

Transfinite Systems Engineering Training Guide

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Managers Handbook



TRANSFINITE
SYSTEMS

Training for the Future

Your engineers are your greatest asset. They are the key to the future of your organization and deserve the best equipment and environment you can provide for them. Basic skills and technical expertise are a pre-requisite and can often be acquired on the job. However in many cases the learning curve is so steep that structure training is the best option.

Transfinite provides in-depth training in the methods of radio interference analysis and in the procedures of the ITU (covering both satellite notification and study group work). Our courses include, but are not restricted to, hands on training with the software products in our Visualyse range

Our intensive training courses, on your site or in our offices in London, can quickly get your staff to a level of competence that even the brightest self starter would take weeks to reach.

Transfinite Training is suitable for all levels of staff, whatever their background.

Our courses include:

- Course 101 - A Comprehensive Course in Satellite Coordination Methods and Procedures – the whole course lasts 10 days, but you can select sections of the course that suit your requirements
- Course 201 - Basic Introduction to Interference Modelling. A 3 day tutorial type course aimed at graduates or experienced engineers new to the field of interference analysis.c
- Course 202 – GSO Satellite Coordination.
- Course 301 - A Visualyse Overview. A one day seminar type presentation aimed at programme managers and technical managers who need to know what the software can do.

Problems Facing Programme Managers

- aggressive timescales
- tight budgets
- international meeting deadlines
- limited staff, limited resources
- difficulty finding and retaining suitable staff
- rapidly changing study requirements and goals

- Course 302 – General Introduction to Visualyse Professional
- Course 303 – Hands on training in Visualyse Advanced Features
- Course 304 - Hands on training in our satellite coordination tool Visualyse GSO
- Course 305 - Hands on training with our earth station coordination tool Visualyse Coordinate
- Course 401 - Tailored Training. A less formal type of course completely tailored to your company's needs. Usually a set of hands on examples and tips, this course is aimed at engineers who have a specific job to complete or a definite area to study. This course is not necessarily for advanced users – you will learn all you need to know to get the job done.

Training is Continuous

Transfinite Training course do not run just for the few days you spend with the instructor. Prior to attending the course our instructor will try to find out as much as possible about your background and your needs. This is a great help in setting the course at the right level and in selecting exercises to use during the course.

This pre-screening is an essential part of the preparation and we are prepared to spend as much time as needed to get it right.

Once the actual training is over, you can contact Transfinite with questions at any time by email or by phone.

We are always happy to set-up refresher sessions if you feel these would be helpful – refresher sessions are made to order and tailored precisely to your needs.

Advantages of Training

- optimise limited resources
- adapt to changing goals
- increase productivity, freeing staff time to concentrate on problem domain
- improve staff morale and help retain staff

Quality is Assured

Course content is tried and tested, and developed systematically by a team including

- product developers,
- the instructor
- and consultants.

This ensures that course content is relevant and up to date, and, for the software based courses that the latest features are used to help solve currentl problems.

Our instructors are experts in ITU methods and Procedures, Visualyse Software and in interference and communications analysis in general. All our instructors have many years experience in the subject area and are drawn from a small pool of Transfinite professional staff and associated consultants.

For tailored training, the instructor will spend several days working up examples prior to the course. Working in conjunction with the course attendees and their program manager he will assure that the course content is relevant and accurate.

If, once the course is finished you feel it was inappropriate or not what you needed or asked for, please contact us to discuss a full refund.

Training for your Goals

At Transfinite Systems we know how difficult it to find and retain staff with the skills needed to get the job done. That's why we place a high value on training – both on the job training and structured formal training. On the job training is essential in most organisations because there is so much to learn and this takes time. The role of the formal training we provide is to develop the necessary basic skills needed

That's also why we understand the problems facing the technical manager and program manager within an organization such as yours. We know that training has to be targeted and specific to your goals. It must also be cost-effective and deliver clear benefits in terms of skills and staff

Our first job at Transfinite Training is to identify your training need and to propose a solution for your team. We offer many types of training suited to all levels of expertise and all backgrounds, and it is important to make sure the training meets your business goals. We would like to discuss this in detail with you before we recommend a suitable course structure. However, the table below gives some indications of when our training courses may be suitable to your needs

Your Requirement	Our Solution	Transfinite Training Courses
You have new staff who will need broad knowledge of satellite coordination, terrestrial coordination, ITU-R processes and interference analysis	We have a 10 day training course in coordination procedures, ITU-R methods and interference analysis. We base the course on our own software but can also provide instruction in the ITU packages Space Cap and MSPACE if you require.	101 - Comprehensive Training
You have bought several copies of Visualyse for a team of engineers who will be working on different projects. You're not sure how Visualyse will be used on each project.	The Visualyse Overview Seminar will give you a very good idea of the capabilities of the software. The General Introduction to Visualyse course for all the engineers who will be using the software is essential. Tailored training on a per project basis – once the engineers are familiar with the software – will ensure that the maximum benefit is gained.	301 Overview – for the technical managers, project managers and engineers. 302 General Introduction – for all the engineers who will use the software 401 Tailored Training –
Your company has hired a new recruit to work in interference analysis. Probably this person would benefit from being proficient in simulation and modelling, but presently they don't have the experience or skills	The Basic Introduction to Interference Modelling will introduce the recruit to modelling concepts and basic theory. The General Introduction to Visualyse and the Visualyse Advanced Features course will complement the theory and concepts with hands on training in use of the simulation	201 Basic Introduction to Interference Modelling 302 General Introduction to Visualyse 303 Visualyse Advanced Features
You have just bought some of our software and need to get your engineers going with it	Hands-on training courses are the best way to get started quickly. You may also need to provide some background training in the processes and procedures	Course 202 + 304 for satellite coordination Course 305 for Earth Station coordination
Your staff have used Visualyse in the past but not looked at it for some time. They now have some day to day need to use it now.	The General Introduction to Visualyse covers all the basic features of the software. As a refresher course it covers all aspects of Visualyse Professional and allows you to ask questions about features you would like to understand in more detail	302 General Introduction to Visualyse
You have a specific job that you need to do, e.g. you company is working on the development of a new satellites system and the licensing process requires specific interference analysis/coordination. You don't have in depth experience with Visualyse.	A tailored training course is ideal in this situation. Normally a 3-5 day hands on course, concentrating on specific features and examples, this course will take staff of any level and train them to get the job done.	401 Tailored Training

Table 1 – some training options to match your requirements

Locations

Training can be provided at our offices in Croydon, south of London. Alternatively the instructor can visit your site or a hotel close to your site if you don't have facilities available.

Pricing

Course pricing varies depending on course type and location. For courses delivered at your offices we will need to add travel and subsistence costs for the trainer.

We also offer discounts if you take a series of courses over a 12 month period – ask about our Training Passports.

Course	Location	Duration
101 Comprehensive Training in Coordination and Interference Analysis	London	10 days
201 Basic Introduction to Interference Modelling	London	2 day
202 GSO Satellite Coordination	London	3 days
301 Visualyse Overview	On site	1 day
302 General Introduction to Visualyse	London/on site*	3 days
303 Visualyse Advanced Features	London/on site*	2 days
304 Visualyse GSO	London	2 days
305 Visualyse Coordinate	London	2 days
401 Tailored Training	London/on –site	

Annex - Course Descriptions

101 - Comprehensive Training in Coordination and Interference Analysis

This course covers satellite and earth station coordination and general aspects of interference analysis. Theoretical and procedural background materials are presented with exercises. Practical applications are given and detailed tuition in the use of our three software packages is provided.

The course duration is 10 days

The course is suitable for students at all levels of experience.

Course contents are given below in outline

- The ITU and the coordination process
- Satellite Systems and Link Budgets
- Interference Analysis
- The Satellite Coordination Process – background
- Hands on Visualyse GSO Software – applications to satellite coordination

- Hands on Visualyse Coordinate Software
- General interference modelling and theory
- Hands on Visualyse Professional Software

Background Theory, Methods and Procedures Training

201 - Basic Introduction to Interference Modelling

This course covers the theoretical background to interference analysis. It is independent of our software packages and serves as an introduction to calculational methods and current issues. Course duration is 1 day.

In conjunction with course 302 (General Introduction to Visualyse Professional) this will provide you with the back grounds and software skills needed to develop and analyse complex interference modelling scenarios.

DT/T analysis

Details of the DT/T calculations are explained

C/I analysis

The more complex and useful C/I approach is introduced

Interference with terrestrial services - satellite pfd

Interference with terrestrial systems is an important issue. Here we discuss the application of satellite pfd masks and the protection of terrestrial services

Interference with terrestrial services - earth station coordination

The operation of an earth station has implications for interference with terrestrial systems. Here we discuss Appendix S8 and the use of software for earth station coordination

Non-GSO and HEO constellations and systems

Non-GSO and HEO systems present a difficult problem for the GSO operator. Major issues are discussed

202 - GSO Satellite Coordination

This course provides an detailed introduction to the procedures and methods of GSO satellite coordination. Background materials are independent of any software, but exercises are illustrated using our product, Visualyse GSO

The course covers background theory and also ITU-R rules of procedure. The course is suitable for people new to the field and also those with experience who want to learn how to apply our software to the process.

The course lasts 3 days and covers the following topics

Background to The Coordination Process

- Satellite services
- Objectives of frequency/orbit management
- Frequency allocations
- Publication of networks and the initiation of coordination
- Role of the BR and the backlog
- Overview of satellite coordination
- Work of the ITU-R: study groups and working parties

Theoretical Background

- A review of Appendix S8

- Recommendations ITU-R 738 and 739 discuss how to apply interference analysis to satellite coordination – they are reviewed here.
- Details of the DT/T calculations are explained
- The more complex and useful C/I approach is introduced
- The concept of interference thresholds and the calculation of interference margins is explained
- The need to combine up and down link calculations is discussed.
- Mitigation techniques are reviewed.

In addition, the course can include a Mock-coordination exercise which will use examples from our software package Visualyse GSO. This course may be taken together with Course 304 to give you a complete package of background training and software training.

Software Training

301 - Visualyse Overview

This one-day introduction gives you a complete overview of the types of application that Visualyse Products can be used for.

It covers

- Visualyse Professional – a tool for general interference modelling and study work.
- Visualyse GSO – a tool for the GSO satellite coordination engineer
- Visualyse Coordinate – our earth station coordination tool

This course is aimed at technical managers who need to know what tools are available and what capabilities they have.

It is not a hands-on course and will not show you how to use the software in detail.

302- General Introduction to Visualyse Professional – Software Training

This three day course is a structured introduction to the use of Visualyse Professional Version 5. It is suitable for absolute beginners and also for users with some experience.

The course is based around a presentation of powerpoint slides and the hands on development of several spectrum sharing scenarios on a step by step basis.

By the end of the course, the student will be able to analyse sharing scenarios and develop Visualyse models of these scenarios.

303 - Visualyse Advanced Features – Software Training

This course is aimed at advanced users who need guidance in use of the software for specialist analysis. Course content will be developed by the tutor in response to your requirements.

Course duration is usually 1 or 2 days, but this is variable depending on the breadth and depth of the materials covered.

Students are assumed to be familiar with the development of Visualyse models to the level provided by the General Introduction to Visualyse Professional.

304 - Visualyse GSO – Software Training

Two days hands on training in the use of Visualyse GSO, satellite coordination tool.

The course covers

- Management of IFIC databases and circulars
- Coordination trigger analysis
- Detailed coordination analysis

- Custom analysis of a network vs. SRS
- Definition and management of your own networks

You may consider this course in conjunction with course 202 which gives the theoretical background and an introduction to satellite coordination procedures.

305 - Visualyse Coordinate – Software Training

This two day course covers earth station coordination using Visualyse coordinate. It includes an overview of the process plus detailed hands-on training with the software.

The course covers:

- Background materials – an overview of coordination contours
- Definition of your earth station and generation of coordination contours
- Interference Analysis
- Linking to Sharing Databases
- Linking to Terrain Databases

401 - Tailored Training

Transfinite can take any combinations of the above courses and develop new materials for your business needs. We are happy to assess the current level of your training candidates and propose tailored training in the necessary areas.

Please contact us to discuss how we can help.