HUARI

Chengdu Huari Communication Technology Co.,Ltd.

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Agenda

who are we

products

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who are we

- Company Introduction
- Market Performance

Company Introduction

- Chengdu Huari Communication Technology Co.,Ltd. was founded in 1993.It is a high-tech enterprise focusing on research and development of radio spectrum management and monitoring facilities, equipment production and provision of technical services.
- Huari has now 320 employees. More than 45% of the company ‘s employees work in R&D, including over 20 technical experts of radio monitoring and DF, antenna design and signal processing.
- Huari always tries to provide outstanding quality products and services to shape the national brand of China.

Company Introduction

The participants of 2nd ITU ASP CoE Training on Spectrum Management & Monitoring

Company Introduction

Radio Receiving Equipment R&D Center

Company Introduction

Building area : 50,000m²

Market Performance

Volume of business :

- 340 million RMB in 2016(about 54 million USD);
- 410 million RMB in 2017(about 65 million USD);

Customers:

- National/Provincial Radio Management Bureau(e.g. SRMC);
- Administration of Radio, Film and TV;
- Civil Aviation;

Status :

- A market-leading supplier of the radio spectrum management and monitoring sector in China;
- Market shares: >30%

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products

- Overview
- Fixed/Mobile Station
- Transportable System
- Drone Detection and Jamming System

Overview

Receiver:

Antenna

Overview

Fixed/Mobile station

Others

Fixed/Mobile Station

A: Ten-Channel Multi-Mode Monitoring and DF System

A system can be used to detect co-channel signals in complex electromagnetic environments with outstanding performance.

Characteristics & Functions:

- Co-channel signals DF and same frequency signals DF by spatial spectrum estimation DF method;
- Separate up to six co-channel signals at a time;
- With spatial spectrum estimation DF method and correlative interferometer DF method;
- Minimum DF time is less than 0.5ms;
- ITU measurement;
- Signal search;
- ……

Fixed/Mobile Station

A: Ten-Channel Multi-Mode Monitoring and DF System

A system can be used to detect co-channel signals in complex electromagnetic environments with outstanding performance.

Main Specification

Monitoring Part	
Frequency range	Vertical polarization 20MHz-8GHz
Phase noise	≤-120dBc/Hz@10kHz
Maximum IF bandwidth	40MHz
Scanning speed	200GHz/s(step width=25kHz)
Direction Finding Part	
Frequency range	Vertical polarization 20MHz-3GHz (can be extended to 8GHz)
DF accuracy	≤1°
Maximum number of identified co-channel signals	6

Note: Horizontal polarization(40MHz-1GHz) is optional for DF and monitoring

Fixed/Mobile Station

B: Tri-Channel Monitoring and DF System

A system is composed of dual-channel DF sub-system and single-channel monitoring sub system.

Characteristics & Functions:

- Dual-channel correlative interferometer DF method;
- Provide various signal analysis tools such as eye diagram, constellation diagram and bit stream, 3D-time frequency diagram;
- High DF accuracy and short minimum DF time;
- Reducing impact to DF from interference signals;
- ITU measurement;
- IF spectrum analysis;
- DF and target location;
- Signal tracking, monitoring and record;
- ……

Fixed/Mobile Station

B: Tri-Channel Monitoring and DF System

A system is composed of dual-channel DF sub-system and single-channel monitoring sub system.

Main Specification

Monitoring Part	
Frequency range	Vertical polarization 20MHz-8GHz
Phase noise	≤-120dBc/Hz@10kHz
Maximum IF bandwidth	40MHz
Scanning speed	≥80GHz/s(step width=25kHz)
Direction Finding Part	
Frequency range	Vertical polarization 20MHz-8GHz
DF accuracy	≤1.5°
Minimum DF time	≤3ms
DF sensitivity	≤10μV/m
Note: Horizontal polarization(40MHz-1GHz) is optional for DF and monitoring	

Fixed/Mobile Station

C: Dual-Channel Monitoring and DF System

A system is composed of single-channel DF sub-system and single-channel monitoring sub system.

Characteristics :

- single-channel correlative interferometer DF method;
- Reducing impact to direction finding from interference signals;
- High DF accuracy and short minimum DF time;
- Provide various signal analysis tools;
- ……

Functions:

- ITU measurement;
- IF spectrum analysis;
- DF and target location
- Signal tracking, monitoring and record;
- ……

Fixed/Mobile Station

C: Dual-Channel Monitoring and DF System

A system is composed of single-channel DF sub-system and single-channel monitoring sub system.

Main Specification

Monitoring Part	
Frequency range	Vertical polarization 20MHz-3GHz
Phase noise	≤-120dBc/Hz@10kHz
Maximum IF bandwidth	40MHz
Scanning speed	≥40GHz/s(step width=25kHz)
Direction Finding Part	
Frequency range	Vertical polarization 20MHz-3GHz
DF accuracy	≤2°
Minimum DF time	≤15ms
DF sensitivity	≤10μV/m
Note: Horizontal polarization(40MHz-1GHz) is optional for DF and monitoring	

Transportable System

A transportable monitoring and DF system allows fast searching, DF and location of nearby radio transmitter.

Characteristics & Functions:

- Dual-channel correlative interferometer DF method;
- It can be carried and deployed easily;
- Multiple use: transportable, handheld or mobile mode;
- High DF accuracy and short minimum DF time;
- ITU measurement;
- DF and target location(including single station location and triangulation);
- Signal tracking, monitoring and record;
- ……

Transportable System

A transportable monitoring and DF system allows fast searching, DF and location of nearby radio transmitter.

Main Specification

Monitoring Part	
Frequency range	Vertical polarization 20MHz-6GHz
Phase noise	≤-95dBc/Hz@10kHz
Maximum IF bandwidth	20MHz
Scanning speed	≥3GHz/s(step width=25kHz)
Direction Finding Part	
Frequency range	Vertical polarization 20MHz-6GHz
DF accuracy	≤2°
Minimum DF time	≤3ms
Power supply	≥4 h(receive mode) ≥2 h(DF mode)

Intelligent Radio Monitoring Network System

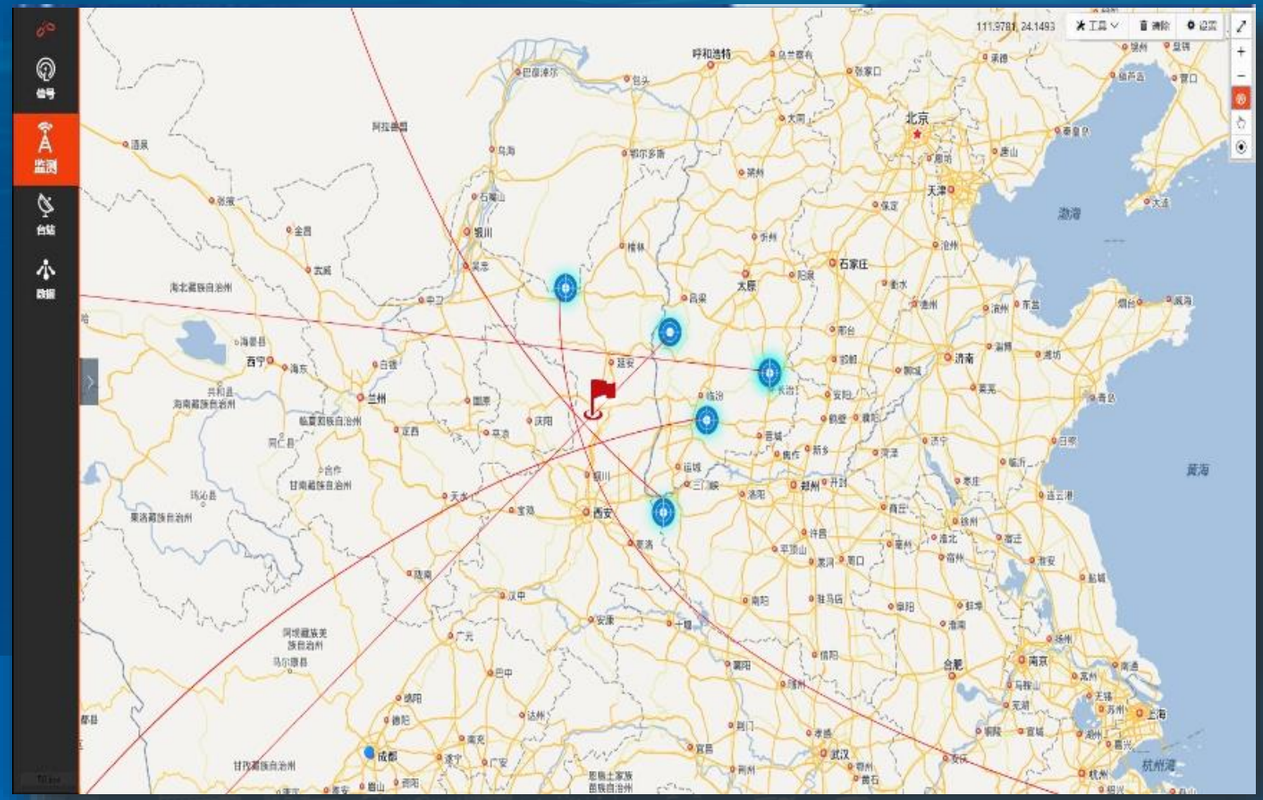
A software system can fix the major challenges with the radio management authorities at present.

Challenges :

- Difficult integration with heterogeneous system;
- Passive and insufficient monitoring means;
- lack of basis for business decision making;
- Inadequate command and dispatch capabilities;
- ……

Functions:

- Solve problems with device networking and integration;
- 24-hour radio monitoring data collection and automatic monitoring capabilities;
- Powerful supports to intelligent radio management based on mass data and cloud calculation technology;
- ……



Drone Detection and Jamming System(DDJS)

A system can cope with drone security threats by using radio spectrum detection technology.

Challenges :

- Low transmitter power and weak signal strength;
- RC signal frequency band is 2.4GHz or 5.8GHz;
- Using FHSS technology with low intercept probability ;
- ……

Characteristics of Drone Radio Signal	
The main frequency band	ISM 2.4GHz and 5.8GHz(more than 90%)
Radio Control Transmission System	FHSS(frequency-hopping spread spectrum) system WLAN (Standard wireless LAN technology)
Burst length	0.5ms-5ms
Frequency hopping rate	90 hopes/s-300 hopes/s

Drone Detection and Jamming System (DDJS)

A system can cope with drone security threats by using radio spectrum detection technology.

single station composition

Receiver

Azimuth DF antenna
and monitoring antenna

Elevation DF antenna
and monitoring antenna

jamming equipment
（optional）

Drone Detection and Jamming System (DDJS)

A system can cope with drone security threats by using radio spectrum detection technology.

Characteristics & Functions:

- It can be deployed in radio sensitive areas;
- Early warning;
- Flight trajectory drawing and playback;
- Multi-target identification and tracking;
- Automatically guide the jamming equipment;
- Integrate with radar, photoelectric and other detection methods;
- With far detection distance and wide detection range;

Drone Manufacturer

Integrate other detection method

Drone Detection and Jamming System (DDJS)

A system can cope with drone security threats by using radio spectrum detection technology.

Characteristics & Functions:

Main Specification	
Frequency range	Vertical polarization 300MHz-6GHz
Target capture time	≤2s(typical value)
Maximum drone detection distance	7km
DF accuracy	≤1.5°
Identification accuracy rate	90%
Jamming mode	driving it away or forcing it landing
Jamming distance	≥1.5km
Weight	Receiver is 27kg and antenna is 6kg

Drone Manufacturer

Integrate other detection method

Case Presentation

Command Vehicle
Dalian Radio Management Bureau

Command Vehicle
Tibet Radio Management Bureau

Case Presentation

Mobile Station
Guizhou Radio Management Bureau

Mobile Station
Liaoning Radio Management Bureau

Case Presentation

Fixed Station
Yunnan Radio Management Bureau

Fixed Station
Heilongjiang Radio Management Bureau

Thank you for your listening!

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