

Group 12	Mono	Stereo	RDS	Multithreading
Alisher	-added support for piping in data and writing to aplay -implementation of mode 0 mono path	-added efficient resampling convolution function. -extraction of stereo components(pre-demodulation) -fixed pll + fm_demod state saving issues -helped with mixing, channel extraction and writing out	-demodulation (carrier extraction + DSBSC demod) -APF and pll phase tuning -RRC filtering -clock and data recovery (w/constellations) -Manchester + differential decoding -frame synchronization with block detection and data extraction	-added support for 2 nd consumer thread(rds)
Kemi	-fmDemod.py to c++ conversion -fmPll.py to c++ conversion + state saving, mono modes if statement implementation -fixed static in mode 1	-mixing stereo channel & stereo carrier -mode implementation for writing for channels (mono or stereo) -debugging bandpass filter -fixed static in modes 0,1 & 3	-binary to string conversion function for PI code and PTY	-overall multithreading implementation -focused on RF & audio multithreading -debugging errors
Taiwo		-stereo left & right channel extraction -implemented bandpass filter -tested and debugged stereo audio with headphones to hear segmentation of channels		-helped understand multithreading concept
Antheus	-helped fmPll c++ conversion and state saving	-testing static in different modes -helped channel extraction -pll troubleshooting		

Pre-recorded Samples Commands Used to Test Our Code

MONO (0)

Mode 0: `cat iq_samples.raw | ./project 0 0 | aplay -c 1 -f S16_LE -r 48000`

Mode 1: **cat iq_samples_960.raw | ./project 1 0 | aplay -c 1 -f S16_LE -r 48000**

Mode 2: **cat iq_samples.raw | ./project 2 0 | aplay -c 1 -f S16_LE -r 44100**

Mode 3: **cat iq_samples_1152.raw | ./project 3 0 | aplay -c 1 -f S16_LE -r 44100**

STEREO (1)

Mode 0: **cat stereo_l0_r9.raw | ./project 0 1 | aplay -c 2 -f S16_LE -r 48000**

Mode 1: **cat stereo_l0_r9_960.raw | ./project 1 1 | aplay -c 2 -f S16_LE -r 48000**

Mode 2: **cat stereo_l0_r9.raw | ./project 2 1 | aplay -c 2 -f S16_LE -r 44100**

Mode 3: **cat stereo_l0_r9_1152.raw | ./project 3 1 | aplay -c 2 -f S16_LE -r 44100**

RDS

Mode 0 (classical): **cat iq_samples.raw | ./project 0 0 | aplay -c 1 -f S16_LE -r 48000**

Mode 0 (jazz): **cat samples1.raw | ./project 0 0 | aplay -c 1 -f S16_LE -r 48000**

Mode 2 (classical): **cat iq_samples.raw | ./project 2 0 | aplay -c 1 -f S16_LE -r 44100**

Mode 2 (jazz): **cat samples1.raw | ./project 2 0 | aplay -c 1 -f S16_LE -r 44100**