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OPERATING MANUAL

HXV/22-E-S SPECIAL
EXPANSION CHASSIS

CYTEC PROJECT #327345

CYTEC

1.0 ADDENDUM

HXV/22-E-S SPECIAL
EXPANSION CHASSIS

CYTEC PROJECT #327345

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LOCKHEED MARTIN

HXV/22-E-S SPECIAL EXPANSION CHASSIS

CYTEC PROJECT #327345

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DRAWINGS

DRWG.##	DESCRIPTION
2-190-5B	POWER SUPPLY WIRING (3 pages)
11-08-50	CM/32-VHP MODULE (2 sheets)
22-08-50	LX SWITCH MODULE EXTENSION ADAPTER
7345-00-00	HXV/22-E-S SPECIAL EXPANSION CHASSIS
7345-00-21	HXV/22-E-S REAR PANEL
7345-00-22	HXV/22-E-S FRONT PANEL
7345-00-30	HXV/22-E-S WIRING DIAGRAM (4 pages)
6756-00-51	SPECIAL LX8/OD OUTPUT DRIVER MODULE - Schematic
	Gigavac GX11 Relay Data Sheets (6 pages)

LOCKHEED MARTIN
HXV/22-E-S SPECIAL EXPANSION CHASSIS
CYTEC PROJECT #327345

1.0 GENERAL

The HXV/22-E-S Special Expansion Chassis supplied to Lockheed Martin has been built in response to the end user's request. Each expansion chassis provides up to 22 individually controlled Form A high power Gigavac GX11 Relays. See the data sheets at the end of this addendum for relay specifications. Inputs and outputs are wired from six rear panel mounted circular Mil-style connectors. Computerized control is provided via a separate Cytec MESA Control Chassis. The standard MESA Control Chassis is described in its own operator's manual. This addendum describes only the custom HXV/22-E-S Special Expansion Chassis.

1.1 HXV/22-E-S SPECIAL EXPANSION CHASSIS

Please reference **Drwg. #7345-00-00.**

The HXV/22-E-S Special Expansion Chassis is a 19" rack mounting chassis, 7" (4U) high and 26" deep.

Installed inside the chassis are 22 Normally Open GIGAVAC Model GX11 High Power Relays **(Ref. 2)**. Relay contacts are wired out to six circular 19 pin Mil-style rear panel connectors labeled J1 - J6 **(Ref. 3)**. The relays are powered via an on-board 24 V, 6.2 A power supply **(Ref. 7).** The 24 volt DC supply output wires out to a screw terminal power bus **(Ref. 8)**.
Also mounted on the rear panel is a 26 cfm fan.

The internal 24 Volt DC power supply operates from the AC line supply via a fused line cord adapter located on the rear panel **(Ref. 4).** This adaptor also houses the ON/OFF switch. The user can select one of two AC voltage ranges: 110/120 Volts or 220/240 volts AC. The power supplies will operate from 100 -140 volts or 200 - 260 volts at 47 - 63 Hz. To change the selected voltage, remove the fuse cartridge using a small blade screw driver or a similar tool. Select the desired voltage by matching the arrow on the fuse cartridge to the arrow located on the Input Module's lower right corner. *Replace the fuse cartridge making sure the voltage selection arrow aligns with the arrow located on the Input Module*. Power supply wiring is shown in **Drwg. #2-190-5B.**

Mounted against the front panel is the CXM/32 Decoder/Driver Module **(Ref. 6)** , which receives control commands from the MESA and then decodes them to select and energize (open) or de-energize (close) individual relays. The CXM/32 connects to the rear panel via an internal ribbon cable that wires out to a 34 pin header connector mounted on the rear panel. Once decoded, the MESA command signals are routed through three LX8/OD-MP Output Driver Modules **(Ref. 5)** which energize or de-energized coils on the individual Gigavac relays.

The front panel holds the power LED and a cooling exhaust port as shown on **Drwg. #7345-00-22**.

Information on controlling the relays is given below.

1.2 THEORY of OPERATION

Please reference Rear Panel **Drwg. #7345-00-21** as well as **Table 1** below. A wiring Drawing # 7345-00-30 also shows the pin-outs for all connectors.

Note that the 22 Gigavac GX11 relays are programmatically addressed as Modules 0 & 1, Switches 0 - 7 and Module 2, Switches 0 - 5. Inputs and Outputs for the individual relays are wired to the rear panel connectors J1 through J6 as shown in the table. The terms Inputs and Outputs are used for reference only since the relays are both bi-directional and passive. The Input and Output connections can be swapped as needed.

Commanding the system to open or close switches is straight forward. One module and switch on one of three expansion chassis must be selected and energized, closing the switch and completing the circuit between the two assigned rear panel connector pins.

1.3 SWITCH CONTROL and PROGRAMMING EXAMPLES

Individual switch points are programmatically addressed as: *COMMAND, Chassis#, Mod#, Switch#* where:

COMMAND is a one letter command mnemonic = L for Latch, U for Unlatch, C for Clear, etc.
Chassis# is 0, 1, or 2, specifying which Expansion Chassis is being addressed.
Mod# is an integer specifying which Module is being addressed (0, 1, or 2).
Switch# is an integer from 0 to 7 that specifies which Switch (Relay Drive) is being addressed and energized (or de-energized) on the selected modules. Energizing the relay drive closes the assigned relay.

Note: In the examples below, individual commands are separated by a semicolon.

Example 1 - on the 'first' expansion chassis, close Relay 0 - connects Pin A and C to Pins B and D on connector J1.

"C ; L 0, 0, 0";

Result - First, clears system. All relays in all expansion chassis default to the NO state. That is, all relays open. Next, close Chassis 0, Module 0, Relay 0. Thus the I/O path is complete.

Example 2 - On the second expansion chassis, close Relay 21, which connects Pins K and M to Pins L and P on Connector J6.

"L 1, 2, 5"

Result - Closes Chassis 1, Module 2, Relay 5, completing the I/O path.

Note that a 'C' Clear command is not issued. Therefore, all previously Latched relays remain closed. The Status command can be used to check for Latched switch points.

The Operator ALWAYS has full control over every Relays CL8. Relays can be energized or de-energized (Latched or Unlatched) in any order at all times.

3.2 SPECIFICATIONS

Dimensions:	19" Rack Mounting x 7" High x 22" Deep
Power:	Max. 300W @ 100-130 VAC or@ 200-260 VAC
Environment:	
Operating:	0˚C to 50˚C @ 95% Relative Humidity
Storage:	-25˚C to 65˚C @ 95% Relative Humidity
Capacity:	20 Form A Gigavac GX11 S.N. 0178528
	22 Form A Gigavac GX11 S.N. 0178526, 0178527
Control Mode:	via separate CYTEC MESA Control Chassis
19 Pin Circular Mil Connector:	MS27656T25F19S - Socket
	MS27656T25F19P - Plug
Pin Numbers:	M39029/58-365 - for Plug
	M39029/56-353 - for Socket
Wire	Weico PN 3212 - PVC (no Teflon used) 12 Gauge multi-strand.
	Red and White wire has been used for Pin and Socket respectively.
Terminal Ends	Panduit PN PNF10-56R Nylon Insulated entry ring tongues.

Individual Relay Specifications:	Gigavac GX11, Type A, passive one pole armature
Contact Resistance:	0.4 Ω Max.
Maximum Switching Power:	30 W DC; 62.5 VA
Maximum Switching Current:	150 A
Maximum Switching Voltage:	750
Breakdown Voltage:	2500V RMS
Operate Time, typical	13 msec
Life Expectancy:	1 million cycles mechanical
	455,000 @ 30 A, 24 V
	See data sheets for complete specifications.

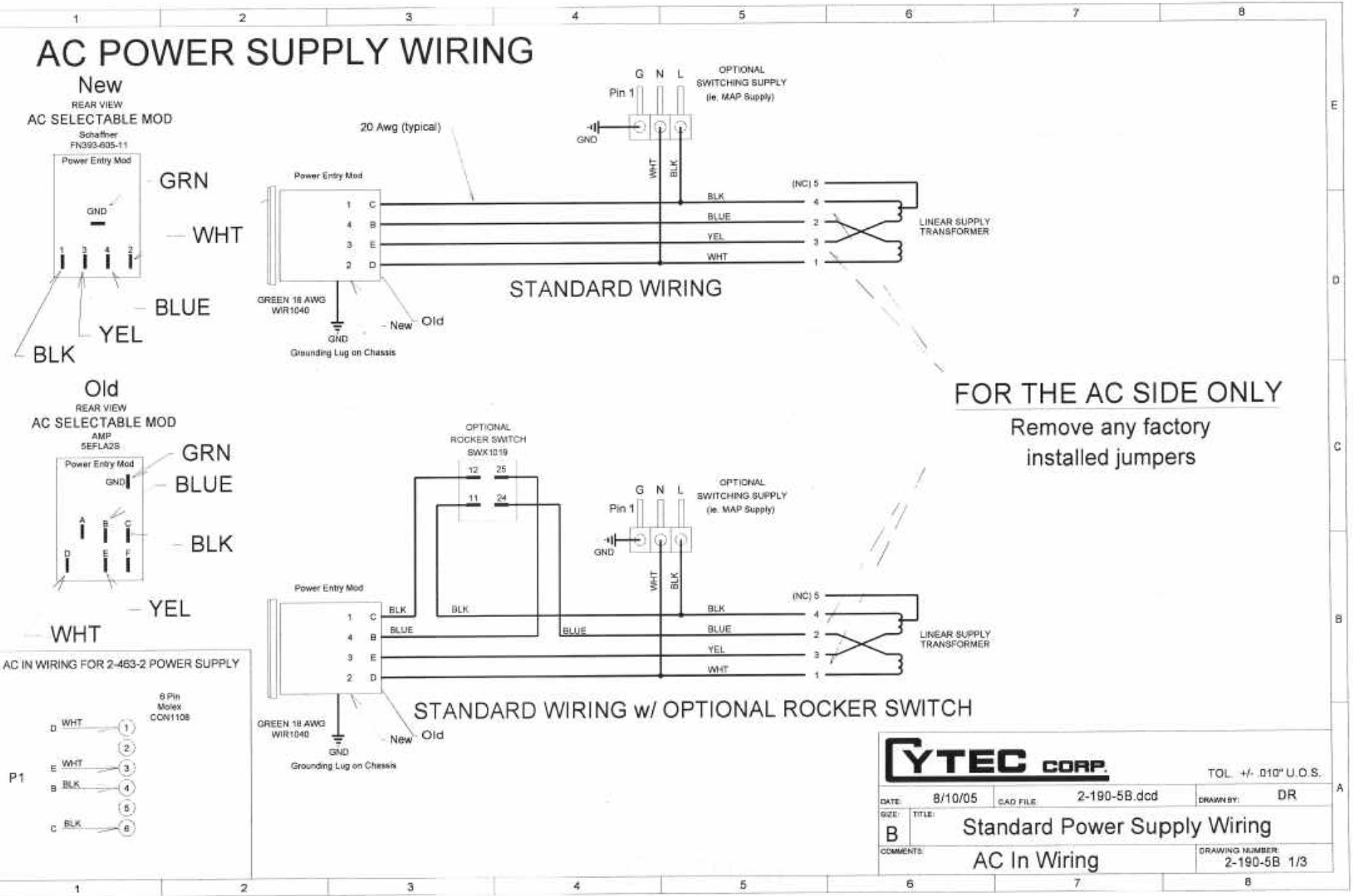
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Outside US: 585-381-4740
E-mail: sales@cytec-ate.com
Web: www.cytec-ate.com

Table 1

	25F19P		25F19S		25F19P	
Pin	J1	Module, Switch	J2	Module, Switch	J3	Module, Switch
A	RLY 0 In	Mod 0, SW 0	RLY 3 Out	Mod 0, SW 3	RLY 7 In	Mod 0, SW 7
B	RLY 0 Out	Mod 0, SW 0	RLY 4 In	Mod 0, SW 4	RLY 7 Out	Mod 0, SW 7
C	RLY 0 In	Mod 0, SW 0	RLY 4 Out	Mod 0, SW 4	RLY 8 In	Mod 1, SW 0
D	RLY 0 Out	Mod 0, SW 0	RLY 4 In	Mod 0, SW 4	RLY 8 Out	Mod 1, SW 0
E	RLY 1 In	Mod 0, SW 1	RLY 4 Out	Mod 0, SW 4	RLY 8 In	Mod 1, SW 0
F	RLY 1 Out	Mod 0, SW 1	RLY 5 In	Mod 0, SW 5	RLY 8 Out	Mod 1, SW 0
G	RLY 1 In	Mod 0, SW 1	RLY 5 Out	Mod 0, SW 5	RLY 9 In	Mod 1, SW 1
H	RLY 1 Out	Mod 0, SW 1	RLY 5 In	Mod 0, SW 5	RLY 9 Out	Mod 1, SW 1
J	RLY 2 In	Mod 0, SW 2	RLY 5 Out	Mod 0, SW 5	RLY 9 In	Mod 1, SW 1
K	RLY 2 Out	Mod 0, SW 2	RLY 6 In	Mod 0, SW 6	RLY 9 Out	Mod 1, SW 1
L	RLY 2 In	Mod 0, SW 2	RLY 6 Out	Mod 0, SW 6	RLY 10 In	Mod 1, SW 2
M	RLY 2 Out	Mod 0, SW 2	RLY 6 In	Mod 0, SW 6	RLY 10 Out	Mod 1, SW 2
P	RLY 3 In	Mod 0, SW 3	RLY 6 Out	Mod 0, SW 6	RLY 10 In	Mod 1, SW 2
R	RLY 3 Out	Mod 0, SW 3	RLY 7 In	Mod 0, SW 7	RLY 10 Out	Mod 1, SW 2
T	RLY 3 In	Mod 0, SW 3	RLY 7 Out	Mod 0, SW 7	RLY 11 In	Mod 1, SW 3

	25F19S		25F19P		25F19S	
Pin	J4	Module, Switch	J5	Module, Switch	J6	Module, Switch
A	RLY 11 Out	Mod 1, SW 3	RLY 15 In	Mod 1, SW 7	RLY 18 Out	Mod 2, SW 2
B	RLY 11 In	Mod 1, SW 3	RLY 15 Out	Mod 1, SW 7	RLY 19 In	Mod 2, SW 3
C	RLY 11 Out	Mod 1, SW 3	RLY 15 In	Mod 1, SW 7	RLY 19 Out	Mod 2, SW 3
D	RLY 12 In	Mod 1, SW 4	RLY 15 Out	Mod 1, SW 7	RLY 19 In	Mod 2, SW 3
E	RLY 12 Out	Mod 1, SW 4	RLY 16 In	Mod 2, SW 0	RLY 19 Out	Mod 2, SW 3
F	RLY 12 In	Mod 1, SW 4	RLY 16 Out	Mod 2, SW 0	RLY 20 In	Mod 2, SW 4
G	RLY 12 Out	Mod 1, SW 4	RLY 16 In	Mod 2, SW 0	RLY 20 Out	Mod 2, SW 4
H	RLY 13 In	Mod 1, SW 5	RLY 16 Out	Mod 2, SW 0	RLY 20 In	Mod 2, SW 4
J	RLY 13 Out	Mod 1, SW 5	RLY 17 In	Mod 2, SW 1	RLY 20 Out	Mod 2, SW 4
K	RLY 13 In	Mod 1, SW 5	RLY 17 Out	Mod 2, SW 1	RLY 21 In	Mod 2, SW 5
L	RLY 13 Out	Mod 1, SW 5	RLY 17 In	Mod 2, SW 1	RLY 21 Out	Mod 2, SW 5
M	RLY 14 In	Mod 1, SW 6	RLY 17 Out	Mod 2, SW 1	RLY 21 In	Mod 2, SW 5
P	RLY 14 Out	Mod 1, SW 6	RLY 18 In	Mod 2, SW 2	RLY 21 Out	Mod 2, SW 5
R	RLY 14 In	Mod 1, SW 6	RLY 18 Out	Mod 2, SW 2		
T	RLY 14 Out	Mod 1, SW 6	RLY 18 In	Mod 2, SW 2		

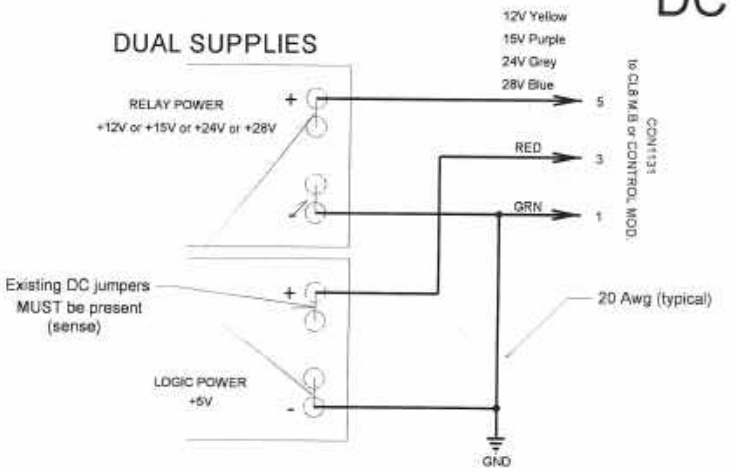
AC POWER SUPPLY WIRING

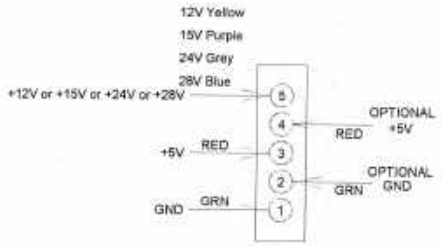


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SIZE: B	TITLE: Standard Power Supply Wiring		
COMMENTS: AC In Wiring			DRAWING NUMBER: 2-190-5B 1/3

DC POWER SUPPLY WIRING

DUAL SUPPLIES





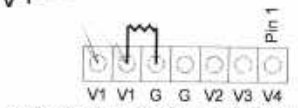
CON1131
to CL8 M.B or CONTROL MOD.

MAP40 & 55 (single output)



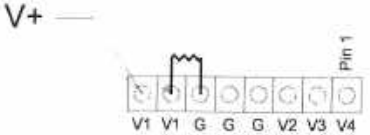
28V @ V1 (Place 220 Ohm RES1270 across V1 to G)
12V @ V1 (Place 50 Ohm RES1096 across V1 to G)
5V @ V1

MAP80 (single output)



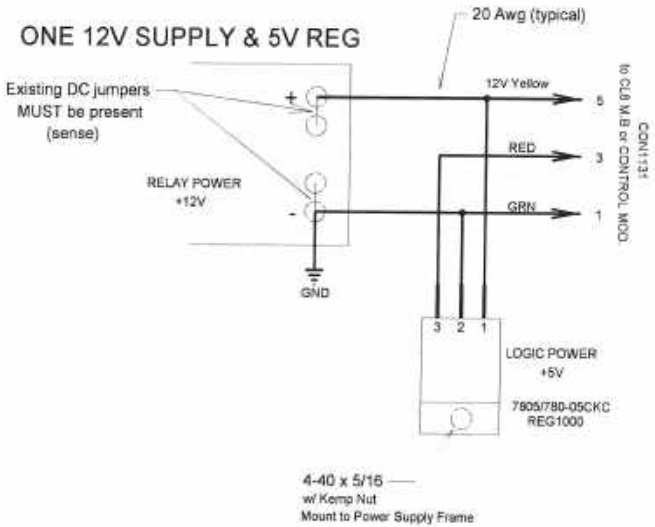
28V @ V1 (Place 220 Ohm RES1270 across V1 to G)
12V @ V1 (Place 50 Ohm RES1096 across V1 to G)
5V @ V1

MAP130 (single output)

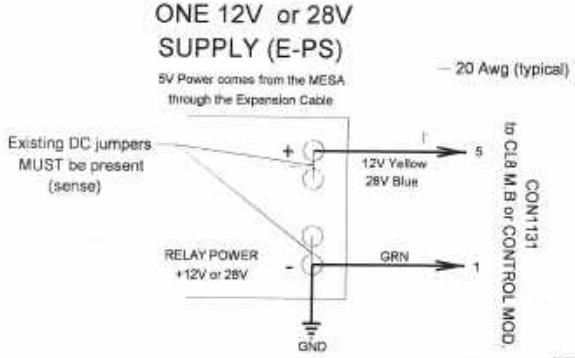


28V @ V1 (Place 220 Ohm RES1270 across V1 to G)
12V @ V1 (Place 50 Ohm RES1096 across V1 to G)
5V @ V1

ONE 12V SUPPLY & 5V REG



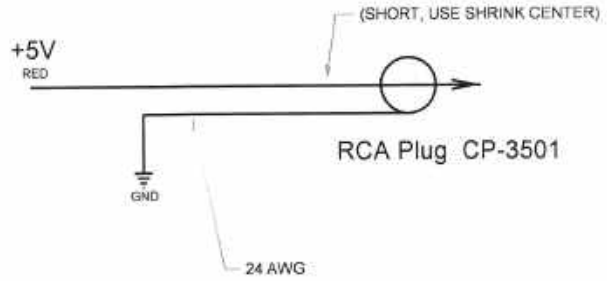
ONE 12V or 28V SUPPLY (E-PS)



CYTEC CORP.			TOL. +/- .010" U.O.S.
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COMMENTS: DC Wiring			DRAWING NUMBER: 2-190-5B 2/3

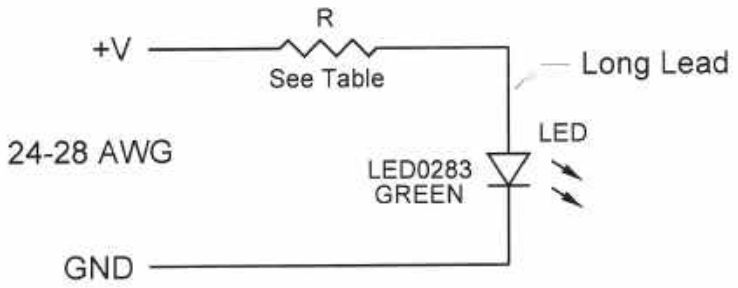
MISCELLANEOUS POWER SUPPLY WIRING

LAN DC POWER (INTERNAL)



+5V ONLY !! (Not 12V or 28V)

FRONT PANEL
POWER INDICATOR



LED Resistor Table		
Volts	Ohms	Part #
2V	10.7 Ohm	RES1066
2.5V	100 Ohm	RES1085
3.3V	200 Ohm	RES1141
5V	390 Ohm	RES1027
12V	680 Ohm	RES1029
15V	2k Ohm	RES1049
28V	5.1k Ohm	RES1172

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TOL. +/- .010" U.O.S.

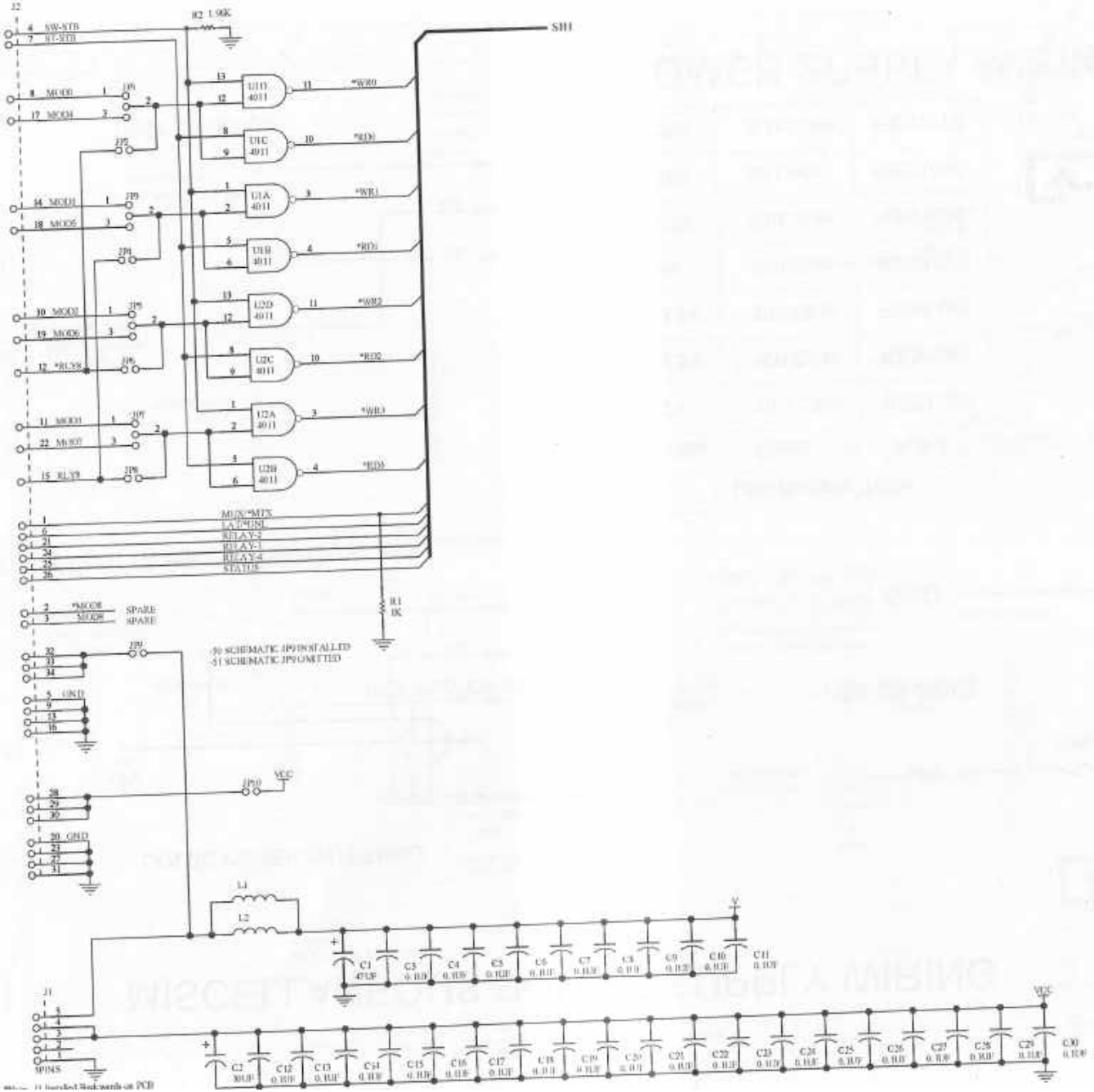
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8/10/05	2-190-5B.dcd	DR

SIZE: B

TITLE: Standard Power Supply Wiring

COMMENTS: Miscellaneous DC Wiring

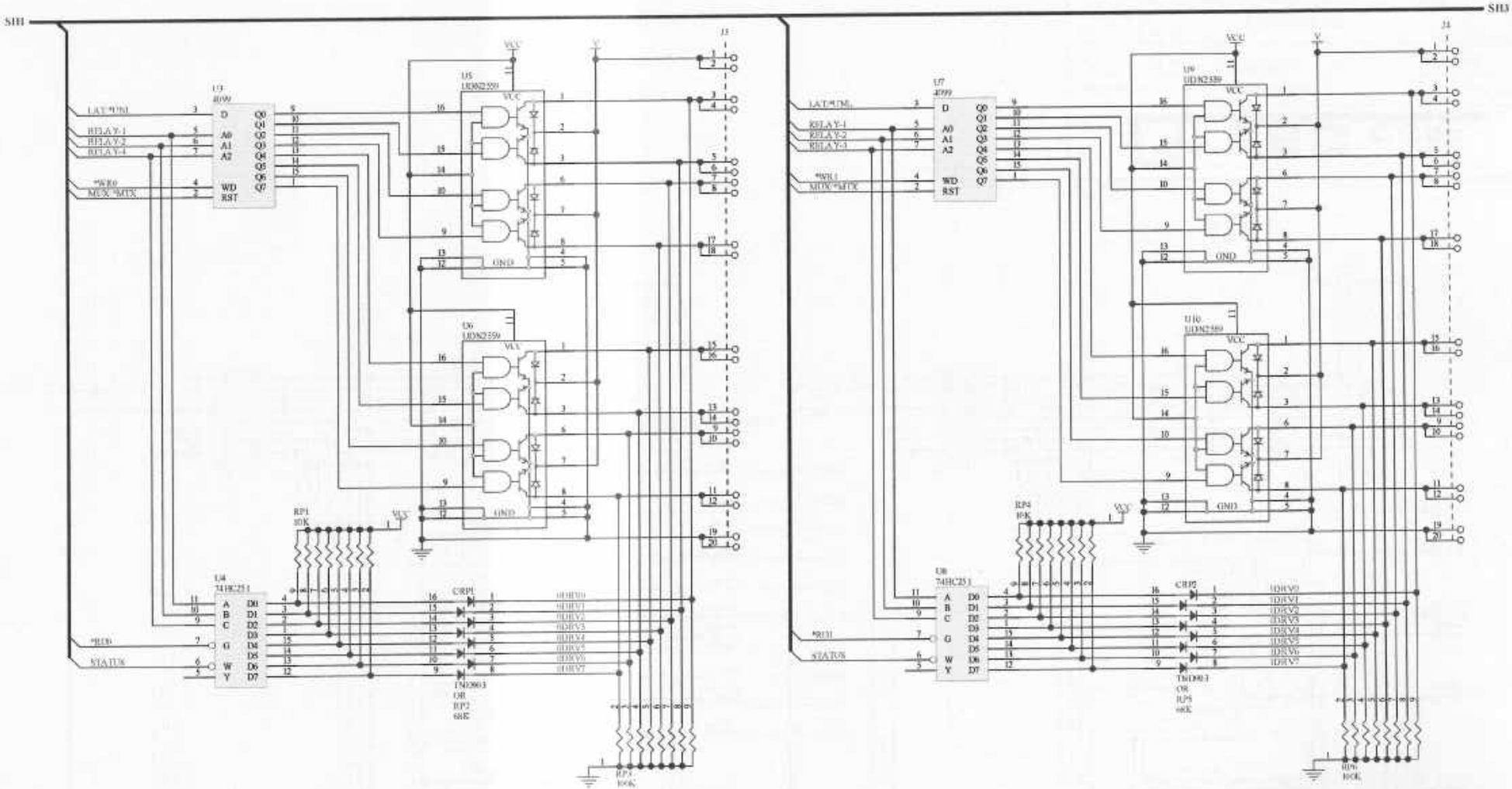
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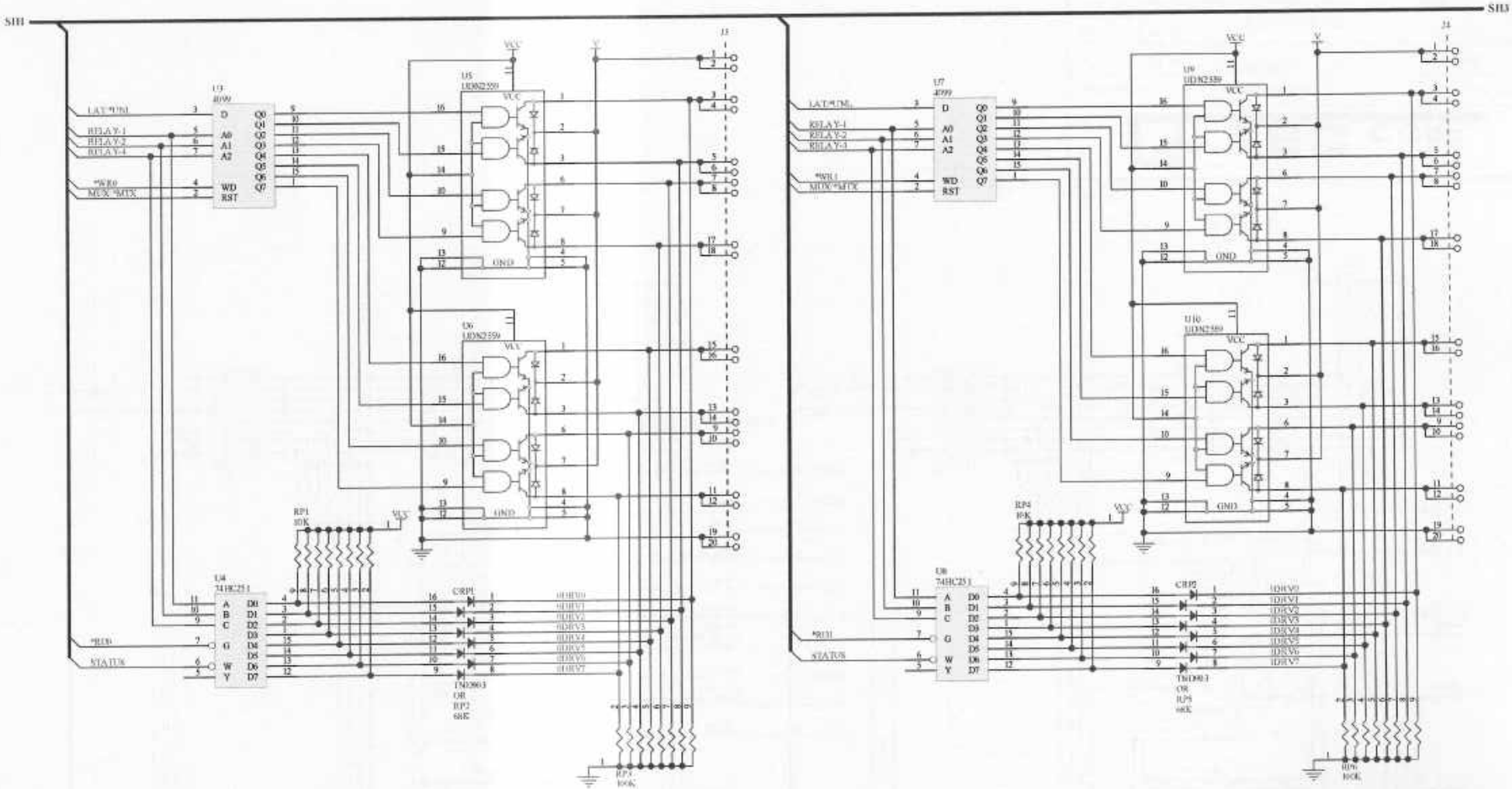
CYTEC CORP.

APPROVED BY:	DRAWING NUMBER:	DRAWN BY: RHB
DATE: 11/2/2007	11-08-50/1	REVISION:
SIZE: A3	TITLE: CM/32-VHP	
		SHEET 1 OF 3



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APPROVED BY	DRAWING NUMBER	DRAWN BY RHB
DATE 11/2/2007	11-08-50/2	REVISION
SIZE A3	TITLE CM/32-VHP	
11-08-50/2		SHEET 3 OF 3



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CYTEC CORP.		
APPROVED BY	DRAWING NUMBER	DRAWN BY RHB
DATE 11/2/2007	11-08-50/2	REVISION
SIZE A3	TITLE CM/32-VHP	
11-08-50/2		SHEET 3 OF 3

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