

# BOGEN®

MASTER PROGRAM CLOCK

CLK-6A



The material in this manual is designed to provide the installer and the user with the information needed to install and operate the CLK-6A Master Program Clock. A careful reading of this manual is recommended before attempting to install or operate this system.

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**THIS EQUIPMENT COMPLIES WITH FCC CLASS A  
REQUIREMENTS PURSUANT TO SUBPART J OF  
PART 15**

**WARNING**

*This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case, the user at his own expense, will be required to take whatever measures necessary to correct the interference.*

## INTRODUCTION

The CLK-6A Master Program Clock, microprocessor-controlled, is designed to provide accurate, reliable automatic or manual control of secondary clocks and programmed events for any combination of six control circuits. A circuit may be assigned to any zone or group of locations for which a common program is desired. Events, user-programmable, may include classroom or workshift change signals, or on/off control of ancillary devices such as lighting, sprinklers, etc.

Three operation schedules may be programmed for the six circuits. Held in static RAM, each schedule can retain up to 128 entries (total of 384) specifying the time, AM/PM, day or days of the week, and circuit(s) selected for each entry. Change from one schedule to another is easily accomplished via keypad pushbuttons. Circuits can be manually enabled or disabled, each independently, for signalling at unscheduled times and for advancing secondary clocks. Circuit sensor contacts may be used for a tone-signalling device, such as the Bogen Model TG-4B. Signal durations are programmable from 1 to 99 seconds, for each circuit.

The user-friendly display board has a red Plexiglas\* front panel with a four-digit, seven-segment LED display of time, LEDs indicating AM/PM, day of the week, signal circuit data, user-prompting information, and selection menu. A pushbutton keypad (similar to a telephone keypad) provides easy programming, review, and control of all functions. Unauthorized data entry is prevented by means of a front-panel, key-lock, security switch. AC power to the CLK-6A may be user-interrupted using the rear panel power switch.

The built-in quartz crystal time base assures timekeeping accuracy independent of power source frequency variations. A daylight saving mode permits advancing or delaying secondaries one hour. In the event of an AC power failure, even lasting up to seven days, the CLK-6A will retain all user-programmed data. Upon power resumption, the six-volt battery will automatically recharge, with current limited to .48 amperes. An external battery connector allows easy disconnection of the battery (if the CLK-6A will not be used for extended periods) and measurement of the standby battery voltage. The CLK-6A incorporates a "watch-dog" program to prevent latch-up. It is packaged for standard 19" rack mounting, and requires only 3-1/2" of vertical mounting space. All wiring connections to secondary equipment (clocks, tone-signalling circuits, bells, latching-relay controlled systems/devices, or any combination thereof) are made via barrier strips located on the rear panel.

The CLK-6A is capable of operating a wide variety of secondary clocks and equipment, as described herein. It will control and correct only those secondary clocks listed in the Appendix Section. The installer must determine the type of secondary clock. Be certain that the brand and model number or series type are listed, and enter the proper Secondary Clock Selection Code by means of the front-panel keypad. If the secondary clock to be used is not listed, contact your Bogen distributor or the factory before proceeding.

## UNPACKING

The clock has been carefully checked before leaving the factory. Inspect the shipping container and the unit carefully for indication of improper handling. If the unit has been damaged, make an immediate claim to the Bogen distributor from whom it was purchased. If the unit was shipped to you, notify the transportation company without delay and place your claim.

## TECHNICAL SPECIFICATIONS

Input Voltage	115VAC
Input Frequency	50Hz or 60Hz
Input Power	30W maximum
Standby Power	1.2Ah 6-Volt Gel Cell battery (automatically recharged)
Standby Time	7 days maximum each occurrence
Signal Schedules	3—each one accepting up to 128 events
Signal Circuits	10A relay contacts
Secondary Clock Control	10A relay contacts
Temperature Range	32° - 140°F (0° - 60°C)
Voltage Range	± 10%
Overall Dimensions	19" W. x 3 1/2" H. x 4 1/4" D. (48.3 x 8.9 x 12.1 cm.)
Shipping Weight	11 lbs. (5 kg.)

## INSTRUCTIONS FOR REPLACING THE EPROM IN THE BOGEN MODEL CLK-6A

If, at any time in the future, custom software is required, follow this procedure to replace the EPROM.

### WARNING

*Read carefully before handling the replacement EPROM.*

**STATIC PRECAUTIONARY PROCEDURES:** Static-sensitive devices can be damaged or destroyed by static discharge. Static charge is energy accumulated on the human body while working in particular environments, and discharged when making contact with an object of very low potential. There are two major static causes which should be avoided when replacing the CLK-6A EPROM:

1. Work areas with carpeted floors.
2. Attire or contact with synthetics/plastics, such as nylon, polyester, acrylics, etc.

If these environments cannot be avoided, the use of an anti-static wrist strap is mandatory. In any case, a wrist strap is always highly recommended. It provides a path of static discharge to ground. Normally, the strap is wrapped around the wrist and the opposite end of the cable is connected to a point of low potential, such as a metal cold water pipe or a screw securing a grounded metal wall outlet cover.

### NOTE

*The following procedure will cause the program schedule in the Model CLK-6A Master Program Clock to be erased. Review and record the program schedule before proceeding with its replacement.*

\*Registered TM, Rohm and Haas Co., for acrylic resin plastic.

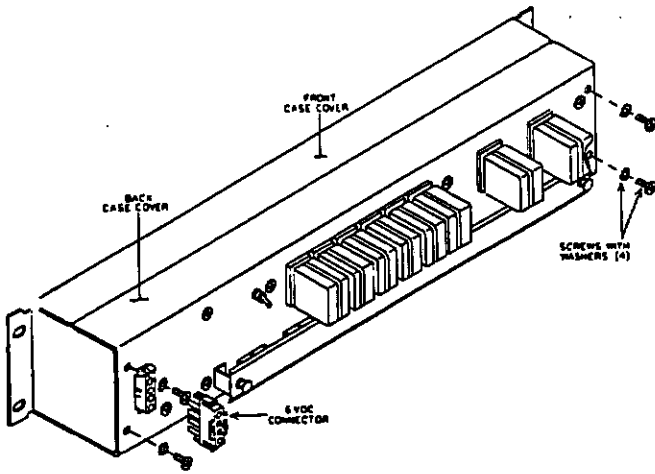


Figure 1

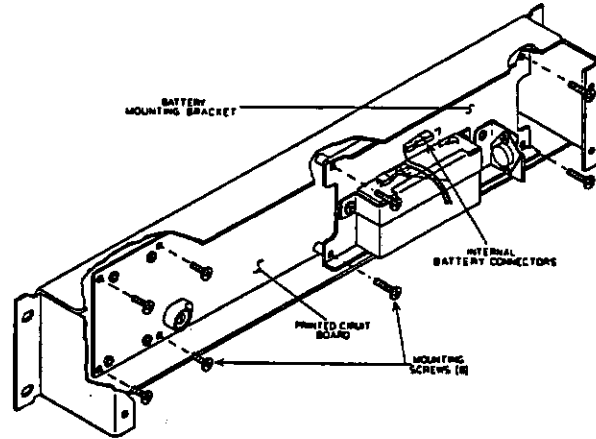


Figure 2

1. Disconnect the AC power source.
2. Disconnect the 6VDC connector.
3. Locate and remove the four (4) screws with washers on the back case cover. (See Figure 1.)
4. Carefully separate the back case cover from the front. It is not necessary to disconnect the wiring; however, care should be exercised to prevent any possibility of damage to the wiring.
5. Loosen the eight (8) screws, including those with spacers, which secure the printed circuit board to the front case cover. (See Figure 2.) Do NOT remove the battery mounting bracket.
6. Carefully lift the printed circuit board from the front case cover, continuing to exercise care with the wiring.
7. Turn the printed circuit board over to locate the EPROM. (See Figure 3.)
8. Remove the existing EPROM by inserting a small screwdriver or similar tool between the EPROM and its socket, gently prying up until it is free.

**CAUTION**

*The replacement EPROM should be installed with the small notch (on the end of the EPROM) toward the keypad. (See Figure 3.)*

9. Insert the replacement EPROM into the socket, carefully aligning the pins. Exercise extreme caution to prevent bending or breaking the pins. Press the EPROM firmly and directly into position.
10. Return the printed circuit board to the front case cover, aligning the mounting holes.

11. Replace the eight (8) mounting screws. (See Figure 2.) Be sure to tighten all screws until they are flush, paying particular attention to those with spacers.
12. Replace the back case cover, arranging the wiring smoothly. Replace the four (4) screws and washers. (See Figure 1.)
13. Connect the 6VDC battery connector. (See Figure 1.)
14. Connect the AC power source.
15. Re-enter all program data.



Figure 3

## FINAL CHECKOUT PROCEDURE

### CAUTION

Removal of the rear cover may present a shock hazard. Be certain that the AC power line is disconnected before removing the cover. All factory specified internal connections must be performed by qualified personnel.

1. Wire according to the appropriate diagram in the Appendix section of the manual.
2. Install header on rear panel to connect internal battery. The built-in NI-CAD battery will provide years of service. If replacement is necessary, remove and replace with same or equal type battery. (See CAUTION above.)
3. Connect power to terminal block TB1. (See Figure 4.)
4. Set rear panel power switch to ON position.
5. Set security switch on front panel to OFF position.
6. Enter the Secondary Clock Selection Code as follows: Upon setting the power switch to the ON position, a cursor followed by a "0" will be displayed. Using the keypad, enter the appropriate Secondary Clock Selection Code (see Appendix section of this manual) and press the  $\square$  key to enter the code.

### NOTE

The correct Secondary Clock Selection Code must be entered properly in order to operate the type of secondary clocks to be used in the system and to exit this mode. This code is entered at power-up only. Once entered, it cannot be changed, except by setting the rear panel power switch to OFF and disconnecting the battery connectors—clearing all user-programmed data from memory. In that case, begin procedure at Step 2 above. If no secondary clocks are to be controlled by the CLK-6A, enter Secondary Clock Selection Code 01.

**IMPORTANT NOTE:** The  $\square$  key is used:

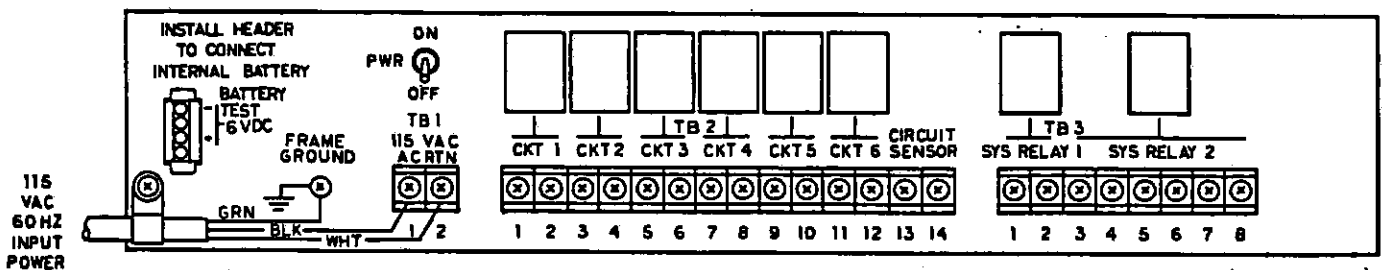
- A. To display normal time. It is a good practice to press  $\square$  before beginning any programming procedure. This will help to avoid the possibility of error or removal of data when in certain modes.
- B. To cancel any erroneous input prior to the final  $\square$  key entry of any procedure. In this instance, the  $\square$  key is identified as an "abort key."
- C. To return to normal time display upon completion of input, in accordance with the instructions.

Security switch must be in the OFF position.

The following sequence of keys provides the user entry into the desired mode:

1. Press  $\square$  Pressing the  $\square$  key addresses the micro-processor and obtains a menu screen of the modes available.
2. Select  $\square$  -  $\square$  Pressing one of the following numbered keys selects the desired mode:
  - $\square$  SET TIME
  - $\square$  SET DAY
  - $\square$  MANUAL CIRCUITS
  - $\square$  PROGRAM CIRCUITS
  - $\square$  SET DURATION
  - $\square$  ENABLE CIRCUITS
  - $\square$  DAYLIGHT SAVING
  - $\square$  SCHEDULE SELECT
3. Press  $\square$  Pressing the  $\square$  key provides the user entry into the mode selected.

**REFER TO PROGRAMMING INSTRUCTIONS FOR EACH MODE, AS SELECTED.**



D 74-6077-01

Figure 4 - Rear Panel Drawing.

## PROGRAMMING INSTRUCTIONS

### MODE 1: SET TIME

Security switch must be in the OFF position.

Allows altering the time display. The user must enter hours, minutes, and either AM or PM. Seconds are set to zero upon final entry. On initial power-up, the time initializes to 11:11AM (except for Secondary Clock Selection Codes 07, and 08) and days initialize to a "no-select" condition.

1. Press **[#]** Request menu screen.
2. Press **[1]** SET TIME mode select.
3. Press **[#]** Enter SET TIME mode selection. The screen will display a cursor followed by three zeros, while the AM/PM indicator is blanked and the colon is fixed. (\_\_\_0:00)
4. Enter Time The cursor will move to the right as each entry is made. The first entry will place data in the 10<sup>S</sup> hours position. **[1]** will result in a "1"; **[0]** will result in a blank. Continue across, entering the correct time. Both the AM and PM indicators will illuminate.
5. Select AM or PM Actuation of the **[0]** will enter PM and extinguish the AM indicator. Actuation of the **[1]** will illuminate AM and extinguish the PM indicator. Failure to select AM or PM will result in a default to AM.

#### NOTE

*If an error has been made and reentry of time is desired, an entry of any numeric key will revert to Step 4 above, but only if **[0]** (for PM) or **[1]** (for AM) has been depressed.*

6. Press **[#]** Actuation of the **[#]** key enters the new time and starts the second counter from 00. The screen will display the new time; the colon between the hour and minute display will blink at 1Hz rate. If an abort **[#]** key is pressed before the entry **[#]** key is pressed, the clock will not accept the new entry; it will return to the previously set time.

#### NOTE

*Entry of a new time will abort any previously selected clock advancement instructions (i.e., Mode 3 or Mode 7).*

**SET TIME Example:** To set the time to 2:45PM, press the following key sequence:

**[#] [1] [#] [0] [2] [4] [5] [0] [#]**

### MODE 2: SET DAY

Security switch must be in the OFF position.

Allows entering the day of the week. Indication is made with the use of seven LEDs above the time display. Each LED represents a day of the week: Sunday **[1]** through Saturday **[7]**. No day is selected during initial power-up. A day must be input in order for the programmed events to occur.

1. Press **[#]** Request menu screen.
2. Press **[2]** SET DAY mode select.
3. Press **[#]** Enter mode selection. This will light all seven indicators showing the days of the week: Sunday **[1]** through Saturday **[7]**.
4. Enter Day A key entry of **[1]** to **[7]** will result in the illumination of the corresponding light; the other six lights will be extinguished. Key entries **[8]**, **[9]**, or **[0]** will recall all day LEDs for the purpose of correction, if required.
5. Press **[#]** The **[#]** key is the terminator entering the new data (day of the week) into memory. The operation will automatically revert to normal time display. If the **[#]** key is actuated prior to the **[#]** key, the unit will default to the previous SET DAY setting.

**SET DAY Example:** To set the clock for Tuesday, press the following key sequence:

**[#] [2] [#] [3] [#]**

### MODE 3: MANUAL CIRCUITS

Security switch may be in either position to operate circuits manually, but must be in the OFF position for secondary clock advancement.

Allows activating circuits at unscheduled times and advancement of secondary clocks at unscheduled times. The manual circuit operation mode is the only mode which can be entered when the security switch is ON.

1. Press **[#]** Request menu screen.
2. Press **[3]** MANUAL CIRCUITS mode select.
3. Press **[#]** Enter mode selection. The six circuit LEDs located below the time display will illuminate and the time display will extinguish.
4. Select Circuits (If all circuits are to be operated, proceed to Step 5.) Select the circuit(s) by pressing each key corresponding to the appropriate circuit number(s) 1 through 6. The circuit LEDs are illuminated upon their selection. A **[0]** selection will extinguish all circuit LEDs for reselection. A **[7]** selection will illuminate the system LED and extinguish all circuit LEDs. Use this selection to advance secondary clocks. The **[7]** key is not operative if the security switch is ON.
5. Press **[#]** Pressing the **[#]** key will cause activation of the selected circuits. Operation of the circuits will be indicated by the blinking of the corresponding circuit indicators. If circuit reselection is desired, revert to Step 4 above. Actuation of **[#]** after a **[7]** selection will cause the display of the normal time with the illumination of the SYSTEM LED. The system will then automatically advance secondary clocks, as described in the Appendix section of this manual for the appropriate secondary clocks. Upon completion of the clock advancement, the SYSTEM LED will extinguish.
6. Press **[\*]** Exit Mode 3 and return to normal clock operation.

**MANUAL CIRCUIT Example:** To signal circuits 1 and 4 for a duration of two seconds, press **[\*] [#] 3 [#] 1 4 [#]** (held down for two seconds) **[\*]**

**SECONDARY CLOCK ADVANCEMENT Example:** **[\*] [#] 3 [#] 7 [#] \***

### MODE 4: PROGRAM CIRCUITS

Security switch must be in the OFF position.

Allows the schedule to be entered, edited, or reviewed. Time entries need not be entered in chronological order; the event schedule is automatically rearranged for review in chronological order (backward or forward) in Mode 4.

1. Press **[#]** Request menu screen.
2. Press **[4]** PROGRAM CIRCUITS mode select.
3. Press **[#]** Enter Mode Selection.
4. Press **[1]**, **[2]**, or **[3]** Enter schedule number to be programmed, edited or reviewed.
5. Press **[#]** Enter schedule selected in prior step. If data has previously been entered, the first event scheduled will display on the screen, illuminating the time, AM/PM, day(s) of the week, and the circuit(s). If no data has been entered, the time will have a cursor in the left digit area, followed by three zeros ( 0:00).
6. OPTIONS Three options are available:
  - Data Entry
  - Schedule Scanning
  - Editing Existing Schedule

### DATA ENTRY

- A. Only when the CLK-6A displays a cursor followed by three zeros, can new data be entered. If data has previously been entered and a scheduled event is displayed on the screen, actuation of the **[6]** key will display a new entry position ( 0:00). A total of 128 entries can be made.
- B. Enter time (hours and minutes). Even though the 10<sup>h</sup> hours will not display a leading "0," it must be entered when required. (Example: To enter 9:30, press **[0] 9 3 0**). Pressing **[0]** will enter a blank in the 10<sup>h</sup> hours, while **[1]** will enter a "1" in that position. All four digits on the clock must be entered. The AM/PM lights will then illuminate.

- C. AM/PM select. Press  to select PM or press  to select AM. The other numeric keys are not active. A "no-select" condition will enter both AM and PM and result in the occurrence of an event signal at that time twice a day.

**NOTE**

*If an error has been made and reentry of time is necessary, an entry of any numeric key will revert to DATA ENTRY, Step B.*

- D. Enter the time data by pressing . This will illuminate all (seven) day indicators.
- E. Select days. Any key from  to  will select its respective day for event actuation; keys , , or  will cause all lights to be recalled. If a selection is not made, the next  key actuation will select an "all-days" actuation.
- F. Enter the selection by pressing the  key. Operation will advance to circuit-select with all six circuit indicators illuminated.
- G. Select circuit(s). Any numeric key between  and  will select its respective circuit and the other circuit lights will be extinguished. Pressing  will extinguish all circuit lights. After making the correct circuit entry, proceed to Step H. If no circuit selection is made before proceeding to Step H, all circuits will be selected.
- H. Enter the data by pressing the  key. All data entered in Steps B through G above will be stored in chronological sequence with previously entered data. At this point, the next display will be a cursor followed by three zeros (  :00), preparatory for a new entry. The process may be repeated from Step B if additional data entries are desired. When the 128th entry has been made, the actuation of the  key will result in the display of the last entry and no further data can be entered into memory.
- I. Exit from DATA ENTRY can be accomplished by pressing the  key while "  :00" is displayed. This will result in a display of the last edited or reviewed event and allow additional editing or reviewing of the schedule.
- J. Exit from Mode 4 PROGRAM CIRCUITS can be accomplished by pressing  key.

**EXAMPLE:** To program an event to schedule 3 at 4:25 PM on Mon./Wed./Fri. for circuits 1 and 2:

**SCHEDULE SCANNING**

- A. Repeatedly pressing the  key will display (in reverse chronological sequence) each event from the most recent previously scheduled event to the first event of the day.
- B. Repeatedly pressing the  key will increment the display to the next scheduled event, and will continue until the last event of the day has been displayed. Note that all entries which were input for both AM and PM will be shown at the end of the schedule scanning (following the PM entries).
- C. Pressing the  key will display the earliest event of any day of the week.

**EXAMPLES:** Enter mode selection (4) for Schedule 1:

To scan forward:    ....

To scan in reverse:    ....

To scan forward and backward:

**EDITING EXISTING SCHEDULE**

- A. Delete only: To delete data displayed and exit this mode, press .
- B. To delete and re-enter data: When the display shows data to be changed, press . Previous entry will be erased from memory and the display will read "  :00" and operation will revert to DATA ENTRY, Step B.

**EXAMPLE:** To delete or change one event from Schedule 1:       Continue to scan forward until the event to be deleted or changed appears; press either  to enter new data, or  to delete data and exit this mode.

- C. Clear entire schedule: Pressing  will cause the time display to show four cursors (bars). **THIS IS A WARNING!** If clearing the entire data input is not intended, press  to return to normal time display, or press any numeric key to return to the display which appeared prior to the actuation of  key. If, however, clearing the entire schedule is desired, press the  at this point.

**EXAMPLE:** To clear entire Schedule 2:

- D. To insert additional program data, refer to Mode 4, DATA ENTRY.



## MODE 5: SET DURATION

### NOTE

*At power-up, all PROGRAM CIRCUIT durations are factory preset for 5 seconds.*

Security switch must be in the OFF position.

Allows changing the number of seconds each circuit will activate at the times programmed in Mode 4.

1. Press **[F]** Request menu screen.
2. Press **[5]** SET DURATION mode select.
3. Press **[F]** Enter selected mode. The screen will clear and display "1" in the first position of the time display, followed by a dash ("—") in the second position, followed by two digits indicating the signal duration (in seconds) for the first circuit.
4. Select Circuit Press the **[F]** key repeatedly, until the desired circuit is displayed in the first position of the screen where 10<sup>S</sup> hours is normally displayed.
5. Set Duration Press any two numeric keys from **[0]** **[1]** to **[9]** **[9]** for the desired duration of that circuit (entering leading zeroes, as required). The duration setting will appear on the screen where minutes are normally displayed.
6. To Continue Press the **[F]** key; display will advance to the next circuit number for verification or change.
7. Press **[◻]** Press **[◻]** at any point to exit this mode and to return to normal time display.

## MODE 6: ENABLE CIRCUITS

Security switch must be in the OFF position.

Allows the manual selection of those circuits required to operate in accordance with the times entered in Mode 4. During the initialization at power-up, all circuits are enabled. Circuits may be disabled manually, so as not to function while output devices are being serviced, during holidays, etc.

1. Press **[F]** Request menu screen.
2. Press **[6]** ENABLE CIRCUITS mode select.
3. Press **[F]** Enter selected mode. The screen will clear and the six circuit indicator lights (located beneath the blanked time display) will illuminate.
4. Press **[1]** - **[6]** Press each numeric key respective to the circuit desired to become enabled. Pressing **[0]** will extinguish all circuit lights. No-selection, prior to Step 5, will result in enabling all circuits.
5. Press **[F]** Enter the circuit selection(s) by depressing the **[F]** key. The normal time will be displayed and the enabled circuit LED(s) will be illuminated.

EXAMPLE: To enable circuits 1 and 2 and to disable circuits 3 through 6: **[◻]** **[F]** **[6]** **[F]** **[1]** **[2]** **[F]** **[◻]**

## MODE 7: DAYLIGHT SAVING

Security switch must be in the OFF position.

Causes the secondary clocks to advance one hour or regress one hour on the following Sunday at 2:00AM. The secondary clocks will advance or regress and the master clock's digital display will simultaneously reset to the proper time.

### NOTE

*If a Daylight Saving change has already been entered, the Mode 7 LED will be illuminated during normal time display. To review or change this input, follow the procedure below.*

1. Press **[#]** Request menu screen.
2. Press **[7]** DAYLIGHT SAVING mode select.
3. Press **[#]** Enter mode selected.  
 (a) If a previous Daylight Saving entry has been made, either a "0" (back one hour) or a "1" (forward one hour) will be displayed. To reverse, press the alternate number and proceed to Step 5; to remove, see Steps 4 and 5.  
 (b) If no previous entry has been made, "0-1" will appear on the display. Proceed to Step 4.
4. Select **[0]**-**[1]** Select **[0]** to set clocks back one hour, or select **[1]** to set the clocks forward one hour. Any other numeric selection will cause the display to read "0-1" for reselection.

**NOTE**

*To abort any previous entry, select a numeric key other than a **[0]** or **[1]**, then press **[#]**. The display will return to normal time and the Mode 7 LED will be extinguished.*

5. Select **[#]** or **[\*]** Press **[#]** to enter a selection. Press **[\*]** to abort the mode and return to normal display without causing a change in the daylight saving status. If the **[#]** key is pressed when display shows "0-1," any previously entered daylight selection will be aborted.

**NOTE**

*Entry of new time in Mode 1, SET TIME will automatically cause an abort to any previously entered selection made in Mode 7, DAYLIGHT SAVING.*

**EXAMPLES:** To advance clocks one hour on the following Sunday, enter **[\*] [#] [7] [#] [1] [#]**

To regress clocks one hour on the following Sunday, enter **[\*] [#] [7] [#] [0] [#]**

**MODE 8: SCHEDULE SELECT**

**Security switch must be in the OFF position.**

1. Press **[#]** Request menu screen.
2. Press **[8]** SCHEDULE SELECT mode.
3. Press **[#]** Enter mode selected. The screen will display the current schedule number (1, 2, or 3).
4. Press **[1]**, **[2]**,  
or **[3]** Press desired numeric key respective to the schedule to become enabled; the selection will be displayed.
5. Press **[#]** Enter the selection by depressing the **[#]** key. The normal time will be displayed and signal control will resume according to the schedule selected.

**EXAMPLE:** To activate schedule 2, enter **[\*] [#] [8] [#] [2] [#]**

## APPENDIX

The following pages include wiring diagrams necessary for the proper installation of secondary clocks and signalling devices used with the F version EPROM.

### **IMPORTANT NOTE**

*Be sure that the secondary clock type, brand, and model number to be connected to the CLK-6A appears in this section. If not, contact your Bogen distributor or the factory before proceeding.*

### **CAUTION**

*Installation may present a shock hazard. Be certain to disconnect AC power line before proceeding and to avoid having foreign objects come in contact with circuit boards.*

After all wiring has been completed, follow the FINAL CHECKOUT PROCEDURE and PROGRAMMING INSTRUCTIONS in this manual. The Secondary Clock Selection Codes referenced in the FINAL CHECKOUT PROCEDURE are shown in the table which follows:

SECONDARY CLOCK SELECTION CODE	TYPE SECONDARY CLOCK	BRAND	MODEL/SERIES	PAGE REFERENCE
01	Three-Wire Synchronous - Analog (59th Minute Correction)	Cincinnati IBM Simplex  Stromberg Latham Franklin	D10 77 Series 77 Series, 93-9, 91-9, 941-9, 943-9 47 Series 3000 SS Wall Clocks 4000 Series	a-4
	Three-Wire Synchronous - Digital (59th Minute Correction)	Condor	U25412	
02	Three-Wire Minute Impulse (59th Minute Correction)	Cincinnati Edwards Faraday IBM Simplex Standard Electric Time Stromberg Franklin	D2, D4 Impulse Impulse 75 Series 75 Series, 91-4, 93-4, 941-4, 943-4 Impulse Impulse 7000 Series	a-5
	Two-Wire Reverse-Polarity Minute Impulse (59th Minute Correction)	Cincinnati	D3	
03	Three-Wire Synchronous (15th and 59th Minute Correction)	Standard Electric Time	MP Series	a-7
04	Two-Wire Dual Voltage	Standard Electric Time	AR-2A	a-8
05	Three-Wire Minute Impulse (58th Minute Correction. These clocks must be modified by the manufacturer or in the field for 58th minute correction.)	Cincinnati Edwards Faraday IBM Simplex Standard Electric Time Stromberg Franklin	D2, D4 Impulse Impulse 75 Series 75 Series, 91-4, 93-4, 941-4, 943-4 Impulse Impulse 7000 Series	a-9
	Two-Wire Reverse-Polarity Minute Impulse (58th Minute Correction)	Cincinnati	D5	

SECONDARY CLOCK SELECTION CODE	TYPE SECONDARY CLOCK	BRAND	MODEL/SERIES	PAGE REFERENCE
06	Synchronous Wired	Cincinnati Faraday	D8 Three-Wire Synchronous	a-11
07	Digital	Dukane	24F200 *24DC200 *24DW200 *25F200	a-12
08	Digital	Rauland	2410 (115VAC)	a-13
	Digital	Rauland	2410 (24VAC)	a-14
09	Dual Motor (59th Minute Correction)	Simplex	59th Minute Dual Motor	a-15
10	Dual Motor (45th Minute Correction)	Simplex	45th Minute Dual Motor	a-16
11	Dual Motor	Edwards	Dual Motor	a-17
17	Two-Wire Dual Voltage Three-Wire Impulse	Standard Electric Time	AR-2 AR-3	a-18

Control Circuit Wiring Diagram for Six-Circuit Time Signalling with Multi-Graphic and COMMUNITEL Systems ..... a-20

Control Circuit Wiring Diagram for Ancillary Signalling and/or Latching Relay Control Functions ..... a-20

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CLK-6A Timer Assembly Board Diagram ..... a-23

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\* Mounting variations of the basic Model 24F200.

**THREE-WIRE SYNCHRONOUS (59th MINUTE CORRECTION)**

120VAC/24VAC is used to operate the clocks normally. An eight-second command signal is automatically applied on the corrective line from 57 minutes, 54 seconds to 58 minutes, 02 seconds and will cause an hourly correction. Automatically, applying a command on the corrective line from 5:58:02 through 5:58:08, in addition to the hourly corrective, will result in a twelve-hour correction.

Secondary clocks of this type which can be used with the CLK-6A are:

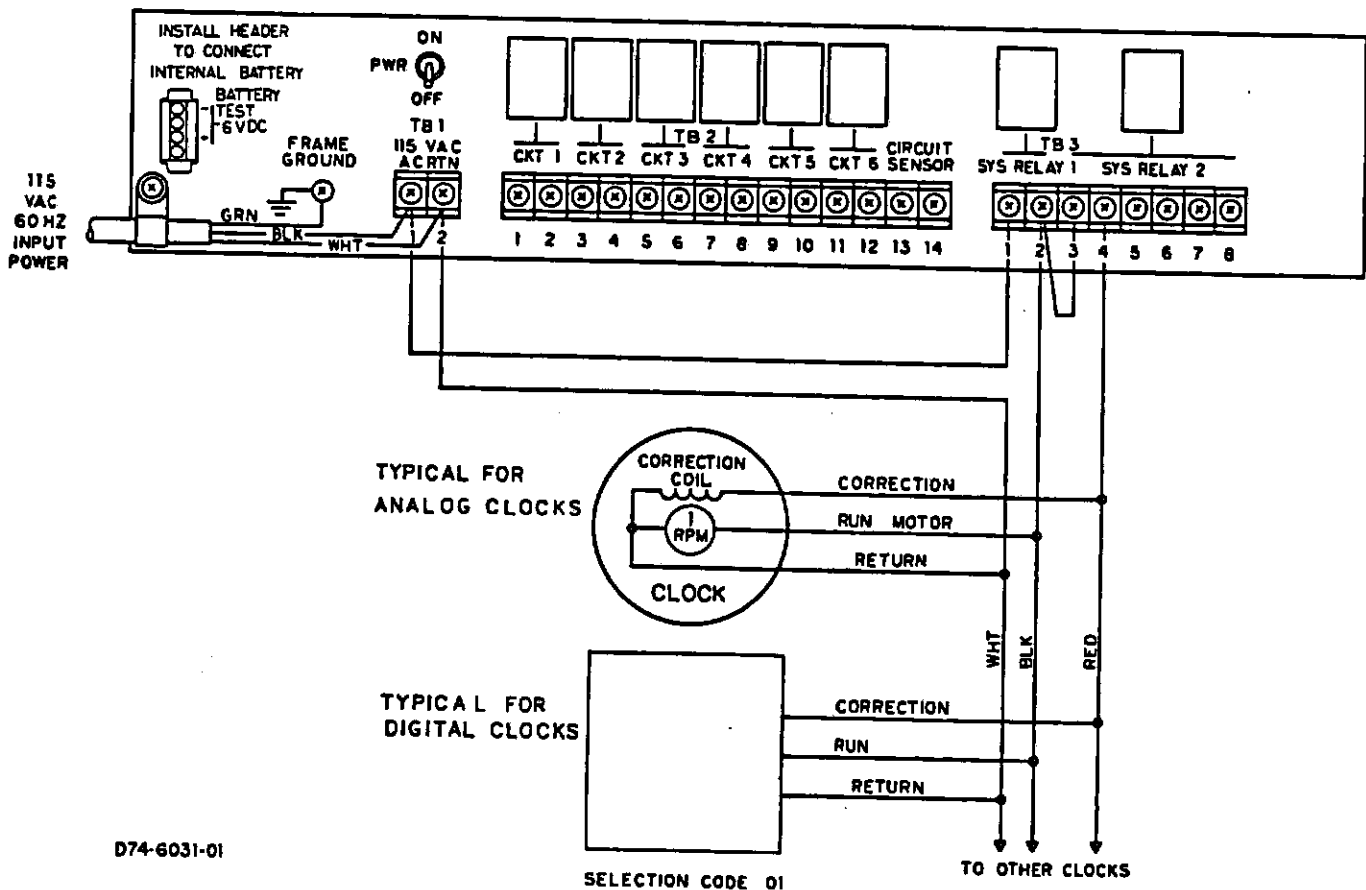
**DIGITAL**

Condor U25412

**ANALOG**

- Cincinnati D10
- IBM 77 Series
- Simplex 77 Series, 93-9, 91-9, 941-9, 943-9, 47 Series
- Stromberg 3000
- Lathem SS Wall Clocks
- Franklin 4000 Series

**ENTER SECONDARY CLOCK SELECTION CODE 01**



D74-6031-01

SELECTION CODE 01

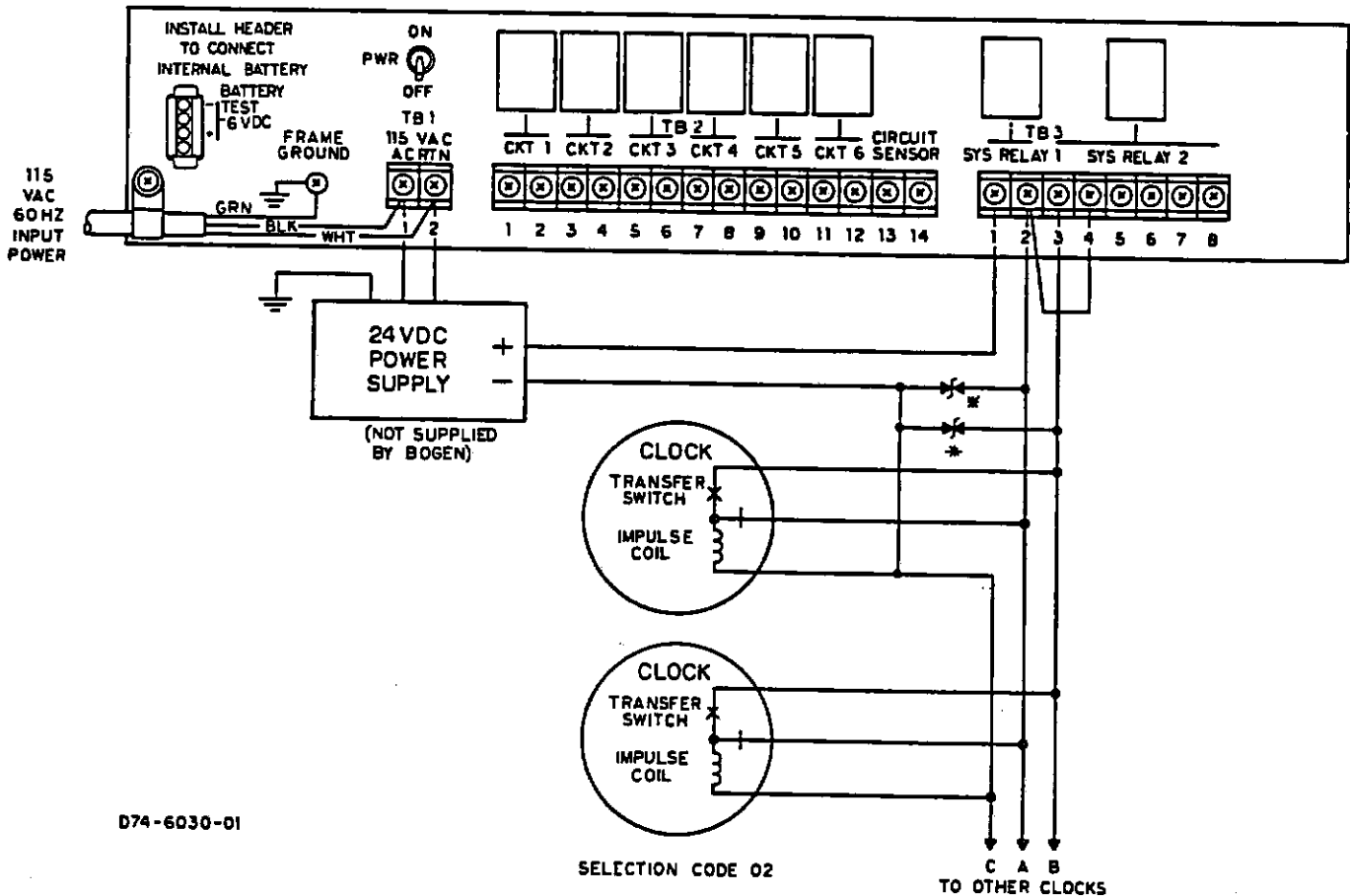
**THREE-WIRE MINUTE IMPULSE (59th MINUTE CORRECTION)**

From the 58th to 00 seconds each minute, a 24VDC pulse is automatically transmitted to the secondary clocks. From the 59th minute through the 49th minute, the pulse is automatically transmitted on both the A and B lines. From the 50th minute to the 59th minute, the pulse is automatically transmitted on the A line only. Clocks which are fast and reach the 59th minute ahead of the master clock will stop, since, at this time, they will respond only to pulses transmitted on the B line. During the 59th minute, from 10 seconds through the 50th second, a total of 20 rapid pulses are automatically transmitted at a 0.5Hz rate on the A line to advance all slow clocks.

Secondary clocks of this type which can be used with the CLK-6A are:

Cincinnati	D2, D4
Edwards	Impulse
Faraday	Impulse
IBM	75 Series
Simplex	75 Series, 91-4, 93-4, 941-4, 943-4
Standard	Impulse
Stromberg	Impulse
Franklin	7000 Series

**ENTER SECONDARY CLOCK SELECTION CODE 02**



D74-6030-01

\*=GE C5 2504 V250 LA4

**TWO-WIRE REVERSE-POLARITY MINUTE IMPULSE  
(59th MINUTE CORRECTION)**

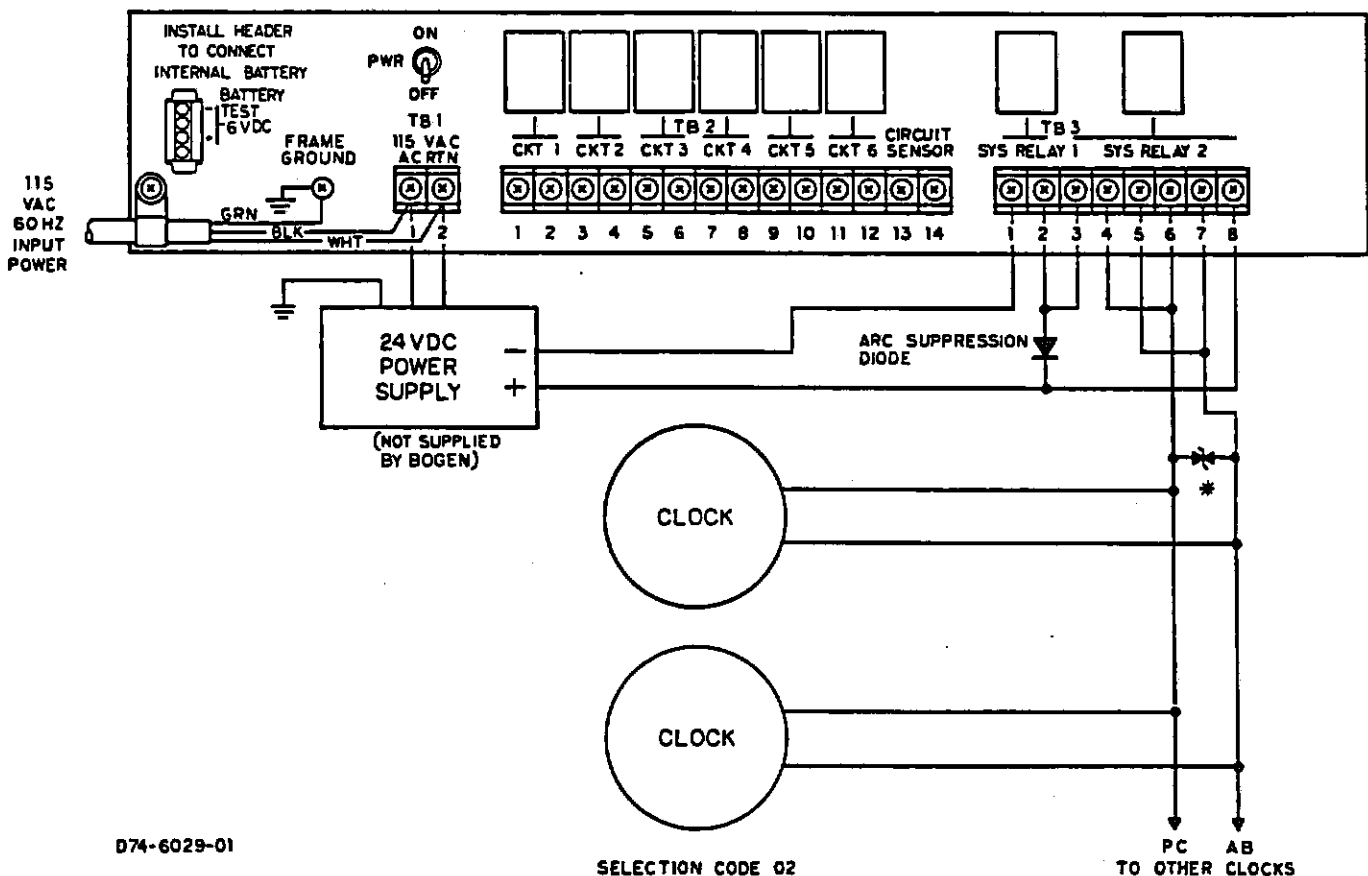
From the 58th second to 00 seconds each minute, a 24VDC pulse is automatically transmitted to the secondary clocks. From the 59th through the 49th minute, the pulse is automatically transmitted with line AB positive with respect to line PC. From the 50th minute to the 59th minute, the pulse is automatically transmitted with line AB negative with respect to line PC. Clocks which are fast and reach the 59th minute ahead of the master clock will stop, since, at this time, they will respond only to pulses transmitted with the line AB positive with respect to PC. During the 59th minute, from 10 seconds

through the 50th second, a total of 20 rapid pulses are automatically transmitted at a 0.5Hz rate to advance all slow clocks. During the rapid pulsing line, AB is negative with respect to line PC. Use a diode, connected as shown below, for arc suppression of the relay contacts.

The secondary clock of this type which can be used with the CLK-6A is:

Cincinnati D3

**ENTER SECONDARY CLOCK SELECTION CODE 02**



\*-GE C5 2504 V250 LA4



**THREE-WIRE SYNCHRONOUS (15th and 59th MINUTE CORRECTIONS)**

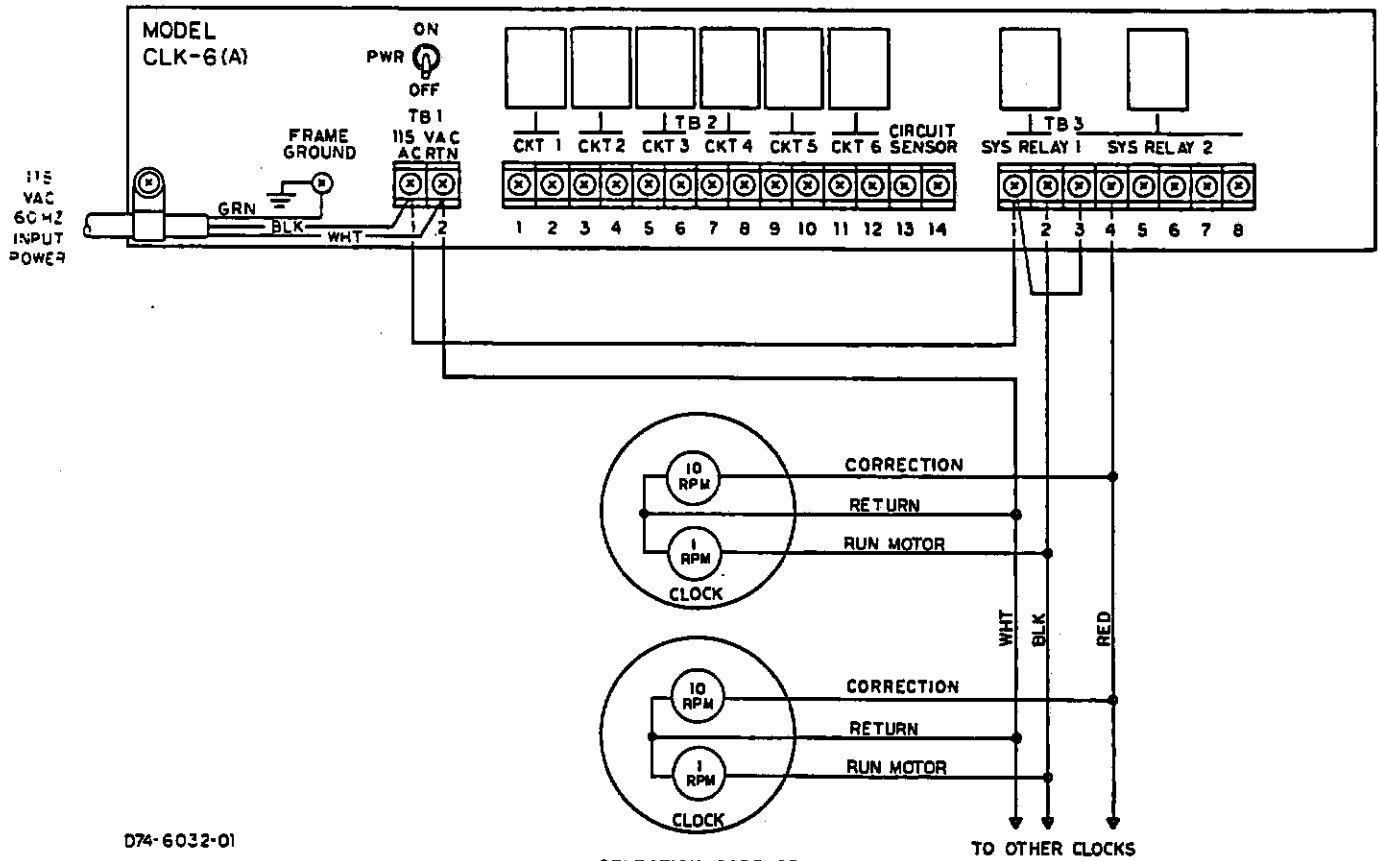
120VAC/24VAC automatically applied to the run motor line will cause normal operation. A 15-minute correction signal automatically applied on the correction motor line will cause a 12-hour correction from 5:15:00 to 5:30:00. This will occur twice daily (AM and PM). Run motor line power is automatically connected during the 12-hour correction. A 29-second signal is automatically applied to the correction motor line

from XX:59:30 to XX:59:59 for hourly corrections. During hourly corrections, power is automatically disconnected from the run motor line.

The secondary clock of this type which can be used with the CLK-6A is:

Standard  
Electric Time MP Series

**ENTER SECONDARY CLOCK SELECTION CODE 03**



D74-6032-01

SELECTION CODE 03

TO OTHER CLOCKS

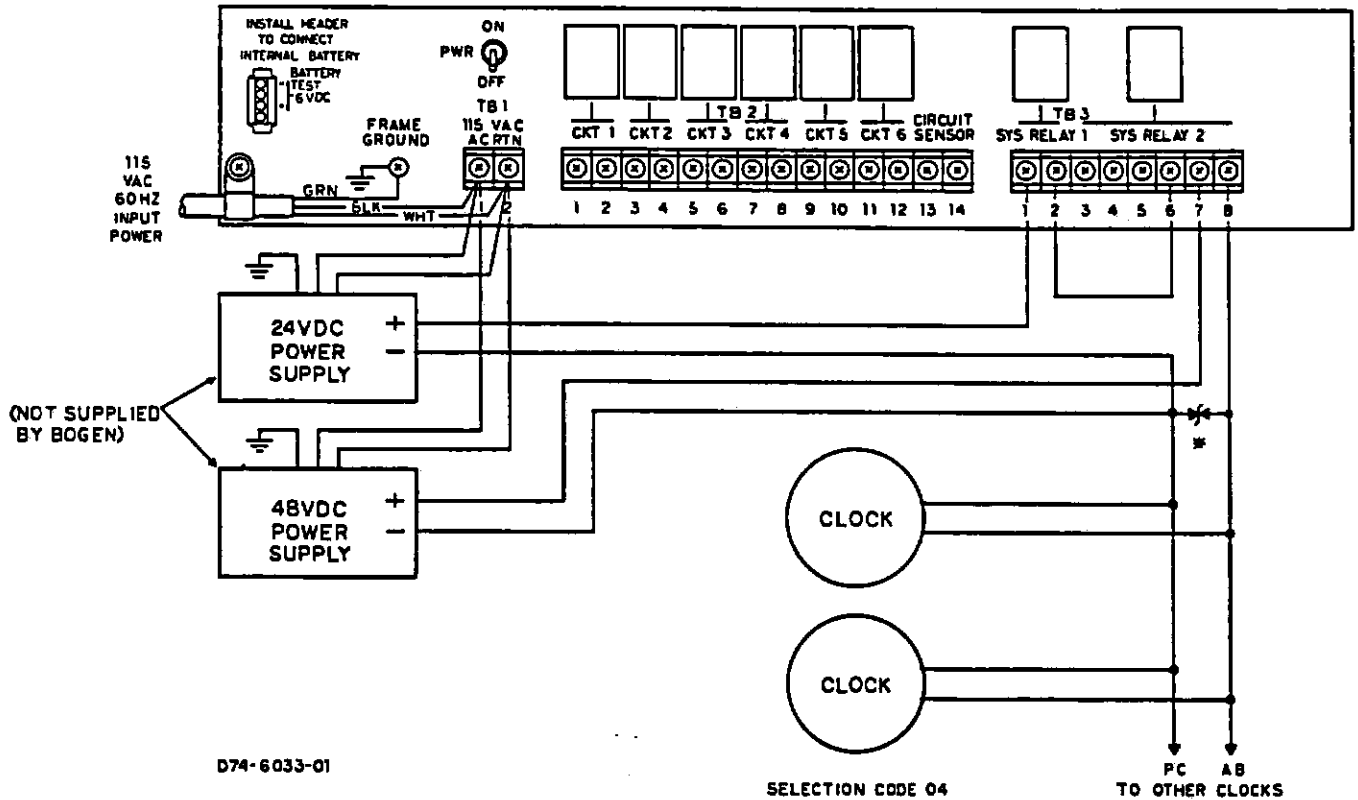
**TWO-WIRE DUAL VOLTAGE**

Each minute from the 58th second to the 00 second, a pulse of low voltage (24VDC) will be automatically transmitted. The secondary clocks will receive the pulses until the 59th minute; then, from the 50th second to the 00 second, a higher voltage pulse (48VDC) will be transmitted to advance clocks to the hour.

The secondary clock of this type which can be used with the CLK-6A is:

Standard  
Electric Time AR-2A

**ENTER SECONDARY CLOCK SELECTION CODE 04**



**THREE-WIRE MINUTE IMPULSE (58th MINUTE CORRECTION)**

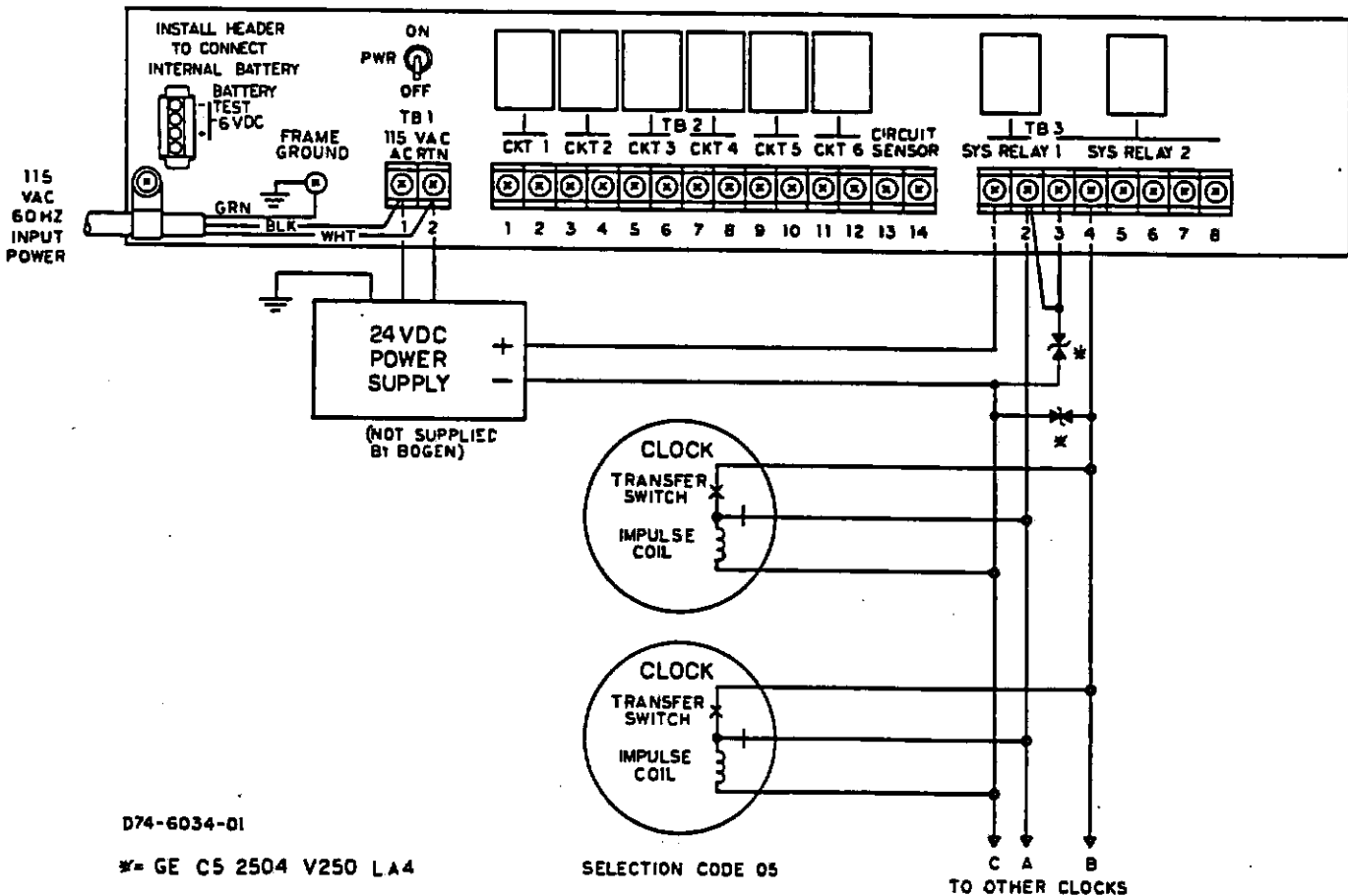
From the 58th second to the 00 second each minute, a 24VDC pulse is automatically transmitted to the secondary clocks. From the 58th minute through the 48th minute, the pulse is automatically transmitted on both the A and B lines. From the 49th minute to the 58th minute, the pulse is automatically transmitted on the A line only. Clocks which are fast and reach the 58th minute ahead of the master clock will stop, since, at this time, they will respond only to pulses transmitted on the B line. During the 58th minute, from 10 seconds through the 50th second, a total of 20 rapid pulses are automatically transmitted at a 0.5Hz rate on the A line, advancing all slow clocks.

**NOTE:** These clocks must be modified by the manufacturer or in the field for 58th minute correction.

The secondary clocks of this type which can be used with the CLK-6A are:

Cincinnati	D2, D4
Edwards	Impulse
Faraday	Impulse
IBM	75 Series
Simplex	75 Series, 91-4, 93-4, 941-4, 943-4
Standard Electric Time	Impulse
Stromberg	Impulse
Franklin	7000 Series

**ENTER SECONDARY CLOCK SELECTION CODE 05**



**TWO-WIRE REVERSE-POLARITY MINUTE IMPULSE  
(58th MINUTE CORRECTION)**

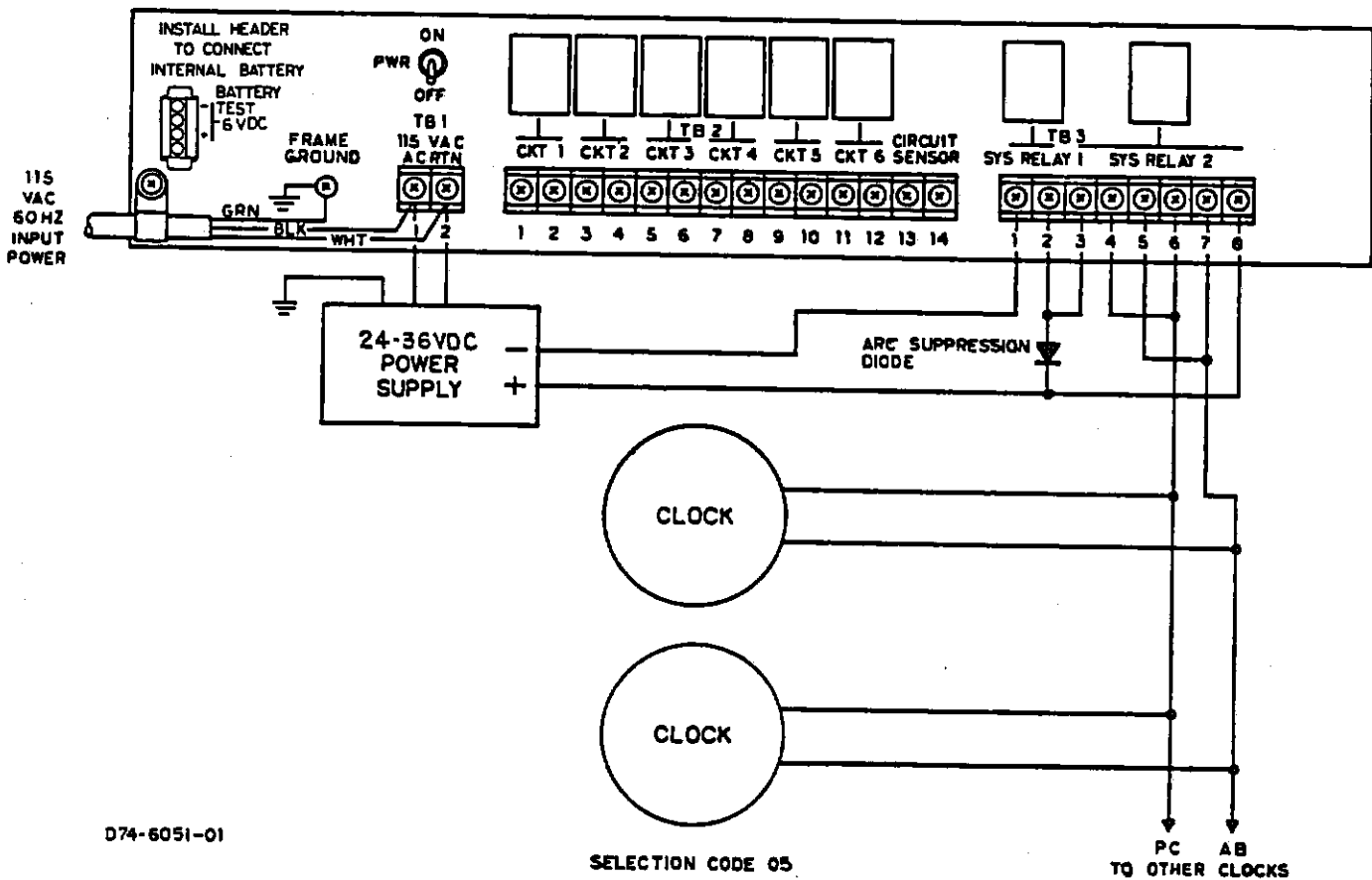
From the 58th second to the 00 second each minute, a 24VDC pulse is automatically transmitted to the secondary clocks. From the 58th minute through the 48th minute, the pulse is automatically transmitted with line AB positive with respect to line PC. From the 49th minute to the 58th minute, the pulse is automatically transmitted with line AB negative with respect to line PC. Clocks which are fast and reach the 58th minute ahead of the master will stop, since, at this time they will respond only to pulses transmitted with line AB positive with respect to line PC. During the 58th minute, from the 10th second through the

50th second, a total of 20 rapid pulses are automatically transmitted at a 0.5Hz rate to advance all slow clocks. During the rapid pulsing, line AB is negative with respect to line PC. Use a diode, connected as shown below, for arc suppression of the relay contacts.

The secondary clock of this type which can be used with the CLK-6A is:

Cincinnati D5

**ENTER SECONDARY CLOCK SELECTION CODE 05**



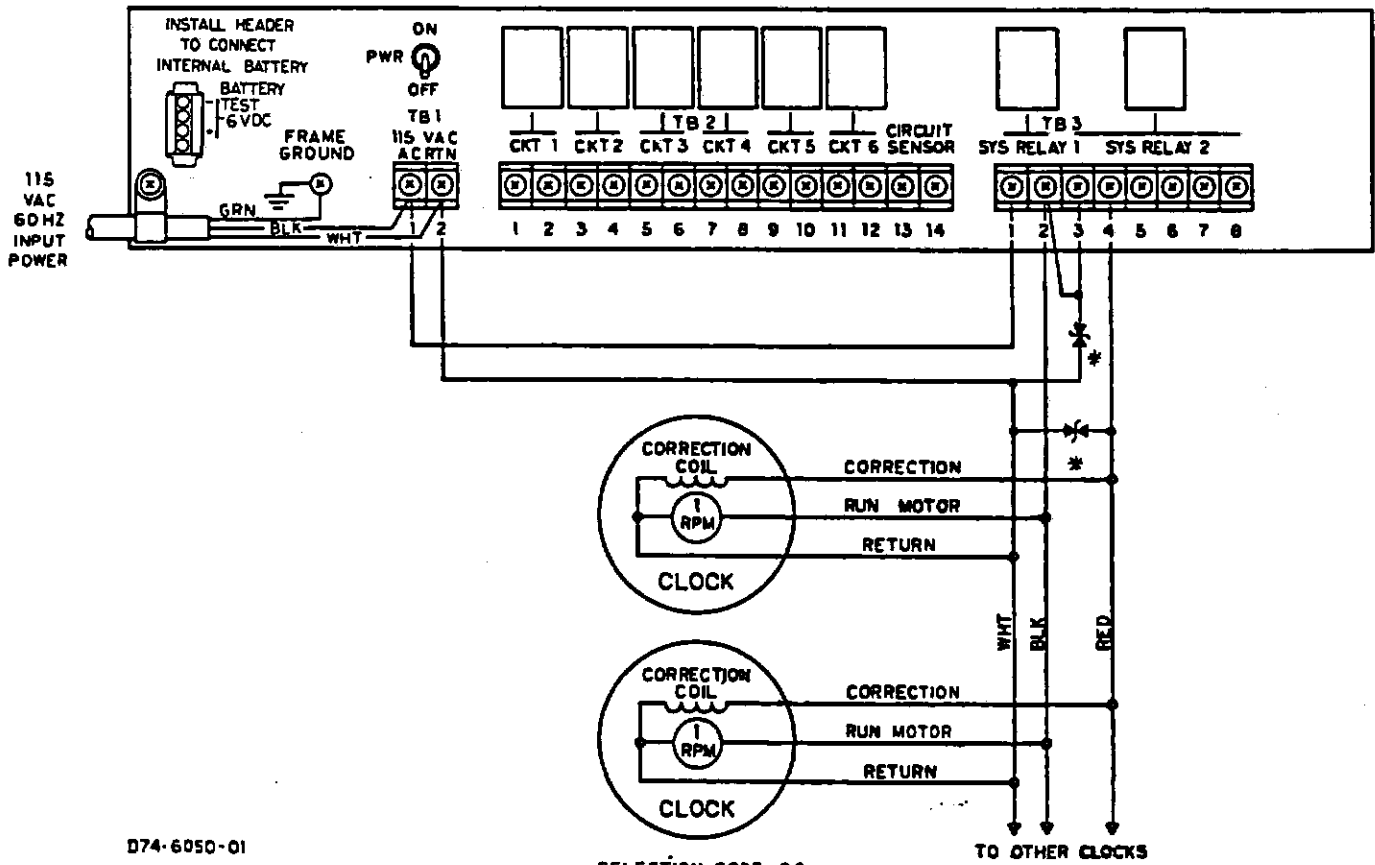
**SYNCHRONOUS WIRED**

115VAC is automatically and continuously applied to the clock run motor line. 115VAC is automatically applied to the clock correction coil for 55 seconds each hour from XX:58:05 to XX:59:00 to provide hourly corrections. To provide 12-hour corrections, 115VAC is automatically applied to the clock correction coil for 55 seconds each four minutes from 5:03:05 through 5:47:59.

The secondary clocks of this type which can be used with the CLK-6A are:

- Cincinnati D8
- Faraday Three-wire synchronous

**ENTER SECONDARY CLOCK SELECTION CODE 06**



D74-6050-01

SELECTION CODE 06

\*=GE C5 2504 V250 LA4

## DUKANE DIGITAL CLOCKS

When power is first applied to the CLK-6A Master Program Clock and the Secondary Clock Selection Code 07 has been entered, the master clock will initialize to 12:00AM and the Dukane 24F200 digital clocks to 0:00, which is equivalent to 12:00AM. Subsequently, any time change made at the master clock will immediately cause a pulsing at the digital clocks, bringing them to that new time entry. During normal operation, the master and digital clocks will simultaneously increment each minute. Once during every 24-hour period, at 12:00:56AM, the master unit will reset the digital clocks to 0:00 to synchronize them with the master. Whenever the digital clocks are not synchronous with the master, they can be adjusted manually by following Mode 3 (7 key) instructions.

The SYS LED will illuminate when a clock-advance is manually initiated; at the 56th second the digital clocks will

reset to 0:00 and, at the 59th second, will begin to pulse until they agree with the current master time. The SYS LED will then extinguish.

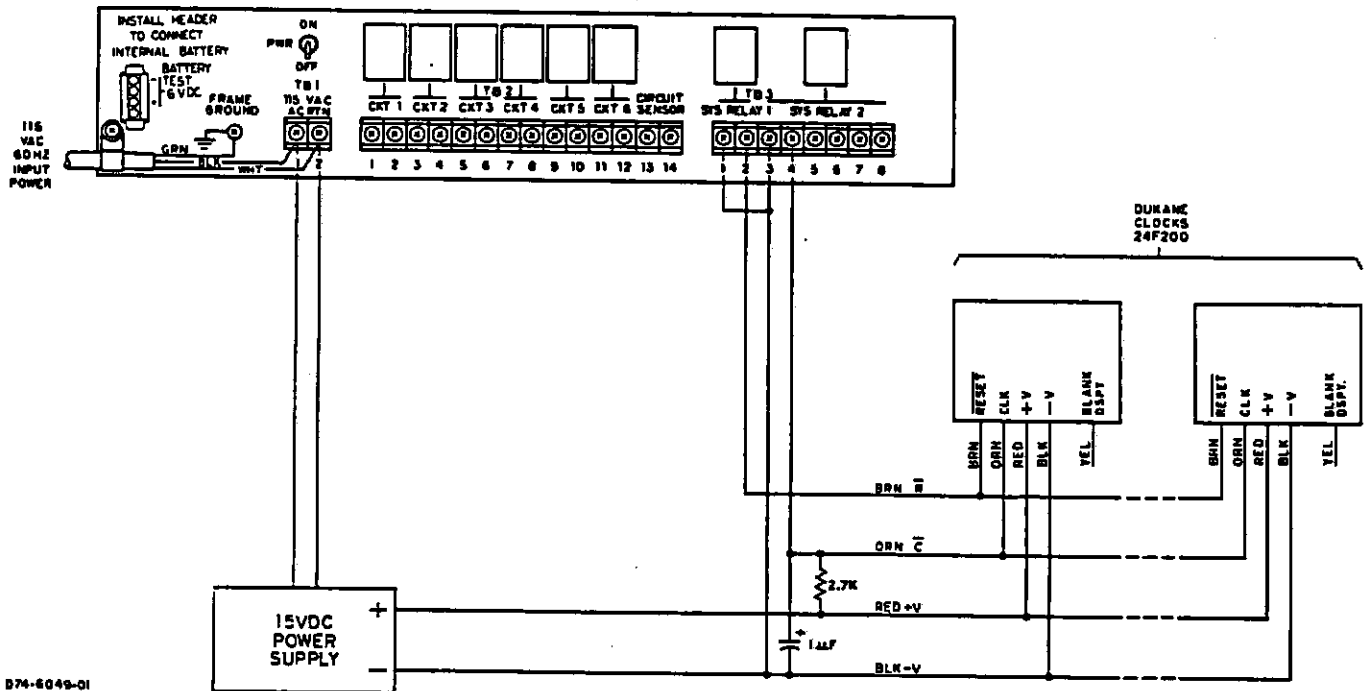
A Daylight Saving entry will result in the digital clocks reading 0:00 at 2:00AM Sunday; the master will then impulse them to either 1:00AM or 3:00AM, depending upon Mode 7 input.

The secondary clocks of this type which can be used with the CLK-6A are:

Dukane 24F200, \*24DC200, \*24DW200,  
\*25F200

\*Mounting variations of the basic Model 24F200.

### ENTER SECONDARY CLOCK SELECTION CODE 07



074-6049-01

24F200 DUKANE CLOCKS  
SYSTEM SELECTION CODE 07

# RAULAND 2410 DIGITAL CLOCKS (115VAC)

## NOTE

The Rauland 2410 (115VAC) Digital Clocks maintain the correct time by counting (sensing) the AC line frequency—115VAC at 60Hz. If the voltage drops below this level, they will advance at a rate of two minutes per second, until the correct time is reached.

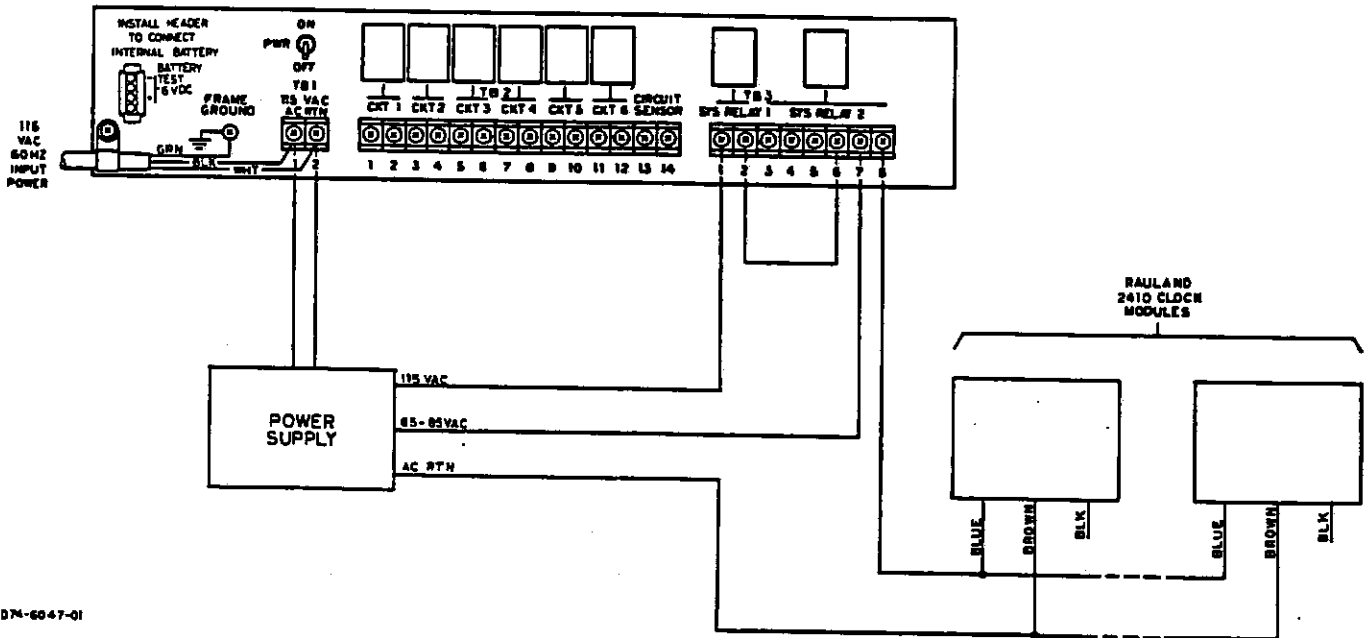
When power is first applied to the master clock and the Secondary Clock Selection Code 08 is entered, the CLK-6A will initialize to 12:01:00AM and apply normal voltage to the Rauland 2410 digital clocks, causing them to set at 12:01:00AM, also. Subsequently, any time change made at the master clock will cause the SYS LED to illuminate, indicating the digital clocks are about to be corrected. At the 56th second, the master will remove power from the digital clocks; at the

59th second it will apply low voltage to the secondary clocks until they agree with the current master time. Normal voltage will then be applied and the SYS LED will extinguish.

During normal operation, the master and digital clocks will increment simultaneously each minute. Once during every 24-hour period, at 12:00:56AM, the master unit will remove power from the secondary clocks and, at 12:00:59AM, will reapply normal voltage, thereby synchronizing the digital clocks with the master unit. Then, if for any reason, the digital clocks are not synchronous with the master, they can be adjusted by following instructions listed under Mode 3 (7 key—manual clock advance).

A Daylight Saving entry (either forward or backward) will cause the master clock to remove power from the digital clocks at 2:00AM Sunday and then apply low voltage until they reach either 1:00AM or 3:00AM, based upon Mode 7 input and normal voltage will resume.

## ENTER SECONDARY CLOCK SELECTION CODE 08



DN-6047-01

RAULAND 2410 CLOCKS (115VAC)  
SYSTEM SELECTION CODE 08

# RAULAND 2410 DIGITAL CLOCKS (24VAC)

## NOTE

The Rauland 2410 (24VAC) digital clocks maintain the correct time by counting (sensing) the AC line frequency—24VAC at 60 Hz. If the voltage drops below this level, they will advance at a rate of two minutes per second until they reach the correct time.

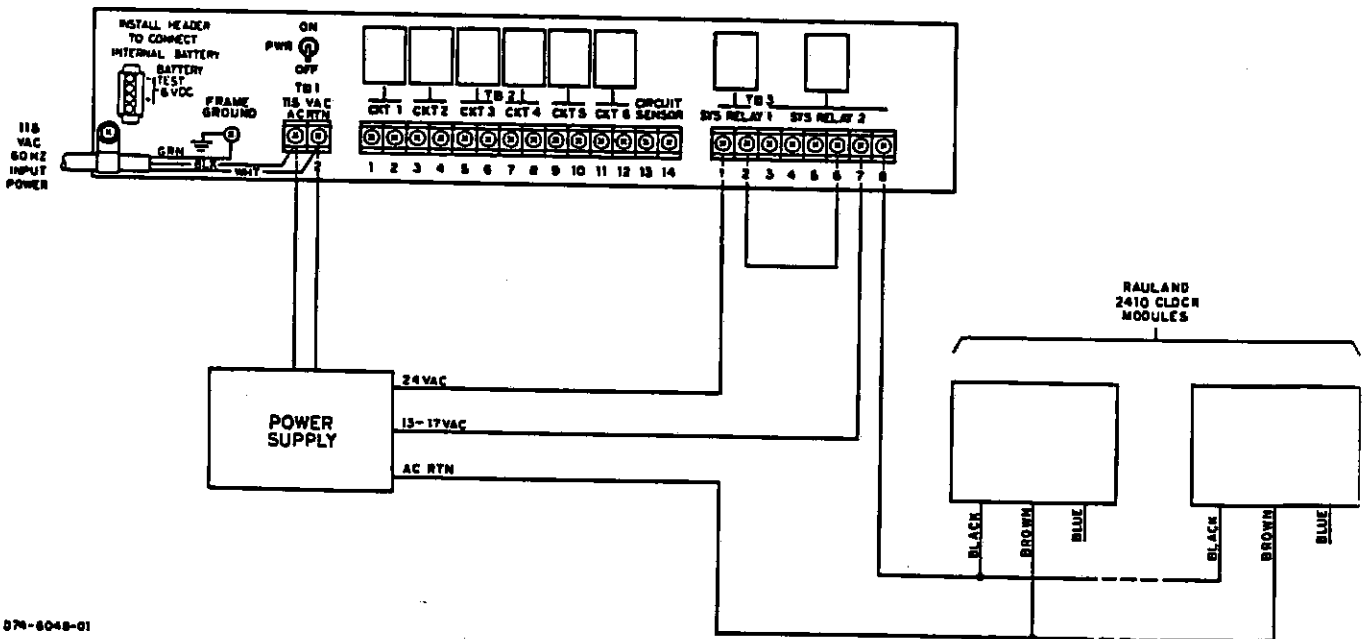
When power is first applied to the master clock and the Secondary Clock Selection Code 08 has been entered, the CLK-6A will initialize to 12:01:00AM and apply normal voltage to the digital clocks, causing them to set at 12:01:00AM, also. During normal operation, the master and secondary clocks will increment each minute simultaneously. Once during every 24-hour period, at 12:00:56AM, the master unit will remove power from the secondary clocks; at 12:00:59AM it will reapply

normal voltage, thereby synchronizing the digital clocks with the master at 12:01:00AM.

Subsequently, any time change made at the master clock will cause the SYS LED to illuminate, indicating the digital clocks are about to be corrected. At the 56th second, the master clock will remove power from the digital clocks; at the 59th second will apply low voltage to these clocks until they agree with the current master clock time. Normal voltage will then be applied and the SYS LED will extinguish. If, for any reason, the digital clocks are not synchronous with the master, they can be adjusted by following instructions under Mode 3 (7 key—manual clock advance).

A Daylight Saving entry (either forward or backward) will cause the master clock to remove power from the digital clocks at 2:00AM Sunday and then apply low voltage until they reach either 1:00AM or 3:00AM, based upon Mode 7 input and normal voltage will resume.

## ENTER SECONDARY CLOCK SELECTION CODE 08



874-8048-01

RAULAND 2410 CLOCKS (24VAC)  
SYSTEM SELECTION CODE 08



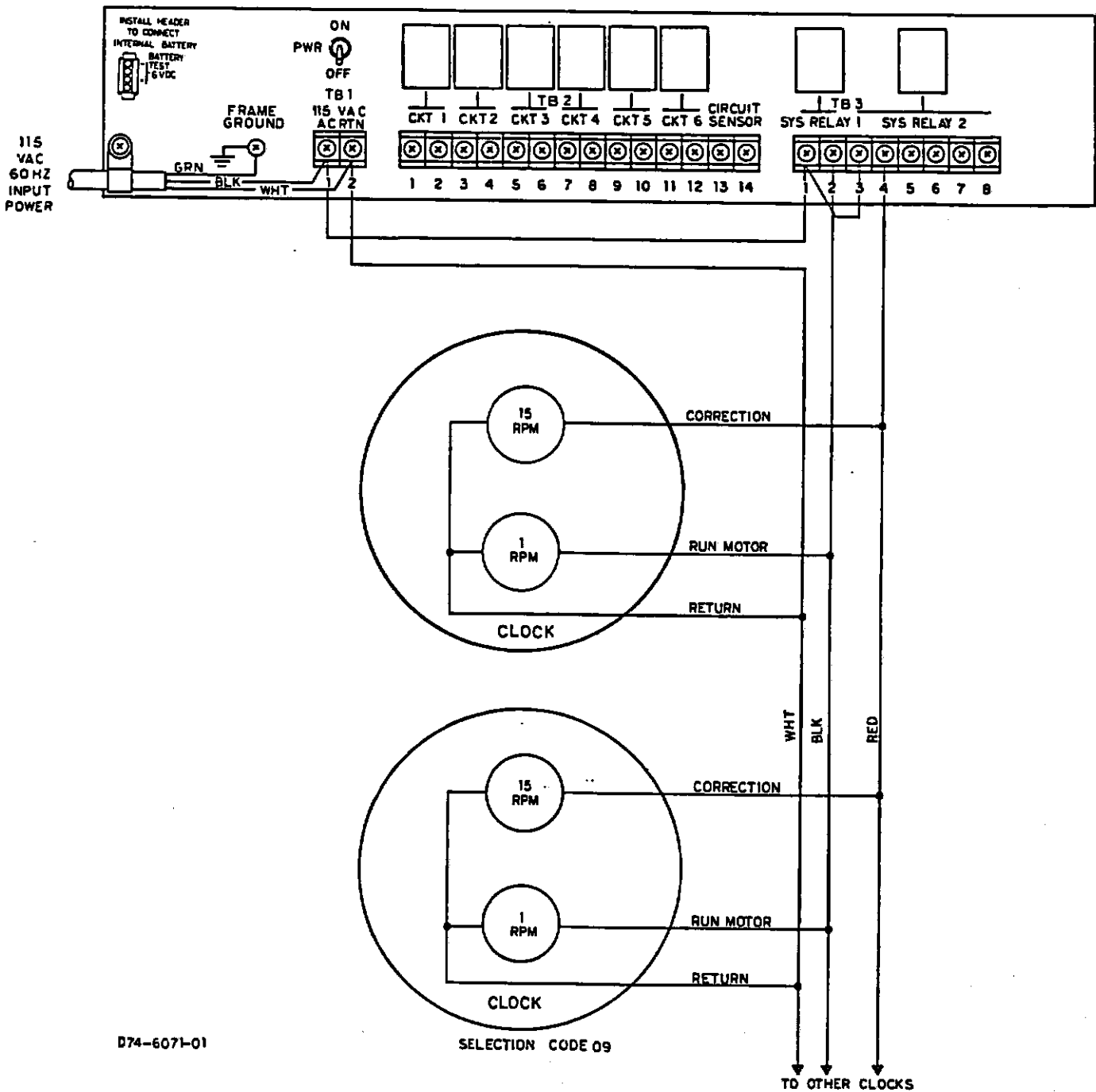
### 59th MINUTE DUAL MOTOR

Normally, power is automatically applied to the 1RPM run motor. Each hour from 58:05 through 58:59, power is automatically removed from the 1RPM run motor and applied to the fast advance motor. Also, during manual clock corrections, power is automatically removed from the 1RPM run motor and applied to the fast advance motor for four minutes. During correction of clocks due to power failures, power is automatically

applied to both the 1RPM run motor and the 15RPM fast advance motor for a period of 1/15th of the amount of time lost. The secondary clock of this type which can be used with the CLK-6A is:

Simplex                      59th Minute dual motor

### ENTER SECONDARY CLOCK SELECTION CODE 09.



### 45th MINUTE DUAL MOTOR

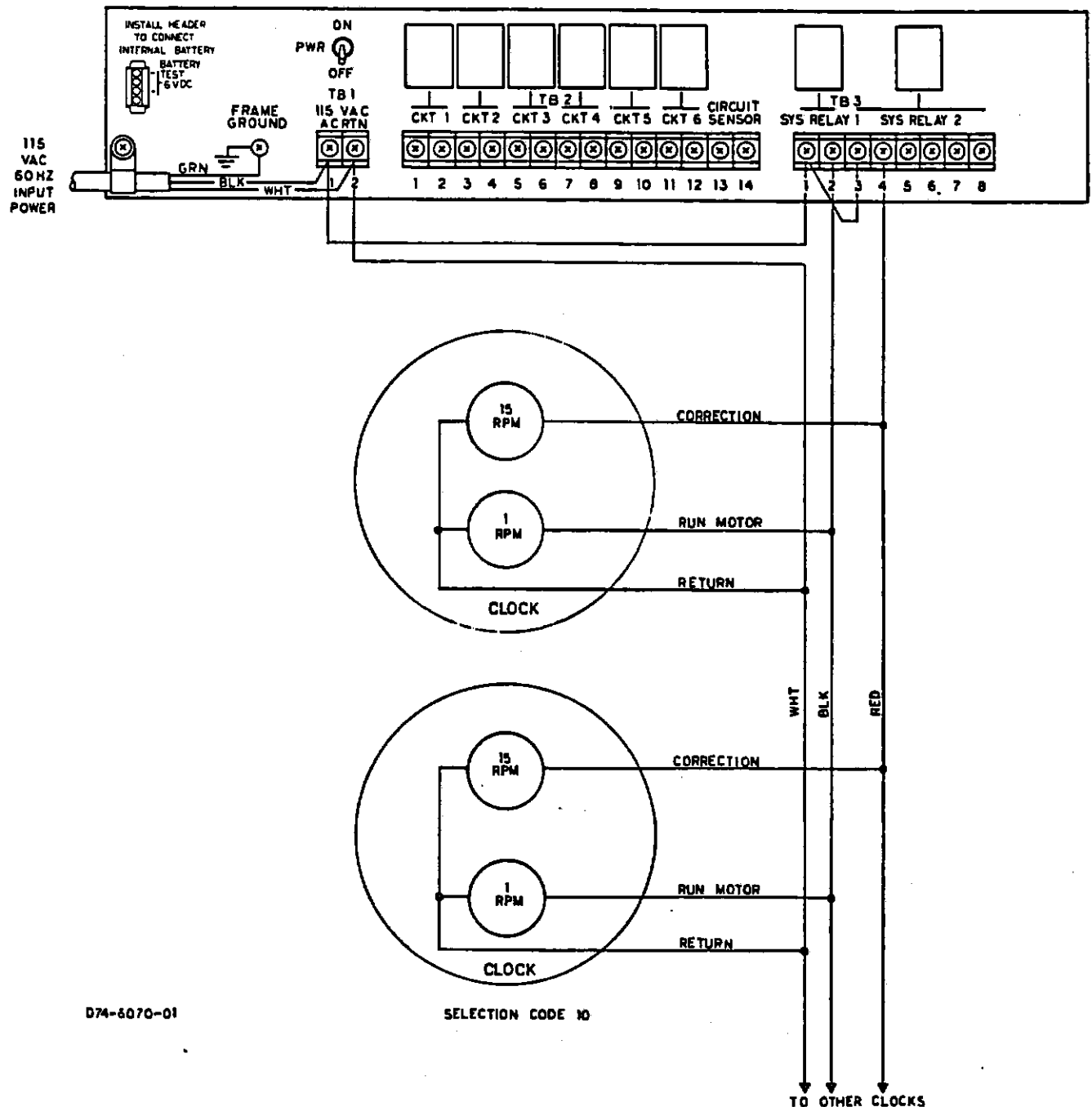
Normally, power is automatically applied to the 1RPM run motor. Each hour from 44:05 through 44:59, power is automatically removed from the 1RPM run motor and applied to the fast advance motor. Also, during manual clock corrections, power is automatically removed from the 1RPM run motor and applied to the fast advance motor for four minutes. During correction of clocks due to power failures, power is automatically

applied to both the 1RPM run motor and the 15RPM fast advance motor for a period of 1/15th of the amount of time lost.

The secondary clock of this type which can be used with the CLK-6A is:

Simplex                      45th Minute dual motor

**ENTER SECONDARY CLOCK SELECTION CODE 10.**



D74-6070-01

## DUAL MOTOR

For normal timekeeping, power is automatically applied only to the run motor. During power failures, while secondary clocks are stopped and during their correction, the master clock accumulates the number of seconds lost by the secondary clocks. Immediately following power restoration, the relays for the run motor and the fast advance motor will operate. Power will be applied to the fast advance motor for 1/10th the number of seconds accumulated, until the secondary clocks are advanced to the correct time. At that point, SYS RELAY 2 will open and SYS RELAY 1 will operate to maintain normal timekeeping.

A Daylight Saving entry will cause the master clock to automatically de-energize SYS RELAY 1, resulting in the loss

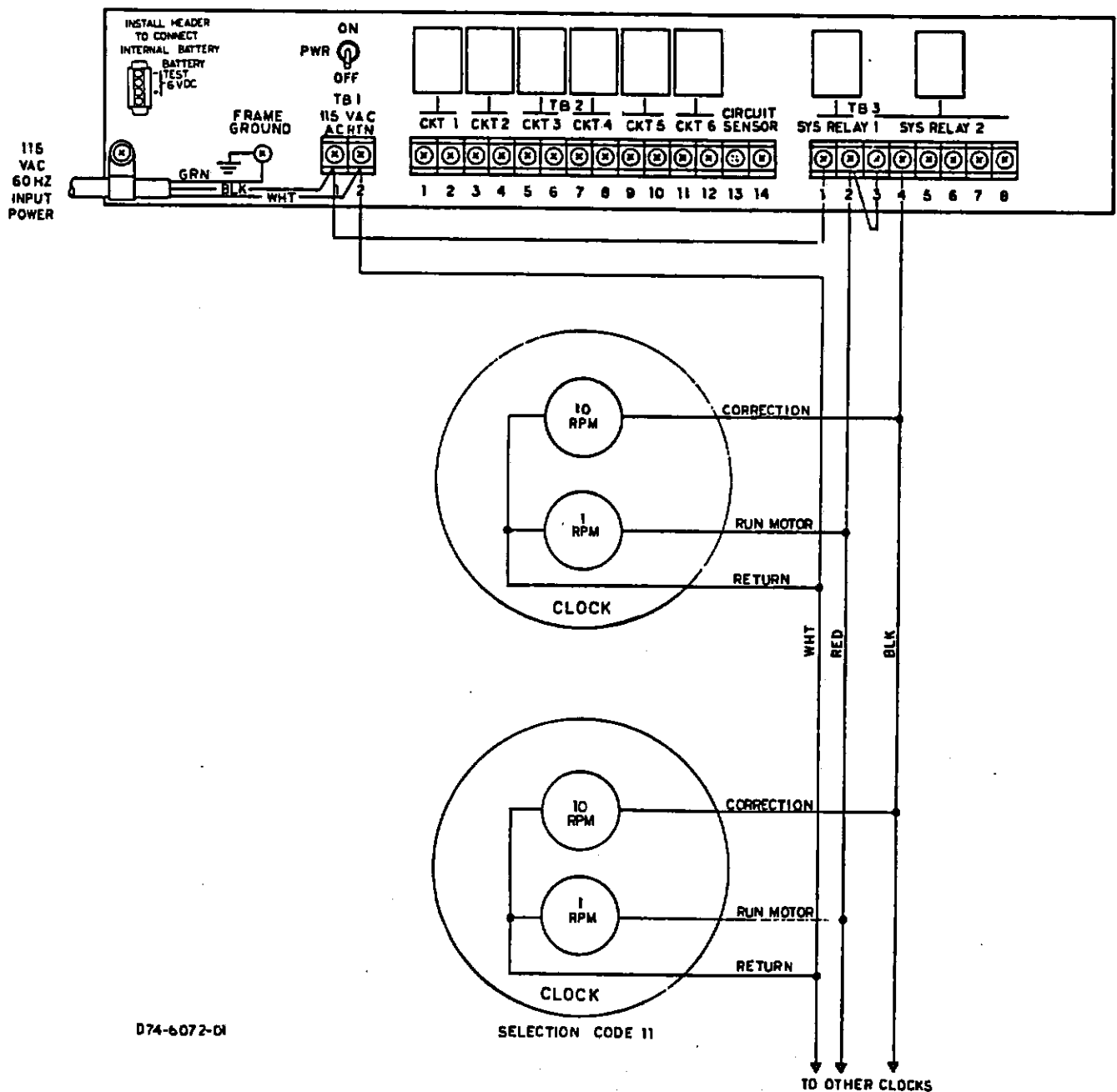
of one hour, or will energize SYS RELAY 2 for approximately 6 minutes and 40 seconds to advance clocks one hour. Clocks can be manually advanced one hour via Mode 3. Manual advance and correction advance due to power failure can be aborted at any time by reentering Mode 3. The abort method is convenient when clocks need to be advanced less than one hour. If a regression in time is desired, remove the SYS RELAY 1 connection until the desired time has been reached.

The secondary clock of this type which can be used with the CLK-6A is:

Edwards

Dual motor

### ENTER SECONDARY CLOCK SELECTION CODE 11.



**TWO-WIRE DUAL VOLTAGE**

Each minute from the 58th second to the 00 second, a pulse of low voltage (24VDC) will be automatically transmitted. The secondary clocks will receive the pulses until the 58th minute; then, from the 50th second to the 00 second, a higher voltage pulse (48VDC) will be transmitted to advance to the hour.

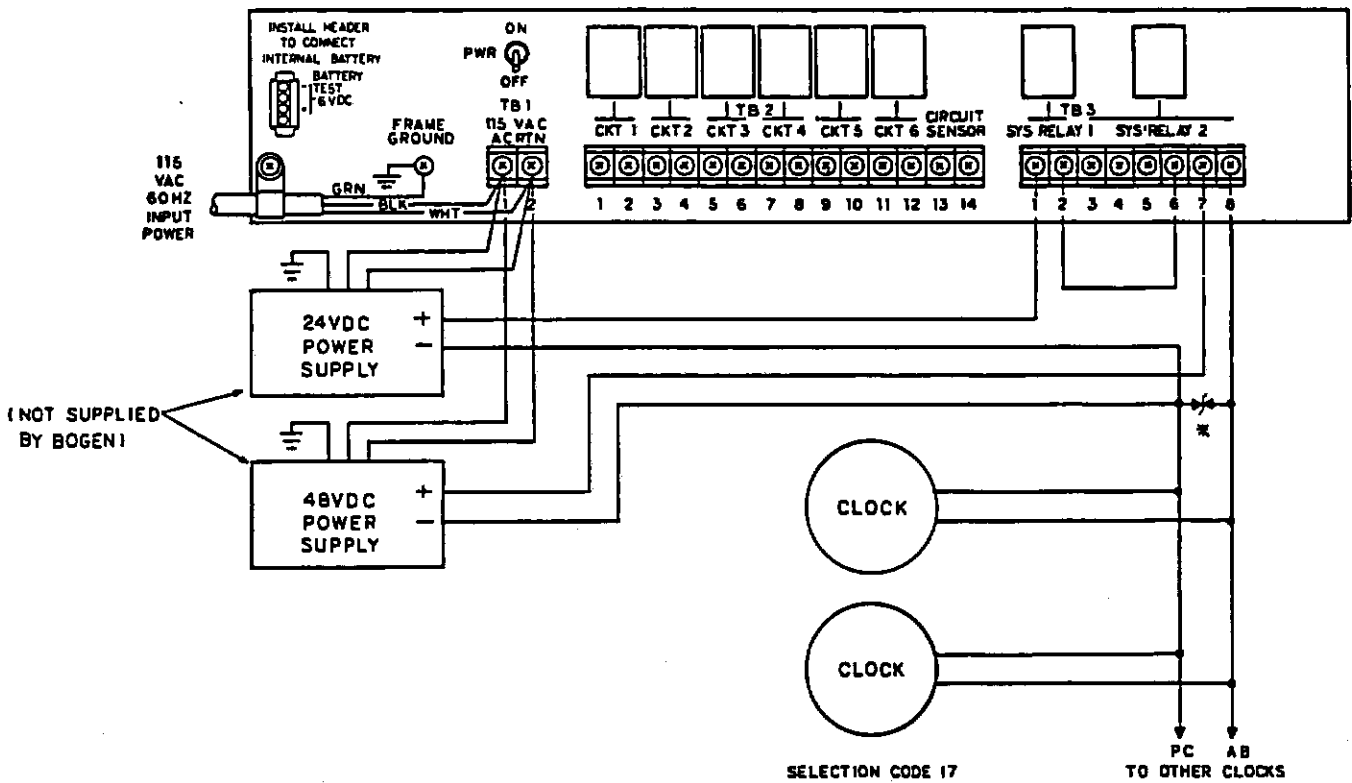
Manual clock advances and daylight saving advances cause the unit to transmit 62 pulses (1 second ON and 1 second OFF—

at 0.5Hz rate) which are all 24VDC. Normal minute pulses are inhibited during these pulses.

The secondary clock of this type which can be used with the CLK-6A is:

Standard Electric Time AR-2

**ENTER SECONDARY CLOCK SELECTION CODE 17**



D74-6200-01

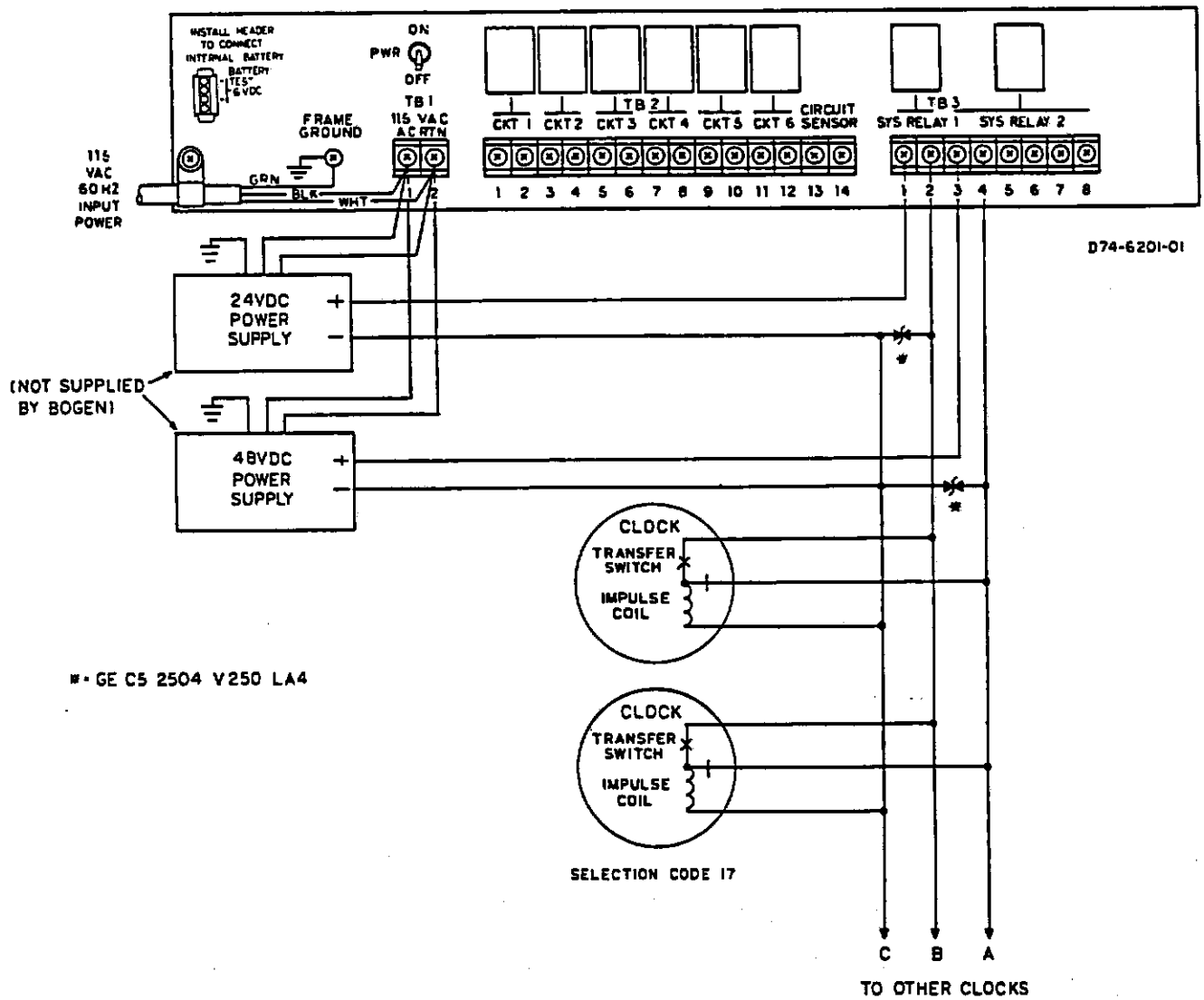
**THREE-WIRE IMPULSE**

Each minute from the 58th second to the 00 second, a pulse will be transmitted on line A. The secondary clocks will receive the pulses until the 58th minute; then from the 50th second to the 00 second a pulse is required on line B to advance to the 59th minute.

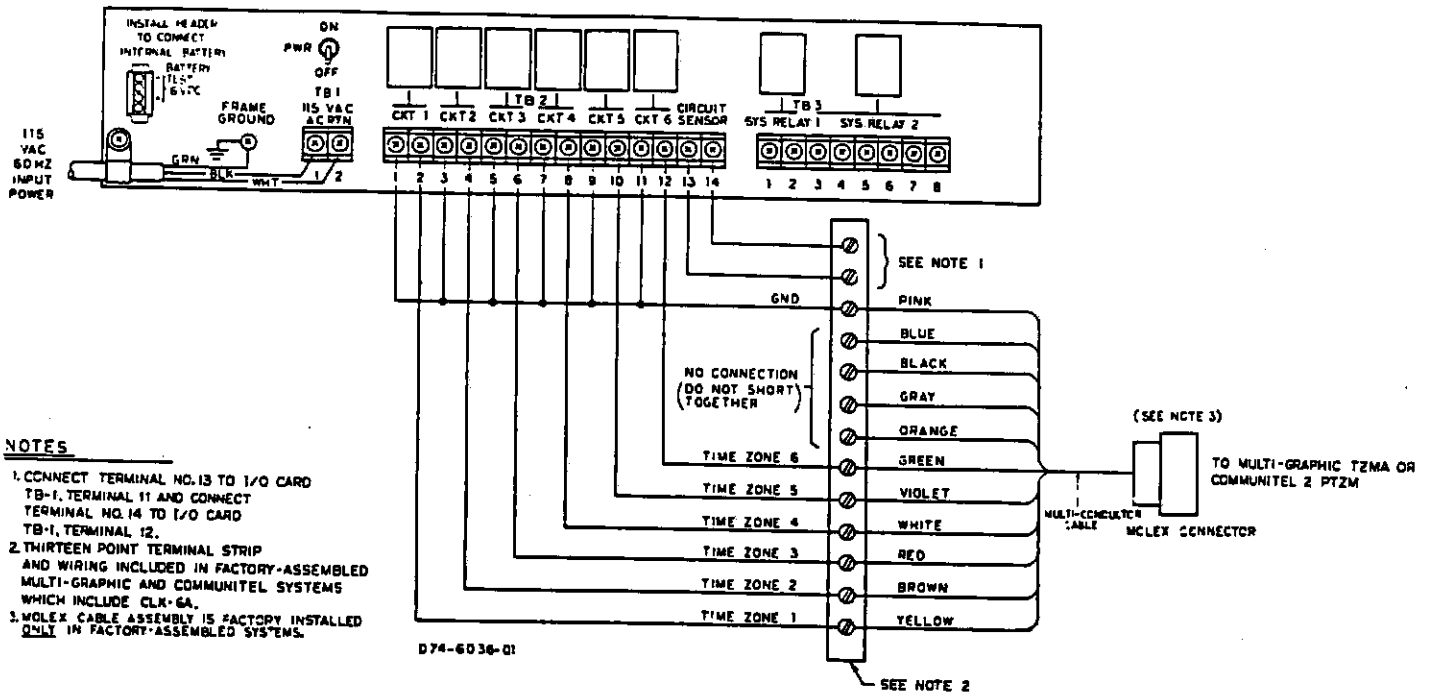
The secondary clock of this type which can be used with the CLK-6A is:

Standard Electric Time AR-3

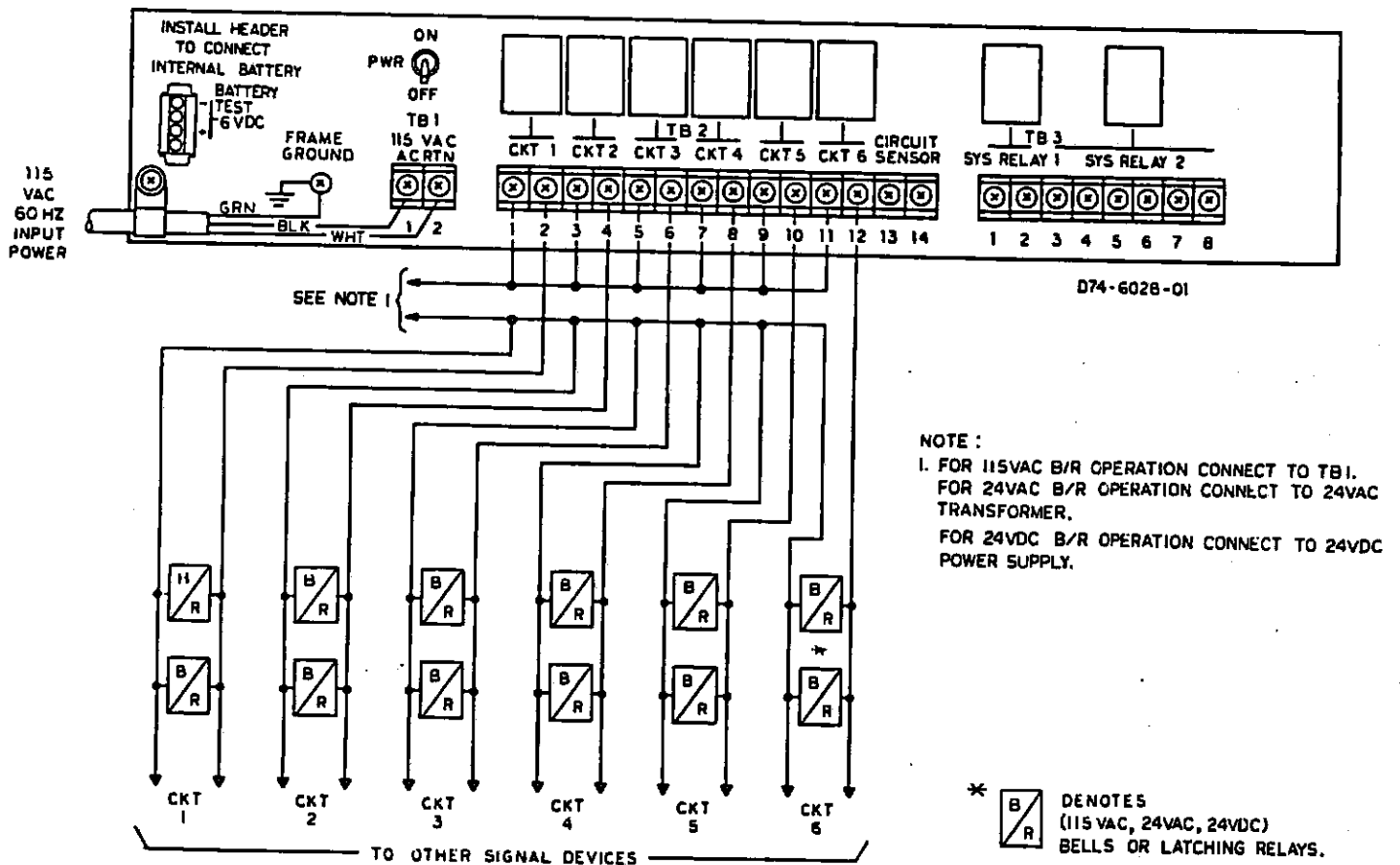
**ENTER SECONDARY CLOCK SELECTION CODE 17**



# GE C5 2504 V250 LA4

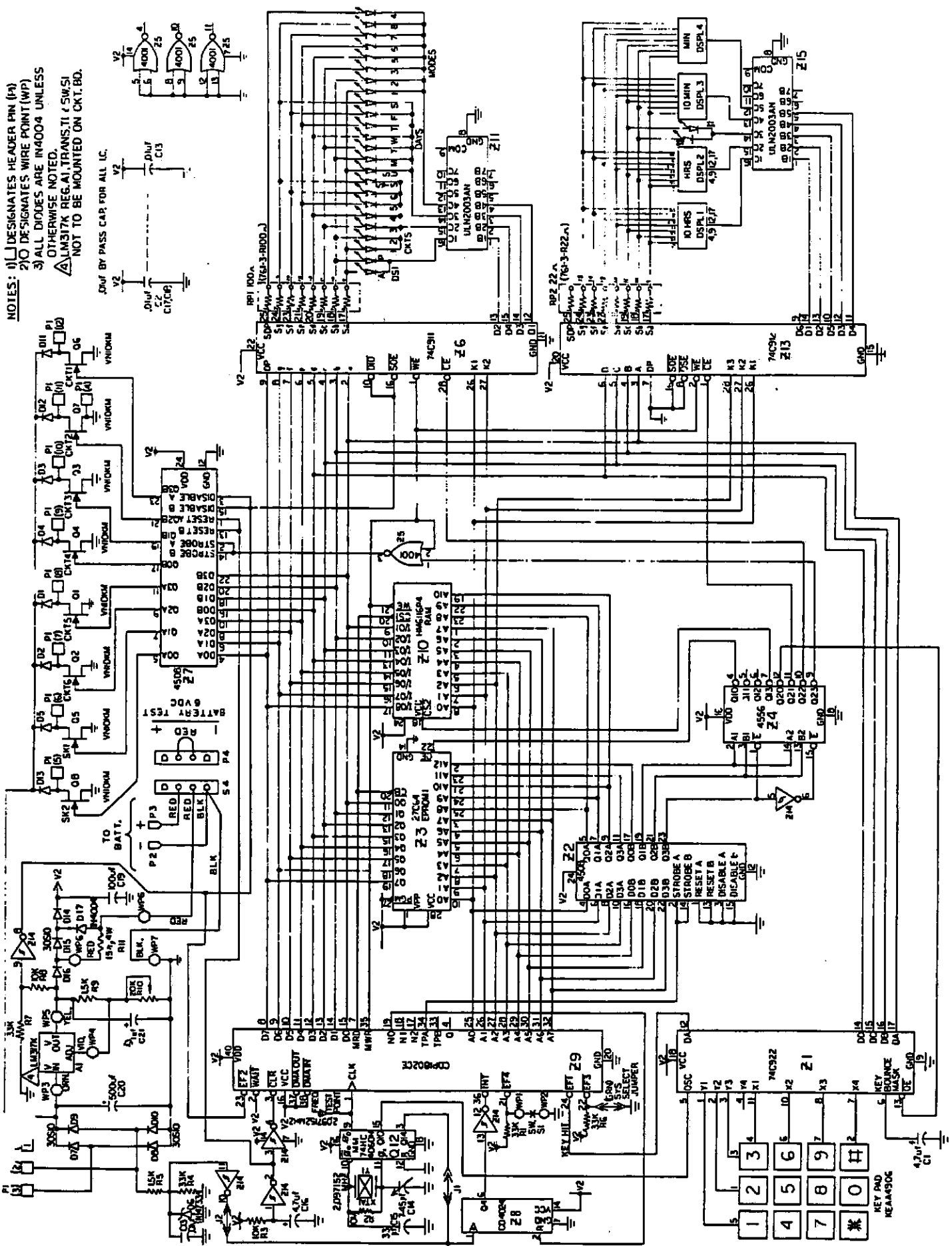


**Control Circuit Wiring Diagram for Six-Circuit Time Signalling  
—with Multi-Graphic and COMMUNITEL Systems**

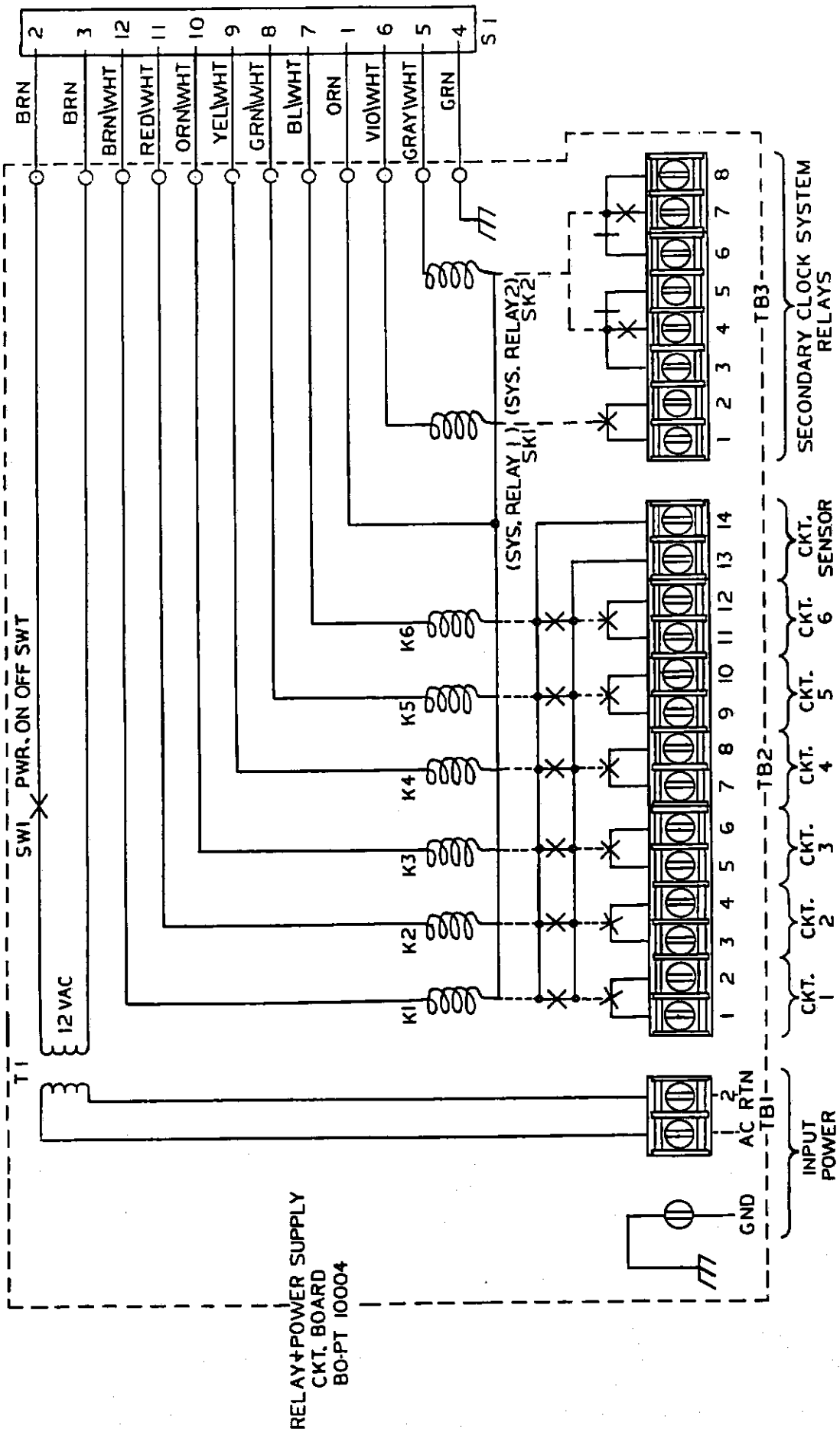


**Control Circuit Wiring Diagram for Ancillary Signalling and/or  
Latching Relay Control Functions**

- NOTES:
- 1) [ ] DESIGNATES HEADER PIN (HP)
  - 2) [ ] DESIGNATES WIRE POINT (WP)
  - 3) ALL DIODES ARE IN4004 UNLESS OTHERWISE NOTED.
  - 4) LM317K REG. A1, TRANS. TI 45W/51 NOT TO BE MOUNTED ON CKT. BD.
- DNF BY PASS CAP FOR ALL IC.

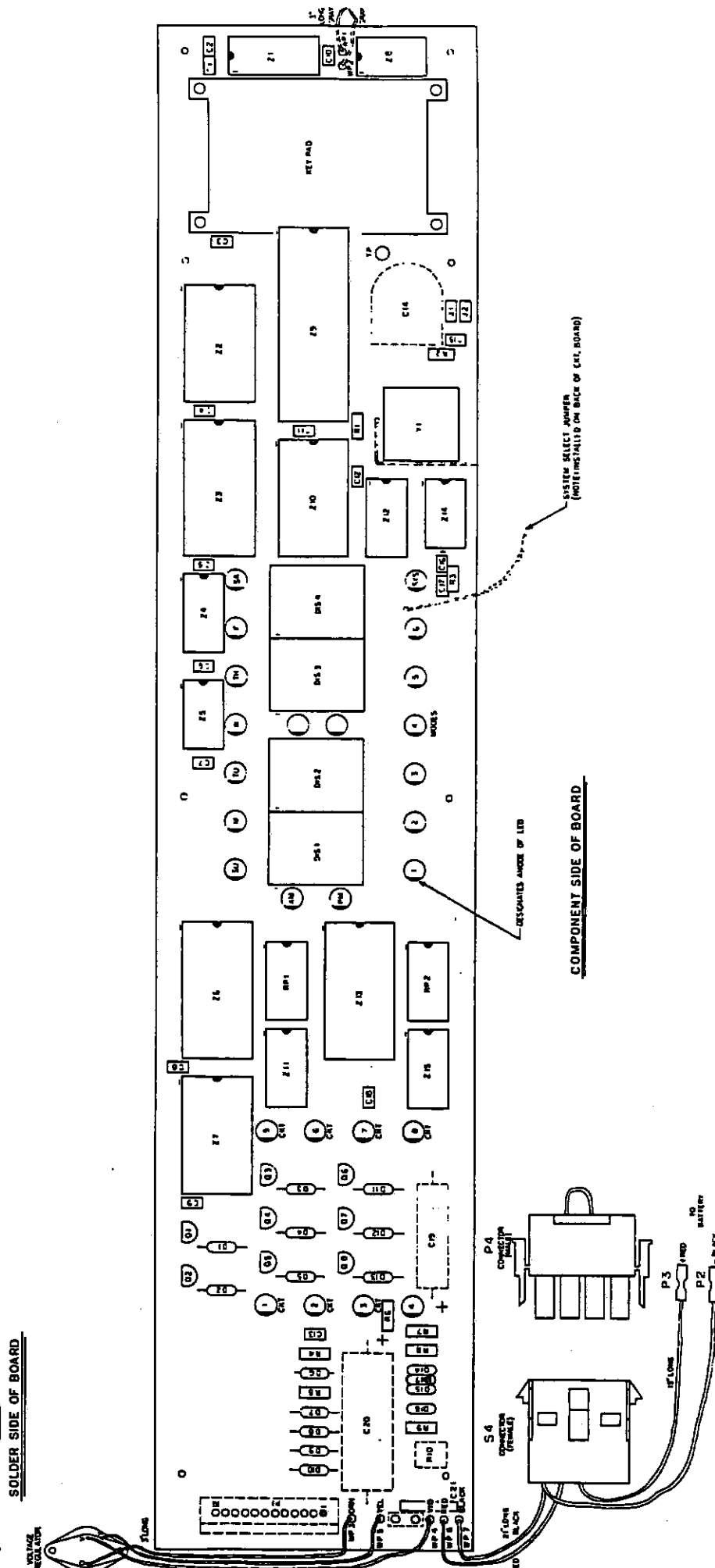
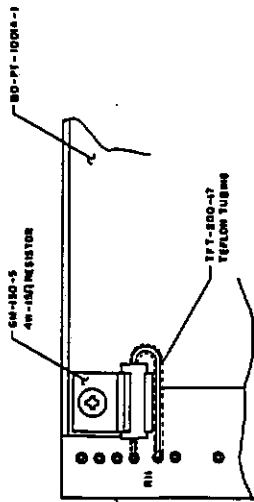


CLK-6A Schematic Diagram



CLK-6A Relay and Power Supply  
Circuit Board Wiring Diagram





**CLK-6A Timer Assembly Board Diagram**





