1. Introduction

ArduinoPhone is a simple wireless telephone device, you can simply realize the phone, answer the phone, send and receive information and Time display function. Communication section uses GPRS Shield to achieve, the display section using TFT Touch Shield, wrote a more complex the firmware, to achieve the UI management, and program screen click function.

The difficulty is:

1. UI management
2. Alphabetic keyboard input
3. Effect zoned screen
4. Serial data processing

2. Hardware

2.1 Use Module

- Arduino / Seeeduino
- GPRS Shield
- TFT Touch Shield
- Grove - RTC
- Homemade 7.4V lithium battery charging plate, circuit diagrams attached, you can also use 9V battery

2.2 Hardware Connection

GPRS Shield serial communication using hard, TFT Touch Shield 1.0 version (non-SPI interface), a simple repair changed code compatible with version 2.0 TFT Touch Shield Grove -. RTC using I2C interface.

Connection as shown in Figure 2-1.

Figure 2-1 hardware connection diagram

3 Software

3.1 Software Process

Main frame is a state machine to switch between the respective states, the following seven states:

- ST_TIME: time mode, real-time displays the current time in this mode, by pressing on the two TFT
- Key to switch to ST_CALL and ST_SMS, if you receive a message, then switched to ST_GETMSG, such as
- If a call comes in, switch to ST_GETCALL.
- ST_CALL: phone mode, then enter the number and dial. Press the call button to switch to ST_CALLING. To Right drag TFT switching to ST_TIME, drag left to switch to ST_SMS
- ST_CALLING: talk mode, if the call ends, the return ST_CALL
- ST_GETCALL: phone into the state, you can use the Accept TFT is turned on or Hand up phone hang
- Off calls. After the call back to the previous state.
- ST_SMS: send a message mode, you can enter the recipient's number and information content, I switched to the Send key
- ST_SENDSMS. Right drag TFT switching to ST_CALL, drag left to switch to ST_GETMSG.
- ST_SENDSMS: Send state, after the information has been sent to return ST_SMS
- ST_GETMSG: read information, press Return TFT can return on a state.

3.2 Serial Data Processing

GPRS Shield with Arduino via serial communication, and communication is the process immediately, so opened the Timer 1 every 10ms to detect whether the serial data, if there is data, the stored data to the serial port of a global array serialdata in and the global variable serialGot set. In each of the above said, the state will determine serialGot cycle is valid, If so, the data is read in serialDta and determines the meaning of the data. For example, serial port to receive the "RING" This String, indicating a call comes in, which is switching state, switch to talk mode.

3.3 Key letter input

Nokia as we usually like to use, such as pressing a button on the 1st consecutive time, will print a different letter, when build, click when it is a, two under is b, three times is c. To achieve this, you need to determine some time, press After that, if there is the same key within a certain period of time pressed, the buttons as a continuous process. There are many ways to obtain the time interval can be achieved, I tried that millis () function, which returns when the system is running between, the unit is ms. Time intervals tested and found 600ms results were better.

3.4 Zoned Screen Effect

You first need to get a lot of data click and slide the screen. Then analyze the data to draw some regularity. When there is a touch behavior when the data through a simple judgment, throw a queue inside, make some judgments, to determine the current behavior is to click on the touch screen or a draw. Here's a little too simple to write, you need to peruse the source code to discover the principle difficulty is debugging parameters.

3.5 Instructions for use:

Software process description which has probably explains the use, in fact, this is similar to an

ordinary cell phone, does not require much
Description and functions are relatively simple.

4 Needs To Be Improved

Overall, this firmware to complete a simple function, a lot of areas for improvement:

- Interface design can be more beautiful, because now use TFT Touch Shield 1.0 is no SD card, while Arduino resources within relatively tight, so this part is very difficult to carry out, if you use TFT 2.0, will A lot easier
- Aspects of receiving information, or that problem, with limited resources, so the information can not keep up!
- Address book, you can add this feature, you need to SD cards and other storage devices power down
- Time settings, this due to time constraints, did not do
- Alarm, again, time is running out!
- Other ~