Version:V01

Level：C

Mini GT06

Communication protocol

Directory

1. Communication agreement

1.1 Introduction

This document defines the GPS locator positioning service platform for the application layer interface protocols.The relevant interface protocols Only apply to the interaction between the platform and positioning terminal.

1.2 Network connection way

Long through GPRS using TCP connection.

2. Terms and definitions

Terms abbreviations	Meaning
CMPP	China Mobile Peer to Peer
GPS	Global Positioning System
GSM	Global System for Mobile Communication
GPRS	General Packet Radio Service
TCP	Transport Control Protocol
LBS	Location Based Services
IMEI	International Mobile Equipment Identity
MCC	Mobile Country Code
MNC	Mobile Network Code
LAC	Location Area Code
CI	Cell ID
RSSI	Received Signal Strength Indicator
UDP	User Datagram Protocol
SOS	Save Our Ship/Save Our Souls
CRC	Cyclic Redundancy Check
NITZ	Network Identity and Time Zone,
GIS	Geographic Information System

3. Basic rules

(1) GPRS connection is established successfully and send the first landing a packet to the server, 5 seconds received server response packet that connection is normal, start sending location information (GPS, LBS packets), 3 minutes will send packets, regular communication is normal.

(2) When the GPRS connection is not successful, the terminal can't send packets.When the GPRS connection failed three times start timing restart function after the final end, time for 20 minutes.In 20 minutes if the terminal and server set up even after success, and received the terminal server to send packets to respond packets of the login, the restart function off timer, the terminal does not restart, or terminal automatic restart after 20 minutes.

(3) After receiving terminal to send the login information to the server terminal returns a response packet, if the end to send the login information package or state packet after more than five seconds didn't receive the server returns package, argues that the current abnormal connection is established, and dynamic GPS positioning data transfer function, disconnect the current GPRS, login and send packets to establish new GPRS connection.

(4) Connection is judged as abnormal, repeat 3 times after establishing a connection to send packets of the login or condition of server response packet packets, terminal launch timing reset function, timing time of 10 minutes, in 10 minutes if the end client and the server successfully establish a connection and receive the server response packet restart function off timer, terminal not heavy qi, or terminal automatic restart after 10 minutes.

(5) After normal connected, terminal after the GPS information change, regularly send GPS, LBS merger packets sent to the server, the server can be sent via command to set the default protocol.

(6) Server for the terminal without registering IMEI number, please reply the login request response and heartbeat packets response, do not disconnect even pick up directly.(if directly disconnected or does not reply, will lead to terminal constantly rewiring, GPRS traffic consumption serious)

4. GPS data packet format

For asynchronous communication transmission mode, and in bytes.

Packet length in total:(10+N Byte)

Format	Length(Byte)
Start bit	2
Packet length	1
Agreement NO.	1
Information content	N
Serial number information	2
Error checking	2
Stop bit	2

(1) Start bit

A fixed value, unified as hexadecimal 0x78 0x78

(2) Packet length

Length = agreement number + information content + serial number + error checking, a total of (5 + N) Byte, because the information content of variable length field.

(3) Agreement NO.

Type	Value
Login information	0x01
Positioning data (UTC)	0x22
State information	0x13
String information	0x21
Alarm data (UTC)	0x26
Time zone	0x27
GPS, phone number query address information (UTC)	0x2A
Information server terminal to send instructions	0x80

(4) Information content

According to the different application, corresponding to the corresponding "agreement date", to determine the specific content.

(5) Serial number information

Boot after sending the first GPRS data (GPS data packets, a heartbeat packets, instruction package) serial number as the '1', after to send data serial number is automatically add 1 at a time.

(6) Error checking

A terminal or server error check code for identifying whether receive information available.In order to prevent data error during transmission, adding error checking and data to prevent wrong operation, so that increase the safety and efficiency of the system.Error checking code the CRC - ITU calibration method.Agreement in the body from the "packet length" to "information serial number" (including "packet length", "information serial number") the CRC - ITU values of the partial data.If the receiver received information calculated CRC errors, are ignored, discard the packet.

(7) Stop bit

A fixed value, unified as hexadecimal 0x0D 0x0A**.**

5. Terminal sent to the server

5.1 Landing information packet

5.1.1 Terminal to the server to send packets

Landing information packet is used to confirm the connection is established from the server to normal, submit terminal ID to the server.

Format		Length(Byte)
Landing information packet (18 Byte)	**Start bit**	2
	Packet length	1
	Agreement NO.	1
	Terminal ID	8
	Type identification number	2
	Time zone language	2
	Serial number information	2
	Error checking	2
	Stop bit	2

(1) Start bit

A fixed value, unified as hexadecimal 0x78 0x78

(2) Packet length

Length = agreement number + information content + serial number + error checking, a total of (5 + N) Byte, because the information content of variable length field.

(3) Agreement NO.

Type	Value
Login information	0x01
Positioning data (UTC)	0x22
State information	0x13
String information	0x21
Alarm data (UTC)	0x26
Time zone	0x27
GPS, phone number query address information (UTC)	0x2A
Information server terminal to send instructions	0x80

(4) Terminal ID

Such as:123456789012345

Terminal ID:0x01 0x23 0x45 .0x67 0x89 0x01 0x23 0x45

(5) Type identification number

Type identification of two bytes.According to the identification number to determine terminal type.

After the first three representative models of two words a representative model.

Model	Identification code
ET200 Power off function	2200
ET200 Not with the function of power	2201
ET130 Power off function	1300
ET130 Not with the function of power	1301

(6) Time zone language

One and a half byte (15bit-4bit)	15	Time zone to expand the value of 100	
	14		
	13		
	12		
	11		
	10		
	9		
	8		
	7		
	6		
	5		
	4		
Lower half byte (bit4-0bit)	3	Time zone thing	
	2	No definition	
	1	Language selection	1
	0	Language selection	0

Bit3 0------Eastern time zone

1-----West zone

Such as:Extension 0x32 0x00 East eight area,GMT +8:00

Calculation method:8×100=800,Converted to hexadecimal 0x0320

Extend byte:0x4D 0xD8 West 12 district and 3/4 time zone,GMT -12:45

Calculation method:12.45×100=1245, Turn the hex 0x04 0xDD

The algorithm here is left will be calculated time zone value cycle again four split time zone east, west, language selection, in order to save four bytes.

5.1.2 Server response packet

Instructions		Length
Landing information packet (18 Byte)	Start bit	2
	Packet length	1
	Agreement NO.	1
	Serial number information	2
	Error checking	2
	Stop bit	2

Terminal server response packet (response packet and terminal sends packets agreement, the agreement on the same)

(1) Start bit

A fixed value, unified as hexadecimal 0x78 0x78

(2) Packet length

Length = agreement number + information content + serial number + error checking, a total of (5 + N) Byte, because the information content of variable length field.

(3) Agreement NO.

Type	Value
Login information	0x01
Positioning data (UTC)	0x22
State information	0x13
String information	0x21
Alarm data (UTC)	0x26
Time zone	0x27
GPS, phone number query address information (UTC)	0x2A
Information server terminal to send instructions	0x80

(4) Information content

According to the different application, corresponding to the corresponding "agreement date", to

determine the specific content.

(5) Serial number information

Boot after sending the first GPRS data (GPS data packets, a heartbeat packets, instruction package) serial number as the '1', after to send data serial number is automatically add 1 at a time.

(6) Error checking

A terminal or server error check code for identifying whether receive information available.In order to prevent data error during transmission, adding error checking and data to prevent wrong operation, so that increase the safety and efficiency of the system.Error checking code the CRC - ITU calibration method.Agreement in the body from the "packet length" to "information serial number" (including "packet length", "information serial number") the CRC - ITU values of the partial data.If the receiver received information calculated CRC errors, are ignored, discard the packet.

(7) Stop bit

A fixed value, unified as hexadecimal 0x0D 0x0A**.**

5.2 Positioning data packets (GPS, LBS merger packet)

5.2.1 Terminal to send positioning data to the server

Format			**Length(Byte)**
Information content	Start bit		2
	Packet length		1
	Agreement NO.		1
	GPS information	Date/time	6
		GPS satellite number information	1
		Latitude	4
		Longitude	4
		Speed	1
		Course and State	2
	LBS information	MCC	2

		MNC	1
		LAC	2
		Cell ID	3
	ACC		1
	Report data model		1
	GPS real-time to fill the		1
	Serial number		2
	Error checking		2
	Stop bits		2

(1) Date/time

Forrmat	Length(Byte)	Sample
Year	1	0x0A
Month	1	0x03
Day	1	0x17
Hour	1	0x0F
Minutes	1	0x32
Seconds	1	0x17

Such as: On March 23, 2010, 15 when 50 minutes 23 seconds

Calculation method: 0 (decimal) = 0A(hexadecimal)

3 (decimal) =03(hexadecimal)

23 (decimal) = 7(hexadecimal)

15 (decimal) = 0F(hexadecimal)

50 (decimal) = 32(hexadecimal)

23 (decimal) = 17(hexadecimal)

Value is: 0x03 0x0A 0x17 0x0F 0x32 0x17

5.2.2 Length of GPS information, participation on the number of satellite positioning

1 byte, according to two hexadecimal character length of the first character for the GPS information, the second character to participate in positioning satellites.

Example: the duty to 0xCB said length of 12 GPS information, participate in the number of satellite positioning of 11.

(C=12 Bit Length,B=11Satellites)

(1) Latitude

Takes up 4 bytes, said latitude value of the location data.Numerical range 0 to 162000000, said the range of 0 to 90 degrees, the conversion method is as follows:

The GPS module output of latitude and longitude values into to decimal divided into unit;And then put into decimal multiplied by 30000, the results into hexadecimal Numbers multiplied.

Such as: 22°32.7658 "=(22X60+32.7658)X3000=40582974, And then converted to hexadecimal number 40582974(10 Decimal)= 26B3F3E（Hexadecimal）

Takes up 4 bytes, said latitude value of the location data.Numerical range 0 to 162000000, said the range of 0 to 90 degrees, the conversion method is as follows:

The GPS module output of latitude and longitude values into to decimal divided into unit;And then put into decimal multiplied by 30000, the results into hexadecimal Numbers multiplied.

Such as 22 DHS '= 32.7658 (22 x60 + 32.7658) X3000 = 40582974, then convert hexadecimal number

40582974 (Decimal) = 26B3F3E (Hexadecimal)

The value is 0x02 0x6B 0x3F 0x3E.

(2) Longitude

Takes up 4 bytes, said the longitude of the location data values.Numerical range 0 to 324000000, said the range of 0 to 180 degrees.

Conversion method and the latitude conversion method

(3) Speed

Takes up one byte, said the GPS speed, value range is 0 x00 ~ 0 XFF indicating range 0 to 255 km/small

At the right time.

Such as: 0x00 represent 0 km/hour.

0x10 represent 16 km/hour

0XFF on behalf of 255 km/h

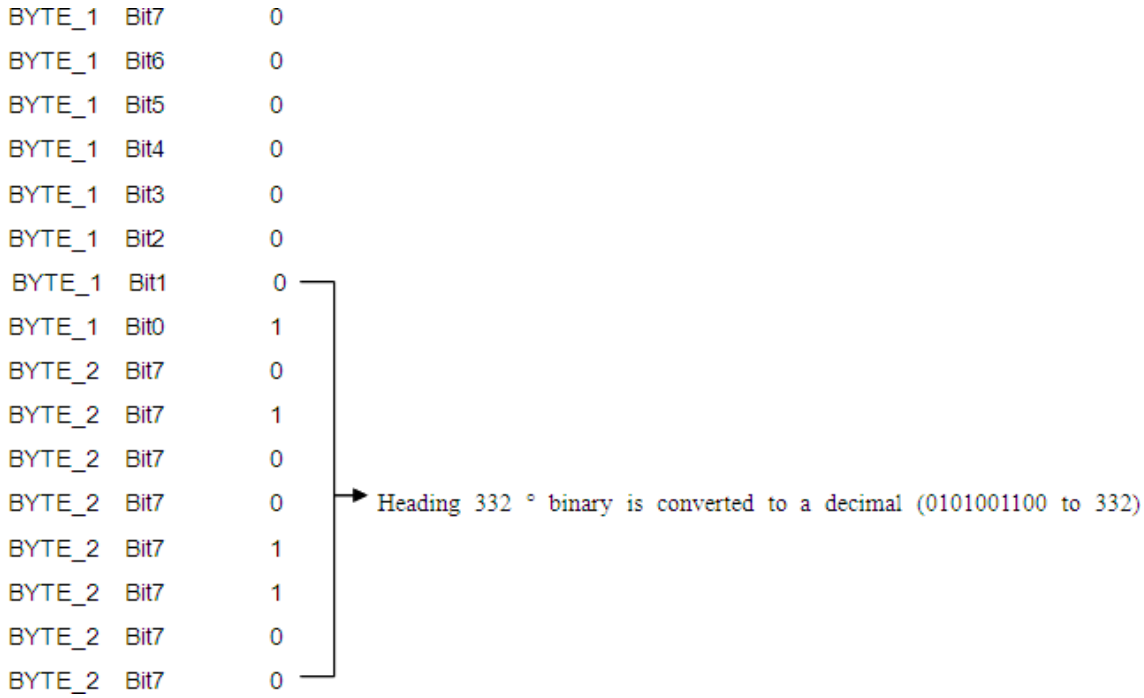
(4) Course

2 bytes, said the running direction of GPS, said range 0 ~ 360, unit: degrees, at due north to 0 degrees, clockwise.

BYTE_1	Bit7	0
	Bit6	0
	Bit5	GPS real-time/difference Bit5 bits
	Bit4	GPS positioning
	Bit3	East, west longitude
	Bit2	South latitude, north latitude
	Bit1	Course
	Bit0	
BYTE_1	Bit7	
	Bit6	
	Bit5	
	Bit4	
	Bit3	
	Bit2	
	Bit1	
	Bit0	

Note: the packet for the state of information in a record time state of the moment.

Such as: the value is 0x15 0x4C, into a binary is : 00000001 0100110



(5) MCC

Mobile user belongs to country code: Mobile Country Code(MCC)

Such as: China mobile number is: China mobile number is 460 (decimal) 0x01 0xCC 460 (decimal into hexadecimal hexadecimal less than four on the left side of the fill 0)

Value range:0x0000~0x03E7

(6) MNC

Mobile number: Mobile Network Code(MNC)

Such as:China mobile 0x00

(7) LAC

The Location Area Code the Location Area Code (LAC) containing in LAI, is composed of two bytes, using hexadecimal codes.Available range of 0x0000-0xFFFE 0, block x0000 0 and 0 XFFFF may not be used (see the GSM specification 03.03, 04.08 and 11.11).

(8) Cell ID

Mobile base station Cell Tower ID (Cell ID), value range is 0 x000000 ~ 0 XFFFFFF

(9) ACC

ACC state ACC low is 00, high ACC is 01

(10) Report data model

GPS Report data point type

0x00 Regular report

0x01 Distance to report

0x02 Inflection point to upload

0x03 Upload the ACC state changes

5.3 Alarm package (GPS, LBS, state merging packet)

5.3.1 Terminal to send alarm data to the server

Format			Length(Bytes)
Information content	Start bits		2
	Packet length		1
	Agreement NO.		1
	Date/time		6
	GPS information	GPS satellite number information	1
		Latitude	4
		Longitude	4
		Speed	1
		Route/State	2
	LBS information	LBS length	1
		MCC	2
		MNC	1
		LAC	2
		Cell ID	3
	State infromation	Terminal information content	1
		Voltage grade	1
		GSM signal strength	1

		Alarm/language/extension port state	2
	Serial number		2
	Error checking		2
	Stop bits		2

Alarm package is on the basis of the orientation package increased state information (alarm message), coding protocol format is also on the basis of orientation package added the status information.

(1) Terminal information

Takes up one byte, used to represent the various state of the cell phone information.

Bit		**Code meaning**
BYTE	Bit7	1: oil electricity disconnect
		0:Oil electric connection
	Bit6	1: GPS positioning
		0: GPS is not positioning
	Bit3~Bit5	100:SOS for help
		011: low power alarm
		010: power outage alarm
		001: vibration alarm
		000:normal
	Bit2	1: have to connect power charging
		2: not to connect power charging
	Bit1	1:ACC high
		0:ACC low
	Bit0	1: set up defense
		0: cancel defense

Such as:0X44 corresponding binary is 01000100

Terminal status :oil and electronic is connection、GPS have to position、normal did not alarm、has

been charging power、ACC for low、cancel defense.

(2) Voltage grade

Range of 0 ~ 6, from low to high voltage size.

0: Without electricity (power off)

1: Very low power (to phone text messaging, etc.)

2: Light is very low (low electric alarm)

3: Low power (normal use)

4: Electricity

5:High power

6: High power

Such as:0x02 Electricity is very low for sending alarm.

(3) GSM signal strength level

0x00 No singal

0x01 Signal is very weak

0x03 Signal is good

0x04 Signal is strong

Such as: 0x03 Signal is good

(4) Alarm/language

0x00 (former) 0x01 (after)

Before a: terminal alarm status (applicable to alarm package and function of electronic fence project) : after terminal current language level

Byte1	0x00 Normal
	0x01 SOS for help
	0x02 Power outage alarm
	0x03 Vibration alarm
	0x04 Into the alarm of the fence

	0x05 out the alarm of the fence
	0x06 Overspeed alarm
	0x09 Displacement of the alarm
	0x0A Into the GPS dead zoom alarm
	0x0B out the GPS dead zoom alarm
	0x0C Starting alarm
	0x0D Positioning p for the first time
	0x0E Low electric alarm
Byte2	0x01 Chinese 0x02 English

Such as: No alarm in Chinese:0x00 0x01 No alarm in English:0x00 0x02

To increase the reliability alarm information, alarm information repeated, in most cases the alarm information consistent with the upper terminal information, inconsistencies are as follows:

A: Low power alarm terminal information B: In and out of the fence alarm, alarm/language information

(5) Reply to send alarm data to the terminal server

Format		**Length(Bbyte)**
Information content	Start bit	2
	Package length	1
	Agreement NO.	1
	Serial number	1
	Error checking	2
	Stop bit	2

Alarm package is on the basis of the orientation package increased state information (alarm message), coding protocol format is also on the basis of orientation package added the status information.

5.3.2 The server terminal to send alarm data address package

<table>
<tr><th colspan="4">Format</th><th>Length</th></tr>
<tr><td rowspan="11">The server terminal to send Instruction package (15 + M + N Byte)</td><td colspan="3">Start bit</td><td>2</td></tr>
<tr><td colspan="3">Packet length</td><td>1</td></tr>
<tr><td colspan="3">Agreement NO.</td><td>1</td></tr>
<tr><td rowspan="8">Information content</td><td colspan="2">Instruction length</td><td>1</td></tr>
<tr><td colspan="2">Server flags</td><td>4</td></tr>
<tr><td rowspan="6">Instruction content</td><td>ALARMSMS</td><td>8</td></tr>
<tr><td>&&</td><td>2</td></tr>
<tr><td>Address content</td><td>M</td></tr>
<tr><td>&&</td><td>2</td></tr>
<tr><td>phone number</td><td>21</td></tr>
<tr><td>##</td><td>2</td></tr>
<tr><td colspan="3">serial number information</td><td>2</td></tr>
<tr><td colspan="3">Check digit</td><td>2</td></tr>
<tr><td colspan="3">Stop bit</td><td>2</td></tr>
</table>

Request Chinese address reply agreement number:0x17

Content instruction content: ALARMSMS && address & telephone number (0) all # #

(ALARMSMS, &&, # # for the fixed string) Chinese address content in UNICODE issued.

Reply address information paradigm in Chinese:

7878 //Start bit

85 //length of the data

17 //Reply to deal

7E // length of the instruction length or send content information

00000001 //Server flags
414C41524D534D53 //ALARMSMS

2626 //separator

624059044F4D7F6E0028

004C004200530029003A

5E7F4E1C77015E7F5DDE

5E0282B190FD533AFF17

FF15FF144E6190530028

004E00320033002E0033

00390035002C00450031

00310032002E00390038

0038002996448FD1

2626 //separator

00000000000000000000000000000000000000000000

2323

0106

3825

0D0A

5.3.3 Reply in English

Considering the English or other foreign address longer, a data not enough use, increased to 2 bytes.Note: the address information is only for back agreement number corresponding to the length of data bits instead of two.

Format				Length
The server terminal to send Instruction package (15 + M + N Byte)	Start bit			2
	Packet length			1
	Agreement NO.			1
	Information content	Instruction length		1
		Server flags		4
		Instruction content	ALARMSMS	8
			&&	2
			Address content	M
			&&	2
			phone number	21
			##	2
	serial number information			2
	Check digit			2
	Stop bit			2

Request Chinese address reply agreement number:097

The instruction content: ALARMSMS && address content & telephone number (0) all # # (ALARMSMS, &&, # # for the fixed string)

7878 //Start bit

85 //length of the data

17 //Reply to deal

7E // length of the instruction length or send content information

00000001 //Server flags
414C41524D534D53 //ALARMSMS

2626 //separator

624059044F4D7F6E0028

004C004200530029003A

5E7F4E1C77015E7F5DDE

5E0282B190FD533AFF17

FF15FF144E6190530028

004E00320033002E0033

00390035002C00450031

00310032002E00390038

0038002996448FD1

2626 //separator

00000000000000000000000000000000000000000000

2323

0106

3825

0D0A

Indicate: As part of the alarm function does not need to return address information platform, the platform after receiving terminal alarm package do not need to reply to parse the address. Don't need to reply address alarm types are as follows: 1. Low power alarm 2. Overspeed alarm 3. GPS blind area 4. GPRS offline alarm 5. Electric low electric alarm 6. Electric is low Electric protection alarm.

5.4 Heartbeat package (State of the packet)

Heartbeat package is maintaining terminal and server connection of packets

5.4.1 Terminal to the server sends a heartbeat packets

Format			Length(Byte)
Information content	Start bit		2
	Package length		1
	Agreement NO.		1
	State information	Terminal information content	1
		Voltage grade	1
		GSM signal strength	1
		Alarm/language/extension port state	2
	Serial number		2
	Error checking		2
	Stop bit		2

5.4.2 Terminal information

Takes up one byte, used to represent the various state of the cell phone information.

Bit		Code meaning
BYTE	Bit7	1: oil electricity disconnect
		0:Oil electric connection
	Bit6	1: GPS positioning
		0: GPS is not positioning
	Bit3~Bit5	100:SOS for help
		011: low power alarm
		010: power outage alarm
		001: vibration alarm
		000:normal
	Bit2	1: have to connect power charging
		2: not to connect power charging

	Bit1	1:ACC high
		0:ACC low
	Bit0	1: set up defense
		0: cancel defense

Such as:0X44 corresponding binary is 01000100

Terminal status :oil and electronic is connection、GPS have to position、normal did not alarm、has been charging power、ACC for low、cancel defense.

(1) Voltage grade

Range of 0 ~ 6, from low to high voltage size.

0: Without electricity (power off)

1: Very low power (to phone text messaging, etc.)

2: Light is very low (low electric alarm)

3: Low power (normal use)

4: Electricity

5:High power

6: High power

Such as:0x02 Electricity is very low for sending alarm.

(2) GSM signal strength level

0x00 No singal

0x01 Signal is very weak

0x03 Signal is good

0x04 Signal is strong

Such as: 0x03 Signal is good

(3) Alarm/language

0x00 (former) 0x01 (after)

Before a: terminal alarm status (applicable to alarm package and function of electronic fence project) : after terminal current language level

Byte1	0x00 Normal
	0x01 SOS for help
	0x02 Power outage alarm
	0x03 Vibration alarm
	0x04 Into the alarm of the fence
	0x05 out the alarm of the fence
	0x06 Overspeed alarm
	0x09 Displacement of the alarm
	0x0A Into the GPS dead zoom alarm
	0x0B out the GPS dead zoom alarm
	0x0C Starting alarm
	0x0D Positioning p for the first time
	0x0E Low electric alarm
Byte2	0x01 Chinese 0x02 English

Such as: No alarm in Chinese:0x00 0x01 No alarm in English:0x00 0x02

5.4.3 Server response packet

Format		**Length**
Heartbeat packets(18 Byte)	Start bit	2
	Packet length	1
	Agreement NO.	1
	Serial number information	2
	Error checking	2
	Stop bit	2

Terminal server response packet (response packet and terminal sends packets agreement, the agreement on the same)

5.4.4 Data instance

Terminal to send sample:

78	78	08	13	4B	04	03	00	01	00	11	06	1F	0D	0A

0x78	0x78	0x08	0x13	0x4B	0x04	0x03	0x00	0x01	0x00	0x11	0x06	0x1F	0x0D	0x0A
Start bit		Length	Agreement NO.	Information content			Reserve bit(language)		Serial number		Error checking		Stop bit	

Server response paradigm:

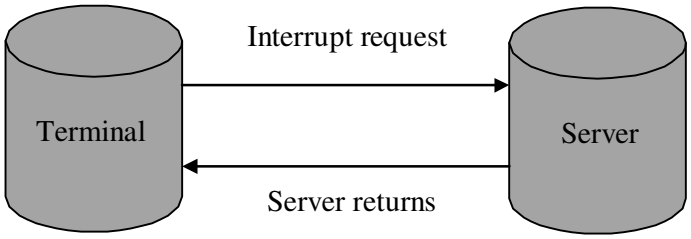
78	78	05	13	00	11	F9	70	0D	0A

Explain:

0x78	0x78	0x05	0x13	0x00	0x11	0xF9	0x70	0x0D	0x0A
Start bit		Length	Agreement NO.	Serial number		Error checking		Stop bit	

6. Address request and replay

6.1 (Terminal to the server) address request packet format



server sends

Format	Length(Byte)
Start bit	2
Package Length	1
Agreement NO.	1

Information Content	**Instruction length**	1
	Server flags	4
	Instruction content	M
	Language	2
serial number information		2
Error checking		2
Stop bit		2

6.2 Terminal return

(1) Terminal return(1)

Format		**Length(Byte)**	**Example**
Start bit		2	0x79 0x79
Package Length		2	0x00 0x09
Agreement NO.		1	0x21
Information content	**Server flags**	4	0x00 0x00 0x00 0x01
	Content encoding	1	
	Cotent	M	
serial number information		2	0x00 0x01
Error checking		2	0xD9 0xDC
Stop bit		2	0x0D 0x0A

(2) Terminal return(2)

Format		**Length(Byte)**
Start bit		2
Package Length		1
Agreement NO.		1
Information content	**Instruction length**	1

	Server flags	4
	Instruction content	M
	Language	2
serial number information		2
Error checking		2
Stop bit		2

6.3 Check the location information

Function description: the location information of instructions.Mobile phone users and message server are available through this will send instructions for positioning information instance and return a string converting ASCII generated instruction content

//server sends

DWXX#

DWXX=Lat:<South of the equator/ North of the equator >,Lon:<East longitude / West longitude >,Course:<Angle>,Speed:<Speed>,DateTime:<Time> Failture return

DWXX=Command Error!

Positioning is not return success:

DWXX=Lat:,Lon:, Course:,Speed:,DateTime:-:

Return to the sample:

DWXX=Lat:N23d5.1708m,Lon:E114d23.6212m,Course:120,Speed:53.02;DateTime:08-09-12 14:52:36

Explain: means: 23 degrees north latitude 5.1708 points and 23.6212 east longitude 114 degrees, Angle: 120 degrees, speed: 53.02 km/hour, time date: 08 on September 12, 14 point 52 minutes and 36 seconds.

6.4 Oil cut-off electric

Function description: to cut off the vehicle oil electric control circuit.Instance will send instruction content and return a string converting ASCII creation.

Server sends：

DYD#

Terminal returns successfully：

DYD=Success!

Failture return：

DYD=Unvalued Fix or DYD=Speed Limit, Speed 40km/h

Explanation: when the GPS positioning or speeds above 20 km/H do not allow the oil electricity cut off

6.5 Recovery oil and electricity

Function description: the electric control circuit connected to the vehicle oil. Instance will send instruction content and return a string converting ASCII creation.

Server sends：

HFYD#

Terminal returns successfully：

HFYD=Success!

Failture return：

HFYD=Fail!

6.6 Server distributed query address information

Instance will send instruction content and return a string converting ASCII creation.

Server sends：

Will send and return a string converting ASCII generated instance.

Server sends：

ADDRESS,Address content,Phone number

Notes: Chinese address content in UNICODE issued.

6.7 Terminal to send server information

Format			**Length(Byte)**
Start bit			2
Package lenght			1
Agreement NO.			1
Information content	**Date/Time**		6
	GPS information	**length of the GPS information**	1
		Latitude	4
		Longitude	4
		Speed	1
		Course state	2
		Phonenumber	21
		Language	2
serial number information			2
Error checking			2
Stop bit			2

6.8 Reply in Chinese

Chinese reply packet is as follows:

Format				**Length**
The server terminal to send Instruction package (15 + M + N Byte)	Start bit			2
	Packet length			1
	Agreement NO.			1
	Information content	Instruction length		1
		Server flags		4
		Instruction content	ALARMSMS	8
			&&	2
			Address content	M

			&&	2
			phone number	21
			##	2
	serial number information			2
	Check digit			2
	Stop bit			2

Request Chinese address reply agreement number:0x17

Content instruction content: ALARMSMS && address & telephone number (0) all # #

(ALARMSMS, &&, # # for the fixed string) Chinese address content in UNICODE issued.

Reply address information paradigm in Chinese:

7878 //Start bit

85 //length of the data

17 //Reply to deal

7E // length of the instruction length or send content information

00000001 //Server flags
414C41524D534D53 //ALARMSMS

2626 //separator

624059044F4D7F6E0028

004C004200530029003A

5E7F4E1C77015E7F5DDE

5E0282B190FD533AFF17

FF15FF144E6190530028

004E00320033002E0033

00390035002C00450031

00310032002E00390038

0038002996448FD1

2626 //separator

00000000000000000000000000000000000000000000

2323

0106

3825

0D0A

6.9 Reply in English

Considering the English or other foreign address longer, a data not enough use, increased to 2 bytes.Note: the address information is only for back agreement number corresponding to the length of data bits instead of two.

Format				Length
The server terminal to send Instruction package (15 + M + N Byte)	Start bit			2
	Packet length			1
	Agreement NO.			1
	Information content	Instruction length		1
		Server flags		4
		Instruction content	ALARMSMS	8
			&&	2
			Address content	M
			&&	2
			phone number	21
			##	2
	serial number information			2
	Check digit			2
	Stop bit			2

Request Chinese address reply agreement number:097

The instruction content: ALARMSMS && address content & telephone number (0) all # # (ALARMSMS, &&, # # for the fixed string)

7878 //Start bit

85 //length of the data

17 //Reply to deal

7E // length of the instruction length or send content information

00000001 //Server flags
414C41524D534D53 //ALARMSMS

2626 //separator

624059044F4D7F6E0028

004C004200530029003A

5E7F4E1C77015E7F5DDE

5E0282B190FD533AFF17

FF15FF144E6190530028

004E00320033002E0033

00390035002C00450031

00310032002E00390038

0038002996448FD1

2626 //separator

00000000000000000000000000000000000000000000

2323

0106

3825

0D0A

7. CRC code

If the receiver received information calculated CRC errors, are ignored, discard the packet.

CRC - ITU look-up table algorithm C language code snippet

```
static const U16 crctab16[]=
{
    0X0000, 0X1189, 0X2312, 0X329B, 0X4624, 0X57AD, 0X6536, 0X74BF,
    0X8C48, 0X9DC1, 0XAF5A, 0XBED3, 0XCA6C, 0XDBE5, 0XE97E, 0XF8F7,
    0X1081, 0X0108, 0X3393, 0X221A, 0X56A5, 0X472C, 0X75B7, 0X643E,
    0X9CC9, 0X8D40, 0XBFDB, 0XAE52, 0XDAED,0XCB64, 0XF9FF, 0XE876,
    0X2102, 0X308B, 0X0210, 0X1399, 0X6726, 0X76AF, 0X4434, 0X55BD,
    0XAD4A, 0XBCC3, 0X8E58, 0X9FD1, 0XEB6E, 0XFAE7, 0XC87C, 0XD9F5,
    0X3183, 0X200A, 0X1291, 0X0318, 0X77A7, 0X662E, 0X54B5, 0X453C,
    0XBDCB,0XAC42, 0X9ED9, 0X8F50, 0XFBEF, 0XEA66, 0XD8FD, 0XC974,
    0X4204, 0X538D, 0X6116, 0X709F, 0X0420, 0X15A9, 0X2732, 0X36BB,
```

```
0XCE4C, 0XDFC5, 0XED5E, 0XFCD7, 0X8868, 0X99E1, 0XAB7A, 0XBAF3,
0X5285, 0X430C, 0X7197, 0X601E, 0X14A1, 0X0528, 0X37B3, 0X263A,
0XDECD,0XCF44, 0XFDDF, 0XEC56, 0X98E9, 0X8960, 0XBBFB, 0XAA72,
0X6306, 0X728F, 0X4014, 0X519D, 0X2522, 0X34AB, 0X0630, 0X17B9,
0XEF4E, 0XFEC7, 0XCC5C, 0XDDD5, 0XA96A, 0XB8E3, 0X8A78, 0X9BF1,
0X7387, 0X620E, 0X5095, 0X411C, 0X35A3, 0X242A, 0X16B1, 0X0738,
0XFFCF, 0XEE46, 0XDCDD,0XCD54, 0XB9EB, 0XA862, 0X9AF9, 0X8B70,
0X8408, 0X9581, 0XA71A, 0XB693, 0XC22C, 0XD3A5, 0XE13E, 0XF0B7,
0X0840, 0X19C9, 0X2B52, 0X3ADB, 0X4E64, 0X5FED, 0X6D76, 0X7CFF,
0X9489, 0X8500, 0XB79B, 0XA612, 0XD2AD, 0XC324, 0XF1BF, 0XE036,
0X18C1, 0X0948, 0X3BD3, 0X2A5A, 0X5EE5, 0X4F6C, 0X7DF7, 0X6C7E,
0XA50A, 0XB483, 0X8618, 0X9791, 0XE32E, 0XF2A7, 0XC03C, 0XD1B5,
0X2942, 0X38CB, 0X0A50, 0X1BD9, 0X6F66, 0X7EEF, 0X4C74, 0X5DFD,
0XB58B, 0XA402, 0X9699, 0X8710, 0XF3AF, 0XE226, 0XD0BD, 0XC134,
0X39C3, 0X284A, 0X1AD1, 0X0B58, 0X7FE7, 0X6E6E, 0X5CF5, 0X4D7C,
0XC60C, 0XD785, 0XE51E, 0XF497, 0X8028, 0X91A1, 0XA33A, 0XB2B3,
0X4A44, 0X5BCD, 0X6956, 0X78DF, 0X0C60, 0X1DE9, 0X2F72, 0X3EFB,
0XD68D, 0XC704, 0XF59F, 0XE416, 0X90A9, 0X8120, 0XB3BB, 0XA232,
0X5AC5, 0X4B4C, 0X79D7, 0X685E, 0X1CE1, 0X0D68, 0X3FF3, 0X2E7A,
0XE70E, 0XF687, 0XC41C, 0XD595, 0XA12A, 0XB0A3, 0X8238, 0X93B1,
0X6B46, 0X7ACF, 0X4854, 0X59DD, 0X2D62, 0X3CEB, 0X0E70, 0X1FF9,
0XF78F, 0XE606, 0XD49D, 0XC514, 0XB1AB, 0XA022, 0X92B9, 0X8330,
0X7BC7, 0X6A4E, 0X58D5, 0X495C, 0X3DE3, 0X2C6A, 0X1EF1, 0X0F78,
};

// A 16-bit CRC calculation for a given length data.

U16 GetCrc16(const U8* pData, int nLength)

{
```

```
        U16 fcs = 0xffff;// Initialize
        while(nLength>0){
            fcs = (fcs >> 8) ^ crctab16[(fcs ^ *pData) & 0xff];
            nLength--;
            pData++;
        }
        return ~fcs;// Not
    }
```

8. Packet format

GPS data packets: 686825266A03586880000001580001100A0C1E0A2E05027AC8390C4657C5000156001DF1000000060D0A

Request address package:

68683B266A03586880000001580005 1B0A0C1E0A2E05027AC8390C4657C5000156001DF100000006313235323031353031333938313436310049004F00020D0A

English address packets:

787800AF9700A8000000014144445245535326260032003000310030002D00310032002D00330030002000310030003A00340036003A00300035002000365 3F7002000590075006E00730068006100 6E00200057006500730074002000520064002C00480075006900630068006500 6E0067002C004800750069007A0068006F0075002C004700750061006E00670064006F006E006726263132353230313530313339383134363100490 04F002323000103020D0A

Chinese address packets:

787872176C0000000141444452455353262600320030003100300020D00310032002D00330030002000310031003A00340031003A0030003500205E7F4E1C770160E05DDE5E0260E057CE533A4E915C71897F8DEF003653F726263132353230313530313339383134363100360036002302300 01ffa80D0A

Heartbeat package:

68680F030403586880000000158E5181A012A0D0A

Heart rate response package:

54681A0D0A

IP request packets:

78781700035868800000015830010 1CC00266A001DF10000DD310D0A

IP response packets:

78780B00716C44082275000025fc0D0A