EXHIBIT 3 OPENCELL SYSTEM DESCRIPTION

3.1 Overview

OpenCell is a cost-effective and flexible RF distribution system that is designed to simultaneously deploy the wireless services of several different carriers within a single unit.

The OpenCell system consists of a centrally located Hub station and multiple Radio Access Nodes (RANs). The RANs are distributed throughout the target area to provide the desired coverage to mobile subscribers.

RANs are installed at a roughly one-mile separation and are typically mounted on utility poles. RAN antennas are deployed on top of the pole at heights of 40-50 feet. The antenna radiates lower power than conventional sites (less than 10 watts), thus creating a microcellular footprint. Each RAN covers about a 0.5-mile range.

Fiber optic cable interconnects each RAN to a centrally located OpenCell Hub. The Hub provides connectivity to the base transceiver station (BTS) of each wireless service provider that offers network service. The Hub converts the BTS RF signals to fiber optic backhaul. Each BTS can thus be interfaced to RAN sites up to 10 miles away.

In a typical deployment, a tower company would complement its existing tower coverage "footprint" in a given area with a network of OpenCell systems. The tower company would normally own the OpenCell network equipment, and would lease access to its wireless service provider (WSP) tenants under long-term arrangements, similar to today’s conventional tower lease business.

OpenCell operates across multiple frequencies and protocols, capable of the full range of digital services offered by WSPs. Each OpenCell RAN site can support up to 8 tenants simultaneously without interference or performance degradation.

The OpenCell system is intended for service providers or tower aggregators. It is not intended for sale to the general public.

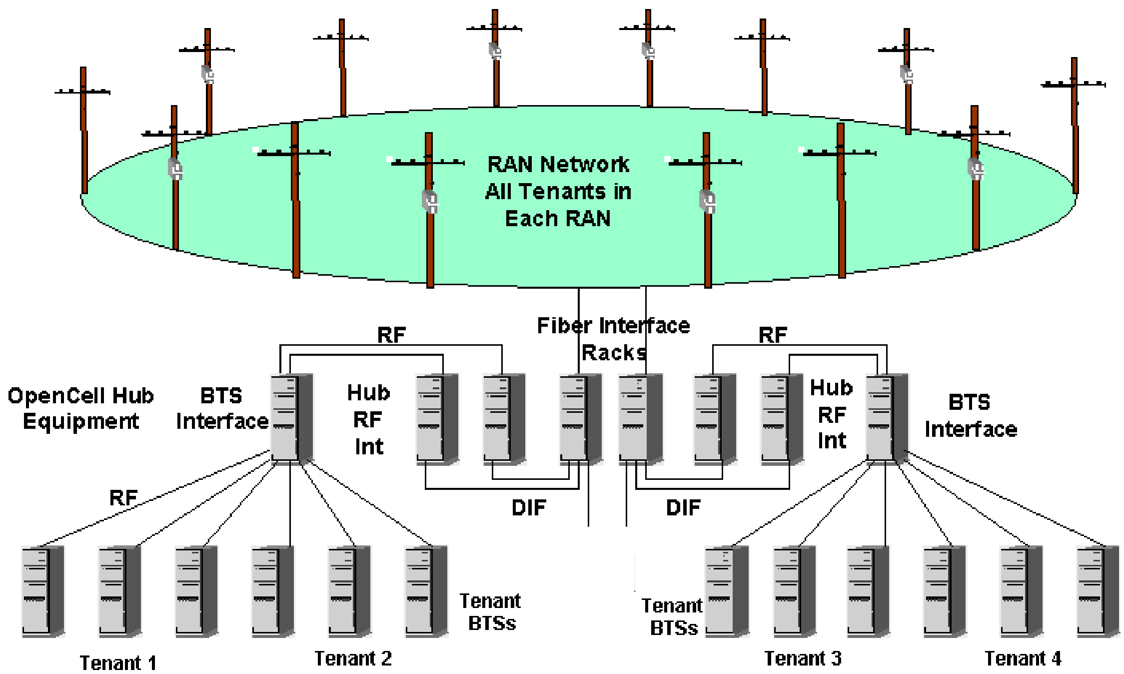

Figure 3-1 OpenCell Architecture

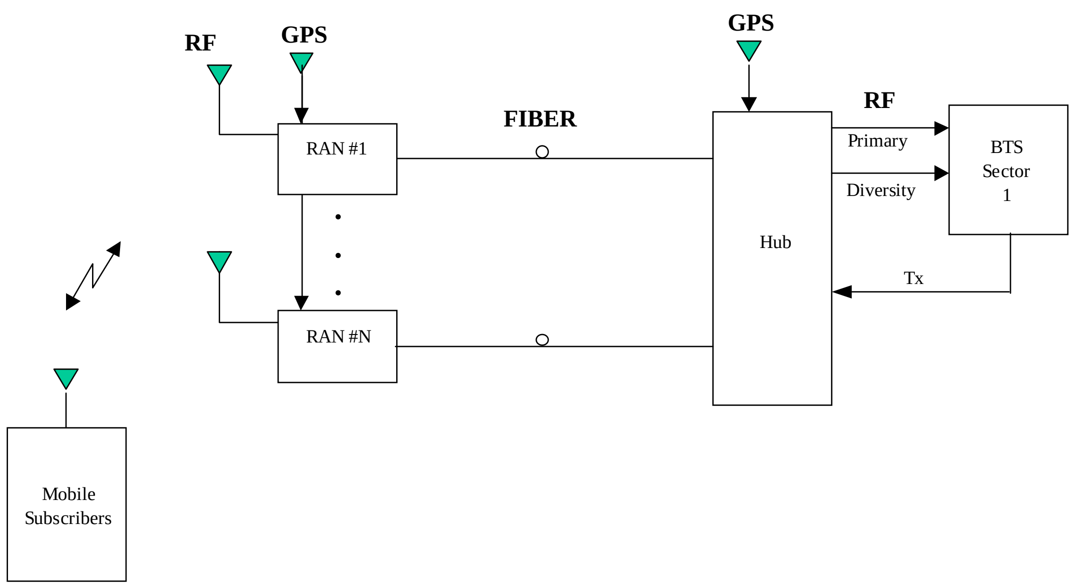

Figure 3-2 OpenCell Top Level Diagram

3.2 Frequency Plan and Output Power

Each RAN equipment set can accommodate up to 8 tenants. Each tenant provides a specific service (cellular, PCS, or SMR) and a protocol associated with that service (i.e. GSM, TDMA, CDMA, etc). One tenant may reside within each available PCS, cellular, or SMR block.

The minimum number of carriers per tenant is 1. The maximum number of carriers per tenant varies from 6 to 8, depending upon the selected protocol. Output power per tenant is approximately 4 watts nominal (the combined total of all carriers within a particular tenant's block). The maximum output power may vary slightly, depending upon the selected protocol. Refer to Table 3-1 below.

Where a tenant is employing multiple carriers, output power per tenant is divided equally among each carrier.

Service/ Protocol	Base Station Transmit Frequency Range, MHz	Maximum # Tenants per Service per RAN location	Maximum # Carriers per tenant	Nominal Power per tenant (composite at RAN output, dBm)
PCS				
CDMA			6	35.2
1xRTT			6	36.4
GSM			8	36.4
TDMA			8	35.7
Cellular				
TDMA	869-894	3 (for the combined SMR/ cellular services)	8	34.7
GSM			8	35.4
CDMA			6	34.2
1xRTT			6	34.2
SMR				
iDEN	855-866		8	34.7

Table 3-1 OpenCell Frequency/Power Capability

The valid range of channel center frequencies and carrier spacing within a band/block is dependent upon the selected protocol. The channel center frequency is selectable by the operator. The valid range of transmit center frequencies is set up such that all selectable channels, including those at the block edges, will not cause spurious or out-of-band requirements to be exceeded at maximum rated power levels. Center frequency spacing is controlled by the WSP BTS. The OpenCell system will support a minimum spacing shown for each protocol in Tables 3-2, 3-3 and 3-4.

Output power is primarily dictated by the BTS input level and preset gain settings. In addition, Forward Gain Control (FGC) within the OpenCell system will maintain a constant gain throughout the OpenCell forward path to within +/- 2 dB over all conditions.

		PCS Block Designator					
		A	**B**	**C**	**D**	**E**	**F**
		1930-1945	1950-1965	1975-1990	1945-1950	1965-1970	1970-1975
Protocol	**Min Carrier Spacing**	**Valid Center Frequency Ranges (MHz)**					
CDMA	1.25 MHz	1931.250 to 1943.750	1951.250 to 1963.750	1976.250 to 1988.750	1946.250 to 1948.750	1966.250 to 1968.750	1971.250 to 1973.750
1xRTT	1.25 MHz	1931.250 to 1943.750	1951.250 to 1963.750	1976.250 to 1988.750	1946.250 to 1948.750	1966.250 to 1968.750	1971.250 to 1973.750
GSM	800 kHz	1930.200 to 1944.800	1950.200 to 1964.800	1975.200 to 1989.800	1945.200 to 1949.800	1965.200 to 1969.800	1970.200 to 1974.800
TDMA	360 kHz	1930.020 to 1944.980	1950.020 to 1964.980	1975.020 to 1989.980	1945.020 to 1949.980	1965.020 to 1969.980	1970.020 to 1974.980

Table 3-2 PCS Tuning Ranges

		Cellular Block Designator	
		A	**B**
		869-880 (A'', A) 890-891.5 (A')	880-890 (B) 891.5-894 (B')
Protocol	**Min Carrier Spacing**	**Valid Center Frequency Ranges(MHz)**	
TDMA	360 kHz	869.020 to 879.980 890.020 to 891.480	880.020 to 889.980 891.520 to 893.980
GSM	800 kHz	869.200 to 879.800 890.200 to 891.300	880.200 to 889.800 891.700 to 893.800
CDMA	1.25 MHz	869.750 to 879.250 890.750	880.750 to 889.250 892.250 to 893.250
1xRTT	1.25 MHz	869.750 to 879.250 890.750	880.750 to 889.250 892.250 to 893.250

Table 3-3 Cellular Tuning Ranges

Protocol	Min Carrier Spacing	Valid Center Frequency Range (MHz)
iDEN	350 kHz	855.0125 to 865.9875

Table 3-4 SMR Tuning Range

3.3 System Interconnections

OpenCell system interconnections include:

- AC Power to RAN (240 VAC, 10 amps each, nominal)
- 48VDC power to Hub
- RF connections from RAN to antenna (PCS, cellular/SMR, and GPS)
- Ethernet (from Hub to remotely located operator station)
- Fiber optic (connects Hub to each RAN)

Neither RAN nor Hub connects directly to the telephone network. The Hub is connected to a BTS (Base Transceiver Station, not provided by Transcept), which provides the interface to the public telephone system.

3.4 Physical Characteristics

3.4.1 RAN Description

The RAN is a RF transceiver housed in an environmentally protected enclosure, designed to be placed outdoors on a utility pole. One RAN enclosure can support 4 tenants. Two RAN enclosures may be interconnected on the same pole to obtain the full 8-tenant capacity. An optional 48 VDC backup battery may reside in a separate enclosure adjacent to the main enclosures. The unit is connected via RF cables to an antenna, located on top of the utility pole. Fiber optic cable connects the RAN to the Hub.

An 8 tenant RAN interconnection diagram is shown in Figure 3-3. A typical installation on the utility pole is shown in Figure 3-4.

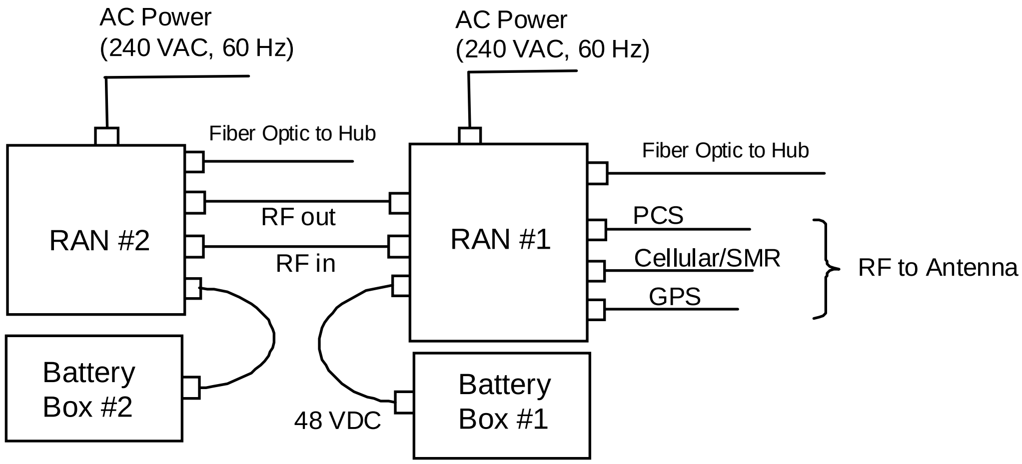

Figure 3-3 RAN Interconnection Diagram

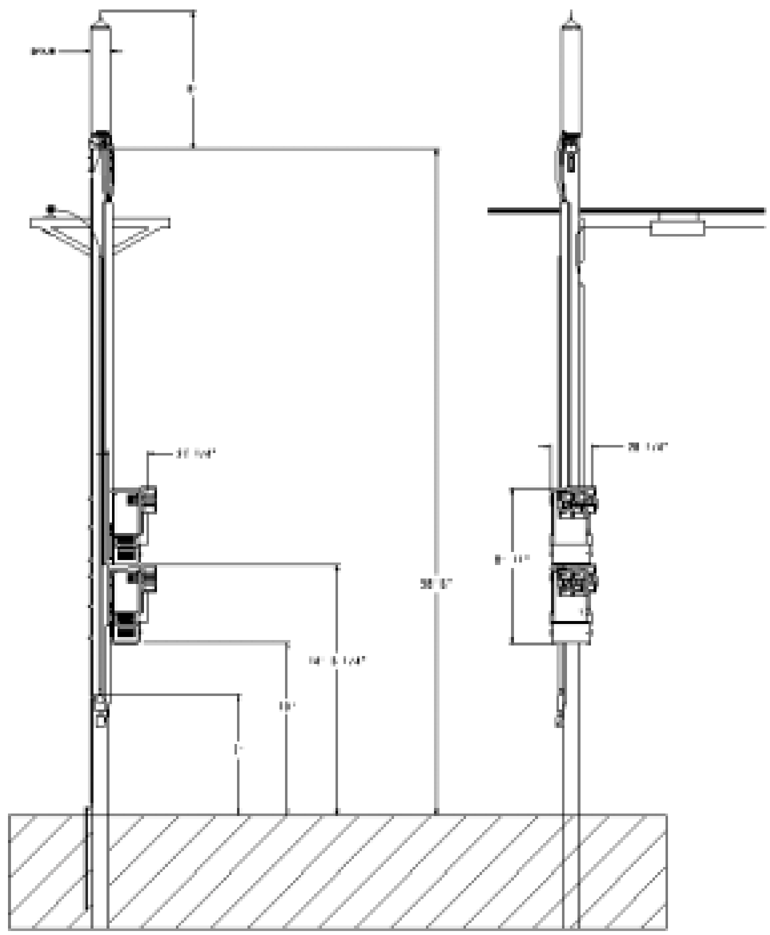

Figure 3-4 Typical OpenCell RAN Installation (showing 2 RAN enclosures with battery backup)

3.4.2 Hub Description

The Hub is an equipment rack set that resides at a central location, inside an environmentally controlled facility. The racks contain several Compact PCI chassis, power supply shelves, RF interface modules, and an Ethernet node. Primary power for the Hub is -48 VDC, obtained from power sources within the facility.

The Hub provides an interface to each WSP BTS in both forward and reverse directions. In the forward direction, RF from each WSP BTS is downconverted to an IF, digitized, and transmitted to the RANs via a fiber optic interface. In the reverse direction, digitized IF data is received via the fiber optic interface, converted to an analog IF, upconverted and sent to the WSP BTS as RF.

3.5 Key OpenCell Components

3.5.1 RAN Modules

The system block diagram of Figure 3-5 depicts the Hub and key components of the OpenCell RAN's. The following provides a brief description of the signal flow.

Beginning with the forward signal path, the wireless provider's BTS output signals are input to the Hub. The Hub accepts power levels up to 40 dBm/carrier from a BTS for dedicated sectors and as low as –50 dBm/carrier for shared sectors. The Hub converts the BTS RF signal to a digitized IF signal. A Synchronous Interface Module (SIF) converts the digitized IF to a digital format suitable for transmission over fiber. The data is then directed to the RAN via a 15 MHz fiber channel.

At the RAN, an identical SIF module converts the fiber stream back to digitized IF. The RAN Upconverter (RUC) accepts the digital data from the SIF modules. Each RUC can service up to 2 tenants. It converts each digitized data stream to RF, and provides the proper RF drive level for the power amplifiers.

Signals from the RUC are fed to the power amplifiers, combined together in a multiplexer (a duplexer, triplexer, or quadplexer), and finally transmitted via the multiband antenna. Paragraphs 3.5.2 and 3.5.3 below provide further details of these components.

In the reverse path, the Multicoupler (MUL) accepts the received signals from the multiplexers. A low noise amplifier in each path sets the system's receive noise figure. The multicoupler further splits the RF signals into 6 PCS or 3 cellular/SMR paths. There are two multicoupler types: one 1900 MHz "double-width" cPCI module, and an 800 MHz "single-width" cPCI module.

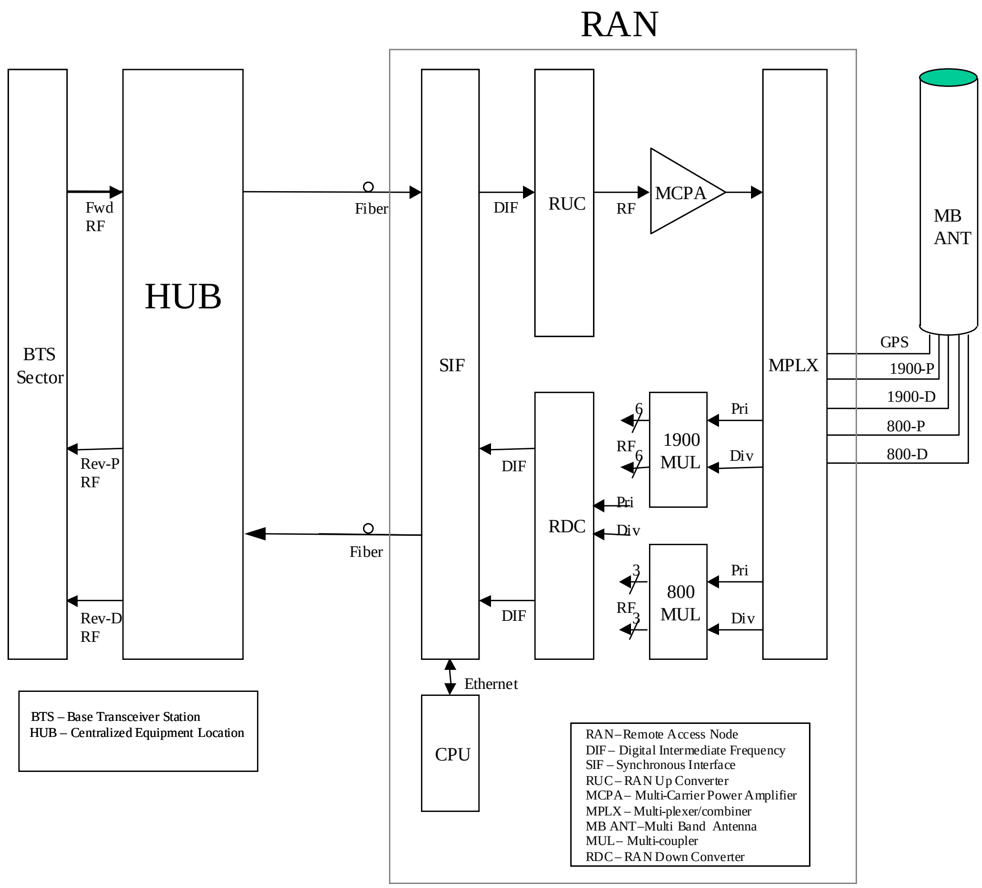

Figure 3-5 OpenCell System Block Diagram

The RAN Downconverter (RDC) is a single width cPCI module. It accepts two receive inputs (primary and diversity) from the multicoupler, and converts the RF to digitized IF. It utilizes a high dynamic range A/D converter with digital AGC loop to avoid saturation.

After conversion of the RF to digitized IF, the signals are sent through the SIF modules for fiber optic transport back to the Hub. The Hub accepts the digital IF channel pair, and converts each data stream back to RF. Each dual diversity RF signal is then sent to the BTS at the Hub location.

3.5.2 Power Amplifiers

The RAN houses one power amplifier (PA) for each cellular/SMR or PCS tenant. Each PA is specifically designed to output multiple closely spaced carriers with minimum spurious response and intermodulation. There are two PA types for the 800 MHz band (one for upper SMR, one for full-band cellular), and one type that will accommodate any PCS block.

The PA is a solid-state unit having the following characteristics:

- Output two-tone TOI (third-order intercept) of +69 dBm at +39 dBm per carrier (PCS)
- Output two-tone TOI of +67 dBm at +37 dBm per carrier (Cellular/SMR)
- -60 dBc in-band intermodulation products
- 15 watt max output (PCS)
- 10 watt max output (Cellular/SMR)
- Spurious outputs less than –14 dBm.
- Harmonic outputs less than +6 dBm.
- Corresponding receive band emissions <-80 dBm in 30 kHz RBW.

Each power amplifier draws a maximum of 20.8 amps (18.0 amps typical) at an input voltage of 12.0 volts DC.

3.5.3 Power Combining Circuitry (Multiplexers)

Power amplifier outputs are combined together using multiplexers in the manner shown in Figures 3-6 and 3-7.

The PCS band utilizes a quadplexer to sum each power amplifier output for subsequent transmission over the air. There are two types of quadplexer - one for PCS blocks A/B/F, and another for PCS blocks D/E/C. There are two quadplexers per RAN.

The 800 MHz band utilizes a duplexer and triplexer set to provide full coverage of the cellular and upper SMR bands. There is one duplexer and one triplexer per RAN.

Each multiplexer features:

- 65 dB min rejection to out-of-band outputs at all frequencies 35 MHz or more from band edges.
- Min 30 dBc rejection of third harmonic

3.5.4 Antenna

The RAN antenna has the following characteristics:

- Provides effective omnidirectional coverage for cellular/SMR and PCS bands.
- Provides polarization diversity reception and transmission through combined slant polarization elements
- Max gain 5.5 dBi in cellular/SMR band.
- Max gain 12.0 dBi in PCS band.
- GPS receive element

Each band utilizes separate elements within the antenna housing. There is no physical combining of the transmitted signals within the antenna. This is the only antenna designated for use with the OpenCell system.

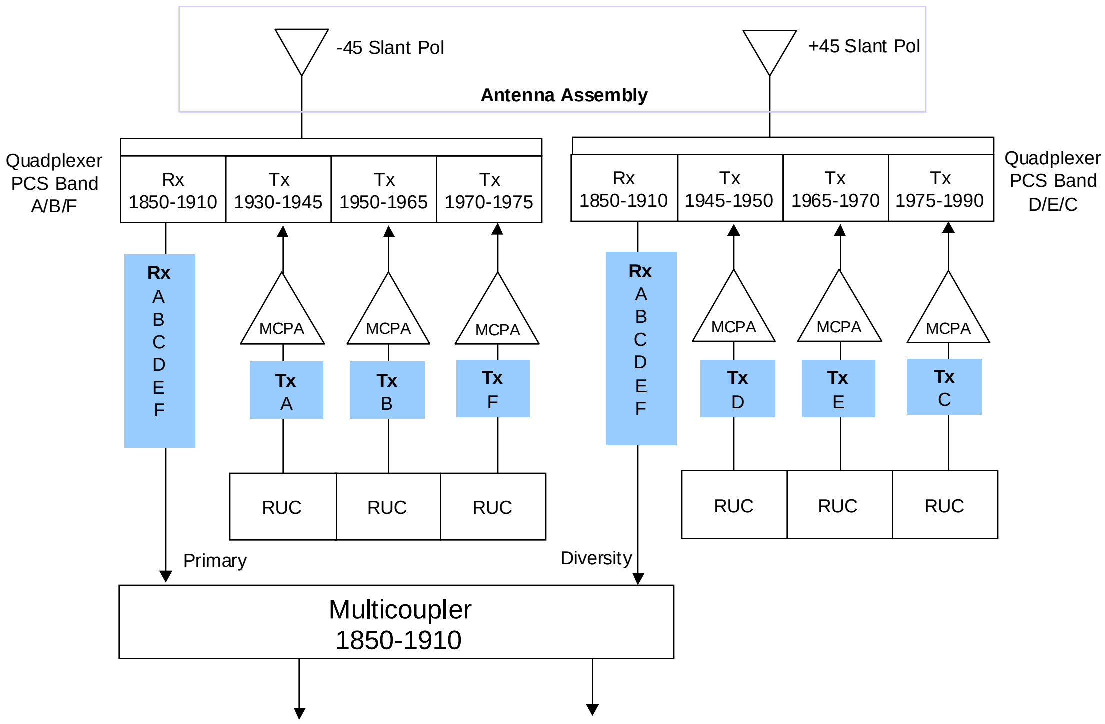

Figure 3-6 PCS Band Combining

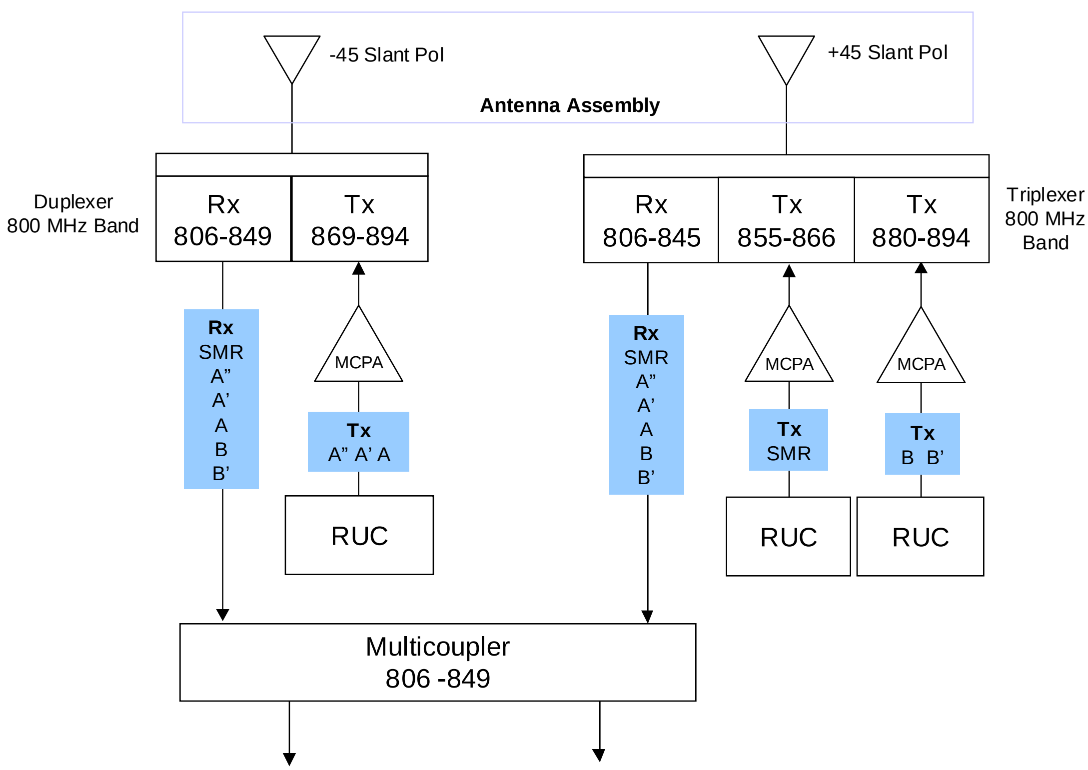

Figure 3-7 Cellular/SMR Band Combining

Additional Design Details

3.6 Emission Types

Various emission types are transmitted, depending upon the protocols used. The following table lists the emissions characteristics by protocol.

Protocol	Modulation Type	Channel Bit Rate	Necessary Bandwidth	FCC Emissions Designator
CDMA	QPSK	1.2288 Mbps	1.23 MHz	1M23G7W
1xRTT	QPSK	1.2288 Mbps	1.23 MHz	1M23G7W
TDMA	$\pi/4$ DQPSK	48.6 kbps	24.3 kHz	24K3G7W
GSM	GMSK (0.3)	270.833 kbps	271 kHz	271KG7W
IDEN	16QAM	64 kbps	18 kHz	18K0D7W

3.7 Rated Power and Output Power Variation

Maximum power output is +36.9 dBm (4.9 watts) per tenant. The per-tenant output represents the total power of all carriers within a block. Total power at a single RF port can be as high as +41.4 dBm (13.8 watts). Up to 12 dB less power can be transmitted.

The OpenCell system utilizes automatic gain control in the forward direction, Forward Gain Control (FGC). FGC utilizes a series of power detectors in the front and back ends of the forward path to monitor the total gain throughout the forward path. The system software will periodically monitor these detectors and adjust gain accordingly using variable RF and digital attenuators within the forward path. FGC will maintain a constant forward path gain within ±2 dB over all conditions.

Output power can be manually adjusted by an operator in 0.5 dB increments. The power level adjustment is accomplished by attenuators within the RUC.

3.8 Tune-up Procedures

No special hardware adjustments are required to set or adjust the transmit frequency. The operating frequency is set by the operating software.

3.9 Frequency Stability Circuitry

Transmitted signal frequency stability is governed primarily by performance of the RUC local oscillators, which are phase-locked to the system reference clock via the fiber interface to the Hub. The Hub maintains the overall system reference using a highly stable Oven Controlled Oscillator (OCXO) at 9.6 MHz. This OCXO is used to frequency lock the digital data that is transmitted to the RANs. The SIF cards at each RAN recover the clock. This recovered clock is used to phase lock the RUC local oscillators.

3.10 Power Limiting Circuitry

The system incorporates a power output level detector. Under normal operation, the power output per tenant is a maximum of +36.9 dBm. If the output power exceeds +39 dBm due to a component fault, then the PA will be automatically disabled and will remain that way until the fault is cleared.

3.11 Spurious Limiting Circuitry

Spurious limiting circuitry is shared between the PA and the multiplexers.

Over the normal operating range of input signals, the PA is very linear, and thus generates very low levels of spurious and harmonic energy over the entire RF range. The multiplexers further limit spurious energy that is well out-of-band.

3.12 Modulation Limiting Circuitry

The OpenCell hardware does not itself modulate the RF carriers - it simply regenerates the RF waveforms provided to it. The equipment is sufficiently linear and incorporates filtering throughout the chain to avoid generation of unwanted frequency components outside of the channel bandwidth.