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Operational Description

EPOCH-M1P Repeater Block Diagram

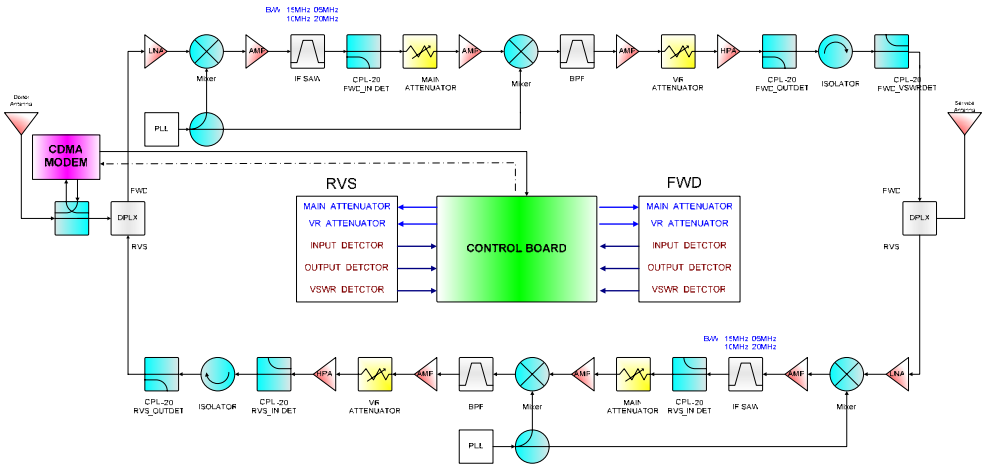

Figure 1

Figure 1 describes the operation of the Epoch-M1P repeater. The donor antenna points to and receives the signal from the BTS (base station) and feeds it to the downlink (DL) path of the repeater. The DL signal is amplified and radiated by the server antenna. On the other side, the uplink (UL) signal from the MS (mobile station) is received by the server antenna, amplified by the repeater and reradiated by the donor antenna to the BTS.

Downlink Signal Flow

When the RF signal from the BTS (base station) comes through the donor antenna and into the Epoch-M1P repeater, it goes to the donor duplexer which separates the UL and DL frequencies. The RF signal then goes to the LNA (Low Noise Amplifier) and its main purpose is to reduce the total noise figure of the DL RF signal which will be later amplified.

After the LNA, the DL RF signal goes through the Mixer which down-converts the RF signal into IF frequencies. The IF signal(s) will then go through a SAW filter (5, 10 or 15 MHz) to properly select

the desired operating 1900 MHz PCS band or bands. The IF signal then goes through the Coupler so that the input signal level can be monitored.

The IF signal then goes through AGC (Automatic Gain Control) circuitry in order to set the correct gain on the repeater. The IF signal(s) are then up-converted (through UDC) back to RF again and goes through Ceramic filter(s) to reject unwanted spurious and harmonic signals. After the Band Pass Filter, the RF signal then goes through a Variable Attenuator which will adjust the total system gain and then goes through the Isolator, which prevents feedback from the HPA (High Power Amplifier).

The RF signal goes through the Power Amplifier or PA which basically amplifies the RF signal. The RF signal then goes through the Coupler so that the output signal level can be monitored. The signal then goes through an Isolator and then a Coupler and then through a VSWR detector to check the final connectivity. The amplified RF signal then goes through the server duplexer and the DL RF signal is finally radiated from the server antenna.

Uplink Signal Flow

When the RF signal from the MS (mobile station) comes through the server antenna and into our repeater, it goes to the server duplexer which separates the UL and DL frequencies. The RF signal then goes to the LNA (Low Noise Amplifier) and its main purpose is to reduce the total noise figure of the UL RF signal which will be later amplified.

After the LNA, the UL RF signal goes through the Mixer which down-converts the RF signal into IF frequencies. The IF signal(s) will then go through a SAW filter (5, 10 or 15 MHz) to properly select the desired operating 1900 MHz PCS band or bands. The IF signal then goes through the Coupler so that the input signal level can be monitored.

The IF signal then goes through AGC (Automatic Gain Control) circuitry in order to set the correct gain on the repeater. The IF signal(s) are then up-converted (through UDC) back to RF again and goes through Ceramic filter(s) to reject unwanted spurious and harmonic signals. After the Band Pass Filter, the RF signal then goes through a Variable Attenuator which will adjust the total system gain and then goes through the Isolator, which prevents feedback from the HPA (High Power Amplifier).

The RF signal goes through the Power Amplifier or PA which basically amplifies the RF signal. The RF signal then goes through the Coupler so that the output signal level can be monitored. The

signal then goes through an Isolator and then a Coupler and then through a VSWR detector to check the final connectivity. The amplified RF signal then goes through the server duplexer and the UL RF signal is finally radiated from the donor antenna.