

MPT9000CZ/
MPT9000PZ
Transmitter/
Control
(Coaxitron®
System 2000)

Installation/
Operation Manual
C550M-E (8/97)

TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
1.0 WARNING	1
2.0 SCOPE	2
3.0 DESCRIPTION	2
4.0 INSTALLATION	2
4.1 RECEIVER POWER INPUT MODIFICATIONS	2
4.1.1 24 VAC Input Conversion	2
4.2 CONNECTOR ASSEMBLY	5
4.3 SYSTEM CONFIGURATIONS	7
5.0 OPERATIONS	10
5.1 FUNCTIONAL CIRCUIT DESCRIPTION	10
5.2 TRANSMITTER	11
5.2.1 Controls	11
5.3 RECEIVER	11
5.4 RECEIVER/TRANSMITTER INPUTS AND OUTPUTS	11
5.5 COAXITRON PREPOSITION RECEIVER	12
5.5.1 Power-Up Routine	13
5.5.2 Creating Presets	13
5.6 AUXILIARY FUNCTIONS	17
5.7 AUTO/RANDOM OPERATION	21
5.8 CX900TLC MANUAL/TEST MODULE	21
6.0 TROUBLESHOOTING GUIDELINES	23
7.0 MAINTENANCE	23
8.0 MODEL NUMBERS	24
8.1 OPTIONAL ACCESSORIES	25
8.2 RECOMMENDED CABLES	25
9.0 SPECIFICATIONS	25
10.0 WARRANTY AND RETURN INFORMATION	28

LIST OF ILLUSTRATIONS

<u>Figure</u>		<u>Page</u>
1	Coaxitron System 2000 Receiver	3
2	24 VAC Input Wiring Schematic	3
3	AC Input and Fuse Values	4
4	Connector Assembly	5
5	Receiver Control Output/Input Pin Assignments	6
6	Basic Coaxitron System 2000	7
7	Coaxitron System 2000 with Manual Video Switcher and Multiple Cameras	7
8	Coaxitron System 2000 with Multiple Transmitters	8
9	Coaxitron System 2000 with Multiple Transmitters and Receivers	9
10	Coaxitron System 2000 Basic Interconnect Diagram	9
11	Wiring Diagram for preposition Alarm Outputs	13
12	SB1900, SS2000, SB2500 and SB2600 Series Preset Wiring Diagram	14
13	PT280, PT520, PT550, PT570, PT680, PT1250, PT1280 and SB2800 Series Preset Wiring Diagram	15
14	Lens Preset Wiring Diagram	16
15	Jumper Settings, Receiver/Driver Mother Board	17
16	External Device Wiring Diagram	18
17	Auxiliary Functions Wiring Diagram	19
18	AI700/AI701 Wiring Diagram	20
19	Coaxitron Receiver Assembly Layout (Top View)	21
20	A9000 Wiring Schematic	22
21	CX900TLC Test Module and Wiring Schematic	23

REVISION HISTORY

<u>Manual #</u>	<u>Date</u>	<u>Comments</u>
C550M	—	Original version.
C550M	8/89	Rev. A. Manual revised to new format.
C550M	9/90	Rev. B. Manual revised to include 230 VAC, 12 V and preset (PP) models. Sections 2.1-2.3, 4.1.1, 4.2 and 5.5-5.6 revised.
C550M	5/91	Rev. C. New figure added for connector assembly (Fig. 2); Figure 16 revised.
C550M	6/92	Rev. D. Revised to 2-column format. Section 4.1.1 and Figures 10-12 revised.
		ADDENDUM to Rev. D created 6/93 for CX9024RX field modification procedures. Pages 4, 18 and 19 revised; pages 4-1 and 19-1 added. (Addendum was incorporated in reprint of manual as pages 4, 5, 5-1, 5-2, 18, 19, 19-1 and 19-2.)
C550M-E	11/94	Rev. E. Completely revised. Updated for PCB1500529 REV J and PCB1500529 REV K production models. Incorporates update for fuse values per ECO 94-376.
	8/96	Revised fusing values for fuse #F1, Figure 3.
	10/96	Revised Figure 2, 24 VAC Input Wiring Schematic, per ECO #96-278.
	8/97	Revised fusing values for fuse #F2, Figure 3 per ECO# 96-362.

INSTALLATION/OPERATION MANUAL COAXITRON SYSTEM 2000

1.0 WARNINGS

Prior to installation and use of this product, the following WARNINGS should be observed.

1. Installation and servicing should only be done by Qualified Service Personnel and conform to all Local codes.
2. Unless the unit is specifically marked as a NEMA Type 3-6P enclosure, it is designed for Indoor use only and it must not be installed where exposed to rain and moisture.
3. The product bears the following marks:
4. Only use replacement parts recommended by Pelco.
5. After replacement/repair of this unit's electrical components, conduct a resistance measurement between line and exposed parts to verify the exposed parts have not been connected to line circuitry.

This symbol indicates that dangerous voltage constituting a risk of electric shock is present within this unit.



CAUTION:
TO REDUCE THE RISK OF ELECTRICAL SHOCK, DO NOT REMOVE COVER. NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

This symbol indicates that there are important operating and maintenance instructions in the literature accompanying this unit.



CAUTION:
RISK OF ELECTRIC SHOCK.
DO NOT OPEN.

Please thoroughly familiarize yourself with the information in this manual prior to installation and operation.

NOTE: This manual applies to those Coaxitron systems using either PCB1500529 REV J or PCB1500529 REV K boards. PCB board drawings were done from the REV J board perspective; however, differences between the two boards that affect function or operation are clearly pointed out.

2.0 SCOPE

The information contained within this manual covers the installation and operation of the Coaxitron System 2000 (transmitter control and receiver).

Installation should be in accordance with all applicable local and national electric codes, utilizing approved materials only.

Please thoroughly familiarize yourself with the information in this manual prior to installation and operation.

3.0 DESCRIPTION

The Coaxitron System 2000 control system provides up to 16 remote control functions without the need for control cables other than for a dedicated video cable for the normal transmission of a remote camera signal to the local monitoring and control position. The Coaxitron Control System lends itself to application in situations where short-to-medium distances are involved and where equalization of cable losses is not required.

Typically, these functions are:

- | | |
|---------------|-------------------------|
| 1. Pan Left | 9. Iris Open |
| 2. Pan Right | 10. Iris Close |
| 3. Tilt Up | 11. Camera Power On/Off |
| 4. Tilt Down | 12. Auto/Manual Scan |
| 5. Zoom In | 13. AUX 1 (Manual Iris) |
| 6. Zoom Out | 14. AUX 2 (Auto Iris) |
| 7. Focus Near | 15. AUX 3 |
| 8. Focus Far | 16. AUX 4 |

Functions 1 through 10, 15 and 16 are momentary; that is, they are only actuated while the associated control switch located on the Coaxitron transmitter or front panel is operated. Functions 11, 12, 13 and 14 are latching; that is, camera power, auto scan, and auto/manual iris are latching functions and remain on until turned off. The latching iris function is not dedicated, and with proper interfacing, it can be used for some other latching function. Alternately, AUX 1, 2, 3 and 4 may be used as momentary functions to control such things as lights or gates with proper external interfacing. Up to ten functions can be operated simultaneously. Functions 11 through 16 must be used individually; although any one of these functions may be used simultaneously with functions 1 through 10.

Coaxitron System 2000 is an improved version of the original Coaxitron. Improvements include the following features:

1. When used with an AI700 Auto Iris Servo, three latching functions rather than two are available: (a) auto scan, (b) camera power and (c) auto/manual iris.
2. When used with a CX900TLC Local Test Board Plug-in Module, manual control of functions from the receiver location plus the ability to check for the valid reception of a given command from the transmitter.
3. Pan/tilt, zoom lens and camera power control are included on the main (video and logic) receiver board, which eliminates malfunctions due to miswiring or broken wires.

Coaxitron System 2000 provides the following standard functions on a single circuit board and chassis with integral power supply:

1. Pan/Tilt (24 VAC or 120 VAC as ordered from the factory)
2. Zoom Lens — Zoom, iris, and focus with adjustable speed (speed not remote controllable)
3. Camera power (24 VAC or 120 VAC as ordered from the factory)
4. An open collector transistor output (latching) intended for use in manual override of an automatic iris control.

4.0 INSTALLATION

Coaxitron System 2000 installation includes the connection of all coaxial cable to the proper connectors, depending on your system configuration. Various connector assembly pin-out geometries are shown in Figure 4. Connector location and pin assignments are illustrated in Figure 5.

For optional auxiliary functions, consult the factory to make the proper connections between the receiver, pan/tilt and camera/enclosure.

4.1 RECEIVER POWER INPUT MODIFICATIONS

4.1.1 24 VAC Input Conversion

The CX9024RX series receivers can be converted to operate with a 24 VAC input. If desired (see Figure 2). Please contact factory for more information. For AC input and fuse values, referred to Figure 3.

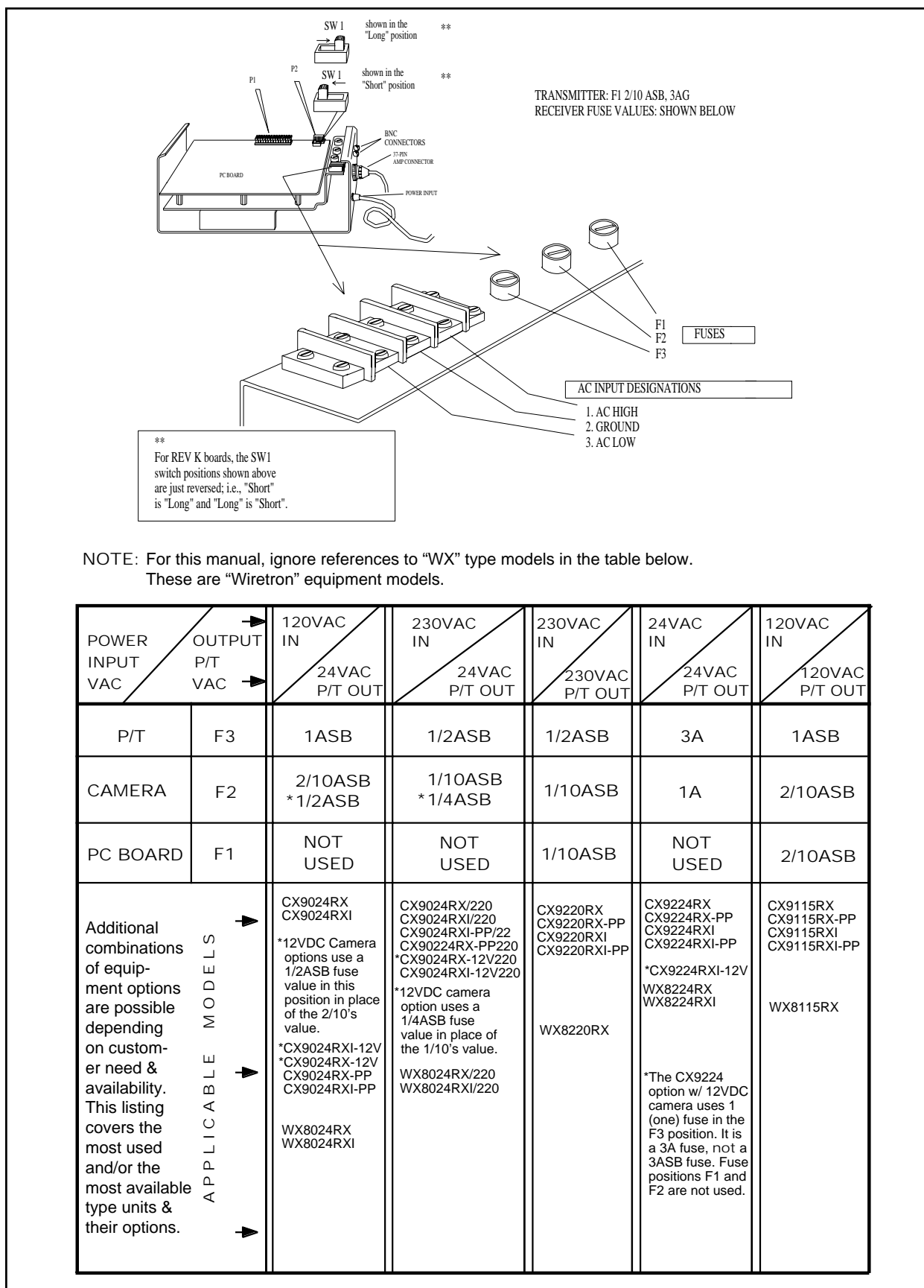


Figure 3. AC Input and Fuse Values

4.2 CONNECTOR ASSEMBLY

Installation and/or testing will require you to assemble the connector parts provided. Fabricate the interconnecting cable according to the following steps (reference Figure 4).

1. Slide part A of the cable clamp (item 1) over the end of the cable (item 1, part C) with the threaded end of the cable clamp facing the connector (item 5).
2. If the cable has a diameter less than 1/2 inch (1.3 cm), slide the rubber boot (item 2) over the end of the cable and pull through the cable clamp to so that the boot encases the cable and forms a good seal.
3. Strip back the cable jacket approximately 1-1/4 inches (3.2 cm) and separate the individual conductors (item 3).

4. The contact pins supplied with the mating connector are the "crimp" type which may also be soldered if you so desired (item 4).
5. After crimping or soldering the contact pins to the conductors, push them into the proper holes in the connector until they snap in place.

Note: Contacts cannot be removed from the connector without the use of the appropriate AMP extraction tool which is available from PELCO.

6. Slide part A of the cable clamp toward the connector and screw the parts together. Attach part B (item 1) onto part A and connect both parts with the screws provided.
7. Connect the cable assembly to the unit and seat the connector by twisting the locking collar until it snaps into position (see Figure 5 and Figure 10).

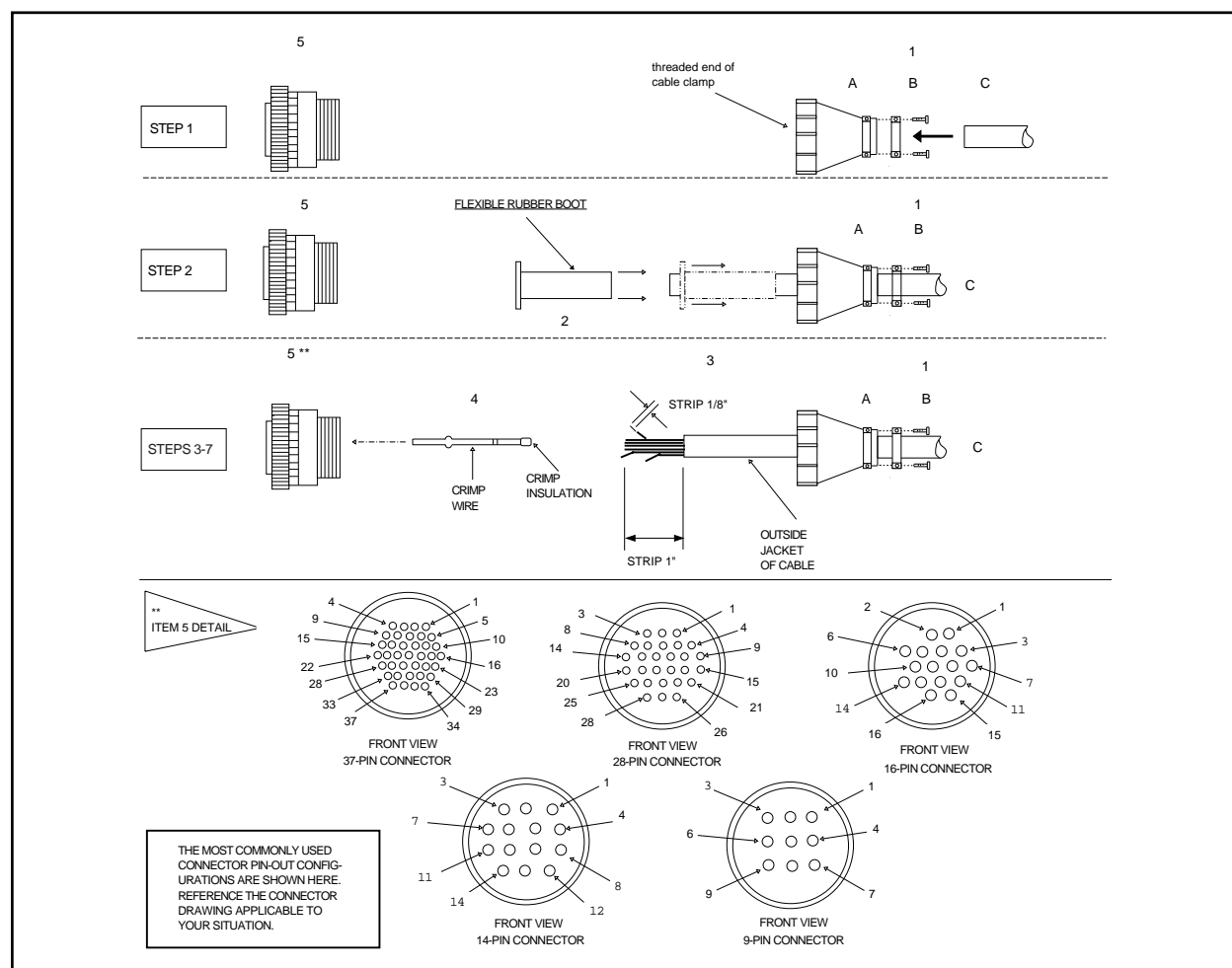


Figure 4. Connector Assembly

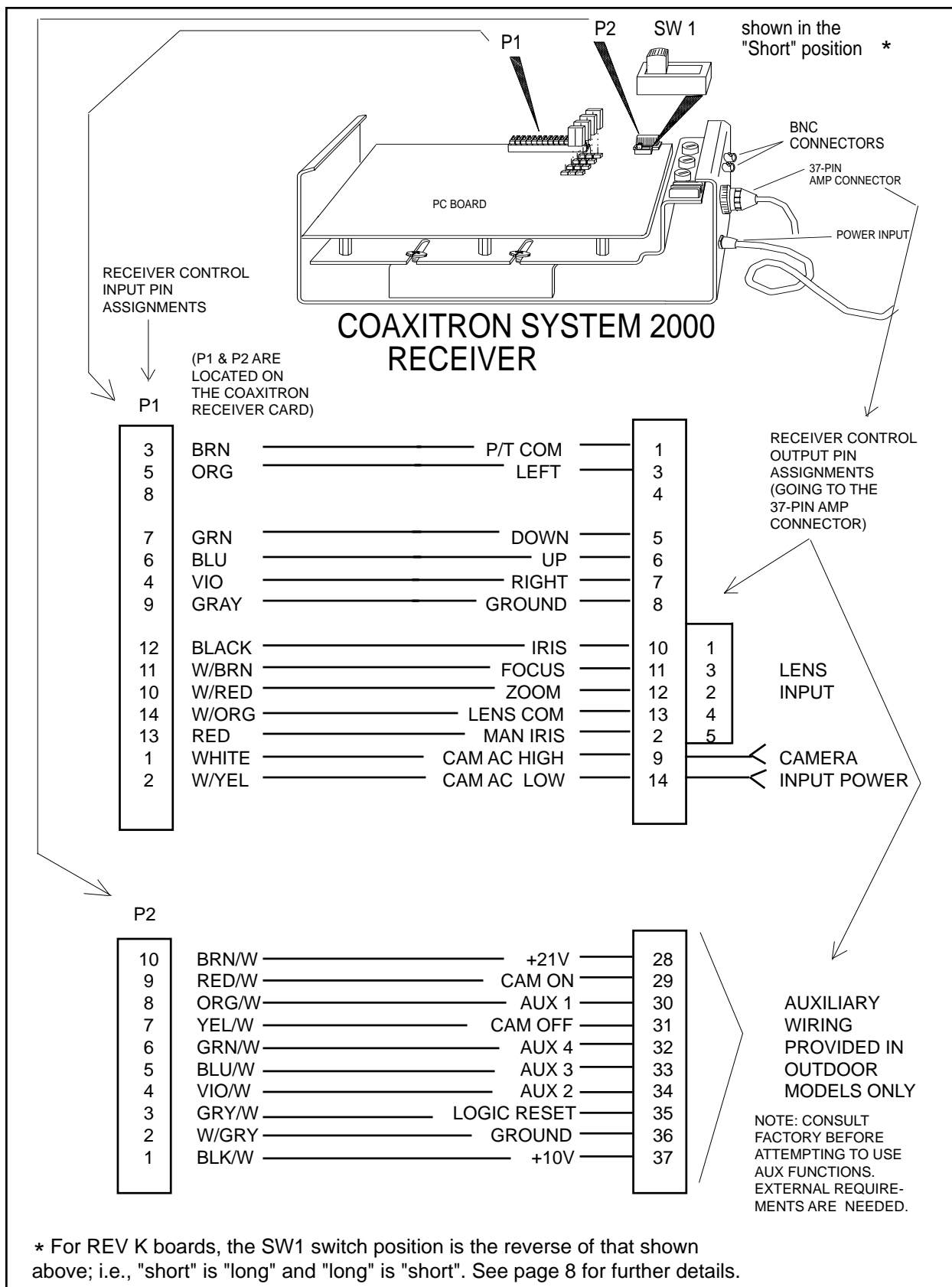


Figure 5. Receiver Control Output/Input Pin Assignments

4.3 SYSTEM CONFIGURATIONS

Figure 6 shows the simplest system configuration utilizing the Coaxitron System 2000. This system consists of the control transmitter, coax cable and receiver/camera. This basic Coaxitron system is flexible in that it can be expanded to control multiple camera sites when a hard contact switching device is added.

Figure 7 shows the addition of a manual video switcher and one receiver/camera. In this example, the active coaxial cable is terminated in the transmitter and the inactive cables are terminated in the switcher. The selected camera signal is fed to the Coaxitron transmitter, which then feeds the monitor. When a camera selection is made, that video line is dedicated to the transmitter that allows the associated Coaxitron receiver to be controlled. Functions such as auto/random are latching and will remain on until turned off by the transmitter.

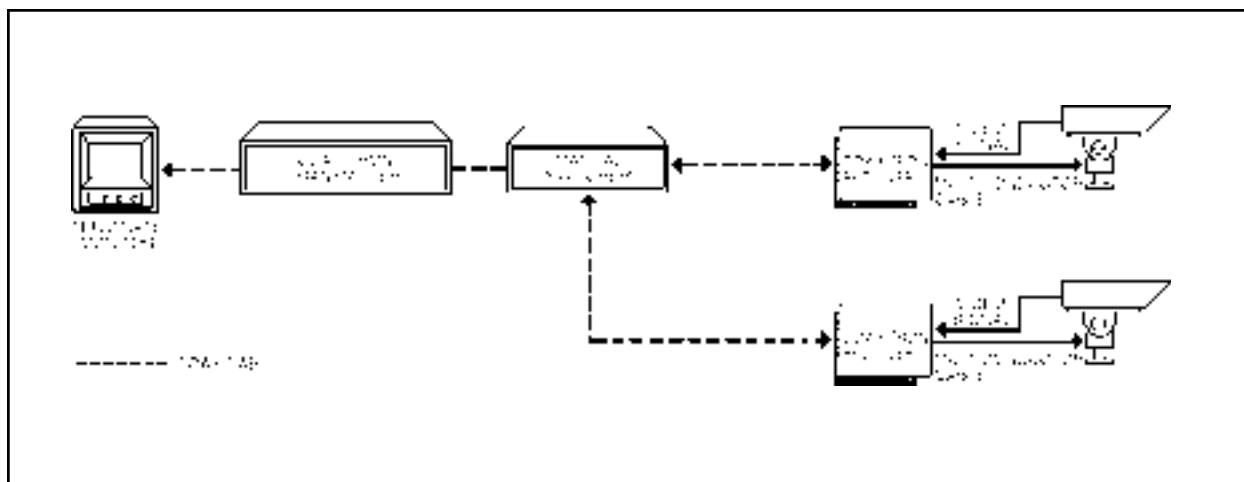


Figure 6. Basic Coaxitron System 2000

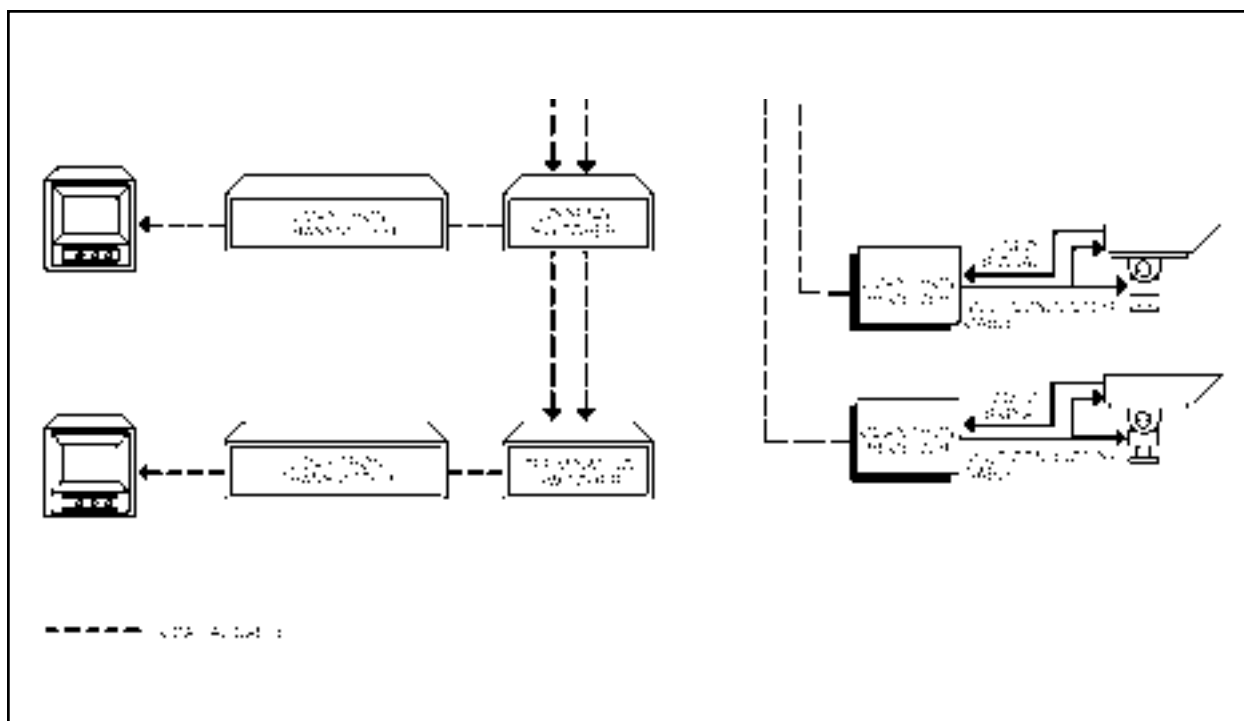


Figure 7. Coaxitron System 2000 with Manual Video Switcher and Multiple Cameras

A more complex system is shown in Figure 8. Here, several control locations can serve a single camera system.

Note: All transmitters, except the last one, must be looping (unterminated) rather than terminating.

In a system of this type, any one of the transmitters can assume control because there is no priority provision. If two or more transmitters are activated simultaneously, error detection circuitry in the receiver will cause multiple commands to be ignored.

Figure 9 shows an even more complex system. In this example, multiple transmitters are controlling multiple receivers.

Note: All but the last transmitter and associated switcher must be looping (unterminated). Transmitters and associated switchers should be physically adjacent to insure against signal deterioration due to cable mismatch.

Video cables from the receivers are looped through the first control station to the second. At the first control station, a bridging-looping type sequential switcher (except VA500 series) is used. The Monitor 2 output is a hard contact switch, otherwise known as the bridged output for continuous viewing or control selection.

This monitor may also be used for sequential switching. As in the previous configuration, any one transmitter can assume control. If two or more control units are activated simultaneously, erroneous responses are prevented by error detection circuitry in the associated receiver.

The switchers depicted in Figure 10 are hard contact devices and do not have isolation or bridging amplifiers. In each case, the Coaxitron transmitter acts as the isolation or bridging amplifier. Do not use VA500 series switchers with Coaxitron systems.

Note: For configurations where RG59 cable length between the transmitter and receiver exceeds 750 feet, it is necessary to reset switch SW1 on the receiver board (PCB1500529) from SHORT to LONG. The switch should be left in the SHORT position when using shorter lengths of RG59 cable or when using RG11 cable (see Figure 5). For RG11 cable, the upper limit is 1800 ft. In any case, these operating distances can be extended by using the EA2000. See the table on page 26.

Coaxitron System 2000 basic interconnections between the transmitter and receiver are shown in Figure 10. If you have chosen a configuration that includes a switching device, refer to the manual provided with the switcher for the appropriate connections.

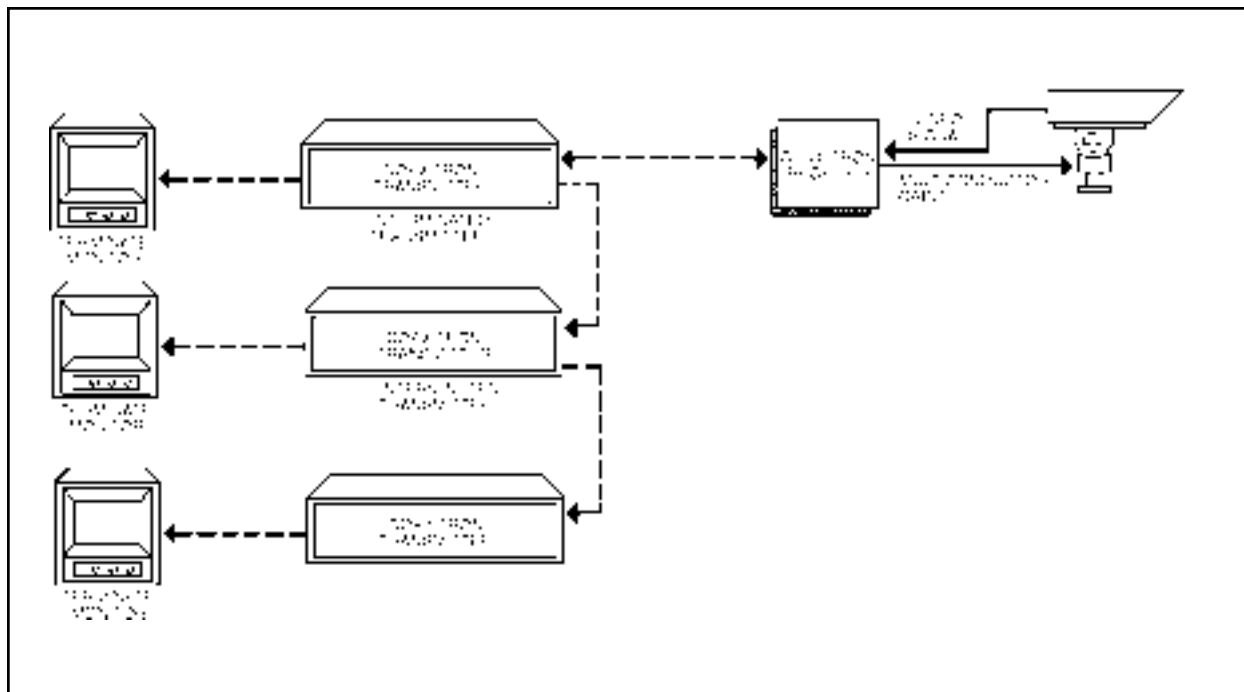


Figure 8. Coaxitron System 2000 with Multiple Transmitters

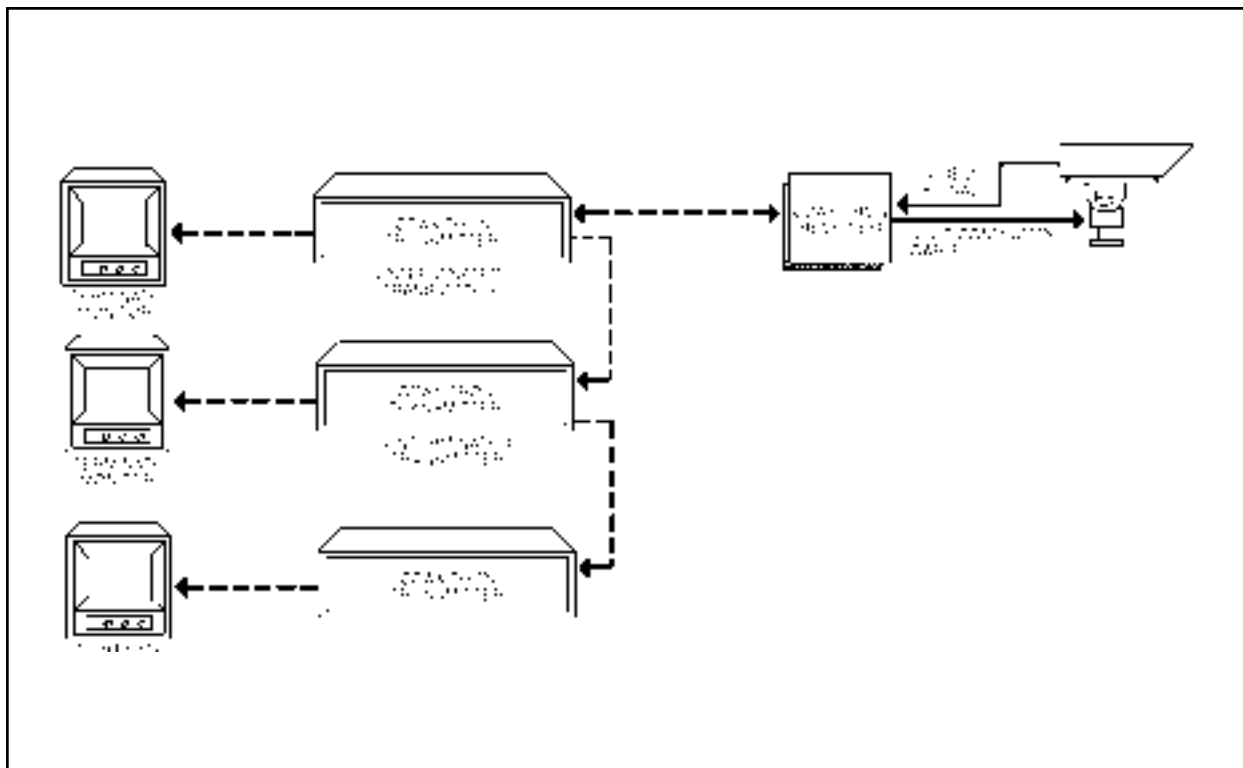


Figure 9. Coaxitron System 2000 with Multiple Transmitters and Receivers

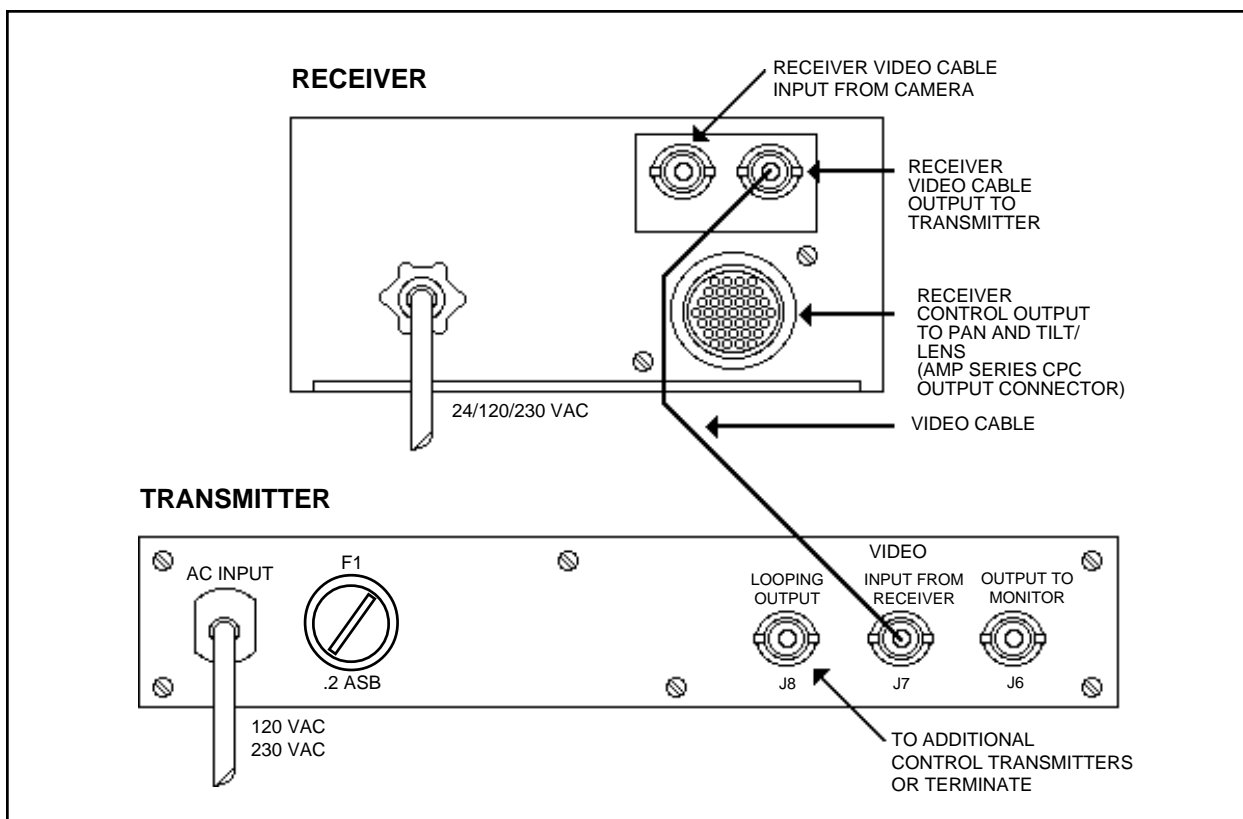


Figure 10. Coaxitron System 2000 Basic Interconnect Diagram

5.0 OPERATION

In general, all operating controls on the transmitter are self explanatory. With the exception of the ON/OFF power switch and the 8-position joystick, all controls are center-off, spring return paddle switches (momentary on-off-on).

5.1 FUNCTIONAL CIRCUIT DESCRIPTION

The basic functional concept of the Coaxitron system is that 15 control pulses are fed in a reverse direction from the control transmitter to the receiver located near each camera station. These control pulses do not interfere with the video monitor presentation because they occur during the vertical blanking interval of the video signal. The equipment is designed to operate with video cable lengths up to 750 feet of RG59B/U (or equivalent), or up to 1,800 feet of RG11. The SW1 switch prominently located on the receiver board (PCB1500529), should be moved to the LONG position when RG59B/U cable of greater than 750 feet is used (see Figure 3).

Cable impedance matching is insured by the video amplifier in the control receiver. Proper receiving and termination impedance is likewise insured by the terminating resistor in the control transmitter. Any equipment placed between the remote and local locations must be of the "loop-through" or "bridging" type; power splitter or line amplifiers cannot be tolerated.

Response time of the system is normally less than 30 ms. Error detection circuitry is incorporated to immunize the system from externally generated noise. Under extremely adverse environmental noise conditions response time may increase, and in the limit, control functions can fail. Under such extreme conditions, however, provision is made to inhibit all momentary functions.

The proper function of the Coaxitron system depends on the compatibility of two signals simultaneously traveling in opposite directions in the same coaxial cable. If the control signal is made large, compared to the video signal, there is the risk that associated equipment will be adversely affected. If the control signal is made small, compared to the video signal, it becomes difficult to separate it from the video signal (and any incumbent noise or hum). Therefore, the Coaxitron system is designed to function with video and control signals nominally equal.

Under such circumstances, reliable performance can be predicted with cable lengths of 1,500 feet or more. Beyond this distance, the control signal amplitude can become attenuated sufficiently to make performance marginal. Marginal performance is also approached if the video signal is allowed to become excessive — the dynamic range of the receiver video amplifier is one limitation. Sending end distortion produced by the coaxial cable is typically the major contributor to the malfunctioning of a Coaxitron system. The amplitude of distortion products is proportional to video signal amplitude and is a non-linear function of cable length. The influence of these distortion products upon system performance is difficult to predict if signal amplitude is allowed to exceed specifications.

Normally, auto-target or auto-iris functions will maintain a video level well within reasonable limits and insure reliable performance. Often, however, automatic or manual level settings may be made abnormally high (perhaps to compensate for long cable losses or to produce a picture with more contrast). An excessively high video level setting can cause the Coaxitron control system to fail completely — with all control functions disabled. In order to prevent system failures due to excessively high video levels, it is recommended that cameras be powered by the receiver.

The Coaxitron System 2000 is designed to combat prolonged loss of control due to the conditions described above by providing the following protective functions:

1. Simultaneous commands from two different sources are processed to insure that manual iris control cannot be inadvertently selected in place of automatic control.
2. A sustained (20 to 40 second) illegal command condition results in (a) camera off, (b) automatic iris, or (c) manual pan.

These functions greatly reduce the possibility of loss of control and usually eliminate the need for service.

As an example, assume that the operator switches to manual iris control and proceeds to open the iris excessively. The result can be a complete loss of control. Within 20 to 40 seconds, camera power is automatically removed (assuming this feature exists) and auto iris is reinstated. Thus, distortion products are eliminated if the camera power function is incorporated in the system or reduced to a tolerable level if only the AUTO/MANUAL iris function is incorporated.

5.2 TRANSMITTER

The transmitter is housed in a 1-3/4" high enclosure, supplied as a desk top unit (rack mount available). Three video connectors (J6, J7, J8) are located on the rear rail (see Figure 10). J8 allows the user to loop the camera signal from one transmitter to another, or to terminate the signal by installing the appropriate resistor. Connector J7 accepts the camera signal from the receiver, and J6 provides an output for monitoring equipment.

5.2.1 Controls

Power ON/OFF	Rocker switch
Pan/Tilt	8-position joystick
Zoom	Paddle switch Tele/Wide
Focus	Paddle switch Near/Far
Iris	Paddle switch Open/Close
Aux 1,2	Paddle switch Auto/Manual Iris (latching function)
Camera Power	Paddle switch On/Off (latching function)
Pan Auto/Man	Paddle switch Manual/Auto (latching function)*
Aux 3, 4	Paddle switch (momentary functions)*

*External requirements are needed for operation

5.3 RECEIVER

The receiver and control function assemblies are contained in a "J-Box" housing. One end of the J-Box has two video connectors (input and output) and CPC-type control cable connector. Provision is made on this same

surface for entry of AC power line (120/230/24 VAC). (See Figure 10.)

The INPUT video connector accepts the signal from the camera and provides a 75 ohm termination.

The OUTPUT video connector is connected to the transmitter input connector (J7) via a dedicated and continuous coaxial cable. Proper termination of this cable is vital to the operation of the equipment. Although loop-through connections in this cable are permissible, power splitter or line amplifiers cannot be tolerated.

5.4 RECEIVER/TRANSMITTER INPUTS AND OUTPUTS

The Receiver/Transmitter inputs and outputs are described as follows:

- Receiver Video Input

Normally, this is the video signal from the camera serviced by the receiver. The receiver provides a 75 ohm cable termination and an isolation amplifier to prevent the control pulse train from being fed to the camera. (See Figure 10.)

- Receiver Video Output

This output is fed to the transmitter video input (J7) via 75 ohm coaxial cable. Active elements or "splitters" in this cable run cannot be tolerated. (See Figure 9.)

- Receiver Power Input

All Coaxitron receivers may be powered by 24/120/230 VAC as ordered from the factory. The AC power input for 24 VAC operation must be changed as described in Section 4.1.

- Receiver Control Output

All control signals from the receiver are available from an AMP Series CPC output connector, except for optional auxiliary functions. (See Figure 10.)

- Receiver Control Output for 12 VDC Camera Option

The usual output for camera power is 24 VAC accessed at pins 9 and 14 of the 37-pin AMP connector (see Fig. 5) where CAM AC HIGH and AC LOW emerge as CAMERA INPUT POWER. The output pin assignments remain the same for 12 VDC camera power options, only now pin 9 (WH) is positive (+) and pin 14 (WH/YEL) is negative (-).

- Transmitter Video Input

The transmitter usually provides for the 75 ohm termination of the cable from the receiver. However, the user may alter this termination in order to loop through and terminate further downstream. (See Figure 10.)

WARNING: Power for enclosure models utilizing heater/blowers cannot be tapped off the secondary of the Coaxitron receiver transformer or off of camera AC power (see Figure 5, Pins 9 and 14). Instead, for example, enclosure power for these purposes could be run off of the primary of the Coaxitron transformer and routed to the enclosure via unused Pins 15 and 16 of the 37-Pin connector.

Although the Coaxitron control system is immune to transient or surge disturbances, its performance can be impaired by the presence of large ground loop voltages between the transmitter and the receiver. The amplitude of ground loop potential that can be tolerated varies as a complex function of cable center conductor resistance, video signal amplitude, and cable length. However, ground loop voltages that induce less than 0.5 volt p-p into the video output of the receiver should not cause the system to malfunction.

In general, ground loop problems will seldom be encountered. However, potentials as high as 10 volts p-p between ground connections within a single building are not unheard of. If such circumstances arise, Pelco recommends the use of its Model GIT100 Ground Isolation Transformer. When inserted in the cable run between two points of different ground potential, the effect of this potential difference on the video signal is reduced by more than 100 times with 200 feet, and more than 20 times with 1,500 feet of RG59 type cable. More than one GIT100 can be utilized in situations where the common mode voltage (CMV) exceeds 10 volts p-p. This transformer is passive and can easily be inserted where required at any time.

Factors that limit the distance over which the Coaxitron can be used are transmission line attenuation and transmission line signal distortion

When signal attenuation becomes large due to excessive cable length, the differential amplifier in the Coaxitron receiver can no longer detect the presence of a control pulse train. The limitation can be overcome by increasing the amplitude of the pulses generated by the transmitter. This is not done without danger, however, because associated equipment may be over-driven by the larger signal. (Note that the presence of the control signal is not restricted to the cable between the transmitter and receiver, but will be on all signal cables downstream from the receiver.)

It has been stipulated that loop-through connections are permissible in the control link, and distribution or equalizing amplifiers are not because of their unidirectional characteristics.

Pre-equalization of the camera signal prior to feeding to the Coaxitron receiver is generally not practical because of the dynamic limits in the receiver video amplifier. Post equalization of the signal (transmitter output signal) is permissible, but probably not practical. It should be kept in mind that although the camera signal has been deteriorated by the transmission line, the control signal has not. Therefore, the equalized control pulses will be extremely large and probably cause an overload in some part of the system downstream from the equalizing amplifier.

In the absence of an assertive control command, the transmitter is inactive. Thus, it is possible to control one receiver from more than one control.

5.5 COAXITRON PREPOSITION RECEIVER

Note: The Coaxitron preposition receiver is designed for use with Coaxitron Matrix controls only.

The Coaxitron System utilizes linear taper precision potentiometers as the position feedback sensors. This feedback voltage is digitized and stored in the receiver. The storage of the presets is held in EEPROM and is therefore nonvolatile.

Up to 32 presets can be stored in each receiver. Up to 8 presets can be activated by alarm contacts connected to the receiver. There is also an open collector output from the receiver to activate an external device (such as the CSA764) when the alarm contacts are activated. Figure 11 shows the wiring for alarmed presets.

If multiple alarms are activated, the receiver will sequence between the alarm presets at a 5 second dwell time per preset.

Figures 12 through 14 provide pin-to-pin connections for preset domes, pan/tilts and lenses to the Coaxitron receiver that are available at this revision manual.

5.5.1 Power-up Routine

When a preposition receiver is first powered up, it has a routine that it goes through to orient itself to the pan/tilt and lens connected to it.

The routine first automatically operates the lens “zoom” and “focus” functions.

The pan/tilt will “nod yes” if the receiver reads the feedback voltages (preposition lens) or “nod no” if it does not read any feedback voltages (manual lens).

This routine is a good troubleshooting indicator of incorrect wiring of the control cable.

The second part of the routine will operate the “pan left” and “pan right” functions. The pan/tilt will “nod yes” if it reads only one feedback voltage (pan/tilt with limit stops) or “nod no” if it reads two feedback voltages (SL pan/tilt).

The total routine takes approximate 45 seconds to complete.

5.5.2 Creating Presets

At the present time the only Coaxitron system transmitters capable of creating presets are the CM7500, the CM9500 Matrix and the MPT9500. Refer to the instructions in the product manuals (C584M, dated 2/90 or later for CM7500 matrix, or C500M for CM9500 matrix or C535M for the MPT9500) to create presets, if necessary.

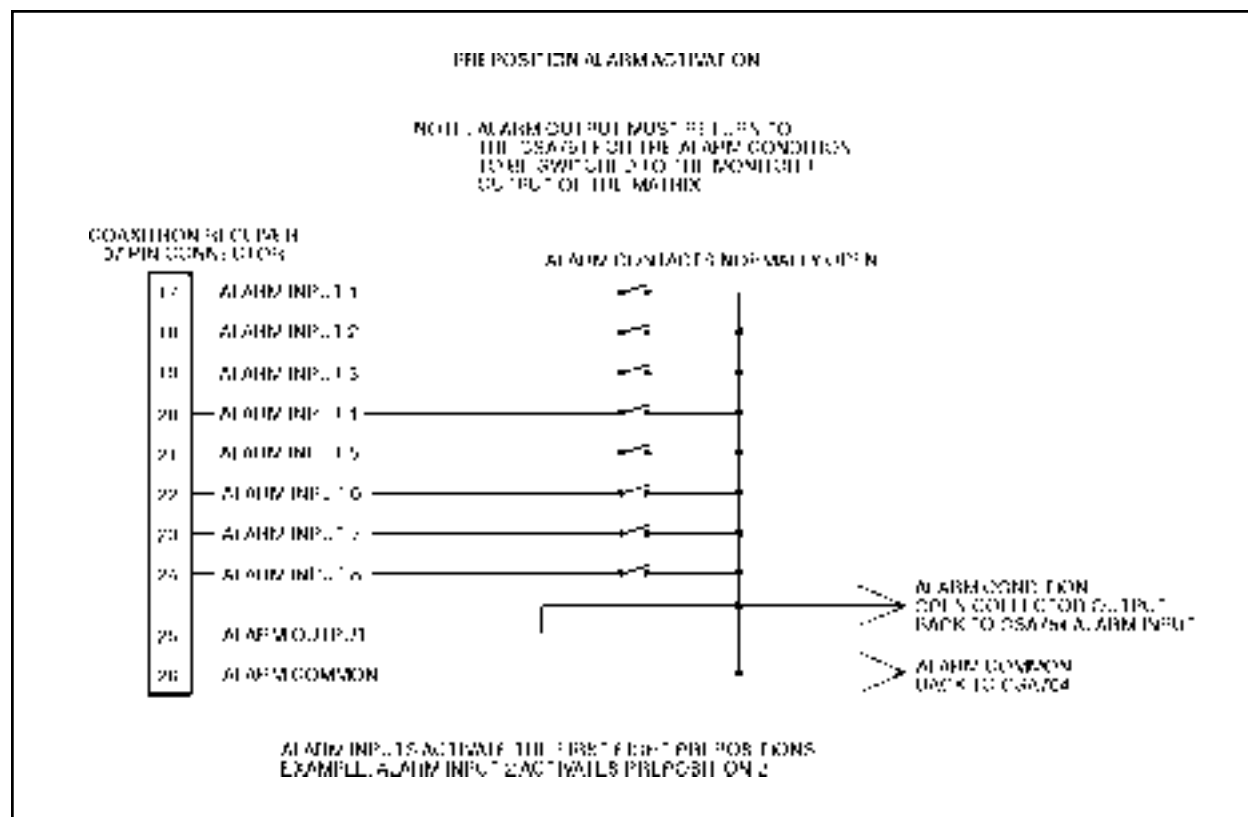


Figure 11. Wiring Diagram for Preposition Alarm Outputs

Coaxitron Receiver Preset Unit Only		SB2500-PP, SB2500SL-PP, SB2600-PP and SB2600SL-PP		SB1900-PP, SB1900SL-PP, SS2000-PP and SS2000SL-PP	
37-pin Connector	Function	37-pin Connector	Function	28-pin Connector	Function
1	Pan/Tilt Common	1	Pan/Tilt Common	1	Pan/Tilt Common
2	Manual Iris	2	Not Used	2	Video Core
3	Pan Left	3	Pan Left	3	Pan Left
4	Video Shield	4	Video Shield	4	Video Shield
5	Tilt Down	5	Tilt Down	5	Tilt Down
6	Tilt Up	6	Tilt Up	6	Tilt Up
7	Pan Right	7	Pan Right	7	Pan Right
8	Ground	8	Ground	8	Ground
9	Camera AC (High)	9	Camera AC (High)	9	Camera AC (High)
10	Iris	10	Iris	10	Iris
11	Focus	11	Focus	11	Focus
12	Zoom	12	Zoom	12	Zoom
13	Lens Common	13	Lens Common	13	Lens Common
14	Camera AC (Low)	14	Camera AC (Low)	14	Camera AC (Low)
15	Not Used	15	Not Used	15	Not Used
16	Not Used	16	Not Used	16	Not Used
17	Alarm Input 1	17	Not Used	17	Preset +5V
18	Alarm Input 2	18	Not Used	18	Preset Ground
19	Alarm Input 3	19	Not Used	19	Cam Sync-C
20	Alarm Input 4	20	Not Used	20	Preset Zoom
21	Alarm Input 5	21	Not Used	21	Preset Focus
22	Alarm Input 6	22	Not Used	22	Preset Pan
23	Alarm Input 7	23	Not Used	23	Preset Tilt
24	Alarm Input 8	24	Not Used	24	Preset Pan (SL models only)
25	Alarm Output	25	Not Used	25	Not Used
26	Ground	26	Not Used	26	Not Used
27	Video Core	27	Video Core	27	Not Used
28	Preset Ground	28	Preset Ground	28	Not Used
29	Preset +5 V	29	Preset +5V		
30	Not Used	30	Cam Sync - C		
31	Not Used	31	Not Used		
32	Not Used	32	Not Used		
33	Pan B Preset	33	Preset Pan		
34	Preset Focus	34	Preset Focus		
35	Preset Zoom	35	Preset Zoom		
36	Preset Tilt	36	Preset Tilt		
37	Pan A Preset (360)	37	Preset Pan (SL models only)		

Figure 12. SB1900, SS2000, SB2500 and SB2600 Series Preset Wiring Diagram

Coaxitron Receiver Preset Unit Only		Preposition Pan/Tilts PT520, PT550, PT570 and PT1250 Series		Preposition Pan/Tilts PT280, PT520, PT550, PT570 and PT1280 Series and SB2800 Series Domes/ PT1280P/PP and PT1280SL/PP	
37-pin Connector	Function	37-pin Connector	Function	28-pin Connector	Function
1	Pan/Tilt Common	1	Pan/Tilt Common	1	Pan/Tilt Common
2	Manual Iris	2	Preset Pan	2	Video Core
3	Pan Left	3	Pan Left	3	Pan Left
4	Video Shield	4	Video Shield	4	Video Shield
5	Tilt Down	5	Tilt Down	5	Tilt Down
6	Tilt Up	6	Tilt Up	6	Tilt Up
7	Pan Right	7	Pan Right	7	Pan Right
8	Ground	8	Ground	8	Ground
9	Camera AC (High)	9	Preset Tilt	9	Camera AC (High)
10	Iris	10	Preset Ground	10	Iris
11	Focus	11	Preset +5 V	11	Focus
12	Zoom	12	Not Used	12	Zoom
13	Lens Common	13	Not Used	13	Lens Common
14	Camera AC (Low)	14	Not Used	14	Camera AC (Low)
15	Not Used	15	Not Used	15	Not Used
16	Not Used	16	Not Used	16	Not Used
17	Alarm Input 1			17	Preset Ground
18	Alarm Input 2			18	Preset + 5 V
19	Alarm Input 3			19	Preset Pan
20	Alarm Input 4			20	Preset Tilt
21	Alarm Input 5			21	Not Used
22	Alarm Input 6			22	Not Used
23	Alarm Input 7			23	Preset Zoom
24	Alarm Input 8			24	Preset Focus
25	Alarm Output			25	Preset Pan (SL models only)
26	Ground			26	Not Used
27	Video Core			27	Not Used
28	Preset Ground			28	Not Used
29	Preset +5 V				
30	Not Used				
31	Not Used				
32	Not Used				
33	Pan B Preset				
34	Preset Focus				
35	Preset Zoom				
36	Preset Tilt				
37	Pan A Preset (360)				

Figure 13. PT280, PT520, PT550, PT570, PT680, PT1250, PT1280 and SB2800 Series Preset Wiring Diagram

Coaxitron Receiver Preset Unit Only		Preposition Lenses	
37-pin Connector	Function	9-pin Connector	Function
1	Pan/Tilt Common	1	Iris
2	Manual Iris	2	Zoom
3	Pan Left	3	Focus
4	Video Shield	4	Lens Common
5	Tilt Down	5	Ground
6	Tilt Up	6	Preset +5V
7	Pan Right	7	Preset Zoom
8	Ground	8	Preset Ground
9	Camera AC (High)	9	Preset Focus
10	Iris		
11	Focus		
12	Zoom		
13	Lens Common		
14	Camera AC (Low)		
15	Not Used		
16	Not Used		
17	Alarm Input 1		
18	Alarm Input 2		
19	Alarm Input 3		
20	Alarm Input 4		
21	Alarm Input 5		
22	Alarm Input 6		
23	Alarm Input 7		
24	Alarm Input 8		
25	Alarm Output		
26	Ground		
27	Video Core		
28	Preset Ground		
29	Preset +5 V		
30	Not used		
31	Not used		
32	Not used		
33	Pan B Preset		
34	Preset Focus		
35	Preset Zoom		
36	Preset Tilt		
37	Pan A Preset (360)		

Figure 14. Lens Preset Wiring Diagram

5.6 AUXILIARY FUNCTIONS

The Coaxitron receiver is capable of operating up to four (4) remotely activated auxiliary functions. Each auxiliary output may be individually converted at the receiver for momentary or latching operation. Refer to Figure 15 for the desired jumper location. When in the latching mode, activating the same AUX function will toggle the function from on to off.

The AUX outputs are buffered to provide a continuous 10 VDC at 25 mA to drive small relays, lamps or some other external device. Refer to Figures 16 and 17 for

examples of typical circuits used for auxiliary functions.

Note: The preceding two paragraphs pertain to Revision J or newer Receiver/Driver Mother boards.

Figure 18 shows a typical connection using the latching command to operate an AI700 or AI701 for auto iris or manual iris operation. AUX 1 latches manual iris; AUX 2 latches auto iris.

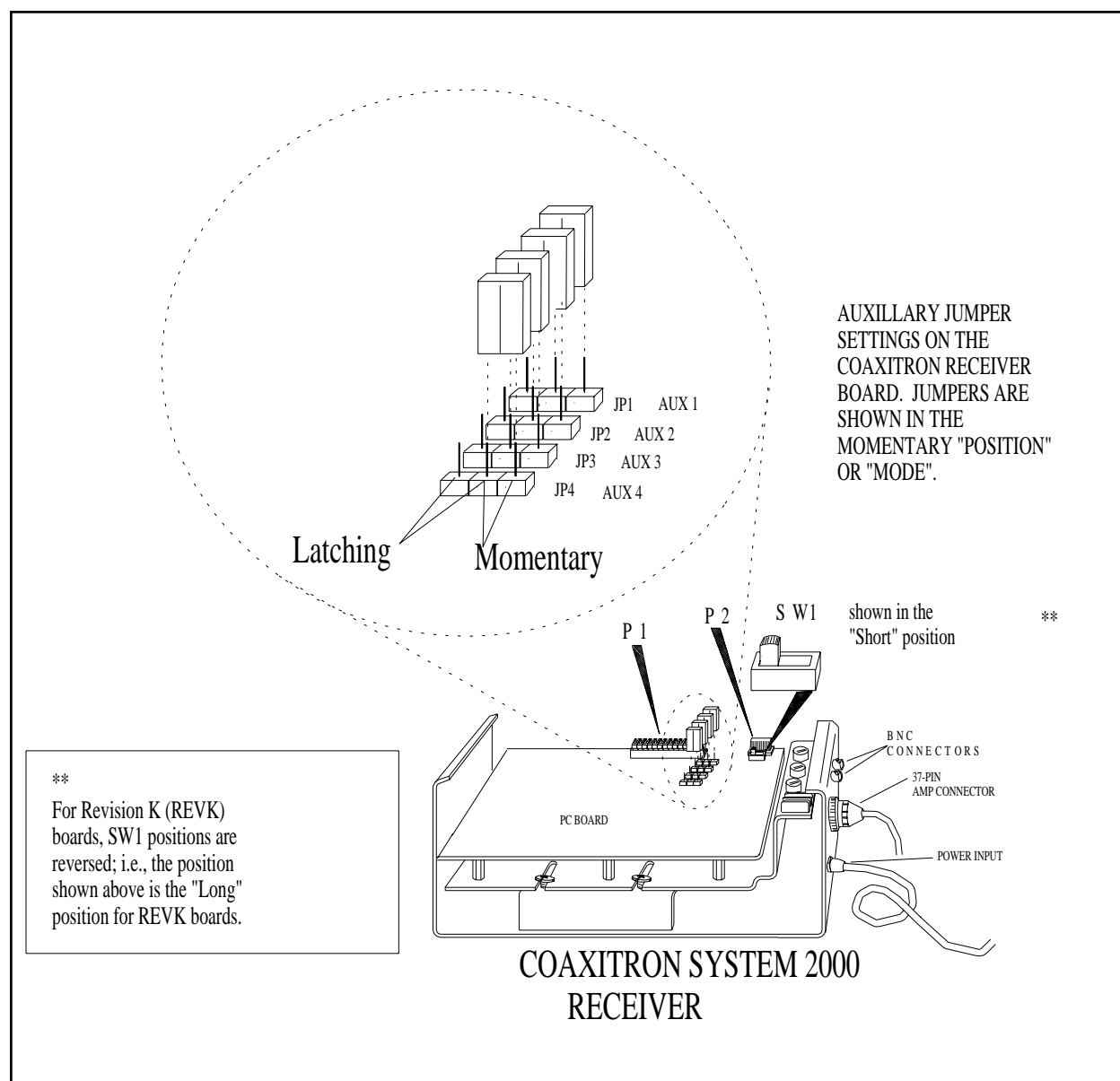


Figure 15. Jumper Settings, Receiver/Driver Mother Board

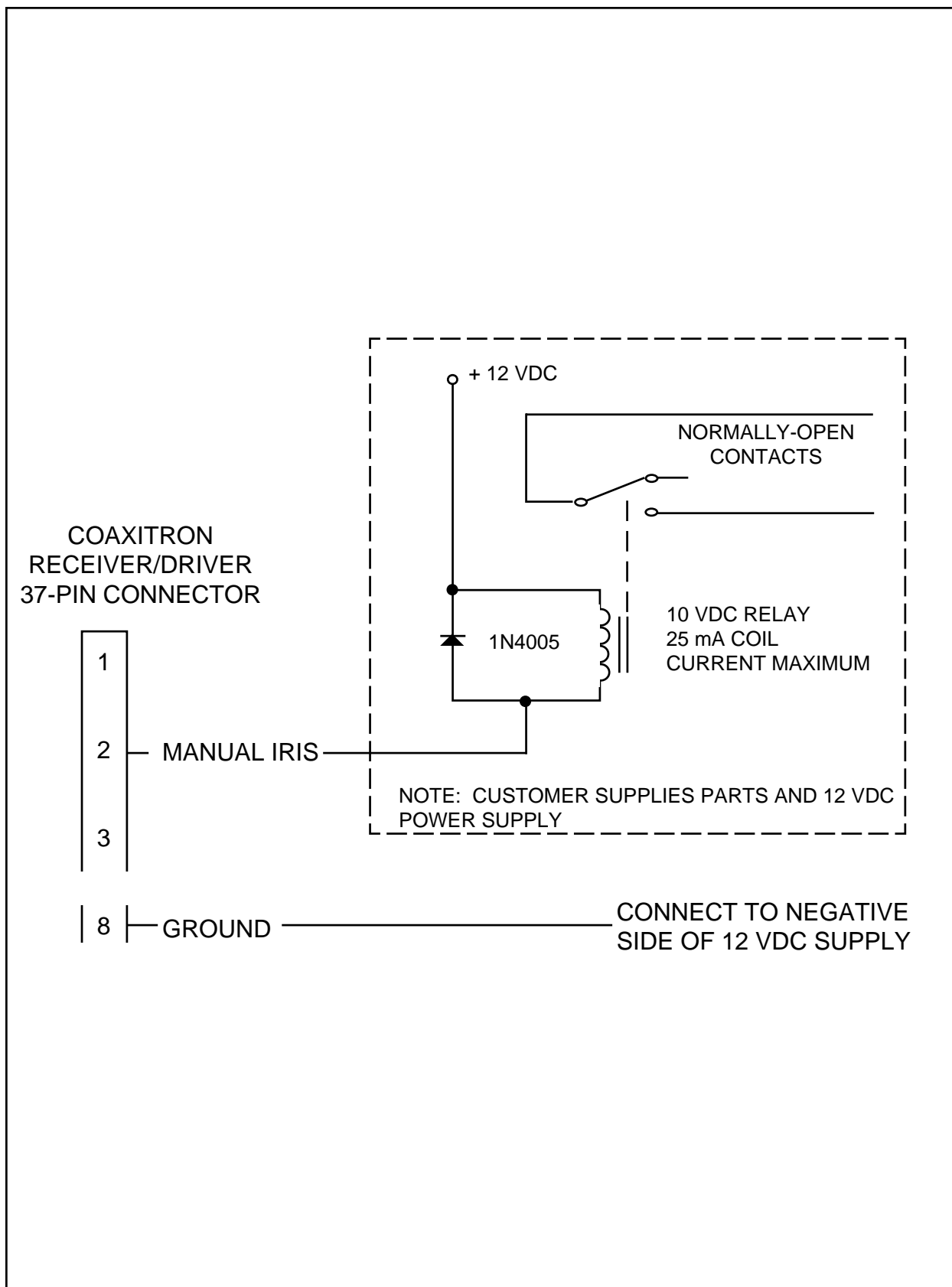


Figure 16. External Device Wiring Diagram

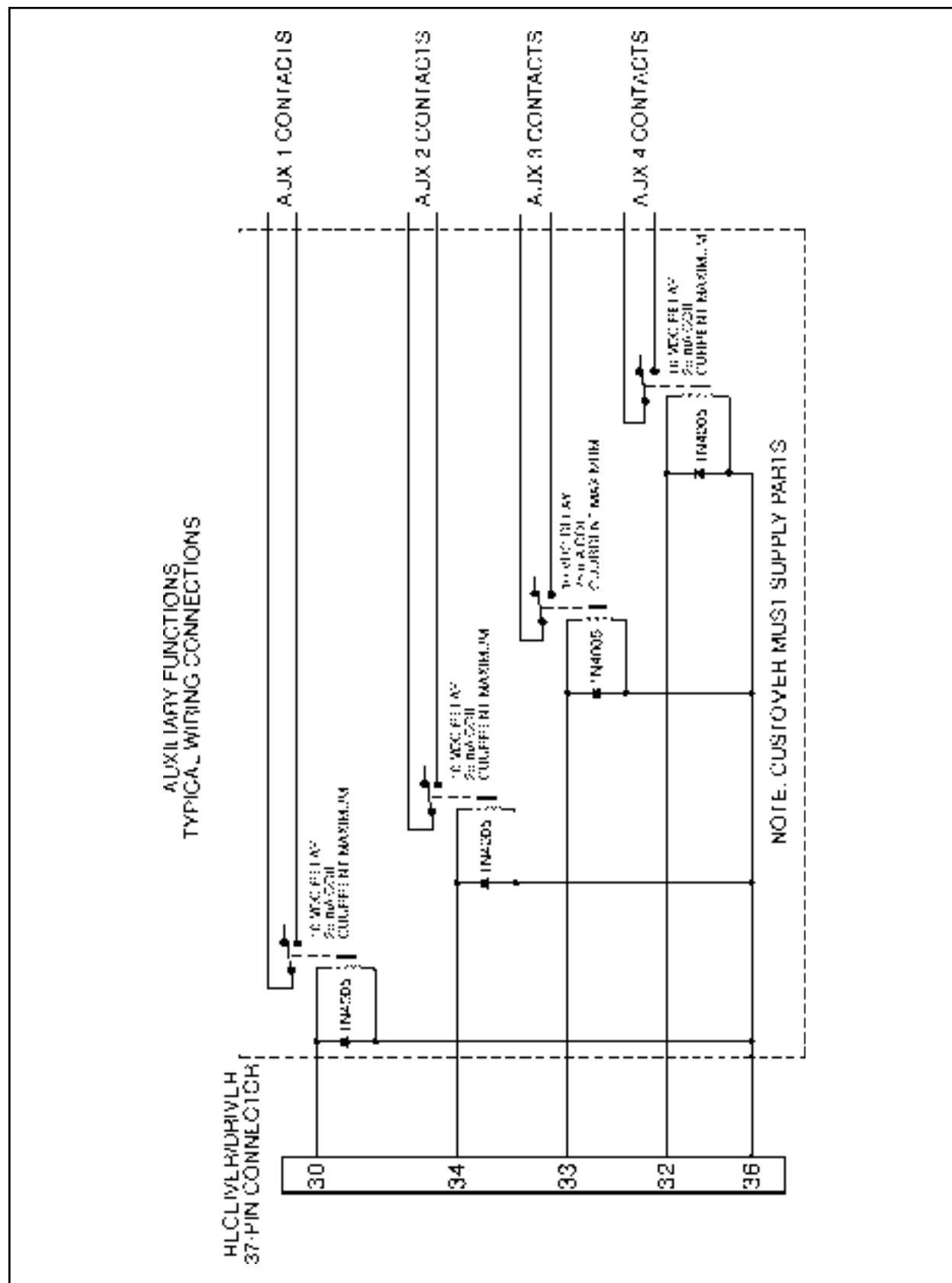


Figure 17. Auxiliary Functions Wiring Diagram

5.7 AUTO/RANDOM OPERATION

The A9000 Auto/Random Scan module is a plug-in P.C. board option (See Fig. 19 for board location) for all Coaxitron receivers. This module provides two modes for automatically controlling pan and tilts within preset limits — Auto Scan and Random Scan. The Random Scan and Auto Scan functions are controlled by the same momentary switch on the control panel labeled AUTO and MAN. The first activation of the switch to the AUTO position will put the pan/tilt into Random Scan. In Random Scan operation the pan/tilt will travel between the preset limits with a random scan period of about 0 to 60 seconds, and a random dwell period of between about 4 seconds and a programmable 60 to 900 seconds. At the completion of a dwell period, another random scan period is started. The direction of this scan period is also randomly determined. When a pan limit is reached, scan direction is reversed automatically. A second activation of the AUTO switch will put the pan/tilt into continuous duty Auto Scan. After approximately 1/2 hour of auto scan, the circuit will reset to random scan. Commanding AUTO while in Random mode causes a shift to Auto mode and starts the half-hour timer. Similarly, commanding AUTO while in Auto mode causes a shift to the Random mode and zeros the half-hour timer.

Advantages of random scan:

1. Because scan direction, scan period and dwell period are unpredictable, unauthorized activities or intrusions are discouraged.
2. Because of the reduced duty cycle, gear train wear, cable fatigue, drive motor wear and temperature rise are reduced. These factors all contribute to higher system reliability and increased equipment life.

The A9000 auto/random scan plug-in module comes equipped with an 8-pin male connector and two nylon spacers factory installed. To install the module perform the following steps:

WARNING: Power must be removed from receiver prior to installing A9000. Destructive failure of A9000 may result if it is plugged into a powered motherboard.

1. Locate the 8-pin female connector (J2) on the motherboard and insert the 8-pin male connector (P5). See Figure 20 for wiring schematic.

2. Insert spacers into appropriate holes in the motherboard and snap firmly into place.

5.8 CX900TLC MANUAL/TEST MODULE

The CX900TLC Manual/Test Board is a dual purpose plug-in module (See Fig. 19 for board location) which permits local operation of all functions directly from the receiver unit, and also serves to verify that the receiver and accessories are operating properly by providing visual confirmation. This module also aids in troubleshooting receiver or transmitter operational problems. See Figure 21 for module functions and wiring schematic.

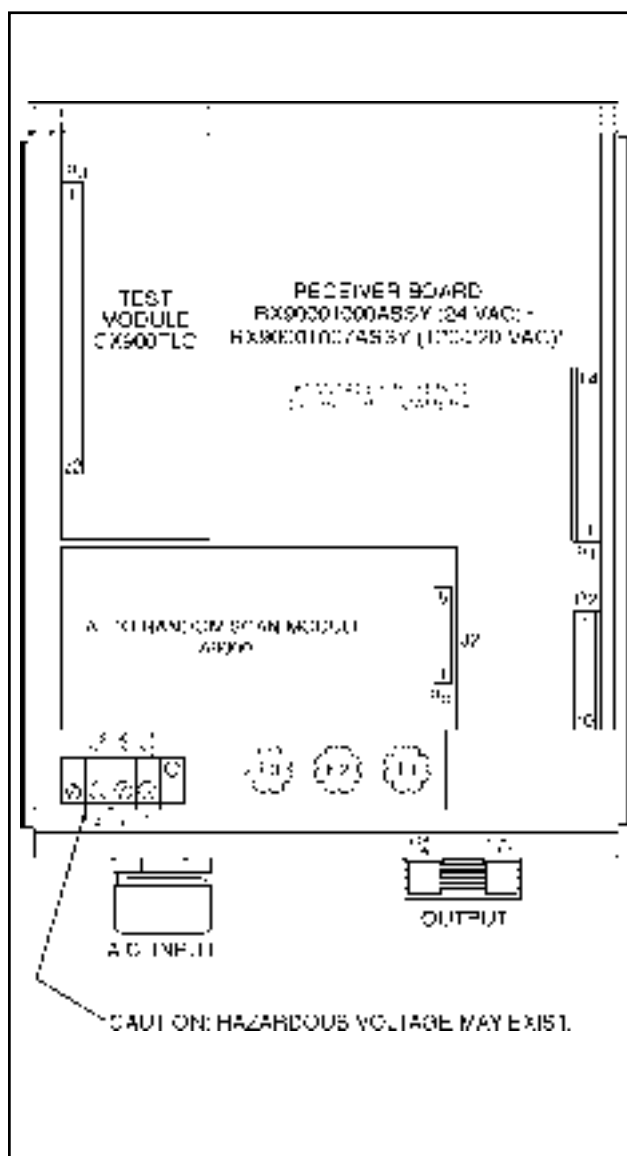
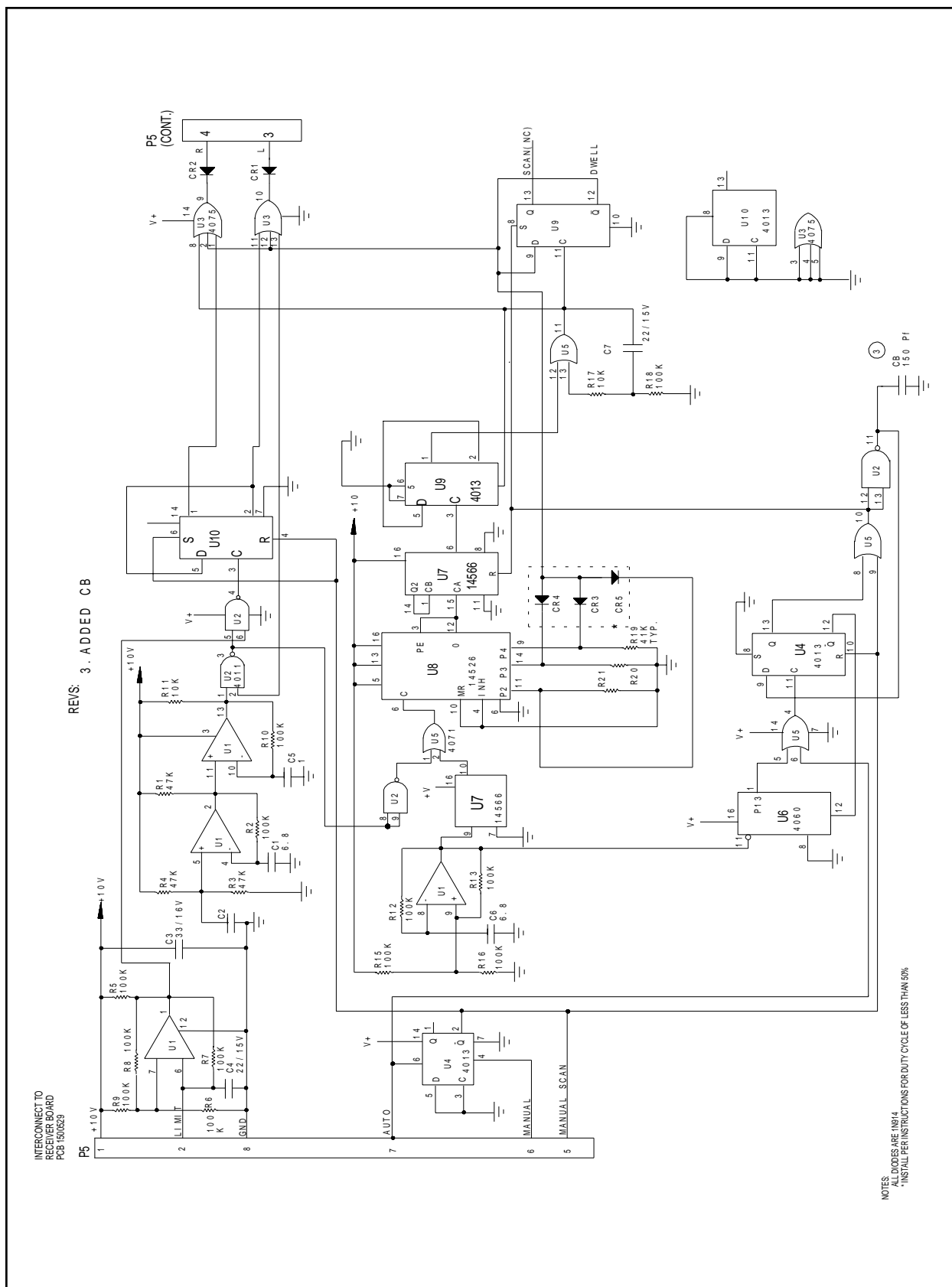


Figure 19. Coaxitron Receiver Assembly Layout (Top View)



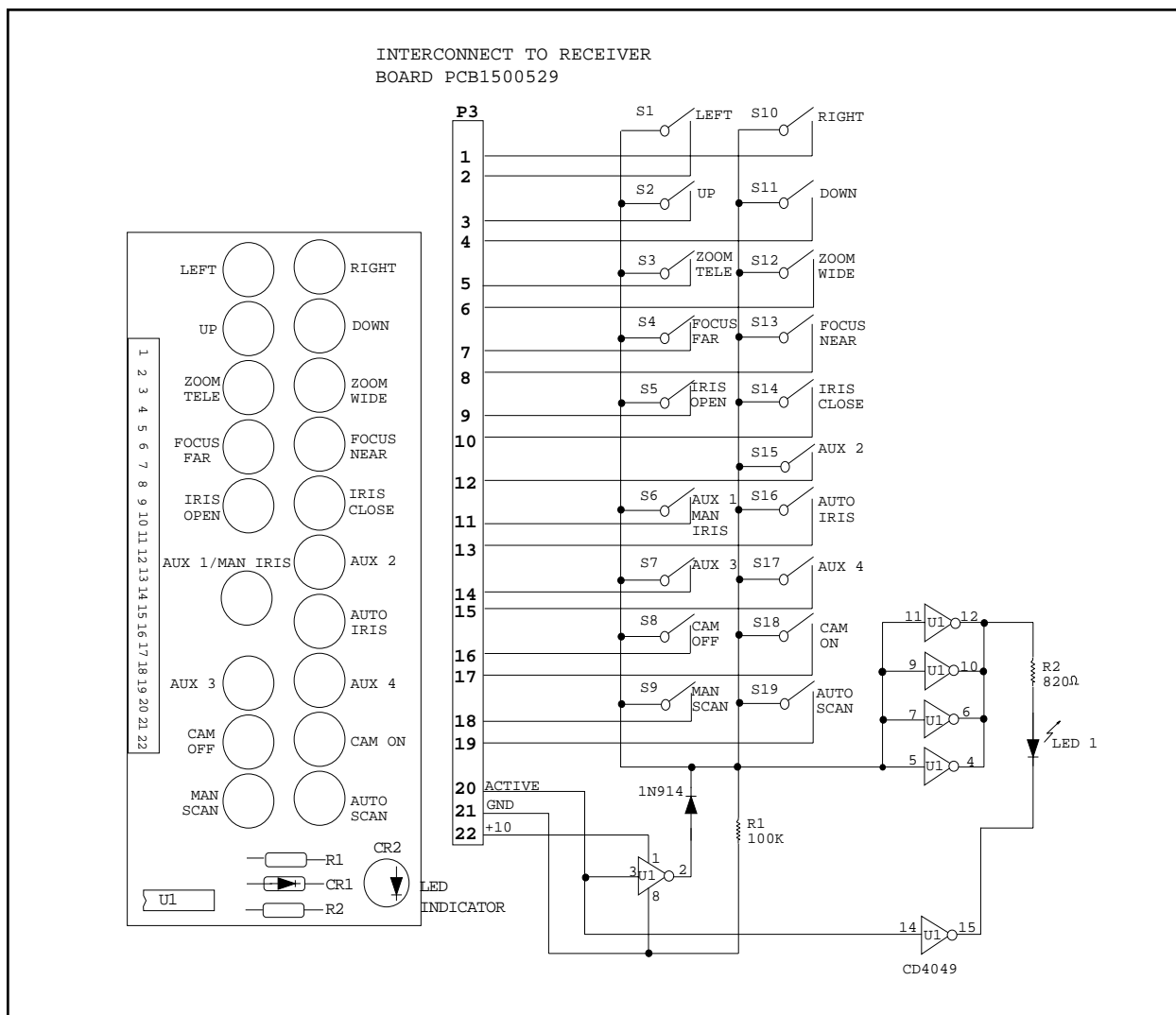


Figure 21. CX900TLC Test Module and Wiring Schematic

6.0 TROUBLESHOOTING GUIDELINES

If you experience operating problems with either the receiver or transmitter, first check all fuses and voltage readings to make sure they are in working order. The CX900TLC can be utilized to verify receiver functions and accessories are operational.

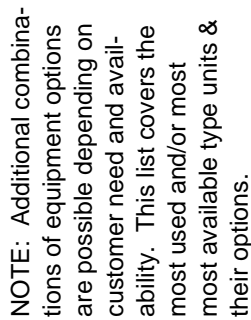
There is little that can be done without the aid of an oscilloscope. We recommend you contact your local dealer or our Customer Service Department for assistance.

Copies of the Coaxitron System 2000 Maintenance Manual (document number C550SM) are available on request.

7.0 MAINTENANCE

The Coaxitron System 2000 is engineered to provide years of reliable service. The Coaxitron System 2000 has very few operator serviceable parts and we recommend that system components be serviced by a trained technician or returned to the factory for repair.

TREE LIST



8.1 OPTIONAL ACCESSORIES

A9000	Auto/random scan, plug-in module.
AUX2000	Auxiliary function relay box for control of wiper/washer functions.
AUX9000	Auxiliary function wiring harness. Required for use with AUX2000 and all indoor Coaxitron/Wiretron receivers (supplied with outdoor receivers).
CX900TLC	Local test board, plug-in module.
EA2000	Coaxitron equalizing video/control amplifier. This unit is highly effective in maintaining picture quality. See Section 9.0 for specific distances.

8.2 RECOMMENDED CABLES

C1906	Pretested 6 foot (2 m) cable for use with ED2820, ED2920, SB2800, SS2000, and SS3000 series enclosures and inverted PT180-24P, PT280-24P pan/tilts.
C1906/PP	Same as C1906 except for use with preset pan/tilts.
C1925	Pretested 25 foot (8 m) cable for use with ED2820/ED2920, SB2800, SS2000 and SS3000 series enclosures and inverted PT180-24P, PT280-24P pan/tilts.
C1925/PP	Same as C1925 except for use with preset pan/tilts.
C2506	Pretested 6 foot (2 m) cable for use with SB2500 series enclosures.
C2525	Pretested 25 foot (8 m) cable for use with SB2500 series enclosures.
C6806	Pretested 6 foot (2 m) cable for use with PT680-24P/PT680-24SL pan/tilts. Not for inverted operation.

C6806/PP	Same as C6806 except for use with preset pan/tilts.
C6825	Pretested 25 foot (8 m) cable for use with PT680-24P/PT680-24SL pan/tilts. Not for inverted operation.
C6825/PP	Same as C6825 except for use with preset pan/tilts.
WH1900-06	6 foot (2 m) wire harness pre-assembled with bare wire and 37-pin connector for use with SB1900 series enclosures.
WH1900-25	Same as WH1900-06 except 25 feet (8 m) long.

9.0 SPECIFICATIONS

ELECTRICAL

Input Voltage:	120 VAC, 60 Hz Transmitter and Receiver (strappable for 230 VAC, 50 Hz)
Power Consumption:	
Transmitter	2.5vA
Receiver	5vA (120 VAC or 24 VAC)
Pan/Tilt Supply	140vA Max. (120 VAC) 50vA Max. (24 VAC)
Lens Supply	0-4vA Max.
Camera Supply	15vA (typical)
Control Method:	15-pulse train (pulse width modulated) superimposed on the video signal during the vertical blanking interval by the control transmitter. Pulse train occupies 1 TV line period.
Pulse Amplitude:	Approximately 1V p-p added to video signal, 333 kHz nominal
Connectors:	
Control	
Transmitter	3 BNC connectors
Receiver	2 BNC connectors for video input and output 37-pin AMP CPC for control output (mate supplied)

Input Video Level: 1V p-p nominal; 2V p-p maximum at less than 75% APL;
1.5V p-p maximum at 90% APL

System
Bandwidth: Less than 2 dB down at 10 MHz
(exclusive of cable)

Fuse Protection: 3 AG type

Power Cord: 3-wire grounded #18 AWG,
Transmitter and Receiver

Operating
Distance: Cable distances are approximate
according to cable type used. 75
ohm coax required.

Cable Type	Distance	Distance Using EA2000
RG59U	750 ft (229 m)	3,000 ft (914 m)
RG6	1,500 ft (457 m)	4,500 ft (1372 m)
RG11	1,800 ft (549 m)	6,000 ft (1829 m)
RG15	—	8,000 ft (2438 m)

GENERAL

Ambient
Temperature: -4°F to +140°F (-20°C to +60°C)

NOTES:

10.0 WARRANTY AND RETURN INFORMATION

WARRANTY

Pelco will repair or replace, without charge, any merchandise proved defective in material or workmanship for a period of one (1) year after the date of shipment. Exceptions to this warranty are as noted below:

- Two (2) years on all standard motorized and fixed focal length lenses.
- Two (2) years on Legacy®, Intercept®, CM8500/CM9500/CM9750/CM9760 Matrix, Spectra™, DF5 Series and DF8 Fixed Dome products.
- Two (2) years on WW5700 series window wiper (excluding wiper blades).
- Two (2) years on cameras.
- Six (6) months on all pan and tilts, scanners or pre-set lenses used in continuous motion applications (e.g., preset scan, tour and auto scan modes).

Pelco will warranty all replacement parts and repairs for 90 days from the date of Pelco shipment. All goods requiring warranty repair shall be sent freight prepaid to Pelco, Clovis, California. Repairs made necessary by reason of misuse, alteration, normal wear, or accident are not covered under this warranty.

Pelco assumes no risk and shall be subject to no liability for damages or loss resulting from the specific use or application made of the Products. Pelco's liability for any claim, whether based on breach of contract, negligence, infringement of any rights of any party or product liability, relating to the Products shall not exceed the price paid by the Dealer to Pelco for such Products. In no event will Pelco be liable for any special, incidental or consequential damages (including loss of use, loss of profit and claims of third parties) however caused, whether by the negligence of Pelco or otherwise.

The above warranty provides the Dealer with specific legal rights. The Dealer may also have additional rights, which are subject to variation from state to state.

If a warranty repair is required, the Dealer must contact Pelco at (800) 289-9100 or (559) 292-1981 to obtain a Repair Authorization number (RA), and provide the following information:

1. Model and serial number
2. Date of shipment, P.O. number, Sales Order number, or Pelco invoice number
3. Details of the defect or problem

If there is a dispute regarding the warranty of a product which does not fall under the warranty conditions stated above, please include a written explanation with the product when returned.

Ship freight prepaid to: Pelco
300 West Pontiac Way
Clovis, CA 93612-5699

Method of return shipment shall be the same or equal to the method by which the item was received by Pelco.

RETURNS

In order to expedite parts returned to the factory for repair or credit, please call the factory at (800) 289-9100 or (559) 292-1981 to obtain an authorization number (CA number if returned for credit, and RA number if returned for repair). Goods returned for repair or credit should be clearly identified with the assigned CA/RA number and freight should be prepaid. All merchandise returned for credit may be subject to a 20% restocking and refurbishing charge.

Ship freight prepaid to: Pelco
300 West Pontiac Way
Clovis, CA 93612-5699