



2524 Master Clock Clock-Functions Programming and Operation

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General Information

Description

The Rauland 2524 is a multi-function Master Clock and Communications Control Center. As a master clock, it will synchronize virtually any kind of secondary clock and control up to 350 "events" (such as sending tone signals or turning lights and equipment on and off). As an intercom controller, it adds control of room-switching functions and display functions to Director III intercom-control panels.

Manuals

This manual tells how to program the 2524 for clock functions. The first section gives the basic programming procedures. The "Clock Modes A-F" section explains the programming for the general settings needed by the unit. The last section deals with specific clock functions. Generally, the Clock Modes A-F, *especially Clock Mode A*, should be done before the numerical modes.

Following the text are tables that list all of the programming functions. Also attached are a work sheet for devising a special clock-correction code and charts for planning the system programming.

For information on installing only clock functions, see KI-1734.

Communications Functions

For information on communications functions, refer to the following manuals:

- 2524 Clock and Communications Installation* KI-1628
- 2524 Clock and Communications Programming* . . . KI-1629
- 2524 Clock and Communications Operation* KI-1630

These manuals cover both communications and clock functions.

Power-up

When the 2524 is turned on, its displays normally appear as follows: the "Mode" window reads "0" (Run Mode), the "Time" window shows the current time, the "Sched" ("Schedule") window shows a flashing "P" (to indicate that the power was off), and the "Clock" LED lights (to show the unit is set for clock operation). Push any key to stop the flashing "P."

- ☛ The "Sched" window will show the number of the schedule currently in use.

Note: If the battery was "disabled" (see IL0341 in KI-1628 or KI-1734), the "Time" display may be random. In this case, set the date and time (Clock Modes 1 and 2).

Programming Summary

This section gives the procedures for accessing, changing, and entering programming information.

After this summary, there is a section on planning. Then the three groups of programming modes are explained. The alphabetical modes (A-F) are explained first because these settings are usually entered during setup and left that

way, except for the annual holiday and Daylight Savings Time changes. The other clock modes follow in that order.

Disabling Programming

Jumper *J2* on the main circuit board of the 2524 can prevent any programming changes from being effected. Although the displays would still change as a user entered

different values, these changes would not be recorded in the EEPROM and so the old settings would remain in effect. The only changes that could be effected from the front panel would be the time and date.

As viewed from the front of the 2524, J2 is near the right rear corner of the circuit board, near the four-pin header of the serial port. J2 has three pins and a sleeve jumper that slides over two pins. To disable the programming, place the sleeve jumper over the middle and rear pins (the "DIS" setting). To enable programming, place the sleeve jumper over the middle and front pins (the "EN" setting).

Caution

Accessing this jumper requires removing the top cover of the 2524, which, in turn, entails removing the power connections on the rightmost rear screw terminals (as viewed from the rear). Before beginning, turn off the AC power going to the unit. Follow the directions in KI-1660 when reconnecting the power.

Sequence

Important: Before entering clock events (Clock Mode 3) or editing them (Clock Mode 4), enter any clock-correction codes (Mode A), because each code takes up two outputs that are not, consequently, available for events. The 2524 will not allow you to enter an event for a zone that is taken up by a clock code. Should you enter events for zones that you subsequently take up with a clock code, the 2524 will not erase them. However, it will not activate events in clock-code zones, and these zones' LEDs will not light when you review the events in Clock Mode 4. The remaining modes may be programmed in any order.

Access to Programming

To begin programming, the clock must be in the Clock Run Mode ("0").

Step 1. Enter the Security Code (*Funct 2524*—that is, press in succession the *Funct*, 2, 5, 2, and 4 keys):

- ◊ The "0" in the "Mode" window will flash, meaning that you can select a programming mode. If you pause more than five seconds between keystrokes or enter invalid keystrokes, the clock will display "Err0," "beep," and revert to the Clock Run Mode.

Note: Should you wish to select intercom programming, you can only select the "Comm" modes. To select the clock modes, you have to first exit to the Clock Run Mode, then begin again with Step 1.

Step 2. To select a numbered mode (1-9), type in its number; to select a letter mode, press *Funct* while you

type the corresponding number ("1" for "A," "2" for "B," etc.).

- ◊ The number or letter you selected will show steady in the "Mode" window. You can now either enter a different mode or commence programming.

General Methods

Flashing, whether in a window or an entire group of LEDs, marks the spot (field) in the programming that will be affected by your entries. We refer to this flashing area as the "flashing cursor."

Step 1. When you are in the desired mode, use the cursor keys (← and →) to move to the desired window or LED group.

Step 2. Use the digit keys to enter the desired programming. Keys 1-8 toggle the individual "Zones" and "Days" LEDs on and off.

Step 3. Use the orange *Clear* key to restore a field's previous setting (except in Mode B, where it is used to enter the entire series of numbers). When you are sure all the entries for the mode (or individual event) are correct, press the orange *Enter* key.

- ◊ The new programming will be stored in the clock's memory, and the "Time" window and any involved LEDs will light steady, to show your final entries. If you enter invalid data, such as "13" for the month, the 2524 will "beep" and flash the left-most field that had an error (for times and dates, the 2524 typically reverts to the last valid entry). Correct that field and press *Enter*, which will cause the 2524 to record this change and check for any other errors. If it finds one, it will flash that field.

Note: In Modes 1 and 2, the 2524 automatically advances to the next mode after you press *Enter*.

Exiting

To quit programming, return the cursor to the "Mode" window and type a "0" (Clock Run Mode). Alternatively, do nothing for one minute. In either case, the 2524 will return to the Clock Run Mode.

T2524 Diagnostics and Programming Disk

This program diskette, which runs on an XT[®]-compatible personal computer, provides a quick, easy method of programming events, holidays, time-change dates, and configuration. It can also store event programming on a disk for later retrieval. The programming diskette includes a self-explanatory manual. The T2524 program can also handle room-station programming and logging (Communications mode).

Planning

Information Needed

Because of the interrelation between the wiring and the programming, a good deal of programming-related planning was required for the installation. You need the following information from that planning:

- ✓ What is connected to each "Zone/Output" terminal (secondary clocks, equipment, etc.).
- ✓ What, if any, secondary clock codes are needed; if two are used, which is needed for Outputs 5 and 6, and which for Outputs 7 and 8.
- ✓ Whether there is an audio program source that can be used for clock events ("Music").
- ✓ Whether there is a tone generator for clock tones.

From the customer, you need to find out:

- ✓ The desired schedules for clock events, including holidays.
- ✓ The desired zones for clock events.
- ✓ The dates of the holidays and other special days for which a special schedule is desired. (You also need to know the dates for the changes to and from Daylight Savings Time.)

Most of this information can simply be entered in one or two steps and, accordingly, will be explained in the appropriate "Modes" section of this manual. The events require more planning.

Planning Charts

Completing the charts attached to the end of this manual is an important part of planning. This will help you organize the programming, make it easier to enter the data, give the user helpful information, and simplify later programming changes. When you are finished, provide copies to the users and keep a set for your own files.

The Zones Chart

When the 2524 is wired and used like a conventional master clock, you can easily figure out how its zones can be used. Any output connected to secondary clocks or to equipment can serve only them.

- The eight zones are tied in with the 2524's "Zone/Output" terminals. For example, if Outputs 7 and 8 are used for a clock-correction code, you cannot use Zones 7 and 8 for events (e.g., for sending clock tones via speakers).
- To have clock tones via speakers, the corresponding output terminals must be wired to the tone generator, in order to activate the tone signals. This eliminates the use of clock events via speakers in any zone

whose corresponding output terminal is used for correcting clocks or controlling equipment.

The Events Chart

This chart contains the most columns and will typically have the largest number of entries. In order to fill it out, you first have to fill out the charts explained above.

An "event" is simply the automatic closing of a "Zone" output terminal and the pulling in of relays on optional speaker relay panels (if the communications function is used).

The circuit closure on an output, in turn, is used to control external devices connected to the clock. The output may activate for a programmed time between one and 59 seconds (to ring bells, for instance), or it may be left on until it is turned off again by another event at a different time (to control lights or heating equipment, for instance).

Entering an event requires five pieces of information: the time and the days when the event will take place, which "Zone" outputs will be activated, which schedule is involved, and, if music or other audio programming is desired, how long it should play after the event bell.

"Event No.": This column is for your reference only—to keep track of the number of events, etc.; it is not programmed into the clock.

Time: If you are using the 12-hour display format, be sure to indicate "AM" and "PM"; if you are using the 24-hour format, leave the "AM" and "PM" columns blank but use "13"—"23" for the "PM" hours and "00" for the Midnight hour. Use this chart for your own and the user's convenience: should you subsequently change modes, the clock will automatically adjust the times for the events. Thus, if you are more familiar with the 12-hour mode, you can enter everything that way and then change the clock to the 24-hour mode.

You may schedule multiple events for the same time. For example, you may want different types of events in different zones but starting at the same hour of the day, or you may want to vary the types or sequence of events on different days of the week.

Days of the Week: You may program each event to occur on one to seven days of the week, in any combination of days.

Schedule: Enter a number from "1" to "8" (or a "9" if there is an attached Amiga Computer with the MR300 Clock and Message Center Software—see KI-1661). Remember that only one schedule can be active at a time. Normally, this is the one selected in Clock Mode 6 and displayed in

that only one schedule can be active at a time. Normally, this is the one selected in Clock Mode 6 and displayed in the "Sched" window. However, the regular schedule will be overridden by a holiday schedule (Clock Mode C).

Zones: Note that a zone must also be selected in Clock Mode 6. An event will be executed only in the zones that have been entered in the event *and* selected; however, such an event could still turn off an ongoing latched event in an active zone (see the "Important" note further on in this subsection).

The distinctive feature of event zones is that they use the 2524's "Zone" output terminals, whether or not relay panels are involved. To send tones to speakers, the system must include a tone generator. Because the "Zone" outputs are needed for clock corrections (except for digital clocks wired to the 2524's "DIG" output), the number of event zones available for use is reduced by two for every clock code that is programmed into Clock Mode A.

Latching events effectively monopolize a zone. You must give their zones a duration of "00" in Clock Mode 5.

Important: Latched events will end upon the execution of any subsequent event that does not include their zones. This could be a regular event or a special "no zones" one whose sole purpose is to end latched events.

Exception: When there are two or more events that will execute at the same time, only one of them needs to include the zone for the latched event.

Music: This should only be selected for speaker zones. Besides having relay switching panels, the system should also be equipped with the necessary program-distribution equipment (e.g., a Director master control panel, a tuner and cassette player, and an appropriate Rauland power amplifier).

You can select a duration of one to 15 minutes. After the bell tone sounds, the music will play for the selected length of time.

Clock Modes A-F

As was explained earlier, these general settings, especially Mode A, should be entered first. Before beginning here, you should fill out the charts, as explained in the "Planning" section.

Mode A (Preprogrammed Clock Codes)

Outputs 5-8 can be used individually to control clock events or in pairs to correct secondary clocks. Each type of secondary clock has its own sequence of correction signals (frequency, duration, etc.); see KI-1734, the 2524 clock-functions installation manual, for an extensive listing of secondary clocks and the correction codes they require. Two of these codes can be used simultaneously in the 2524. Digital secondary clocks can be controlled by the 2524's Dig output; this arrangement does not use up either a Mode A code or any event-zone outputs.

Note: The 2524's standard codes should correct all of the widely distributed secondary clocks and most of the others. You should be able to accommodate virtually any clock by entering a custom code for it in Mode B, below.

Step 1. After entering the programming function, press *Funct* while you type 1 to select Mode A.

◊ The left half of the "Time" window will display the first correction code, and the right half will display the second correction code. If no code has been entered, the display will show "00." The "Zones" LEDs will light to show which outputs are available for events (4, 6, or 8, depending upon how many correction codes are used). The "Sched" window will

show "d" if the power-up correction is disabled, or "E" if it is enabled (see Step 3).

Step 2. Use the right cursor key (→) to select the "Time" window.

If only one correction code is needed, enter its two-digit code (e.g., "07") in the left "Time" window, and enter "00" in the right "Time" window. In this case, *Out 7* and *Out 8* will be used for correcting the clocks.

If a second correction code is needed, enter it (for *Out 5* and *Out 6*) in the right "Time" window.

If you do not want any code, press *Clear* to change both entries to "00."

You can also use *Clear* if you make a mistake and want to re-enter the codes.

◊ As soon as you enter a digit, it will replace the corresponding digit in the "Time" window, and the "Zone" LEDs will turn off.

Step 3. Press → to move to the "Sched" window. Push *Funct* to toggle between the "E" (enabled) and "d" (disabled) setting for immediate time correction. When this function is enabled, the 2524 will send corrections to the secondary clocks whenever the time is changed or as soon as power is restored after a power failure; when the function is disabled, the 2524 will only send corrections at the regular times (hourly and 12-hour). This function is very useful for systems with minute-impulse clocks, because it accumulates the pulses for the slave clocks.

Step 4. Press *Enter* to record your changes.

- ☐ The "Time" and "Sched" windows will show steady, and the "Zone" LEDs will light to show which outputs are now available. However, if the 2524 finds an invalid code entry, it will "beep" and keep the cursor on the "Time" window.

Mode B (Custom Clock Code)

This mode is used to program a correction routine for a secondary clock that does not match any of the 2524's standard codes. You can enter up to two sets of seven integers. The first set consists of Integers "01" through "07," and the second set consists of Integers "08" through "14."

Creating a Custom Code

Find out the precise correction requirements of your special secondary clock. This includes such items as the on and off times for correcting the time, whether there is more than one clock motor involved, and the output or outputs on the 2524 to which the clock is wired. Use the "Custom Code Work Sheet" at the back of this manual to establish the 2524 programming for the clock. After entering this programming into the 2524, keep this work sheet with the other installation documents for future reference.

Important: For proper operation, be sure to enter a value for every bit in both programming blocks.

Entering the Custom Code

Step 1. After entering the clock programming modes, select Mode B by holding in *Funct* while you press 2.

- ☐ A "b" will appear in the "Mode" window, and the left "Time" window will display "01," which indicates that the number in the right window is the first integer for the custom code.

Step 2. Push → to move the flashing cursor into the right "Time" window.

- ☐ The two digits in that window will flash.

Step 3. Type in the first two-digit number from your work sheet, then push *Enter*.

- ☐ The left "Time" window will increment to the next number, and the right window will flash the current entry for that integer.

Note: For integers that need to be designated as minutes or seconds (bytes 4, 6, 11, and 13), push *Funct* to toggle between minutes and seconds (the "PM" LED lights for "minutes"). When the setting is satisfactory, press *Enter*.

Step 4. When you have finished with this mode, push *Clear* to enter your code into the EEPROM.

- ☐ All the custom-code settings will be entered, and the "Time" windows will show the first integer.

Step 5. Go to Mode A and enter "21" as one of the correction codes. Be sure to select it as the first or second code in accordance with your work sheet.

Mode C (Holidays and Time Changes)

This mode is used to enter the dates for the holidays and Daylight Savings time changes.

Step 1. After entering the clock programming modes or finishing in another mode, select this mode by holding in *Funct* while you press 3.

- ☐ A "C" will appear in the "Mode" window.

Step 2. Press → to move the "flashing cursor" to the "Time" windows.

- ☐ The "Time" windows will flash.

Step 3. To select a day for a special schedule or an automatic time-change, type two digits for the month and two more for the date (MMDD). Press → to move the cursor to the "Sched" window.

- ☐ The "Time" windows will go steady and the "Sched" window will flash.

Step 4. Make one of the following entries:

To disable all events on that day: Type "0."

To select a special schedule for that day: Type in the schedule's number (1 through 8). Whether or not the schedule is selected in Mode 6, it will automatically run on this date.

To repeat a holiday schedule on consecutive days: After you enter a schedule number, as explained in the preceding paragraph, the Schedule window will go steady and the "Music" LED will flash. If you want the holiday schedule you just entered to run for more than one day, type "1." The left "Time" display will show "du" ("duration"). Type in an integer (from 1 to 15) to specify how many consecutive days you want this holiday schedule to run. (Because you have already selected a holiday schedule, the 2524 will run it for one day even if you enter a "0" here). This option is useful for vacation periods.

To advance the time one hour at 2 a.m.: Press *Funct* and 1 to enter "A" ("Advance") in the "Sched" window.

To turn back the time one hour at 2 a.m.: Press *Funct* and 6 to enter "F" ("Fall" or "fall back") in the "Sched" window.

Step 5. When you are satisfied with your entries, press *Enter*.

- ☐ The 2524 will check your entry for a valid date; if it finds an error, it will flash your entry in the "Time" windows. If you entered a "duration" value (to repeat a holiday schedule), the program will check it for validity, too. If it finds an error, it will "beep"

to indicate an error, continue displaying "du" in the left "Time" window, and flash the right "Time" window. If you did not enter a duration value or if the program does not find any errors, it will store this holiday event and flash the "Time" windows again, signaling that it is ready for another entry.

Mode D (Edit Holiday events)

This mode is used to review, edit, and delete the holiday and time-change events entered in Mode C.

Step 1. After entering the clock-programming modes, select Mode D by holding in *Funct* while you press 4.

- ◊ The "Mode" window will read "d," and the remaining windows and LEDs (except "Clock" and "Comm") will display the first holiday (in chronological order).

Step 2. If you want to work with this event, skip to Step 3. To move to the next holiday, push the *Enter* key. To move directly to an event for a certain date, press → to move the cursor into the "Time" windows, enter the desired date in the "MMDD" format, and push *Funct*.

- ◊ The front-panel displays will show the selected holiday event. If no holiday event has been programmed on the selected date, the 2524 will display the event for the earliest following date. If there is no later holiday event, the 2524 will "beep" and display its earliest holiday event; if no holidays are programmed, the 2524 will "beep" and flash the "Mode" window.

Step 3. To modify an event, use the cursor keys to select the appropriate window or LED block, then enter the desired number. To delete an event, move the flashing cursor into the "Time" windows, then press *Erase*. Check your entries, then press *Enter*.

- ◊ The 2524 will enter any changes into the EEPROM (or erase an event from there) and display the next event.

Step 4. When you are finished programming in this mode, move the flashing cursor to the "Mode" window and select another programming mode or enter "0" to return the 2524 to the Clock Run Mode.

Mode E (Relay Panels, Comm Activation)

This mode has three settings. The first tells the 2524 how many "SC" relay panels (TC4110, TC4130, or TC4131) are connected to it. The second tells the 2524 whether or not it should activate its communications functions. Unless this operating mode is activated here, the 2524 will not receive call-ins, make calls, do paging, or even enter the "Comm" mode. The third setting determines whether or not the 2524 will handle call-ins.

For information on the communications functions, see the combined clock and communications manuals for the 2524, listed on page 2 of this manual.

Step 1. After entering the clock-programming function, hold in *Funct* while you press 5.

- ◊ The "Mode" window will flash "E," the left "Time" window will display "SC," the right "Time" window will show the previously programmed number of relay panels, and the "Sched" window will show "O" ("Off") if the call-in function has been disabled or "C" if it is enabled.

Step 2. Push → to move the flashing cursor to the "Time" windows.

- ◊ The right "Time" window will flash.

Step 3. Enter any number between "00" and "20," then move the flashing cursor to the "Zones" LEDs.

- ◊ If the communications mode is enabled, the first LED will flash at the approximate rate of one second on and one second off; the remaining LEDs in this block will remain off. If the "Comm" mode is disabled, all eight LEDs in the block will flash at the rate of a half-second on and one-and-a-half seconds off. If the "Comm" mode has already been enabled, the first "Zone" LED will light steadily, and the other LEDs will be off.

Step 4. Use the 1 key to toggle between the two settings. When the setting is satisfactory, press → to move the flashing cursor to the "Sched" window.

- ◊ The "Sched" window will flash.

Step 5. Push *Funct* to toggle between "O" ("Off") and "C" (call-ins). Make sure that all three settings are satisfactory, then push *Enter* to store the data.

Important: Turn Pot *RP1* fully counterclockwise when you are not using the communications functions.

- ◊ The stored settings will be displayed, and the "Mode" window will flash.

Step 6. You can now specify another mode for programming or enter "0" to return the 2524 to the Clock Run Mode.

Mode F (Events: Totals and Erase All)

This mode will show how many regular events and how many holiday events have been programmed. It can be also used to erase *all* of these events.

Step 1. If necessary, enter the clock programming mode. Hold in *Funct* while you press 6.

⊕ The "Mode" window will flash "F," the "Time" windows will display the number of events, and the "Sched" window will show an "E" (regular Events).

Step 2. Use the *Enter* key to toggle between the regular events and the holiday events.

⊕ For the holiday events, the "Time" windows will display the appropriate number, and the "Sched" window will show "H."

Step 3. To simultaneously delete all events (both regular and holiday), move the flashing cursor to the "Time"

windows, push and release the *Funct* key, type "2524," then press *Enter*.

Note: It does not matter which kind of event is currently displayed, since this procedure will erase both kind kinds at the same time.

⊕ The "Mode" window will flash "F," and the "Time" windows will show "0000," indicating that no events are stored.

Step 4. You can now proceed to another mode or exit the programming function.

Clock Modes 1-6

Before beginning here, you should fill out the programming charts, as explained in the "Planning" section of this manual. You should also have completed the programming Modes A-F, especially Mode A.

Mode 1 (Date)

Step 1. If necessary, enter the clock programming function. If you are in a different programming mode, press *1* while the "Mode" window is flashing.

⊕ A "1" will flash in the "Mode" window, and the "Time" windows will show the current setting for the year.

Step 2. Press \rightarrow to flash the "Time" windows. To change the year, type in any number from "1989" to "2099." Check the entry, then press *Enter*.

⊕ If you typed an invalid date, the 2524 will "beep," redisplay its current setting, and wait for you to repeat this step. Otherwise, the 2524 will store your new date and flash its current setting for the month in the left "Time" window and that for the day in the right "Time" window (e.g., "03 15").

Step 3. To change the date, type two digits for the month and two more for the day's date (e.g., "03" for "March" and "15" for the day. Make sure that your entry is satisfactory, then store it by pressing *Enter*.

⊕ If you typed an invalid date, the 2524 will "beep," redisplay its current date setting, and wait for you to repeat this step. If your date is valid, the 2524 will store it and flash a "2" in the "Mode" window, indicating that the unit has automatically advanced to the next mode.

Mode 2 (Time)

Step 1. If necessary, press *2* while the "Mode" window is flashing.

⊕ A "2" will flash in the "Mode" window, and the "Time" windows will show the current time setting.

Step 2. Push \rightarrow .

⊕ The "Time" windows will flash.

Step 3. To change to the 12- or 24-hour format, hold in the *Funct* key while you press one of the following:

For the 12-hour mode, press *1*.

For the 24-hour mode, press *2*.

⊕ The "AM" or "PM" LED will light if you selected the 12-hour mode, or turn off if you switched to the 24-hour mode. If an afternoon-time is set in the clock, the numbers will change (e.g., between "03:27" pm and "15:27"). The "Time" windows will continue flashing.

Step 4. Enter four digits for the time (e.g., "0305" for "3:05"). Your entry must match the 12- or 24-hour time mode (e.g., a 2524 in the 12-hour mode will not accept "20:50" for "8:50 p.m.>").

⊕ If the 2524 is in the 12-hour mode, the "Time" windows will go steady and the "AM" or "PM" LED will flash. If the 2524 is in the 24-hour mode, the "Time" windows will continue to flash after you have typed in the new numbers.

Step 5. (If you are in the 24-hour mode, skip to Step 6.) Press *1* to change to AM, or *2* to change to PM.

Step 6. When you are satisfied with the settings, press *Enter*.

⊕ An invalid time will cause the 2524 to "beep," flash its current setting in the "Time" windows, and wait for you to enter a valid time. A valid entry will cause the 2524 to enter the new time and automatically switch to Mode 3.

Step 7. Continue with Mode 3, enter the number of a different mode, or enter "0" to return the 2524 to the Run Mode.

Mode 3 (Enter Regular Events)

This mode is used to load new events (ringing bells, turning equipment on or off, etc.). You will need to write out all the events first, using copies of the attached Events Chart as guides.

Step 1. If necessary, get the "Mode" window to flash by entering the programming function or moving out of another programming mode.

Step 2. Type a "3".

- ◊ The "Mode" window will flash the "3," the "Time" windows will show the current time, all the valid "Zones" LEDs and the "Days" LEDs will light, the "Sched" window will show "1," and the "Music" LED will be off.

Step 3. Push → to move the flashing cursor into the "Time" windows.

- ◊ The "Time" windows will flash.

Step 4. Type in the time, using four digits.

- ◊ The new time will appear in the "Time" windows. If the 2524 is in the 24-hour mode, all the available "Zones" LEDs will flash, so you can skip to Step 6. If the 2524 is in the 12-hour mode, the "AM" or "PM" LED will flash.

Step 5. Press 1 to select "AM" or 2 to select "PM." Alternatively, if the desired LED is flashing, you can press → to move to the next field.

- ◊ The selected LED will light steadily and all the available "Zone" LEDs will flash.

Step 6. Select the desired zones by using the corresponding keys. For example, pressing 3 will toggle the Zone 3 LED on and off. When only the desired LEDs are lit, press → to move to the "Days" LEDs.

- ◊ The "Zone" LEDs you selected will light steadily, and all the "Days" LEDs will flash.

Note on the Flashing of LEDs: In this mode, when the "cursor" is on the "Zones," "Days," or "Music" LEDs, the 2524 provides two types of flashing. If at least one LED in the field is selected, the 2524 will flash it at the rate of a half-second on and a half-second off. However, if no LED in that field is selected, the 2524 will flash the entire field at the rate of a half-second on and one-and-a-half seconds off. This enables you to quickly detect when the entire LED block is off or on.

Step 7. Select the desired days by using the corresponding keys. For example, pressing 4 will toggle the "Th" LED

on and off. When only the desired LEDs are lit, press → to move to the "Sched" window.

- ◊ The selected "Days" LEDs will light steadily, and the "Sched" window will flash.

Step 8. Enter one schedule number ("1" through "8").

- ◊ The number will be shown steadily in the "Sched" window, and the "Music" LED will flash.

Step 9. If you want music to play over the speakers after they have sounded the bell tone, type in a "1." If you do not want this music, type in a "0."

- ◊ If you did not select music ("0"), the "Music" LED will flash at the rate of a half-second on and one-and-a-half seconds off. If you selected music ("1"), the "Music" LED will glow steadily, the left "Time" window will read "du" ("duration"), and the right "Time" window will flash.

Step 10. If you did not select music, skip to Step 11. If you did select music, type in a two-digit number to indicate how long you want the music to play. You can specify from one minute to 15 minutes ("01" through "15").

- ◊ The right "Time" window will flash the number you entered.

Step 11. Check all the settings for the event. When all is satisfactory, push *Enter*.

- ◊ The 2524 will check all the settings for this event. If it finds an invalid setting, it will "beep" and flash that setting; if there is more than one error, the 2524 will flash the left-most one, and work its way to the right as you correct each error. If no errors are found the 2524 will store the event and flash the "Time" window to show it is ready for you to enter another event (the time shown will be that which you entered for the last event).

Note: To change any setting, use the cursor keys in the usual way to move back and forth through the settings. The one exception is when the cursor is in the "Time" windows for the "du" setting: in this case, press the left (←) cursor to move the flashing cursor back to the "Sched" window (or further back). To change the "du" setting when you have just entered an undesired value, push ←, to return to the "Sched" window, push → to move back to the "Music" LED, then push 1 to select music again.

Step 12. When you are finished with this mode, move the flashing cursor back to the "Mode" window and either select another programming mode or type in "0" to return the 2524 to the Clock Run Mode.

Mode 4 (Edit Regular Events)

This mode is used to Review, Edit, and Delete regular events.

Step 1. If necessary, get the "Mode" window to flash by entering the clock-programming function or moving out of another of its modes.

Step 2. Type a "4."

- ◊ The "Mode" window will flash the "4," the "Time" window will show the earliest time of day programmed for an event, and the LEDs and windows will show the programming for this event.

Step 3. To move to the next event, push the *Enter* key. To move to a specific event, push the → key once to move the flashing cursor into the "Time" windows, enter the time of the event there, then press *Funct*.

Caution: Do not press *Enter*, because that would enter a new time for the displayed event.

- ◊ The next or the selected event will be displayed, and the flashing cursor will move back to the "Mode" window. If you entered a time for which there is no event, the 2524 will display the earliest event following the time you entered. If there is no event at that time or later, the 2524 will "beep" and display the latest event.

Step 4. To edit (change) any part of an event, move the flashing cursor to the appropriate window or LED block. Enter changes by typing in the desired value or using the numerical keys to toggle the LEDs on and off, as in Mode 3. To access the "duration" window, you have to enter a "1" when the "Music" window is flashing. When the 2524 shows the event as you want it, push *Enter*. To erase a displayed event, move the flashing cursor into the "Time" window and press *Erase*.

- ◊ The event will be reprogrammed or erased, and the 2524 will display the next event and move the flashing cursor back to the "Mode" window.

Step 5. When you are finished with this mode, move the flashing cursor back to the "Mode" window, if necessary, and either select another programming mode or type in "0" to return the 2524 to the Clock Run Mode.

Mode 5 (Zone Duration)

This mode is used to program the length of time (duration) that each zone's relay will close when it is activated by an event. Two kinds of events are set up here: regular, short-duration events like sounding a bell tone, and latched events, which turn on a relay until another event turns it off. Latched events are used for controlling such things as lights and equipment for heating and

cooling. Note that the duration for music or other program material is set as part of the event itself in Mode 3.

Step 1. If necessary, get the "Mode" window to flash by entering the programming function or moving out of another programming mode.

Step 2. Type a "5."

- ◊ The "Mode" window will flash the "5," the "Zone 1" LED will light, the left "Time" window will show "du" ("duration"), and the right "Time" window will flash with the programmed duration of Zone 1.

Step 3. To cycle through the zones, press *Enter* while the right "Time" window is flashing.

- ◊ Whenever you press *Enter*, the 2524 will advance in numerical order to the next zone; after Zone 8, it will wrap around to Zone 1. If a zone is used for a clock-correction code and is therefore not available for events, the "Time" windows will show "Corr."

Step 4. For a regular duration, type in from "01" second to "59" seconds; for a latched event, type in "00." When the zone is the way you want it, press *Enter*.

- ◊ The 2524 will store the new duration, turn off the LED for that zone, and display the duration for the next zone.

Step 5. When you are finished with this mode, move the flashing cursor back to the "Mode" window and either select another clock-programming mode or type in "0" to return the 2524 to the Clock Run Mode.

Mode 6 (Activate Zones and Schedules)

This mode determines which zones and schedules are active. Unless a zone is "turned on" in this mode, it will not run even though it is included in a regular event that the 2524 executes. For example, if a regular event included Zones 1-4 but only Zone 3 was activated in Mode 6, the 2524 would only carry out this event in Zone 3.

Only one schedule can be active at a time, and only those regular events that have the currently selected schedule will be executed.

Note: A holiday entry will execute the events in its selected schedule even if they have not been selected in Mode 6.

Step 1. If necessary, get the "Mode" window to flash by entering the clock-programming function or moving out of another of its modes.

Step 2. Type a 6.

- ◊ The "Mode" window will flash the "6," the "Time" window will be blank, the LED of each active zone

will be lit, and the "Sched" window will show the currently selected schedule.

Step 3. To select a different schedule, skip to Step 5. To select different zones, move the flashing cursor to the "Zones" block.

◊ The currently selected "Zones" LEDs will flash; if none is selected, the entire block will light for a half-second every two seconds.

Step 4. Use the corresponding numeric keys to toggle the "Zones" LEDs on and off.

◊ Each available zone's LED will toggle on and off as you press its corresponding numeric key. If you press the numeric key for a zone being used for clock corrections, nothing will happen.

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Step 5. To select a different schedule, press → to move the flashing cursor to the "Sched" window. Type in a number from "1" to "8." Double-check both this value and the "Zone" LEDs, then push *Enter*.

◊ The "Zone" LEDs and the "Sched" window will light steadily with your new entries, and the "Mode" window will flash.

Step 6. Select another clock-programming mode or type in "0" to return the 2524 to the Clock Run Mode.

Mode 0 (Run)

The Clock Run Mode is the normal operating state of the 2524. To enter this mode from any programming mode, type a "0" while the "Mode" window is flashing. Note that the 2524 will automatically revert to the Clock Run Mode from any programming mode after one minute of inactivity (no button is pushed).

Work Sheet for Custom Secondary-Clock Code

Bit	Value	Bit	Value	Description
01		08		Starting hour: any number between "01" and "12." Enter "80" to select every hour.
02		09		Starting minute: any number between "00" and "59." Enter "80" to select every minute.
03		10		Starting second: any number between "00" and "59." Enter "80" to select every second.
04		11		How long the relay should remain "on": indicate whether your units are seconds ("S") or minutes ("M").*
05		12		Number of cycles.
06		13		How long the relay should remain "off": indicate whether your units are seconds ("S") or minutes ("M").*
07		14		Select the output relay that this seven-byte block will control: enter "1" for <i>Out 5</i> or <i>Out 7</i> ; enter "2" for <i>Out 6</i> or <i>Out 8</i> **

* The way you enter this number during programming will determine whether the 2524 interprets it as minutes or seconds: after typing the number, press *Enter* for seconds or *Funct* for minutes.

** You must coordinate three factors to direct a seven-number block to a particular clock or motor in the clock:

- ✓ You must wire the clock to a particular relay (*Out 5*, *Out 6*, *Out 7*, or *Out 8*).
- ✓ In Mode A, you must enter the Custom Code as either the first correction code (the only choice when only one code is used) or the second code. The first correction code controls *Out 7* and *Out 8*, and the second code controls *Out 5* and *Out 6*.
- ✓ Use the seventh number of the block to designate the odd or even relay.

Note: Although Mode A and the seventh number in the block each designate two possible relays, in combination they designate only one relay. For example, choosing the second code in Mode A limits the relay choice to 7 or 8; entering a "2" in the seven-number block designates Relay 6 or 8. Only *Out 8* matches both these designations.

- ✓ For proper operation, program every bit in both blocks.

Example

The following table shows how the correction code for Rauland analog clocks (regular Correction Code 1) would be set up as a special code. This is done for illustration only; you would not usually need to enter a regular code

Block 1		Block 2	
Entry	Value	Entry	Value
01	80	08	06
02	00	09	00
03	00	10	25
04	25*	11	24*
05	00	12	00
06	00	13	00
07	01	14	01

as a special code (the only exception would be entering a simple standard code for each seven-number block, in order to get two corrections in a single code and thereby free up two output terminals).

Commentary:

Entry 1: "80" = hourly correction.

Entry 2: "00" = start the correction pulse during the "zero" minute.

Entry 3: "00" = start the correction pulse on the "zero" second.

Entry 4: "25" = close the relay for 25 seconds per pulse.

Entry 5: "00" = only one correction pulse.

Entry 6: "00" matches Entry 5: no time between pulses, since there is only one pulse.

Entry 7: "01" = send this correction out the odd-numbered relay.

Entry 8: "06" = start the 12-hour correction during the sixth hour.

Entry 9: "00" = start the 12-hour correction during the "zero" minute.

Entry 10: "25" = start the correction 25 seconds after the minute. Note that the standard code would start this at "00" seconds. The difference here is that we are using the same output terminal for both the

hourly and the 12-hour correction (see Entries 7 and 14). Therefore, we have to wait 25 seconds for the hourly pulse to end (Entry 4) before beginning this pulse.

Entry 11: "24" = close the relay for 24 minutes.

Entry 12: (Like Entry 5.)

Entry 13: (Like Entry 6.)

Entry 14: (Like Entry 7.)

Table 1. Clock Modes A-F

Mode	Function
A	Secondary Clock Codes; each code takes up two clock zones.
b	Custom Clock-Correction Code.
C	Holiday and time-change dates.
d	Review, edit, and delete holidays.
E	How many SC25s; enable or disable call-in scanning and "Comm."
F	Display the number of events and holiday entries; erase them all.

Table 2. Clock Modes 1-6

Mode	Function
1	Date.
2	Time.
3	Enter Events.
4	Review, edit, or delete events.
5	Duration for each zone.
6	Select active zones and schedules.
7	[Future.]
8	[Future.]
9	[Future.]

Table 3. Clock Function Factory Settings

Mode	Setting
A	Correction Code "01"
Clock 5	"03" sec., all zones
Clock 6	Zones 1-6 selected; Sched. 1

Note: The time and date are not set, and no event Programming is entered.

Programming Charts

Schedule Chart

Schedule	Description
1	
2	
3	
4	
5	
6	
7	
8	

Holidays Chart

Number	Date MMDD	Schedule*	Repeat (no. of days)

Zone Chart (Clock Mode 5)

Zone	Duration	Description
1		
2		
3		
4		
5		
6		
7		
8		

"00" duration indicates latched mode.

* Enter "F" for "Fall" and "A" for "advance" (for Spring) in the Schedule block for time-change correction.

Clock Events Chart

Event No.	Time				Zones								Days							Schedule	Music Duration (in min.)		
	Hr	Min	AM	PM	1	2	3	4	5	6	7	8	Mo	Tu	We	Th	Fr	Sa	Su				

Operation

Variations in Programming

The other major factor that determines which operations the 2524 will run is the programming. For example, the 2524 will not even enter the "Comm" mode unless that has been enabled. See the communications- and clock-programming manual, KI-1629, for complete information.

Changing Run Modes

When the 2524 is in the Clock Run Mode, the "Clock" LED remains lit and its displays show the time of day, any event-zone activities, the day of the week, and the current schedule.

Clock Mode

Run-Mode Displays

While the 2524 is in the Clock Run Mode, its front-panel windows and LEDs will display the following information:

- ✓ The "Mode" window will show "0."
- ✓ The "Time" window will show the current time.
- ✓ The "AM" or "PM" LED will be lit (if the 2524 is in the 12-hour mode).
- ✓ Each "Zone/Output" LED will light whenever its corresponding output is active for an "event" (time tones, music during a class change, running equipment), paging, or clock-correction activities.
- ✓ The appropriate "Days" LED will be lit.
- ✓ The "Sched" (Schedule) window will show which schedule is currently running.
- ✓ The "Music" LED will light if a music event is running.
- ✓ The "Clock" LED will be lit.

Show the Date

To display the date on the front panel, hold in *Enter*.

- ☞ The "Time" window will show the month and day. Releasing *Enter* will return the normal display.

Preview the Next Event

To see what event the 2524 will run next, hold in the right cursor (→).

- ☞ The "Time" window will show the time when the event will start, the "Zone" LEDs will light to show which zones will be activated, and, if the event includes music, the "Music" LED will light. Releasing the cursor key will bring back the normal time

display. If no more events are to run on that day, the 2524 will "beep" and leave the display unchanged.

Manually Disable All Events

This function allows you to temporarily stop all events from running.

Step 1. Push *Manual*, then *Erase*.

- ☞ The "Time" window will read "Off," and no events will be carried out.

Step 2. To return the 2524 to its normal operation, press *Clear*.

- ☞ The "Time" window will show the time again, and the 2524 will carry out events at their scheduled times (however, it will not run any events that were skipped).

Manual Zone Activation

This function can be used to activate any "Zone-Outputs" desired (except those used for correcting clocks). Depending upon what is wired to the selected outputs, the result could be sending time tones or activating lights and equipment. This manual activation can be used to send a special signal or to test the system.

Step 1. Push *Manual*.

- ☞ All the available "Zone" LEDs will flash.

Step 2. Select the zones by pushing the corresponding numerical keys ("1" for "Zone 1," etc.). To turn a zone back off, push its corresponding key again. To select all zones, press "0."

- ☞ As soon as you select a zone, its LED will flash and the others will remain off unless you select them as well.

Step 3. When you have finished selecting the zones, hold in *Enter* for as long as you want to activate them.

- ☞ The selected zones will be activated and their LEDs will glow steadily while you hold in *Enter*. Releasing *Enter* will de-activate the zones and cause the LEDs to flash again.

Step 4. To end this function, press *Clear*.

- ☞ The "Zone" LEDs will turn off (unless a clock event is taking place).

Test All Time Zones

This function enables one person to check, unassisted, whether all the room speakers are operating. It activates all the zones (except those used for clock corrections) for a limited number of seconds (determined by the Clock Mode 5 programming) and automatically repeats the test every minute.

Step 1. Push *Manual*, then *Funct*.

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☐ The "Time" window will display "CH--" ("Check"), and the 2524 will momentarily activate all the event zones every minute.

Step 2. After verifying that the proper "Zone" LEDs are lighting, walk through the facility to verify that all the bells and room speakers are working.

Step 3. To end the test function, press *Clear*.

☐ The "Time" window will revert to showing the time.