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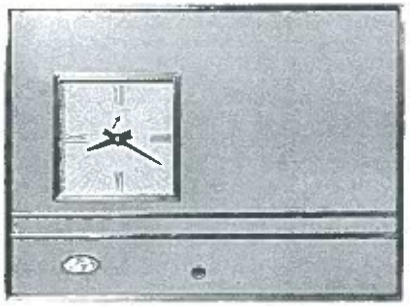
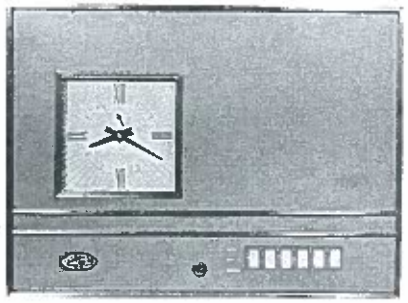
CUSTOMER OPERATING INSTRUCTIONS



TYPE 943-6



TYPES 943-3 and 943-9

MASTER TIME CENTER

SIMPLEX TIME RECORDER CO.

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OPERATING INSTRUCTIONS
MASTER TIME CENTER TYPES 943-3, 943-6 AND 943-9

Introduction

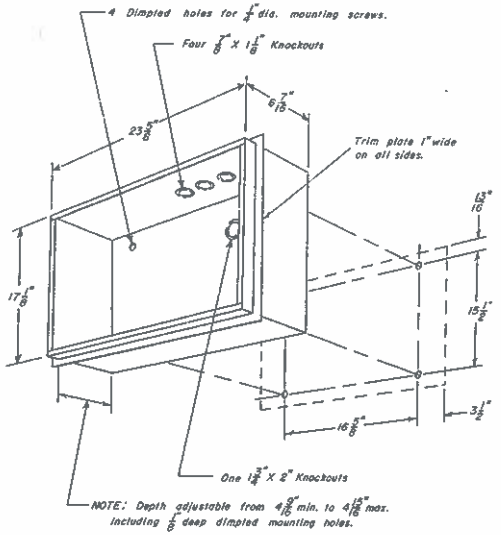
The Types 943-3, 943-6 and 943-9 Master Clocks are the time controls for the regulation of secondary timekeeping units on synchronous-wired and electronic systems. The movement in all three types is driven by a synchronous motor, the operating frequency of which is controlled by a crystal oscillator and a series of solid-state divider circuits. Power is supplied to the oscillator and divider circuits by a bank of nickel cadmium secondary cells which are maintained at full charge by the AC line circuit. Battery power is available for over 24 hours of operation after main AC power failure. The Types 943-3 and 943-9 are also each equipped with a Type 803 Program Machine to control the sounding of six circuits of audible signaling devices. In addition to clock supervision and audible signaling, the coded operation of the 943-3 allows for "on" and "off" control of utility equipment. The following information pertains to all three types when no explicit distinction is made.

Power Requirements

The master clocks are designed to be connected to a 115-volt or 230-volt, 50- or 60-Hz source. The data plate on the bottom of each cabinet provides the particular specifications.

Installation

Shipped with each master clock is an envelope containing four mounting screws with washers, spare fuses, keys, appropriate instructions and, with the Types 943-3 and 943-9 only, program bars for the Type 803 Program Machine. Mounting specifications are outlined in Figure 1.



Dimensions for Semiflush Installation

Figure 1

Electronic System Operation

In a Type 943-3, 943-6 or 943-9 electronic system, the transmitter is the source of the time and signal control impulses that are superimposed on the electrical power circuits at the installation site. The transmitter is controlled by the frequency-selection relays mounted in the master clock. All electronic indicating clocks and electronic relays that may exist on a system incorporate a fixed-frequency electronic receiver that is tuned to accept the time control impulses.

Synchronism between the electronic secondary units and the master clock is automatically checked hourly, and any variation within the limits of 59 minutes slow to 55 seconds fast is corrected by 59' 00". In addition to the normal hourly corrections, 12-hour correction signals are transmitted at the master clock reference hours of 6 AM and 6 PM, correcting all secondaries that may be more than one hour slow to these reference hours.

The electronic relay (if used) also contains a self-regulating impulsing mechanism for the operation of minute-impulse type equipment. Every hour the synchronism between the relay and the minute-impulse units is checked. Any unit that is out of time with the relay is restored automatically to the correct time, provided they are not more than 10 minutes fast or 49 minutes slow. The range of automatic correction within any one hour is 10 minutes for fast units and approximately 15 minutes for slow units.

The Type 803 Program Machine in the Type 943-3 and 943-9 Master Clocks provides automatic audible signaling on any or all of six circuits at predetermined times of the day and days of the week. A manual switch for each circuit is accessible at the front of the cabinet and must be in the "AUTO." position for an automatic function to occur. When immediate signaling is necessary at times other than those programmed, the switch must be transferred to and held in the spring-loaded "MANUAL" position for the desired duration of signal sounding. When the switch is released, it will return automatically to the "OFF" position and must be transferred to the "AUTO." position if future automatic signaling is desired. The program device is automatically corrected every hour by impulse operation for any variation up to 10 minutes fast or 49 minutes slow. It is also synchronized with the master clock at the reference hours of 6 AM and 6 PM to correct any variation of time up to 12 hours. Coded operation of signaling devices on a 943-3 system allows for greater utilization of one frequency.

NOTE: As an optional feature, a Daylight Time Change Device may be provided for semiautomatic time changes as described under a separate section later in the text.

Synchronous-Wired System Operation

The operation of a Type 943-3, 943-6 or 943-9 synchronous-wired system is identical to that which is previously described under "Electronic Systems" with the following exception: time synchronization between the master clock and the secondary units is accomplished by means of direct-wired supervisory impulses instead of a transmitter and receiver. Audible signal devices on the available six circuits are also controlled by means of wired circuits.

Minute-Impulse Operation (Optional)

As an optional feature, additional components may be provided in the master clock to allow for the operation of a circuit of minute-impulse secondary units along with the standard electronic or synchronous-wired circuits. The secondaries on a minute-impulse circuit are advanced one minute each time they receive a pulse from the master. Synchronism between the minute-impulse secondaries and the master is compared

hourly, and any unit that is out of time with the master is restored automatically to the correct time by the impulse self-regulating method, provided it is not more than 10 minutes fast or 49 minutes slow. The range of automatic correction within any one hour is 10 minutes for fast units and approximately 15 minutes for slow units. As another optional feature, the minute-impulse circuit may be provided with a 12-hour correction feature to allow the secondary units to be synchronized with the master clock at the reference hours of 6 AM and 6 PM to correct any variation of time up to 12 hours. If the optional Daylight Time Change Device is provided with the master, the minute-impulse circuit will be affected in the same way as the electronic or synchronous-wired circuits.

Setting the Master Clock

The following procedure should be used for adjusting the Types 943-3, 943-6 and 943-9 Master Clocks as the first step in setting the time on the entire system.

1. Transfer the "CLOCK MOTOR" switch to the "OFF" position.
2. Advance the minute hand in a clockwise direction until it is one or two minutes ahead of the correct time.
3. When the actual time coincides to the second with the time indicated by the master clock, transfer the "CLOCK MOTOR" switch to the "ON" position.

CAUTION: All corrections must be made by the clockwise advance of the minute hand; in other words, in order to set the master clock back one hour, the minute hand must be advanced through 11 hours. Do not move the hour hand.

Setting the Secondary Units on Electronic Circuits

On Type 943-3, 943-6 or 943-9 electronic circuits, the correction range for automatic hourly correction of the secondary units is up to 59 minutes slow and 55 seconds fast. In addition, 12-hour correction of all secondaries is provided by the master clock at the reference hours of 6 AM and 6 PM.

However, if immediate approximate correction of equally slow secondary units is desired, they may be advanced manually. Setting the "ELECT. & SYN." switch on the "ADV" position allows the secondaries to advance in unison at the rate of one hour for every minute the switch is in this position. The switch should be transferred at a time between the 3rd and the 45th seconds, as estimated by the second hand on the master clock. Immediately after the secondaries reach a time less than one hour behind the master clock and between the 3rd and 15th seconds on the master, the switch should be returned to the "RUN" position. The secondary units will continue to advance until they reach their 59th minute, leaving them minutes behind the master clock. On the next 59th minute the secondaries and the master will be in exact agreement.

When it is necessary to manually correct fast secondaries, the procedure depends on the system circuitry. If all secondary units are operating completely on power from the master clock, they may be delayed for the required length of time by setting the "POWER" switch to the "OFF" position. If the secondaries are operating on their own local power, any recording equipment that might be used on the system must first be disconnected for the required time delay, or for adjustments to be made in accordance with the operating instructions for that equipment. Then the other secondary units, including indicating clocks and electronic relays (if used), may be advanced as many hours as necessary in accordance with the advancing procedure described in the previous paragraph. On the 59th minute following the return of the "ELECT. & SYN." switch to the "RUN" position, the indicating clocks and electronic

relays will be in exact agreement with the master clock. When the recorders are reconnected after proper adjustment, the complete system will be synchronized.

NOTE: When the optional Daylight Time Change Device is included, exceptions to the previous setting instructions may exist as explained in a separate section later in the publication.

Setting the Secondary Units on Synchronous-Wired Circuits

The automatic correction range and the manual setting procedure for secondary units on Type 943-3, 943-6 or 943-9 synchronous-wired circuits are identical to those described previously under "Electronic Circuit".

Setting the Secondary Units on a Minute-Impulse Circuit (Optional)

If a minute-impulse circuit is added as an optional feature to a Type 943-3, 943-6 or 943-9 electronic or synchronous-wired system, the secondary units on the circuit are automatically corrected each hour for any variation in time up to 10 minutes fast or 49 minutes slow. As an additional option, the minute-impulse secondaries may also automatically receive 12-hour correction from the master clock.

If immediate approximate correction is necessary, however, all secondaries may be manually set in unison by transferring the "HOUR IMP." switch on the master. Setting the switch on the "ADVANCE" position allows the secondary units to advance one minute every two seconds. When the secondaries are one or two minutes behind the correct time, the switch should be returned to the "RUN" position. The secondaries will be exactly synchronized with the master clock at the next automatic hourly correction.

When the minute-impulse secondary units are as fast as the secondaries on electronic or synchronous-wired circuits of the same system, manual correction, when desired, may be achieved by the transfer of the "POWER" switch as explained in the section entitled "Electronic Circuits". Manual correction of fast secondaries on the minute-impulse circuit only, however, is accomplished by setting the "HOUR IMP." switch on the "OFF" position. The secondaries are delayed until the switch is returned to the "RUN" position.

If the optional Daylight Time Change Device is provided with the master, the minute-impulse circuit will be affected in the same way as the electronic or synchronous-wired circuits.

NOTE: In the Types 943-3 and 943-9 Master Clocks, the transfer of the "HOUR IMP." switch affects the program machine in the same way it affects the minute-impulse secondaries.

Setting the Program Machine (Types 943-3 and 943-9 Only)

Since the program machine in a Type 943-3 or 943-9 is a minute-impulse-operated device, it receives automatic hourly correction at the same time and in the same way as do the secondary units on a minute-impulse circuit. (See "Minute-Impulse Operation".) Although 12-hour correction of minute-impulse secondaries is optional, the program machine in any system is always corrected at the master clock reference hours of 6 AM and 6 PM for any variation of time up to 12 hours.

When immediate approximate correction is desired, however, the operation of the "HOUR IMP." switch, as explained under the section which describes the setting of minute-impulse secondaries, will provide manual correction of the program machine. It must be remembered, however, that, when the optional minute-impulse circuit is provided, the secondaries on that circuit will be affected at the same time.

Whenever it is necessary to separately advance the program machine without affecting any possible minute-impulse circuit, the setting disc located on the right-hand side of the machine may be slowly turned in a counterclockwise direction.

If the program machine is as fast as the secondary units on the electronic or synchronous-wired circuits, manual correction, when desired, is accomplished by the transfer of the "POWER" switch to the "OFF" position as explained in the section which describes the setting of secondaries on electronic circuits. If the program machine alone is fast, the "PROGRAM MOTOR" switch in the master may be transferred to the "OFF" position without affecting the operation of the rest of the system. When the program machine has been delayed long enough to synchronize it with the master clock, the switch must be returned to the "ON" position.

The time indicated by the program machine can be determined by observing the relative positions of the stop fingers in the stop finger guide comb. In each section of the guide comb (Days, AM-PM, Hours, Tens, Minutes) the stop finger that is in the raised position serves as the time indicator.

If the optional Daylight Time Change Device is provided with the master, the program machine will be affected in the same way as the rest of the system.

Daylight Time Change Device

As an optional feature, the Daylight Time Change Device may be provided with either the Type 943-3, 943-6 or 943-9 Master Clocks to accomplish the correction of one hour in the spring and fall for the change between daylight time and standard time. The time change is achieved by advancing the system two hours during a one-hour period or stopping the system for one hour. The procedure for initiating the correction operation is as follows: (1) Place the toggle switch in the "SPRING" or "FALL" position. (2) Press the momentary "PUSH TO START" switch. The selected function will cause the system time to be approximately correct at the end of one hour. Any minor variation will be adjusted by the normal correction of the system at the next full hour. Once the "PUSH TO START" switch is operated, the function set at that moment becomes automatic in the fullest sense. If an error has been made in the position of the "SPRING" and "FALL" switch, it is recommended that before the initiation of the correct function, one hour be allowed to elapse to prevent scattering of the secondaries on the system. Then, additional corrections, one hour at a time, may be made as necessary.

Maintenance

To insure proper operating conditions for this equipment, periodic inspection and maintenance is important. It is recommended that appropriate servicing by authorized Customer Engineers be obtained by contacting your nearest Simplex branch office.