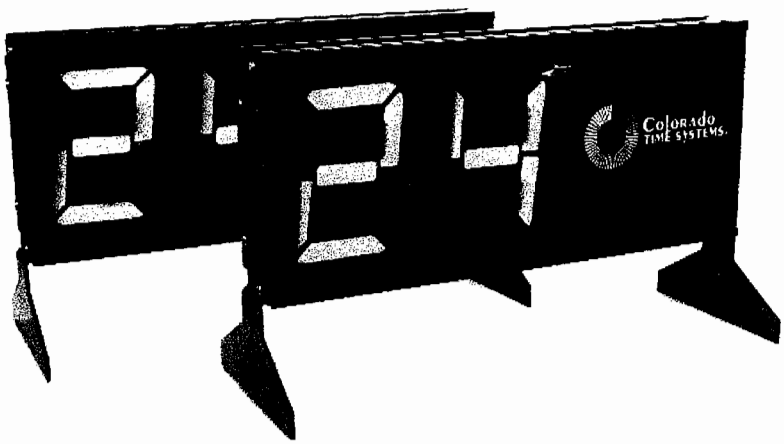
Shot Clocks (SC1, 2, 4 & 5)



User Guide

Colorado TIME SYSTEMS®

F410 Rev. 0595

Colorado Time Systems

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Part Number F410, Rev. 0595

Table of Contents

1

Introduction

Please accept our thanks for choosing Colorado Time Systems as your scoreboard company.

Your new shot clock system combines high technology with simplicity to provide ease of installation, smooth operation, and long life. Please spend a few minutes reviewing the information included in this manual before turning on your new COLORADO scoreboard for the first time.

If, during assembly, you note any missing parts or have difficulty in accomplishing the installation steps, confirm that your are following all directions correctly. If you continue to experience problems, contact our Customer Service Department for assistance at 303/667-1000 or 800/287-0653.

With proper care and by following the instructions included in this manual, your new scoreboard will provide years of dependable service.

Attention New Customer

Before operating your new scoreboard, please check all connectors to ensure that they have not been disconnected in shipping.

1. Connector at each digit.
2. All connectors at the control board.

✦NOTE

The control board is located inside the scoreboard at the right side of each clock, see Fig. 9, page 9.

3. Individual yellow digit segments on each digit.

✦NOTE:

Scoreboards in a swimming pool environment must ALWAYS operate off battery power (DC) only. The AC cords on the Models SC-2 and SC-5 are for recharging purposes only.

Important

Proper position of the battery ON/OFF switch, located on the control board in each clock (see page 6, Figure 1), is essential for trouble free operation.

For Models SC-1 and SC-4 (no batteries), the battery ON/OFF switch must be placed in the "BATTERY OFF" position. See page 11, "Power." Always keep this switch in the "BATTERY OFF" position.

For Models SC-2 and SC-5 the battery ON/OFF switch must be placed in the "BATTERY ON" position for DC (battery) operation. For AC operation of Models SC-2 and SC-5 the switch must be placed in the "BATTERY OFF" position. See page11 "Power" and page12 "Re-charging Model SC-2 and SC-5."

2

System Components and Definitions

The following terms are used throughout this manual. A working knowledge of them increases your potential for successful installation and operation. Your system consists of the following components:

Operator's Console

(Or keyboard console) :The unit the shot clock operator uses to enter information transmitted to the shot clock, see Fig. 1 below.

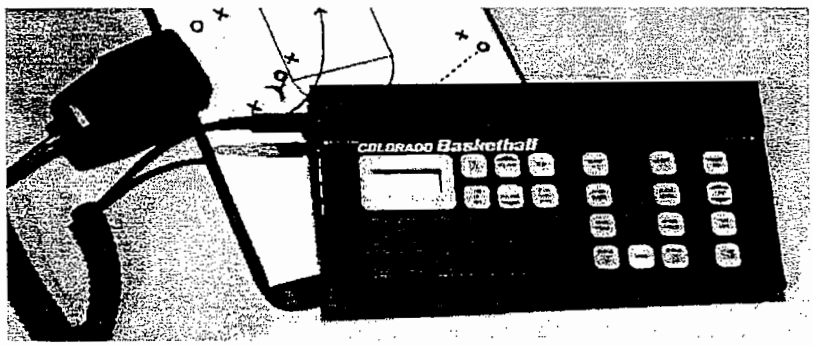

Figure 1

Scoreboard Display

(Or clock): The shot clock unit itself. It displays scores or time and is viewed by the spectators and participants, see Fig. 2 below.

Figure 2

Main Control Board

The printed circuit board that contains all the electronic components needed to operate the shot clock and console, and therefore is considered the "brain" of the system. It is located internally on the right-hand side of the shot clock as you face the board, see Fig. 8 on page 9.

Individual Digits

(Either nine or twelve inches in height): The seven-segment flip displays that are found in the shot clocks, display numbers for the various functions, i.e. "SCORE" and "TIME," see Fig. 3 below.

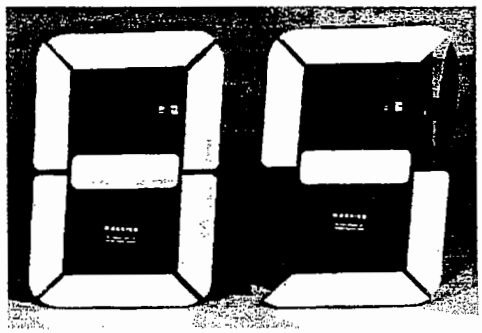

Figure 3

Data Cable

The communication cable that transmits the data and audio signals from the operator's console to the shot clock, see Fig. 4 below.

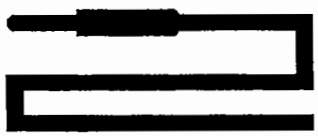

Figure 4

Digit Enable Cable

The cable inside the scoreboard, that connects the digits to the control board.

Weathershield

The rectangular piece of polycarbonate on the front of the shot clock that protects the internal components from weather, projectiles and tampering.

Optional Accessories

WB-1 Wall Box

Junction box used in permanent installations, see Fig. 5 below.

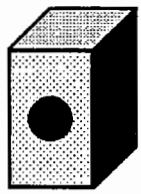

Figure 5

CA-1 Cigarette Lighter Adapter

Power cord from automotive cigarette lighter receptacle to scoreboard allowing operation from car battery. 40' length, see Fig. 6 below.

Figure 6

BP-3 External Battery Pack

12V gel-cell rechargeable battery used as external power source for scoreboard (replaces BP-1), see Fig. 7 below.

Figure 7

Scoreboard Wiring and Connections

Before turning on your new Shot Clock system, several items will need to be connected to the main control circuit board located inside each unit on the right-had side, see Fig. 8, below.

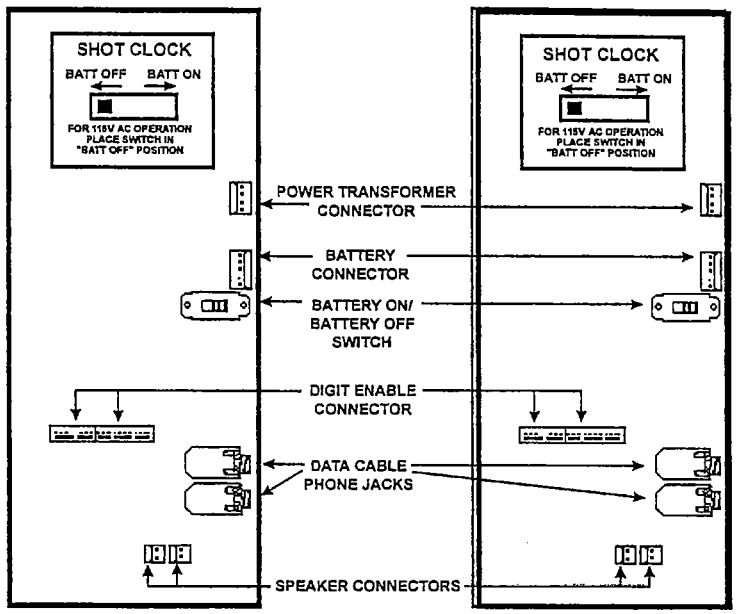

Figure 8

Clock #1 Connections

The unit you select to plug in the operator's console becomes "Clock #1." You may plug the operator's console into either clock.

Step 1 To access the control board, as you face the front of the clock, slide the polycarbonate digit shield to the left exposing approximately 10 inches of the clock's interior. (For Models SC-1 and SC-4, you will have to back out the two screws which secure the polycarbonate digit shield.)

Step 2 Referring to Fig. 8, identify:

a. the two modular speaker connectors
b. the two 1/4-inch phono jacks used to connect data cable (DC-3)
c. the battery ON/OFF switch

d. the battery connector
e. the digit enable connector

Step 3 Route the speaker cable through the rear panel cover and plug the connector into either of the two speaker connectors. The speaker slides into the top (or bottom) channel of Clock #1.

Step 4 Route the data cable (DC-3) used to connect the Operator's Console to Clock #1 through the rear panel cover and plug into the BOTTOM 1/4-inch phono jack, see Fig. 9 below.

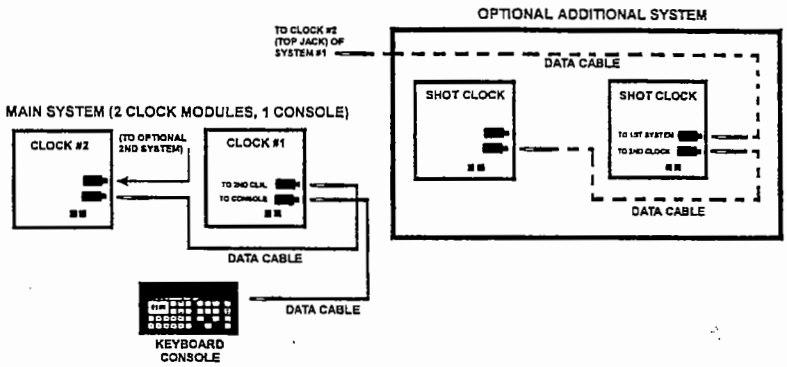

Figure 9

✦***NOTE*** The other end of this data cable plugs into the RIGHT side of your operator's console.

Step 5 Route the data cable used to connect Clock #1 to Clock #2 through the rear panel cover of Clock #1 and plug into the TOP 1/4-inch phono jack.

✦***NOTE*** The other end of this data cable plugs into the BOTTOM 1/4-inch phono jack located on Clock #2's control board, see Fig. 8.

Step 6 IF you purchased one system (i.e., two clocks, one console) go to Step 7.

IF you purchased an optional additional system (i.e., four clocks, one console), follow the diagram in Fig. 9, to connect the cables for the second system.

Step 7 Observe the position of the BATTERY ON/OFF switch. Operation of this switch is covered on page 11 and 12. Placement of this switch into the correct position on BOTH Clock #1 and Clock #2 is essential for correct operation.

Clock #2 Connections

Clock #2 will be the unit that the operator's console is NOT connected to, see Fig. 9.

Step 1 Plug the data cable from Clock #1 into the BOTTOM 1/4-inch phono jack located on Clock #2's control board, see Fig. 9.

Step 2 Route the speaker cable through the rear panel cover of Clock #2 and plug the connector into either of the two speaker connectors. The speaker slides into the top (or bottom) channel.

Step 3 Note the position of the BATTERY ON/OFF switch located on the control board inside of Clock #2. Operation of this switch is covered in "Power" below.

Power

✦NOTE

Clocks in a swimming pool environment must always operate off batter power (DC) only. Exercising proper caution is essential for safety purposes. The AC cord is for recharging purposes only.

Always plug each clock of your Model SC-2 or SC-5 system into a standard electrical outlet after use to maintain a completely charged battery.

Models SC-1 and SC-4

Clock #1 and Clock #2 are designed to operate on standard 115VAC power. (Minimum power requirements 110 volts; maximum power requirements 140 volts.) The power cord is shipped taped to the rear of each clock. Plug the AC power cord into a standard 3-prong grounded outlet. After all data cable connections have been made and power is applied to both clocks, press the DUAL SCBD SYNC key (located on operator's console) to synchronize the two clocks.

✦NOTE

To operate the unit, the BATTERY ON/OFF switch located inside on the control board of each clock (see Fig. 9) must be placed in the "BATTERY OFF" position.

Models SC-2 and SC-5

Models SC-2 and SC-5 are designed to operate on battery power (DC power) for swimming pool applications, or standard 115VAC power for other applications.

To operate the units off DC power, the BATTERY ON/OFF switch (located on the control board in each clock) should be placed into the "BATTERY ON" position. After use, be sure to follow the instructions for "To Charge the Battery" on page 32.

To operate the units off AC power, the BATTERY ON/OFF switch (located on the control board n each clock) should be placed into the "BATTERY OFF" position.

After all data cable connections have been made and power is applied to both clocks, press the DUAL SCBD SYNC key (located on operator's console) to synchronize the two clocks.

Recharging Model SC-2 and SC-5

After use, always plug BOTH clocks of your SC-2 or SC-5 system into a standard electrical outlet (115VAC) to ensure a fully charged battery. The BATTERY ON/OFF switch in both clocks should be placed in the "BATTERY OFF" position during recharging.

The battery in each clock will recharge itself and the recharing circuit will be automatically turned off. Circuits in the clock prevent overcharging. The battery requires 12 hours to recharge. The life of the battery will be extended if you recharge it FULLY after each use. The clocks will operate 6 hours off fully charged batteries.

Operator's Console Connections

Plug the data cable used to connect Clock #1 to the Operator's Console into the receptacle located on the RIGHT side of your operator's console.

Mounting

Floor Stands

Slide the stands into the channel on the bottom of the scoreboard (or clock) frame, see Fig. 10 below.

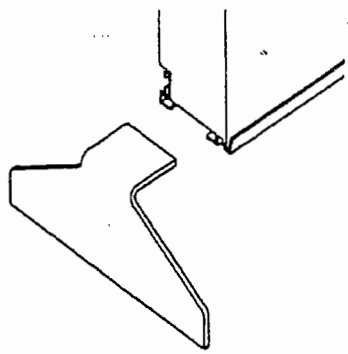

Figure 10

Wall Mounting

Step 1 Slip the correct number of wall brackets (found in your WM-4 kit) into the top groove on the rear of your clock frame. Position them as shown in Fig. 11 below:

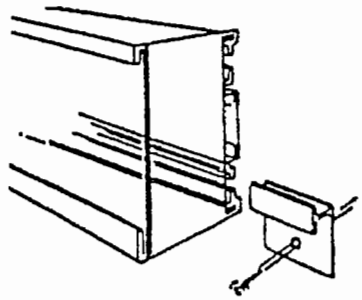

Figure 11

Step 2 Raise the clock into position and mount to the wall using the appropriate hardware.

Step 3 Slide two brackets into the bottom groove on the rear of the clock frame. These brackets are used as leveling devises and do not require bolting to the wall.

Above the Basket Mounting

Step 1 First, mount the base of the speaker into the three holes located on the side of the shot clock. Secure the screws, see Fig. 12 below. Route the speaker cable through the rear panel cover and plug the connector into either of the two speaker connectors.

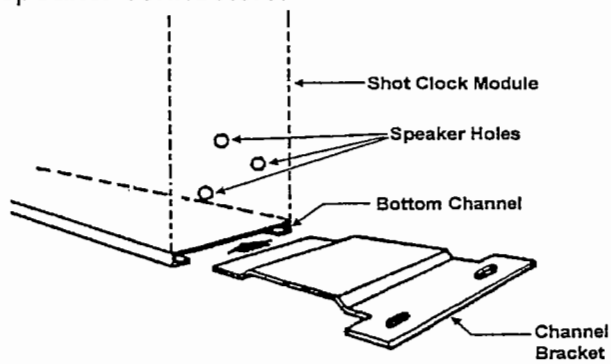

Figure 12

Step 2 Slide the channel bracket into the bottom channel of the shot clock module as shown in Fig. 13 on the next page.

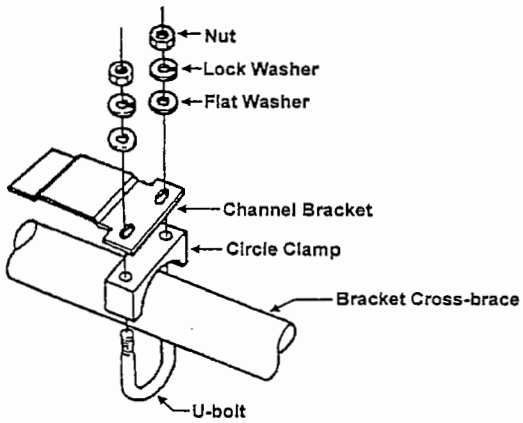

Figure 13

Step 3 Place shot clock module on top of the basket's cross-brace.

Step 4 Position the U-bolt under the basket's cross-brace.

Step 5 Position circle clamp above the basket's cross-brace.

Step 6 Slide U-bolt into the circle clamp holes and then into the channel bracket's holes, see Fig. 13.

Step 7 Position flat washer and lock washer as indicated in Fig. 13.

Step 8 Tighten nuts securely.

Step 9 Slide the second channel bracket into the other side of the module. Repeat Steps 3 - 8.

✦NOTE Inspect bolts and lock washer periodically to ensure that vibration does not loosen bolts.

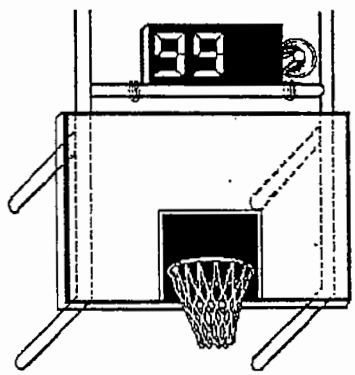

Figure 14

4

Console Operation

Your Shot Clock System operates in 2 modes:

1. Programmable Shot Clock (0-99)
2. HOME/GUEST Scoreboard (0-99)

ON/OFF

Press to turn clocks' display OFF. The clocks will blank out. Press again to turn the clocks' display ON. This key only controls the display. Power will remain ON at the clocks and operator's console.

✦NOTE

The BATTERY ON/OFF switch located inside BOTH clocks on the control board must be in the proper position in order for the console to operate correctly.

Refer to Fig. 15 for the following items:

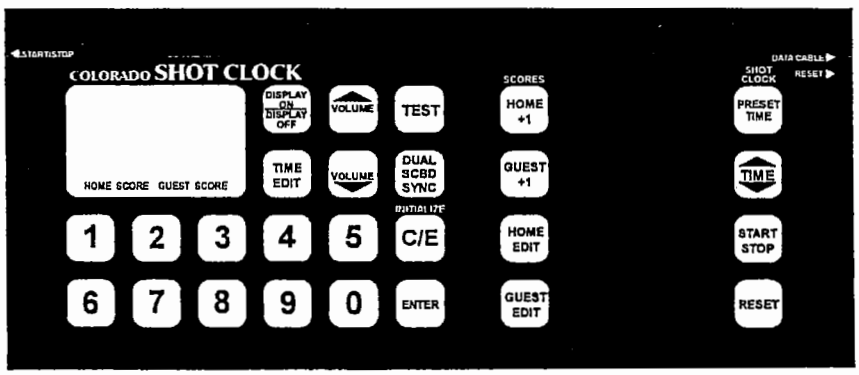

Figure 15

VOLUME

The volume for the horn is preset at the factory, so the volume keys do not adjust the volume of the horn. The two volume keys adjust the PA volume for the optional microphone.

TEST

Press the "TEST" key to check or test clock/console operation. The clocks will sequentially display "8" until all displays have turned on. Several seconds later, the clocks will return to normal. The LCD console display will indicate "88:88" throughout the test.

ENTER

When using the numeric keys to adjust a Preset Time, or to edit time using the TIME EDIT function, or to edit the Home or Guest score, press ENTER to send the information to the system.

C/E (Clear Entry)

Press to clear an entry at the console prior to pressing ENTER key. If you press ENTER prior to clearing an entry, you will have to perform the original operation over again.

SHOT CLOCK OPERATION

To place the clocks into the Shot Clock mode, first apply power by plugging each clock into a standard electrical outlet (Models SC-1 and SC-4). When the units are turned ON, the preprogrammed preset time of 30 seconds will appear on Clock #1 and Clock #2. If your sporting event requires a preset time other than 30 seconds, follow the steps listed under "PRESET TIME" below.

PRESET TIME

Make sure that the power is ON.

1. Press the PRESET TIME key once.
2. Using the numeric keys on the console, enter the desired preset time. The LCD console display will indicate the time you have entered.
3. Press the ENTER key once to store the information in the clocks. Each time the RESET key is touched, the preset time that you have entered will appear on both clocks.

For example, if your sporting event requires a 45 second shot clock, press the PRESET key once. Then, using the numeric keys, press the "4" and then the "5." The LCD console display will indicate ":45." Now press the ENTER key once. Each time the RESET key is pressed, the clocks will time down from 45 to 0 (or time up from 0 to 45 depending on weather the Time Up or Time Down mode is selected. See TIME UP/TIME DOWN).

✦NOTE

The preset time will have to be reprogrammed after each time power is removed from the system.

TIME UP/TIME DOWN

This key sets the clock to time DOWN from the preset time to 0, or to time UP from the preset time to 0. press the key once. If "UP" appears in the LCD console window, when the "START" key is pressed, the clocks start at 0 and time up to the preset time. If the clocks reach the preset time, the horn will automatically sound.

Press the key once. If "dn" (for down) appears in the LCD console window, when the "START" key is pressed,

the clocks start at the preset time and time down to 0. If the clocks reach 0 before the RESET key is pressed, the horn will automatically sound.

START/STOP

If you purchased your Shot Clocks after November 1, 1991, your console will be equipped with external hand-held pushbuttons for start/stop and reset. These buttons duplicate the function of the START/STOP and RESET keys which appear on the console keyboard.

Simply insert the two-pronged plug on the end of the cord of one of the pushbuttons (it does not matter which one; they are interchangeable) into the receptacle designated START/STOP on the right side end cap of the console. Insert the plug of the other pushbutton into the left side end cap designated RESET.

Depress the button on the START/STOP pushbutton to start the clocks; press again to stop them.

Depress the button on the RESET pushbutton to return the clock to the preset time.

RESET

Press once to return the clocks to the preset time.

✦NOTE

This key may be pressed if the clocks are running or if they are stopped. The clocks will continue timing in the direction originally established.

TIME EDIT

This key is used to edit the time displayed on the clocks. With the clock stopped, press the TIME EDIT key once. (This is a yellow key located directly below the on/off key.) Next, using the numeric keys on the console, enter the time desired. The console LCD window will indicate the time entered. Finally, press the ENTER key once. The time will immediately change on the clocks to the time your have entered.

For example, if " : 3" (i.e. 3 seconds) is indicated on the clocks, and you want to change the time indicated to " : 5" (i.e. 5 seconds), with the clocks stopped, first press the TIME EDIT key once. Then, using the numeric keys on the console, press the "5." (The LCD console display will indicate " : 5" to indicate 5 seconds). Now press the ENTER key once. Both clocks will immediately change to 5 seconds and are ready to time in the direction already established. When the RESET key or RESET pushbutton is pressed, the clocks will return to the preset time originally established.

DUAL SCBD SYNC (Dual Scoreboard Synchronization)

After all data cable connections have been made and power is applied to both clocks, press the DUAL SCBD SYNC key to synchronize the two clocks. Once the two clocks display the same number (for example, both clocks display "30"), the clocks are synchronized.

During operation of the clocks, if at any time a digit(s) is misconfigured, press DUAL SCBD SYNC to clear the misconfiguration. The key can be pressed with the clocks running or stopped.

For example, if your shot clocks are located above the basket and a player were to slap the backboard creating an unusual amount of vibration, a digit could become misconfigured. Pressing DUAL SCBD SYNC will clear the misalignment immediately.

If you are operating two or more shot clock systems from one console, this key allows the clocks to synchronize with each other so that all module display will be identical. After all connections have been made, press DUAL SCBD SYNC. The clocks will now be synchronized.

If at any time there is a "mismatch" between what is displayed on the LCD console display and the clocks, press DUAL SCBD SYNC once to correct the mismatch.

HOME/GUEST Scoreboard Operation

✦NOTE

The unit you select to plug in the operator's console becomes "Clock #1." The other clock module becomes "Clock #2." You may plug the operator's console into either clock.

Make sure that power is ON.

Make sure that the scoreboard display is ON by pressing the ON/OFF key on the console.

When the units are turned ON, the preprogrammed preset time of 30 seconds will appear on Clock #1 and Clock #2.

To place the clocks into the Home/Guest Scoreboard Mode, press the HOME EDIT (or GUEST EDIT) key. Both scoreboards will indicate "00."

HOME +1

This key is used to increment the Home score which is displayed on Clock #2. Each time the key is pressed, the Home score will increase by one.

GUEST +1

This key is used to increment the Guest score which is displayed on Clock #1. Each time the key is pressed, the Guest score will increase by one.

HOME EDIT

This key is used to enter a specific score or to change (or edit) the Home score (the Home score is displayed on Clock #2). To edit the Home score, follow these steps:

1. Press the HOME EDIT key once.
2. Using the numeric keys on the console, enter the appropriate score.
   The LCD console display will indicate what is entered.
3. Press the ENTER key once. The Home score, which is displayed on Clock #2, will automatically display the score you entered.

For example, if the Home score displayed on Clock #2 indicates "21" and you want to change the display to "45," first press the HOME EDIT key once. Then, using the numeric keys on the console, press the "4" and then the "5." The LCD console display will indicate "45." Finally, press the ENTER key once. Clock #2 will automatically display 45.

GUEST EDIT

This key is used to enter a specific score or to change (or edit) the Guest score (the Guest score is displayed on Clock #1). To edit the Guest score, follow these steps:

1. Press the GUEST EDIT key once.
2. Using the numeric keys on the console, enter the appropriate score.
   The LCD console display will indicate what is entered.
3. Press the ENTER key once. The Guest score, which is displayed on Clock #1, will automatically display the score you entered.

5

Public Address System

Horn Operation

The COLORADO Shot Clock system includes a built-in amplifier with two weatherproof speakers, see Fig. 16 below. Slide one of the two speakers into the top channel (or bottom channel) of Clock #1 and repeat the same operation for Clock #2's speaker.

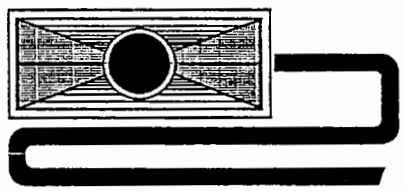

Figure 16

✦*NOTE*

The volume for the horn is preset at the factory.

In the Shot Clock mode, the horn will sound automatically when:

1. in the Time Down mode, 0 is reached before the "RESET" key is pressed.
2. in the Time Up mode, the preset time is reached before the "RESET" key is pressed.

Optional Microphone

If you purchased the optional microphone (Model MIC-LC), plug the 1/4-inch phone plug into the microphone jack on the left side of the console. To use the microphone for public address, press the push-to-talk switch on the side of the microphone and speak into the grill on the front.

Adjust the volume of the PA system by using the two volume keys on the operator's console: the UP arrow to increase volume; the DOWN arrow to lower the volume level. Each time you press a volume key, the LCD window on the console displays the relative power of the PA: setting "1" is the lowest level and "16" is the loudest level. When held down, the level steps up or down until the maximum or minimum level is attained.

Optional Music Adapter

If you have purchased the optional music adapter (Model MA-1, tape cassette interface cable), plug the 1/4-inch phone plug into the microphone jack on the left side of the console and the 1/8-inch phone plug into the headphone jack on your tape recorder. Adjust the volume on your tape recorder to prevent distortion over the public address system. This option allows you to amplify such things as your school song or "The Star Spangled Banner" during sporting events.

6

Service

Introduction

All COLORADO TIME SYSTEMS scoreboards are designed for easy maintenance should it ever be necessary. Every component is modular to aid in fast trouble shooting and easy exchange/repair. If a problem develops, first determine what is wrong using the instructions found in section "Trouble Shooting" on page 23 through 33. Second, call the factory for a price quote.

✦*NOTE*

All repair prices are quoted for surface shipment. Air freight will be additional and must be requested.

Third, return the malfunctioning component to the factory with the appropriate payment. Please label the component with your organization's name, your name and phone number. We will either repair your part or send you a substitute component (our discretion).

Always return items carefully packed, prepaid, and fully insured. Our shipping address is:

Colorado Time Systems, Inc.
c/o Customer Service Department
1551 East Eleventh STreet
Loveland, Colorado 80537
Phone: 303/667-1000
U.S. and Canada: 800-287-0653

System Units

The scoreboard consists of the following units:

1. (1) keyboard console
2. (2) scoreboard control boards
3. (4) digits (9 or 12 inches)
4. (2) speakers
5. (1) data cable
6. (optional) internal battery

7

Trouble Shooting

This section will assist you in trouble shooting the shot clocks down to a part that can be easily returned to the factory for repair. If you are able to describe accurately the problem, we will be able to respond more quickly to correct the problem.

Before calling the factory, attempt to solve the problem using the suggestions in this section. To determine what is defective or not working, begin by determining what IS working. It is important for the person doing the trouble shooting to view the scoreboard not as one unit, but rather as several small units or components. The key to solving a problem is to isolate which specific component has failed.

Identify the Problem

The following are problems you might encounter if your COLORADO Shot Clock fails to operate properly. They are grouped by system units. Possible solutions to the problem are listed beginning on page 24.

1. Operator's (keyboard) Console, page 27.
   - **a.** Console displays shows no data
   - **b.** Console displays random data
   - **c.** Console display appears black or multicolored
   - **d.** One or more keys do not operate

✦***NOTE***

Always access your Shot Clock module from the front of the unit by sliding the weather shield to expose the malfunctioning component.

2. Scoreboard Control Board, see page 28.
   Since components on the control board affect operation of all aspects of the system, failure of the control board will often be the cause of the apparent problem.
3. Digits, see page 28.
   - **a.** None of the scoreboard digits operate
   - **b.** All segments in one or more digits fail to operate
   - **c.** One segment in one digit fails to operate
   - **d.** One or more segments operate intermittently

4. No audio emitted from speaker, see page 28.
   a. No horn blast
5. Data Cable, see page 30.
   a. Clocks do not respond to operator's console operation
   b. Operator's console display does not show data

Problems/Solutions What to do if "Nothing Works"

Step 1 Check to see if your data cable jack is plugged into the connector located on the right side of your operator's console (labeled "Data Cable").

Step 2 Reset the scoreboard electronics by removing power to the clocks. Follow the procedure outlined below:

a. Unplug the 115VAC electrical cord on both clocks.
b. Check the BATTERY ON/OFF switch in both clocks. The switch should be placed in the "BATTERY OFF" position.
c. Wait 10 seconds.
d. Plug the 115VAC electrical cord back into the outlet.
e. Press the "TEST" key on the console. After several seconds, all "8's" will appear on the clocks and in the console LCD window. The clocks should now function normally.
f. If you own Model SC-2 or SC-5 (clocks with internal batteries), transfer to battery power by unplugging the 115VAC electrical cord and moving the BATTERY ON/OFF switch to "BATTERY ON." Repeat step 4 above.

If the clocks still do not function correctly, check the following areas:

Step 3 Check each clock individually for control board failure. Remove the power from the clock by unplugging the 115VAC electrical cord from the wall outlet. Check that the BATTERY ON/OFF switch is placed in the "BATTERY OFF" position. Unplug the data cable connecting Clock #1 to Clock #2 and the data cable connecting the operator's console to Clock #1. Manually flip the digit segments of the last digit on the right hand side of the clock so that the number "1" is displayed. Now, apply electrical power to the clock and observe the right hand digit.

a. If the digit flips to 0, the control board is probably good. Go to Step 5.

b. If nothing happens, the control board or electrical power is bad. Go to Step 4.

Step 4 Check to be sure that there is voltage at the wall outlet. Check your electrical supply by using a lamp or other 115VAC electrical device. If the electrical power is good, the control board is bad and will need to be returned for service.

Step 5 Check the data cable. Check cable by using an OHM meter, see page 30.

Step 6 IF YOU OWN A MODEL SC-2 or SC-5:
Test the internal battery in both Clock #1 and Clock #2. The problem may be that the battery is dead in one (or both) of the two clocks and is overloading the power supply. (See "How to Check the Battery, page 32)
Place the BATTERY ON/OFF switch to the "BATTERY OFF" position and recheck the clock using 115VAC power.

Step 7 Check the operator's console. The only way to determine if the operator's console is good is to replace it with another console. All COLORADO consoles, regardless of the sport, are the same electronically. If you have a spare console, (even if it's a console that operates another type of COLORADO scoreboard) or, if possible, you can borrow one from someone with a COLORADO scoreboard, plug the second console in and check to see if the problem is solved. If the second console solves the problem, your original console will need to be returned for service.

If you do not have a second console to run a test, you will need to return your console for service, see page 22.

What to do if your clock display has a problem

✦NOTE DO NOT SPRAY ANY LUBRICANTS ONTO THE DIGIT BEARINGS. SEE PAGE 31 "SEGMENT REPAIR AND MAINTENANCE" FOR DIGIT MAINTENANCE.

Check for the following problems:

1. All digits inoperative
   - **a.** No power to clock, see page 11.
   - **b.** Digit data cable and/or digit enable cable is disconnected. Check all connections.
   - **c.** Bad control board, see Step 3, page 24.

d. Scoreboard/clock needs to be reset, see Step 2, page 24.

2. All segments in one digit are inoperative
   a. Digit enable cable connector on digit is unplugged. Be certain that it is plugged in.
   b. Digit is bad. Interchange a known operating digit for the suspected digit. If the interchanged digit operates properly in this position on the scoreboard, the suspected digit is bad and should be returned for service.
   c. Enable wire from the control board to the digit is disconnected (open). Check the connection.
   d. Bad control board, see page 28.
3. One segment is bad in all digits
   a. Digit enable cable is not plugged in properly or the data connector is dirty at the control board. Clean and then plug the connector in.
   b. Digit enable cable has a broken wire at the control board. Check with an Ohm-meter, see page 30.
   c. Control board is bad. Return the control board for service, see page 28.
4. One segment is bad on one digit
   a. If you own Model SC-2 or SC-5: Battery is low. Check for "lo b" on console, see #5 below and/or Step 2, page 24.
   b. Digit enable cable connector at the bad digit is dirty or plugged in wrong. Ensure that it is pushed all the way in and is clean.
   c. Clean bad segment flipper magnet.
   d. Bad diode on digit board or discolored digit segment coil. Interchange a known operating digit for the suspected digit. If the interchanged digit operates properly in this position on the clock, the suspected digit is bad and should be returned for service, see page 22.
5. Low battery (Model SC-2 or SC-5)
   a. Check for "lo b" on console display or check battery voltage. Check scoreboard again with battery unplugged from the connector located on the control board and operating on 115VAC.
   b. The scoreboard is lying on its back. It will not operate correctly in this position. Place the scoreboard upright.

What to do if your operator's console does not work

1. LCD Console display
   a. No display at the console. This will occur if power is not being supplied to the clock. Check 115VAC outlet to be certain that power is in fact being supplied. OR, data cable from the scoreboard to the console is disconnected or broken. Check that the data cable jack is plugged into the RIGHT side of your console labeled "Data Cable" and not into the left side of the console labeled "Microphone." To check cable see page 30.
   b. LCD display is all or partially black. This occurs if the console display is exposed to high temperatures. Shield console display (LCD) from direct sunlight or high heat. Display (LCD) will return to normal when it cools.
   c. LCD displays black with multi-colored patterns. Display is broken internally. Return console for repair.
2. Displayed information:
   a. Display shows incorrect data, random data, or incomplete segments. This could occur if console is not synchronized with the scoreboard. Press DUAL SCBD SYNC key on the console. OR, the console is "locked up." Remove power to the scoreboard, see Step 2, page 24.
   b. Console display tries to show "lo b" and scoreboard does not count properly. (Some segments probably won't flip.)

The battery is very low and needs to be charged. Two operations can be performed:

1. You can apply 115VAC power and place the BATTERY ON/OFF switch in the "BATTERY OFF" position.
2. You can recharge the battery and not use the clocks, see page 32.

   c. If the problem cannot be isolated:

Assume failure of either the control board or the console. Return both units for service.

✦***NOTE***

You may want to try the suggestions under "What to do if nothing works," page 24.

3. Keyboard
   a. One or more keys are inoperative, or work randomly. Remainder of the keys work correctly. The console has failed. Return it for service.
   b. Keys don't "click." Return console for repair.

What to do if no audio is emitted from speaker

If the speaker does not emit sound, execute the following:

1. Confirm that the speaker connector is plugged into the proper place on the control board. You may plug into either of the two available connectors.
2. check that the ON/OFF slide switch, located on the control board, is in the "ON" position.
3. Check the speaker using an OHM meter. The reading should be 5 to 10 OHMs, see Fig. 17 below.

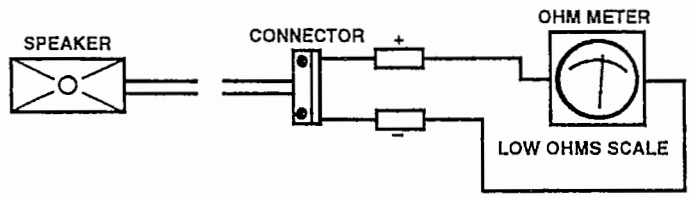

Figure 17

4. If none of these suggestions are successful, return the speaker to the factory for service.

How to remove a digit

1. Remove electrical power to the scoreboard.

✦***NOTE***

If you own Model SC-2 or SC-5, turn the BATTERY ON/OFF switch located on the control board inside Clock #1 and Clock #2 to the "BATTERY OFF" position.

2. Backout the 4 screws located on the digit module.
3. Unplug the digit enable cable.
4. Remove the digit module, see Fig. 18.

How to remove the control board

1. Remove power to the scoreboard, see Fig. 19 on the following page. (See Step 1 above under "How to remove a digit.")
2. Remove all modular plugs on the control board.

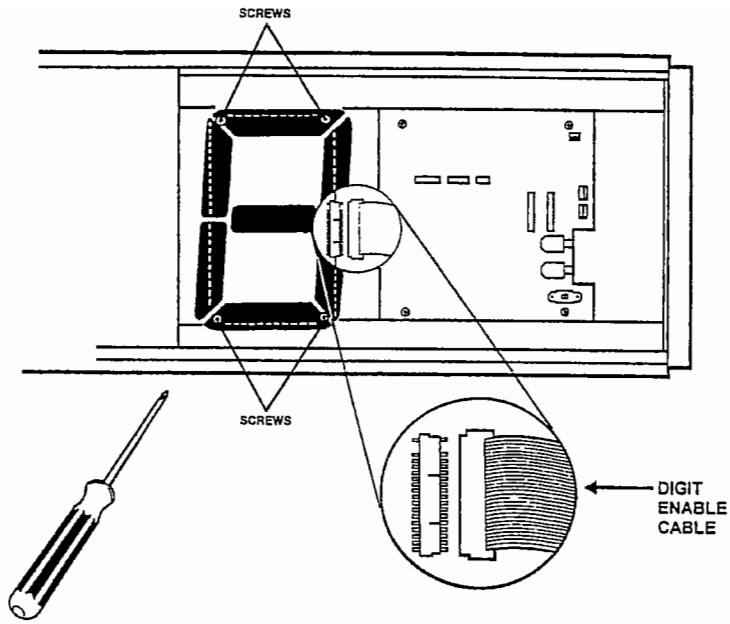

Figure 18

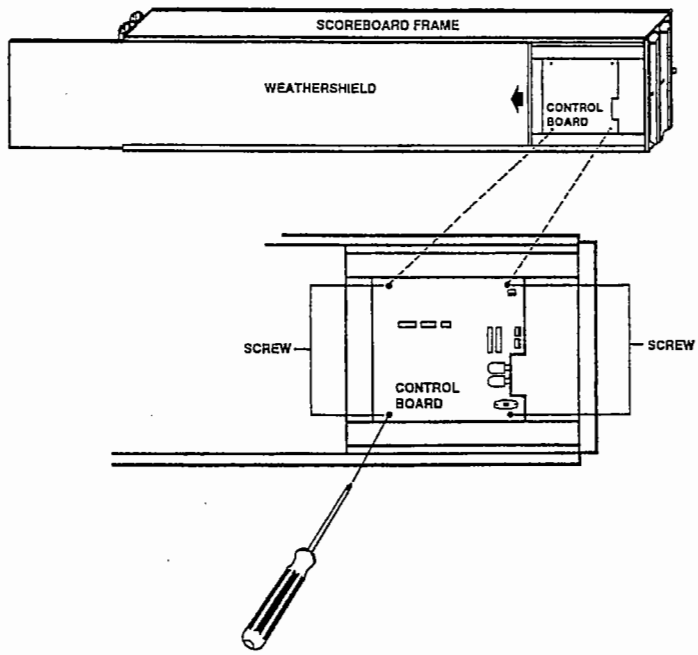

Figure 19

3. Backout the screws located on the control board module.
4. Remove the control board.

How to check the data cable

The data cable consists of two pairs of wires with a shield wrapped around each pair. The "data" uses one pair and the audio uses the other pair. If shielded wire is not used, the "data" will cause "noise" to be heard through the speaker.

If you suspect that the data cable may be bad, check your data cable using the following methods:

1. Unscrew the phone plug and inspect the wires.
2. Using an OHM meter, measure the resistance of the cable, see Fig. 20 below.

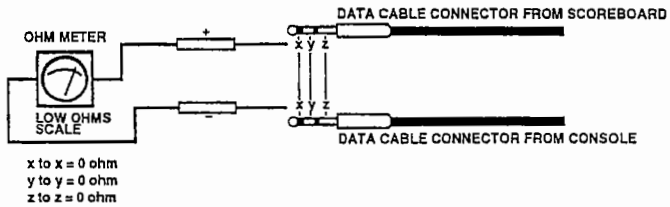

Figure 20

3. Using a volt meter, measure the voltage at the phone plug which would normally plug into the operator's console, see Fig. 21 below.

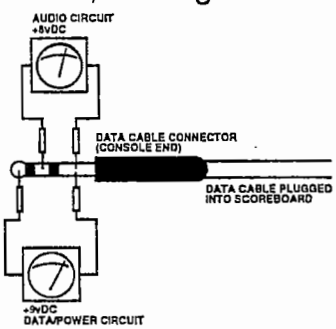

Figure 21

4. To wire data cable to the phone plug, see Fig. 22 below.

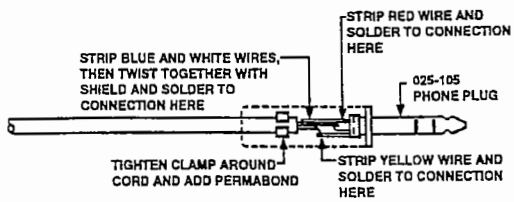

Figure 22

Segment Repair and Maintenance

Removal

Place index finger under segment and thumb on top of segment, see Fig. 23 below. Pull straight up.

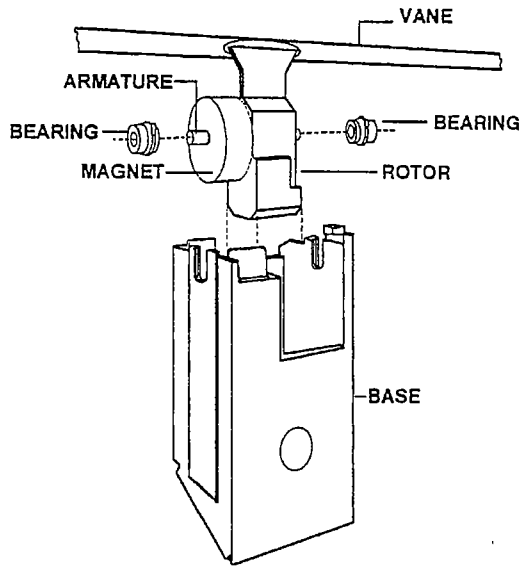

Figure 23

✦NOTE

Two small bearings will fall off the shaft when pulled out of the holder. To prevent this place index finger and thumb of the other hand on the end of the shaft to hold bearings on the shaft.

Cleaning

While the rotor is out of the base inspect the magnet and armature for small particles (similar to iron filings on a magnet). Remove any materials clinging to the magnet or armature with your finger, see Fig. 23 above.

✦NOTE

Do not use any lubricants on digit bearings.

Installing

Install bearings on axle properly, see Fig. 24 on the next page.

Seat bearings on "U" shaped groove. Push down until a click is hear. Check for proper seating of bearing and free movement of vane.

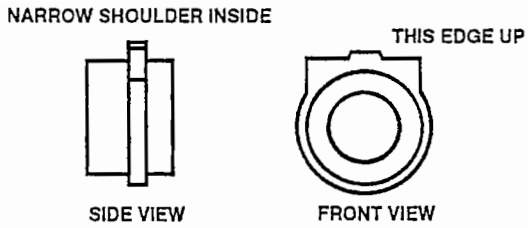

Figure 24

Optional Battery

If your Shot Clock uses an optional battery (either internal or external), proper care of the battery is essential. The gel-cell battery should be recharged fully after each use. If the battery is low/dead, it could overload the power supply and prevent the scoreboard from working. "Bypass" the battery by unplugging the battery connector on the control board. Test the scoreboard using AC power only. If the scoreboard works, the battery is bad and needs to be recharged or replaced.

To check the battery, use a volt meter.

✦CAUTION

Batteries are capable of delivering high current if the output is shorted. Do not allow any conductive instrument (screwdriver, etc.) to make contact with both battery terminals simultaneously, see Figure 25 below.

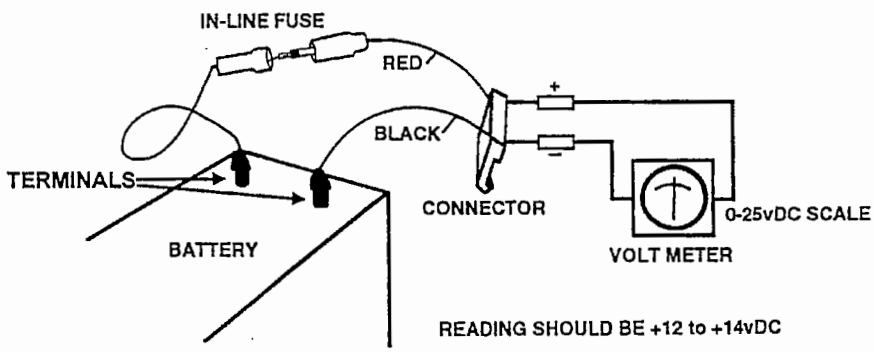

Figure 25

If additional assistance is required please contact our Customer Service Department at:

Colorado Time Systems, Inc.
1551 East Eleventh Street
Loveland, Colorado 80537-5056
Phone: 303-667-1000 **800-287-0653**
Facsimile: 303-667-0988

To Charge the Battery

1. Slide the on/off switch on the control board to the "OFF" position.
2. Plug the scoreboard power cord into an electrical outlet.
3. The battery will require at least eight hours to fully recharge.

✦NOTE The display on the operator's console window will show "Lo b" (low battery) whenever the ON/OFF switch on the control board is in the "OFF" position, and does not indicate that the battery is low.

To Replace the Battery

✦NOTE Remove all electrical power to the scoreboard.

1. Slide the weathercover of your shot clock to the left to expose the battery on its sheet metal holder.
2. Unplug the battery cable from the control board.
3. Remove the two Phillips screws and star washers, one securing the top left of the sheet metal battery holder to the scoreboard frame, and the other screw and washer from the bottom right.
4. Rotate the battery holder counter-clockwise and remove from the scoreboard.

✦NOTE Be careful when rotating the battery holder not to dislodge any digit segments. If this does occur, consult page 31 for digit repair instructions.

5. Note the position of the battery so you can replace the new battery in the same position.
6. Unplug the wires (one black, the other red) from the two battery terminals.
7. Using a blade screwdriver, remove the bolt from one of the two steel bands securing the battery to the sheet metal holder, being careful not to lose the nut. Remove the bolt and nut from the other steel band.
8. Spread the bands and remove the battery.
9. Insert the new battery between the two prongs on the holder.
10. Close the two steel bands around the battery and replace the two bolts and nuts securing the bands around the battery.

✦ ***CAUTION***

DO NOT allow a steel band to make contact with both battery terminals simultaneously. This will short the output and may cause a shock.

11. Plug the two wires onto the battery terminals, black wire to black terminal, red wire to red terminal.
12. Put the battery mounted on the holder into the scoreboard by rotating the holder clockwise into a vertical position aligned with the two screw holes, again being careful not to dislodge any digit segments. Replace the two Phillips screws and star washers to secure the battery holder to the scoreboard frame.
13. Plug the battery connector into the circuit board.
14. Slide the switch on the control board to "ON" position and test for proper operation.

Long-Term Battery Storage

When storing a scoreboard with a fully charged battery for an extended period of time, make sure the switch on the control board is in the "OFF" position so the battery will not discharge. The power cord should be unplugged and the scoreboard display blanked.

8

Limited Two Year Warranty

COLORADO TIME SYSTEMS, INC. warrants this Product against any defects in materials and workmanship affecting electronic and mechanical performance for two years from the date of purchase from COLORADO TIME SYSTEMS, INC. Colorado Time Systems' Products, when properly installed, are warranted not to fail due to defects in materials and workmanship. This warranty is limited to the original purchaser of the product and is not transferable. This two year warranty is limited to equipment in service within the United States and its territories; equipment in service elsewhere is limited to a one year warranty. No warranty claim will be honored unless at the time the claim is made you present proof of purchase.

COLORADO TIME SYSTEMS, INC. will, at its option, repair or replace the defective product at no additional charge except as set forth below. Repaired components, parts and replacement products will be furnished on an exchange basis and will be either reconditioned or new. All replaced parts and products become the property of COLORADO TIME SYSTEMS, INC. This limited warranty does not include service to repair damage to the products as a result of modification of the product, misuse, abuse, neglect, negligence, vandalism, accident, or abnormal conditions including war, flood, accident, lighning, or other acts of God or damage caused by occurrences over which COLORADO TIME SYSTEMS, INC. has not control.

Limited Warranty service may be obtained by delivering the product or component part to COLORADO TIME SYSTEMS, INC. You agree to insure the product or assume the risk of loss or damage in transit, to prepay shipping charges to the service location and to use the original shipping container or equivalent. Repaired products will be returned to you by surface delivery at Colorad Time Systems' expense or by air freight at buyer's expense.

All expressed and implied warranties for these products including the warranties of merchantability and fitness for a particular purpose are limited in duration to a period of two years (or one year, as applicable) from the date of purcahse, and no warrantyies, whether expressed or im-

plied, will apply after this period. Some states do not allow limitations on how long an implied warranty lasts, so the above limitations may not apply to you.

If this product is not in good working order as warranted above, your sole remedy shall be repair or replacement as provided above. In no such event will COLORADO TIME SYSTEMS be liable to you for any damages, including lost profits, lost savings or other incidental or consequential damages arising out of the use of or inability to use such product, even if COLORADO TIME SYSTEMS has been advised of the possibility of such damages or for any claim by any other party.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights, and you many also have other rights which may vary from state to state.

Please return the product along with dated proof of purchase and a written statement explaining the defect to:

Colorado Time Systems
1551 E. 11th Street
Loveland, CO 80537
970-667-1000 ext. 256
Fax: 970-667-1032
Toll-free in U.S. and Canada 800-287-0653 ext. 256