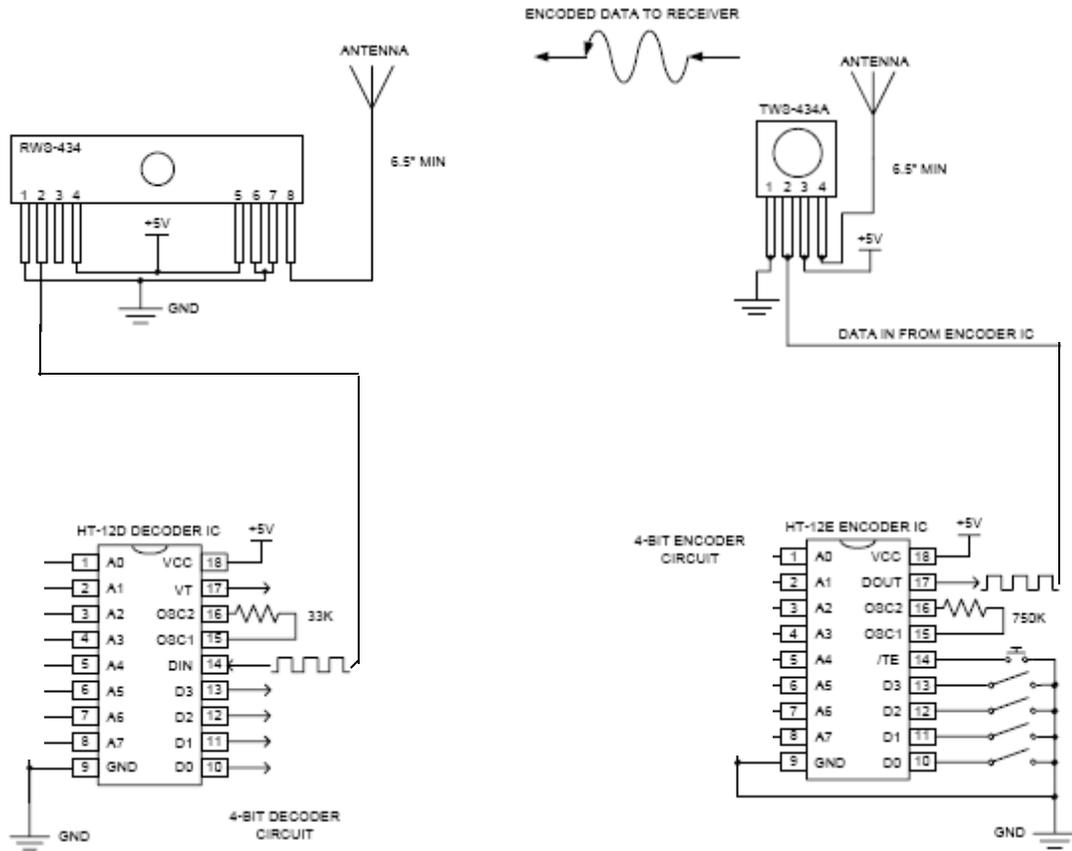


## Transmitting and receiving wireless data.

The goal of this lab is to learn how to send and receive data via wireless connection. You will be given a wireless transmitter (TWS-434A) and a wireless receiver (RWS-434) operating at 434 MHz and a data encoder (HT-12A) and a data decoder (HT12D). You will find the relevant data sheets on line. All these elements are sensitive. Touch the ground (for example BNC connector on the oscilloscope before handling.

You should start with connecting your transmitter and receiver as shown on the figure below. The data input of the encoder should be connected to the four switches on the board. The TE pin (Transmit enable) should be connected to one of the pulse push buttons to the pin which goes down (to logical 0) when pushed. The data receive pins should be connected to data inputs of the 7 segment display. The address pins of both the encoder and decoder should be connected directly to ground (for binary 0) or left open (for binary 1) to form an address byte. Both your encoder and decoder should have the same address. The VT (Valid Data) pin can be used to strobe the 7-segment display. Notice that you will only need one digit of the display so the address pins can be permanently set to activate one digit. Press the push button to transmit and Measure the Dout signal (pin 17 of encoder) and the Din signal (pin 14 of decoder). If there is no Din signal double check the address lines on the encoder and the decoder – they have to correspond to the same address. If you still do not have Din signal ask for help, the fault is possibly with the TWS or RWS.

Once you can transmit data from the switches to the 7 segment display you can use port A to send data to the encoder and to enable transmission. **Notice that your program can only bring /TE pin to ground for 140 milliseconds!** If the period is too short the transmission is not reliable if it is too long (or the pin is kept low) there will be a continues transmission preventing others to use their transmitters.



A0 – A7 address lines.  
 Open input corresponds to 1,  
 grounded input corresponds to 0. To  
 transmit data both  
 transmitter and receiver  
 have to have the same  
 address.

A0 – A7 address lines Open  
 input corresponds to 1,  
 grounded input corresponds  
 to 0. To transmit data both  
 transmitter and receiver  
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 address.

Notice: You have to ground pin 14 on the encoder for about a 20 millisecond to send data. Once the data is received pin 17 on the decoder will go from 0 to 1 to indicate valid data. Use it as an interrupt to read data.

The figure below shows an example of data transmitted by the encoder.

