



GPS Sounding System

MAIN SYSTEM COMPONENTS

Besides GPS radiosonde, the sounding system comprises two main components: a computer terminal which runs the special software and stores sounding data; a telemetering system which receives telemetering data and GPS location data.

GTS3 DIGITAL RADIOSONDE

The GTS3 digital radiosonde is carried aloft by a meteorological balloon up to an altitude of 36,000m. Utilizing GPS satellite navigation data, it measures the air temperature, atmospheric pressure, relative humidity, wind direction and wind velocity of different height during the whole flight.

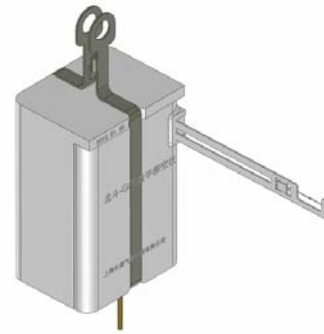
EXCELLENT MEASUREMENT PERFORMANCE

The PTU measurement performance of the GPS radiosonde is newly improved.

Aluminized bead thermistor— temperature sensor with fast response time and minimized long- wave and short- wave radiation error.

Thin film capacitance— humidity sensor with fast response time and excellent long-term stability.

Silicon electric-bridge pressure sensor— small pressure sensor with well flexibility and repeatability.



GROUND EQUIPMENT

GTC3 TELEMETERING RECEIVER AND ANTENNA

GTC3 radio telemetering receiver; it is used to receive the information of air pressure, temperature, humidity (PTU) and GPS location data via the local omnidirectional antenna. The collected data is then sent to the computer terminal for analysis and storage. Introducing of the digital spot frequency technique, the receiver can lock the radiosonde's frequency automatically and receive the PTU and GPS data sent from the radiosonde with high telemetry stability.

COMPUTER TERMINAL

A personnel computer (PC) with the Windows operating system (OS) allows to display, storage, and print observed data and output with various weather report based on WMO- codes.

GROUND CHECK SET JKZ1

Ground checking of GTS3 digital radiosonde is done with the Ground Check Set JKZ1 and the computer terminal. It is used to find out the rejects by comparing with the reference standard and ensuring excellent PTU measurement accuracy.

RADIOSONDE COMPATIBILITY

The software is compatible with all the CWQX's digital radiosondes, operating at the frequency of 400MHz or 1680MHz. Special sensors can be interfaced for other measurement, such as the electric field sensor and so on.

GPS 高空探测系统

系统主要组成部分

除了 GPS 探空仪外，整个探空系统主要由两部分组成：计算机处理终端—用于运行专门的软件及储存探空数据；遥测接收系统—用于接收探空数据和 GPS 定位数据。

GTS3 数字探空仪

GTS3 数字探空仪由气象气球带到高空，利用 GPS 卫星导航数据，可综合观测到地面至 36km 范围内，不同高度的大气温度、压力、相对湿度和风向风速。

卓越的测量性能

GTS3 数字探空仪的 PTU 测量性能是经过改良的。

镀铝珠状热敏电阻- 响应速度快；减小长短波辐射的影响

薄膜湿敏电容- 响应速度快；长期稳定性好

硅电桥压力传感器- 具有良好的弹性和重复性；体积小



GIS1型放线器

GIS1 Automatic
Let-string Set

地面设备

GTC3 遥测接收机和天线

通过 GTC3—无线电遥测接收机和设置在现场的全向天线接收气压、温度、湿度（PTU）以及定位数据，将这些数据集合起来送到计算机处理终端进行分析和储存。该设备采用数字点频技术能自动锁定探空仪频率，可稳定接收探空仪所传送的 TPU 和 GPS 信息。

计算机处理终端

装有 Windows 操作系统的计算机，用以显示、储存和打印探测数据以及生成的各类气象报告。

JKZ1地面检测箱

GTS3数字探空仪的地面检测是通过JKZ1型探空仪检测箱和计算机处理终端共同完成的。通过与标准器的数据比较，剔除超差探空仪，以保证PTU的探测精度。

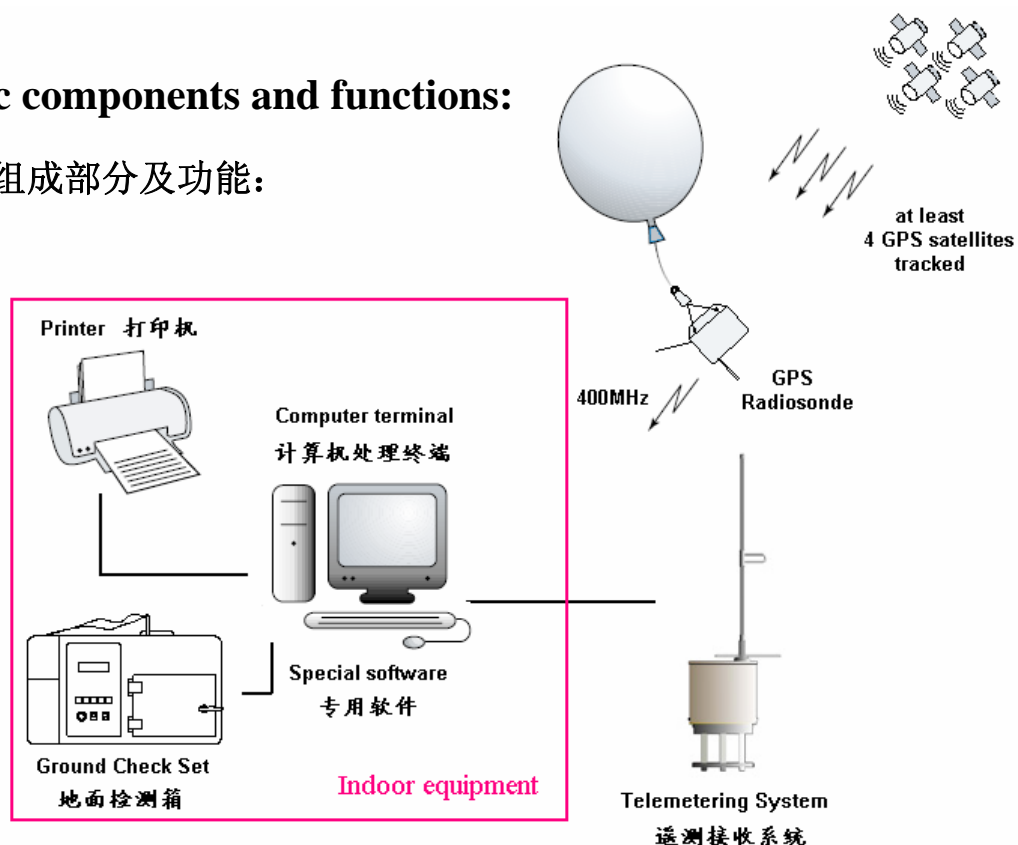
探空仪的兼容性

专用软件可兼容于各型号用于 400MHz 或 1680MHz 的数字式探空仪。可以根据需要添加特殊传感器进行其他测量，例如电场传感器等。



Basic components and functions:

基本组成部分及功能:



A basic GPS sounding system configuration includes a computer terminal running the special software, a Telemetry Receiver, antennas, radiosonde ground check set and a printer.

一个基本的 GPS 探空系统的结构包括用于运行专门软件的计算机处理终端、遥测接收机、天线、探空仪检测箱以及打印机。

GPS SOUNDING SYSTEM

GPS 高空探测系统

PHYSICAL DIMENSIONS (l x b x h)

尺寸

GTS3 digital radiosonde	
GTS3 数字探空仪	90×70×140mm
Ground check set JKZ1	
JKZ1 地面检测箱	496×176×276 mm
GTC3 telemetering system	
GTC3 遥测系统	1500+Ø340*530+1500 mm

WEIGHT (kg)

重量

GTS3 digital radiosonde	0.3
GTC3 Telemetering System	15
Ground check set JKZ1	18

POWER SUPPLY

电源

Ground equipment	AC 150...240V, 50...60Hz
alkaline battery	
碱性电池	+9V
Operation time	120min

STORAGE

储存

Storage temperature range	-30°C ~ +50°C
Storage humidity	0%RH ~ 85%RH

Sounding range

探测距离	250km
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Sounding altitude

探测高度	Up to 36km
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GTS3 DIGITAL RADIOSONDE- A GPS RADIOSONDE

GTS3 数字探空仪 (GPS 探空仪)

METEOROLOGICAL SENSORS

气象传感器

Temperature	Aluminized bead thermistor
温度	镀铝珠状热敏电阻
Range	+50°C ~ -90°C
Accuracy (k=1)	0.2°C
Response time (+25°C, 0m/s flow)	< 3sec
Resolution	0.1°C
Humidity	Thin film capacitance
湿度	薄膜湿敏电容
Range	0%RH ~ 100%RH
Accuracy (k=1)	5%RH
Response time	
+25°C	< 3sec
-20°C	< 15sec
Resolution	1%RH
Pressure	Silicon electric-bridge pressure sensor
气压	硅电桥压力传感器
	(direct sensor measurement and computation)
GPS geometric height	
Range	1060hPa ~ 5hPa
Accuracy (k=1)	
1060hPa ~ 500hPa	1.5hPa
500hPa ~ 5hPa	0.7hPa
Resolution	0.1hPa
Measurement cycle for PTU sensors	1sec

GPS MODULE

GPS 模块

Receiver Frequency	1575.46MHz
Receiver sensitivity	-130db/m
Receiver antenna	panel antenna

WIND MEASUREMENT

风的测量

Altitude	高度
Range	0km ~ 36km
Accuracy	15m
Position	定位
Accuracy	15m
Wind velocity	风速
Range	0m/s ~ 100m/s
Accuracy (in twin sondings)	0.2m/s
Resolution	0.1m/s
Wind direction	风向
Range	0° ~ 360°
Accuracy (3m/s flow)	2°
Resolution	1°

TELEMETRY

发射机

Transmitter type	Digital
Frequency band	403MHz
Tuning range	400MHz ~ 406MHz
Frequency setting	50kHz step
Frequency stability	2×10 ⁻⁵ MHz
Output power	≤350mW
Modulation	GFSK
Transmission rate	2400Baud
Transmission cycle	1sec

CALIBRATION

校准

Factory calibration	Stored in floppy disk
Ground check	Prior launch



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