



# 2524 ChronoCom™ Master Clock and Intercom Controller Installation

RAULAND-BORG CORPORATION • 3450 West Oakton Street, Skokie, Illinois 60076-2951 • (708) 679-0900

## General Information

### Description

The Rauland 2524 combines the full features of a **master clock** with intercom control functions. As a master clock, it can correct virtually any secondary clocks and control up to 350 "events" (such as ringing bells or turning lights and equipment on and off). As an intercom control center, it enables a user to "dial" room speakers, displays the number of a room calling in, and provides software zones for bell tones and paging. For security applications, it can automatically check the wiring to room stations every hour (or manually at any time) and enable an intercom user to monitor selected rooms in order to listen for disturbances.

The unit's LEDs **and keypad make it easy to enter and check** all programming. Of **special note is the ease with which any part of the programming can be accessed and**

changed without having to cycle through many **other** parts and without having to re-enter every-thing else.

### Unpacking

The 2524 is shipped with all the hardware needed to mount it in a rack. Locate the following items before discarding the packing material:

Qty.	Description	Rauland Part No.
4	#10-32 x 3/8" black machine screw.	B0439
4	#10 Flat Washer.	WJ0305
4	Fiber Washer.	WL0315
4	Tinnerman for #10-32 mounting screw.	AB3640
1	Intercom-functions label.	N1710

## Specifications

Programming Capacity:	tip to 350 Events and 100 Holidays. Up to 500 Room Stations.	Outputs:	8 Zone/Output contacts, each with a relay (120-VAC, 5-Amp resistive).
LED Digit Displays:	Mode, time or Station Number, and Schedule.	Power Failure Back-up:	Five-year, 3-volt lithium battery.
LED Indicators:	AM and PM 8 Zones Outputs 7 Days. Music, Clock, and Communication (COMM).	Power Required:	<b>120-230 volts.</b> 50 or 60 Hz, 20 watts.
Keyboard:	18 Buttons: '0 through 9," Left and Right Cursors, four functions, Clock-Comm select, and Manual.	Dimensions:	19" (48.3 cm) panel, 3" (8.9 cm) high, 9" (24.1 cm) deep (including rear conduit box).
		Net Weight:	<b>9 lbs. (4.1 kg).</b>
		Panel Finish:	Textured charcoal gray, with white numerals and function designations.

## Planning

The attached wiring diagrams show typical installations for the 2524: used as a master clock only, and used in typical clock-and-intercom applications. You will also find helpful information in the next subsection, "Accessories."

### Zones

What may require closer attention in more complex installations is the wiring to the 2524's "Zone/Output"

terminals. For a thorough explanation of "zones," consult the **2524** programming manual, KI-1629. Briefly remember that outputs used for clock corrections or equipment control cannot be used for other "event," such as clock tones and music on class changes. You will also need to coordinate the wiring of secondary clocks with the "Mode A" and clock-code programming mode. Be sure to fill out

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the "Zones Chart" (in the *programming* manual), which should be kept with this manual.

### Associated Equipment

This list is representative only. The 2524 is designated to be highly flexible. Therefore, it is not practicable to list every possible application in this manual. What is listed, the attached wiring diagrams, and the descriptions of the outputs should cover most applications and give you some ideas for working out special installations.

### Clock Equipment

**Secondary Clocks:** The 2524 can correct all of Rauland's secondary analog and digital clocks. It can also correct all of the widely distributed clocks from other manufacturers (see the list and the wiring diagrams at the end of this manual). Finally, you should be able to program a special correction code for virtually any other clocks **that are not handled by the standard codes.**

**Clock Power Supplies:** Rauland's 2415 24-VAC and 2416 120-VAC Power Supplies can handle up to 25 secondary clocks per unit.

**Buffers:** The 2524's outputs each have a relay that can handle up to five amperes of current at up to 120 VAC or 30 VDC. Should the equipment you connect to a given **output require more** power, you can accommodate it by using buffers. The 2418 AC Buffer can switch up to 10 amperes at 110 VAC, and the 2419 DC Buffer can switch up to five amperes at 60 VDC (the higher voltage is needed by minute-impulse clocks). Wiring two or more buffers to **split** the load **increases** the total load that the output can handle

**2417 Correction Module:** This is used to enable the 2524's "DIG" output to control a power supply with up to 25 digital secondary clocks.

### Intercom Equipment

**Director Control Panels:** The combination of the 2524 and a Director intercom system provides a sophisticated communications control center. The intercom panels enable the user to talk and listen to rooms, and to distribute program material (from optional program sources and over optional power amplifiers). The 2524 shows all-ins on its display, enables the user to dial rooms on its keypad, and provide software zones for paging (and time tones). All of the station-related functions also require optional speaker relay modules and room speakers.

**Speaker Relay Modules:** These panels carry out the zoning and calling commands from the 2524 by connecting the proper rooms. The TC4 130, like the TC4 120 (SCC25), has a chassis for rack-mounting. The TC4131, like the TC41 10 (SC25), is designed to be mounted on the back of Rauland switch panels, such as the SW Series.

**Telephone:** A CRT3 Staff Telephone can be used for communicating with room stations and paging. The 2524 will show call-ins on its display and signal them with "beeps." Again, this requires optional relay modules for **switching the speakers on.** Also required is a TC4160 CM2 Voice-Controlled Module) which is an amplifier

unit that automatically switches from "listen" to "talk" when the telephone user begins speaking. For a more complete display of all-ins (and for a remote location), install a TC4200 Vacuum Fluorescent Display. See the attached wiring diagram KM0983.

**Music:** The 2524 can distribute a program or music source connected to its "Program" input for continuous listening. It can also distribute a program source connected to its "Music" input as part of a class-change event. Besides the relay modules and room speakers, this requires a program source, such as the Rauland MCX300 Tuner and Tape Cassette Player, and a power amplifier.

### Output Terminals

In the following descriptions, the 2524's rear terminals are described in order, from left to right as viewed from the rear of the chassis.

**In-Gnd-Out:** These four wire-wrap terminals (there are two "GND" pins) can be wired to a standard RS-232 cable and **connected thence to a computer or a modem for remote programming, or to a serial printer** to provide a log of intercom activities, **event execution, and faulty lines (see the sample log below).** For the wiring to the cable, see the attached KM0991.

**RPI:** This potentiometer must be adjusted for the 2524 to respond to all-ins (see "Calibrating RPI" in this manual).

**SC25:** This 26-pin connector must be connected to all optional speaker relay panels in the system. It conveys the data for switching the **speaker** relays.

## Logging Messages

### Print-out

<.CALL 126  
11:37AM 4-5-90  
<.ANSW 126  
11:38AM 4-5-90  
<.EMER 129  
11:45AM 4-5-90  
<.ANSW 129  
11:45AM 4-5-90  
<.ZONES 1234  
12:45PM 4-5-90  
<.FAULT 101  
1:00PM 4-5-90  
<.TIME 00:00:00

### Explanation

**Station 126 placed normal call at 11:37 AM 4/5/90**  
**Call from Station 126 answered.**

**Station 129 placed emergency call.**

**Call from Station 129 answered.**

Event occurred on Zones I, 2, 3, and 4 at 12:45 P.M. on 4/5/90.  
**Fault detected at station 101.**

**Synchronization command sent at midnight.**

**Answer:** Momentarily connecting this input to a circuit ground instructs the 2524 to connect a remote telephone to a station that is calling in. If this and a ground terminal

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arc wired across the phone's hook switch (use the "Aux" terminals on the CRT3). Lifting the handset will immediately connect it to the caller. It is also necessary to keep the "Reset" terminal (described next) connected to a circuit common throughout the communication. See the attached KM0983.

**Reset:** This must remain connected to a circuit common while the remote phone is paging or in communication with a room station. Connect this input and a ground terminal across the hook switch of a remote phone (the "Aux" terminals on a CRT3 Staff Telephone). Note that this output is active when it is high: it disconnects the paging and intercom amplifiers and releases the speaker relays unless it is grounded. See the attached KM0983.

**Page In:** Momentarily connecting this input to a circuit common instructs the 2524 to connect a remote telephone to all room stations for an All-Page announcement. This takes precedence over the "Answer" terminal. Thus, if "Page" and "Answer" are grounded simultaneously, the 2524 will party out the page and ignore the answering function. If the remote telephone is in communication with a room station, pressing the Page button would disconnect the room and engage the paging function. It is also necessary to keep the "Reset" terminal (described immediately above) connected to a circuit common throughout a page. See the attached KM0983.

**In:** Connecting another master clock here enables it to control the time in this unit. When the 2524 receives a valid synchronization signal from another Rauland master clock, it changes its time to 12:01 a.m.

**Gnd:** This is a circuit common, which also serves as the ground.

**S-Bus:** These screw terminals are for the balanced 25-volt speaker audio lines. They must be connected to the S-Bus terminals of all the optional relay panels in the system. Refer to the attached wiring diagrams for more details.

**IC Amp:** Connect the intercom-amplifier output of an optional Director master control panel to these screw terminals. The 2524 can then internally connect this audio to the S Bus, which runs from it to the optional relay panels. Refer to the attached KM0983 and KM0984 for more details.

**A Amp:** These screw terminals are used to receive the output of the "A" Channel amplifier. The 2524 internally connects this to the S Bus for program-distribution and paging functions. Refer to the attached system wiring diagrams for more details.

**Music Amp:** Connect the output of the music amplifier to these screw terminals to provide music after clock tones (controlled by the event programming). If there is a remote phone install an external relay as shown in KM0983.

Connect the VCM2's "S" terminals to this relay's normally closed contacts and the music amplifier to its normally open contacts. With this arrangement, lifting the remote telephone off-hook causes the 2524 to internally connect the C Bus with the S Bus. When an event calls for music, the "Music" terminal pulls in the external relay, connecting the music amplifier's output to these "Music Amp" terminals; the 2524 internally connects these terminals to the S Bus.

Since only one source of programming can be distributed at a time, the "A" Channel amplifier may be wired in parallel to this input, as shown in the attached system wiring diagrams. However, if the customer wants to use a different program source for program-distribution and the music associated with clock tones, connect a separate music amplifier and source to these terminals.

**LCD:** These three terminals are connected to the corresponding terminals on an optional TC4200 Vacuum Fluorescent Display.

**Music:** This output is used to control an optional external relay when there is a remote phone (see the attached KM0983). When a clock event calls for music after a tone, this terminal is internally grounded, which activates the external relay (see the "Music Amp" terminals, above).

**Beep:** The 2524's built-in Sonalert® beeper will signal all-ins. If a signal is desired in another location (e.g., by a remote phone that does not have an associated TC4200 display), the 2524 can also drive an external 6-VDC Sonalert type of sounding device. Connect the device's positive lead to the "Beep" terminal and its negative lead to a ground terminal.

**Busy:** These outputs are used to connect an external indicator (LED, lamp, etc.), which could be used by the remote phone to show when the 2524 is being used for communications or programming. The device will be activated whenever the front-panel keypad is used, and will remain on until that function has ended. The "+" terminal can provide up to 45 milliamperes of current.

**Page Out:** This output is wired to a Director master control panel when a remote phone is installed (see the attached KM0983). When the remote phone performs an All-Page, the 2524 connects this output to the circuit common. This, in turn, causes the master control panel to feed the remote phone's audio into the "A" Channel amplifier.

**+5V** This output can be used as an auxiliary power supply (5 Vdc, 100mA). Its most common application is to power a 2417 Correction Adapter Module, which is used with the "DIG" output (explained next).

**DIG:** This output sends serial data pulses that can be used to control digital secondary clocks. This application requires a 2417 Correction Adapter Module.

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**GND:** A chassis ground, which also serves as the circuit common. To be used when connecting 24 17 Correction Adapter Module to 2524.

**OUT1-OUT8:** These eight pairs of screw terminals are for the relay contacts, to which you can connect signaling devices, secondary clocks, equipment, or relay panels. Each relay is normally open, can handle up to five amperes

of current at 30 VDC or 120 VAC, and has an arc-suppression Circuit connected across it.

**-GND-:** These three screws on the far right are for connecting the unit to 120-VAC power. The middle terminal is for chassis ground, and the two outer (—) terminals are for the hot and neutral lines.

## Installation

### Rack Mounting

The 2524 is designed for mounting in a standard 19-inch rack. No special treatment is required if other equipment is mounted next to it.

Step 1. Locate 3½ inches of rack space where 2524 will be mounted. Slide the four supplied # 10 Tinnerman clips over the mounting holes in the channel rails. (If the channel rails holes are tapped, do not use these clips.)

Step 2. Prepare the mounting screws by placing a black flat washer and then a fiber washer over each one (all supplied).

Step 3. Position the 2524 in the rack, align its front-panel mounting holes with the Tinnerman clips, and use the four prepared machine screws to secure it to the channel rails.

### Wiring

Follow the attached wiring diagrams and refer as necessary to the earlier descriptions of the terminals and accessories. What follows here are a few helpful details.

#### Screw-Terminal Cover

To access the screw terminals, remove the shield from the bottom of the electrical box that is attached to the rear of the chassis (on the right, as viewed from the rear). Remove the two sheet metal screws, then disengage the cover's tabs from the slots in the 2524's chassis by sliding the cover to the left and then pulling it straight back. Reverse this process to re-secure the cover.

For a permanent installation and to protect against shock hazard, run the 120-VAC wires through conduit attached to one of the cover's knockouts. If you are running both high- and low-voltage wires, use separate conduits and knockouts. For any low-voltage wires run in conduit, use the knockout nearest the "Zone/Output" terminals. The 120-VAC wires should be 14-AWG or heavier-gauge, and they should have an added six-inch loop inside the cover.

#### Signaling Devices and Equipment

The attached KM0987 shows how signaling devices and equipment can be connected for each zone. If two or more signaling devices are required for a given zone, they can be connected in parallel and share the connections to the relay terminals for that zone. For loads that exceed the built-in relays' rating, you can install 24 18 or 24 19 Buffers (see the "Accessories" descriptions in the earlier part of this manual).

The 2524 can activate these devices for up to 59 seconds or "latch" them on for any number of minutes, up to a week. For more information, refer to "Clock Mode 5" programming in the 2524 programming manual, KI-1629.

#### Correctable Secondary Clocks

The 2524 can simultaneously correct two different types secondary clocks through its "Zone/output" terminals and Clock Mode A programming. The tables and "Figure" drawings at the back of this manual show how to hook up virtually every widely-distributed secondary clock. It is also possible to make a custom code for a dock (in Clock Mode B programming).

Use the secondary-clock table to find the associated drawing for each type of clock. The drawing will tell you the standard code and show the wiring needed.

If only one correction code is used, then Out 7 and Out 8 must be used to connect the secondary clocks. Out 7 will send out the "X" corrections, and Out 8 will send out the "Y" corrections.

If two different correction codes are programmed then tie secondary clocks for first code must be connected to Out 5 (for the "X" corrections) and Out 6 or the "Y" corrections). The clocks for the second code must be connected to Out 7 (for the "X" corrections) and Out 8 (for the "Y" corrections).

#### Telecenter® Systems

Instead of sending tones directly to room speakers, the 2524 can be wired to a Telecenter system and cause the latter to send the tones. In this arrangement, the Telecenter software defines the zones. Telecenter IV systems have eight zones, so the 2524 can control them individually. In contrast, Telecenter 5000 and 5500 systems provide only four zones for time tones. In the TC5000, each of these zones consists of two or three paging zones: for example, the first time-tone zone consists of paging zones 1 and 2, and the fourth time-tone zone consists of paging zones 7-9. The TC5500 simply uses its first four paging zones for time tones. On a TC5000 or TC5500 system, the 2524 also synchronizes the system clock.

Use the appropriate table below for the wiring. Note that the "A" side of each "Zone/Output" terminal used is connected to the corresponding zone input on the Telecenter system, but the "B" sides are jumpered together and connected to a common on the Telecenter system.

### Telecenter IV Wiring Connections

TCIV MIO "B" Connector Pin	2524 'Zone/Output' Terminal Pin	Time Zone
2	1A	1
4	2A	2
6	3A	3
8	4A	4
10	5A	5
12	6A	6
*14	7A	7
• 16	8A	8
18	1B-8B*	[Common]

#### Notes:

1. The "MIO" is the Main Input/Output Board in the TeleCenter IV.
2. The MIO has wire-wrap terminals, and the 2524 has screw terminals.
3. Use 22-AWG tinned cable for all connections.
4. Do not connect the TCIV ribbon cable to the 2524.
5. • Usually the 2524's "Zone/Output" terminals are **used** for correcting secondary clocks and so are not available for connection to a Telecenter system.

### Turning on the 2524

When the power is applied to the 2524, it displays: "Mode" 0, "Time" (the current time), and "Sched" a flash-

## Functional Descriptions

This section explains the way the 2524 operates some special features. The regular operations are explained in the section on the individual outputs, above.

### Supervision

When this function is enabled, the unit scans the speaker stations every hour for shorted, open, or grounded lines. This scanning will start on the hour and proceed when no other activities are taking place (e.g., paging and music events) until either all lines are scanned or the **first** faulty line is found. If it finds a fault, it will flash an 'F' in the "Sched" window, and display the station number **in** the "Time" windows. Push → to continue scanning. You can also have the 2524 do a cycle of scanning at any time by pressing Manual while the unit is in the "Comm" Mode.

Even as it is displaying faults one-by-one in its "Sched" window, the 2524 will immediately send a complete list of all faults to its serial port. Thus, you can obtain an immediate and permanent record of the faults by **connecting** a serial printer or a computer to this port (the "In-Gnd-out" terminals-see "Output Terminals," above and the attached KM0991).

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ing "P" (to indicate that there was a power failure). The unit comes up in CLOCK mode of operation. Push any key to stop the flashing "P."

Note: **When** the clock is turned on for the first time or at any time when the battery was "disabled," the "Time" windows may show random numbers. In **this case set the**

### TC5000 and TC5500 Wiring Connections

TC5000 or TC5500 Terminal	2524 "Zone/Output" Terminal Pin	TC5500 Zones*	TC5000 Zones
1	1A	1	1 and 2
2	2A	2	3 and 4
3	3A	3	5 and 6
4	4A	4	7, 8, and 9
5	DIG	[N.A.]	[N.A.]
-0V	GND and 1B-4B		

• Note: **On the TC5500, Zone 9 can be** programmed (#20\*) to (a) ring with only Zone 1, 2, 3, or 4, (b) ring when any of those Zones ring, or (c) not ring at all.

date and the time (Clock Modes 1 and 2-see KI-1629).

### Adjusting the Call-in Sensitivity

You must adjust Pot RPI on the 2524 for call-in sensitivity before running the **unit in the "Comm" mode** or activating the call-scanning function in Mode E. Use **Comm** Mode 5 programming to make this adjustment (see KI1629, the 2524 programming manual).

### Monitoring

When this function is activated by the operator, the 2524 connects each selected room station, one by one, to the Director control panel's **speaker**. **Each station will remain connected for one to 15 seconds, depending upon the programming. This enables the operator to listen briefly to each room** for a disturbance that might call for action. See the **2521 programming manual, ICI-1629**, for details on selecting the rooms, setting the connection time, and enabling the function, and the 2524 operation manual, KI-1630, for details on using the function.

### Music Events

A clock event can specify that a time tone be followed by one to fifteen minutes of music. The 2524 handles this in two different ways, depending upon whether or not it is using speaker relay **panels**.

#### With Speaker Relay Panels

In this case, the Clock Mode E programming will specify a number greater than "0" for **SC25s**.

First, the 2524 sends out the time tone by:

1. Activating the appropriate "Zone/Output" relays

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2. Activating the external tone generator and connecting it to the input of the program amplifier.

3. Connecting the S Bus to the output of the program amplifier.

4. Pulling in the speaker panels' **relays for the appropriate zones.**

Next, the 2524 ends the tones and sends out the music (or other program source) by:

5. Deactivating the "Zone/Output" relays.

6. Switching the S Bus to the output of the music source.

7. Deactivating the external tone generator, disconnecting it from the program amplifier, and connecting the music source in its place.

Finally, the 2524 ends the event by:

8. De-energizing the speaker panels' relays.

9. Connecting the S Bus to a Director control panel or the output of a program amplifier.

### Without Speaker Relay Panels

In this case, Clock Mode E programming specifies "0" for the number of SC25s, and its outputs are connected to a Telecenter system.

First, the 2524 will activate the Telecenter system's tones by:

1. Activating the appropriate "Zone/Output" relays.

Next, the 2524 ends the tones and sends out the music (or other program source) by:

2. Deactivating its "Zone/Output" relays.

3. Switching the Off Bus to the music source's output.

Finally, the 2524 ends the event by:

4. Disconnecting the Off Bus from the output of the music source.

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### Clock Codes

### Clock Codes

SECONDARY CLOCK MANUFACTURER AND MODEL	CLOCK TYPE	REFERENCE FIGURE
Rauland Analog: 2460 Series	Synchronous Wired	1 or 2
NATIONAL- 010-NNE-SRAX, 010-NNE-SRAXLV, 023-NNE-SRAX, 023-NNE-SRAXLV, <b>030-NNE-SRhx</b> , 030-NNE-SRAXLV, 060-12E-SRAX, and 060-12E-SRAXLV (NN = any two-digit number)		
<b>Dukane:</b> 24030, 24023, 24050, 24060 and 24010 types		
<b>SIMPLEX:</b> 2310-91XX 56 and 76 Scria	Electronic- Coded	3
<b>IBM:</b> <b>56, 61, 66, 76, 81</b> and 86 Series		
<b>STROMBERG:</b> E3109 and WS310	Synchronous Wired	4
NATIONAL. 010-NNE-SR, 010-NNE-SRLV, 023-NNE-SR, 023-NNE-SRLV, 030-NNE-SR 030-NNE-SRLV, 060-12E-SR, and 060-12E-SRLV (NN = any two-digit number)	Synchronous Wired	5
<b>DUKANE:</b> 24BF209, 24BF2 12 7078 and 707-9 types	Synchronous- Wired (old type)	6
<b>SIMPLEX</b> 77M45 Series	Synchronous Wired (dual-motor)	7
<b>IBM:</b> 77M-45 Series		

SECONDARY CLOCK MANUFACTURER AND MODEL	CLOCK TYPE	REFERENCE FIGURE
<b>HONEYWELL:</b> <b>ST 402, 403, 404, 4</b> 10, 411, 412, 413, 802, 803, 804, 810, 811, 812. and 813	Synchronous- Wired	8
<b>FARADAY:</b> 1310, 1311. 1320. and 1321		
CINCINNATI: D8		
STANDARD/FARADAY: New Types Models 2310, 2331	Synchronous- Wired (dual-motor)	9
STANDARD ELECTRIC <b>TIME</b> <b>GRC</b> and FMT Series		
COUCH: C452014 through C3452019. and C452 133 through C452145	Minute Impulse	10
<b>SIMPLEX:</b> 77M-59 Series	Synchronous- Wired (dual-motor)	11
IBM 77M-59 Series		
<b>SIMPLEX:</b> 23 10-92XX 57 and 77 Series	Synchronous Wired	12
<b>IBM:</b> 57, 62, 67, 77, 82, and 87 Series		
CINCINNATI: <b>D10 and D12</b>		
<b>LATHEM:</b> <b>SS 12 Types</b>	Minute Impulse	13
<b>ED WARDS:</b> 0 10		
<b>DUKANE:</b> 24SS Series	Minute Impulse	13
<b>STANDARD ELECTRIC</b> <b>TIMEARZ</b>		

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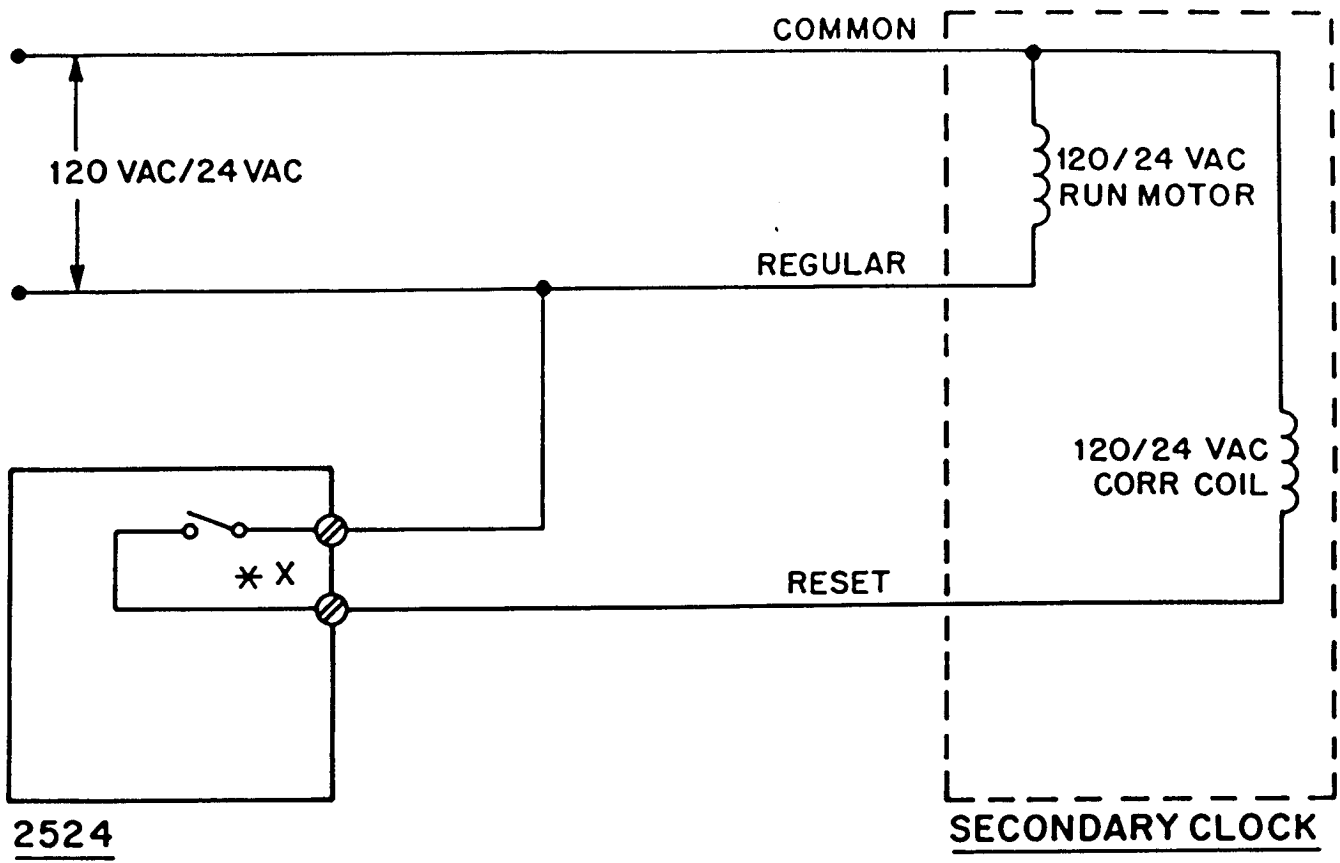
### Clock Codes con t'd

SECONDARY CLOCK MANUFACTURER AND MODEL	CLOCK TYPE	REFERENCE FIGURE
<i>IBM: 55, 60, 65, 75, 80, and 85 Series</i>	Minute Impulse	<b>14</b>
<b>SIMPLEX:</b> 23 10-90XX 55 and 75 Series		
<b>DUKANE:</b> 241SC Series		
<b>CINCINNATI:</b> D3 (two-wire polarized)	Minute Impulse	15
<b>CINCINNATI:</b> D1	Minute Impulse	<b>16</b>
<b>STROMBERG: 2-Wire</b> (58th-minute correction)	Minute Impulse	17
<b>STANDARD ELECTRIC</b> <b>TIME: AR2A</b>	Minute Impulse	<b>18</b>
<b>STANDARD ELECTRIC</b> <b>TIME: AR3A</b>	Minute Impulse	<b>19</b>
<b>CINCINNATI:</b> D6 (two-wire polarized, 12-hour corrective)	Minute Impulse	<b>20</b>
<b>EDWARDS: 06</b>		

### Clock Codes cont'd

SECONDARY CLOCK MANUFACTURER AND MODEL	CLOCK TYPE	REFERENCE FIGURE
AMANO: (Made by STANDARD TIME)	Minute Impulse	21
RAULAND: Digital Secondary using 24 VAC	Digital	22
R A W : Digital Secondary using 120 VAC	Digital	23
<b>RAULAND:</b> Digital Secondary using Serial Output (DIG) and 24 VAC	Digital	24
RAULAND: Digital Secondary wing Serial Output (DIG) and 120 VAC	Digital	25
FRANKLIN Mark 5M	Bi-Polar Im- pulse	26

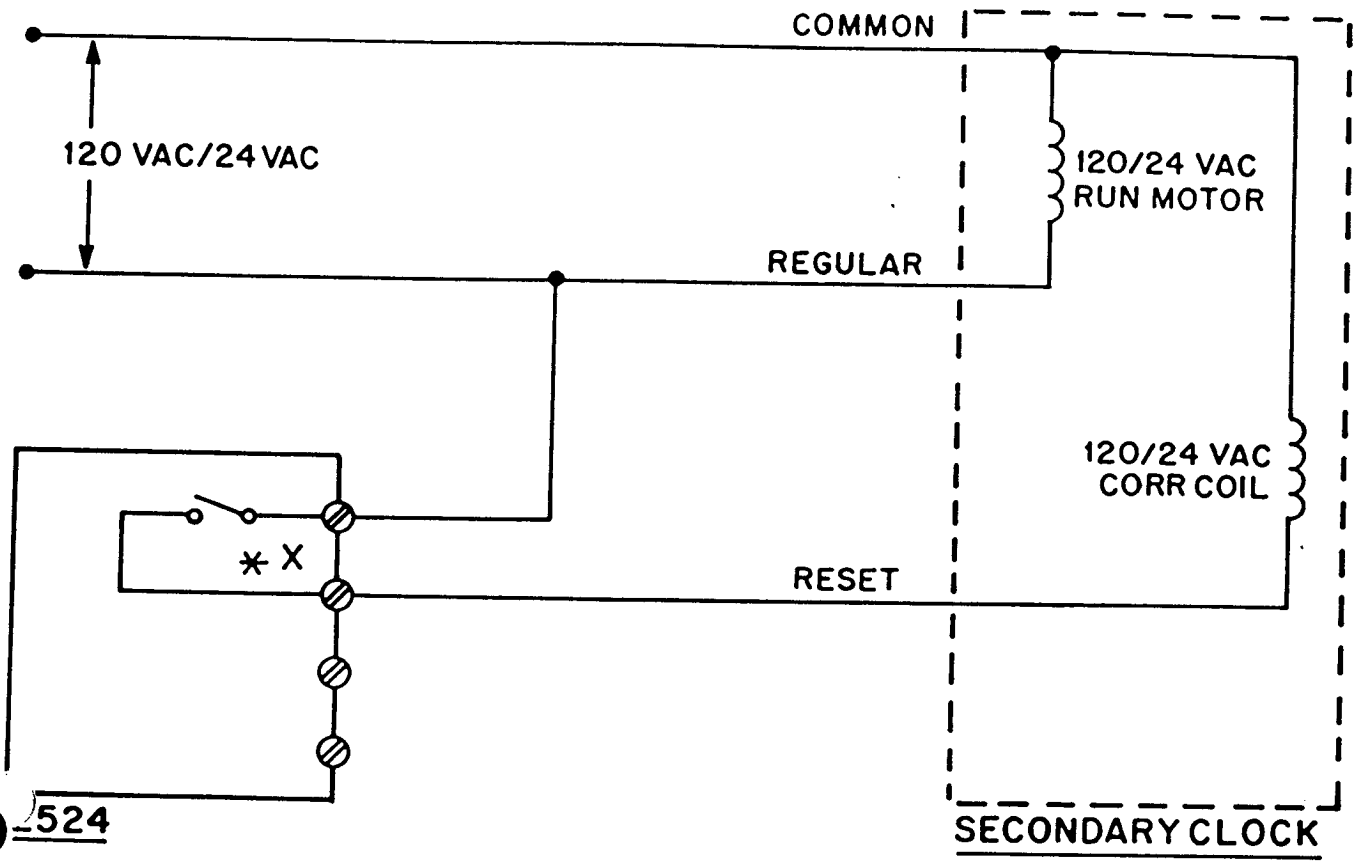




Correction Code (Mode A)	Correction Timing	
	Hourly	12-Hour
#01	"X" is activated for 25 seconds every hour From X:00:00 To X:00:25.	"X" is activated for 24 minutes; 25 seconds every 12 hours (for 25 seconds on and 35 seconds off) From 6:00:00 To 6:24:25.

\* See "Correctable Secondary Clocks" (under "Wiring") to determine the output terminals.

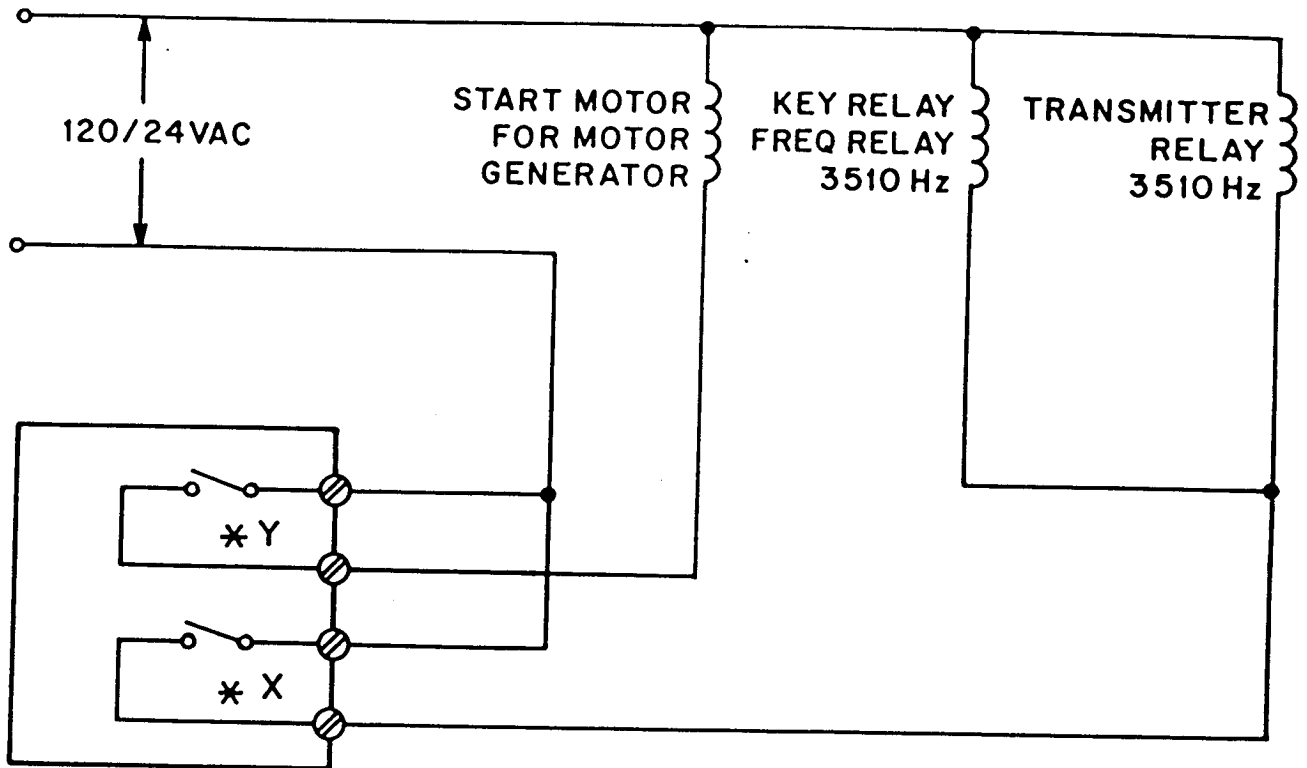
Figure 1.



Correction Code (Mode A)	Correction Timing	
	Hourly	12-Hour
#02	"X" is activated for 25 seconds every hour From X:00:00 To X:00:25.	"X" is activated for 24 minutes every 12 hours From 6:00:25 To 6:24:25.

\* See "Correctable Secondary Clocks" (under "Wiring") to determine the output terminals.

Figure 2.

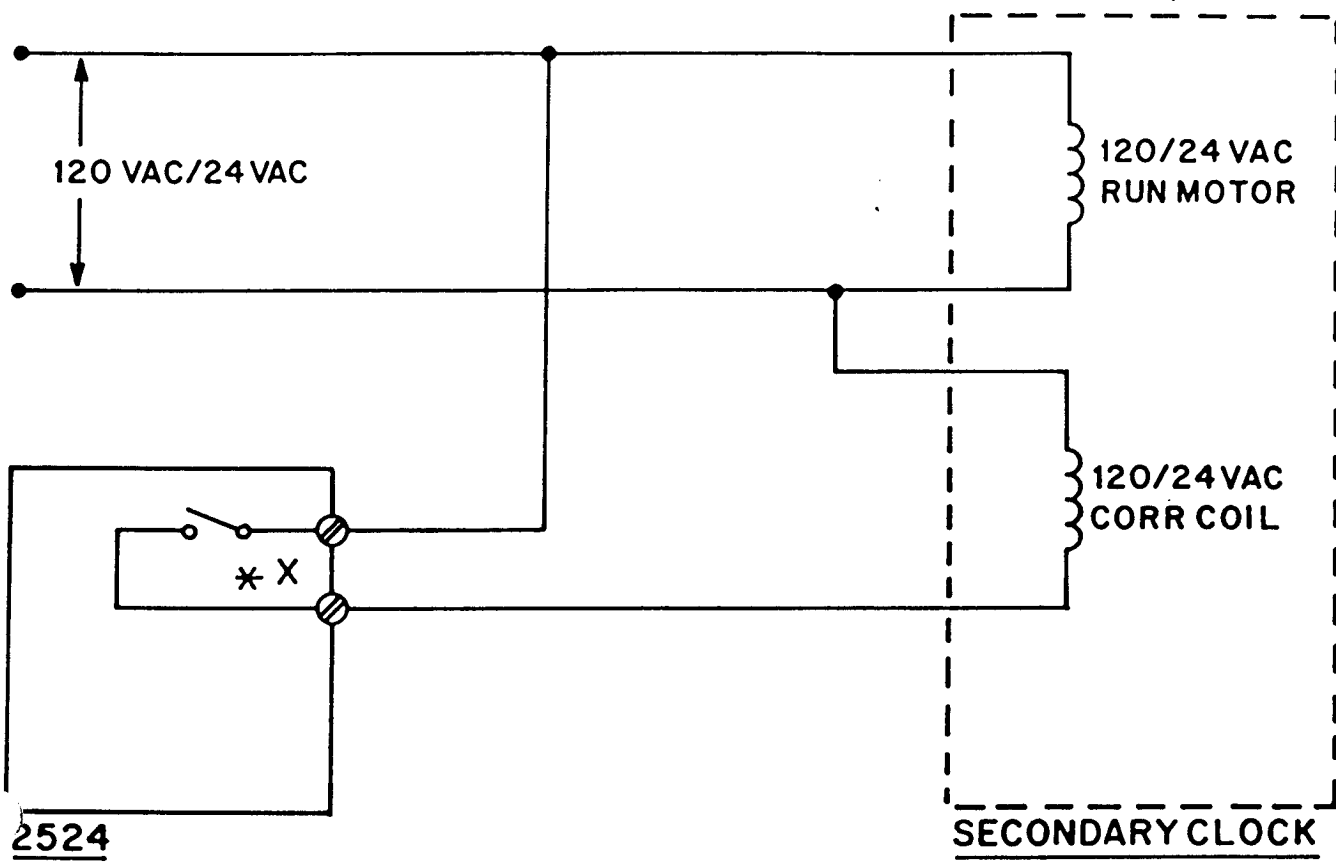


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Correction Code (Mode A)	Correction Timing	
	Hourly	12-Hour
#03	"Y" is activated for 38 seconds every hour From X:57:39 To X:58:17. "X" is activated for 8 seconds every hour From X:57:54 To X:58:02.	"X" is activated for 14 seconds every 12 hours From 5:57:54 To 5:58:08.

\* See "Correctable Secondary Clocks" (under "Wiring") to determine the output terminals.

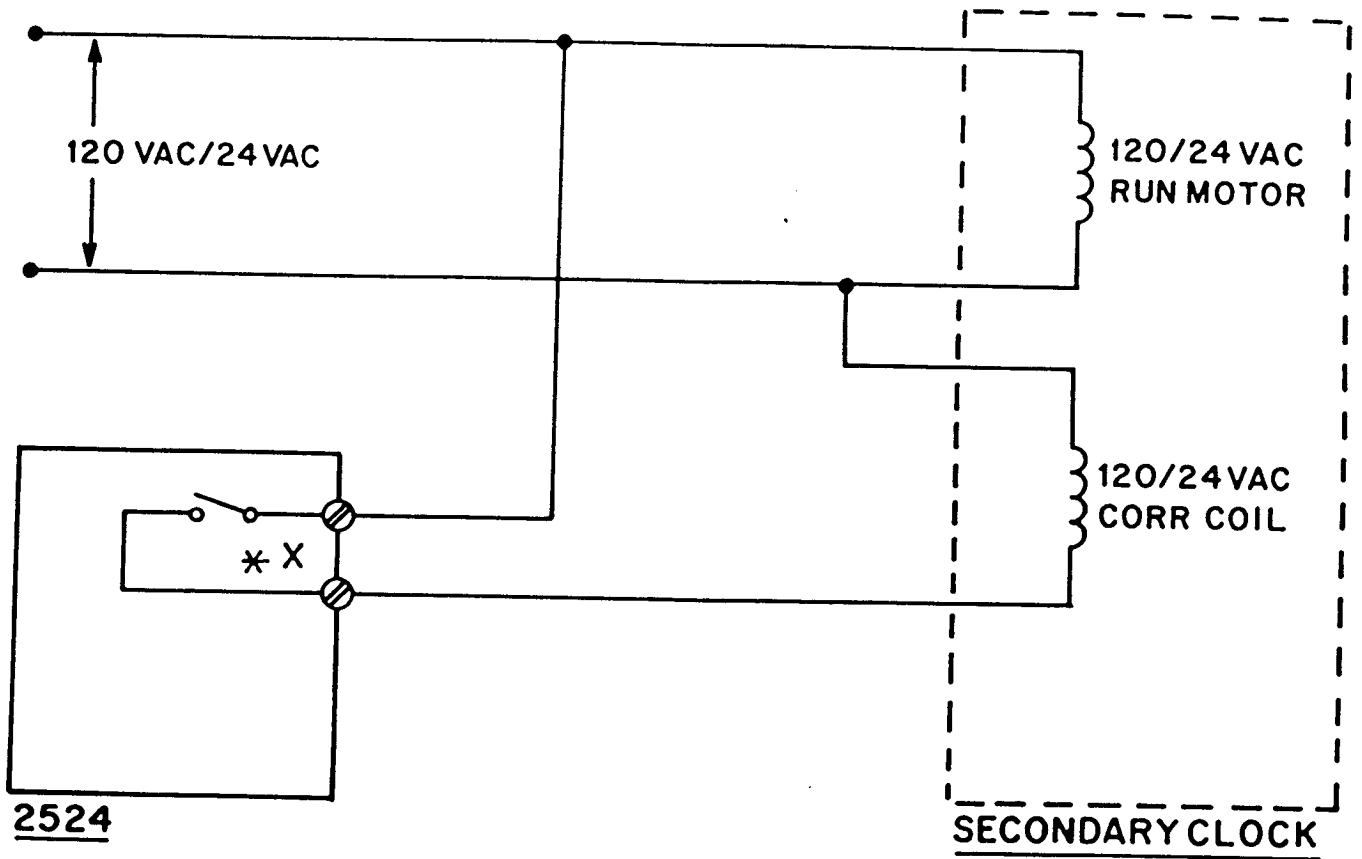
Figure 3.



Correction Code (Mode A)	Correction Timing	
	Hourly	12-Hour
#04	"X" is activated for 10 seconds every hour From X:56:05 To X:56:15.	"X" is activated for 45 seconds every 12 hours From 11:56:00 To 11:56:45.

\* See "Correctable Secondary Clocks" (under "Wiring") to determine the output terminals.

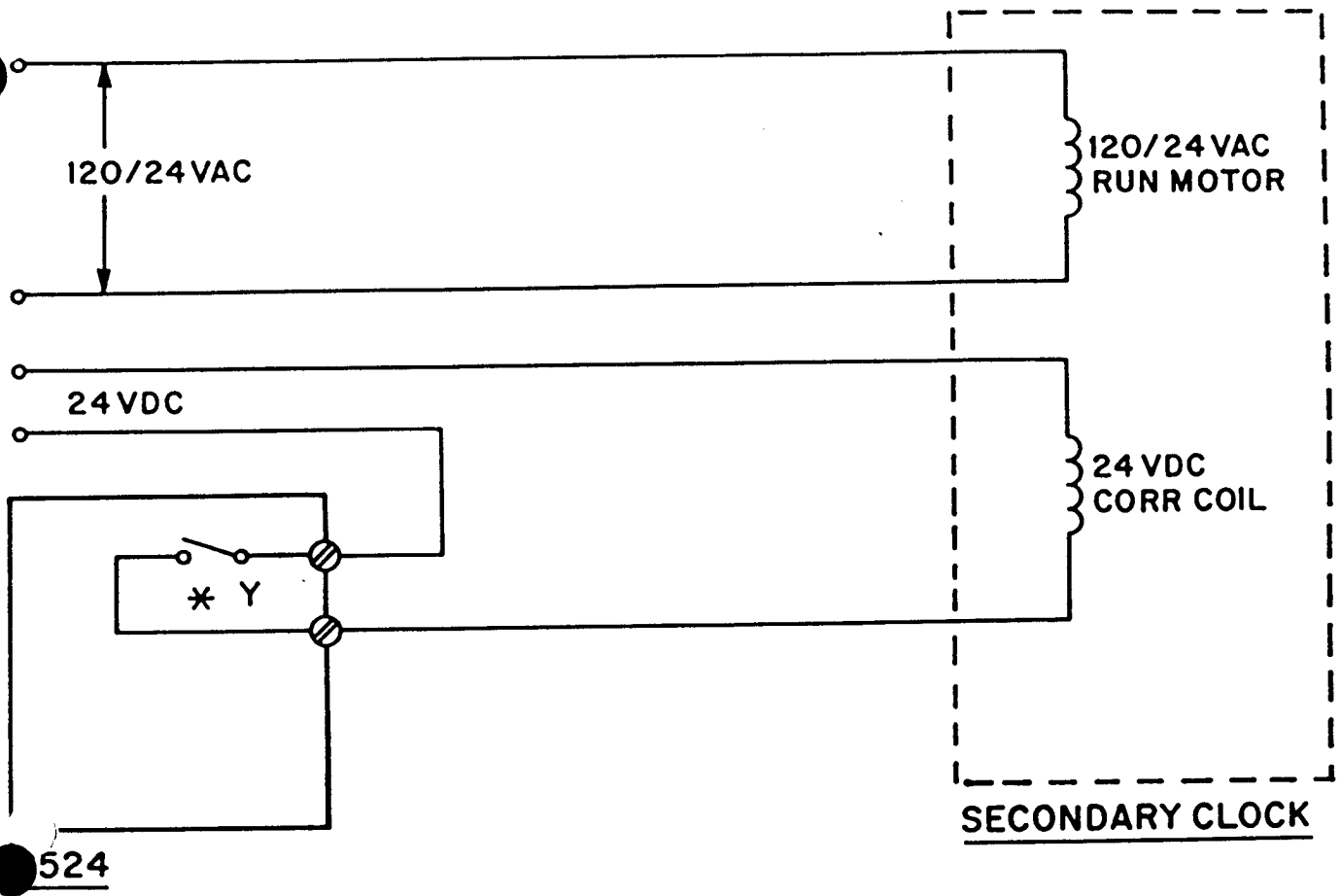
Figure 4.



Correction Code (Mode A)	Correction Timing	
	Hourly	12-Hour
#05	"X" is activated for 25 seconds every hour From X:00:00 To X:00:25.	Not Applicable

\* See "Correctable Secondary Clocks" (under "Wiring") to determine the output terminals.

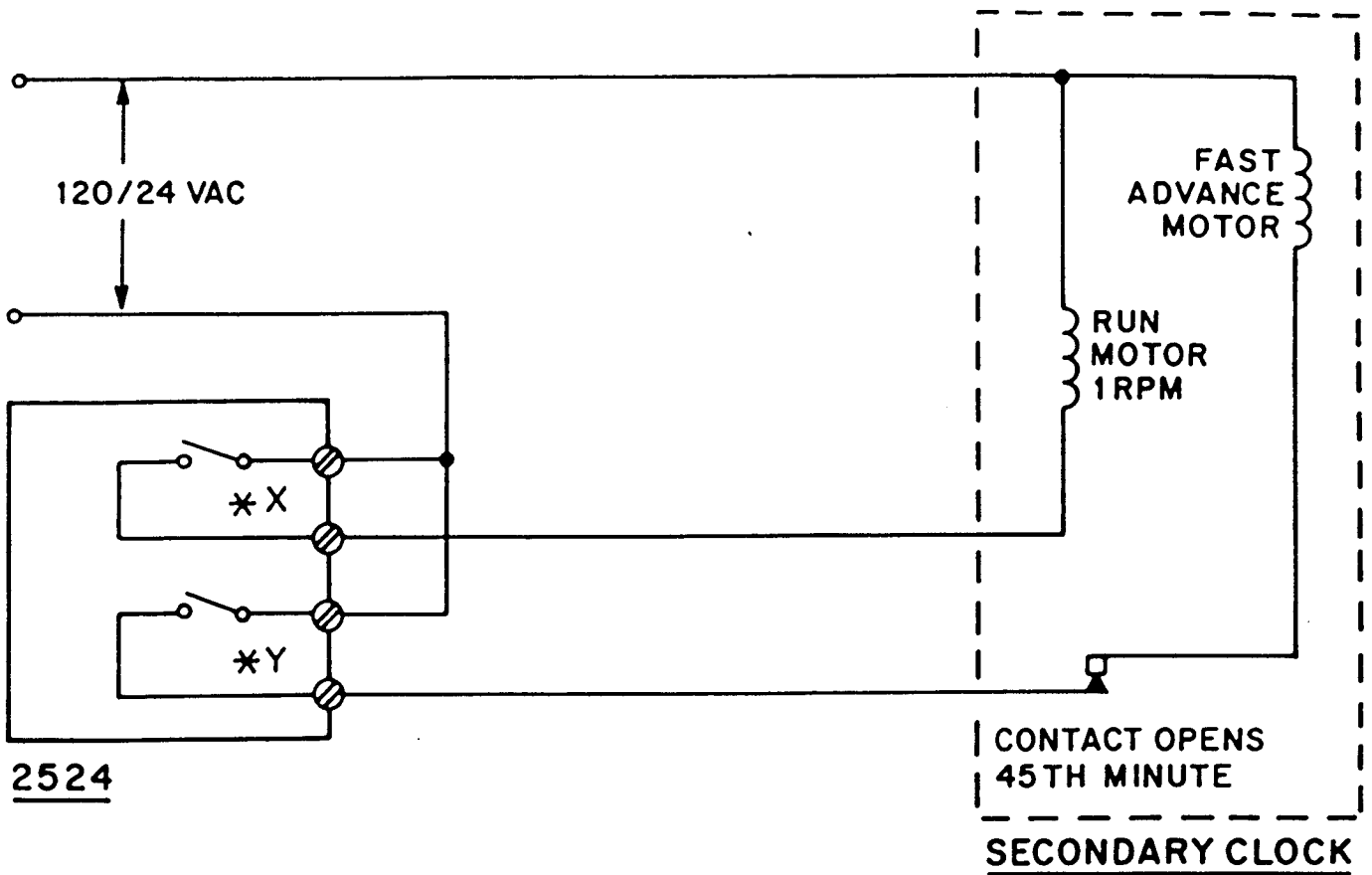
Figure 5.



Correction Code (Mode A)	Correction Timing	
	Hourly	12-Hour
#06	"Y" is activated for 57 seconds every hour From X:57:03 To X:58:00.	"Y" is activated in 11 cycles (57 seconds on, 63 seconds off) From 5:59:03 To 6:20:00.

\* See "Correctable Secondary Clocks" (under "Wiring") to determine the output terminals.

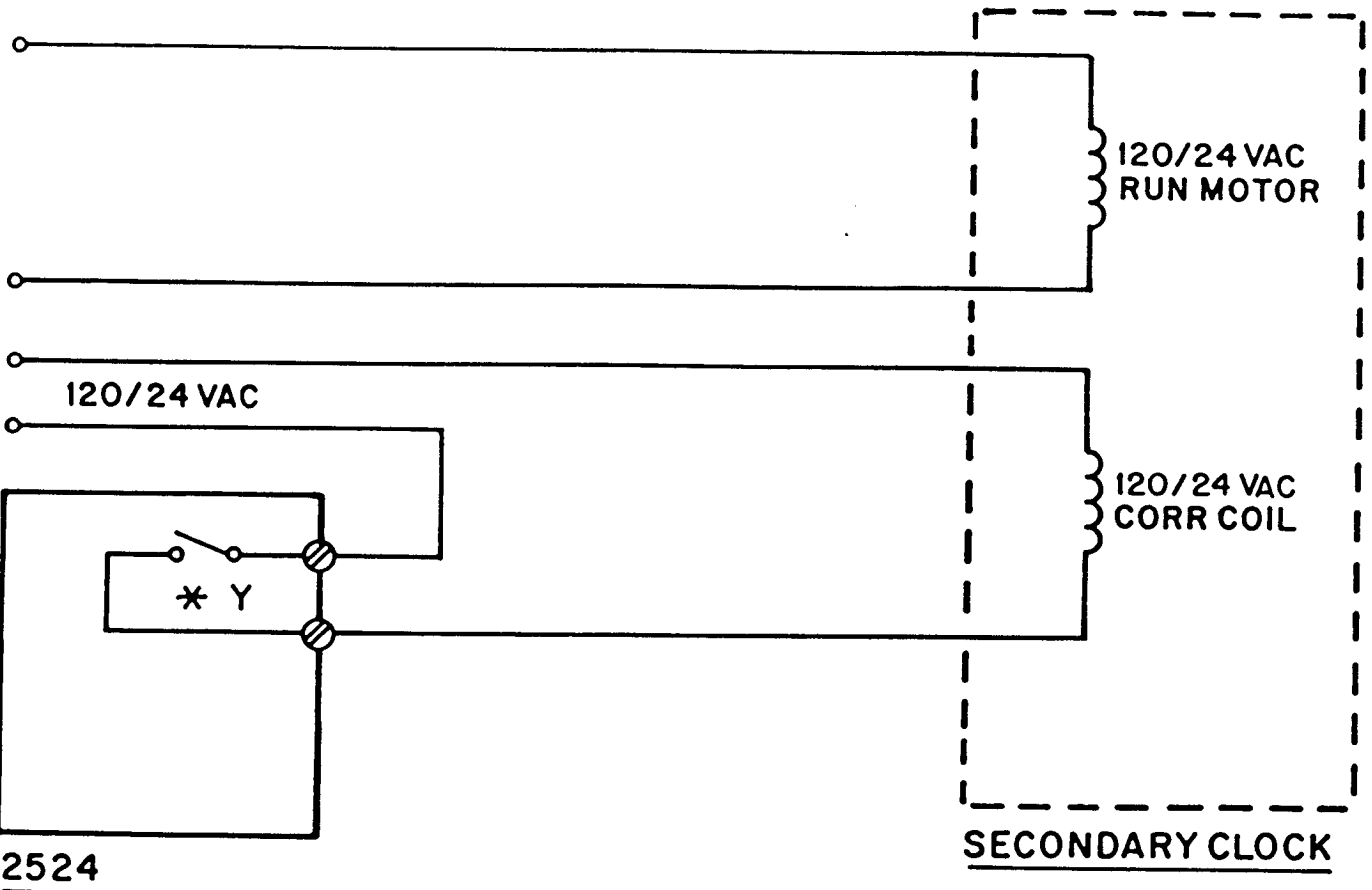
Figure 6.



Correction Code (Mode A)	Correction Timing	
	Hourly	12-Hour
#07	"X" is activated for 59 minutes, 6 seconds every hour From X:44:59 To (X+1):44:05. "Y" is activated for 54 seconds every hour From X:44:05 To X:44:59.	Not Applicable

\* See "Correctable Secondary Clocks" (under "Wiring") to determine the output terminals.

Figure 7.

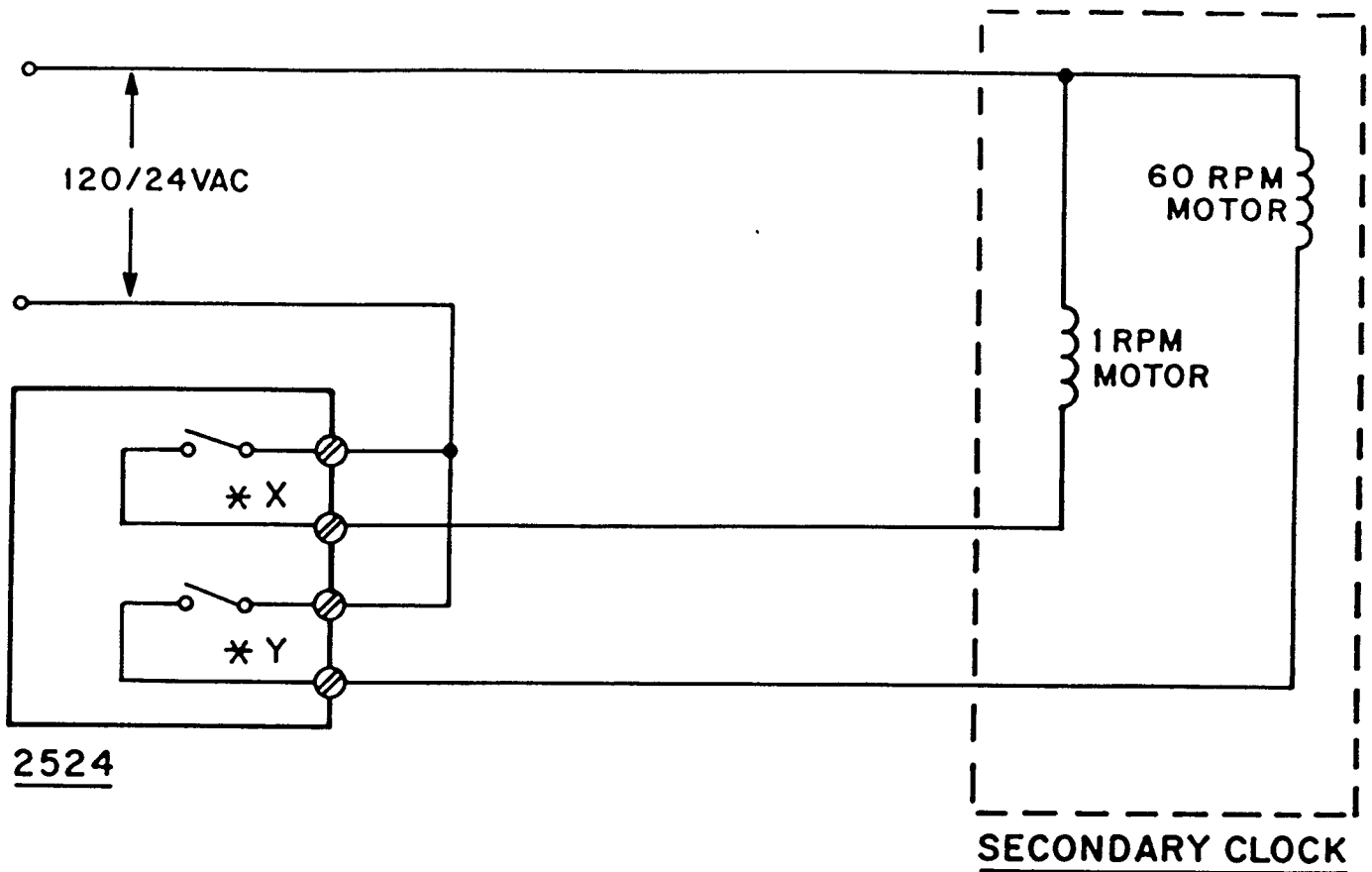


Correction Code (Mode A)	Correction Timing	
	Hourly	12-Hour
#08	"Y" is activated for 55 seconds every hour From X:58:05 To X:59:00.	"Y" is activated on and off 12 times (65 seconds on and 25 seconds off) every 12 hours From 5:05:00 To 5:22:35.

\* See "Correctable Secondary Clocks" (under "Wiring") to determine the output terminals.

Figure 8.

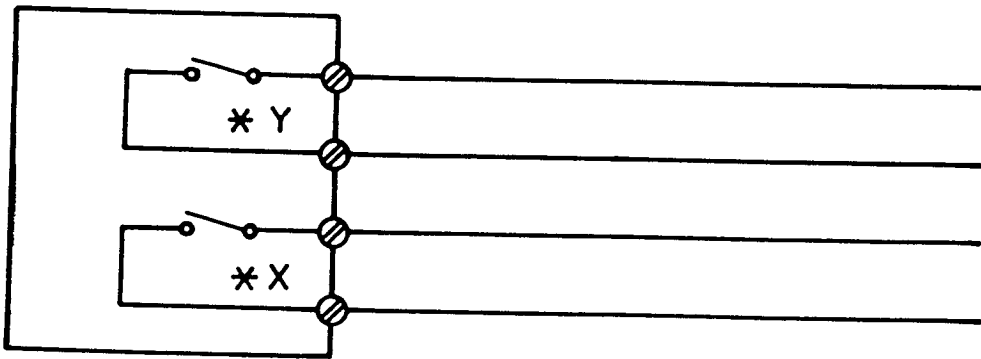




Correction Code (Mode A)	Correction Timing	
	Hourly	12-Hour
#09	"X" is activated for 59 minutes, 25 seconds every hour From X:00:00 To X:59:25. "Y" is activated for 35 seconds every hour From X:59:25 To X:00:00.	"Y" is activated for 16 minutes every 12 hours From 5:12:00 To 5:28:00.

\* See "Correctable Secondary Clocks" (under "Wiring") to determine the output terminals.

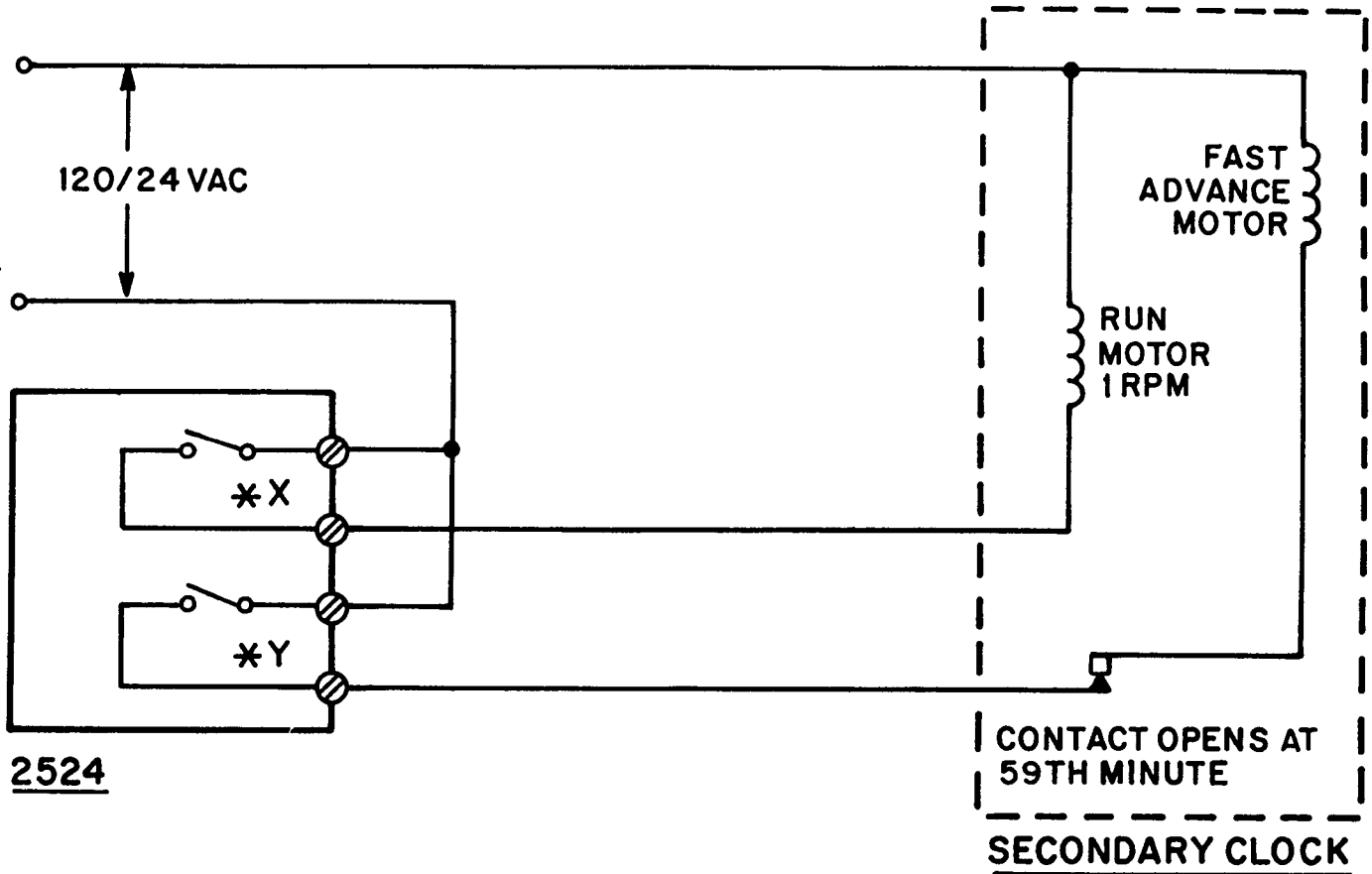
Figure 9.



Correction Code (Mode A)	Correction Timing	
	Minute Impulse	Hourly and 12-Hour
#10	"Y" is activated for 2 seconds every minute From X:XX:58 To X:XX:00. "X" is pulsing at the rate of 1 second on and 1 second off.	Not Applicable

\* See "Correctable Secondary Clocks" (under "Wiring") to determine the output terminals.

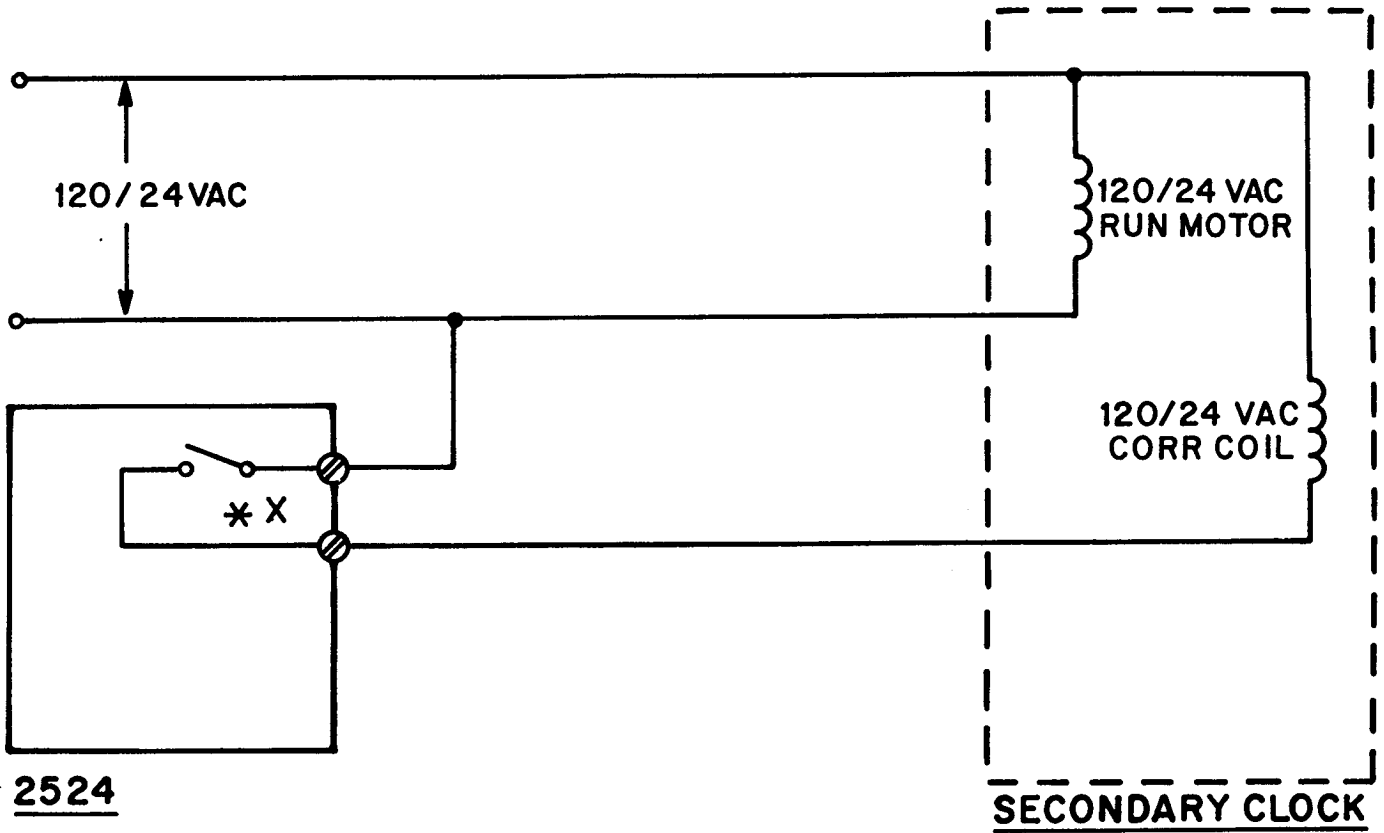
Figure 10.



Correction Code (Mode A)	Correction Timing	
	Hourly	12-Hour
#11	"X" is activated for 59 minutes, 6 seconds every hour From X:58:59 To (X+1):58:05. "Y" is activated for 54 seconds every hour From X:58:05 To X:58:59.	Not Applicable

\* See "Correctable Secondary Clocks" (under "Wiring") to determine the output terminals.

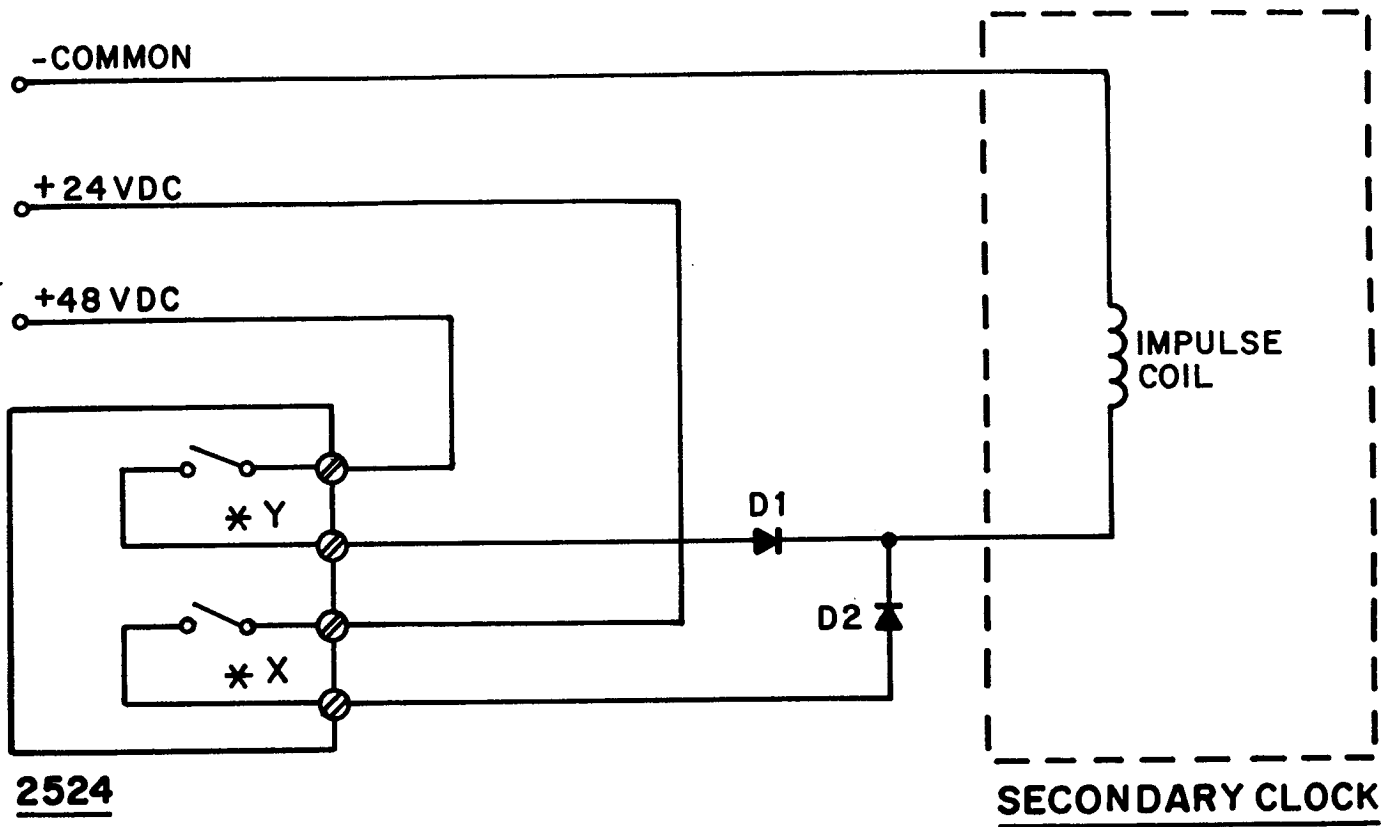
Figure 11.



Correction Code (Mode A)	Correction Timing	
	Hourly	12-Hour
#12	"X" is activated for 8 seconds every hour From X:57:54 To X:58:02.	"X" is activated for 14 seconds every 12 hours From 5:57:54 To 5:58:08.

\* See "Correctable Secondary Clocks" (under "Wiring") to determine the output terminals.

Figure 12.

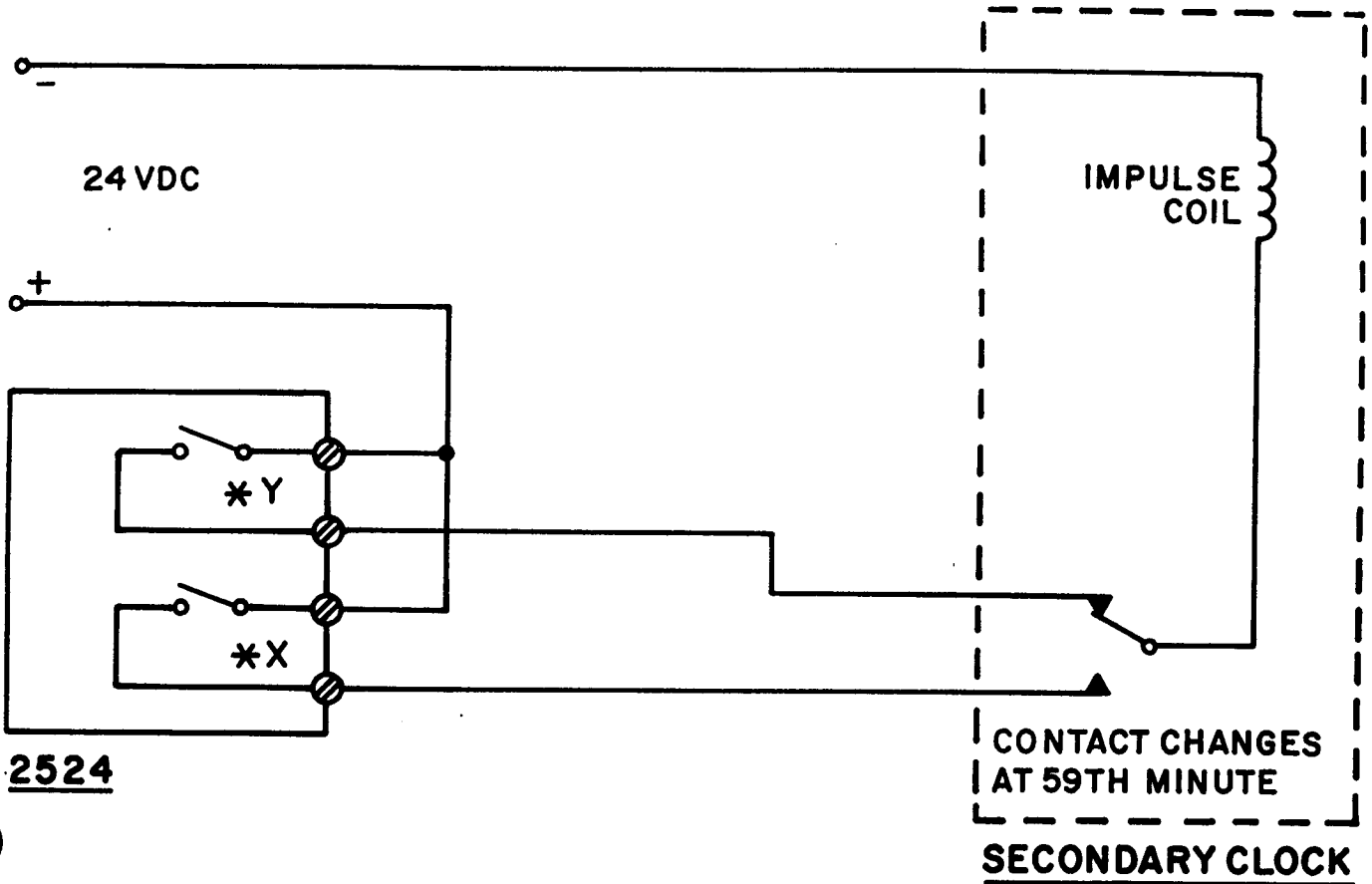


D1 AND D2 ARE 1N3210 OR EQUIVALENT.

Correction Code (Mode A)	Correction Timing	
	Minute Impulse	Hourly
#13	"X" is activated for 2 seconds every minute From X:XX:58 To X:XX:00.	"Y" is activated for 10 seconds every hour From X:59:40 To X:59:50.

\* See "Correctable Secondary Clocks" (under "Wiring") to determine the output terminals.

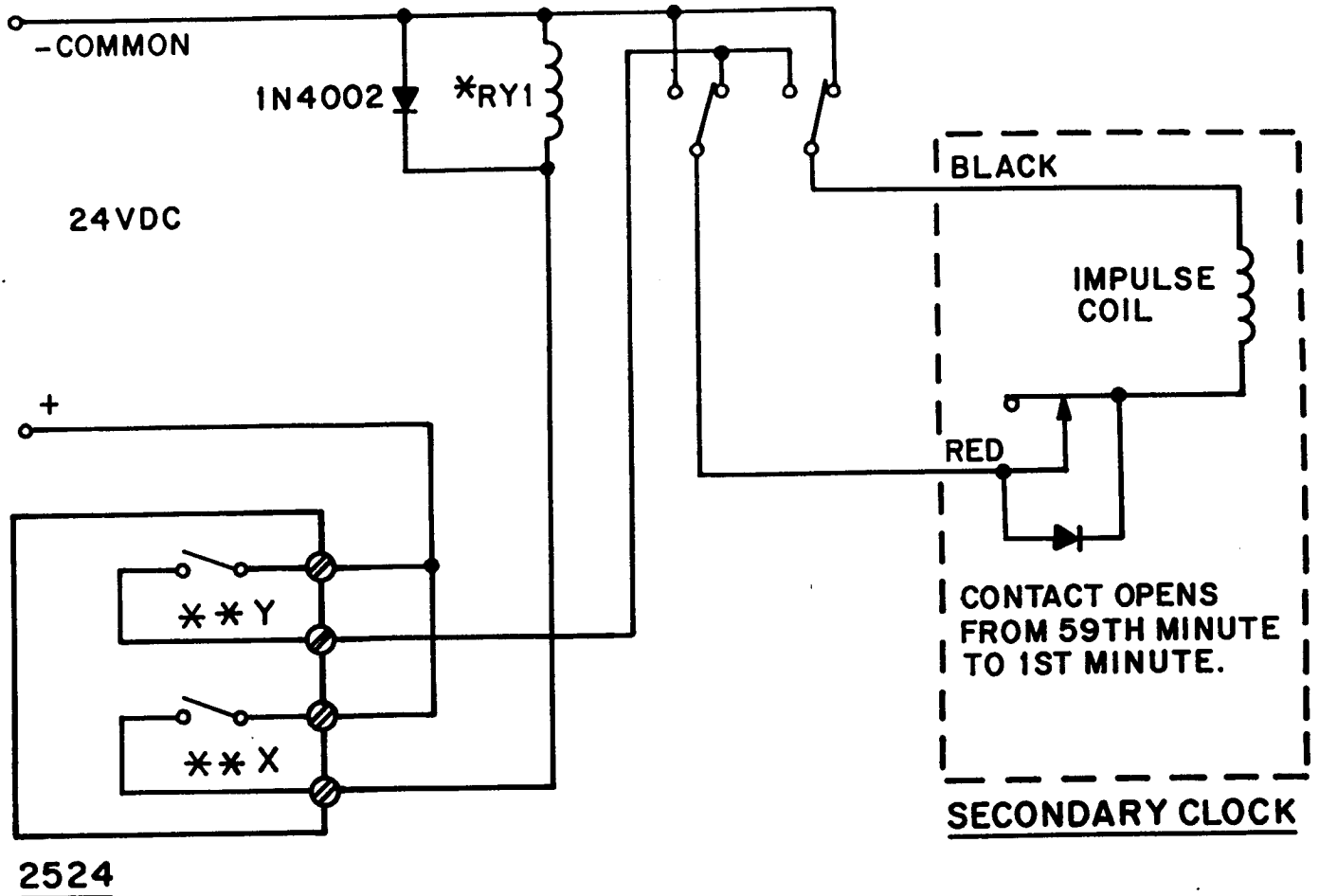
Figure 13.



Correction Code (Mode A)	Correction Timing	
	Minute Impulse	Hourly
#14	"Y" is activated for 2 seconds every minute From X:XX:58 To X:XX:00.	"Y" is activated for 16 cycles (1 second on, 2 seconds off) From X:59:02 To X:59:48. "X" is activated for 50 minutes every hour From X:59:50 To (X+1):49:50

\* See "Correctable Secondary Clocks" (under "Wiring") to determine the output terminals.

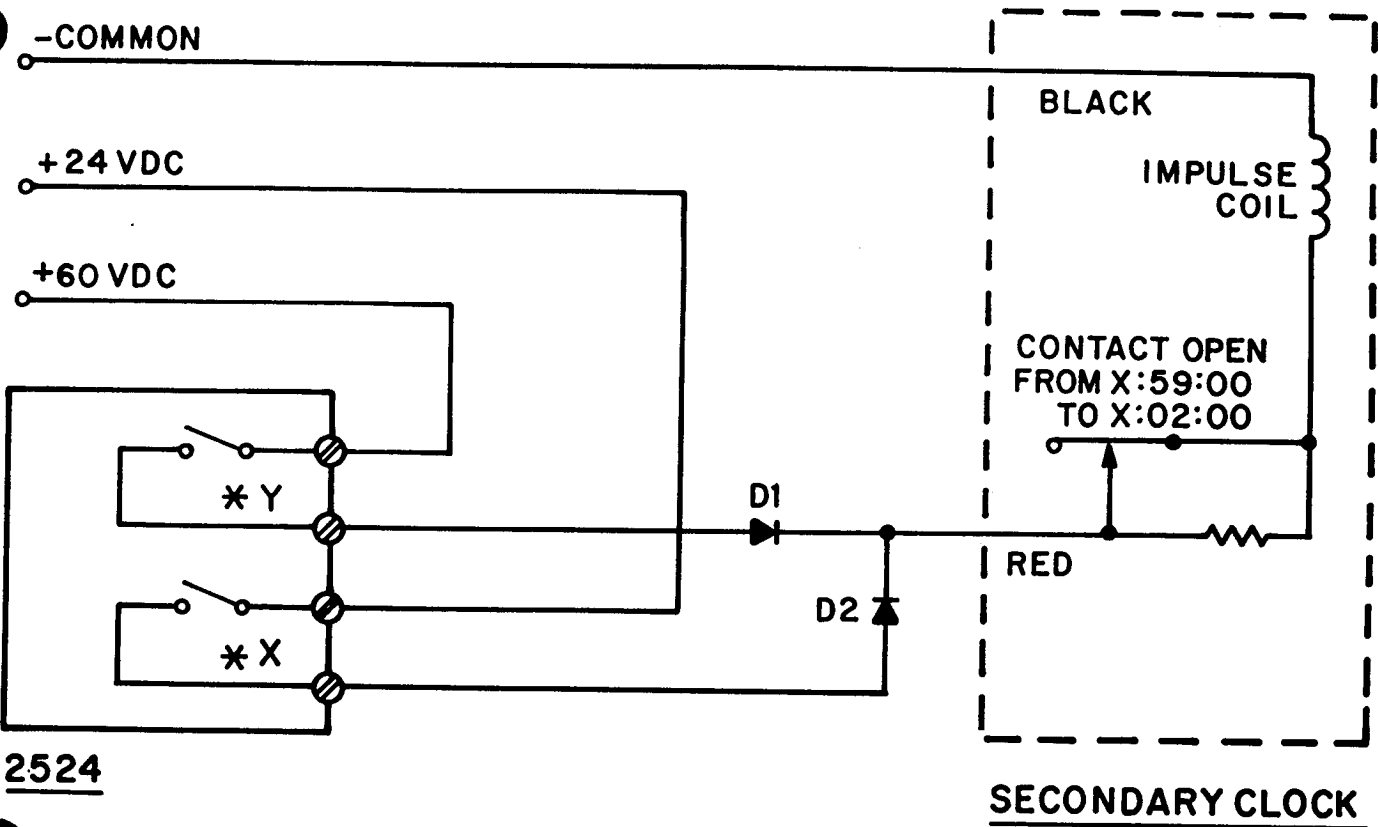
Figure 14.



Correction Code (Mode A)	Correction Timing	
	Minute Impulse	Hourly Correction
#14	"Y" sends a positive pulse to the impulse coil for 2 seconds every minute From X:XX:58 To X:XX:00.	"Y" is activated for 16 cycles (1 second on, 2 seconds off) From X:59:02 To X:59:48. "X" activates the external relay, reversing the polarity of the pulses, for 50 minutes From X:59:50 To (X+1):49:50.

\* RY1 is a customer-provided 24-VDC DPDT relay.  
 \*\* See "Correctable Secondary Clocks" (under "Wiring") to determine the output terminals.

Figure 15.



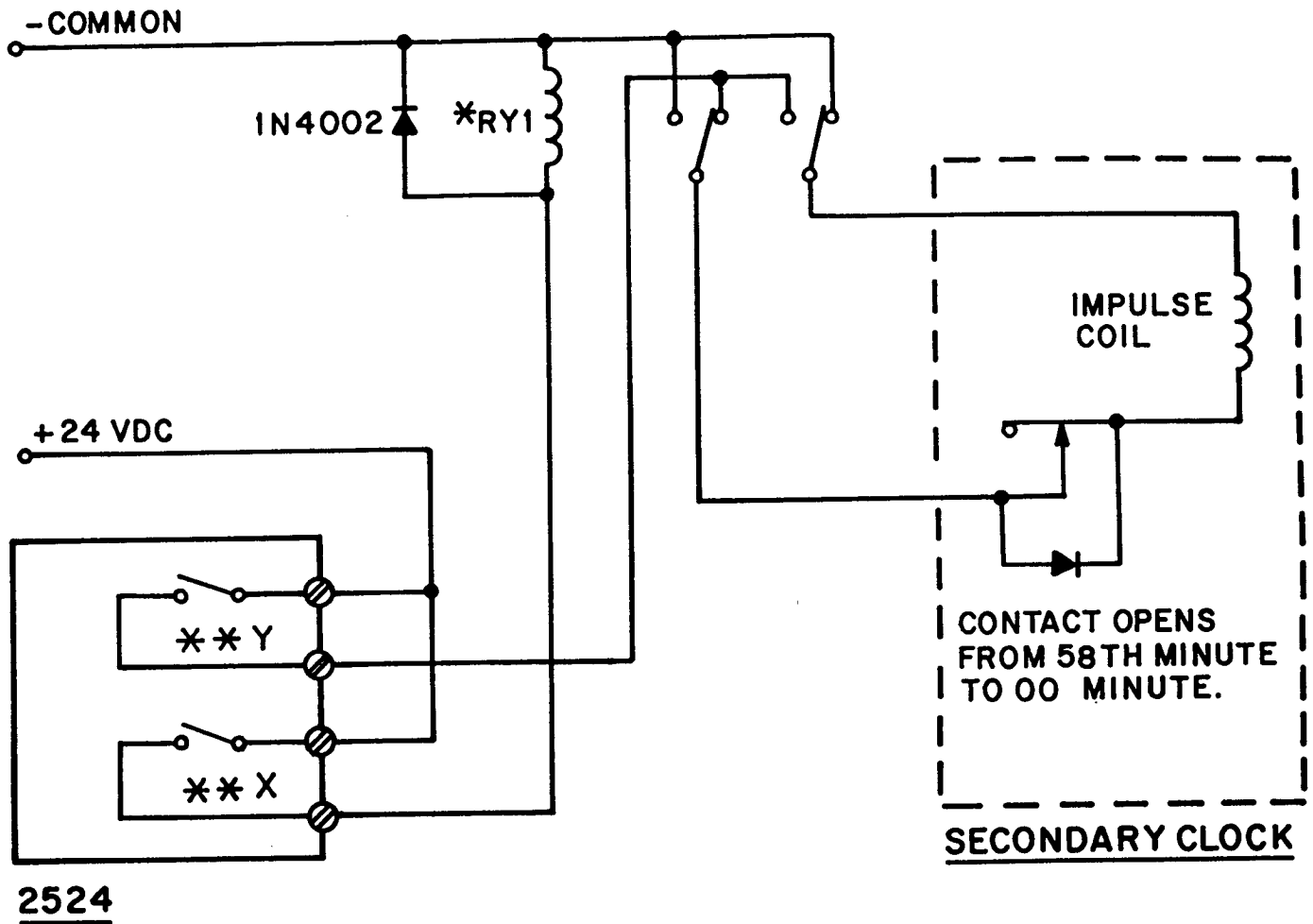
D1 AND D2 ARE 1N3210 OR EQUIVALENT.

Correction Code (Mode A)	Correction Timing	
	Minute Impulse	Hourly
#15	<p>"X" is activated for 2 seconds every minute From X:XX:58 To X:XX:00. (provides 24-VDC pulses)</p>	<p>"X" is activated 16 cycles (1 second on, 2 seconds off) From X:59:02 To X:59:48. "Y" is activated for 3 times each hour (for 2 seconds on, 58 seconds off) From X:59:58 To (X+1):00:00; X:00:58 To X:01:00; X:01:58 To X:02:00. (provides 60-VDC pulses)</p>

\* See "Correctable Secondary Clocks" (under "Wiring") to determine the output terminals.

Figure 16.

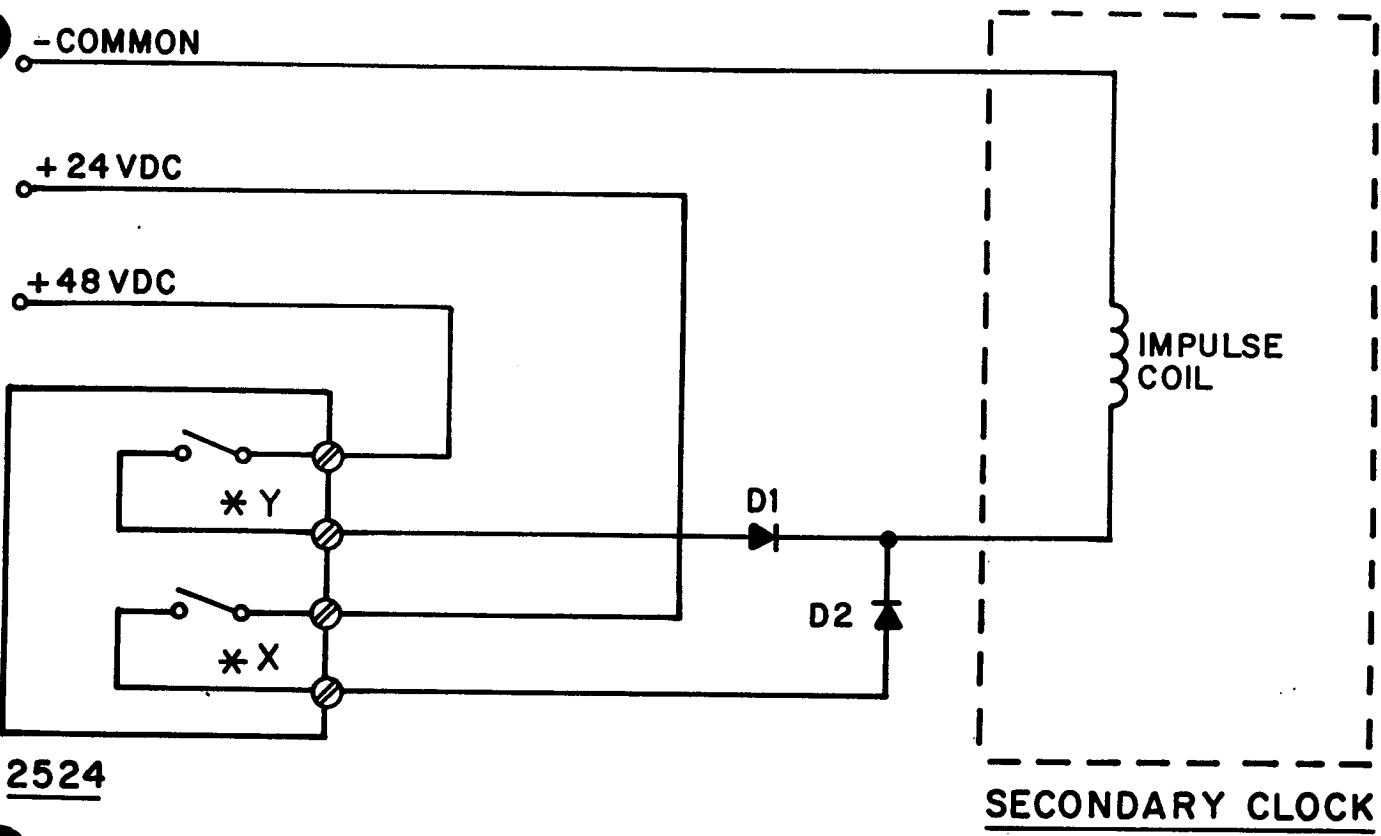




Correction Code (Mode A)	Correction Timing	
	Minute Impulse	Hourly
#16	"Y" sends a positive pulse to the impulse coil for 2 seconds every minute From X:XX:58 To X:XX:00.	"Y" is activated for 15 cycles (1 second on, 2 seconds off) From X:58:10 To X:58:55. "X" activates the external relay, reversing the polarity of the pulses, for 7 minutes every hour From X:51:50 To X:58:50.

\* RY1 is a customer-provided 24-VDC DPDT relay.  
 \*\* See "Correctable Secondary Clocks" (under "Wiring") to determine the output terminals.

Figure 17.

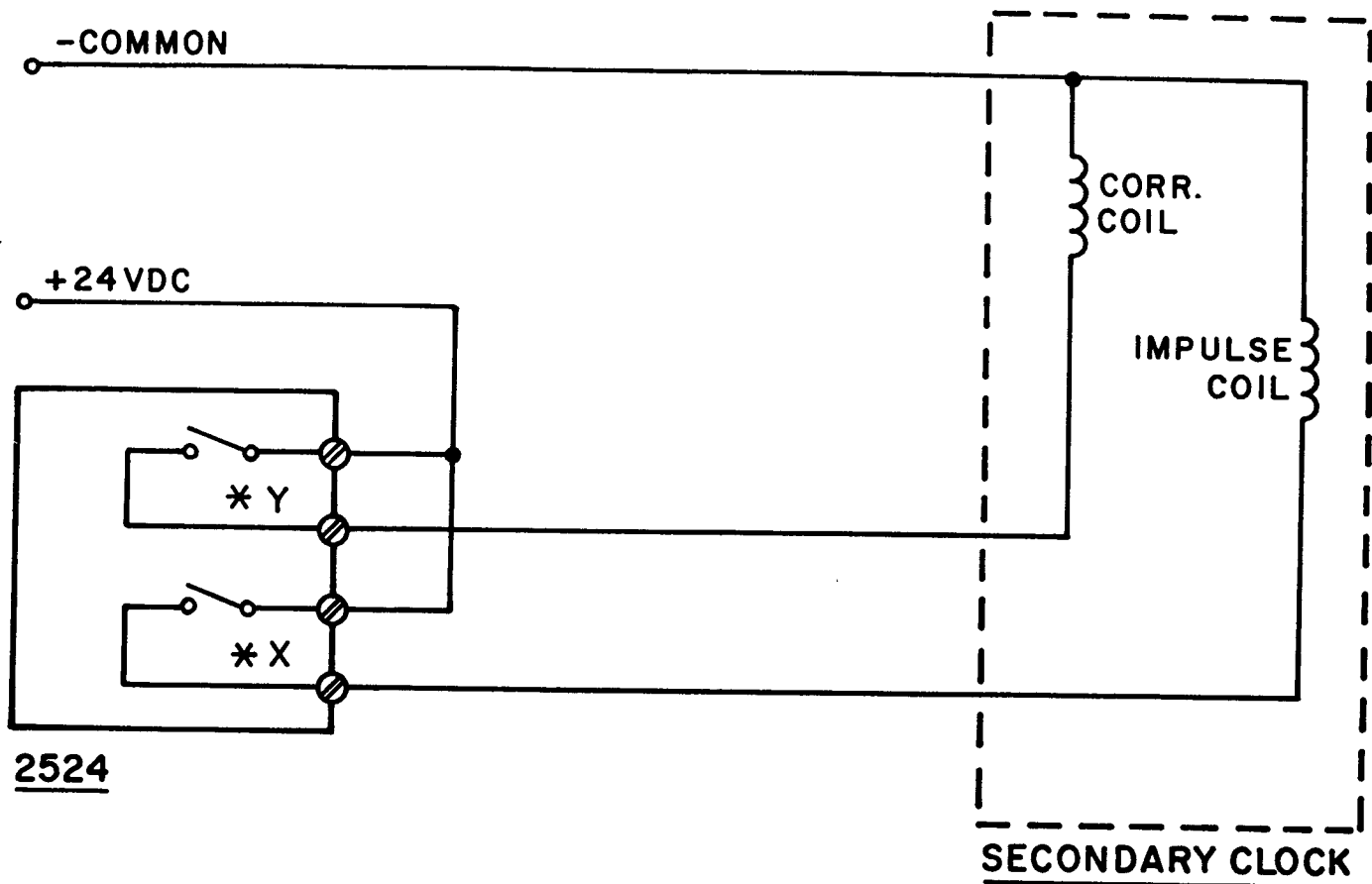


D1 AND D2 ARE 1N3210 OR EQUIVALENT.

Correction Code (Mode A)	Correction Timing	
	Minute Impulse	Hourly
#17	"X" is activated for 2 seconds every minute From X:XX:58 To X:XX:00. Except for the 59th minute.	"Y" is activated 10 seconds every hour From X:59:40 To X:59:50.

\* See "Correctable Secondary Clocks" (under "Wiring") to determine the output terminals.

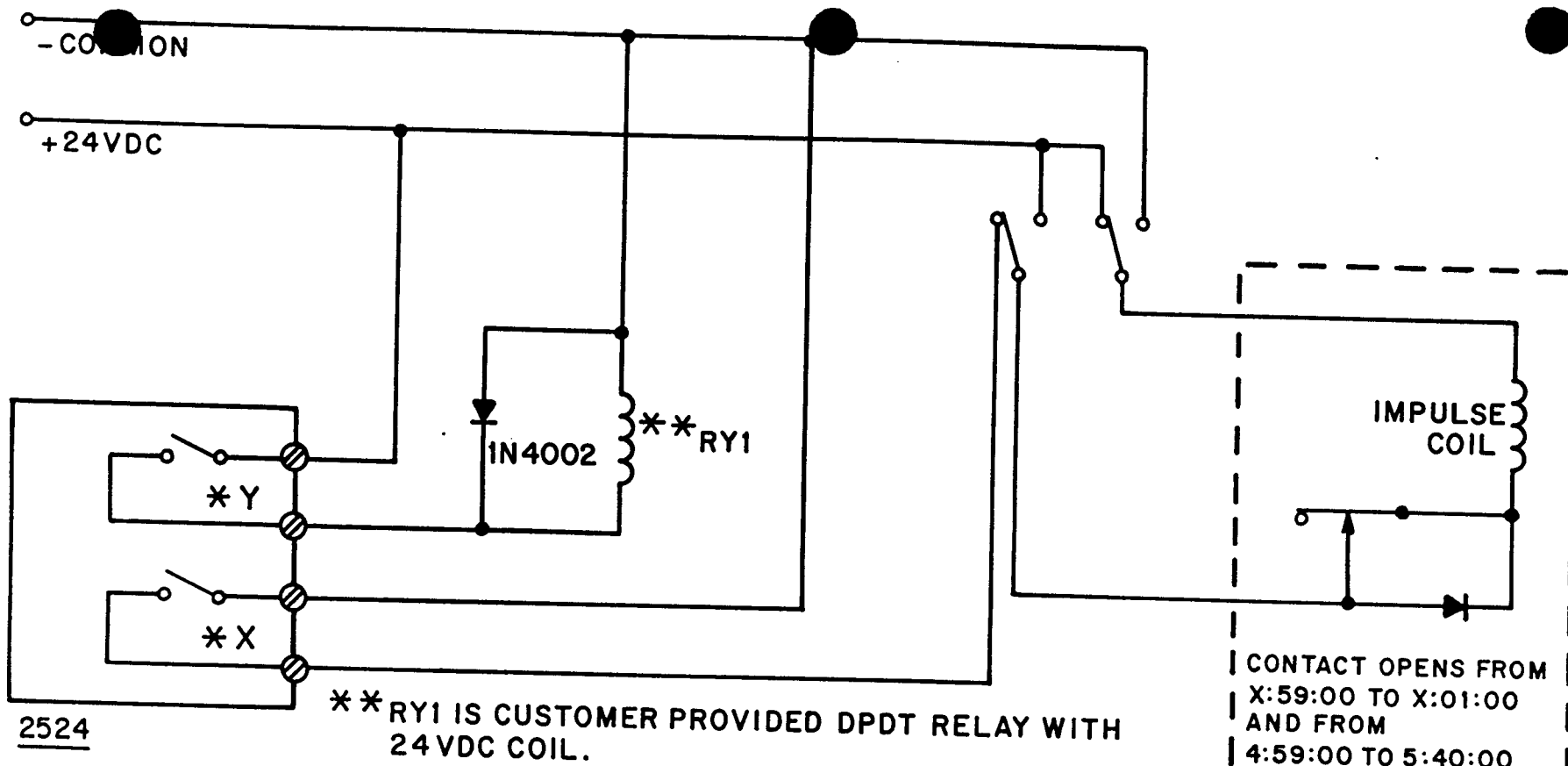
Figure 18.



Correction Code (Mode A)	Correction Timing	
	Minute Impulse	Hourly
#17	"X" is activated for 2 seconds every minute From X:XX:58 To X:XX:00. Except for the 59th minute.	"Y" is activated for 10 seconds every hour From X:59:40 To X:59:50.

\* See "Correctable Secondary Clocks" (under "Wiring") to determine the output terminals.

Figure 19.



2524

\*\* RY1 IS CUSTOMER PROVIDED DPDT RELAY WITH 24 VDC COIL.

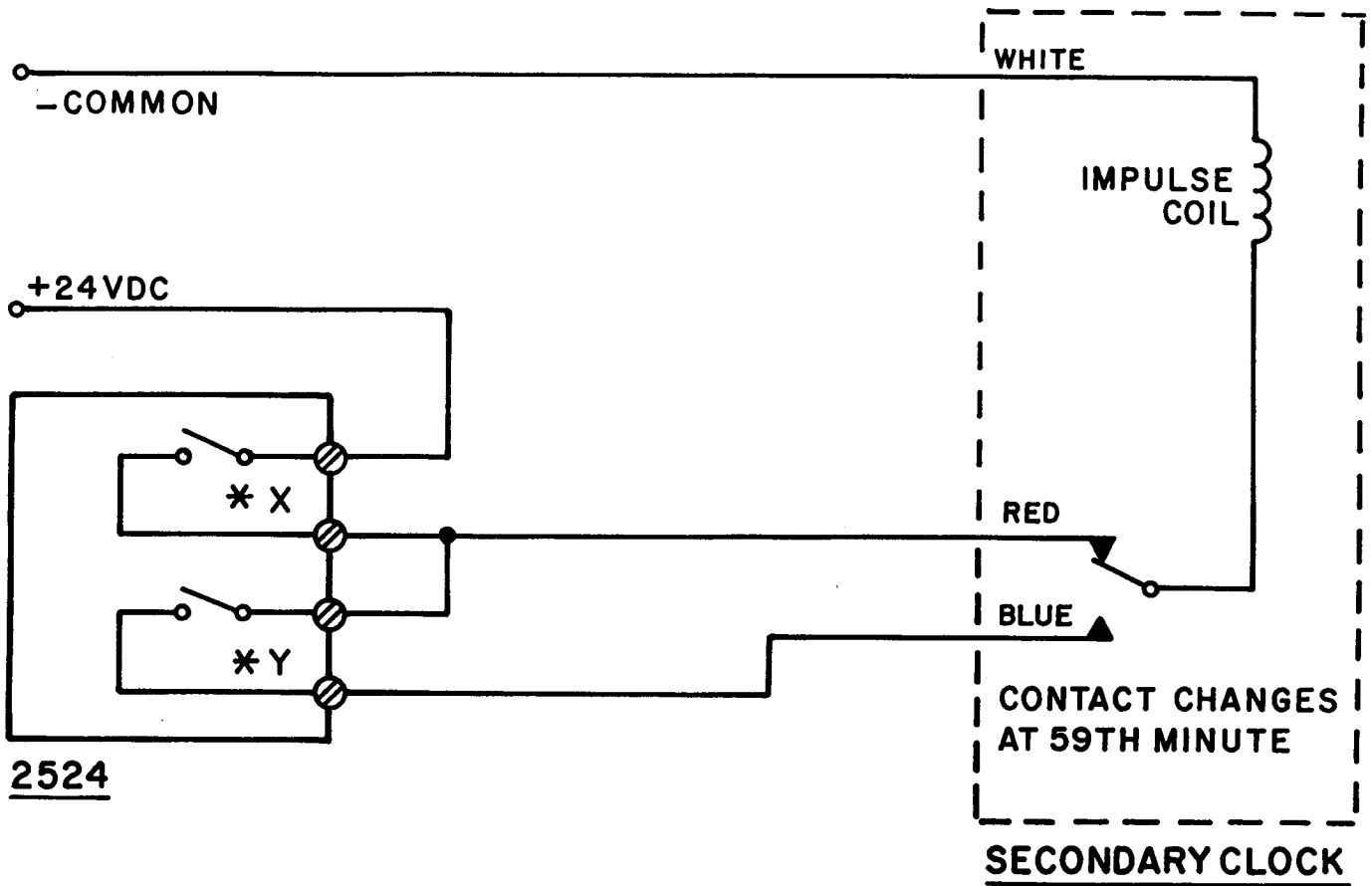
CONTACT OPENS FROM X:59:00 TO X:01:00 AND FROM 4:59:00 TO 5:40:00

SECONDARY CLOCK

Correction Code (Mode A)	Impulse	Correction Timing	
	Minute	Hourly	12-Hour
#18	"Y" is activated for 2 seconds every minute for 52 minutes From X:59:58 To (X+1):51:00.	"X" is activated for 2 seconds every minute for 8 minutes From X:51:58 To X:59:00. then for 19 cycles (2 seconds on, 1 second off) From X:59:01 To (X+1):00:00.	"X" activates for 25 minutes (2 seconds on, 1 second off) From 5:00:00 To 5:25:00.

\* See "Correctable Secondary Clocks" (under "Wiring") to determine the output terminals.

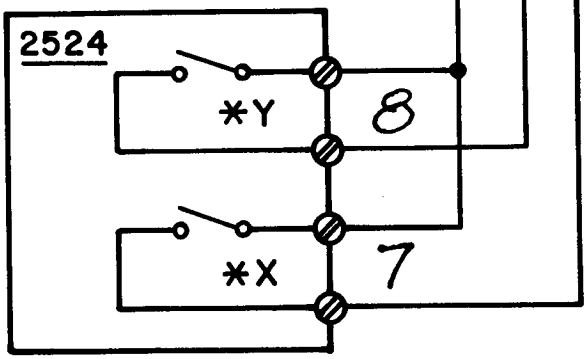
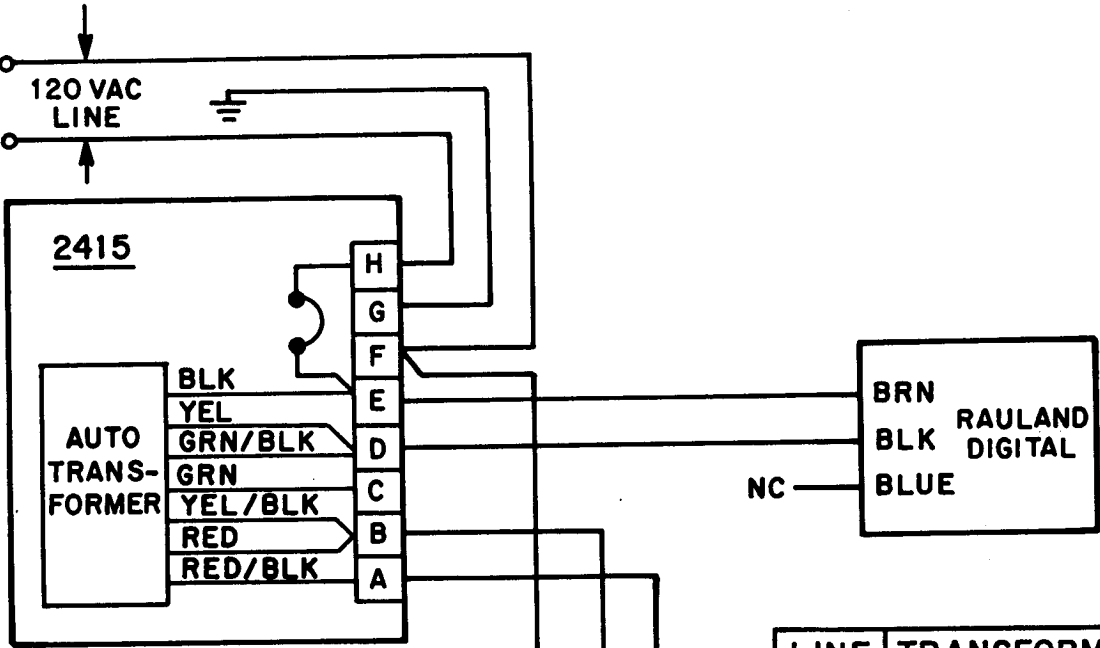
Figure 20.



Correction Code (Mode A)	Correction Timing	
	Minute Impulse	Hourly
#19	"X" is activated for 2 seconds every minute From X:XX:58 To X:XX:00.	"X" is activated for 18 cycles (1 second on, 2 seconds off) From X:58:04 To X:58:56. "Y" is activated for 8 minutes every hour From X:59:00 To (X+1):07:00.

\* See "Correctable Secondary Clocks" (under "Wiring") to determine the output terminals.

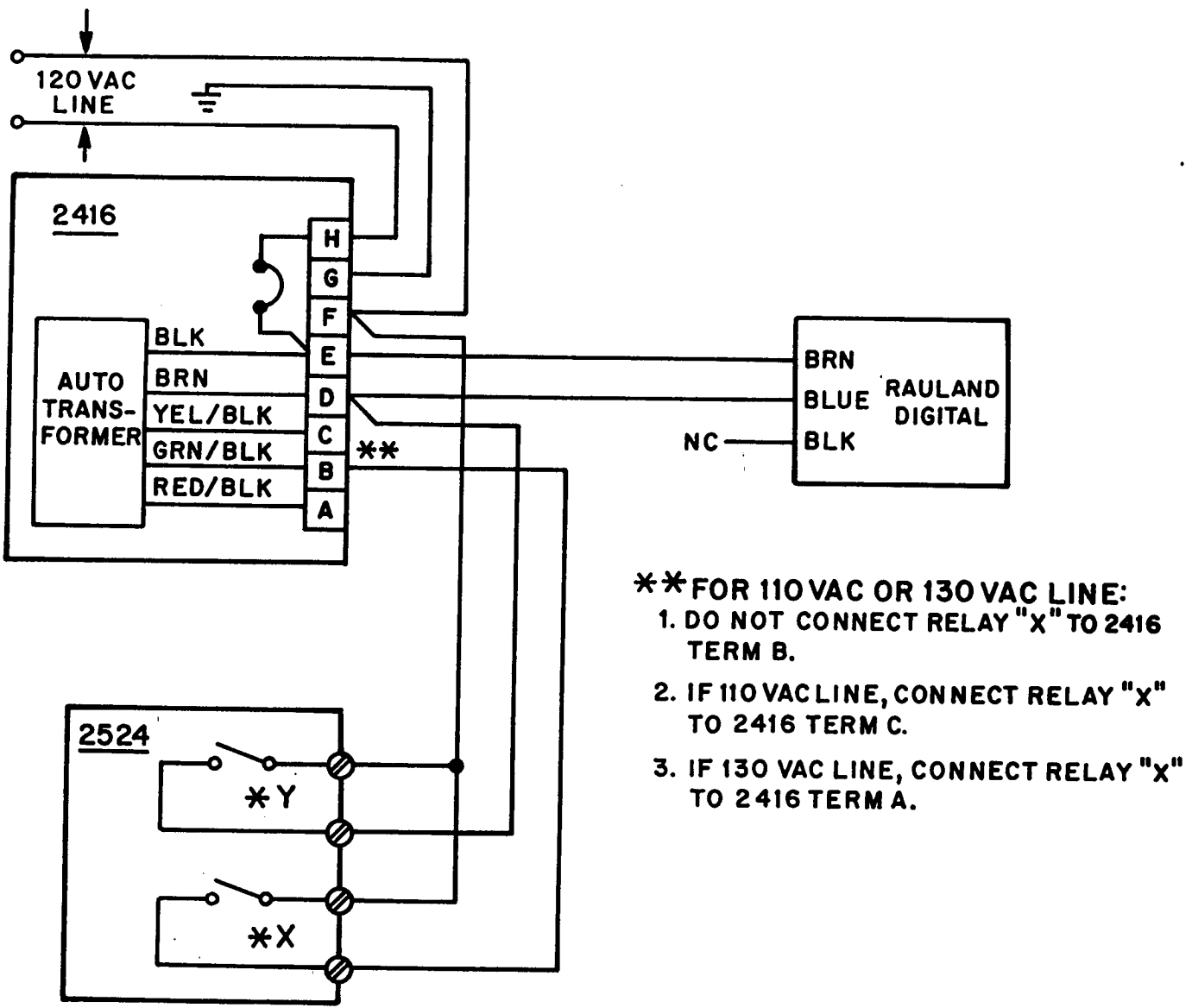
Figure 21.



LINE VOLT	TRANSFORMER LEADS	TERMINAL
110 VAC	RED & GREEN	B
	GREEN/BLACK & YELLOW/BLACK	C
130 VAC	RED & GREEN/BLACK	B
	GREEN & YELLOW/BLACK	C

Correction Code (Mode A)	Correction Timing
#20	<ul style="list-style-type: none"> <li>• Correction every 24 hours at 12:01 a.m.</li> <li>• Correction when the time is set</li> <li>• Correction when power is restored after a power failure</li> </ul>

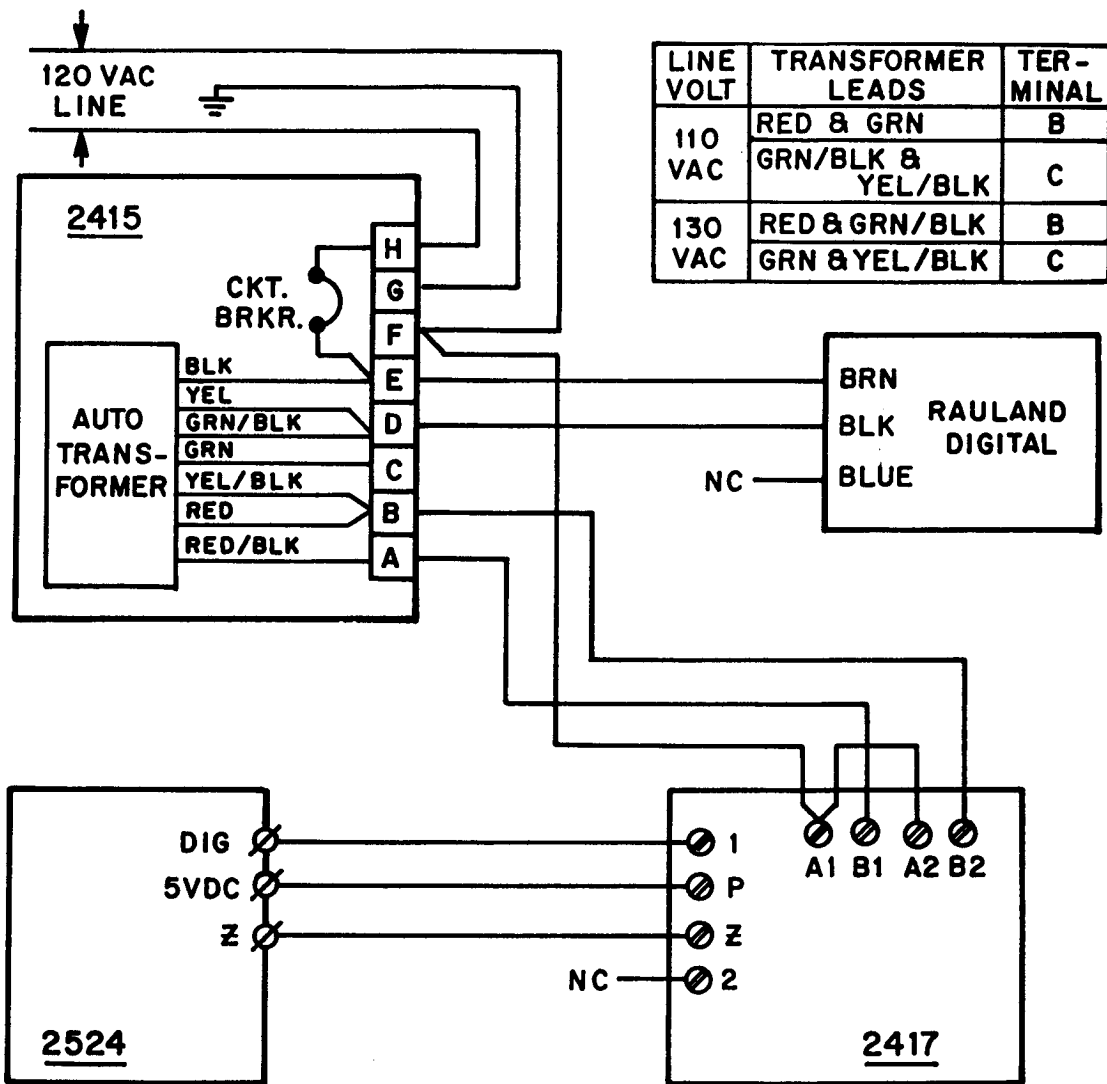
\* See "Correctable Secondary Clocks" (under "Wiring") to determine the



Correction Code (Mode A)	Correction Timing
#20	<ul style="list-style-type: none"> <li>● Correction every 24 hours, at 12:01 a.m.</li> <li>● Correction when the time is set</li> <li>● Correction when power is restored after a power failure</li> </ul>

\* See "Correctable Secondary Clocks" (under "Wiring") to determine the output terminals.

Figure 23.

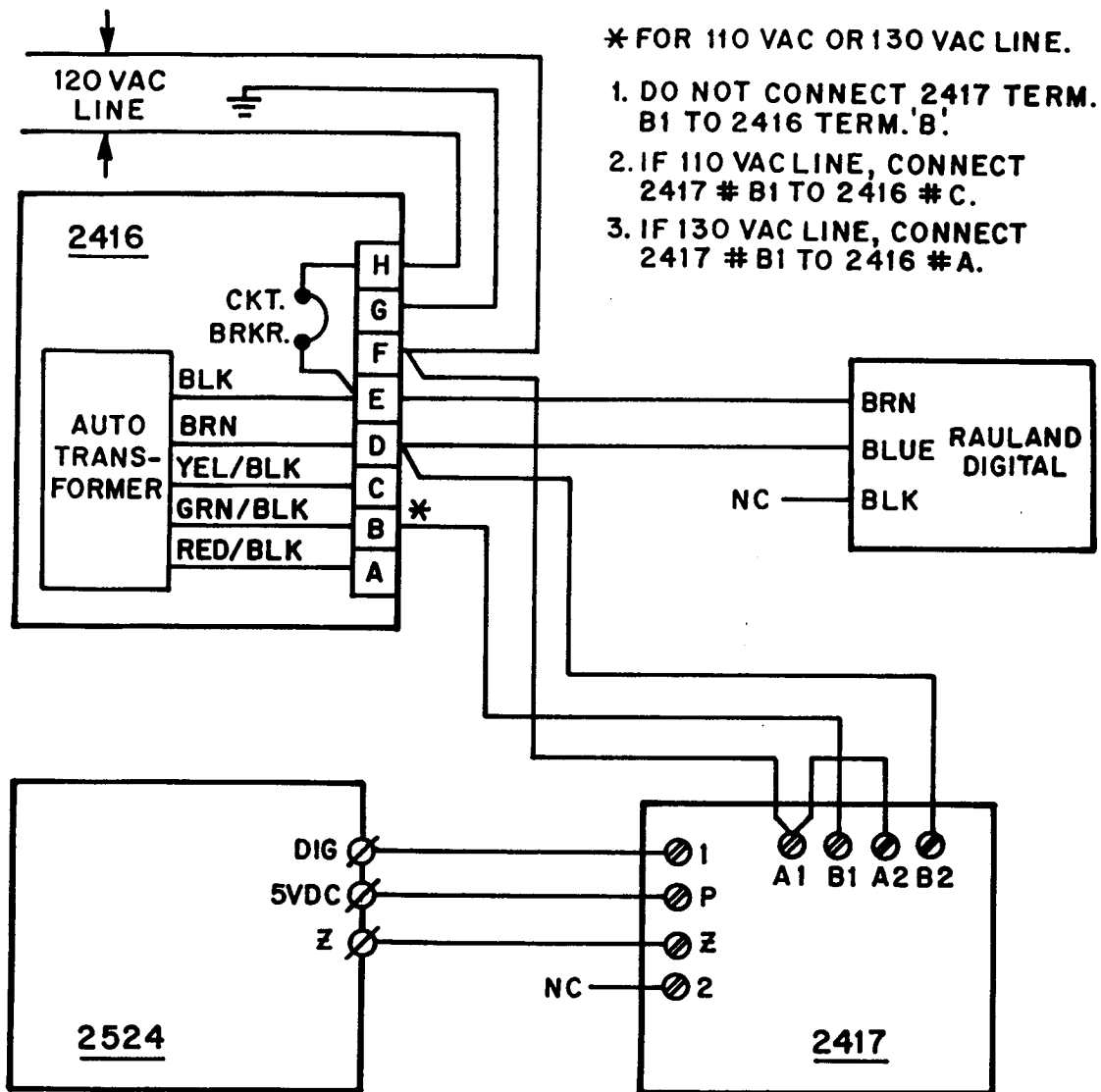


Correction Code (Mode A)	Correction Timing
None (See Note)	<ul style="list-style-type: none"> <li>● Correction every 24 hours, at 12:01 a.m.</li> <li>● Correction when the time is set</li> <li>● Correction when power is restored after a power failure</li> </ul>

*Note:* The "DIG" output is always available regardless of the zone configuration or the Correction Codes used.

Figure 24.

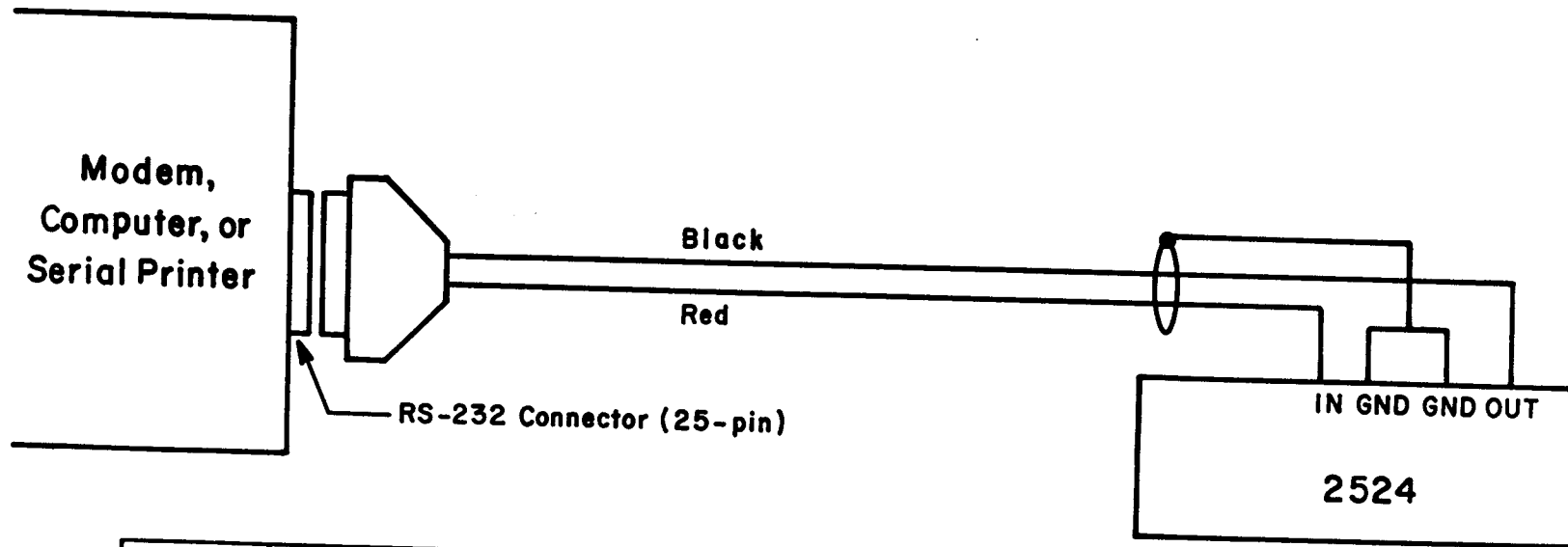




Correction Code (Mode A)	Correction Timing
None (see Note)	<ul style="list-style-type: none"> <li>• Correction every 24 hours, at 12:01 a.m.</li> <li>• Correction when the time is set</li> <li>• Correction when power is restored after a power failure</li> </ul>

Note: The "DIG" output is always available regardless of the zone configuration or the Correction Codes used.

Figure 25.

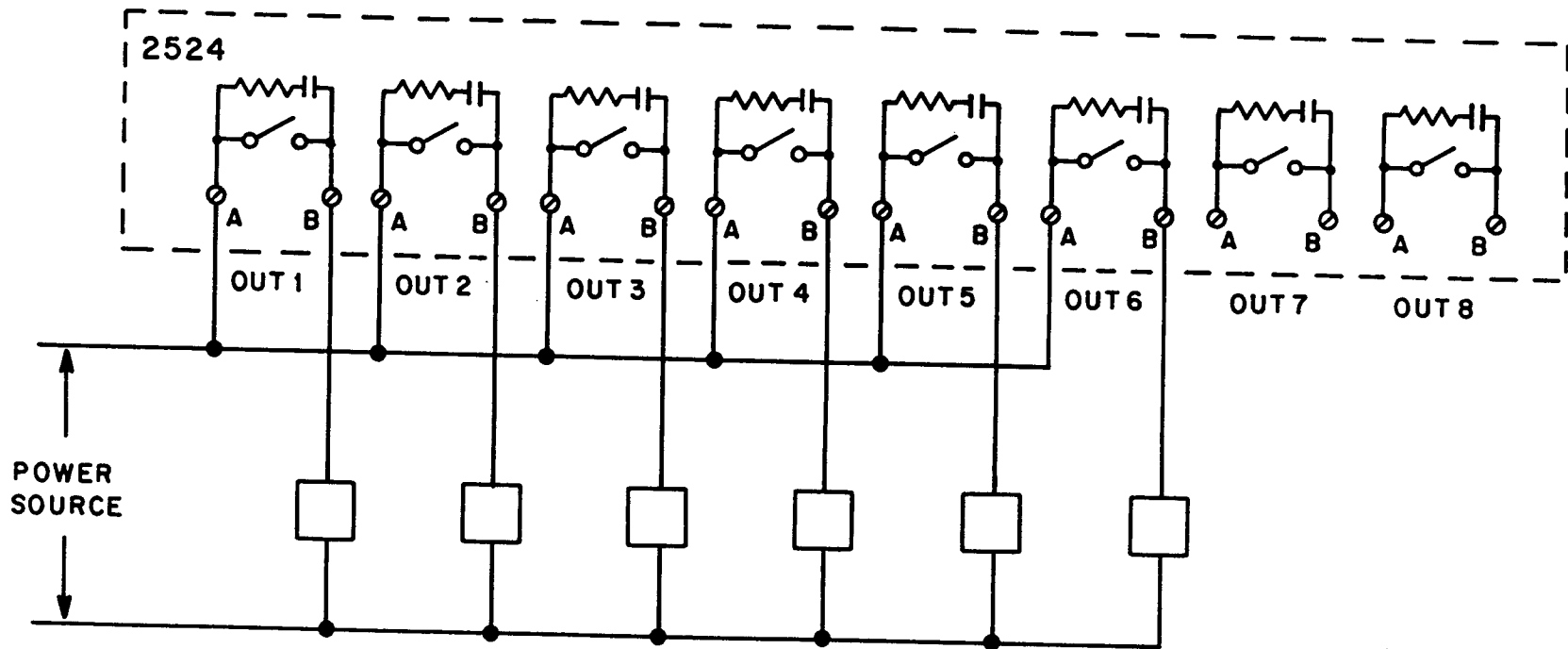


Shielded Pair	Pin	Function in Device
Black	3	Recv.
Red	2	Xmt.
Shield	7	Gnd.

**NOTES:**

1. The data transmission settings on the 2524 and the serial device must match. The 2524's factory settings are: 1200 baud, 1 stop bit, no parity, and 8 data bits.
2. The pin connections shown here apply only to a 25-pin RS-232C connector.

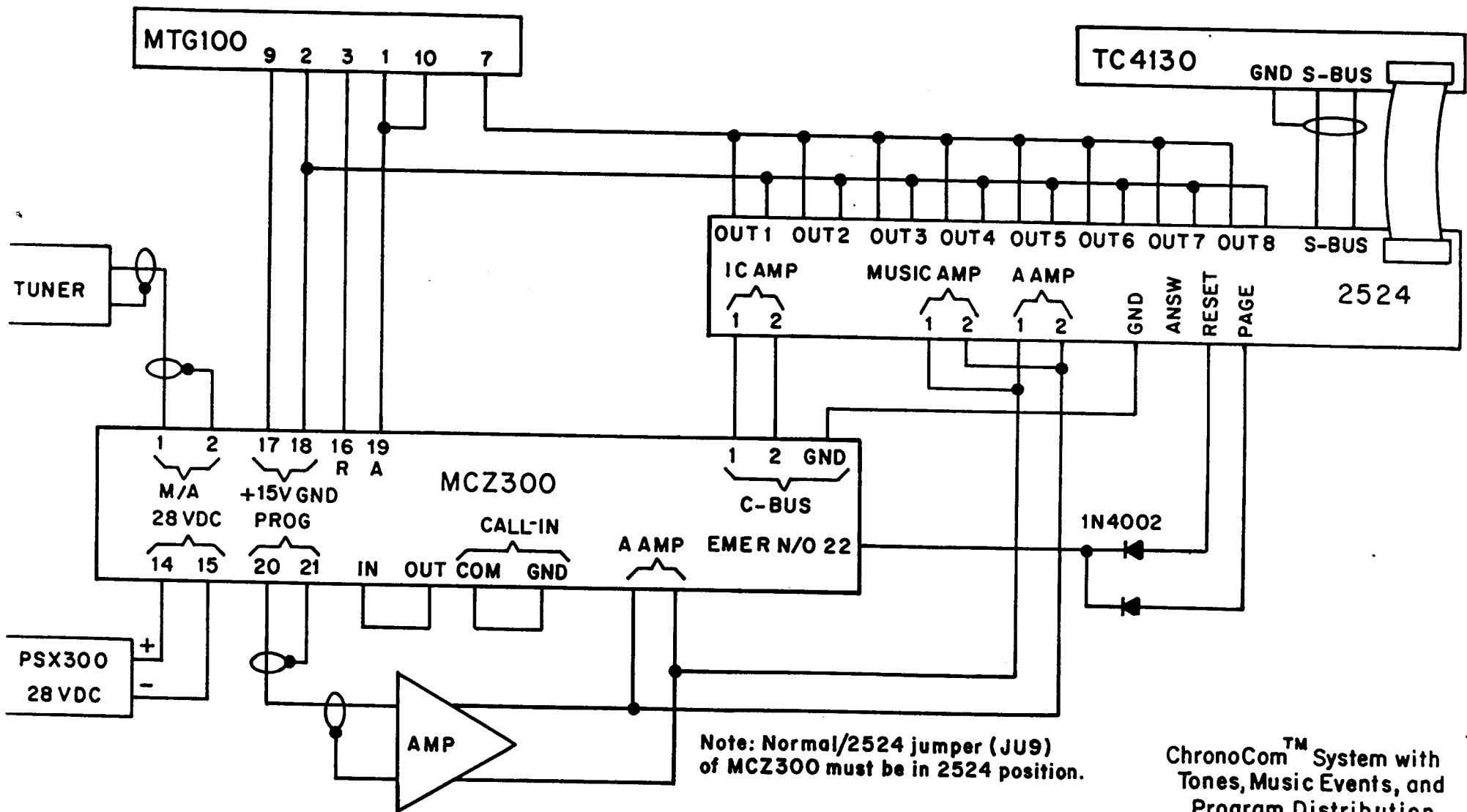
CONNECTING A SERIAL DEVICE TO 2524  
KM0991




**NOTES:**

1. "Mode A" programming determines how many outputs are available as clock zones.
2. Each box (□) represents a load (signaling device or equipment). Each load's current should be limited to 5 amperes (resistive) at 30 VDC or 125 VAC.
3. "Out 7" and "Out 8" are normally used for clock correction but may be used for loads instead.

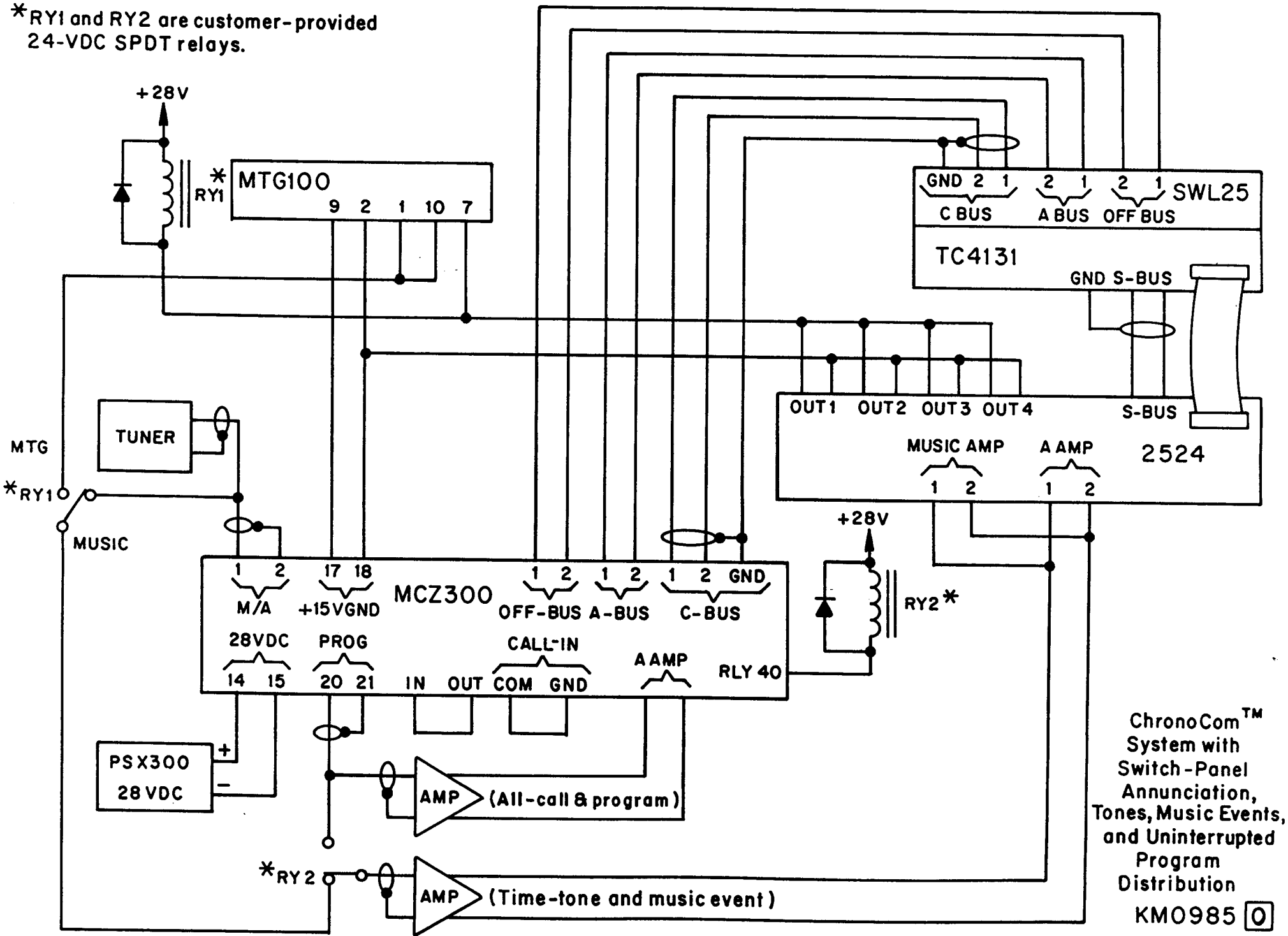
2524 ChronoCom™  
 Connecting Signaling Devices and Equipment  
 KM0987 □




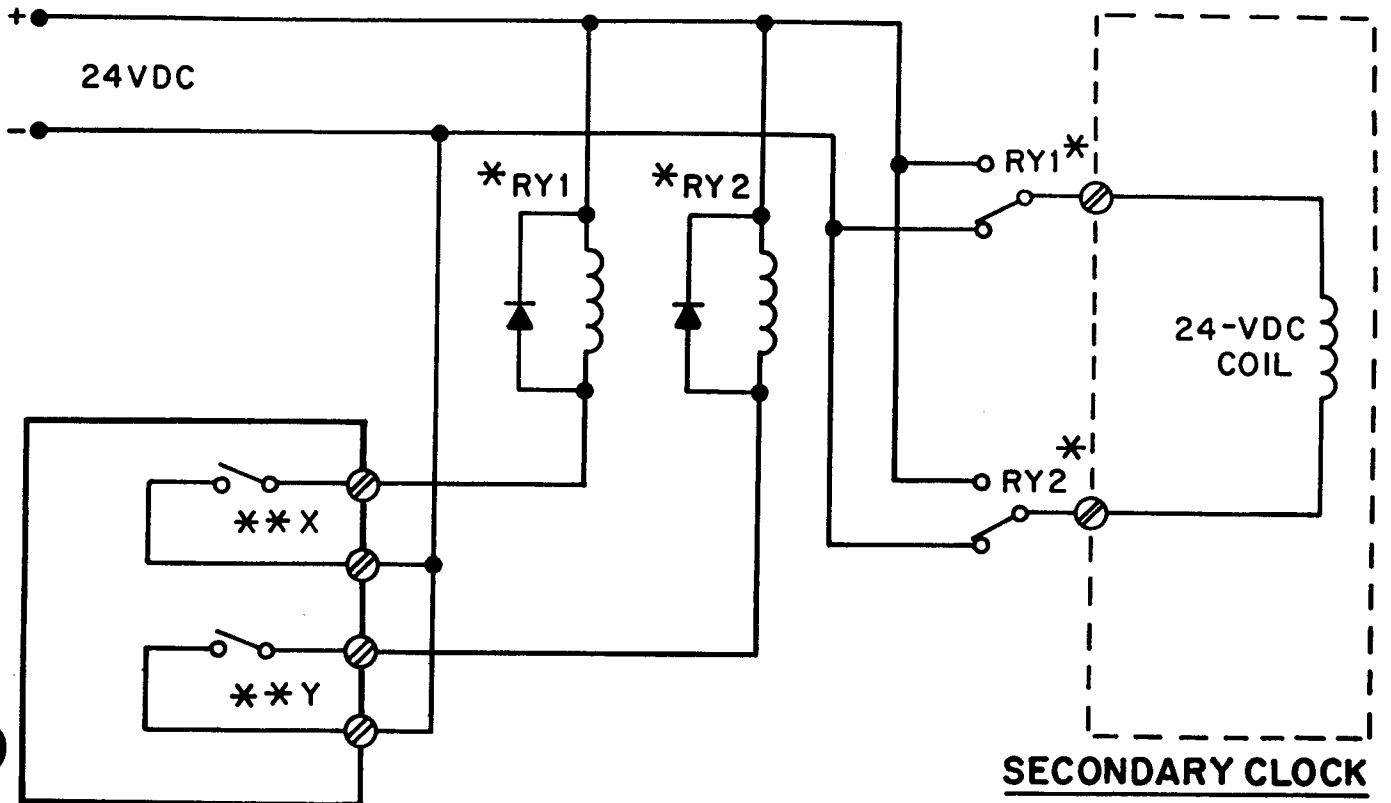
ChronoCom™ System with  
Tones, Music Events, and  
Program Distribution

KM0984 

\*RY1 and RY2 are customer-provided 24-VDC SPDT relays.



ChronoCom™  
 System with  
 Switch-Panel  
 Annunciation,  
 Tones, Music Events,  
 and Uninterrupted  
 Program  
 Distribution  
 KM0985 

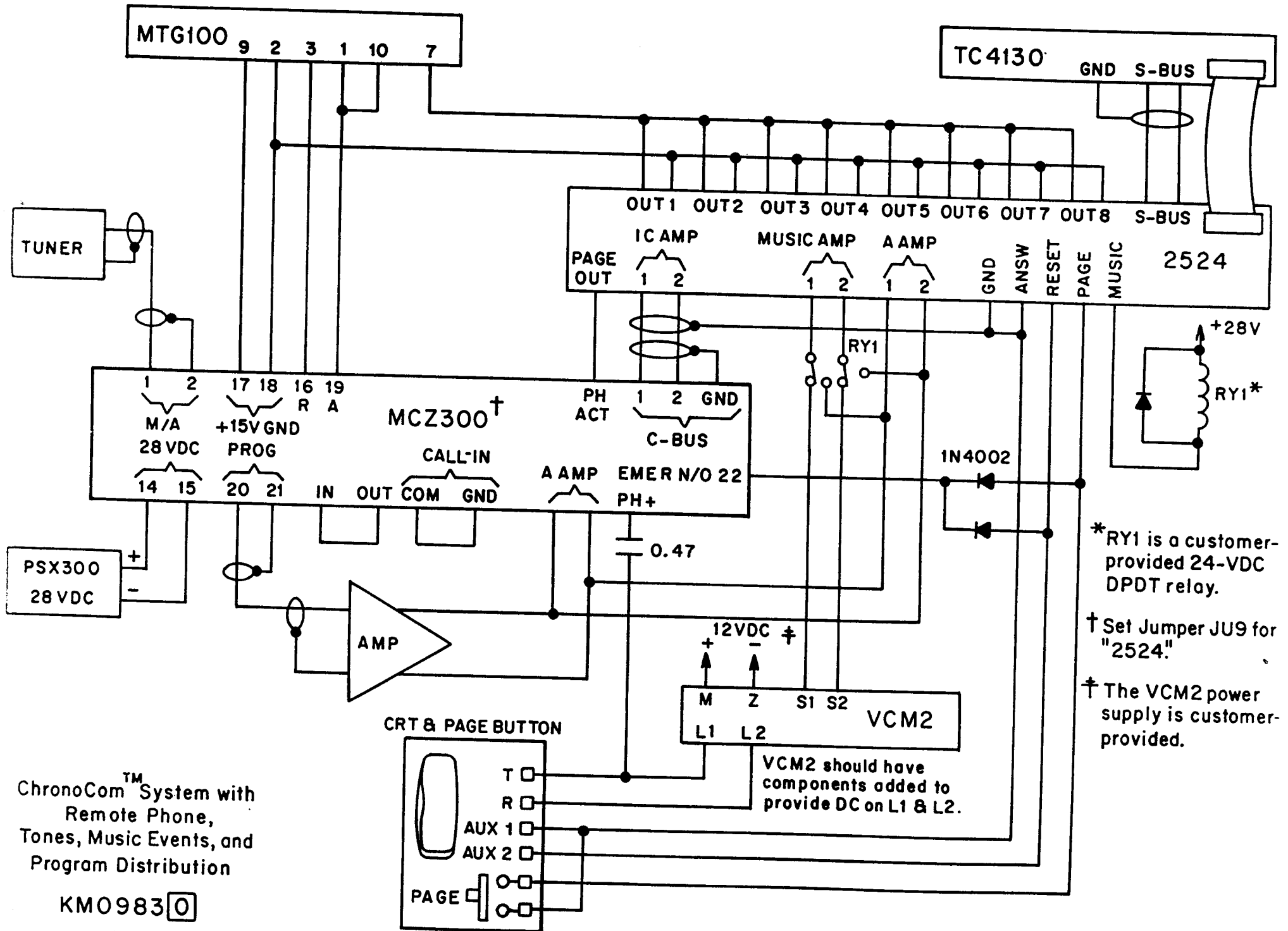


2524

Correction Code (Mode A)	Correction Timing	
	Minute Impulse	Hourly
#22	"X" is activated for 2 seconds every even minute (2 seconds on, 118 seconds off, 30 cycles per hour) From X:00:58 To X:58:58. "Y" is activated 2 seconds every odd minute (2 seconds on, 118 seconds off, 30 cycles per hour) From X:01:58 To X:59:58.	Not Applicable

\* RY1 and RY2 are customer-provided 24-VDC SPDT relays.  
 \*\* See "Correctable Secondary Clocks" (under "Wiring") to determine the output terminals.

Figure 26.



\*RY1 is a customer-provided 24-VDC DPDT relay.

† Set Jumper JU9 for "2524".

‡ The VCM2 power supply is customer-provided.

VCM2 should have components added to provide DC on L1 & L2.

ChronoCom™ System with Remote Phone, Tones, Music Events, and Program Distribution

KM0983