

## THE GENESIS IPG SYSTEM

The Genesis™ System is a multi-programmable implantable neurostimulation system designed to deliver low-intensity, electrical impulses to nerve structures. The system consists of a hand-held battery powered patient programmer which communicates to a self-powered implantable pulse generator (IPG). The IPG delivers electrical impulses through an implanted lead(s) to the selected nerve fibers in order to provide therapeutic stimulation. The patient programmer enables the patient to adjust current stimulation parameters and select new programs for customized therapy.

The Genesis Programmer and IPG communicate by modulating a 116Khz +/-5% signal for data sent to the IPG and modulating a 40Khz signal for data sent back to the patient programmer. The data is modulated using a standard 2400 Baud RS232 protocol. All of the RF circuitry for the patient programmer is included in the paddle-like device which attaches to the patient programmer called the 'wand'. The wand must be placed within several inches of the implanted IPG to communicate with it.

For the transmitter section of the wand circuitry, timer circuitry generates a signal which is approximately 116Khz that drives the carrier signal through an airwound inductor that acts as an antenna. The carrier is switched on and off by a signal from the patient programmer such that it meets the RS232 2400 baud timing requirements.

For the receiver section of the wand circuitry, when the wand is in receive mode, the airwound inductor becomes part of a 40Khz LC resonant tank circuit and the received carrier is sent through a two stage 40Khz bandpass circuit where it is then lowpass filtered to recover a 2400 baud logic level signal.