



ATC Cabinet Startup Guide

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February 2016

Safetran[®]

An Econolite Group Company

Warranty

Econolite Control Products, Inc. warrants, for a period as shown below, from date of shipment, all control equipment listed below to be free from defects in material or workmanship and to be of the kind and quality designated or specified in the contract. This warranty does not extend to products not manufactured or sold by Econolite. Econolite has the sole right to determine whether or not an item is covered under our warranty policy.

Cabinet	Warranty Period
ATC Cabinet	1 year

Econolite is not responsible for damage caused by negligence, acts of God, or use of equipment in a manner not originally intended. Econolite's liability under this warranty shall not exceed the cost of correcting defects in the equipment. Upon the expiration of the warranty period, all such liability shall terminate.

Service

Before you return a product, you should first consult with your local support team to make sure the product needs to be returned for repair. Occasionally, product that appears to need repair can be made operable by configuration changes.

To obtain service, whether under warranty or not, contact the Econolite Repair Department at Repairs@Econolite.com (phone 714-575-5566)

To return products for service:

1. Obtain a Repair Authorization (RA) number from the Repair Department. Supply them with model name/number, equipment serial number, description of the problem and date of installation. They will send you a confirmation email that has details about the product and includes shipping instructions and shipping address.
2. Pack the product in its original (or equivalent) shipping container and include the confirmation email.
3. Insure the package (or assume the risk of loss/damage during shipment).

For products that are out-of-warranty, to eliminate the delays inherent in the repair quoting process, we are developing a flat rate repair schedule to give you a repair quote immediately on first contact. If you agree with the quote, you will then be required to supply a purchase order or authorized credit card prior to return shipping.

Documentation

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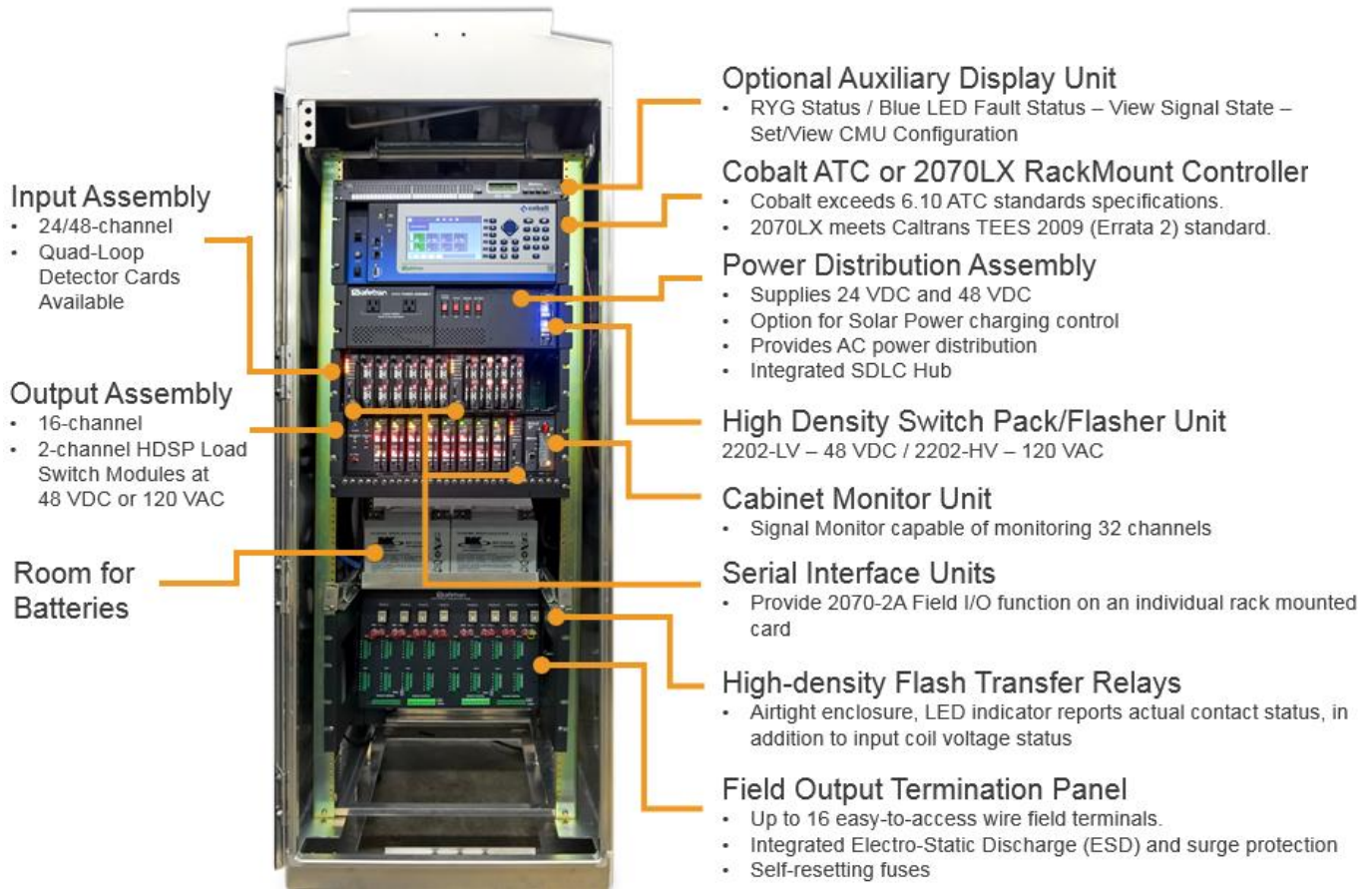
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Table of Contents

Warranty.....	2
Service.....	2
Documentation	2
Trademarks.....	2
Safetran ATC Cabinet, Front View, Main Components	4
Glossary	5
Introduction	6
Purpose.....	6
ATCC Compared to 33x-Type Rack-Mount Cabinets.....	6
Block Diagram	7
More Information.....	7
Startup Procedure	9
1. Intersection plans and specifications check list	9
2. Make sure the cabinet is equipped to fulfill all the needs of the intersection	9
3. Review the cabinet prints	9
4. Inspect the cabinet.....	9
5. Wire power at the Service Panel Assembly (at the back of the cabinet in the bottom right corner)	10
6. Test field indication with flash out voltage.....	10
7. Install components and hardware.....	10
Field Output Termination Panel notes	12
Position adjustments	12
“Tail Section”	12
Transparent Cover.....	12
Self-Resetting Fuse	12
8. Powering up the cabinet	13
9. Intersection turn-on	13
10. Walk the intersection.....	13

Safetran ATC Cabinet, Front View, Main Components



- Cabinet has both front and back doors. Front door not shown.
- Service Panel Assembly is at the back of the cabinet in the bottom right corner.
- Cable harnesses interface with assemblies through connectors.

Glossary

ADU	Auxiliary Display Unit	
ATC	Advanced Traffic Controller	
ATCC	Advanced Traffic Controller Cabinet	
CMU	Cabinet Monitor Unit	
EIA	Electronics Industry Alliance	
FTR	Flash Transfer Relay	
GFCI	Ground Fault Circuit Interrupter	
HV	High Voltage (120 VAC)	
HDFU	High Density Flasher Unit	Same universal Model 2202 unit is used for both applications, as a load switch or flasher
HDSP	High Density Switch Pack	
LV	Low Voltage (48 VDC)	
NEMA	National Electrical Manufacturers Association	
NTCIP	National Transportation Communication for ITS Protocol (https://ntcip.org)	
RM	Rack Mount	
SDLC	Synchronous Data Link Controller	
SIU	Serial Interface Unit	
SB1 and SB2	Serial Bus 1 and Serial Bus 2	
TEES	Transportation Electrical Equipment Specifications	
TRIAC	TRIode for Alternating Current	

Introduction

Purpose

This guide for the Safetran Advanced Traffic Controller Cabinet (ATCC) gives you¹ a procedure to start up the cabinet after installation at an intersection. First, we explain the differences between this latest generation cabinet and traditional 33x-type rack-mount cabinets—then we give a recommended startup procedure.

ATCC Compared to 33x-Type Rack-Mount Cabinets

This cabinet is designed to be used with an ATC-compliant traffic controller such as a Safetran Cobalt rack-mount controller or a 2070-1C CPU Host Module with ATC Engine Board, running Linux OS, installed in a 2070 controller. To help familiarize you with this new cabinet, the table that follows lists several features of the ATCC that differ from traditional 33x-type rack-mount (RM) cabinets. In general, the ATCC is much more compact (components take up about half the space compared to traditional cabinets) and easier to install because the cables have connectors instead of screw terminals. Unlike a 33x-type cabinet, it can be configured with 48 VDC to drive low-power LED signal heads and use off-the-grid environmentally-green power sources.

Feature	ATC Cabinet	Traditional RM Cabinet	ATC Cabinet Notes
Operating voltage	120 VAC or 48 VDC	120 VAC only	
Service assembly	Protective cover over high voltage contacts	High voltage contacts exposed	Safety protection against inadvertently touching high voltage (120 VAC)
Rack-mount assemblies	All major rack-mount assemblies shipped installed in the rack rails	Rack-mount assemblies boxed separately	
Cable harnesses	Installed and dressed	Cables boxed separately	
Cable wire connections	Plug-in Connectors	Terminal block connections	
Controller connectors	C1 and C11 connectors NOT used	C1 and C11 connectors used	ATCC uses SDLC connector C13S
Input/Output channels	120 Detector inputs 32 Channel outputs		
Load Switches	Solid state high density switch packs (HDSP)	Standard TRIAC load switches	
SDLC communication between assemblies	Connections daisy-chained between assemblies	Because SDLC is a NEMA function not found in 33x-type cabinets, would need additional module to route SDLC signals	Each major assembly has two 25-pin D connectors, IN and THROUGH, for SB1-SB2

¹ **Audience for this Guide:** To use this startup guide, you should be familiar with traffic cabinet startup procedures.

Feature	ATC Cabinet	Traditional RM Cabinet	ATC Cabinet Notes
Malfunction diagnostics	Compact CMU and optional ADU that work together	One big MMU or CMU	<ul style="list-style-type: none"> ATCC CMU includes current monitoring ADU has additional diagnostics
Flash out voltage access points	Two each of fused 120 VAC and 48 VDC power points in the Output Termination Panel	Access to 120 VAC at an unprotected bus bar	Use a test point to do flash out procedure
Power for plug-in modules	Optional High Voltage (HV) or Low Voltage (LV) plug-in modules	Only HV (120 VAC) plug-in modules	Install equivalent HV or LV modules, depending if signals are 120 VAC or 48 VDC
NEMA SDLC connection	Three 15-pin D connector SDLC hub on the rear panel of the Power Assembly	Not available	To connect Autoscope cameras, etc.
Cabinet maintenance when intersection is in flash	Can remove Controller, Input and Output Assemblies and still keep the intersection in flash	Cannot remove assemblies without the intersection going dark	
Terminal block connections for field wires	Pluggable connectors with screw terminals	Typical terminal blocks	Terminal Block Plug Connectors are shipped separately in a bag
High voltage transient and self-setting fuses for short circuit protection	16 pluggable transient protectors	The load switch is the fuse	These are covered with a transparent panel so you can observe the condition of the protectors

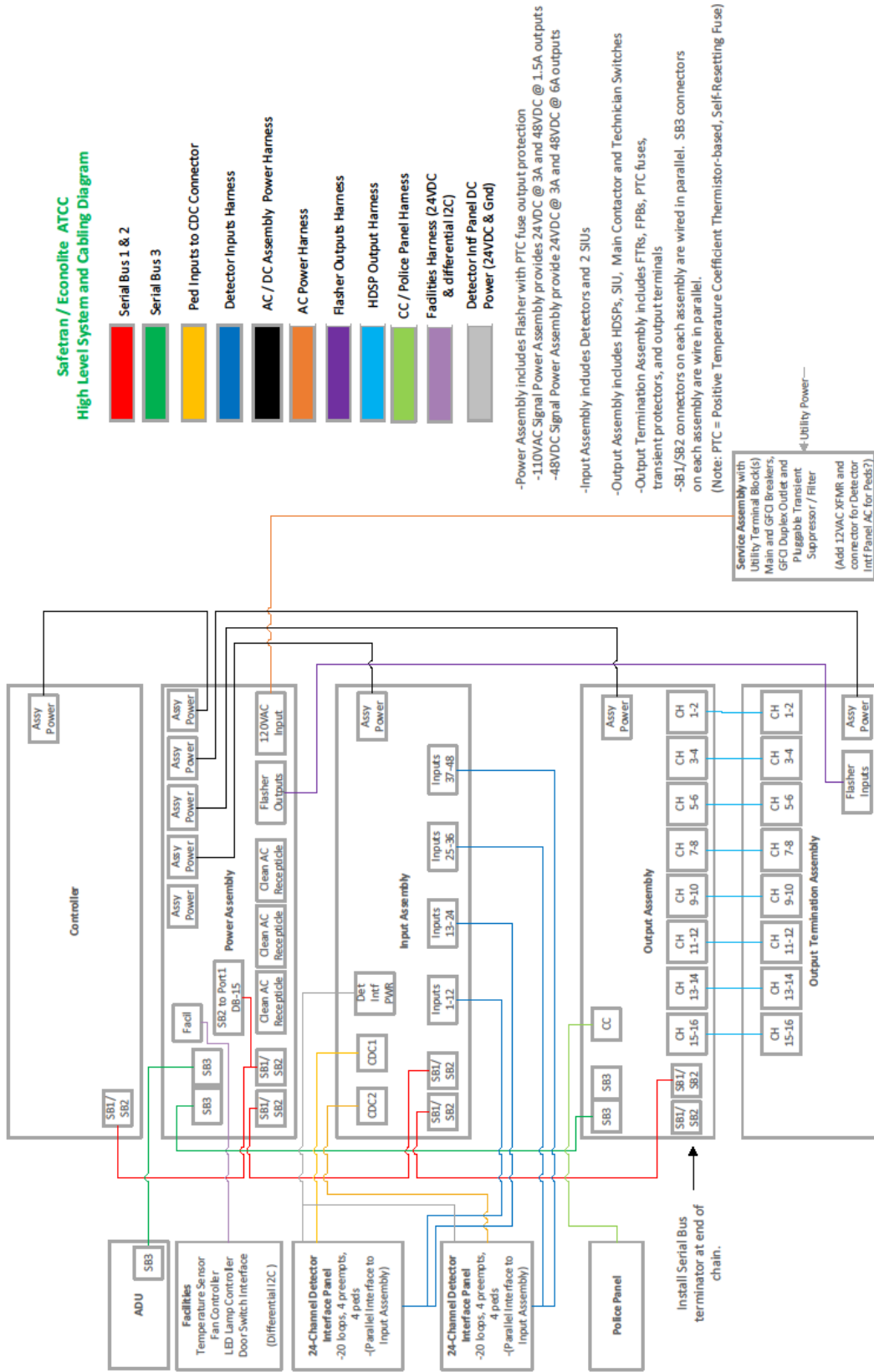
Block Diagram

To give you an overview of the functionality of this cabinet, on the subsequent page is a High Level System and Cabling Diagram that shows how the Safetran ATC Cabinet assemblies are interconnected.

More Information

For more information about the ATCC features, including details about the different assemblies, refer to the ATCC Product Suite brochure. There is also a video to introduce you to this cabinet.

**Safetrax / Econolite ATCC
High Level System and Cabling Diagram**



ATC Cabinet High Level System and Cabling Diagram

Startup Procedure

Before you start:

- Determine if the field indication signal heads are 120 VAC or 48 VDC.
- Make sure the cabinet operating voltage (120 VAC or 48 VDC) agrees with the operating voltage of the signal heads.

Caution! If you have a 48 VDC cabinet, remember to use the 48 VDC power points when you flash out the signals. 120 VAC would destroy 48 VDC signal heads. Notice that this warning should also be on the inside of the cabinet doors.

- Make sure that you have the correct “HV” or “LV” HDSP and CMU units². For example, 2202-LV is the HDSP for 48 VDC operation and 2202-HV is the HDSP for 120 VAC operation.
- Make sure all plug-in components are NOT yet installed.

1. Intersection plans and specifications check list

- All vehicle and pedestrian signal heads are in the correct location
- All vehicle and pedestrian signal heads are aimed correctly
- All necessary traffic signs are installed including stop signs
- Lane striping is correct

2. Make sure the cabinet is equipped to fulfill all the needs of the intersection

- Detector channels
- Number of phases
- Emergency vehicle preemption

3. Review the cabinet prints

- Cabinet is for the right intersection
- CMU program card is correct
- Loop conductor cables are terminated to correct location
- All field wires landed to correct terminals

4. Inspect the cabinet

- Make sure all debris and trash is removed
- Verify that all field terminations are secure
- All necessary components are provided
- If service is bonded, remove the bonding jumper inside the cabinet

² LV = Low Voltage (48 VDC) and HV = High Voltage (120 VAC)

5. Attach power wires at the Service Panel Assembly

(at the back of the cabinet in the bottom right corner)

- A. Remove the protective cover from the terminal block access opening.
- B. Attach the utility power cables to the right-hand terminal block.
- C. Use the left-hand terminal block to attach cables for a generator, UPS other AC power source.
- D. Reinstall the protective cover over the terminal block access opening.

Note: The Service Panel Assembly has another clean power outlet located on the side of the enclosure opposite the GFCI outlet that you can use to attach additional power strips.

6. Test field indication with flash-out voltage

- Before you start, make sure:
 - All plug-in components are NOT installed.
 - Any cabinet breakers are in the OFF position.
- Notice that to “flash out” the field wiring, there are four auxiliary power points on the front panel of the Field Output Termination Panel to temporarily apply power to the signal heads while verifying correct field wire connections. Use the two labeled 120VAC with 120VAC signal heads and the two labeled 48VDC with 48VDC signal heads.

Caution! If you have a 48 VDC cabinet, remember to use 48 VDC when you flash out the signals. Do not apply 120VAC to 48VDC signal heads. 120 VAC would destroy 48 VDC signal heads. Notice that this warning should also be on the inside of the cabinet doors.

Caution! Make sure that the HDSPs and Flasher are NOT installed. To prevent damage, do NOT perform this procedure with the HDSP load switches or flasher installed.

- A. Ask another person to observe the phases and colors in the field to make sure that they are correct.
- B. Set the MAIN breaker to ON at the Service Panel Assembly (back of cabinet, bottom right corner).
- C. Use a meter and test for correct voltage.
- D. Apply the applicable voltage to each field wire terminal, one-at-a-time, as the other person makes sure of correct phasing and operation of each indication.
- E. Turn OFF the MAIN breaker at the Service Panel Assembly.

7. Install components and hardware

Caution! Make sure that the MAIN breaker at the Service Panel Assembly is OFF.

Unpack the plug-in modules and other components and install them in the applicable labeled slots or sockets in their assemblies as given in the table below.

Important: Make sure each component is well-seated in its connector.

Component	Install In	Notes
ADU	The rack above the controller	This is an optional unit that operates together with the CMU

Component	Install In	Notes	
2-channel HDFU module (used as flasher unit)	Power Assembly	Install in the slot on the far right of the front panel	Make sure the modules are correct for the application.
2-channel HDSP modules (used as load switches)	Output Assembly	Up to 8 modules for 16-channel operation	For 48 VDC signals, use model 2202-LV For 120 VAC signals, use model 2202-HV
Detectors	Input Assembly	For 24 channels, install 12 2-channel detectors For 48 channels, install 12 4-channel detectors	
SIUs		For 24 channels, install 1 SIU, model 2218 For 48 channels, install 2 SIUs, model 2218	
SIU	Output Assembly	In in second-to-the-last slot from the far right of the front panel	
CMU		Install in the slot on the far right of the front panel	
Flash Transfer Relays	Front panel of Field Output Termination Panel	Up to 8, each with 2 channels, in the top row of the front panel	
Flash Program Blocks		Up to 16, in the second row of the front panel, per the red/yellow flash requirements	
Output Terminal Block Plugs (shipped in a bag)		<p>Important: Do NOT install a Terminal Block Plug without a field wire connected. This is because, after installation, it only slightly protrudes from the panel. Thus, if a plug were installed without a field wire connected, it would be very difficult to remove.</p> <p>Each channel/phase uses three, 3-position plugs. The plugs support up to 3 field wires each. The top plug is for the Reds associated with this phase, the middle plug is for Yellows and the bottom plug is for Greens.</p> <p>Phase Wiring</p> <ol style="list-style-type: none"> 1. Install a field wire in a plug. 2. Insert the plug into its socket until the latch mechanism snaps. 3. Repeat this process for all phases. <p>Neutral/DC Ground Wiring</p> <p>The Ground/Neutral DC Ground return terminal blocks are located along the bottom edge of the panel. Install the Ground/Neutral DC wires with the same procedure as the phase wiring (above).</p> <p>Note: To remove a block, push the latch mechanism toward the left and pull on the wire.</p>	

Component	Install In	Notes
Optional high-voltage Transient Suppressor Modules	Back panel of Field Output Termination Panel	<p>If you observe correct safety precautions, you can plug in or remove the Transient Suppressor Modules without shutting down the intersection.</p> <hr/> <p>Warning! To prevent electric shock, you must wear gloves when you install or remove the modules.</p> <hr/> <p>There are two models of the transient suppressor module; one is labeled for use with 120 VAC signal heads and one is labeled for 48 VDC signals.</p> <hr/> <p>Caution! If you were to incorrectly install a 48 VDC module in a 120 VAC assembly, you would destroy the module. If you were to incorrectly install a 120 VAC module in a 48 VDC assembly, there would NOT be sufficient transient protection.</p>

Field Output Termination Panel notes

Position adjustments

- The angle of the panel can be adjusted to three different angles by “flipping” the two levers, one located on the top left and one on the top right, and moving the panel to the desired locating slot.
- The depth of the panel can be adjusted if necessary but will require removal from the rack to make the adjustment.

“Tail Section”

The Output Termination Panel includes a strain relief “tail section” that allows you to use tie-wraps to dress the field wires, if desired. You can remove the tail section if it will not be used.

Transparent Cover

There is a transparent cover on the rear of the panel that, when removed, gives access to the over-current and transient protection circuitry. This cover should be installed at all times to prevent shock hazards.

Self-Resetting Fuses

Each circuit for each channel/phase has a self-resetting fuse located on the rear of the panel. In the event of a shorted output, the resettable fuse will heat up and temporarily “open up” protecting the circuitry. After the short is removed, the fuse will cool down and close making the circuit active again.

Warning! When a resettable fuse is in the “open” condition, it is very hot and will burn you if you touch it!

8. Powering up the cabinet

- A. At the left side of the Output Assembly, set the AUTO/FLASH switch to FLASH. This puts the cabinet in manual flash.
- B. **First make sure that you have done Step A**—then, at the Service Panel Assembly (at the back of the cabinet in the bottom right corner), set the MAIN breaker to ON.
- C. Make sure that the controller is NOT stop timed.
- D. Make sure that all signal heads are flashing red.
- E. Remove stop signs.
- F. Make sure that there are no faults on the controller, the CMU, or the ADU (allow the controller to cycle several times to make sure there are no programming errors).
- G. Check that the controller timing matches the timing sheets.
- H. Verify that all detection is functional and calls the correct phases.

9. Intersection turn-on

- A. Have a contractor stop the traffic in all directions.
- B. Reset the controller to allow programmed start up sequence.
- C. At the left side of the Output Assembly, set the AUTO/FLASH switch to AUTO. This turns OFF the manual flash.
- D. Allow the intersection to make at least one complete cycle before allowing traffic to flow.
- E. Watch for several cycles to make sure of correct operation.

10. Walk the intersection

- A. Check that all indications are functional.
- B. Check all pedestrian push buttons.
- C. Check all detection.
- D. Report your findings to the city representative.