; AltoIIIMRT16K.mu

; last modified December 1, 1977 1:13 AM

; This is the part of the Memory Refresh Task which
; is specific to Alto IIs with Extended memory.

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$EngNumber $30000; ALTO II WITH EXTENDED MEMORY

; This version assumes MRTACT is cleared by BLOCK, not MAR= R37
; R37 [4-13] are the low bits of the TOD clock
; R37 [8-14] are the refresh address bits
; Each time MRT runs, four refresh addresses are generated, though
; R37 is incremented only once. Sprinkled throughout the execution
; of this code are the following operations having to do with refresh:

; MAR= R37
; R37= R37 +4
; NOTE THAT R37 [14] DOES NOT CHANGE
; MAR= R37 XOR 2
; TOGGLS BIT 14
; MAR= R37 XOR 200
; TOGGLS BIT 8
; MAR= R37 XOR 202
; TOGGLS BITS 8 AND 14

MRT: MAR= R37; **FIRST REFRESH CYCLE**
SINK= MOUSE, BUS; MOUSE DATA IS ANDED WITH 17B
MRTA: L= T= -2; ;TXO; DISPATCH ON MOUSE CHANGE
TXO: L= R37 AND NOT T, T= R37; INCREMENT CLOCK
T= 3+T+1; SH=0; IE. T= T +4; IS INTV TIMER ON?
L= REFINSK AND T, :DOTIMER: :[DOTIMER,NOTIMER] ZERO HIGH 4 BITS
NOTIMER: R37= L; STORE UPDATED CLOCK
NOTIMERINT: T= 2; NO STATE AT THIS POINT IN PUBLIC REGS
MAR= R37 XOR T,T= R37; **SECOND REFRESH CYCLE**
L= REZERO AND T; ONLY THE CLOCKB BITS, PLEASE
SH=0, TASK; TEST FOR CLOCK OVERFLOW
:NOCLK; [NOCLK,CLOCK]

NOCUR: CUDATA= L, TASK;
MRLAST: CUDATA= L, :MRT; END OF MAIN LOOP

DOTIMER: R37= L; STORE UPDATED CLOCK
MAR= EIALOC;
L= 2 AND T;
SH=0, L= T= REZERO,T; **V3 CHANGE (USED TO BE BIAS)
CUDATA= L, :SPCHK;
SPCHK= SINK= MD, BUS=0, TASK; CHECK FOR EIA LINE SPACING
SPIA: :NOTIMERINT, CLOCKTEMP+ L;

NOSPCHK: L=MD;
MAR=TRAPDISP-1; CHECK FOR TIME = NOW
MTEMP+= L;
L= MD-T;
SH=0, TASK, L=MTEMP, :SPIA;

TIMERINT: MAR= ITQUAN;
L= CURDATA;
R37= L;
T=NWW;
MD=CLOCKTEMP;
AND CAUSE AN INTERRUPT ON THE CHANNELS
SPECIFIED BY ITQUAN+1
L= MD OR T, TASK;
NWW+= L, :NOTIMERINT;

; The rest of MRT, starting at the label CLOCK is unchanged