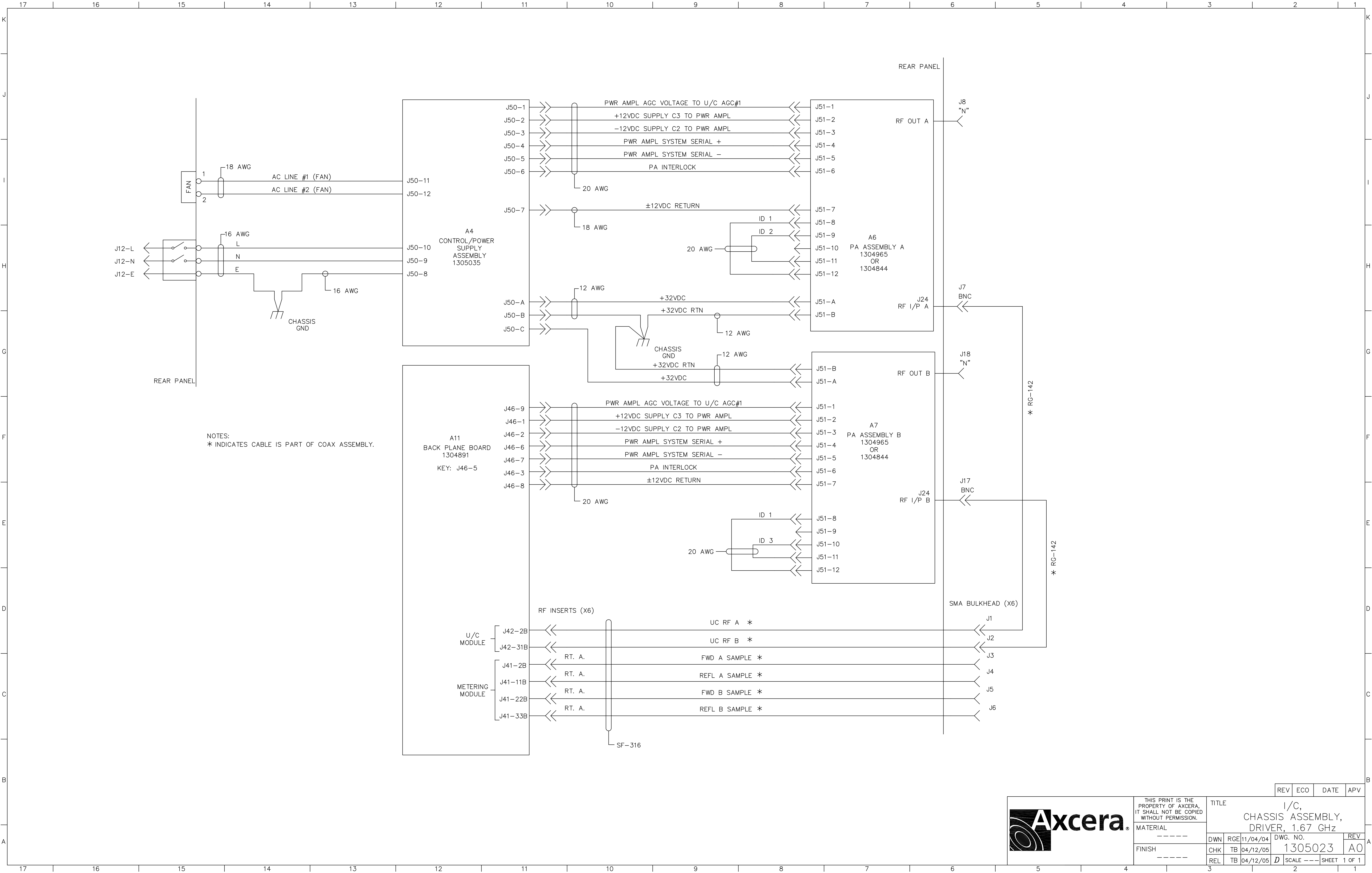
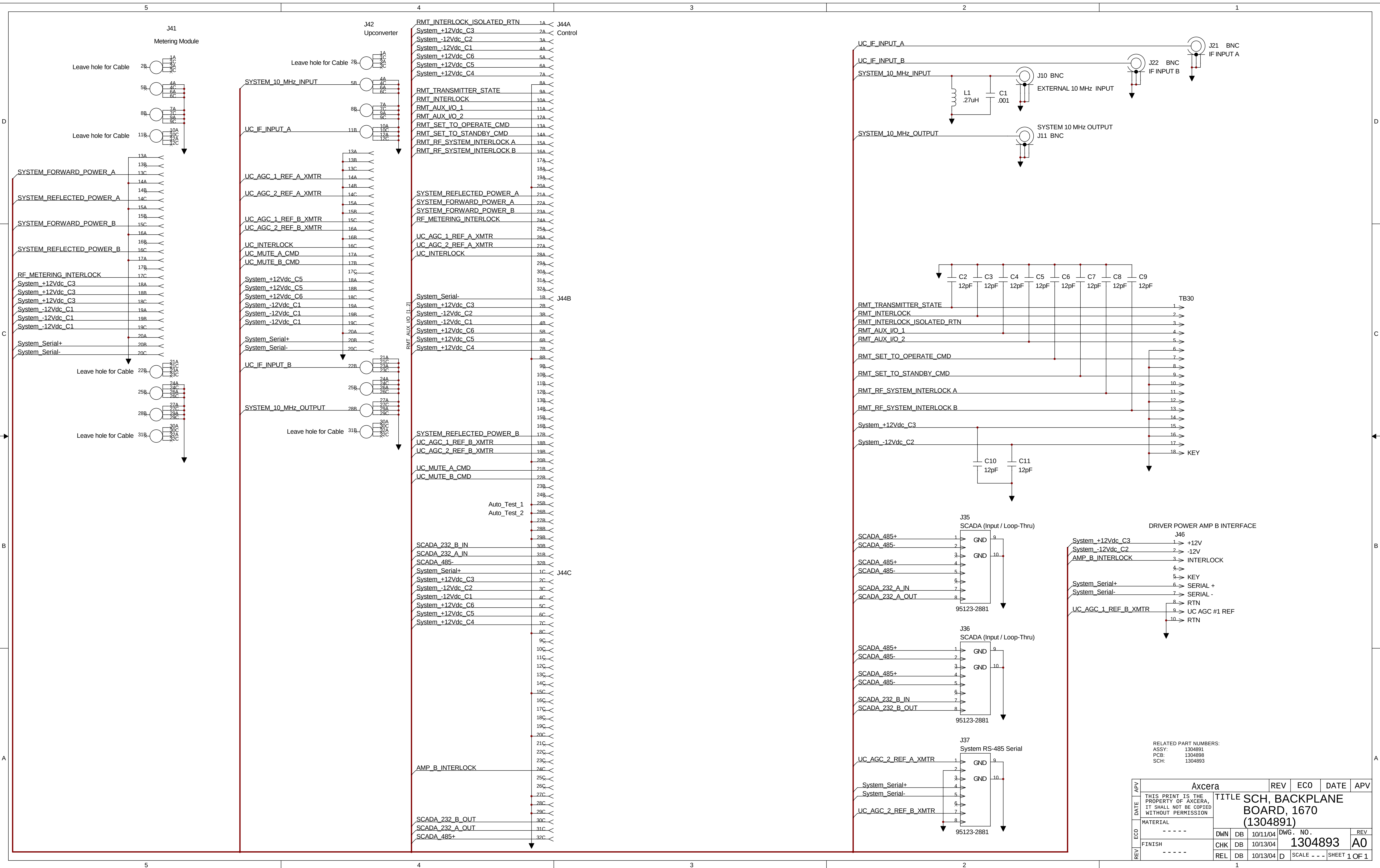
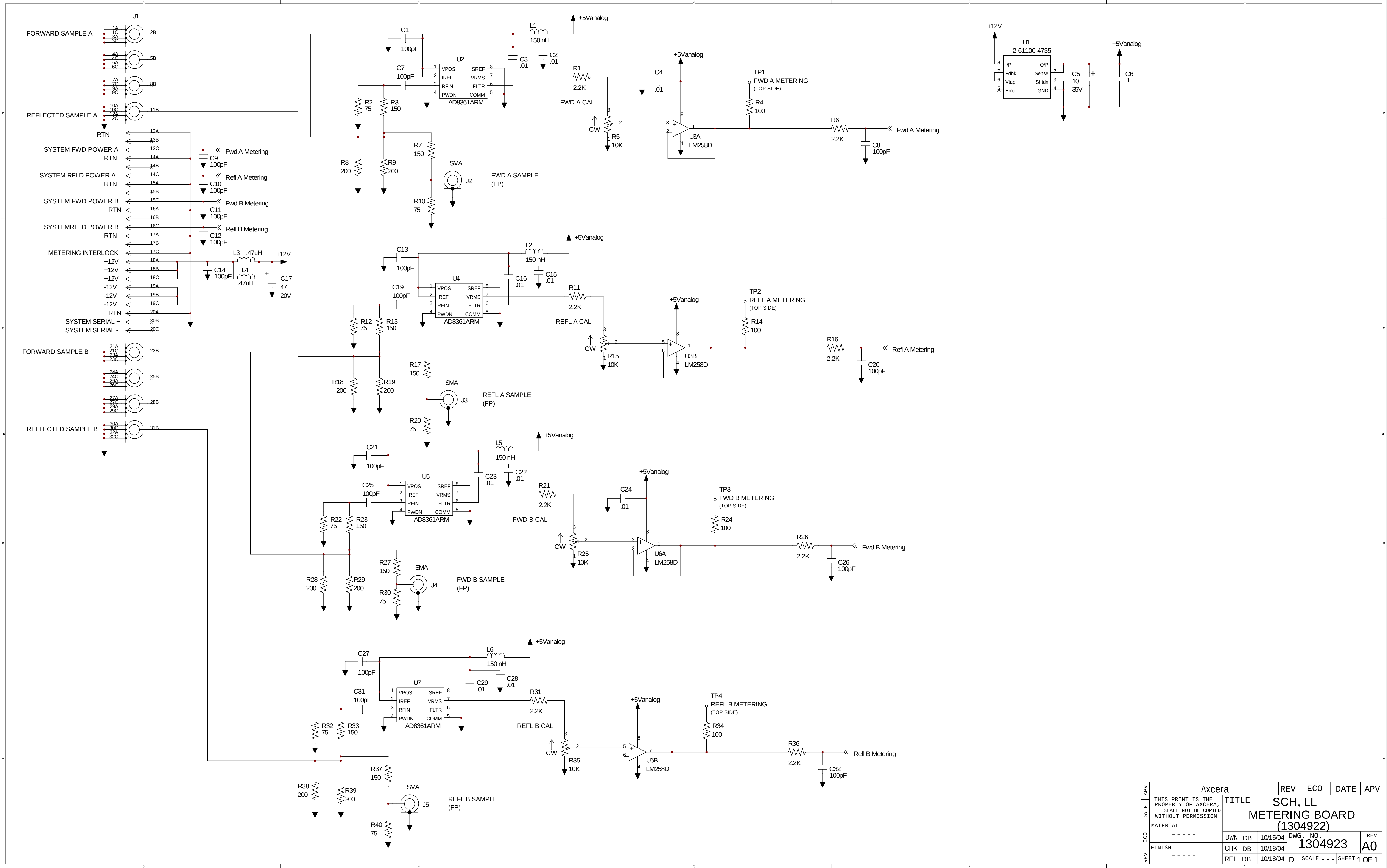
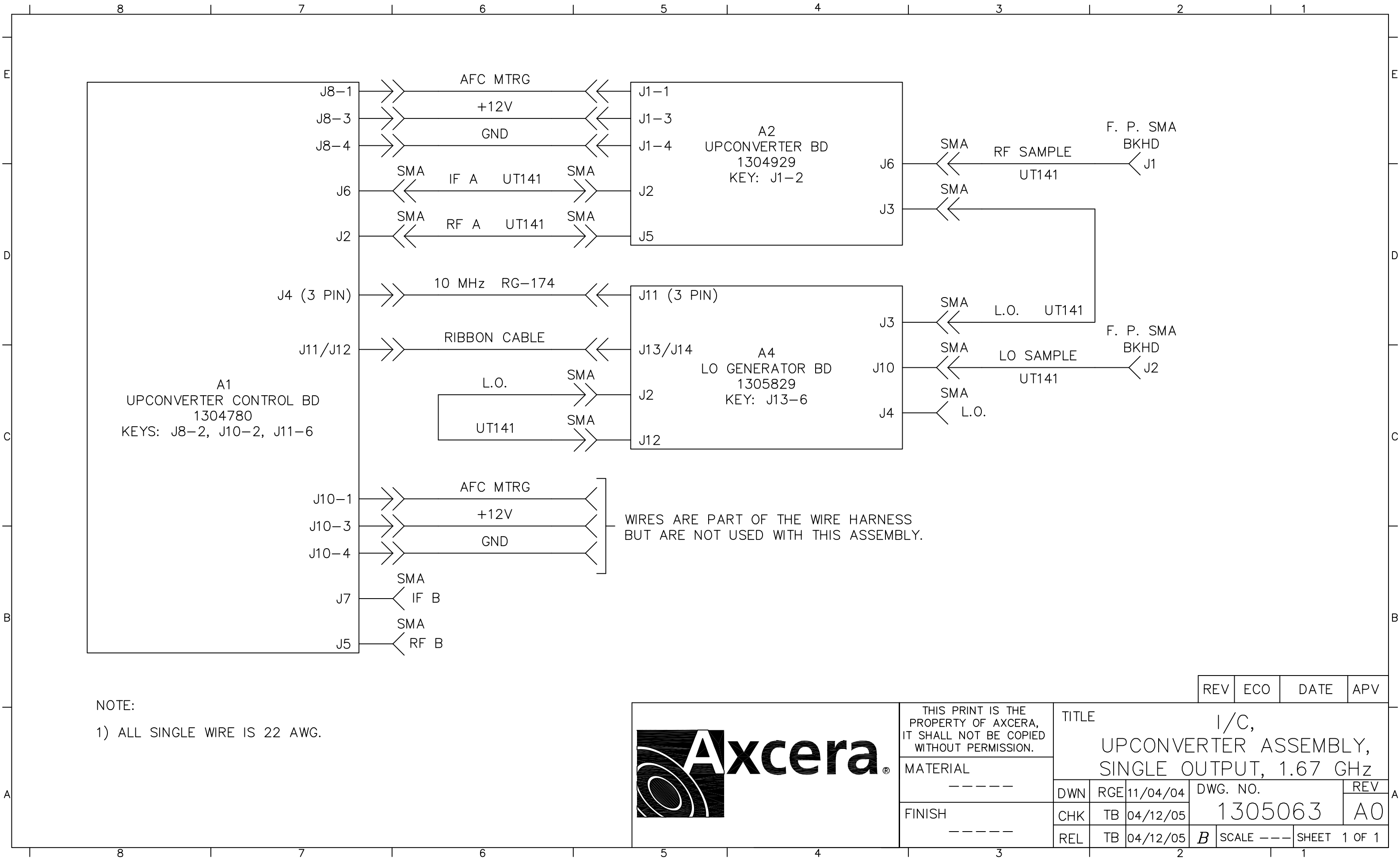


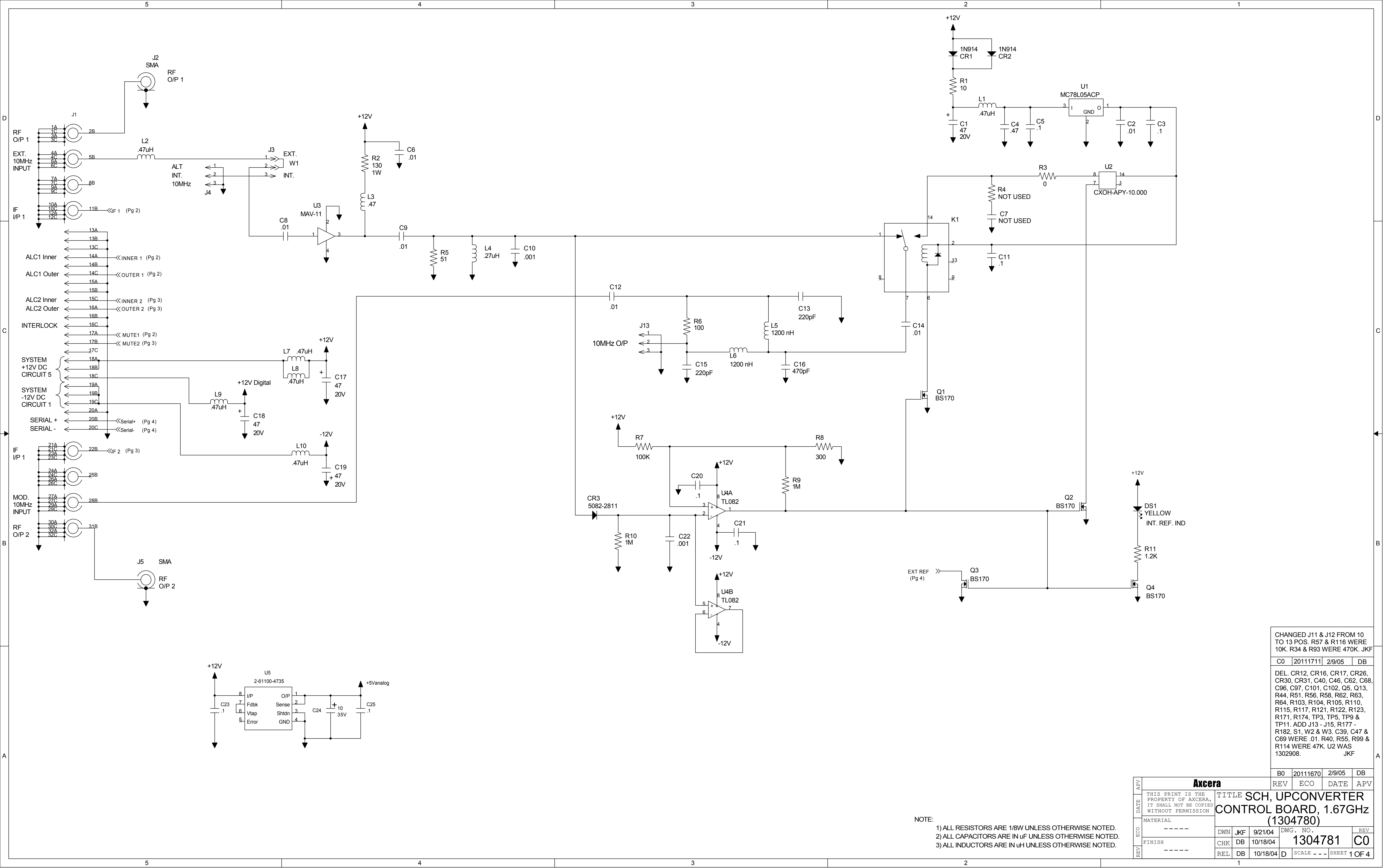






APV	Axcera				REV	ECO	DATE	APV	
DATE	THIS PRINT IS THE PROPERTY OF AXCERA, IT SHALL NOT BE COPIED WITHOUT PERMISSION				TITLE				
MATERIAL					SCH, LL				
ECO	-----				METERING BOARD (1304922)				
REV	FINISH				DWN	DB	10/15/04	DWG. NO.	REV
					CHK	DB	10/18/04	1304923	A0
	-----				REL	DB	10/18/04	D	SCALE --- SHEET 1 OF 1





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.

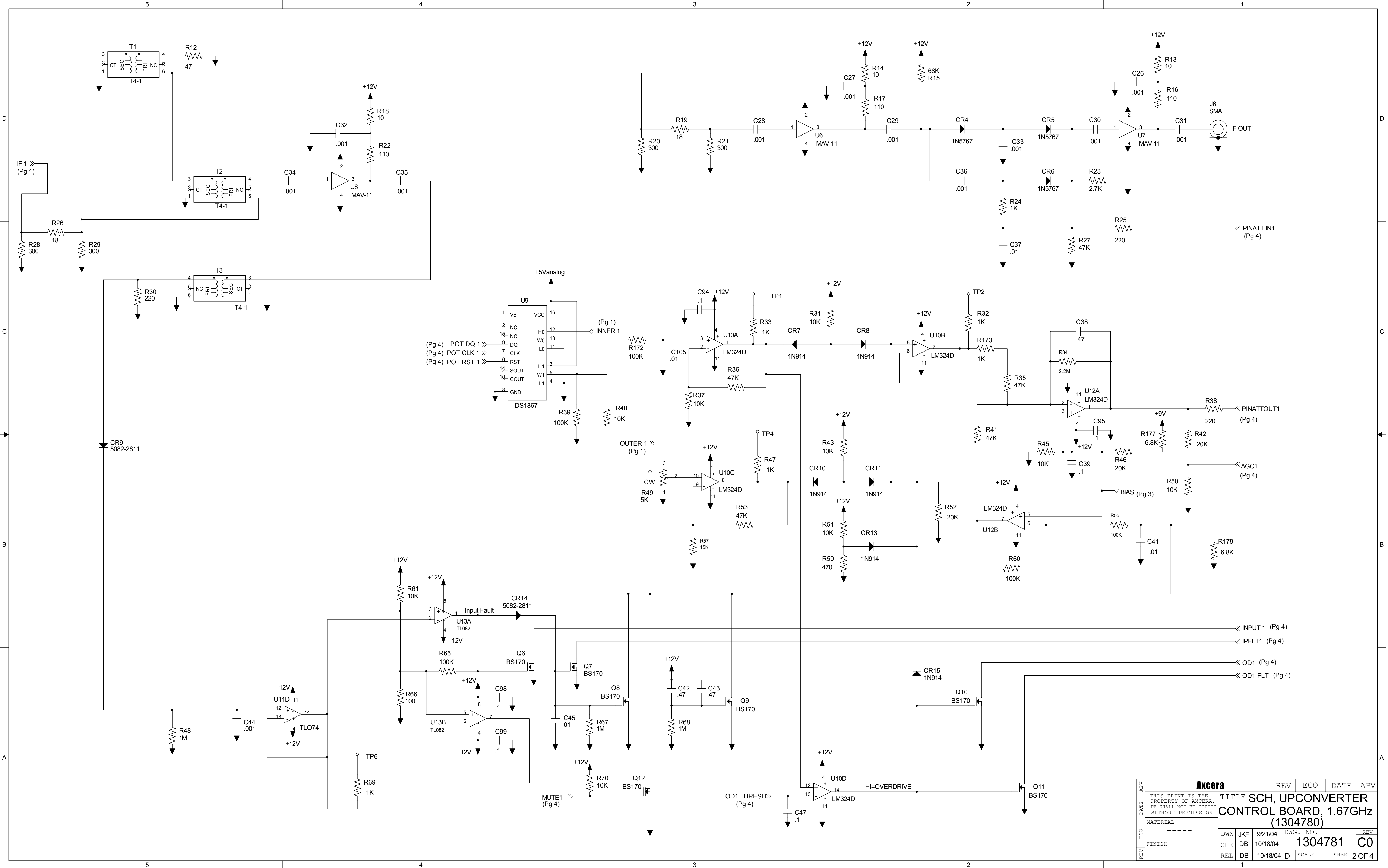
CHANGED J11 & J12 FROM 10 TO 13 POS. R57 & R116 WERE 10K. R34 & R93 WERE 470K. JKF

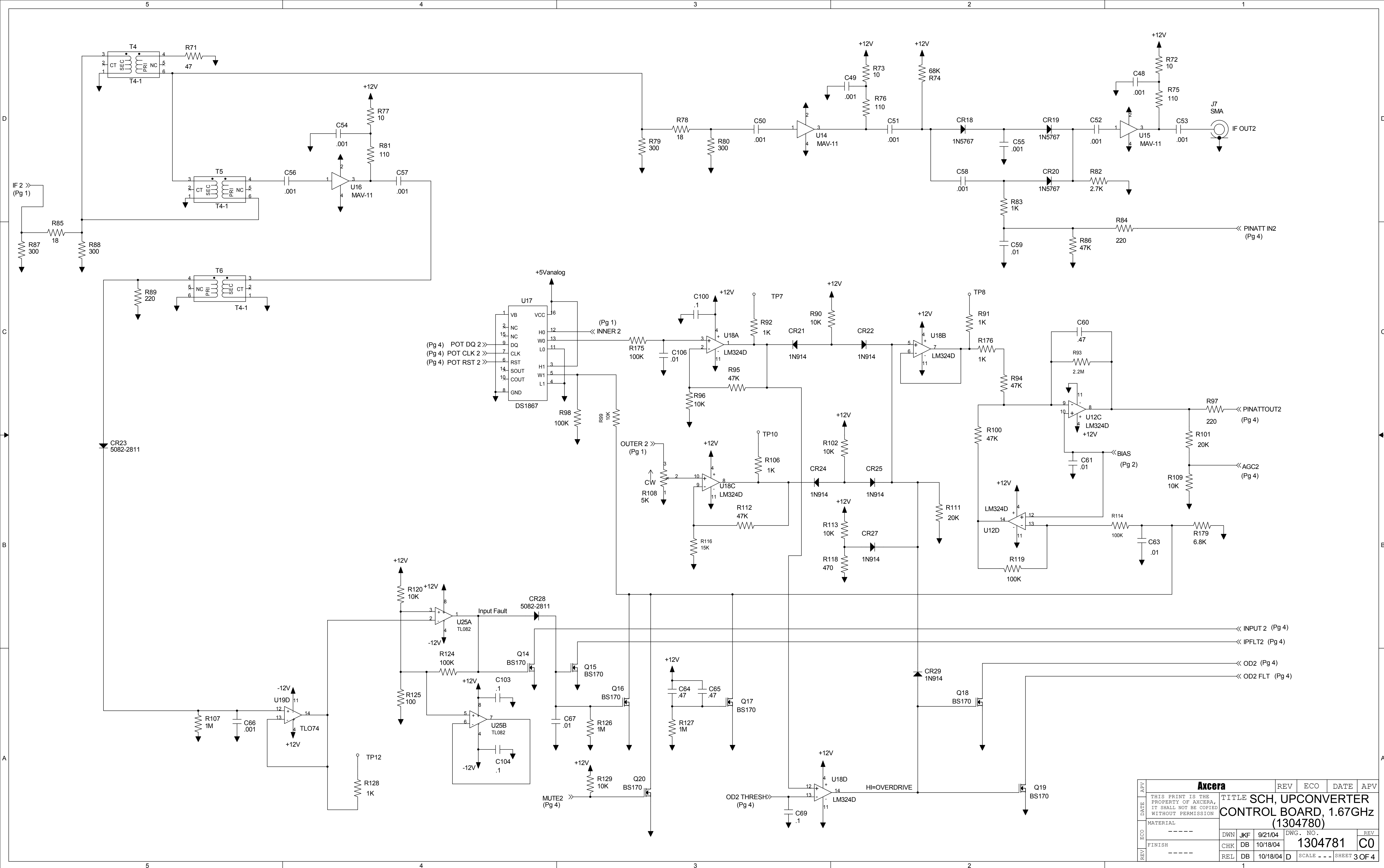
C0	20111711	2/9/05	DB
----	----------	--------	----

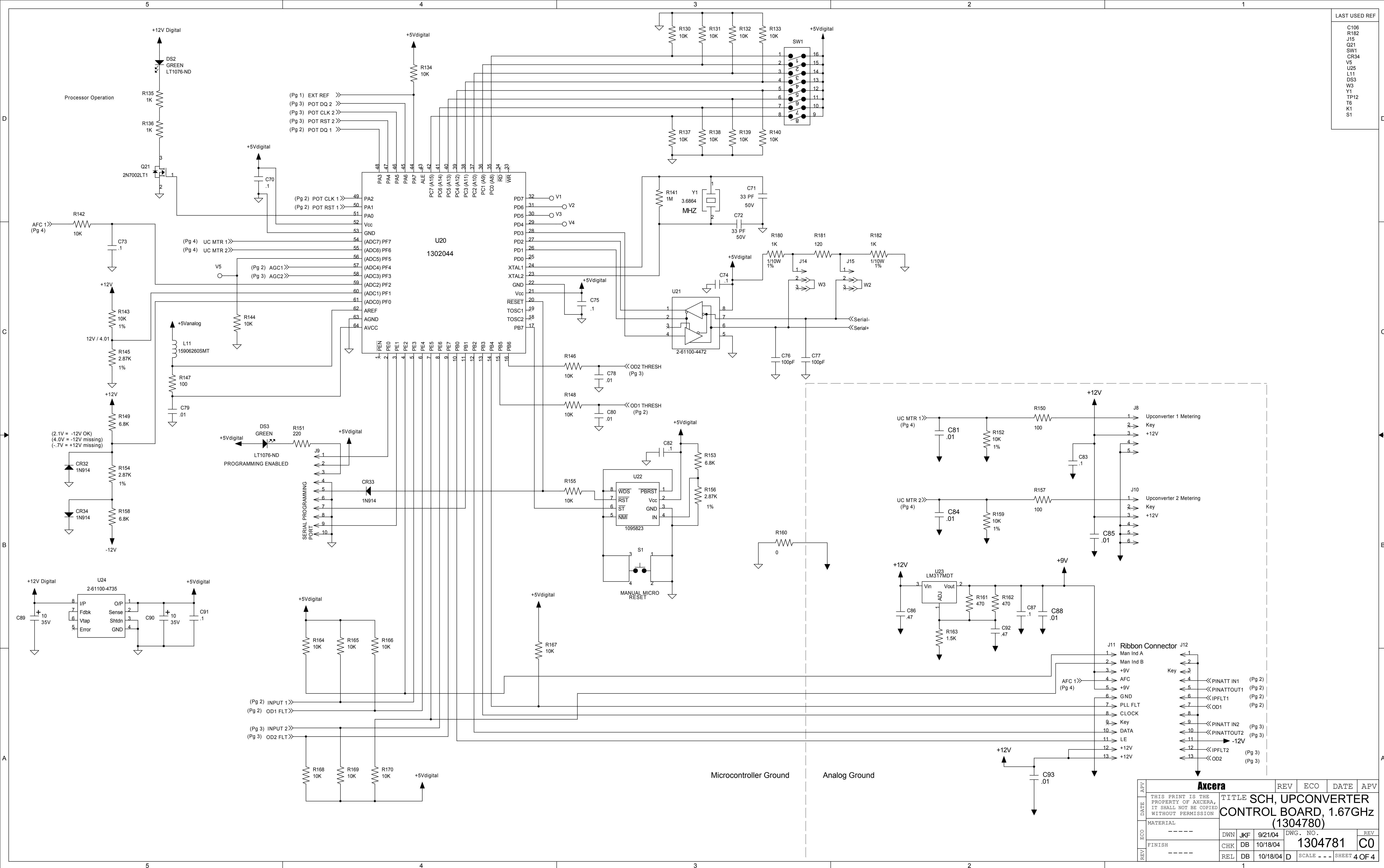
DEL. CR12, CR16, CR17, CR26, CR30, CR31, C40, C46, C62, C68, C96, C97, C101, C102, Q5, Q13, R44, R51, R56, R58, R62, R63, R64, R103, R104, R105, R110, R115, R117, R121, R122, R123, R171, R174, TP3, TP5, TP9 & TP11. ADD J13 - J15, R177 - R182, S1, W2 & W3. C39, C47 & C69 WERE .01. R40, R55, R99 & R114 WERE 47K. U2 WAS 1302908. JKF

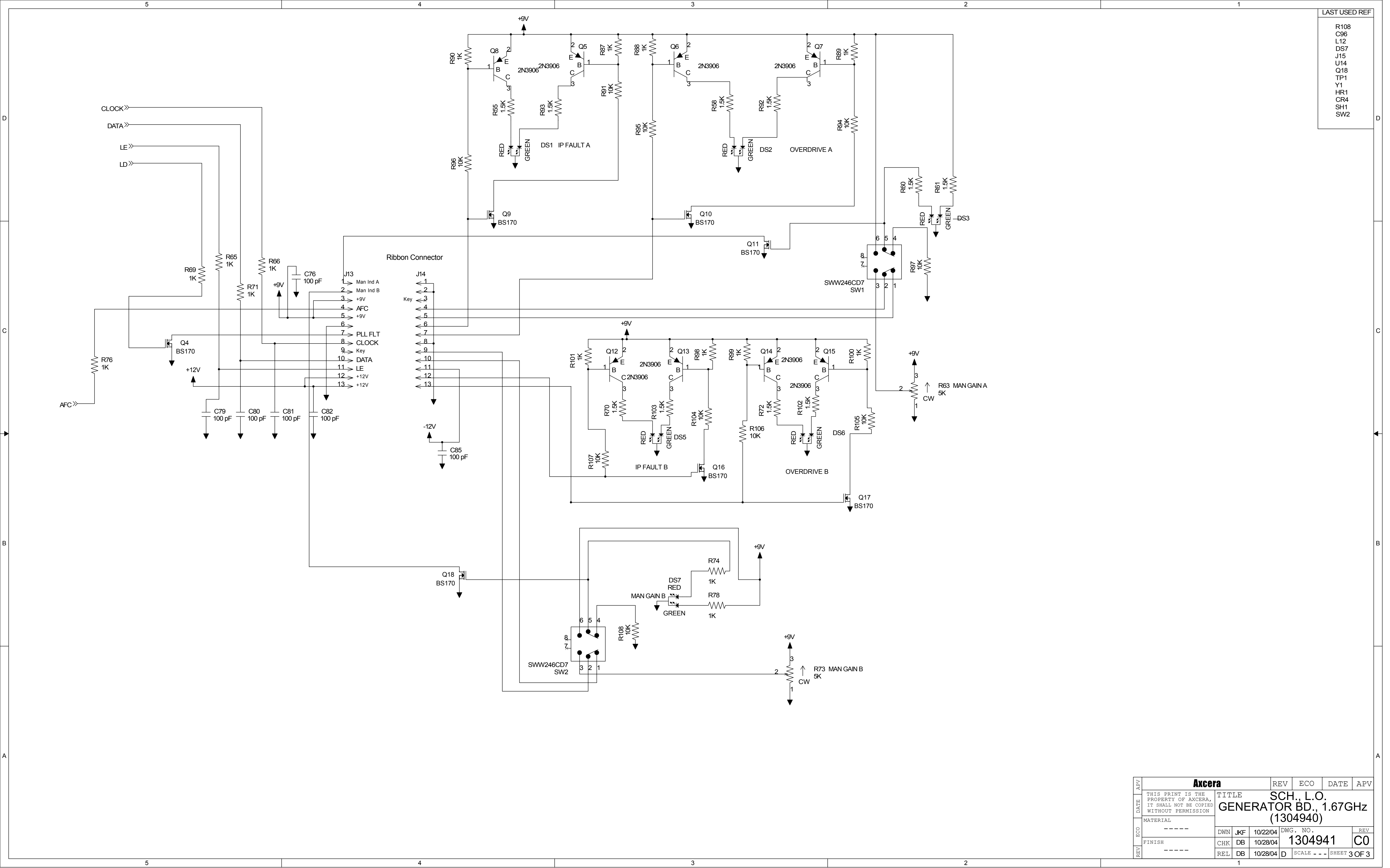
B0	20111670	2/9/05	DB
----	----------	--------	----

Axcera				REV	ECO	DATE	DB	APV
THIS PRINT IS THE PROPERTY OF AXCERA, IT SHALL NOT BE COPIED WITHOUT PERMISSION				TITLE SCH, UPCONVERTER CONTROL BOARD, 1.67GHz (1304780)				
				DWN	JKF	9/21/04	DWG. NO.	REV
				CHK	DB	10/18/04	1304781	C0
				REL	DB	10/18/04	D	SHEET 1 OF 4



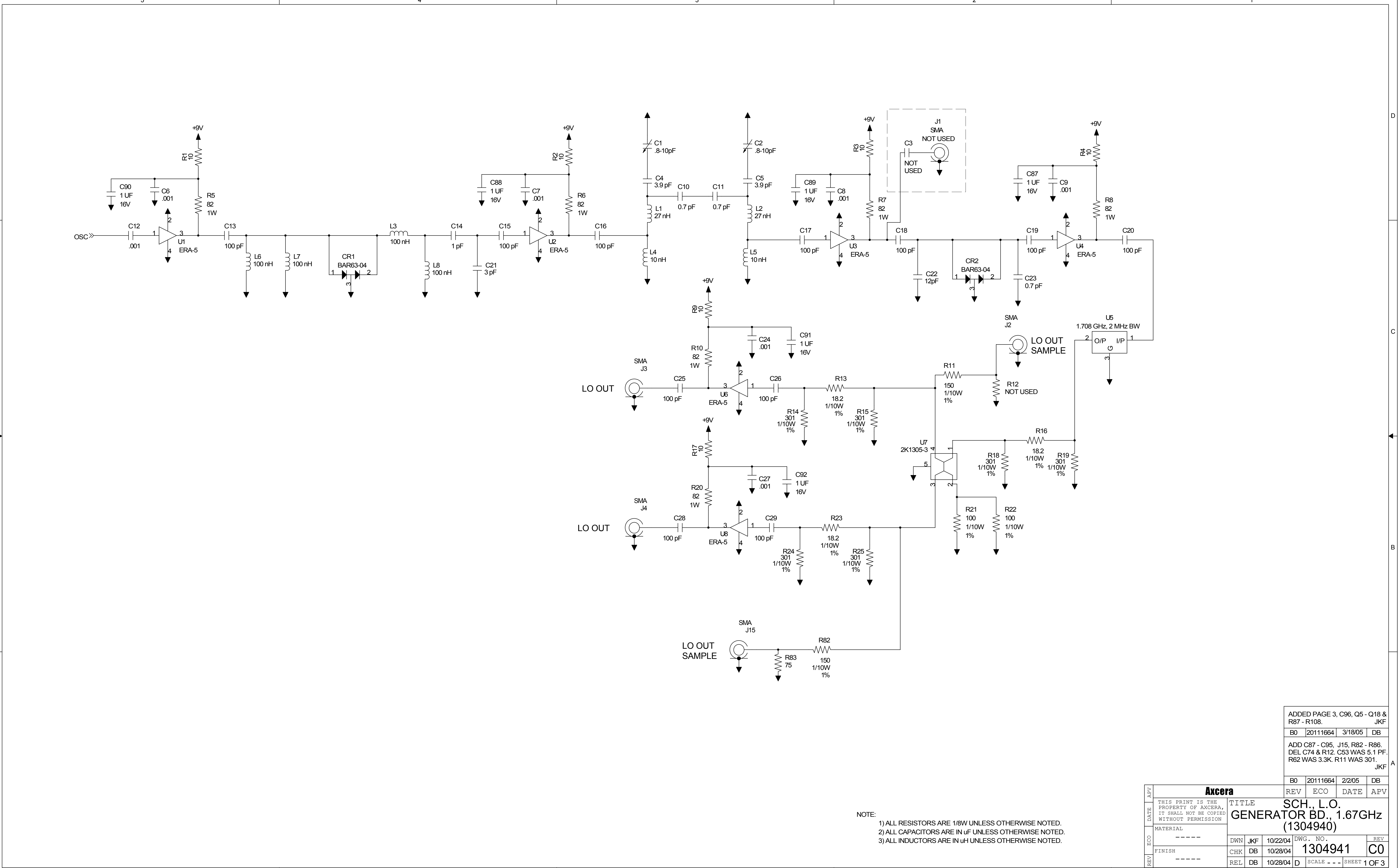






LAST USED REF	
R108	
C96	
L12	
DS7	
J15	
U14	
Q18	
TP1	
Y1	
HR1	
CR4	
SH1	
SW2	

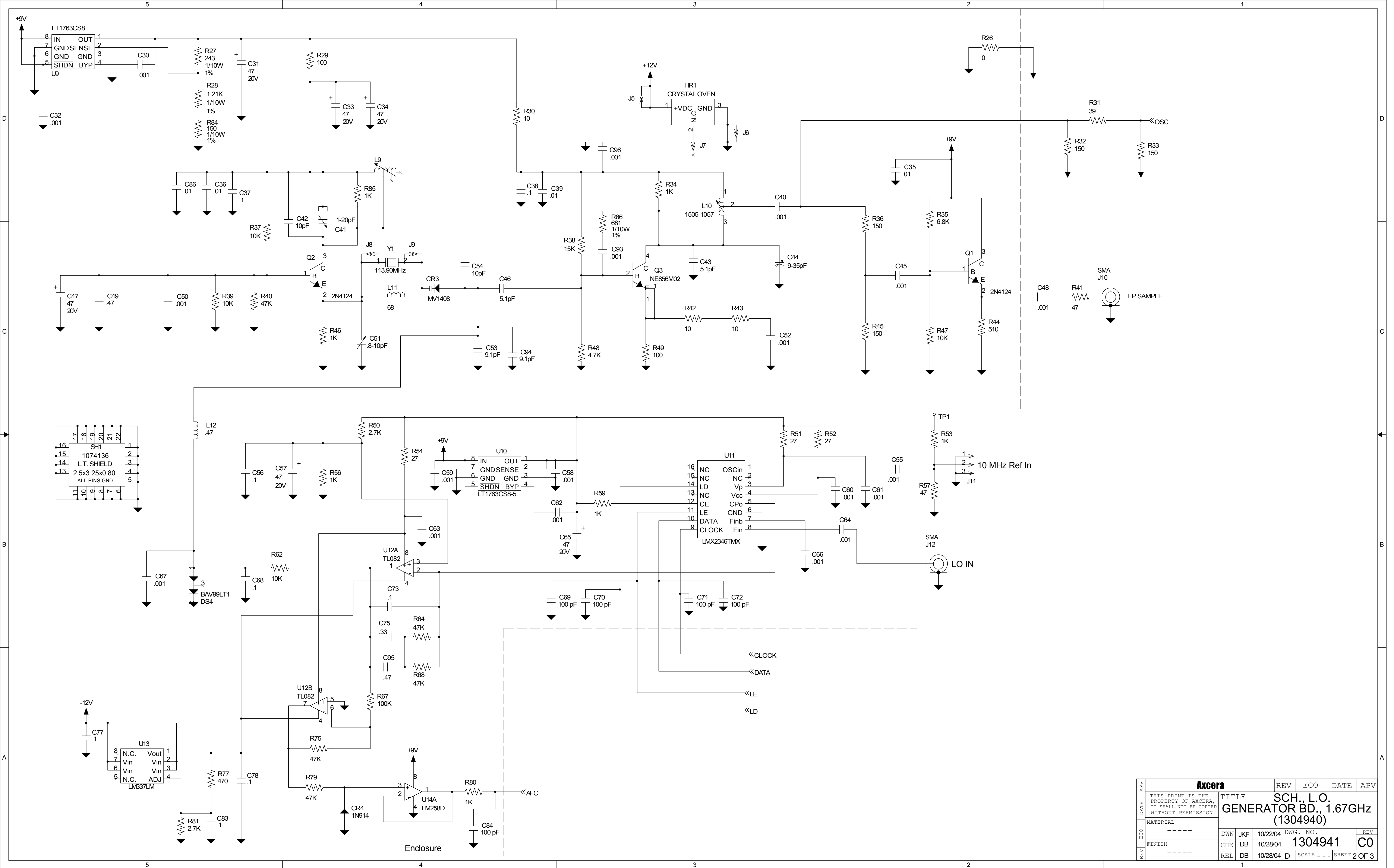
APV				Axcera				REV		ECO		DATE		APV	
DATE		THIS PRINT IS THE PROPERTY OF AXCERA, IT SHALL NOT BE COPIED WITHOUT PERMISSION		TITLE		SCH., L.O. GENERATOR BD., 1.67GHz (1304940)									
MATERIAL															
ECO		-----		DWN		JKF		10/22/04		DWG. NO.				REV	
FINISH				CHK		DB		10/28/04		1304941				C0	
REV		-----		REL		DB		10/28/04		D		SCALE - - -		SHEET 3 OF 3	



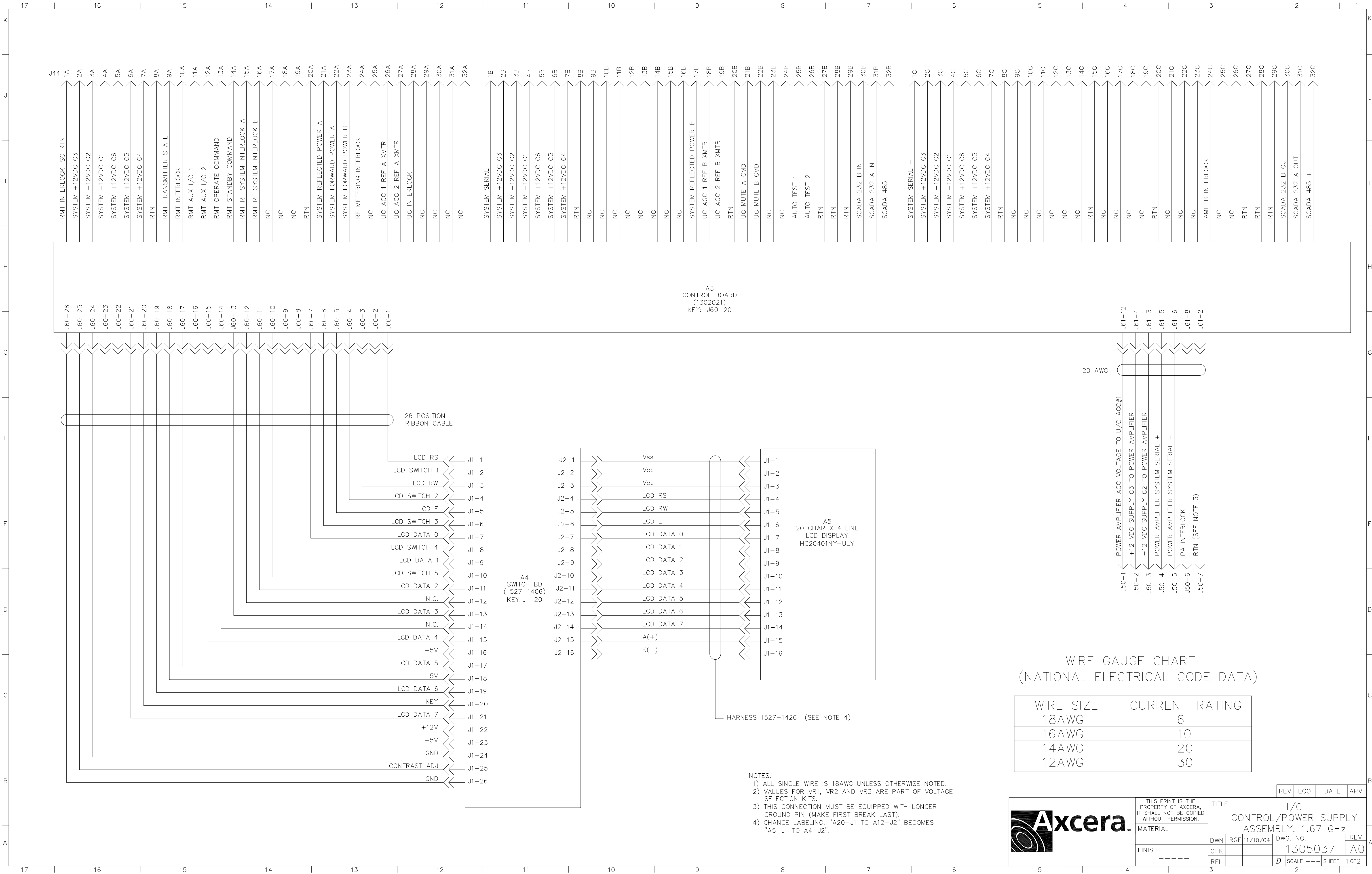
NOTE:
1) ALL RESISTORS ARE 1/8W UNLESS OTHERWISE NOTED.
2) ALL CAPACITORS ARE IN uF UNLESS OTHERWISE NOTED.
3) ALL INDUCTORS ARE IN uH UNLESS OTHERWISE NOTED.

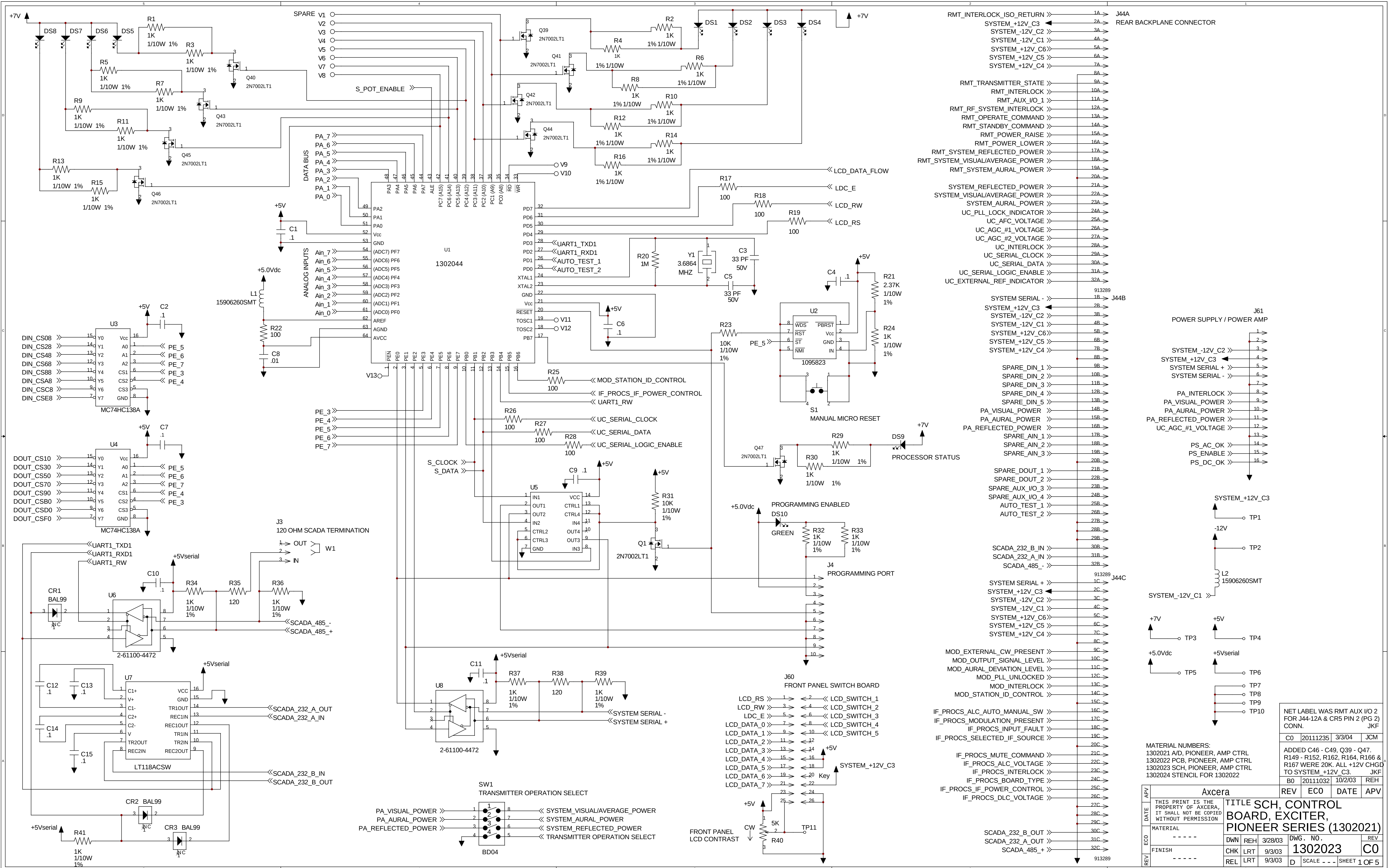
ADDED PAGE 3, C96, Q5 - Q18 & R87 - R108. JKF			
B0	20111664	3/18/05	DB
ADD C87 - C95, J15, R82 - R86. DEL C74 & R12. C53 WAS 5.1 PF. R62 WAS 3.3K. R11 WAS 301. JKF			
B0	20111664	2/2/05	DB

REV	Axcera						REV	ECO	DATE	APV	
DATE	THIS PRINT IS THE PROPERTY OF AXCERA, IT SHALL NOT BE COPIED WITHOUT PERMISSION		TITLE		SCH., L.O. GENERATOR BD., 1.67GHz (1304940)						
MATERIAL											
ECO			DWN JKF 10/22/04 DWG. NO. REV								
FINISH			CHK DB 10/28/04 1304941 C0								
REV			REL DB 10/28/04 D SCALE - - - SHEET 1 OF 3								



APV		REV		ECO		DATE		APV	
THIS PRINT IS THE PROPERTY OF AXCERA, IT SHALL NOT BE COPIED WITHOUT PERMISSION		TITLE		SCH., L.O. GENERATOR BD., 1.67GHz (1304940)		DWN		JkF	
MATERIAL		REL		DB		10/28/04		DWG. NO.	
FINISH		REL		DB		10/28/04		1304941	
REV		REL		DB		10/28/04		D	
SCALE		SHEET		2 OF 3		REV		C0	



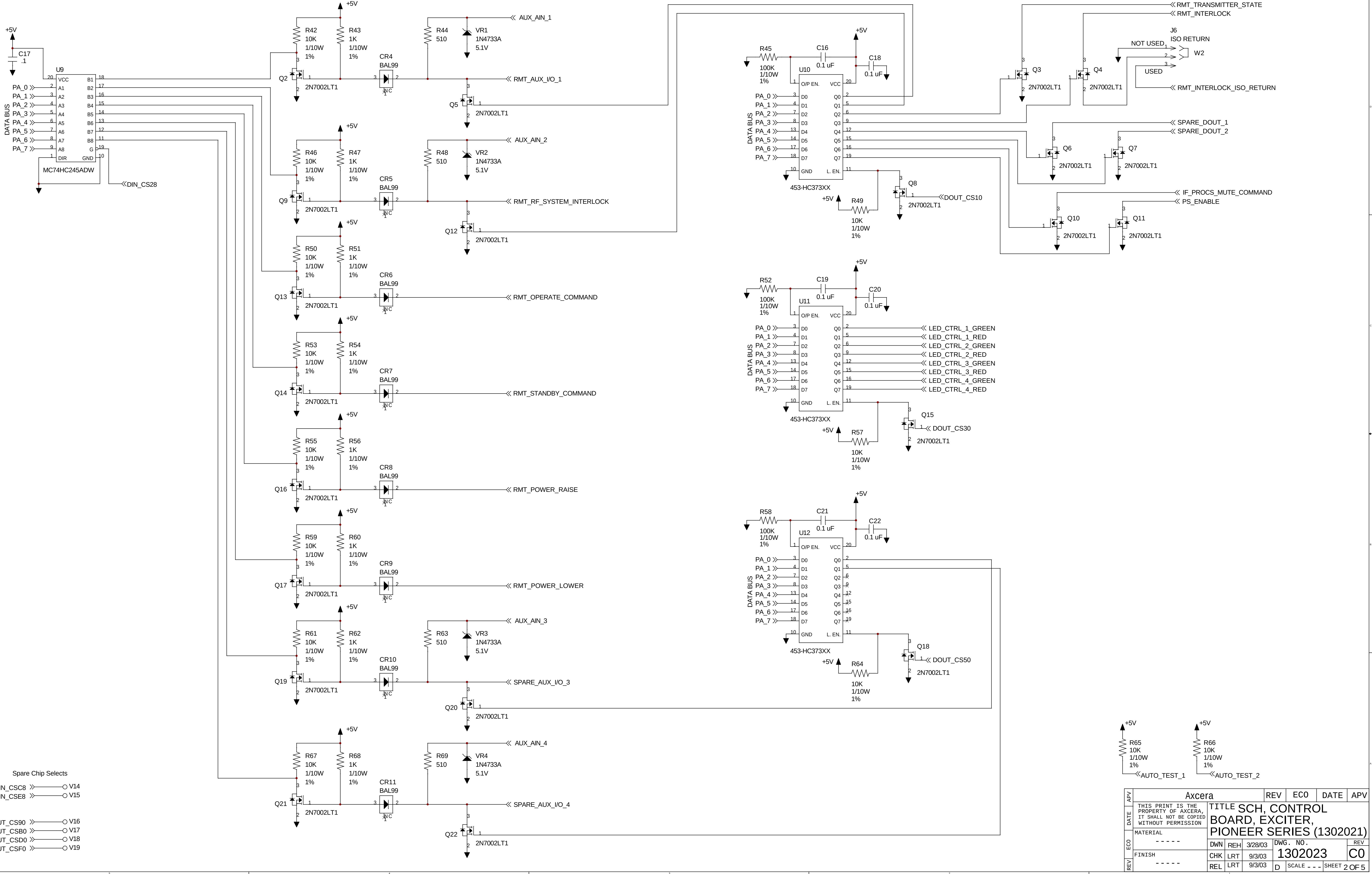


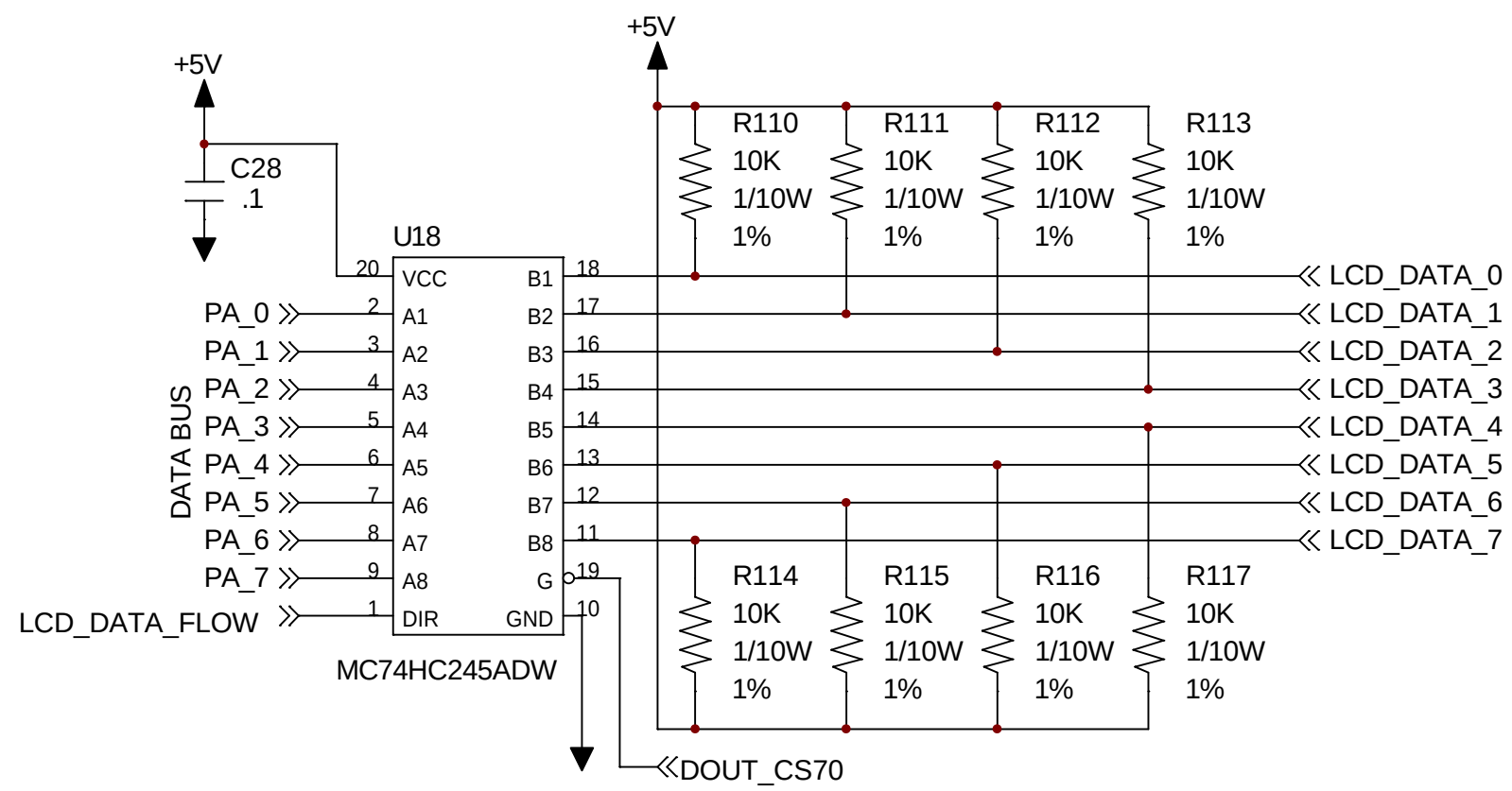
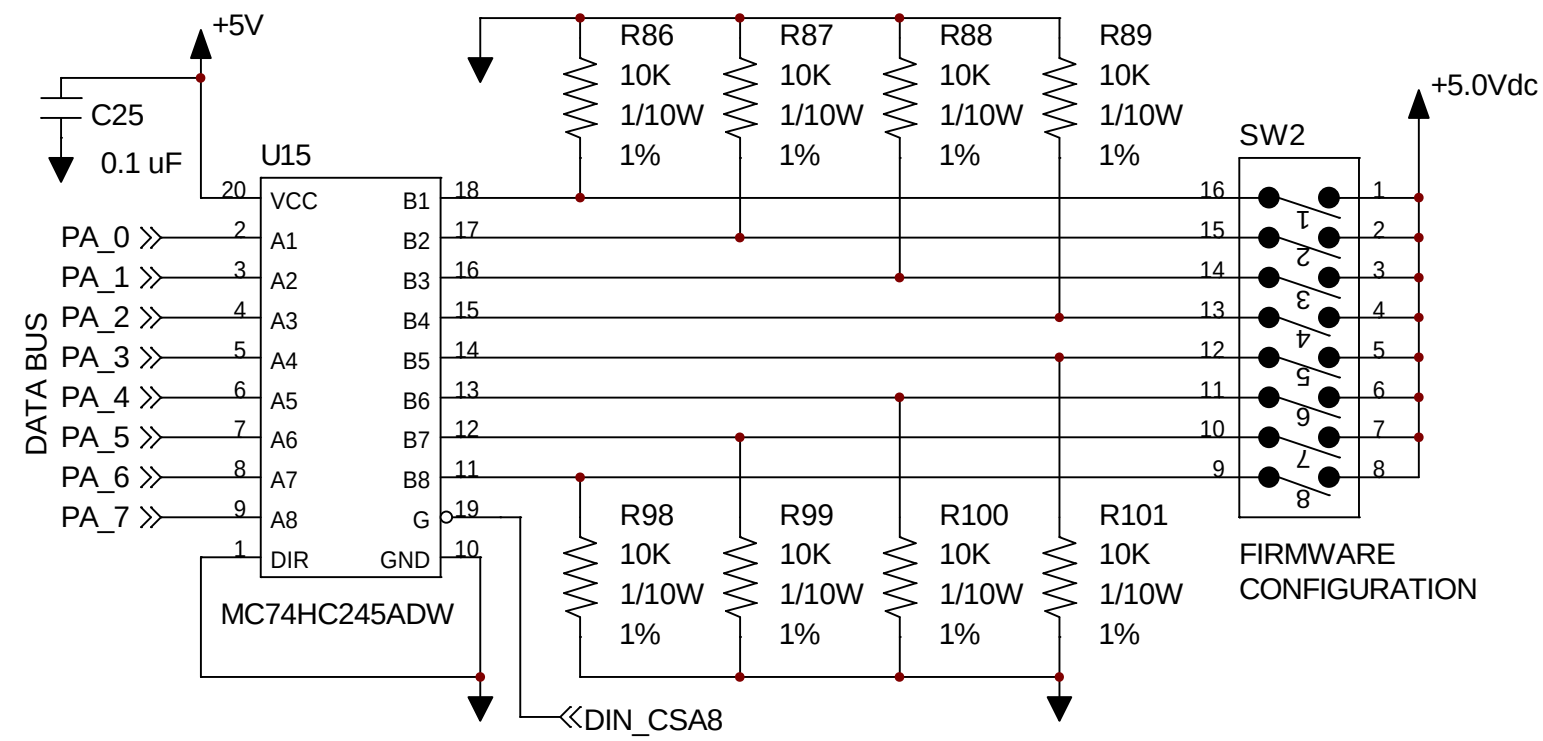
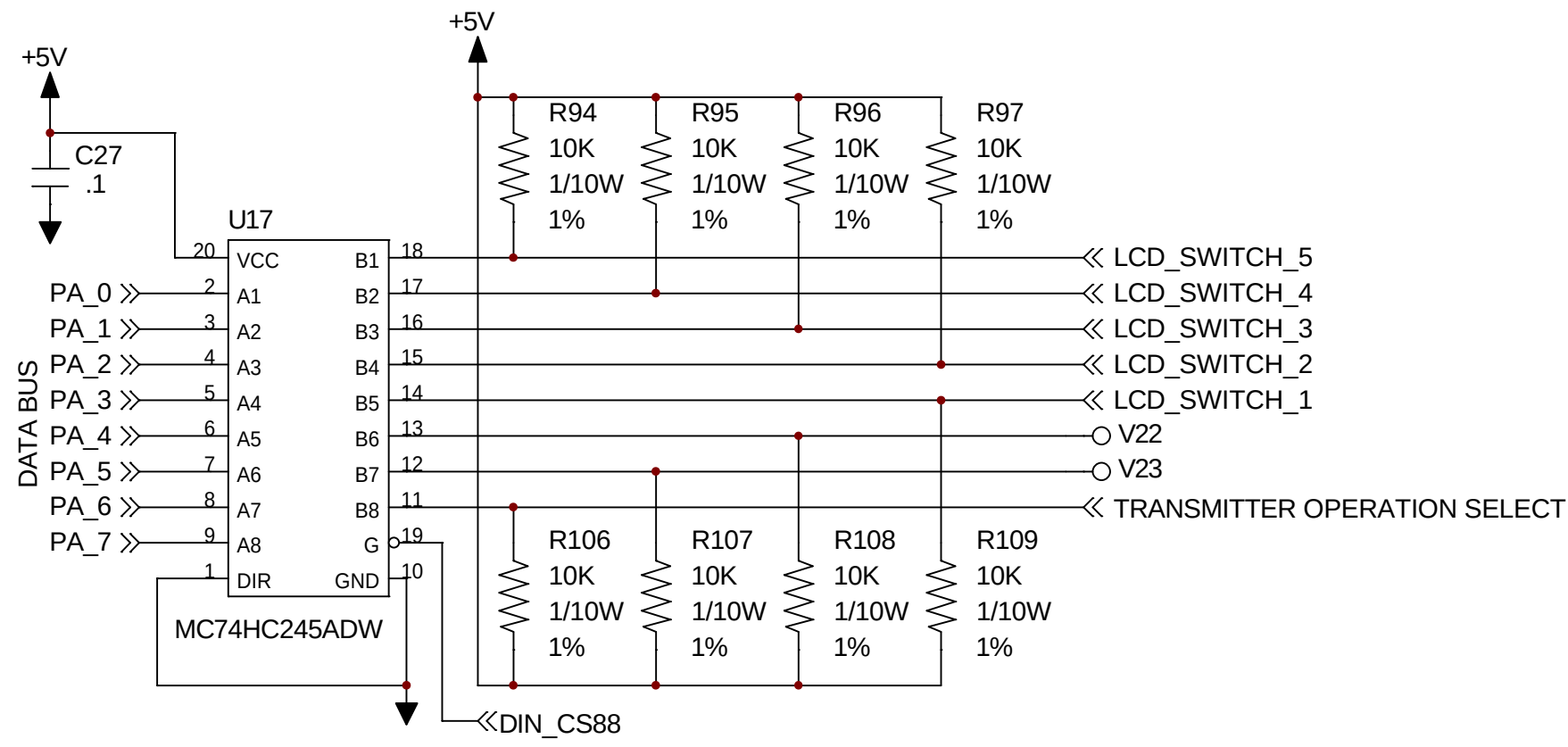
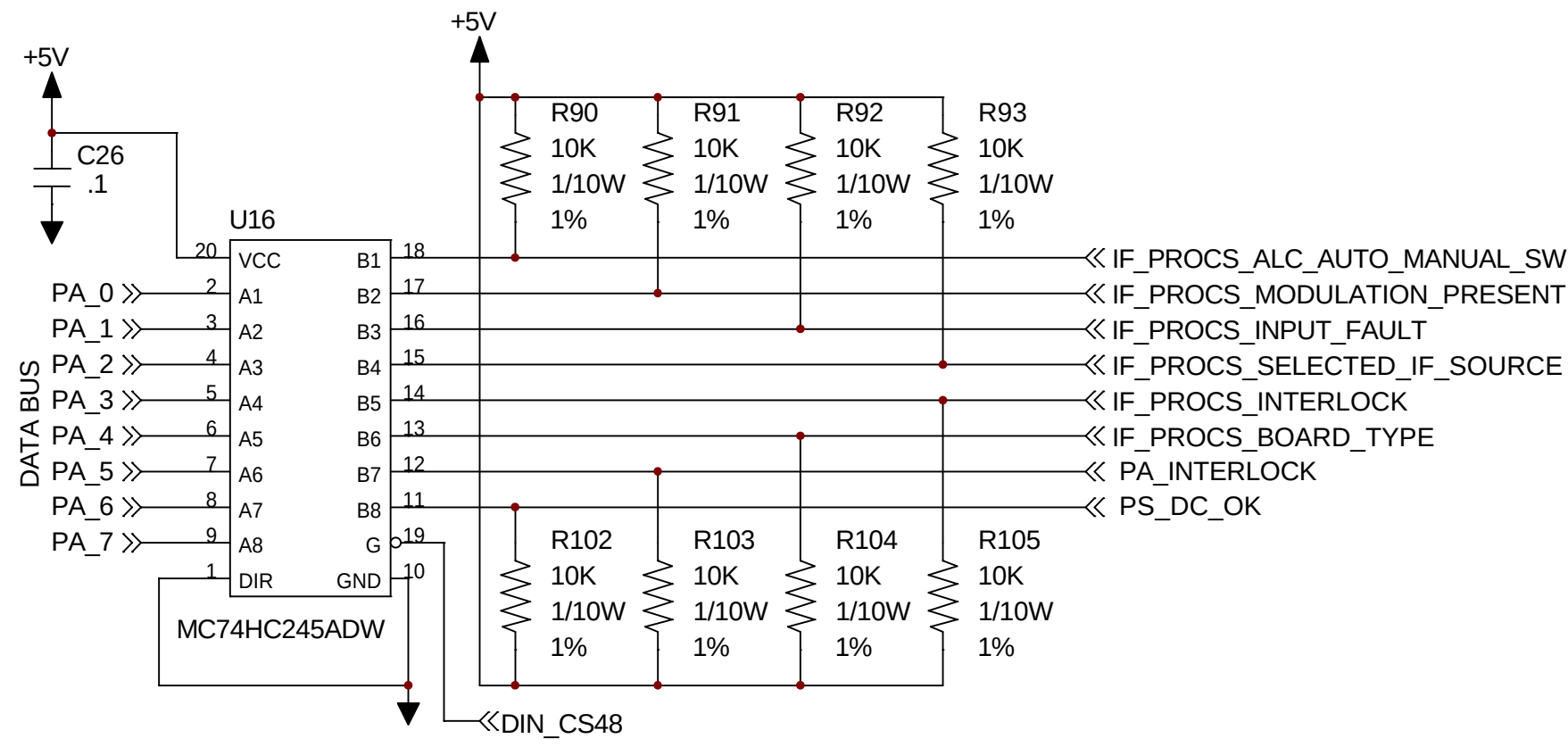
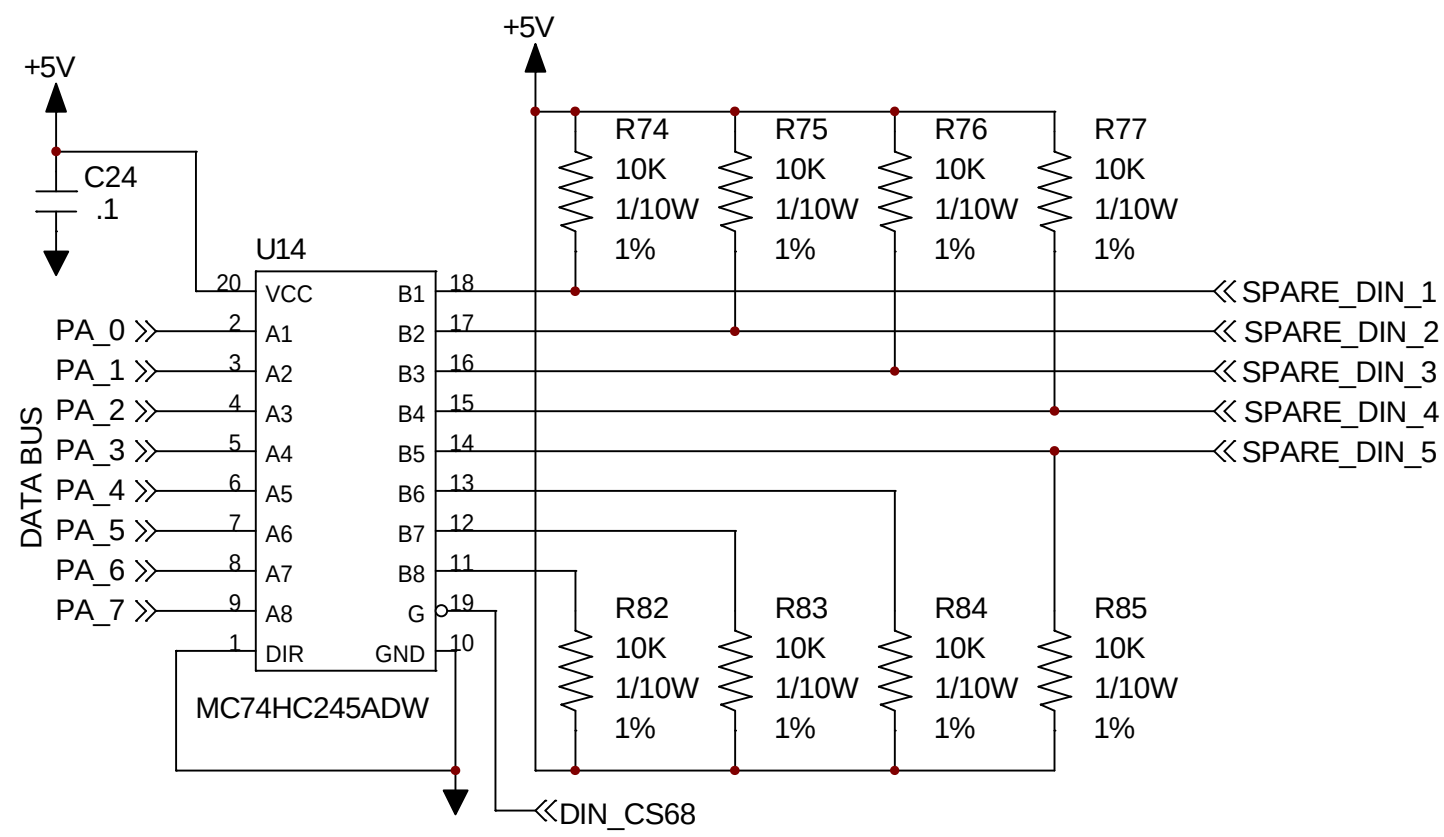
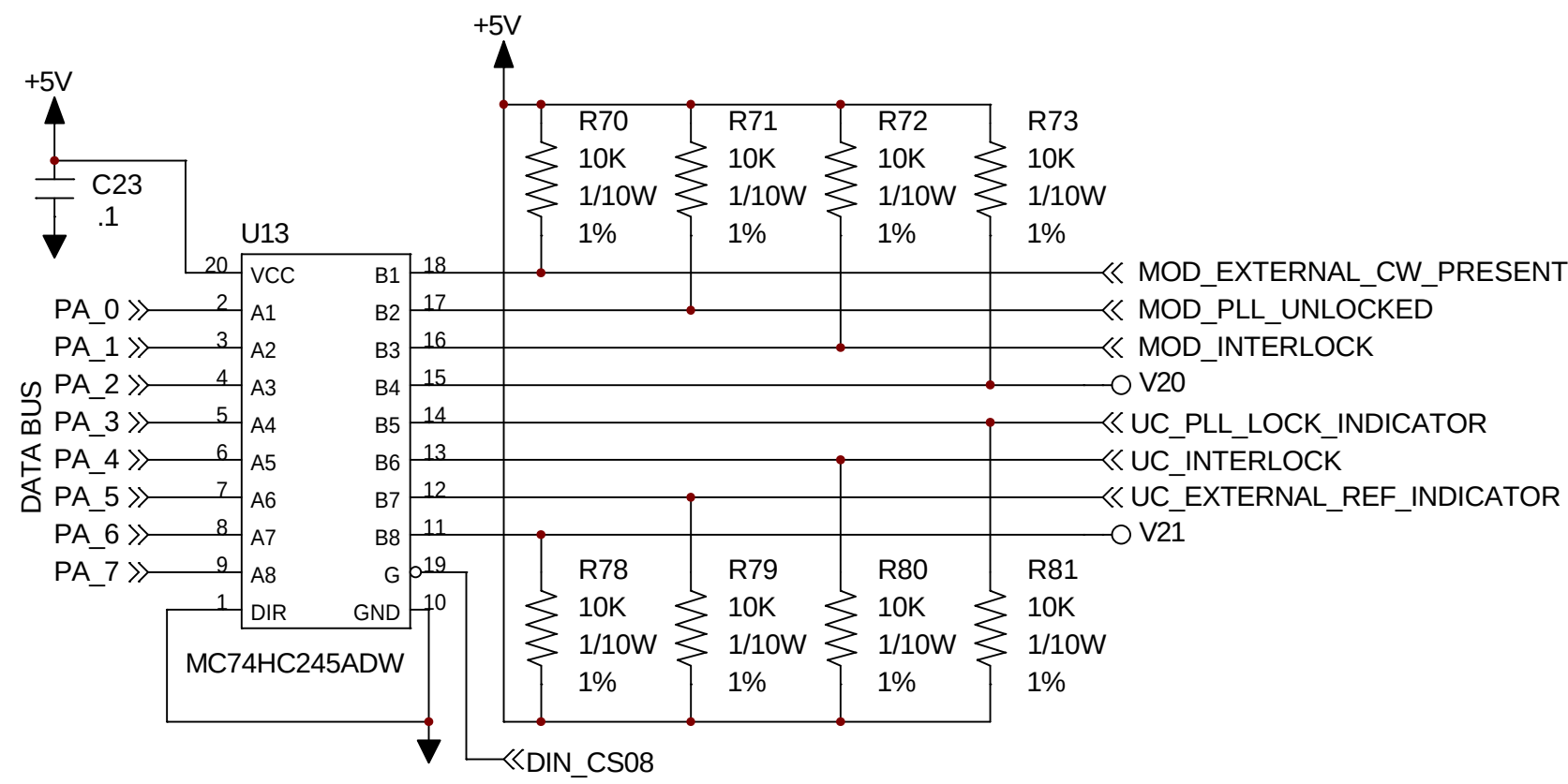
NET LABEL WAS RMT AUX I/O 2 FOR J44-12A & CR5 PIN 2 (PG 2) CONN. JKF

C0	20111235	3/3/04	JCM
ADDED C46 - C49, Q39 - Q47, R149 - R152, R162, R164, R166 & R167 WERE 20K. ALL +12V CHGD TO SYSTEM +12V_C3. JKF			
B0	20111032	10/2/03	REH

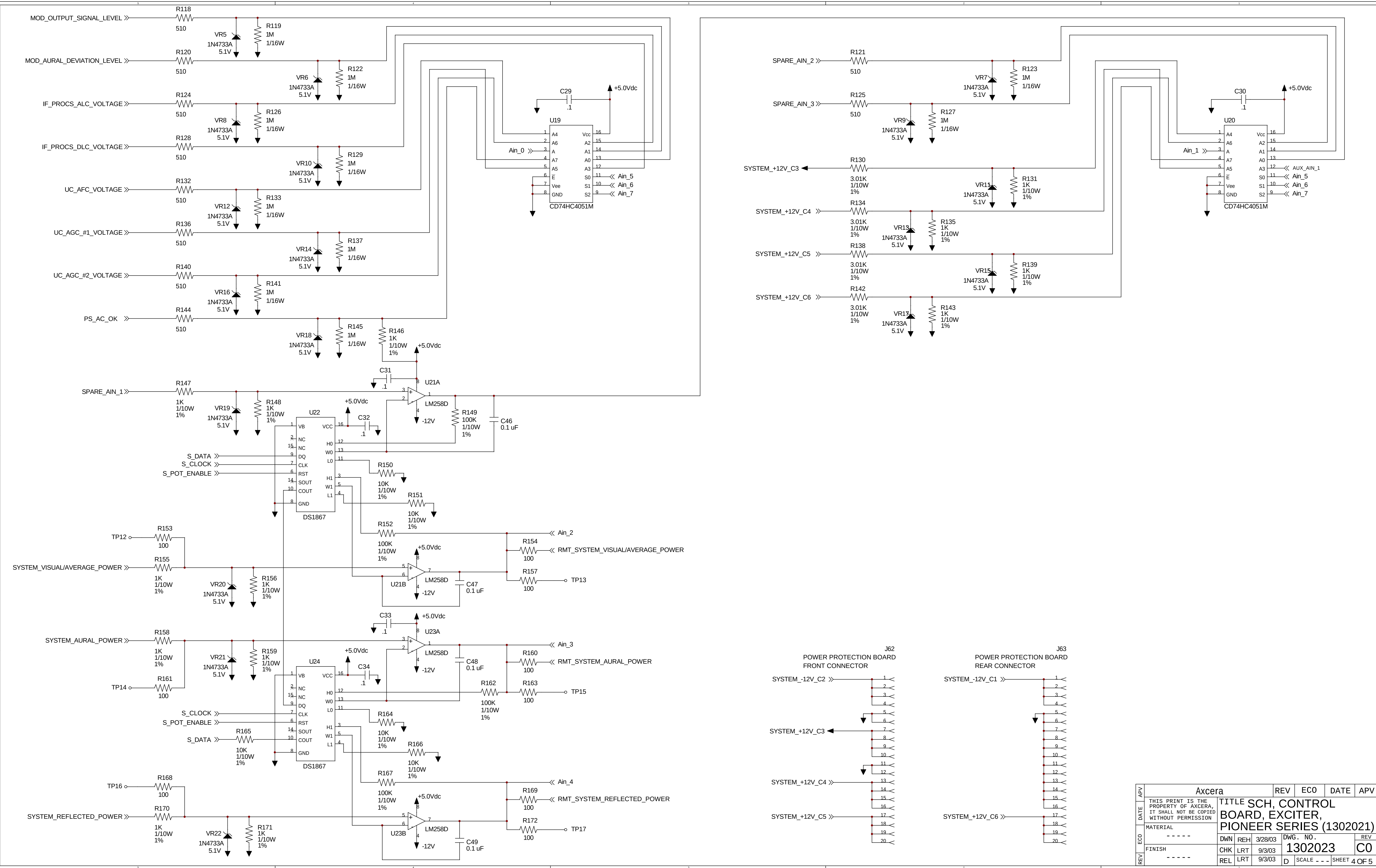
MATERIAL NUMBERS:
1302021 A/D, PIONEER, AMP CTRL
1302022 PCB, PIONEER, AMP CTRL
1302023 SCH, PIONEER, AMP CTRL
1302024 STENCIL FOR 1302022

Axcera				REV	ECO	DATE	APV
THIS PRINT IS THE PROPERTY OF AXGERA, IT SHALL NOT BE COPIED WITHOUT PERMISSION				TITLE SCH, CONTROL BOARD, EXCITER, PIONEER SERIES (1302021)			
MATERIAL				DWN	REH	3/28/03	DWG. NO.
FINISH				CHK	LRT	9/3/03	1302023
				REL	LRT	9/3/03	C0
				D SCALE - - - SHEET 1 OF 5			

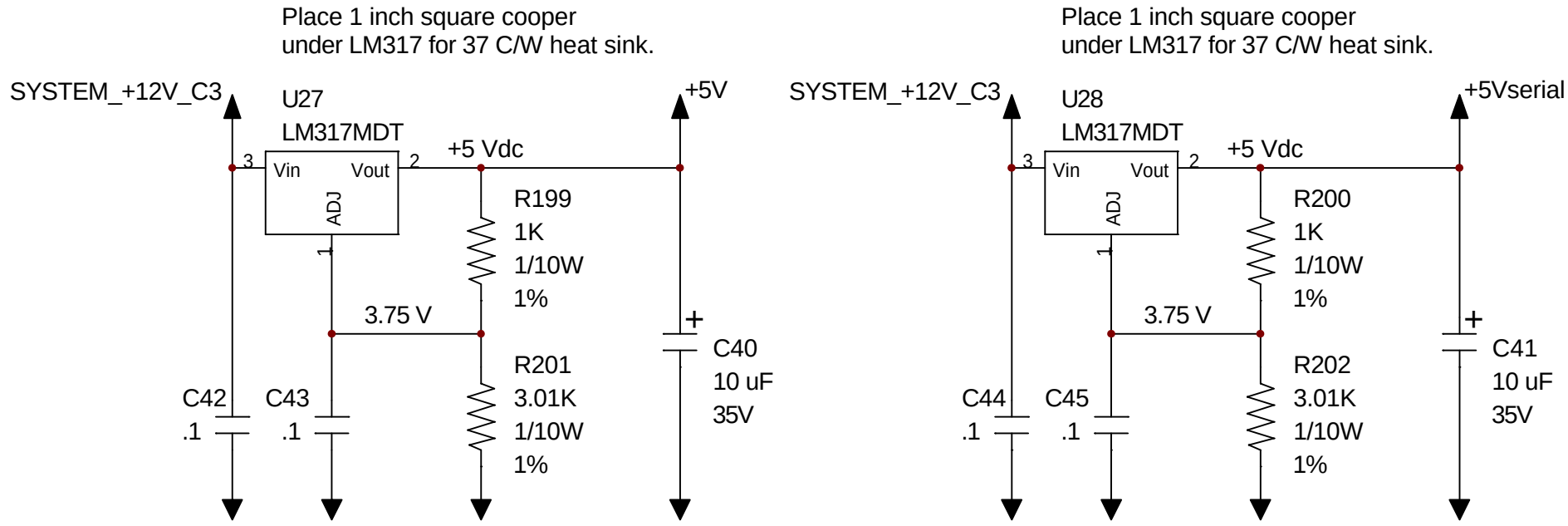
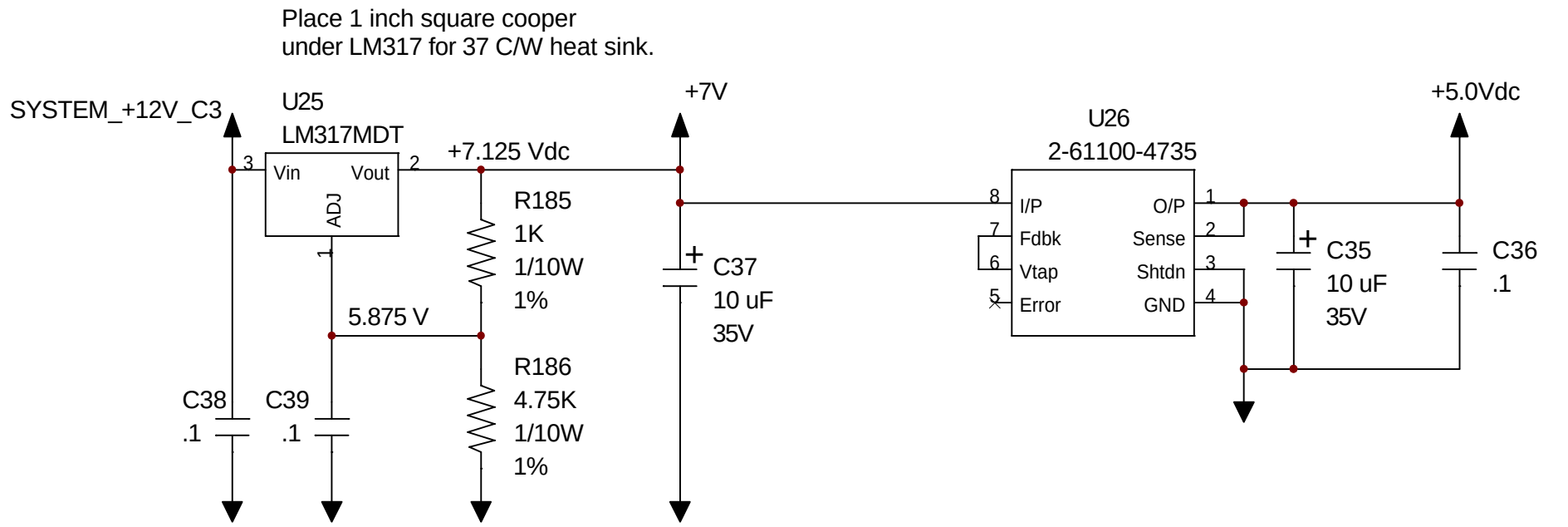




APV	Axcera					REV	ECO	DATE	APV	
DATE	THIS PRINT IS THE PROPERTY OF AXCERA, IT SHALL NOT BE COPIED WITHOUT PERMISSION		TITLE SCH, CONTROL BOARD, EXCITER, PIONEER SERIES (1302021)							
ECO			MATERIAL					DWN REH 3/28/03		DWG. NO.
REV	FINISH		CHK LRT		9/3/03		1302023		C0	
			REL LRT		9/3/03		D	SCALE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



PAGE 1:

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 (!ST) is not clocked every second. A manual reset switch is provided but should not be needed.

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

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.

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.

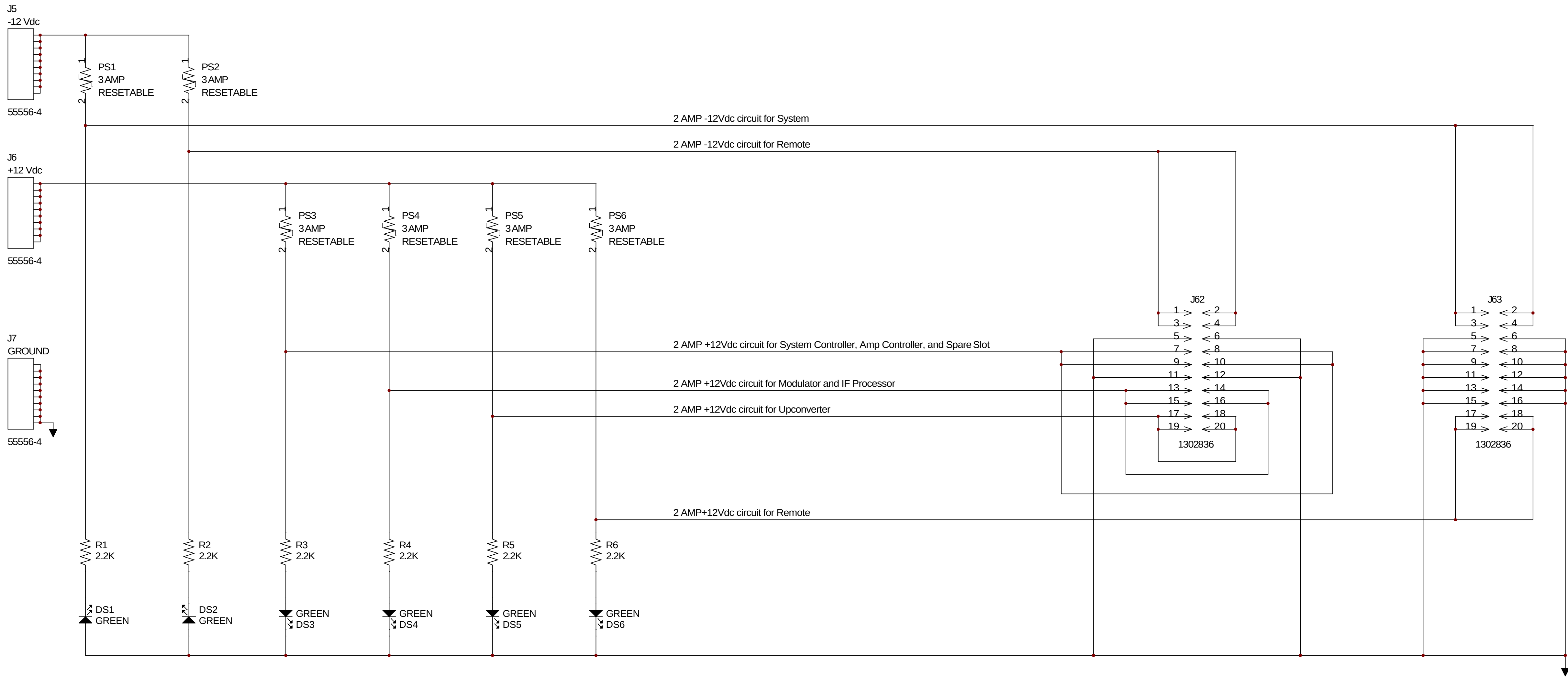
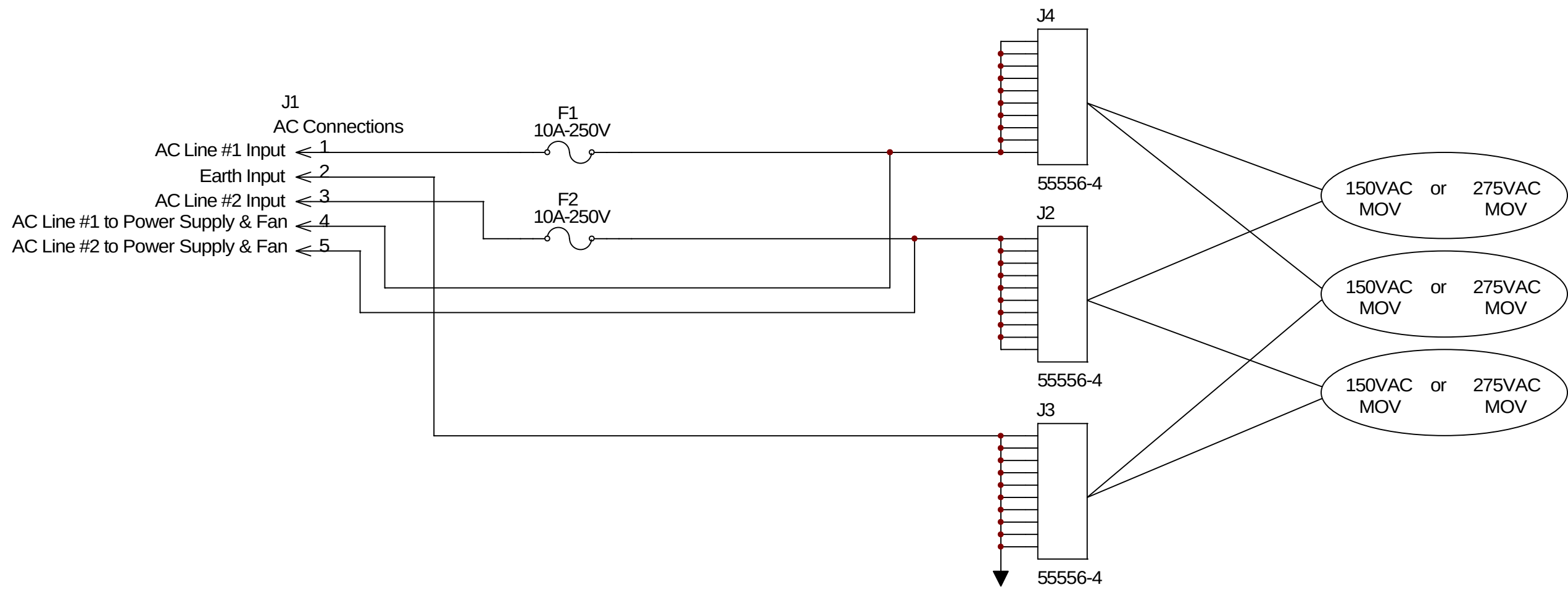
Four of the circuits on page two are auxiliary I/O connections wired for future use. They are wired similar to the remote digital inputs but include a FET for digital output operation. To operate these signals as an input, the associated output FET must be turned off. These circuits are also connected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

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.

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 definitely 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).

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.

APV	Axcera				REV	ECO	DATE	APV
DATE	THIS PRINT IS THE PROPERTY OF AXCERA, IT SHALL NOT BE LOANED 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 5 OF 5



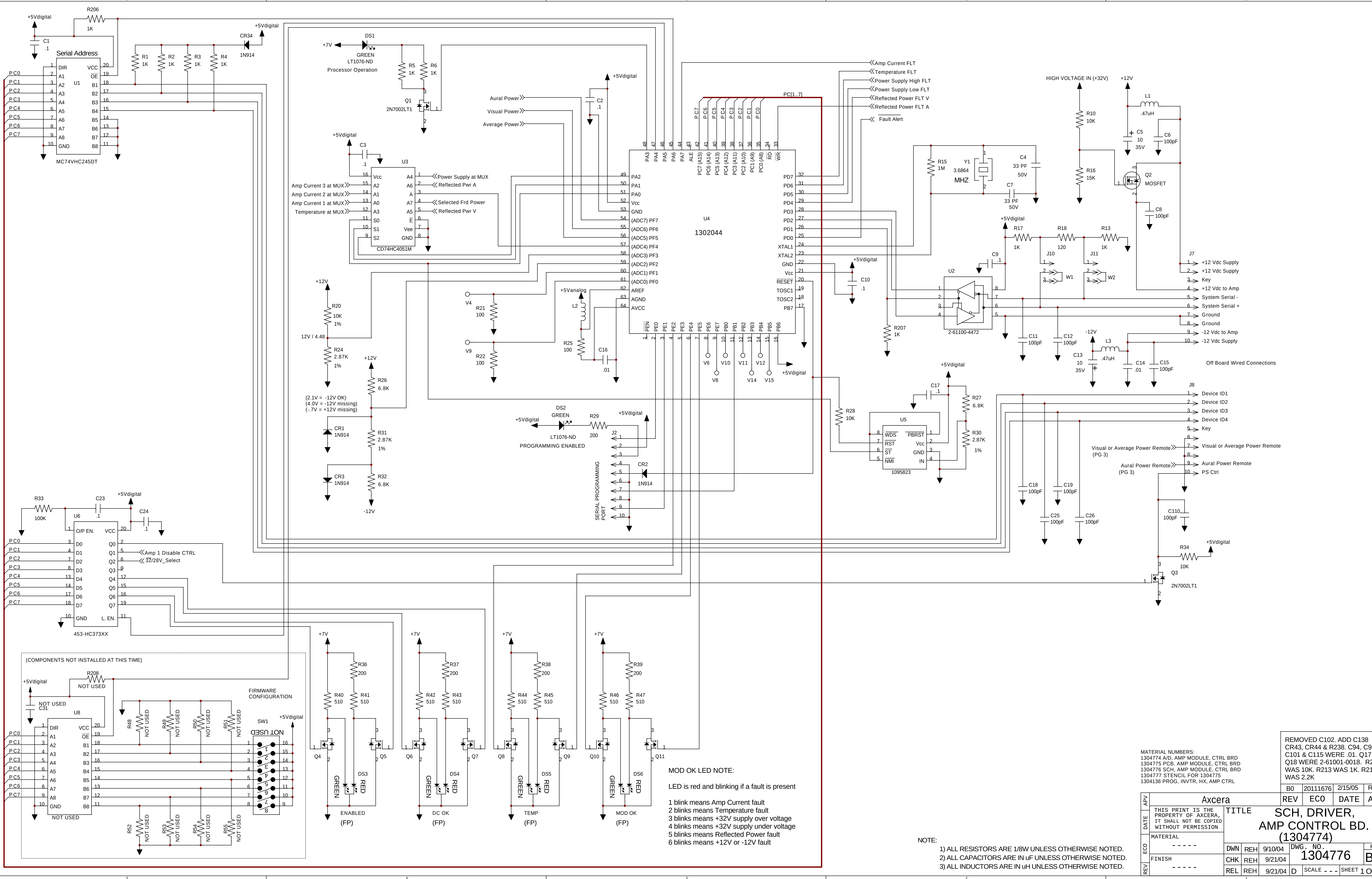
Circuit Design Notes:

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

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



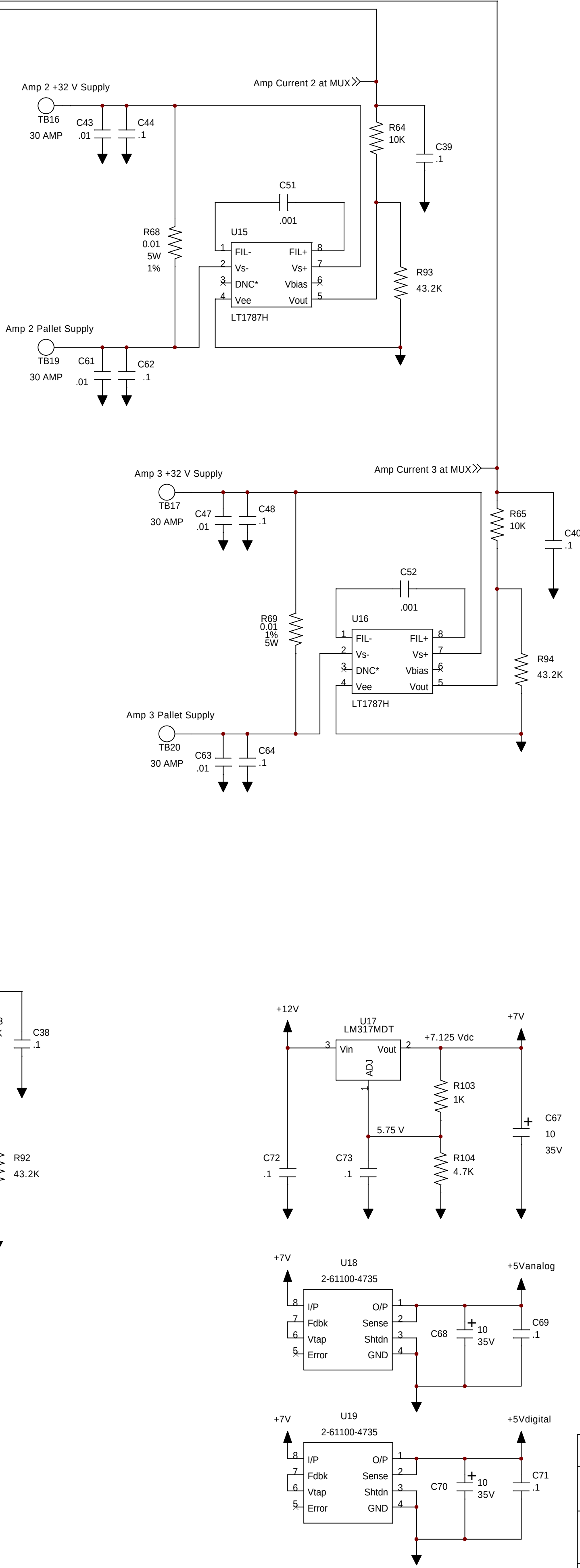
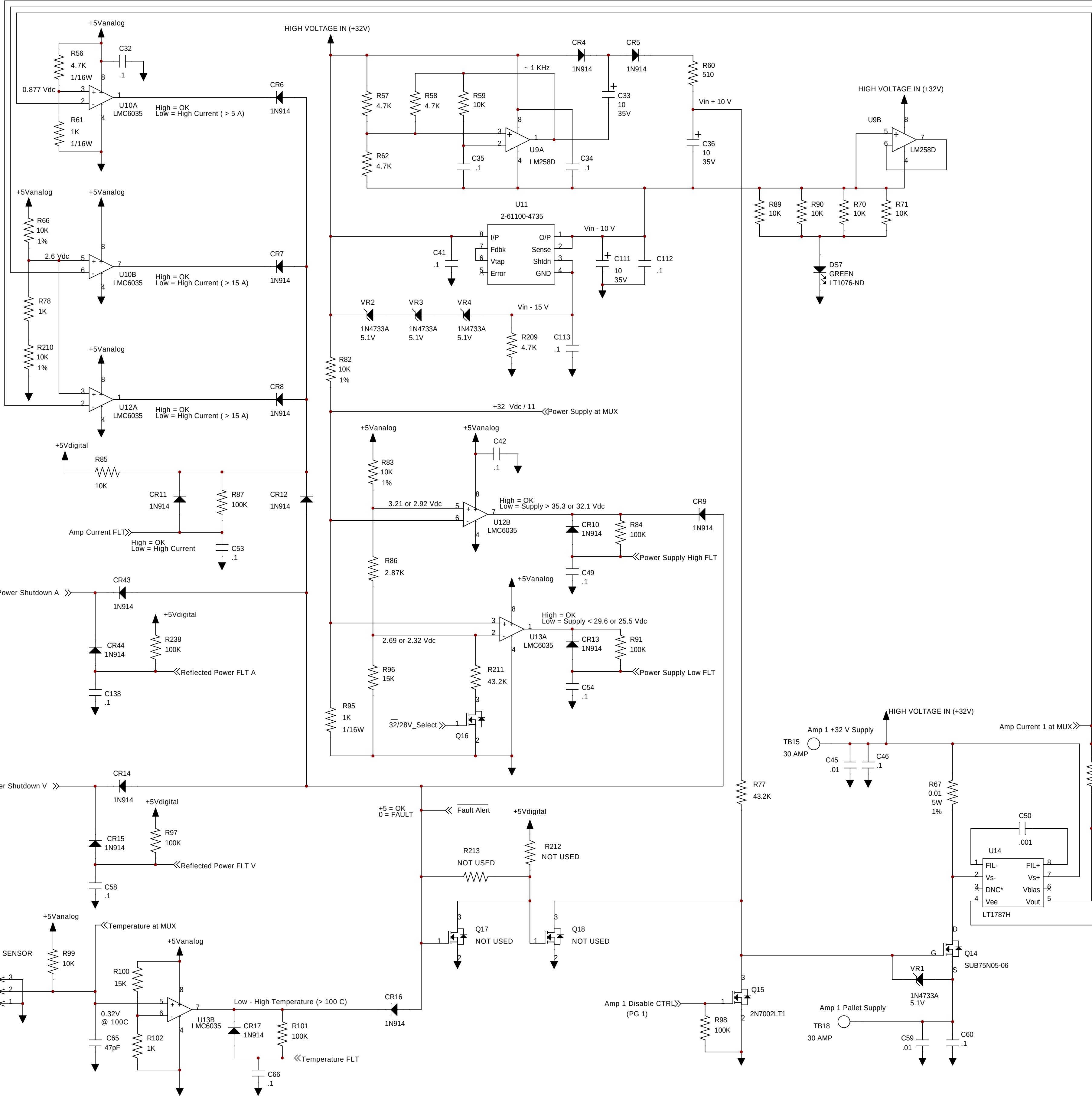
MATERIAL NUMBERS:
1304774 A/D, AMP MODULE, CTRL BRD
1304775 PCB, AMP MODULE, CTRL BRD
1304776 SCH, AMP MODULE, CTRL BRD
1304777 STENCIL FOR 1304775
1304136 PROG, INVTR, HX, AMP CTRL

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	Axcera		REV	ECO	DATE	APV
DATE	THIS PRINT IS THE PROPERTY OF AXGERA, IT SHALL NOT BE COPIED WITHOUT PERMISSION		TITLE		SCH, DRIVER, AMP CONTROL BD. (1304774)	
ECO			DWN	REH	9/10/04	REV
REV	FINISH		CHK	REH	9/21/04	B0
			REL	REH	9/21/04	D
			SCALE	- - -		SHEET 1 OF 3

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

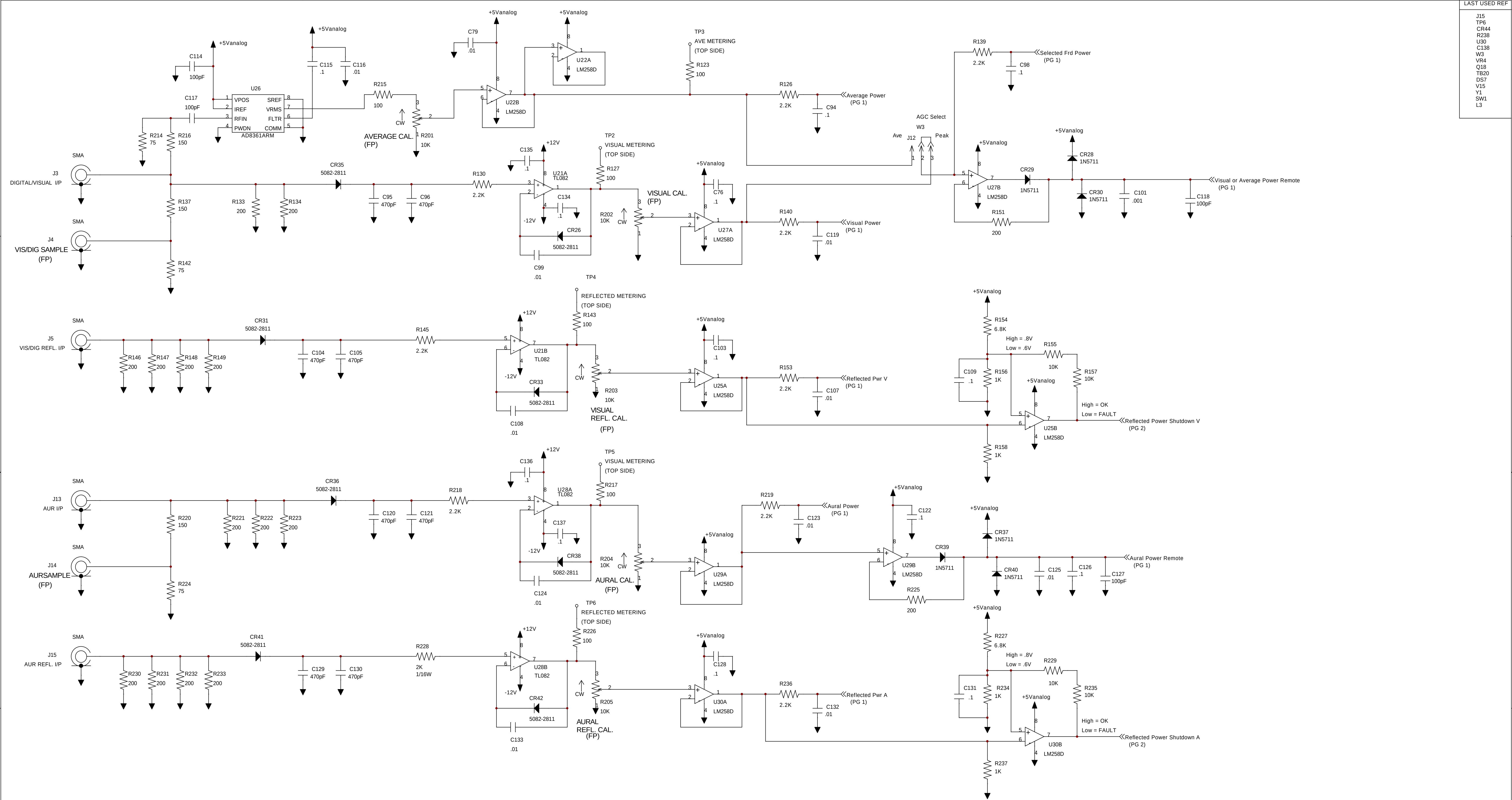


NOTE:

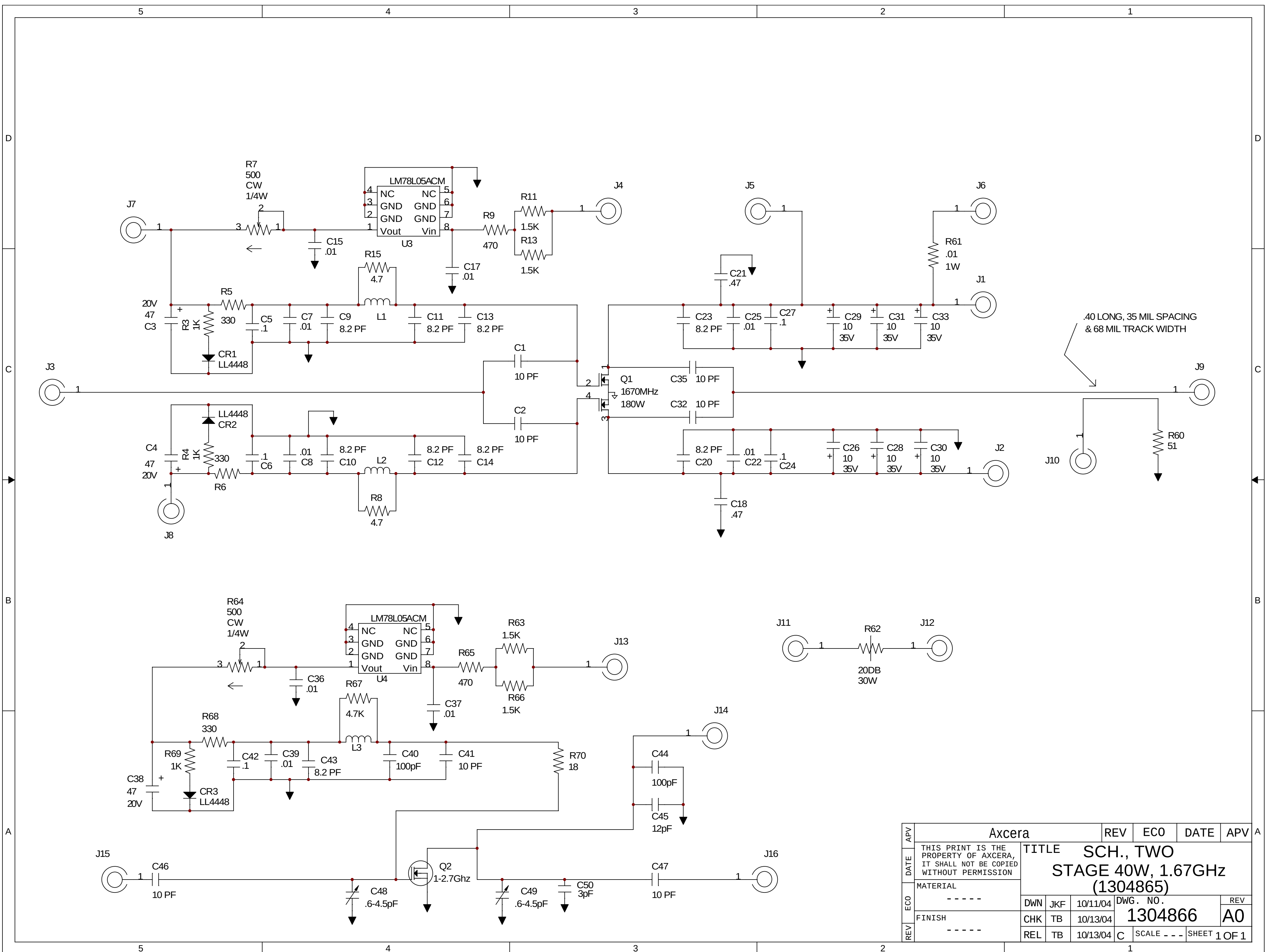
A track width of 0.3 inch is needed between power input vias and sense resistors R55,R56,R57. 0.3 inch track width is also needed between the output of the sense resistors and the output vias that provide power to the amplifier pallets.

APV		Axcera				REV	ECO	DATE	APV
DATE	THIS PRINT IS THE PROPERTY OF AXCERA, IT SHALL NOT BE COPIED WITHOUT PERMISSION		TITLE		SCH, DRIVER, AMP CONTROL BD. (1304774)				
MATERIAL									
ECO	-----		DWN	REH	9/10/04	DWG. NO. 1304776			REV
REV	FINISH		CHK	REH	9/21/04	B0			
	-----		REL	REH	9/21/04	D	SCALE - - -	SHEET 2 OF 3	

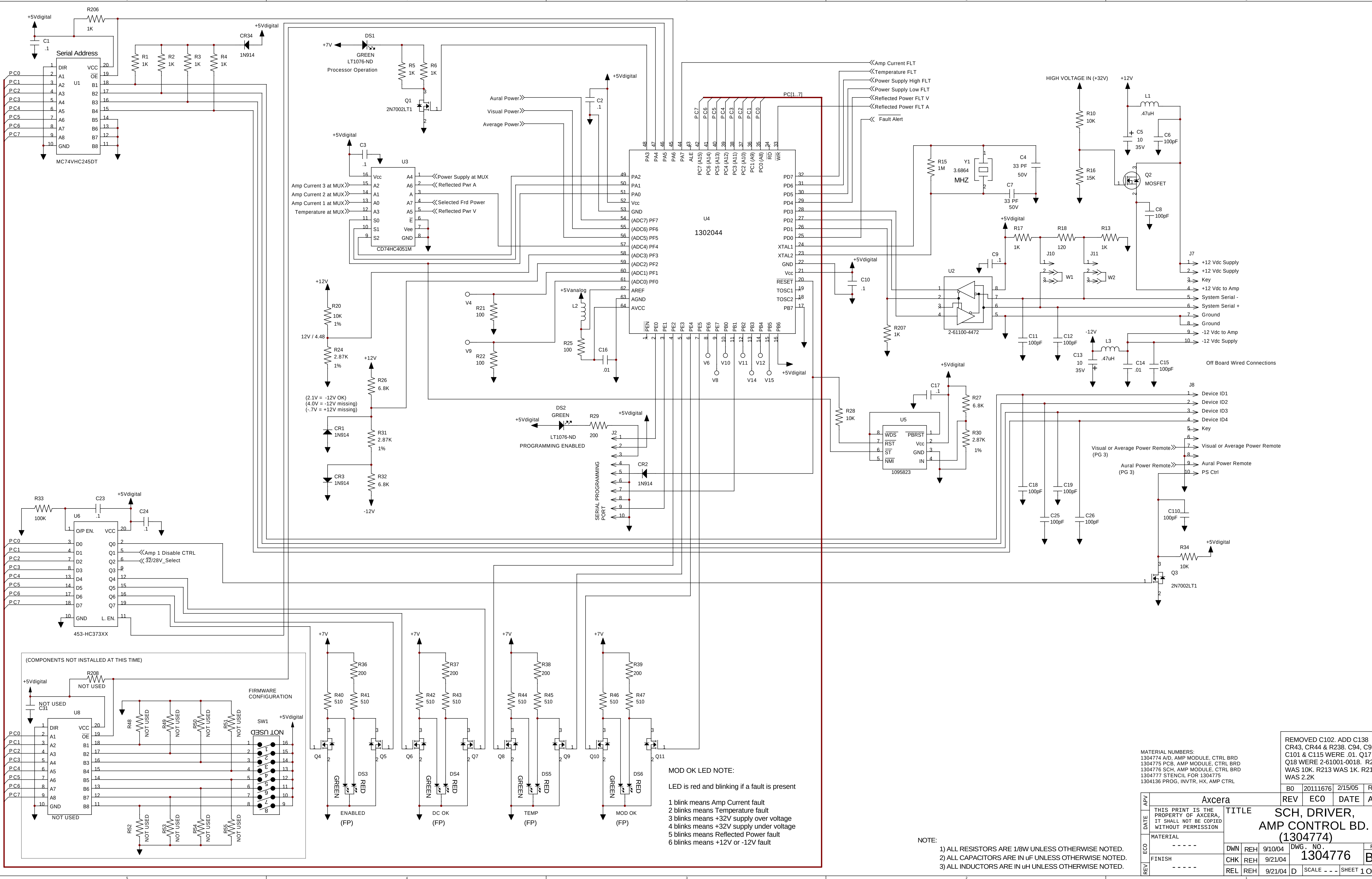
LAST USED REF			
J15	TP6		
CR44			
R238			
C138			
W3			
VR4			
Q18			
T820			
DS7			
V15			
Y1			
SW1			
L3			



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	DWG. NO. 1304776
REV					CHK	REL	9/21/04	B0
REV	FINISH				REL	REL	9/21/04	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., TWO STAGE 40W, 1.67GHz (1304865)			
ECO	MATERIAL -----				DWN	JKF	10/11/04	DWG. NO. 1304866
REV	FINISH -----				CHK	TB	10/13/04	REL
					REL	TB	10/13/04	C
					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.

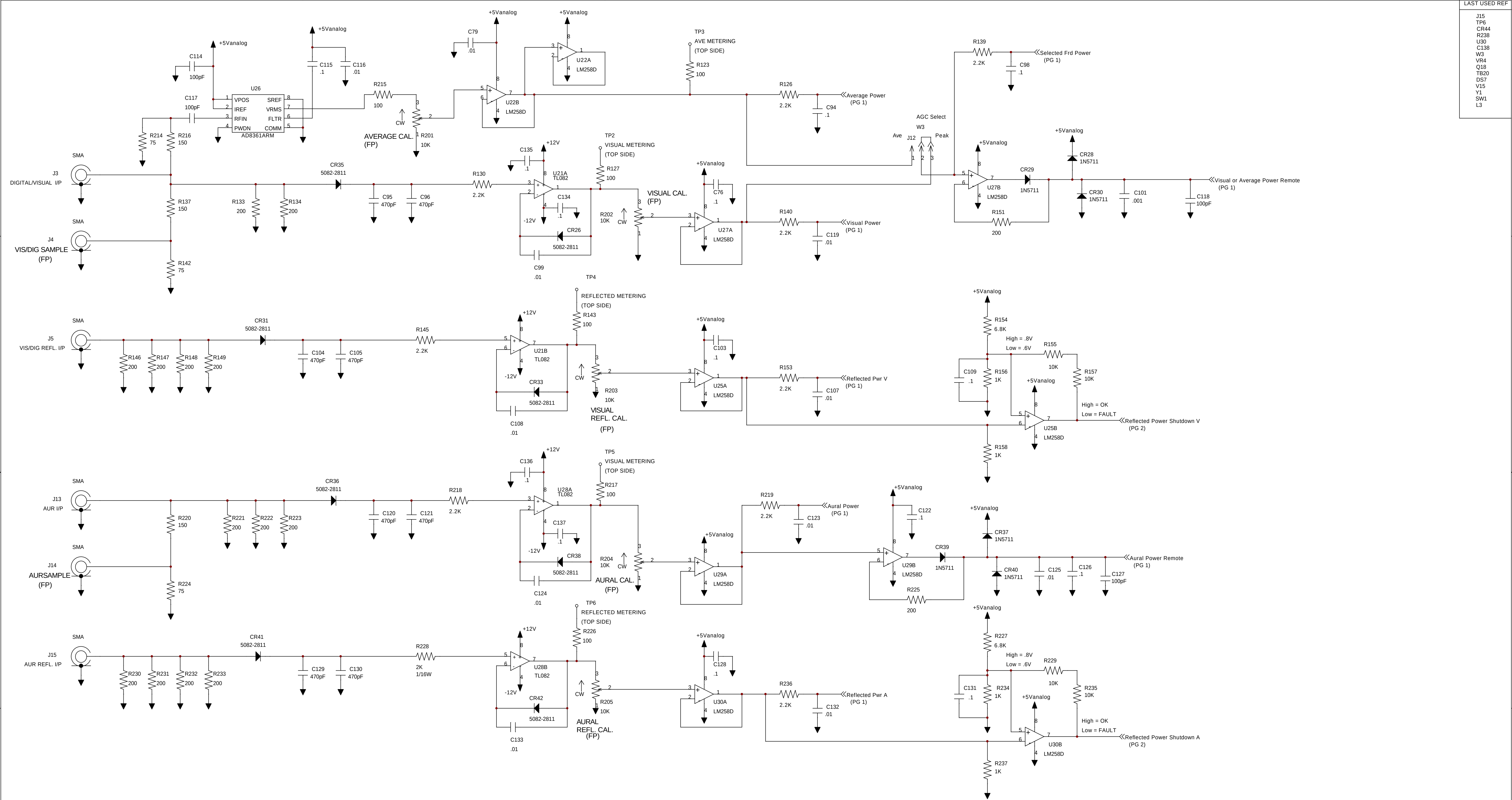
MATERIAL NUMBERS:
1304774 A/D, AMP MODULE, CTRL BRD
1304775 PCB, AMP MODULE, CTRL BRD
1304776 SCH, AMP MODULE, CTRL BRD
1304777 STENCIL FOR 1304775
1304136 PROG, INVTR, HX, AMP CTRL

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	APV
APV	REV	ECO	DATE	APV
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

LAST USED REF			
J15	TP6		
CR44			
R238			
C138			
W3			
VR4			
Q18			
T820			
DS7			
VS15			
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	DWG. NO. 1304776
REV	FINISH				CHK	REL	9/21/04	B0
	-----				REL	REL	9/21/04	D SCALE --- SHEET 3 OF 3