

Installing and Running the Spectrum Utilization Study Software (SUSS) Programs

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FCC / OET / ECD / TAB

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General Introduction

The Federal Communications Commission publishes on its web site extracts of its licensing databases. A table of contents, description of these extracts and download information can be found on the Commissions web site. Each data set is composed of extracts of the various tables contained in the associated licensing system. These individual files are exported as pipe delimited ASCII files in the Microsoft format, i.e., the end of line is character string “LfCr” which are then zipped up into a single file for posting on the Commissions web site.

A series of programs were written in Microsoft Visual BASIC (Professional) version 6.0 (32-bit) using the MS Jet engine DAO 3.6 (i.e., ACCESS) by Donald Campbell. And it has been upgraded to VB.net using .net framework 4.6 by Chris Gao. In order to reduce the time required to process the data, it has been found that these programs should run on a Workstation which has three independent hard drives installed because of the very large amount of reading and writing of data required. It is highly recommended to follow this drive/file structure in order for the software to run/compile smoothly: (1) the raw data may be load on drive “F” and the output written to drive “E”. Using this method, the read / write functions are on separate drives and controller cards. The compiled executable file (.exe) and the .ini file are located in the “bin” directory for each VB.net solution/project. You will need to specify your input and output database file locations and other configuration settings in the .ini file in order to run the software correctly.

Because of the interdependency of the SUSS, the programs must be run in the order listed below. The SUSS programs can be downloaded from the web site. <https://www.fcc.gov/spectrum-utilization-study-software-suss>. It would be a better practice creating a directory in which all the SUSS programs will reside. The programs files are over 10 MB each in size. Various Commission licensing systems can be found from web site <https://www.fcc.gov/licensing> and <https://www.fcc.gov/engineering-technology/engineering-technology/electromagnetic-compatibility-division/fcc-frequency#block-menu-block-4> . It should be noted that many of these date sets are over 100 MB in size.

This software is supplied "as is" without any warranties and/or support. The FCC assumes no liability related to the use of the software provided. Warning running the software may change library files that are associated with the Windows operating system.

Data Conversion Notes

In some cases, assignments have been made from 'band edge to band edge' or 'channel edge to channel edge'. The program attempts to expand this type of assignment to individual carrier assignments whenever possible. The "Freq" table contains three frequency entries: "FreqC" (carrier frequency), "FreqL" (lower band/channel edge frequency) and "FreqU" (upper band/channel edge frequency). In all cases, the original lower and upper band/channel edge is retained.

In the conversion process all liner dimensions have been converted to metric values, *i.e.*, ground elevation, antenna height about ground *etc.*

In the case of stations licensed under Part 74 – Subpart D "Remote Pickup Broadcast Stations; Subpart E "Aural Broadcast Auxiliary Stations" and Subpart F "Television Broadcast Auxiliary Stations, the area of operation is not always defined as a distance (in kilometers) around a specified point (Lat/Lon) but in terms of a descriptive geographical location, *i.e.*, "20 kilometers around New York City". This latter description does not permit the geographic plotting of the station location/area of operation. These Part 74 facilities are required to identify the "parent" stations under which they function via parent's "Facility ID Number" or as a last resort, the parent's "call sign". In order to accomplish this task, "CnvUls" accesses the Media Bureaus' "Consolidated Database System (CDBS) to create a "parent" location record.

MFF Data Base structure

The MFF data base consist of both a temporary and a permanent set of tables and databases.

Running Order

Because several of the convert programs rely on files generated by other programs, you will need to run the programs in the following order.

- Antenna Site Database – required by all
- Convert Tower Data – required by all but only need to be created once.
- Convert CDBS
- Convert IBFS
- Convert ULS – CnvUls uses table created by CnvCdbS
- MffTools

Antenna Site Database

(AntSiteDb)

All the "convert" programs use a common antenna site data set. This requires the creating of a database which consists of "Registrations" files of the "Antenna Structure Registration" data set (see,

<http://wireless.fcc.gov/uls/index.htm?job=transaction&page=weekly> or
<ftp://wireless.fcc.gov/pub/uls/complete/>) and the creation of “AntSiteDb’s A, B, C & D” tables using the program “Antenna Site Database” (“AntSiteDb”). The setup program and associated files, program documentation, database file structure and source code are all contained in the zipped file "antsitedb.zip"

For initial setup installation of SUSS programs, please extract and run the “setup.exe” that contained inside the zip file “antsitedb.zip”. The installation will install associated runtime files on your system.

Setting up the program

- Launch the program “AntSiteDb”
- Left click on “Setup”
- Left click on “Modify File Location”
- Select source of raw ASR data and output files.
- Left click on “Exit” to exit program

Running the program

- Launch the program “AntSiteDb”
- Left click on “Of Raw ASR Database”
- Left click on “Of Tower Databases: A, B, C & D”
- Left click on “Update / Populate ASR Database”
- Left click on “Exit” to exit program



Figure 1 – AntSiteDb.jpg



Figure 2 – AntSiteDb_1.JPG

Convert Tower Data (CnvTwrData)

Convert Tower Data (CnvTwrData) program is used to create a supplemental data set of antenna structures based on data found on the web. Many of the major commercial antenna tower companies along with the major cellular and PCS operators publish on the web information on their antenna site locations in the hopes of renting antenna space to other users. Some of these tower are also recorded in the “Antenna Structure Registration” database.

Currently, this programs only handles the following nine data sets:

- American Telephone and Telegraph (AT&T)
- American Tower Corporation (ATC)
- Crown Castle International (CCI)
- Global Tower Partners (GTP)
- KGI Wireless (Kampen and Greenwell, Inc.)
- SBA (SBA Communications Corporation)
- Sprint
- T-Mobile
- TowerCo
- Vangard Wireless

Information on how to gather and import these data sets can be found in Appendix A.

NOTE: It is not necessary to install and run this program for the SUSS system to function properly.

Geographic Area Index Database

A database “fipsidx.mdb” is needed to run the MffTools program. This database contains data that relates the FIPS code with the textual name of the State and County it represents. This database is included in sourcecode.zip

Convert CDBS (CnvCdb)

This program, *CnvCdb*, converts bulk assignment data (licensed and applications) extracted from Federal Communication Commission’s Media Bureau’s (MB) Consolidated Database System into a relational radio assignment data base system — OET’s Master Frequency File (MFF) database system. The MFF database has been structured to optimize the conducting of spectrum management studies. The “Consolidated Database System” (CDBS) is used to license the following services:

| Radio Service | Frequency Range (MHz) |
|--|--|
| AM Broadcast Stations (47 CFR Part 73 Subpart A) | .530 to 1.600 |
| FM Broadcast Stations (47 CFR Part 73 Subpart B) | 88 to 108 |
| Noncommercial FM Broadcast Stations (47 CFR Part 73 Subpart C) | 88 to 92 |
| Digital TV Broadcast Stations (47 CFR Part 73 Subpart E) | 54 to 72, 76 to 88 174 to 216, 470 to 698 |
| Low Power FM Broadcast Stations (47 CFR Part 73 Subpart G) | 88 to 108 |
| Low Power TV, TV Translator and TV Booster Stations (47 CFR 74 Subpart G) | 54 to 72, 76 to 88 174 to 216, 470 to 806 |
| FM Broadcast Translator Stations and FM Broadcast Booster Stations (47 CFR 74 Subpart L) | 88 to 108 |

On a daily bases, the FCC publishes bulk extracts of the Consolidated Database System (CDBS) on the FCC Web Site. This extracts consists of a series of flat ASCII file using the pipe character “|” as the field delimiter and the string “|^” as the record terminator. These files are zipped together and uploaded on the web.

Installing *CnvCdb*

Create a permanent directory to host the program *CnvCdb* (i.e., “c:\Program Files\Fcc\CnvCdb\”) as well as a temporary directory into which you unzip the file *CnvCdb.zip*.

UnZip the file **CnvCdb_s.zip** in the temporary directory. Then double click on the “setup” file and follow the program installation instructions.

Create Input and Output Data Directories

Create a directory to store raw CDBS data.

Create a directory to house the assignment MS Access database created by the CnvCdb_s program.

It is suggested that these two directories be placed on different controllers and hard drives on your computer to speed up the conversion process, i.e., on drives “D” and “E”

Acquiring Raw Data

CDBS public datasets can be downloaded at <https://www.fcc.gov/media/radio/cdb_s-database-public-files>.

Download the zipped CDBS file set to the appropriate directory location.

Unzip the files.

Running the Program

Launch the program *CnvCdb_s*.

Upon startup, the program will test to see if the file “CnvCdb_s.ini” exists. If not, the program will create the “ini” file and fill it with default values.

Define the location of the input and output files.

To do this, left click on <Setup> on the Menu Bar. This causes a drop down menu to appear.

Left click on the <Modify File Location> option on the drop down menu. This causes window to open. Click on the <Browse> button to edit the location of the input and output path and file names.

Left click on the <Accept> command button to accept your selections.

Run the Program.

Click on the < Initialize Database and Process Raw Data> command button. This action will create an Access database shell in the directory previously selected to store the output file and create the output database

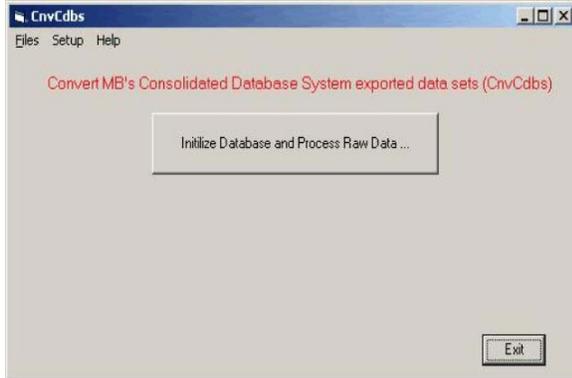


Figure 5 – CnvCdbms.jpg

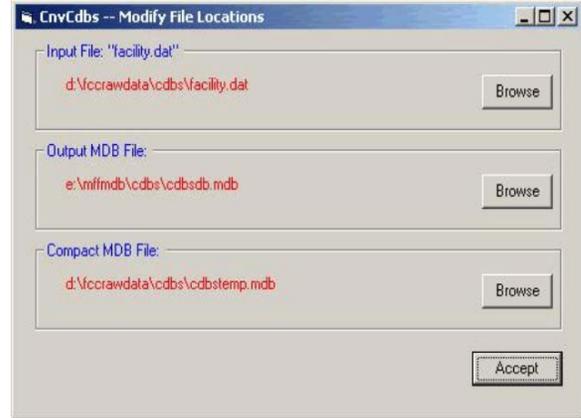


Figure 6 – CnvCdbms_1.jpg

The program **CnvCdbms** also generates and creates a “Television White Space” data file, “TvWsData.txt”, which contains the television facilities which must be protect from the operation of White Space devises.

Convert IBFS

(CnvIbfs)

Introduction

The International Bureau Electronic Filing System (IBFS) processes applications for 13 service areas:

| Radio Service / Functions | Frequency Range (MHz) |
|--|-----------------------|
| International Public Fixed Radio (IPF) (47 CFR Parts 23) | |
| Earth Stations (SES) (47 CFR Parts 25) | |
| Space Stations (SAT) | |
| International HF Broadcast (47 CFR Parts 73) | |
| (47 CFR Parts 74) | |
| Section 214 Authorizations (ITC) | |
| Submarine Cable Landing licenses (SCL) | |
| Recognized Operating Agency (ROA) | |
| Foreign Carrier Notification (FCN) | |
| Accounting Rate Changes (ARC) | |
| Data Network Identification Codes (DNIC) | |
| International Signaling Point Codes (ISPC) | |
| Section 325-C Authorizations (325) | |
| International Special Project (ISP) | |
| | |

This program, *CnvIbfs*, converts data extracted from International Bureau Filing System (IBFS) into a relational data base system — OET’s Master Frequency File (MFF) database system. The MFF database has been structured to optimize the conducting of spectrum management studies.

On a daily basis, the FCC publishes all non-administrative and internal tracking system tables associated with IBFS on the Commission’s Web Site. The underlying database management system for this licensing system is Sybase. These tables are exported from the licensing system using the Sybase BCP

function which creates a series of flat ASCII file using the pipe character “|” as the field delimiter and the character string “|^\\n” as the record terminator.

Installing *CnvIbfs*

The IBFS public datasets can be downloaded at <ftp://ftp.fcc.gov/pub/Bureaus/International/databases/IBFS.zip>.

Create a permanent directory to host the program *CnvIbfs* (i.e., “c:\Program Files\Fcc\CnvIbfs\”) as well as a temporary directory in which you unzip the file *CnvIbfs.zip*.

UnZip the file **CnvIbfs.zip** in a temporary directory. Then double click on the “setup” file and following the program installation instructions.

Create Input and Output Data Directories

Create a directory to store various tables that comprise IBFS and another directory for the assignment data base to be created by this program.

It is suggested that these two directories be place on different controllers and hard drives on your computer to speed up the conversion process, i.e., on drives “D” and “E”

Acquiring Raw Data

Download the zipped IBFS file set to the appropriate directory location.

Unzip the files.

Running the Program

Launch the program *CnvIbfs*.

Upon startup, the program will test to see if the file “CnvIbfs.ini” exists. If not, the program will create the “ini” file and fill it with default values. The program then test to see if the files referenced in “CnvIbfs.ini” exist. If not, a window will be displaced so that you can enter the correct path name information.

Define the location of the input and output files.

To do this, left click on <Setup> on the Menu Bar. This causes a drop down menu to appear. Left click on the <Modify File Location> option on the drop down menu. “Modify File Location” widow to be displayed.

To define the location where the “CnvIbfs.dat” file is located, left click on the “Input Data Table of Contents” <Browse> command button. This will cause a “File Location” dialog box to appear. Select the desired path and file name.

To define the path and filename of the MFF data base to be created, left click on the “Output MDB File” <Browse> command button. This will cause a “File Location” dialog box to appear. Select the desired path and file name.

Left click on the <Accept> command button to accept your selections.

Run the Program.

Click on the < Initialize Database and Process Raw Data> command button. This action will create an Access database shell in the directory previously selected to store the output file and create the output database



Figure 10 – CnvIbfs.jpg

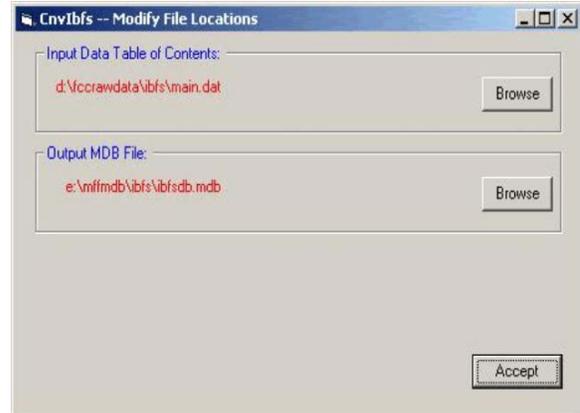


Figure 11 – CnvIbfs_1.jpg

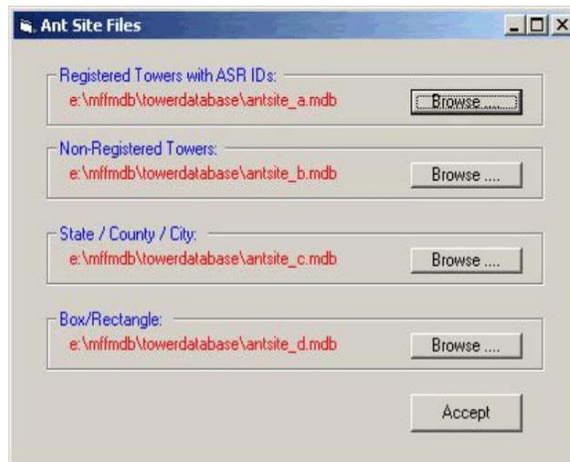


Figure 12 – CnvIbfs_2.jpg

Convert ULS

(CnvULs)

Introduction

This program, *CnvULs*, converts bulk assignment data (licensed and applications) extracted from Federal Communication Commission’s Wireless Telecommunication Bureau’s (WTB) Universal Licensing System into a relational radio assignment data base system — OET’s Master Frequency File (MFF) database system. The MFF database has been structured to optimize the conducting of spectrum management studies.

On a weekly bases, the FCC publishes bulk extracts (licensed and applications) of the Universal Licensing System (ULS) by radio group on the FCC Web Sites –

<http://wireless.fcc.gov/uls/index.htm?job=transaction&page=weekly> or
<ftp://wireless.fcc.gov/pub/uls/complete>

The “Universal Licensing System” (ULS) is used to license following radio services and actions: Aircraft (47 CFR Part 87), Amateur Radio (47 CFR Part 97), Antenna Structure Registration (47 CFR Part 17), Assignments and Transfers, Cellular (47 CFR Part 22), General Mobile Radio Service (GMRS) (47 CFR Part 95, Subpart A), Land Mobile Services (47 CFR Parts 21, 22 and 90), Market-based Services, Microwave (47 CFR Parts 74 and 101), Paging (47 CFR Part 22), and Personal Communications Service (47 CFR Part 24).

| Extract Group | Radio Service | Zipped File Name |
|---|--|-------------------------|
| Aircraft - 47 CFR Part 87 | AC Aircraft Stations | l_aircr.zip |
| Amateur | HA Amateur Radio Services HV Vanity | l_amat.zip |
| BRS & EBS (Formerly known as MDS/ITFS) | BR Broadband Radio Service ED Educational Broadband Service MD Multipoint Distribution Service (MDS and MMDS) VX Instructional Television Fixed Service | l_mdstitfs.zip |
| Cellular – 47 CFR Part 22 | CL Cellular | l_cell.zip |
| Comm. Radio and Restricted Radiotelephone - FRC | CM Commercial Operator RR Restricted Operator | l_frc.zip |

| Extract Group | Radio Service | Zipped File Name |
|-------------------------------------|---|-------------------------|
| General Mobile Radio Service (GMRS) | ZA General Mobile Radio (GMRS) | l_gmrs.zip |
| Land Mobile - Broadcast Auxiliary | LP Broadcast Auxiliary Low Power LV Low Power Wireless Assist Video Devices RP Broadcast Auxiliary Remote Pickup | l_LMbcast.zip |
| Land Mobile - Private | GB Business, 806-821/851-866 MHz, Conventional GE PubSafty/SpecEmer/PubSaftyNtlPlan,806-817/851-862MHz,Conv GF Public Safety Ntl Plan, 821-824/866-869 MHz, Conv. GI Other Indust/Land Transp, 896-901/935-940 MHz, Conv. GJ Business/Industrial/Land Trans, 809-824/854-869 MHz, Conv. GO Other Indust/Land Transp, 806-821/851-866 MHz, Conv. GP Public Safety/Spec Emerg, 806-821/851-866 MHz, Conv. GU Business, 896-901/935-940 MHz, Conventional IG Industrial/Business Pool, Conventional IQ Intelligent Transportation Service (Public Safety) PA Public Safety 4940-4990 MHz Band PW Public Safety Pool, Conventional QM Non-Nationwide Public Safety/Mutual Aid, 220 MHz QQ Intelligent Transportation Service (Non-Public Safety) RS Land Mobile Radiolocation SG Conventional Public Safety 700 MHz SL Public Safety 700 MHz Band-State License SP 700 MHz Public Safety Broadband Nationwide License SY Trunked Public Safety 700 MHz YB Business, 806-821/851-866 MHz, Trunked YE PubSafty/SpecEmer/PubSaftyNtlPlan, 806-817 / 851-862 MHz, Trunked YF Public Safety Ntl Plan, 821-824/866-869 MHz, Trunked YG Industrial/Business Pool, Trunked YI Other Indust/Land Transp. 896-901/935-940 MHz, Trunked YJ Business/Industrial/Land Trans, 809-824/854-869 MHz, Trunked YO Other Indust/Land Transp. 806-821/851-866 MHz, Trunked YP Public Safety/Spec Emerg, 806-821/851-866 MHz, Trunked YU Business, 896-901/935-940 MHz, Trunked YW Public Safety Pool, Trunked | l_LMpriv.zip |

| Extract Group | Radio Service | Zipped File Name |
|----------------------------------|---|-------------------------|
| Land Mobile - Commercial | GL 900 MHz Conventional SMR (SMR, Site-Specific) GM 800 MHz Conventional SMR (SMR, Site-specific) GR SMR, 896-901/935-940 MHz, Conventional GS Private Carrier Paging, 929-930 MHz GX SMR, 806-821/851-866 MHz, Conventional IK Industrial/Business Pool - Commercial, Conventional LN 902-928 MHz Location Narrowband (Non-multilateration) LW 902-928 MHz Location Wideband (Grandfathered AVM) NC Nationwide Commercial 5 Channel, 220 MHz QD Non-Nationwide Data, 220 MHz QO Non-Nationwide Other, 220 MHz QT Non-Nationwide 5 Channel Trunked, 220 MHz YK Industrial/Business Pool - Commercial, Trunked YL 900 MHz Trunked SMR (SMR, Site-Specific) YM 800 MHz Trunked SMR (SMR, Site-specific) YS SMR, 896-901/935-940 MHz, Trunked YX SMR, 806-821/851-866 MHz, Trunked | l_LMcomm.zip |
| Maritime Coast & Aviation Ground | AA Aviation Auxiliary Group AF Aeronautical and Fixed AR Aviation Radionavigation MA Marine Auxiliary Group MC Coastal Group MK Alaska Group MR Marine Radiolocation Land | l_coast.zip |

| Extract Group | Radio Service | Zipped File Name |
|--|--|-------------------------|
| Market Based Services | AW AWS, 1710-1755/2110-2155 MHz bands BA 1390-1392 MHz Band, Market Area BB 1392-1395 and 1432-1435 MHz Bands, Market Area BC 1670-1675 MHz Band, Market Area CJ Commercial Aviation Air-Ground Radiotelephone (800 MHz band) CN PCS Narrowband CP Part 22 VHF/UHF Paging (excluding 931MHz) CW PCS Broadband CX Cellular, Auctioned CY 1910-1915/1990-1995 MHz Bands, Market Area CZ Part 22 931 MHz Paging DV Multichannel Video Distribution AND Data Service GC 929-931 MHz Band, Auctioned GW General Wireless Communications Service LD Local Multipoint Distribution Service LS Location and Monitoring Service, Multilateration (LMS) MS Multiple Address Service, Auctioned PC Public Coast Stations, Auctioned QA 220-222 MHz Band, Auctioned TN 39 Ghz, Auctioned TZ 24 GHz Service WS Wireless Communications Service WX 700 MHz Guard Band WZ 700 MHz Lower Band YC SMR, 806-821/851-866 MHz, Auctioned YD SMR, 896-901/935-940 MHz, Auctioned YH SMR, 806-821/851-866 MHz, Auctioned (Rebanded YC license) ZV 218-219 MHz Service | l_market.zip |
| Microwave - 47 CFR Parts 74 and 101, and 3650 – 3700 MHz | AB Aural Microwave Booster AI Aural Intercity Relay AS Aural Studio Transmitter Link CE Digital Electronic Message Service - Common Carrier CF Common Carrier Fixed Point to Point Microwave CT Local Television Transmission MG Microwave Industrial/Business Pool MM Millimeter Wave 70/80/90 GHz Service MW Microwave Public Safety Pool NN 3650-3700 MHz PE Digital Electronic Message Service - Private TB TV Microwave Booster TI TV Intercity Relay TP TV Pickup TS TV Studio Transmitter Link TT TV Translator Relay WA Microwave Aviation WM Microwave Marine WR Microwave Radiolocation | l_micro.zip |

| Extract Group | Radio Service | Zipped File Name |
|-------------------------|---|-------------------------|
| Paging - 47 CFR Part 22 | CA Commercial Air-ground Radiotelephone CB BETRS CD Paging and Radiotelephone CG General Aviation Air-ground Radiotelephone CO Offshore Radiotelephone CR Rural Radiotelephone | l_paging.zip |
| Ship - 47 CFR Part 80 | SA Ship Recreational or Voluntarily Equipped SB Ship Compulsory Equipped SE Ship Exemption | l_ship.zip |

There are two sets of zipped files for each group – licensed (l_XXX.zip) and application (a_XXX.zip). The zipped files contain several tables sets depending on the radio group being extracted. The program currently only will process the licensed data set, *i.e.*, (l_XXX.zip)

These extracts are comprised of several table sets that are radio service dependent which are in turn zipped into a single. These tables are exported from the licensing system using the Sybase BCP function which creates a series of flat ASCII file using the pipe character “|” as the field delimiter and the string “|^|” as the record terminator .

Installing CnvUls

Create a permanent directory to host the program *CnvUls* (*i.e.*, “c:\Program Files\Fcc\CnvUls\”) as well as a temporary directory in which you unzip the file *CnvUls.zip*.

UnZip the file **CnvUls.zip** in a temporary directory. Then double click on the “setup” file and follow the program installation instructions.

Create Input and Output Data Directories

Create a directory to store each radio group with sub-directories for “licensed” and “applications”.

Create a directory for the assignment data base to be created by this program.

It is suggested that these two directories be place on different controllers and hard drives on your computer to speed up the conversion process, *i.e.*, on drives “D” and “E”

Acquiring Raw Data

Download the desired radio group zipped file sets to the appropriate directory location.

Unzip the files.

The unzipped files have use the naming convention “uls_extract..PUBACC_XX.dat” where “XX” is the data set type for the extract.

Rename to “PUBACC_xx.dat”

Running the Program

Launch the program *CnvUls*.

Upon startup, the program will test to see if the file “CnvUls.ini” exists. If not, the program will create the “ini” file and fill it with default values.

Define the location of the input and output files.

To do this, left click on <Setup> on the Menu Bar. This causes a drop down menu to appear. Left click on the <Modify File Location> option on the drop down menu. This causes an other drop down menu to appear listing the various radio groups the program can convert. Left clicking on the radio group will cause a “Modify File Location” widow to be displayed.

To define the location where the “CnvUls.dat” file is located, left click on the “Input Data Table of Contents” <Browse> command button. This will cause a “File Location” dialog box to appear. Select the desired path and file name.

To define the path and filename of the MFF data base to be created, left click on the “Output MDB File” <Browse> command button. This will cause a “File Location” dialog box to appear. Select the desired path and file name.

Left click on the <Accept> command button to accept your selections.

Run the Program

It should be noted that the Microsoft ACCESS programs has a maximum file size limit of 2 GB. Several of the data set exceed this 2 GB limitation. In order to process these data sets, they have been split apart as follows:

Left click on the data set to be converted button.

| Extract Group | Radio Service Codes | Zipped File Name |
|---|-------------------------------|-------------------------|
| Aircraft | AC | 1_aircr.zip |
| Amateur | HA and HV | 1_amat.zip |
| Cellular | CL | 1_cell.zip |
| Coast and Ground [Maritime Coast & Aviation Ground] | AA, AF, AR, MA, MC, MK and MR | 1_coast.zip |
| GMRS [General Mobile Radio Service] | ZA | 1_gmrs.zip |
| LM Broadcast Auxiliary | LP, LV and RP | 1_LMbcast.zip |

| Extract Group | Radio Service Codes | Zipped File Name |
|--|--|-------------------------|
| LM Commercial < 806 MHz | IK, YK, NC, QD, QO and QT | l_LMcomm.zip |
| LM Commercial > 806 MHz | GM, YM, GX, GR, YS, GL, YL, LN, LW and GS | l_LMcomm.zip |
| LM Commercial = 806 MHz (YX) | YX (806-821 MHz) | l_LMcomm.zip |
| LM Commercial = 851 MHz (YX) | YX (851-866 MHz) NOTE: because of the number of frequencies per site, only the first twenty are processed. | l_LMcomm.zip |
| LM Private < 806 MHz (IG) | IG | l_LMpriv.zip |
| LM Private < 806 MHz (YG) | YG | l_LMpriv.zip |
| LM Private > 806 MHz | GE, GP, YE, YP, GP, YE, GF, YF, IQ and PA | l_LMpriv.zip |
| LM Public Safety < 806 MHz | AW, BA, BB, BC, CJ, CN, CP, CW, CX, CY, CZ, DV, GC, GW, LD, LS, MS, PC, QA, TN, WS, WX, WZ, YC, YD, YH, ZV | l_LMpriv.zip |
| LM Public Safety > 806 MHz | GE, GP, YE, YP, GP, YE, GF, YF, IQ and PA | l_LMpriv.zip |
| Market [Market Based Services] | AW, AWS, BA, BB, BC, CJ, CN, CP, CW, CX, CY, CZ, DV, GC, GW, LD, LS, MS, QA, TN, TZ, WS, WX, WZ, YC, YD, YH and ZV | l_market.zip |
| Microwave | AB, AI, AS, CE, CF, CT, MG, MM, MW, NN, PE, TB, TI, TP, TS, TT, WA, WM and WR | l_micro.zip |
| Paging | CA, CB, CD, CG, CO and CR | l_paging.zip |
| BRS & EBS | BR, ED, MD and VX | l_mdsitfs.zip |
| Ship | SA, SB and SE | l_ship.zip |
| Radio Operator [Comm. Radio and Restricted Radiotelephone - FRC] | CM and RR | l_frc.zip |

Source of “special_cond_code.dat” Data

The “special_cond_code.dat” file can be download from the following web page <http://wireless.fcc.gov/uls/index.htm?job=transaction&page=weekly>. The file name has a sequence number and thus need to be renamed “special_cond_code.dat”

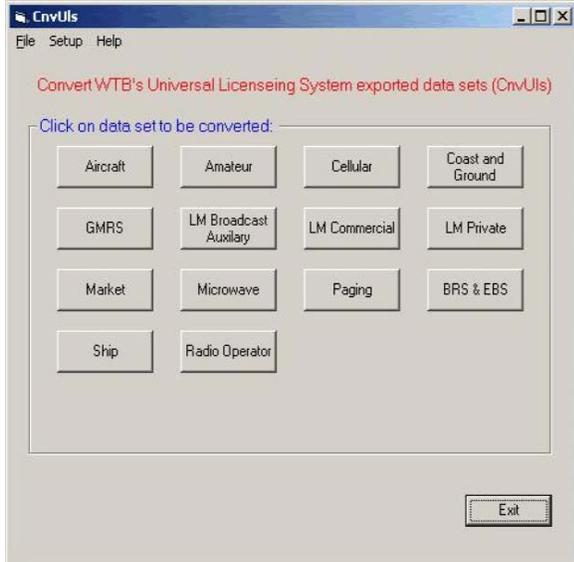


Figure 13 – CnvUls.jpg



Figure 14 – CnvUls_1_mw.jpg

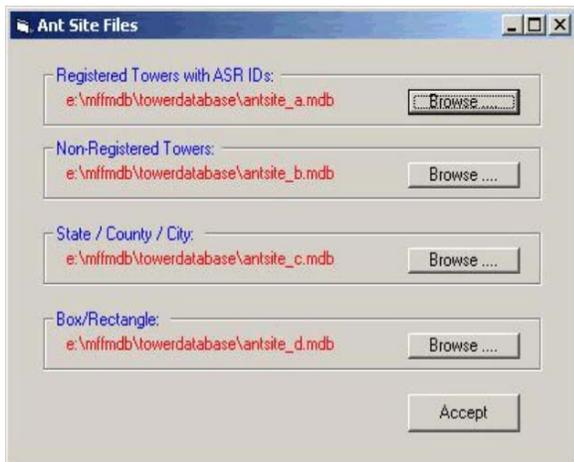


Figure 15 – CnvUls_2.jpg

Master Frequency File Tools

(MffTools)

Introduction

This program, *MffTools*, extracts radio assignment information from a relational database system (OET's Master Frequency File (MFF) database) based on user selected extraction criteria and generates several reports. The setup program and associated files, program documentation, database file structure documentation and program source code are all contained in the zipped file "MffTool.zip".

Installing *MffTools*

Create a permanent directory to host the program *MffTools* as well as a temporary directory in which you can unzip the file *mfftool.zip*

Unzip the file *mfftool.zip* in a temporary directory. Then double click on the "setup" file and following the program installation instructions.

Create a directory to store the output map files created by MffTools

Create a "scriptfiles" folder. If the path is on the "C" drive, for example "c:\mffmdb\scriptfiles\", you will have to modify the path in the "mfftools.ini" file located in the MffTools program directory. Change the drive letter from "e:\\" to "c:\\" on the line that contains "ScriptLstFileName". The final edit will be as follows "c:\mffmdb\scriptfiles\script.lst"

Running *MffTools*

If you are running *MffTools* for the first time or if you have changed the location of the input and output files, you will need to tell the program where these files are located, otherwise skip to Section 3.2.

Defining Input and Output File Locations.

MFF Path and Filename – Define the path and filename of the MFF database (*.mdb) by left clicking on the <Browse> button in "MFF Location and Name" frame which causes the "file command dialog" window to appear. Select the desired Master Frequency File Database.

Project Path and Filename – Define the path and filename of the output project file (*.pjt) by left clicking on the <Browse> button in the "Project Path and File Name" frame causing the "file command dialog" window to appear. Select a project output file name. This project file name is the base name used in creating the associated "*.wor", "*start.wor" and other files created by this program. **NOTE:** The project file name must begin with a character between the letters 'a' and 'z'. If the project name is "all6525",

then following files were created by *MffTools* – “all6525.pjt”, “all6525.mid”, “all6525.mif”, “all6525.wor” and “startall6525.wor”, *etc.*²

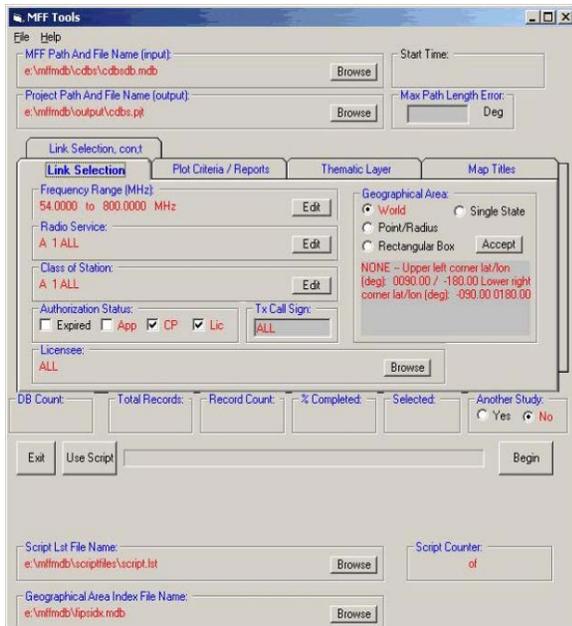


Figure 16 – MffTools.jpg

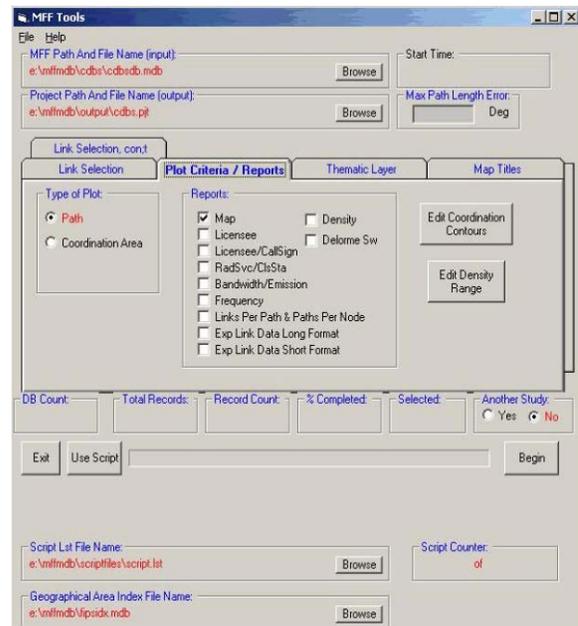


Figure 17 – MffTools_1.jpg

Maximum Path Length Error

The program can be used to identify suspect data, i.e., links³ whose paths are vary long. In Max Path Length Error frame enter the path length trigger point in decimal degrees.

Establish Extraction Criteria

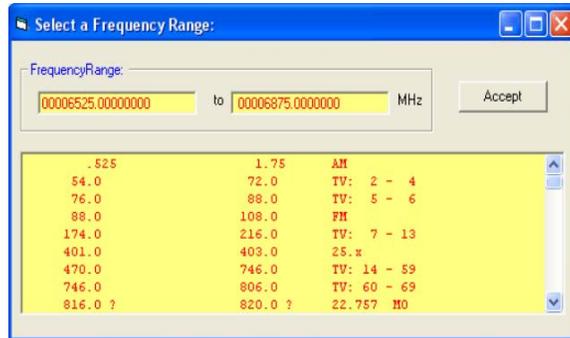
It should be noted that this program can only be used with “site specific” assignments. Radio systems are licensed by FCC as either a “site specific” authorization or a “geographic area” (market based) authorization. A “geographic area” authorization (PCS and cellular systems are prime examples of this) contain no information on transmitter locations (lat/long *etc.*) or technical information on the equipment used (transmitter/ receiver, power levels, antennas) and operating parameters. A “site specific” authorization, on the other hand, will contain transmitter and receiver site location information as well as technical operating parameters and make and model information for the transmitter and antennas.⁴

Click on the <Link Selection> tab to access the following options: ‘Frequency Range’, ‘Radio Service’, ‘Class of Station’, ‘Authorization Status’, ‘Tx Call Sign’, ‘Licensee’ and ‘Geographical Areas’. Select the desired option and follow the option sequencing.

³ **NOTE:** A “link” is defined as a single frequency/ polarization combination between a fixed transmitter site and a receiver site via passive repeaters sites if any are presents. There can be several links on a given “path”. You might consider the “path” to be a sidewalk and “links” to be the people walking on the “path”.

⁴ If polygon data sets can be developed that defines each of the geographic areas used to authorize market base systems, the program can be modified to generate MapInfo ‘mid’ and ‘mif’ files of the authorized service area .

Frequency Range: To select the frequency range, left click on the <‘Frequency’ Edit> command button to display the “Select Frequency Range” window, Figure 2. Enter the desired frequency range and left click on <Accept>. A list of frequency bands and associated radio service / rule section is provided in



a list box for conveyance.

Radio Service: To select a radio service(s), left click on the <‘Radio Service’ Edit> command button to display the “Select Radio Service” window, Figure 3. In the “Options” list box, left click on the radio service(s) to extracted to place that radio service in the “Selections” list box. After making your selecting, left click on the <Accept> command button.



Class of Station: To select a desired class of station(s), left click on the <‘Class of Station’ Edit> command button to display the “Select Class of Station” window, Figure 4. In the “Options” list box, left click on the class of stations to extracted to place that class of stations in the “Selections” list box. After making your selecting, left click on the <Accept> command button.

Figure 19 3 – Select Radio Services

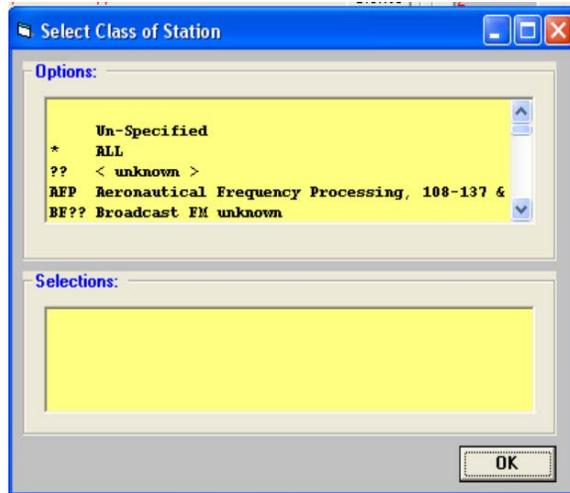
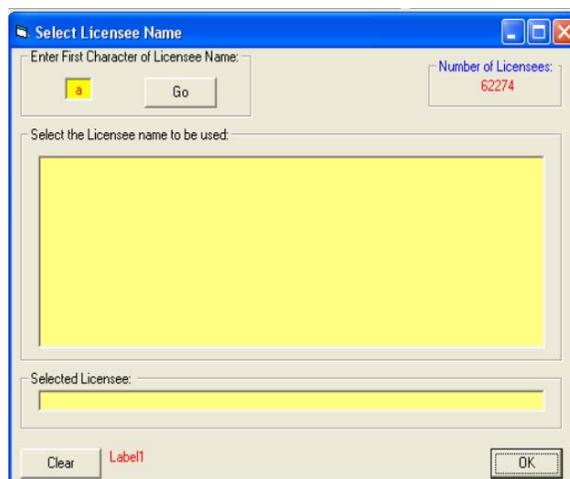


Figure 20 – Select Class of Station

Authorization Status: To select a authorization status”, left click on the one or more of the following “Authorization Status” check boxes: ‘Expired’, “App(lication)”, “CP” or “Lic(ensed)”.
[StatusCode (gtSCL and gtSCU): 0 = expired, 5 = tendered 6 = application, 7 = CP, 8 = STA, 9 = licensed (or lic / cp). By default, checking “Lic” picks-up STA.]

Tx Call Sign: To select a TX Call Sign, enter the transmitter call sign in the text box.

Licensee: To select a licensee, left click on the <‘Licensee’ Browse> command button to display the “Select Licensee Name” window, Figure 7. First enter the first character of the licensee name in the text box and then left click on the <Go> command button. This action will cause the “Select the Licensee name to used” list box to be filled. Left click on the desired name to place that name in the “Selected Licensee” list box. NOTE: Only ONE name can be selected. After making your selection, left click on the



<Accept> command button.

Figure 21 – Select a Licensee Name

If you select “a” you will get a list of all licensees whose name begins with the letter “a” and will find what appears to be duplicate licensee entries. Why? If you look closely at the names you will find minor variations in the spelling and presentation, *e.g.*, “ALBANY BROADCASTING CO INC”, “ALBANY BROADCASTING CO., INC.” and “ALBANY BROADCASTING COMPANY, INC.”. These three entities share the same address and one would presume that are one and same.

The Commission now requires applicants and licensee to obtain a “FCC Registration Number” (FRN) before they can file an application to modify an existing station or apply for a new station. As part of the registration process, the applicant/licensee must provide the Commission with the entity’s Taxpayer Identification Number (TIN). For a business the TIN is the business’ Employer Identification Number (EIN). While for an individual, is the individual’s Social Security Number (SSN). Because of privacy concerns, the entities’ TIN is not made public.

The FRN is sort of a TIN equivalent, however, if an entity empowers its distributed offices to file its own applications with the Commission, each difference office can acquire its own FRN. If one tries to get a picture of what all “AT&T”⁵ owns, you will find several “AT&T” address with various FRNs.

Geographical Area of Operation: There are three geographical area of operation options: “World”, “Point/Radius” and “Rectangular Box”, see Figure 1.⁶

If you left click on the <World> radio button, followed by left clicking on the <Accept> command button, the area is defined as Latitude: 90E North to 90E South, Longitude: 180E West to 180E West.

If you left click on the <Point/Radius> radio button, followed by left clicking on the <Accept> command button, the “Geographical Area: Point/Radius” window appears, see Figure 6. This widow allows the used to define the reference point and radius to be used as well as to define the style of line to drawn around the selected point – circle, box or none. Left click on the <Accept> command button to accept entered values.

If you left click on the <Rectangular Box> radio button, followed by left clicking on the <Accept> command button, the “Geographical Area: Rectangular Box” window appears, see Figure 7. This widow allows the used to use one of the following predefined areas (CONUS, Alaska, Hawaii, Guam or PR/VI) or to define a unique box. Left click on the <Accept> command button to accept entered values.

⁵ American Telephone and Telegraph Company, AT&T Corp., etc.

⁶ Many broadcast auxiliary mobile pickup assignments (Part 74) lack a latitude/longitude reference point and associated radius of operation value. The only positional information is the state and city/place of operation. In order to identify an approximate location of operation of the broadcast auxiliary station, the program associates the parent broadcast station latitude/longitude coordinates with broadcast auxiliary station to establish an approximate location around which the mobile units are operating.



Figure 22 – Geographical Area: Point/Radius

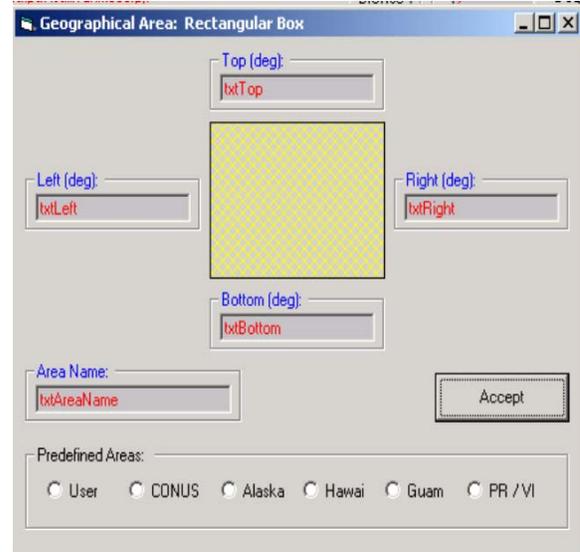


Figure 23 – Geographical Area: Rectangular Box

Define the Type of Plot and Reports.

Click on the <Type Plot / Reports> tab to access the following options: “Type of Plot” and “Reports”, Figure 8.

- Currently only one type of plot is available – “Path”
- Select one or more report formats:

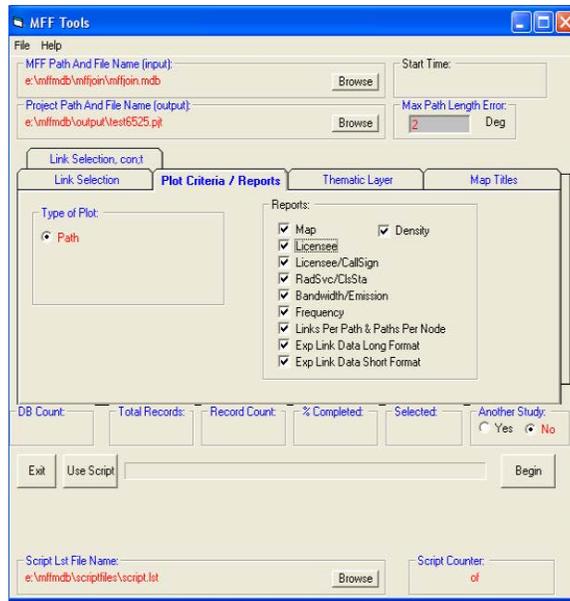


Figure 24 – Plot Criteria / Reports tab

Define thematic layer file locations.

Click on the <Thematic Layer> tab to define the location of the thematic layer map file locations. Figure 9. Using the associated check boxes, define which maps are to be displayed and then left click on the associated <Browse ...> command button.

- Click on the <Thematic Layer> tab to display the various report image options.

The States “tab” File is required and can be downloaded from the FCC/OET web site. To specify the location of the file, click on the <Browse> button in the “States TAB File” frame, causing a “file command dialog” window to appear. Select the “tab” file.⁷

- The County “tab” File is required and can be downloaded from the FCC/OET web site. To specify the location of the file, click on the <Browse> button in the “County TAB File” frame, causing a “file command dialog” window to appear. Select the “tab” file.⁸

⁷ Note, the states tab file defines the boundaries of the 50 states, the District of Columbia, Puerto Rico, American Samoa, Guam, the Northern Mariana Islands, Palau, and the Virgin Islands of the United States. A description of how this file was derived can be found at <http://www.fcc.gov/oet/info/maps/census/states/> while the file itself can be download from <www.fcc.gov/oet/info/maps/census/states/states.zip>.

⁸ Note, the county tab file defines the boundary of first order-divisions of the 50 states, the District of Columbia, Puerto Rico, American Samoa, Guam, the Northern Mariana Islands, Palau, and the Virgin Islands of the United States. A description of how this file was derived can be found at “<http://www.fcc.gov/oet/info/maps/census/county/>” while the file itself can be download from <[www.fcc.gov/oet/info/maps/census/ states cntyfcc.zip](http://www.fcc.gov/oet/info/maps/census/states cntyfcc.zip)>.

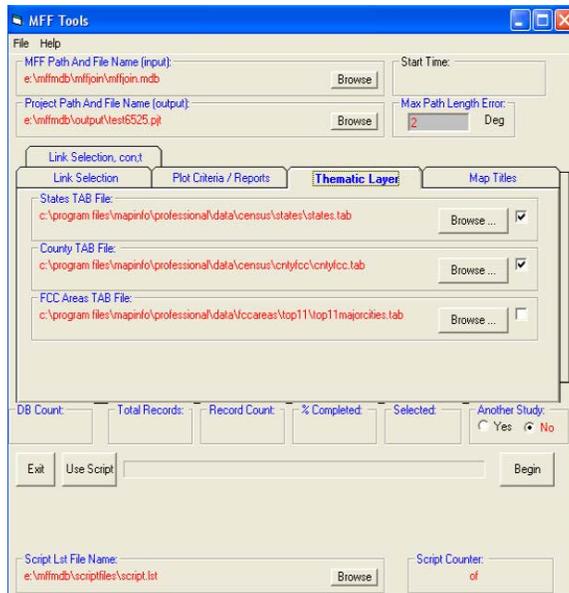


Figure 25 – Thematic Layer tab

Map Titling:

Click on the <Map Title> tab to define the text to be used in titling the map. Figure 10.

- The default Map Title name is the same as that indicated in the ‘MFF Location and Name’ text box. To change the displayed map title caption, just type over the entry in the “Map Title” text box and then click on the <Save> button.
- To change the Map Caption text, just type over the entries in the “Map Caption” text boxes and then click on the <Save> button.

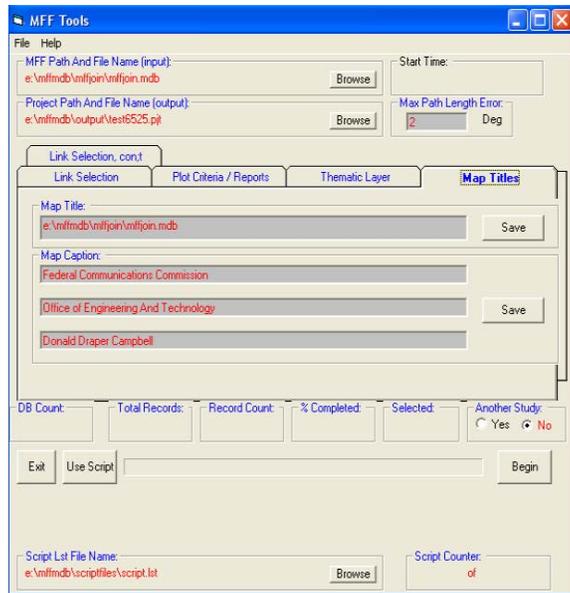


Figure 26 – Map Titles

Running MffTools

There are two running options: non-script and script. To begin the “non-script” extraction process, just left click on the <Begin> command button and set back a wait. It should not take long to complete the task. To begin the “script” extraction process, just left click on the <Script> command button and set back a wait. It should not take long to complete the task. Make sure you have defined the location of the “script.ini” file.

Using Scripts

In the case where a spectrum study is being conducted for say thirty cities, the only difference between the studies is the reference point location (latitude / longitude). All other values remain constant. If this is the case, a script can be created to run the desired series of retrievals. When the <Begin> command button is left clicked, the selection criterion is written to the file “mfftools.ini” located in both the *MffTools* program directory and the “ScriptLstFileName” directory.

```

[File Location]
MffDbFileLocation=e:\mffmdb\mffjoin\mffjoin.mdb
ProjectPathAndFileName=e:\mffmdb\output\test6525.pjt
ScriptListFileName=e:\mffmdb\scriptfiles\script.lst

[Link Selection]
FrequencyRange=00006525.00000000 00006875.00000000 00000000.00000000 00000000.00000000
RadioService=A 1 ALL
ClassOfStation=A 1 ALL
AuthStatusFlag=0111
SqlFlag=100
SqlLicenseKey=
SqlTxCallSign=ALL

[Plot Criteria]
TypeOfPlot=P
PlotLinkYN=Y
TxRxSiteDensity=T 00001 00025 00026 00050 00051 00100 00101 00150 00151 99999
Contour=T L 1 0000.0 0000.0 0000.0
MapProjection=1
ExpLinkDataYN=N

[GeoArea]
RetrievalArea=8
GeoAreaName=World
LatUpper= 90
LatLower=-90
LonRight= 180
LonLeft=-180
UserDefAreaFlag= 0

[PointRadius]
PointRadiusFlag=0
PointRadiusStyle=1
CircleBoxBlankFlag= 1
PointLatD=31
PointLatM=31
PointLatS=48
PointLatHem=N
PointLonD=93
PointLonM=48
PointLonS=41
PointLonHem=W
PointRadiusKm=100.00

[MapInfo]
MapInfoAnsYN=Y
StatesTabDisplay=1
StatesTabFile=c:\program files\mapinfo\professional\data\census\states\states.tab
StatesZoomMin=300
StatesZoomMax=100000
CountyTabDisplay=1
CountyTabFile=c:\program files\mapinfo\professional\data\census\cntyfcc\cntyfcc.tab
CountyZoomMin=0
CountyZoomMax=300
FccAreasTabDisplay=0
FccAreasTabFile=c:\program files\mapinfo\professional\data\fccareas\top11\top11majorcities.tab
FccAreasZoomMin=300
FccAreasZoomMax=100000

[Titles]
MapTitle=e:\mffmdb\mffjoin\mffjoin.mdb
MapCaption1=Federal Communications Commission
MapCaption2=Office of Engineering And Technology
MapCaption3=Donald Draper Campbell

[ReportsFlag]
StatsMapYN=Y
StatsLicenseYN=N
StatsLicenseCallSignYN=Y
StatsRadSvcClsStaYN=Y
StatsBandwidthEmissionYN=Y
StatsFrequencyYN=Y
StatsLinksPerPathYN=Y
ExpLinkDataLongYN=Y
ExpLinkDataShortYN=Y
StatsDensityYN=N

[MaxPathLengthError]
MaxPathLengthError=2

[EarthStationElevAng]
EarthStationElevAngFlag=0
EarthStationElevAngMax=-9999.9
EarthStationElevAngMin=-9999.9

```

Figure xx – xxxx (File: “mfftools.ini”)

Using your favorite editor, modify the “mfftools.ini” as required, i.e., point location latitude and longitude and save the file with a new file name, i.e., ‘newyorkcity.ini’. Do this for each location change. Using the editor, create a file name “script.lst”. In this file add the names of the ‘INI’ files to be processed, i.e., “newyorkcity.ini”, “washingtondc.ini”, etc.



```
newyorkcity.ini
washingtondc.ini
```

Figure xx – Script List (File: “script.lst”)

You will need to define location of the script file list. Do this by left clicking the “Define Script Lst File Name” <Begin> command button.

Status Reporting

The status of the data extraction progress is display in the lower half of the main program window.

- DB Count is the total number of frequency records contained in the MFF database. [**glNumFreqRecs**]
- Total Records is the number of MFF database records selected meeting the “Frequency Range” and “Authorization Status” criteria. [**glNumRecs**]
- Record Count indicates how many links have been processed. [**glRecCnt**]
- % Completed is an indication of the percentage of the number of links processed since the run began.
- Selected is the number of records actually plotted. This value is always less than or equal to the “Total Records” count. The difference between “Total Records” count and the “Selected” count is attributed to the following selection criteria: “Radio Service”, “Class of Station”, “Authorization Status”, “Licensee”, “Tx Call Sign” and “Geographic Area” in addition to exclusion of “bad data” (i.e., links whose coordinates put the link “off the planet”). [**gdSelectedLinkCnt**]

NOTE: You will notice that the total number of records meeting “Frequency Range” and “Authorization Status” criteria may vary from report to report. In some case the “Freq” table and the “SiteRx” tables are joined in other cases just the “Freq” table is used. It appears that there are orphaned “Freq” records, i.e., “Freq” records without any “SiteTx” or “SiteRx” records.

Sample Report Outputs

Output file naming convention. The basic file name must begin with a letter (a to z). Base on the report generated, additional character will be appended to the basic file name, where “xxxx” is the base file name. In this section sample outputs are presented for an extraction of the 6525 to 6875 MHz band along with discussion of how the data sort was made. You will notice, depending on the band being studied, that there are differences between the number of links extracted for each report. As it turns out, there are orphaned frequency table records, that is frequency records which have no corresponding TX or RX site records. This problem does not appear to be data conversion problem but just plain bad data.

Project File and MapInfo ‘mid’, ‘mif’ and ‘wor’ files. This report is generated using a ‘recordset’ sorted ascending on ‘Freq.FreqC’ using the ‘Freq’ table.

Figure xx – This file contains information on the extraction run: frequency range, Extraction area, class of station and radio service constraints as well as extraction counts. (File: “xxxx.pjt”)

```
Date/Time: 10/4/2002 / 8:42:39 AM

Source: ULS-Micro(2002.09.29)

Image parameter data file: e:\mffmdb\output\all6525.pjt
World
Extraction area:
  Lat Upper: 90.0000   Lat Lower: -90.0000
  Lon Left: -180.0000  Lon Right: 180.0000
Freq Range (MHz)      Lower           Upper
                     6525.00000000      6875.00000000
FCC Radio Service: All

Number of 'freq table' records: 1,003,279

      Number of SQL records: 027,675

      Number of links processed: 027,675

      Number of links mapped: 027,675

      Number of links NOT mapped: 000,000

Number of records off the world: 000,000
```

Figure xx – This file contains information on the extraction run: frequency range, Extraction area, class of station and radio service constraints. (File: “xxxx.pjt”)

Path Length
'Freq' table.

This report is generated using a 'recordset' sorted ascending on 'Freq.FreqC' using the

```
Path Length Statistics

Dist (km)  Link Count      Link Cnt Sum
0.2         6                6
0.3         9                15
0.4         4                19
0.5         2                21
0.6        12                33
0.7         6                39
0.8         6                45
0.9        12                57
1.0        13                70
.....
150.0        1          27498
152.6        2          27500
155.3        2          27502
160.3        2          27504
166.1        2          27506
170.9        4          27510
187.1        1          27511
200.0       18          27529

Avg Path Length (km) = 30.7
      Path Count = 27529
Median Path Length (km) = 27.2
Standard Deviation (km) = 0.0

Suspect links which have been excluded from path lenght computations.

      Dist (km)  Link Count
=      0.0        146
>= 200.0         18
Off the World     0
```

Figure xx – Path Length Statistics (File: “xxxx_len.txt”)

Links per Frequency This report is generated using a 'recordset' sorted ascending on 'Freq.FreqC' using the 'Freq' table.

```
Frequency Use Statistics

Count FreqC

  1 00006525.42500000
 10 00006525.62500000
  4 00006525.68500000
  1 00006525.90000000
  4 00006526.25000000
  8 00006527.07500000
    . . . .

  3 00006872.92500000
  1 00006873.75000000
  5 00006874.10000000
  2 00006874.37500000
  2 00006874.57500000
  8 00006874.57500000

Number of links processed: 027,599
Number of links in selected area: 027,599
```

Figure xx – Links per Frequency Statistics (File: “xxxx_freq.txt”)

Links per Bandwidth/Emission Statistics This report is generated using a 'recordset' sorted ascending on 'Freq.EmissionDesignator1' using the “Freq” table.

```
Bandwidth/Emission Statistics

Count Bandwidth/Emission

14907 10M0A7W
  596 10M0A9W
   4 10M0D7D
   1 10M0D7W
 2116 10M0D8W
   1 10M0D9W
  356 10M0F2D
    . . . .

  35 800KF9W
   1 882KG7D
   1 8M50F9W
   2 8M60F9W
   5 9M95F9W
  21 9M95F9W

Number of links processed: 027,599
Number of links in selected area: 027,599
```

Figure xx – Links per Bandwidth/Emission Statistics (File: “xxxx_bwem.txt”)

Links per Licensee This report is generated using a 'recordset' sorted ascending on 'Lice.LiceName' using the 'Freq' and 'Lice' tables.

| Count | FRN | Licensee |
|---|---------|--|
| 9/18/2002 10:43:02 PM | | |
| 4 | 2841252 | 360 communications company of florida |
| 2 | 2543650 | a g edwards & sons inc |
| 19 | 4521977 | ab cellular la, llc |
| 3 | 1837814 | acadiana cellular general partnership |
| 6 | 1765031 | acc kentucky license llc |
| 19 | 3475613 | acc new york license i llc |
| | | |
| 4 | 4536264 | wyoming, state of |
| 137 | 6242689 | xcel energy services inc. |
| 9 | 2321156 | yakima msa limited partnership |
| 6 | 1602713 | yavapai college |
| 2 | 1539626 | yolo, county of |
| 3 | 2156370 | yosemite community college district |
| 2 | | youngstown/warren msa limited partnership d/b/a alltel |
| Number of links processed: 027,599 | | |
| Number of links in selected area: 027,599 | | |

Figure xx – Links per Licensee Statistics (File: "xxxx_lice.txt")

Links per Callsign This report is generated using a 'recordset' sorted ascending on 'Lice.LiceName' + 'SiteTx.TxCall' + 'SiteRx.RxCall' using the 'Freq', 'Lice', 'SiteTx' and 'SiteRx' tables.

Licensee / Licensed Link by Callsign Statistics

| Count | FRN | CallSign | Licensee |
|-----------|---------|----------|--|
| 1 | 2841252 | WMJ214 | 360° communications company of florida |
| 2 | 2841252 | WMJ655 | 360° communications company of florida |
| 1 | 2841252 | WNTL715 | 360° communications company of florida |
| 1 | 2543650 | WNTL716 | a g edwards & sons inc |
| 1 | 2543650 | WLW435 | a g edwards & sons inc |
| 2 | 4521977 | WLW491 | ab cellular la, llc |
| 2 | 4521977 | WMJ339 | ab cellular la, llc |
| 3 | 4521977 | WMJ340 | ab cellular la, llc |
| 3 | 4521977 | WMQ538 | ab cellular la, llc |
| 1 | 4521977 | WMQ786 | ab cellular la, llc |
| | | | |
| 2 | 1602713 | WNTW309 | yavapai college |
| 2 | 1602713 | WNTW310 | yavapai college |
| 2 | 1602713 | WNES344 | yavapai college |
| 1 | 1539626 | WNES345 | yolo, county of |
| 1 | 1539626 | WNEY485 | yolo, county of |
| 2 | 2156370 | WNEY487 | yosemite community college district |
| 1 | 2156370 | WLC413 | yosemite community college district |
| 1 | 2531275 | WLM622 | youngstown/warren msa limited partnership d/b/a alltel |
| 1 | 2531275 | WLM622 | youngstown/warren msa limited partnership d/b/a alltel |

Number of links processed: 027,584
 Number of links in selected area: 027,584

Figure xx – Links per Callsign Statistics (File: “xxxx_cs.txt”)

Links per Radio Service / Class of Station This report is generated using a ‘recordset’ sorted ascending on ‘Freq.FccRadSvc’ + ‘SiteTx.TxClassStation’ + ‘SiteRx.RxClassStation’ using the ‘Freq’, ‘Lice’, ‘SiteTx’ and ‘SiteRx’ tables.

RadSvc / Class Station Statistics

| Count | RadSvc | Class Station | |
|-------|--------|---------------|-----|
| | | TX | RX |
| 4 | CF | FXO | FXO |
| 5489 | CX | TC | |
| 10 | MG | FX5 | FX5 |
| 60 | MG | FXO | FXO |
| 14366 | MW | FX5 | FX5 |
| 18 | MW | FXO | FXO |
| 7631 | MW | MO5 | MO5 |
| 2 | TP | MO | MO |
| 1 | WA | FXO | FXO |
| 3 | WA | FXO | FXO |
| 27574 | | | |

Number of links processed: 027,584
 Number of links in selected area: 027,584

Figure xx – Links per Radio Service / Class of Station Statistics (File: “xxxx_rscs.txt”)

specific information on the location of the associated receiver site – only distance and bearing information which cannot really be relied on to determine position (lat/lon) of the receiver site.

In the case of broadcast auxiliary mobile, their area of operation is a defined radius around a defined point. In many cases the broadcasters have deployed permanent receive-only base stations within this point/radius defined service area at considerable expense to assure that realtime coverage can be had at all times. These systems are licensed using WTB's ULS, however that system was not designed to record the location of the permanent receive-only base stations. This situation was of little concern until the satellite systems were granted access to this spectrum and sharing was required. In order to protect these receiving sites, the earth station operators need to know where they are located and when they were deployed.¹⁰

A similar situation exists for receive-only earth station deployed in fixed satellite service spectrum.¹¹ In the case of receive-only earth stations, those facilities can be registered with the Commission (IB) if the owner wants to receive interference protection.

In many cases the licensing period for a radio license is 10 years. License holders are supposed to turn in their licenses when facilities are no longer in use. License holders quit using their radio systems or go out of business and in many cases fail to turn in their licenses. Thus, there may be a lot of deadwood in the databases.

Quality assurance of data collected. This is a particular problem with legacy assignment data converted from previous licensing system. Quality assurance checking routines are slowly being added to existing systems. This particularly noticeable when a point-to-point system operating above 900 MHz appears from the database to span from Los Angeles to New York City or an earth station seems to be located in Canada, the Atlantic or Pacific Oceans.

Creating a Map using the *MapInfo* program

MffTools creates MapInfo files: "mid", "mif" and "wor" files. For example: "all6525.mif", "all6525.mid", "all6525.wor" and "all6525start.wor".¹² All four of the files are ASCII text files. The "all6525 mif" file defines the placement, color and shape of the object (*i.e.*, transmitter sites, or the path between a transmitter and receiver sites) to be displaced on the resulting generated map. The "all6525 mid" contains data technical data associated with these objects (*i.e.*, operating frequency, site coordinates, *etc.*). The "all6525.wor" file is a script that MapInfo use to layout of the map that is to be generated by MapInfo. (See Figure ____ .) MapInfo use "dat", "id", and "tab" files to create the map. The "all6525start.wor" files is a script that tells MapInfo what files are to be to generate these "dat", "id", and "tab" files.

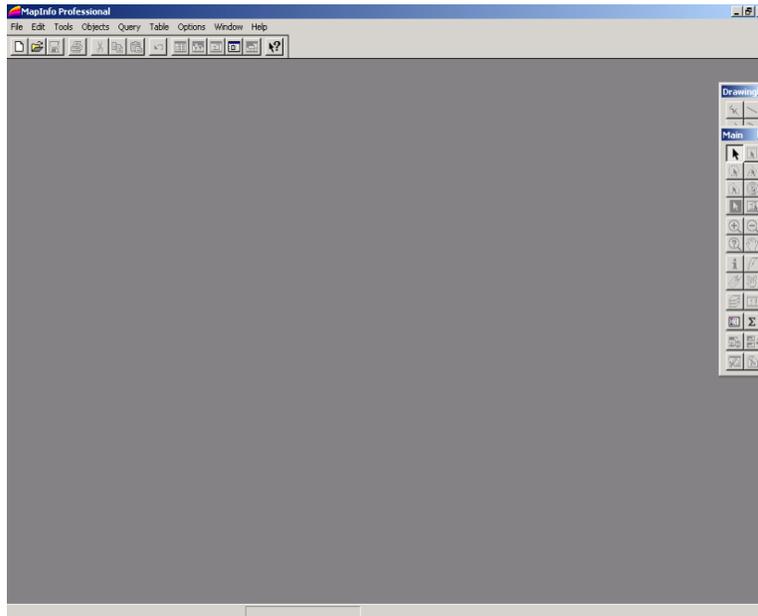
10 When the Form 310 form was used to apply for broadcast auxiliary authorizations, data on the location of permanent receive-only base stations was collected. With the introduction of Form 601 by WTB, RX-only data is no longer collected. However, Form 327 does collect RX-only data for the Cable Operations and Licensing System (COALS). It should be noted that these operations share the same spectrum: 1990-2110, 6875-7125 and 12700-13250 MHz.

11 In the band segments 3.7 to 4.2, 10.7 to 11.7, 11.7 to 12.2, 14.0 to 14.5 GHz, etc.

12 These files are compatible with MapInfo Professional version 3.5 upward. MapInfo's *ProViewer* [version 4.5](#) can be used in lieu of MapInfo Professional. This version of ProViewer has the engine need to generate the required "dat", "id", and "tab" files discussed below.

This section describes how to create the stylized map shown in Figure ____ . If you want to incorporate the extracted link data as a layer in an existing MapInfo map all you will need to create “dat”, “id”, and “tab” files.¹³

The first step is to launch **MapInfo**, Figure MI01.



Then in menu bar, left click on “File|Open Tables or Workspaces . . . “ to display the “Open MapInfo Tables or Workspaces” dialog box, left click on “Open Workspace, Figure MI02.

Figure 27 MI01 – MapInfo startup screen

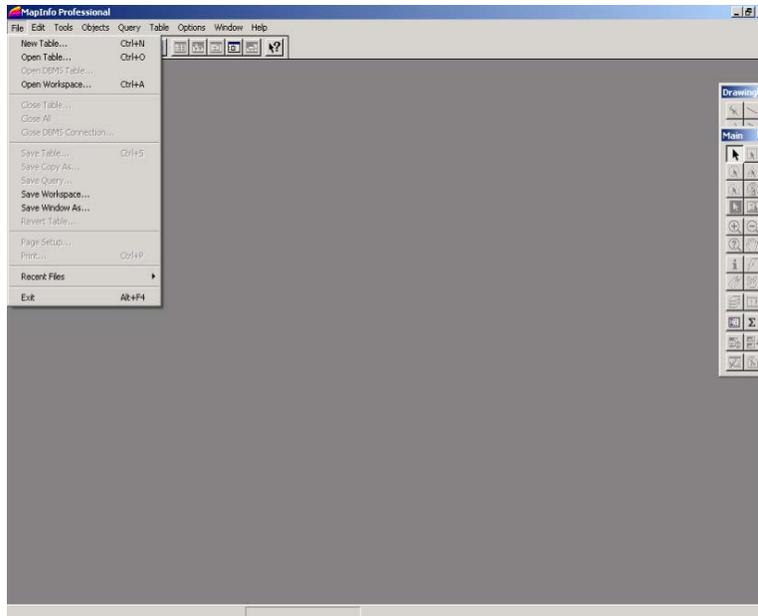


Figure 28 – MapInfo

Select the start-up work file, which in this example is “startall6525.wor” and open the file, Figure MI03. *MapInfo* will begin processing the “wor”, “mid” and “mif” files. A status window will appear. *MapInfo* uses the contents of “mid”, “mif” and “wor” files to build several other *MapInfo* files – “DAT”, “ID”, “Map”, and “TAB”.

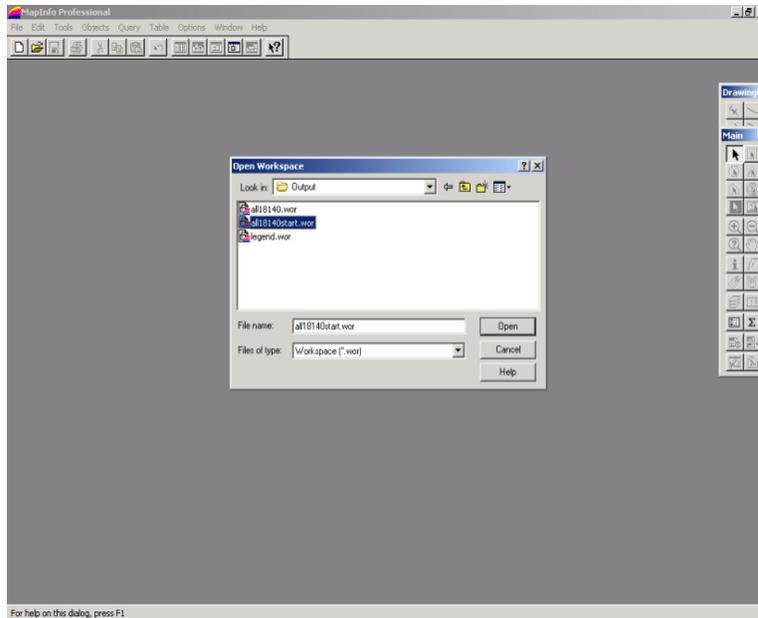


Figure 29 – MapInfo

A composite map is generated displaying the results of the links/stations you selected. Along the bottom of this composite map image there are five minimized map images (“CONUS map”, “AK Map”, “PR&VI Map”, “HI Map” and “Zero Map”). These components are used to create the composite map. See Figure MI04.

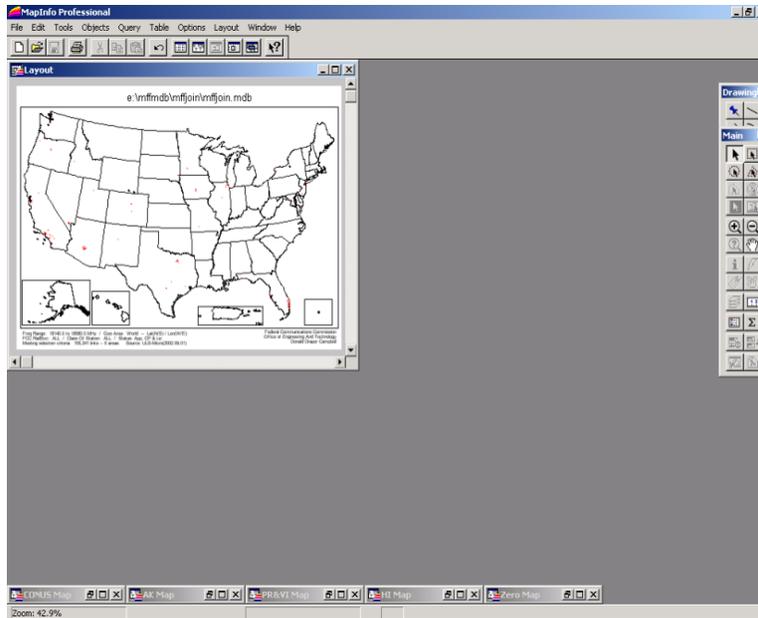


Figure 30 – MapInfo

To view the technical parameters of a station or link you need to first maximize a minimized map, for example, the “CONUS Map”. To do this left click on the restore icon for the “CONUS Map”. The “CONUS Map” will be maximized. See Figure MI05

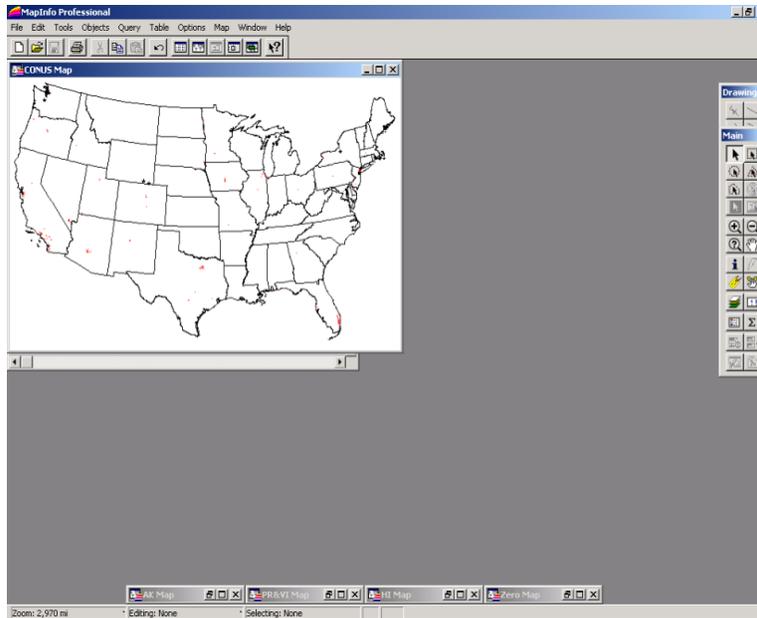
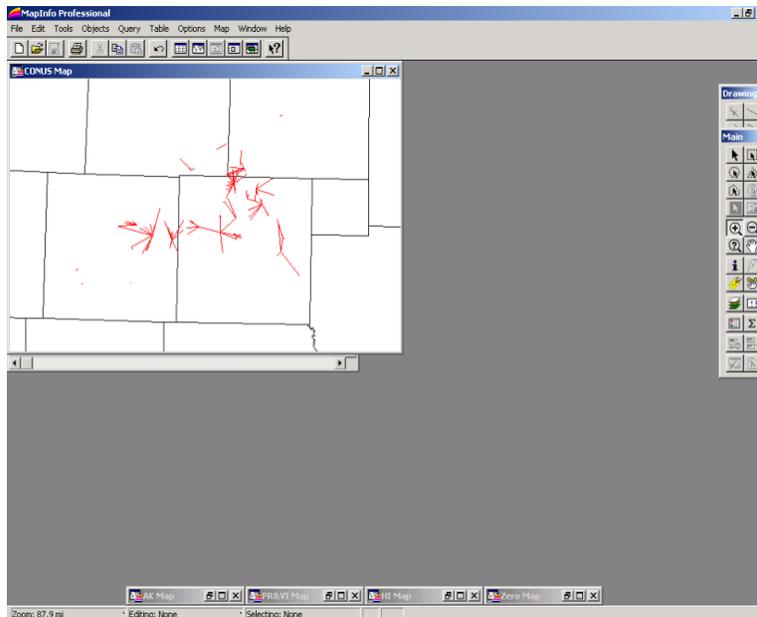


Figure 31 – MapInfo

To zoom in on an area, right click on the “+” icon on the menu bar, then left double click on the area to be expanded. You may need to do this several times to distinguish between several objects on the map. See Figure MI06.



To display the parameters associated with a map object, left click on the “i” icon on the menu bar. Then left click on the object of interest. This action will display a “Info Tool” drop down box which contains

Figure 32 – MapInfo

a list of entries associated with this object. Left click on an entry to display the contents of the entry. See Figure MI07.

To move across the map to display, left click on the “hand” icon on the menu bar. Drag the “hand” across the map to view the area of interest to display the next map.

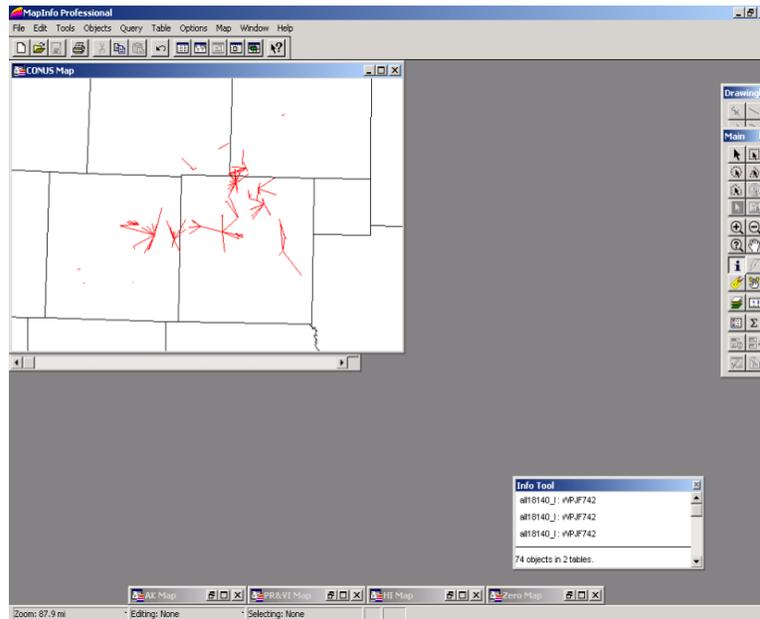


Figure 33 – MapInfo

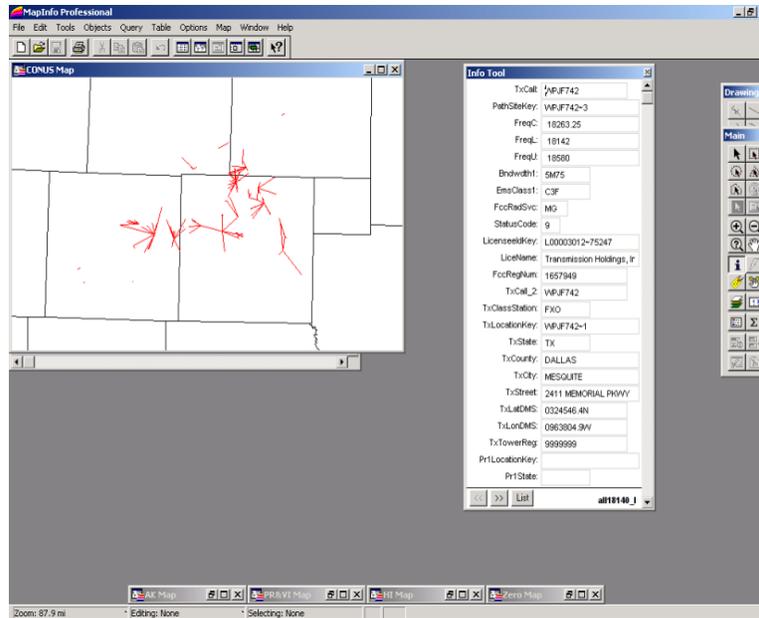


Figure 34 – MapInfo

To return the “CONUS Map” to the bottom of the composite map image, left click the “Minimize” icon for the “CONUS Map”.

Before selecting another map, left click on “File|Close All”. Then repeat the above instructions.

NOTE: Once you have created the map object, you need only select the “all6525.wor” file to redisplay the map.

To print a map, just left click on “File|Page Setup ...” on the menu bar to display the “Page Setup” dialog box. Set page “Orientation” to “Landscape” and then click “OK” to close the box. Now right click on the printer icon on the menu bar.

All: 6525 to 6875 MHz

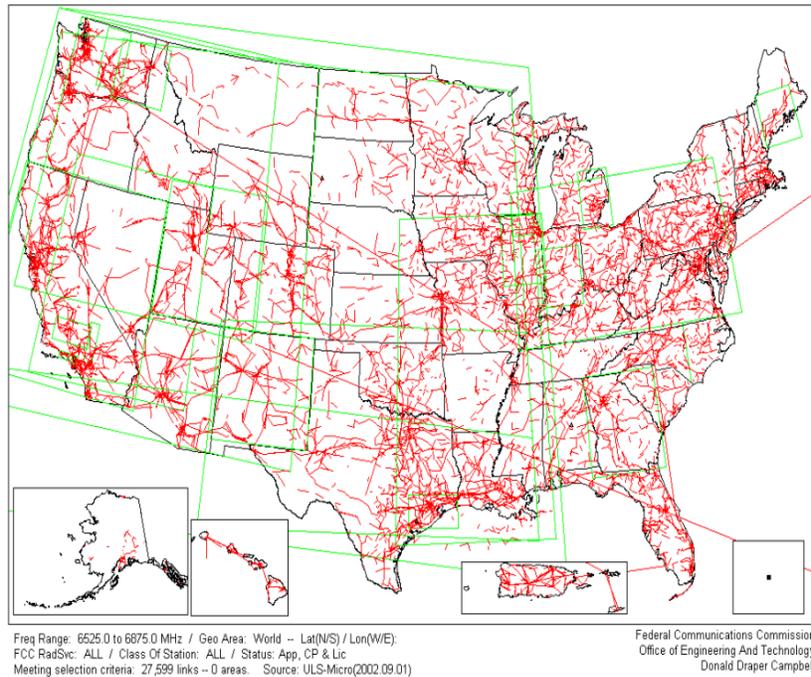


Figure 35 – Radio System Map. Derived from the MapInfo files:
“xxxx a mid” “xxxx a mif” “xxxx l mid” “xxxx l mif”

Map Legend:

Each time the program is run, it creates a “Map Legend” file which is written to the same directory at the “project”.

A **Red Line** “—” represents the path between a fixed transmitter site and a fixed receiver site via up to four passive repeater sites if any are present. A “link” is defined as a single frequency/ polarization combination between a fixed transmitter site and a receiver site via passive repeaters sites if any presents.

A **Blue Up Triangle** “▲” represents the transmitter site of a fixed link where the corresponding receiver site is not defined in the assignment record.

A **Blue Down Triangle** “▼” represents the point round which a mobile transmitter is assumed to operate. This point may be in fact be the receiver site for the mobile operation.

A **Blue Diamond** “◆” represents the point round which a mobile transmitter is assumed to operate. Since the assignment record did not have either TX or RX coordinates, the coordinates of this object are the coordinates of the parent broadcast station.

A **Green Star** “★” represents a fixed earth station (transmit or receive) site in the fixed or mobile satellite service.

A **Red Dot** “•” represents a full-service station: TV (NTSC), FM or AM.

A **Blue Dot** “*” represents a full-service station: TV (digital).

A **Green Dot** “*” represents a low power station: TV

A **Yellow Dot** “*” represents a translator station: TV or FM.

A **Black Dot** “*” represents a booster station: TV

A **Green Polygon** “9” defines the area of operation of a temporary fixed or mobile station(s).

Map Legend

Terrestrial Services

-  A Red Line represents the path between a fixed transmitter site and a fixed receiver site with up to four passive repeater sites if any are present.
-  A Blue Up Triangle represents the transmitter site of a fixed link where the corresponding receiver site is not defined by the assignment record.
-  A Green Down Triangle represents a base station around which mobile stations are assumed to operate.
-  A Blue Diamond represents a point-to-multipoint transmitting station with undefined fixed subscriber units.
-  A Green Diamond represents a point-to-multipoint receiving station with undefined fixed subscriber units.
-  A Yellow Down Triangle represents the base station around which mobile stations are assumed to operate. Because the assignment record did not have either TX or RX coordinates, the coordinates of this object are assigned the coordinates of the parent broadcast station.
-  A Green Polygon defines the area of operation of temporary fixed or mobile stations, or market area.

Space Services

-  A Green Star represents a transmitting earth station in the fixed or mobile satellite service.
-  A Blue Star represents a receiving earth station in the fixed or mobile satellite service.

Broadcast Services

-  A Red Dot represents a full-service station: TV (NTSC), FM, or AM.
-  A Blue Dot represents full-service station: TV (digital).
-  A Green Dot represents a low power station: TV (Class A) or FM (Class A).
-  A Yellow Dot represents a translator: TV or FM.
-  A Black Dot represents a booster station: TV.

Figure 36 – Map Legend

Appendix A

Tower Information Available from Web Sites

As of: 2009.05.13

Retrieval process of publicly available antenna site data from the web which can then be processed by “Convert Tower Data” (CnvTwrData) program.

List of Tower Companies

| Company | | | Sites |
|---|--------------------------|----|-----------------------|
| American Telephone and Telegraph (AT&T) | | 1 | 9,722 |
| American Tower Corporation (ATC) | | 2 | 30,766 |
| Badger Towers | | | 95 |
| CitySwitch (Norfolk Southern Communications and Signaling Facilities) | ActiveTowers | 21 | 45 |
| | CitySwitch-NSMicro | 20 | 429 |
| | CitySwitch-NSVHF | | 793 |
| | DispatchRadioInformation | | 764 |
| | NS_BCP_MCP Total | | <u>1,462</u> 3,463 |
| Com Sites West, LLC | | | 33 |
| Communication Enhancement, LLC | | 17 | 140 |
| Crown Castle International (CCI) | | 3 | 23,466 |
| Day Wireless Systems (PDF file) | | | 88 |
| Diamond Communications LLC | | 11 | 288 |
| DukeNet Communication Services, LLC | | 12 | 152 |
| Faulk & Foster Real Estate, Inc. | | | 41 |
| Global Tower Partners (GTP) | | 4 | 10,763 |
| Heartland Tower, Inc | | | 81 |
| Horvath Communications, Inc. | | 13 | 204 |
| KGI Wireless (Kampen and Greenwell, Inc.) | a | 5 | 18,062 |
| | b | | 54,117 |
| | c | | 37,853 |
| | Tower in use | | 9,273 |

| Company | | | Sites |
|--|----------------------|----|----------------|
| Liberty Towers, LLC (Liberty) | | | 51 |
| Message Center Management, Inc. | | | 50 |
| Mid Atlantic Tower, LLC | | | 35 |
| MidAmerica Towers | | | 23 |
| Pegasus Tower Company | Towers Billboards | 15 | 1,012 3,389 |
| SBA (SBA Communications Corporation) | SBA AAT | 6 | 8,150 4,708 |
| Shared Towers LLC | | | 280 |
| Sprint | | 7 | 361 |
| Stratus Telecom Managers | | 14 | 5,622 |
| Subcarrier Communications | | 16 | 976 |
| T-Mobile | | 8 | 7,026 |
| Tower Sites Inc. | | | 28 |
| Tower Maps (Antenna database, pay to bulk use) | | | |
| Tower Source (Antenna database, pay to bulk use) | | | |
| TowerCo | | 10 | 3,170 |
| TowerCom | | | 89 |
| Unison Site Management | | 19 | 2,077 |
| Vanguard Wireless | | 9 | 300 |

<http://www.skywaytowers.com/sitelocator.aspx>

<http://www.utilityservice.com/>

<http://www.insitewireless.com/>

total: 110,117

=====

Acadia Towers: *

Contacts:

3814 West Street Suite 210, Cincinnati, OH 45227-3725

[513-271-5999](tel:513-271-5999)

www.atttowers.com

<http://www.arcadiatowers.com/index.php?page=sites>

American Telephone and Telegraph (AT&T):

Contacts:

Call Us: 1.866.593.1383

Email: towers@cingular.com

www.atttowers.com

Account Logon Info:

User ID:

Password:

Retrieval Process:

Go to web page:

http://atttowers.com/towers/files/ATT_Towers_FullList.xls

(outdated maybe: Note, if you do not already have a “username” and “password” register to get one

Enter your username and password

Click on “Advanced Search”

Click on “Download All AT&T Tower Sites”

When the spreadsheet appears, click on the “excel” button.

Save the Excel Spread Sheet as “ATT_Towers_FullList_yyyymmdd.xls” to your hard drive)

Open “ATT_Towers_FullList_yyyymmdd.xls”

Delete the first row containing the phrase “All AT&T Towers”

Then save the file as a “Text (Tab delimited) (*.txt)” file – “att_data.txt”

Using the program “Notepad”, retrieve the file “att_data.txt”.

First delete the first line which is blank.

You now need to modify the column “field names” by removing blank spaces between words and save as a text file “att_data.txt”.

Data info:

| Original Field Name | Modified Field Name | Misc Info |
|----------------------------|----------------------------|--|
| Site ID | SiteId | |
| Site Name | SiteName | |
| Address | Address | |
| City | City | |
| State | State | |
| County | County | |
| ZipOrPostCode | ZipOrPostCode | |
| Latitude | Latitude | In decimal degrees. Datum: NAD83 |
| Longitude | Longitude | In decimal degrees. Datum: NAD83 |
| Tower Height | TowerHeight | In feet |
| Elevation | Elevation | In feet |
| HeightAboveAvgTerrain | HeightAboveAvgTerrain | In feet |
| Compound Dimensions | CompoundDimensions | In feet |
| Tower Type | TowerType | Flagpole, Guyed, Lattice, Monopole, NULL, OTHER, Stealth, Watertank, Wood Pole |
| Occupied RAD Heights | OccupiedRADHeights | In feet |

Datum: NAD83

American Tower Corporation (ATC):

116 Huntington Avenue, 11th Floor

Boston, MA 02116

Tel: 617-375-7500

Fax: 617-375-7575

Contacts:

Account Logon Info:

Retrieval Process:

Go to the web page:

<https://onairaccess.americantower.com/OLA/faces/login.jspx>

You need to sign in with valid user name and password.

You can download the entire site list in MS Excel format or csv format etc. by clicking on "National Site List"

Save the excel spreadsheet as "ATC_NationalSiteList_yyyymmdd.xls"

Rename ""NationalSiteList.xls" to "atc_data.xls"

Open "atc_data.xls"

Save the file as a "Tab Delimited" file

Open "atc_data.txt"

You now need to modify the column "field names" by removing blank spaces between words and save as a text file "att_data.txt".

Save the file as "atc_data.txt"

Data info:

| Original Field Name | Modified Field Name | Misc Info |
|----------------------------|----------------------------|---|
| TowerName | TowerName | |
| FCCNo | FCCNo | FCC Antenna Structure Registration Number |
| ATCNumber | ATCNumber | |
| Address | Address | |
| City | City | |
| Zip | Zip | |
| County | County | |
| State | State | |
| Region | Region | |
| ATCArea | ATCArea | |
| Latitude | Latitude | In decimal degrees |
| Longitude | Longitude | In decimal degrees |
| CoordinateType | CoordinateType | NAD27 / NAD83 / -No Datum |
| HeightStructure | HeightStructure | In feet |
| GroundElevation | GroundElevation | In feet |
| TowerType | TowerType | -- Unknown Tower Type -- Building, Casino, Church, Educational, Guyed, Hospital, Hotel, Hotel/Casino, Industrial, Mall, Monopolar, Monopole, Municipal, Office, Open Land, Other, Parking Garage, Recreational, Residential, Restaurant, Retail, Roof Top, Self Support, Smokestack, Stealth - Fire Tower, Stealth - Flagpole, Stealth - Light Pole, Stealth - Micropole, Stealth - Other, Stealth - Silo, Storage, Unknown Tower Type, Utility Bldg, Water Tower, Wood Pole |
| TowerStatus | TowerStatus | Active / In Development / Inactive |
| TowerClass | TowerClass | Broadcast - Region, In Building, Rooftop, Wireless |

Branch Communications *

Contacts:

1516 South Boston Avenue, Suite 215, Tulsa, OK 74119

918-949-4551

<http://www.branchcomm.net/wp-content/plugins/towers/towerdownload.php>

Capital Telecomm *

Contacts:

973 425-06061500 Mt. Kemble Ave.Suite 203Morristown, NJ 07960

918-949-4551

<http://www.capitaltelecom.com/export/excel.xlsx?type=all>

Central States Tower *

Contacts:

323 S. Hale Street, Suite 100

Wheaton, IL 60187

(630) 221-8500

Fax: (630) 221-8516

<http://www.capitaltelecom.com/export/excel.xlsx?type=all>

CitySwitch, LLC (Norfolk Southern Communications and Signaling Facilities)

Contacts:

CitySwitch, LLC
c/o Norfolk Southern Railroad
1200 Peachtree Street, NE
12th Floor, Mailstop 114
Atlanta, Georgia 30309
404-518-2064
marshall.hazlehurst@cityswitch.net
marshall.hazlehurst@nscorp.com

<http://www.cityswitchllc.com/contact/>

Account Logon Info:

Existing Norfolk Southern Communications and Signaling Facilities:

Microwave Towers: (CitySwitch-NSMicro.xls) – NS Microwave Towers for Lease

| Original Field Name | Modified Field Name | Misc Info |
|---------------------|---------------------|-------------------------|
| Latitude | | dd.dddddddd |
| Longitude | | ddd.dddddddd |
| SiteName | | |
| State | | |
| Callsign | | |
| Mp | | MP # = Mile Post number |
| ClosestCityState | | city, state |
| LatNad27 | | dd-mm-ss.ss |
| LonNad27 | | ddd-mm-ss.ss |
| LatNad83 | | dd-mm-ss.ss |
| LonNad83 | | ddd-mm-ss.ss |
| Amsl(ft) | | feet |

| Original Field Name | Modified Field Name | Misc Info |
|---------------------|---------------------|-------------|
| Agl (Ft) | | feet |
| Appur(ft) | | feet |
| FaaStudy | | |
| TwrReg | | Ant Reg Num |

Latitude Longitude SiteName State Callsign Mp ClosestCityState
 LatNad27 LonNad27 LatNad83 LonNad83 Amsl Agl Appur
 FaaStudy TwrReg

Site Construction Services / New Tower:

ActiveTowers.xls

| Original Field Name | Modified Field Name | Misc Info |
|-------------------------|-----------------------|---------------------|
| Site Name | SiteName | |
| Site Address | SiteAddress | |
| Site City | SiteCity | |
| Site State | SiteState | |
| Site ZIP Code | SiteZipCode | |
| Site County | SiteCounty | |
| Latitude (NAD83) | LatitudeNAD83 | dd.dddddd / NAD83 |
| Longitude (NAD83) | LongitudeNAD83 | -ddd.dddddd / NAD83 |
| Height AGL (feet) | HeightAgl | feet |
| Structure Type | StructureType | Monopole, DAS, SST |
| FAA File Number | FaaFileNumber | |
| FCC Registration Number | FccRegistrationNumber | |
| Construction Status | ConstructionStatus | |

SiteName SiteAddress SiteCity SiteState SiteZipCode SiteCounty
 LatitudeNAD83 LongitudeNAD83 HeightAgl StructureType FaaFileNumber
 FccRegistrationNumber ConstructionStatus

Additional Norfolk Southern Communication and Signaling Facilities:

VHF Towers/Facilities (CitySwitch-NSVHF.xls) – VHF Towers

| Original Field Name | Modified Field Name | Misc Info |
|---------------------|---------------------|------------|
| CALLSIGN | | Call Sign |
| STATION | | Place Name |
| STATE | | State |
| LAT | | dd-mm-ss |
| LONG | | ddd-mm-ss |
| AMSL | | feet |
| TWR HGT | | feet |

CALLSIGN STATION STATE LAT LONG AMSL TWR HGT

Dispatch Data Radio Facilities (DispatchRadioInformation.xls) – Radio Towers

| Original Field Name | Modified Field Name | Misc Info |
|---------------------|---------------------|--------------|
| Radio Location | | Place name |
| ST | | State |
| Freq 1 | | MHz |
| Freq 2 | | MHz |
| Lat | | dd-mm-ss.ss |
| Long | | ddd-mm-ss.ss |

Radio Location ST Freq 1 Freq 2 Lat Long

Train Control Radio Facilities (NS_BCP_MCP.xls) – Norfolk Southern BCP Listing

| Original Field Name | Modified Field Name | Misc Info |
|---------------------|---------------------|-------------|
| CITY | | City |
| ST | | State |
| LAT | | dd-mm-ss.ss |

| Original Field Name | Modified Field Name | Misc Info |
|---------------------|---------------------|--------------|
| Lon | | ddd-mm-ss.ss |
| M/W SITE | | CallSign |
| DIVISION | | Division |
| Chnl | | Channel |

CITY ST LAT M/W SITE DIVISION Chnl

Communication Enhancement, LLC:

479 Centennial Blvd.

Voorhees, NJ 08043

Contact: Andrew Thompson

856-782-3700 / 856-782-3701 (f) / 609-217-8095 (m)

athompson@ce-llc.com

<http://www.ce-llc.com/Towers%20Main.htm>

Contacts:

Account Logon Info:

| Original Field Name | Modified Field Name | Misc Info |
|---------------------|---------------------|-----------|
| Status | | |
| CESite | | |
| OldSiteNumber | | |
| SiteName | | |
| StreetAddress | | |
| City | | |
| State | | |
| Zip | | |
| County | | |

| Original Field Name | Modified Field Name | Misc Info |
|---------------------|---------------------|-----------|
| Latitude | | |
| Longitude | | |
| DecimalLAT | | |
| DecimalLON | | |
| GrElev | | feet |
| ParcelSize | | |
| Acres | | |
| TowerHt | | feet |
| Structure | | |

Datum: NAD83

Status CESite OldSiteNumber SiteName StreetAddress City State Zip County
Latitude Longitude DecimalLAT DecimalLON GrElev ParcelSize Acres
TowerHt Structure

Status CESite OldSiteNumber SiteName StreetAddress City State Zip
CountyLatitude Longitude DecimalLAT DecimalLON GrElev ParcelSize
Acres TowerHt Structure

Com Sites West, LLC:

725 Main Street Suite 228 Woodland, CA 95695

Phone: 888-960-8300 or 530-662-6300 Fax 530-662-6331

Emergency: 916-799-1131 or 530-913-6451

<http://comsiteswest.com/library/> (data sent to email)

<http://comsiteswest.com/sites-list/> (active sites only, copy and paste as Unicode text to excel)

Contacts:

Account Logon Info:

| Original Field Name | Modified Field Name | Misc Info |
|---------------------|---------------------|-----------|
| | | |
| | | |

Enter your username and password

Click on “site information”

Click on “Generate Site List”

Once the list is generated, click on “download”

When the page is displayed, click on the “excel” button and save file as a “csv” file.

Rename “SiteList[1].csv” to “cci_data.csv”

Open “cci_data.csv” and save as a Tab Delimited text file

Open “cci_data.txt”

Delete all “-“ and “)” , replace all blank spaces, “/” and “(“ with “_” in the first line and then save the file.

Save the file as a “Tab Delimited” file

Data Info:

| Original Field Name | Modified Field Name | Misc Info |
|------------------------------|------------------------------|--|
| Country | Country | |
| Site Manager | Site Manager | |
| Site ID | SiteID | |
| Contact Name | ContactName | |
| Contact Phone | ContactPhone | |
| Site Name | SiteName | |
| Address | Address | |
| City | City | |
| County | County | |
| State | State | |
| Zip Code | ZipCode | |
| Structure Type | StructureType | “Blank”, Compound, Guyed, Monopole, Other, Roof Top, Rooftop, Self Support, Single Use, Unclassified |
| Ground Elev | GroundElev | feet |
| Structure Height | StructureHeight | feet |
| Structure Height With Appurt | Structure_Height_With_Appurt | feet |
| FAA Approved Height | FAA_Approved_Height | feet |
| Latitude | Latitude | decimal degrees |
| Longitude | Longitude | decimal degrees |
| Latitude - Degrees | LatitudeDegrees | degrees |
| Latitude - Minutes | LatitudeMinutes | minutes |
| Latitude - Seconds | LatitudeSeconds | decimal seconds |
| Longitude - Degrees | LongitudeDegrees | degrees |
| Longitude - Minutes | LongitudeMinutes | minutes |
| Longitude - Seconds | LongitudeSeconds | decimal seconds |
| MTA ID | MTAID | |
| MTA Name | MTAName | |
| BTA ID | BTAID | |
| BTA Name | BTAName | |
| MSA/RSA ID | MSARSAID | |
| MSA/RSA Name | MSARSAName | |

| Original Field Name | Modified Field Name | Misc Info |
|---------------------|---------------------|-----------|
| | | |
| | | |
| | | |
| | | |
| | | |

Datum: NAD83

Diamond Communications LLC (Diamond):

Contacts:

Diamond Communications LLC
820 Morris Turnpike, Suite 104
Short Hills, NJ 07078
Phn: 973-544-6818
Fax: 973-206-0098
e-mail: info@diamondcomml.com

Account Logon Info:

Retrieval Process:

<http://www.diamondcomm.com/contact-us/> (send email to ask data)

Logon to www.diamondcomm.com/towerdata.php
([invalid now](#))

Click on “Download Tower List” and file save as “Diamond_yyyymmdd.csv”

Open “Diamond_yyyymmdd.csv” and save as ‘Text (Tab delimited)’ file
“Diamond_yyyymmdd.txt”

Then save the file as a “Text (Tab delimited) (*.txt)” file – “diamond_data.txt”

Using the program “Notepad”, retrieve the file “diamond_data.txt”.

First delete the first line which is blank.

You now need to modify the column “field names” by removing blank spaces between words and save as a text file “diamond_data.txt”.

Data Info:

| Original Field Name | Modified Field Name | Misc Info |
|----------------------|---------------------|---|
| SITE ID | SiteId | |
| SITE NAME | SiteName | |
| CITY | City | |
| COUNTY | County | |
| STATE | State | |
| ZIP | Zip | |
| LATITUDE | Latitude | decimal degrees |
| LONGITUDE | Longitude | decimal degrees |
| FCC NUMBER | FccNumber | FCC ASR number |
| STRUCTURE TYPE | StructureType | Flagpole, Guyed, Monopine, Self-support |
| TOWER HEIGHT(FT) | TowerHeight | |
| GROUND ELEVATION(FT) | GroundElevation | in feet |
| BTA NAME | BtaName | |
| BTA NUMBER | BtaNumber | |
| BTA RANK | BtaRank | |
| MTA | Mta | |
| MTA NUMBER | MtaNumber | |
| STATUS | Status | |

SiteId SiteName City CountyState Zip Latitude Longitude FccNumber
 StructureType TowerHeight(ft) GroundElevation(ft) BtaName BtaNumber
 BtaRank Mta MtaNumber Status

Datum: NAD 83
 ASR data

Contacts:

Diamond Communications LLC
820 Morris Turnpike, Suite 104
Short Hills, NJ 07078
Phn: 973-544-6818

Fax: 973-206-0098
e-mail: info@diamondcomml.com

DukeNet Communication Services, LLC (DukeNet)
(acquired by time warner)

Contacts:

DukeNet Communication Services, LLC
139 E. Fourth St.
Mail Code: EA501
Cincinnati, OH 45202

Account Logon Info:

Retrieval Process:

Logon to www.duke-energy.com/dukenet-towers/dukenet-towers-tower-site-list.asp

Click on “tower site list” and file save as “DukeNet_yyyymmdd.xls”

Open “DukeNet_yyyymmdd.xls” and save as ‘Text (Tab delimited)’ file
“DukeNet_yyyymmdd.txt”

Then save the file as a “Text (Tab delimited) (*.txt)” file – “dukenet_data.txt”

Using the program “Notepad”, retrieve the file “dukenet_data.txt”.

First delete the first line which is blank.

You now need to modify the column “field names” by removing blank spaces between words and save as a text file “dukenet_data.txt”.

Data Info:

| Original Field Name | Modified Field Name | Misc Info |
|---------------------|---------------------|---|
| Tower ID | Towerid | |
| Site Name | Sitename | |
| ADDRESS | Address | |
| CITY | City | |
| STATE | State | |
| ZIP CODE | ZipCode | |
| COUNTY | County | |
| LATITUDE | Latitude | Hdd mm ss |
| LONGITUDE | Longitude | Hddd mm ss |
| MTA | Mta | |
| STRUCTURE TYPE | StructureType | Guyed, Monopole, Self Support, Transmission Tower |
| AGL | Agl | in feet (above ground level) |
| FCC | Fcc | FCC ASR number |
| STATUS | Status | |

' TowerId SiteName Address City State ZipCode CountyLatitude
 Longitude Mta StructureType Agl Fcc Status

Datum: NAD 83
ASR data

Faulk & Foster Real Estate, Inc.

Faulk & Foster Real Estate
1811 Auburn Avenue,
Monroe, LA 71201
Tel: (318) 325-4666
<http://www.faulkandfoster.com/towers/>

Contacts: contact.us@faulkandfoster.com

Account Logon Info:

Goto <http://www.gtpsites.com/Pgs/SiteLocator.aspx>

Select “Export Search Results to Excel” and download the file “GTPSiteSearch.xls”

Open the file “GTPSiteSearch.xls” and save it as a Tab Delimited file – “GTPSiteSearch.txt”

Rename “GTPSiteSearch.txt” as “gtp_data.txt”

Open the file “gtp_data.txt” and in the first line, replace all blank spaces in column names. Save the file.

Data Info:

| Original Field Name | Modified Field Name | Misc Info |
|-------------------------|---------------------|---|
| Site Number | Site_Number | |
| Site Name | Site_Name | |
| Address | Address | |
| City | City | |
| State | State | |
| County | County | |
| Zip | Zip | |
| Latitude | Latitude | In decimal degrees Datum: NAD83 |
| Longitude | Longitude | In decimal degrees Datum: NAD83 |
| Site Type | SiteType | ROOFTOP, ROOF TOP TOWER |
| Structure Type | StructureType | “blank”, APTS, BANK, CONDO, GARAGE, GUYED, HOSP, HOTEL, INDUST, INDUSTRIAL/FLEX, LAND, MONO, MUN, OFC, OFC-M, OTHER, PTWR, RECREA, RETAIL, SST, STEALTH, STORAGE, STWR, TWR-IP, W-POLE, WTANK |
| AGL (feet) | AGL | In feet |
| Ground Elevation (feet) | GroundElevation | In feet |
| MTA | MTA | |
| BTA | BTA | |

| Original Field Name | Modified Field Name | Misc Info |
|---------------------|---------------------|-----------|
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Datum: NAD83

Horvath Communications, Inc. (Horvath)

Contacts:

Horvath Communications, Inc.
 401 E. Colfax Ave. - Suite 101
 South Bend IN 46617
 Phone: 574-237-0464
 Fax: 574-237-0484

Account Logon Info:

Retrieval Process:

Logon to <http://horvathcommunications.com/towers/>

Click on “Here” on line "**Download our latest list of towers [HERE.](#)**"

Open “HorvathTowers_yyyymmdd.xls” and save as ‘Text (Tab delimited)’ file
 “HorvathTowers_yyyymmdd.txt”

Then save the file as a “Text (Tab delimited) (*.txt)” file – “horvath_data.txt”

Using the program “Notepad”, retrieve the file “horvath_data.txt”.

First delete the first line which is blank.

You now need to modify the column “field names” by removing blank spaces between words and save as a text file “horvath_data.txt”.

Data Info:

| Original Field Name | Modified Field Name | Misc Info |
|---------------------|---------------------|---|
| Tower No. | TowerNo | |
| Tower Name | TowerName | |
| Address | Address | |
| City | City | |
| County | County | |
| State | State | |
| Latitude | Latitude | decimal degrees |
| Longitude | Longitude | decimal degrees |
| AGL | Agl | in feet (above ground level) |
| AMSL | Amsl | in feet (above mean sea level) |
| FAA Study | FaaStudy | FAA Study number |
| FCC Reg. | FccReg | FCC Antenna Structure Registration number |
| Status | Status | |

‘ No. Tower Name Address City CountyState Latitude Longitude AGL
 AMSL FAA Study FCC Reg. Status

Datum: NAD 83
 ASR data

Contacts:

Horvath Communications, Inc.
 401 E. Colfax Ave. - Suite 101
 South Bend IN 46617
 Phone: 574-237-0464
 Fax: 574-237-0484

K2 Towers:

http://www.k2towers.com/K2Towers_TowerSummary.xls

Contacts:

86 West Street, Chagrin Falls, Ohio 44022
Phone: 866.962.0904
Fax: 440.528.0334
Email: info@k2towers.com

KGI Wireless (Kampen and Greenwell, Inc.):

Contacts:

Kathy Charmello at 512.345.9595, Ext 206
512.334.3206 Direct
Building Four, Suite 520
6200 Bridge Point Parkway
Austin, Texas 78730

clark rountree
425-383-1919

Account Logon Info:

A tower management firm. They do not own any towers.

Retrieval Process:

Goto <http://kgiwireless.com/site-locator/>

Click on "Download KGI Sites in excel"

Rename the file "KGIExcelSiteDatabase.xls" to "kgi_data.xls".

Open "kgi_data.xls" and delete the first row of data as well as the last row of data and save the file.

Also, delete all blank columns on the right side.

Save the file as a "Tab Delimited" file "kgi_data.txt"

Open “kgi_data.txt” and delete the first row and then replace all banks in the column header names with “_”.

- Delete the following strings •
- “http://www.KGIWireless.com/Documents/TowerProfiles.asp?TowerNumber=”
 - “http://www.KGIWireless.com/WebMapsMS/HTSL.aspx?State=”

Remove all quotation marks and commas in number fields by
 replacing “,b” with “|”
 replacing “,” with blank
 replacing “|” with “, “
 replacing quotation marks with blanks

Save the file as a “Tab Delimited” file

Data Info:

File Name: KGIExcelSiteDatabase.xls

| Original Field Name | Modified Field Name | Misc Info |
|---------------------|---------------------|---|
| Site | KGISiteID | “blank” = KGI “MCD” = McDonald’s “PSA” = Public Storage Account Logon Info “FTS” = First Telecom Service |
| Tower URL | TowerURL | “Do not import” |
| Tower Number | TowerNumber | “Do not import” |
| Latitude | Latitude | DMS |
| Longitude | Longitude | DMS |
| Site Address | SiteAddress | |
| City | City | |
| State | State | |
| WebMap URL | WebMapURL | “Do not import” |
| State Label | StateLabel | “Do not import” |
| ZIP Code | ZIPCode | |
| Elevation AMSL | ElevationAMSL | feet |
| Height AGL | HeightAGL | feet |

Datum: NAD83

| | | | | | |
|-----------|----------|-------------|------------|-----------|---------------|
| KGISiteID | TowerURL | TowerNumber | Latitude | Longitude | SiteAddress |
| SiteCity | State | WebMapURL | StateLabel | ZIPCode | ElevationAMSL |
| HeightAGL | | | | | |

Contacts:

Building Four, Suite 520
 6200 Bridge Point Parkway
 Austin, Texas 78730

Tower King: *

Contacts:

Address: 23434 Elliott Road, Defiance, Ohio 43512
 Phone: 419.782.8591
 Fax: 419.782.3299
 Email: contact@towerking.com

<http://towerking.com/tk/wp-content/uploads/2016/03/Towerking-Site-List-2016.csv>

Vertical Bridge (previously Liberty Towers, LLC (Liberty))

51 Monroe Street, Plaza East 7
 Rockville, Maryland 20850-0243
 888-LIBTWRS (542-8977) - Phone
 202-420-7308 - Fax

<http://sitelocator.verticalbridge.com/Home/List>

click "Export to excel" button

Contacts:

Account Logon Info:

| Original Field Name | Modified Field Name | Misc Info |
|---------------------|---------------------|-----------|
| SiteID | | |
| SiteName | | |

| Original Field Name | Modified Field Name | Misc Info |
|---------------------|---------------------|---------------------------|
| State | | |
| County | | |
| BTA | | |
| MTA | | |
| FCCASR | | |
| Coordinates | | 2C Coordinates (NAD83) |
| GroundElevation | | Ground Elevation (NGVD29) |
| TowerHeight | | Tower Height (AGL) |
| TowerType | | Tower Type |

Datum: NAD83

SiteID SiteName State CountyBTA MTA FCCASR 2C Coordinates (NAD83)
Ground Elevation (NGVD29) Tower Height (AGL) Tower Type

Message Center Management, Inc.:

40 Woodland Street

Hartford CT 06105

(888) 973-SITE

(888) 973-7483

<http://www.mcmgmt.com/locator/search.aspx>

msscotti@mcmgmt.com

Maria Scotti 860-727-5742

Contacts:

Account Logon Info:

| Original Field Name | Modified Field Name | Misc Info |
|---------------------|---------------------|-----------|
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Datum: NAD83

| MAP (overview) | State | Site Name | Address | City | County | Zip | Code |
|----------------|------------------------|--------------------------------|-------------------|-----------|----------------|----------|------|
| Jurisdiction | MTA # | MTA NAME | BTA# | BTA NAME | Structure Type | Latitude | |
| Longitude | Latitude (rev?) | Longitude (rev?) | LAT (dec) | LONG | | (dec) | |
| Ground Hgt | Ground Hgt (m) | Existing Structure Height (ft) | Existing | Structure | | | |
| Height (m) | HAAT (ft) | HAAT (m) | Available Height | FCC | Registration | | # |
| | Available Ground Space | exist carriers | FAA Determination | | | | |

Mid Atlantic Tower, LLC:

636 South Main Street
 Emporia, Virginia 23847
 Phone: 804.634.6100 / Fax: 804.634.5700 / Cell: 804.370.2000

<https://milestone.towersource.com/> clicke on "Download all"

Contacts:

12110 Sunset Hills Rd. #100
 Reston, VA 20190
 Phone: 703.620.2555
 Fax: 703.668.0418

NexTower:

<http://www.nextower.net/images/NexTower-Collocation-List.pdf>

Contacts:

4210 NW 37th Place, Suite 600, Gainesville, FL 32606
 Phone 407-907-7984
jcollins@nextower.net

Nsight Tower:

<http://www.nsighttower.com/downloads/NTH-II-tower-list-and-details.xlsx>

Contacts:

(920) 617-7100

Nsight-Tower@cellcom.com

Parallel Infrastructure:

<http://pitowers.com/download.php?file=docs/pi-sites-and-developable-raw-land.xlsx>

Contacts:

General Inquiries

904.450.4830

info@parallelinfrastructure.com

Towers and Telecom Services - Sales and Management
2855 Le Jeune Road, 4th floor, Coral Gables, FL 33134

Towers and Telecom Services - Operations and Development
7411 Fullerton Street, Suite 110, Jacksonville, FL 32256

Real Estate Management Services
7411 Fullerton Street, Suite 301, Jacksonville, FL 32256

Pegasus Tower Company: (?)

Contacts:

139 Steelsburg Hwy

Cedar Bluff, VA 24609

276-964-7416 / 276-963-2587 (F)

info@pegasustower.com

<http://www.pegasustower.com/sites.html>

Account Logon Info:

| Original Field Name | Modified Field Name | Misc Info |
|----------------------------|----------------------------|------------------|
| State | | |
| County | | |

| Original Field Name | Modified Field Name | Misc Info |
|---------------------|---------------------|-----------|
| City | | |
| SiteName | | |
| LatDMS | | |
| LonDMS | | |
| AGL | | feet |
| AMSL | | feet |
| SiteType | | |
| LatD | | |
| LatM | | |
| LatSec | | |
| blank | | |
| LonD | | |
| LonM | | |
| LonS | | |
| LatDec | | |
| LonDec | | |
| CoID | | |

Datum: NAD83

'State County City SiteName LatDMS LonDMS AGL AMSL SiteType LatDeg LatMin
LatSec Blank1 LonDeg LonMin LonSec LatDecimal LonDecimal CoId

| State | County | City | SiteName | LatDMS | LonDMS | AGL | AMSL | SiteType | LatDeg | LatMin | LatSec | Blank1 | LonDeg | LonMin | LonSec | LatDecimal | LonDecimal | CoId |
|-------|----------|----------|-----------------------|-------------|---------------|-------------|---------------|----------|--------|--------|--------|--------|--------|--------|--------|------------|------------|------|
| AL | Baldwin | Loxley | Loxley 206 Site | 30 39 19 | 87 46 08 0 | 190 | Raw Land 30 | 39 | 19 | | | | | | | | | |
| | | 46 | 8 | 30.65527778 | 87.76888889 | 17 | 302 PTC | | | | | | | | | | | |
| AL | Baldwin | Loxley | Loxley 206 Sign | 30 39 19 | 87 46 08 90 | 190 | sign 30 | 39 | 19 | | | | | | | | | |
| | | 46 | 8 | 30.65527778 | 87.76888889 | 17 | 302 PTC | | | | | | | | | | | |
| AL | Calhoun | Anniston | TCA Kindergarten Site | 33 35 21 | 85 52 22 0 | 633 | Raw Land 33 | 35 | | | | | | | | | | |
| | | 21 | 85 | 52 22 | 33.58916667 | 85.87277778 | 29 | 17 | PTC | | | | | | | | | |
| AL | Cleburne | Delta | Mt. Cheaha Tower | 33 29 07 | 85 48 33 2050 | 2392 | Guyed-Wire 33 | 29 | | | | | | | | | | |
| | | 7 | 85 | 48 33 | 33.48527778 | 85.80916667 | 29 | 17 | PTC | | | | | | | | | |

RG Towers, LLC:

<http://www.rgtowers.com/RGtowers.xls>

Contacts:

2141 Alternate A1A, South, Suite 440, Jupiter.Florida 33477

Phone: 561.748.0302

Fax: 561.748.0303

Email: info@rgtowers.com

SBA (SBA Communications Corporation):

Contacts:

SBA Network Services, Inc.
5900 Broken Sound Pkwy NW
Boca Raton, FL 33487

Account Logon Info:

Retrieval Process:

Goto <http://www.sbsite.com/http://map.sbsite.com/default.aspx>

Click on “Download Our Sites”.

On the “Welcome to SBA’s Owned Site Locator Application”, click on “Email Me A CSV File of All Sites” button

File in who is requesting info form.

Data is e-mailed to you. Download file.

Then click on “Click Here to Vist AAT’s Managed Site Locator” button

Data is e-mailed to you. Download ‘Owned’ file.

Open the ‘Owned’ csv file and save as and Excel file.

Open the Excel file and save as Tap Delimited file – “sba_data.txt”

Open “sba_data.txt” and replace all blanks in column names with “_”and save file.

Data Info:

| Original Field Name | Modified Field Name | Misc Info |
|---------------------|---------------------|---|
| Site Code | SiteCode | |
| Site_Name | SiteName | |
| Latitude | Latitude | decimal degrees |
| Longitude | Longitude | decimal degrees |
| City | City | |
| MTA | MTA | |
| BTA | BTA | |
| State | State | |
| County | County | |
| Type | | “blank”, Billboard, Building, Clocktower, Flagpole, Generic AAT, Tower, Guyed, MonoCross, Monopole, Monopole Tree, Other, Roof Mount, Self Support, Silo, Smokestack, SST, Stealth, Tree, Water Tower, Wood Pole, Wood Pole |
| Height | DecLong | feet |
| MTA | | |
| BTA | | |
| Contact | Contact | |
| Phone | Phone | |
| Email | Email | |

Datum: NAD83

SBA and ATT

Site Code Site Name Latitude Longitude Address City State Zip
CountyType Height MTA BTA Contact Phone Email

Skyway Towers:

<http://www.skywaytowers.com/SiteInventoryCurrent.xls?x=225>

Contacts:

3637 Madaca Lane, Tampa, FL 33618
Phone 813.960. 6200
Fax 813.960.6210

Sprint:

Contacts:

Account Logon Info:

donald.campbell@fcc.gov
in_harmony

Retrieval Process:

Goto <http://www.sprintsitesusa.com/>

Enter Email Address and Password:

Click on “All Sites Download”

Click on Excel button and save resulting file as an Excel file

Rename files as “sprint_data.xls”

Open the Excel file and save as a Tab Delimited file

Replace blank spaces with “_” and delete pound sign, “(“ and “)”. ”.

Data Info:

| Original Field Name | Modified Field Name | Misc Info |
|----------------------------|----------------------------|------------------|
| Cascade Site # | CascadeSite | |
| Site Name | SiteName | |
| Latitude | Latitude | DMS |
| Longitude | Longitude | DMS |
| Street Address | StreetAddress | |
| Street Address (continued) | StreetAddressContinued | |
| City | City | |
| State | State | |
| Postal Code | PostalCode | |

| Original Field Name | Modified Field Name | Misc Info |
|----------------------|---------------------|--------------------------------|
| County | County | |
| TowerHt_in_Ft | TowerHt | feet |
| AMSL_in_Ft | AMSL | feet |
| Enclosure_Dimensions | EnclosureDimensions | feet |
| Latitude_Decimal | LatitudeDecimal | decimal degrees |
| Longitude_Decimal | LongitudeDecimal | decimal degrees |
| AddDate | AddDate | "Do not import" |
| Owner | Owner | Mobilitie, NEXTEL, OTHER, SPCS |

Datum: NAD83

Stratus Telecom Managers(?)

Waterfront Technology Center
200 Federal St., Suite 300
Camden, NJ 08103

<http://www.stratussites.com/>

Contacts:

Account Logon Info:

| Original Field Name | Modified Field Name | Misc Info |
|---------------------|---------------------|-----------|
| LocationNo | | |
| Address | | |
| City | | |
| State | | |
| ZipCode | | |
| LatitudeDegrees | | |
| LatitudeMinutes | | |
| LatitudeSeconds | | |
| LongitudeDegrees | | |
| LongitudeMinutes | | |

| Original Field Name | Modified Field Name | Misc Info |
|---------------------|---------------------|-----------|
| LongitudeSeconds | | |
| LatitudeDecimal | | |
| LongitudeDecimal | | |
| MTA | | |
| BTA | | |

Datum: NAD83

| | | | | | | | |
|-------------|--------------------|---------------------|---------------------|-----------|--------------------|----------|---|
| Location No | Address | City | State | Zip Code | Latitude - Degrees | Latitude | - |
| Minutes | Latitude - Seconds | Longitude - Degrees | Longitude - Minutes | Longitude | - | | |
| Seconds | Latitude - Decimal | Longitude - Decimal | MTA | BTA | | | |

Subcarrier Communications:

139 White Oak Lane
 Old Bridge, NJ 08887
 732-607-2828 / 732-607-1390 (f)

<http://www.subcarrier.com/roster.php>

pdf file is available for download

Contacts:

Account Logon Info:

| Original Field Name | Modified Field Name | Misc Info |
|---------------------|---------------------|--------------------|
| StieID | | |
| State | | |
| Location | | |
| County | | |
| Latitude | | |
| Longitude | | |
| G | | feet |
| AGL | | feet |
| AMSL | | feet |
| StructureType | | T=Tower B=Building |

Datum: NAD83

SiteID State Location CountyLatitude Longitude G AGL AMSL
StructureType

Suez Water Advanced Solutions:

<http://www.utilityservice.com/dwnlds/UtilityServiceTankListings.xls>

Contacts:

Fax: 888-600-5876

help@utilityservice.com

T-Mobile:

Contact(s):

Account Logon Info Info:

Retrieval Process:

goto <http://www.t-mobiletowers.com/coLocationSitesSearch.aspx>
<http://www.t-mobiletowers.com/>

Click on “Search”

Click on “Save Results”

Click on “Download Report”

Click on “Excel” button

Open “tmobile_data.csv” file and save as Excel file

Open “tmobile_data.xls” file and save a Tab Delimited file “tmobile_data.txt”

Data Info:

| Original Field Name | Modified Field Name | Misc Info |
|---------------------|---------------------|-----------|
| site_id | SiteID | |
| structure_type | StructureType | |
| latitude | Latitude | Deg |
| longitude | Longitude | Deg |
| Bta | BTA | |
| Mta | MTA | |
| structure_height | StructureHeight | In feet |
| address | Address | |
| City | City | |
| State | State | |
| County | County | |
| Status | Status | |

Datum: NAD83

Telecom Tower Group. LLC (TTG): – (Antenna database, pay to bulk use)

<http://telecomtowergroup.com/ttg/sitelisting.download>

Contacts:

CORPORATE INFO:

Ray French
President
2424 Corby Drive
Plano, TX 75025

Main: 214.440.1668

Fax: 972.618.2941

Cell: 813.340.3016

rfrench@telecomtowergroup.com

Tower Access Group:

<http://toweraccessgroup.com/wp-content/uploads/2016/03/TAG-Tower-List-2-1-16-update.xls>

Contacts:

108 Forbes Court, Suite 1
Richmond, KY 40475

Telephone: (859) 623-5513

Facsimile: (859) 623-5213

Tower Maps: – (Antenna database, pay to bulk use)

38659 Bolington Road
Lovettsville, VA 20180
540-822-5092 / 540-822-4469

www.towermaps.com

Contacts:

Account Logon Info:

Tower Source: – (Antenna database, pay to bulk use)

3214 Blackwood Place
Colorado Springs, CO 80920
610-284-9289

www.towersource.com

Contacts:

Account Logon Info:

Tower Sites Inc.

6420-B South Howell Ave.
Oak Creek, WI 53154-1104
(414) 764-7400
Terry Michaels: tmichaels@tower-sites.com

<http://www.tower-sites.com/>

Contacts:

Account Logon Info:

Retrieval Process:

Url: <http://www.towerco.com/simplicityfound/search/index.aspx?keywords=towerco>
(registration is required)

Open the Excel file and save as “TAB delimited” file.

Data Info:

| Original Field Name | Modified Field Name | Misc Info |
|----------------------------|----------------------------|------------------|
| Tower ID | TowerID | |
| Site Name | SiteName | |
| Address | Address | |
| City | City | |
| State | State | |
| Zip | Zip | |
| County | County | |
| Structure Type | StructureType | |
| Height | Height | In feet |
| Ground AMSL | GroundAMSL | In feet |
| Lat Deg | LatDeg | Lat Deg |
| Lat Min | LatMin | Lat Min |
| Lat Sec | LatSec | Lat Sec |
| Latitude | Latitude | Decimal Deg |
| Long Deg | LongDeg | Lon Deg |
| Long Min | LongMin | Lon Min |
| Long Sec | LongSec | Lon Sec |
| Longitude | Longitude | Decimal Deg |
| BTA Name | BTAName | |
| BTA | BTA | |
| BTA Ranking | BTARanking | |
| MTA Name | MTAName | |
| MTA | MTA | |

| Original Field Name | Modified Field Name | Misc Info |
|---------------------|---------------------|-----------|
| Status | Status | |
| Region | Region | |
| FCC | FCC | FCC ASR |

Datum: NAD83

TowerCom:

7411 Fullerton Street, Suite 200
 Jacksonville, FL 32256
 office 904.880.8887
 fax 904.880.8872

<http://towercomenterprises.com/tower-assets.html>

click on "site list"

Contacts:

Account Logon Info:

| Original Field Name | Modified Field Name | Misc Info |
|---------------------|---------------------|-----------|
| SiteName | | |
| Entity | | |
| SiteAddress | | |
| City | | |
| State | | |
| County | | |
| SiteStatus | | |
| TowerHeight | | |
| TowerType | | |
| LatDeg | | |
| LatMin | | |
| Lat sec | | |
| Latitude | | |
| LonDeg | | |

| Original Field Name | Modified Field Name | Misc Info |
|---------------------|---------------------|-----------|
| LonMin | | |
| LonSec | | |
| Longitude | | |
| Contact Information | | |

Datum: NAD83

SiteName Entity SiteAddress City State CountySiteStatus TowerHeight
TowerType LatDegLatMinLatSec Latitude LonDeg LonMin
LonSec Longitude ContactInformation

Triangle Communications:

http://www.trianglesc.com/uploads/4/7/8/7/47876343/triangle_tower_ss.xlsx

Contacts:

Lancaster: 717.656.2211 | Harrisburg: 717.774.7455
940 West Main Street, New Holland, PA 17557

Unison Site Management

Unison Site Management
340 Madison Avenue, Suite 12F
New York, NY 10173
866.599.SITE
<http://www.unisonsite.com/search-cell-sites/index.html>

Contacts:

Account Logon Info:

| Original Field Name | Modified Field Name | Misc Info |
|---------------------|---------------------|-----------------|
| Unison Site # | UnisonSiteNo | |
| Latitude | Latitude | decimal degrees |
| Longitude | Longitude | decimal degrees |

| Original Field Name | Modified Field Name | Misc Info |
|---------------------|---------------------|-----------|
| AGL | AGL | feet |
| Structure Type | StructureType | |
| Address | Address | |
| City | City | |
| Zip | Zip | |
| County | County | |
| State | State | |
| BTA | BTA | |
| | | |

UnisonSiteNo Latitude Longitude AGL StructureType Address City Zip
CountyState BTA

Vanguard Wireless:

Contacts:

Vanguard Wireless, LP
P.O. Box 6060
Abilene, Texas 79608
800.555.8935 Toll Free
325.691-0495 Local
325.691-0483 Fax
Warren Harkins - President, C.E.O. & C.F.O. :: warren@vanguardwireless.com
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Mike O'Neal - Sales & Marketing :: mike@vanguardwireless.com
Tony Poorman - V.P. - Administration :: tony@vanguardwireless.com

Account Logon Info:

Retrieval Process:

<http://www.vanguardwireless.com/search/home.html>

“List Towers”

Data Info:

File Name: vangard.wpd

| | | |
|------------------|------------------|------|
| | | |
| State | State | |
| Tower Name | Tower_Name | |
| Location (City) | Location_City | |
| County | County | |
| Latitude | Latitude | DMS |
| Longitude | Longitude | DMS |
| Height | Height | feet |
| Ground Elevation | Ground_Elevation | feet |

Datum: NAD83

Wireless Asset Group LLC(WAG):

http://www.wirelessassetgroup.com/WAG_Tower_Specs.xlsx

Contacts:

5055 Hwy "N" Suite 200, Saint Charles, MO 63304
(636) 922-3400