Maryanne Angliongto **December 28, 1998**

NIRSPEC Electronics Application Note 03.00
NIRSPEC Power Supplies

1. Power Supply Distribution

Power for the whole system is packaged into three sections. One section contains the S10399 Acopian +15V power supply and a custom made +5V power supply (see Figure 3). The second section contains the S10400 +15V power supply, and a custom made +5V power supply. The third section is an Acopian A5NT350 +5V supply. Front and rear views of the three sections can be found in Figures 1 and 2. Details of the power supply distribution can be found in Table 1. The terms 1024 and 256 refer to the 1024x1024 pixel ALADDIN detector and the 256x256 HgCdTe PICNIC array.

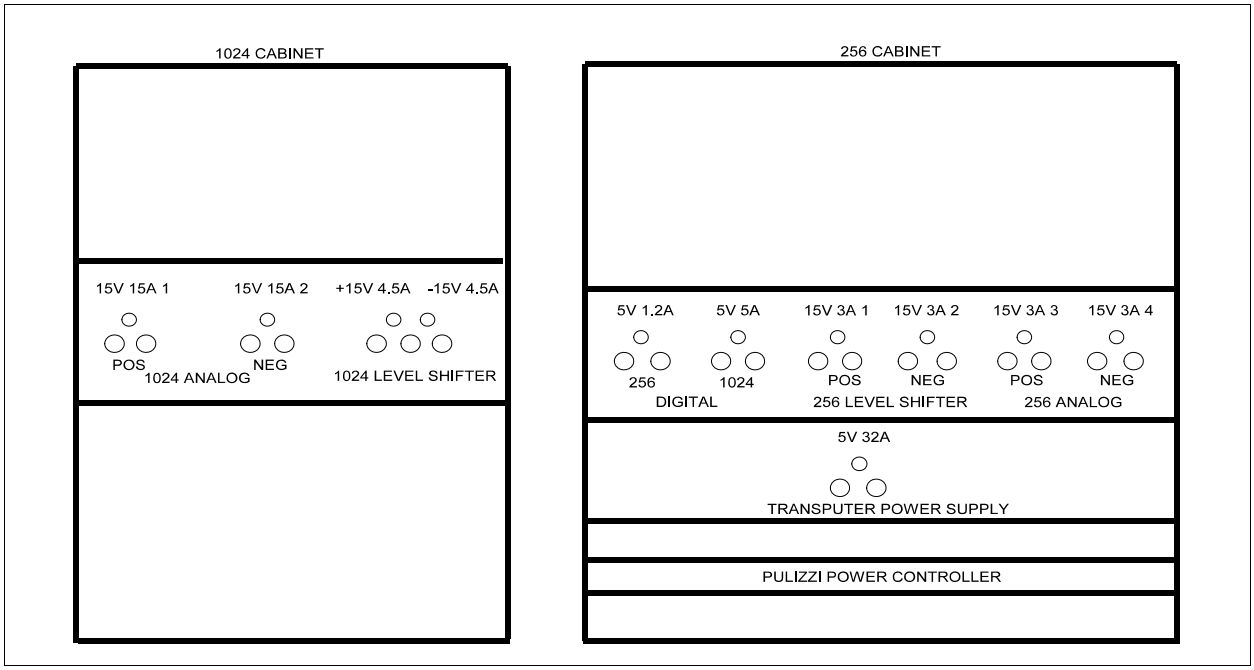

Figure 1.. Front View of Electronics Cabinets with Power Supplies (not to scale)

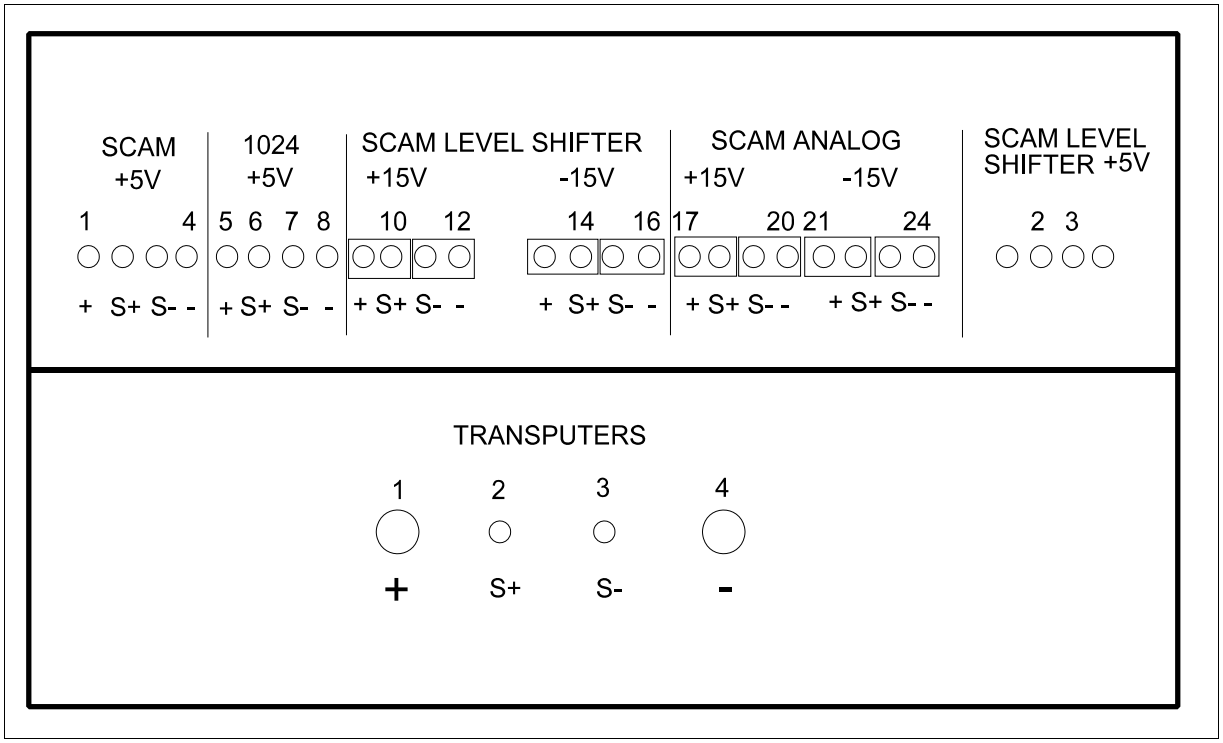

Figure 2. Rear View of Scam cabinet power supplies. The numbers show where connections are being made, and the boxes around the terminals show jumper bars for local sensing.

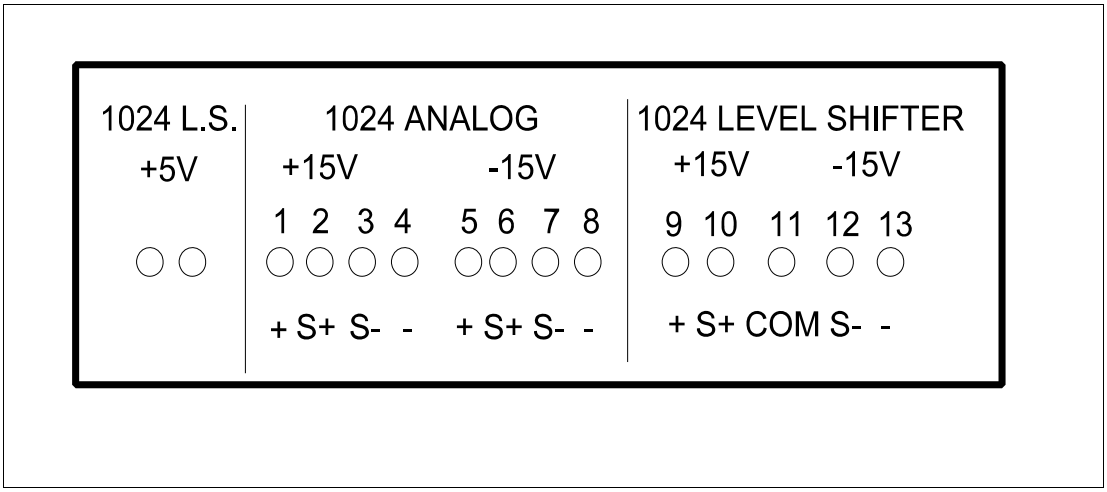

Figure 3. Rear View of the 1024 cabinet power supply.

2. Power Management

The power for NIRSPEC is managed by a Pulizzi Power Controller, shown in Figure 5. This strip has 8 power outlets on its back, and when the controller power is turned on, it sequentially turns each outlet on. This prevents a power surge when NIRSPEC is powered up. An extension is plugged into each outlet in order to increase the number of power outlets available for the system. The power is divided into 7 power controller outlets: Housekeeping Transputer, 256 Power Supply

Unit, Motors and Main Transputers, 1024 Power Supply Unit, Heat Exchangers, Temperature Control, and Lamps for the Calibration Unit. The housekeeping transputer controls the operation of the power controller.

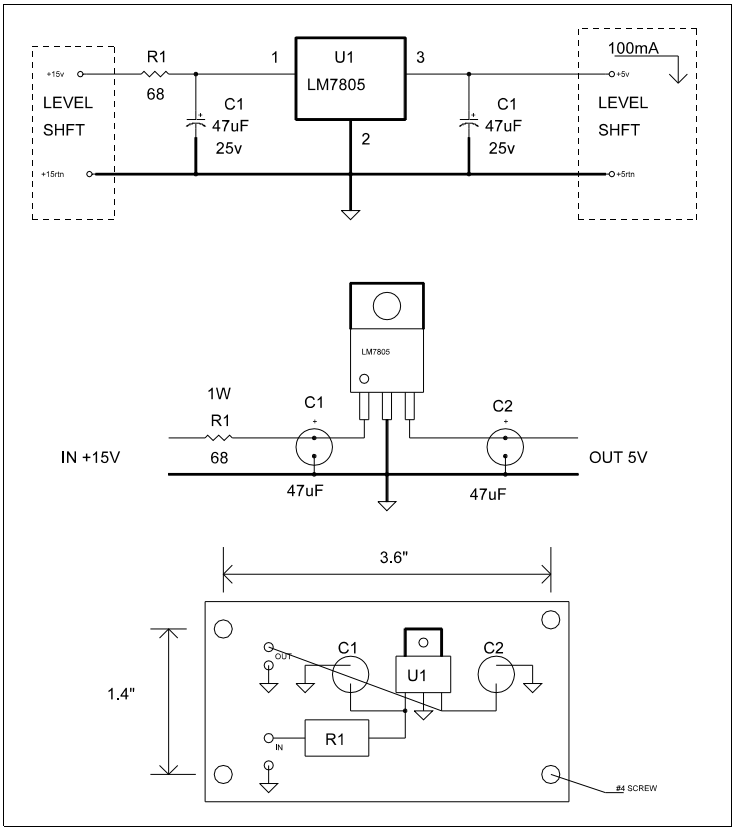

Figure 4. Custom-made +5V power supply for 1024 and 256 Level Shifters

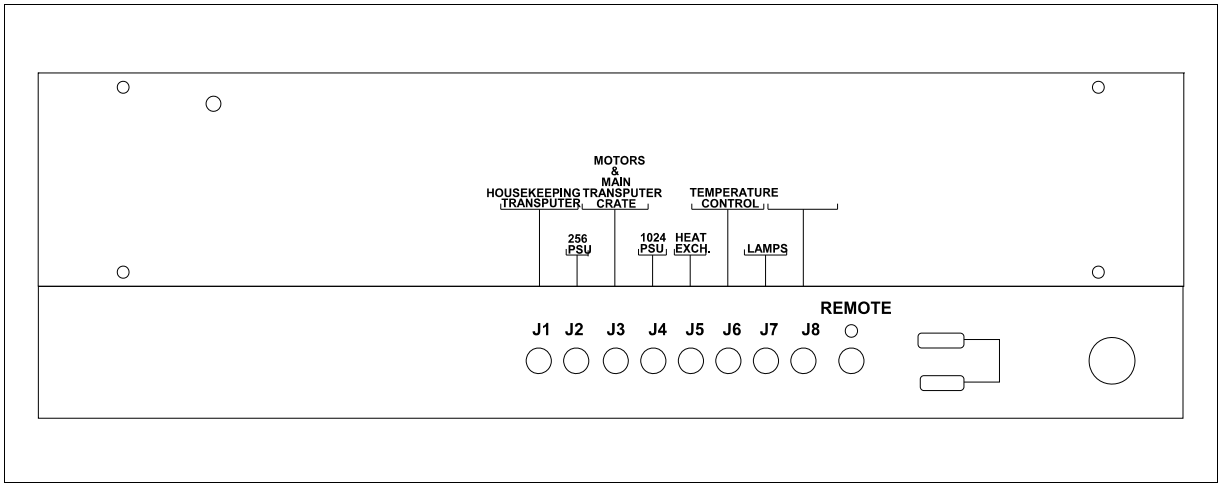

Figure 5. Front View of the Pulizzi Power Controller layout.

Table 1. Power Supply Distribution and DC Power Measurement

Power Supply	Acopian Part#	Assigned to	Comments	DC Current	DC Power
+15V 15A	S10399	1024 Analog +15V	These two connected together for tracking	6.13A	92W
+15V 15A	S10399	1024 Analog -15V		6.93A	104W
+15V 4.5A	S10399	1024 Level Shifter +15V		243mA	3.65W
-15V 4.5A	S10399	1024 Level Shifter -15V		221mA	3.32W
+5V 100mA	Custom made (see figure 4)	1024 Level Shifter +5V	Installed inside Acopian #R10325	50.0mA	250mW
+5V 1.2A	A5NT350	256 Digital +5V	Installed inside Acopian #S10400	62mA	310mW
+5V 5A	A5NT350	1024 Digital +5V		2.18A	10.9W
+15V 3A	S10400	256 Level Shifter +15V	These two connected together for tracking	119mA	1.79W
+15V 3A	S10400	256 Level Shifter -15V		104mA	1.56W
+15V 3A	S10400	256 Analog +15V	These two connected together for tracking	27.0mA	405mW
+15V 3A	S10400	256 Analog -15V		710mA	10.6W
+5V 100mA	Custom made (see figure 4)	256 Level Shifter +5V	Installed inside Acopian #S10400	159uA	795uW
+5V 32A	R10325	Logic/Transputers +5V		17.2A	86W

Table 2. Distribution of Power Outlets

Power Controller Outlet	Connected to
J1 Housekeeping Transputer	Housekeeping Transputer
	Black Box (connected to Matchbox)
	Matchbox
J2 256 PSU	256 Power Supply
	256 Analog Crate.
J3 Motors and Main Transputer	Motor box power
	Fan tray for logic crate
	Transputer Power Supply
J4 1024 PSU	1024 Power Supply
	1024 Analog Crate Fan Tray
J5 Heat Exchanger	256 Cabinet Heat Exchanger
	1024 Cabinet Heat Exchanger
J6 Temperature Control	Lakeshore 330 Temperature Controller
	Lakeshore 208 Temperature Controller
J7 Lamps	Arclamp Box
J8	PXL Camera
	PXL AIA- SCSI
	Black Box connected to PXL

Table 3. AC Power Measurement

AC Measurement	AC Current	AC Power
1024 PSU	4.25A	510W
256 PSU	1.58A	189W
Transputer PSU	0.98A	117W
Matchbox	100mA	12W
Blackbox (Q=2)	175mA	21W
Lakeshore 208	100mA	12W
Lakeshore 330	275mA	33W
Knurr Cooling Unit (Q=2)	675mA	81W
PXL Camera (not operating)	1.03A	123W
Arclamps (not operating)	50mA	6W
Motorbox (not operating)	1.3A	156W
Total AC Power*	12.58A	1510W

* Conditions for this measurement:

1024 & 256 all operating
All logic boards operating
Motor box connected with no motors running
Lakeshore 208 &330 on
PXL controller on but not operating the camera
Housekeeping box is on
Cal Unit not installed
Arclamp Box on but not operating
Heat Exchangers operating