

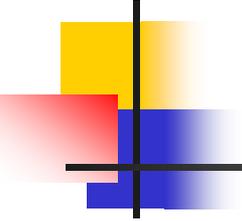
# WiFi Forth

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Chen-Hanson Ting

SVFIG

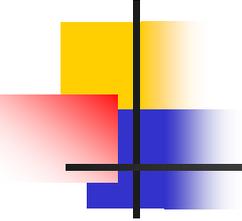
December 17, 2016



# Evolution of Firmware Engineering

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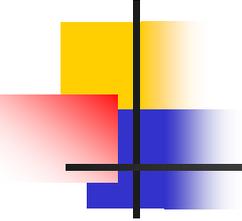
Terminal	Connection	Target
Teletype	RS232	Microcomputers
ADAM3		
PC		
Windows	USB	Microcontrollers
	<u>WiFi</u>	ESP8266



# ESP8266

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- 32-bit Xtensa LX106 at 80 MHz
- 64 KB program RAM, 96 KB of data RAM, 4 MB flash
- IEEE 802.11 b/g/n Wi-Fi
- GPIO, SPI, I<sup>2</sup>C, UART, ADC



# ESP8266

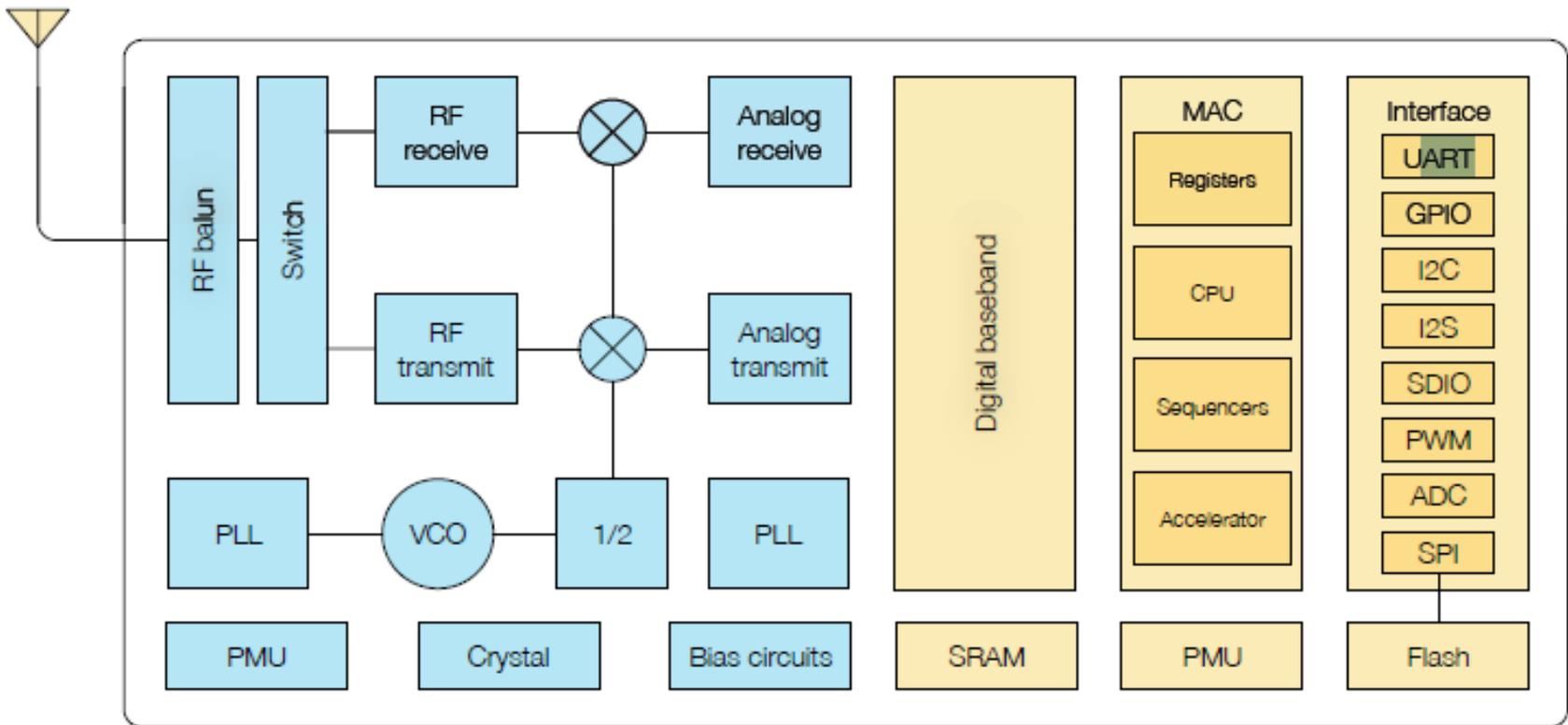
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- It looks that ESP8266 12E will replace Arduino Uno, with its WIFI capability, 32-bit processor, and large memories.
- We need a WIFI ready eForth implementation to participate in the new revolution

# ESP 12E



# ESP8266



# NodeMCU



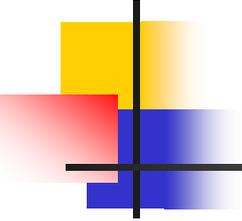


# Doctors of Intelligence & Technology (SZDOIT)

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- ESP-12E is designed and developed by SZDOIT based on the Ultra-low power consumption UART-WiFi ESP8266, which is specially for mobile devices and application of IoT (Internet of Things). Now, ESP-12E is widely applied to internet.

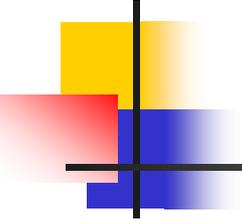




# espForth

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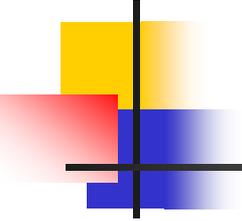
- I ported my eForth written in C to WiFiBoy kit successfully.
- I could only communicate with it through UDP.



# espForth

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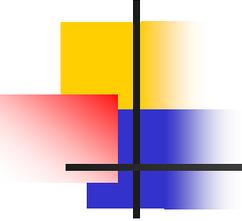
- Upload espForth
- Interact through Serial Monitor
- Turn on UPD
- Interact through Packet Sender
- Interact through Hercules



# YAFFA

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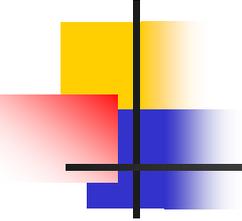
- Yet Another Forth For Arduino
- Fairly sophisticated ANCI Forth written in Arduino C
- IO interface: Serial\_IO, Net\_IO, File\_IO
- LCD interface
- GPIO interface



# Goal

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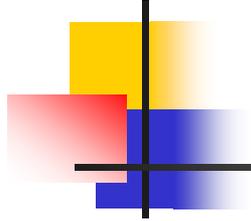
- A local network with a number of ESP8266 running Forth. They can communicate with a host computer.
- The host computer sends out Forth commands to all ESP8266 to accomplish a common task.



# An Experiment

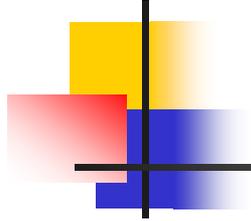
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- 6 ESP8266, each control one speaker.
- The host computer sends commands to generate 4 channel of voices on 6 speakers.
- Play Bach's D Minor Toccata and Fugue



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**Questions?**



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**Thank you.**