

MI PROPIO SIMULADOR DE VUELO

CON ARDUINO



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NUESTRO
EJEMPLO
SERÁ EL
CESSNA 172

Microsoft Flight
Simulator X



PASOS PREVIOS

-ELEGIR EL MODELO A SIMULAR: CESSNA 172

-¿EXISTE EL AVIÓN?: A2A y CARENADO

-SELECCIONAR UN NIVEL DE REALISMO

-¿PRESUPUESTO?

-¿ESPACIO DISPONIBLE?



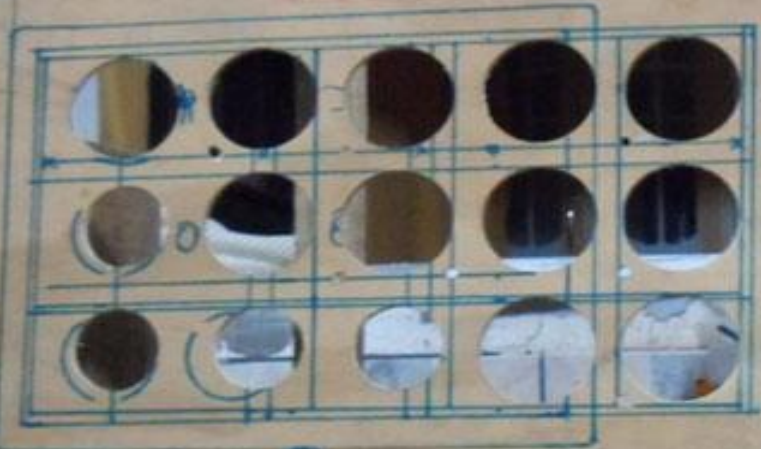


MANEUVER SPEED 97 KIAS



Star 925

1 2 3 4 5 6 7 8 9 10 11 12



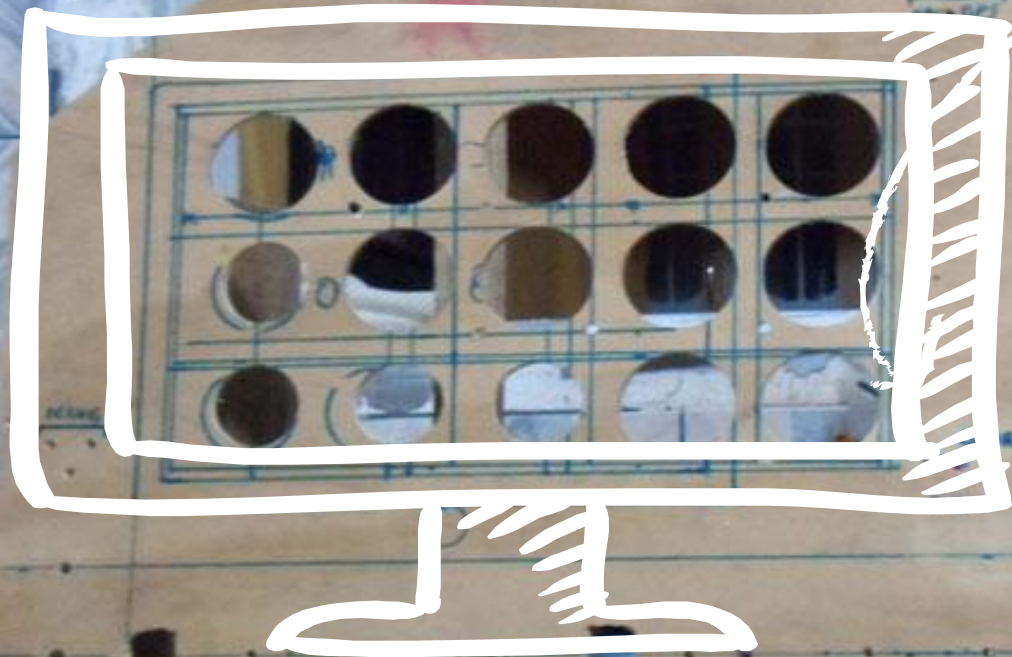
12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

Star

Flaps

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100





MONITOR PARA
INSTRUMENTOS

¿CÓMO SE COMUNICAN ESTOS INTERRUPTORES Y BOTONES
CON MI SIMULADOR?

LINK2FS Y ARDUINO



LINK2FS

Programa gratuito que actúa de intérprete entre Arduino y FSX

Extrae todos los parámetros de vuelo

Los identifica mediante símbolos seguidos de su valor numérico

Traffic Monitor

- ☒ Card 1 ☐ Card 4
☐ Card 2 ☐ Card 5
☐ Card 3

To Card

From Card

FSX not running

Expert Error

Communications Settings

SimConnect Extractions(1)

Extractions(2)

Extractions(3)

SimConnect Inputs

Key's Inputs

Annunciators

GPWS Options

ATC Chatter Options

Monitor

=

Experts

On Startup,,

- ☐ Connect Arduino Card 1
☐ Connect Arduino Card 2
☐ Connect Arduino Card 3
☐ Connect Arduino Card 4
☐ Connect Arduino Card 5

- ☐ and then Minimize
☐ Just Start Minimized
☐ Suppress Error Beeps

REMEMBER !!

After changing anything in any page .. you need to SAVE the profile.

Serial Com.s CARD 1

Serial Port Baud Rate Include CR/LF at end ☐Include Comma's between ☐Cycle time (M/s) Refresh time (Sec)

Not Connected

Connect or
Disconnect
Card 1

CARD 2

Serial Port: Choose one

Not Connected

Connect or
Disconnect
Card 2

CARD 4

Serial Port: Choose one

Not Connected

Connect or
Disconnect
Card 4

CARD 3

Serial Port: Choose one

Not Connected

Connect or
Disconnect
Card 3

CARD 5

Serial Port: Choose one

Not Connected

Connect or
Disconnect
Card 5

Card 1 Card 2 Card 3
Card 4 Card 5

Connect Card1
or
Disconnect everything

Saved Profiles

(Click on one to select.)

Profile in use ☒ Make this the start file

Save all settings
for all Cards
and Start-up

Build 4 September 2014

Jimspage.co.nz

To recover default settings, just erase the cards "Card" file, then, restart this program. (It wont affect the other "Card" files)
For normal Arduino use do NOT tick "Include CR/LF" or "Include Comma's" (They are there for other types of cards)
All data bursts sent from the Arduino must end with a linefeed. Use "Serial.println" as that will include a linefeed at the end.
All user adjustable settings in this program are "HOT" .. that means they take affect as soon as they are changed.
Closing this program using the 'X' at the top right hand corner WILL automatically close all the open ports properly.
Plugging in or unplugging cards while this program is running, may cause it to "Crash". (No error trapping for that yet.)

Card 1

Card 2

Card 3

Card 4

Card 5

COM's

Monitor

Traffic Monitor

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☐ Card 3

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Experts

Nav/Com Radios

- ☐ =A Com1 frequency
- ☐ =B Com1 s/b frequency
- ☐ =C Com2 frequency
- ☐ =D Com2 s/b frequency
- ☐ =E Nav1 Frequency
- ☐ =F Nav1 s/b Frequency
- ☐ =G Nav2 Frequency
- ☐ =H Nav2 s/b frequency
- ☐ =I ADF1 frequency
- ☐ =J Transponder code
- ☐ =K DME1 N.miles
- ☐ =L DME2 N.miles
- ☐ =M Com1 sound active
- ☐ =N Com2 sound active
- ☐ =O Com all sound active
- ☐ =P Nav1 sound active
- ☐ =Q Nav2 sound active
- ☐ =R DME sound active
- ☐ =S ADF1 sound active
- ☐ =T ADF2 sound active
- ☐ =U Marker sound active
- ☐ =V Marker state(1=Out,2=Mid,3=In)
- ☐ =W DME selected
- ☐ =X DME1 Speed. Knots
- ☐ =Y DME2 Speed. Knots
- ☐ =Z ADF2 frequency

More Radio stuff in "Other"

Autopilot

- ☐ =a AP (Autopilot) active
- ☐ =b AP altitude set
- ☐ =c AP vertical speed set
- ☐ =d AP heading set
- ☐ =e AP course (CRS) set
- ☐ =f AP speed set knots
- ☐ =g AP speed set mach
- ☐ =h AP mach active
- ☐ =i AP Current Mach
- ☐ =j AP Heading lock active
- ☐ =k AP Altitude lock active
- ☐ =l AP GPS drives Nav1
- ☐ =m AP Approach hold active
- ☐ =n AP Backcourse active
- ☐ =o AP Nav1 lock active
- ☐ =p AP Wind leveler active
- ☐ =q AP Flight director active
- ☐ =r AP Glideslope hold active
- ☐ =s AP Airspeed hold active
- ☐ =t AP Autothrottle armed
- ☐ =u AP Autothrottle active
- ☐ =v AP Take-off power active
- ☐ =w HSI CDI needle position
- ☐ =x HSI GSI needle position
- ☐ =y HSI flag(0=off, 1=to, 2=from)
- ☐ =z HSI bearing valid

Tick what you want to be sent to the Arduino Card.

Indications

- ☐ <A Gear nose ☐ In Detail
- ☐ <B Gear left ☐ In Detail
- ☐ <C Gear right ☐ In Detail
- ☐ <D Altitude
- ☐ <E Ground clearance
- ☐ <F G Force
- ☐ <G Flaps position ☐ In %
- ☐ <H Trim position
- ☐ <I Plane on ground
- ☐ <J Heading
- ☐ <K Angle of attack
- ☐ <L Vertical speed
- ☐ <M Total Fuel %
- ☐ <N Turn Co-ordination ball
- ☐ <O Ground speed
- ☐ <P Airspeed indicated
- ☐ <Q Pitch
- ☐ <R Roll
- ☐ <S Stall warning
- ☐ <T Engine 1 RPM
- ☐ <U Engine 2 RPM
- ☐ <V Throttle 1 position
- ☐ <W Throttle 2 position
- ☐ <X Fuel left %
- ☐ <Y Fuel centre %
- ☐ <Z Fuel right %

Card 1 Card 2 Card 3
Card 4 Card 5

Connect Card1
or
Disconnect everything

Saved Profiles

(Click on one to select.)

Profile in use ERASE

beta1.v6card1

☒ Make this the start file

Save all settings
for all Cards
and Start-up

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Card 1

Card 2

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Card 5

COM's

Monitor

Traffic Monitor

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Experts

Simconnect Codes

This page shows all the items available for direct input using Simconnect.

All codes sent from the Arduino must end with a linefeed.
ie. Use 'Serial.println'

On this page you can test these codes.
Just click on code in the list, then "Send it"
On some you need to add some more digits.

Click on a code

Send it to FSX

This has nothing to do with the "keys" section.

--- RADIO's Codes -----

A01	Decrements COM by one MHz
A02	Increments COM by one MHz
A03	Decrements COM by 25 KHz
A04	Increments COM by 25 KHz
A05xxxx	Sets COM frequency (In Hz) (A05 and 4 digits, the '1' is assumed, no dot)
A06	Swaps COM 1 frequency with standby
A07	Decrements COM2 by one MHz
A08	Increments COM2 by one MHz
A09	Decrements COM2 by 25 KHz
A10	Increments COM2 by 25 KHz
A11xxxx	Sets COM2 frequency(In Hz) (A11 and 4 digits, the '1' is assumed, no dot)
A12	Swaps COM 2 frequency with standby
A13	Decrements Nav 1 by one MHz
A14	Increments Nav 1 by one MHz
A15	Decrements Nav 1 by 25 KHz
A16	Increments Nav 1 by 25 KHz
A17xxxx	Sets NAV 1 frequency (In Hz) (A17 and 4 digits, the '1' is assumed, no dot)
A18	Swaps NAV 1 frequency with standby
A19	Decrements Nav 2 by one MHz
A20	Increments Nav 2 by one MHz

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Card 1

Card 2

Card 3

Card 4

Card 5

COM's

Monitor

ARDUINO

Controlará nuestra cabina eléctrico-mecánica

Muy sencillo de programar

Existen varios tipos, el más recomendable es el modelo MEGA

CABINA Y FSX

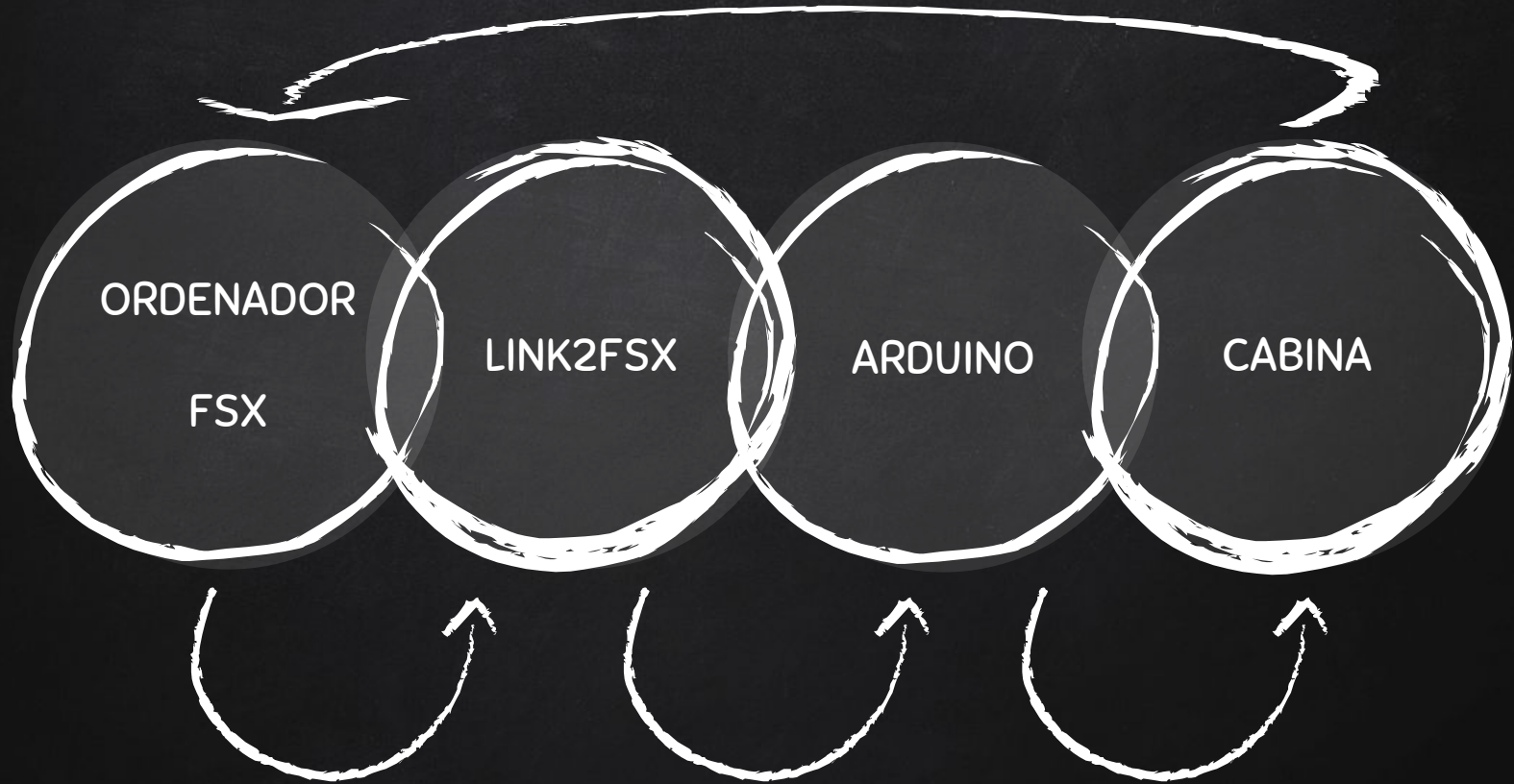
Compuesta por botones, interruptores, servos, pulsadores, displays, leds, potenciómetros....

Cada uno en función del parámetro a simular o mostrar

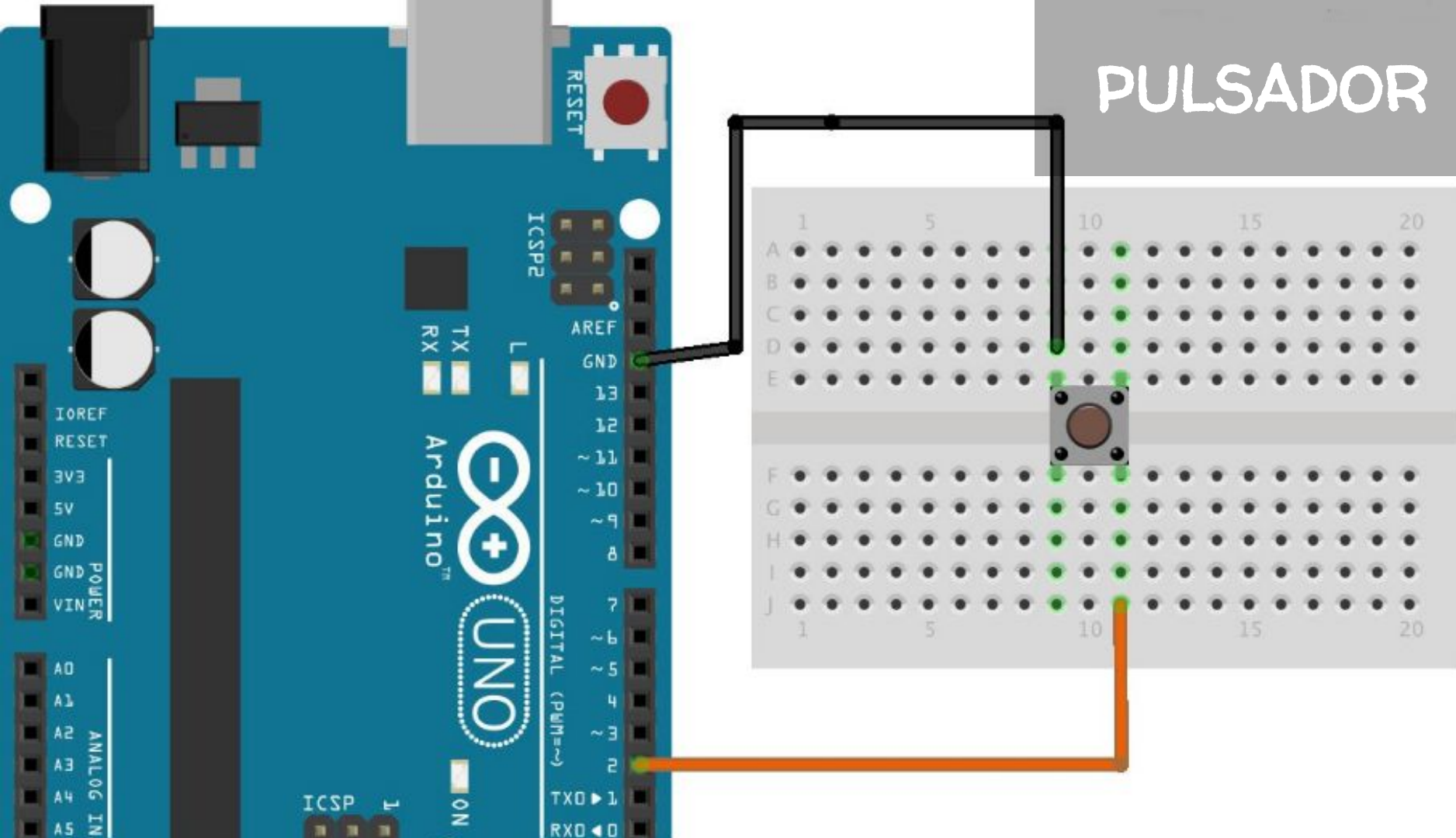
El simulador utiliza interruptores ($T=1$, $F=0$) y potenciómetros $[0, 1023]$

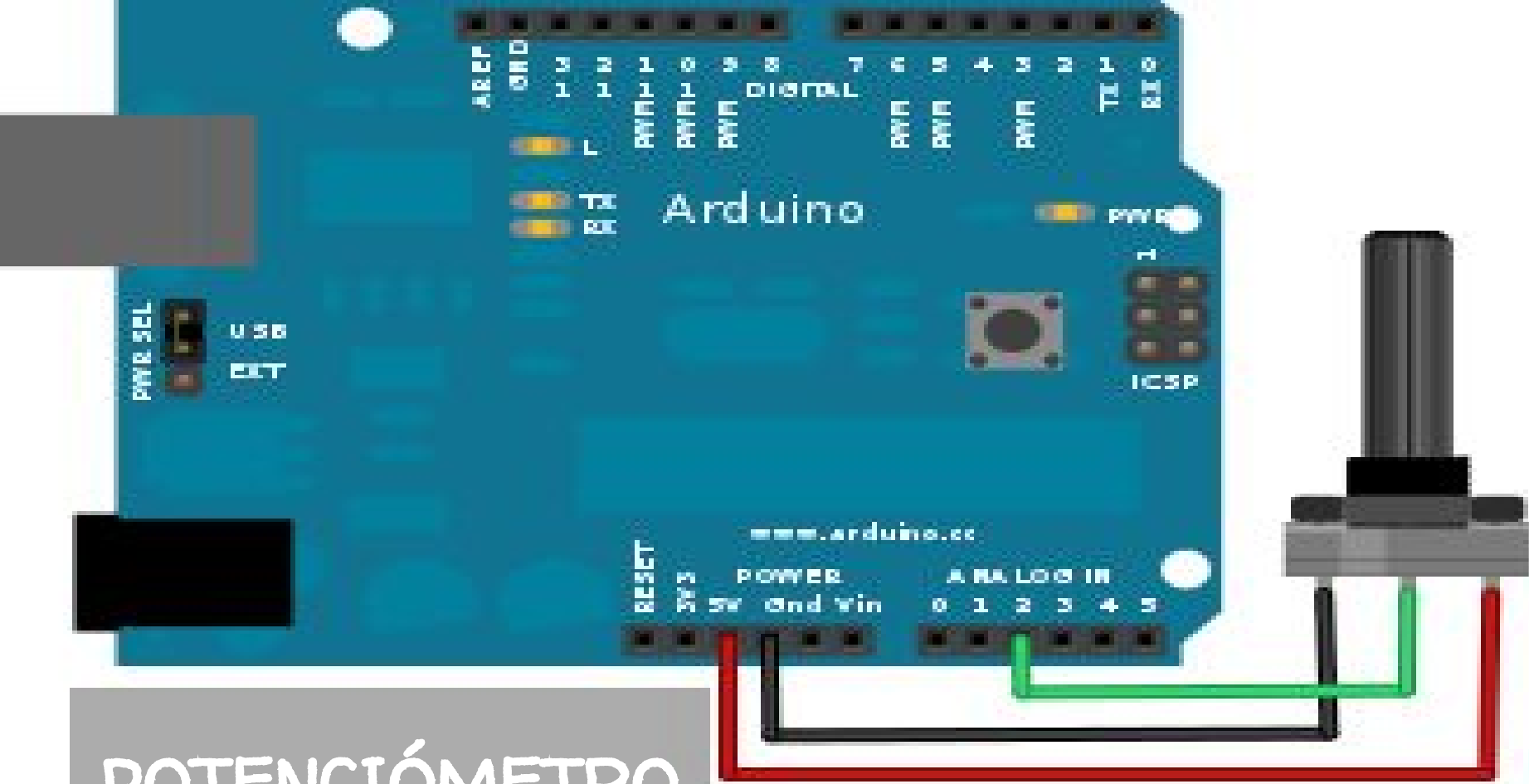
Los primeros simulan botones, los segundos ejes de control

EL CONCEPTO BÁSICO DE NUESTRO SIMULADOR



PULSADOR



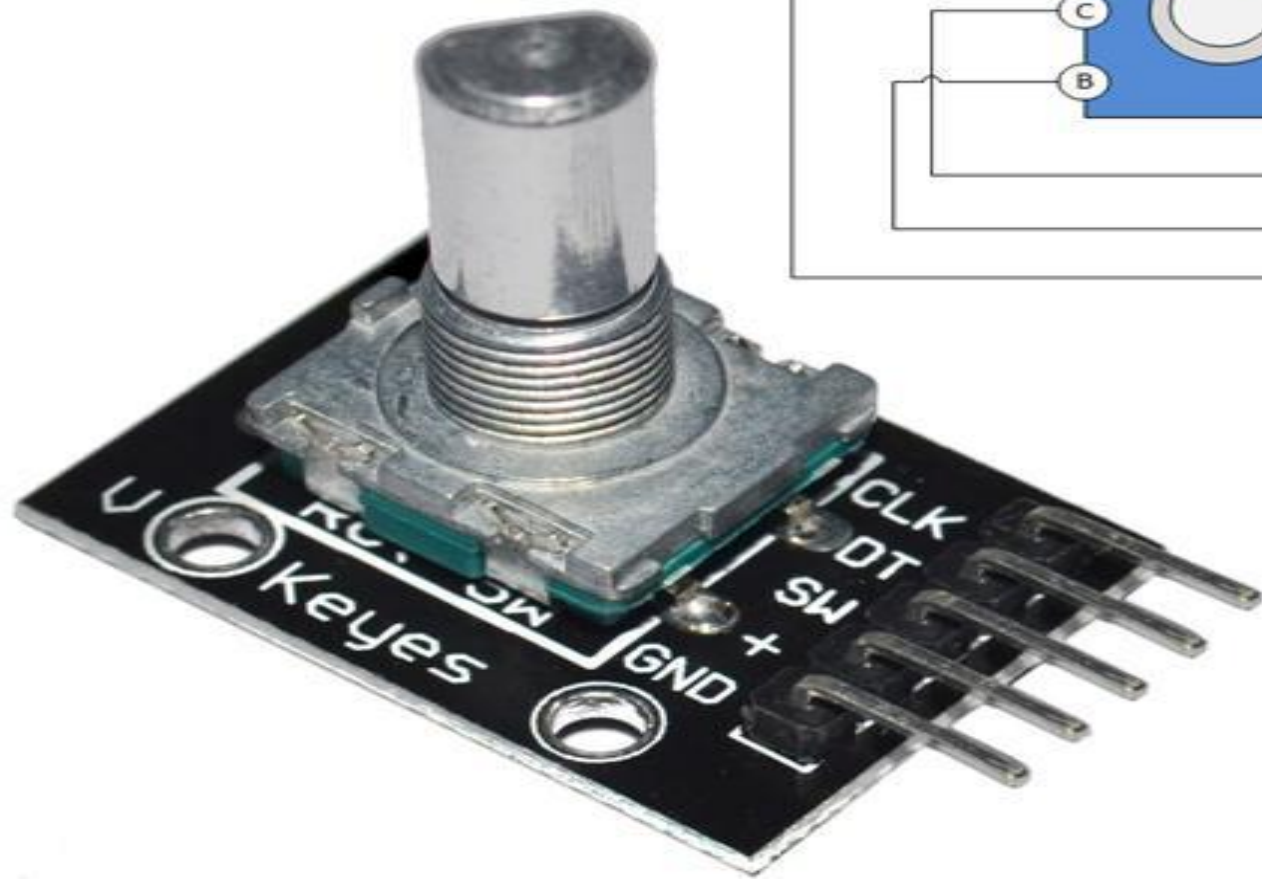
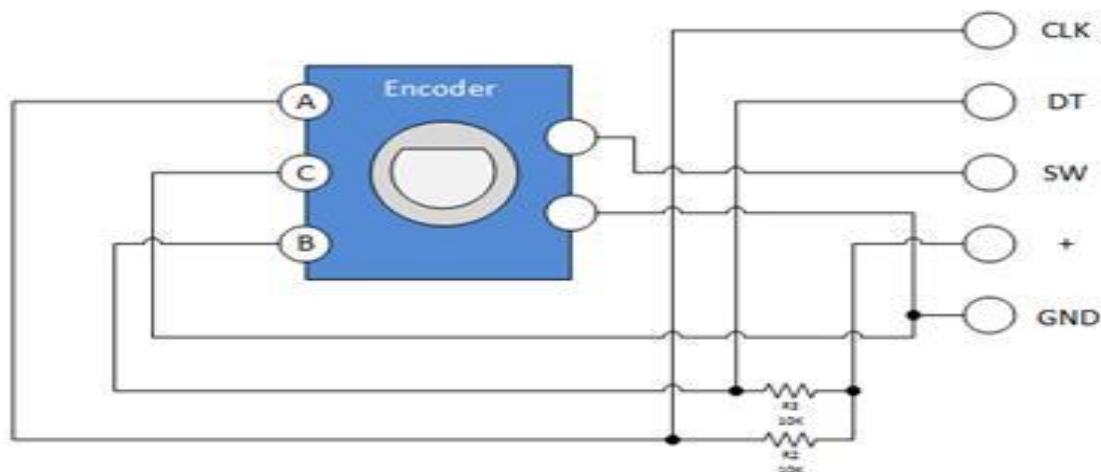


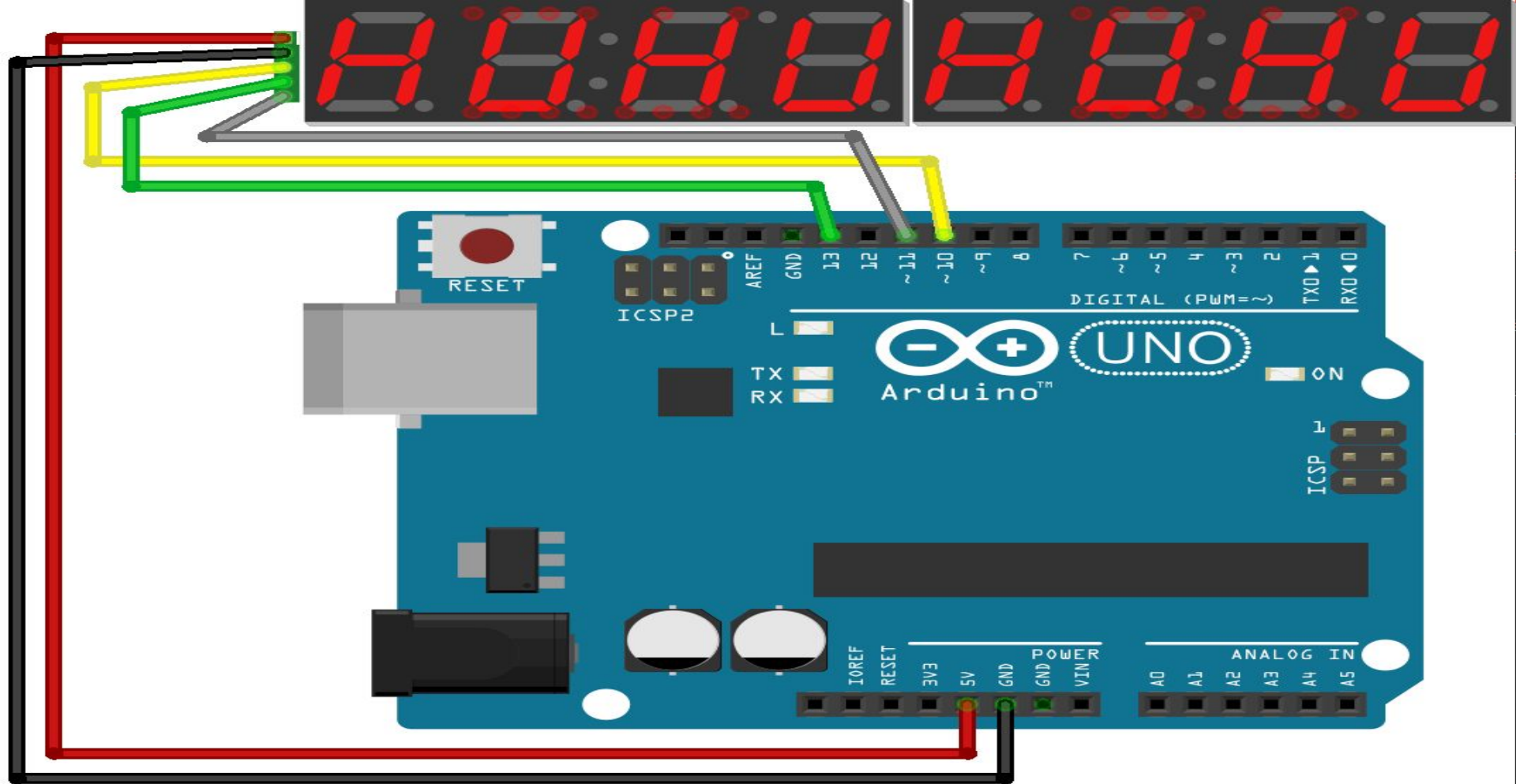
POTENCIÓMETRO

Made with  Fritzing.org

Little Craft

— imaginary to reality —







VAMOS CON
ELLO !!!