

CF-2C/CF-3C
CONTROL UNIT ONLY
(Sound & Lights)



INSTALLATION/OPERATION MANUAL



TABLE OF CONTENTS

Introduction.....	3
Serial Number.....	3
Location of Control Unit.....	3
Floodlight Relay Wires.....	3
Installing Control Unit	3
Power and Battery Backup	4
Earth Ground.....	4
Trip-Test Button	5
Extra Set of Relay Contacts	5
Hooking to a Security or Home Automation Panel	5
Using Probe Fault Mode for Testing.....	5
Adjusting CT-A1 (formerly FC-9(Exit Delay.....	6
Adjusting Sounder (Annunciator) Time.....	6
Adjusting Re-Trigger Hold-Off	6
Adjusting Floodlight Entry Delay Time.....	6
Adjusting Floodlight Time	7
Adjusting Photocell Sensitivity.....	7
Adjusting Probe Sensitivity	7
Adjusting Transient Suppressor	7
Field Troubleshooting	7
Warranty Information	Back Cover
Merchandise Return Information	Back Cover
Technical Specifications	Back Cover

CF-2C CONTROL UNIT MANUAL

INTRODUCTION

[Back to Table of Contents](#)

Congratulations on purchasing the most professional vehicle detection system available! It has been manufactured to give years of trouble-free service. However, if it should need servicing, please consult the dealer who installed your system.

Read these instructions completely. Each system should be bench-tested by the dealer before installation. The installer should become acquainted with the CF-2C control unit and sensor probe in the shop; make all adjustments and settings; and study all system functions. If there are any questions or problems that need to be discussed, contact the technical staff by calling our 800 number.

SPECIAL NOTE: *In this edition, look for new information gleaned from fielding technical calls for over fifteen years. It is contained under the heading "Special Note" throughout this manual.*

SERIAL NUMBER:

[Back to Table of Contents](#)

Attached to the relay on the circuit board is a sticker with a set of numbers and letters. This series of numbers and letters reveals the specific unit, its year of manufacture, its issue number and ends with the serial number (see illustration).



When calling Preferred for technical help, please have these numbers handy so that your call may be handled in a timely manner.

LOCATION OF CONTROL UNIT

[Back to Table of Contents](#)

Install the control unit in a dry, weatherproof building away from heavy electrical motors, radio transmitters, main power service, or any equipment that may introduce electrical or R. F. noise. Install control unit in a sealed box when used in a corrosive atmosphere such as an animal barn or chemical plant.

Install in a sealed, weather-proof box when installed outside. The weatherproof box must have a thermostatically controlled light bulb or heater to maintain temperatures above freezing. Drastic changes in temperature cause condensation on the board and will make the unit malfunction.

FLOODLIGHT RELAY WIRES

[Back to Table of Contents](#)

On the CF-2C circuit board is a floodlight relay (normally open, dry contacts) rated 15 amps at 115 VAC. Two 12 gauge, black wires connected to this relay exit out the back of the CF-2C case. This floodlight relay can be used to operate three types of systems:

1. The relay can be used to operate up to 1800 watts directly (see Figures 1A, 1B, and 1C and "Installing Control Unit" below).
2. The relay can be used to operate the coil of an auxiliary relay or contactor to power banks of lights (see "Installing Control Unit" below).
3. The relay can be used to activate low voltage lighting up to 15 amps maximum or trigger a line carrier system such as X10 Powerhouse Interface Module or equivalent.

INSTALLING CONTROL UNIT

[Back to Table of Contents](#)

See Figure 1, top of next page. Install a single-gang electrical box in the wall behind the control unit so that the black wires from the unit go directly into the electrical box.

With the power to the floodlight switching system off, run a 14-gauge, two-wire Romex cable from the new single-gang electrical box to the existing floodlight switching system as shown in Figure 1A.

Connect the Romex cable across the switch of a single-switch system as shown in Figure 1B.

Connect the Romex cable across the "A" and "B" screw terminals of any switch in a multiple-switch system

Figure 1

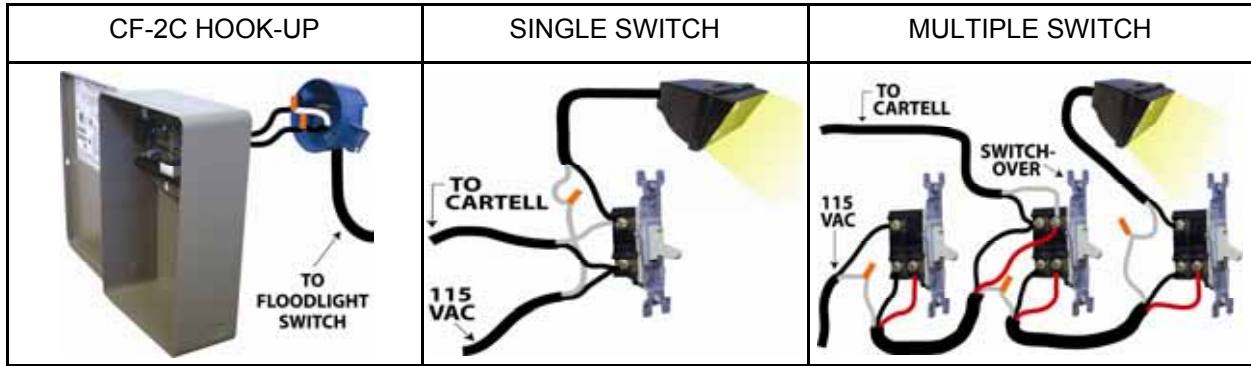


Figure 1A

Figure 1B

Figure 1C

as shown in Figure 1C.

Connect the black leads from the control unit to the two wires of the Romex cable with wire nuts as shown in Figure 1A.

Mount the control unit to the wall over the electrical box as shown.

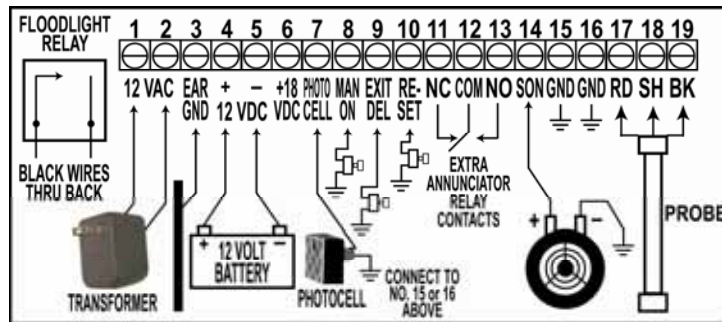


Figure 2

POWER AND BATTERY BACKUP

[Back to Table of Contents](#)

See Figure 2. The control unit operates on 12 VAC or 12 VDC. Hook up the 12 VAC transformer between terminals No. 1 and 2 as shown in Figure 2 (NOTE: Do not connect a DC power source to terminals 1 and 2).

A built-in battery charger will keep a 12 volt sealed lead-acid battery (not included) charged for operating the Sonalerts during power failure. **NOTE: The battery back-up is not needed for normal operation of the CF-2C control.** If you choose to purchase a battery, only a sealed lead acid (starved, wet-cell) battery should be used. DO NOT use a gelled-electrolyte battery. Recommended batteries are made by Yuasa Battery, Inc.; Gates Energy Products, Inc.; Eagle Picher Industries, Inc.; Panasonic Industries, Co.; or G.S. Battery, Inc.

The positive (RED) lead connected to terminal No. 4 and the negative (BLACK) lead connected to terminal No. 5 are provided for connections to the battery. When an outside DC power source is being used, connect to these terminals in place of a battery.

SPECIAL NOTE: During initial power-up or power-down and power-up sequence, the "Exit Delay" timer is automatically activated. Be patient, for the CF-2C control cannot be accessed until the "Exit Delay" timer times out. It is recommended that when the control unit is first installed that the "Exit Delay" adjustment (potentiometer "C") be set at minimum (fully counter-clockwise) until the system is operational. (See "Adjusting FC-9 Exit Delay" on page 6.)

EARTH-GROUND

[Back to Table of Contents](#)

See Figure 2. A proper earth-ground is essential. A proper earth-ground is established by using an 8 foot copper or copper-clad ground rod driven deeply into the earth.

Use a ground wire of at least 12 gauge. Solder wire to ground rod and then clamp it. Tin the other end of the ground wire and connect it to terminal No. 3 on the control unit.

SPECIAL NOTE: A galvanized ground rod will not give a proper ground for this system.

TRIP-TEST BUTTON

[Back to Table of Contents](#)

The trip-test button, located center right on the circuit board, is a tool to evaluate most of the control electronics and to help in setting the relay time. To test the control unit, a working probe must be attached to terminals No. 17, 18, and 19 (see Figure 2, page 4). If the probe is disabled or not connected, simply connect a 500 to 1000 ohm resistor between the probe terminals No. 17 and 19. NOTE: The TRIP TEST button will not work if the PROBE FAULT LED is lit (this indicates a disabled probe).

Set the probe sensitivity potentiometer "G" to the halfway point, i.e., vertically up and down (see Figure 5, p. 6). Push the TRIP-TEST button on and off quickly. DO NOT hold the button on. The signal generated simulates that of a detected vehicle. No response indicates component failure on the circuit board or failure of the power supply. It may be that the EXIT DELAY timer has not timed out as well (the EXIT DELAY time may have been preset anywhere between 50 seconds and 15 minutes (see "Adjusting FC-9 Exit Delay," p. 6).

EXTRA SET OF RELAY CONTACTS

[Back to Table of Contents](#)

The annunciator relay has a second set of Form "C" relay contacts on terminals No. 11, 12, and 13. These contacts may be used to trip an alarm panel, trip a dialer, trip a line carrier interface module such as "X-10", trigger a transmitter or trip a door bell. Potentiometer "F" controls the relay time of these contacts.

HOOKING TO A SECURITY OR HOME AUTOMATION PANEL

[Back to Table of Contents](#)

See Figure 2 on page 2.

The CF-2C has a floating, dry relay contact that can be used in conjunction with any security or home automation (H. A.) system.

Two things will help you to have a successful installation:

1. The manual for your home automation or security panel
2. A resistor, if required (security or H.A. system manual will tell you if a resistor is required)

Note: Use the power supply that came with the CF-2C to power it rather than relying on the H.A. or security panel for power.

Hook the CF-2C to two zone inputs on your security or H.A panel. If your system's contacts are normally closed, use terminals 11 & 12 on the CF-2C. At your system's panel, place a resistor (if required) between the terminals in parallel (see system manual for correct resistor size).

If your security or H.A. contacts are normally open, use terminals 12 & 13 on the CF-2C and place a resistor (if required) between the terminals in series (see system manual for correct resistor size).

USING PROBE FAULT MODE FOR TESTING

[Back to Table of Contents](#)

With power applied and the probe wires disconnected, if the LED does not light, there may be power supply failure. If the LED does light but does not cycle the annunciator(s), the cause may be related to one of three things:

1. The exit delay timer has not timed out yet (see "Adjusting FC-9 Exit Delay on page 6.)
2. Wiring problems going to terminal No. 9
3. Component failure on the circuit board

Other uses in PROBE FAULT mode:

The cycling of the sounders can be used to set annunciator duration (see page 6), re-trigger hold-off time (see page 6), and the FC-9 exit delay time (see page 6). It may also be used to check all of the sounders without the need for a vehicle tripping the system.

MAKING ADJUSTMENTS

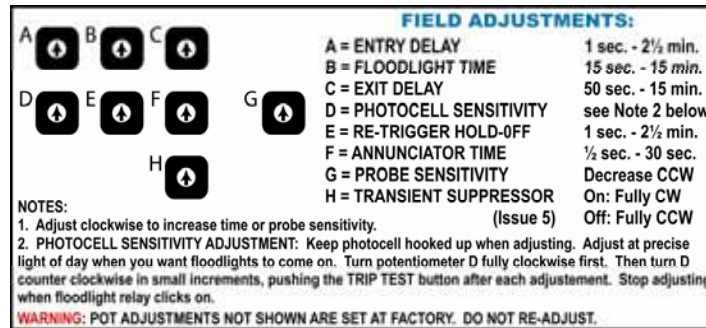


Figure 5

ADJUSTING CT-A1 (FORMERLY FC-9) EXIT DELAY

[Back to Table of Contents](#)

See Figure 5. The exit-delay time (potentiometer "C") can be adjusted from 50 seconds to 15 minutes. To determine the exit delay time, first remove the RED probe wire from terminal No. 17. This will put the CF-2C into PROBE FAULT mode (see page 6). When the exit delay timer times out the annunciator relay will constantly cycle on and off.

To activate the exit delay timer on an installed FC-9 annunciator, press the exit delay button on the annunciator plate. If other devices are being used to activate the exit delay timer (such as an alarm panel, etc.), take a wire and short the terminals between No. 9 and No. 15 at the CF-2C control panel. Doing this for 2 seconds will trigger the timer. When the timer is activated, the annunciator relay will stop cycling.

Measure the time from when the relay stops and when the relay begins cycling again and you will know the exit delay time. For longer exit delay time, adjust the potentiometer marked "C" clockwise and repeat until the desired time is achieved. Re-attach the RED probe wire to terminal No. 17 when finished.

ADJUSTING ANNUNCIATOR TIME

[Back to Table of Contents](#)

See Figure 5. This function controls the amount of time the customer desires the noisemaker to stay on. It may be adjusted to stay on anywhere from 1/2 to 30 seconds. To adjust, use the potentiometer marked "F". Turning it clockwise increases the time. Push the trip-test switch to hear your adjustment. Adjust until the desired time is achieved.

ADJUSTING RE-TRIGGER HOLD-OFF

[Back to Table of Contents](#)

See Figure 5. The re-trigger hold-off keeps the system from re-triggering (and thus annunciating) should multiple cars pass the probe in a caravan. Once the system is tripped, it will time-out but not be able to re-trigger for an adjustable time period up to 2½ minutes. To adjust this time period, disconnect the RED probe wire from terminal No. 17 (this puts the control unit in PROBE FAULT mode, see page 5).

The annunciator relay will constantly cycle on and off. To increase the re-trigger hold-off, adjust potentiometer marked "E". Turn it clockwise for a longer hold-off period of time. Repeat until the desired hold-off time is achieved. Re-attach the RED probe wire.

ADJUSTING FLOODLIGHT ENTRY DELAY TIME

[Back to Table of Contents](#)

See Figure 5. This function can be used to delay activation of the floodlight timer after the CF-2C is tripped. Adjustment time is from 1 second up to 2½ minutes. For long driveways, or if the exact location of the probe is to be concealed for security reasons, use this feature. The annunciator, however, is not delayed.

To set the desired floodlight entry delay timer, first remove the photocell lead from terminal No. 7 (see Figure 2 on page 4) on the CF-2C control unit. Push the TRIP TEST button and measure from the moment the annunciator relay clicks on (a relatively quick click) and the moment the floodlight relay activates (a

relatively loud click).

To increase the delay time, adjust the potentiometer marked "A" clockwise. After the floodlight relay times out, repeat the cycle until the desired time is achieved. Re-connect the photocell wire to terminal No. 7.

SPECIAL NOTE: Do not use the MANUAL-ON button on the FC-9 annunciator plate to set the entry delay time. On the CF-2C (Issue 5), the MANUAL-ON button on the FC-9 instantly activates the floodlight timer, bypassing the entry delay timer circuit.

ADJUSTING FLOODLIGHT TIME

[Back to Table of Contents](#)

See Figure 5. The amount of time the floodlights remain on after the system is tripped may be adjusted from 15 seconds to 15 minutes. The normal floodlight time is 5-10 minutes.

To set the floodlight time, remove the photocell wire from terminal No. 7. Push the TRIP-TEST button. Measure from the moment the floodlight relay clicks on to the moment it clicks off. Adjust potentiometer "B" (clockwise for time increase) and repeat until desired time is achieved. Reconnect the photocell wire to terminal No. 7.

ADJUSTING PHOTOCCELL SENSITIVITY

[Back to Table of Contents](#)

See Figure 5. Photocell sensitivity determines the level of outdoor light at which the lights are allowed to come on. The factory sets the floodlights to come on at dusk.

To set the photocell sensitivity, make all adjustments at the precise moment when the amount of daylight is visible at which time you want the floodlights to come on. Adjust potentiometer "D" counter clockwise in very small increments and push the TRIP-TEST button after each adjustment (see page 5). Stop adjusting at the point where the floodlight relay clicks on. The floodlights will be allowed to turn on at that same daylight level from then on.

ADJUSTING PROBE SENSITIVITY

[Back to Table of Contents](#)

See Figure 5. Probe sensitivity is set at the factory and does not usually need to be adjusted. Factory setting allows a single standard probe to cover a 12 foot wide driveway when installed beside it). Increasing the sensitivity above the factory setting is not recommended unless the probe is located in a low sensitivity area.

When the probe is placed in the center of a driveway that is 18 feet wide or less, the sensitivity may be decreased considerably, allowing the probe to be installed close to highway traffic, power lines, etc.

To adjust probe sensitivity, turn the potentiometer "G" clockwise to increase, counter-clockwise to decrease. A typical setting should be such that the CF-2C reliably detects a small car going 5 MPH. You may increase sensitivity if necessary. Be aware, increasing sensitivity may cause false alarms.

ADJUSTING TRANSIENT SUPPRESSOR

[Back to Table of Contents](#)

See Figure 5. The factory setting for the transient suppressor circuit potentiometer "H" is in the "on" position (fully clockwise). In this setting, short duration transient signals will be ignored. With the circuit activated, false alarms from lightning will be reduced.

Note: if the probe sensitivity cannot be properly set as described in the "Adjusting Probe Sensitivity" section above, turn off the transient suppressor by adjusting potentiometer "H" full counter-clockwise.

FIELD TROUBLESHOOTING

[Back to Table of Contents](#)

Preferred does not provide schematic diagrams or service manuals for our products. However, we try our best to provide technical support through our 800 number and fast repair service for our products.

Before calling Preferred, refer to the "SPECIAL NOTE" sections under the following headings:

♦ Initial power-up and exit delay, page 4; ♦ Purchasing ground rod, page 5; ♦ Using Probe Fault Mode to test circuit board, page 5; ♦ Entry delay time, p. 7.

When trouble-shooting a CF-2C system that is false alarming, check the ground system. House electrical panel grounds can cause transient feedback that could cause false alarms.

To determine if false alarms are board related or probe system related, disconnect the probe and connect a

500 to 1000 ohm resistor across terminals 17 and 19 and leave it connected for a long period of time. If the board false alarms, it is circuit board related or ground system related. If it does not false alarm with the resistor installed, then the probe system is suspect.

NOTE: when trouble-shooting the CF-2C, an active cell phone within five feet of the control unit will false alarm the system.

If either the probe or control unit fails the test, call Preferred's technical staff using the 800 number. Further instructions will be given or authorization to return the ostensibly defective product for testing and repair. If the probe is bad there is no way of repairing it. It is recommended that all repairs be returned directly to Preferred and not be sent through a distributor.

LIMITED FIVE YEAR WARRANTY

[Back to Table of Contents](#)

All CARTELL products are warranted against defects in material and workmanship for five years. This warranty does not cover defects caused by, but not limited to: acts of God, improper installation, abuse, fire and water damage, electrical surges, and damage to cable caused by slicing, pulling, tangling, or improper splicing. For more information, visit www.cartell.com.

MERCHANDISE RETURN INFORMATION

[Back to Table of Contents](#)

Before returning products for repair, please call Preferred Technologies Group at (800) 223-4743 for a Return Merchandise Authorization (R.M.A.) number. Write the R.M.A. number on the return shipping box and any correspondence included with the defective product.

TECHNICAL SPECIFICATIONS - CONTROL UNIT

[Back to Table of Contents](#)

POWER REQUIRED:	12 VAC or 12-15 VDC
STANDBY CURRENT:	35 mA
ALARM CURRENT:	180 mA max. with (1) FC-9 or (1) CT-8
ANNUNCIATOR RELAY CONTACT RATING:	Double Pole, Double Throw 1st Pole: 12 VDC, 200 mA for remotes 2nd Pole: SPDT, 5 amps, 30 VDC
RELAY TIME:	1/2 to 30 seconds
FLOODLIGHT CONTACT	SPST, 15 amp, 125 VAC CSA certified (1800 watts)
FLOODLIGHT TIME	15 seconds to 15 minutes
FLOODLIGHT DELAY	1 second to 2 1/2 minutes
BATTERY CHARGER	13.5 VDC, 5 mA minimum charge (w/ voltage off)
TEMPERATURE RANGE:	35° F. to 140° F.
DIMENSIONS:	7 1/2 in. x 12 3/4 in. x 3 in.
WEIGHT:	5 lbs.

