

Indiana University – Purdue University Fort Wayne  
**Opus: Research & Creativity at IPFW**

---

Computer and Electrical Engineering Technology &  
Information Systems and Technology Senior Design  
Projects

School of Engineering, Technology and Computer  
Science Design Projects

---

12-23-1969

## AC/ DC Period Converter

Ronald A. Patton

*Indiana University - Purdue University Fort Wayne*

Follow this and additional works at: [http://opus.ipfw.edu/etcs\\_seniorproj](http://opus.ipfw.edu/etcs_seniorproj)



Part of the [Computer Sciences Commons](#), and the [Engineering Commons](#)

---

### Opus Citation

Ronald A. Patton (1969). AC/ DC Period Converter.  
[http://opus.ipfw.edu/etcs\\_seniorproj/324](http://opus.ipfw.edu/etcs_seniorproj/324)

This Senior Design Project is brought to you for free and open access by the School of Engineering, Technology and Computer Science Design Projects at Opus: Research & Creativity at IPFW. It has been accepted for inclusion in Computer and Electrical Engineering Technology & Information Systems and Technology Senior Design Projects by an authorized administrator of Opus: Research & Creativity at IPFW. For more information, please contact [admin@lib.ipfw.edu](mailto:admin@lib.ipfw.edu).

AC/DC PERIOD CONVERTER

FINAL REPORT

SUBMITTED TO

EET DEPARTMENT

PURDUE CAMPUS

FORT WAYNE, INDIANA

RONALD A. PATTON

*Ronald A. Patton*

I2/23/69

## ABSTRACT

The theoretical discussion of operation, calculation, and testing of a AC/DC converter are covered to obtain the operating parameters of the converter. The period converter works like a digital counter except that the converter provides a D.C. output voltage.

## TABLE OF CONTENT

FIGURE	DESCRIPTION	PAGE
	ABSTRACT. . . . .	i
	TABLE OF CONTENT. . . . .	ii
	TABLE OF ILLUSTRATIONS. . . . .	iii
I	INTRODUCTION. . . . .	I-I
II	STATEMENT OF PROBLEM. . . . .	2-I
III	DIFFERENT APPROACHES. . . . .	3-I
IV	THEORITICAL DISCUSSION OF THE CIRCUIT . . . . .	4-I
V	CIRCUIT CALCULATIONS. . . . .	5-I
	(A) Schmitt Trigger Calculations. . . . .	5-3
	(B) Waveform Generator Calculations. . . . .	5-4
	(C) Constant Current Generator Calculations . . . . .	5-5
	(D) Power Dissipation Of The Transistors. . . . .	5-6
VI	TEST PROCEDURES . . . . .	6-I
VII	DISCUSSION OF TEST RESULTS. . . . .	7-I
VIII	OPERATING SPECIFICATIONS. . . . .	8-I
IX	SUMMARY . . . . .	9-I

TABLE OF ILLUSTRATIONS  
DESCRIPTION

FIGURE		PAGE
3- 1	Block Circuit of Period Converter . . . . .	3- 1
3- 2	Block Circuit of Frequency Converter . . . . .	3- 2
4- 1	Schmitt Trigger Schematic . . . . .	4- 1
4- 2	Waveform Generator Schematic . . . . .	4- 1
4- 3	Constant Current Schematic . . . . .	4- 2
4- 4	Shorting Transistor Schematic . . . . .	4- 3
4- 5	Peak Detector Schematic . . . . .	4- 3
5- 1	Calculated Circuit For the Period Converter . . . . .	5- 7
5- 2	Actual Circuit For The Period Converter . . . . .	5- 8
7- 1	Pulse Duration Vs Positive Input Voltage . . . . .	7- 5
7- 2	Constant Pulse Width Waveform . . . . .	7- 2
7- 3	Input Pulse Duration Vs Constant Width Pulse Period . . . . .	7- 6
7- 4	Pulse Duration Vs Peak and D.C. Output . . . . .	7- 7
7- 5	Pulse Duration Vs Scale Error . . . . .	7- 8
7- 6	Pulse Duration Vs Output Ripple Voltage . . . . .	7- 9
7- 7	Pulse Duration Vs % of A.C. Ripple . . . . .	7-10
7- 8	Pulse Duration Vs Response Time of Peak Detector.	7-11
7- 9	D.C. Output Voltage Vs D.C. Supply Voltage . . . . .	7-12
7-10	Output Load Vs D.C. Voltage Output . . . . .	7-13
7-11	Output Load Vs. Output A.C. Ripple . . . . .	7-14