A. **Appendix for as7000 Frankenstein Assembler**

A.1 **Pseudo Operations**

A.1.1 *Standard_Pseudo_Operation_Mnemonics*

```
End                                   END
File Inclusion                        INCL INCLUDE
If                                    IF
Else                                  ELSE
End If                                ENDI
Equate                                EQU
Set                                   SET
Org                                   ORG
Reserve Memory                        RESERVE RMB
Define Byte Data                      BYTE DB FCB
Define Word Data                      DW FDB WORD
Define String Data                    FCC STRING
Define Character Set Translation      CHARSET
Define Character Value                CHARDEF CHD
Use Character Translation             CHARUSE
```

A.2 **Instructions**

A.2.1 *Differences_with_the_TI_defined_Syntax*

```
TI syntax                              as7000 syntax

op % immediate , register              op # immediate , register
op % immed , register, jump dest       op # immed , register , jump dest
op @ label                             op label
op @ label ( B )                       op expr ( B )
op *register                           op [ register ]
movd % immed ( B ) , register          movd # immed (B), register

Constants

?0101010                               %01010101
>89ab                                  $89ab
''''                                   "'"

Comments

after the last operand                 everything following a semicolon

Symbols

R0-R255                                equ with value between 0 and $ff
R0-R255                                0 to 255, Not Recommended !
P0-P255                                equ with value between $100 and $1ff
P0-P255                                256 to 511, Not Recommended !
```

A.2.2 ***Instruction_List***

```
Opcode    Syntax                               Selection Criteria


ADC       '#' expr ',' expr
ADC       '#' expr ',' expr                    DSTA
ADC       '#' expr ',' expr                    DSTB
ADC       expr ',' expr
ADC       expr ',' expr                        DSTA
ADC       expr ',' expr                        DSTB
ADC       expr ',' expr                        SRCB DSTA

ADD       '#' expr ',' expr
ADD       '#' expr ',' expr                    DSTA
ADD       '#' expr ',' expr                    DSTB
ADD       expr ',' expr
ADD       expr ',' expr                        DSTA
ADD       expr ',' expr                        DSTB
ADD       expr ',' expr                        SRCB DSTA

AND       '#' expr ',' expr
AND       '#' expr ',' expr                    DSTA
AND       '#' expr ',' expr                    DSTB
```

```
Opcode     Syntax                                 Selection Criteria

AND        expr ',' expr
AND        expr ',' expr                          DSTA
AND        expr ',' expr                          DSTB
AND        expr ',' expr                          SRCB DSTA

ANDP       '#' expr ',' expr
ANDP       expr ',' expr                          SRCA
ANDP       expr ',' expr                          SRCB

BR         '[' expr ']'
BR         expr '(' REG ')'                       SRCB
BR         expr

BTJO       '#' expr ',' expr ',' expr
BTJO       '#' expr ',' expr ',' expr            DSTA
BTJO       '#' expr ',' expr ',' expr            DSTB
BTJO       expr ',' expr ',' expr
BTJO       expr ',' expr ',' expr                DSTA
BTJO       expr ',' expr ',' expr                DSTB
BTJO       expr ',' expr ',' expr                SRCB DSTA

BTJOP      '#' expr ',' expr ',' expr
BTJOP      expr ',' expr ',' expr                SRCA
BTJOP      expr ',' expr ',' expr                SRCB

BTJZ       '#' expr ',' expr ',' expr
BTJZ       '#' expr ',' expr ',' expr            DSTA
BTJZ       '#' expr ',' expr ',' expr            DSTB
BTJZ       expr ',' expr ',' expr
BTJZ       expr ',' expr ',' expr                DSTA
BTJZ       expr ',' expr ',' expr                DSTB
BTJZ       expr ',' expr ',' expr                SRCB DSTA

BTJZP      '#' expr ',' expr ',' expr
BTJZP      expr ',' expr ',' expr                SRCA
BTJZP      expr ',' expr ',' expr                SRCB

CALL       '[' expr ']'
CALL       expr '(' REG ')'                       SRCB
CALL       expr

CLR        expr
CLR        expr                                   DSTA
CLR        expr                                   DSTB

CLRC

CMP        '#' expr ',' expr
CMP        '#' expr ',' expr                      DSTA
```

```
Opcode     Syntax                             Selection Criteria

CMP        '#' expr ',' expr                  DSTB
CMP        expr ',' expr
CMP        expr ',' expr                      DSTA
CMP        expr ',' expr                      DSTB
CMP        expr ',' expr                      SRCB DSTA

CMPA       '[' expr ']'
CMPA       expr '(' REG ')'                   SRCB
CMPA       expr

DAC        '#' expr ',' expr
DAC        '#' expr ',' expr                  DSTA
DAC        '#' expr ',' expr                  DSTB
DAC        expr ',' expr
DAC        expr ',' expr                      DSTA
DAC        expr ',' expr                      DSTB
DAC        expr ',' expr                      SRCB DSTA

DEC        expr
DEC        expr                               DSTA
DEC        expr                               DSTB

DECD       expr
DECD       expr                               DSTA
DECD       expr                               DSTB

DINT

DJNZ       expr ',' expr
DJNZ       expr ',' expr                      DSTA
DJNZ       expr ',' expr                      DSTB

DSB        '#' expr ',' expr
DSB        '#' expr ',' expr                  DSTA
DSB        '#' expr ',' expr                  DSTB
DSB        expr ',' expr
DSB        expr ',' expr                      DSTA
DSB        expr ',' expr                      DSTB
DSB        expr ',' expr                      SRCB DSTA

EINT

IDLE

INC        expr
INC        expr                               DSTA
INC        expr                               DSTB

INV        expr
```

```
Opcode     Syntax                           Selection Criteria

INV        expr                             DSTA
INV        expr                             DSTB

JC         expr

JEQ        expr

JGE        expr

JGT        expr

JHS        expr

JL         expr

JLT        expr

JMP        expr

JN         expr

JNC        expr

JNE        expr

JNZ        expr

JP         expr

JPZ        expr

JZ         expr

LDA        '[' expr ']'
LDA        expr '(' REG ')'                 SRCB
LDA        expr

LDSP

MOV        '#' expr ',' expr
MOV        '#' expr ',' expr                DSTA
MOV        '#' expr ',' expr                DSTB
MOV        expr ',' expr
MOV        expr ',' expr                    DSTA
MOV        expr ',' expr                    DSTB
MOV        expr ',' expr                    SRCA
MOV        expr ',' expr                    SRCA DSTB
MOV        expr ',' expr                    SRCB
MOV        expr ',' expr                    SRCB DSTA
```

Opcode	Syntax	Selection Criteria
MOVD	'#' expr '(' REG ')' ',' expr	
MOVD	'#' expr ',' expr	
MOVD	expr ',' expr	
MOVP	'#' expr ',' expr	
MOVP	expr ',' expr	DSTA
MOVP	expr ',' expr	DSTB
MOVP	expr ',' expr	SRCA
MOVP	expr ',' expr	SRCB
MPY	'#' expr ',' expr	
MPY	'#' expr ',' expr	DSTA
MPY	'#' expr ',' expr	DSTB
MPY	expr ',' expr	
MPY	expr ',' expr	DSTA
MPY	expr ',' expr	DSTB
MPY	expr ',' expr	SRCB DSTA
NOP		
OR	'#' expr ',' expr	
OR	'#' expr ',' expr	DSTA
OR	'#' expr ',' expr	DSTB
OR	expr ',' expr	
OR	expr ',' expr	DSTA
OR	expr ',' expr	DSTB
OR	expr ',' expr	SRCB DSTA
ORP	'#' expr ',' expr	
ORP	expr ',' expr	SRCA
ORP	expr ',' expr	SRCB
POP	STATUS	
POP	expr	
POP	expr	DSTA
POP	expr	DSTB
PUSH	STATUS	
PUSH	expr	
PUSH	expr	DSTA
PUSH	expr	DSTB
RETI		
RETS		
RL	expr	
RL	expr	DSTA

```
Opcode    Syntax                              Selection Criteria

RL        expr                                DSTB

RLC       expr
RLC       expr                                DSTA
RLC       expr                                DSTB

RR        expr
RR        expr                                DSTA
RR        expr                                DSTB

RRC       expr
RRC       expr                                DSTA
RRC       expr                                DSTB

SBB       '#' expr ',' expr
SBB       '#' expr ',' expr                   DSTA
SBB       '#' expr ',' expr                   DSTB
SBB       expr ',' expr
SBB       expr ',' expr                       DSTA
SBB       expr ',' expr                       DSTB
SBB       expr ',' expr                       SRCB DSTA

SETC

STA       '[' expr ']'
STA       expr '(' REG ')'                    SRCB
STA       expr

STSP

SUB       '#' expr ',' expr
SUB       '#' expr ',' expr                   DSTA
SUB       '#' expr ',' expr                   DSTB
SUB       expr ',' expr
SUB       expr ',' expr                       DSTA
SUB       expr ',' expr                       DSTB
SUB       expr ',' expr                       SRCB DSTA

SWAP      expr
SWAP      expr                                DSTA
SWAP      expr                                DSTB

TRAP      expr

TSTA

TSTB

XCHB      expr
```

```
Opcode     Syntax                              Selection Criteria

XCHB       expr                                DSTA
XCHB       expr                                DSTB

XOR        '#' expr ',' expr
XOR        '#' expr ',' expr                   DSTA
XOR        '#' expr ',' expr                   DSTB
XOR        expr ',' expr
XOR        expr ',' expr                       DSTA
XOR        expr ',' expr                       DSTB
XOR        expr ',' expr                       SRCB DSTA

XORP       '#' expr ',' expr
XORP       expr ',' expr                       SRCA
XORP       expr ',' expr                       SRCB
```

A.2.3 ***Selection_Criteria_Keywords***

    DSTA   The instruction will use a short form if the A register is used as the destination register.

    DSTB   The instruction will use a short form if the B register is used as the destination register.

    SRCA   The instruction will use a short form if the A register is used as the source register.

    SRCB   The instruction will use a short form if the B register is used as the source register.

A.2.4 ***Apostrophes*** The apostrophes in the syntax field are a notation used for the parser generator and are not put in the assembler source statement.

A.3 **Notes**

A.3.1 ***Reserved_Symbols***

A.3.1.1 ***Machine_Dependent_Reserved_Symbols*** A B ST a b st

A.3.1.2 ***Standard_Reserved_Symbols*** AND DEFINED EQ GE GT HIGH LE LOW LT MOD NE NOT OR SHL SHR XOR and defined eq ge gt high le low lt mod ne not or shl shr xor

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