EX7100 Operational description

The EX7100 digital link provides a transparent 64kbit/s channel that operates inside internationally recognised 25kHz RF channels

It can provide the following services:

- Digital interconnect with synchronous V.35 and G703
- 6 channel Telephone 2Wire Subscriber interface
- 6 channel Telephone 2Wire or 4/6 Wire Exchange interface.

Each terminal may be controlled from a front panel display. Set-up is also possible when used in conjunction with suitable application software that can operate on a common PC. An RS485 9600 bits per second port also supplies Network Management Services.

When operated in telephone type service the link provides the equivalent of a 6 x telephone line replacements, these include the ability to provide Payphone services, Fax and Data Services to 9600 bit/s.

When being used for telephone calls the link codes the speech for transmission over the digital radio. All telephone signalling is regenerated, this includes modem and Fax operation so each end of the link is capable of operating as a fax or modem and the data is transferred digitally across the link.

When being used for data transmission the link provides G.703 and V.35 interfaces for 64kbit/s data.

The basic radio uses 16QAM modulation and transfers data at 68kbit/s. This includes a control channel for communication with the remote terminal and framing overheads as well as the 64 kbit/s data channel.

The operation of each individual unit is described below:

Power Supply module

The power supply module converts the incoming DC input from the rear panel to the voltages needed to operate the circuitry within the EX7100 terminal. The first stage of the power supply is an isolated forward converter. This converts the incoming DC voltage to a 24 volt supply. The 24 volt supply is used as required in the ex7100 terminal and is used to supply a second stage flyback converter that provides ±5 and ±15 volt outputs.

Transmitter module

The transmitter module accepts data from the Modem controller module. This data is filtered, modulated with a locally generated carrier, amplified and then filtered again ready for amplification by the power amplifier module.

Power amplifier module

The RF power amplifier is driven by a modulated signal on the required RF frequency by the transmitter module The power amplifier module maintains a constant gain with the RF power being adjusted in the transmitter module.

Receiver module

Received RF is passed from the antenna through the duplexer to the front-end sub module where it is filtered and amplified. This signal is then fed to the main receiver module where it is filtered, amplified mixed down in frequency and demodulated. The micro controller associated with the transmitter module provides metering for the receiver and generates the AGC voltages as well as controlling the synthesisers and storing the information.

Duplexer

The duplexer allows the receiver and transmitter modules to be connected to one antenna. The duplexer isolates the receiver from the large signals produced by the transmitter and in addition provides significant protection against lightning damage to the radio.

Modem/controller module

The modem/controller module provides the bulk of the EX7100 terminals control and data conversion functionality. Incoming data to the terminal is converted to a format suitable for transmission over the link and output to the transmitter module. Similarly data from the receiver is converted from the transmission format to the line format appearing at the rear panel.

The module also contains the master controller for the EX7100. This controls the front panel and manages the micro controllers that are present on many of the other modules.

Line interface modules

The line interface modules allow six analogue exchange or subscriber telephone lines to be operated over the EX7100 link. Voice, Fax and data traffic can be accommodated. Each line interface module carries all the necessary line interface, speech compression and control components.

Isolated power supply

The isolated power supply provides DC power to the six channel interface boards. The output rails of the power supply are isolated from the input rail: the isolated supply can withstand 3.5kV potential difference between input and output.