

516-39  
HL  
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### Resource Monitor Meters

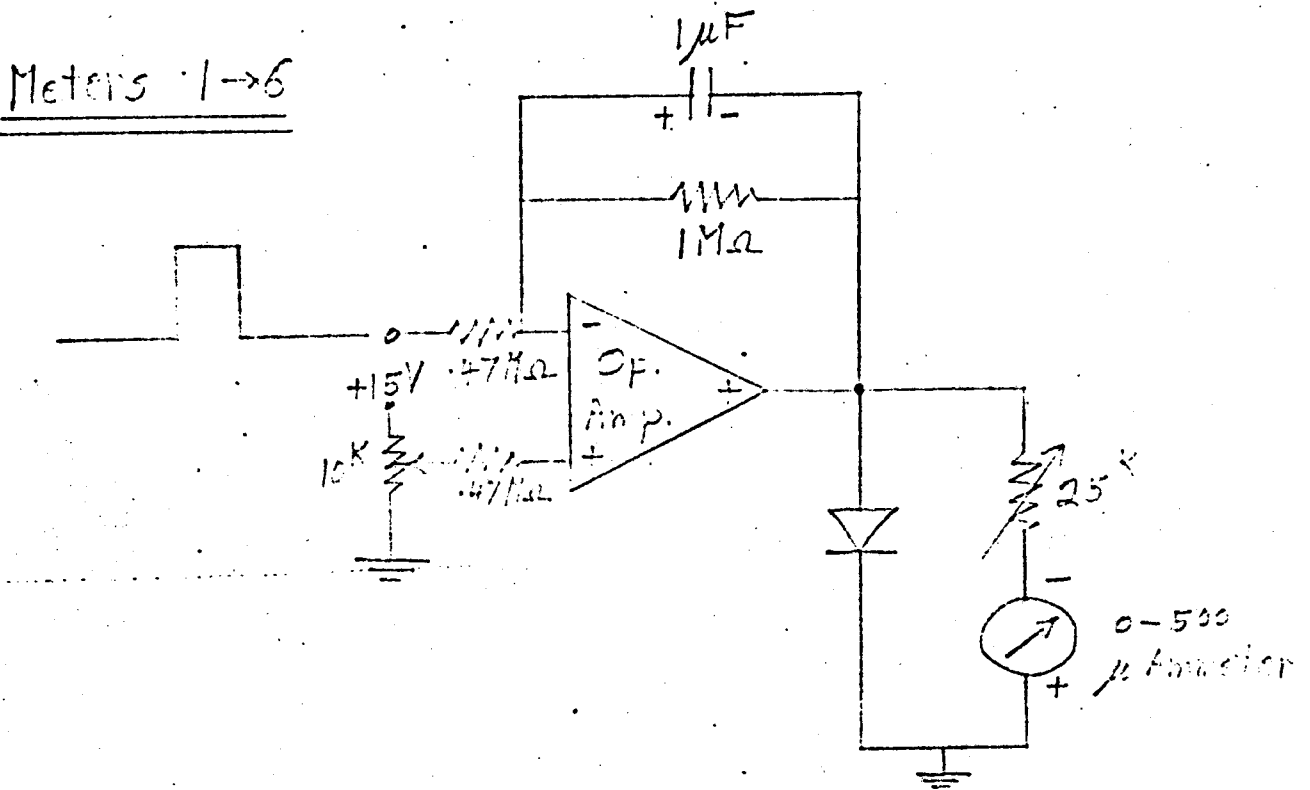
Seven meters have been added to the DDP-516 hardware to monitor various features of the multi-programming operating system. Four of the meters monitor the percentage of time that the four clock register counters are enabled as set up by the .CLØCK routine discussed in Document #516-35. The time constant associated with these meters is of the order of one second. Another two meters monitor the word transfer rate to and from disk as indicated by the time during which the DMA channel is active. One of these meters has a time constant of 1 second associated with it, thus giving a measure of the average word transfer rate. The second meter with a time constant of about ten seconds approximates an integral of the word transfer rate and thus gives a rough indication of the virtual memory size. The seventh meter is used to display the contents of any core memory location desired (scaled down to the range 0-15). Thus the meter can monitor such quantities as the number of entries in the disk queue, the number of users and the number of disk write errors. The meter is loaded by means of the following sequence of commands:

```
LDA  METR  
SSM  
CLKSTT
```

where METR contains the number to be displayed and the minus sign selects the meter rather than the megacycle clock. The time constant associated with this meter is also of the order of one second.

All meters are driven by operational amplifiers. The proper offset voltages for the operational amplifiers are obtained by adjusting the small potentiometers provided on the augat board. External potentiometers are used to adjust the current in each ammeter (0 → 500µA). Figure 1 shows a block diagram of the circuitry used to drive the meters.

Meters 1-6



Meter 7

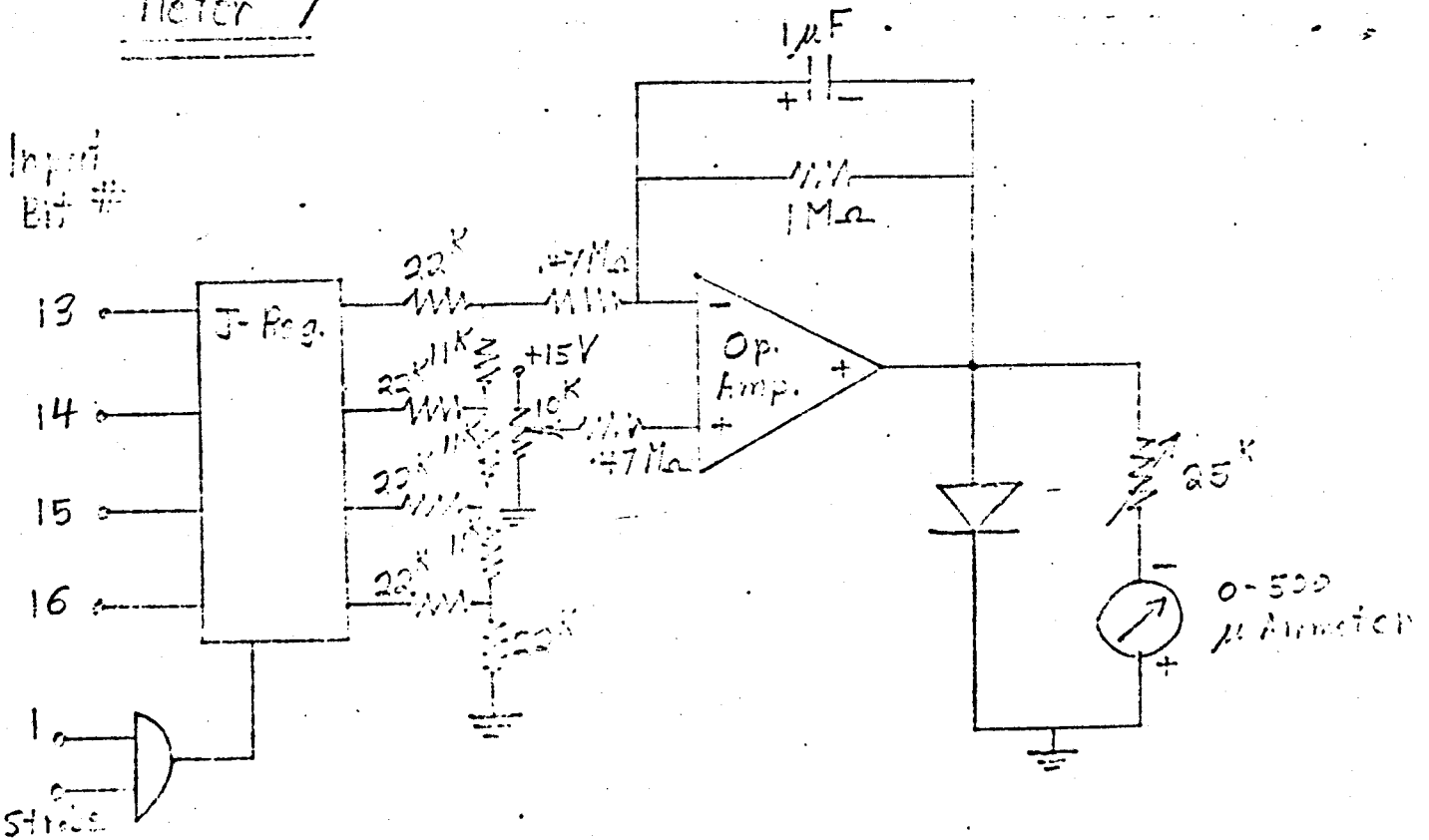


Fig. 1

Support Software

Two segmented programs have been written to control and calibrate the meters, namely:

CMETER

METCAL

The CMETER program allows one to choose which parameter will be displayed on the CONTENTS meter by typing in the name of the corresponding symbol. The METCAL program allows one to make an absolute calibration of all the meters. The possible input commands are:

- C calibrate the CONTENT.meter
- P calibrate the four PERCENT meters
- W calibrate the two WORD meters
- E return to executive program

Having answered all of the queries presented by the program, the appropriate meters are set up and all other users are excluded from using the system by disabling all interrupts. The system is turned back to normal (i.e., allowing other users to obtain the system resources) by changing the state of sense switch 1.