BPL telecom

POWER LINE CARRIER COMMUNICATION SYSTEM MODEL-9505

BPL telecom
Revolutionising the industry

Behind every successful company are happy customers. Behind every happy customer is a breakthrough product. And behind every breakthrough product is a company committed to excellence.

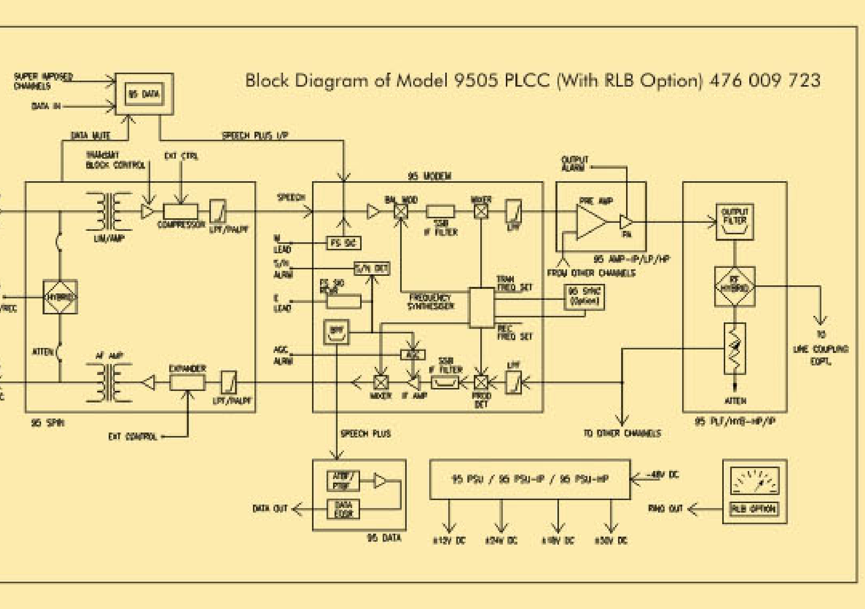
BPL started its Telecom division in 1968. Since then, it has revolutionized the Indian Telecom industry, with its high quality products and service. It has a lot of firsts to its credit in the Indian market. Electronic Private Automatic Branch Exchanges, Voice Communication Networks, Digital Hybrid Key Telephone Systems, to name just a few.

Considering BPL's tie-ups and R&D facilities, the path breaking products don't come as a surprise. Further, the ISO 9001 Quality System and the country-wide service network has resulted in a successful company, happy customers and not to forget, several breakthrough products. The Model 9505 Power Line Carrier System is one of them.

Power Line Carrier Communication System Model-9505

The Power line Carrier System enables Power Utilities to have a communication link of their own thus reach the remote areas where telephone cables don't reach. It is fully integrated, voice/data communication system capable of supporting the most demanding Power line networking environment for communication between electricity board sub-stations and load dispatch centers.

The power and flexibility of the model 9505 system's proven architecture has earned BPL a loyal following in Electricity Boards and Private Power Projects throughout India. The IC version system provides single or multiplexed voice grade channels of transmitting speech or audio tones over high voltage transmission lines. The transmitted audio tones can be used for tele-metering, supervisory control, protective relaying data and for other purposes.



The equipment can be configured for "speech-plus" operation (simultaneous transmission of speech and data). When used for data only, each channel can carry up to twenty four 50 baud telegraphic/data channels or a smaller number of channels at higher baud rates. Elements of the system may also be used for transmission over cable, open-wire lines, and radio multiplex applications.

This is a single-side-band (SSB) carrier system that uses the available frequency spectrum quite efficiently. Each terminal is available as either a single or twin channel unit. Each channel provides a voice-grade circuit over the transmission medium, and occupies a separate 4KHz band in either direction of transmission.

Model 9505 terminals can be supplied with RF power output of 10, 20 or 40 watt PEP. The modules and assemblies employ proven design techniques to achieve low power

Product features

The typical Model 9505 terminal contains one MODEM, one speech interface module, one data interface module, a power supply unit, an amplifier, a line filter and an optional synchronizer mounted in two 19" double Euro chassis. The typical terminal also contains a RF line interface assembly.

Modem

The 95 MODEM contains the modulator and demodulator for Power Line Carrier Communication applications. It is fully programmable from 40 KHz upto 511.5 KHz in 0.5 KHz steps and the pilot signal can be programmed at 2580 +/- 30Hz, 3600 +/- 30Hz or 3825+/-30Hz. The MODEM incorporates a signaling transceiver with an optical isolator to accept signal inputs: the output being the Form C contacts of a relay. The 95 MODEM contains the Automatic Gain Control (AGC), pilot tone alarm and signal to noise ratio alarm that can be wired together as inputs to a master alarm. The frequency programming is accomplished within the module. MODEMs can also be easily reprogrammed at site without special tools or accessories.

Speech Interface Module

The 95 SPIN (speech interface) contains the interface from the speech circuits to the 95 MODEM. Interface is provided for 2 wire-telephone, 4 wire-telephone, 2 wire-express, 4 wire express, and jack telephone communication. The Module contains the tone generating circuits, speech equalizing and alarm indications. An in built compander circuit with selectable option is also provided. The speech band can be programmed in three ranges viz., 2000 Hz 2400Hz, 3400 Hz.

Data Interface Module

The Model 95 DATA interfaces data input (7 Numbers) and output (3 numbers) to the 95 MODEM module. It equips an optional Digital Signal Processing (DSP) based Programmable Transit Band Filter (PTBF). The filter can be easily reprogrammed at site without special tools or accessories.

95PTBF

PROGRAMMABLE TRANSMIT BAND FILETR

It is an add-on module for 95DATA card. The module works on latest DSP technology and the heart of it is ADSP2181.

This card works with a combination of 6 low-pass and 6 high-pass filters. The selection of the Band-pass filter is done by selecting the required low-pass and high-pass filters whose combination would give the pass band and the stop band for the resulting Band pass filter. The selection of the filter bands is done by using the DIP switches provided on the card.

Power Supply Unit

The Power supply unit of the Model 9505 system, the 95 PSU IP/HP, is basically a Switched Mode Power Supply designed to provide a regulated power output of +/-12 V DC and an unregulated output of +/- 18 V DC or +/- 50 V DC

Amplifier

Four different amplifiers are available for the Model 9505 system – 95 AMP LP, 95 AMP HP, 95 AMP IP and 95 AMP TP, the maximum RF power output for the four amplifiers are 10W 20W 40W and 80W respectively. All amplifiers perform in the frequency range from 30KHz – 500KHz.

Programmable Line Filter

The Model 95 POWER LINE FILTER comprises the programmable line filters (PLF) section. The filter is site tunable into different frequency ranges. By means of the strapping provided it could be tuned to the required frequency band.

95 MEMRI

Metering, Monitoring Module

95MEMRI module consist of six sections : a metering unit, a monitoring unit, an optional ringer unit, an oscillator, AL and RLB. A metering unit is used for metering various AC & DC levels in the system. The monitoring section monitors the healthy condition of the terminal by monitoring the status of all the supply voltages, transmit, receive, pilot and guard section. Failure in any of these sections is announced by visual indication. Two set of potential free changeover relay contacts are also provided. The ringer section supplies 25Hz / 75V ring voltage to the telephone. It also provides the ring back tone to the called end. OSC provides a test tone of 1KHz for the RLB section. The RLB section provides a test facility for checking the entire speech path in a link. AL section controls the buzzer provided for audible indication of alarm and dial condition.

Synchronizer

The model 95 SYNC, Synchronizer, provides a precise 102.4KHz clock signal which can be used to synchronize all the MODEM modules installed at both ends of the 9505 communication link. The clock signal is derived from a precision quartz crystal.

RSI

REMOTE SUBSCRIBER INTERFACE MODULE

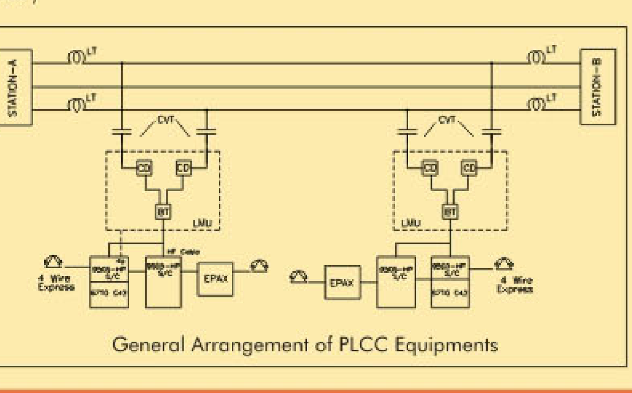
The remote subscriber interface facility makes the remote end PLCC Terminal (With no PBX), a subscriber of the near end PLCC (With PBX).

95 LINT

The 95 LINT modules contains the necessary circuit for interfacing the 9505 PLCC equipment to the co-axial cable. The hybrid, receive attenuator, filter and dummy loads (75/125/150 Ohms) are also housed inside this module. The 95 COAX board is used for terminating PLCC equipment and the co-axial cable.

Typical Application

The 9505 single channel PLCC terminal can be used in a tandem configuration. The speech signals are shown repeating at the transit station through an EPAX. The low-speed data (speech-plus) signal is bypassed at the intermediate station using Transit Band Pass Filters (TBF/PTBF)



General Arrangement of PLCC Equipments

Basic Chassis

The double Euro chassis serves as a housing for all the sub-assemblies (except the RF line interface assemblies that are housed separately). It contains only passive interconnection. The chassis fits into a standard EIA 19 inch rack.The interconnections between printed circuit boards (modules) in the chassis are made through a PCB back plane or Mother Board that contains the mating connectors for the circuit boards. Connections between the chassis and the external circuits are made through connectors and barrier type terminal blocks at the rear of the chasis.

Complete Terminals

The model 9505 chasis is a complete system mounted on a swinging frame housed in a sheet metal cabinet. The model 955 Power Line Carrier Terminal can be interconnected with other BPL make Power Line Carrier Communication associated equipments like EPAX, Protection Coupler, VFT, Coupling Device and Wave traps to form a fully integrated communication system for power utilities.

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Specifications

HF Section:	
Operating Mode	: Amplitude modulation, Single Sideband
Carrier frequency range	: 40KHz to 500 KHz in steps of 0.5 KHz.
Channel Bandwidth	: 4 Khz
Impedance	: 75 Ohms, 125 Ohms unbalanced and 150 Ohms balanced.
Output Power (PEP)	: 10, 20 or 40 watts PEP, depending on Amplifier/ PSU used.
Return Loss	: Better than 10 dB.
Frequency stability	: +/- 5 ppm standard. Synchroniser can be optionally provided. Spacing between Speech
and Pilot Channel	: Factory set to 14 dB.
Spurious outputs:	
Harmonic	: <-40dB
Carrier	: -50 dB
Spurious emissions	: Within IEC 495 limits
Receiver sensitivity	: -45 dB
Receiver selectivity	: -55dBMO or Greater 4KHz from either side of operating channel, measured at the AF Output.
VF Section:	
Input Output levels and Impedance	
Four Wire send	
level	: Factory set to -3.5dB
Impedance	: 600 Ohms
Two Wire send	
level	: Factory set to 0dB
Impedance	: 600 Ohms
Four Wire receive	
level	: Factory set to -3.5dB
Impedance	: 600 Ohms
Two Wire receive	
level	: Factory set to -7dB
Impedance	: 600 Ohms
Speech frequency band	: Programmable
Speech plus input :	
Input/output level	: -20 dB
Impedance	: 600 Ohms
Speech plus frequency bands	: Programmable
Automatic Gain Control	: Less than 1 dB change in audio outpur for an RF variation of 30 dB.
Signalling	: 2580+/- 30 Hz, 3600+/- 30 Hz, 3825+/- 30 Hz,
Cabinet dimensions	: 1764 mm x 735 mm x 505 mm
Cabinet weight	: 200Kg (Approx)
General:	
Standard compliance	: The model is designed to meet applicable IEC standards.
Operating range	: 0 to +55 Degree centigrade.
Power requirement	: Determined by amplifier/power supply modules used. All amplifiers / power supply module provide complete isolation between the system and the power source. The standard input voltage is 48V DC (+20% to -15

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