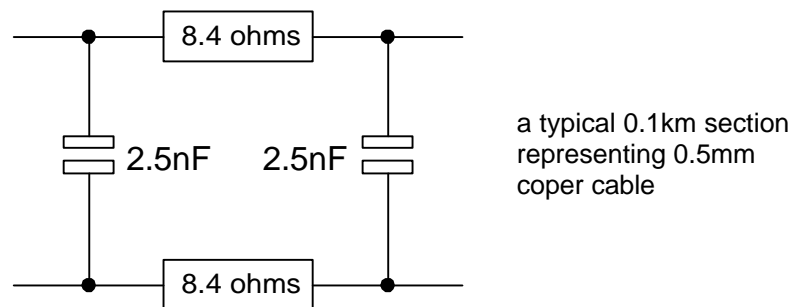


Specification for the MSB Design Artificial Line AL-1

Introduction

An Artificial Line, as the name suggests, is an apparatus that can simulate a real length of telephone cable such as is used in the local loop to route exchange lines to the subscriber via the Public Switched Telephone Network (PSTN).

The British Standard publication BS6305 defines one form that such a simulation should take, and this describes a 0.1km section of 0.5mm copper conductor as being represented by a series resistor of value 8.4ohms in each leg with a parallel capacitor of value 2.5nF at each end of the section. Thus different lengths of line are made up of cascaded 0.1km sections, as shown below :-



The Artificial Line AL-1 from MSB Design faithfully reproduces this standard and is constructed with components having a tolerance of +/- 1% and a rated voltage of 250v dc; this ensures that the lines are capable of operating with ringing voltages to the full 100v RMS level, as well as low level speech signals.

Features

The selection of line segments is achieved by the setting of toggle switches, which bring into circuit sections constructed from 0.1km segments

These sections are configured to a binary format; i.e. 0.1km, 0.2km, 0.4km, 0.8km etc., the only deviation from that being an extra 1.6km section, and thus by selecting a combination of sections with the toggle switches any length of line can be achieved from 0km to 7.9km in 0.1km steps.

Those switches not selected just feed through directly to the next section; thus if all of the switches are in the 'direct' position then the line length is a dead short. If distances greater than 7.9km are required then the units can be cascaded as needed.

Provision is made for the reversal of the input terminals by means of the 'reverse' switch, an occurrence which must be allowed for when designing equipment to be connected to the PSTN as no instructions apply to the polarity of the incoming subscriber lines.

The output side of the 'A' line is broken by a pair of terminals with which the line current can be measured; if this is not required then the terminals should be shorted together to maintain line continuity.

The inputs consist of a 2-way IDT connector in parallel with a pair of 4mm screw terminals, and the outputs provided are a pair of 4mm screw terminals and two line jacks, again in parallel. No attempt has been made to provide any connection to pin 3 of the line jacks (normally the ringing line) as the splitting off of this signal is achieved after the line end.

Uses

Clearly the use to which this equipment is put will depend on the requirements of the user, but some suggestions are presented below as an indication :-

- a) BS6305 test Section A2 - detection of bell tinkle
- b) BS6305 test Section A8 - dial pulse distortion
- c) BS6305 test Section D1 - REN determination
- d) ring detector sensitivity
- e) speech circuit sensitivity
- f) data pulse distortion
- g) line bandwidth effect on signals

etc.

Specification

Line length	0km to 7.9km in 0.1km increments
Resolution	0.1km
Inputs	1 off 2-way IDT connector 1 pair 4mm screw terminals line reversal switch
Outputs	1 pair 4mm screw terminals 2 off line jacks loop current terminals in 'A' leg
Component Tolerance	+/- 1% all components
Voltage Rating	250v dc all components

IMPORTANT

It is essential that this line is only connected to such apparatus that will limit the current to a maximum of 250mA. Care should be taken when ringing voltages and short line lengths are used in combination - direct selected is fine.

The unit is housed in a welded aluminium enclosure, with all the switches and main connectors mounted on the top surface.

Please note that the two white current-monitor terminals must be connected together, either by a link or a current measuring instrument. Without this connection the line will be open-circuit, and no transmission will be possible.