

## The 3.65GHz Band

This paper will provide a brief history and an overview of the 3.65GHz licensing scheme that was adopted by the FCC on May 22, 2007.

The FCC removed the cost barrier by allowing operators to pay a small registration fee for nationwide operation in the 50MHz band between 3.65GHz and 3.70GHz. The 3.65GHz band opened up new service possibilities for independent ISPs and other competitive service providers.

## Non-Exclusive Nationwide License

The FCC will issue an unlimited number of non-exclusive nationwide licenses to non-Federal entities for this band for commercial use only.

The 3650-3700 MHz band also contains three Federal grandfathered, radiolocation stations as well as non-Federal incumbent licensees in the fixed satellite service (FSS). Deployment of a base or fixed station near [these protected sites](#) is restricted, unless a separate permission is granted by the respective licensee.

The following are the four key steps involved in obtaining a licence to operate a base or fixed station in this band:

1. Obtain a nationwide, non-exclusive license using FCC's online Universal Licensing System (ULS).
2. Before registering a base or fixed station, examine ULS for nearby stations.
3. Obtain FCC-certified equipment (fixed, base and mobile equipment operating in the band must incorporate a "contention-based protocol").
4. Register each fixed and base station using ULS.

### A. FCC Registration

To conduct business with the FCC, you must first register through the FCC's online COmmission REgistration System ([CORES](#)). Upon registration, you will be assigned an FCC Registration Number (FRN). This number will be used to uniquely identify you in all transactions with the FCC. Registration with the FCC is free of charge.

If you're registering as a business, then you'll need to submit your business's federal tax number. If you're registering as an individual, then your social security number or taxpayer ID will be required. Businesses or users may hold multiple FRNs, but each application can only be associated with only one FRN.

### B. License Application

Once you've registered with the FCC and received your FRN and password, then you're ready to login to the FCC's Universal

#### A Brief History

Originally, the 3.65GHz band was allocated exclusively for the Federal Government for radiolocation services. Non-Government radiolocation services were later allowed to share this band with the Government on a secondary basis.

In 1984, Fixed Satellite Services (FSS) Space-to-Earth Operations were allowed to share the 3.65GHz band with the radiolocation services.

In 1998, the FCC proposed to allocate the 3.65GHz band to non-Government fixed services on a primary basis.

In 2000, the FCC announced reallocation of 50MHz of spectrum at 3.65GHz from Government to non-Government for both fixed and mobile commercial applications.

In 2005, plans for nonexclusive licensing for terrestrial services were announced, but not until 2007, the rules for "restricted" and "unrestricted" contention-based protocols were adopted.

In 2007, FCC-certified 3.65GHz equipment started shipping.

Licensing System ([ULS](#)) to apply for a non-exclusive nationwide license to allow you to register base and fixed stations in the 3.65GHz band.

The non-exclusive nationwide license will be valid for **10 years** from the date of your first base station registration.

***"A nationwide, non-exclusive license does NOT authorize any operation in the 3650MHz band—unless and until each base and fixed station is registered in ULS."***

To complete the online application, log into ULS using your FRN and password. Once logged in, select **"Apply for a New License"** from the menu, then select "NN – 3650 – 3700 MHz" ULS Service Code on the following page, then click continue and follow the online prompts to complete the application.

Once you finish completing the application, you'll be presented with a summary page that enables you to double check the information that you've entered and make changes, if needed.

Once you've confirmed that the summary is correct, you could proceed to the certification page. Once you've read and agreed with the certification statements, enter the name of the person that is authorized to sign such document and press submit application to continue.

After the information has been submitted, you will be presented with the payment page, where you can also print the application. License applications are normally approved within **4-6 weeks**.

## Searching the ULS Database

Licensees are required to examine the ULS registration database before registering a station, and must cooperate with other 3.65GHz band operators and make every effort to avoid harmful interference, as priority will NOT be given to licensees who were first to deploy in any given service area.

Licensees can use the [ULS License Search](#) feature to search the database for licenses with registered locations. The geosearch capability in ULS allows you to specify the frequency band and geographic information such as county and state, address and radius or geographic coordinates and radius. The ULS will then return any licenses with registered locations within the search criteria.

*“Licensees of stations suffering or causing harmful interference are expected to cooperate and resolve the problem by mutually satisfactory arrangements.”*

## FCC-Certified Equipment

Fixed, base, mobile, and portable equipment in the 3.65GHz band must use “contention-based protocols” that have been certified by the FCC as either “unrestricted” or “restricted.” WiMAX devices use Time Division Multiple Access (TDMA) protocol to prevent interference with other devices incorporating the same protocol. Equipment using a “restricted” protocol can only operate in the lower 25MHz of the band (3650-3675MHz).

Base and fixed stations are limited to **25 Watts for 25MHz**, and a peak EIRP power density of **1 Watt per 1MHz**. Mobile and portable stations that can’t exceed 1 Watt per 25MHz and 40mW per 1MHz peak EIRP power density don’t have to be registered with the FCC.

## C. Equipment Registration

You must have a non-exclusive nationwide license before you can register a base or fixed station. Each base or fixed station must then be registered using ULS before it is deployed. A lawyer is not required, and the registration process should only take about 15 minutes to complete, if all the site and equipment information is available.

To register a station, the licensee will need to provide specific technical details including whether the equipment uses a restricted or unrestricted protocol, the FCC Equipment Identification number, the base or fixed station’s location (latitude and longitude), and other technical parameters including EIRP and antenna height above ground.

To complete the online application, log into ULS using your FRN and password. Once logged in, select **“My Licenses”** from the menu, a list of call signs associated with this FRN will be displayed. Click on the nationwide non-exclusive (NN radio service) call sign under which you intend to register your stations, then click the **“Register Locations”** link to proceed.

Now, click on **“Add New Location”** to step through the process of

FCC’s Universal Licensing System (ULS) Home Page

registering a base or fixed station. This process needs to be repeated for each location that you need to register, unless you’ve been granted approval to use the batch filing feature to register a group of stations.

The ULS electronic form checks the information you enter, and verifies that technical parameters such as power are within the limits specified in the FCC rules. It will also determine whether you are eligible for the full 50MHz of spectrum based on the use of an unrestricted protocol or the lower 25 MHz of the band based on the use of a restricted protocol.

Finally, based on the station’s coordinates, the ULS will automatically determine whether the base station is in an area requiring international coordination or whether the station is within one of the protection zones established around the three grandfathered Federal radiolocation stations or the grandfathered FSS Earth stations.

If you are attempting to locate stations within the protection zones around the three grandfathered Federal sites, FCC will refer those applications to the Frequency Assignment Subcommittee (FAS) of the Interdepartment Radio Advisory Committee (IRAC). Stations may only be located within the protection zone of a grandfathered FSS station if an agreement is negotiated between the parties. If a station is located within the protection zone of a grandfathered FSS station and the licensee does not certify that they have negotiated an agreement with the grandfathered FSS licensee, ULS will dismiss the registration application.

## Filing Fees

The 3.65GHz band is licensed as a land mobile service, under Part 90 of the FCC’s Rules, for non-exclusive wireless operations on a Commercial Mobile Radio Service (CMRS) basis and/or on a Private Mobile Radio Service (PMRS) basis. These applications are subject to regulatory filing fees, which are detailed in [Part 90 Land Mobile Radio Service Fee Guide](#). At the time this paper was written, the fee was **\$260**.

## Tranzeo Wireless Technologies Inc.

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## 3.65GHz WiMAX

WiMAX equipment has been certified by the FCC for use in the lower 25MHz of the 3.65GHz band. WiMAX technology has also been proven world-wide in other licensed and unlicensed frequency spectrums.

WiMAX is designed for "last mile" point to multi-point solutions. Like WiFi, it can support multi-megabit throughput. However, WiMAX has an inherent Quality of Service (QoS) protocol and is designed to operate over longer distances compared to WiFi. WiMAX can operate in the unlicensed 5.1-5.8GHz spectrum similar to WiFi but it can also operate in the 3.3-3.8GHz licensed spectrum. The 3GHz licensed spectrum allows for higher data rates and can transmit over longer distances since there is no interference from competing services.

A typical WiMAX network consists of a Base Station (BS), a number of Subscriber Units (CPE's), and a central management system. The Base Station manages all subscriber units and determines when the subscriber units can transmit or receive based on a Time Division Duplex (TDD) algorithm that assigns guaranteed time slots for each subscriber unit. This enables a carrier-class Quality of Service (QoS) mechanisms that can guarantee levels of service .

Tranzeo's WiMAX system can also be managed from a central location, or remotely using AirSync's Element Management System (EMS), a license for which is included with each Base Station.

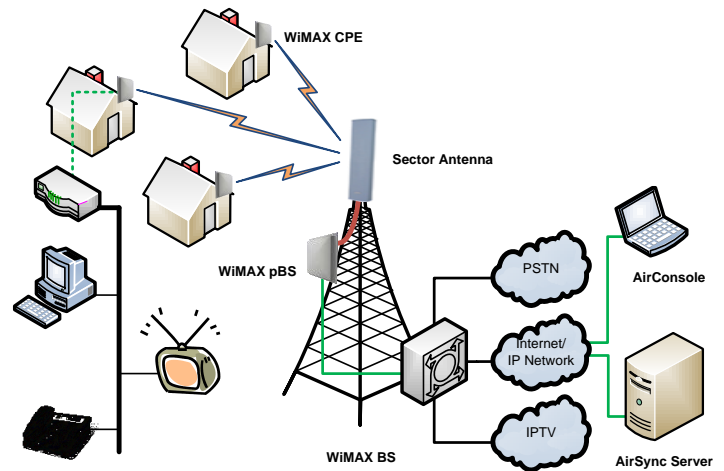
## Tranzeo's 3.65GHz WiMAX is RUS Accepted

Tranzeo's 3.65GHz WiMAX Pico Base Station and Customer Premise Equipment have been accepted into the US Federal Government Rural Utility Service program (RUS) with "Buy America" status, making them qualified for stimulus funding.

Accepted equipment includes Tranzeo's backhaul, point-to-multipoint, and public safety bands equipment, allowing RUS funding to be used for complete end to end solutions. This means that rural communities will have a variety of low cost options for both last mile and for long range backhaul. Tranzeo's low cost point to point links allows service to be brought quickly and inexpensively to underserved areas.

The Recovery Act appropriated \$7.2 billion and directed the Department of Agriculture's Rural Utilities Service (RUS) and The Department of Commerce's National Telecommunications Information Administration (NTIA) to expand broadband access to unserved and underserved communities across the U.S., increase jobs, spur investments in technology and infrastructure, and provide long-term economic benefits.

Please visit [www.broadbandusa.gov](http://www.broadbandusa.gov) for more information regarding the RUS program.



Typical WiMAX Network

## TR-WMX-365-pBS Emission Designators

Channel Width	Emission Designator
3.5 MHz	5M00G1D
7.0 MHz	7M79G1D

There are two emission designators for Tranzeo's 3.65GHz Pico Base Station (TR-WMX-365-pBS), which depends on the channel width being used. These emission designators are required when registering the Pico Base Station with the FCC.



Outdoor CPE



Outdoor Pico BS



Indoor CPE

## Why Tranzeo

Tranzeo offers a complete family of 802.16d (802.16-2004) WiMAX products for 3.5GHz, 3.65GHz, and 5.8GHz spectrums including indoor and outdoor Subscriber Units and Pico Base Stations. As well, we offer a comprehensive line of 900MHz, 2.4GHz, 4.9GHz, and 5.8GHz 802.11a/b/g and 802.11n standards-based WiFi products including Routing Access Points, CPE's, Full-Duplex PtP Bridges, and advanced Mesh Routers and Access Points for complete turnkey solutions.

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### Online Resources

FCC – Universal Licensing System (ULS)

<http://wireless.fcc.gov/uls/index.htm?job=home>

FCC – 3650–3700MHz Radio Service Home

[http://wireless.fcc.gov/services/index.htm?job=service\\_home&id=3650\\_3700](http://wireless.fcc.gov/services/index.htm?job=service_home&id=3650_3700)

FCC – 3650–3700MHz Filing Procedures Public Notice

[http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/DA-07-4605A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/DA-07-4605A1.pdf)

FCC – License Search

<http://wireless2.fcc.gov/UlsApp/UlsSearch/searchLicense.jsp>

FCC – List of Protected Sites

<http://licensing.fcc.gov/prod/ib/forms/help/GrandFatherList.pdf>

FCC – Fee Filing Guide

[http://wireless.fcc.gov/index.htm?job=about\\_fee\\_filing\\_guide](http://wireless.fcc.gov/index.htm?job=about_fee_filing_guide)



### About Tranzeo Wireless™

Tranzeo Wireless Technologies Inc. (TSX:TZT) leads the wireless broadband industry for value, by producing high-performance wireless network equipment with a low cost of ownership and unparalleled service allowing communities and businesses to communicate without boundaries. Since the company's inception in 2000, Tranzeo's optimum cost effectiveness, premium quality and responsive support have attracted a growing number of devoted dealers, distributors, and customers worldwide. Tranzeo's full spectrum of point-to-point and point-to-multipoint radios, WiMAX equipment, and mesh network solutions are designed for use by wireless internet service providers, governments, campuses, military, carriers, enterprise, and systems integrators worldwide.

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