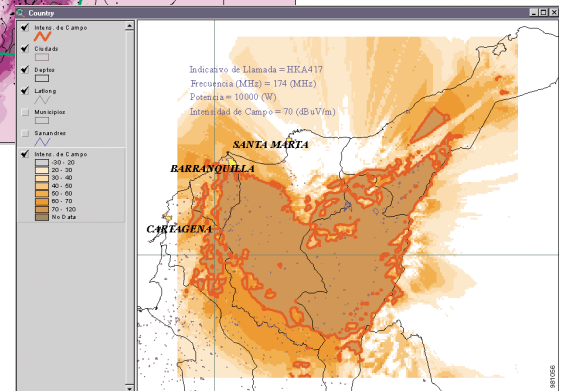
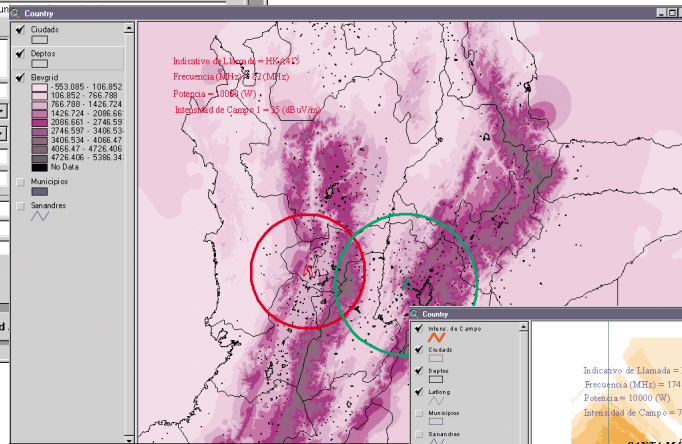


Application Form

Application Information	Client Information
A# 28685	Client Type Applicant
Status Pending	Last Name [Redacted] First Name [Redacted]
Application Type New Service	National ID No. [Redacted] City Issued [Redacted]
Application No. TCI-4302	Company Technology for Commu. [Redacted]
License Type Private New	Business Address
Application Priority 2	Street 222 Caspian Dr.
Service Nature CV	District [Redacted]
Service Class Mobile	City Sunnyvale
Date of Application 9/11/1998	State California
Operation Area Santa Clara Valley	Zip Code 94089
Notes: Application for license to broadcast low-power signals for test of SMS and DF systems	Country USA
	Telephone No. 408-747-6100
	Fax No. 408-747-6101
	Date 9/11/1998

TCI software streamlines all spectrum management tasks, from processing license applications to conducting engineering analysis studies and displaying the results.



The TCI Model 710 Spectrum Management Software provides automated ITU-compliant turnkey spectrum allocation and regulation of RF usage in compliance with its governing regulations. Comprehensive administrative, engineering analysis, map display, and accounting functions enable easy and efficient spectrum management from frequency assignment through the processing of license applications, notices, invoices, fees and fines, and reports.

A unique advantage of the 710 software is the seamless integration it provides between spectrum management and monitoring functions. TCI is the world's only supplier of systems in which spectrum management and monitoring are fully integrated.

The 710's powerful relational Database Management System assures data integrity, consistency, and security. Engineering Analysis tools assist operators in evaluating propagation, path loss, terrain profile, intermodulation products, and electromagnetic compatibility. Geographical Map Displays present DF results and field strength contours on detailed geographic maps to facilitate spectrum assignment and analysis. Powerful query forms allow customized data selection. Autodiagnosics assure reliable operation.

Tasks are performed via easy-to-use screens. When installed in a multi-workstation system on a Local Area Network (LAN), the 710 optimizes productivity by making all spectrum management resources rapidly accessible system-wide. It also offers the ideal means for upgrading or expanding the spectrum management system since software upgrades are far easier to implement and less costly than new hardware.

- Automated turnkey operation
- ITU-compliant
- Unique seamless integration with spectrum monitoring
- Multi-level security
- Comprehensive reporting
- Cost-effective system upgrades

Automatic functionality... that's very easy to use

Rapid spectrum assignment is the key to encouraging licensed RF usage—and generating the revenue it brings. TCI's 710 software enables Spectrum Management System administrators to achieve these goals by streamlining and automating every SMS task. Efficiency is “designed into” the software, from processing licence applications and allocating frequencies to invoicing fees and printing reports. System security is equally assured, with multiple security groups offering many levels of database access.

Seamless Integration of Management and Monitoring

Effective spectrum management requires effective monitoring. Ideally, management and monitoring functions interface seamlessly, making it easy for management administrators to task monitoring stations and use monitoring results to verify compliance with spectrum usage regulations.

TCI is unique in providing a seamless interface between the two systems. It's 710 spectrum management software has been designed and field-tested to provide full integration with TCI monitoring software and equipment assuring consistent and reliable performance of every management task.

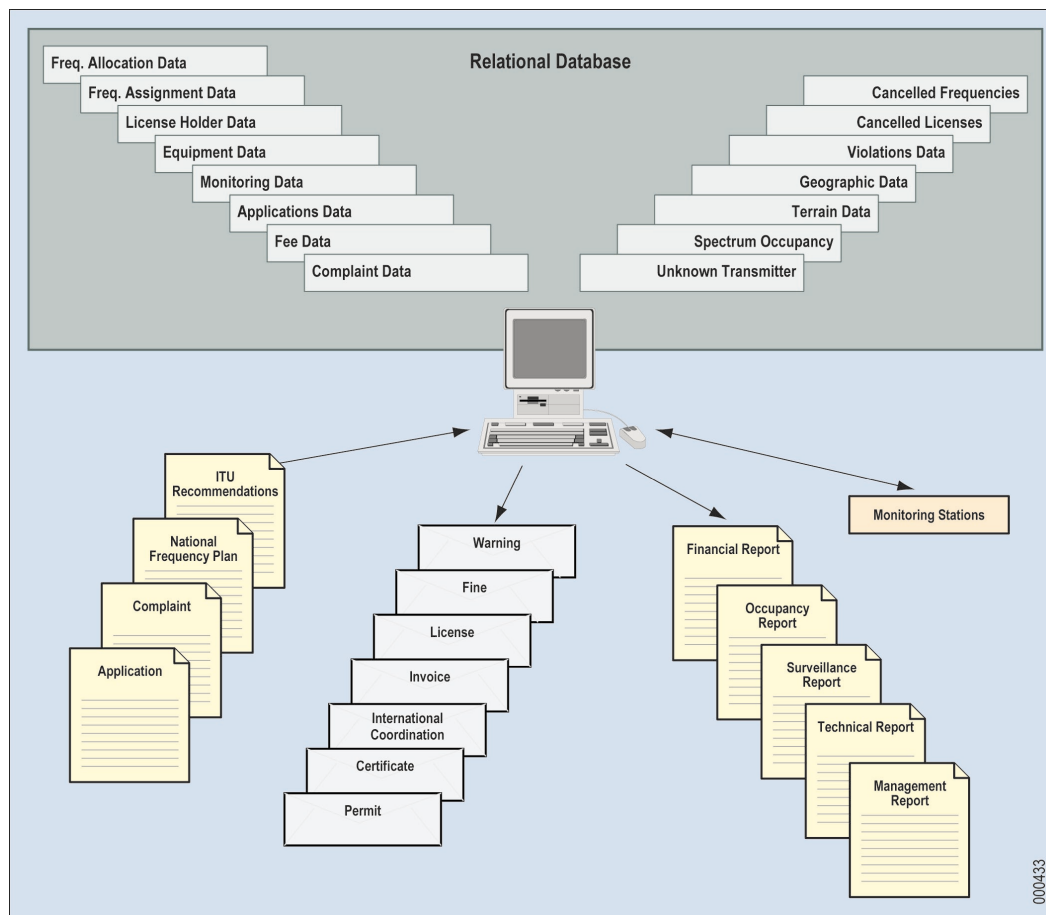
Easy Operation, Enhanced Productivity

Tasks are performed via easy-to-use graphical screens. Administrators, supervisors, and operators have at their fingertips access to all data, management functions, and analysis tools required for effective spectrum management. “Smart” software guards against error by automatically rejecting invalid data.

Multiple screens can be displayed simultaneously, so operators can move back and forth between them to complete tasks quickly. The same format is used for all screens, reducing the need for training and enhancing staffing flexibility to optimize human resources.

The Right Tools

Frequency assignment and usage monitoring are easy when you have the right tools. The 710's complete toolset enables operators to use database information on licensed transmitters and geographical features to complete all spectrum engineering tasks. Engineering analysis tools enhance operator efficiency in identifying channels available for licensing, responding to requests from a neighbor country for border coordination, investigating interference complaints, and performing all other radio signal analysis tasks required for RF assignment and usage in accordance with ITU-R SM1370 recommendations of 1998 and national and local regulations.



Spectrum management via software: Any workstation can receive applications and complaints, search the database, task monitoring stations and receive their measurement results, and issue reports and notices.

Spectrum management is seamlessly integrated with monitoring, making it easy to task mobile stations to investigate emitters and verify compliance with licenses (Automated Violation Detection).



Automatic Violation Detection Results

Station Name: NFS15V

Task	Date	Time	Date	Time	Status
4263	05/11/00	17:55	05/11/00	17:58	Completed
4264	05/11/00	19:25	05/11/00	19:28	Completed

AVD Results: Task 4264, Station NFS15V

Chn	Freq	Result	Freq	Dev Hz	%Occp	BW kHz
2	89.1	40 Not Found	46 000	0	0	0.0
3	89.3	60 Compliant	89 299	259	100	120.2
4	89.5	70 Not Found	70 000	0	0	0.0
5	89.7	80 Compliant	90 700	557	100	98.4
6	90.1	90 Compliant	90 100	114	100	89.4
7	90.5	110 Compliant	90 499	163	100	153.6
8	90.7	120 Not Found	120 000	0	0	0.0
9	91.1	130 Compliant	91 100	149	100	67.4
10	91.5	140 Compliant	91 499	461	100	94.5
11	92.3	Unlicensed (High Usage)	92 887	495	100	101.4
12	92.3	160 Compliant	92 300	906	100	147.4
13	92.5	Unlicensed (High Usage)	92 456	5944	100	161.7
14	93.3	190 Compliant	93 299	418	100	120.2

Detailed Reports Generated Automatically

Creation of the many types of reports required for efficient spectrum management is expedited via a Report Processing function. Both text and graphic reports can be generated for:

Administrative tasks

(e.g. licensing notices, invoices, correspondence)

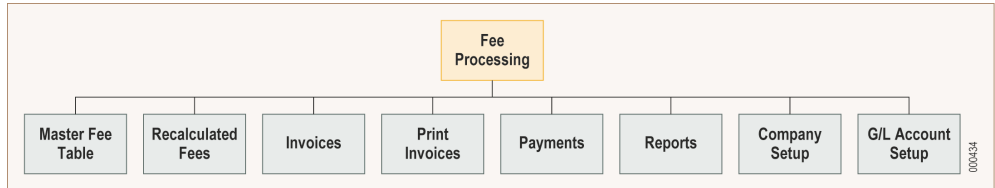
Engineering analysis results

(e.g. field strength, terrain profile, interference, band allocation, EMC computation)

Statistical accounts of relevant data

(e.g. number of applications approved, pending, incomplete, or rejected; license status; financial records; and complaints received, resolved, and rejected).

Standard reports can also be customized. Operators use the powerful query capabilities supplied with the system to specify data criteria in customized reporting.



Comprehensive fee processing software accelerates revenue generation

Reliable Operation, Affordable Upgrades

System software includes autodiagnostic tools that assure reliable operation. And TCI 710 software enables a spectrum management to keep pace with increased RF usage and technological advances quickly and affordably simply by upgrading software instead of purchasing new hardware.

VHF/UHF Analysis Tools

Transmitter

Latitude: 32 24 6 N

Longitude: 122 1 32 W

Power (W): 10

Frequency (MHz): 162.55

Line Loss (dB): 2

Antenna Height (m): 20

Main Beam Direction: 332

Antenna Type: Horizontal Log-Periodic

Antenna Parameters:

Horizontal Log-Periodic:

3dB Vertical Beam Width: 120°

3dB Horizontal Beam Width: 70°

Power Gain (dB): 6

Side Lobe Level (dB): -12

Receiver

Latitude: 32 25 43 N

Longitude: 122 6 52 W

Sensitivity (dBm): -93

Line Loss (dB): 5

Antenna Height (m): 3

Main Beam Direction: 0

Antenna Type: Centered Vertical Dipole

Antenna Parameters:

Link Analysis and Path Loss

Interference Analysis

Field Strength Contour

Service Area Analysis

Terrain Profile Plot

Shadow Plot

Close

Ground and Atmosphere Constants

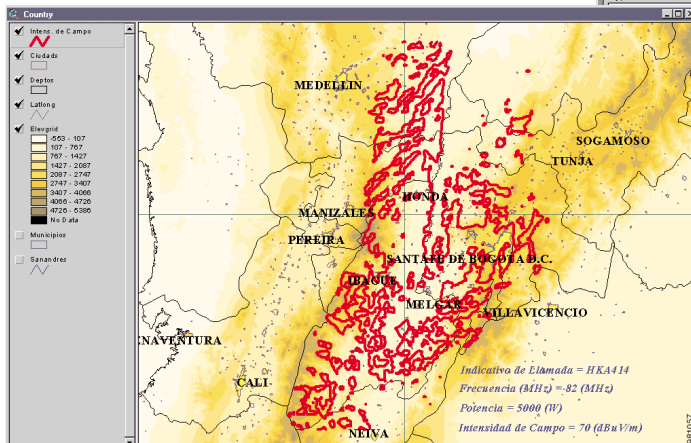
Type of Ground/Water: []

Climatic Zone: Continental Temperate

Atmospheric Humidity (gm/m³): 10

Atmospheric Refractivity: 301

Percentage of Year: 50



A complete set of engineering analysis tools assures rapid and interference-free frequency assignment (above). Analysis results, such as the service area analysis (left), are displayed in easy-to-understand graphic formats.

Capabilities

Administrative

Application Processing

- New Service
- Modification to License
- Modification Transaction Record
- Print Application Forms
- Supplier Certification Print Notices
- Border Coordination

System Tables

- Country Code
- Station Class
- Service Class
- ITU Frequency Allocation
- National Frequency Allocation
- Radio Broadcast Plan
- Call Signs
- Fees
- Type Approved Equipment
- State and City Code
- Equipment Utilities
- Client Utilities
- Site Utilities
- User and Group Accounts
- Language
- System Status

Licensing

- Creation
- Modification (Technical)
- Modification (Non-technical)
- Approval
- Rejection
- Printing Notice

Reports

- Applications (Statistical)
- Licenses (Statistical)
- Complaints (Statistical)
- A/R History
- Aged Receivables
- Collection Call List
- Client Statements
- Invoice Detail Listings
- Master Client List
- Recurring Invoices Listing
- Tax Jurisdictions
- Frequency Allocation
- Licensed Station
- License General
- Technical Chart
- Complaint
- Violation
- Equipment
- Site
- Radio Plan
- ITU Notification

Notices

- Application Incomplete
- Application Rejected
- License Approval
- License Modification
- License Termination
- License Renewal
- Fee Increase
- Warning
- Violation

- Request for Fee Payment
- Request for Fine Payment
- Acknowledgement
- Complaint Resolution
- Supplier Certificates

International Coordination

- Request
- Response

Frequency Assignment

- National Frequency Plan compliance
- Band allocation plot
- Co-channel interference analysis
- Adjacent channel interference analysis
- Optimal channel selection assistance

Fees

- Fee Tables
- Fee Recalculation
- Invoices (New)
- Invoices (Modify existing)
- Invoices (Recurring)
- Payments (Individual)
- Payments (Batch)
- Company Setup
- GA Account Setup

Accounting/General Ledger

- Client Receivables
- Non-recurring Receivables
- Recurring Receivables
- Finance Charges
- Payment History
- Tax Information
- Department Information
- Account Creation
- Account Deletion
- Account Modification

Complaints

- New
- Existing Status
- Violation, New
- Violation, Existing
- Violation Notices
- Resolution Notices

Query Forms

- License Application
- Complaints
- Violations

Engineering Analysis Tools

LF/MF (groundwave & skywave propagation models)

- Path Loss
- Link Analysis
- Interference Analysis
- Field Strength Contour
- Color-coded Field-strength Plot on map
- Service Area Analysis

HF (IONCAP propagation model)

- Path Loss
- Link Analysis
- Interference Analysis
- Field Strength Contour

- Color-coded Field-strength Plot on Map
- Service Area Analysis

VHF/UHF (Terrain-integrated propagation model)

- Path Loss
- Link Analysis
- Interference Analysis
- Field Strength Contour (Topographic database)
- Color-coded Field-strength Plot on Map
- Terrain Profile Plot
- Service Area Analysis

Microwave (Free-space propagation model)

- Path Loss
- Link Analysis
- Interference Analysis
- Antenna Height Analysis
- Frequency Planning (Freq. vs. signal to-noise)
- Terrain Profile Plot (Fresnel zone)
- Color-coded Field-strength Plot on Map

Intermodulation

- Potential Interference (harmonic and intermodulation products of co-located transmitters)

EMC

- Interference and Interference-to-noise ratio at receiver

Terrain Profile Plot

- Line-of-sight visibility path between sites

Geographic Map Display*

- Geographic Data
- Terrain Topography Data
- ARCView format
- ArcInfo
- Grid Format

Security

- Multi-level security groups
- Database performance monitor

Autodiagnostics

- Windows NT Event Viewer
- NT Performance Monitor
- Database Performance Monitor

Hardware

- PC/AT-compatible Intel Pentium processor
- 64 M RAM
- 4 G hard drive
- LAN card
- Color monitor
- Keyboard with mouse
- Printer

*Map data can be converted from other formats.

