



ER Diagram Description:

A path represents a radio communications path with references to both the transmit and receiver locations and antennas. There is also a path_type_desc attribute that tells the type of path. A path can be uniquely identified using its unique_system_identifier. This identifier is used by the FCC to uniquely identify each license. A path has at most two associated locations, and at most two associated antennas.

A licensee represents an entity that holds a license. The licensee is identified by their licensee_id and has attributes name, email, street_address, city, and state. A licensee can own multiple paths, and each path must have a single licensee associated with it.

The location table represents a location of transmission and/or a location of reception for a path. Each entry can be identified using the associated path and location number. It has attributes location_address, location_city, location_county, and location_state.

The antenna represents the type of antenna and frequency for antennas used within a path. Each entry can be identified from its associated path and an antenna number. It has attributes antenna_type_code and frequency_assigned.

The coordinate uses a unique id to identify a set of latitude and longitude coordinates. For both latitude and longitude, we have attributes for degrees, minutes, and seconds. A location must be associated with a coordinate, and a coordinate can be associated with 0 or many locations.

Relational Schema:

```
License(unique_system_identifier: INT [PK], name:VARCHAR(100),
email:VARCHAR(100), street_address:VARCHAR(255), city:VARCHAR(100),
state:VARCHAR(20))
```

```
Path(path_number:INT [PK], unique_system_identifier:INT [foreign key to
License.unique_system_identifier][PK], transmit_location_number:INT,
receiver_location_number:INT, transmit_antenna_number:INT,
receiver_antenna_number:INT, path_type_desc:VARCHAR(255))
```

```
Locations(location_number:INT [PK], unique_system_identifier:INT [foreign key
to License.unique_system_identifier][PK], location_address:VARCHAR(100),
location_city:VARCHAR(100), location_county:VARCHAR(100),
location_state:VARCHAR(100), id:INT [foreign key to Coordinate.id])
```

```
Antenna(antenna_number:INT [PK], unique_system_identifier:INT [foreign key to
License.unique_system_identifier][PK], beamwidth:DOUBLE, gain:DOUBLE,
height_above_avg_terrain:DOUBLE, height_to_tip:DOUBLE,
antenna_action_performed:char(1))
```

```
Coordinate(id:INT [PK], lat_degrees:DOUBLE, lat_minutes:DOUBLE,
lat_seconds:DOUBLE, lat_direction:VARCHAR(10), long_degrees:DOUBLE,
long_minutes:DOUBLE, long_seconds:DOUBLE, ong_direction:VARCHAR(10))
```