EPOCH-S02-19001W
OPERATIONAL DESCRIPTION

~ 1 W Composite Output Power ~

Advanced RF Technologies, Inc.
2607 Colorado Blvd., Los Angeles, CA 90041
Tel: (323) 254-8131
Fax: (323) 254-4928
www.adrftech.com

Block Diagram

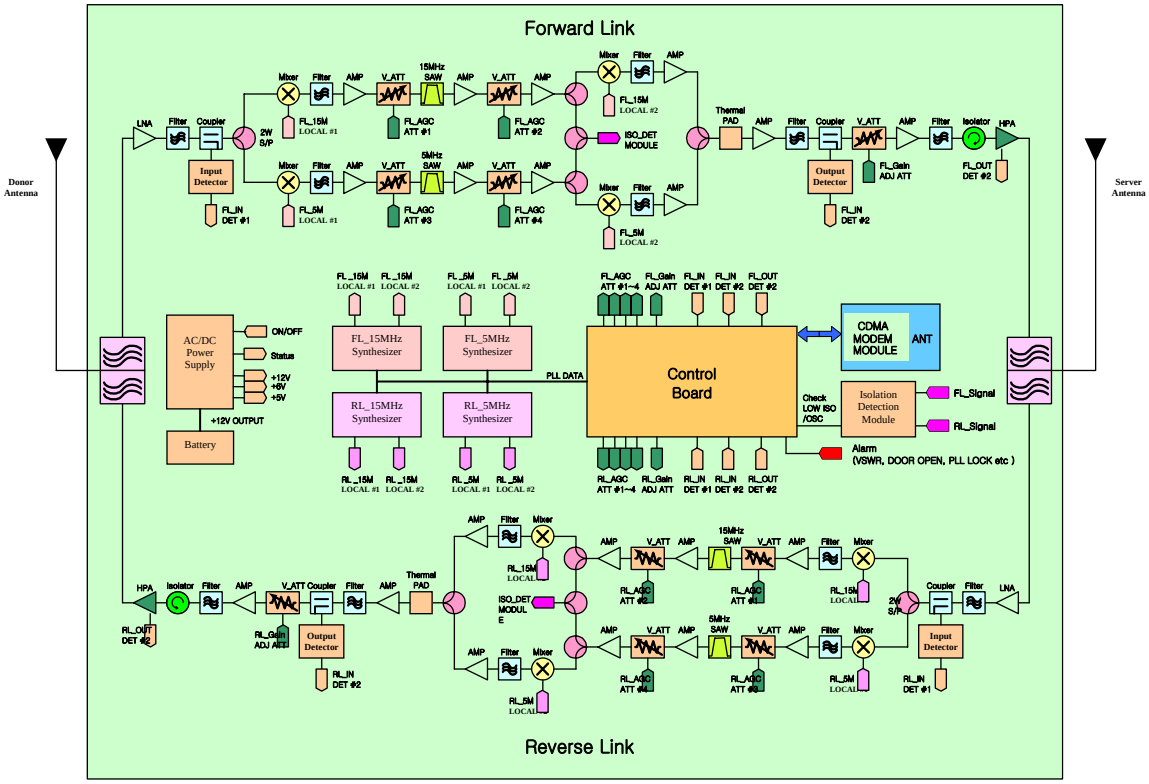

Figure 1: Epoch-S02-19001W Block Diagram

Figure 1 describes the operation of the Epoch-S02-19001W repeater. The donor antenna points to and receives the signal from the BTS 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 mobile station (MS) 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 our 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 Coupler so that the input signal level can be monitored. This RF signal then goes through a splitter and a switch, which will allow the RF signal to go through either one of the paths (5 MHz or 15 MHz) or both (5 MHz & 15 MHz). The RF signal(s) goes to a Mixer which down-converts the RF signal (PCS Bands) into IF frequencies, which then goes through the first stage of AGC (Automatic Gain Control) circuitry in order to set the correct gain on the repeater. The IF signal will then go through either one or both SAW filters (5 MHz & 15 MHz) to properly select the desired operating PCS band or bands. The IF signal(s) then goes through the second stage of AGC (Automatic Gain Control) circuitry in order to set the correct gain on the repeater. The IF signal is then up converted back to RF again and goes through Ceramic filter(s) to reject unwanted spurious and harmonic signals.

The RF signal(s) are then combined and goes through a Thermal PAD, so that the combined system gain is compensated according to the system temperature. The RF signal goes through the Coupler through which the output signal level can be monitored. The RF signal then goes through a Variable Attenuator which will adjust the total system gain and then goes to the Isolator, which prevents feedback from the HPA (High Power

Amplifier). Finally, the RF signal goes through the Power Amplifier or PA which basically amplifies the RF signal. 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 Coupler so that the input signal level can be monitored. This RF signal then goes through a splitter and a switch, which will allow the RF signal to go through either one of the paths (5 MHz or 15 MHz) or both (5 MHz & 15 MHz). The RF signal(s) goes to a Mixer which down-converts the RF signal (PCS Bands) into IF frequencies, which then goes through the first stage of AGC (Automatic Gain Control) circuitry in order to set the correct gain on the repeater. The IF signal will then go through either one or both SAW filters (5 MHz & 15 MHz) to properly select the desired operating PCS band or bands. The IF signal(s) then goes through the second stage of AGC (Automatic Gain Control) circuitry in order to set the correct gain on the repeater. The IF signal is then up converted back to RF again and goes through Ceramic filter(s) to reject unwanted spurious and harmonic signals.

The RF signal(s) are then combined and goes through a Thermal PAD, so that the combined system gain is compensated according to the system temperature. The RF

signal goes through the Coupler through which the output signal level can be monitored. The RF signal then goes through a Variable Attenuator which will adjust the total system gain and then goes to the Isolator, which prevents feedback from the HPA (High Power Amplifier). Finally, the RF signal goes through the Power Amplifier or PA which basically amplifies the RF signal. The amplified RF signal then goes through the donor duplexer and the UL RF signal is finally radiated from the donor antenna.

Other Major Blocks

The Epcoh-S02 uses a Linux based 32-bit control board which can control four Phase Locked Loops at the same time, so that the repeater can select up to 15 band combinations in the 1900 MHz PCS spectrum (e.g. A, B, C, D, E, F, AD, AE, AF, BD, BE, BF, CD, CE or CF). The 32-bit control board can also support a 3G Wireless modem for SNMP based alarming. Also, an isolation detection module is also supported by the 32-bit control board so that the gain can be adjusted automatically in the event of an oscillation.

The AC/DC Power Supply of the Epoch-S02 unit supports free voltage from 100 to 240 volts. Also, the power supply also has surge protector built in and is also capable of switching automatically to back-up battery in the case of a power failure. Similarly, the same process applies the other way around. The power supply is also capable of generating three different output power levels (e.g. 5, 6 & 12 V).