

# VoxBox

A signal processing demo for Caltoopia

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# BOSS VOICE TRANSFORMER VT-1

PEAK

PRESET

1

2

3

4

USER

WRITE

BYPASS

PITCH

FORMANT

MIX BALANCE

REVERB

+OCT

+10

EFFECT

10

ROBOT

0

0

0

0

-OCT

-10

NORMAL

0

VOICE CHARACTER

# Boxes, ports and connectors...







```
actor Source() ==> float Out :  
  action ==> Out:[0]  
  end  
end
```

```
actor VoxBox() float In ==> float Out :  
  action In:[x] ==> Out:[x]  
  end  
end
```

```
actor Sink() float In ==> :  
  action In:[x] ==>  
  end  
end
```

network TestBed() ==> :

entities

src = Source();

box = VoxBox();

sink = Sink();

structure

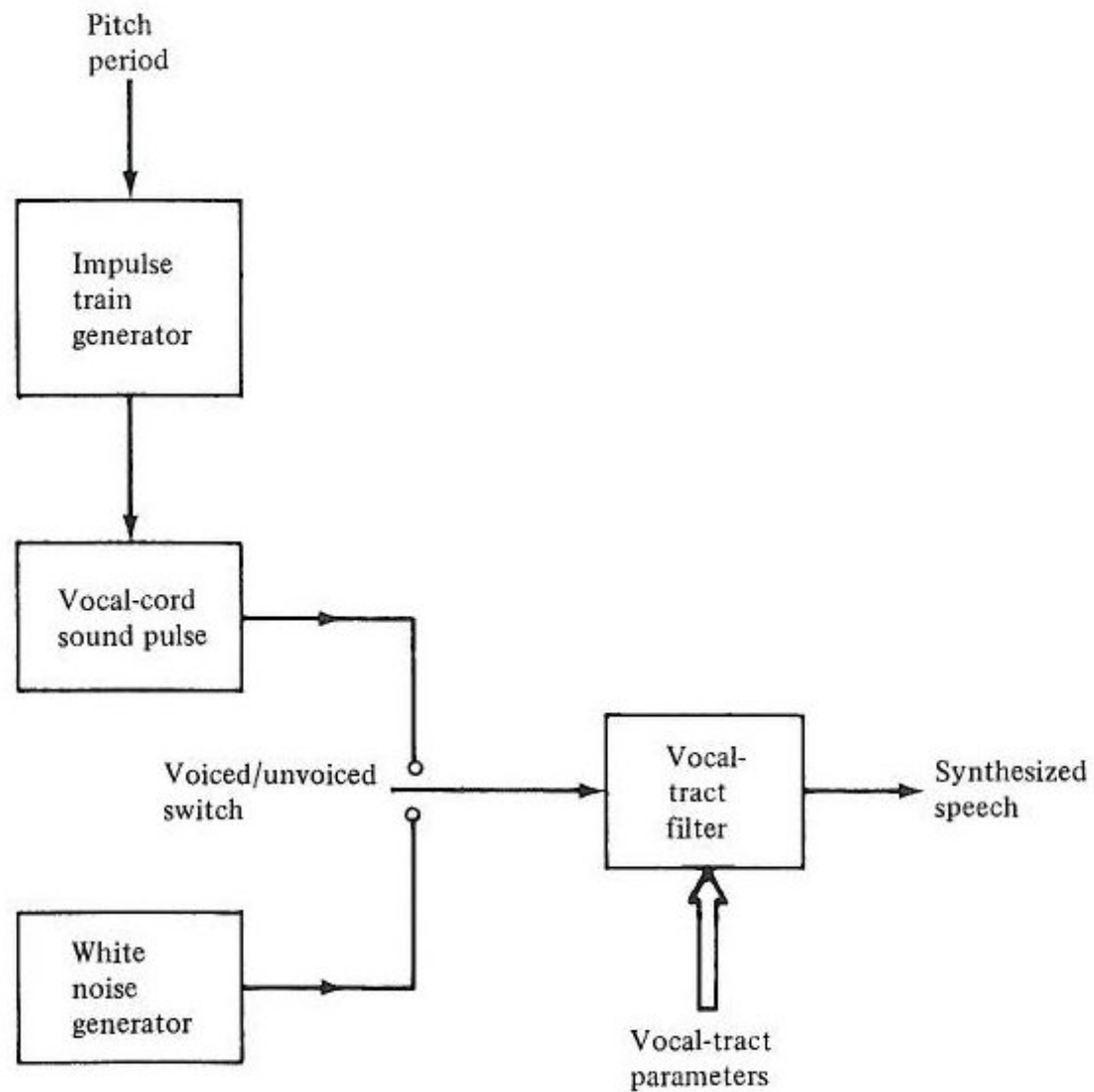
src.Out --> box.In;

box.Out --> sink.In;

end

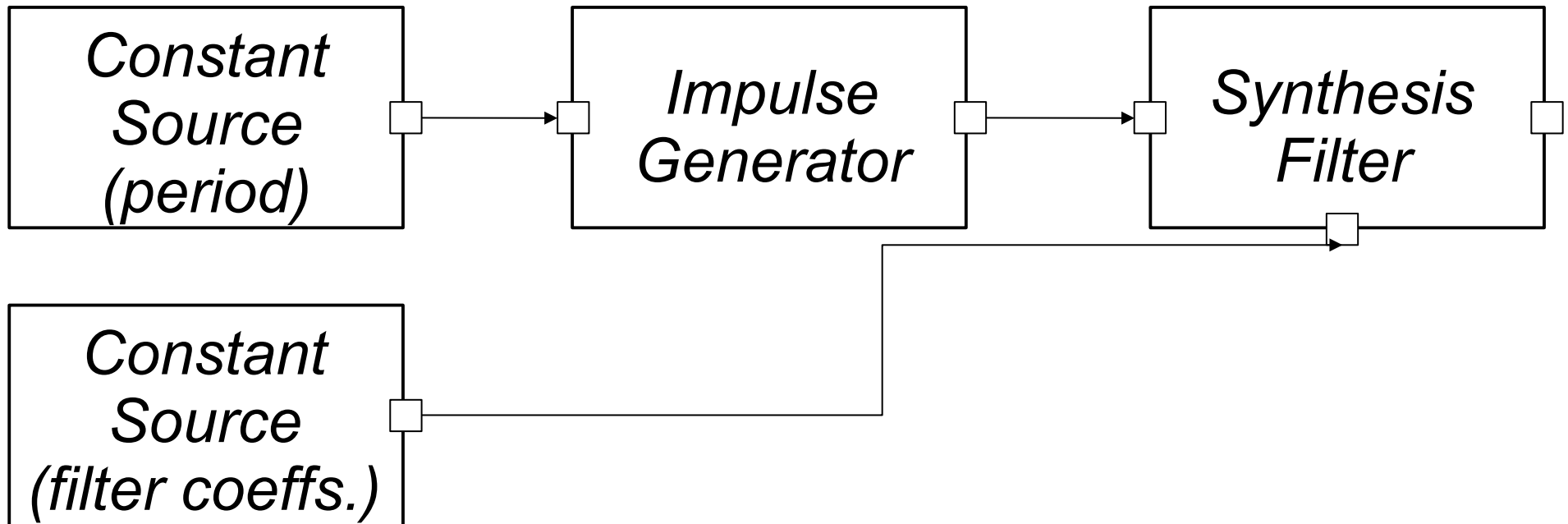






*Receiver of a linear predictive vocoder (from S. Haykin, "Modern Filters")*

# Vowel sound synthesizer (demo)



*Coefficients computed from parameters in tables II and III of Dennis H. Klatt; "Software for a formant synthesizer"; J. Acoust. Soc. Am, 67:3 (March 1980)*

# Linear predictive coding (LPC)

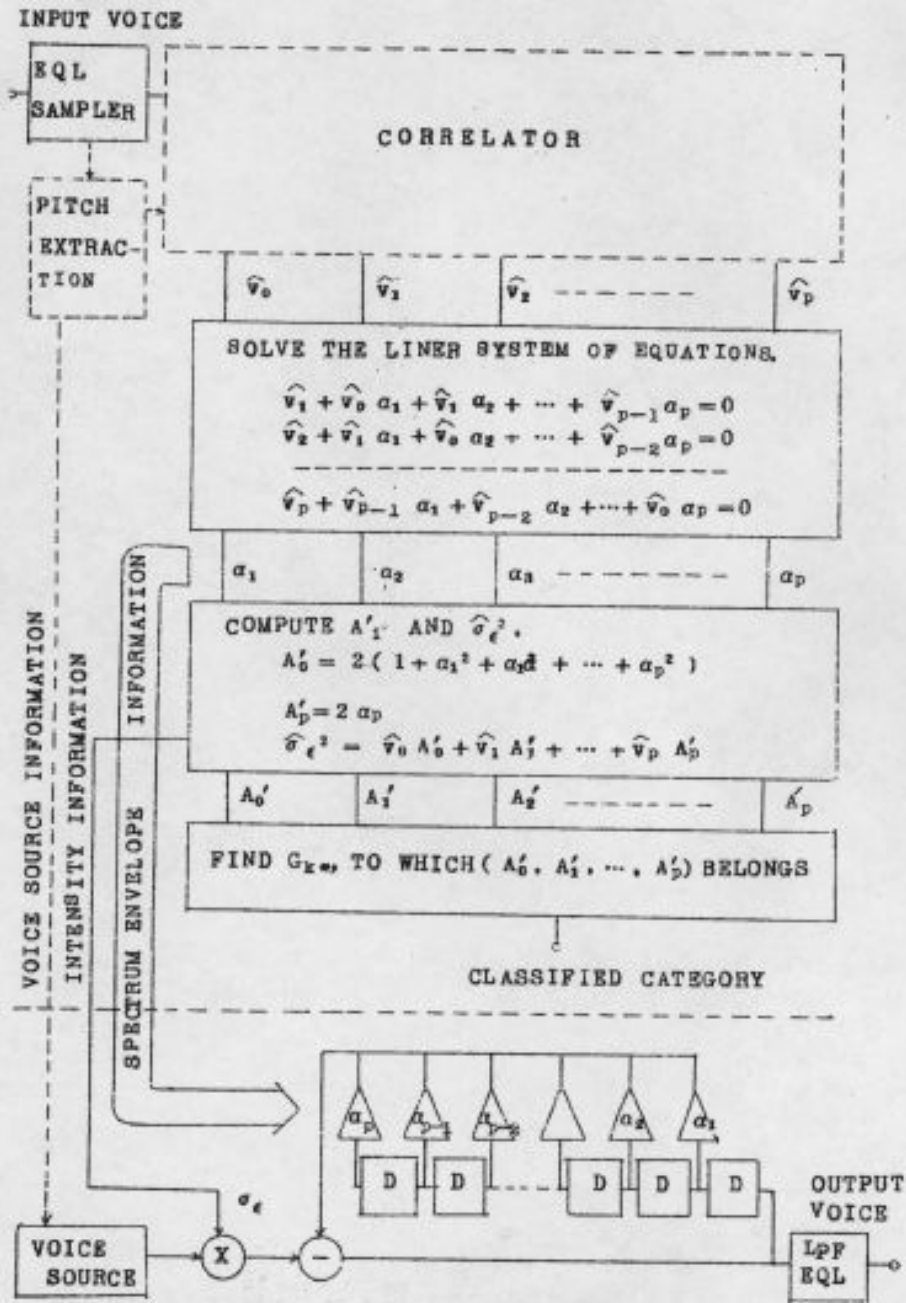


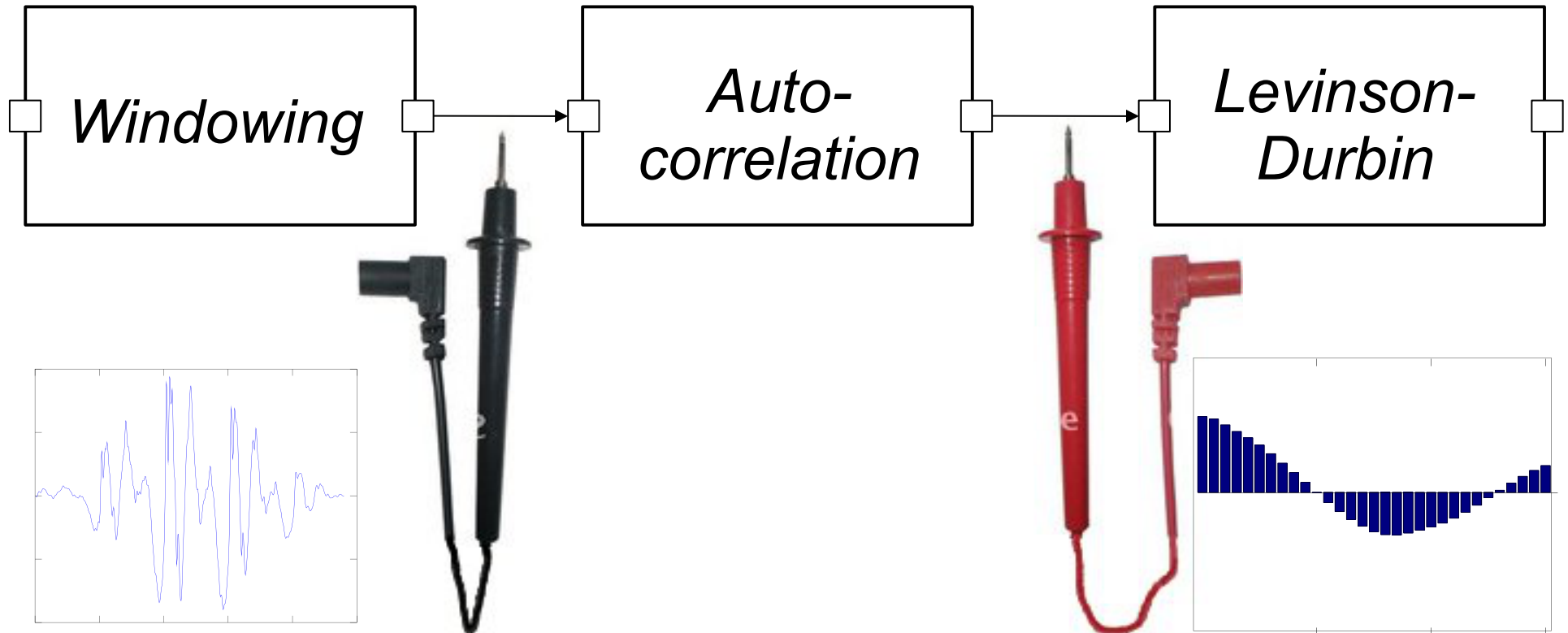
図 5. 新しいパラメータ伝送方式

S. Saito and F. Itakura, "The theoretical consideration of statistically optimum methods for speech spectral density," Report No. 3107, Electrical Communication Laboratory, NTT, Tokyo, December 1966.

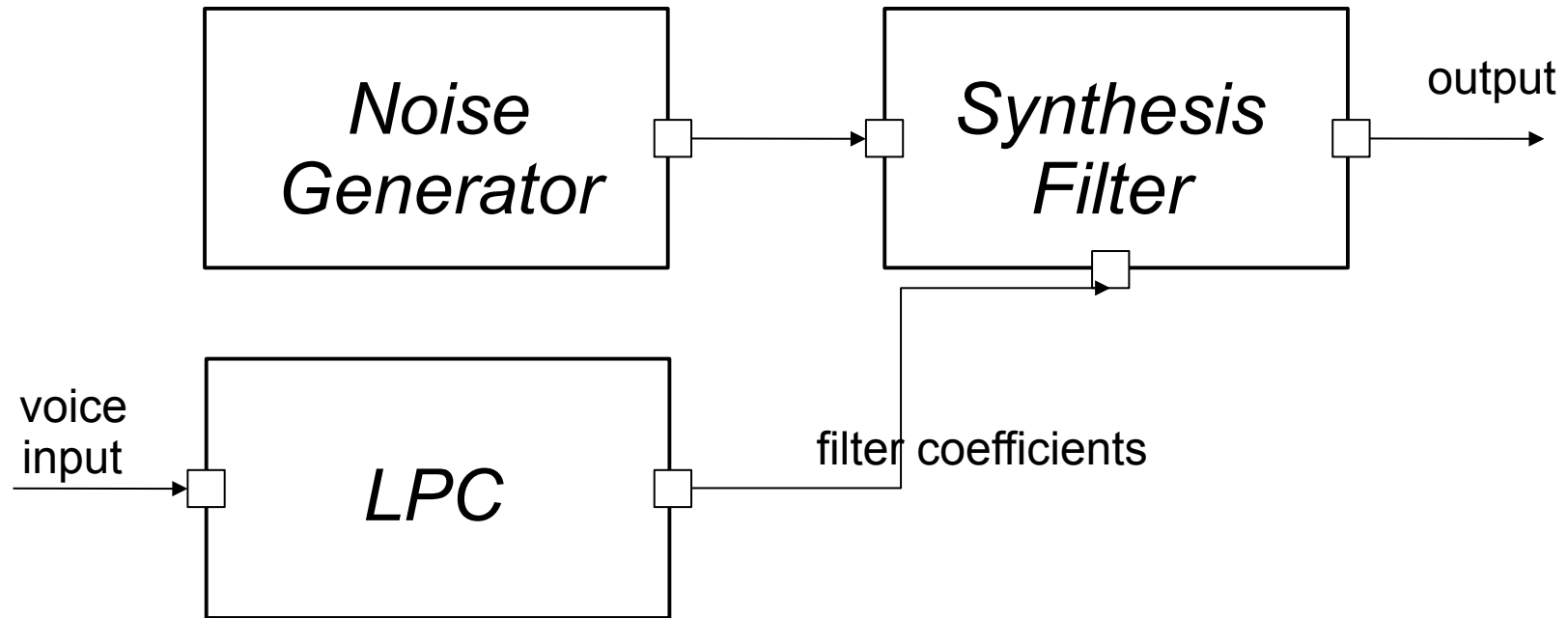
# Linear predictive coding (LPC)



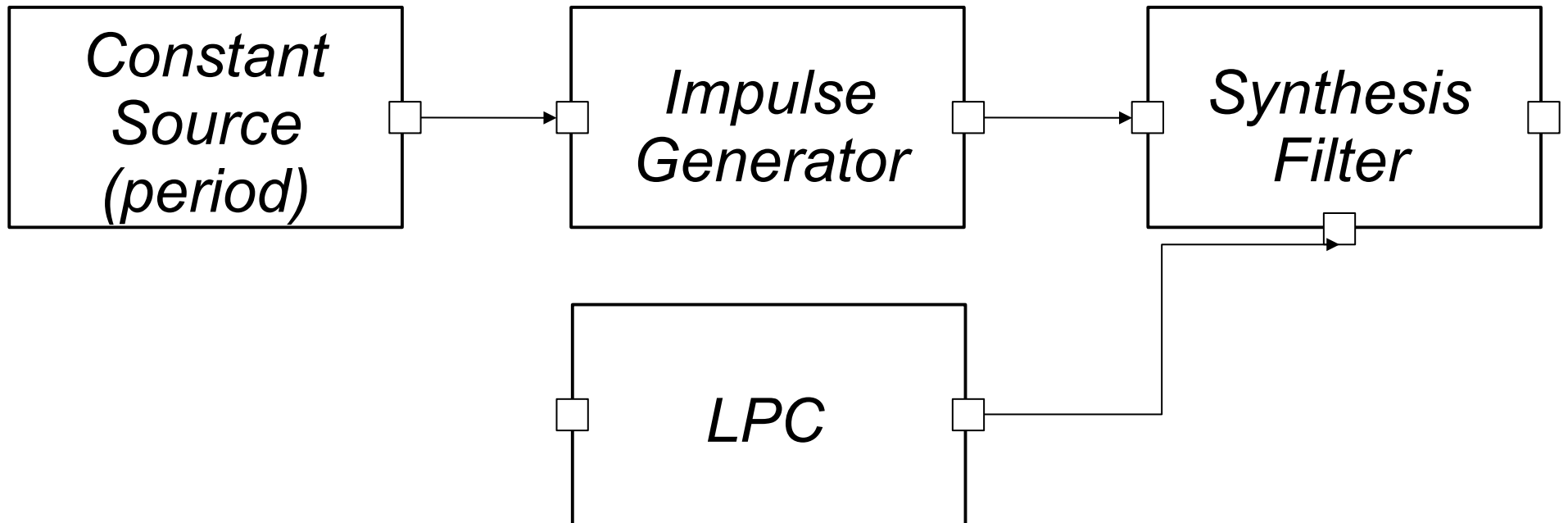
# Module Testing



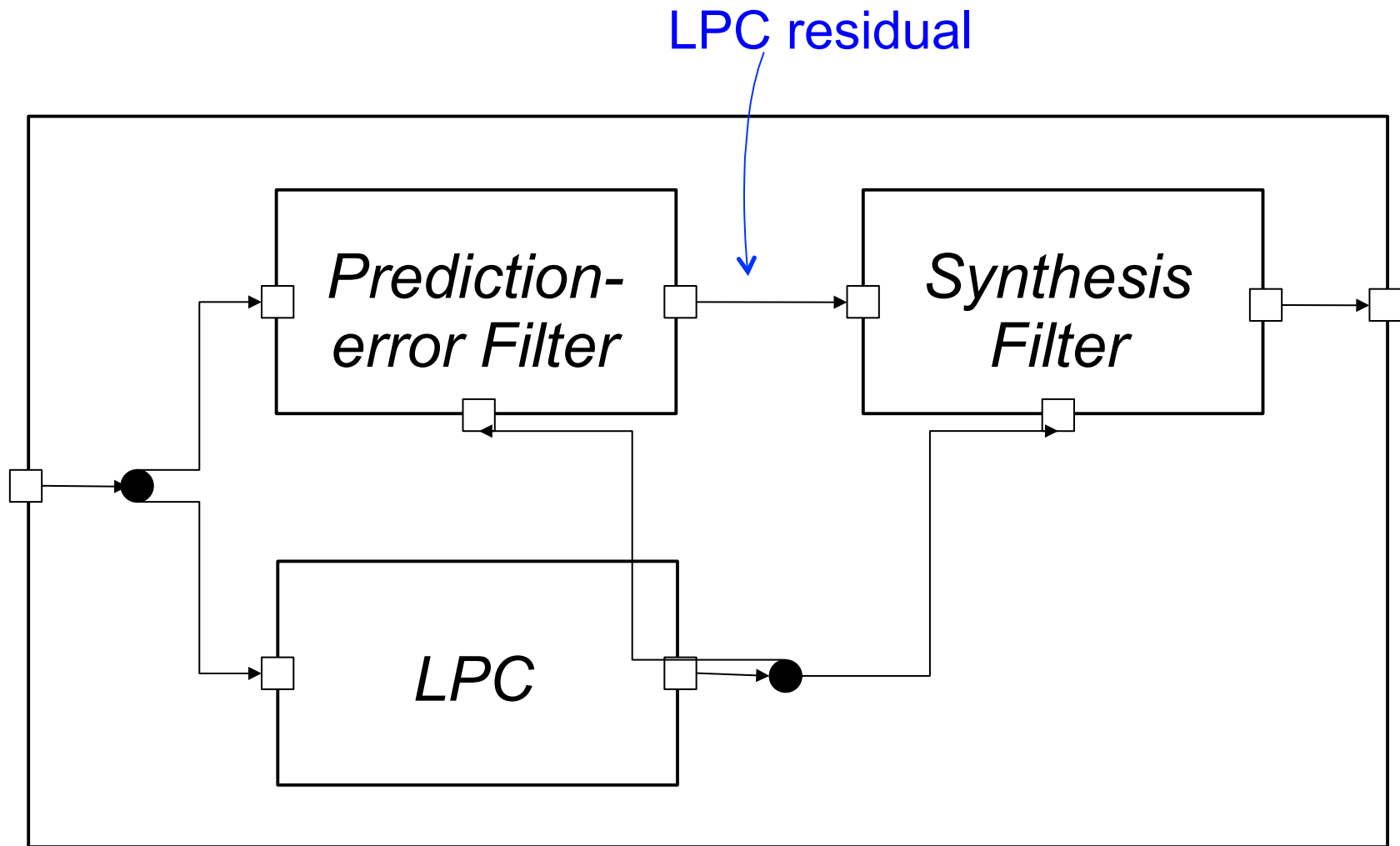
# Whispering vocoder (demo)



# Robot Voice (demo)

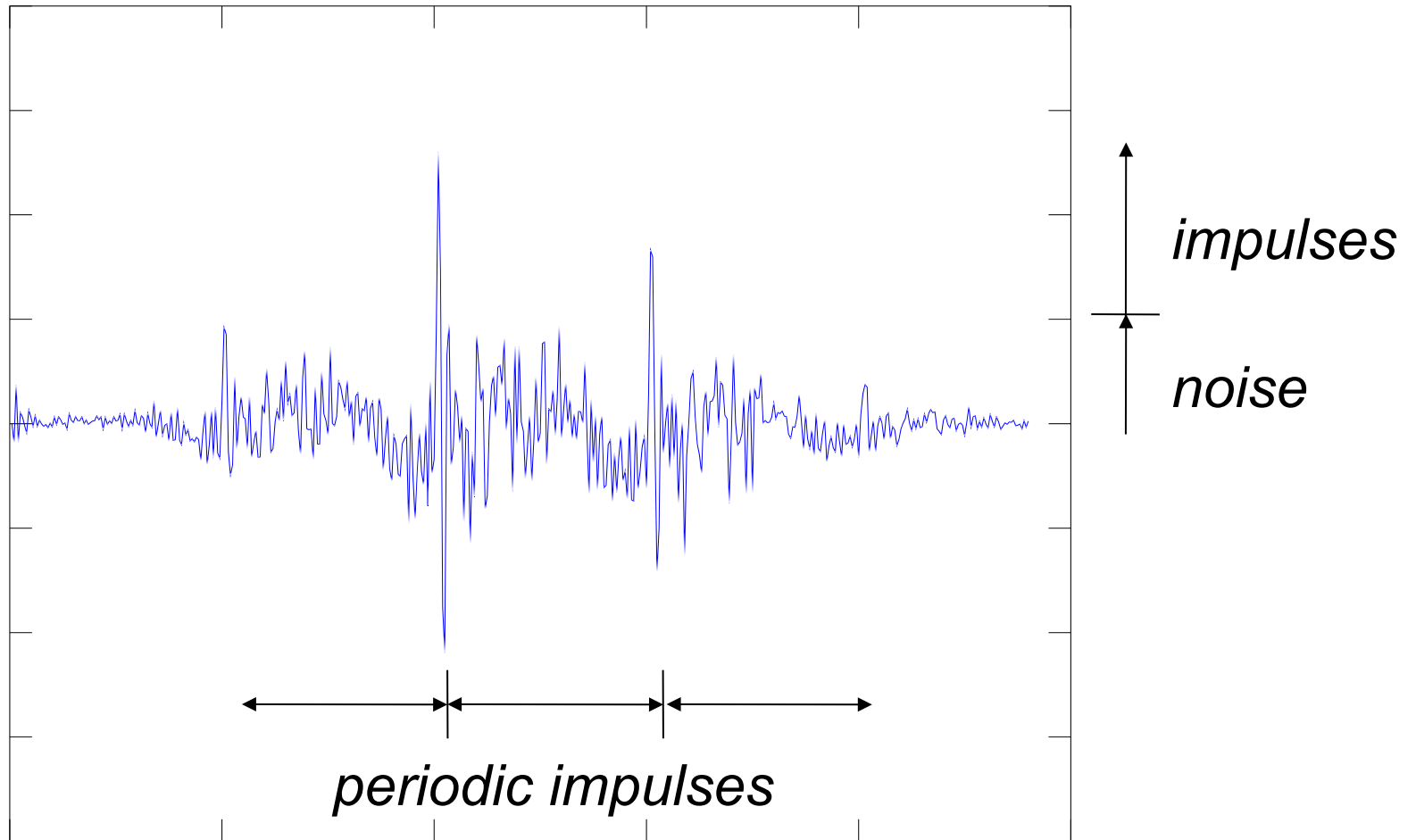


# Fancy identity actor (boring demo)

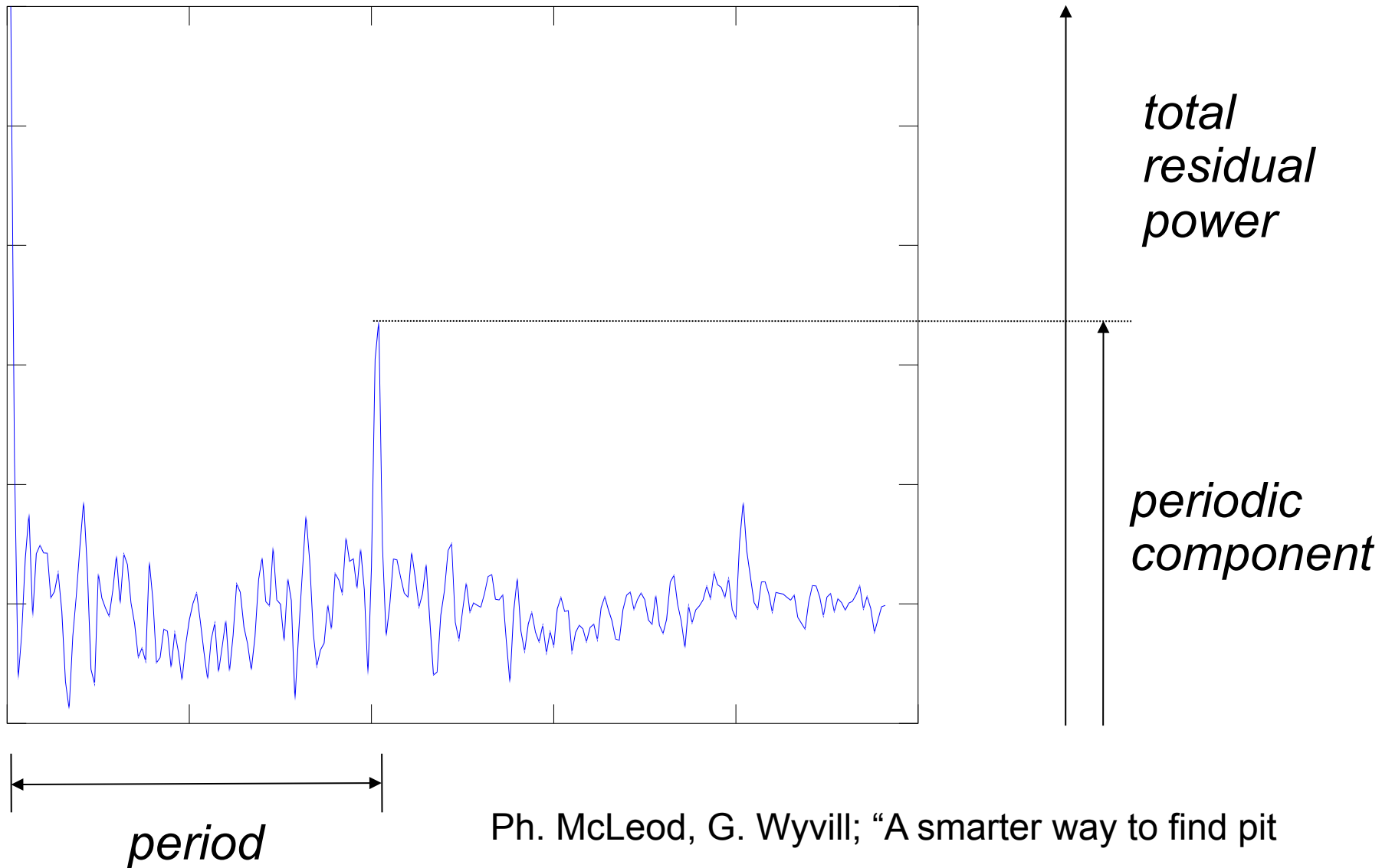




# LPC residual

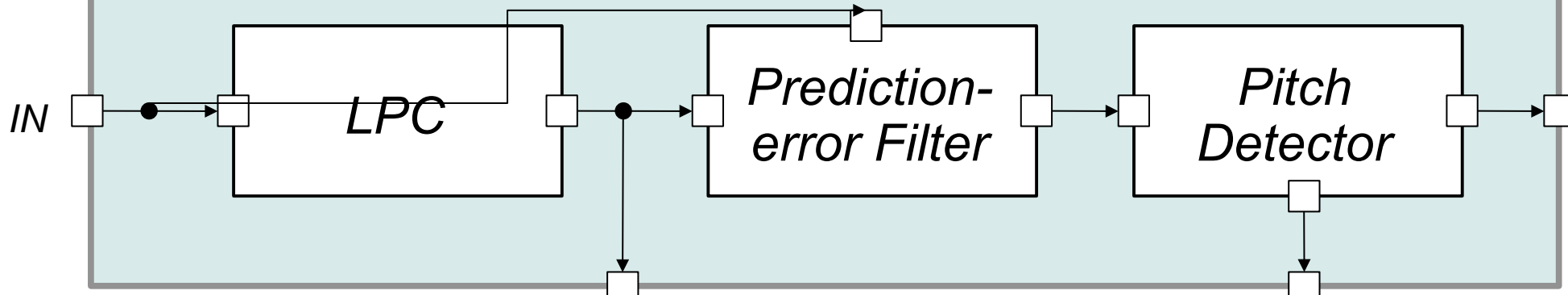


# Pitch Detection

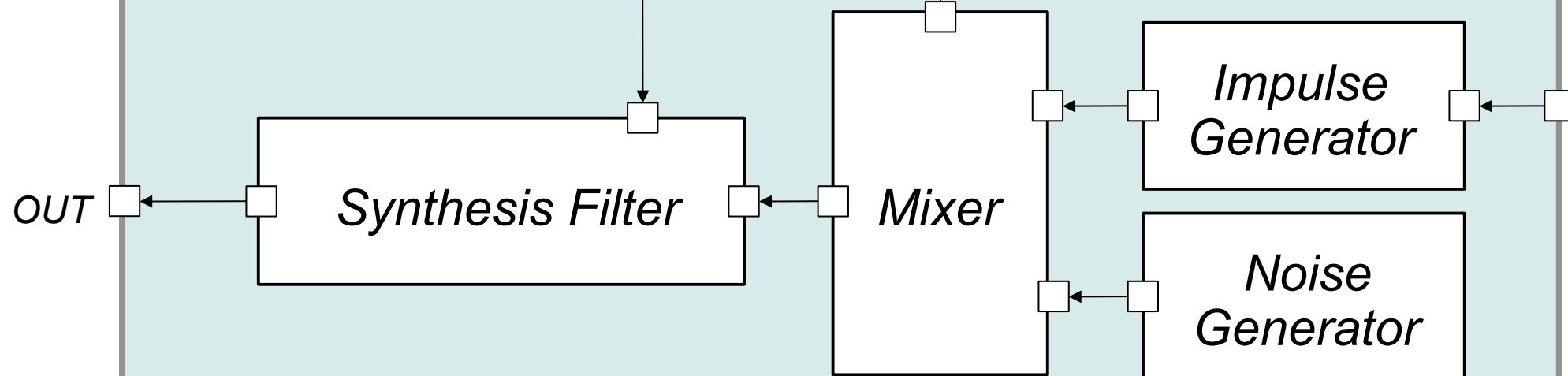


Ph. McLeod, G. Wyvill; "A smarter way to find pit

# Analyzer



# Synthesizer



- I'm, claiming is that CAL and dataflow programming are “natural” and convenient for streaming, signal-processing applications
- Similar to other established modeling abstractions
- Encourages (and enforces) subdivision into components, specific about interdependence
- Advantages for testing and reuse
- Translate into higher productivity, higher quality?
- Also (but not today's topic) interesting opportunities for analysis and transformation, which come in particularly handy when