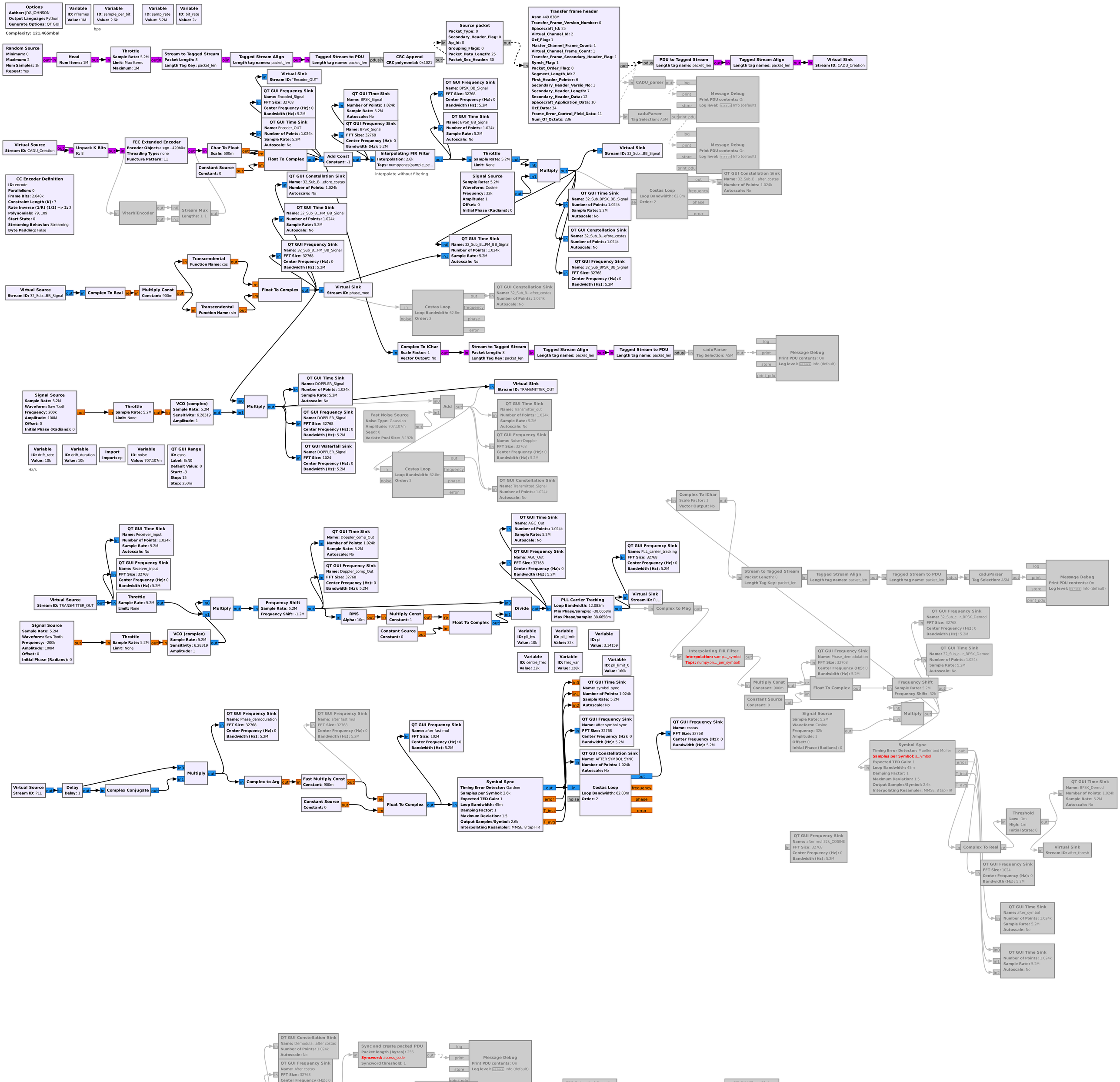
Options
Author: JIYA JOHNSON
Output Language: Python
Generate Options: QT GUI
Complexity: 121.465mbal
Variable
ID: nframes
Value: 1M
Variable
ID: sample_per_bit
Value: 2.6k
bps
Variable
ID: samp_rate
Value: 5.2M
Variable
ID: bit_rate
Value: 2k
Random Source
Minimum: 0
Maximum: 2
Num Samples: 1k
Repeat: Yes
Head
Num Items: 1M
Throttle
Sample Rate: 5.2M
Limit: Max Items
Maximum: 1M
Stream to Tagged Stream
Packet Length: 8
Length Tag Key: packet_len
Tagged Stream Align
Length tag names: packet_len
Tagged Stream to PDU
Length tag name: packet_len
CRC Append
CRC polynomial: 0x1021
Source packet
Packet_Type: 0
Secondary_Header_Flag: 0
Ap_Id: 0
Grouping_Flags: 0
Packet_Data_Length: 25
Packet_Sec_Header: 30
Transfer frame header
Asm: 449.838M
Transfer_Frame_Version_Number: 0
Spacecraft_Id: 25
Virtual_Channel_Id: 2
Ocf_Flag: 1
Master_Channel_Frame_Count: 1
Virtual_Channel_Frame_Count: 1
Transfer_Frame_Secondary_Header_Flag: 1
Synch_Flag: 1
Packet_Order_Flag: 0
Segment_Length_Id: 2
First_Header_Pointer: 6
Secondary_Header_Versio_No: 1
Secondary_Header_Length: 7
Secondary_Header_Data: 12
Spacecraft_Application_Data: 10
Ocf_Data: 34
Frame_Error_Control_Field_Data: 11
Num_Of_Octets: 236
PDU to Tagged Stream
Length tag name: packet_len
Tagged Stream Align
Length tag names: packet_len
Virtual Sink
Stream ID: CADU_Creation
CADU_parser
caduParser
Tag Selection: ASM
Message Debug
Print PDU contents: On
Log level: Info (default)
Virtual Sink
Stream ID: "Encoder_OUT"
QT GUI Frequency Sink
Name: Encoded_Signal
FFT Size: 32768
Center Frequency (Hz): 0
Bandwidth (Hz): 5.2M
QT GUI Time Sink
Name: Encoder_OUT
Number of Points: 1.024k
Sample Rate: 5.2M
Autoscale: No
QT GUI Time Sink
Name: BPSK_Signal
Number of Points: 1.024k
Sample Rate: 5.2M
Autoscale: No
QT GUI Frequency Sink
Name: BPSK_Signal
FFT Size: 32768
Center Frequency (Hz): 0
Bandwidth (Hz): 5.2M
QT GUI Frequency Sink
Name: BPSK_BB_Signal
FFT Size: 32768
Center Frequency (Hz): 0
Bandwidth (Hz): 5.2M
QT GUI Time Sink
Name: BPSK_BB_Signal
Number of Points: 1.024k
Sample Rate: 5.2M
Autoscale: No
Virtual Source
Stream ID: CADU_Creation
Unpack K Bits
K: 8
FEC Extended Encoder
Encoder Objects: <gn...420b0>
Threading Type: none
Puncture Pattern: 11
Char To Float
Scale: 500m
Constant Source
Constant: 0
Float To Complex
Add Const
Constant: -1
Interpolating FIR Filter
Interpolation: 2.6k
Taps: numpy.ones(sample_pe...
interpolate without filtering
Throttle
Sample Rate: 5.2M
Limit: None
Multiply
Signal Source
Sample Rate: 5.2M
Waveform: Cosine
Frequency: 32k
Amplitude: 1
Offset: 0
Initial Phase (Radians): 0
Virtual Sink
Stream ID: 32_Sub...BB_Signal
Costas Loop
Loop Bandwidth: 62.8m
Order: 2
QT GUI Constellation Sink
Name: 32_Sub_B...after_costas
Number of Points: 1.024k
Autoscale: No
QT GUI Time Sink
Name: 32_Sub_BPSK_BB_Signal
Number of Points: 1.024k
Sample Rate: 5.2M
Autoscale: No
QT GUI Constellation Sink
Name: 32_Sub_B...efore_costas
Number of Points: 1.024k
Autoscale: No
QT GUI Frequency Sink
Name: 32_Sub_BPSK_BB_Signal
FFT Size: 32768
Center Frequency (Hz): 0
Bandwidth (Hz): 5.2M
CC Encoder Definition
ID: encode
Parallelism: 0
Frame Bits: 2.048k
Constraint Length (K): 7
Rate Inverse (1/R) (1/2) --> 2: 2
Polynomials: 79, 109
Start State: 0
Streaming Behavior: Streaming
Byte Padding: False
ViterbiEncoder
Stream Mux
Lengths: 1, 1
QT GUI Constellation Sink
Name: 32_Sub_B...efore_costas
Number of Points: 1.024k
Autoscale: No
QT GUI Time Sink
Name: 32_Sub_B...PM_BB_Signal
Number of Points: 1.024k
Sample Rate: 5.2M
Autoscale: No
QT GUI Frequency Sink
Name: 32_Sub_B...PM_BB_Signal
FFT Size: 32768
Center Frequency (Hz): 0
Bandwidth (Hz): 5.2M
QT GUI Time Sink
Name: 32_Sub_B...PM_BB_Signal
Number of Points: 1.024k
Sample Rate: 5.2M
Autoscale: No
Transcendental
Function Name: cos
Transcendental
Function Name: sin
Virtual Source
Stream ID: 32_Sub...BB_Signal
Complex To Real
Multiply Const
Constant: 900m
Float To Complex
Virtual Sink
Stream ID: phase_mod
Complex To IChar
Scale Factor: 1
Vector Output: No
Stream to Tagged Stream
Packet Length: 8
Length Tag Key: packet_len
Tagged Stream Align
Length tag names: packet_len
Tagged Stream to PDU
Length tag name: packet_len
caduParser
Tag Selection: ASM
Message Debug
Print PDU contents: On
Log level: Info (default)
Signal Source
Sample Rate: 5.2M
Waveform: Saw Tooth
Frequency: 200k
Amplitude: 100M
Offset: 0
Initial Phase (Radians): 0
Throttle
Sample Rate: 5.2M
Limit: None
VCO (complex)
Sample Rate: 5.2M
Sensitivity: 6.28319
Amplitude: 1
Multiply
QT GUI Time Sink
Name: DOPPLER_Signal
Number of Points: 1.024k
Sample Rate: 5.2M
Autoscale: No
QT GUI Frequency Sink
Name: DOPPLER_Signal
FFT Size: 32768
Center Frequency (Hz): 0
Bandwidth (Hz): 5.2M
QT GUI Waterfall Sink
Name: DOPPLER_Signal
FFT Size: 1024
Center Frequency (Hz): 0
Bandwidth (Hz): 5.2M
Fast Noise Source
Noise Type: Gaussian
Amplitude: 707.107m
Seed: 0
Variate Pool Size: 8.192k
Add
Virtual Sink
Stream ID: TRANSMITTER_OUT
QT GUI Time Sink
Name: Transmitter_out
Number of Points: 1.024k
Sample Rate: 5.2M
Autoscale: No
QT GUI Frequency Sink
Name: Noise+Doppler
FFT Size: 32768
Center Frequency (Hz): 0
Bandwidth (Hz): 5.2M
Costas Loop
Loop Bandwidth: 62.8m
Order: 2
QT GUI Constellation Sink
Name: Transmitted_Signal
Number of Points: 1.024k
Autoscale: No
Variable
ID: drift_rate
Value: 10k
Hz/s
Variable
ID: drift_duration
Value: 10k
Import
Import: np
Variable
ID: noise
Value: 707.107m
QT GUI Range
ID: esno
Label: EsN0
Default Value: 0
Start: -3
Stop: 15
Step: 250m
Complex To IChar
Scale Factor: 1
Vector Output: No
QT GUI Time Sink
Name: Receiver_input
Number of Points: 1.024k
Sample Rate: 5.2M
Autoscale: No
QT GUI Frequency Sink
Name: Receiver_input
FFT Size: 32768
Center Frequency (Hz): 0
Bandwidth (Hz): 5.2M
Virtual Source
Stream ID: TRANSMITTER_OUT
Throttle
Sample Rate: 5.2M
Limit: None
Multiply
Frequency Shift
Sample Rate: 5.2M
Frequency Shift: -1.2M
QT GUI Time Sink
Name: Doppler_comp_Out
Number of Points: 1.024k
Sample Rate: 5.2M
Autoscale: No
QT GUI Frequency Sink
Name: Doppler_comp_Out
FFT Size: 32768
Center Frequency (Hz): 0
Bandwidth (Hz): 5.2M
RMS
Alpha: 10m
Multiply Const
Constant: 1
Constant Source
Constant: 0
Float To Complex
Divide
QT GUI Time Sink
Name: AGC_Out
Number of Points: 1.024k
Sample Rate: 5.2M
Autoscale: No
QT GUI Frequency Sink
Name: AGC_Out
FFT Size: 32768
Center Frequency (Hz): 0
Bandwidth (Hz): 5.2M
PLL Carrier Tracking
Loop Bandwidth: 12.083m
Min Phase/sample: -38.6658m
Max Phase/sample: 38.6658m
QT GUI Frequency Sink
Name: PLL_carrier_tracking
FFT Size: 32768
Center Frequency (Hz): 0
Bandwidth (Hz): 5.2M
Virtual Sink
Stream ID: PLL
Complex to Mag
Signal Source
Sample Rate: 5.2M
Waveform: Saw Tooth
Frequency: -200k
Amplitude: 100M
Offset: 0
Initial Phase (Radians): 0
Throttle
Sample Rate: 5.2M
Limit: None
VCO (complex)
Sample Rate: 5.2M
Sensitivity: 6.28319
Amplitude: 1
Variable
ID: pll_bw
Value: 10k
Variable
ID: pll_limit
Value: 32k
Variable
ID: pi
Value: 3.14159
Variable
ID: centre_freq
Value: 32k
Variable
ID: freq_var
Value: 128k
Variable
ID: pll_limit_0
Value: 160k
Interpolating FIR Filter
Interpolation: samp..._symbol
Taps: numpy.on..._per_symbol)
Multiply Const
Constant: 900m
Constant Source
Constant: 0
Float To Complex
QT GUI Frequency Sink
Name: Phase_demodulation
FFT Size: 32768
Center Frequency (Hz): 0
Bandwidth (Hz): 5.2M
QT GUI Frequency Sink
Name: 32_Sub_c...r_BPSK_Demod
FFT Size: 32768
Center Frequency (Hz): 0
Bandwidth (Hz): 5.2M
QT GUI Time Sink
Name: 32_Sub_c...r_BPSK_Demod
Number of Points: 1.024k
Sample Rate: 5.2M
Autoscale: No
Frequency Shift
Sample Rate: 5.2M
Frequency Shift: -32k
Multiply
Signal Source
Sample Rate: 5.2M
Waveform: Cosine
Frequency: 32k
Amplitude: 1
Offset: 0
Initial Phase (Radians): 0
Symbol Sync
Timing Error Detector: Mueller and Müller
Samples per Symbol: s...ymbol
Expected TED Gain: 1
Loop Bandwidth: 45m
Damping Factor: 1
Maximum Deviation: 1.5
Output Samples/Symbol: 2.6k
Interpolating Resampler: MMSE, 8 tap FIR
Threshold
Low: -1m
High: 1m
Initial State: 0
Complex To Real
QT GUI Time Sink
Name: BPSK_Demod
Number of Points: 1.024k
Sample Rate: 5.2M
Autoscale: No
Virtual Sink
Stream ID: after_thresh
QT GUI Frequency Sink
Name: 1024
Center Frequency (Hz): 0
Bandwidth (Hz): 5.2M
QT GUI Time Sink
Name: after_symbol
Number of Points: 1.024k
Sample Rate: 5.2M
Autoscale: No
QT GUI Time Sink
Number of Points: 1.024k
Sample Rate: 5.2M
Autoscale: No
QT GUI Frequency Sink
Name: after mul 32k_COSINE
FFT Size: 32768
Center Frequency (Hz): 0
Bandwidth (Hz): 5.2M
Virtual Source
Stream ID: PLL
Delay
Delay: 1
Complex Conjugate
Multiply
QT GUI Frequency Sink
Name: Phase_demodulation
FFT Size: 32768
Center Frequency (Hz): 0
Bandwidth (Hz): 5.2M
Complex to Arg
QT GUI Frequency Sink
Name: after fast mul
FFT Size: 32768
Center Frequency (Hz): 0
Bandwidth (Hz): 5.2M
Fast Multiply Const
Constant: 900m
Constant Source
Constant: 0
QT GUI Frequency Sink
Name: after fast mul
FFT Size: 1024
Center Frequency (Hz): 0
Bandwidth (Hz): 5.2M
Float To Complex
Symbol Sync
Timing Error Detector: Gardner
Samples per Symbol: 2.6k
Expected TED Gain: 1
Loop Bandwidth: 45m
Damping Factor: 1
Maximum Deviation: 1.5
Output Samples/Symbol: 2.6k
Interpolating Resampler: MMSE, 8 tap FIR
QT GUI Time Sink
Name: symbol_sync
Number of Points: 1.024k
Sample Rate: 5.2M
Autoscale: No
QT GUI Frequency Sink
Name: After symbol sync
FFT Size: 32768
Center Frequency (Hz): 0
Bandwidth (Hz): 5.2M
QT GUI Constellation Sink
Name: AFTER SYMBOL SYNC
Number of Points: 1.024k
Autoscale: No
Costas Loop
Loop Bandwidth: 62.83m
Order: 2
QT GUI Frequency Sink
Name: costas
FFT Size: 32768
Center Frequency (Hz): 0
Bandwidth (Hz): 5.2M
Virtual Source
Stream ID: after_thresh
Constant Source
Constant: 0
Float To Complex
Costas Loop
Loop Bandwidth: 62.83m
Order: 2
QT GUI Constellation Sink
Name: Demodula...after costas
Number of Points: 1.024k
Autoscale: No
QT GUI Frequency Sink
Name: After costas
FFT Size: 32768
Center Frequency (Hz): 0
Bandwidth (Hz): 5.2M
Complex To IChar
Scale Factor: 1
Vector Output: No
Sync and create packed PDU
Packet length (bytes): 256
Syncword: access_code
Syncword threshold: 1
Message Debug
Print PDU contents: On
Log level: Info (default)
Unpack K Bits
K: 8
Correlate Access Code - Tag
Access Code: access_code
Threshold: 4
Tag Name: syncword
Char To Float
Scale: 1
FEC Extended Decoder
Decoder Objects: decoder
Threading Type: capillary
Annihilator: None
Puncture Pattern: 11
IChar To Complex
Scale Factor: 1
Vector Input: No
QT GUI Time Sink
Name: Decoder
Number of Points: 1.024k
Sample Rate: 5.2M
Autoscale: No
CC Decoder Definition
ID: decoder
Parallelism: 0
Frame Bits: 4.096k
Constraint Length (K): 7
Rate Inverse (1/R) (1/2) --> 2: 2
Polynomials: 79, 109
Start State: 0
End State: -1
Streaming Behavior: Streaming
Byte Padding: False
Variable
ID: syncword_hex
Value: 034776C7272895B0
Variable
ID: syncword
Value: 2*np.unp...pe('int')-1
Variable
ID: access_code
Value: ''.join(...ord+1)/2])
IChar To Complex
Scale Factor: 1
Vector Input: No
QT GUI Time Sink
Name: INPUT
Number of Points: 1.024k
Sample Rate: 5.2M
Autoscale: No
caduParser
Tag Selection: ASM
Message Debug
Print PDU contents: On
Log level: Info (default)
Virtual Source
Stream ID: CADU_Creation
Pack K Bits
K: 8
BER
Test Mode: False
QT GUI Number Sink
ID: qtgui_number_sink_0
Autoscale: No
Average: 0
Graph Type: Horizontal
Complex To IChar
Scale Factor: 1
Vector Output: No
Stream to Tagged Stream
Packet Length: 8
Length Tag Key: packet_len
Tagged Stream Align
Length tag names: packet_len
Tagged Stream to PDU
Length tag name: packet_len