

Bidirectional RS-485 repeater

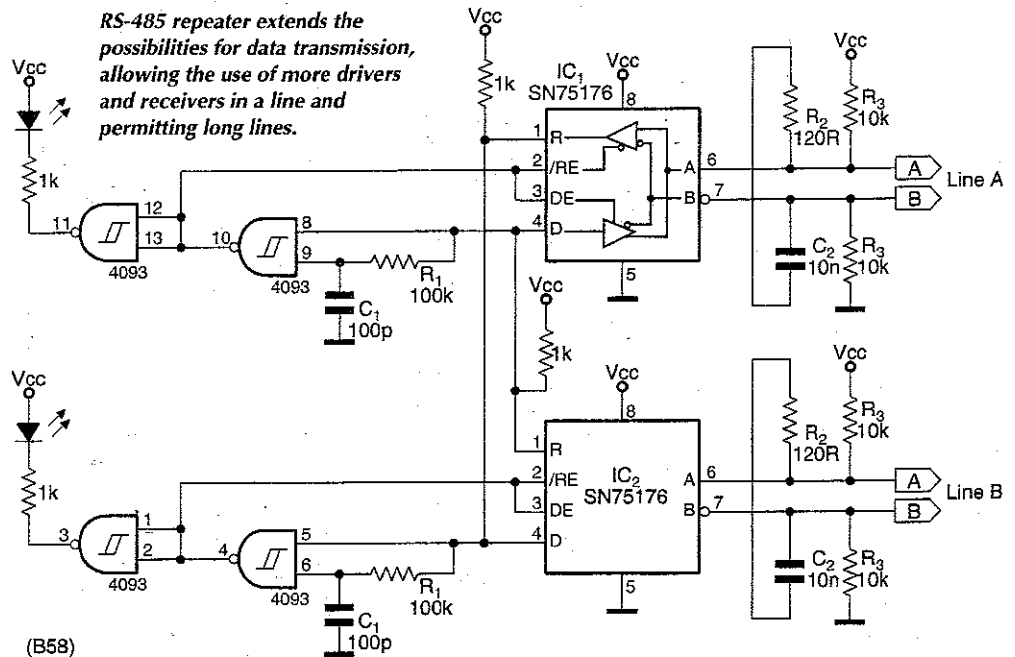
To be inserted in long lines or to allow radial lines in a star arrangement to be isolated from the others, each being terminated, this repeater shows which line is receiving data and opens the other line to forward the data.

A line not transmitting is inactive, its state being logic one. Both drivers are disabled and both receivers enabled. If no driver is active in the line, resistors R_3 keep it at one.

If line A goes to zero, the receiver in IC_1 detects the level. Output pin R is taken to IC_2 input pin D, IC_2 being activated at pin DE by gate IC_2 and imposing a zero on line B. Reception on line B is disabled at pin /RE. This state of affairs lasts while the zero level remains on Line A.

When line A goes to one again, line B is driven to one and is disabled after a time R_1C_1 , overriding the

RS-485 repeater extends the possibilities for data transmission, allowing the use of more drivers and receivers in a line and permitting long lines.



effect of the resistors R_3 . The time constant of terminating components R_2C_2 should be shorter than that of R_1C_1 to allow C_2 to charge by the driver before the driver is disabled. Nevertheless, R_1C_1 has to be shorter than the time of one bit.

The circuit has operated at 9600baud and should go to 100kbaud.

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Split supply from a single battery

From the one battery, this circuit arrangement produces symmetrical positive and negative outputs equal to the battery voltage and is protected against short circuits

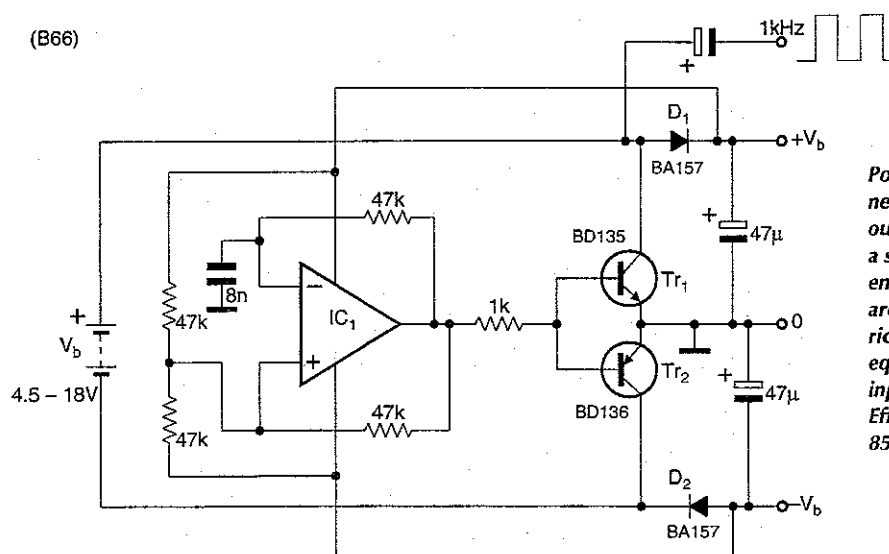
The 741 op-amp operates as a 1kHz square-wave generator and is, at switch-on, supplied with $V_{batt}/2$ to each supply pin by way of the two diodes. When the op-amp starts to oscillate, its output drives the transistors, their outputs being superimposed on the battery voltage and the op-amp now receiving double its steady-state supply.

The increased voltages are taken as the output after smoothing by the two 47 μ F capacitors. If required, the square wave is available as an output and, if symmetry of the square wave needs adjustment, the 47k Ω resistors on the op-amp input can be replaced by a potentiometer.

In the event of an excessive demand from the load, the oscillator stops and output current is reduced.

Efficiency is about 85% with a 12V

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Positive and negative outputs from a single-ended supply are symmetrical and equal to the input. Efficiency is 85%.

supply and the maximum operating frequency is about 20kHz; above that, faster diodes will be needed. Higher powers could be achieved with low on-resistance mosfets and Schottky

diodes.
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