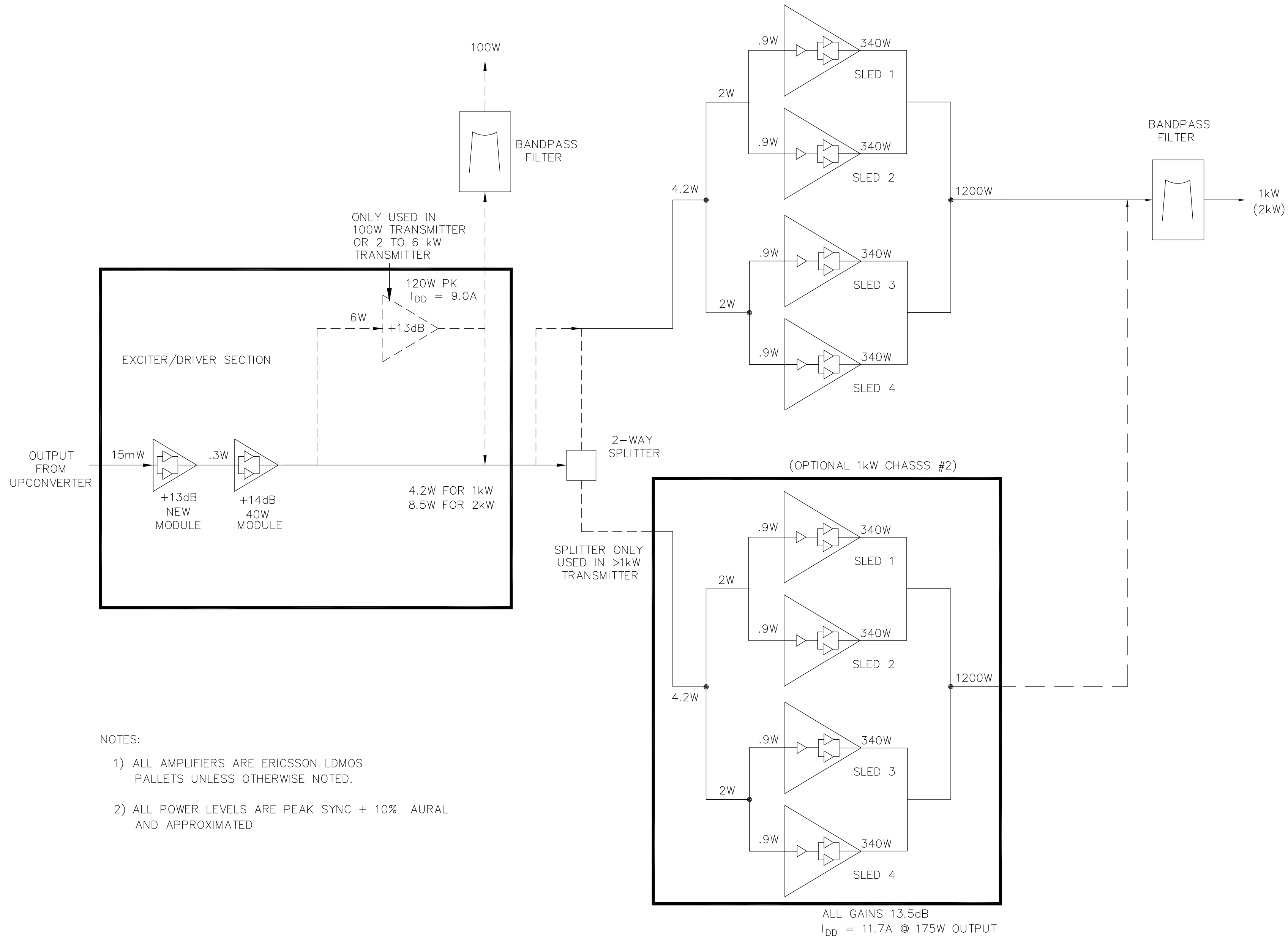


LX SERIES AMPLIFIER LINE UP

CHASSIS #1 FOR 1kW
EACH SLED CONTAINS (2) LDMOS PALLETS & (1) NEW MODULE.



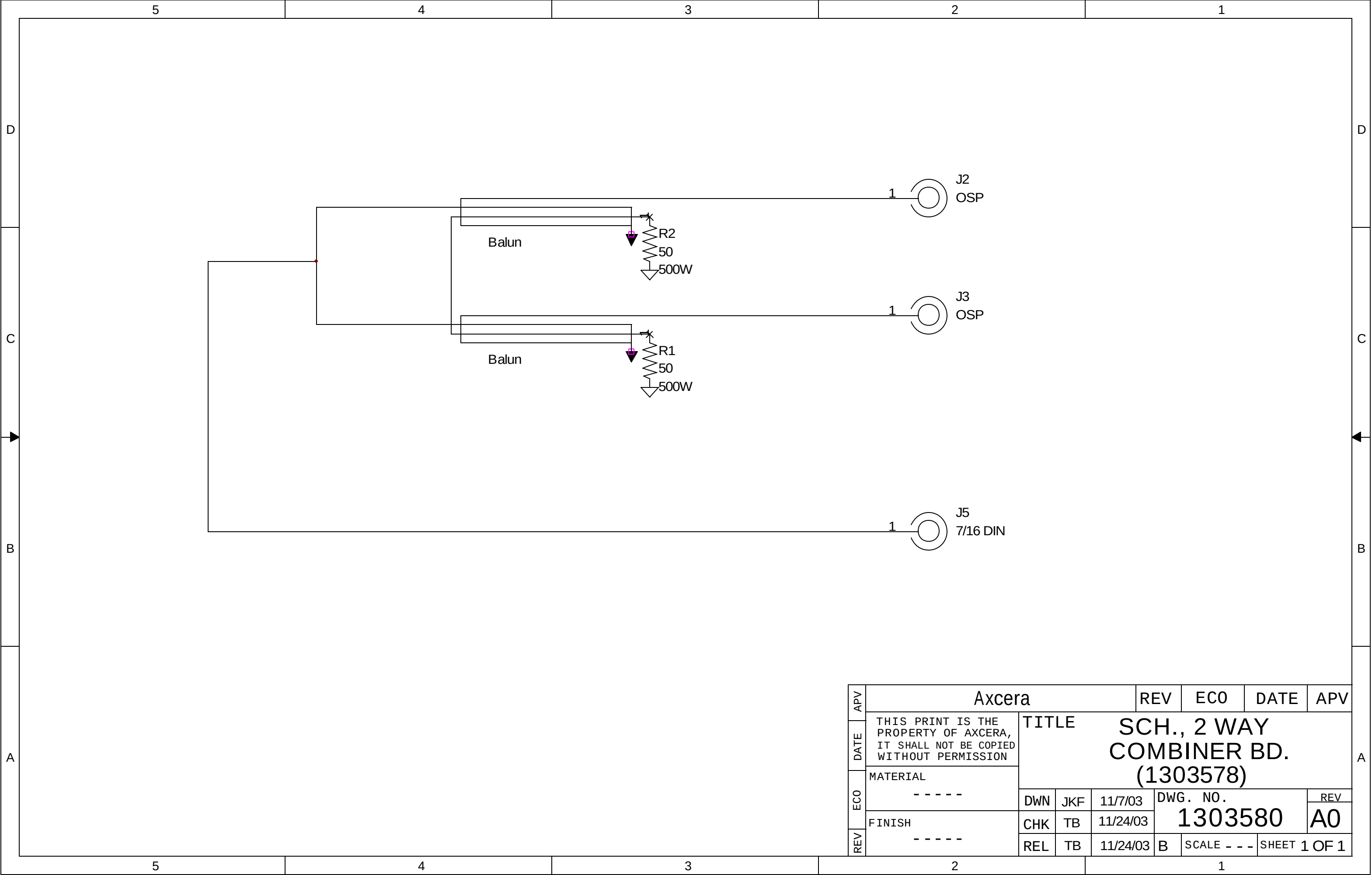
NOTES:

- 1) ALL AMPLIFIERS ARE ERICSSON LDMOS PALLETS UNLESS OTHERWISE NOTED.
- 2) ALL POWER LEVELS ARE PEAK SYNC + 10% AURAL AND APPROXIMATED

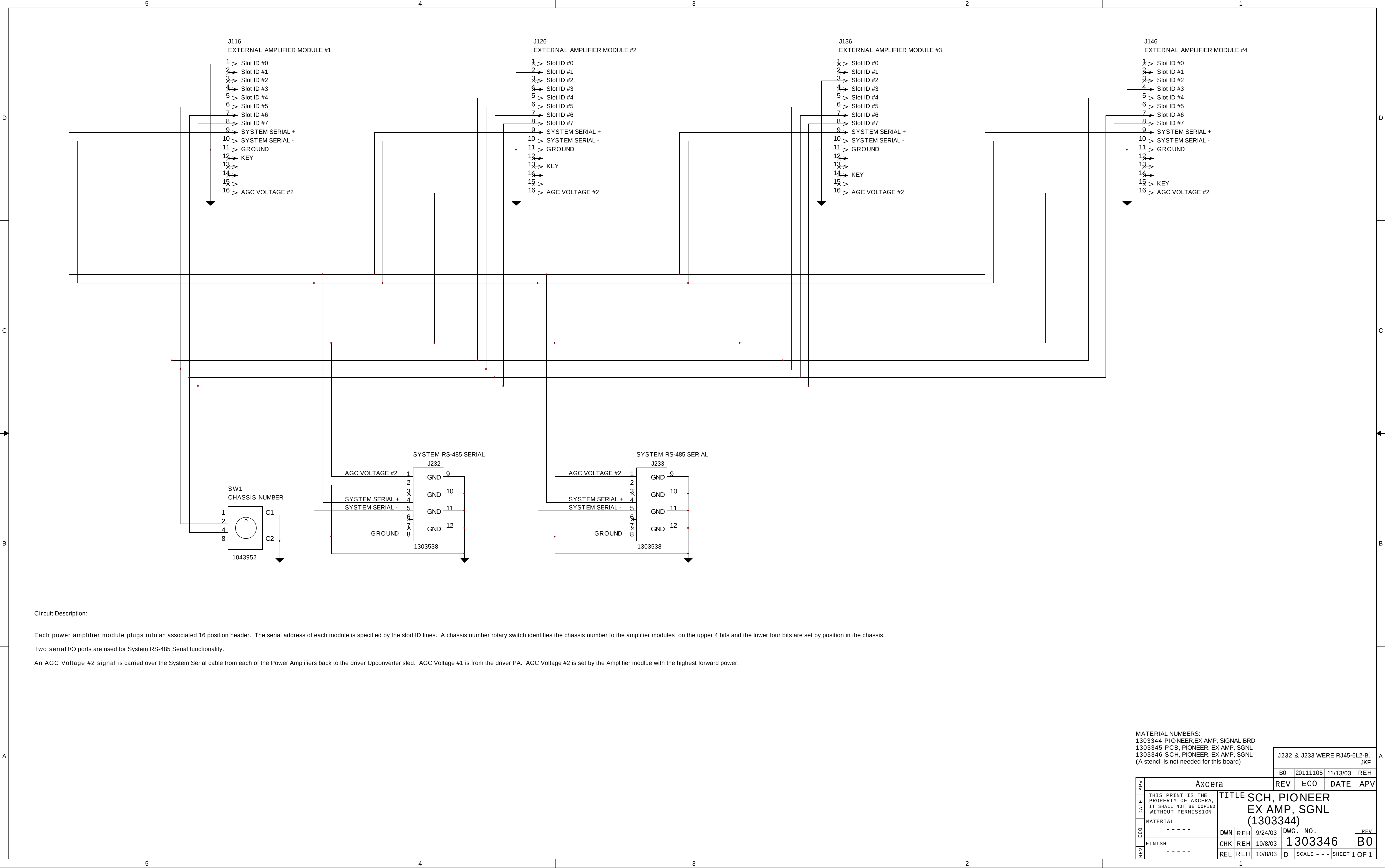
ALL GAINS 13.5dB
 $I_{DD} = 11.7A @ 175W OUTPUT$



THIS PRINT IS THE PROPERTY OF AXCERA, IT SHALL NOT BE COPIED WITHOUT PERMISSION.				REV	ECO	DATE	APV
MATERIAL				TITLE			
FINISH				B/D, LX SERIES AMPLIFIER LINE UP, 1 - 2 KW			
---				DWN	CDD	1/9/03	DWG. NO.
---				CHK			1302633
---				REL			20
				SCALE -- SHEET 1 OF 1			



APV	Axcera					REV	ECO		DATE		APV
DATE	THIS PRINT IS THE PROPERTY OF AXCERA, IT SHALL NOT BE COPIED WITHOUT PERMISSION		TITLE SCH., 2 WAY COMBINER BD. (1303578)								
ECO	MATERIAL - - - - -		DWN	JKF	11/7/03	DWG. NO. 1303580				REV A0	
REV	FINISH - - - - -		CHK	TB	11/24/03						
			REL	TB	11/24/03	B	SCALE - - -		SHEET 1 OF 1		



Circuit Description:

Each power amplifier module plugs into an associated 16 position header. The serial address of each module is specified by the slot ID lines. A chassis number rotary switch identifies the chassis number to the amplifier modules on the upper 4 bits and the lower four bits are set by position in the chassis.

Two serial I/O ports are used for System RS-485 Serial functionality.

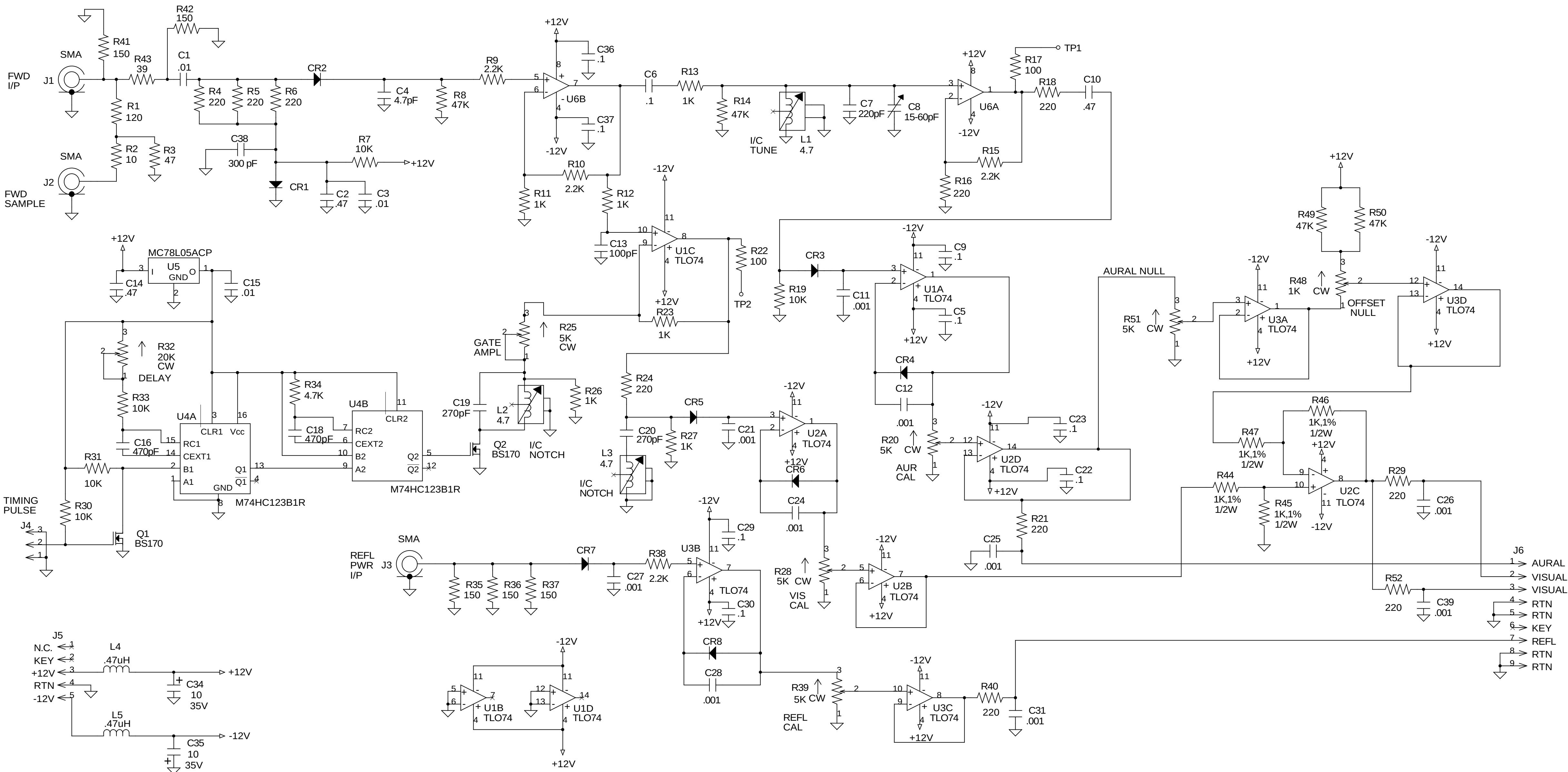
An AGC Voltage #2 signal is carried over the System Serial cable from each of the Power Amplifiers back to the driver Upconverter sled. AGC Voltage #1 is from the driver PA. AGC Voltage #2 is set by the Amplifier module with the highest forward power.

MATERIAL NUMBERS:
1303344 PIONEER,EX AMP, SIGNAL BRD
1303345 PCB, PIONEER, EX AMP, SGNL
1303346 SCH, PIONEER, EX AMP, SGNL
(A stencil is not needed for this board)

J232 & J233 WERE RJ45-6L2-B.
JKF

B0	20111105	11/13/03	REH
REV	ECO	DATE	APV

APV	Axcera				TITLE SCH, PIONEER EX AMP, SGNL (1303344)			
DATE	THIS PRINT IS THE PROPERTY OF AXCERA, IT SHALL NOT BE COPIED WITHOUT PERMISSION							
ECO	MATERIAL				DWN	REH	9/24/03	DWG. NO.
REV	FINISH				CHK	REH	10/8/03	1303346
REL	-----				REL	REH	10/8/03	D
					SCALE - - -		SHEET 1 OF 1	



NOTES:
1) ALL RESISTORS ARE 1/8 WATT UNLESS NOTED OTHERWISE.
2) ALL CAPACITORS ARE uF UNLESS NOTED OTHERWISE.
3) ALL INDUCTORS ARE uH UNLESS NOTED OTHERWISE.
4) ALL DIODES ARE 5082-2811 UNLESS NOTED OTHERWISE.
5) ALL TRANSISTORS ARE BS170 UNLESS NOTED OTHERWISE.
6) U6 IS HA50231B OR LT1229CS8.

ADDED R52 AND C39. (PJK)

A0 20092325 5/31/01 LRT

R8 WAS 4.7K. (TMY)

5 8470 9/30/96 LRT

R7 WAS 100K. (PJK)

4 8408 9/9/96 JAG

ADDED R41 - R51 & C38. R13 WAS 10K, R19 WAS 2.2K, R7 WAS 10K. CHGD U1A TO U6B. CHGD U1D TO U1A. ADDED CIRCUIT TO U2B & U2D. ENLARGED TO "D" SIZE DWG. (TMY)

3 8052 7/16/96 JAG

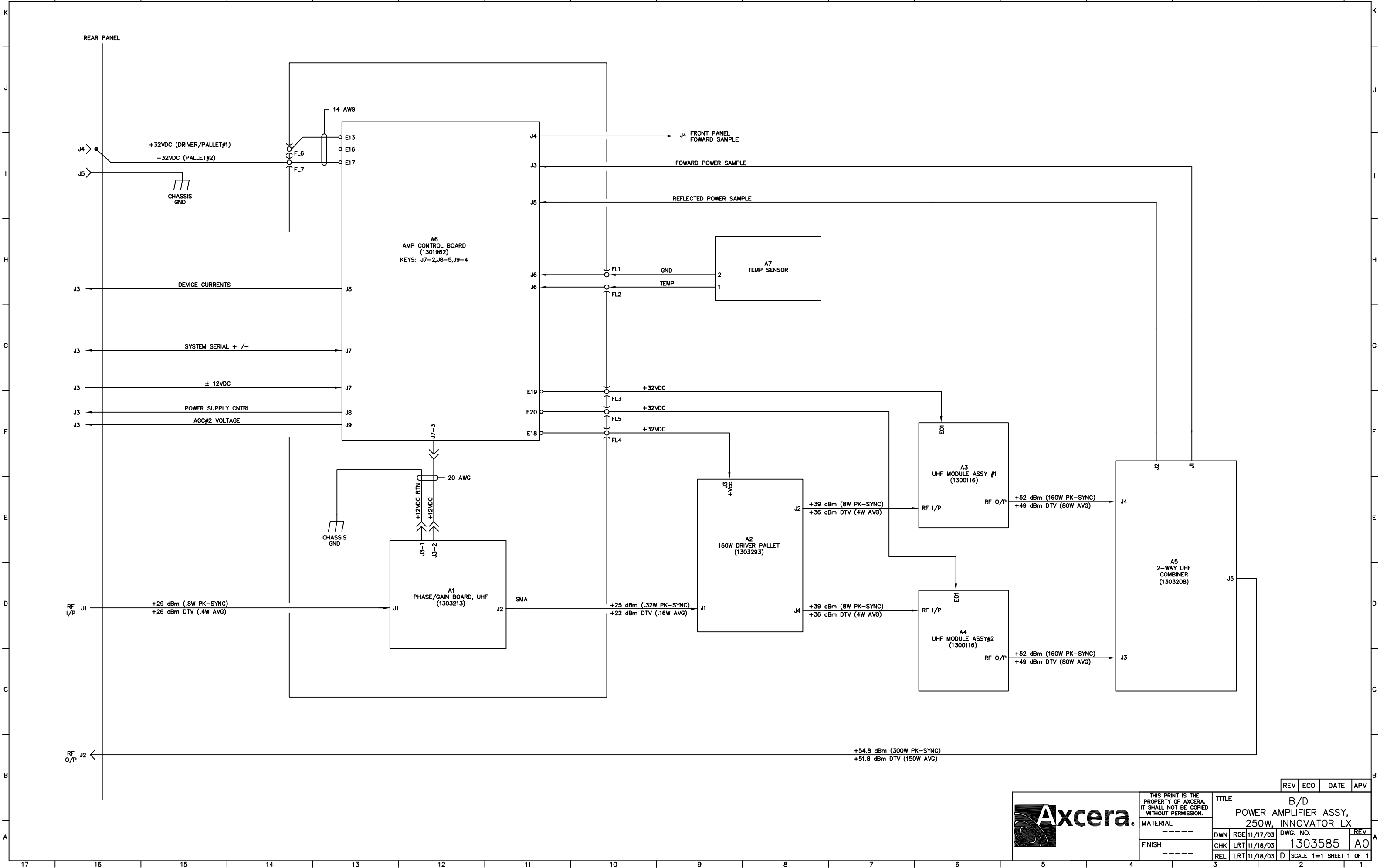
C7 WAS 160pF. J6 WAS A 7 PIN CONNECTOR. (PJK)

2 8026 4/2/96 LRT

ADDED U6, C36, C37. ADDED NOTE #6. U5 WAS M78L05ACN. L5 WAS CONNECTED TO J5-1. U6A WAS U1A. 1A WAS U1B. U2B WAS U2A. U2A WAS U2B. U2B WAS U3D. (PJK)

1 7999 3/4/96 LRT

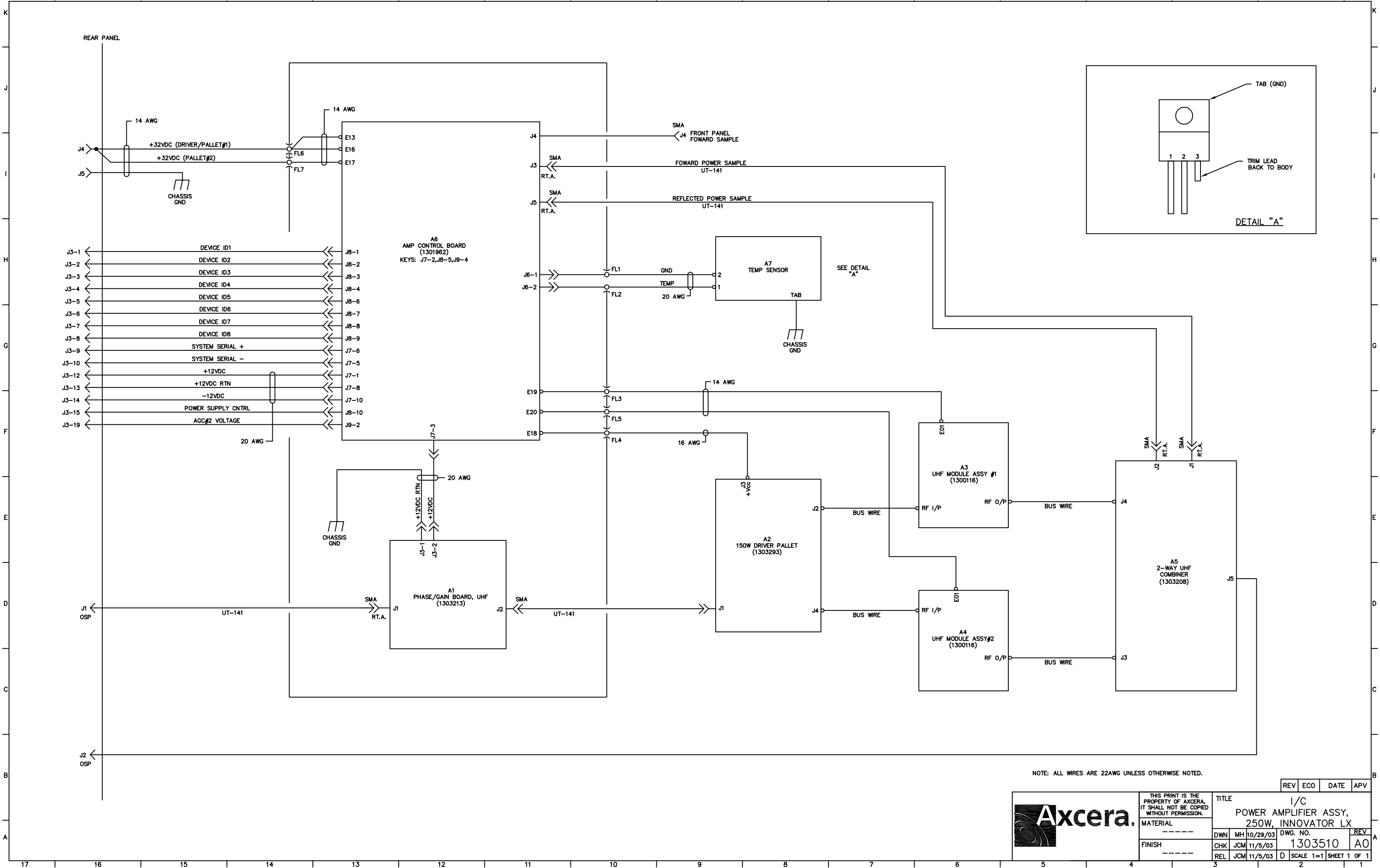
APV	ADC Telecommunications			REV	ECO	DATE	APV
DATE	THIS PRINT IS THE PROPERTY OF ADC. IT SHALL NOT BE COPIED WITHOUT PERMISSION			TITLE 91-00-00-50AC-61 SCH., VIS/AURAL MTRNG BD (1265-1309)			
ECO	MATERIAL			DWN PJK 12/21/95 DWG. NO.			REV
FINISH	-----			CHK DWB 1/3/96	1265-3309		A0
REV	-----			REL DWB 1/3/96	D	SCALE - - -	SHEET 1 OF 1



THIS PRINT IS THE PROPERTY OF AXCERA, IT SHALL NOT BE COPIED WITHOUT PERMISSION.				TITLE B/D POWER AMPLIFIER ASSY, 250W, INNOVATOR LX			
MATERIAL -----				DWN	RGE	11/17/03	DWG. NO.
FINISH -----				CHK	LRT	11/18/03	1303585
				REL	LRT	11/18/03	D
				SCALE 1=1 SHEET 1 OF 1			

REV	ECO	DATE	APV
-----	-----	------	-----

REV
A0

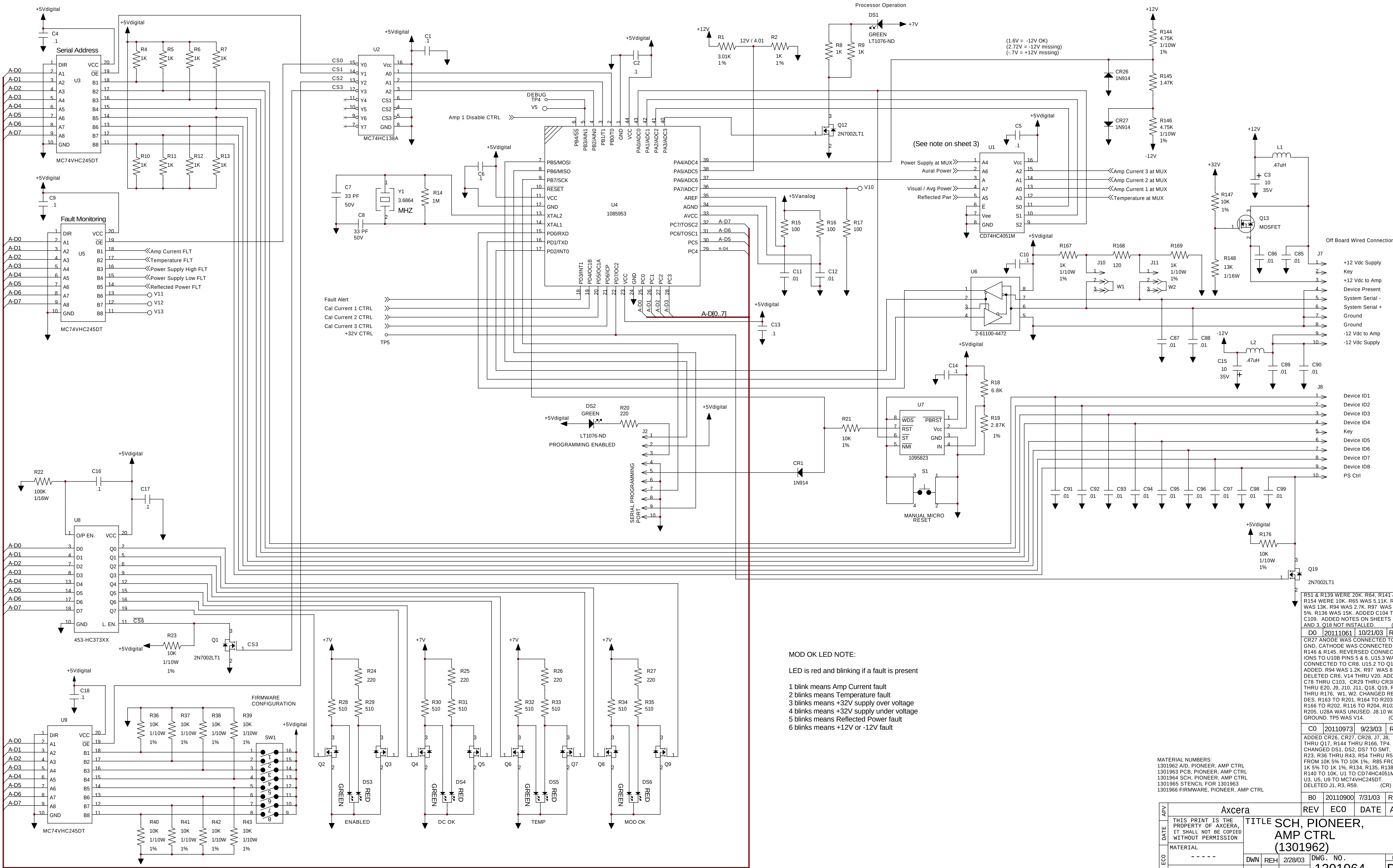


NOTE: ALL WIRES ARE 22AWG UNLESS OTHERWISE NOTED.



THIS PRINT IS THE PROPERTY OF AXCERA, IT SHALL NOT BE COPIED WITHOUT PERMISSION.				TITLE I/C POWER AMPLIFIER ASSY, 250W, INNOVATOR LX			
MATERIAL -----				DWN	MH 10/29/03	DWG. NO.	REV
FINISH -----				CHK	JCM 11/5/03	1303510	A0
				REL	JCM 11/5/03	D	SCALE 1=1 SHEET 1 OF 1

REV	ECO	DATE	APV
-----	-----	------	-----



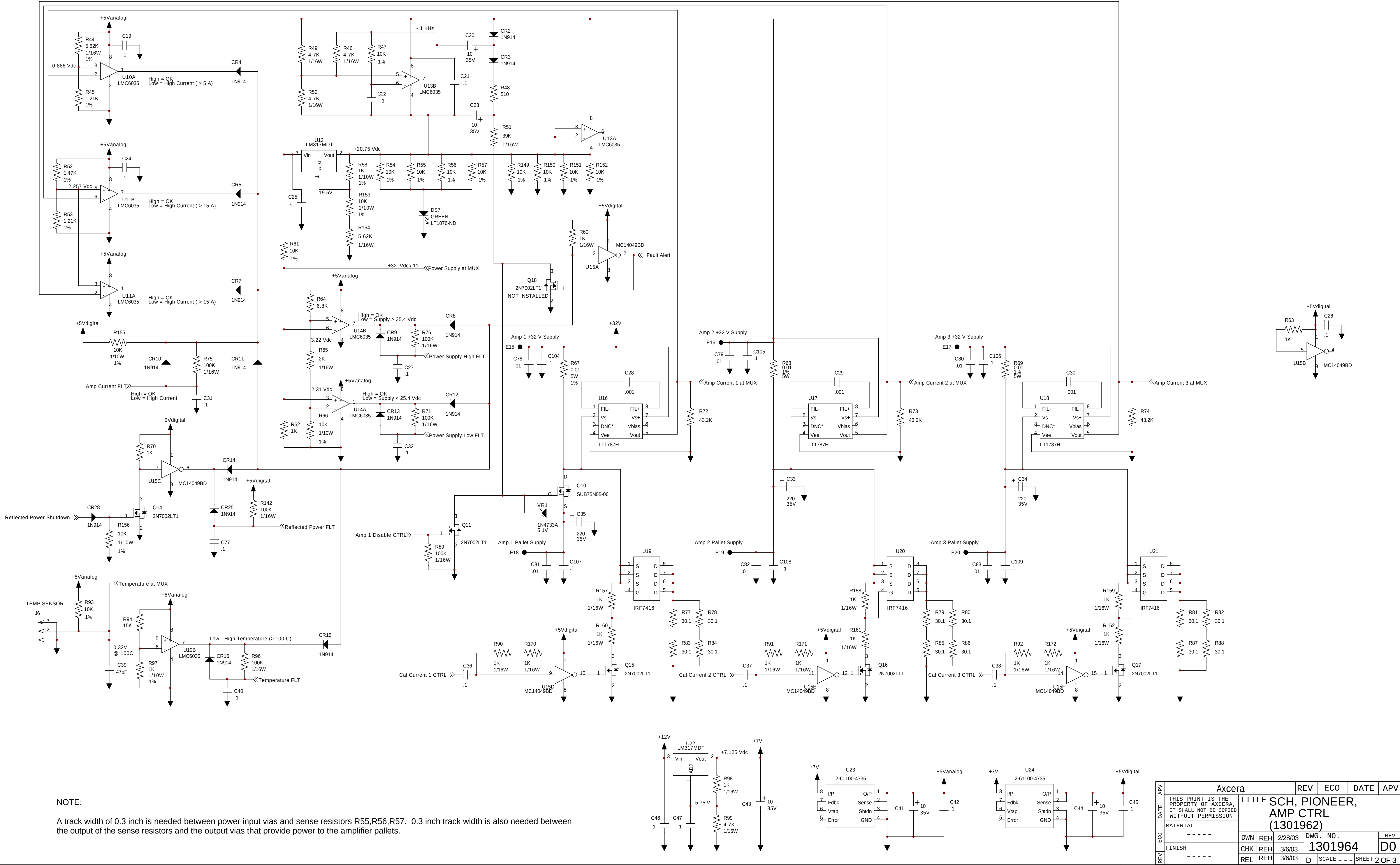
MOD OK LED NOTE:

LED is red and blinking if a fault is present

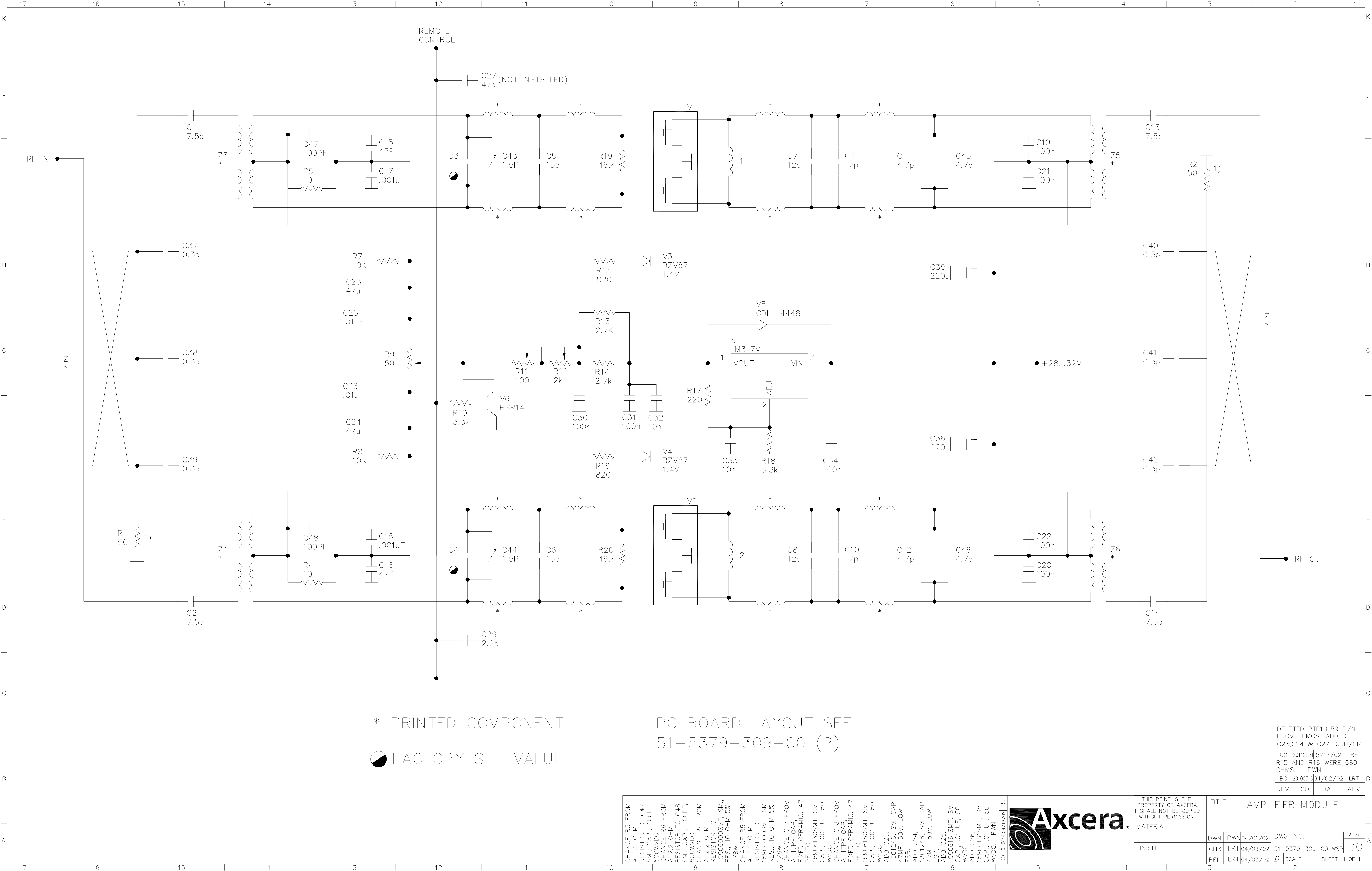
- 1 blink means Amp Current fault
- 2 blinks means Temperature fault
- 3 blinks means +32V supply over voltage
- 4 blinks means +32V supply under voltage
- 5 blinks means Reflected Power fault
- 6 blinks means +12V or -12V fault

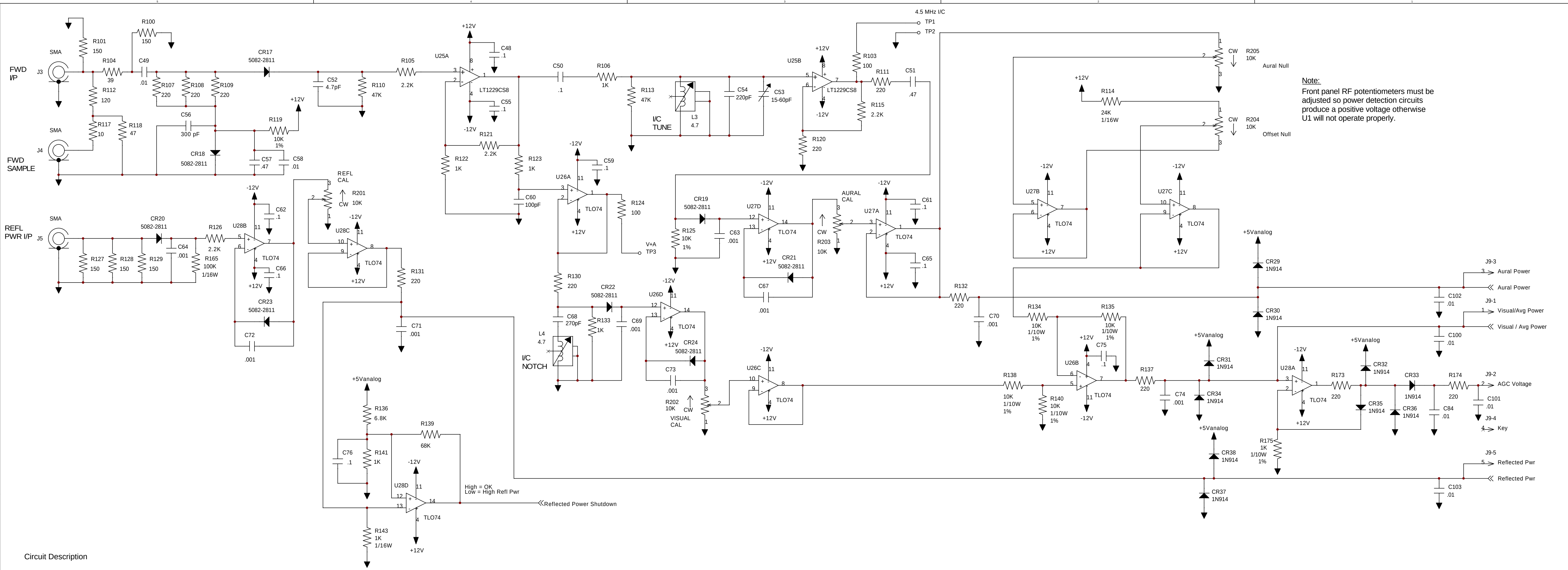
MATERIAL NUMBERS:
1301962 A/D, PIONEER, AMP CTRL
1301963 PCB, PIONEER, AMP CTRL
1301964 SCH, PIONEER, AMP CTRL
1301965 STENCIL FOR 1301963
1301966 FIRMWARE, PIONEER, AMP CTRL

APV				Xxcera		REV	ECO	DATE	APV
DATE	THIS PRINT IS THE PROPERTY OF XCCERA, IT SHALL NOT BE COPIED WITHOUT PERMISSION		TITLE SCH, PIONEER, AMP CTRL (1301962)						
ECO	MATERIAL								
REV	FINISH		DWN	REH	2/28/03	DWG. NO.		REV	
	-----		CHK	REH	3/6/03	1301964		D0	
	-----		REL	REH	3/6/03	D	SCALE ---	SHEET 1 OF 3	



APV		Xxcera		REV	ECO	DATE	APV
DATE	DATE	THIS PRINT IS THE PROPERTY OF XxcERA, IT SHALL NOT BE COPIED WITHOUT PERMISSION				TITLE SCH, PIONEER, AMP CTRL (1301962)	
ECO	ECO	MATERIAL	-----	DWN	REH	2/28/03	DWG. NO.
REV	REV	FINISH	-----	CHK	REH	3/6/03	1301964
		REL	REH	3/6/03	D	SCALE	--- SHEET 2 OF 3





Note:
Front panel RF potentiometers must be adjusted so power detection circuits produce a positive voltage otherwise U1 will not operate properly.

Circuit Description

Page 1:
Upper center of page one is U4 which is the controller. This in-circuit Atmel microcontroller is operated at 3.6864 MHz. Programming of this device is performed through J2. U4 selects the desired analog channel of U1 through the settings of PA0 - PA3. PA4 of U4 is a processor operating LED that can be flashed to show continued operation. The outputs of Port A must be set and not changed during an analog input read of channels PA5 - PA7. PA5 is used to monitor the +12 Vdc supply to the board. PA6 is the selected channel of analog switch U1. PA7 is connected to a via for future access.

U6 is our standard serial to RS-485 driver IC. U7 is a watchdog IC used to hold the microcontroller in reset if the supply voltage is less than 4.21 Vdc; (1.25 Vdc < Pin 4 (IN) < Pin 2 (Vcc)). U7 momentarily resets the microcontroller if Pin 6 (IST) is not clocked every second. A manual reset switch is provided but should not be needed.

Upper right corner U3 is used to determine where the amplifier control board is located. The eight inputs come from the main amp connector and are used to set the SCADA address of the controller. Pull-up resistors set a default condition of logic high.

U5 below U3 is used for getting digital input information of the board. Page two has several monitoring circuits that provide information on the amplifier's status. Many of these circuits automatically shut down the amplifier if a specific fault occurs.

U8 below U5 is used to control four board mounted status LEDs. A FET is turned on to shut current away from the LED to turn it off. U9 below U8 is used to enable different features within software. Actual use is TBD.

Page 2:

In the lower right corner are voltage regulator circuits. U22 should allow for 0.14 amps of power using its 92 C/W rating if Ta = 60C max and Tj = 125C max. 0.26 amps can be obtained from U22 if the mounting pad is 0.5 sq. inches. The controller will not need this much current.

U23 and U24 are low drop-out voltage regulators with a tolerance greater than or equal to 1%. 100 mA is available from each device but again the controller will not need this much current.

In the upper left section are circuits with U12 and U13. U12 is used to generate a regulated voltage that is about 5 Volts less than the +32 Volt supply. When the +32 Volt supply is enabled, the circuitry around U13B is used to provide gate voltage to Q10 that is 5 volts greater than the source pin of this FET. The gate of Q10 can be turned off by any one of a few different circuits.

U10A is used to turn off the gate of Q10 in the event of high current in amplifier #1. At 0.886 Vdc, the current to amplifier #1 should be about 5.12 Amps. U11 is used to turn off the FET if high current is detected in amplifier #2 or #3. With 2.26 Vdc at pin 5 and pin 3 of U11, the voltage output of current sense amplifier U17 or U18 at high current shut down should be about 13.1 Amps.

U14B is used to turn off the gate of Q10 in the event of high power supply voltage. U14A is used to keep the FET disabled if the power supply voltage is less than 26 volts.

U28D on page 3 is used to turn off the gate of Q10 in the event of high reflected power. U10B turn off the gate of Q1 if the power supply temperature gets too hot.

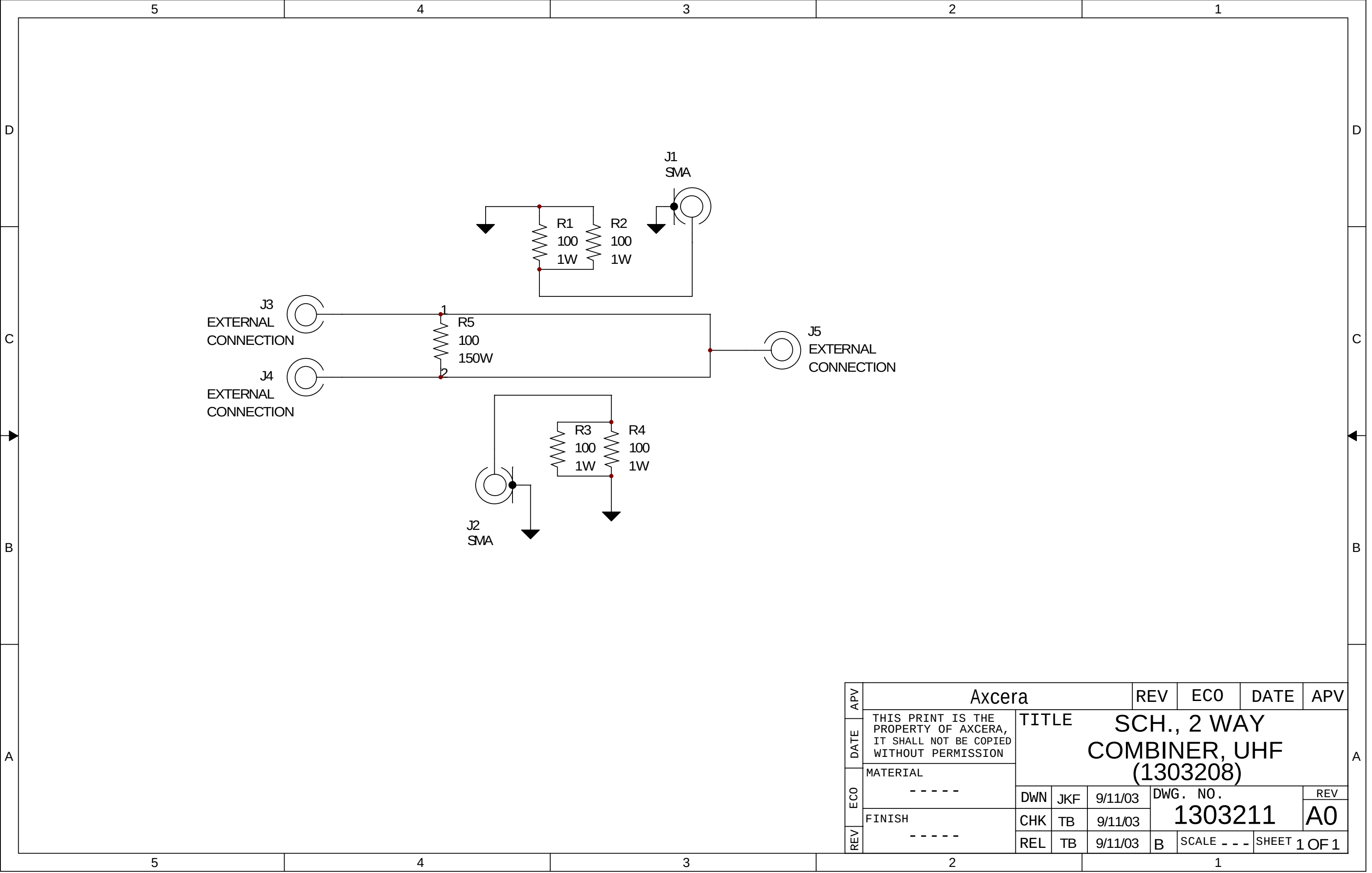
Current Monitoring Sections - A 0.01 ohm 1% 5 Watt thru-hole resistor is used for monitoring the current through several sections of the amplifier. The voltage developed across this resistor is amplified for current monitoring by U16, U17, or U18. The Linear Technology LT1787HVCS8 precision high side current sense amplifier accepts a maximum voltage of 60 Vdc. The 43.2 Kohm resistor from Pin 5 to ground sets the gain of the amplifier to about 17.28. This value is not set with much accuracy since the manufacture internal matches the resistors of this part but their actual resistance value is not closely defined. A trimming resistor is suggested to give a temperature stability of -200ppm/C but instead the microcontroller will determine the exact gain of the circuit and use a correction factor for measurements. Circuit loading components are located in the lower portion of each current monitoring circuit. These components allow for short duration high current loading of the supply. By measuring the current through the sense resistor with and without the additional load, the microcontroller can determine the gain of each circuit. The input to each hex inverter protects the load resistors from prolonged power dissipation. The load resistors are four 30.1 ohm 1% 1206 resistors. For very short duration pulses, a 1206 resistor can handle up to 60 watts. The Atmel processor requires 226 uSec per conversion. A supply voltage of 32 volts will pass 1.06 amps + 1% through the load resistors.

Page 3:

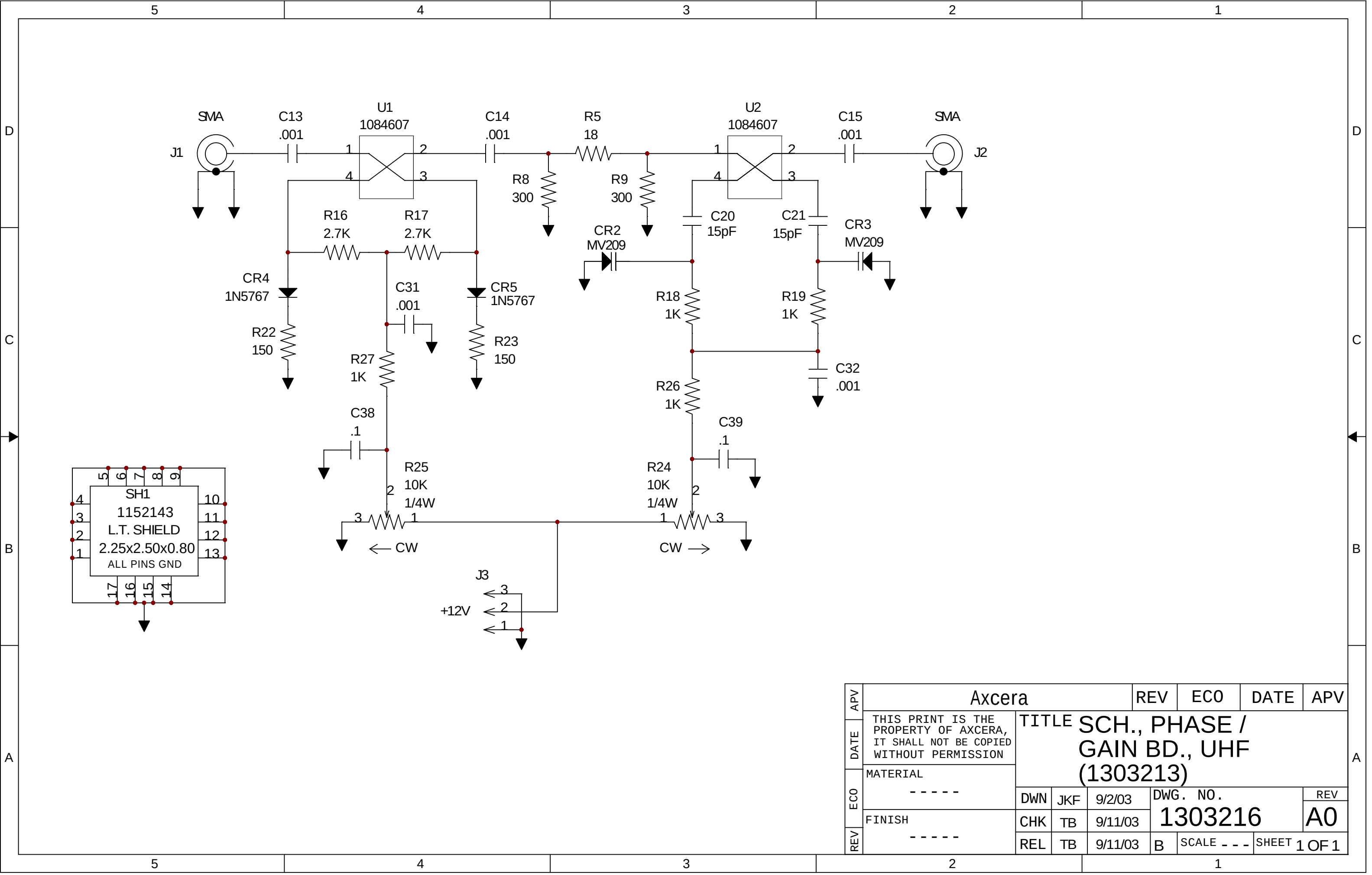
RF power detector circuits. Gain of power measurements will be done through software. Only the Aural Null and Offset Null need to be done through front panel pots.

- NOTES:
1) ALL RESISTORS ARE 1/8 WATT UNLESS NOTED OTHERWISE.
2) ALL CAPACITORS ARE uF UNLESS NOTED OTHERWISE.
3) ALL INDUCTORS ARE uH UNLESS NOTED OTHERWISE.

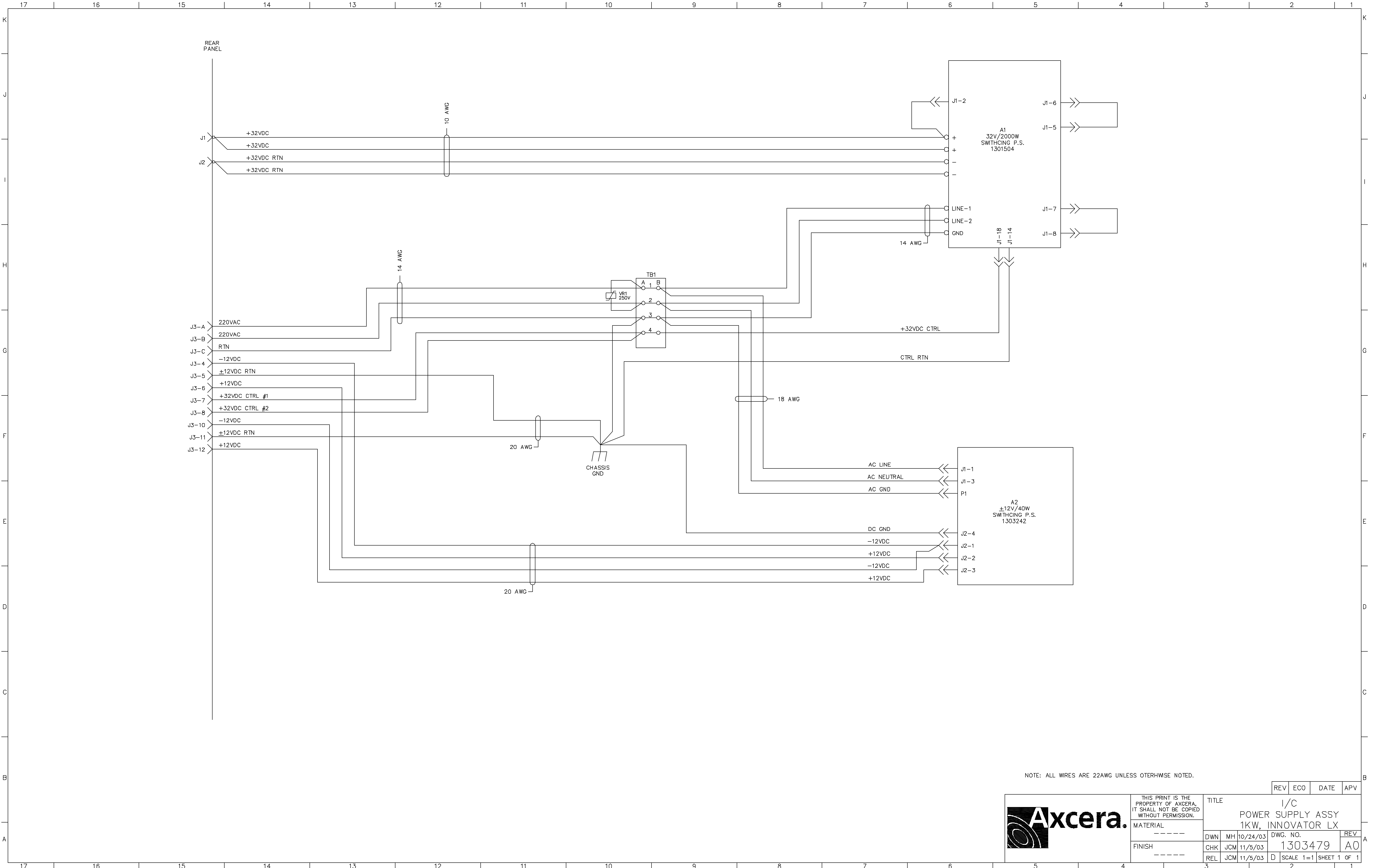
APV	Axcera				REV	ECO	DATE	APV
DATE	THIS PRINT IS THE PROPERTY OF AXCERA, IT SHALL NOT BE COPIED WITHOUT PERMISSION				TITLE SCH, PIONEER, AMP CTRL (1301962)			
ECO	MATERIAL				DWN	REH	2/28/03	DWG. NO.
REV	FINISH				CHK	REH	3/6/03	1301964
					REL	REH	3/6/03	D
								SCALE - - - SHEET 3 OF 3



APV	Axcera				REV	ECO	DATE	APV
DATE	THIS PRINT IS THE PROPERTY OF AXCERA, IT SHALL NOT BE COPIED WITHOUT PERMISSION				TITLE SCH., 2 WAY COMBINER, UHF (1303208)			
ECO								
REV	FINISH				CHK	TB	9/11/03	REV
	-----				REL	TB	9/11/03	B
					DWN	JKF	9/11/03	DWG. NO.
								1303211
								A0
								SCALE - - -
								SHEET 1 OF 1



APV	Axcera					REV	ECO	DATE	APV
DATE	THIS PRINT IS THE PROPERTY OF AXCERA, IT SHALL NOT BE COPIED WITHOUT PERMISSION		TITLE SCH., PHASE / GAIN BD., UHF (1303213)						
ECO									
	- - - - -								
REV	FINISH		CHK	TB	9/11/03	1303216			A0
	- - - - -		REL	TB	9/11/03	B	SCALE - - -	SHEET 1 OF 1	



NOTE: ALL WIRES ARE 22AWG UNLESS OTERHWSE NOTED.

	THIS PRINT IS THE PROPERTY OF AXCERA, IT SHALL NOT BE COPIED WITHOUT PERMISSION.	TITLE	I/C POWER SUPPLY ASSY 1KW, INNOVATOR LX			
	MATERIAL	DWN	MH	10/24/03	DWG. NO.	
	FINISH	CHK	JCM	11/5/03	1303479	
		REL	JCM	11/5/03	SCALE 1=1	
				SHEET 1	OF 1	

REV	ECO	DATE	APV
-----	-----	------	-----

REV

A0