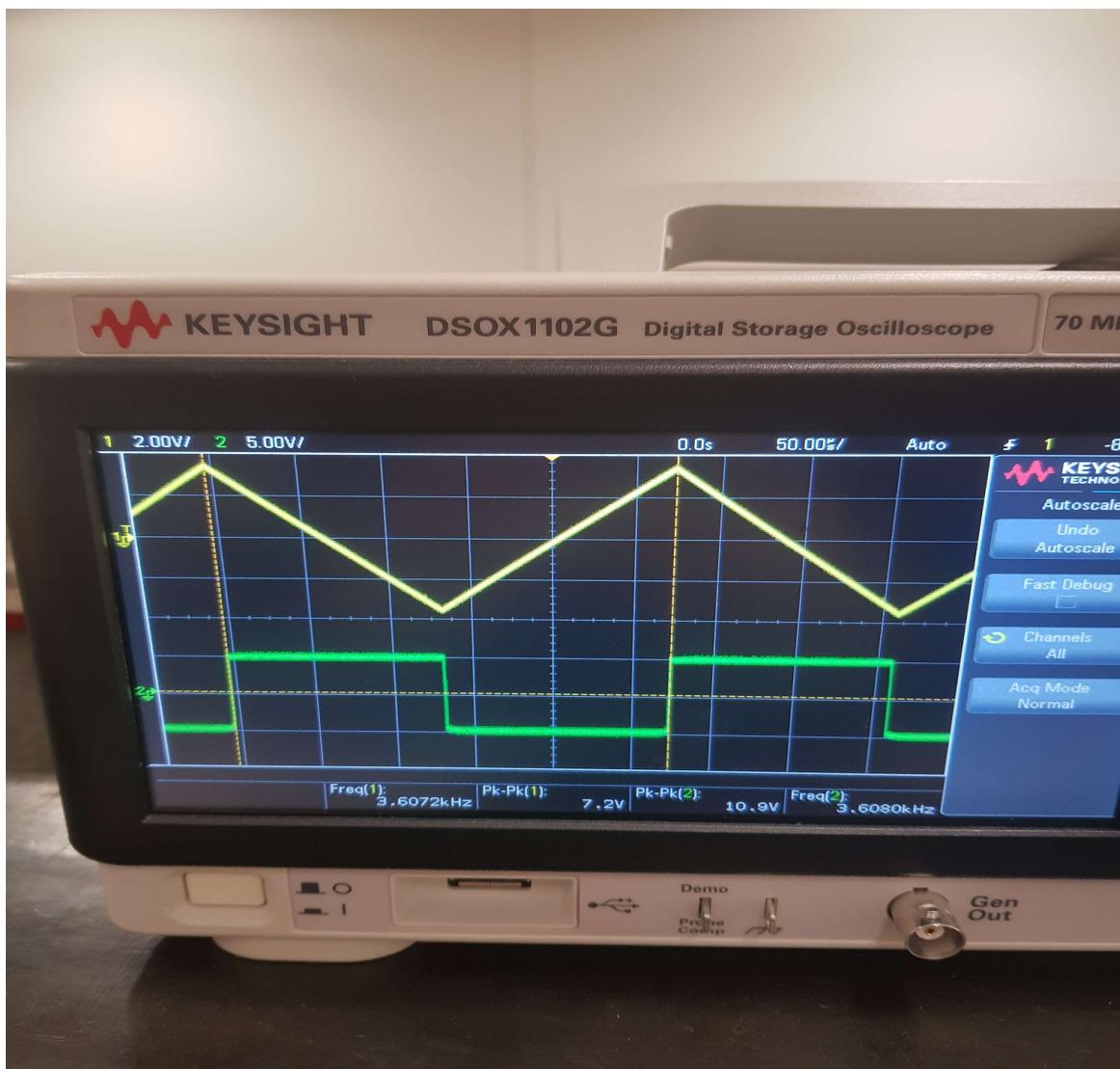
*By signing above you attest that you have contributed to this written lab report and confirm that all work you have contributed to this lab report is your own work. Any suspicion of copying or plagiarism in this work will result in an investigation of Academic Misconduct and may result in a "0" on the work, an "F" in the course, or possibly more severe penalties, as well as a Disciplinary Notice on your academic record under the Student Code of Academic Conduct, which can be found online at:
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1) Introduction:

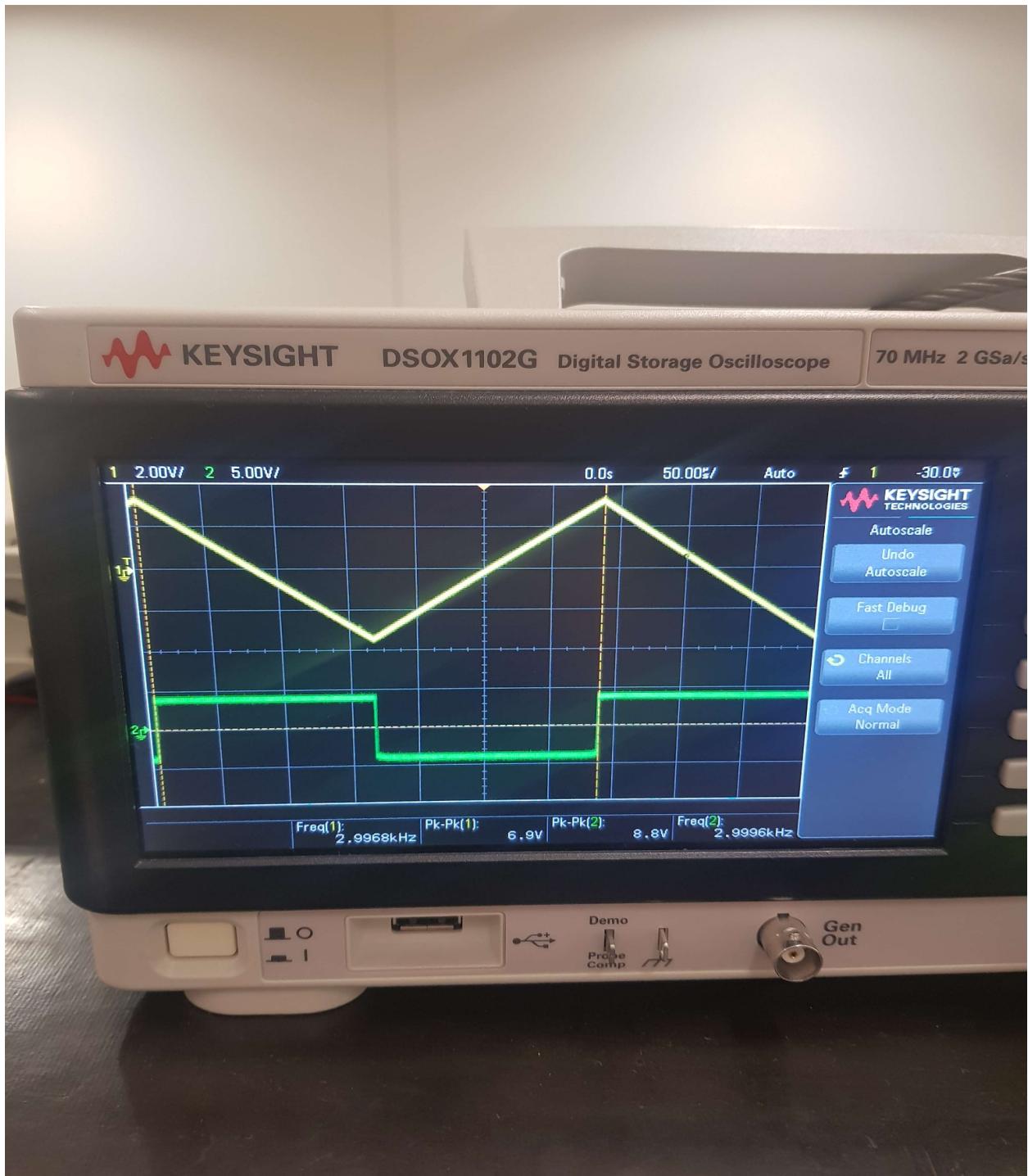
The objective of this lab was to design and implement the Linear Voltage Controlled Waveform Generator discovered in milestone 2 with the addition of the D.C to +D.C converter. In the previous lab, each circuit was tested individually with the D.C converter being provided with a signal from the function generator. In this lab, both individual circuits will be combined into one to create a self sustaining Linear voltage controlled waveform generator. The results and observations of the circuits from oscilloscope readings from the In-Lab experiments are found below.

2) Results and Observations:

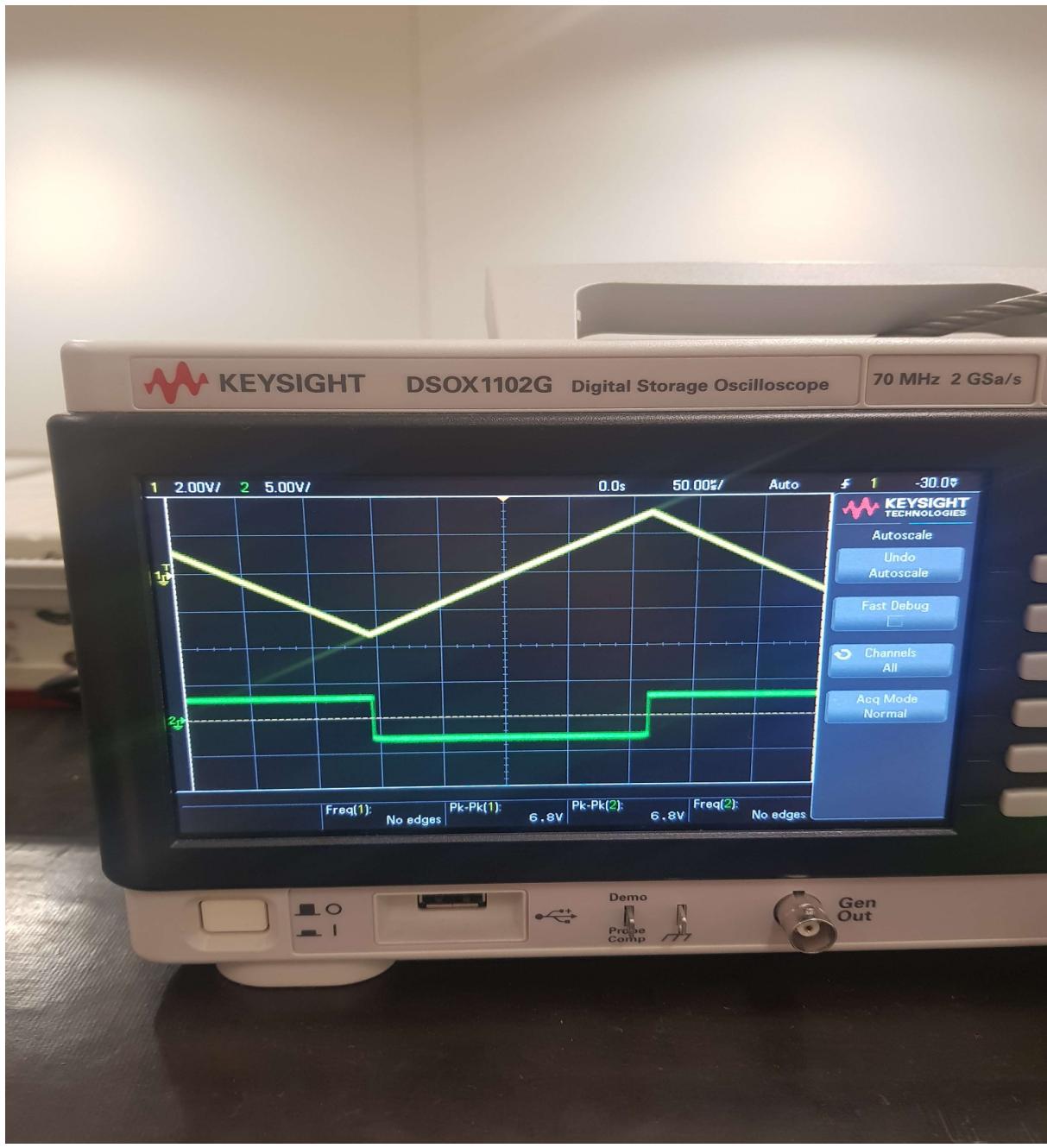
Vc at 5V



Vc at 4V



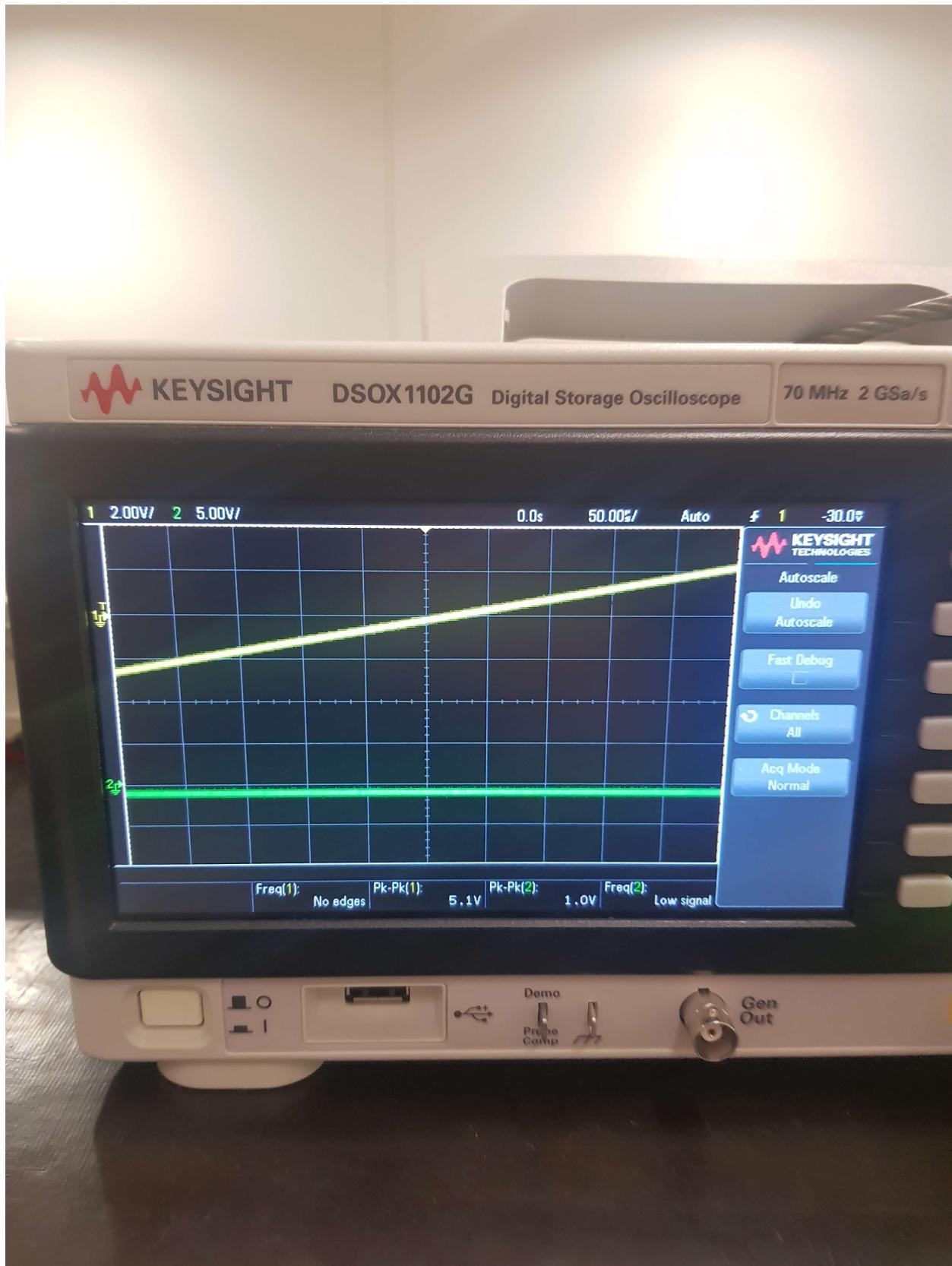
Vc at 3V



Vc at 2V



Vc at 1V



3) Conclusion:

Prior to the analysis of the integrated Linear Voltage Controlled waveform generator, it was predicted in prelab that the system consisting of a DC converter, inverting integrator, and a non-inverting bistable will have an overall system feedback that is positive. This is why implementing an inverting op-amp design into the system (with a polarity of -) will result in the overall system feedback being negative, hence creating an oscillating effect of the signal. The output of the bistable enters the inverting op amp, which then becomes the input of the base of the BJT in the DC converter. Since the bistable oscillates between an L+ and L- values at a particular frequency, this operates as a substitute for the function generator used in the previous milestone. All the values obtained from the previous milestones were implemented in this design with little to no changes since previous circuits ran well with no issues. As you can observe in the pictures above, at different Vc values, the output of the integrator and the bistable resulting in square and triangular waves in phase with each other. This was predicted in the prelab analysis and hence no deviation from the expected result was observed.