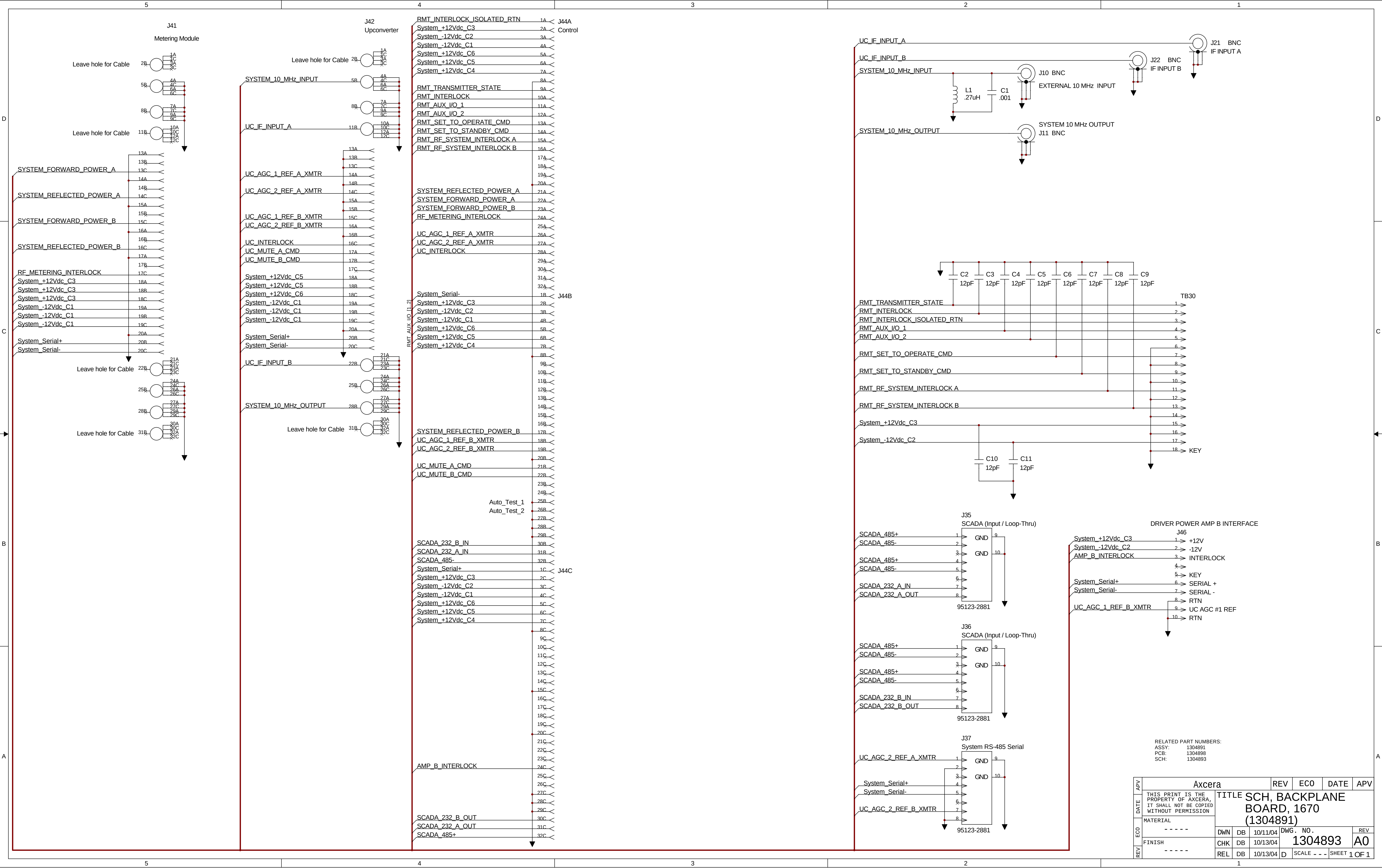
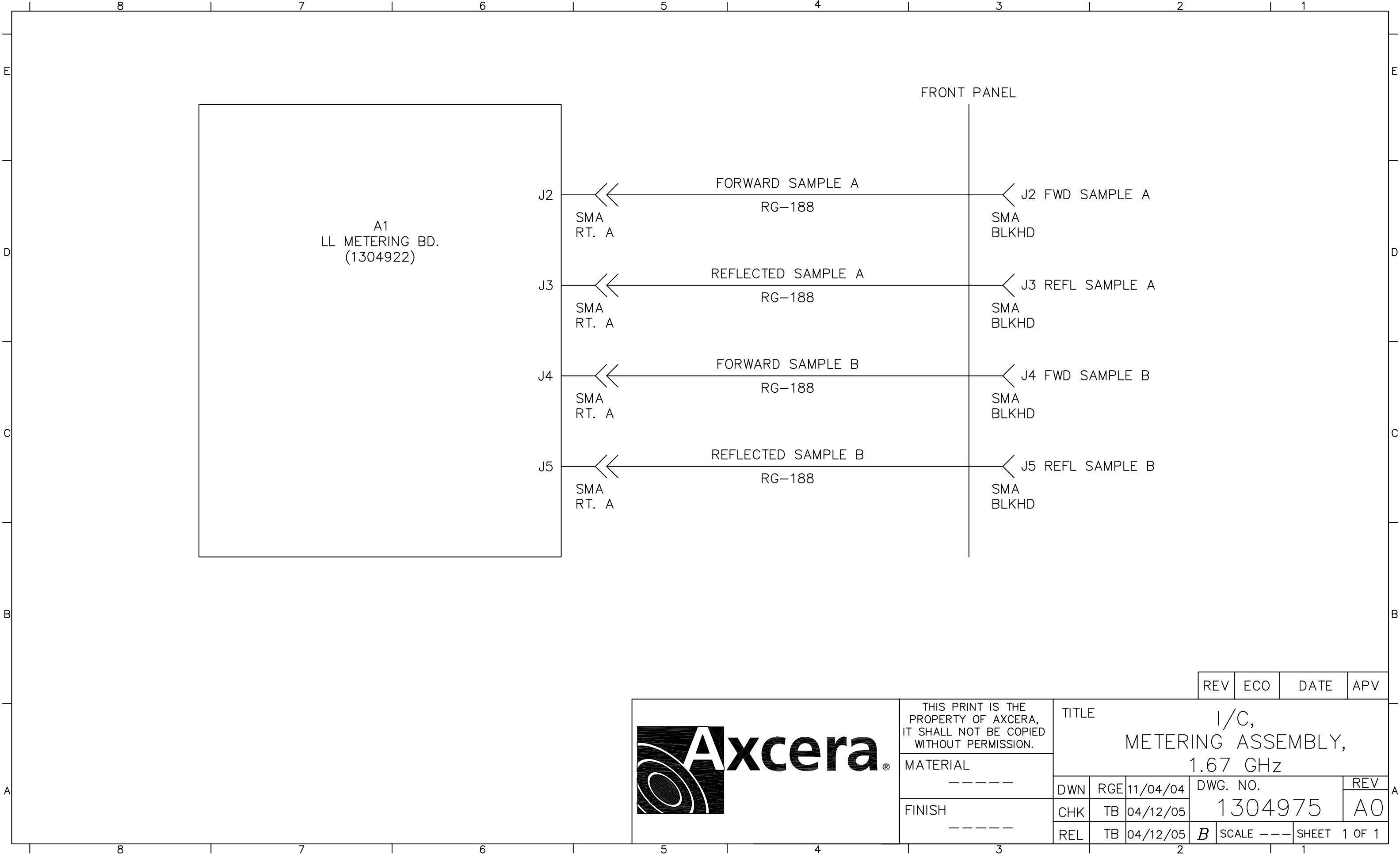




Axcera				REV	ECO	DATE	APV
THIS PRINT IS THE PROPERTY OF AXCERA, IT SHALL NOT BE COPIED WITHOUT PERMISSION				TITLE SCH, BACKPLANE BOARD, 1670 (1304891)			
MATERIAL				DWN	DB	10/11/04	DWG. NO.
FINISH				CHK	DB	10/13/04	1304893
REL				REL	DB	10/13/04	D
SCALE				SHEET 1 OF 1			



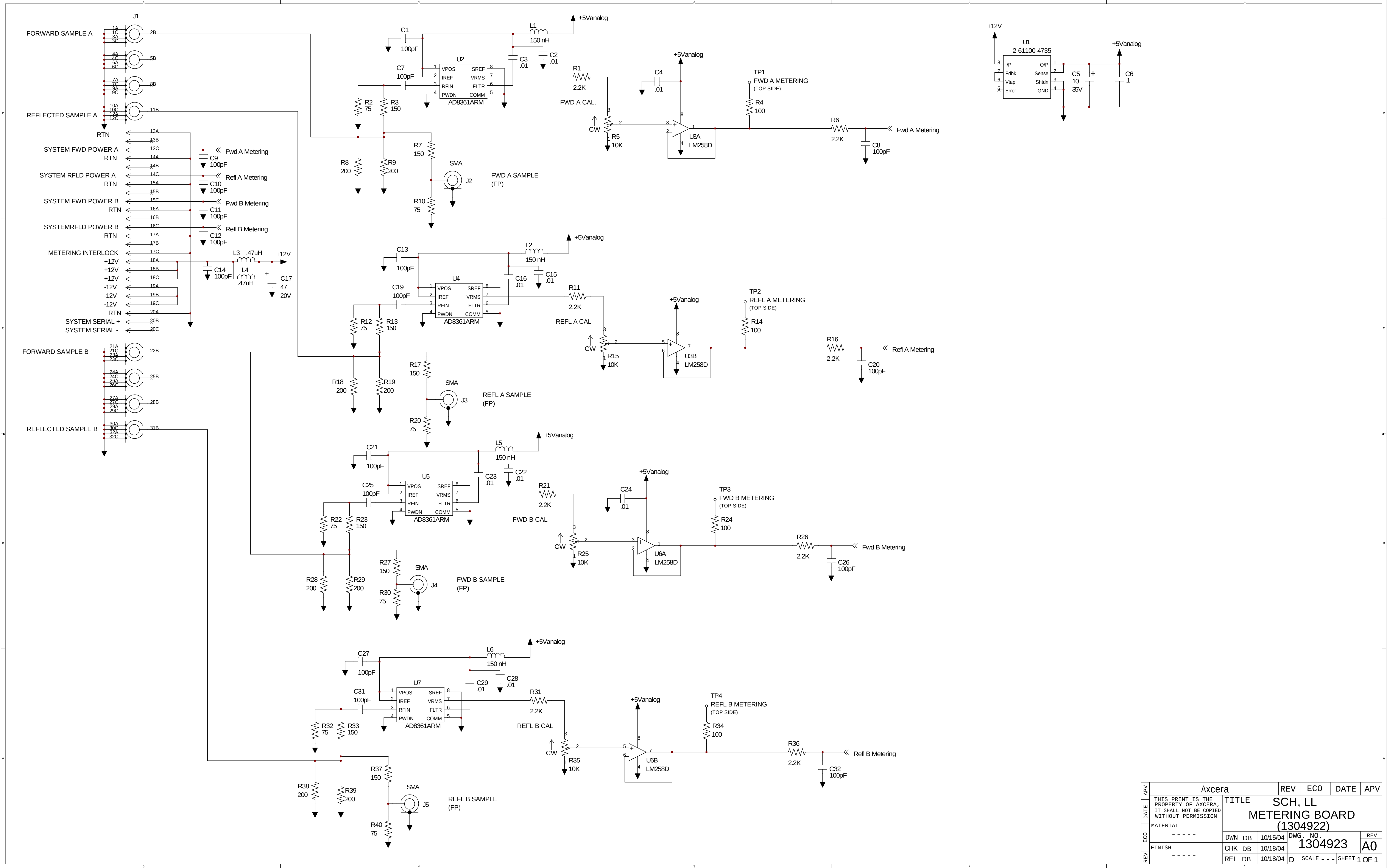
THIS PRINT IS THE
PROPERTY OF AXCERA,
IT SHALL NOT BE COPIED
WITHOUT PERMISSION.

MATERIAL

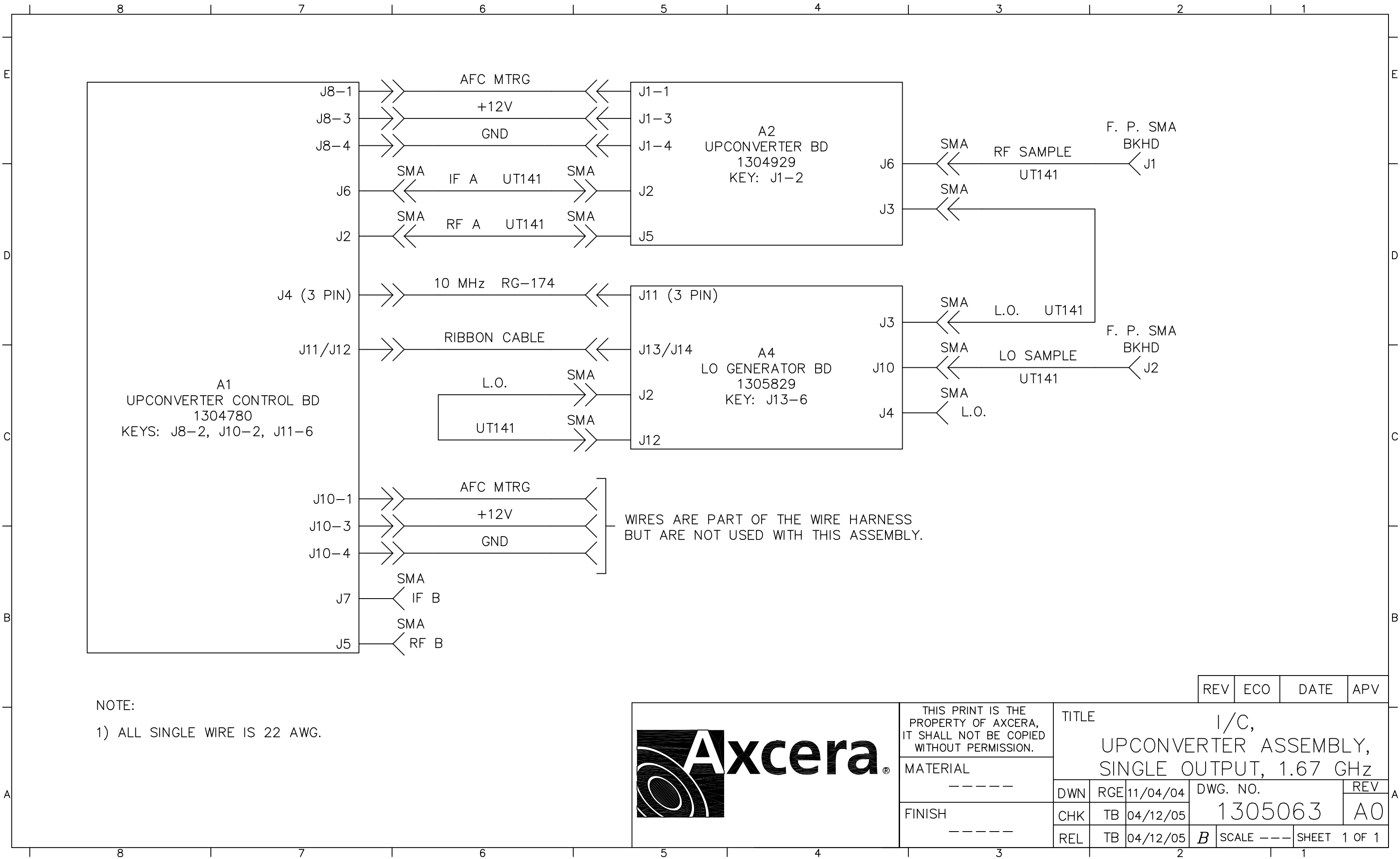
FINISH

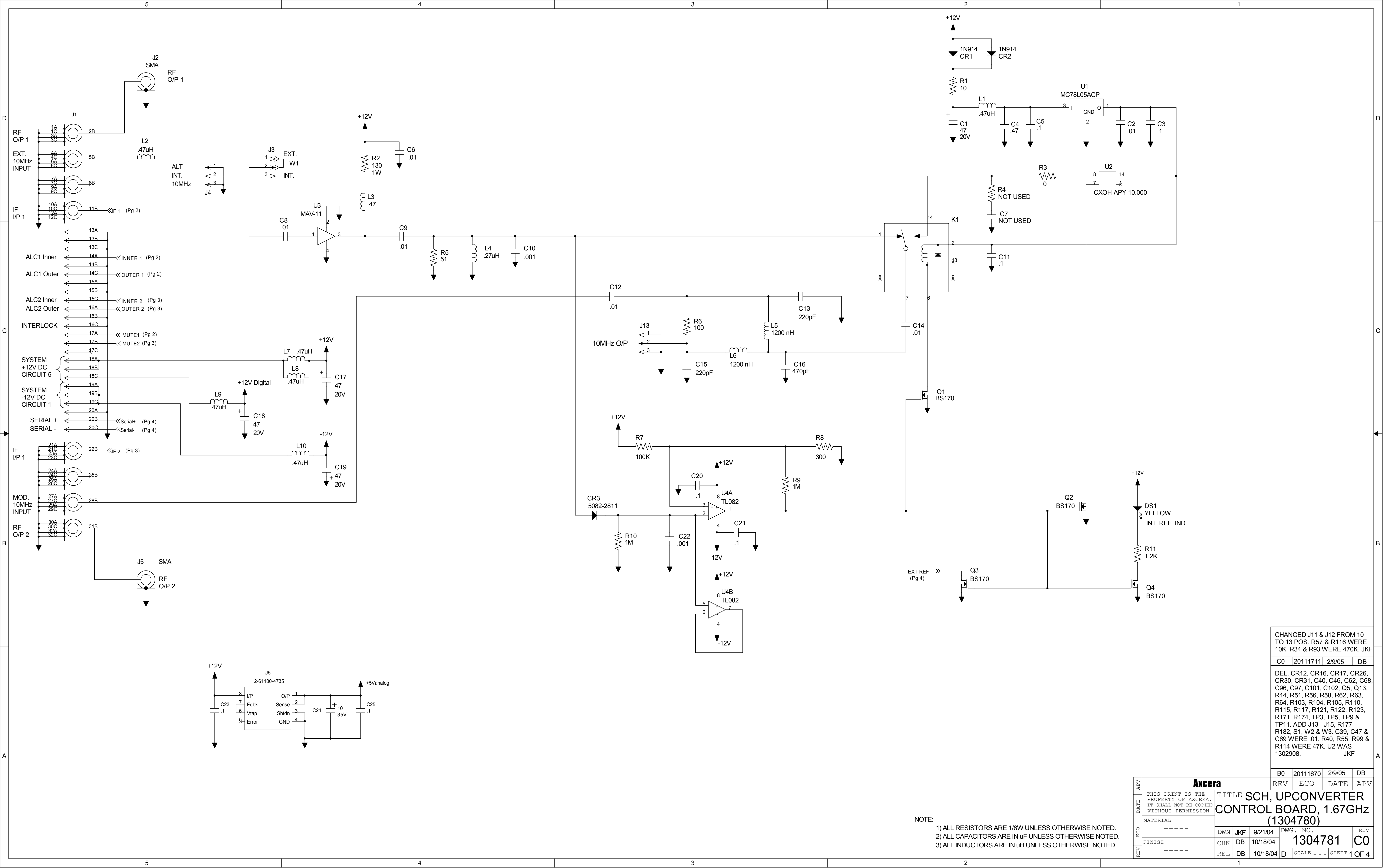
TITLE
I/C,
METERING ASSEMBLY,
1.67 GHz

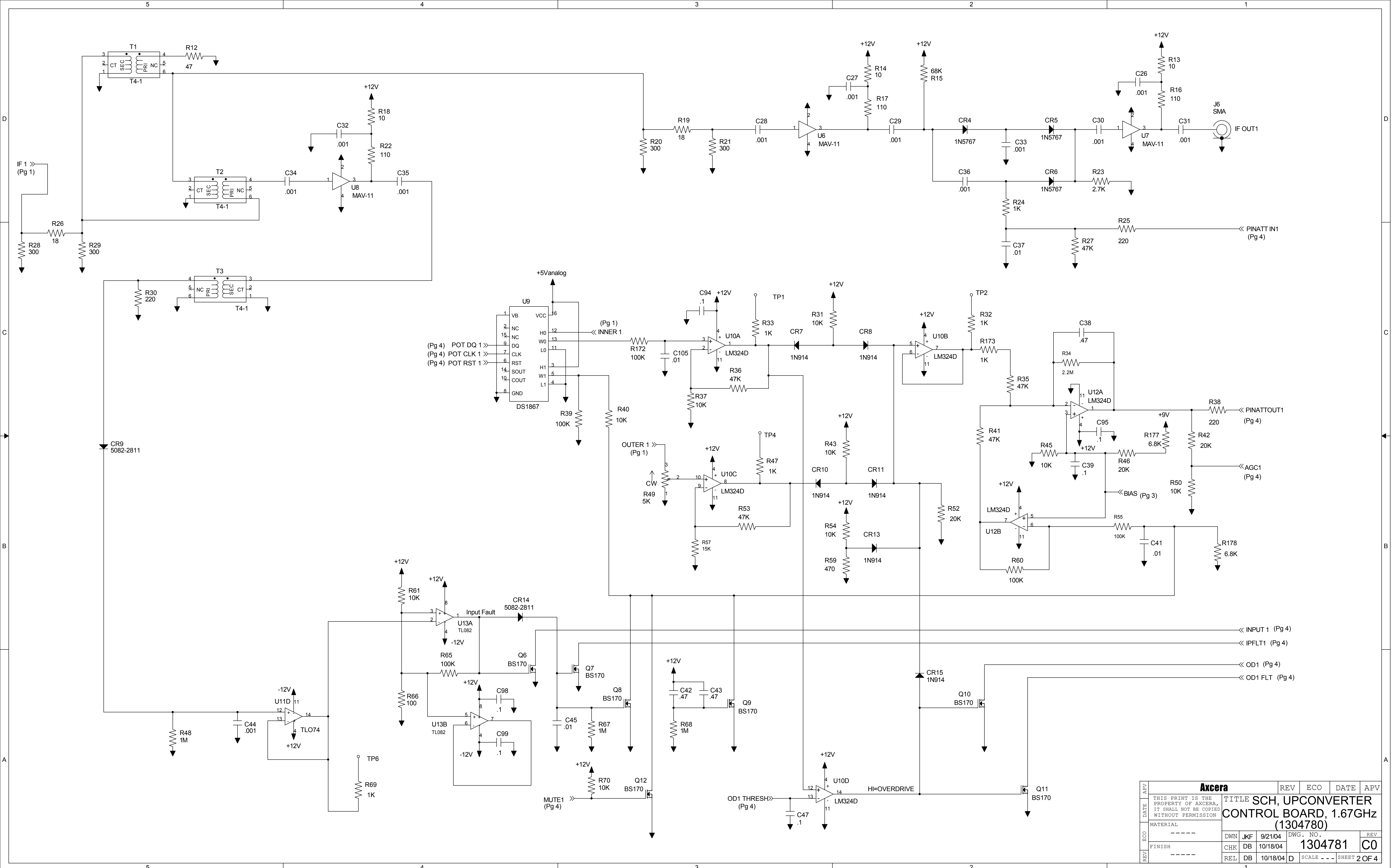
DWN	RGE	11/04/04	DWG. NO.	REV
CHK	TB	04/12/05	1304975	A0
REL	TB	04/12/05	B SCALE ---	SHEET 1 OF 1



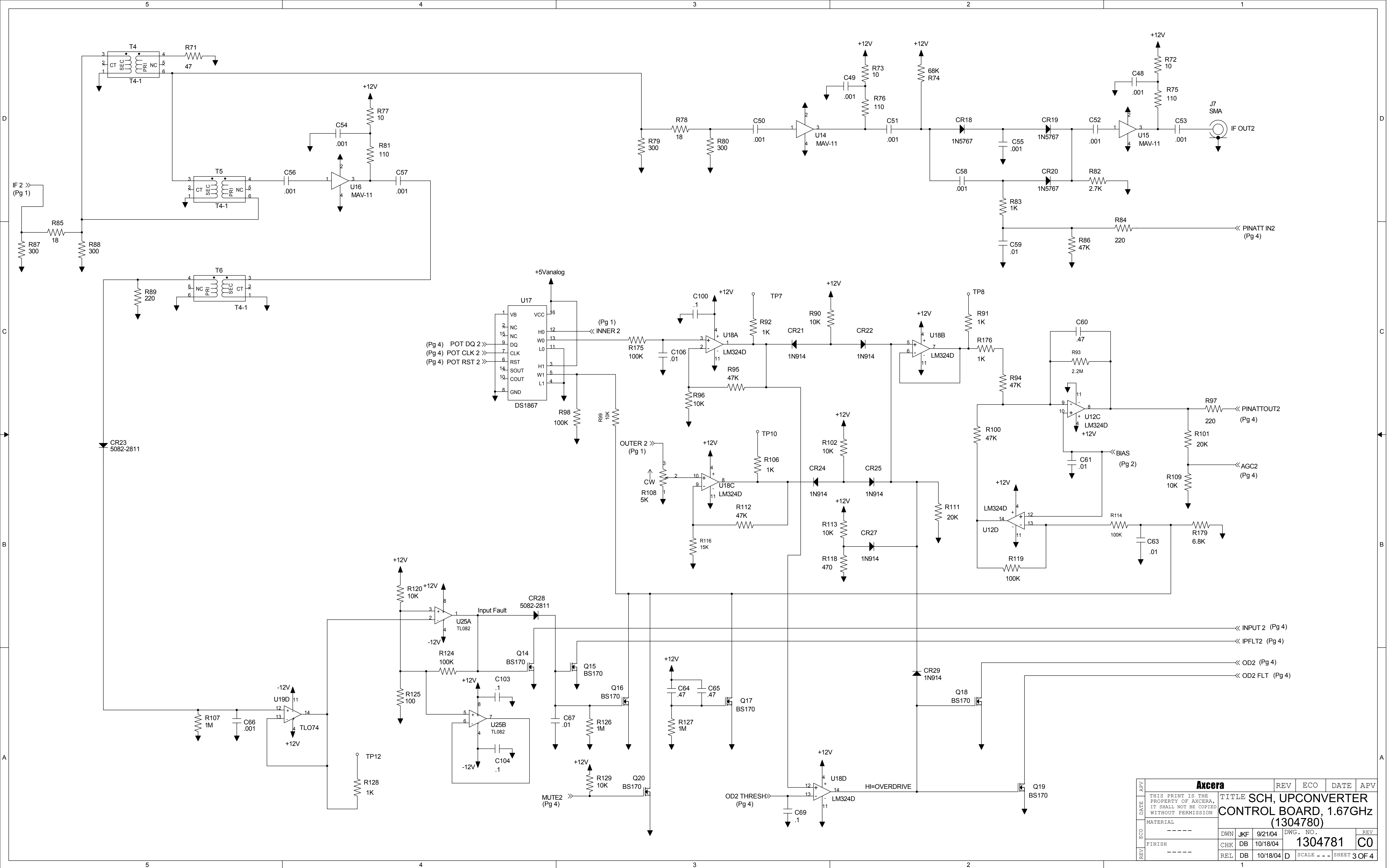
APV	Axcera				REV	ECO	DATE	APV	
DATE	THIS PRINT IS THE PROPERTY OF AXCERA, IT SHALL NOT BE COPIED WITHOUT PERMISSION				TITLE				
MATERIAL					SCH, LL				
ECO	-----				DWN DB 10/15/04			DWG. NO.	REV
REV	FINISH				CHK DB 10/18/04			1304923	A0
	-----				REL DB 10/18/04			D SCALE - - -	SHEET 1 OF 1

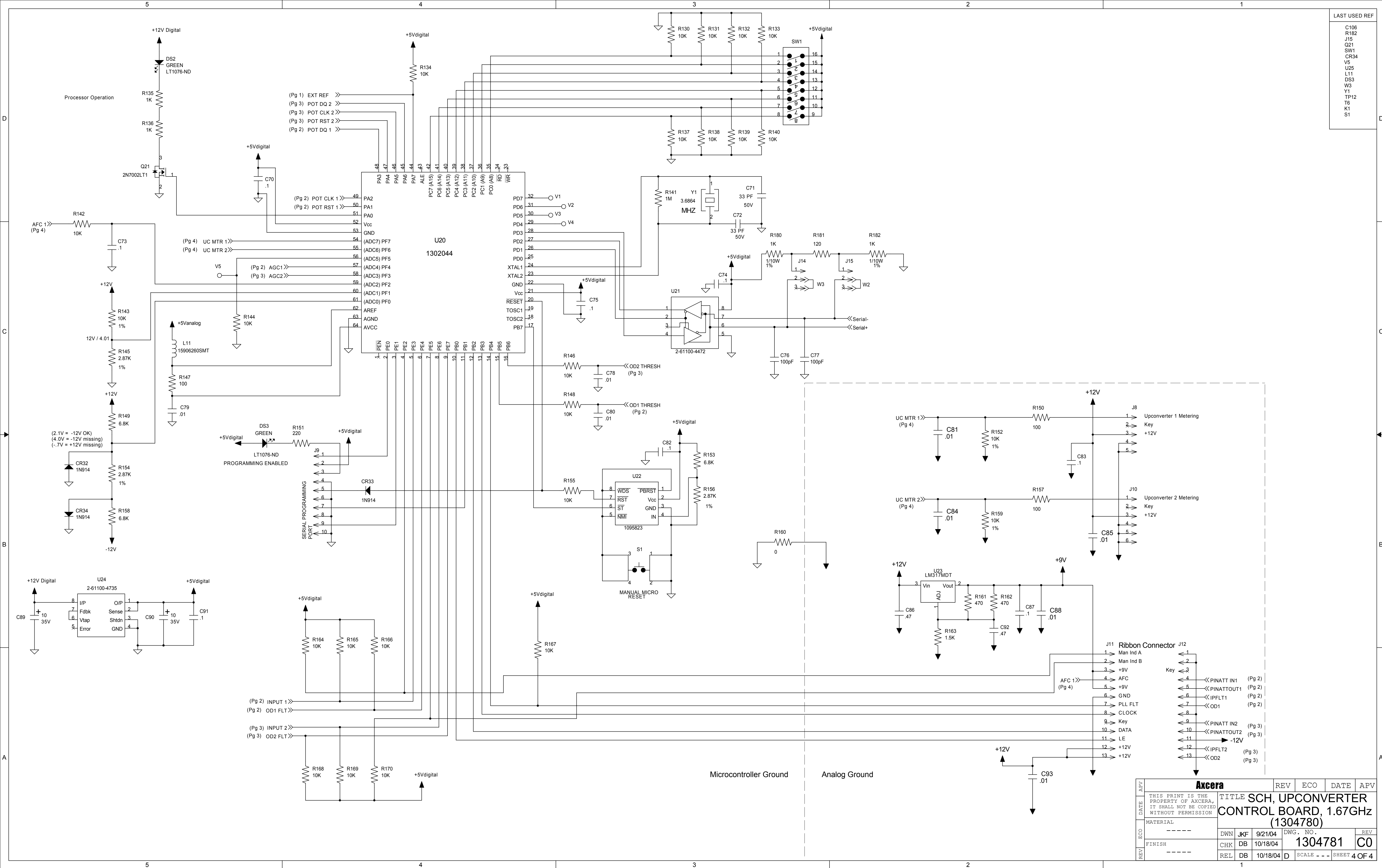


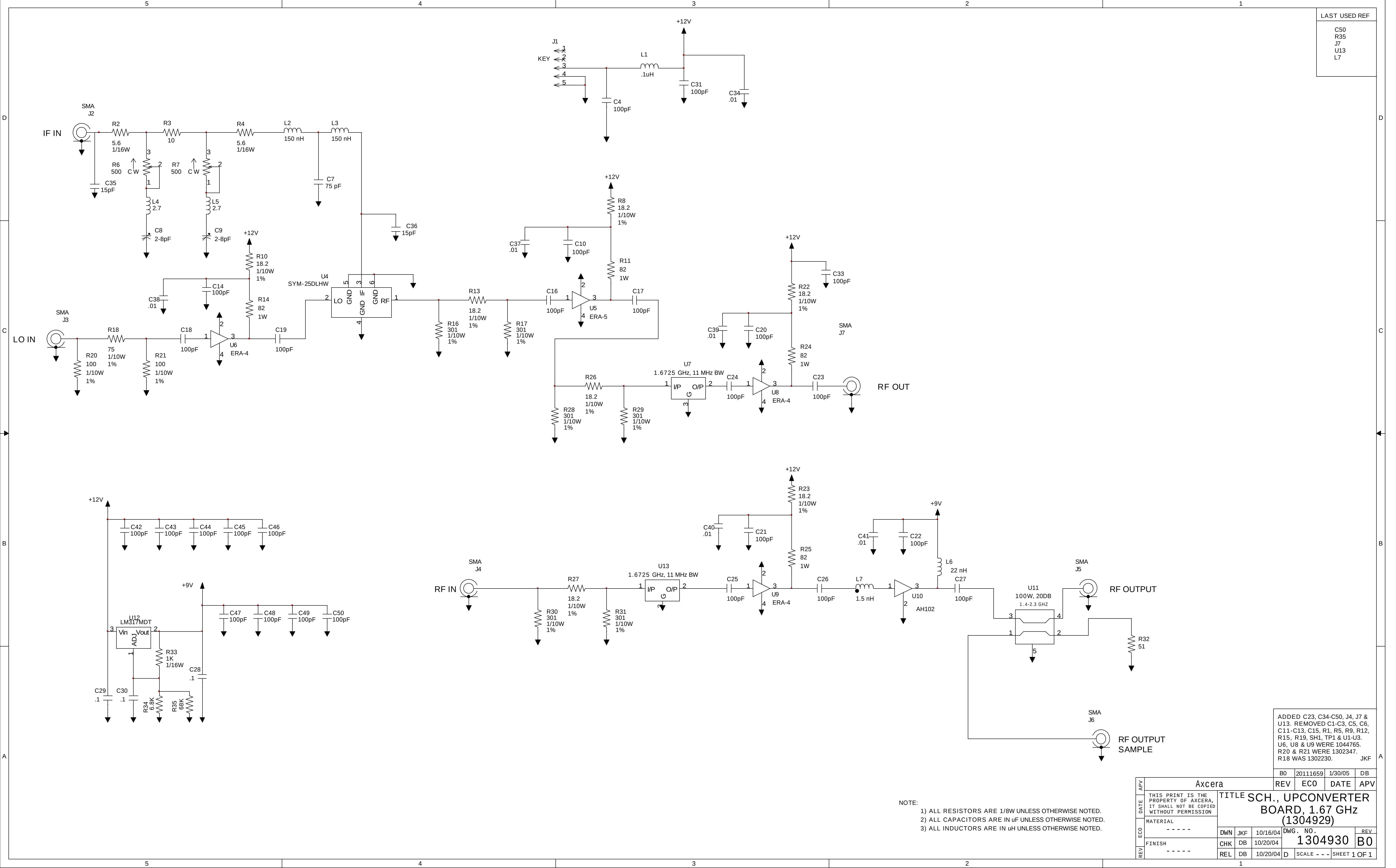




APV		Axcera				REV	ECO	DATE	APV
DATE	THIS PRINT IS THE PROPERTY OF AXCERA, IT SHALL NOT BE COPIED WITHOUT PERMISSION		TITLE SCH, UPCONVERTER CONTROL BOARD, 1.67GHz (1304780)						
ECO	MATERIAL		DWN	JKF	9/21/04	DWG. NO.		REV	
	FINISH		CHK	DB	10/18/04	1304781		C0	
REV	-----		REL	DB	10/18/04	D	SCALE - - -	SHEET 2 OF 4	





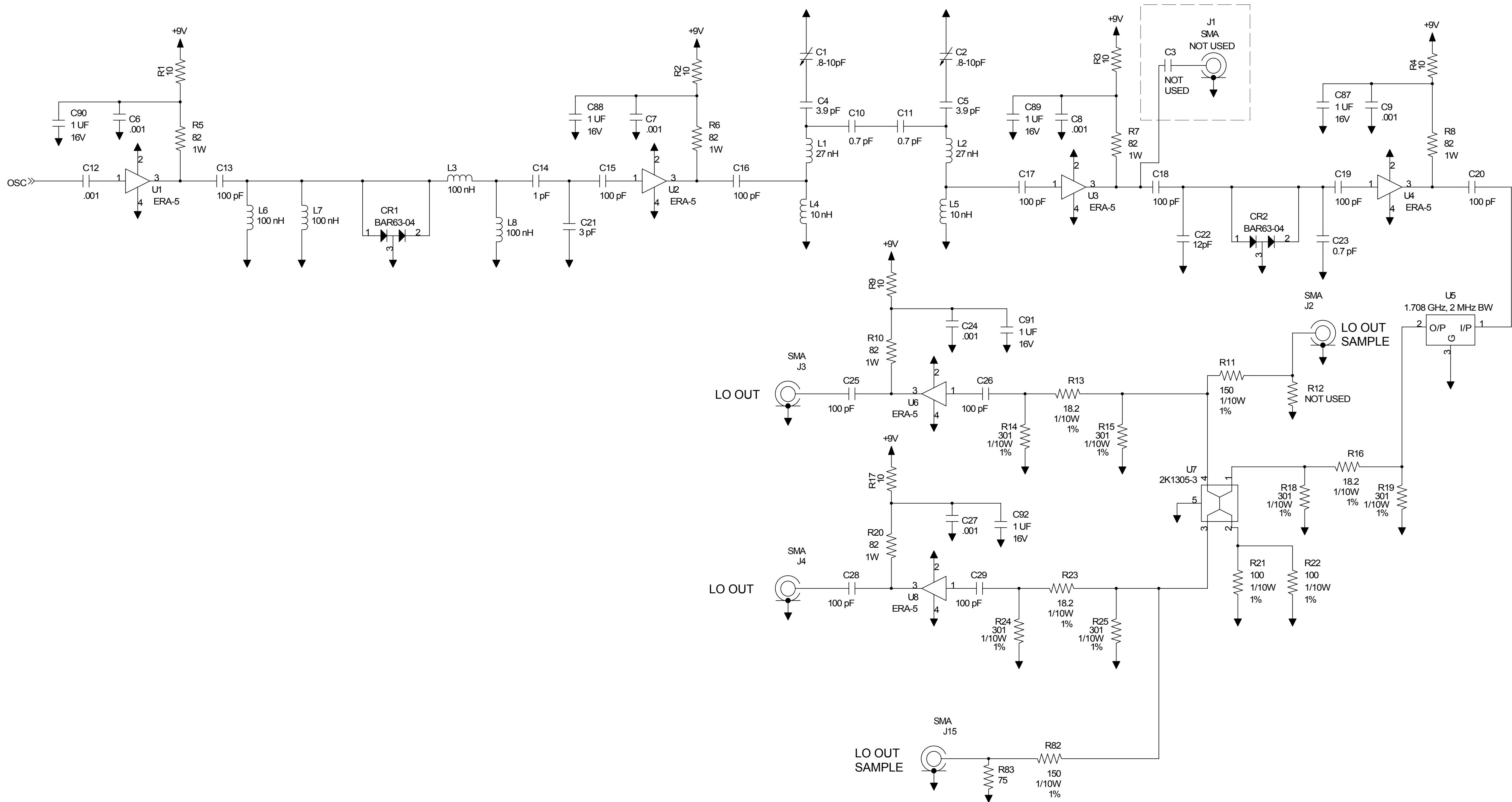


LAST USED REF
C50
R35
J7
U13
L7

NOTE:
1) ALL RESISTORS ARE 1/8W UNLESS OTHERWISE NOTED.
2) ALL CAPACITORS ARE IN uF UNLESS OTHERWISE NOTED.
3) ALL INDUCTORS ARE IN uH UNLESS OTHERWISE NOTED.

Axcera				REV	ECO	DATE	APV	
DATE	THIS PRINT IS THE PROPERTY OF AXCERA, IT SHALL NOT BE COPIED WITHOUT PERMISSION			TITLE SCH., UPCONVERTER BOARD, 1.67 GHz (1304929)				
ECO	MATERIAL							
REV	- - - -			DWN	JKF	10/16/04	DWG. NO.	REV
	FINISH			CHK	DB	10/20/04	1304930	B0
	- - - -			REL	DB	10/20/04	D	SCALE - - - SHEET 1 OF 1

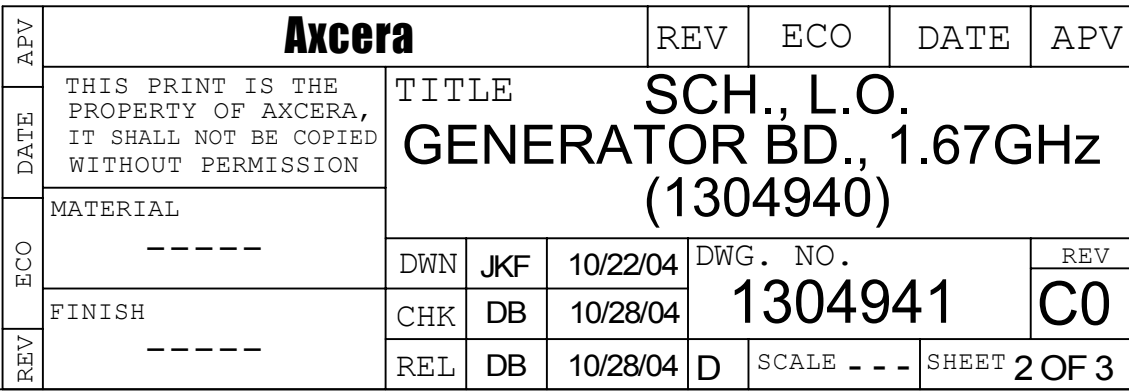
ADDED C23, C34-C50, J4, J7 & U13. REMOVED C1-C3, C5, C6, C11-C13, C15, R1, R5, R9, R12, R15, R19, SH1, TP1 & U1-U3. U6, U8 & U9 WERE 1044765. R20 & R21 WERE 1302347. R18 WAS 1302230. JKF

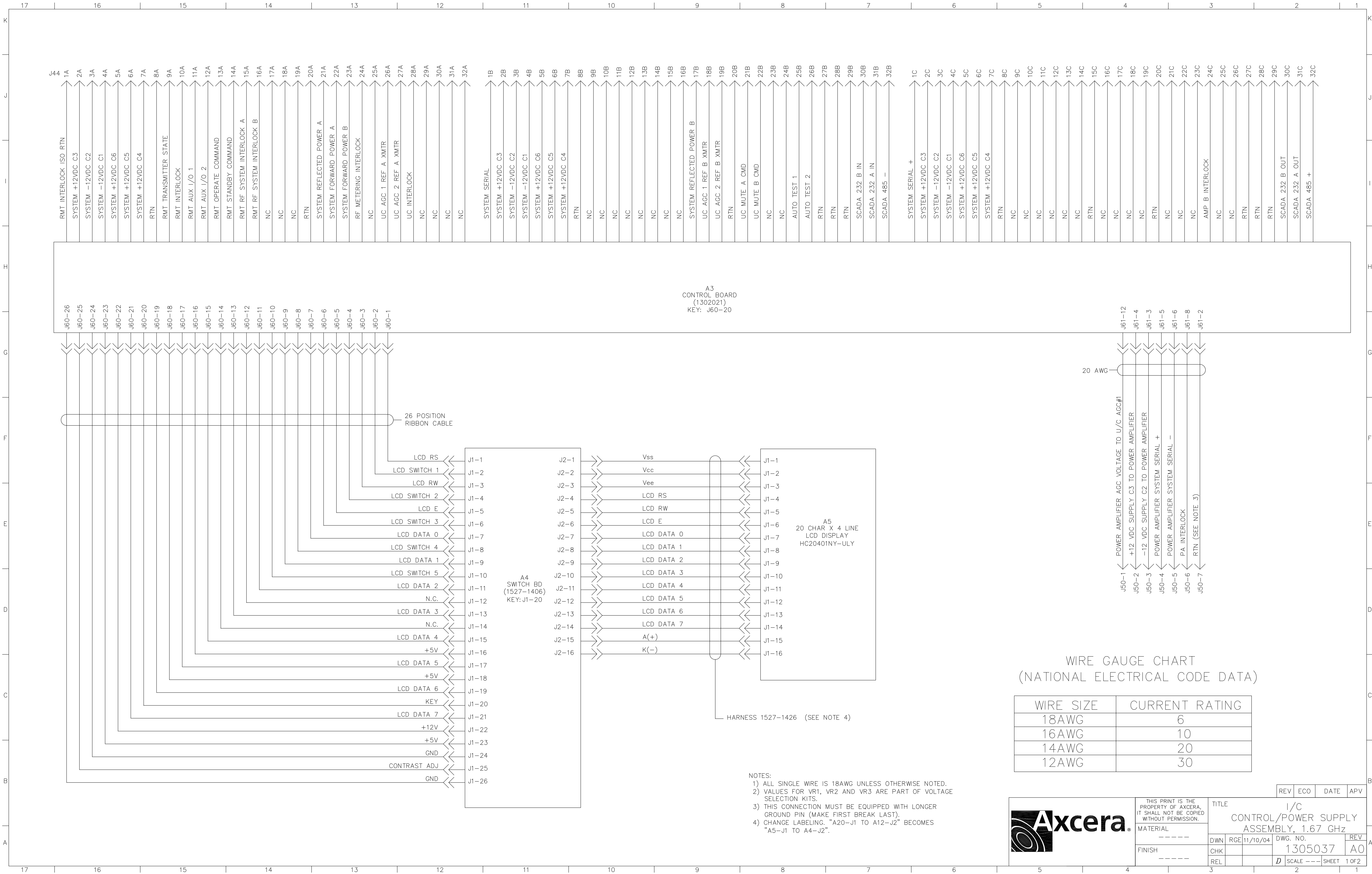


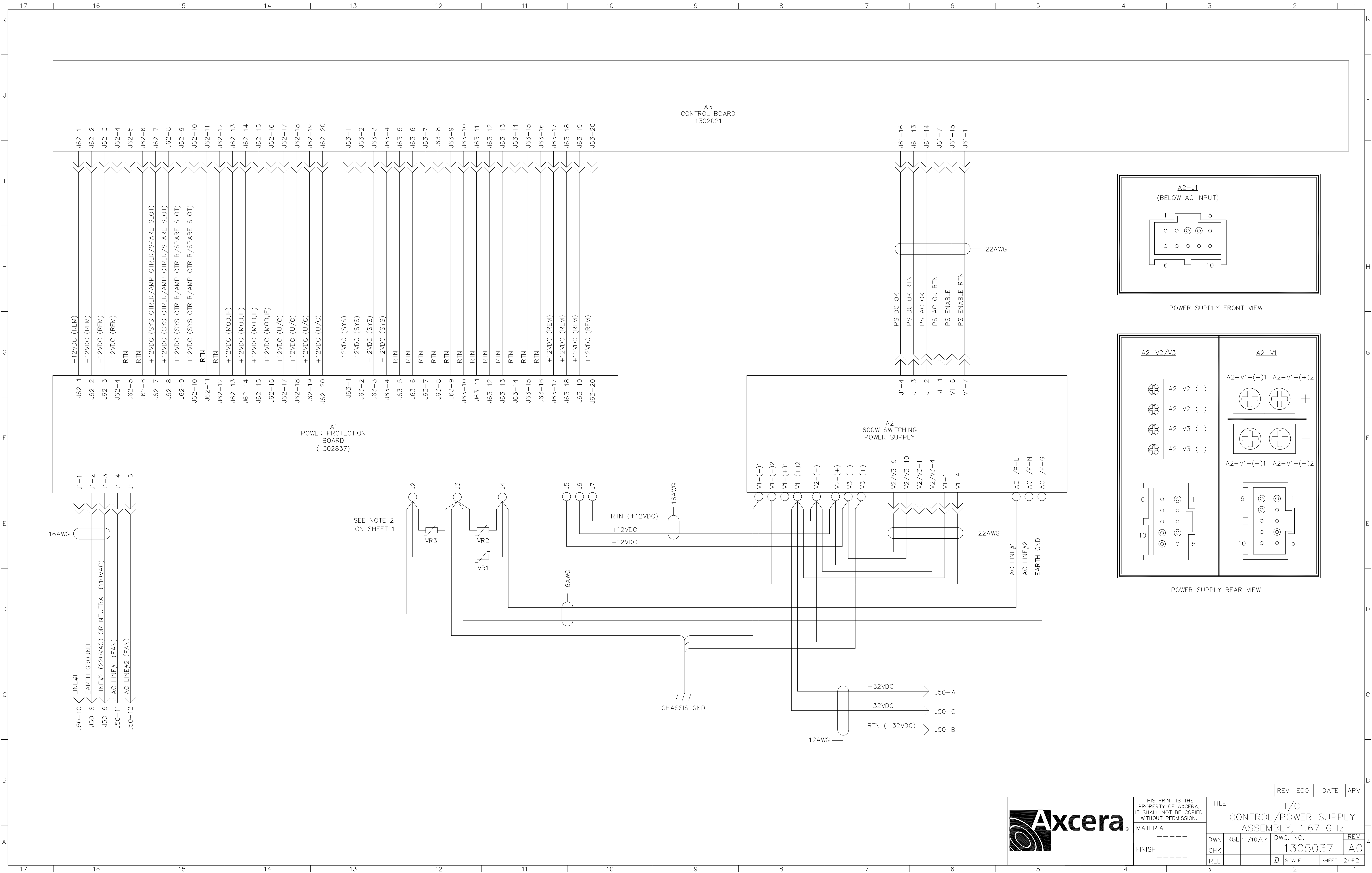
NOTE:
1) ALL RESISTORS ARE 1/8W UNLESS OTHERWISE NOTED.
2) ALL CAPACITORS ARE IN uF UNLESS OTHERWISE NOTED.
3) ALL INDUCTORS ARE IN uH UNLESS OTHERWISE NOTED.

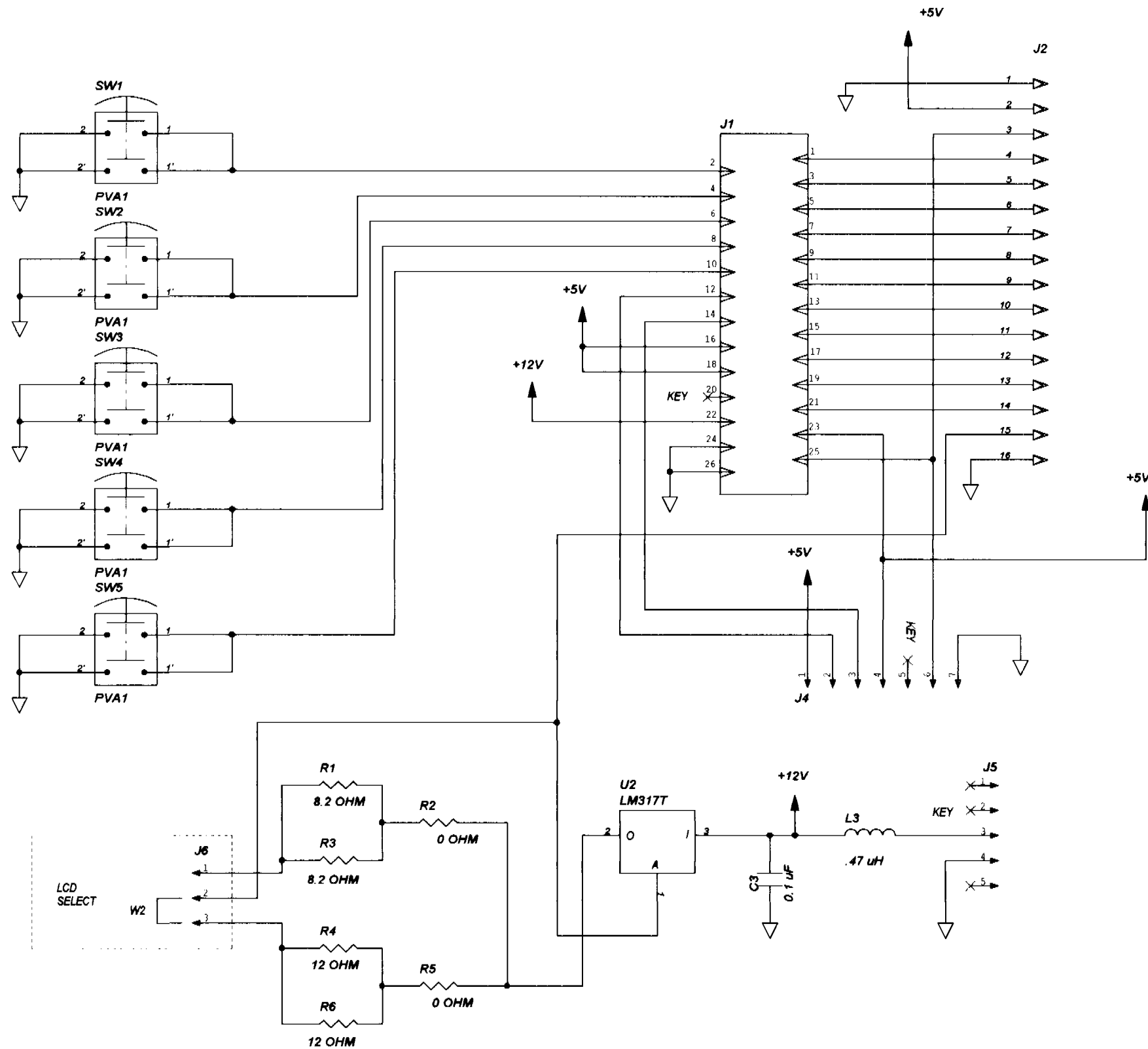
REV	ECO	DATE	APV	Axcera				TITLE			
				REV	ECO	DATE	APV	SCH., L.O. GENERATOR BD., 1.67GHz (1304940)			
FINISH	REL	CHK	DWN	DB	DB	10/28/04	D	SCALE	D	DWG. NO.	REV
----	----	----	----	----	----	----	----	----	----	1304941	C0
----	----	----	----	----	----	----	----	----	----	1 OF 3	----

ADDED PAGE 3, C96, Q5 - Q18 & R87 - R108. JKF			
B0	20111664	3/18/05	DB
ADD C87 - C95, J15, R82 - R86. DEL C74 & R12. C53 WAS 5.1 PF. R62 WAS 3.3K. R11 WAS 301. JKF			
B0	20111664	2/2/05	DB
REV	ECO	DATE	APV



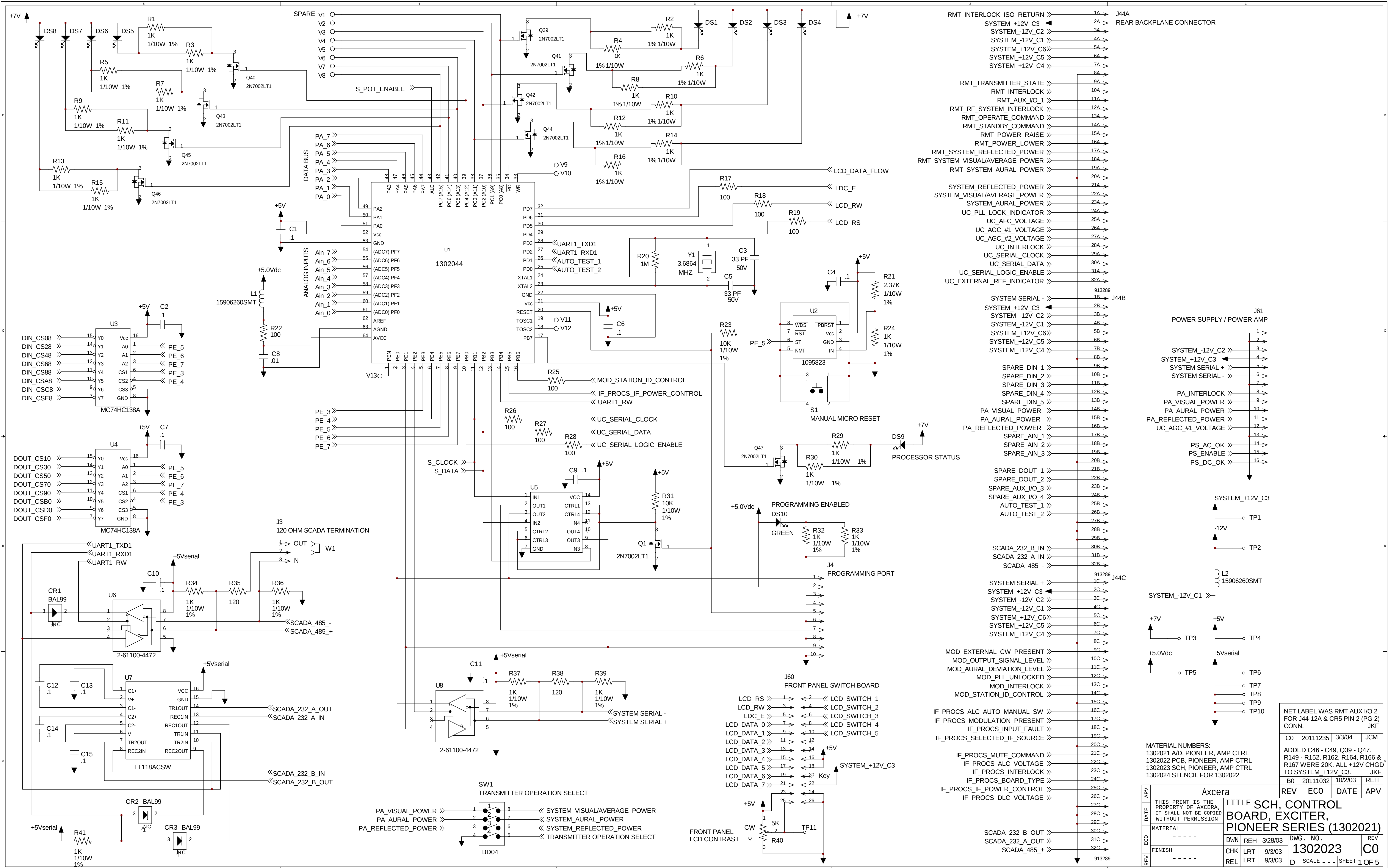






DELETED C1, C2, L1, L2, U1, J3, & W1. MOVED W2 FROM J6-1,-2 TO J6 -2,-3. JKF			
3	8603	11/7/96	RAS
AT J2 W2 WAS W1. (TMY)			
2	8424	9/29/96	JCM
SWITCHED PINS 1 & 2 OF U2. (TMY)			
1	8368	8/27/96	RAS
REV	ECN	DATE	APV

ITS CORPORATION			
THIS PRINT IS THE PROPERTY OF ITS CORP IT SHALL NOT BE COPIED WITHOUT PERMISSION		TITLE	
		SCHEMATIC SWITCH BOARD (1527-1406)	
MATERIAL	DWN	DLM	6/3/96
	CHK	RAS	6/14/96
FINISH	REL	RAS	6/14/96
	REL	RAS	6/14/96
DWG. NO.		REV	
1527-3406		3	
SCALE		SHEET 1 OF 1	

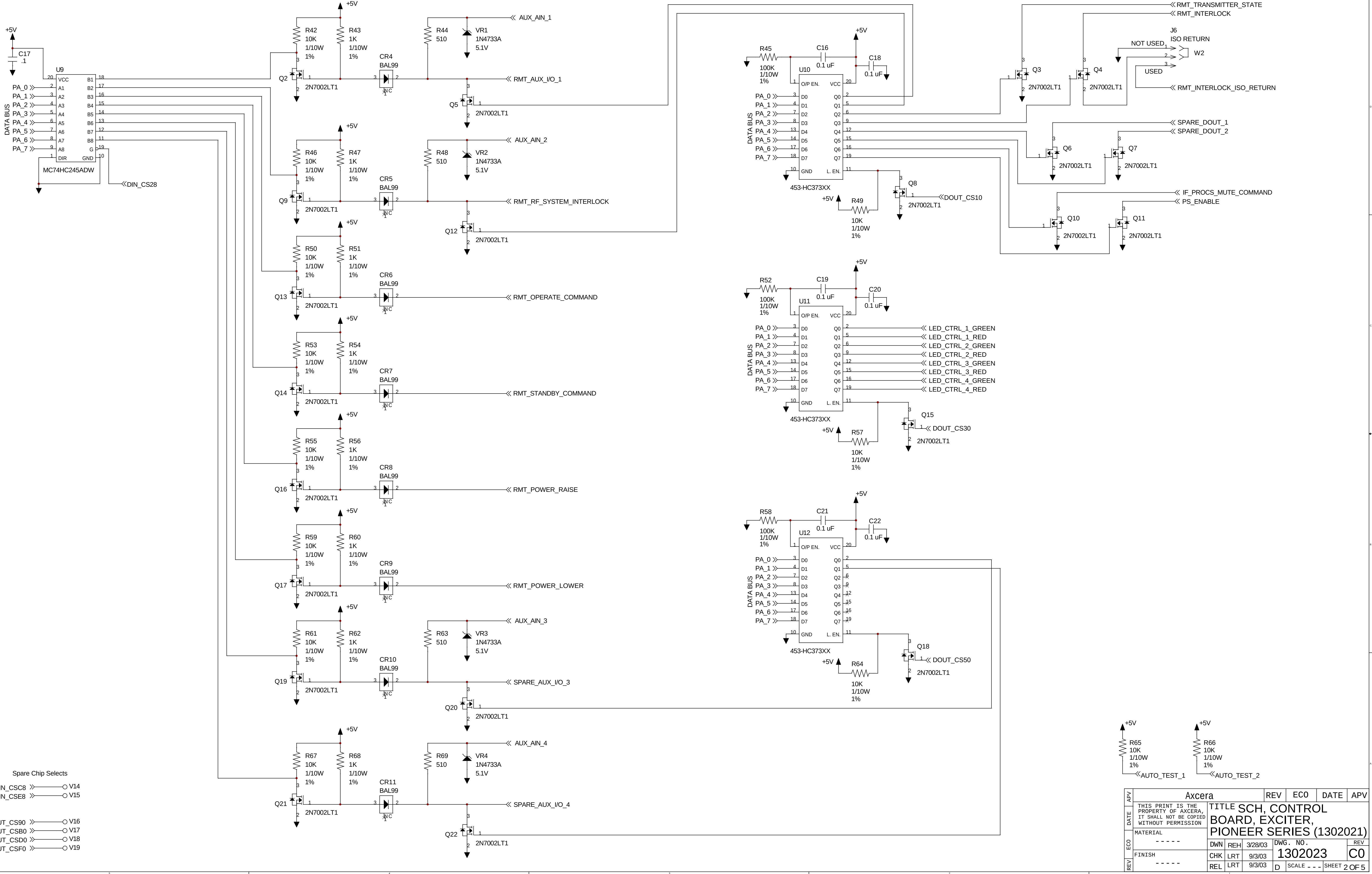


NET LABEL WAS RMT AUX I/O 2 FOR J44-12A & CR5 PIN 2 (PG 2) CONN. JKF

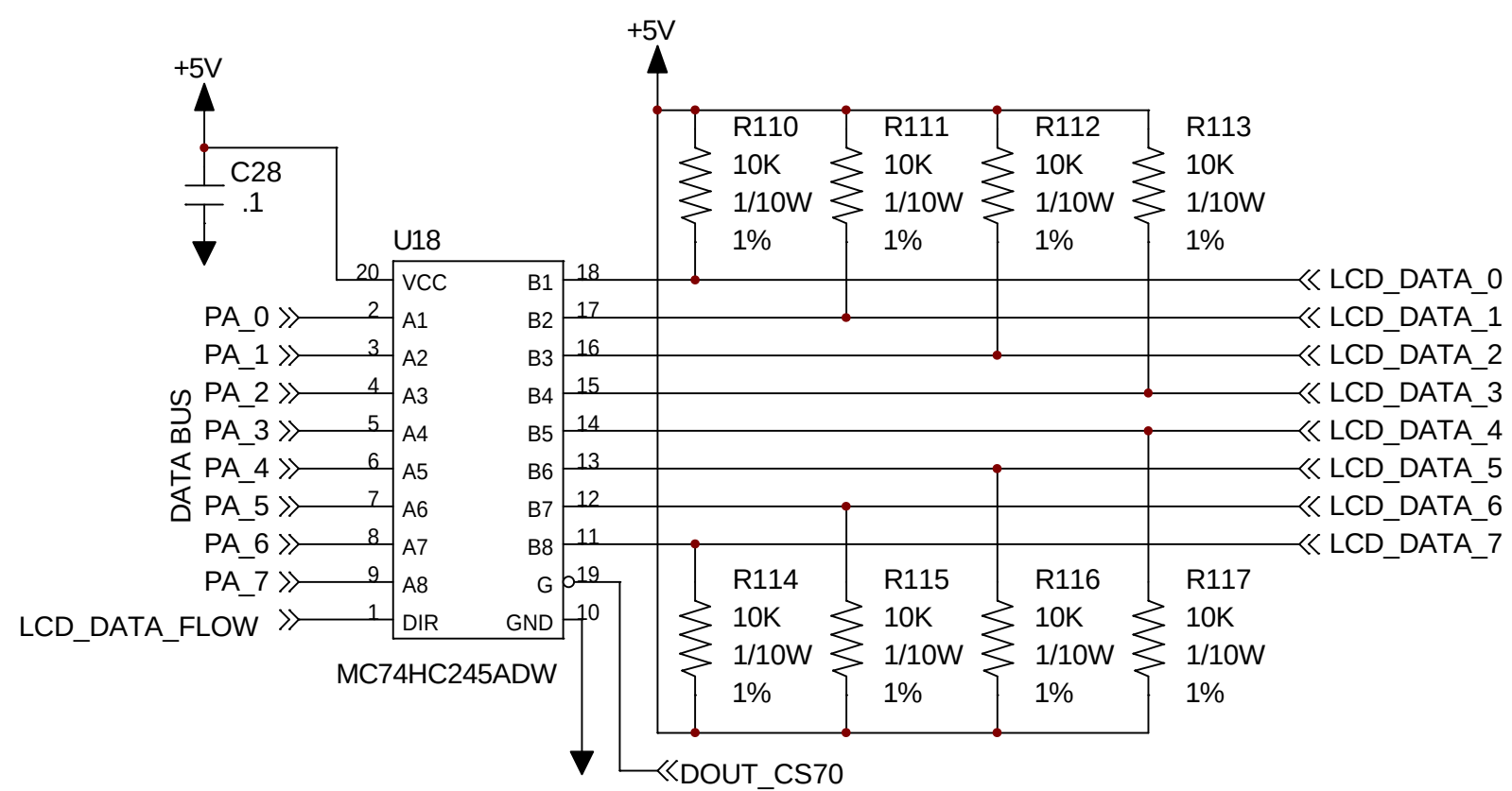
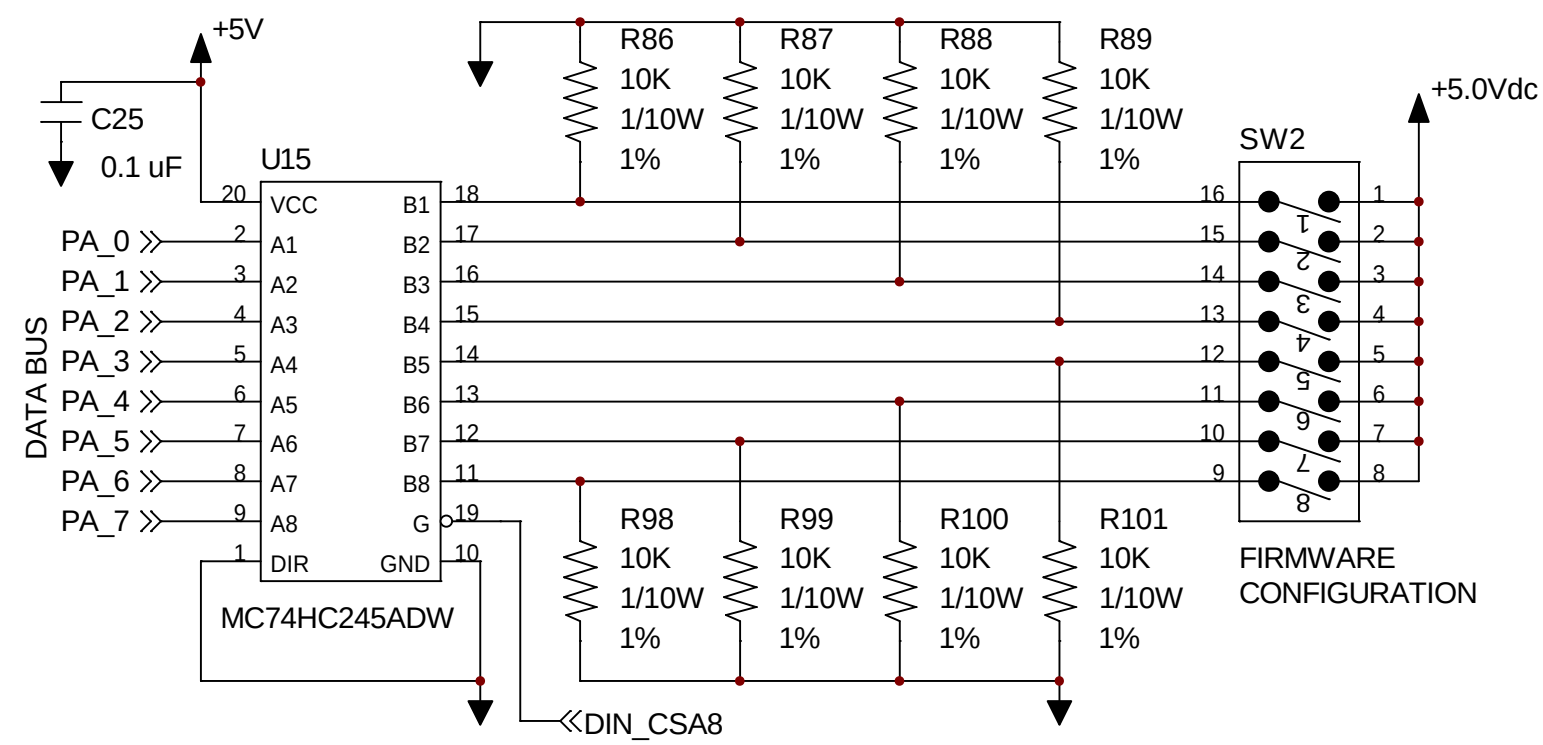
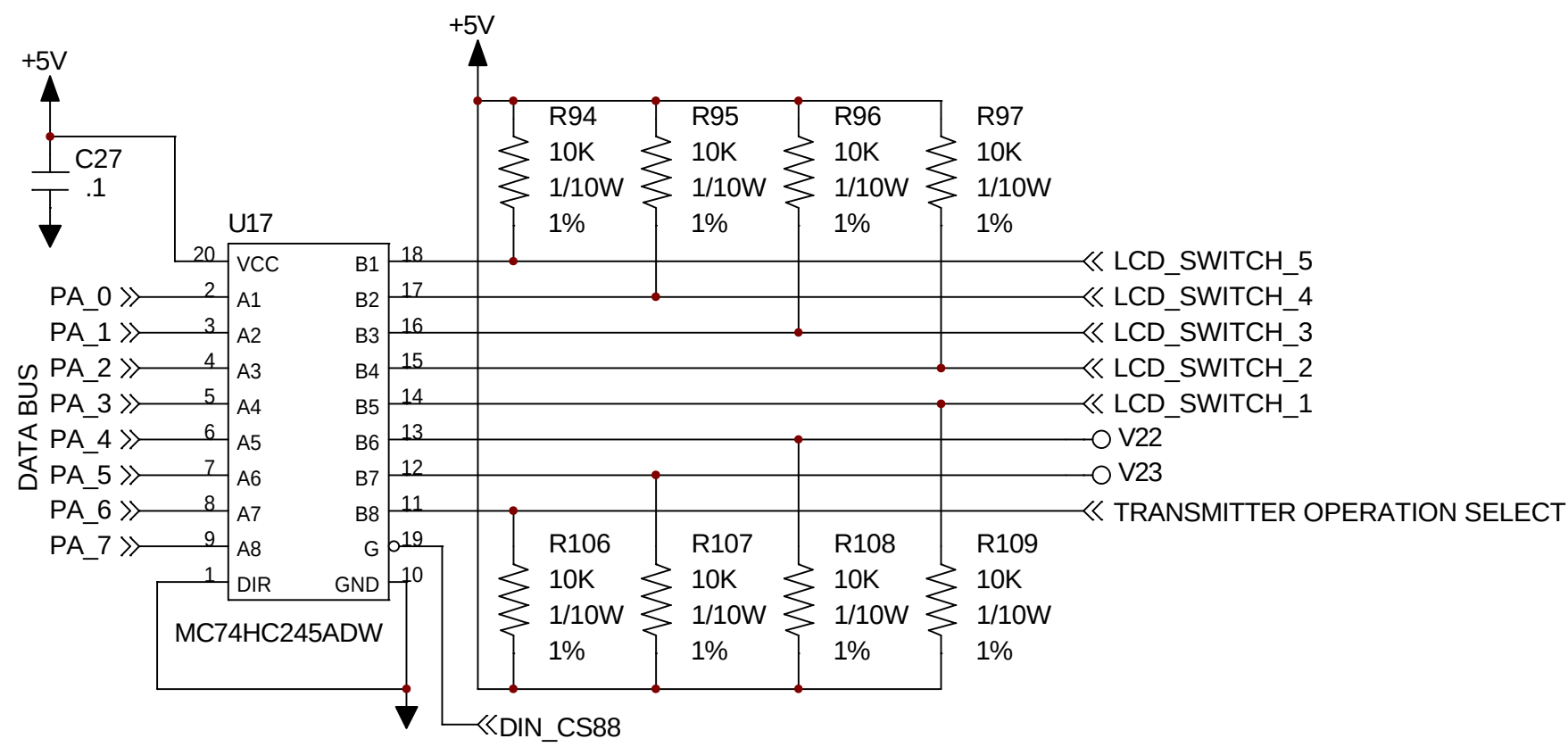
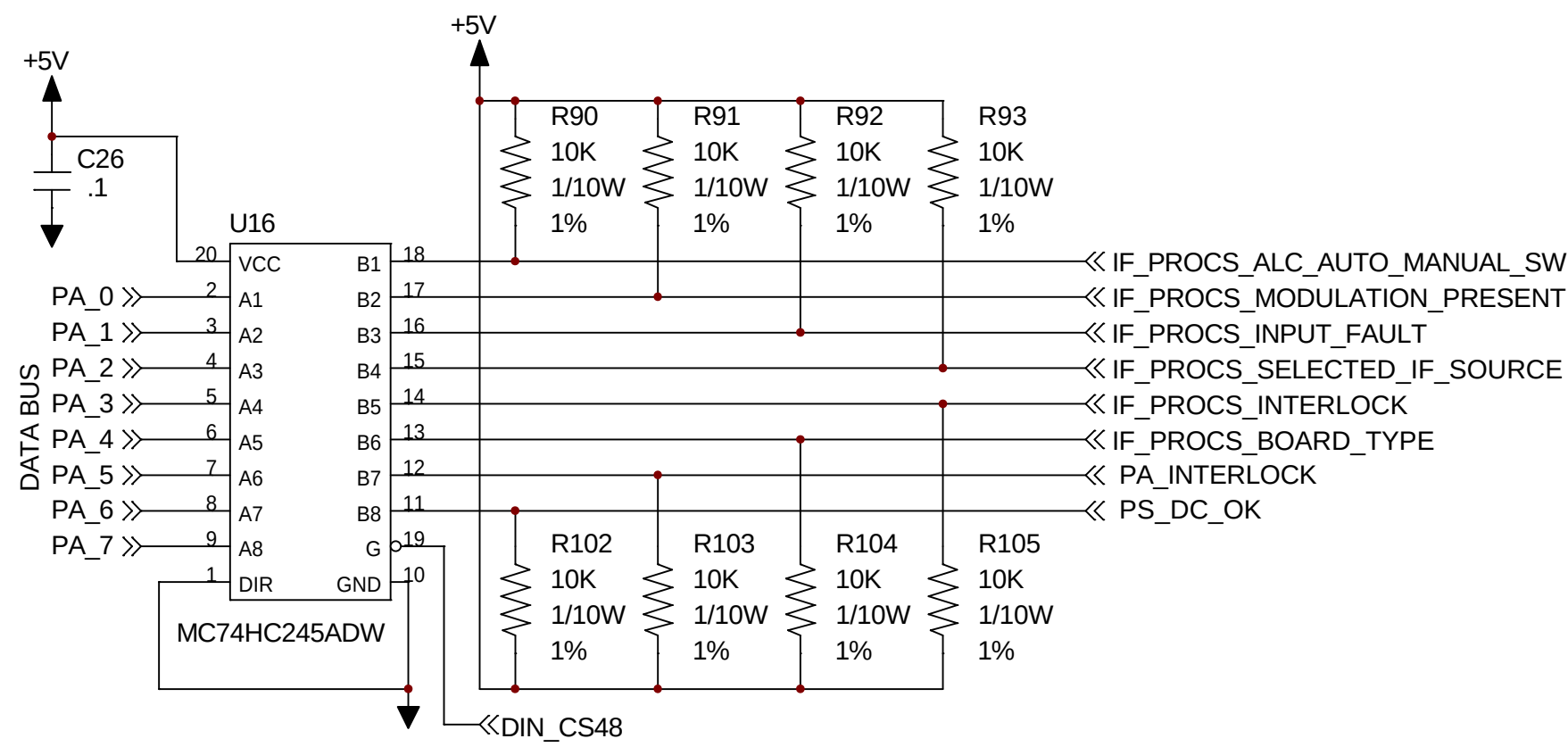
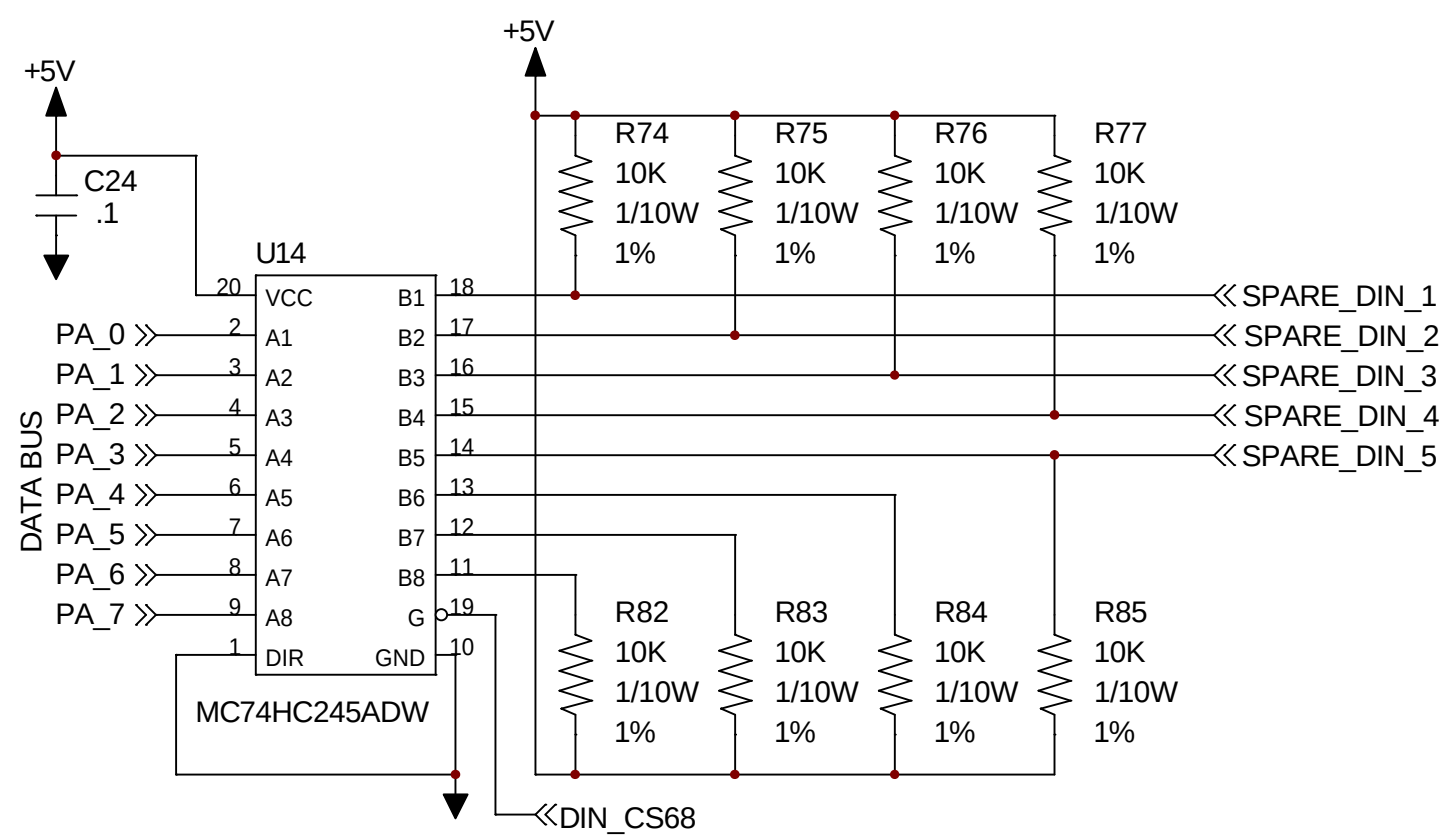
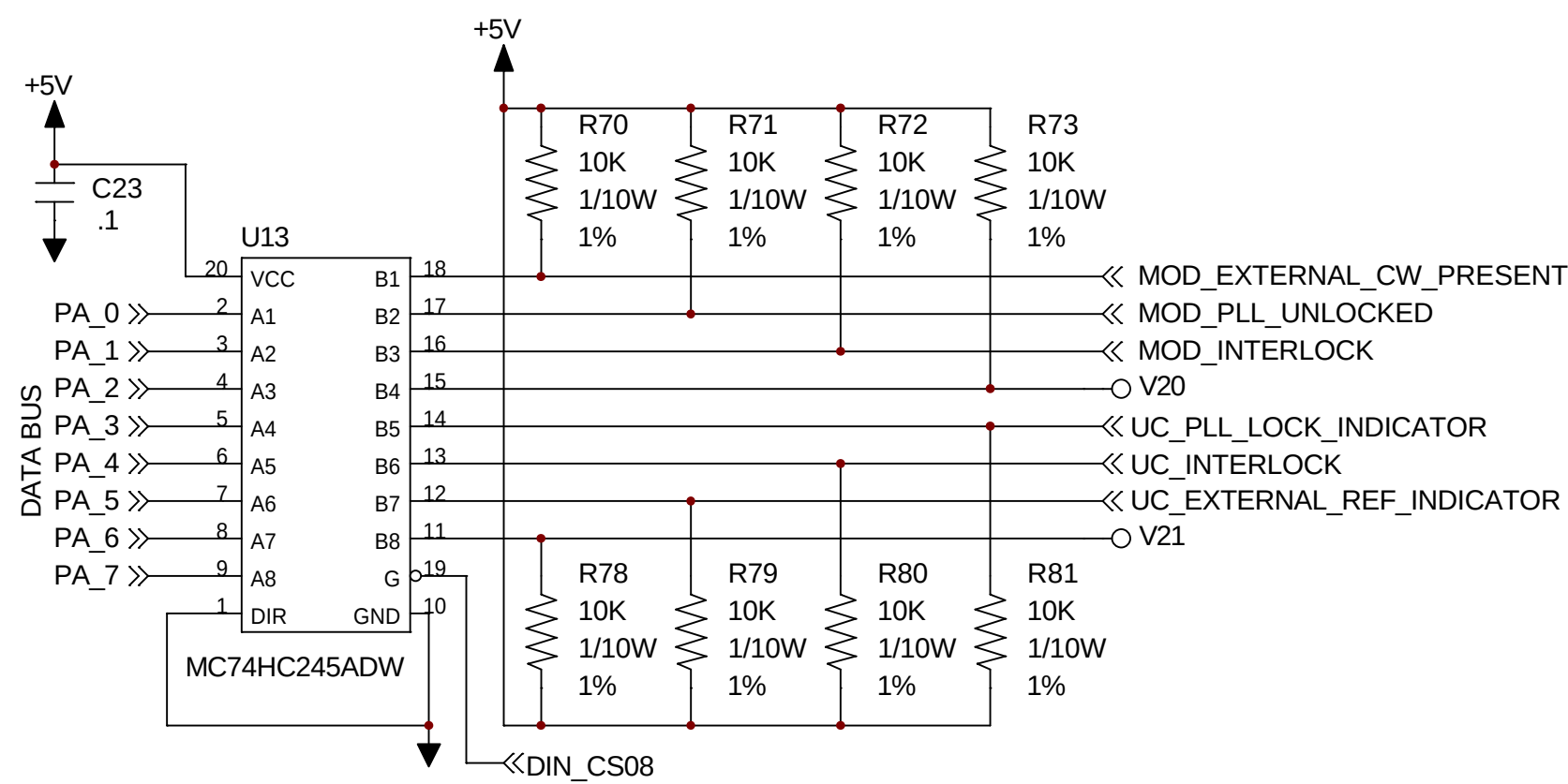
C0	20111235	3/3/04	JCM
----	----------	--------	-----

MATERIAL NUMBERS:
1302021 A/D, PIONEER, AMP CTRL
1302022 PCB, PIONEER, AMP CTRL
1302023 SCH, PIONEER, AMP CTRL
1302024 STENCIL FOR 1302022

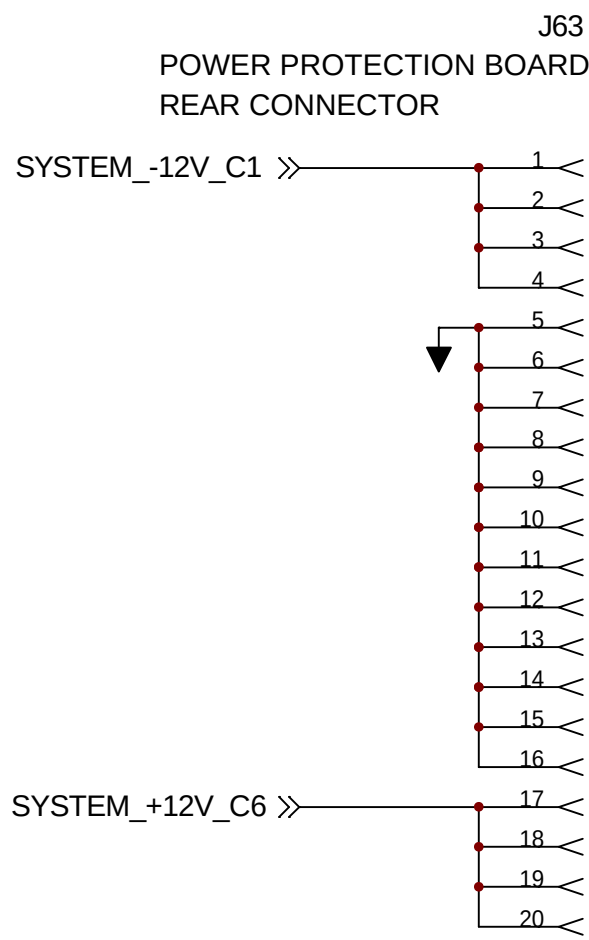
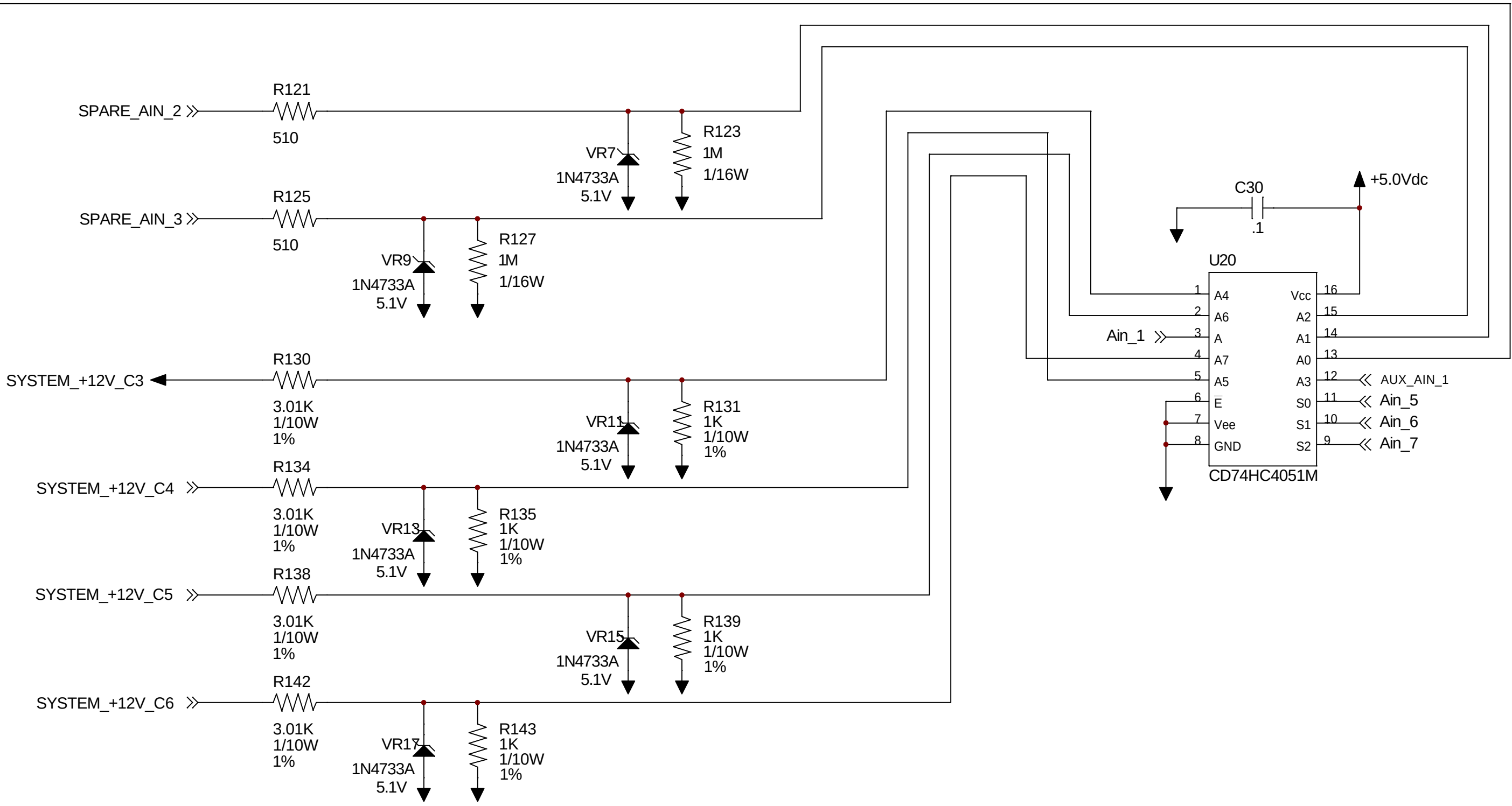
Axcera				REV	ECO	DATE	APV
DATE	THIS PRINT IS THE PROPERTY OF AXGERA, IT SHALL NOT BE COPIED WITHOUT PERMISSION			TITLE SCH, CONTROL BOARD, EXCITER, PIONEER SERIES (1302021)			
ECO	MATERIAL			DWN	REH	3/28/03	DWG. NO.
				CHK	LRT	9/3/03	1302023
REV	FINISH			REL	LRT	9/3/03	SHEET 1 OF 5
				D SCALE - - -			



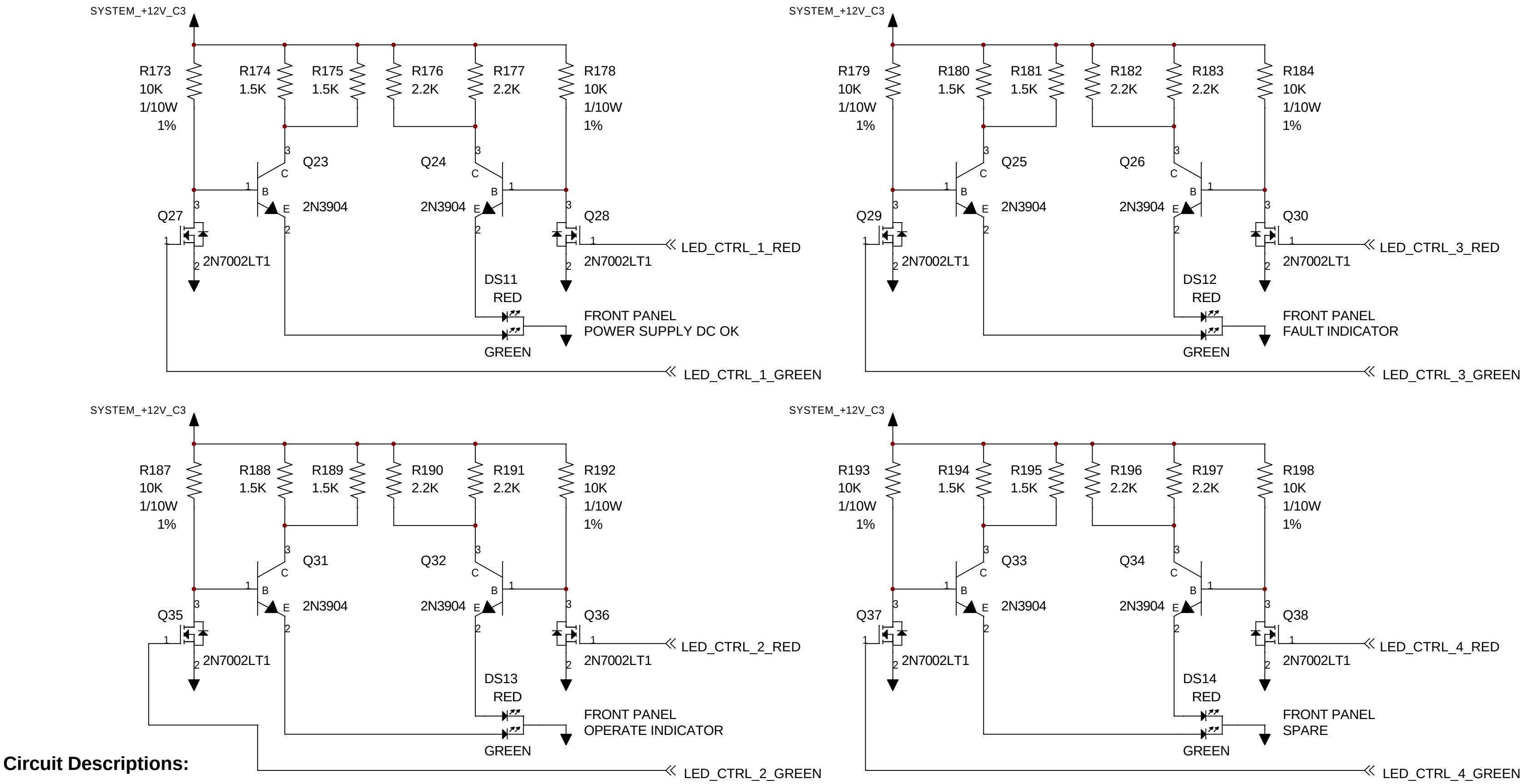
APV	Axcera				REV	ECO	DATE	APV
DATE	THIS PRINT IS THE PROPERTY OF AXCERA, IT SHALL NOT BE COPIED WITHOUT PERMISSION				TITLE SCH, CONTROL BOARD, EXCITER, PIONEER SERIES (1302021)			
ECO	MATERIAL				DWN	REH	3/28/03	DWG. NO.
REV	FINISH				CHK	LRT	9/3/03	1302023
					REL	LRT	9/3/03	C0



APV	Axcera					REV	ECO	DATE	APV			
DATE	THIS PRINT IS THE PROPERTY OF AXCERA, IT SHALL NOT BE COPIED WITHOUT PERMISSION		TITLE SCH, CONTROL BOARD, EXCITER, PIONEER SERIES (1302021)									
ECO			MATERIAL					DWN		REH	3/28/03	DWG. NO.
REV	FINISH		CHK		LRT	9/3/03	1302023		C0			
	-----		REL		LRT	9/3/03	D	SCALE	---	SHEET	3 OF 5	



APV	Axcera				REV	ECO	DATE	APV
DATE	THIS PRINT IS THE PROPERTY OF AXCERA, IT SHALL NOT BE COPIED WITHOUT PERMISSION		TITLE SCH, CONTROL BOARD, EXCITER, PIONEER SERIES (1302021)					
ECO	MATERIAL -----		DWN	REH	3/28/03	DWG. NO.		REV
REV	FINISH -----		CHK	LRT	9/3/03	1302023		C0
			REL	LRT	9/3/03	D	SCALE ---	SHEET 4 OF 5



Circuit Descriptions:

PAGE 1:

U1 is an Atmel Atmega128 microcontroller. This part is in-circuit programmed using the serial programming port. When the microcontroller is held in reset by either the programming port or the external watchdog IC, a transistor inverts the reset signal while serial programming lines are connected to U1 through analog switch U5.

U2 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)). The watchdog momentarily resets the microcontroller if Pin 6 (IST) is not clocked every second. A manual reset switch is provided but should not be needed.

Diodes DS1 through DS8 are used for display of auto test results. A test board is used to execute self test routines. When the test board is installed, Auto_Test_1 is held low and Auto_Test_2 is allowed to float at 5 Vdc. This is the signal to start the auto test routines.

U3 and U4 are used to selectively enable various input and output ICs found on page 2 and 3 of the schematic.

U1 has two serial ports available. In this application, one port is used to communicate with transmitter system components where U1 is the master of a RS-485 serial bus. The other serial port is used to provide serial data I/O where U1 is not the master of the data port. A dual RS-232 port driver IC and a RS-485 port driver is also in the second serial data I/O system. The serial ports are wired such that serial data input can come through one of the three serial port channels. Data output is sent out through each of the three serial port channels.

Switch SW1 is used to select either transmitter operation or exciter driver operation. When the switches of SW1 are on, transmitter operation is selected and the power monitoring lines of the transmitter's power amplifier are routed to the system power monitoring lines.

PAGE 2:

Digital output latches are used to control system devices. Remote output circuits are implemented using open drain FETs with greater than 60 Volt drain to source voltage ratings.

Remote digital inputs are diode protected with a 1 Kohm pull-up resistor to 5Vdc. If the remote input voltage is greater than about 2 volts or floating, a FET is turned on and a logic low is applied to the digital input buffer. If the remote input voltage is less than the turn on threshold of the FET (about 2 Vdc), a logic high is applied to the digital input buffer.

Four of the circuits on page two are auxiliary I/O connections wired for future use. They are wired similar to the remote digital inputs but include a FET for digital output operation. To operate these signals as an input, the associated output FET must be turned off. These circuits are also connected to an analog input multiplexer IC.

PAGE 3:

Several ICs are used as input buffers to allow the microcontroller to monitor various digital input values. Most digital inputs use a 10 Kohm pull-up resistor. The buffer IC used for data transfer to the display is wired for read and write control.

PAGE 4:

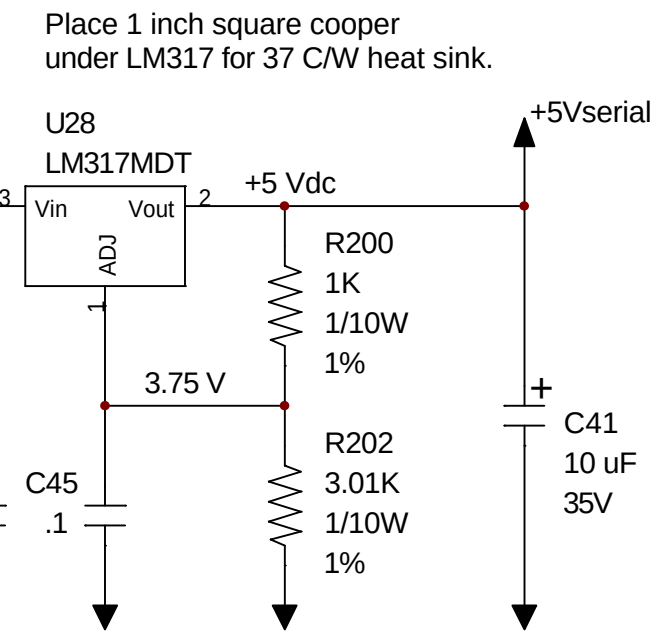
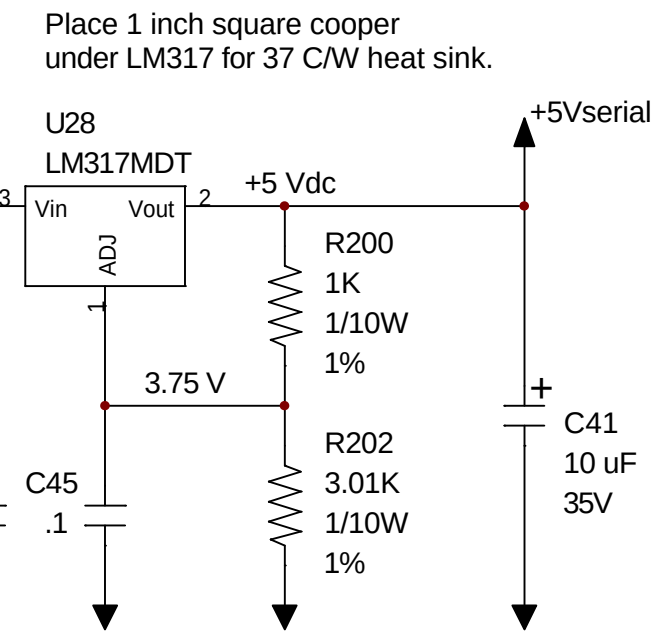
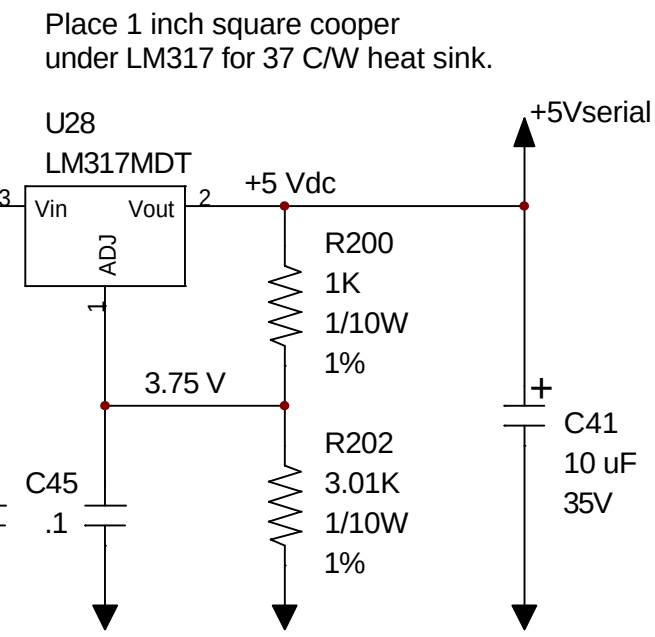
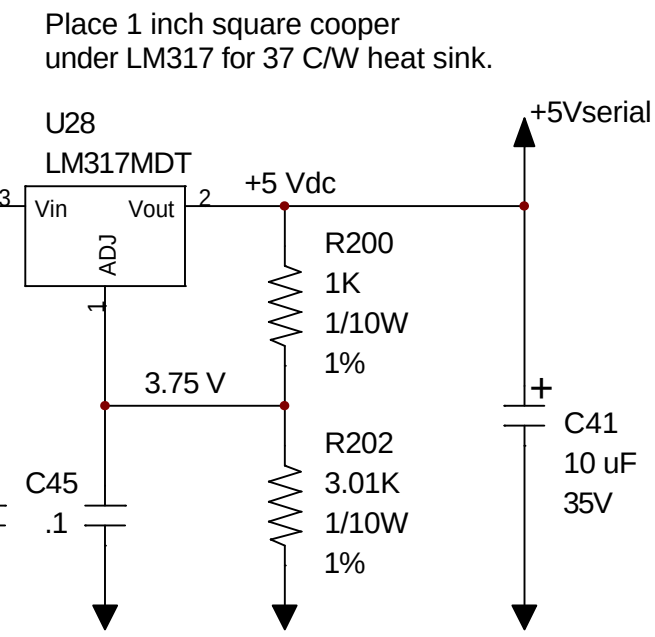
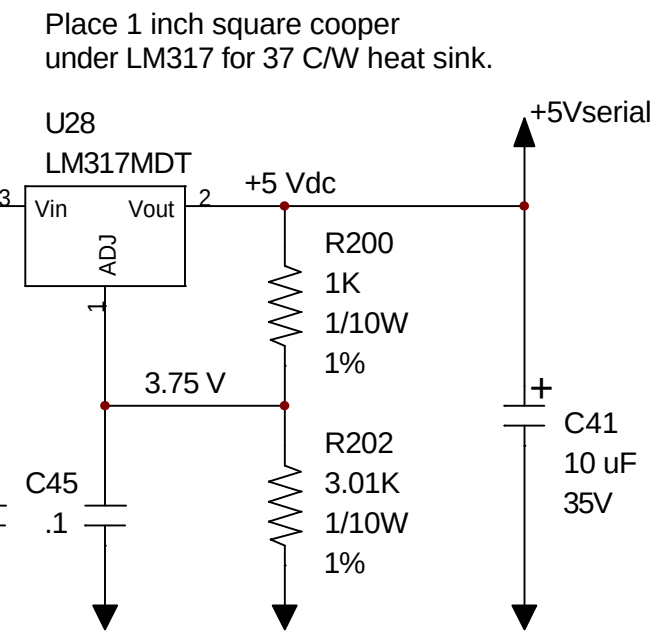
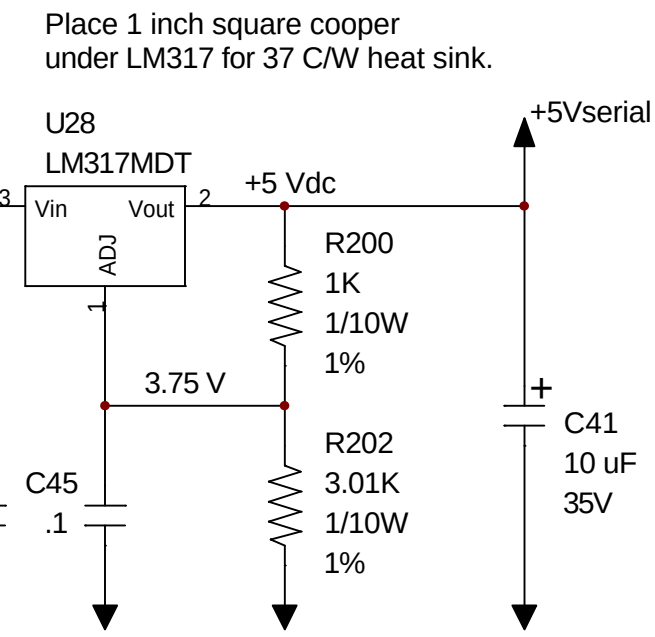
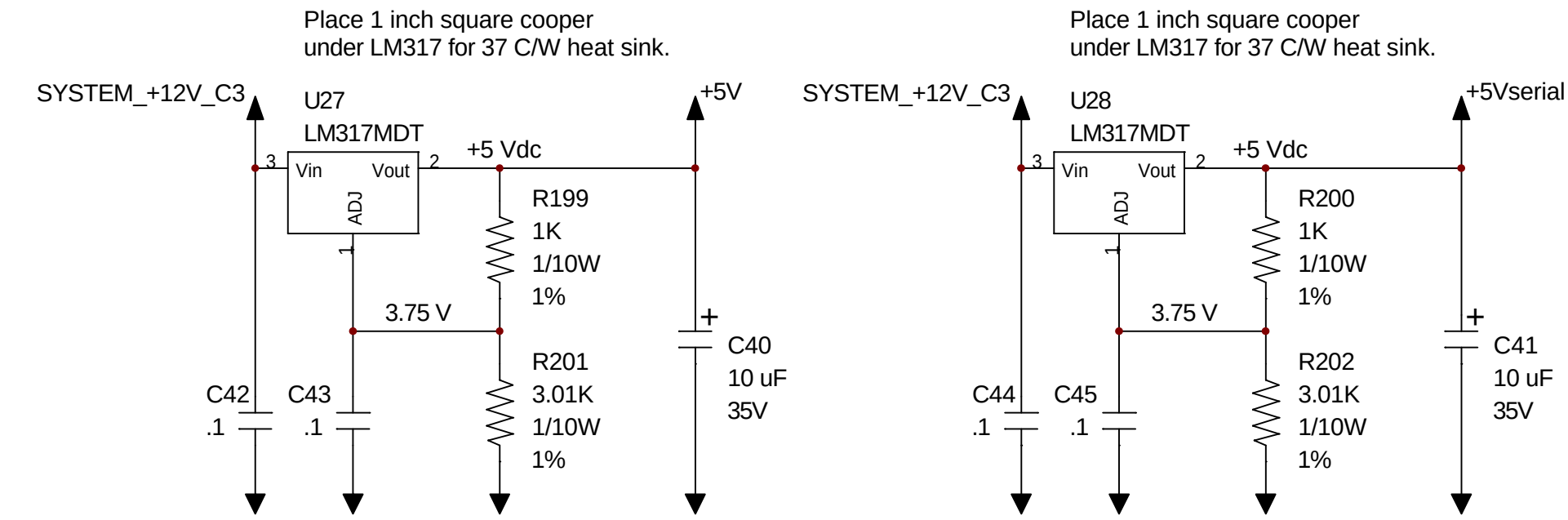
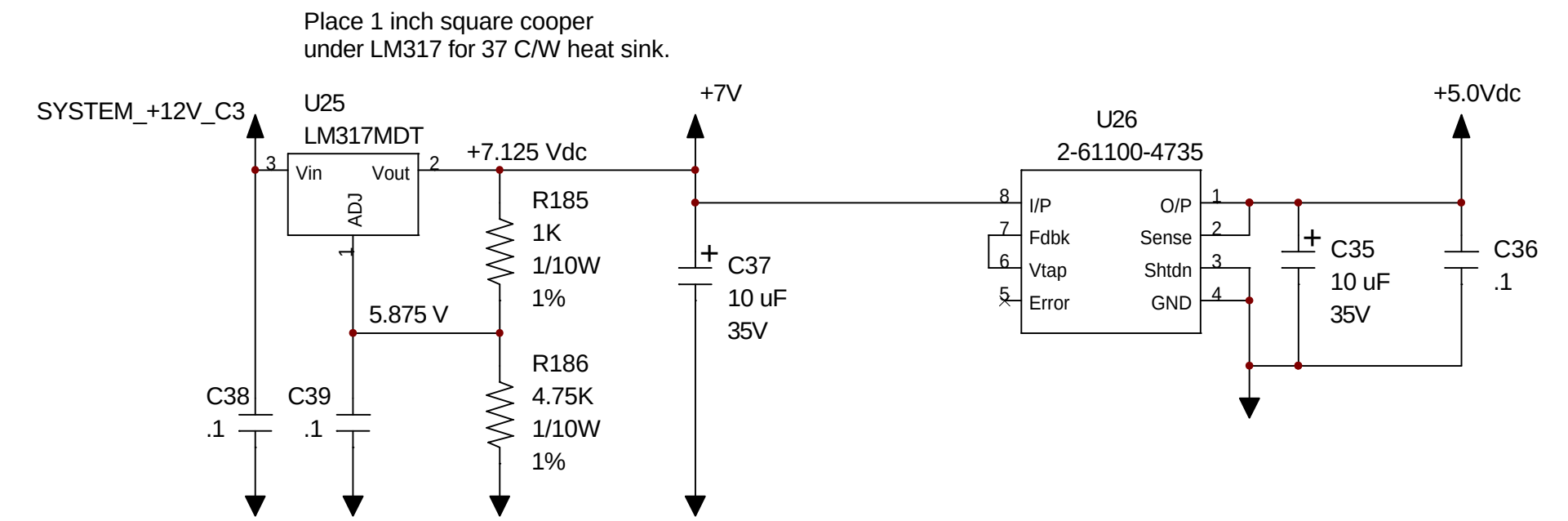
Each analog input is expected to be between 0 and 5 Vdc. If a signal exceeds 5.1 Vdc, a 0.225 Watt zenor diode clamps the signals voltage. Most signals are calibrated at their source however two dual serial potentiometer ICs are used to calibrate four signals. For these four circuits, the input value is divided in half before it is applied to an op-amp. The serial potentiometer is used to adjust the input signal between 80 and 120% of the input signal. Serial data to the second serial potentiometer is transferred through the first IC. The wiper position of the digital potentiometer circuit is used to set the gain of the op-amp. Lower digital values for the wiper setting increases the gain of the op-amp. If N= 0, gain = 6.0. If N = 255, gain = 3.00. If Vin = 1.0 at spare_Ain_1 and N = 128, U21A out = 4.0V with gain = 4.

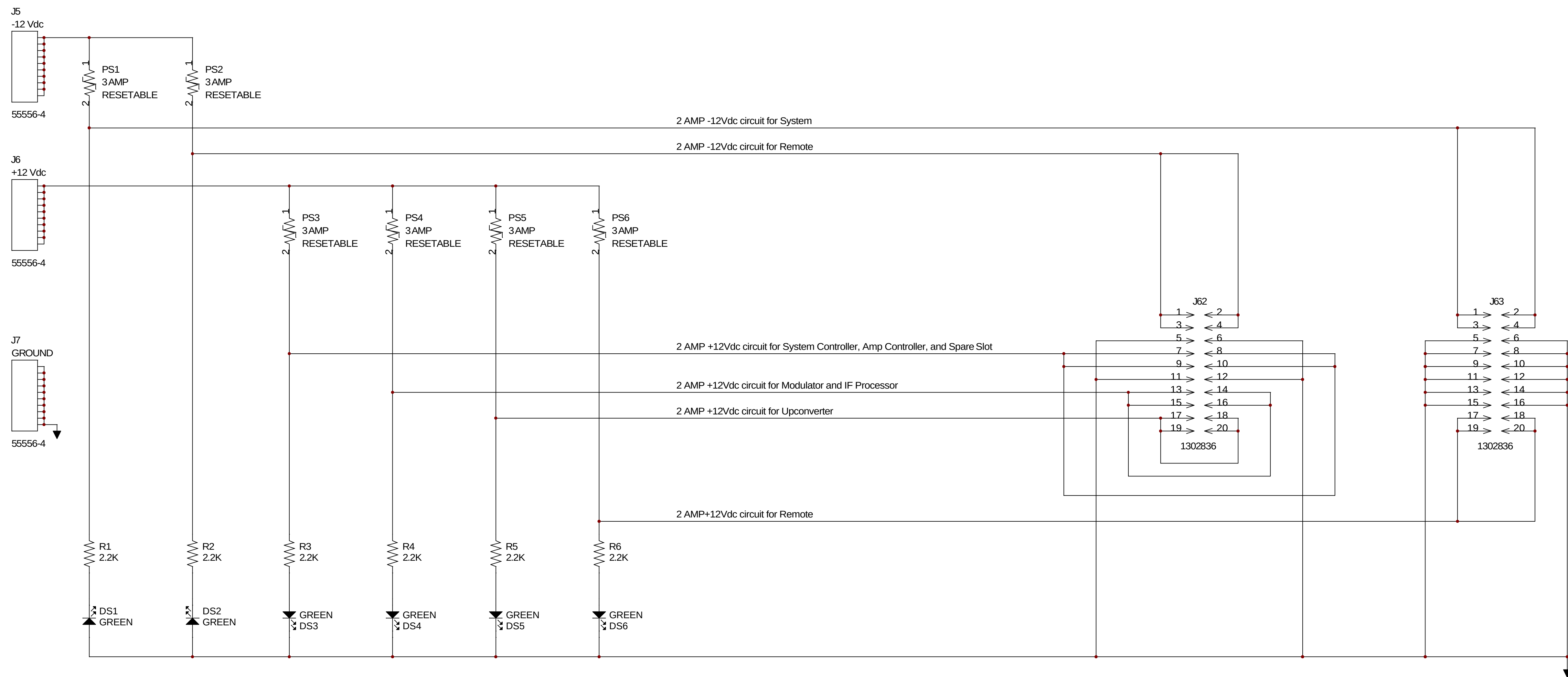
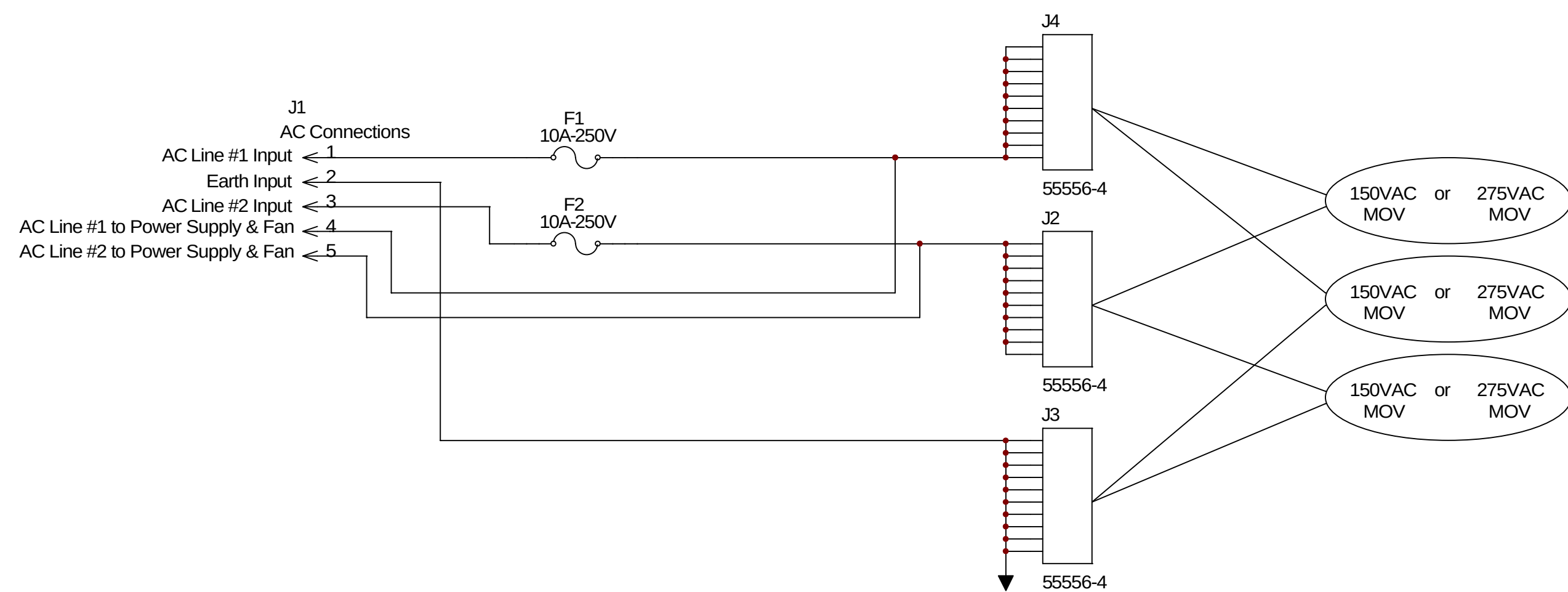
Two 20 position connectors are used to provide power to the backplane. J62 and J63 get power from the power supply after a nominal 3 amp resettable fuse. The Raychem polyswitch resettable fuses may open on a current as low as 2.43 amps at 50C, 3 amps at 25 C or 3.3 amps at 0C. They definately will open when the current is 4.86 amps at 50C, 6 amps at 20C, or 6.6 amps at 0C. Trace widths of these circuits are 0.140" (designed for maximum current).

PAGE 5:

Each of the four LED circuits drive a dual element common cathode LED. To make a good amber color, the current applied to the green element is slightly greater than the red element.

Several voltage regulators are used to power the board. Seven volts is typically applied to board LEDs and to the input of a precision 5.0 volt regulator. The 5.0 volt regulator is used for analog circuits and the microcontroller analog reference voltage. Another two 5 volt regulator circuits are used for most other board circuits.





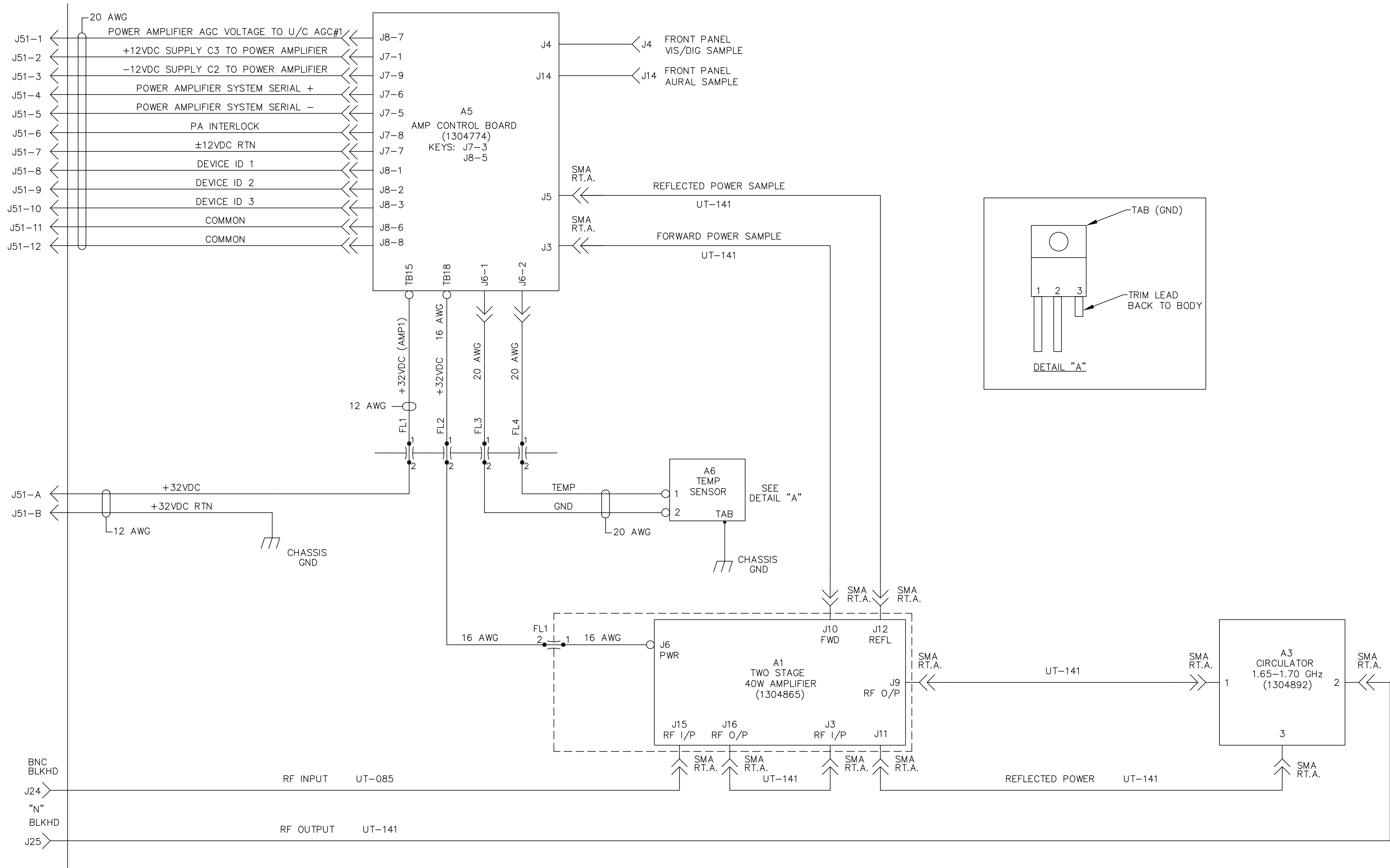
Circuit Design Notes:

1. Track widths of 0.140 inch minimum top and bottom of board shall be used to connections to J1, J2, J3, J4.
2. Track widths of 0.140 inch minimum top of board shall be used to connections to J5 and J6.
3. Track widths of 0.065 inch minimum shall be used to connections to J62 and J63.
4. Track widths of 0.020 inch minimum shall be used to connections between LEDs and resistors.
5. Board BOM needs the following items added to those exported from Orcad:

Part Number	Qty	Description
102071	4	Fuse Clip, PC BD Mnt., 15 Amp

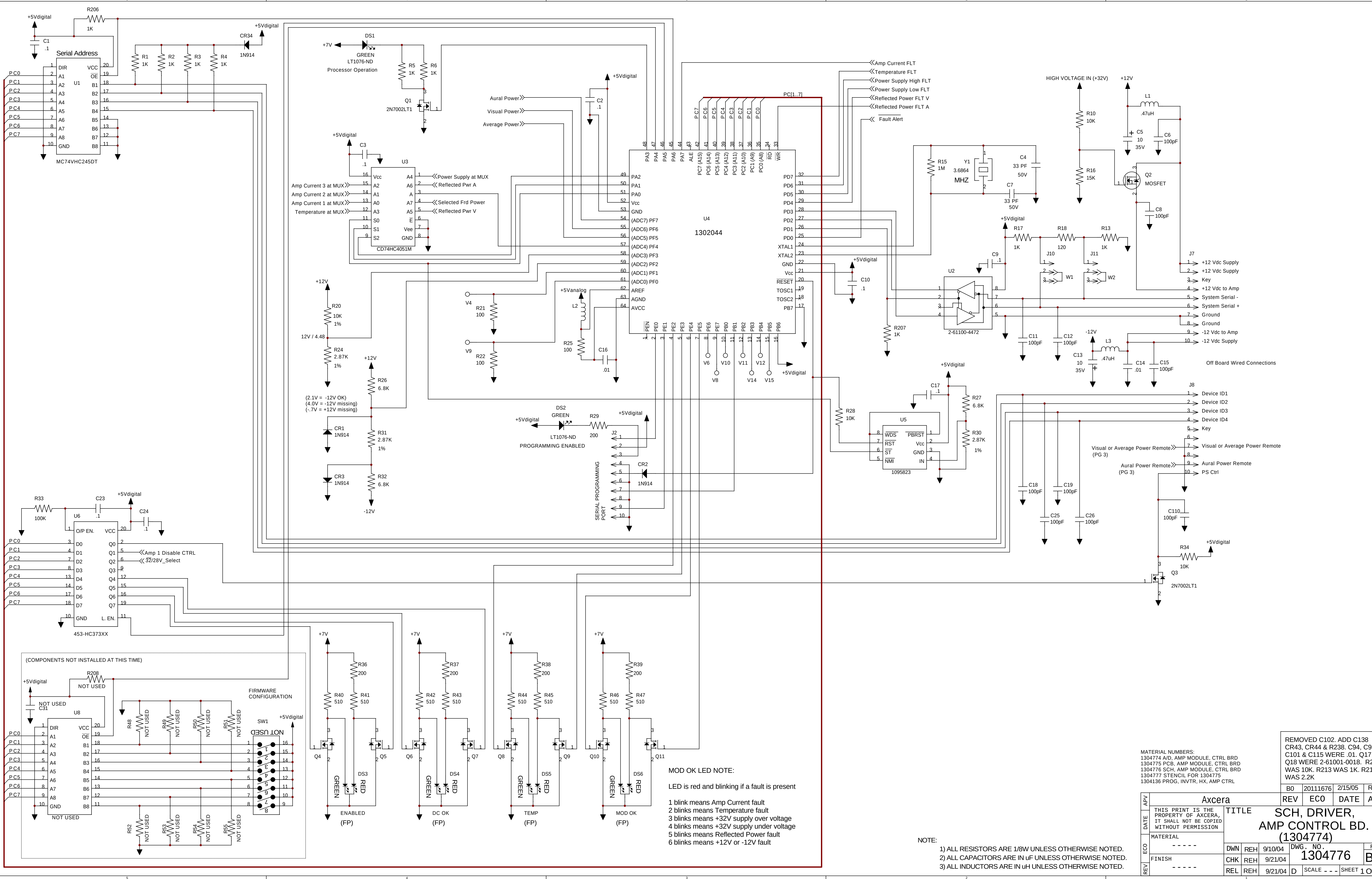
MATERIAL NUMBERS:
1302837 PIONEER, POWER PROTECTION
1302838 PCB, PIONEER, PWR PROTECT
1302839 SCH, PIONEER, PWR PROTECT
1302840 STENCIL FOR 1302838

APV	Axcera				REV	ECO	DATE	APV
DATE	THIS PRINT IS THE PROPERTY OF AXCERA, IT SHALL NOT BE COPIED WITHOUT PERMISSION	TITLE SCH, PIONEER, PWR PROTECT (1302837)						
ECO		MATERIAL		DWN	REH	5/29/03	DWG. NO.	REV.
	FINISH	CHK	REH	5/29/03	1302839			AO
REV	-----	REL	REH	5/29/03	D	SCALE ---	SHEET	1 OF 1



NOTE:
1. ALL WIRE IS 20AWG UNLESS OTHERWISE NOTED.

Axcera		THIS PRINT IS THE PROPERTY OF AXCERA, IT SHALL NOT BE COPIED WITHOUT PERMISSION.		TITLE		I/C, PA ASSEMBLY, 5W 1.67 GHz		REV	
MATERIAL		FINISH		DWN		RGE		11/11/04	
				CHK		TB		04/12/05	
				REL		TB		04/12/05	
						D		SCALE ---	
								SHEET 1 OF 1	



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

NOTE:

- 1) ALL RESISTORS ARE 1/8W UNLESS OTHERWISE NOTED.
- 2) ALL CAPACITORS ARE IN uF UNLESS OTHERWISE NOTED.
- 3) ALL INDUCTORS ARE IN uH UNLESS OTHERWISE NOTED.

MATERIAL NUMBERS:
1304774 A/D, AMP MODULE, CTRL BRD
1304775 PCB, AMP MODULE, CTRL BRD
1304776 SCH, AMP MODULE, CTRL BRD
1304777 STENCIL FOR 1304775
1304136 PROG, INVTR, HX, AMP CTRL

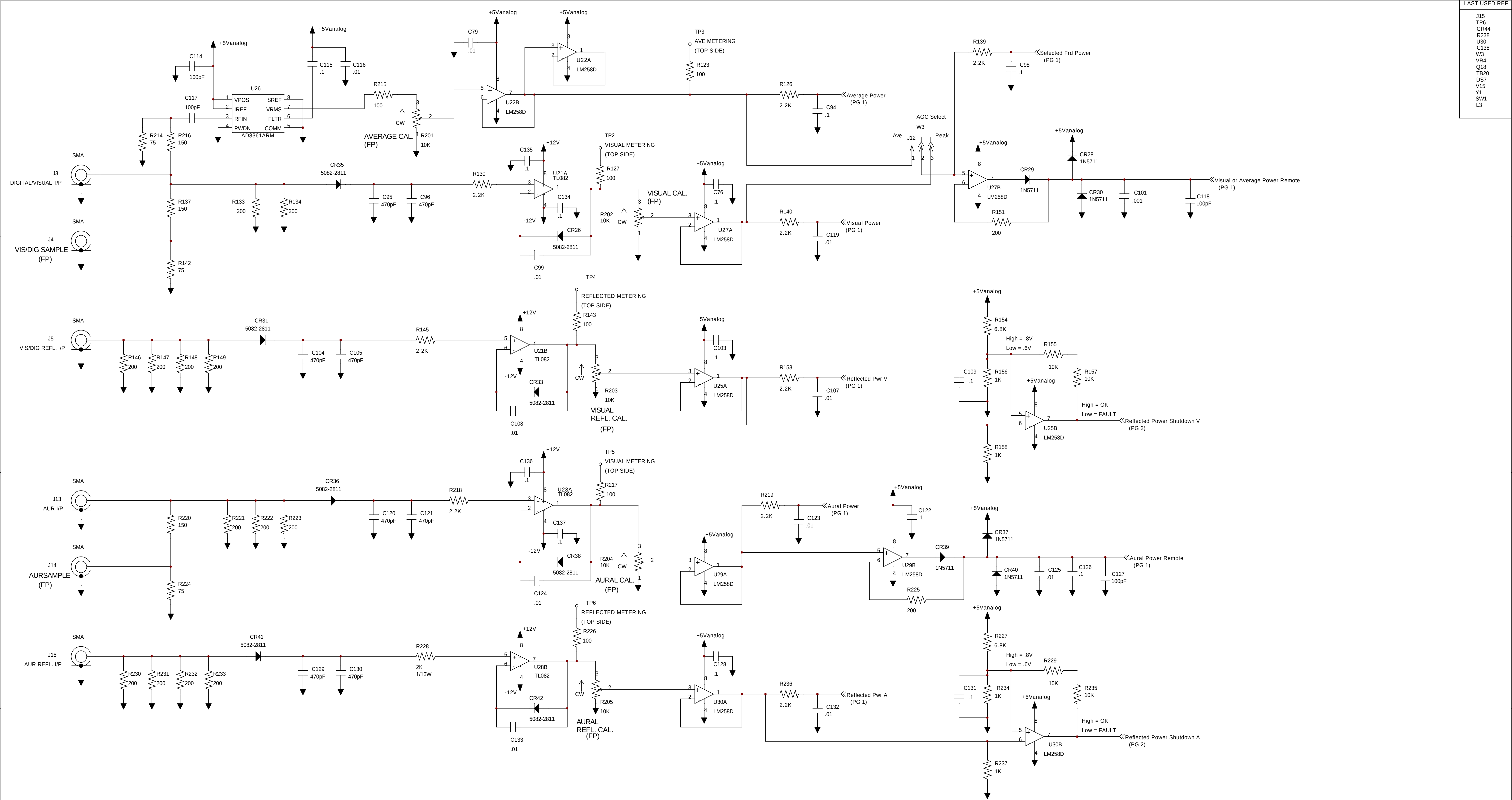
REMOVED C102. ADD C138
CR43, CR44 & R238. C94, C98,
C101 & C115 WERE .01. Q17 &
Q18 WERE 2-61001-0018. R212
WAS 10K. R213 WAS 1K. R215
WAS 2.2K JKF

APV	REV	ECO	DATE	REH
APV	REV	ECO	DATE	REH
DATE	DATE	DATE	DATE	DATE
ECO	ECO	ECO	ECO	ECO
REV	REV	REV	REV	REV

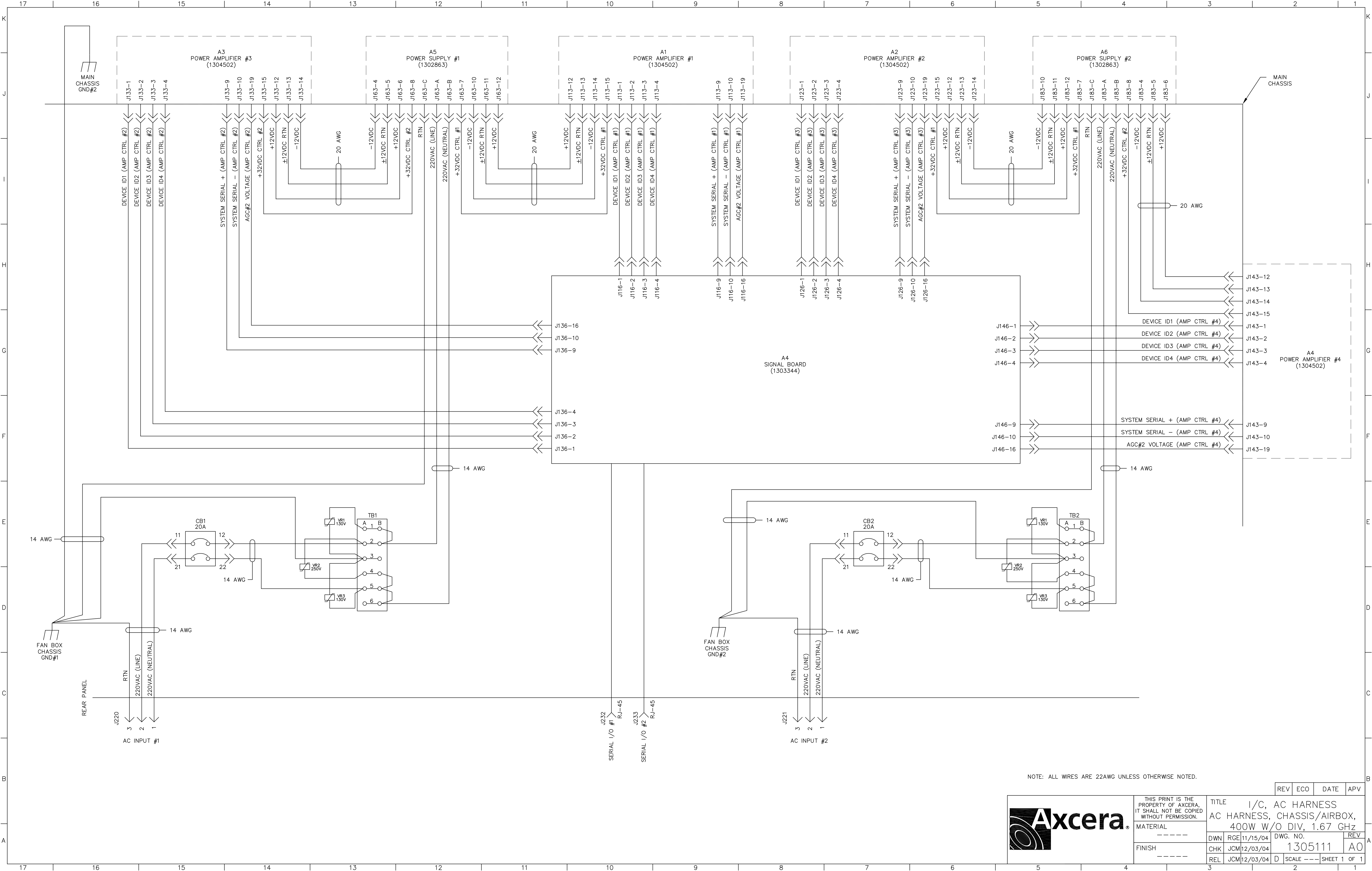
TITLE	DWG. NO.	REV
SCH, DRIVER, AMP CONTROL BD. (1304774)	1304776	B0

FINISH	REL	SCALE	SHEET
CHK	REL	9/21/04	1 OF 3

LAST USED REF			
J15	TP6		
CR44	CR238		
U30	C138		
W3	VR4		
Q18	T820		
DS7	V15		
Y1	SW1		
L3			

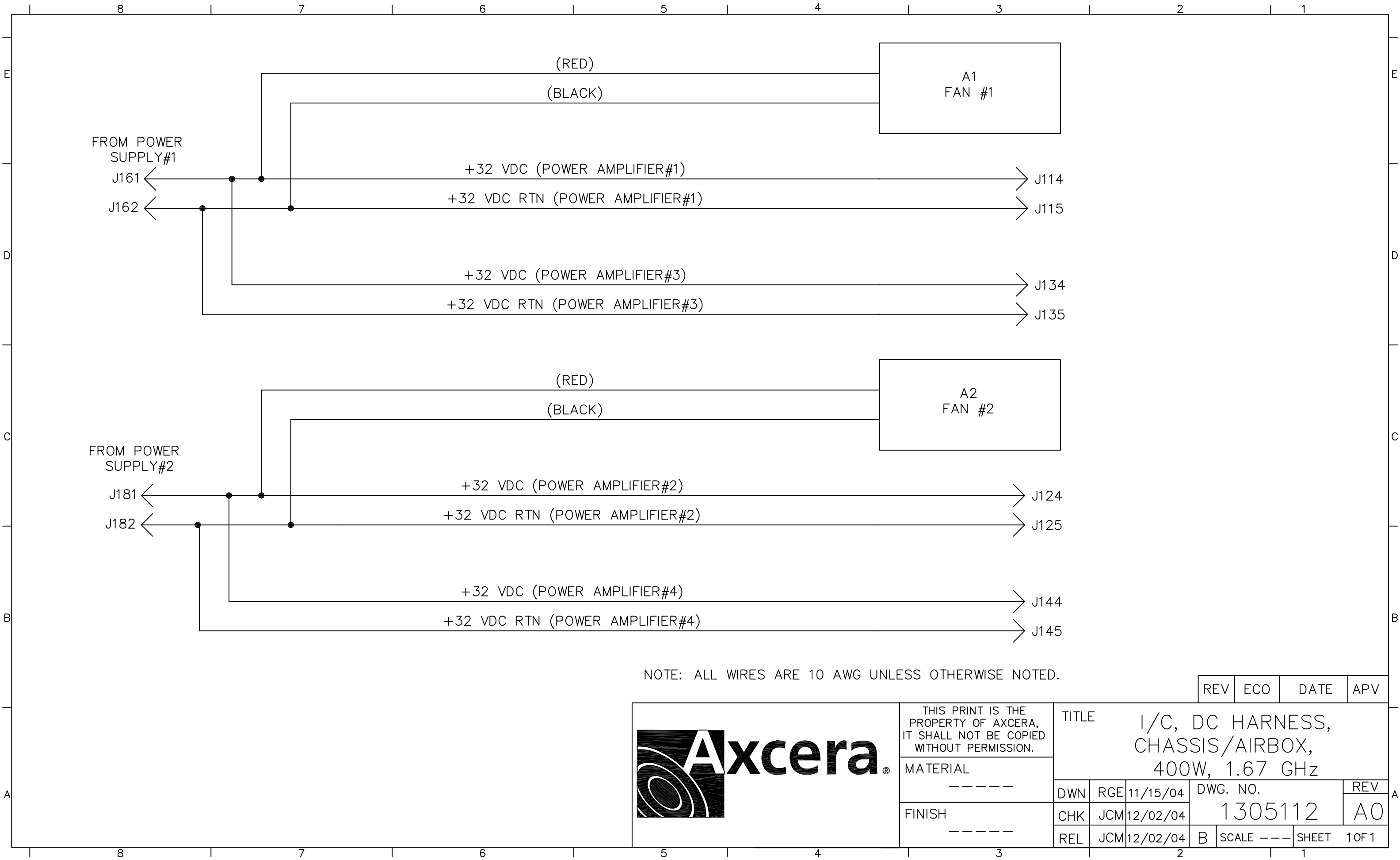


APV	Axcera				REV	ECO	DATE	APV
DATE	THIS PRINT IS THE PROPERTY OF AXCERA, IT SHALL NOT BE COPIED WITHOUT PERMISSION				TITLE SCH, AMP. MODULE, CTRL BD (1304774)			
ECO					DWN	REH	9/10/04	REV
REV					CHK	REL	9/21/04	B0
					REL	REH	9/21/04	D
					SCALE	---	SHEET 3 OF 3	



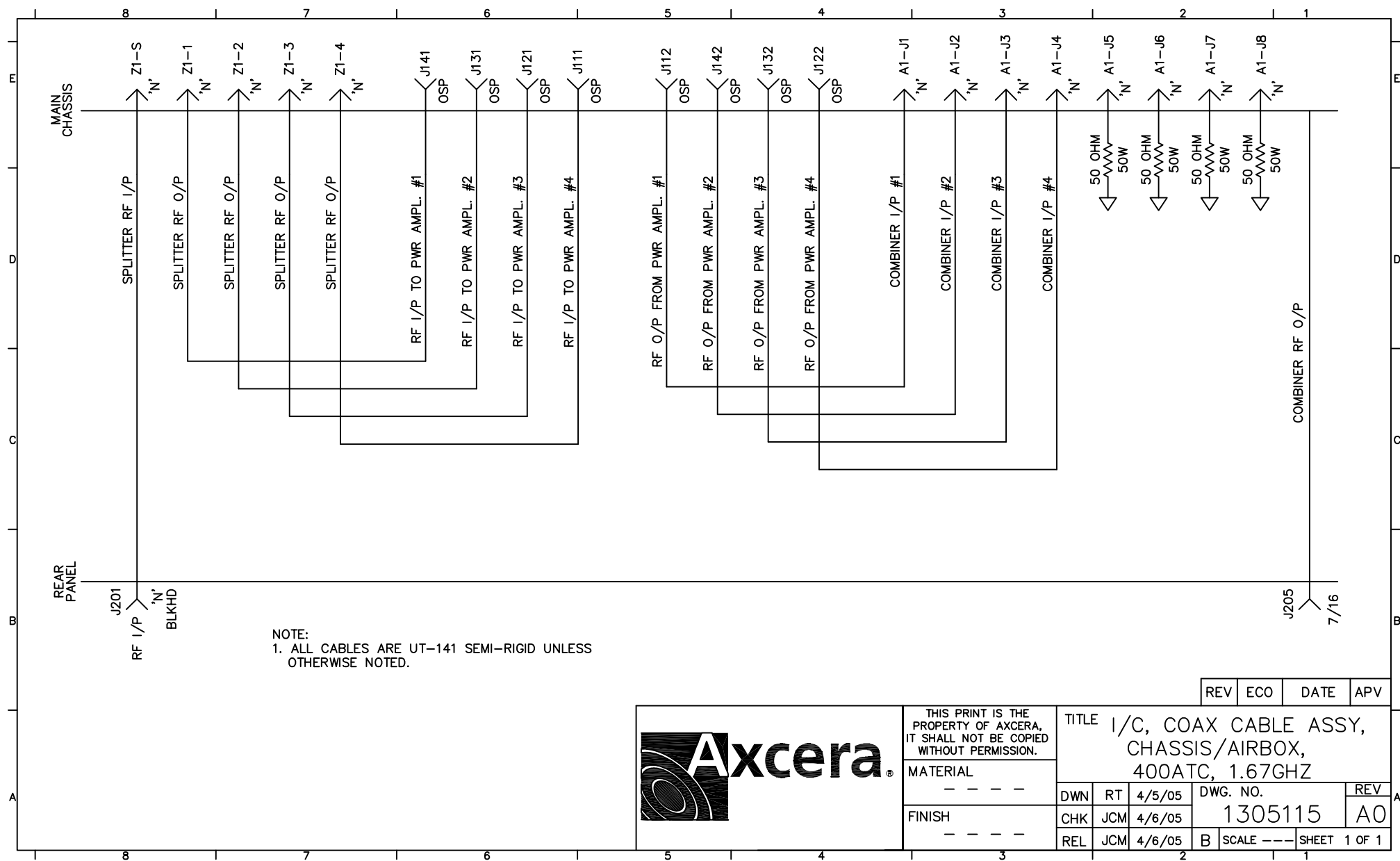
NOTE: ALL WIRES ARE 22AWG UNLESS OTHERWISE NOTED.

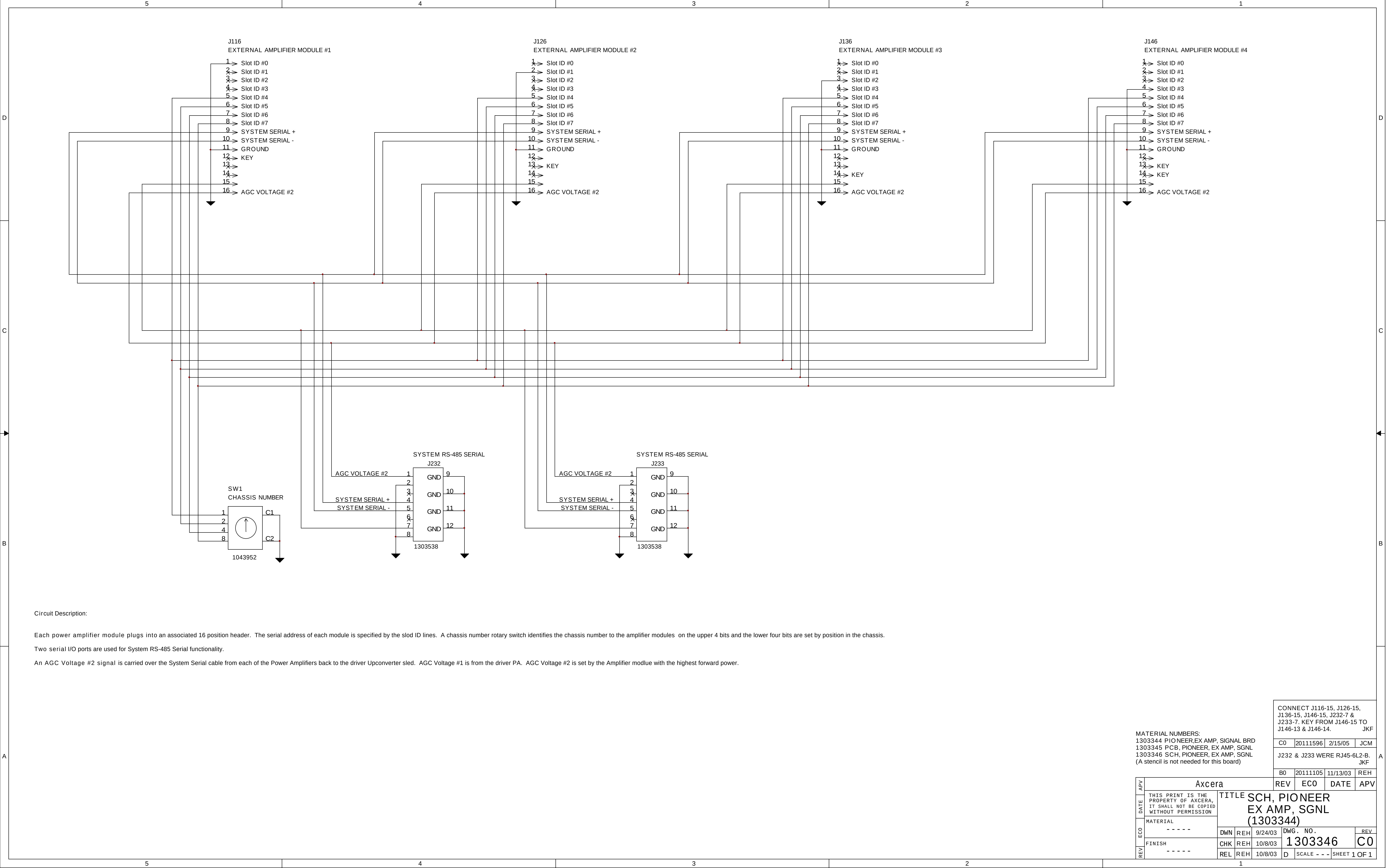
	THIS PRINT IS THE PROPERTY OF AXCERA, IT SHALL NOT BE COPIED WITHOUT PERMISSION.				TITLE I/C, AC HARNESS AC HARNESS, CHASSIS/AIRBOX, 400W W/O DIV, 1.67 GHz			
	MATERIAL				DWN RGE 11/15/04 DWG. NO. 1305111			
	FINISH				CHK JCM 12/03/04 D SCALE --- SHEET 1 OF 1			
					REV ECO DATE APV			



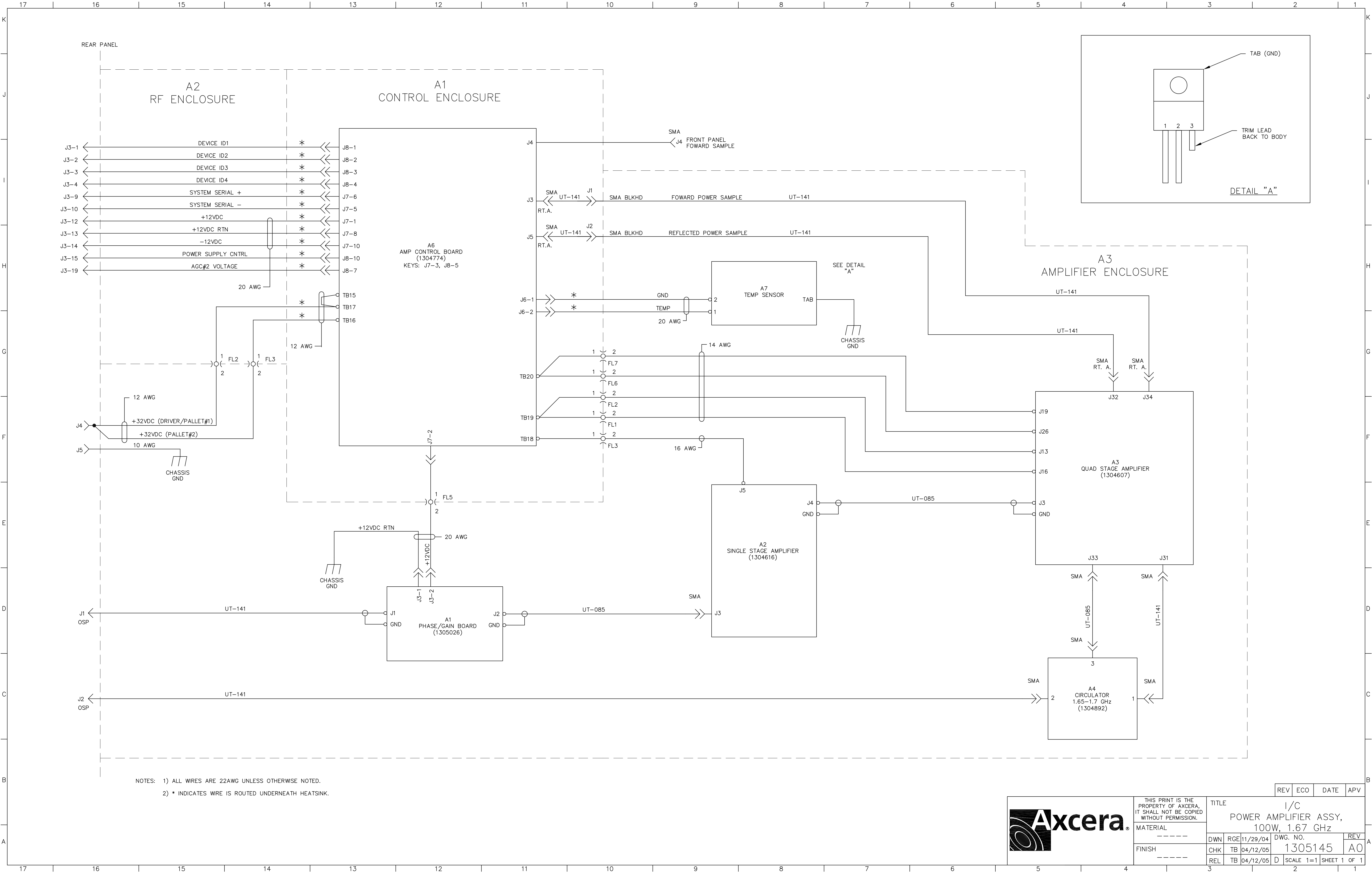
NOTE: ALL WIRES ARE 10 AWG UNLESS OTHERWISE NOTED.

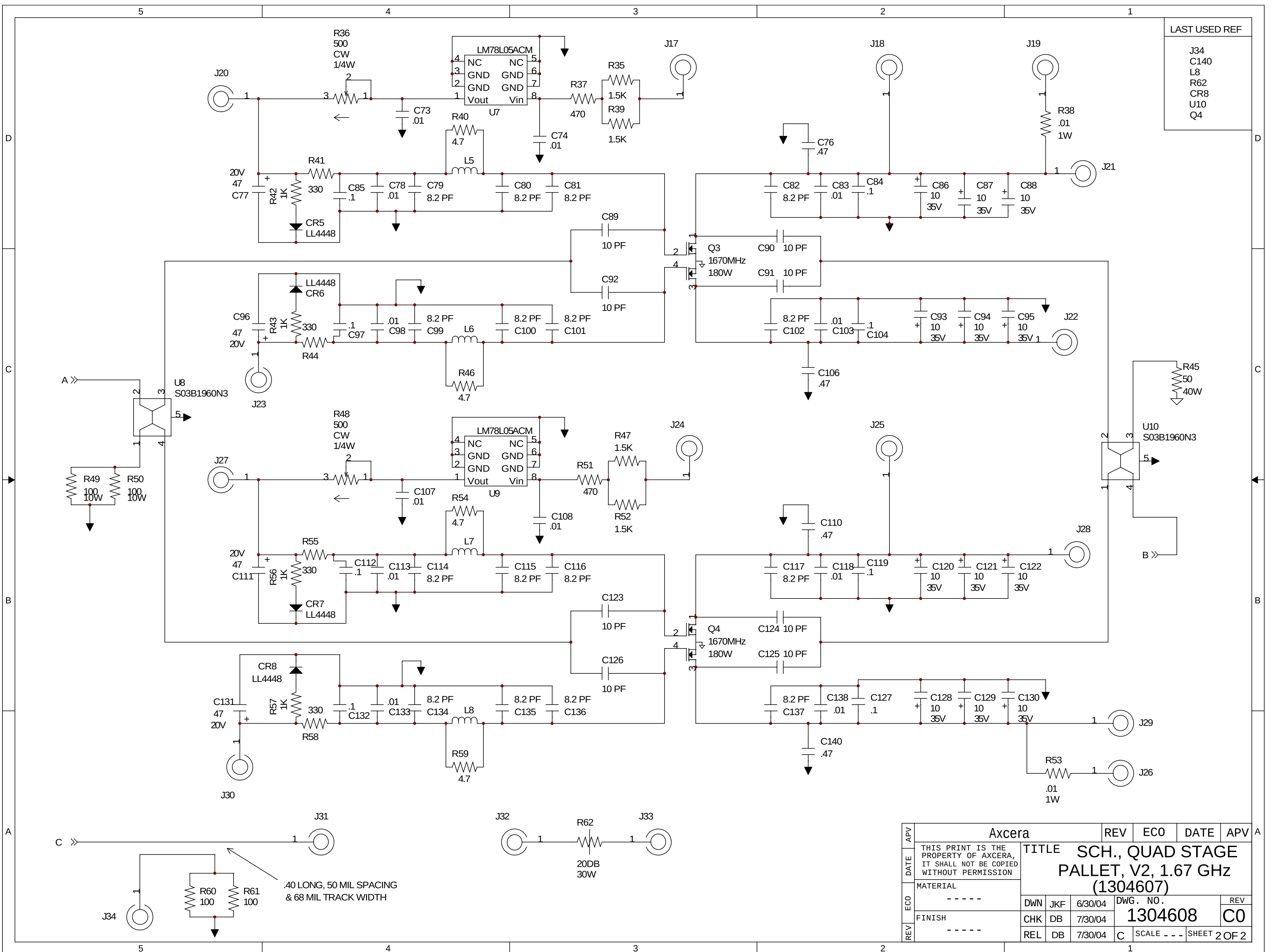
 Axcera®	THIS PRINT IS THE PROPERTY OF AXCERA, IT SHALL NOT BE COPIED WITHOUT PERMISSION.		TITLE I/C, DC HARNESS, CHASSIS/AIRBOX, 400W, 1.67 GHz						
	MATERIAL -----		DWN	RGE	11/15/04	DWG. NO. 1305112			REV A0
	FINISH -----		CHK	JCM	12/02/04				
			REL	JCM	12/02/04	B	SCALE ---	SHEET	1 OF 1





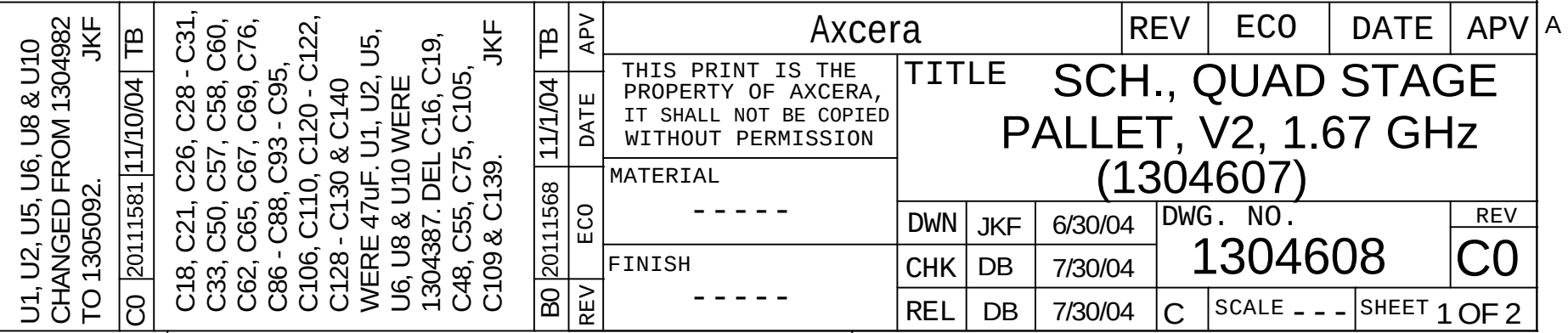
MATERIAL NUMBERS: 1303344 PIONEER,EX AMP, SIGNAL BRD 1303345 PCB, PIONEER, EX AMP, SGNL 1303346 SCH, PIONEER, EX AMP, SGNL (A stencil is not needed for this board)						J146-13 & J146-14. JKF			
						C0	20111596	2/15/05	JCM
						J232 & J233 WERE RJ45-6L2-B. JKF			
						B0	20111105	11/13/03	REH
						REV	ECO	DATE	APV
APV	Axcera								
DATE	THIS PRINT IS THE PROPERTY OF AXCERA, IT SHALL NOT BE COPIED WITHOUT PERMISSION			TITLE SCH, PIONEER EX AMP, SGNL (1303344)					
ECO	MATERIAL								
FINISH				DWN	REH	9/24/03		DWG. NO.	REV
REV	----			CHK	REH	10/8/03		1303346	C0
				REL	REH	10/8/03		D	SCALE - - - SHEET 1 OF 1

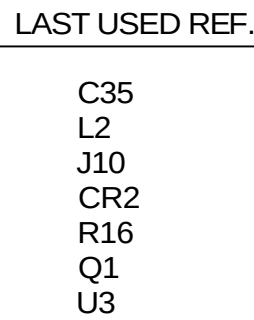




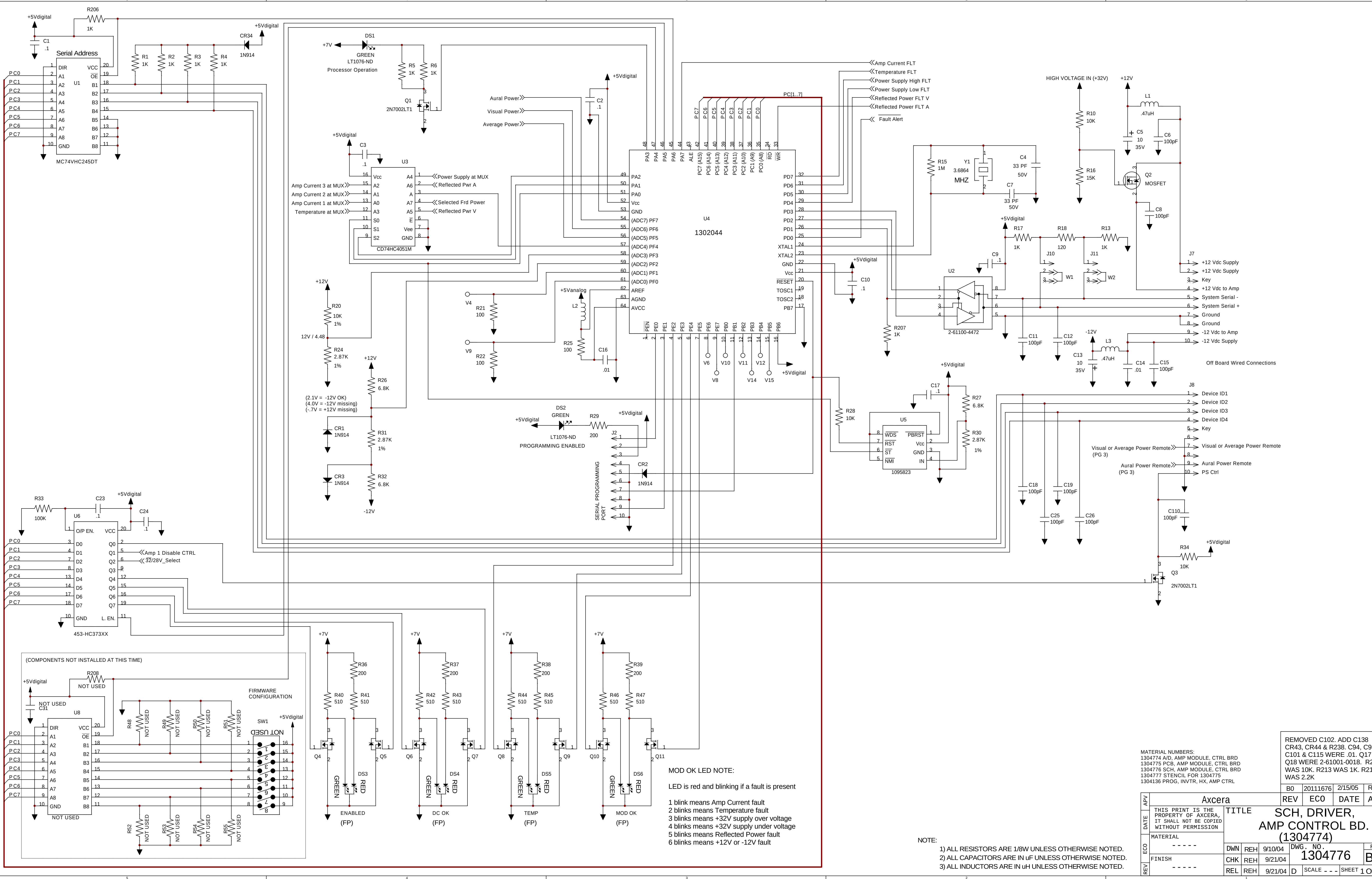
LAST USED REF
J34
C140
L8
R62
CR8
U10
Q4

APV	Axcera					REV	ECO	DATE	APV
DATE	THIS PRINT IS THE PROPERTY OF AXCERA, IT SHALL NOT BE COPIED WITHOUT PERMISSION					TITLE SCH., QUAD STAGE PALLET, V2, 1.67 GHz (1304607)			
ECO	MATERIAL -----					DWN	JKF	6/30/04	DWG. NO.
REV	FINISH -----					CHK	DB	7/30/04	1304608
						REL	DB	7/30/04	C
						SCALE - - -		SHEET 2 OF 2	





APV	Axcera					REV	ECO	DATE	APV	A
DATE	THIS PRINT IS THE PROPERTY OF AXCERA, IT SHALL NOT BE COPIED WITHOUT PERMISSION		TITLE SCH., SINGLE STAGE PALLET, V2, 1.67 GHz (1304616)							
ECO	MATERIAL - - - - -									
REV	FINISH - - - - -		DWN	JKF	6/28/04	DWG. NO. 1304546			REV A0	
			REL	DB	7/20/04	C	SCALE - - -	SHEET 1	OF 1	



MATERIAL NUMBERS:
1304774 A/D, AMP MODULE, CTRL BRD
1304775 PCB, AMP MODULE, CTRL BRD
1304776 SCH, AMP MODULE, CTRL BRD
1304777 STENCIL FOR 1304775
1304136 PROG, INVTR, HX, AMP CTRL

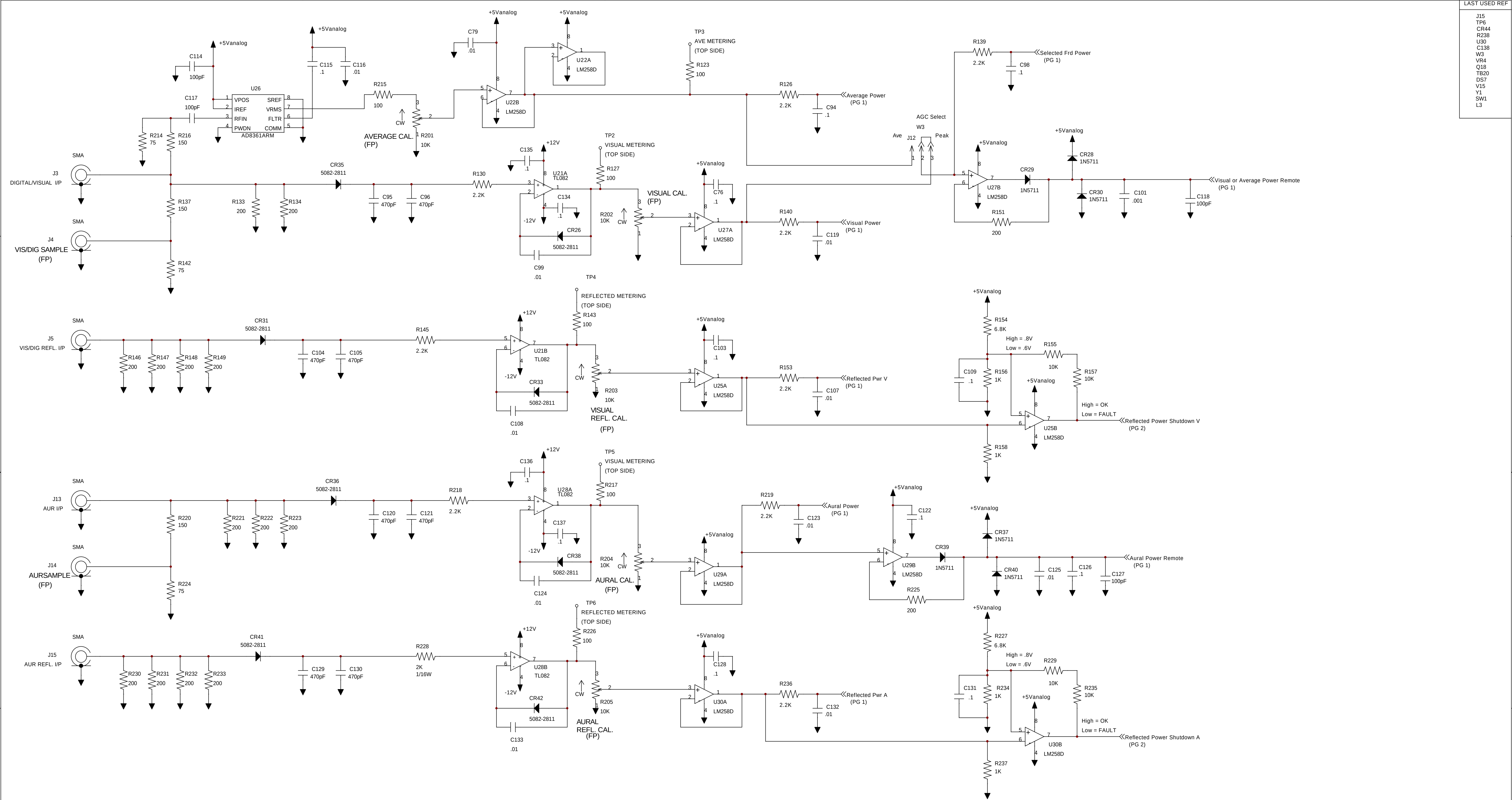
REMOVED C102. ADD C138
CR43, CR44 & R238. C94, C98,
C101 & C115 WERE .01. Q17 &
Q18 WERE 2-61001-0018. R212
WAS 10K. R213 WAS 1K. R215
WAS 2.2K JKF

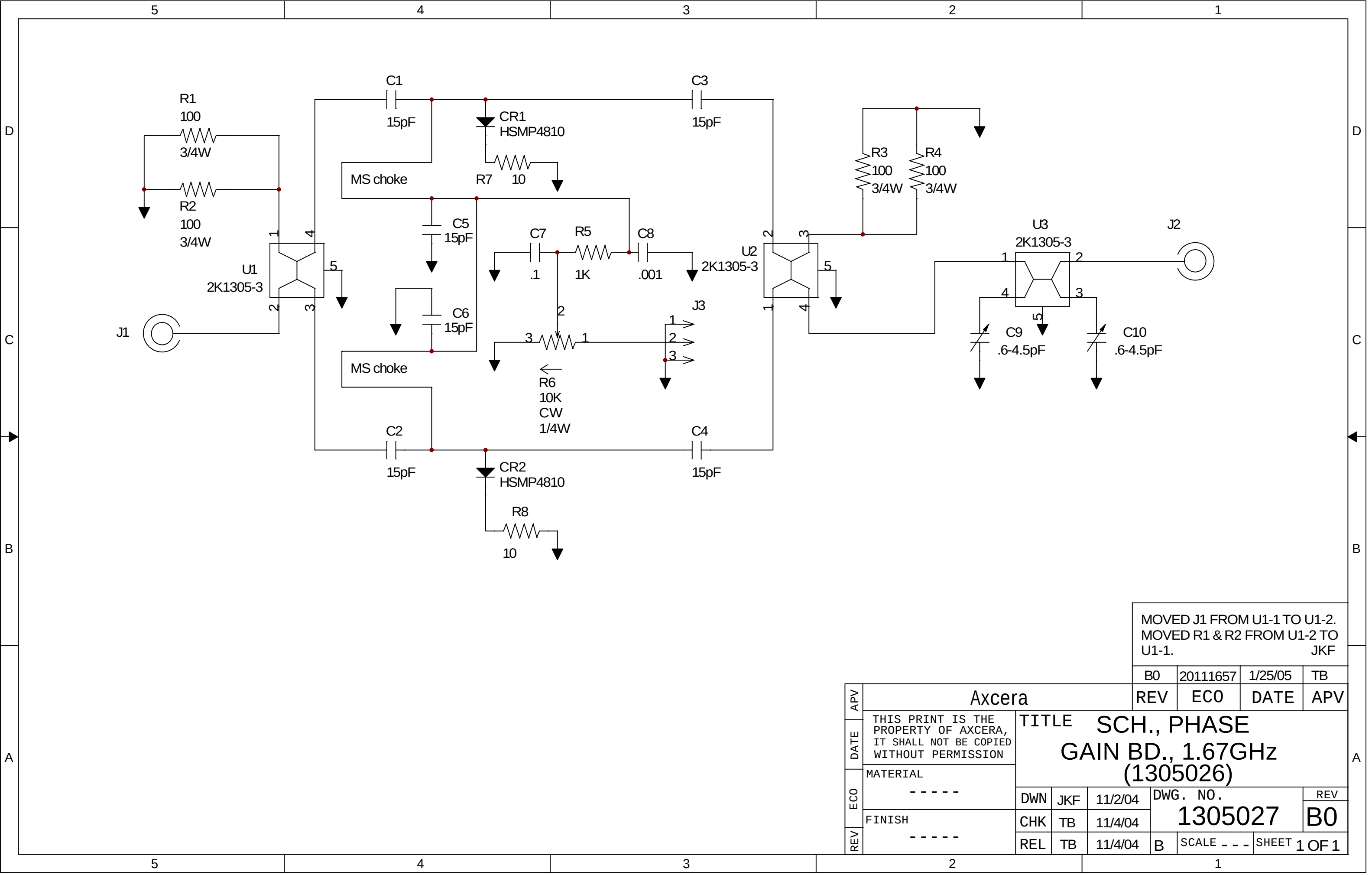
APV	REV	ECO	DATE	APV
APV	REV	ECO	DATE	APV
DATE	DATE	DATE	DATE	DATE
ECO	ECO	ECO	ECO	ECO
REV	REV	REV	REV	REV

NOTE:
1) ALL RESISTORS ARE 1/8W UNLESS OTHERWISE NOTED.
2) ALL CAPACITORS ARE IN uF UNLESS OTHERWISE NOTED.
3) ALL INDUCTORS ARE IN uH UNLESS OTHERWISE NOTED.

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

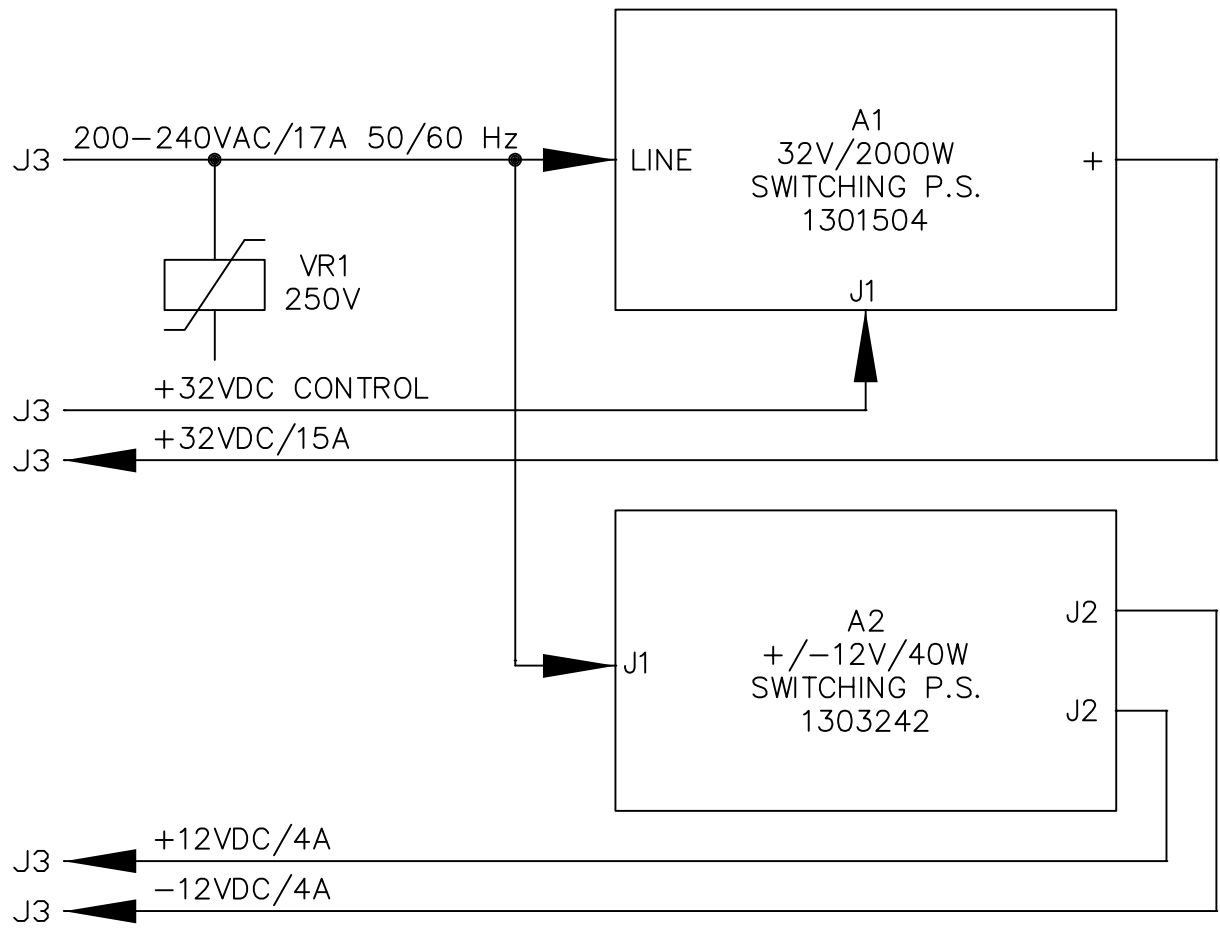
LAST USED REF			
J15	TP6		
CR44			
R238			
C138			
W3			
VR4			
Q18			
T820			
DS7			
V15			
Y1			
SW1			
L3			





MOVED J1 FROM U1-1 TO U1-2.
MOVED R1 & R2 FROM U1-2 TO
U1-1. JKF

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., 1.67GHz (1305026)						
ECO									
REV	FINISH - - - - -		DWN	JKF	11/2/04	DWG. NO. 1305027		REV B0	
			REL	TB	11/4/04	B	SCALE - - -	SHEET 1 OF 1	



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MATERIAL

FINISH

TITLE				
B/D, POWER SUPPLY ASSY, 1KW, INNOVATOR LX				
DWN	RGE	1/27/04	DWG. NO.	REV
CHK	JCM	1/27/04	1303886	A0
REL	JCM	1/27/04	A	SCALE --- SHEET 1 OF 1

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

