

**Type 99A-MI
INSTALLATION & OPERATIONS MANUAL
MANUAL #244**

Attachments: DS-480, A-6308
M244.doc

Before Installation:

- 1) Disconnect power to any circuit(s) that you will be wiring to, or that you may come in contact with.
- 2) You should have the following parts.
 - a. One 99A-MI Control Box (see Fig. 1)
 - b. Clock(s) (type MI)
 - c. GPS Receiver (optional) (see Fig. 2)



Fig. 1. 99A-MI Controller



Fig. 2. GPS Receiver (optional)

INSTALLATION

- 1) Mount the 99A to the wall by means of putting screws through the mounting ears.
- 2) From the bottom of the 99A there will be sets of wires coming out. Each set of wires will be taped together and marked. One set will contain a black, white, and a green wire with labels marked 1,2,3 respectively. These are the (L/N/E) power wires and should be connected to the main 110 VAC power supply. Note: Power circuit must be dedicated, i.e. no other devices on it.
- 3) A second set of wires containing a black, red, and a white wire are marked L1, L2, and NEUT respectively. These are the movement wires and should be connected to the terminal plug on the back of the clock. On the clock movement you will see a green terminal plug on the bottom of the circuit board. Below this plug are marked L1, L2, and NEUT. Connect the marked wire to the appropriate terminal on the plug, i.e. L1 to L1, L2 to L2 and NEUT to NEUT. (See Fig. 3)

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Page 1 of 1

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Fig 3. Showing the circuit board found on the clock movement where the movement wires connect. Note: Lead from ground on terminal plug must by connected to good ground on building electrical system.

GPS Receiver (Optional)

- 4) The remaining wires coming from the bottom of the 99A are the wires for the GPS receiver. They will be marked for GPS and will include a blue, black, white, and a red wire. These should be carefully connected to the wire that runs to your GPS Receiver (which should be placed in such an area to be able to receive satellite signals without interference i.e. a clear view of the sky).
- 5) Make sure that all the clock(s) are set to 12:00 noon.
- 6) Turn on the power to your 99A-MI.
Note: The 99A control will be set to your local time zone at the factory and when energized will know that the hands are at 12:00 (DO NOT SET THE HANDS TO THE LOCAL TIME BEFORE TURNING THE POWER ON)
- 7) LED display should read the correct time and date, if not see how to set:TIME below
- 8) Tower and system clocks should be advancing, stopped, or reading the correct time, if not see how to set:HANDS below. NOTE: If local time is between 10:00 a.m. and noon the clocks will be stopped and the LCD display will read 'stopped' until 12:00 noon. If the local time is before 10:00 or after noon the LCD display will read 'Advancing' and the clock hands will be moving faster than normal to catch up to the correct local time.



Description of 99A Functions

To access the many functions of the 99A control you must first “unlock” the unit. This is done by pressing the ‘*’ key and the ‘1’ key at the same time. The display will then read ‘unlocked’ momentarily. After you are done using the control press the ‘*’ and the ‘1’ key again to re-lock the control.

To access the menu once you have unlocked the control press the ‘*’ key to page through the functions and press the ‘#’ key to access a function.

Set: TIME Enter the current time in the form HH:MM using the keypad, use the ‘#’ to alternate between AM and PM. Press ‘*’ when done. Note: when ‘*’ is pressed the clock second counter is reset to zero, i.e. 11:59:00.

Set: DATE Enter the current date in the form MM/DD/YY. Then select the day using the ‘#’ to scroll through the display, press ‘*’ when done. Note: It is important for the date of the week to be set properly for the daylight/standard time feature to work properly.

Set: MODE Allows you to select, if you wish, seconds to be displayed on the LED display. Use the ‘#’ to alternate between show min and show sec, press ‘*’ when complete.

Adv: CLK Allows manual advancing of the tower clock. When selected the tower clocks will advance until you press ‘*’ to stop.

Stop: CLK Allows manual stop of the tower clocks. When selected the tower clocks will stop until you press ‘*’ to resume.

Set: HANDS Allows you to enter the current position of the clock hands of the tower clock. When this function is selected by pressing ‘#’, the tower clocks will stop. Enter the time using the keypad. If you make a mistake you must re-enter the time.

Troubleshooting Notes:

In case of severe electrical disturbance pull the fuse on the face of the 99A and then put it back in to reset the control. You will then have to set:TIME and set:HANDS (see description of 99A Functions)

If the date function will not set, the Smart watch chip may be loose. It is chip #U6 on the backside of the PC board and is labeled "Dallas"

If the neutral line on the output of the 99A is incorrectly wired to either L1 or L2 on the clock movements, the clock movements will not operate correctly. Symptoms are;

- Clock only runs 1 minute.
- Clock motor makes peculiar noises and does not run.
- Toggling switch on the back of the clock movement only allows the movement to run 1 minute and then it stops.

On older clock movements before 2002 - if the clock does not run, the switch on the backside of the clock movement may be in the upright position. For proper operation, it needs to be either in the even or odd position.

Factory Installation only

Configuration Settings (0= No Jumper, 1= jumper in)

| | |
|--|---|
| Jumper 1: (U16 pin 1 to pin 16) | Selects dual frequency |
| Jumper 2: (U16 pin 2 to pin 15) | Selects DST disabled |
| Jumper 4: | Use 12:00am sync pulse. Minimum of ¾ seconds long. |
| Note: When Jumper 4 is in, Jumper 2 should also be in. | |
| Jumper 5: | Selects split phase drive logic. (NOTE: Jumper 1 must not be installed for correct 10x speed reset) |
| Jumper 6: | Select 50 Hertz Input |
| Jumper 7: | Display Blanks after 20 seconds. |
| Jumper 8: | Minute Impulse Through Stepper Board |



Note: When Jumper 2 is in Jumper 8 should also be in.

Shipping size is 18" x 18" x 9" (45.72 cm x 45.72 cm x 22.86 cm) and weight is 13 lbs (5.9 kg)

Important notes:

Do not wire lighting (including the clock lighting) through the same conduit

Unit must be installed on a dedicated circuit – in particular do not install on a circuit that has a photocopy machine, laser printer, motors or relays

Revision history 1.18.2000 Added dedicated circuit note

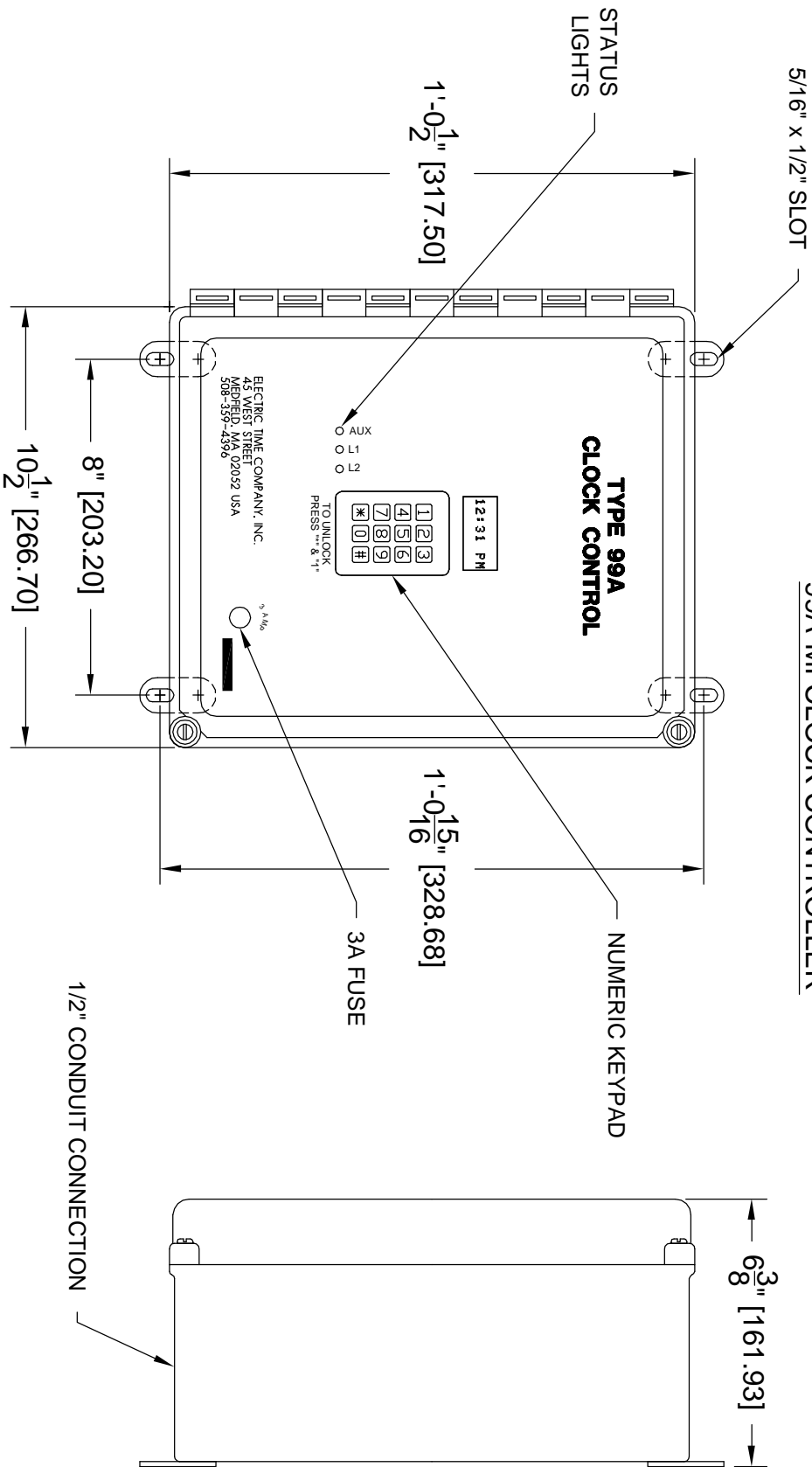
05.03.2000 Added no other wiring through control.

08.30.2000 Various corrections/updates

12.28.2000 Replaced CMI Picture with Rev. K

5.30.2002 Removed event reference – modified switch note

99A-MI CLOCK CONTROLLER



MECHANICAL SPECIFICATIONS

- 1) FIBERGLASS ENCLOSURE
- 2) NEMA 4, 4X, 12, & 13
- 3) POLYESTER MOUNTING FEET INCLUDED
- 4) HINGED & GASKETED FRONT COVER
- 5) OPTIONAL QUICK RELEASE LATCH (#A-L48)

ELECTRICAL SPECIFICATIONS

- 1) POWER REQUIREMENT 115VAC, 60HZ, 15A DEDICATED CIRCUIT
- 2) MAXIMUM CONTROL WIRE RUN 350' (16 AWG RECOMMENDED)
- 3) CONTROLS UP TO (4) ELECTRIC TIME CLOCKS (FOR LARGER NUMBERS OF CLOCKS CONTACT FACTORY)

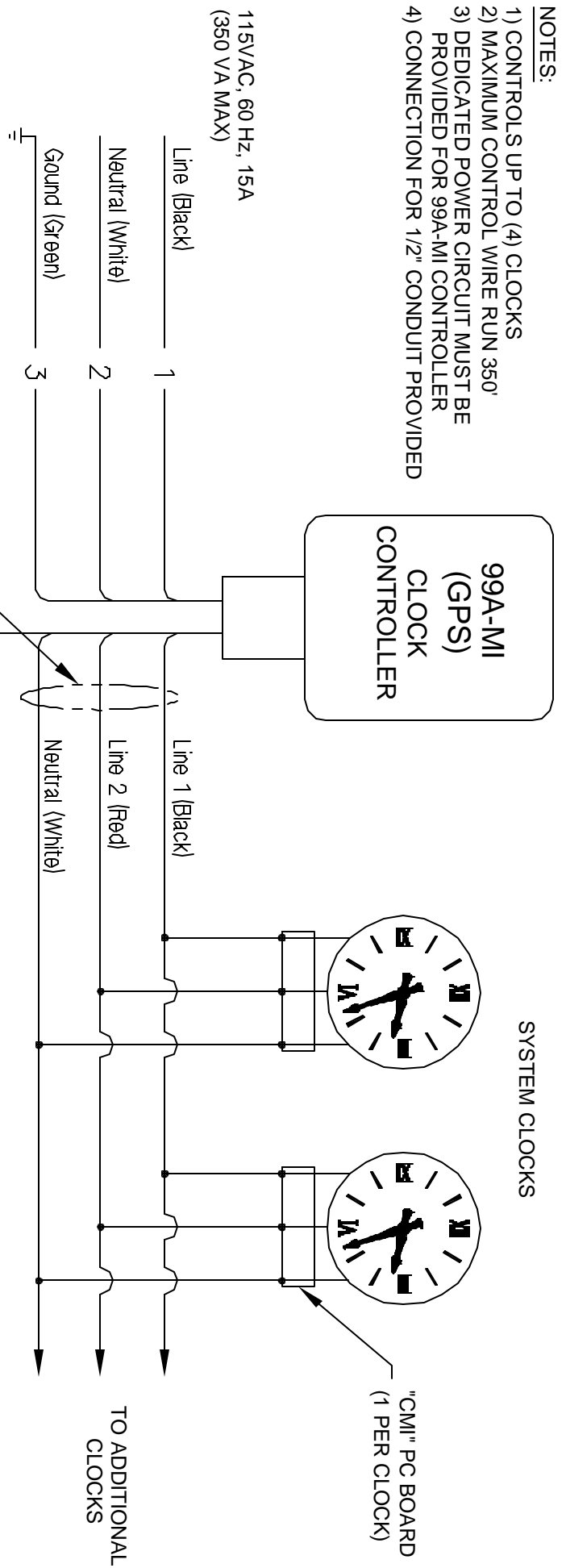
NOTE:

REF. ELECTRIC TIME MANUAL #244 FOR OPERATION & INSTALLATION INSTRUCTIONS

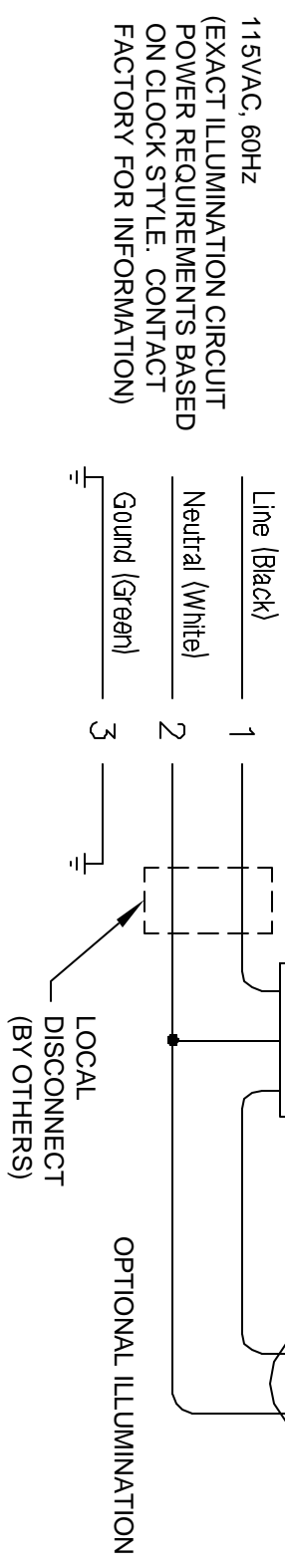
Note: Specifications subject to change without notice.

NOTES:

- 1) CONTROLS UP TO (4) CLOCKS
- 2) MAXIMUM CONTROL WIRE RUN 350'
- 3) DEDICATED POWER CIRCUIT MUST BE PROVIDED FOR 99A-MI CONTROLLER
- 4) CONNECTION FOR 1/2" CONDUIT PROVIDED



DO NOT RUN LIGHTING OR OTHER CIRCUIT WIRES THROUGH OR DIRECTLY ADJACENT TO THE 99A-MI CONTROLLER



| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| NEW | LAST | REV. A | REV. B | REV. C | REV. D | REV. E | REV. F | REV. G | REV. H | REV. I | REV. J | REV. K | REV. L | REV. M | REV. N | REV. O | REV. P | REV. Q | REV. R | REV. S | REV. T | REV. U | REV. V | REV. W | REV. X | REV. Y | REV. Z | REV. AA | REV. AB | REV. AC | REV. AD | REV. AE | REV. AF | REV. AG | REV. AH | REV. AI | REV. AJ | REV. AK | REV. AL | REV. AM | REV. AN | REV. AO | REV. AP | REV. AQ | REV. AR | REV. AS | REV. AT | REV. AU | REV. AV | REV. AW | REV. AX | REV. AY | REV. AZ | REV. BA | REV. BB | REV. BC | REV. BD | REV. BE | REV. BF | REV. BG | REV. BH | REV. BI | REV. BJ | REV. BK | REV. BL | REV. BM | REV. BN | REV. BO | REV. BP | REV. BQ | REV. BR | REV. BS | REV. BT | REV. BU | REV. BV | REV. BV | REV. BW | REV. BX | REV. BY | REV. BZ | REV. CA | REV. CB | REV. CC | REV. CD | REV. CE | REV. CF | REV. CG | REV. CH | REV. CI | REV. CJ | REV. CK | REV. CL | REV. CM | REV. CN | REV. CO | REV. CP | REV. CQ | REV. CR | REV. CS | REV. CT | REV. CU | REV. CV | REV. CW | REV. CX | REV. CY | REV. CZ | REV. DA | REV. DB | REV. DC | REV. DD | REV. DE | REV. DF | REV. DG | REV. DH | REV. DI | REV. DJ | REV. DK | REV. DL | REV. DM | REV. DN | REV. DO | REV. DP | REV. DQ | REV. DR | REV. DS | REV. DT | REV. DU | REV. DV | REV. DW | REV. DX | REV. DY | REV. DZ | REV. EA | REV. EB | REV. EC | REV. ED | REV. EE | REV. EF | REV. EG | REV. EH | REV. EI | REV. EJ | REV. EK | REV. EL | REV. EM | REV. EN | REV. EO | REV. EP | REV. EQ | REV. ER | REV. ES | REV. ET | REV. EU | REV. EV | REV. EW | REV. EX | REV. EY | REV. EZ | REV. FA | REV. FB | REV. FC | REV. FD | REV. FE | REV. FF | REV. FG | REV. FH | REV. FI | REV. FJ | REV. FK | REV. FL | REV. FM | REV. FN | REV. FO | REV. FP | REV. FQ | REV. FR | REV. FS | REV. FT | REV. FU | REV. FV | REV. FW | REV. FX | REV. FY | REV. FZ | REV. GA | REV. GB | REV. GC | REV. GD | REV. GE | REV. GF | REV. GG | REV. GH | REV. GI | REV. GJ | REV. GK | REV. GL | REV. GM | REV. GN | REV. GO | REV. GP | REV. GQ | REV. GR | REV. GS | REV. GT | REV. GU | REV. GV | REV. GW | REV. GX | REV. GY | REV. GZ | REV. HA | REV. HB | REV. HC | REV. HD | REV. HE | REV. HF | REV. HG | REV. HH | REV. HI | REV. HJ | REV. HK | REV. HL | REV. HM | REV. HN | REV. HO | REV. HP | REV. HQ | REV. HR | REV. HS | REV. HT | REV. HU | REV. HV | REV. HW | REV. HX | REV. HY | REV. HZ | REV. IA | REV. IB | REV. IC | REV. ID | REV. IE | REV. IF | REV. IG | REV. IH | REV. II | REV. IJ | REV. IK | REV. IL | REV. IM | REV. IN | REV. IO | REV. IP | REV. IQ | REV. IR | REV. IS | REV. IT | REV. IU | REV. IV | REV. IW | REV. IX | REV. IY | REV. IZ | REV. JA | REV. JB | REV. JC | REV. JD | REV. JE | REV. JF | REV. JG | REV. JH | REV. JI | REV. JJ | REV. JK | REV. JL | REV. JM | REV. JN | REV. JO | REV. JP | REV. JQ | REV. JR | REV. JS | REV. JT | REV. JU | REV. JV | REV. JW | REV. JX | REV. JY | REV. JZ | REV. KA | REV. KB | REV. KC | REV. KD | REV. KE | REV. KF | REV. KG | REV. KH | REV. KI | REV. KJ | REV. KK | REV. KL | REV. KM | REV. KN | REV. KO | REV. KP | REV. KQ | REV. KR | REV. KS | REV. KT | REV. KU | REV. KV | REV. KW | REV. KX | REV. KY | REV. KZ | REV. LA | REV. LB | REV. LC | REV. LD | REV. LE | REV. LF | REV. LG | REV. LH | REV. LI | REV. LJ | REV. LK | REV. LL | REV. LM | REV. LN | REV. LO | REV. LP | REV. LQ | REV. LR | REV. LS | REV. LT | REV. LU | REV. LV | REV. LW | REV. LX | REV. LY | REV. LZ | REV. MA | REV. MB | REV. MC | REV. MD | REV. ME | REV. MF | REV. MG | REV. MH | REV. MI | REV. MJ | REV. MK | REV. ML | REV. MM | REV. MN | REV. MO | REV. MP | REV. MQ | REV. MR | REV. MS | REV. MT | REV. MU | REV. MV | REV. MW | REV. MX | REV. MY | REV. MZ | REV. NA | REV. NB | REV. NC | REV. ND | REV. NE | REV. NF | REV. NG | REV. NH | REV. NI | REV. NJ | REV. NK | REV. NL | REV. NM | REV. NN | REV. NO | REV. NP | REV. NQ | REV. NR | REV. NS | REV. NT | REV. NU | REV. NV | REV. NW | REV. NX | REV. NY | REV. NZ | REV. OA | REV. OB | REV. OC | REV. OD | REV. OE | REV. OF | REV. OG | REV. OH | REV. OI | REV. OJ | REV. OK | REV. OL | REV. OM | REV. ON | REV. OO | REV. OP | REV. OQ | REV. OR | REV. OS | REV. OT | REV. OU | REV. OV | REV. OW | REV. OX | REV. OY | REV. OZ | REV. PA | REV. PB | REV. PC | REV. PD | REV. PE | REV. PF | REV. PG | REV. PH | REV. PI | REV. PJ | REV. PK | REV. PL | REV. PM | REV. PN | REV. PO | REV. PP | REV. PQ | REV. PR | REV. PS | REV. PT | REV. PU | REV. PV | REV. PW | REV. PX | REV. PY | REV. PZ | REV. QA | REV. QB | REV. QC | REV. QD | REV. QE | REV. QF | REV. QG | REV. QH | REV. QI | REV. QJ | REV. QK | REV. QL | REV. QM | REV. QN | REV. QO | REV. QP | REV. QQ | REV. QR | REV. QS | REV. QT | REV. QU | REV. QV | REV. QW | REV. QX | REV. QY | REV. QZ | REV. RA | REV. RB | REV. RC | REV. RD | REV. RE | REV. RF | REV. RG | REV. RH | REV. RI | REV. RJ | REV. RK | REV. RL | REV. RM | REV. RN | REV. RO | REV. RP | REV. RQ | REV. RR | REV. RS | REV. RT | REV. RU | REV. RV | REV. RW | REV. RX | REV. RY | REV. RZ | REV. SA | REV. SB | REV. SC | REV. SD | REV. SE | REV. SF | REV. SG | REV. SH | REV. SI | REV. SJ | REV. SK | REV. SL | REV. SM | REV. SN | REV. SO | REV. SP | REV. SQ | REV. SR | REV. SS | REV. ST | REV. SU | REV. SV | REV. SW | REV. SX | REV. SY | REV. SZ | REV. TA | REV. TB | REV. TC | REV. TD | REV. TE | REV. TF | REV. TG | REV. TH | REV. TI | REV. TJ | REV. TK | REV. TL | REV. TM | REV. TN | REV. TO | REV. TP | REV. TQ | REV. TR | REV. TS | REV. TT | REV. TU | REV. TV | REV. TW | REV. TX | REV. TY | REV. TZ | REV. UA | REV. UB | REV. UC | REV. UD | REV. UE | REV. UF | REV. UG | REV. UH | REV. UI | REV. UJ | REV. UK | REV. UL | REV. UM | REV. UN | REV. UO | REV. UP | REV. UQ | REV. UR | REV. US | REV. UT | REV. UY | REV. UZ | REV. VA | REV. VB | REV. VC | REV. VD | REV. VE | REV. VF | REV. VG | REV. VH | REV. VI | REV. VJ | REV. VK | REV. VL | REV. VM | REV. VN | REV. VO | REV. VP | REV. VQ | REV. VR | REV. VS | REV. VT | REV. VU | REV. VV | REV. VW | REV. VX | REV. VY | REV. VZ | REV. WA | REV. WB | REV. WC | REV. WD | REV. WE | REV. WF | REV. WG | REV. WH | REV. WI | REV. WJ | REV. WK | REV. WL | REV. WM | REV. WN | REV. WO | REV. WP | REV. WQ | REV. WR | REV. WS | REV. WT | REV. WU | REV. WV | REV. WW | REV. WX | REV. WY | REV. WZ | REV. XA | REV. XB | REV. XC | REV. XD | REV. XE | REV. XF | REV. XG | REV. XH | REV. XI | REV. XJ | REV. XK | REV. XL | REV. XM | REV. XN | REV. XO | REV. XP | REV. XQ | REV. XR | REV. XS | REV. XT | REV. XU | REV. XV | REV. XW | REV. XX | REV. XY | REV. XZ | REV. YA | REV. YB | REV. YC | REV. YD | REV. YE | REV. YF | REV. YG | REV. YH | REV. YI | REV. YJ | REV. YK | REV. YL | REV. YM | REV. YN | REV. YO | REV. YP | REV. YQ | REV. YR | REV. YS | REV. YT | REV. YU | REV. YV | REV. YW | REV. YX | REV. YZ | REV. ZA | REV. ZB | REV. ZC | REV. ZD | REV. ZE | REV. ZF | REV. ZG | REV. ZH | REV. ZI | REV. ZJ | REV. ZK | REV. ZL | REV. ZM | REV. ZN | REV. ZO | REV. ZP | REV. ZQ | REV. ZR | REV. ZS | REV. ZT | REV. ZU | REV. ZV | REV. ZW | REV. ZX | REV. ZY | REV. ZZ |
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WIRING DIAGRAM
99A-MI CLOCK CONTROLLER

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| SCALE | DATE | DRAWN | APP'V |
| NONE | 6-16-98 | WOR | TDE |



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| REV. A | 7-28-00 | WOR |
| REV. B | 8-02-00 | MJE |
| REV. C | 8-08-00 | MJE |
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| REV. CH | | |
| REV. CI | | |
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