**Failure Modes and Effect Analysis:**

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| **Process Step/Input** | **Potential Failure Mode** | **Potential Failure Effects** | **Potential Failure Causes** | **Action Recommended** |
| Bits in packets | -Receiving TNC/Computer mistakes bits for flags | **-**misinterpretation of information from receiving end  -disposal of packet due to invalid size | -Bits, anywhere in payload of KISS packet, are arranged as “11000000”  -Bits, anywhere not in flags of HDLC packet, are arranged as “01111110” | -**Bit stuffing:**   * In KISS mode, a “1” is added after every “00000” arrangement in payload. Receiving TNC removes added “1” after every “00000” * In a HDLC, a “0” is added after every “11111” arrangement. Receiving TNC removes added “0” after every “11111” |
| Packet format | -Invalid Packet Format:   * Less than 136 bits in frame * Not bounded by opening and closing flags * Not octect aligned   -bit errors | **­**-Inaccurate information received | -Code failure  -Excess noise on the received audio to digital conversion | -Receiving TNC disposes packet  -Rewrite Code |
| Transmitter | -Transmitter is kept on for an extensive amount of time | -Receiver is polling for an extensive amount of time for frames to be sent | - Delay in frames being sent | **-Inter-Frame Time Fill:** when necessary for a TNC to keep transmitter on while not sending frames, flags should be sent to fill in timebetween frames being sent |
| Microcontroller | -Transmits audio signals with improper frequencies | -bit errors  -Receiving TNC misinterprets data | **­-**Incorrect code/configuration | -Reconfigure microcontroller or rewrite code |
| Push-to-talk (PTT) | -LED burns out  -MOSFET gets too hot | -User cannot tell if TNC is sending audio signal to radio.  -Can damage components near MOSFETs  -MOSFET can burn out and TNC cannot perform audio transmission | -LED used is old  -MOSFET is consuming too much power  -insufficient MOSFET used to handle required Power  -improper capacitors and resistors used in PTT circuit | -Replace old LED  -Add heat sink to MOSFET  -Replace MOSFET with a better one  -Reconsider using different resistors/capacitors in circuit |
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