

Arduino et Minitel



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image pour minitel fablab

<https://chanterie37.fr/perso2/ateliersfablab/minitel/minitelfablab12.gif>



Presentation du Castel'lab



Materiel

1. - 1 [Minitel 1 alcatel](#)
2. - 1 [module de connexion ideoo](#) (comprenant : 1 ESP32 dev Module, un connecteur DIN mâle , un circuit adaptateur USB /Minitel)
3. - 1 [cable usb C](#) (pour la connection en tre le PC et l'ESP32)
4. - 1 pc avec [IDE arduino](#) (Pour flasher le programme sur l'esp32)
5. - 1 logiciel [IDE Processing](#) (pour transformer une image contrastée en mode videotex)
6. - 1 logiciel [Miedit](#) sur le web (pour la creation des pages minitel)
7. - 1 [doc sur le minitel](#) avec le bibliotheque arduino (pour la programmation de l'ESP32)

Programme

[presentationfablab29082026.ino](#)

```
#include <Minitel1B_Hard.h> // Voir
https://github.com/eserandour/Minitel1B_Hard

#if defined(ESP32) || defined(ARDUINO_ARCH_ESP32) // Pour ESP32
// Le troisième port série matériel de l'ESP32 (Serial2 / U2RXD U2TXD)
```

```
// est utilisé pour la connexion avec le Minitel.
Minitel minitel(Serial2, 16, 17); // Testé avec esp32 d'Espressif
Systems (version 3.3.7)
#else // Pour ATmega 1284P ou ATmega 2560 notamment
// Le deuxième port série matériel de l'ATmega (Serial1 / RXD1 TXD1)
// est utilisé pour la connexion avec le Minitel.
Minitel minitel(Serial1);
#endif

// Variables
int attente2= 2000;
int attente5 = 5000;
int attente10 = 10000;
int attente15= 15000;
int attente25 = 25000;

//Page 2
String P002L002= "le Fablab de la MJC";
int LP2L2 = P002L002.length();// on calcul la longueur de la chaine de
caracteres
String P002L003= "de ChâteauRenault";
int LP2L3 = P002L003.length();

//Page 3
String P003L002= "Nous vous proposons des activités pour";
int LP3L2 = P003L002.length();
String P003L003= "les adultes et les jeunes";
int LP3L3 = P003L003.length();

//Page 4
String P004L002= "Pour l'année";
int LP4L2 = P004L002.length();
String P004L003= "2026-2027";
int LP4L3 = P004L003.length();

//Page 5
String P005L002= "- Pour les jeunes -";
int LP5L2 = P005L002.length();

//Page 6
String P006L002= " - Atelier initiation à partir 10 ans ";
int LP6L2 = P006L002.length();
String P006L003= "1/mois le samedi de 14h à 16h30";
int LP6L3 = P006L003.length();
```

```
//Page 7
String P007L002= " - Atelier Coupe Robotique minimales ";
int LP7L2 = P007L002.length();
String P007L003= " 1/mois le samedi de 09h30 à 12h ";
int LP7L3 = P007L003.length();

//Page 8
String P008L002= " - Atelier Coupe Robotique 15a à +18a" ;
int LP8L2 = P008L002.length();
String P008L003= " le samedi de 14h à 17h30";
int LP8L3 = P008L003.length();

//Page 9
String P009L002= "- Pour les Adultes -";
int LP9L2 = P009L002.length();

//Page 10
String P010L002= " Un atelier Adultes le lundi soir";
int LP10L2 = P010L002.length();
String P010L003= "de 20h à 22h";
int LP10L3= P010L003.length();

//Page 11
String P011L002= "Des Après-midi Castel'Repar pour TOUS";
int LP11L2= P011L002.length();
String P011L003= "1/mois Le samedi de 14h à 18h";
int LP11L3= P011L003.length();

//Page 12
String P012L002= "Fablab37110.ovh ";
int LP12L2= P012L002.length();
String P012L003= "mjcfablab@gmail.com";
int LP12L3= P012L003.length();
String P012L004= "castelrepar.free.fr";
int LP12L4= P012L004.length();
String P012L005= "Tél MJC: 0670119400";
int LP12L5= P012L005.length();

//Page 13

String P013L001= "Planning du ";
int LP13L1= P013L001.length();
String P013L001a= "Castel'Repar";
int LP13L1a= P013L001a.length();
String P013L001b= "A ChateauRenault";
int LP13L1b= P013L001b.length();
String P013L001c= "A Villedomer";
int LP13L1c= P013L001c.length();
String P013L002= "Le samedi 14h à 18h";
int LP13L2= P013L002.length();
```

```
String P013L003= "26 septembre 2026";
int LP13L3= P013L003.length();
String P013L004= "31 octobre 2026 ";
int LP13L4= P013L004.length();
String P013L005= "28 novembre 2026 ";
int LP13L5= P013L005.length();
String P013L006= "30 janvier 2027 ";
int LP13L6= P013L006.length();
String P013L007= "27 février 2027 ";
int LP13L7= P013L007.length();
String P013L008= "27 mars 2027 ";
int LP13L8= P013L008.length();
String P013L009= "24 avril 2027 ";
int LP13L9= P013L009.length();
String P013L010= "29 mai 2027 ";
int LP13L10= P013L010.length();
String P013L011= "26 juin 2027 ";
int LP13L11= P013L011.length();

String P013L012 =" Au Cheval Blanc ";
int LP13L12= P013L012.length();
String P013L012a ="café associatif" ;
int LP13L12a= P013L012a.length();
String P013L013 ="Le Dimanche de 10h00 à 12h00";
int LP13L13= P013L013.length();
String P013L014 ="29 novembre 2026 ";
int LP13L14= P013L014.length();
String P013L015 ="31 janvier 2027 ";
int LP13L15= P013L015.length();
String P013L016 ="28 mars 2027 ";
int LP13L16= P013L016.length();
String P013L017 ="30 mai 2027 ";
int LP13L17= P013L017.length();

String P014L001="ADHESIONS :";
int LP14L1= P014L001.length();
String P014L002=" mjc-chateau-renault.goasso.org";
int LP14L2= P014L002.length();
String P014L003="Jeunes = 30e/an";
int LP14L3= P014L003.length();
String P014L004="Adultes = 50e/an";
int LP14L4= P014L004.length();

// entree fablab bienvenue
const int LONGUEUR_TRAME_Q1 = 944;
const prog_uchar IMAGE_Q1[] PROGMEM =
{0x0A,0x0A,0x0A,0x1F,0x43,0x41,0x0E,0x20,0x12,0x4E,0x40,0x58,0x1B,0x57,
0x1B,0x40,0x23,0x1B,0x50,0x1B,0x47,0x54,0x30,0x20,0x12,0x4F,0x1F,0x44,
x41,0x0E,0x20,0x12,0x4B,0x1B,0x44,0x40,0x1B,0x47,0x58,0x1B,0x57,0x1B,0x
40,0x21,0x20,0x20,0x20,0x20,0x20,0x22,0x1B,0x50,0x1B,0x47,0x54,0x30,0x2
```

0,0x12,0x4C,0x1F,0x45,0x41,0x0E,0x20,0x12,0x49,0x50,0x1B,0x57,0x1B,0x40
0x23,0x20,0x20,0x20,0x20,0x20,0x20,0x20,0x20,0x20,0x20,0x20,0x22,0x1B,
0x50,0x1B,0x47,0x54,0x1B,0x44,0x30,0x20,0x20,0x20,0x20,0x20,0x20,0x20,
x20,0x20,0x20,0x1F,0x46,0x41,0x0E,0x20,0x12,0x46,0x50,0x1B,0x57,0x1B,0x
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0,0x20,0x20,0x20,0x20,0x23,0x1B,0x50,0x1B,0x47,0x50,0x20,0x12,0x47,0x1F
0x47,0x41,0x0E,0x20,0x12,0x43,0x40,0x58,0x1B,0x57,0x1B,0x46,0x21,0x20,
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0x20,0x22,0x1B,0x50,0x1B,0x47,0x54,0x20,0x12,0x42,0x1F,0x49,0x41,0x0E,
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A,0x1B,0x50,0x20,0x20,0x1B,0x47,0x23,0x1B,0x57,0x1B,0x40,0x50,0x20,0x1B
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A,0x20,0x20,0x1B,0x41,0x23,0x20,0x1B,0x40,0x4A,0x1B,0x50,0x20,0x20,0x20
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12,0x45,0x1B,0x51,0x1B,0x40,0x25,0x1B,0x50,0x20,0x20,0x1B,0x57,0x20,0x2
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0x1B,0x50,0x1B,0x44,0x54,0x20,0x20,0x20,0x20,0x20,0x20,0x21,0x20,0x1F,0x4C,
x41,0x0E,0x20,0x12,0x43,0x1B,0x43,0x22,0x1B,0x41,0x22,0x1B,0x43,0x23,0x
20,0x20,0x1B,0x47,0x23,0x1B,0x57,0x1B,0x40,0x50,0x50,0x1B,0x50,0x1B,0x4
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0x1B,0x44,0x21,0x20,0x20,0x20,0x20,0x20,0x20,0x20,0x1F,0x4D,0x41,0x0E,
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1B,0x41,0x12,0x42,0x21,0x20,0x20,0x20,0x20,0x20,0x20,0x20,0x20,0x20,0x2
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A,0x09,0x4A,0x09,0x4A,0x09,0x1B,0x57,0x1B,0x40,0x4A,0x09,0x48,0x1B,0x50
0x1B,0x47,0x23,0x1F,0x52,0x46,0x0E,0x22,0x23,0x23,0x21,0x22,0x09,0x23,
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1B,0x40,0x48,0x34,0x09,0x1B,0x50,0x1B,0x47,0x4A,0x09,0x4A,0x1F,0x54,0x5
0,0x0E,0x1B,0x57,0x1B,0x40,0x42,0x31,0x09,0x1B,0x50,0x1B,0x47,0x4A,0x09

```
,0x4A,0x1F,0x55,0x50,0x0E,0x25,0x2A,0x09,0x2A,0x2C,0x1B,0x57,0x1B,0x40,
0x51,0x1F,0x56,0x48,0x0E,0x40,0x50,0x30,0x09,0x09,0x09,0x09,0x09,0x48,
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57,0x48,0x0E,0x1B,0x57,0x1B,0x40,0x4A,0x09,0x09,0x49,0x1B,0x50,0x1B,0x4
7,0x34,0x42,0x1B,0x57,0x1B,0x40,0x2C,0x1B,0x50,0x1B,0x47,0x34,0x4A,0x21
,0x4A,0x1B,0x57,0x1B,0x40,0x26,0x09,0x4A,0x09,0x1B,0x50,0x1B,0x47,0x4A,
0x09,0x09,0x1B,0x57,0x1B,0x40,0x49,0x1B,0x50,0x1B,0x47,0x34,0x09,0x1B,
x57,0x1B,0x40,0x42,0x1B,0x50,0x1B,0x47,0x44,0x1F,0x58,0x48,0x0E,0x45,0x
50,0x30,0x1B,0x57,0x1B,0x40,0x48,0x4A,0x1B,0x50,0x1B,0x47,0x2A,0x1B,0x5
7,0x1B,0x40,0x2C,0x1B,0x50,0x1B,0x47,0x31,0x4A,0x09,0x4A,0x50,0x09,0x1B
,0x57,0x1B,0x40,0x2A,0x1B,0x50,0x1B,0x47,0x30,0x4A,0x50,0x09,0x1B,0x57,
0x1B,0x40,0x48,0x4A,0x09,0x2A,0x45
};
```

```
void setup() {
  Serial.begin(9600);
  minitel.changeSpeed(minitel.searchSpeed());
  minitel.changeSpeed(1200);
  minitel.newScreen();
  minitel.noCursor();
}
```

```
void newPage() {
  minitel.newScreen();
  //minitel.writeByte(0x07); Bip
  for (int i=1; i<=40; i++) {
    minitel.writeByte(0x7E); // Ecrit ----- sur 40 colonnes
  }
  minitel.moveCursorXY(0,22); // X=0 , Y=22
  for (int i=1; i<=40; i++) {
    minitel.writeByte(0x7E);
  }
  minitel.moveCursorReturn(1);
}
```

```
void page0() {
  minitel.newScreen();
  for (int i = 0; i < LONGUEUR_TRAME_Q1; i++) {
    minitel.writeByte(pgm_read_byte_near(IMAGE_Q1 + i));
  };
  delay(attente10);
  minitel.clearScreen();
  minitel.moveCursorReturn(1);
}
```

```
void page1() {
  minitel.moveCursorXY(10,8) ; // X=10 , Y = 8
  minitel.attributs(DOUBLE_Grandeur);
  minitel.println(" BIENVENUE ");
}
```

```
minitel.println();
minitel.setCursorXY(6,13) ;
minitel.println(" au Castel'lab");
delay(attente5);
minitel.clearScreen();
minitel.moveCursorReturn(1);
}

void page2() {
  int positX1 = (40 - LP2L2)/2; // position de X : LP2L2 = 19 , positX1
= (40 -19)/2 = 10 = X
  int positX2 = (40 - LP2L3)/2;
  minitel.setCursorXY(positX1-8,8) ; // on est obligé de compenser car
la grandeur est double , donc x= 10-8 = 2
  minitel.attributes(DOUBLE_GRANDEUR);
  minitel.println(P002L002); //le fablab de la MJC
  minitel.println();
  minitel.setCursorXY(positX2-7,13) ;
  minitel.println(P002L003); //de ChateauRenault
  delay(attente5);
  minitel.clearScreen();
  minitel.moveCursorReturn(1);
}

void page3() {
  int positX1 = (40 - LP3L2)/2;
  int positX2 = (40 - LP3L3)/2;
  int positX3 = (40 - LP5L2)/2;
  int positX4 = (40 - LP6L2)/2;
  int positX5 = (40 - LP6L3)/2;
  int positX6 = (40 - LP7L2)/2;
  int positX7 = (40 - LP7L3)/2;
  int positX8 = (40 - LP8L2)/2;
  int positX9 = (40 - LP8L3)/2;
  minitel.setCursorXY(positX1,2) ;
  minitel.attributes(GRANDEUR_NORMALE);
  minitel.println(P003L002); //Nous vous proposons des activités pour
minitel.setCursorXY(positX2,3) ;
minitel.println(P003L003); //les adultes et les jeunes
  delay(attente2);
  minitel.setCursorXY(positX3,5) ;
  minitel.println(P005L002); //- Pour les jeunes -
  delay(attente2);
  minitel.setCursorXY(positX4,8) ;
  minitel.println(P006L002); //- 1 Atelier initiation à partir 10 ans
minitel.setCursorXY(positX5,9) ;
minitel.println(P006L003); //1/mois le samedi de 14h à 16h30
  delay(attente5);
}
```

```
minitel.moveCursorXY(positX6,11) ;
minitel.println(P007L002);//- 1 Atelier Coupe Robotique minimes
minitel.moveCursorXY(positX7,12) ;
minitel.println(P007L003);//1/mois le samedi de 09h30 à 12h
delay(attente5);
minitel.moveCursorXY(positX8,15) ;
minitel.println(P008L002);//- 1 Atelier Coupe Robotique 15 à +18
minitel.moveCursorXY(positX9-4,16) ;
minitel.println(P008L003);//le samedi de 14h à 18h
delay(attente15);
minitel.clearScreen();
minitel.moveCursorReturn(1);

}

void page4() {
minitel.moveCursorXY(10,8) ;
minitel.attributs(DOUBLE_Grandeur);
minitel.println(P004L002);// pour l'année
minitel.println();
minitel.moveCursorXY(13,11) ;
minitel.println(P004L003);//2026-2027
delay(attente5);
minitel.clearScreen();
minitel.moveCursorReturn(1);

}

void page5() {
int posX1 = (40 - LP3L2)/2;
int posX2 = (40 - LP3L3)/2;
int posX3 = (40 - LP9L2)/2;
int posX4 = (40 - LP10L2)/2;
int posX5 = (40 - LP10L3)/2;
int posX6 = (40 - LP11L2)/2;
int posX7 = (40 - LP11L3)/2;
int posX8 = (40 - LP12L2)/2;
int posX9 = (40 - LP12L3)/2;
minitel.moveCursorXY(positX1,2) ;
minitel.attributs(Grandeur_Normale);
minitel.println(P003L002);//Nous vous proposons des activités pour
minitel.moveCursorXY(positX2,3) ;
minitel.println(P003L003);//les adultes et les jeunes
delay(attente2);
minitel.moveCursorXY(positX3,5) ;
minitel.println(P009L002);//- Pour les Adultes -
delay(attente2);
minitel.moveCursorXY(positX4,8) ;
minitel.println(P010L002);//Un atelier Adultes le lundi soir
minitel.moveCursorXY(positX5,9) ;
minitel.println(P010L003);//De 20h à 22h
```

```
    delay(attente5);
    minitel.setCursorXY(positX6,11) ;
    minitel.println(P011L002);//Des Après-midi Castel'Repar pour TOUS
    minitel.setCursorXY(positX7,12) ;
    minitel.println(P011L003);//1/mois Le samedi de 14h à 18h
    delay(attente15);
    minitel.clearScreen();
    minitel.moveCursorReturn(1);

}

void page6() {
    int positX1 = (40 - LP13L1)/2;
    int positX2 = (40 - LP13L1b)/2;
    int positX3 = (40 - LP13L1a)/2;

    minitel.attributes(DOUBLE_GRANDEUR);
    minitel.setCursorXY(positX1-5,5) ;
    minitel.println(P013L001);//Planning du
    minitel.setCursorXY(positX3-5,8) ;
    minitel.println(P013L001a);//Castel'Repar
    minitel.setCursorXY(positX2-7,15) ;
    minitel.println(P013L001b);//A ChateauRenault
    delay(attente5);
    minitel.clearScreen();
    minitel.moveCursorReturn(1);

}

void page7() {
    int positX2 = (40 - LP13L2)/2;
    int positX3 = (40 - LP13L3)/2;
    int positX4 = (40 - LP13L4)/2;
    int positX5 = (40 - LP13L5)/2;
    int positX6 = (40 - LP13L6)/2;
    int positX7 = (40 - LP13L7)/2;
    int positX8 = (40 - LP13L8)/2;
    int positX9 = (40 - LP13L9)/2;
    int positX10 = (40 - LP13L10)/2;
    int positX11 = (40 - LP13L11)/2;
    minitel.setCursorXY(positX2,2) ;
    minitel.attributes(GRANDEUR_NORMALE);
    minitel.println(P013L002);//Le samedi 14h à 18h
    minitel.println();
    delay(attente5);
    minitel.setCursorXY(positX3,4) ;
    minitel.println(P013L003);//26/09/2026
    minitel.setCursorXY(positX4,6) ;
    minitel.println(P013L004);//31/10/2026
    minitel.setCursorXY(positX5,8) ;
```

```
minitel.println(P013L005);//28/11/2026
minitel.moveCursorXY(positX6,10) ;
minitel.println(P013L006);//30/01/2027
minitel.moveCursorXY(positX7,12) ;
minitel.println(P013L007);//"27/02/2027
minitel.moveCursorXY(positX8,14) ;
minitel.println(P013L008);//27/03/2027
minitel.moveCursorXY(positX9,16) ;
minitel.println(P013L009);//24/04/2027
minitel.moveCursorXY(positX10,18) ;
minitel.println(P013L010);//29/05/2027
minitel.moveCursorXY(positX11,20) ;
minitel.println(P013L011);//26/06/2027
delay(attente15);
minitel.clearScreen();
minitel.moveCursorReturn(1);

}

void page8() {
int positX1 = (40 - LP13L1)/2;
int positX2 = (40 - LP13L1c)/2;
int positX3 = (40 - LP13L1a)/2;
int positX4 = (40 - LP13L12)/2;
int positX5 = (40 - LP13L12a)/2;

minitel.attributs(DOUBLE_GRANDEUR);
minitel.moveCursorXY(positX1-5,4) ;
minitel.println(P013L001);//Planning du
minitel.moveCursorXY(positX3-5,7) ;
minitel.println(P013L001a);//Castel'Repar
minitel.moveCursorXY(positX2-5,11) ;
minitel.println(P013L001c);//A Villedomer
minitel.moveCursorXY(positX4-7,14) ;
minitel.println(P013L012);//Au Cheval Blanc
minitel.moveCursorXY(positX5-6,17) ;
minitel.println(P013L012a);//café associatif Villedomer
delay(attente5);
minitel.clearScreen();
minitel.moveCursorReturn(1);

}

void page9() {
int positX2 = (40 - LP13L13)/2;
int positX3 = (40 - LP13L14)/2;
int positX4 = (40 - LP13L15)/2;
int positX5 = (40 - LP13L16)/2;
int positX6 = (40 - LP13L17)/2;
minitel.moveCursorXY(positX2,2) ;
```

```
minitel.attributs(GRANDEUR_NORMALE);
minitel.println(P013L013); //Le Dimanches de 10h00 à 12h00
minitel.println();
delay(attente5);
minitel.moveCursorXY(positX3,8) ;
minitel.println(P013L014); //29/11/2026
minitel.moveCursorXY(positX4,10) ;
minitel.println(P013L015); //31/01/2027
minitel.moveCursorXY(positX5,12) ;
minitel.println(P013L016); //28/03/2027
minitel.moveCursorXY(positX6,14) ;
minitel.println(P013L017); //30/05/2027
delay(attente15);
minitel.clearScreen();
minitel.moveCursorReturn(1);

}

void page10() {
int positX1 = (40 - LP12L2)/2;
int positX2 = (40 - LP12L3)/2;
int positX3 = (40 - LP12L4)/2;
int positX4 = (40 - LP12L5)/2;
minitel.moveCursorXY(1,2) ;
minitel.attributs(GRANDEUR_NORMALE);
minitel.println( "CONTACTS : ");
minitel.attributs(DOUBLE_GRANDEUR);
minitel.moveCursorXY(positX1-5,6) ;
minitel.println(P012L002); //Fablab37110.ovh
delay(attente5);
minitel.moveCursorXY(positX2-7,10) ;
minitel.println(P012L003); //mjcfablab@gmail.com
delay(attente2);
minitel.moveCursorXY(positX3-7,14) ;
minitel.println(P012L004); //castelrepar.free.fr
minitel.moveCursorXY(positX4-7,18) ;
delay(attente2);
minitel.println(P012L005); //Tél MJC : 0670119400
delay(attente15);
minitel.clearScreen();
minitel.moveCursorReturn(1);

}

void page11() {
int positX1 = (40 - LP14L1)/2;
int positX2 = (40 - LP14L2)/2;
int positX3 = (40 - LP14L3)/2;
int positX4 = (40 - LP14L4)/2;
minitel.moveCursorXY(1,2) ;
minitel.attributs(GRANDEUR_NORMALE);
minitel.println(P014L001); //ADHESION :
```

```
minitel.moveCursorXY(positX2,6) ;
minitel.println(P014L002); //https://mjc-chateau-renault.goasso.org/
minitel.attributes(DOUBLE_GRANDEUR);
minitel.moveCursorXY(positX3-5,10) ;
minitel.println(P014L003); //Jeunes = 30€/an
minitel.moveCursorXY(positX4-5,13) ;
minitel.println(P014L004); //Adultes = 50€/an
delay(attente15);
minitel.clearScreen();
minitel.moveCursorReturn(1);

}

void loop() {
  page0(); // page d'accueil
  //newPage(); page1(); // Bienvenue
  newPage(); page2(); // Le Fablab de la MJC
  newPage(); page4(); // Année 2026-2027
  newPage(); page3(); // Activités Jeunes
  newPage(); page5(); // Activités Adultes
  newPage(); page6(); // Planning Castel'Lab ChateauRenault
  newPage(); page7(); // Dates Castel'Lab ChateauRenault
  newPage(); page8(); // Planning Castel'Lab Villedomer
  newPage(); page9(); // Dates Castel'Lab Villedomer
  newPage(); page10(); // Contacts
  newPage(); page11(); // Adhesions

}
```

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