CI WIRELESS
800 MHZ CELLULAR BAND EKOCELL REPEATER SYSTEM
DESCRIPTION OF OPERATION

1.0 BASIC DESCRIPTION

The EUT is a 50 watt 800 MHz Cellular Band Repeater System. This system is a U.S. Cellular band repeater system which enhances the coverage of a cellular system by adding base station capability to traditional poor cellular coverage areas (i.e. subways, shopping malls, convention centers). The system has a set of automatic setup features, enabling the repeater to be installed & configured by one person. Automatic system monitoring is present to monitor system health & report/record any EUT problems. The CI Wireless 800 MHz Cellular Band 50 watt Repeater supports CDMA, TDMA and AMPS communications in the U.S. cellular band.

The EkoCell system is comprised of two components: a Hub unit and a Remote unit. The Hub is installed at a cellular base station while the remote unit is installed at the desired transmit/receive location and attached to an antenna assembly. The two pieces are connected by two fiber optic links (one for transmit, one for receive). Due to the low loss of the fiber link, the Remote is usually not installed at the same location as the Hub unit.

2.0 RF THEORY OF OPERATION

The CI Wireless 800 MHz Cellular Band 50 watt Repeater operates in two basic modes of operation simultaneously: transmit and receive. When installed, the Hub portion of the EkoCell is connected in to a standard base station for the cellular system. The Remote Unit is then installed at a location up to 10 kilometers away from the base station.

In the transmit mode of operation, the Hub taps the RF signals from the base, routes the signals through an RF modem, then feeds the output of the RF modem into a fiber optic modulator. The fiber optic modulator contains a solid state laser and optic receiver. The output of the laser is fed via a multimode fiber optic cable to the Remote Unit. When the signal arrives at the Remote Unit, the signal is received by another fiber optic modulator, fed to an RF Modem, then routed to an amplifier. The output of the power amplifier is regulated to maintain a 50 watt output level. The output of the amplifier is fed to a duplexer (with lightning protection) then to the antenna port for transmission.

In the receive mode of operation, the mobile signals are received from the antenna port on the Remote Unit, routed through the duplexer, then boosted and filtered by a low noise amplifier/band pass filter assembly. This signal is modulated by the RF modem, fed to the Remote Unit fiber optic modulator, then transmitted back to the Hub Unit. The Hub Unit receives the optical signal and reconstitutes the original mobile signal. This signal is then fed to the base station circuitry. The system does perform RF pre-emphasis on the signals to correct for transmission losses.

3.0 SYSTEM CONFIGURATION(S)

The two models for the system components tested are:

Hub Unit: Eko-8H0B0-DB0000
Remote Unit: Eko-8M0CR-DAC000

The test covered under this report address all subseries of these models. The base model designators for the components of this system are Model Eko-8HXB0-XXXXXX for the Hub unit and Model Eko-8MXCR-XXXXXX for the Remote Unit. See attached sheet for model designator definitions. The two particular models used for this test were loaded with all active circuit options available, providing a worst case configuration for emissions testing.

CONFIGURATION INDEX

800 Hub **Example:** Eko-8HEB0-0AC000

Eko-8H X X X - X X X X X X

Option Designators (Include only equipped options)
Combiner 0 2 4
Wave Division Multiplex Option
Heater Option (N/A for Hub)
Crossband Coupler Option(1.9 and 800)
AC Power Option (DC Standard)
Duplexer Option

Standard Nomenclature
Reserved
B-Both
C- Cellular
S - Trunking/Cellular
Expansion Configured Hub Unit
H - Hub Unit Only 1.9 GHz, Non-Expandable

Microcell (Remote) **Examples:** Eko-8M0C0-DAC000
Eko-8M0S0-DAC000

Eko-8M X X X - X X X X X X

Option Designators (Include only equipped options)
Combiner 0 2 4 (N/A)
Wave Division Multiplex
Heater Option
Crossband Coupler Option
AC Power - Standard
Duplexer - Standard

Standard Nomenclature
Reserved
C - Cellular
S - Trunking/ESMR
Expansion or Slave Unit*
M - Standard Power Microcell Unit
R - Microcell Unit, 1900 MHz, 8 watt

* Slave Unit is equipped to interconnect with Eko-1.9M which includes the Eko-M-X option

For the 1900 MHz unit, the 8 shown in these descriptions is replaced by 1.9