

NMEA Buffer

Overview

NMEA 0183 (and 0182) is carried on a standard RS232 electronic communications protocol, exactly as data on a computer serial port. This means any of the RS232 devices available on the market can be used to provide signal conditioning to the NMEA data stream. Many current NMEA senders (GPS etc) are limited in their output power and can only drive typically three devices, so a buffer is often necessary to increase their 'fan-out' to more than three listeners.

In this case a Garmin 152 GPS is used to feed: (a) a laptop computer, (b) a DSC radio, (c) a Radar, (b) an Autohelm device. Others could be added.

Circuit description

The circuit is based on a MAX 232 RS232 transceiver which is readily available from Maplin; RS etc. The designation number 232 is coincidental and the device is one of a number of RS232 / 422 devices that may be useful as an NMEA buffer; they differ in the number of input and output lines available, so if the 232 does not meet your requirements try one of the others.

The MAX 232 takes inputs from RS232 / RS422 (depending on the wiring configuration) and converts them to TTL. Alternatively the TTL can be transposed back to RS232. Thus an RS232 input on pin 13 stimulates a TTL output on pin 12 which can be fed back to a TTL input on pin 11 to generate an RS232 output on pin 14 which results in an increased fan-out. In addition, the MAX 232 input represents only one of the devices the GPS can drive so it is still able to drive two more in parallel to the MAX232 device.

In our design, the NMEA input from the GPS is fed into R1IN (pin13). An alternative, chart table handheld, GPS can be input to R2IN (pin 8). Only one of the GPS signals can be present at once, the other must be unplugged. The GPS NMEA signals are converted to TTL, ANDed together and drive both T1IN and T2IN. These signals can each then drive three standard RS232 loads so the one GPS input now drives six devices (plus two others directly from the GPS itself).

The rest of the circuit is specific to our own installation. It allows: (a) direct linking between the laptop and either GPS for waypoint uploading, (b) a switch selectable drive to the Autohelm (including a bypass from the wind instrument) (c) a 12v raw power socket output for the handheld GPS (d) a repeater buzzer from the GPS 152. The necessary 5v supply for the two chips is derived from a 7805 regulator in a TO220 can. Decoupling capacitors are not shown.

Necessary Legal clauses

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