

NATIONAL RADIO ASTRONOMY OBSERVATORY
GREEN BANK, WEST VIRGINIA

ELECTRONICS DIVISION TECHNICAL NOTE NO. 158

Title: **Clock Information for AST 286 Computers**

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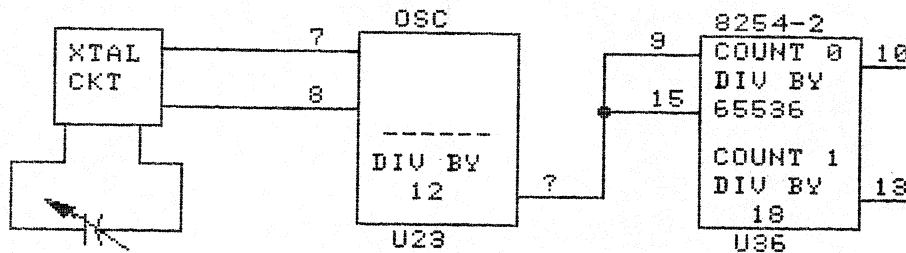
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CLOCK INFORMATION FOR AST 286 COMPUTERS

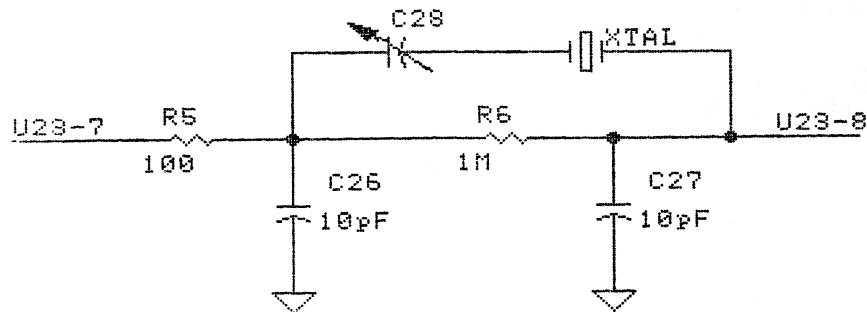
Ronald B. Weimer

The battery backed clock is only read on startup and I could not find a way to adjust its rate. Once the time is read or set by "TIME" command (which does not set the battery clock) the AST keeps time from a second crystal oscillator. A rough block diagram is shown below.

Desired:
 $f_{osc} = 14.31818 \text{ MHz}$
 $U_{36-9} = 1.1931817 \text{ MHz}$
 $1 \text{ sec/day} = 0.0000138 \text{ MHz}$
 at U_{36-9}

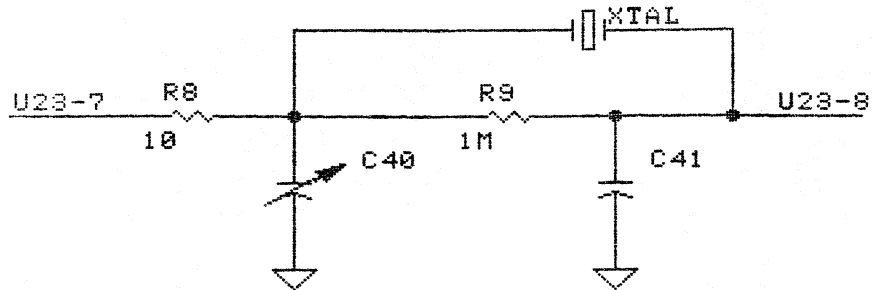


To prevent loading of oscillator I usually monitored pin 9 of U_{36} . Two oscillator circuits were used. The first AST used is shown below:



The adjustment range of C28 was not large enough so I had to put 55 pF in parallel with C27. This gave a range of 1.193627 to 1.193139 MHz. When using a counter not locked to maser or Rb 5 MHz, I would read the 5 MHz standard and correct for the offset when setting frequency. I did not record what the AST serial number was.

The later units had a different oscillator circuit.



First one SN = 148516 (I think.)
C min => 1.1933008 MHz |
C max => 1.1931984 MHz | (Too high!)

Then tried 33 pF in parallel with C41:
C min => 1.1930968 MHz |
C max => 1.1929522 MHz | (Too low!)

Tried 11 pF in parallel with C41:
C min => 1.1932097 |
C max => 1.1931105 | o.k.
Set 1.1931821 MHz.

Serial No. TW0061308 - 3-29-89:
C min => 1.1932707 MHz |
C max => 1.1931588 MHz | o.k.
Set for 1.1931822 MHz correcting for counter.

Serial No. TW0090300 - 5-18-89:
C min => 1.1932203 MHz |
C max => 1.1931355 MHz | o.k.
Set for 1.1931826 MHz correcting for counter.