



Digital Lighting Systems, Inc Protocol Dimming System

LiteComp

To

PROTOCOL

Conversion of Vantage Controls, Inc. 1st Generation Dimming Systems to
Digital Lighting Systems Next Generation Lighting Control Systems



RETROFIT MANUAL

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LRM
Rev. C - 11/02

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INTRODUCTION

Digital Lighting Systems, Inc. is introducing an upgrade kit for the LiteComp 1000, 2000 & 3000 series systems. This kit allows an easy migration to our new Protocol control system by using the existing dimmer modules and enclosures. All low-voltage cables from the CPU enclosure to the stations and dimmer modules are used by the new system, without any alterations. The loads remain connected, as they previously were, to the old dimmer modules. There is no need for any re-wiring. The new boards are designed to slide in the card holders on the mother board, inside the existing CPU enclosure. There are no electrical connections to the mother board, it is merely used as mechanical support for the new system boards. The existing CPU, SW, LED and OUTPUT boards are removed, as well as the power supply and the zero-cross board, leaving the CPU enclosure to house the new components.

Here are some of the most salient advantages the new Protocol system brings over its LiteComp predecessor:

- Distributed processing which eliminates catastrophic shut-downs due to any failure of the CPU board.
- In-field Programming and Diagnostics.
- On-line Programming and Diagnostics, from anywhere.
- Intelligent Stations with Expanded Switch Functions.
- Infrared Remote Control.
- Telephone Voice-Prompted Control from land and Cellular phones.
- Intuitive and Easy to Use Windows-based User Software for programming and setting up the system.

The new LiteComp upgrade consists of the following components: *(Refer to Drawing A-1)*

- PA018 Station Bus Boards.
- LCOP997 Output Boards.
- PASxx Series Intelligent Stations.
- BC88-1 Twisted-pair data cables.
- WT103 Power Transformers.
- (Optional) RAU-96 Remote Access Unit for field setup & diagnostics.
- (Optional) External Modem for dial-in from a remote site.

INSTALLATION PROCEDURE

System Boards and Control Cables

- 1) Find the circuit breaker for the CPU enclosure and turn it off. *(Refer to Drawings A-10, A-11)*
- 2) Label the OUTPUT cables (terminated with 9-position plugs) connected to the old OUTPUT boards inside the CPU enclosure, before unplugging them. Start with OUTPUT board #1 and label the cables 1 through 6, from top to bottom. Label cables on OUTPUT board #2 starting at 7 through 12, and so on. The cables may have already been labelled correctly. *(Refer to Drawings A-2 and A-4.)*
- 3) Label the LED INPUT cables (terminated with 8-position plugs) connected to the old LED INPUT boards inside the CPU enclosure, before unplugging them. Start with LED INPUT board #1 and label the cables 1 through 16, top to bottom. label cables on LED INPUT board #2 starting at 17 through 32, and so on. These cables usually had a TAN color jacket. The cables may have already been labeled A, B, C,, AA, AB, AC, and so on. This corresponds to station numbers 1 through 63.
- 4) Label the SW INPUT cables (terminated with 10-position plugs) connected to the old SW INPUT boards inside the CPU enclosure, before unplugging them. Start with SW INPUT board #1 and label the cables 1 through 16, top to bottom. Label the cables on SW INPUT board #2 starting at 17 through 32, and so on. These cables usually had a GRAY color jacket. The cables may have already been labeled A, B, C,, AA, AB, AC, and so on. This corresponds to station numbers 1 through 63. The SW INPUT cables will not be used. However, since they go to the same station as their corresponding LED cable, they may be used as substitutes if an LED cable is damaged for any reason. Bundle the cables together and move them out of the way.

INSTALLATION PROCEDURE Cont'd

- 5) The two cables connected to the CPU board, will not be used and may be pulled back out of the way.
- 6) Once all cables have been properly labelled and unplugged from the boards, remove all boards from the CPU enclosure. The power supply and the zero-cross board on top of it may also be removed. Before doing so, label the power feed cables connected to the top board as phase A, B, C and Neutral. (*Refer to Drawings A-10, A-11*).
- 7) Install the LCOP997 boards. Plug the OUTPUT cables in the same sequence as the older boards. Plug OUTPUT cables #1 through #6 into the (OH) headers on LCOP997 board #1, plug cables #7 through #12 into the (OH) on LCOP997 board #2, etc... (*Refer to Drawings A-4*)
- 8) Install the PA018 boards. These boards are interchangeable and do not need to be placed in any particular order. Plug the LED cables into the 8-position headers (BH). The order of the cables is not critical. However, for clarity purposes, it makes sense to follow the same sequence as the old LED boards. (*Refer to Drawing A-3*)
- 9) Install the new BC88-1 data communication cables as illustrated in the following drawings. A proper procedure is to start with the first LCOP997, connect it to the one before it, at either CC1 or CC2 connector, and work your way down to the last LCOP997 board. From the last LCOP997 board connect a BC88-1 cable to the closest PA018 board and work your way down to the last PA018 board. The BC88-1 cables can be plugged into any available slot on the PA018 boards. If an RAU-96 is purchased with the system, the long BC88-1 cable coming from the RAU-96 may be plugged into any convenient slot on any of the PA018 boards. The PA018 boards act as a system, power and data bus. (*Refer to Drawing A-1*)
- 10) Remove the stations from their individual wall boxes. At each location, label the LED cable with the same label that was used at the CPU enclosure. The cables may have already been labelled A, B, C,, AA, AB, AC, and so on. This corresponds to station numbers 1 through 63.
- 11) Set the addresses of the new stations, According to the cable label (A=1, M=13, etc..). Consult the station addressing chart for setting up the hexadecimal address selectors to the corresponding decimal numbers and the station connection drawings provided in this manual. (*Refer to Drawings A-13, B-1*)

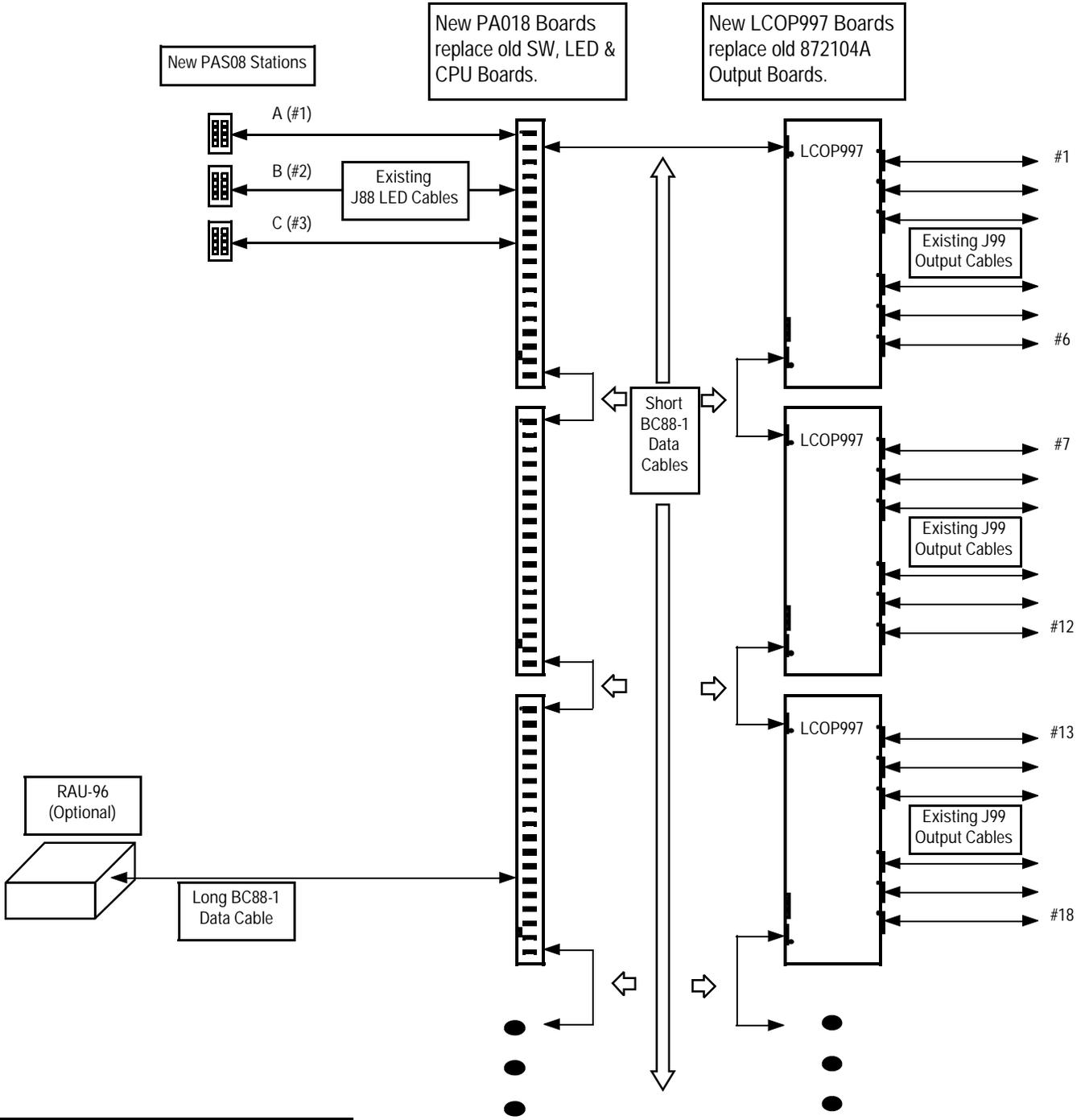
System Power Supply Connection

Ensure that the supply circuit breaker is off, before proceeding. The new system has a decentralized power supply network. Each system component has its own on-board power regulation circuitry. The only external components used are 10 VAC step-down transformers. (*Refer to Drawings A-10, A-11*)

RAU-96 and Modem Installation

The RAU-96 has its own built-in transformer and power supply. The modem comes with an external power supply wall adapter. The RAU-96 and modem should be plugged together into a switched outlet, in order to allow the occupant to switch off external access to the system from a convenient location. Please, consult the attached drawing for more details on the installation and operation of these devices. (*Refer to Drawing A-12*)

LOW-VOLTAGE CABLES OVERVIEW



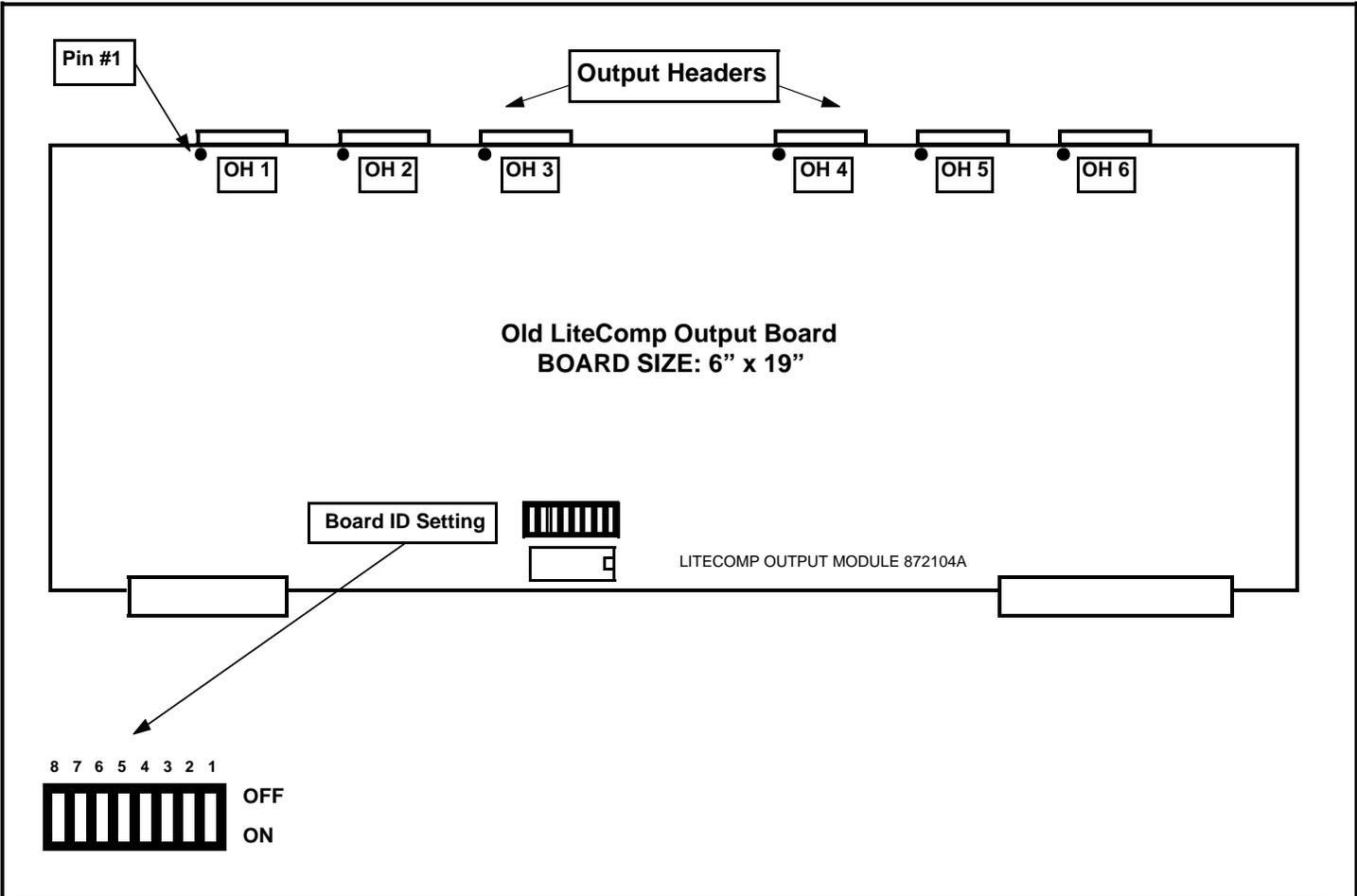
Description of BC88-1 Cables

- Twisted-pair Data Communication Cable.
- Conductors are in Positions 2 & 3.
- Short cables are used for communication among all new system boards.
- Long cable connects system bus to RAU96.
- Wire insertion side of connector show below.

To Other PA018 Boards
Up to 4 may be daisy-chained
using BC88-1 cables.

To Other LCOP997 Boards
Up to 5 may be daisy-chained
using BC88-1 cables.

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7588 NW 8th Street, Miami, Fl. 33126, Ph: (305) 264 -8391		
LOW-VOLTAGE CABLES OVERVIEW		
Date: 06-11-98	Drawing#: LCRETRO.PUB	Page: A-1
By: A.M.K	Model: Protocol	Scale:



Output Board Number Identification

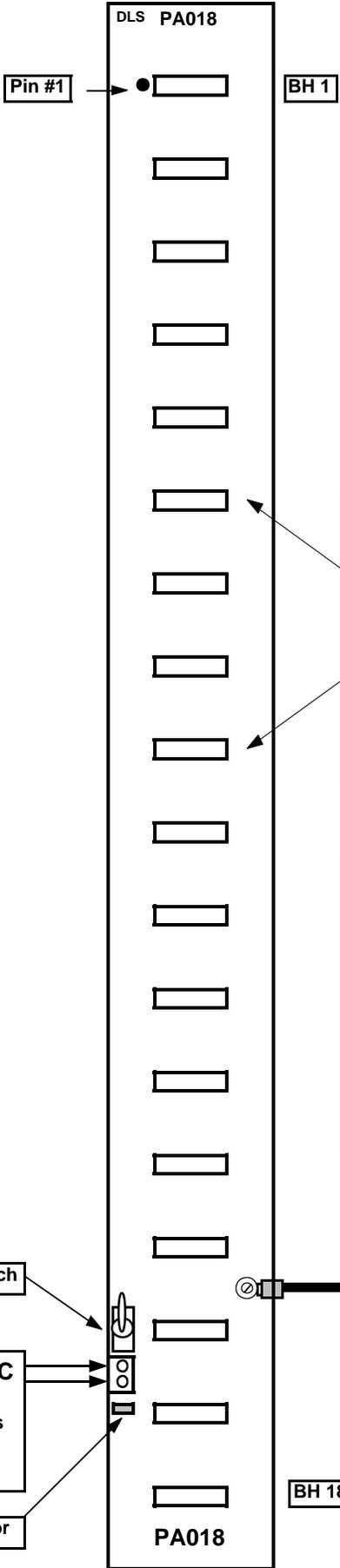
- Switch 1 ON (Closed) and all others Open, Board ID=1 and it controls dimmer modules 1 through 6.
- Switch 2 ON (Closed) and all others Open, Board ID=2 and it controls dimmer modules 7 through 12.
- Switch 3 ON (Closed) and all others Open, Board ID=3 and it controls dimmer modules 13 through 18.
- Switch 4 ON (Closed) and all others Open, Board ID=4 and it controls dimmer modules 19 through 24.
- Switch 5 ON (Closed) and all others Open, Board ID=5 and it controls dimmer modules 25 through 30.

NOTE

Before unplugging cables from Output Headers, make sure they are properly labelled.

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7588 NW 8th Street, Miami, Fl. 33126, Ph: (305) 264 -8391		
LITECOMP Output Board Address Identification		
Date: 06-11-98	Drawing#: LCRETRO.PUB	Page: A-2
By: A.M.K	Model: 872401A	Scale:

PA018
Board Dimensions
1.80" x 19.00 "



BH1 to BH18 Bus Headers (8-Pin)
 Use To Plug-in System Components in Any Order:

- PAS08 Stations.
- LCOP997 Output Boards.
- RAU-96 Remote Access Unit.

NOTE:
 Use Cables with One Twisted Pair Only to Connect

Bus Headers Pins

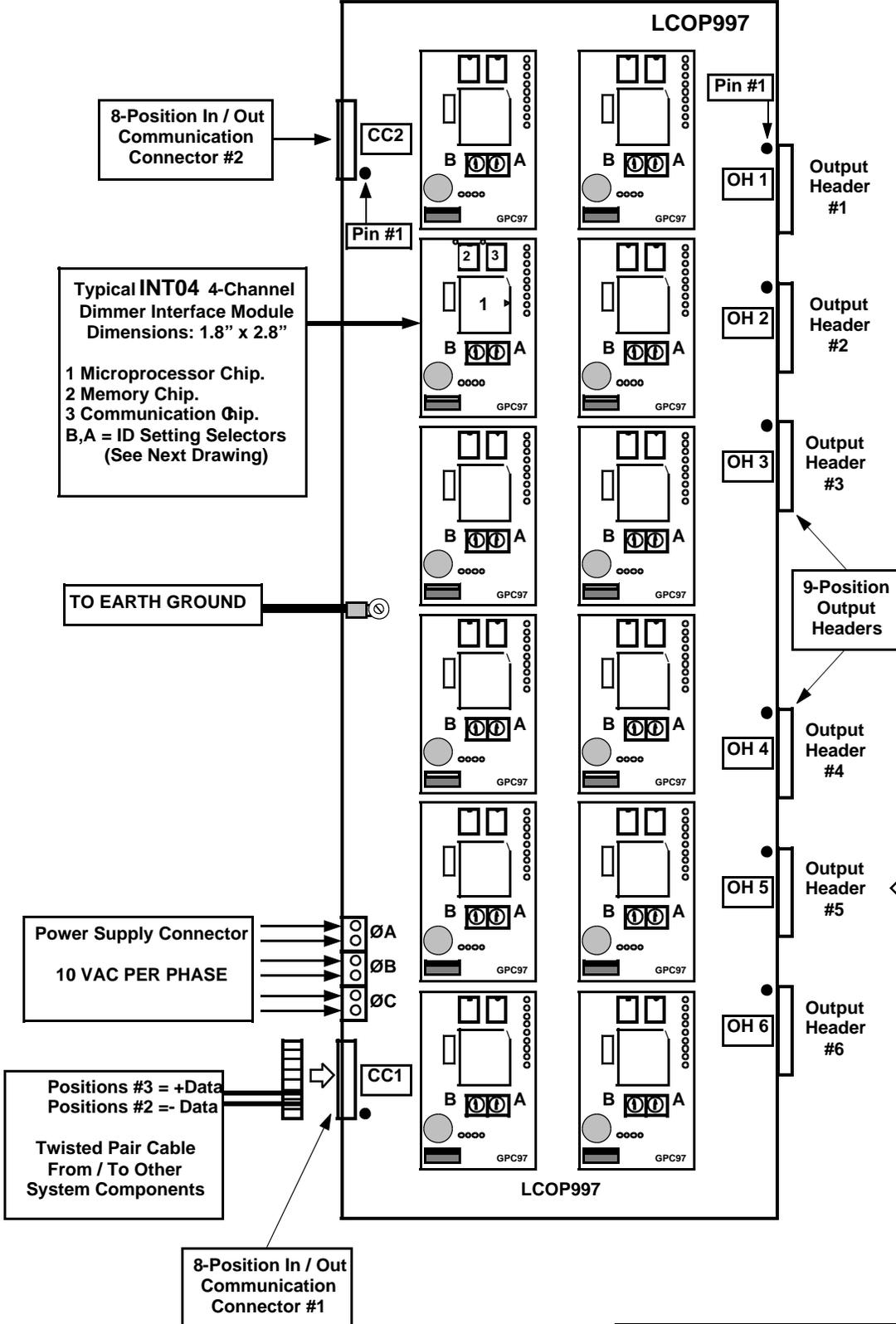
Pin 1 Power
 Pin 2 - Data
 Pin 3 +Data
 Pin 4 Power
 Pin 5 Not Assigned
 Pin 6 Chassis Ground
 Pin 7 Not Assigned
 Pin 8 Not Assigned

TO EARTH GROUND

All PA018 Transformers must be on the same Electrical Phase.

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PA018 Input Board - Components Identification		
Date: 06-11-98	Drawing#: LCRETRO.PUB	Page: A-3
By: A.M.K	Model: PA018	Scale:

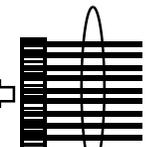
LCOP997
Board Dimensions
5.50" x 19.00 "



Typical INT04 4-Channel Dimmer Interface Module
Dimensions: 1.8" x 2.8"

1 Microprocessor Chip.
2 Memory Chip.
3 Communication Chip.
B,A = ID Setting Selectors
(See Next Drawing)

9-Position Output Headers



Typical 9-Conductor Cable To Load Driver Modules

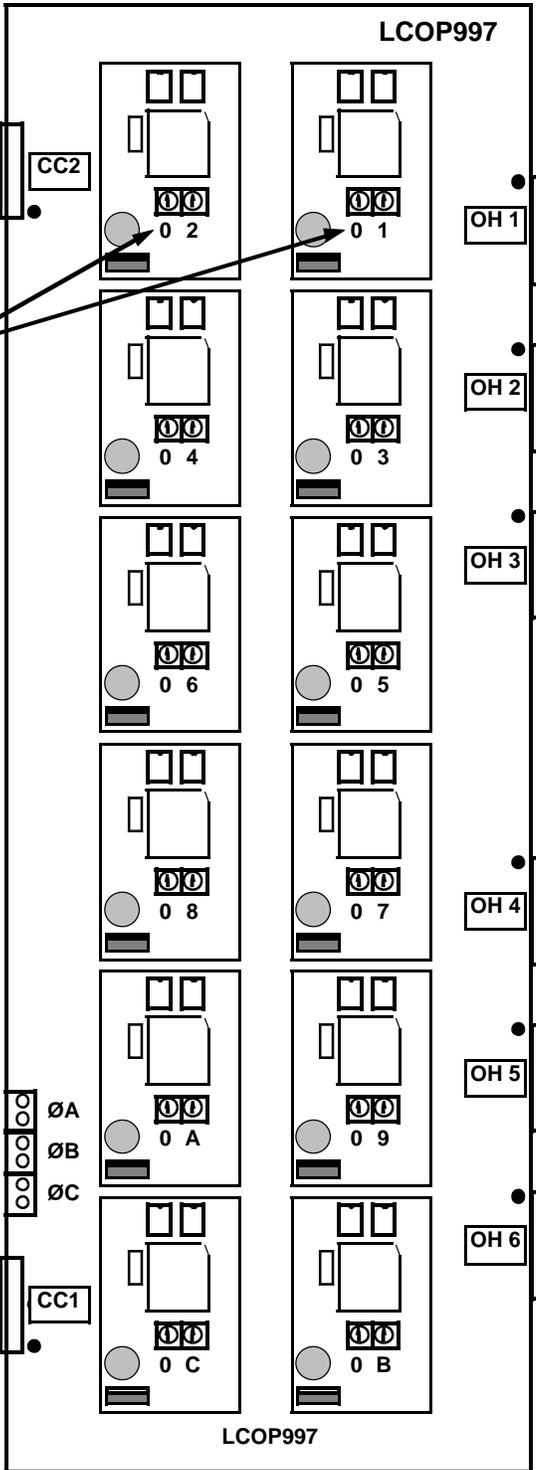
Pin 1	Channel 1
Pin 2	Channel 2
Pin 3	Channel 3
Pin 4	Channel 4
Pin 5	Channel 5
Pin 6	Channel 6
Pin 7	Channel 7
Pin 8	Channel 8
Pin 9	+5 VDC Common

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LCOP997 Output Board - Components Identification

Date: 06-11-98	Drawing#: LCRETRO.PUB	Page: A-4
By: A.M.K	Model: LCOP997	Scale:

**INT04 ID SETTINGS
FOR
OUTPUT BOARD #1**



**Control For
8-Circuit Dimmer #1**

**Control For
8-Circuit Dimmer #2**

**Control For
8-Circuit Dimmer #3**

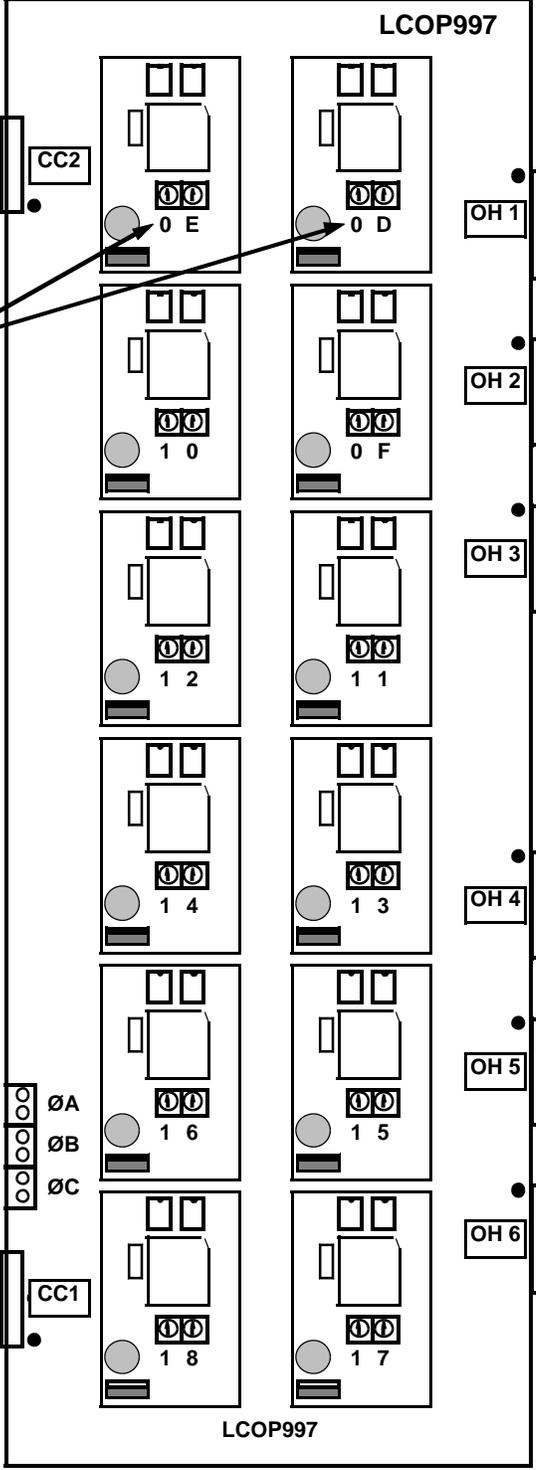
**Control For
8-Circuit Dimmer #4**

**Control For
8-Circuit Dimmer #5**

**Control For
8-Circuit Dimmer #6**

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LCOP997 Output Board #1 - INT04 ID Settings		
Date: 06-11-98	Drawing# LCRETRO.PUB	Page: A-5
By: A.M.K	Model: LCOP997	Scale:

**INT04 ID SETTINGS
FOR
OUTPUT BOARD #2**



**Control For
8-Circuit Dimmer #7**

**Control For
8-Circuit Dimmer #8**

**Control For
8-Circuit Dimmer #9**

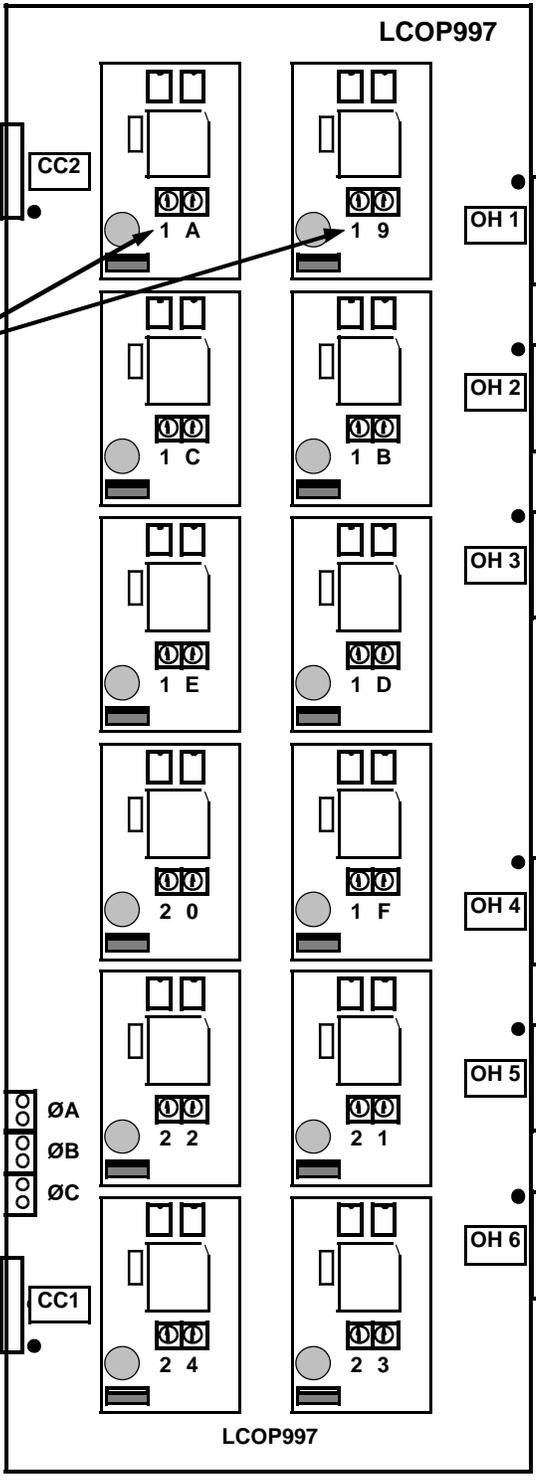
**Control For
8-Circuit Dimmer #10**

**Control For
8-Circuit Dimmer #11**

**Control For
8-Circuit Dimmer #12**

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LCOP997 Output Board #2 -INT04 ID Settings		
Date:06-11-98	Drawing#LCRETRO.PUB	Page: A-6
By: A.M.K	Model: LCOP997	Scale:

**INT04 ID SETTINGS
FOR
OUTPUT BOARD #3**



Control For
8-Circuit Dimmer #13

Control For
8-Circuit Dimmer #14

Control For
8-Circuit Dimmer #15

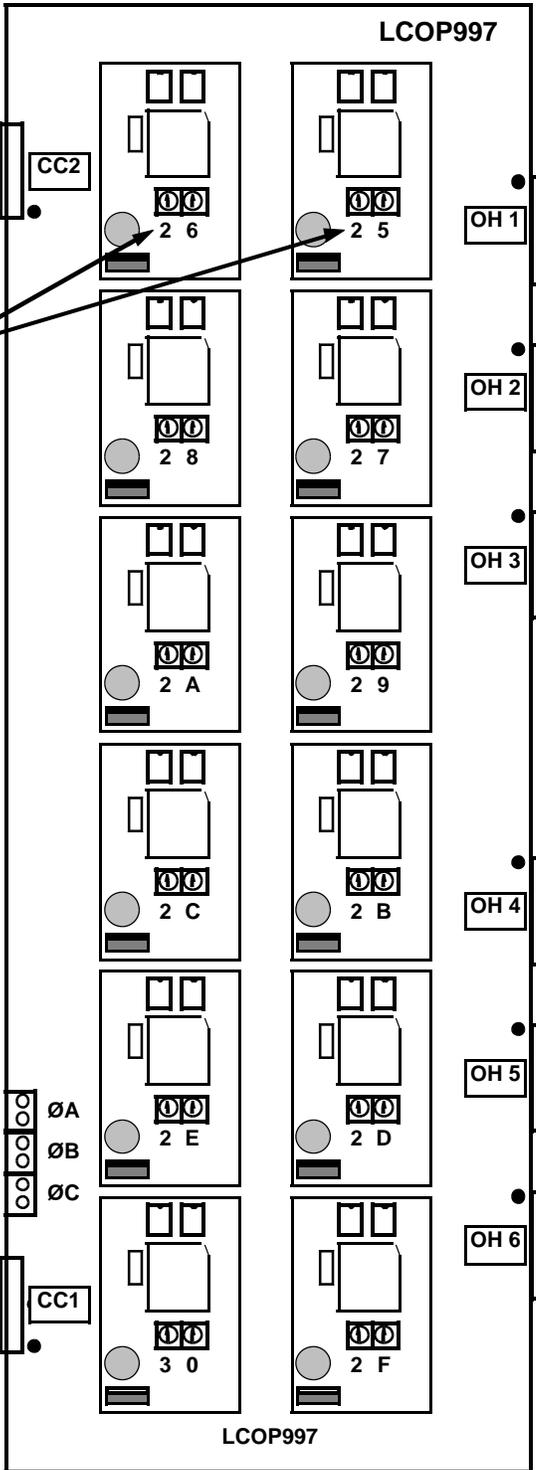
Control For
8-Circuit Dimmer #16

Control For
8-Circuit Dimmer #17

Control For
8-Circuit Dimmer #18

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LCOP997 Output Board #3 - INT04 ID Settings		
Date: 06-11-98	Drawing# LCRETRO.PUB	Page: A-7
By: A.M.K	Model: LCOP997	Scale:

**INT04 ID SETTINGS
FOR
OUTPUT BOARD #4**



Control For
8-Circuit Dimmer #19

Control For
8-Circuit Dimmer #20

Control For
8-Circuit Dimmer #21

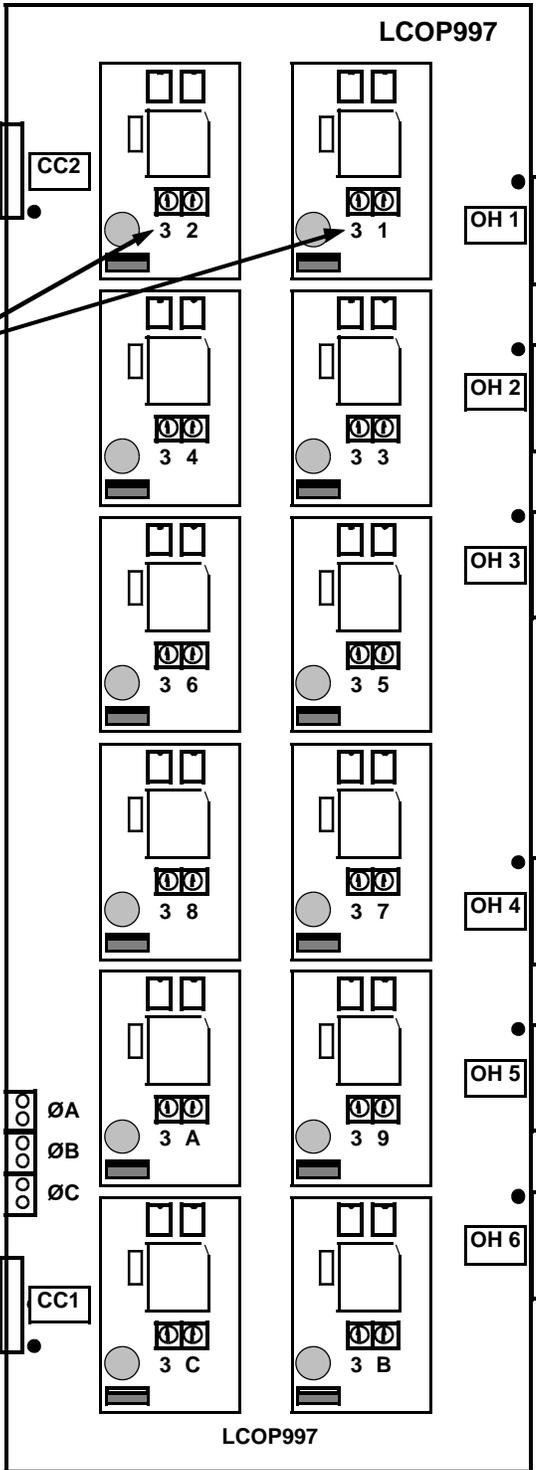
Control For
8-Circuit Dimmer #22

Control For
8-Circuit Dimmer #23

Control For
8-Circuit Dimmer #24

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7588 NW 8th Street, Miami, Fl. 33126, Ph: (305) 264 -8391		
LCOP997 Output Board #4 - INT04 ID Settings		
Date: 06-11-98	Drawing# LCRETRO.PUB	Page: A-8
By: A.M.K	Model: LCOP997	Scale:

**INT04 ID SETTINGS
FOR
OUTPUT BOARD #5**



Control For
8-Circuit Dimmer #25

Control For
8-Circuit Dimmer #26

Control For
8-Circuit Dimmer #27

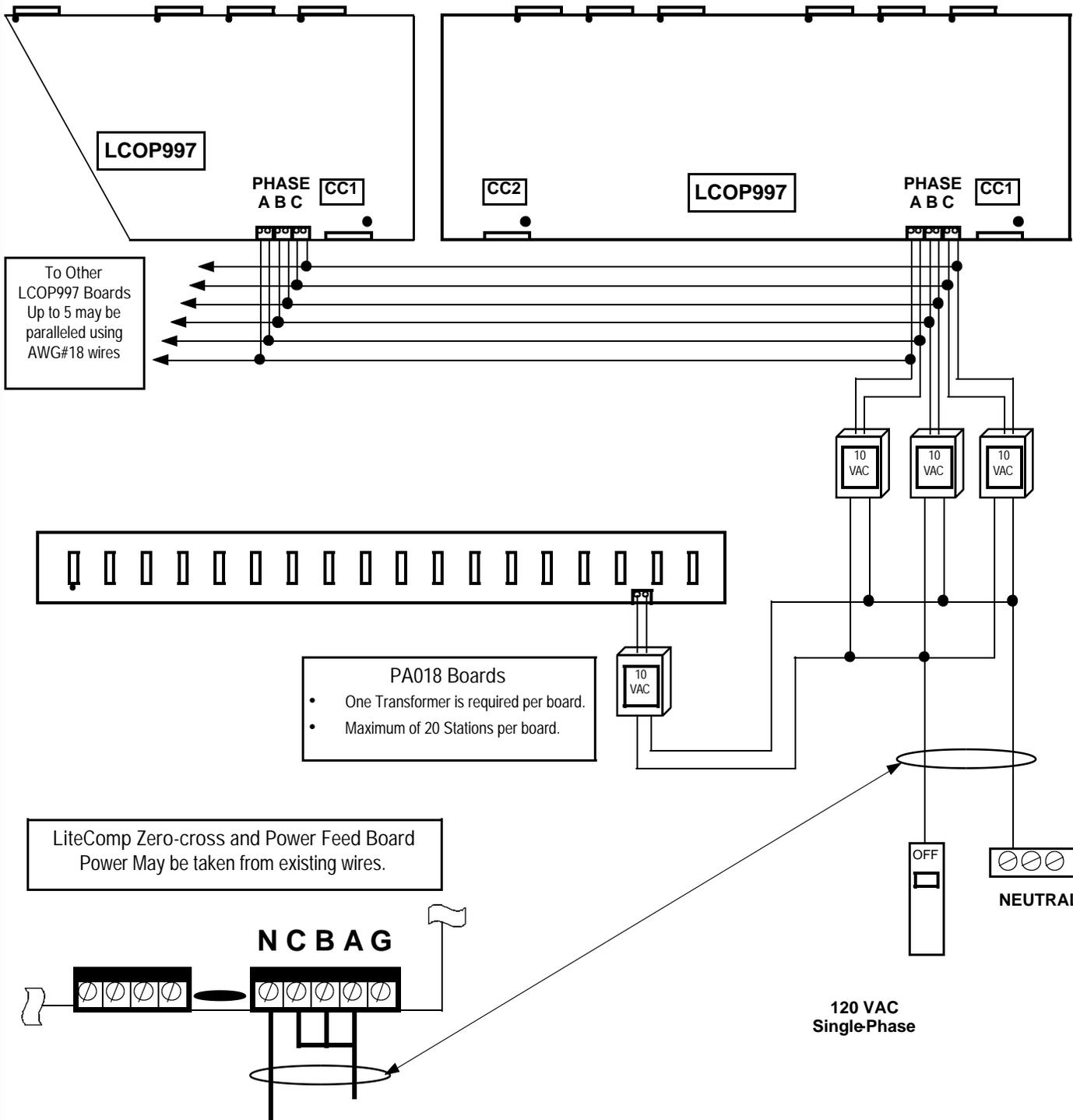
Control For
8-Circuit Dimmer #28

Control For
8-Circuit Dimmer #29

Control For
8-Circuit Dimmer #30

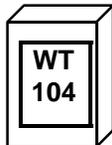
DIGITAL LIGHTING SYSTEMS, INC.		
7588 NW 8th Street, Miami, Fl. 33126, Ph: (305) 264 -8391		
LCOP997 Output Board #5 - INT04 ID Settings		
Date: 06-11-98	Drawing# LCRETRO.PUB	Page: A-9
By: A.M.K	Model: LCOP997	Scale:

POWER SUPPLY WIRING FOR SINGLE PHASE



WT104 Power Transformer Specifications.

- Primary 120 VAC.
- Secondary, 10 VAC at 4 AMPS.

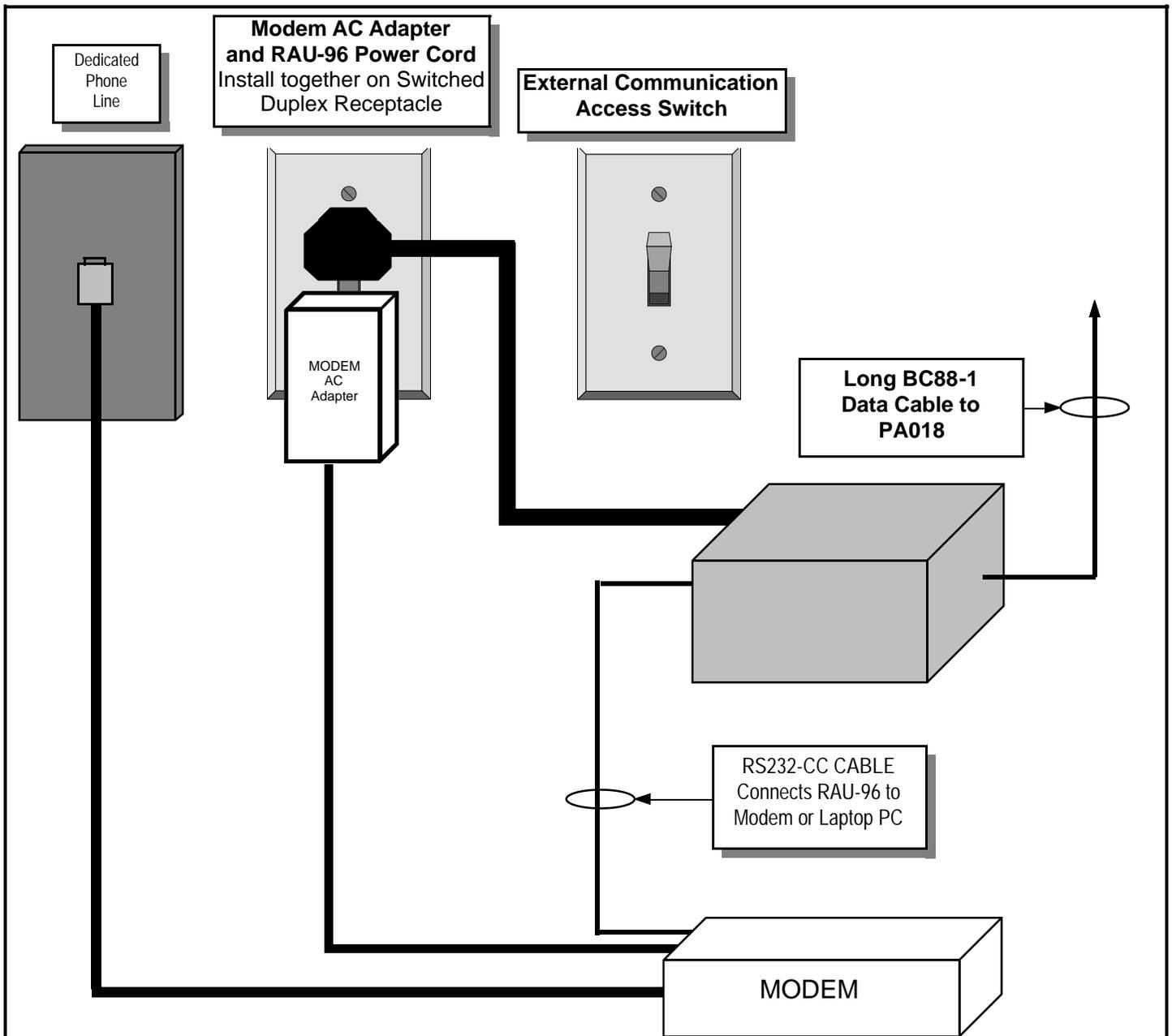


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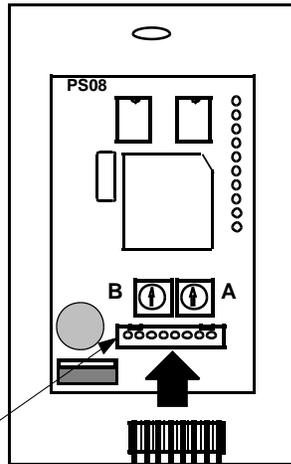
SINGLE-PHASE POWER SUPPLY WIRING

Date: 06-11-98	Drawing#: LCRETRO.PUB	Page: A-10
By: A.M.K	Model: Protocol	Scale:



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7588 NW 8th Street, Miami, Fl. 33126, Ph: (305) 264 -8391		
RAU-96 and Modem Installation		
Date: 06-11-98	Drawing#: LCRETRO.PUB	Page: A-12
By: A.M.K	Model: Protocol	Scale:

PAS08 Station Normal Installation.



Position #1 Identification

Normally a Black or a Brown color conductor is used in Position #1

Connectors Pin Assignment

- Position 1 = Power.
- Position 2 = - Data.
- Position 3 = +Data.
- Position 4 = Power.
- Position 5 = Not Used.
- Position 6 = Chassis Ground.
- Position 7 = Not Used.
- Position 8 = Not Used.

Cable Identification

Use the Existing LED Cable. This Cable has 8-Position Plugs at Both Ends and Normally has a Tan Color Jacket.

Position #1 Identification

Normally a Black or a Brown color conductor is used in Position #1

Plug into any Header on the PA018 retro-fit Bus Board.

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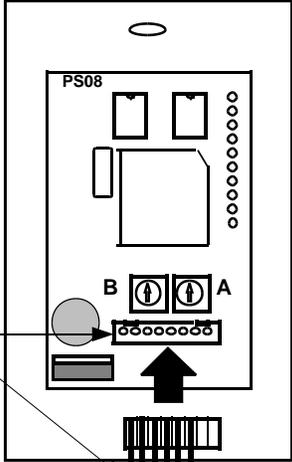
7588 NW 8th Street, Miami, Fl. 33126, Ph: (305) 264 -8391

PAS08 Station Installation Without Cable Alteration

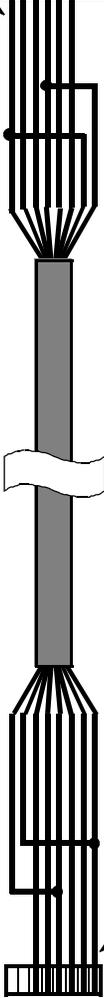
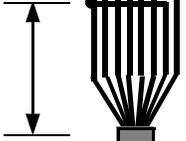
Date: 06-11-98	Drawing#: LCRETRO.PUB	Page: A-13
By: A.M.K	Model: PAS08	Scale:

Compensating For Voltage Drop at PAS08 Stations.

Position #1 Identification
 Normally a Black or a Brown color conductor is used in Position #1



At Both Ends:
 Strip Jacket Approximately 4 inches Back



Position #1 Identification
 Normally a Black or a Brown color conductor is used in Position #1

Plug into any Header on the PA018 retro-fit Bus Board.

LED Cable Alteration At Both Ends

In certain instances, when stations have unusually long home runs, it may be necessary to boost the size of the two conductors (#1 & #4) which carry power to the station. This must be done if and only if an excessive voltage drop is causing the station to operate erratically.

The following paragraph and diagram illustrate the procedure which must be repeated identically at both ends of the cable.

You need two extra conductors to re-enforce power conductors #1 & #4. There may be two spare conductors in the existing cable. If not, conductors in positions #7 & #8 can be used.

SPLICING PROCEDURE:

- 1 Carefully, pull these two conductors out of the plugs at both ends.
- 2 At the Station, splice conductors #7 to #1 and #8 to #4, using any appropriate splicing technique.
- 3 Repeat the same procedure at the opposite end of the cable, ensuring that the cables are not crossed, causing a short-circuit of the power source.

If you are using spare conductors from the cable, conductors #7 & #8 may be left in the plugs. However, make sure you maintain the same color code with the spare conductors, at both ends of the cable.

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Boosting Power Connections to PAS08 Station

Date: 06-11-98	Drawing#: LCRETRO.PUB	Page: A-14
By: A.M.K	Model: PAS08	Scale:

ID settings for INT04 Modules and PAS08 Stations

Device #	Set BA to	Device #	Set BA to	Device #	Set BA to	Device #	Set BA to
0	Not Allowed	32	20	64	40	96	60
1	01	33	21	65	41	97	61
2	02	34	22	66	42	98	62
3	03	35	23	67	43	99	63
4	04	36	24	68	44		
5	05	37	25	69	45		
6	06	38	26	70	46		
7	07	39	27	71	47		
8	08	40	28	72	48		
9	09	41	29	73	49		
10	0A	42	2A	74	4A		
11	0B	43	2B	75	4B		
12	0C	44	2C	76	4C		
13	0D	45	2D	77	4D		
14	0E	46	2E	78	4E		
15	0F	47	2F	79	4F		
16	10	48	30	80	50		
17	11	49	31	81	51		
18	12	50	32	82	52		
19	13	51	33	83	53		
20	14	52	34	84	54		
21	15	53	35	85	55		
22	16	54	36	86	56		
23	17	55	37	87	57		
24	18	56	38	88	58		
25	19	57	39	89	59		
26	1A	58	3A	90	5A		
27	1B	59	3B	91	5B		
28	1C	60	3C	92	5C		
29	1D	61	3D	93	5D		
30	1E	62	3E	94	5E		
31	1F	63	3F	95	5F		

NOTE

Maximum INT04 ID=63 (3F), Maximum PS08 ID=99 (63).



LIMITED WARRANTY

Digital Lighting Systems warrants to the purchaser that its products have been carefully manufactured and inspected and are warranted to be free from defects of workmanship and materials when used as intended. Any abuse or misuse contrary to normal operation shall void this warranty.

Digital Lighting Systems' obligation under this warranty shall be limited to replacement or repair of any units as shall within two years of date of invoice from Digital Lighting Systems, prove defective; and Digital Lighting Systems shall not be liable for any other damages, whether direct or consequential. The implied warranties of merchantability and fitness for a particular purpose are limited to the duration of the expressed warranty. Some states do not allow the exclusion of the limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, you may also have other legal rights which vary from state to state.

Defective merchandise may be returned to Digital Lighting Systems, prepaid, after prior notification has been given and approval obtained for the return. To obtain prior approval for the return of the defective items, contact your local Digital Lighting Systems distributor, representative, or:

Digital Lighting Systems, Inc.
Attn: Customer Service Department
7588 NW 8th Street
Miami, FL 33126
(305) 264-8391

Upon request, replacement unit(s) will be shipped as soon as available. Unless immediate shipment of replacement merchandise is requested, Digital Lighting Systems will not ship replacement merchandise until defective merchandise is received, inspected, and determined to be defective.

No labor charges in connection with warranty problems will be reimbursed by Digital Lighting Systems without prior written approval from the factory.

Digital Lighting Systems distributors and representatives have no authority to change this warranty without written permission.

Digital Lighting Systems reserves the right to determine the best method of correcting warranty problems.





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