

Overview:

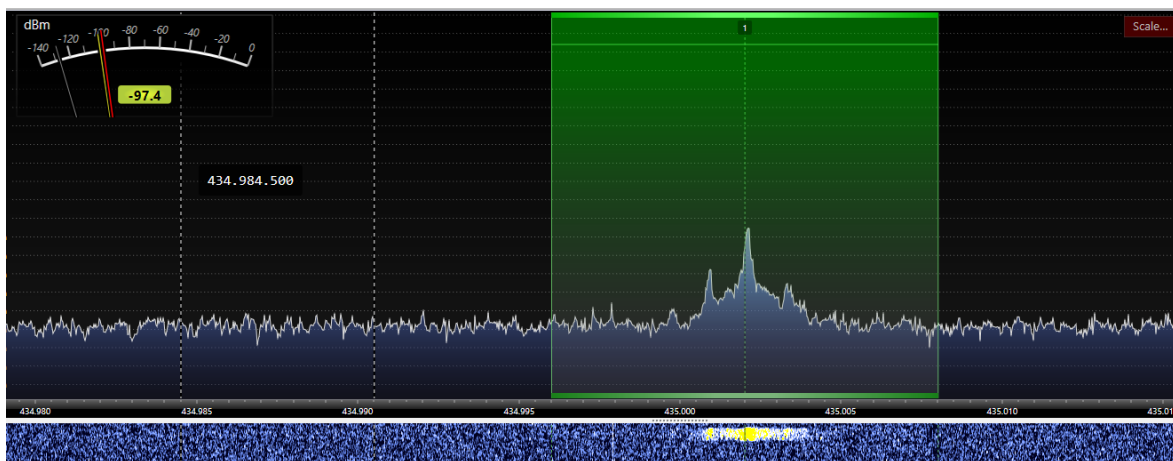
Static, and Debug mode do not give any new information on what is causing it to hang, Verbose mode gives back an error when compiling.

Of the 37 transmissions before it hangs, all are seen as waterfalls on our SDR, but none are able to be decoded. On an Arduino Uno all of the transmission gets decoded and no hanging/freezing occurs.

Default Usage:

- What happens during general usage:

It gives no error as it sends messages 1 to 37, so according to the library the message is successfully sent. We also get a transmission in our SDR which is shown in the image below



We get all 37 waterfalls of this. However soundmodem does not successfully recognize any of these transmissions. Using the same code on an arduino uno with the same radio (RFM96) the messages are successfully decoded in soundmodem. We have also tried powering the radio with a different Vin and GND to see if the issue was with power supply from the Arduino Nano BLE but the result is the same. (Note while the water fall looks small here we tried with a better antenna later and it was much bigger (larger than the green bounds in the picture above) but still with no decoding)

Static Mode Only

- Does not change any functionality, the serial monitor outputs the same as it did before and fails at message 37 like before.

Debug Mode

- Turning on debug mode gives this warning

```
In file included from C:\Users\Kazar\Documents\Arduino\libraries\RadioLib\src\TypeDef.h:4:0,
                 from C:\Users\Kazar\Documents\Arduino\libraries\RadioLib\src\RadioLib.h:38,
                 from C:\Users\Kazar\Documents\Arduino\bletest\bletest.ino:21:
C:\Users\Kazar\Documents\Arduino\libraries\RadioLib\src\BuildOpt.h:502:57: note: #pragma message: RADIOLIB_PLATFORM: Arduino Nano 33 BLE
#define RADIOLIB_PLATFORM          "Arduino Nano 33 BLE"
                                   ^
C:\Users\Kazar\Documents\Arduino\libraries\RadioLib\src\RadioLib.h:50:41: note: in expansion of macro 'RADIOLIB_PLATFORM'
#pragma message "RADIOLIB_PLATFORM: " RADIOLIB_PLATFORM
                                   ^~~~~~
```

Text form

```
In file included from C:\Users\Kazar\Documents\Arduino\libraries\RadioLib\src\TypeDef.h:4:0,
                 from C:\Users\Kazar\Documents\Arduino\libraries\RadioLib\src\RadioLib.h:38,
                 from C:\Users\Kazar\Documents\Arduino\bletest\bletest.ino:21:
C:\Users\Kazar\Documents\Arduino\libraries\RadioLib\src\BuildOpt.h:502:57: note: #pragma message: RADIOLIB_PLATFORM: Arduino Nano 33 BLE
#define RADIOLIB_PLATFORM          "Arduino Nano 33 BLE"
                                   ^
C:\Users\Kazar\Documents\Arduino\libraries\RadioLib\src\RadioLib.h:50:41: note: in expansion of macro 'RADIOLIB_PLATFORM'
#pragma message "RADIOLIB_PLATFORM: " RADIOLIB_PLATFORM
                                   ^~~~~~
```

The program then runs without issue and no extra messages in the serial monitor (so the only messages in the serial monitor are the ones you would see if you ran our program)

After transmission 37 the arduino hangs like before with no new messages.

Verbose Mode Only

- Turning on verbose mode gives back an error

This error happens as it compiles, so it never gets to the upload stage

The first part of the message is the warning message shown when only Debug Mode is enabled (which does not fail the compiler), the next part is the error that makes it fail compiling. This error seems to have to do with a print statement

```
In file included from C:\Users\Kazar\Documents\Arduino\libraries\RadioLib\src\TypeDef.h:4:0,
                 from C:\Users\Kazar\Documents\Arduino\libraries\RadioLib\src\RadioLib.h:38,
                 from C:\Users\Kazar\Documents\Arduino\bletest\bletest.ino:21:
C:\Users\Kazar\Documents\Arduino\libraries\RadioLib\src\BuildOpt.h:502:57: note: #pragma message: RADIOLIB_PLATFORM: Arduino Nano 33 BLE
#define RADIOLIB_PLATFORM           ^
                                   ^
C:\Users\Kazar\Documents\Arduino\libraries\RadioLib\src\RadioLib.h:50:41: note: in expansion of macro 'RADIOLIB_PLATFORM'
#pragma message "RADIOLIB_PLATFORM: " RADIOLIB_PLATFORM
                                   ^
In file included from C:\Users\Kazar\Documents\Arduino\libraries\RadioLib\src\TypeDef.h:4:0,
                 from C:\Users\Kazar\Documents\Arduino\libraries\RadioLib\src\Module.h:4,
                 from C:\Users\Kazar\Documents\Arduino\libraries\RadioLib\src\Module.cpp:1:
C:\Users\Kazar\Documents\Arduino\libraries\RadioLib\src\Module.cpp: In member function 'void Module::SPItransfer(uint8_t, uint8_t, uint8_t*, uint8_t*, uint8_t)':
C:\Users\Kazar\Documents\Arduino\libraries\RadioLib\src\BuildOpt.h:862:78: error: no matching function for call to 'arduino::UART::print()'
#define RADIOLIB_DEBUG_PRINT(...) { RADIOLIB_DEBUG_PORT.print(__VA_ARGS__); }
                                   ^
C:\Users\Kazar\Documents\Arduino\libraries\RadioLib\src\BuildOpt.h:879:41: note: in expansion of macro 'RADIOLIB_DEBUG_PRINT'
#define RADIOLIB_VERBOSE_PRINTLN(...) RADIOLIB_DEBUG_PRINT(__VA_ARGS__)
                                   ^
C:\Users\Kazar\Documents\Arduino\libraries\RadioLib\src\Module.cpp:232:3: note: in expansion of macro 'RADIOLIB_VERBOSE_PRINTLN'
  RADIOLIB_VERBOSE_PRINTLN();
  ^
In file included from C:\Users\Kazar\Documents\ArduinoData\packages\arduino\hardware\mbed_nano\2.6.1\cores\arduino/api/ArduinoAPI.h:31:0,
                 from C:\Users\Kazar\Documents\ArduinoData\packages\arduino\hardware\mbed_nano\2.6.1\cores\arduino/Arduino.h:27,
                 from C:\Users\Kazar\Documents\Arduino\libraries\RadioLib\src\BuildOpt.h:6,
                 from C:\Users\Kazar\Documents\Arduino\libraries\RadioLib\src\TypeDef.h:4,
                 from C:\Users\Kazar\Documents\Arduino\libraries\RadioLib\src\Module.h:4,
                 from C:\Users\Kazar\Documents\Arduino\libraries\RadioLib\src\Module.cpp:1:
C:\Users\Kazar\Documents\ArduinoData\packages\arduino\hardware\mbed_nano\2.6.1\cores\arduino/api/Print.h:63:12: note: candidate: size_t arduino::Print::print(const
arduino::__FlashStringHelper*)
  size_t print(const __FlashStringHelper *);
  ^
C:\Users\Kazar\Documents\ArduinoData\packages\arduino\hardware\mbed_nano\2.6.1\cores\arduino/api/Print.h:63:12: note: candidate expects 1 argument, 0 provided
C:\Users\Kazar\Documents\ArduinoData\packages\arduino\hardware\mbed_nano\2.6.1\cores\arduino/api/Print.h:64:12: note: candidate: size_t arduino::Print::print(const
arduino::String&)
  size_t print(const String &);
  ^
C:\Users\Kazar\Documents\ArduinoData\packages\arduino\hardware\mbed_nano\2.6.1\cores\arduino/api/Print.h:64:12: note: candidate expects 1 argument, 0 provided
C:\Users\Kazar\Documents\ArduinoData\packages\arduino\hardware\mbed_nano\2.6.1\cores\arduino/api/Print.h:65:12: note: candidate: size_t arduino::Print::print(const
char*)
  size_t print(const char[]);
  ^
C:\Users\Kazar\Documents\ArduinoData\packages\arduino\hardware\mbed_nano\2.6.1\cores\arduino/api/Print.h:65:12: note: candidate expects 1 argument, 0 provided
C:\Users\Kazar\Documents\ArduinoData\packages\arduino\hardware\mbed_nano\2.6.1\cores\arduino/api/Print.h:66:12: note: candidate: size_t arduino::Print::print(char)
  size_t print(char);
  ^
C:\Users\Kazar\Documents\ArduinoData\packages\arduino\hardware\mbed_nano\2.6.1\cores\arduino/api/Print.h:66:12: note: candidate expects 1 argument, 0 provided
C:\Users\Kazar\Documents\ArduinoData\packages\arduino\hardware\mbed_nano\2.6.1\cores\arduino/api/Print.h:67:12: note: candidate: size_t arduino::Print::print(unsigned
char, int)
  size_t print(unsigned char, int = DEC);
  ^
C:\Users\Kazar\Documents\ArduinoData\packages\arduino\hardware\mbed_nano\2.6.1\cores\arduino/api/Print.h:67:12: note: candidate expects 2 arguments, 0 provided
C:\Users\Kazar\Documents\ArduinoData\packages\arduino\hardware\mbed_nano\2.6.1\cores\arduino/api/Print.h:68:12: note: candidate: size_t arduino::Print::print(int, int)
  size_t print(int, int = DEC);
  ^
C:\Users\Kazar\Documents\ArduinoData\packages\arduino\hardware\mbed_nano\2.6.1\cores\arduino/api/Print.h:68:12: note: candidate expects 2 arguments, 0 provided
C:\Users\Kazar\Documents\ArduinoData\packages\arduino\hardware\mbed_nano\2.6.1\cores\arduino/api/Print.h:69:12: note: candidate: size_t arduino::Print::print(unsigned
int, int)
  size_t print(unsigned int, int = DEC);
  ^
C:\Users\Kazar\Documents\ArduinoData\packages\arduino\hardware\mbed_nano\2.6.1\cores\arduino/api/Print.h:69:12: note: candidate expects 2 arguments, 0 provided
C:\Users\Kazar\Documents\ArduinoData\packages\arduino\hardware\mbed_nano\2.6.1\cores\arduino/api/Print.h:70:12: note: candidate: size_t arduino::Print::print(long int,
int)
  size_t print(long, int = DEC);
  ^
C:\Users\Kazar\Documents\ArduinoData\packages\arduino\hardware\mbed_nano\2.6.1\cores\arduino/api/Print.h:70:12: note: candidate expects 2 arguments, 0 provided
C:\Users\Kazar\Documents\ArduinoData\packages\arduino\hardware\mbed_nano\2.6.1\cores\arduino/api/Print.h:71:12: note: candidate: size_t arduino::Print::print(long
unsigned int, int)
  size_t print(unsigned long, int = DEC);
  ^
C:\Users\Kazar\Documents\ArduinoData\packages\arduino\hardware\mbed_nano\2.6.1\cores\arduino/api/Print.h:71:12: note: candidate expects 2 arguments, 0 provided
```

```

C:\Users\Kazar\Documents\ArduinoData\packages\arduino\hardware\mbed_nano\2.6.1\cores\arduino/api/Print.h:72:12: note: candidate: size_t arduino::Print::print(long long
int, int)
  size_t print(long long, int = DEC);
  ^~~~~
C:\Users\Kazar\Documents\ArduinoData\packages\arduino\hardware\mbed_nano\2.6.1\cores\arduino/api/Print.h:72:12: note: candidate expects 2 arguments, 0 provided
C:\Users\Kazar\Documents\ArduinoData\packages\arduino\hardware\mbed_nano\2.6.1\cores\arduino/api/Print.h:73:12: note: candidate: size_t arduino::Print::print(long long
unsigned int, int)
  size_t print(unsigned long long, int = DEC);
  ^~~~~
C:\Users\Kazar\Documents\ArduinoData\packages\arduino\hardware\mbed_nano\2.6.1\cores\arduino/api/Print.h:73:12: note: candidate expects 2 arguments, 0 provided
C:\Users\Kazar\Documents\ArduinoData\packages\arduino\hardware\mbed_nano\2.6.1\cores\arduino/api/Print.h:74:12: note: candidate: size_t arduino::Print::print(double,
int)
  size_t print(double, int = 2);
  ^~~~~
C:\Users\Kazar\Documents\ArduinoData\packages\arduino\hardware\mbed_nano\2.6.1\cores\arduino/api/Print.h:74:12: note: candidate expects 2 arguments, 0 provided
C:\Users\Kazar\Documents\ArduinoData\packages\arduino\hardware\mbed_nano\2.6.1\cores\arduino/api/Print.h:75:12: note: candidate: size_t arduino::Print::print(const
arduino::Printable&)
  size_t print(const Printable&);
  ^~~~~
C:\Users\Kazar\Documents\ArduinoData\packages\arduino\hardware\mbed_nano\2.6.1\cores\arduino/api/Print.h:75:12: note: candidate expects 1 argument, 0 provided
exit status 1
Error compiling for board Arduino Nano 33 BLE.

```

Snipped of error in code

```

In file included from C:\Users\Kazar\Documents\ArduinoData\packages\arduino\hardware\mbed_nano\2.6.1\cores\arduino/api/ArduinoAPI.h:31:0,
               from C:\Users\Kazar\Documents\ArduinoData\packages\arduino\hardware\mbed_nano\2.6.1\cores\arduino/Arduino.h:27,
               from C:\Users\Kazar\Documents\Arduino\libraries\RadioLib\src\BuildOpt.h:6,
               from C:\Users\Kazar\Documents\Arduino\libraries\RadioLib\src\TypeDef.h:4,
               from C:\Users\Kazar\Documents\Arduino\libraries\RadioLib\src\Module.h:4,
               from C:\Users\Kazar\Documents\Arduino\libraries\RadioLib\src\Module.cpp:1:
C:\Users\Kazar\Documents\ArduinoData\packages\arduino\hardware\mbed_nano\2.6.1\cores\arduino/api/Print.h:63:12: note: candidate: size_t arduino::Print::print(const arduino::_FlashStringHelper*)
  size_t print(const __FlashStringHelper*);
  ^~~~~
C:\Users\Kazar\Documents\ArduinoData\packages\arduino\hardware\mbed_nano\2.6.1\cores\arduino/api/Print.h:63:12: note: candidate expects 1 argument, 0 provided
C:\Users\Kazar\Documents\ArduinoData\packages\arduino\hardware\mbed_nano\2.6.1\cores\arduino/api/Print.h:64:12: note: candidate: size_t arduino::Print::print(const arduino::Strings)
  size_t print(const String s);
  ^~~~~
C:\Users\Kazar\Documents\ArduinoData\packages\arduino\hardware\mbed_nano\2.6.1\cores\arduino/api/Print.h:64:12: note: candidate expects 1 argument, 0 provided
C:\Users\Kazar\Documents\ArduinoData\packages\arduino\hardware\mbed_nano\2.6.1\cores\arduino/api/Print.h:65:12: note: candidate: size_t arduino::Print::print(const char*)
  size_t print(const char[]);
  ^~~~~
C:\Users\Kazar\Documents\ArduinoData\packages\arduino\hardware\mbed_nano\2.6.1\cores\arduino/api/Print.h:65:12: note: candidate expects 1 argument, 0 provided
C:\Users\Kazar\Documents\ArduinoData\packages\arduino\hardware\mbed_nano\2.6.1\cores\arduino/api/Print.h:66:12: note: candidate: size_t arduino::Print::print(char)
  size_t print(char);
  ^~~~~
C:\Users\Kazar\Documents\ArduinoData\packages\arduino\hardware\mbed_nano\2.6.1\cores\arduino/api/Print.h:66:12: note: candidate expects 1 argument, 0 provided
C:\Users\Kazar\Documents\ArduinoData\packages\arduino\hardware\mbed_nano\2.6.1\cores\arduino/api/Print.h:67:12: note: candidate: size_t arduino::Print::print(unsigned char, int)
  size_t print(unsigned char, int = DEC);
  ^~~~~
C:\Users\Kazar\Documents\ArduinoData\packages\arduino\hardware\mbed_nano\2.6.1\cores\arduino/api/Print.h:67:12: note: candidate expects 2 arguments, 0 provided
C:\Users\Kazar\Documents\ArduinoData\packages\arduino\hardware\mbed_nano\2.6.1\cores\arduino/api/Print.h:68:12: note: candidate: size_t arduino::Print::print(int, int)
  size_t print(int, int = DEC);
  ^~~~~
C:\Users\Kazar\Documents\ArduinoData\packages\arduino\hardware\mbed_nano\2.6.1\cores\arduino/api/Print.h:68:12: note: candidate expects 2 arguments, 0 provided
C:\Users\Kazar\Documents\ArduinoData\packages\arduino\hardware\mbed_nano\2.6.1\cores\arduino/api/Print.h:69:12: note: candidate: size_t arduino::Print::print(unsigned int, int)

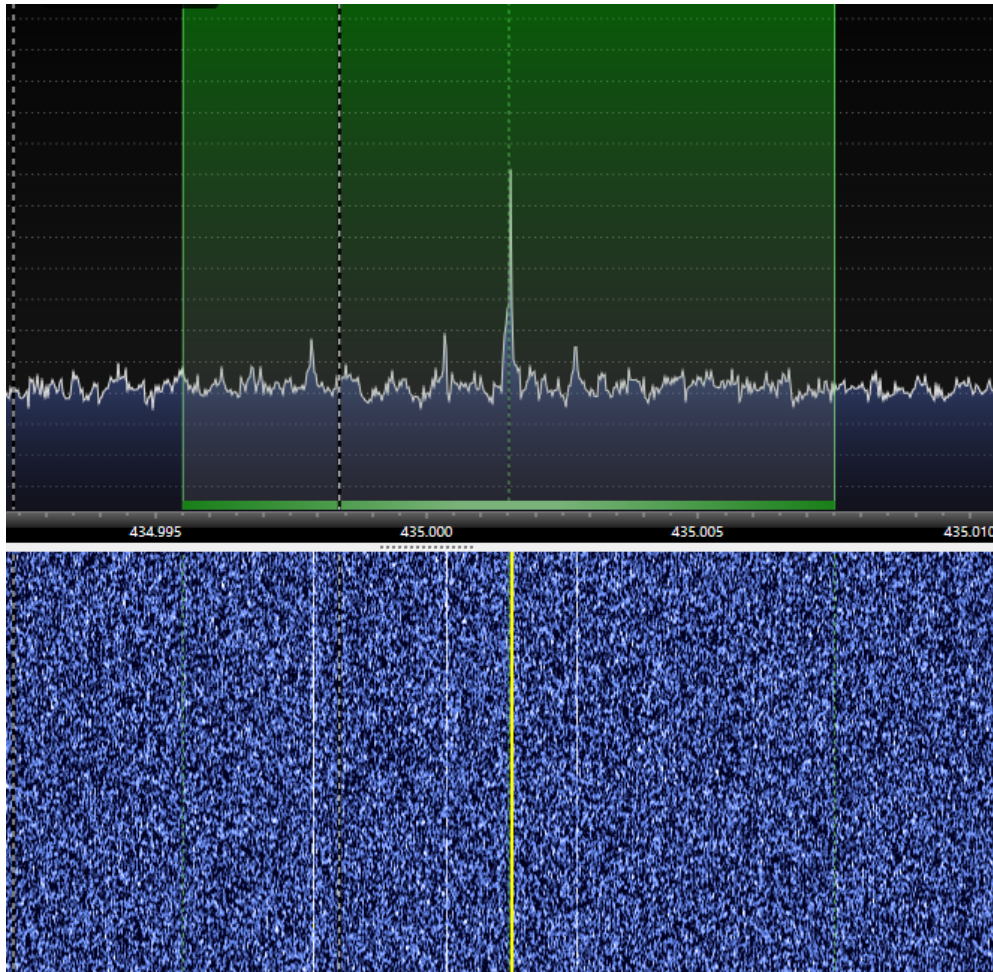
```

Debug Mode And Verbose Mode On

The same error and warning shown in only Verbose mode happens and it fails to compile

After 37th message (when it hangs)

While no new messages are shown in the serial monitor we do notice that the transmission returns a constant peak in our SDR as shown below



Our Code

This has been the code we have used to do all these tests, it is adapted from the example “AX25_Trasmit_AFSK”

```
/*
  Radiolib AX.25 Transmit AFSK Example
  This example sends AX.25 messages using
  SX1278's FSK modem. The data is modulated
  as AFSK at 1200 baud using Bell 202 tones.
  Other modules that can be used for AX.25
  with AFSK modulation:
  - SX127x/RFM9x
  - RF69
  - SX1231
  - CC1101
  - nRF24
  - Si443x/RFM2x
  For default module settings, see the wiki page
  https://github.com/jgromes/Radiolib/wiki/Default-configuration
  For full API reference, see the GitHub Pages
  https://jgromes.github.io/Radiolib/
*/

// include the library
#include <RadioLib.h>

// SX1278 has the following connections:
// NSS pin: 10
// DIO0 pin: 2
// RESET pin: 9
// DIO1 pin: 3
RFM96 radio = new Module(5, 2, 6, 3);
int count = 0;

// or using RadioShield
// https://github.com/jgromes/RadioShield
//SX1278 radio = RadioShield.ModuleA;

// create AFSK client instance using the FSK module
// pin 5 is connected to SX1278 DIO2
AFSKClient audio(&radio, 4);

// create AX.25 client instance using the AFSK instance
AX25Client ax25(&audio);

void setup() {
  Serial.begin(9600);

  // initialize SX1278 with default settings
  Serial.print(F("[SX1278] Initializing ... "));
  int state = radio.beginFSK(435.0, 1.2, 125.0, 10, 16, false);
```

```

//int state = radio.beginFSK(435.0);
radio.setOutputPower(17);
radio.setCurrentLimit(140);

// when using one of the non-LoRa modules for AX.25
// (RF69, CC1101,, Si4432 etc.), use the basic begin() method
// int state = radio.begin();

if(state == RADIOLIB_ERR_NONE) {
  Serial.println(F("success!"));
} else {
  Serial.print(F("failed, code "));
  Serial.println(state);
  while(true);
}

// initialize AX.25 client
Serial.print(F("[AX.25] Initializing ... "));
// source station callsign:  "N7LEM"
// source station SSID:    0
// preamble length:       8 bytes
state = ax25.begin("N7LEM");
if(state == RADIOLIB_ERR_NONE) {
  Serial.println(F("success!"));
} else {
  Serial.print(F("failed, code "));
  Serial.println(state);
  while(true);
}
ax25.setCorrection(200, -200);

// Sometimes, it may be required to adjust audio
// frequencies to match the expected 1200/2200 Hz tones.
// The following method will offset mark frequency by
// 100 Hz up and space frequency by 100 Hz down
/*
  Serial.print(F("[AX.25] Setting correction ... "));
  state = ax25.setCorrection(100, -100);
  if(state == RADIOLIB_ERR_NONE) {
    Serial.println(F("success!"));
  } else {
    Serial.print(F("failed, code "));
    Serial.println(state);
    while(true);
  }
*/
}

void loop() {
  // send AX.25 unnumbered information frame
  Serial.print(F("[AX.25] Sending UI frame ... "));
  // destination station callsign:  "NJ7P"
  // destination station SSID:    0
  String myString = String(count);
  String str = "message 1 try" + myString;

```

```
Serial.println(str);
count = count + 1;
int state = ax25.transmit(str.c_str(), "NJ7P");
if (state == RADIOLIB_ERR_NONE) {
  // the packet was successfully transmitted
  Serial.println(F("success!"));
  #ifdef RADIOLIB_STATIC_ONLY
  Serial.println("static");
  #endif

} else {
  // some error occurred
  Serial.print(F("failed, code "));
  Serial.println(state);
}

delay(3000);
}
```