\*\*\* IMPORTANT NOTE \*\*\*

Far Memory Support is only available in the PK51 package.

If you have an CA51, DK51, or Evaluation Package the far memory

support is not available and this example will not work.

This T89C51RD2 DEMO program shows you how to use the new features of

C51 Version 7 and LX51 Linker/Locater to access the three available

xdata areas: EEPROM, on-chip XRAM and off-chip xdata RAM.

All these memory areas (EEPROM, on-chip XRAM and off-chip xdata RAM)

are accessed in the same xdata address space and are overlapping the

same address ranges. The 'far' memory support available in the PK51

Professional Developers Kit is configure to switch between these three

memory areas. Therefore the user application has full access to all

three memory types at the same time.

This files can be used as template for own projects.

XBANKING.A51 configures the expanded 'far' memory space as EEPROM space

and on-chip XRAM space.

EEPROM.H contains the data definitions that are stored in the EEPROM space.

EEPROM.C defines the user class HDATA\_EEPROM which starts at X:0x020000

The memory type 'far' is used to store variables in on-chip xdata RAM.

The memory type 'xdata' is used to store variables in off-chip xdata RAM.

The LX51 CLASSES directive specifies the address ranges for the HDATA\_EEPROM

and HDATA memory areas. In uVision this memory classes are entered

under Options for Target - LX51 Locate - User's Classes.

For save interrupt behaviour of the application it is required to invoke

the C51 Compiler with the directive VARBANKING (1). Therefore the uVision

project enables under Project - Options for Target: 'far' memory type support

and Save address extension SFR in interrupts. During an interrupt, the register

EECON that is defined as ?C?XPAGE1SFR will be saved and set to 0.

This EEPROM space is simulated under uVision with the V: memory type prefix.

This memory space can be manipulated using standard uVision debugging commands.

For example:

D V:0 // displays the EEPROM memory space

SAVE EEPROM.HEX V:0, V:0x7FF // saves the EEPROM memory space

LOAD EEPROM.HEX // loads the EEPROM contents

It is also possible to display variables in the EEPROM space using standard

uVision features, i.e. the Watch Window. The mapping for the uVision debugger

is configured via the ?B?xMEM symbols in the XBANKING.A51 config file.

\*\*\* Notes \*\*\*

1. In the current version of the uVision simulator it is not possible to

simulate the banking in the on-chip XRAM and off-chip xdata RAM space.

2. The C51 compiler allows to save ONE address extension SFR. This feature is

enabled under Options for Target - Save Address Extensions SFR. Since the

on-chip XRAM and the EEPROM use two different SFR registers, it is impossible

to save both registers the EECON and the AUXR register during interrupts.

Therefore it is required to disable and enable interrupts when accessing on-chip

XRAM.

3. When the EEPROM support is not required, you may use the XBANKING4XRAM.A51 file

instead of the XBANKING.A51 file. This file supports just the switching between

on-chip and off-chip xdata memory and is therefore useful on many 8051 variants.