Appendix A: Example Programs

Often the best way to learn is by example. The sample programs shown here aren't necessarily intended to do anything useful by themselves, but are meant to show how one or more elements of the XPRESS language are used.

Example 1

```
!
! Blink a direct output at a 2-second rate.
!
CONFIG SC = HCS180

DEFINE BlinkTimer = Timer(0)
DEFINE Light = Output(0)

BEGIN
IF Reset THEN
  BlinkTimer = ON
END

IF BlinkTimer>=2 THEN
  IFA Light=OFF THEN
    Light = ON
  ELSE
    Light = OFF
  END
  BlinkTimer = ON
END
```

Example 2

```
!
! Watch a motion detector connected to a netbit and count
!  how many times motion is detected in a 30-second period.
!  If the count exceeds 5 within that time period, sound
!  the horn also connected to a netbit and turn on the
!  lights.
!
CONFIG SC = HCS180
CONFIG PL-Link = 1
CONFIG DIO = 1
CONFIG LCD = 1

DISPLAY Modules = L

DEFINE Motion      = Netbit(0)
DEFINE MotionCount = Variable(0)
DEFINE MotionTimer = Timer(0)
DEFINE Light1      = Module(L5)
DEFINE Light2      = Module(L7)
DEFINE Horn        = Netbit(7)
DEFINE Console     = LCD(0)
```

```
BEGIN
IF Reset THEN
  MotionTimer = OFF; Motion = ON
  Horn = OFF; MotionCount = 0
END

IF MotionTimer>30 AND MotionCount>5 THEN
  Horn = ON
  Light1 = ON; Light2 = ON
  MotionTimer = OFF; MotionCount = 0
  Console = "Motion limit exceeded.\n"
END

IFA Motion=ON THEN
  IF MotionTimer=OFF THEN
    MotionTimer = ON
  END
  IF MotionTimer = ON THEN
    Inc(MotionCounter)
  END
END
```

Example 3

```
!
! Turn on lights in response to motion, but only if it is
!  dark outside. Turn the lights off 20 minutes after the
!  last motion has been detected at all hours (so the
!  lights are automatically turned off even during the
!  day). A light-level detector is connected to an
!  ADIO-Link A/D converter.
!
CONFIG SC = HCS180
CONFIG PL-Link = 1
CONFIG ADIO-Link = 1

DISPLAY Modules = E

DEFINE LivingLamp   = Module(E2)
DEFINE LivingFloods = Module(E12)
DEFINE LivingTimer  = Timer(45)
DEFINE LivingMotion = Input(4)
DEFINE LightLevel   = ADC(16)
DEFINE Setpoint     = 85
DEFINE Mode         = Variable(3)
DEFINE Day          = 0
DEFINE Night        = 1

BEGIN
IF Reset THEN
  Mode = Day; LivingTimer = OFF
END
```

```
IF LightLevel<=Setpoint THEN
  Mode = Night
END
IF LightLevel>Setpoint THEN
  Mode = Day
END
IF Mode=Night AND LivingMotion=EDGE THEN
  LivingLamp = ON; LivingFloods = ON
END

IF LivingMotion=EDGE THEN
  LivingTimer = ON
END

IF LivingTimer>=20 THEN
  LivingLamp = OFF; LivingFloods = OFF
  LivingTimer = OFF
END
```

Example 4

```
!
! A number of buttons on your hand-held remote are defined
!  to put the HCS/SS into different modes. Actions are
!  carried out depending on those modes.
!
CONFIG SC = HCS180
CONFIG PL-Link = 1
CONFIG IR-Link = 3

DISPLAY Modules = B,D,F

DEFINE MovieMode    = IRcode(2)
DEFINE DinnerMode   = IRcode(3)
DEFINE RomanticMode = IRcode(7)
DEFINE SleepMode    = IRcode(9)
DEFINE FamilyRoom   = 0          ! IR-Link #0
DEFINE DiningRoom   = 1          ! IR-Link #1
DEFINE Bedroom      = 2          ! IR-Link #2
DEFINE FamilyLight  = Module(F3)
DEFINE DiningLight  = Module(D1)
DEFINE BedLight     = Module(B4)
DEFINE FamilyShades = Output(2)

BEGIN
IF MovieMode=FamilyRoom THEN
  FamilyLight = Dim(8)
  FamilyShades = ON
END

IF DinnerMode=DiningRoom THEN
  DiningLight = ON
END
```

```
IF RomanticMode=DiningRoom THEN
  DiningLight = Dim(10)
END

IF SleepMode=Bedroom THEN
  BedLight = OFF; DiningLight = OFF
  FamilyLight = OFF; FamilyShades = ON
END
```

Example 5

```
!
! The following is a simple telephone-based menuing system
!  using the text-to-speech synthesizer for voice prompts
!  and the DTMF board for user input.
!
CONFIG SC = HCS180
CONFIG PL-Link = 1

DISPLAY Modules = A,B

DEFINE LightLevel   = ADC(0)
DEFINE RingTimer    = Timer(3)
DEFINE AlarmOn      = Variable(17)
DEFINE Password     = Variable(30)
DEFINE PhoneLevel   = Variable(31)
DEFINE Selection    = Variable(32)
DEFINE Light        = Variable(33)
DEFINE DoorSensor   = Input(4)
DEFINE InsideLight  = Module(A6)
!=============================================
BEGIN                   ! Start of continuous section

IF Reset THEN
  ClearTimers
  OnHook
  PhoneLevel = 0
  Say"Successful system reset."
END

IF DoorSensor=EDGE AND DoorSensor=ON THEN
  InsideLight = ON
END

IF DoorSensor=OFF THEN
  InsideLight = OFF
END

!=============================================
SEQUENTIAL        ! Start of sequential section
!=============================================
!
! Wait for a single ring followed by a hang up.
! Then wait up to one minute for another ring.
! If detected, immediately pick up the phone.
```

```
! This is done so an answering machine can be
! used on the same line as the computer.
!
IF RingTimer=OFF AND Rings=1 THEN
  RingTimer = ON
END

IF RingTimer=ON AND Rings>1 THEN
  RingTimer=OFF
END
IF RingTimer>60 THEN
  RingTimer = OFF
END

IF RingTimer>8 AND Rings=1 THEN
  RingTimer = OFF
  OffHook
  Say"~@ ~60P ~3F"
  Say"~2 Hello. ~5S"
  Say"Welcome to our house."
  Say"Please enter your password."
  Password = DTMFnumber(150)
  IFA Password=1234 THEN
    Say"|Thank you."
    PhoneLevel = 1
  ELSE
    SayW"That is wrong. Goodbye."
    PhoneLevel = 0
    OnHook
  END
END

IFA PhoneLevel=1 THEN
  Say"Please make a selection."
  Say"Press zero for a list of choices."
  Selection = DTMFdigit(250)
  IFA Selection<0 THEN
    SayW"Timed out. Good bye."
    PhoneLevel = 0
    OnHook
  END
  IFA Selection=0 THEN
    Say"|Press 1 for light level.."
    Say"Press 2 for alarm status.."
    Say"Press 9 to finish.."
  END
  IFA Selection=9 THEN
    SayW"|Have a nice day. Good bye."
    PhoneLevel = 0
    OnHook
  END
  IFA Selection=1 THEN
    Light = (LightLevel * 100) / 26
    Say"|~D DH IY ~T outside light"
    Say"is at %P1%%.",Light
  END
```

```
  IFA Selection=2 THEN
    IFA AlarmOn=TRUE THEN
      Say"|~D DH IY ~T alarm is on."
    ELSE
      Say"|~D DH IY ~T alarm is off."
    END
  END
  IFA (Selection>2 AND Selection<9)
      OR Selection>9 THEN
    Say"|Invalid selection. Please try again."
  END
END

IF PhoneLevel=0 THEN
  OnHook
END
```

Example 6

```
!
! Allow both a modem and the voice/DTMF pair to occupy the
!  same phone line.  If you call and allow the phone to ring
!  twice, the voice is used to answer the phone and presents
!  you with a list of options.  If you call, let the phone
!  ring once, hang up, then call again within 1 minute, the
!  modem will answer instead, allowing the remote use of
!  HOST.
!
CONFIG SC = HCS180

DEFINE RingTimer = Timer(3)

BEGIN

IF Reset THEN
  ClearTimers
  ModemRings = 0
END

IF RingTimer=OFF AND Rings=1 THEN
  RingTimer = ON
END

IF RingTimer=ON AND Rings>1 THEN
  RingTimer = OFF
  ModemRings = 0                    ! Disable modem answer
END

IF RingTimer>60 THEN
  RingTimer = OFF
  ModemRings = 0                    ! Disable modem answer
END
```

```
IF RingTimer>8 THEN
  ModemRings = 1                    ! Enable modem answer
END

SEQUENTIAL

IF Rings>=2 THEN
  RingTimer = OFF
  OffHook
  SayW"This is the menu"
  .
  .
  .
  OnHook
END
```