

# comtest

wireless europe

**Wireless Design and optimisation services**



## Introduction

Established in May 2003, CWE is a joint venture between Comtest Wireless Italy and senior Agilent engineering and business development staff.

Although a new alliance, CWE personnel have over ten years of international experience in the sale of test and measurement equipment; and the testing, optimisation and design of wireless networks to both Network Operators and Equipment Manufacturers.

CWE personnel have been involved at the forefront of network test equipment design for GSM/GPRS and UMTS networks. Extensive work has been carried out throughout the world including the first European UMTS network (Isle of Man) and UMTS networks in Japan.

An understanding and appreciation of quality standards, key market conditions and product development complements this wealth of experience.



As well as a unique access into Agilent as an Authorised Value Added Reseller, CWE links to Comtest Wireless Italy, which provides access to a dedicated team of support staff, a Research and Development team of engineers and the state of the art test and measurement equipment.

By utilising this equipment and methodology and by building upon the engineering skills of its highly focused team, CWE provides not only second to none engineering standards, but also cost effective, innovative solutions to their client base.

## Services

CWE offer a comprehensive list of services to the wireless industry that include all aspects of network design and optimization. As a value added reseller of Agilent equipment we are placed to utilize the latest service offering and also with our own team of research and development engineers CWE can quickly adapt to our clients future requirements by designing new measurement tools.



CWE is committed to industry quality of its projects and uses qualified Prince2 Project management methodologies to ensure compliance and successful completion of all our projects.

With its highly experienced team CWE engineering services are uniquely placed to provide you with:

- ❑ Vendor Selection studies
- ❑ Deployment management
- ❑ Data Services Benchmarking for GPRS and UMTS
- ❑ Voice Benchmarking
- ❑ Radio Network Planning
- ❑ Transmission Planning
- ❑ Network Optimisation (GSM,GPRS and UMTS)
- ❑ Indoor Design Solutions for GSM and UMTS systems
- ❑ Radio Surveys
  - Site validations
  - Test Transmissions
  - Enhancer Surveys
  - Railway Surveys
  - Frequency Scans
- ❑ Electromagnetic field radiation measurements
- ❑ Technical training and consulting
- ❑ Turnkey network planning services

## Indoor Design Solutions for GSM and UMTS systems

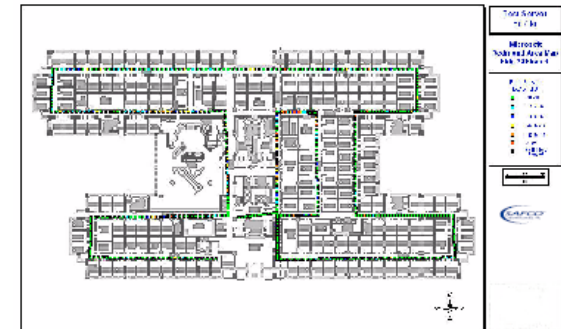
Indoor solutions are the ideal method of providing extra capacity for indoor traffic hot spots. CWE personnel have had experience not only designing some of the largest indoor solutions in Europe but also developing the necessary software and tools necessary to make indoor designs. CWE staff has had experience in developing indoor solutions across Europe in:

- ❑ Railway Stations and Motorways Services
- ❑ Airports and ports of entry
- ❑ Shopping Centres and Exhibition Halls
- ❑ Corporate Building
- ❑ Tunnels



Utilising a multitude of technologies from passive/active distributed antenna systems and leaky feeders systems. CWE can provide the best coverage or capacity solution for the right environment. CWE services for indoor design include:

- ❑ Radio design
- ❑ Installation
- ❑ Verification
- ❑ Existing indoor solution optimisation (GSM, GPRS and UMTS)

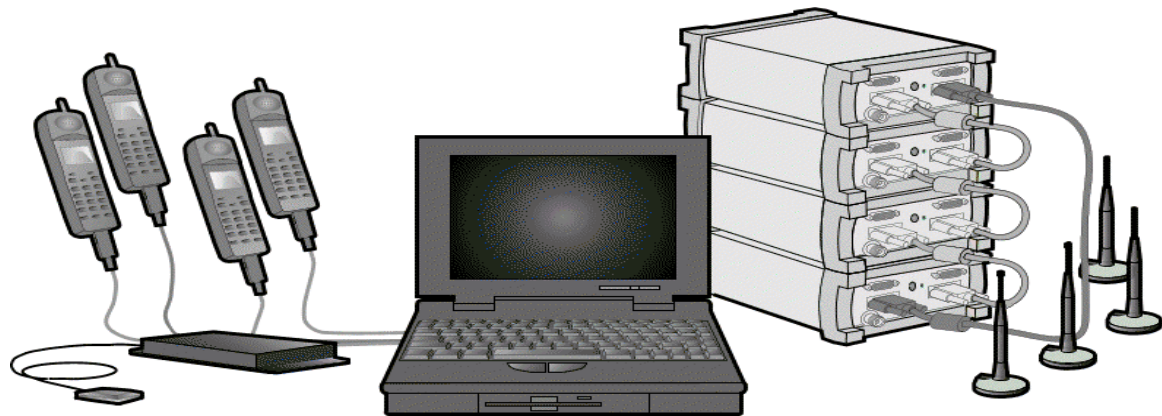


## Voice Benchmarking

Keeping a competitive edge in today's evolved networks requires vision. You need to know your own position in relation to your competitors network. CWE can provide you with this insight.

CWE's standard voice report contains relative ranking of the measured operators with regards to quality, coverage and performance and is presented in a statistical format in all measured area.

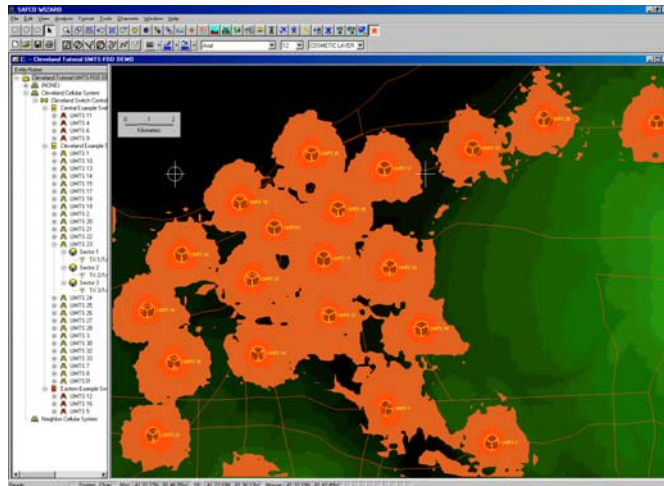
By outsourcing to CWE, you will gain our expertise in network performance analysis and evaluation. You will be able to determine how your voice network is being perceived and how they compared to your competitors. CWE presents these findings in wireless network reports that are customised to your requirements.



## Turnkey UMTS

CWE personnel have a collective experience of CDMA technology, having designed and/or optimised IS-95, JCDMA and CDMA2000 systems internationally.

UMTS designs are unique to ensure that they provide a diverse range of consumer based services at differing data rates and quality requirements. Network capacities must be dimensioned between voice and data service types to ensure positive client perceptions and effective resource management. CWE provides designs to meet these challenges which incorporate the crucial optimisation of key network parameters.



Each design considers the financial, technical, marketing and scheduling constraints apparent in any project. Clearly provision of high-end data services must be balanced with the financial implications.

CWE acknowledges these constraints and works in partnership with clients to decide the most appropriate way forward. In doing so, CWE ensures the application of accurate propagation parameters, link budgets, scrambling code plan, intelligent use of available sites and a suite of reliable UMTS analysis will set the foundations for a robust and highly optimised design.

As an independent service or as an integral part of the turnkey process CWE can provide:

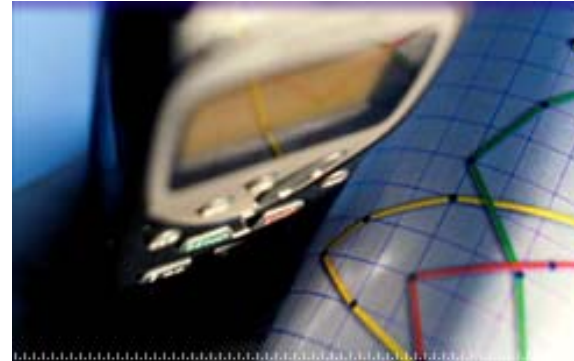
- ❑ Drive Test Measurements to determine cluster/system performance for both voice and data
- ❑ Site Validation
- ❑ Test Transmissions and CW Measurements
- ❑ UMTS Competitive Benchmarking

## GPRS end to end testing

In order to effectively evaluate the performance of a GSM/GPRS network, CWE uses a multi-platform setup that, based on the user's perception of network quality, allows identification of two basic types of problems:

- ❑ Voice and data problems associated with the health of the air interface
- ❑ Voice and data problems associated with the health of the "fixed" network

This multi-platform data collection engine includes drive test equipment as well as fixed terminals that are set up to collect both air interface and fixed network information in unison. The collected information is feed to custom scripts that filter, sort, and manipulate the data. Once this data post-processing is completed, the areas of poor network performance can be easily identified and evaluated.



In evaluating the network and identifying the problem areas, CWE uses a "top-to-bottom" approach throughout the test, which comprises of the following criteria:

- ❑ Service Level Management and Monitoring
- ❑ Performance Management and Monitoring
- ❑ Troubleshooting

## Radio Surveys

At CWE we have access to all the latest test and measurement equipment from:

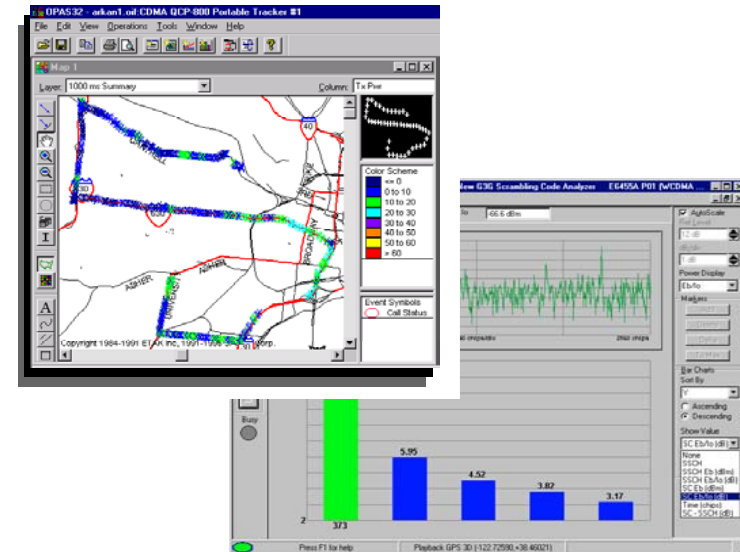
- ❑ High Power CW Transmitters
- ❑ Scanning Receivers
- ❑ Spectrum analysers
- ❑ Base station test sets etc.



CWE pride themselves in not only providing you with the post processed data, but also providing the analysis of the data to provide you with the required recommendation. Freeing time spent by your engineers

Some of the services on GSM and UMTS we can offer include:

- ❑ Competitive Benchmarking
- ❑ Site validation
- ❑ Test Transmissions
- ❑ Cluster testing
- ❑ Enhancer Surveys
- ❑ Railway Surveys
- ❑ Electromagnetic field radiation measurements



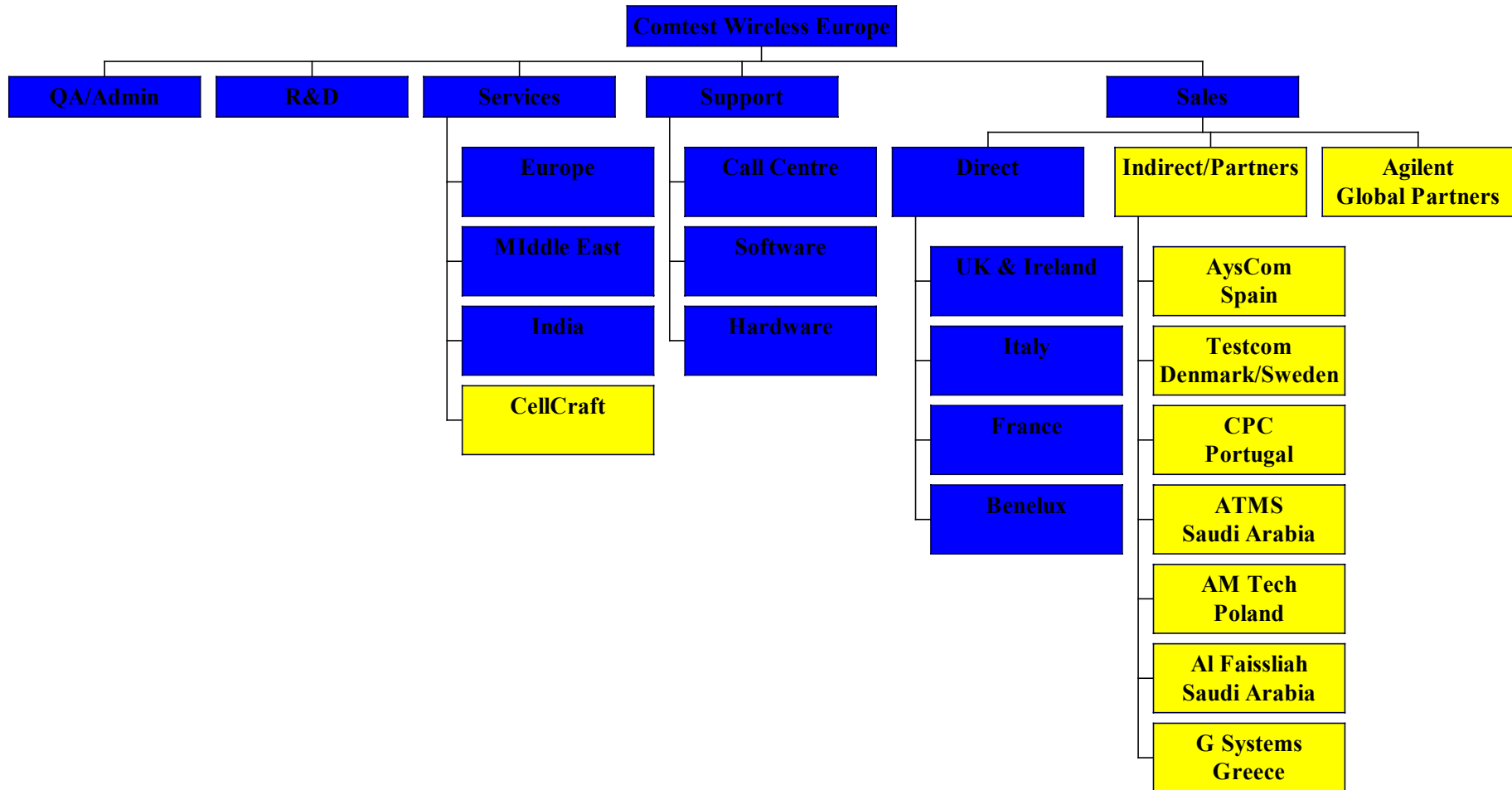
## Experience

CWE staff have worked internationally to deliver communication based projects and therefore bring a wealth of experience to the services provision on offer. The management team alone has over 60 years of combined experience in wireless services. The following provides a brief summary of projects CWE staff have undertaken.

- Site validation of 35 UMTS sites for a network operator in Sweden. The project included the set up of test transmitters, rigging, data collection, and post processing and report generation. Sites included existing structures and cherry pickers.
- Site validation of over 200 GSM sites for a UK operator on green field site, radio masts, tunnels and existing buildings.
- Designed and built over 100 in-building schemes in some of the most prestigious buildings in the UK. Designs included passive, active and hybrid systems.
- Propagation model optimization in Bulgaria. This project included data collection post processing and model calibration.
- Set up and delivered the first UK UMTS competitive benchmark report for all UK operators using the Agilent drive test solution. The drive test included the entire motorway network and every major city.
- GPRS benchmark for of all the UK operators that provided true user perspective measurements in mobile and static locations. This provided true end-to-measurement campaign on live network servers.
- Competitive voice benchmark campaign in the UK and in over 6 countries across the world. The reports included MOS scores and statistical analysis of call events with a break down all failures.
- Radio network design of over 100 sites in the UK which included nominal design, link budget analysis, search area creation, candidate analysis and final configuration planning.
- Singapore - Performed in-building propagation measurement and design services for 40+ buildings using client micro-cell BS equipment and optical fibre distributed antenna arrangements.

## Offices and Partners

CWE has offices in the UK, France, Italy and Benelux. As an Agilent value added reseller we have partners based in each European country.



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**Agilent Technologies**

*Channel Partner*