RECEIVER:

The LAN receiver utilizes single conversion for any one of 3 spread spectrum ISM band channels, 911.58MHz, 914.58MHz or 917.58MHz.

A typical received signal approximately 1 MHz wide at it 6dB BW is amplified, filtered and down converted to a 50MHz IF.

It is further filtered using two SAW filters, amplified and fed to a digital attenuator, and then to a 'A-to-D' converter. The digitized signal is hetrodyned against a digitally synthesized local oscillator fully modulated by the psudo-random code (prc), which matches the received prc.

The digital IF output signal is processed by a digitally implemented bank of 11 bandpass filters having 20KHz BW.

The receiver's matching code is made to 'slip' until it matches the received signal's psudo-random code. This condition is called a locked. The receiver gain for this condition is increased and a large signal appears in one of the 20KHz filters, typically increased 12 to 14 dB(process gain).

The received signal's power is than ranked in the 11 frequency channels based on most power received per channel. The three strongest adjacent channels are used to adjust the agc (digital attenuator) to the point where the On-and-Off Keying (OOK) creates the one's and zeros for data reception.

For the first 5ms, the received signal packet has a continuous psudo-random signal to allow the receiver to trip and lock onto the code. Then the received packet has it's carrier modulated on and off (OOK) where the data modulation has been applied to the spread carrier.

After receiving the sync pulse, the received data contained within is processed into bins to be retransmitted as outgoing data.

Periodically, during the data packet (every 8 bytes), the receiver's psudo-random code is re-adjusted to exactly match the received signal's code.

The received data can be monitored via a RJ45 S.I.O. (serial interface) or transmitted as a relayed (repeated) message packet.

TRANSMITTER:

The transmit oscillator (VCO) operates directly at any of the three output frequencies 911.58MHz, 914.58MHz or 917.58MHz.

TRANSMITTER Continued:

The transmit packet's timing and message format is the same as the received packet described above.

While capable of transmitting continuously, the LAN transmitter duty cycle is seldom higher than 5 to 10%.

The transmit output frequency is synthesized and phase locked to a TCXO at 18.205952MHz. The transmit signal is buffered, and mixed with the psudo-random code.

From the mixer, the signal is routed through the preamp, which also switches the signal on and off (OOK) for the message data.

From there, the signal is band-pass filtered, and routed to the final power amps.

The signal is low-pass filtered and routed to the output.

TRANSCEIVER:

By an internal configuration control EEPROM, or control from the RJ45 SIO, the two antenna ports can be operated as follows:

> Port A or B one-at-a-time using a four-way diversity switch. I.E., the LAN can receive from antenna port A or B, or, the transmitter can be routed to antenna port A or B in single duplex.
>
> It can receive on one antenna port and then transmit on the other, or both the same.
>
> It can receive (and) or transmit on 'alternating ports' (switched at .5 second intervals for receive and alternating successive packets for transmit).

Selection of the receive and transmit frequency is independent. I.E., the LAN can receive on 911.58MHz and then transmit at 914.58 or 917.58MHz or visa-versa.

The LAN transceiver is powered by an external +10.5 to +15.5 Vdc drawing approximately .5 amps in receive and .6 amps in transmit (typically .1 more with 10.5 volt and .1 less with 15.5 volts input).

The LAN transceiver operates in sheltered enclosures at temperatures from -40 to +85 degrees C ambient.