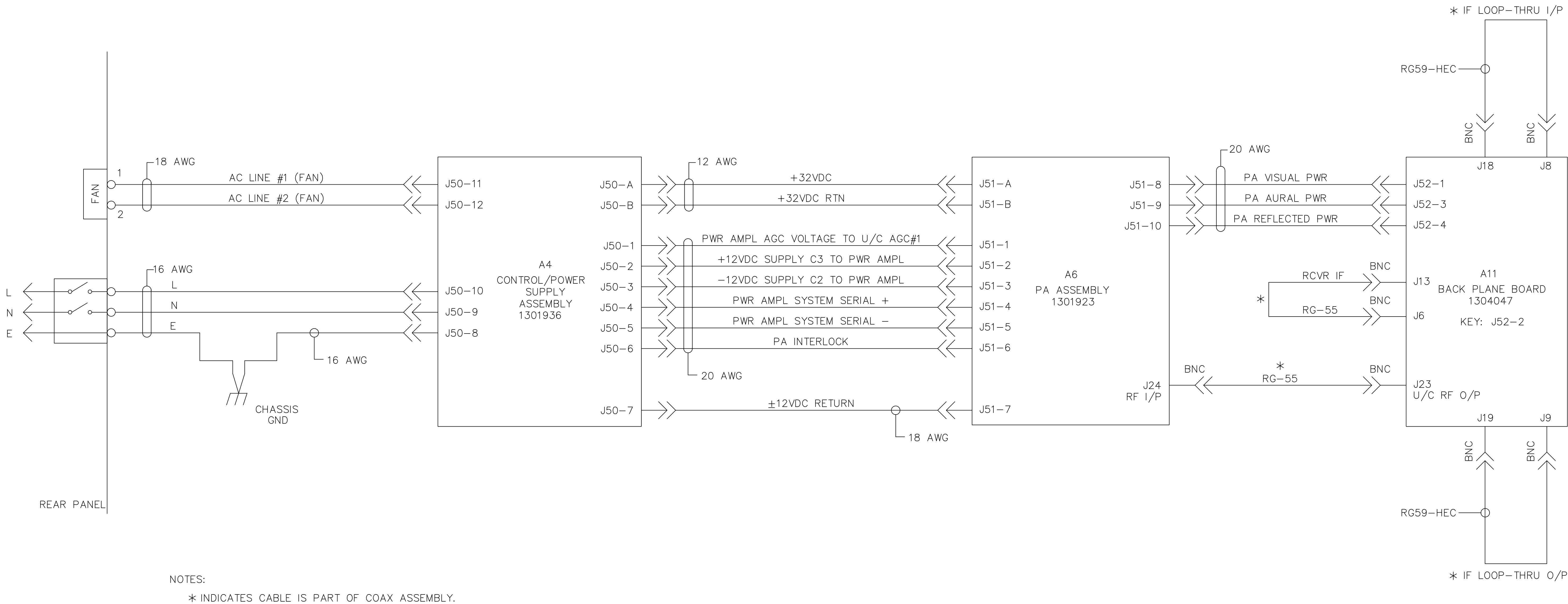
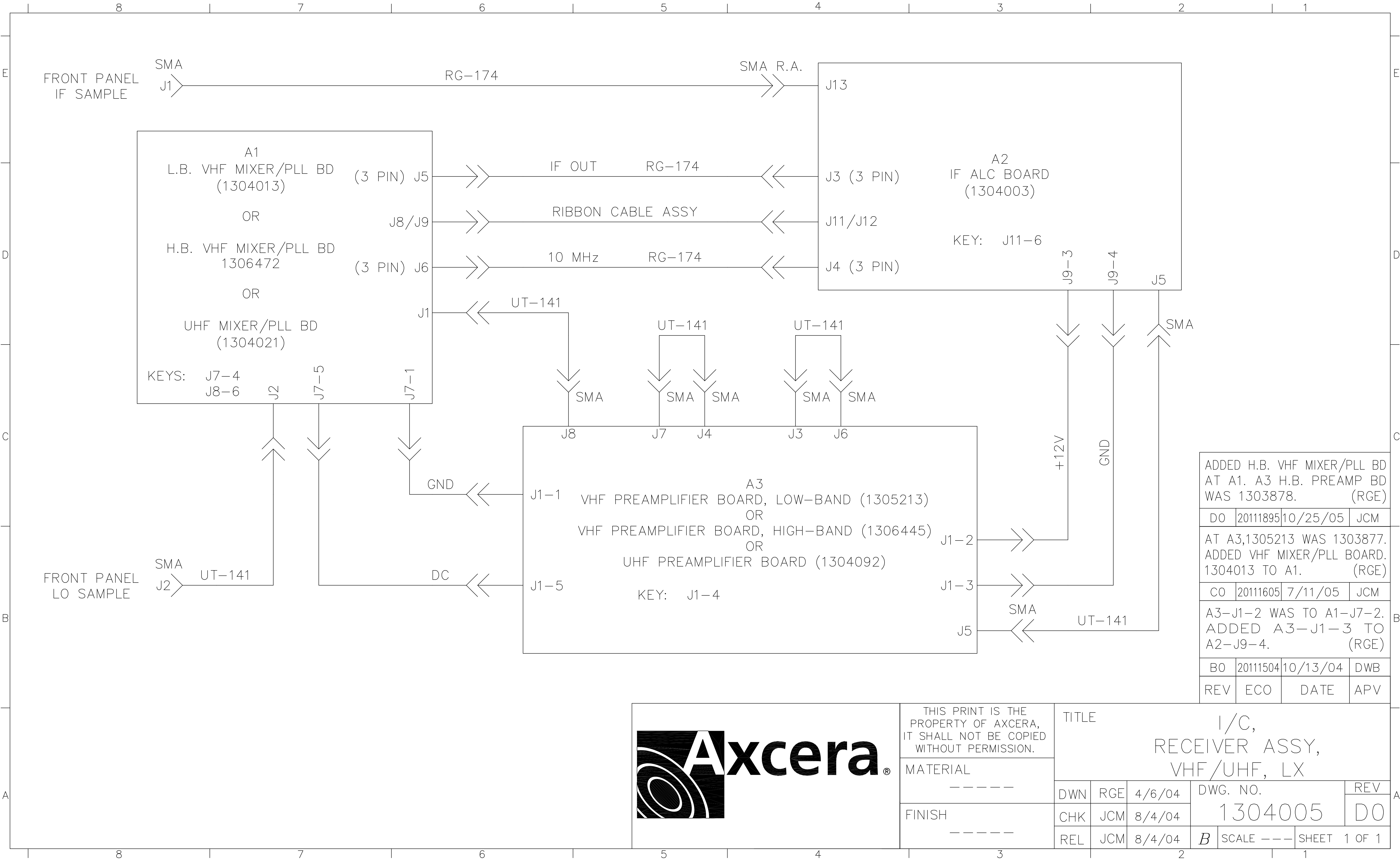




REV				ECO	DATE	APV
				THIS PRINT IS THE PROPERTY OF AXCERA, IT SHALL NOT BE COPIED WITHOUT PERMISSION.		
				MATERIAL		
				FINISH		

TITLE				I/C, CHASSIS ASSEMBLY INNOVATOR LX, V2		
DWN				RGE	6/7/04	DWG. NO.
CHK				JCM	6/18/04	1304064
REL				JCM	6/18/04	D
SCALE				---		
SHEET				1 OF 1		



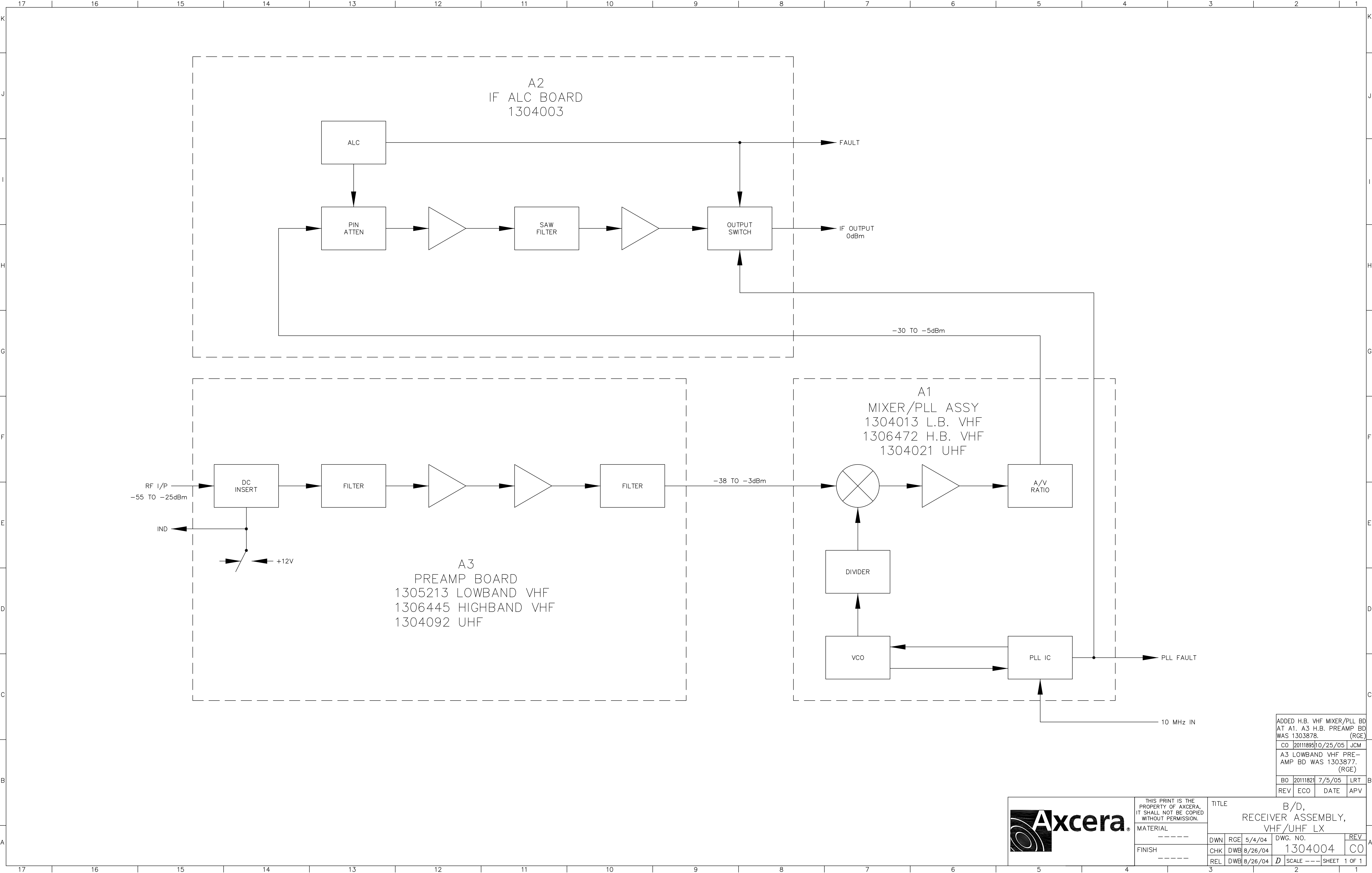
THIS PRINT IS THE
PROPERTY OF AXCERA,
IT SHALL NOT BE COPIED
WITHOUT PERMISSION.

MATERIAL

FINISH

TITLE
I/C,
RECEIVER ASSY,
VHF/UHF, LX

DWN	RGE	4/6/04	DWG. NO.	REV
CHK	JCM	8/4/04	1304005	D0
REL	JCM	8/4/04	B SCALE ---	SHEET 1 OF 1



ADDED H.B. VHF MIXER/PLL BD
AT A1. A3 H.B. PREAMP BD
WAS 1303878. (RGE)

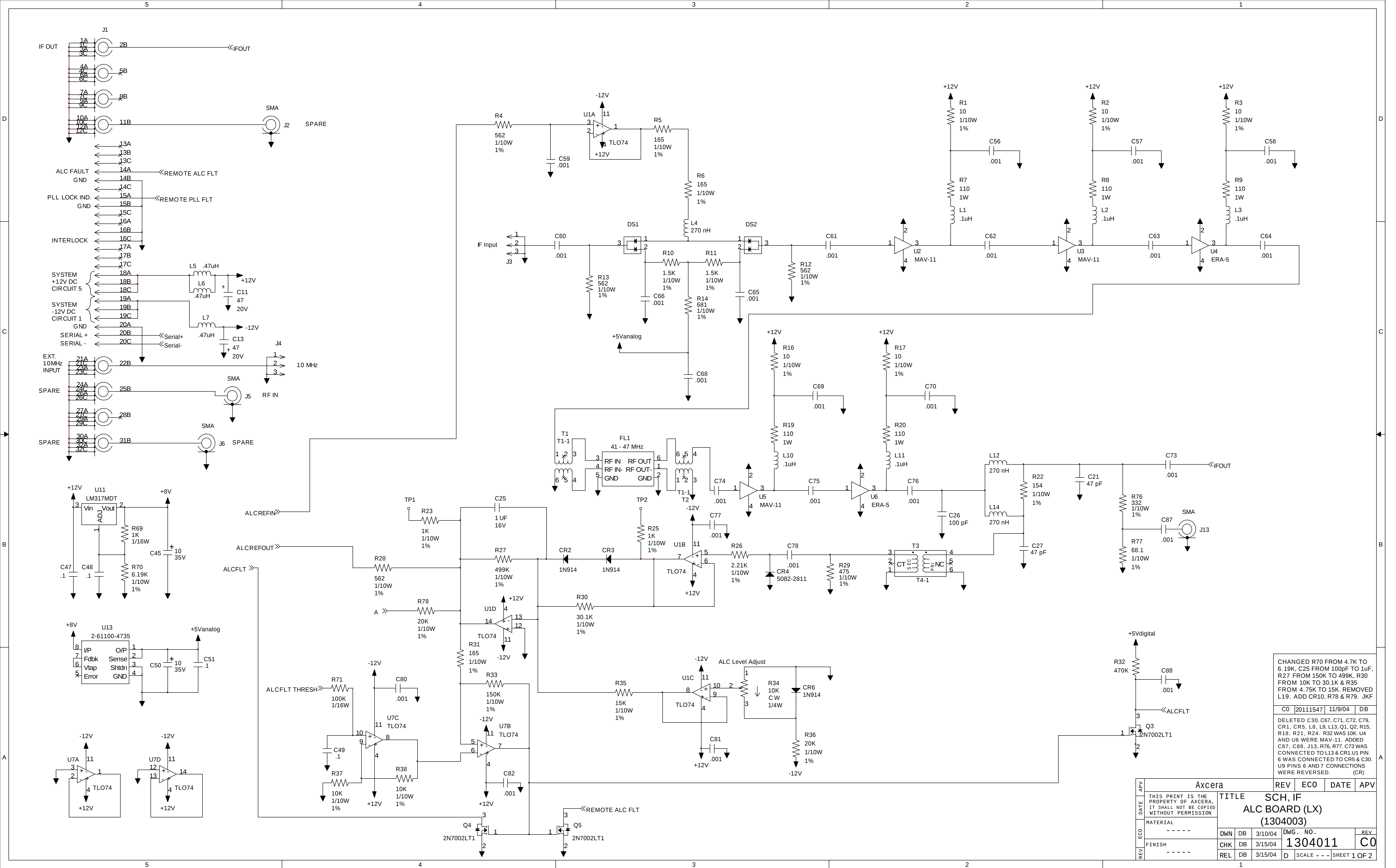
CO 2011189510/25/05 JCM
A3 LOWBAND VHF PRE-
AMP BD WAS 1303877.
(RGE)

BO	20111821	7/5/05	LRT
REV	ECO	DATE	APV



THIS PRINT IS THE PROPERTY OF AXCERA, IT SHALL NOT BE COPIED WITHOUT PERMISSION.				TITLE B/D, RECEIVER ASSEMBLY, VHF/UHF LX			
MATERIAL -----				DWN	RGE	5/4/04	DWG. NO.
FINISH -----				CHK	DWB	8/26/04	1304004
				REL	DWB	8/26/04	D SCALE --- SHEET 1 OF 1

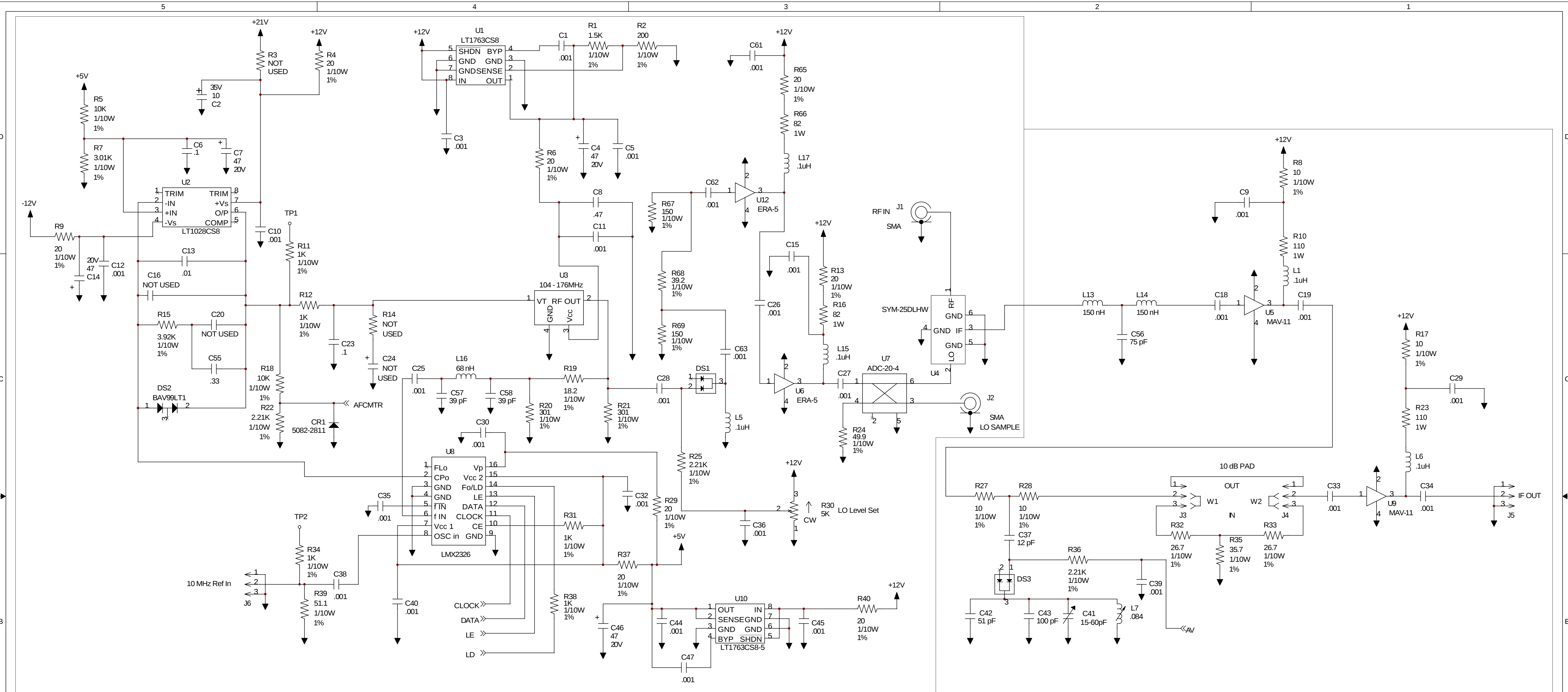
APV	Axcera				REV	ECO	DATE	APV
DATE	THIS PRINT IS THE PROPERTY OF AXCERA, IT SHALL NOT BE COPIED WITHOUT PERMISSION		TITLE SCH, HIGH BAND VHF PREAMPLIFIER (1303878)					
MATERIAL	-----							
ECO			DWN	DB	2/10/04	DWG. NO.		REV
FINISH	-----		CHK	DB	2/26/04	1303901		A0
REV			REL	DB	2/26/04	D	SCALE --	SHEET 1 OF 1



CHANGED R70 FROM 4.7K TO 6.19K, C25 FROM 100pF TO 1uF, R27 FROM 150K TO 499K, R30 FROM 10K TO 30.1K & R35 FROM 4.75K TO 15K. REMOVED L19. ADD CR10, R78 & R79. JKF

C0	20111547	11/9/04	DB
DELETED C30, C67, C71, C72, C79, CR1, CR5, L8, L9, L13, Q1, Q2, R15, R18, R21, R24, R32 WAS 10K. U4 AND U6 WERE MAV-11. ADDED C87, C88, J13, R76, R77, C73 WAS CONNECTED TO L13 & CR1.U1 PIN 6 WAS CONNECTED TO CR5 & C30. U9 PINS 6 AND 7 CONNECTIONS WERE REVERSED. (CR)			

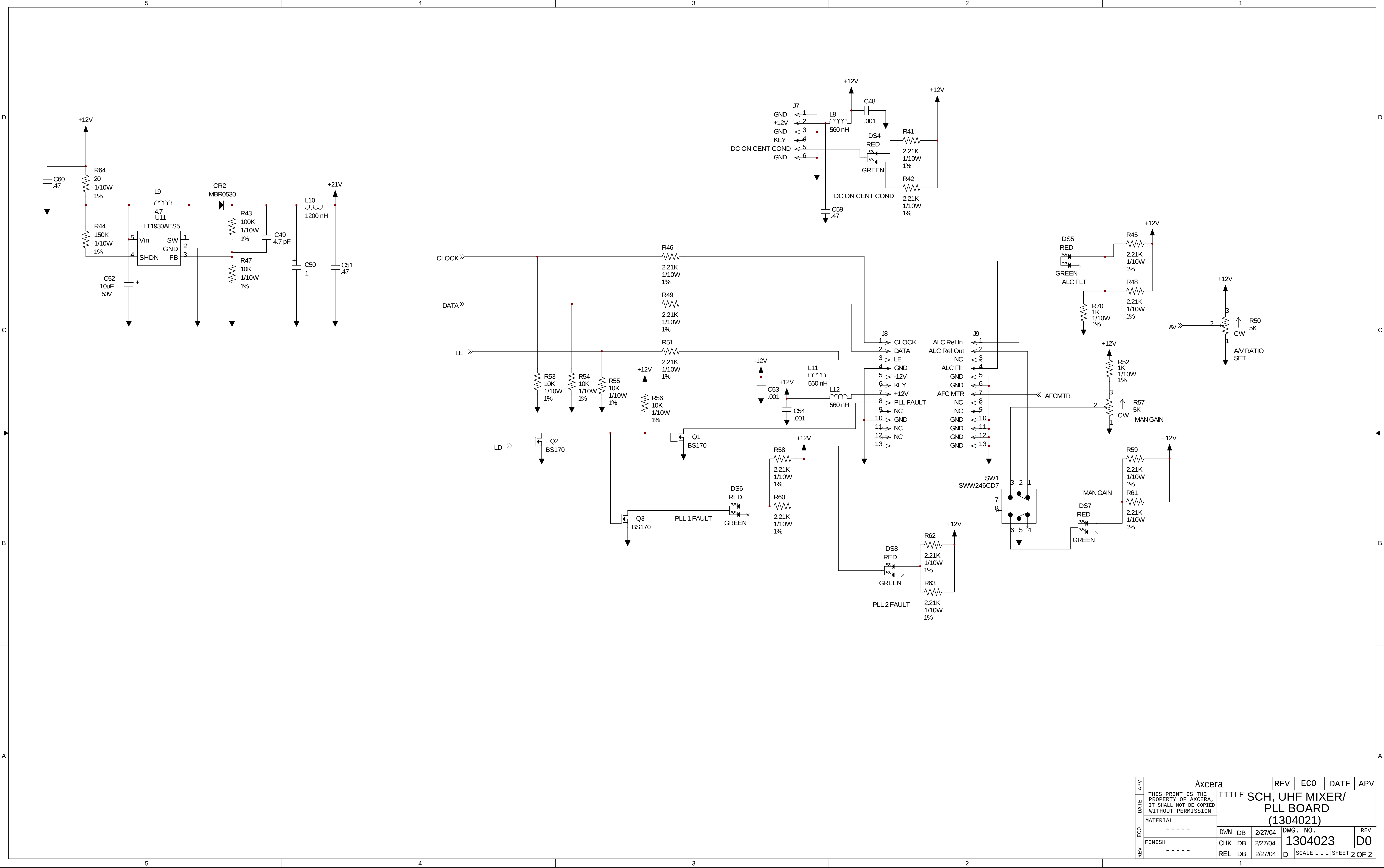
APV				Xxcera			REV	ECO	DATE	APV
DATE	THIS PRINT IS THE PROPERTY OF AXCERA, IT SHALL NOT BE COPIED WITHOUT PERMISSION			TITLE SCH, IF ALC BOARD (LX) (1304003)						
ECO	MATERIAL			DWN	DB	3/10/04	DWG. NO.			REV
REV	FINISH			CHK	DB	3/15/04	1304011			C0
	-----			REL	DB	3/15/04	D	SCALE - - -	SHEET 1 OF 2	
1										



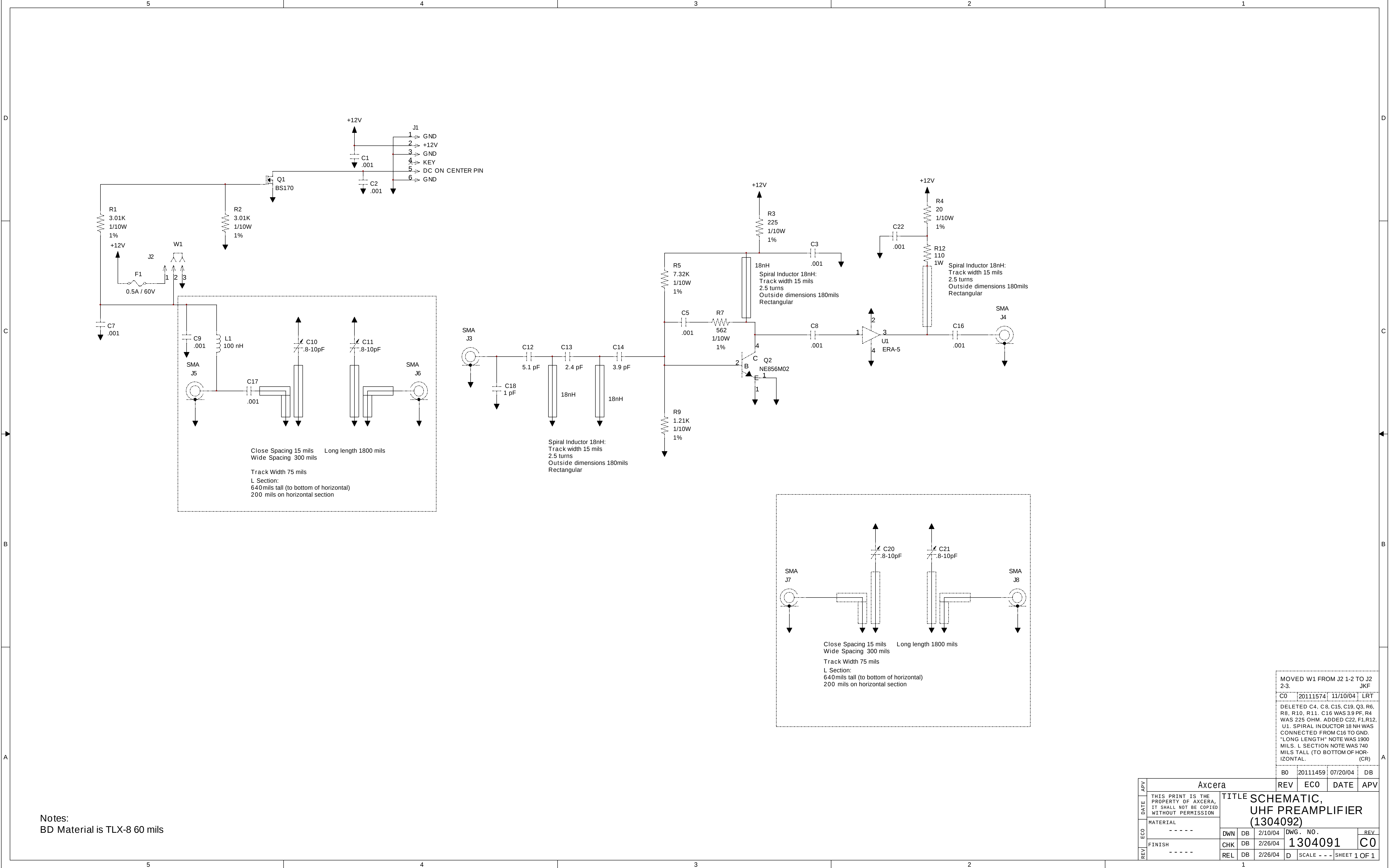
NOTE:

- 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.
- 4) Bd Material 30 mil FR4

REV	ECO	DATE	APV
1		12/14/04	DB
2		12/14/04	DB
3		12/14/04	DB
4		12/14/04	DB
5		12/14/04	DB
6		12/14/04	DB
7		12/14/04	DB
8		12/14/04	DB
9		12/14/04	DB
10		12/14/04	DB
11		12/14/04	DB
12		12/14/04	DB
13		12/14/04	DB
14		12/14/04	DB
15		12/14/04	DB
16		12/14/04	DB
17		12/14/04	DB
18		12/14/04	DB
19		12/14/04	DB
20		12/14/04	DB
21		12/14/04	DB
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29		12/14/04	DB
30		12/14/04	DB
31		12/14/04	DB
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43		12/14/04	DB
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96		12/14/04	DB
97		12/14/04	DB
98		12/14/04	DB
99		12/14/04	DB
100		12/14/04	DB



APV	Axcera				REV	ECO	DATE	APV
DATE	THIS PRINT IS THE PROPERTY OF AXCERA, IT SHALL NOT BE COPIED WITHOUT PERMISSION				TITLE SCH, UHF MIXER/ PLL BOARD (1304021)			
MATERIAL	-----							
ECO	-----				DWN	DB	2/27/04	DWG. NO.
FINISH	-----				CHK	DB	2/27/04	1304023
REV	-----				REL	DB	2/27/04	D
				SCALE - - - SHEET 2 OF 2				

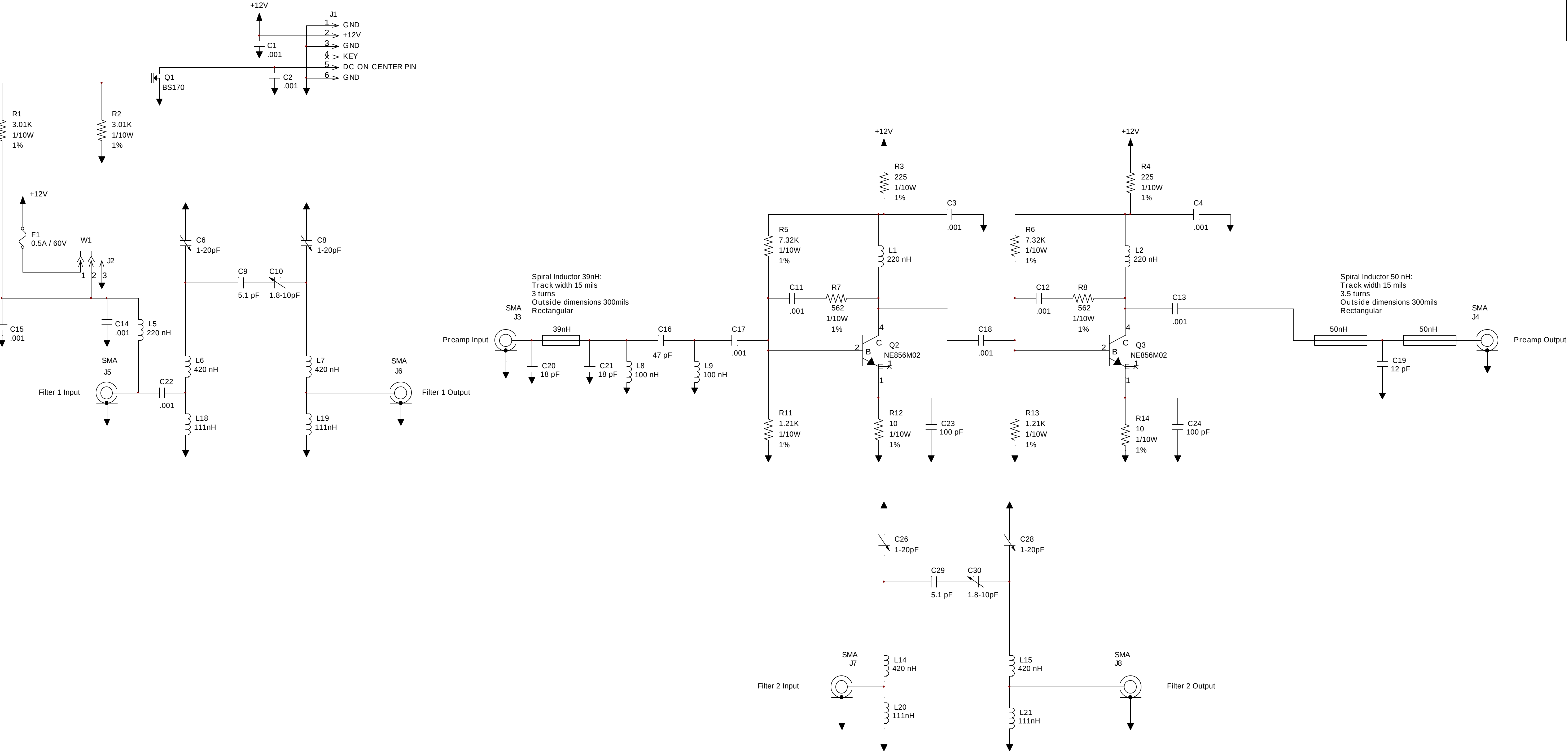


Notes:
BD Material is TLX-8 60 mils

Axcera		REV	ECO	DATE	APV
DATE	THIS PRINT IS THE PROPERTY OF AXCERA, IT SHALL NOT BE COPIED WITHOUT PERMISSION	TITLE SCHEMATIC, UHF PREAMPLIFIER (1304092)			
REV	MATERIAL	DWN	DB	DWG. NO.	REV
ECO	-----	CHK	DB	2/10/04	1304091
FINISH	-----	REL	DB	2/26/04	C0
		REL	DB	2/26/04	D
		SCALE - - - SHEET 1 OF 1			

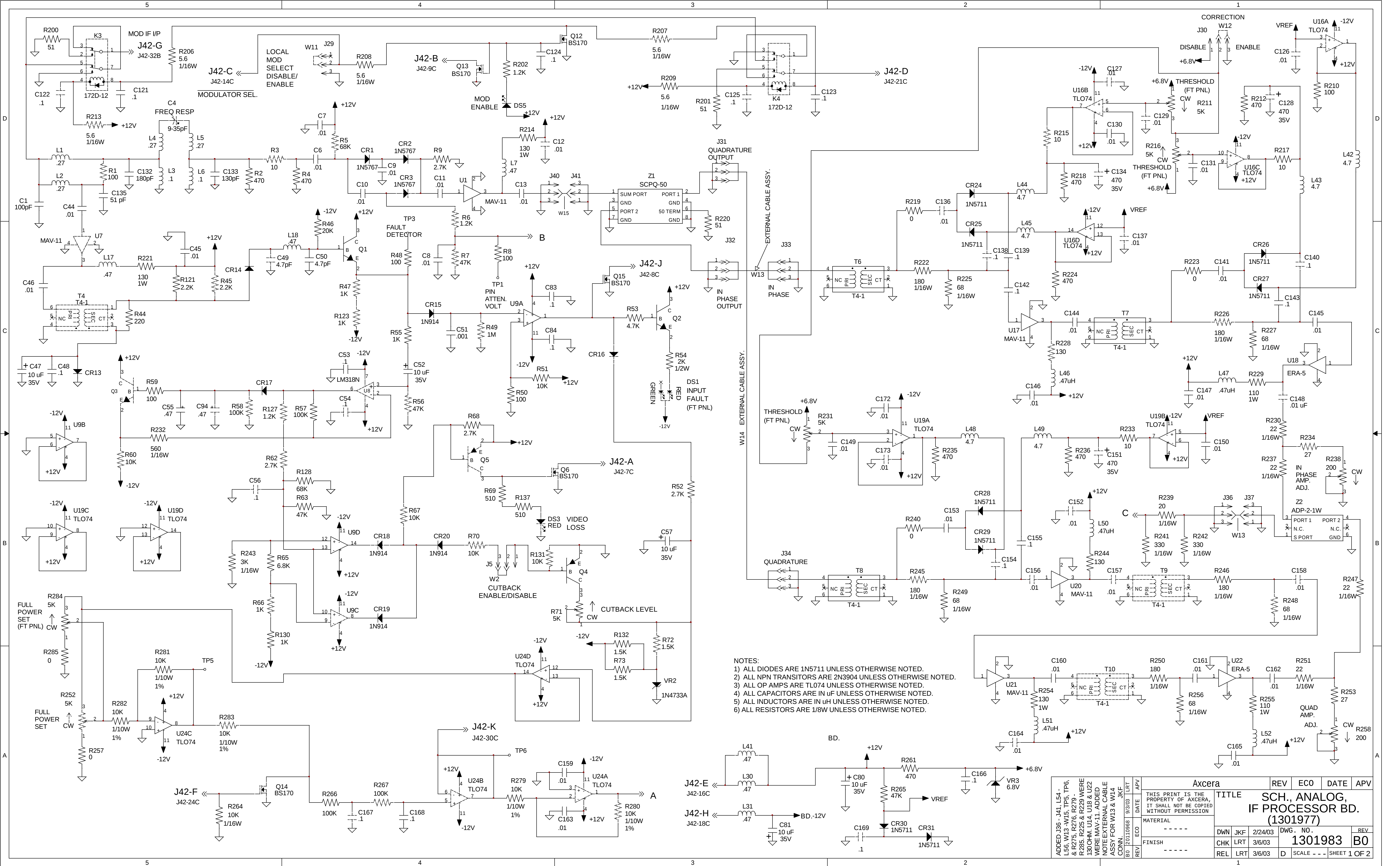
MOVED W1 FROM J2 1-2 TO J2 2-3.				JKF
C0	20111574	11/10/04	LRT	
DELETED C4, C8, C15, C19, Q3, R6, R8, R10, R11. C16 WAS 3.9 PF, R4 WAS 225 OHM. ADDED C22, F1, R12, U1. SPIRAL INDUCTOR 18NH WAS CONNECTED FROM C16 TO GND. "LONG LENGTH" NOTE WAS 1900 MILS. L SECTION NOTE WAS 740 MILS TALL (TO BOTTOM OF HORIZONTAL.				
B0	20111459	07/20/04	DB	

LAST USED REF
Q3
C30
R14
J8
L21
W1
F1

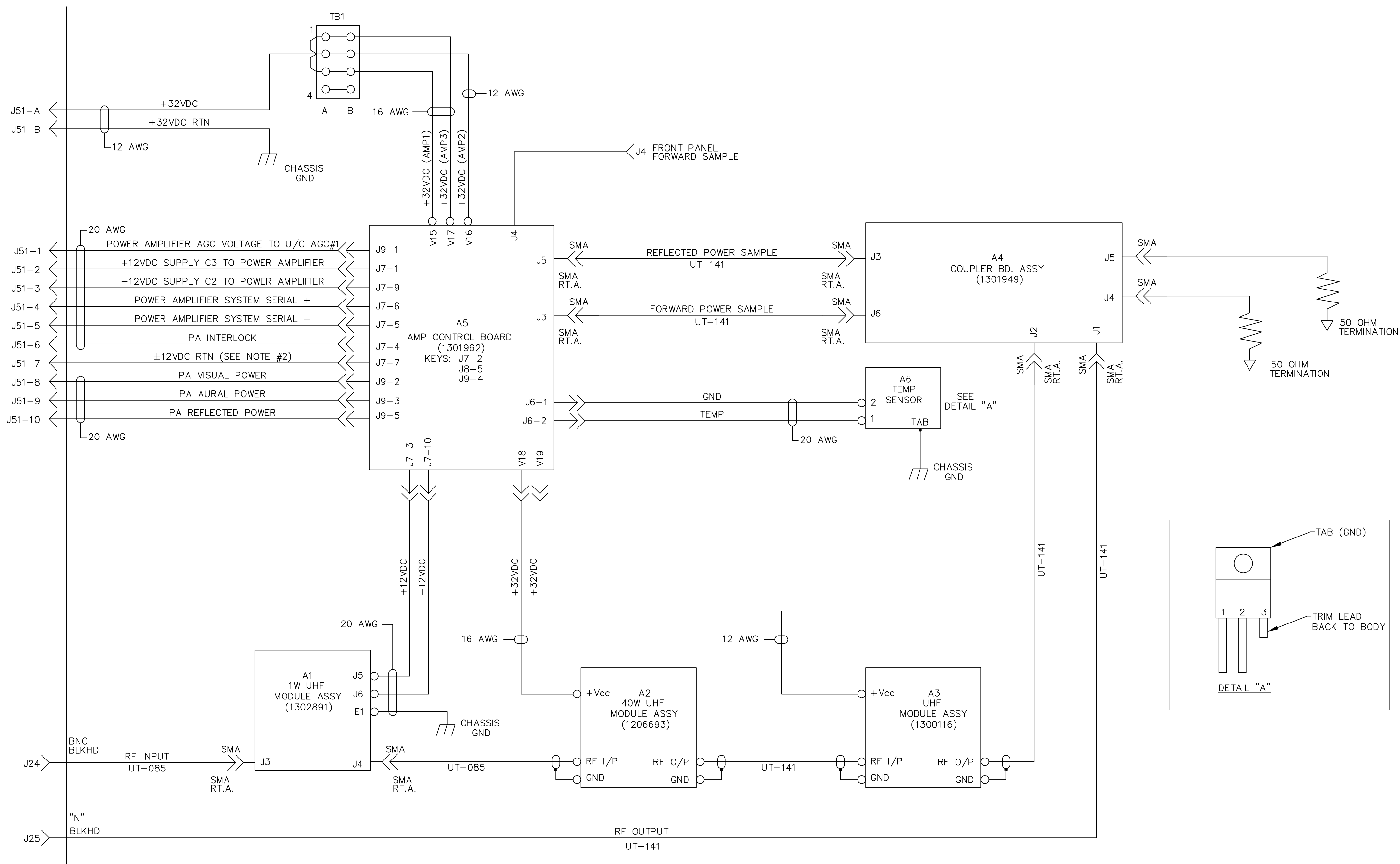


Notes:
BD Material is FR-4, 60 mils thick

APV	Axcera				REV	ECO	DATE	APV
DATE	THIS PRINT IS THE PROPERTY OF AXCERA, IT SHALL NOT BE COPIED WITHOUT PERMISSION				TITLE SCH, LB VHF PREAMPLIFIER BD, LX (1305213)			
ECO	MATERIAL				DWN	JKF	12/7/04	DWG. NO.
REV	FINISH				CHK	DB	12/8/04	1305214 A0
				REL	DB	12/8/04	D	SCALE - - - SHEET 1 OF 1



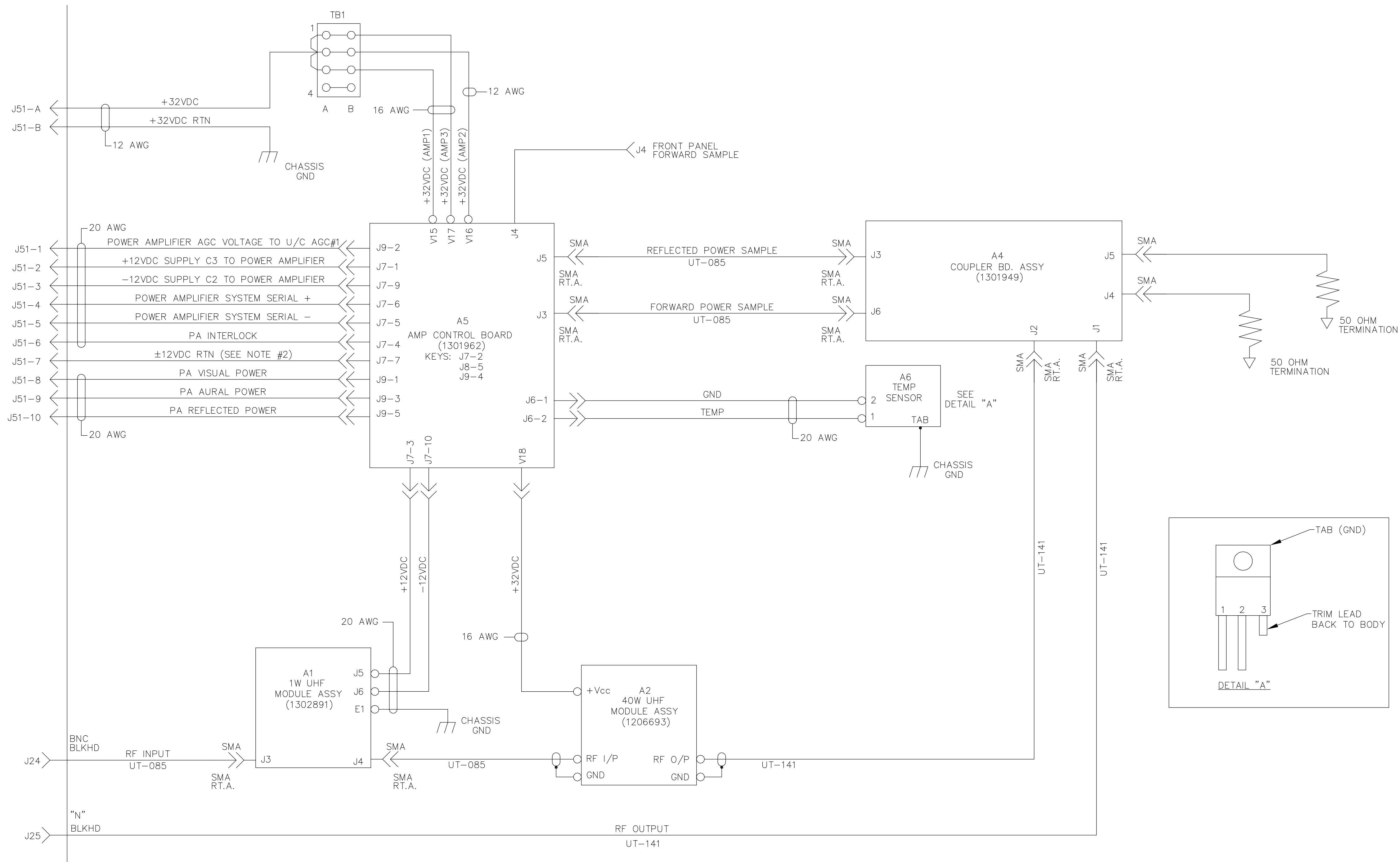
Xccera		REV	ECO	DATE	APV
THIS PRINT IS THE PROPERTY OF XCCERA, IT SHALL NOT BE COPIED WITHOUT PERMISSION		TITLE			
MATERIAL		SCH., ANALOG, IF PROCESSOR BD. (1301977)			
FINISH		DWN	JKF	2/24/03	DWG. NO.
		CHK	LRT	3/6/03	1301983
		REL	LRT	3/6/03	B0
		SCALE --- SHEET 1 OF 2			



NOTE:
 1. ALL WIRE IS 18AWG UNLESS OTHERWISE NOTED.
 2. THIS CONNECTION MUST BE EQUIPPED WITH LONGER GROUND PIN. (MAKE FIRST BREAK LAST)

		THIS PRINT IS THE PROPERTY OF AXCERA, IT SHALL NOT BE COPIED WITHOUT PERMISSION.		TITLE I/C, PA ASSEMBLY, 100W PIONEER SERIES		DWG. NO. 1302061		REV B0	
MATERIAL		DWN		MH		8/13/03		REL	
FINISH		CHK		JCM		8/27/03		SCALE	
		REL		JCM		8/27/03		SHEET	
								1 OF 1	

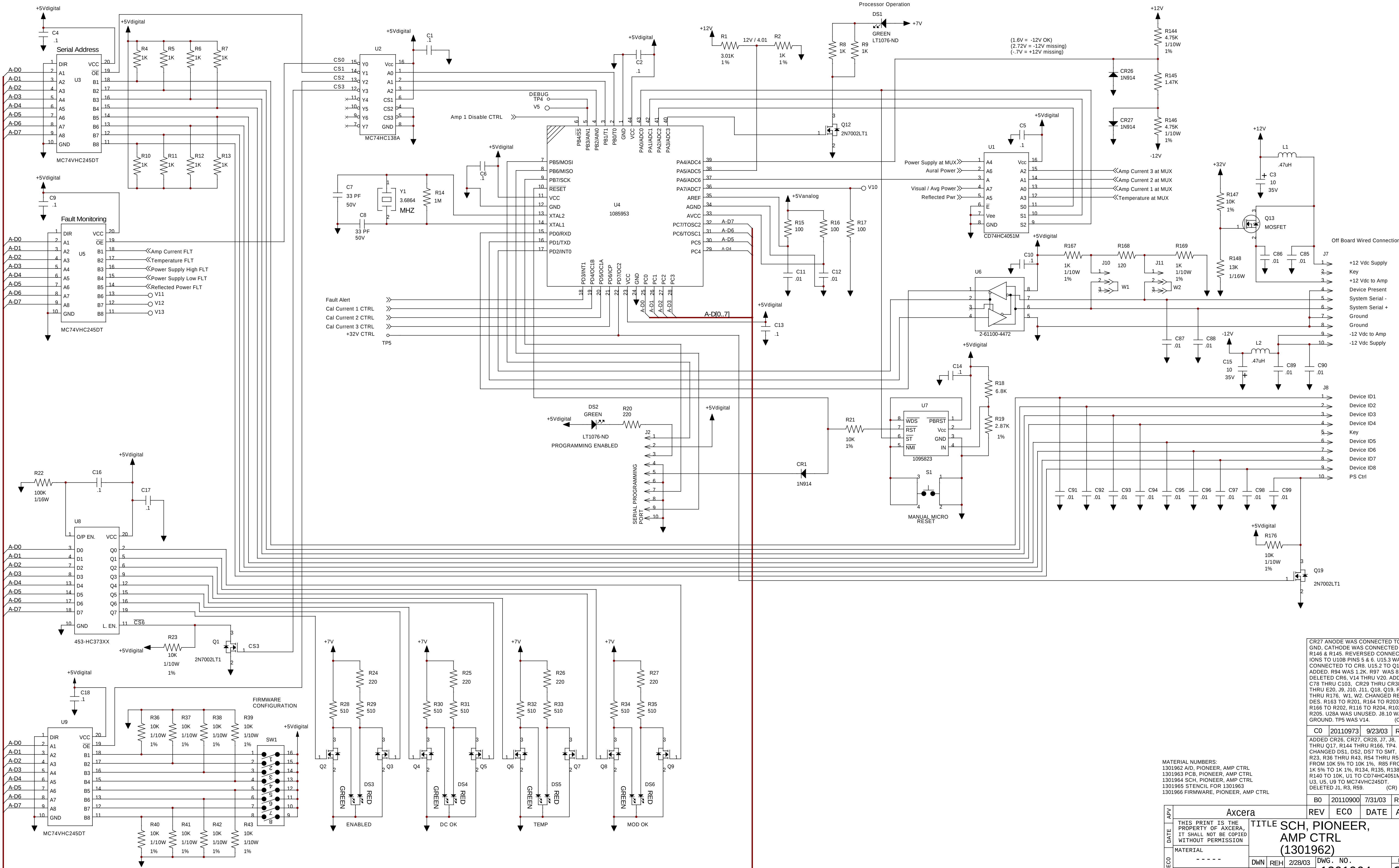
DELETED .141 RIGID BETWEEN A5-J4 AND J1. (SAK)			
REV	ECO	DATE	APV



NOTE:
1. ALL WIRE IS 18AWG UNLESS OTHERWISE NOTED.
2. THIS CONNECTION MUST BE EQUIPPED WITH LONGER GROUND PIN. (MAKE FIRST BREAK LAST)

	THIS PRINT IS THE PROPERTY OF AXCERA. IT SHALL NOT BE COPIED WITHOUT PERMISSION.	TITLE							I/C, PA ASSEMBLY, 1KW, DRIVER LX SERIES				
		MATERIAL											
	FINISH	-----							DWN	MH	10/21/03	DWG. NO.	REV
		-----							CHK	RT	10/22/03	1303452	B0
		REL	JCM	10/22/03	D	SCALE	---	SHEET	1 OF 1				

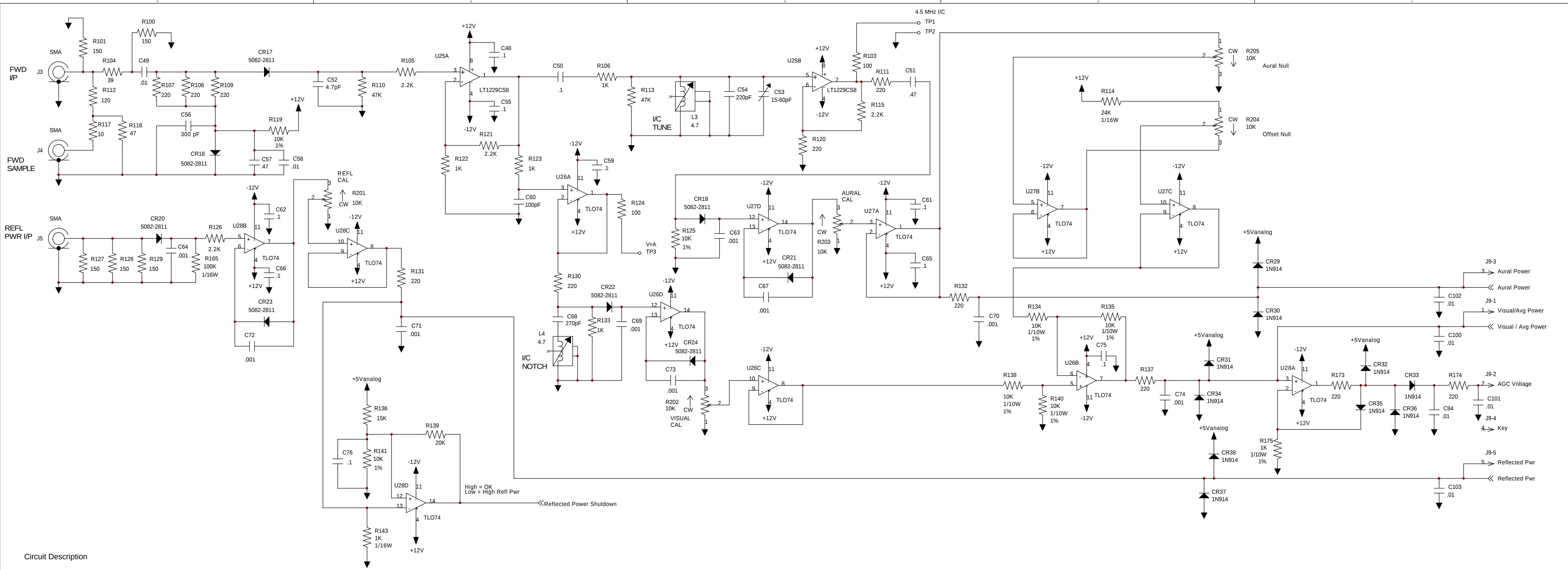
A5-J9-2 WAS A5-J9-1.		A5-J9-1 WAS A5-J9-2.		REFLECTED AND FORWARD POWER SAMPLE CABLES WERE UT-141.		(RGE)
BO	20111102	11/6/03	JCM			
REV	ECO	DATE	APV			



CR27 ANODE WAS CONNECTED TO GND, CATHODE WAS CONNECTED TO R146 & R145. REVERSED CONNECTIONS TO U10B PINS 5 & 6. U15.3 WAS CONNECTED TO CR8. U15.2 TO Q18.1 ADDED. R94 WAS 1.2K. R97 WAS 8.25K. DELETED CR6, V14 THRU V20. ADDED C78 THRU C103. CR29 THRU CR38, E15 THRU E20, J9, J10, J11, Q18, Q19, R167 THRU R176, W1, W2. CHANGED REF. DES. R163 TO R201, R164 TO R203, R166 TO R202, R116 TO R204, R102 TO R205. U28A WAS UNUSED. J8.10 WAS GROUND. TP5 WAS V14. (CR)

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		DWN	REH	2/28/03	DWG. NO.
REV		FINISH		CHK	REH	3/6/03	1301964
				REL	REH	3/6/03	D SCALE - - - SHEET 1 OF 3



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 (!ST) 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 of 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.

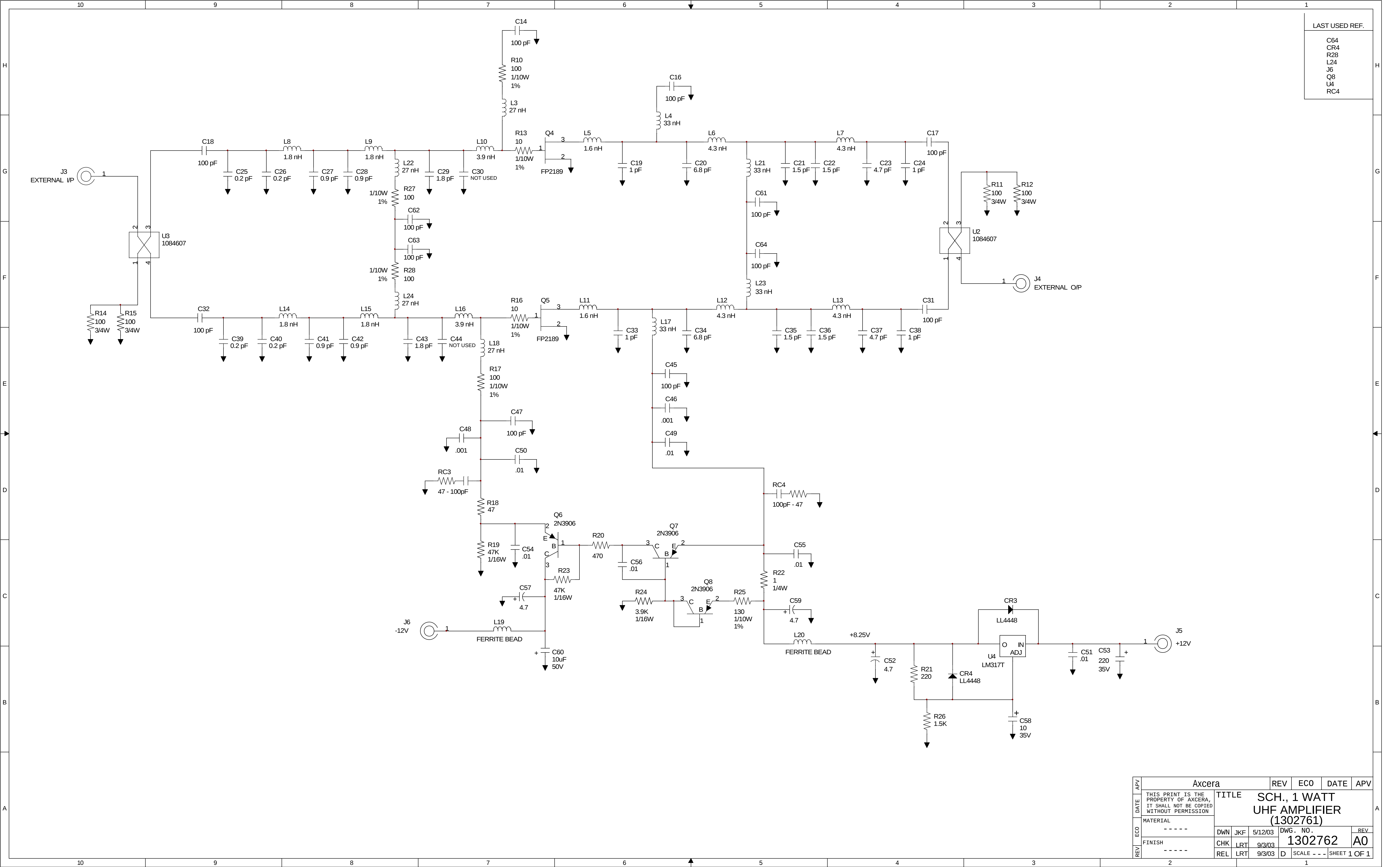
Current Monitoring Sections - A 0.01 ohm 1% 5 Watt thru-hole resistor is used for monitoring the current through several sections of the amplifier. The voltage developed across this resistor is amplified for current monitoring by U16, U17, or U18. The Linear Technology LT1787HVCS8 precision high side 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	C0
					D	SCALE - - - SHEET 3 OF 3		

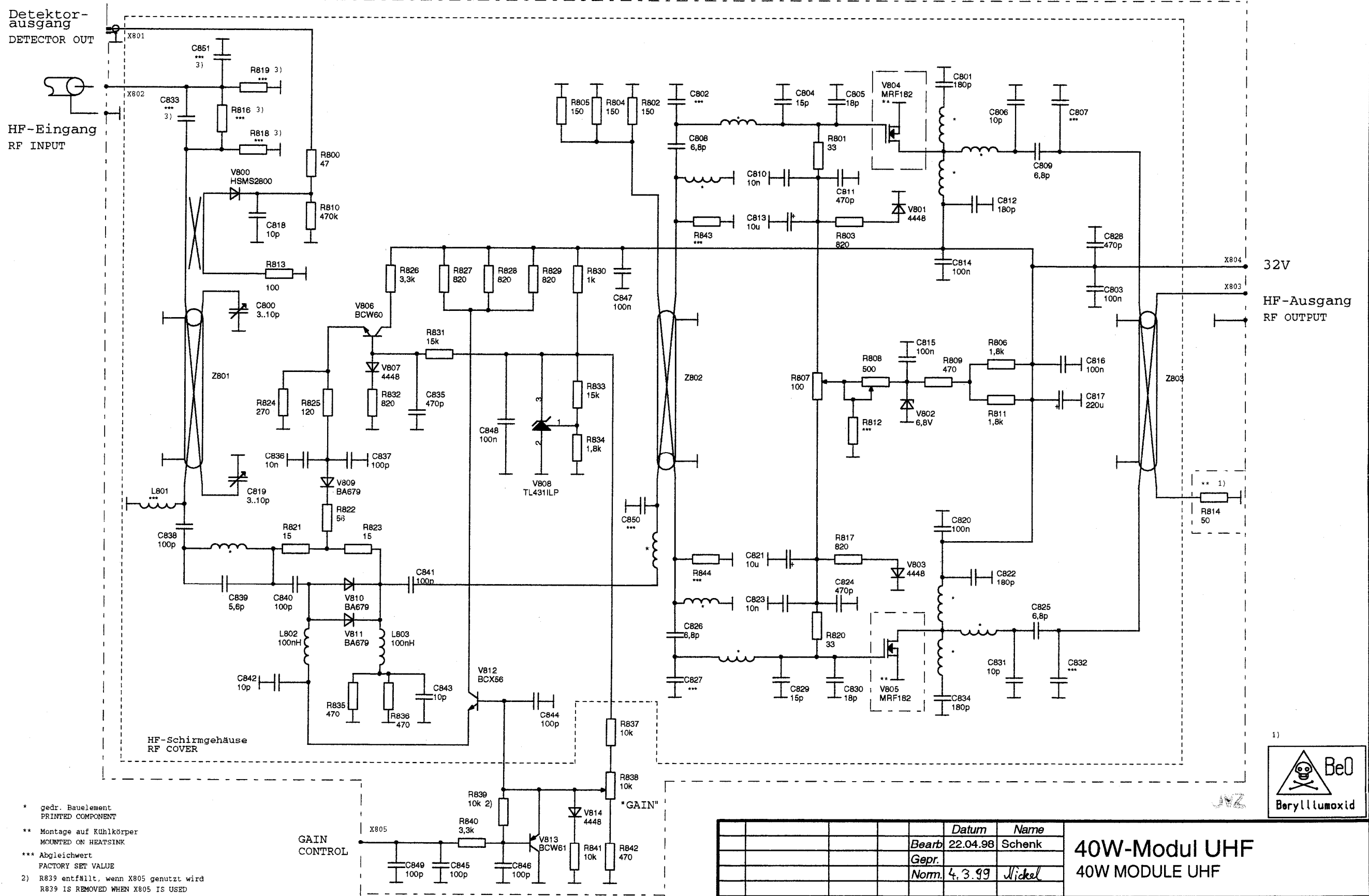


Maschinell erzeugt!
Nicht manuell ändern!

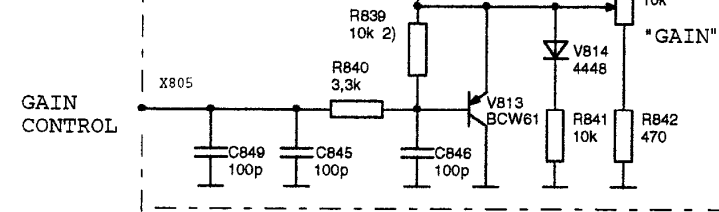
Schutzvermerk nach DIN 34 beachten!
NOTE: copyright protected as in DIN 34!

SN79-308
SCHEMATIC 1
G:\PROJ\ORCAD\WSP\5379\308-02\SN79-308.DSN

ORCAD SCHEMATIC

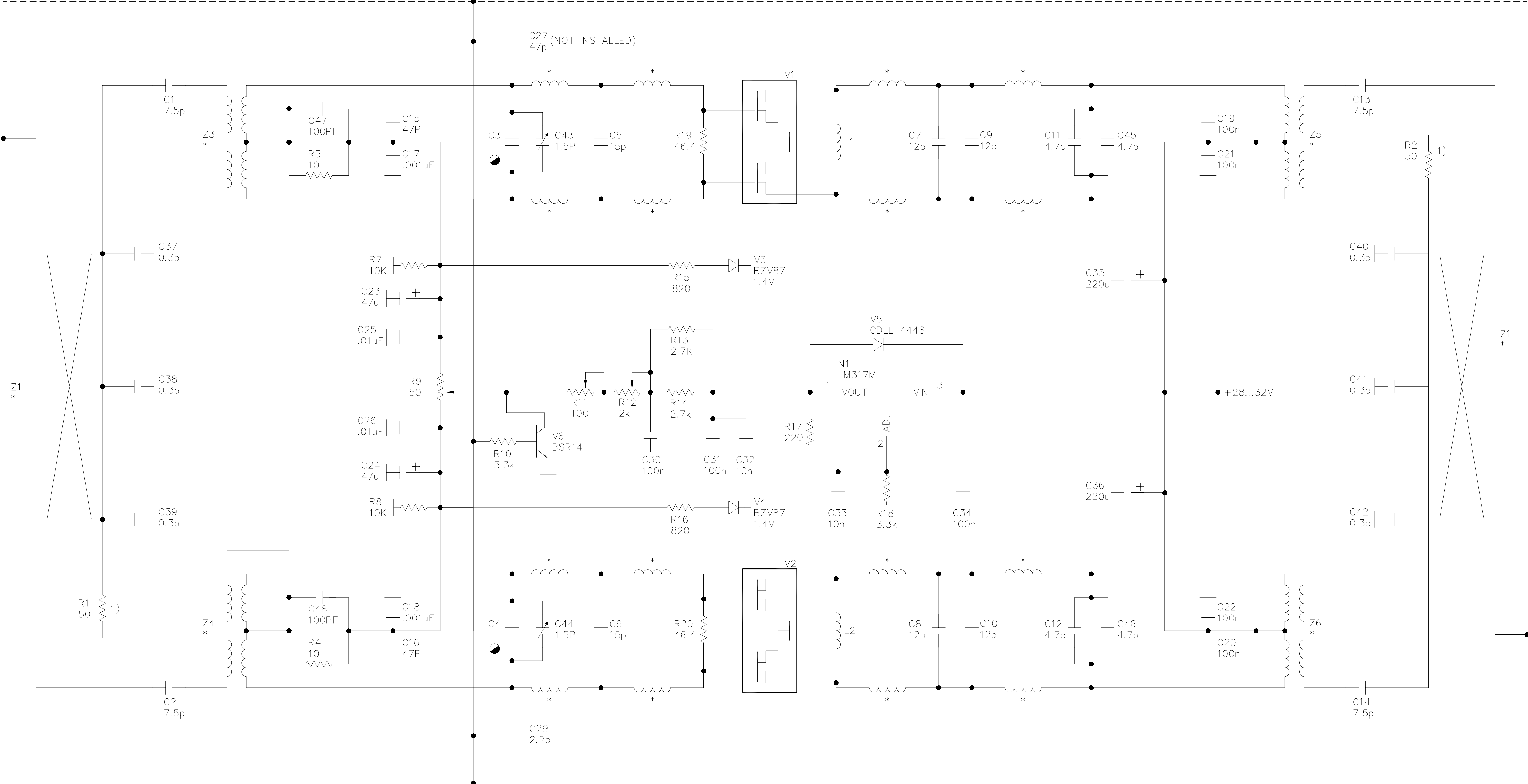


- * gedr. Bauelement
PRINTED COMPONENT
- ** Montage auf Kühlkörper
MOUNTED ON HEATSINK
- *** Abgleichwert
FACTORY SET VALUE
- 2) R839 entfällt, wenn X805 genutzt wird
R839 IS REMOVED WHEN X805 IS USED
- 3) C833, C851 entfallen bei Bestückung von R816, R818
u. R819
C833, C851 ARE REMOVED WHEN R816, R818, R819 ARE INSTALLED



Leiterplattenbestückung siehe
PC BOARD LAYOUT SEE
51-5379-308-00 (1)

				Datum	Name	40W-Modul UHF 40W MODULE UHF	Blatt 1
				Bearb.	22.04.98		
				Gepr.			
				Norm.	4.3.99		
02	E185	26.10.98	Sche	TELEFUNKEN Sendertechnik		51-5379-308-00 WSP XB	1 Bl.
01		8.5.98	Sche				
Zust.	Änderung	Datum	Name	Urspr.:	Ers. f.:	Ers. d.:	K



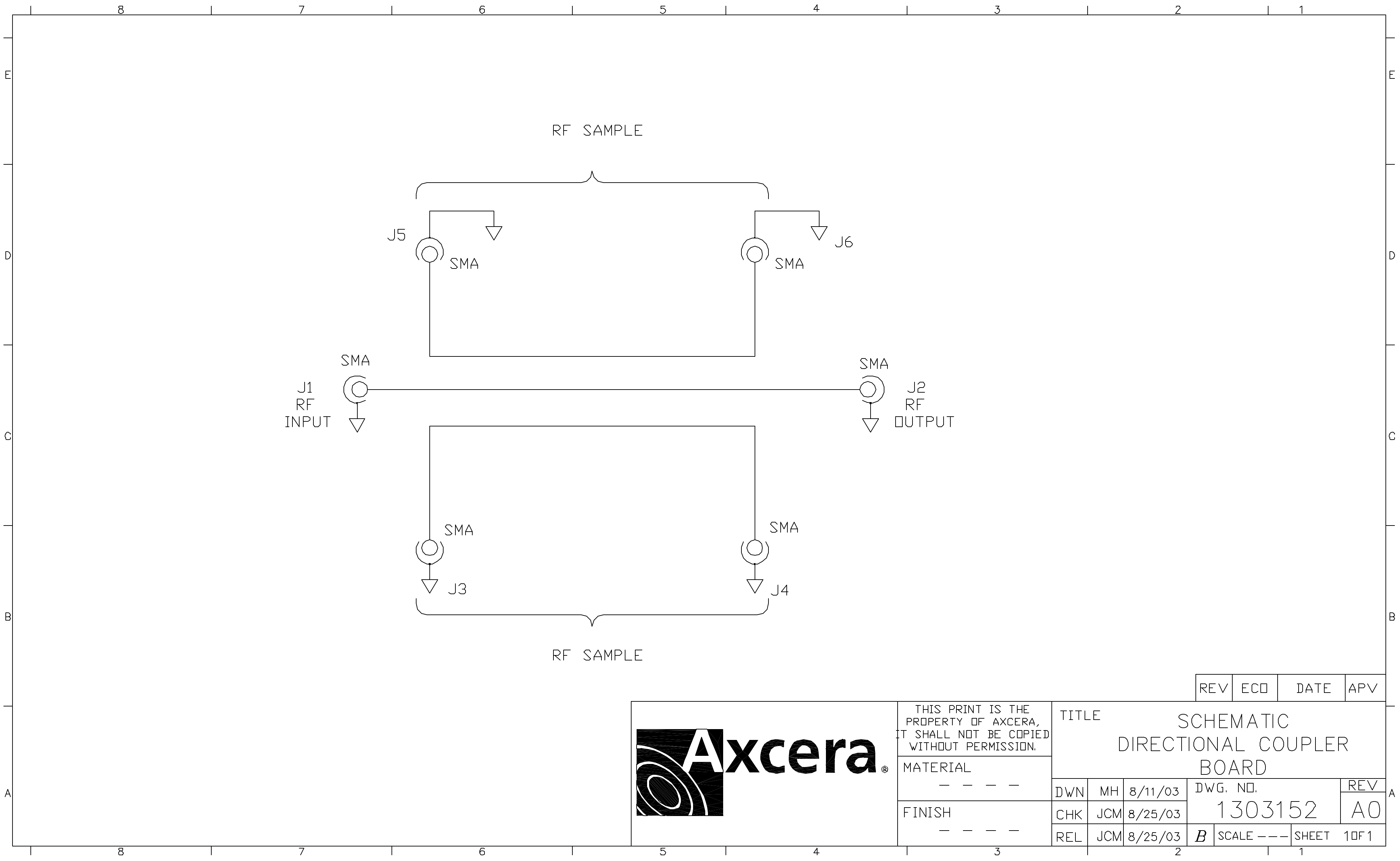
* PRINTED COMPONENT

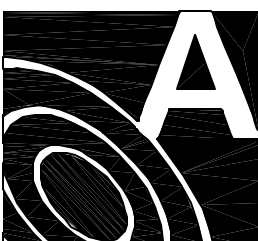
FACTORY SET VALUE

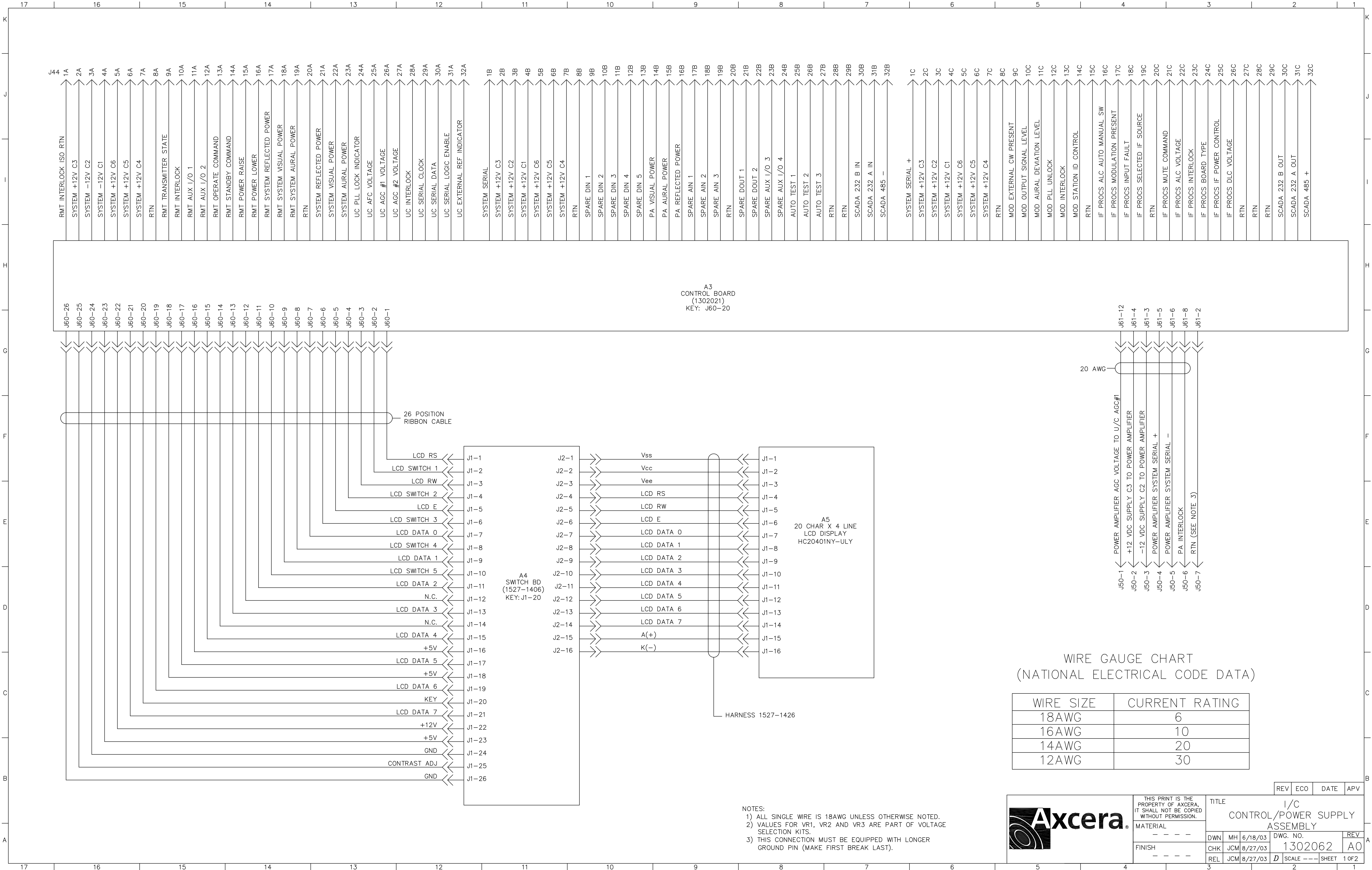
PC BOARD LAYOUT SEE
51-5379-309-00 (2)

DELETED PTF10159 P/N FROM LDMOS. ADDED C23,C24 & C27. CDD/CR			
CO	20110221	5/17/02	RE
R15 AND R16 WERE 680 OHMS. PWN			
BO	20100316	04/02/02	LRT
REV	ECO	DATE	APV

CHANGE R3 FROM A 22 OHM RESISTOR TO C47, SM, CAP, 100PF, 500WDC. FROM CHANGE R6 FROM A 22 OHM RESISTOR TO C48, SM, CAP, 100PF, 500WDC. FROM CHANGE R4 FROM A 22 OHM RESISTOR TO 15906003SMT SM,, RES, 10 OHM 5% 1/8W CHANGE R5 FROM A 22 OHM RESISTOR TO 15906003SMT SM,, RES, 10 OHM 5% 1/8W CHANGE C17 FROM A 47PF CAP FIXED CERAMIC, 47 PF TO 15906160SMT SM,, CAP, .001 UF, 50 WVDC CHANGE C18 FROM A 47PF CAP FIXED CERAMIC, 47 PF TO 15906160SMT SM,, CAP, .001 UF, 50 WVDC ADD C23 1301246 SM, CAP, 47MF, 50V, LOW ESR ADD C24 1301246 SM, CAP, 47MF, 50V, LOW ESR ADD C25 15906161SMT SM,, CAP, .01 UF, 50 WVDC ADD C26 15906161SMT SM,, CAP, .01 UF, 50 WVDC PWN				DO 20100409/18/02 RJ			
				THIS PRINT IS THE PROPERTY OF AXCIERA, IT SHALL NOT BE COPIED WITHOUT PERMISSION.			
MATERIAL				TITLE AMPLIFIER MODULE			
FINISH				DWN	PWN	04/01/02	DWG. NO.
				CHK	LRT	04/03/02	51-5379-309-00 WSP
				REL	LRT	04/03/02	D SCALE
				SHEET 1 OF 1			



 Axcera®	THIS PRINT IS THE PROPERTY OF AXCERA, IT SHALL NOT BE COPIED WITHOUT PERMISSION.			TITLE						SCHEMATIC DIRECTIONAL COUPLER BOARD			
	MATERIAL			DWN	MH	8/11/03	DWG. NO. 1303152			REV			
	— — — —									A0			
	FINISH												
— — — —			CHK	JCM	8/25/03								
			REL	JCM	8/25/03	B	SCALE — — —	SHEET		1 OF 1			



A3
CONTROL BOARD
(1302021)
KEY: J60-20

A4
SWITCH BD
(1527-1406)
KEY: J1-20

A5
20 CHAR X 4 LINE
LCD DISPLAY
HC20401NY-ULY

HARNESS 1527-1426

WIRE GAUGE CHART
(NATIONAL ELECTRICAL CODE DATA)

WIRE SIZE	CURRENT RATING
18AWG	6
16AWG	10
14AWG	20
12AWG	30



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MATERIAL
- - - -

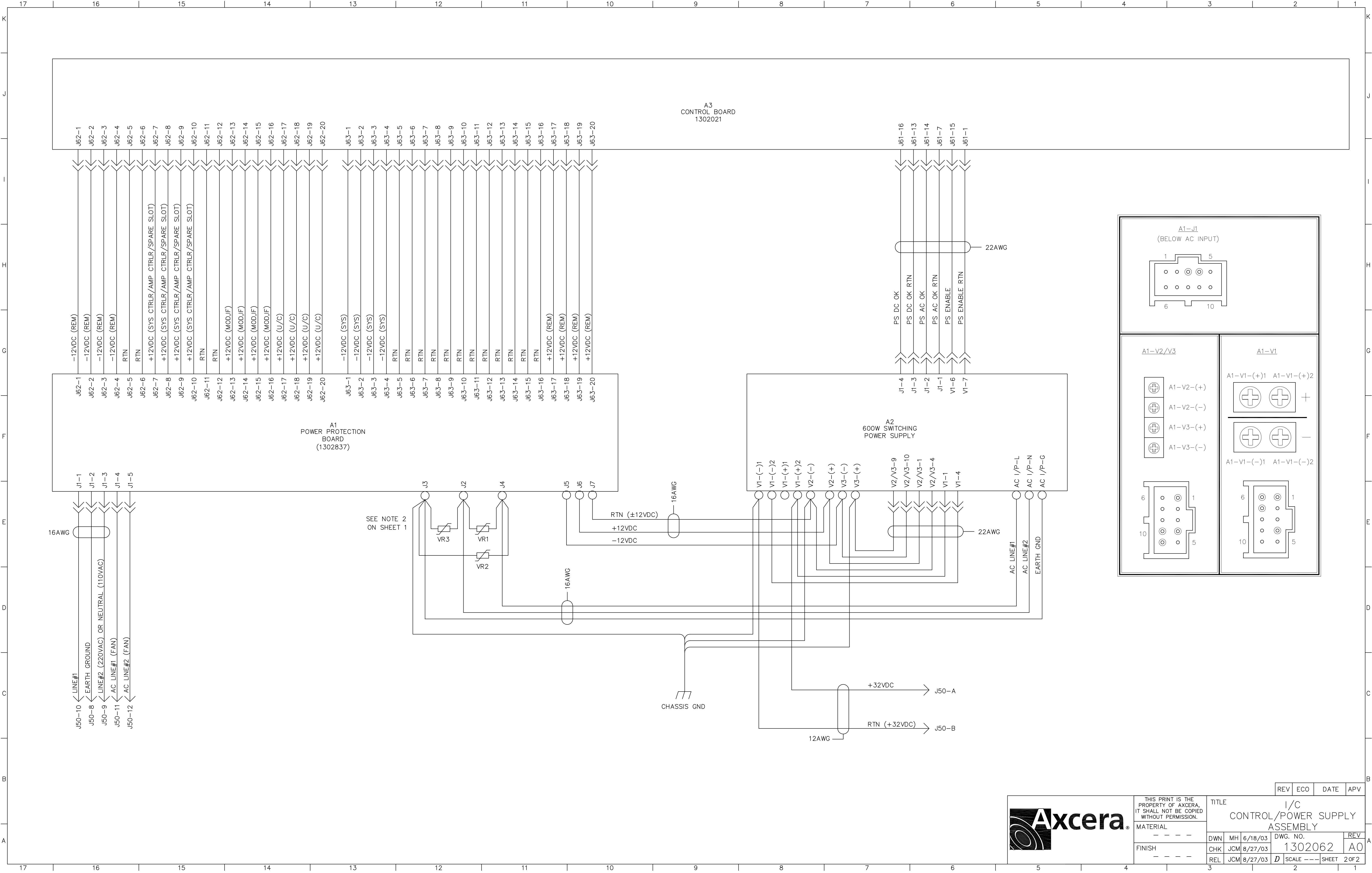
FINISH
- - - -

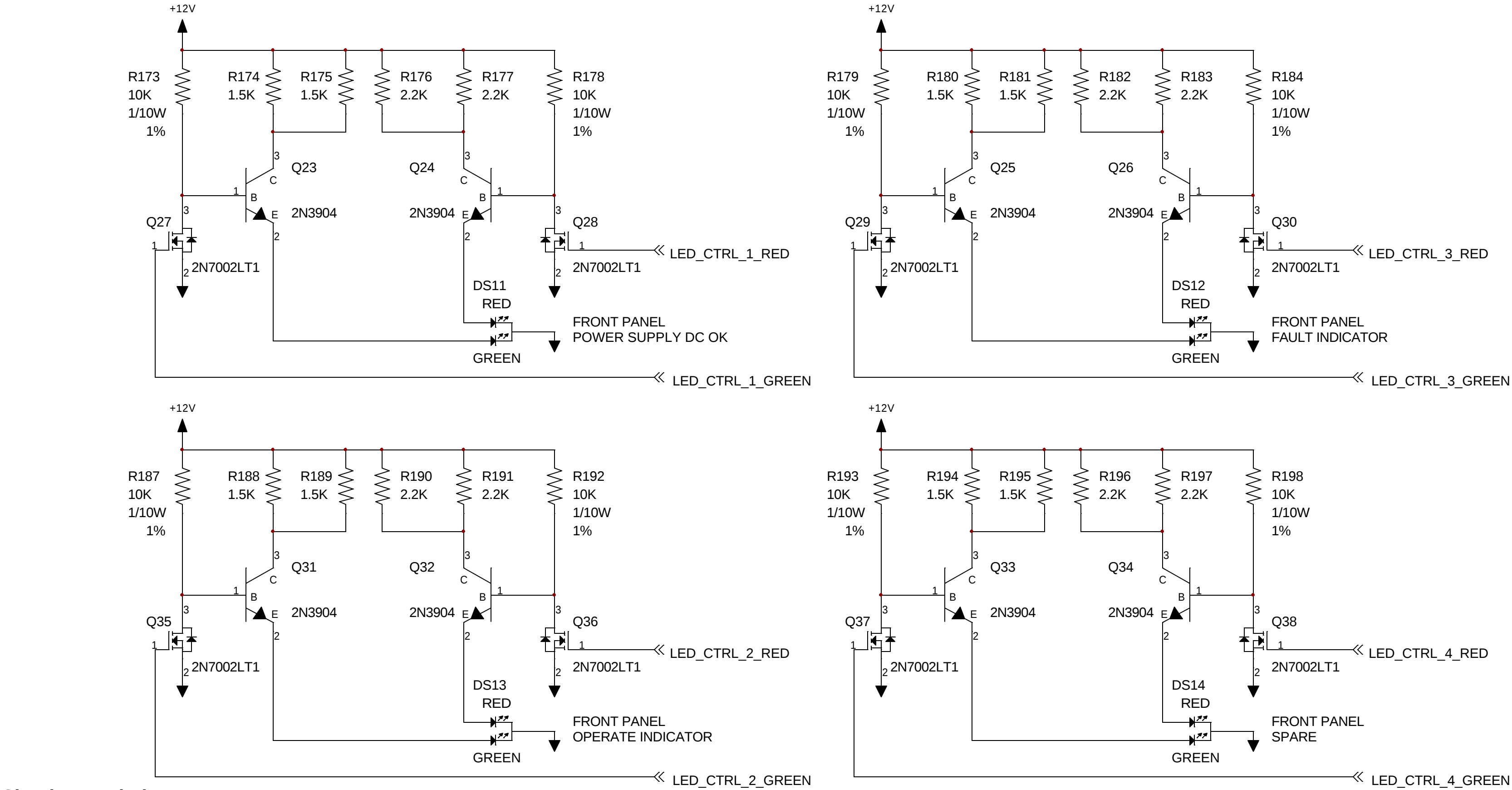
TITLE
I/C
CONTROL/POWER SUPPLY
ASSEMBLY

DWN	MH	6/18/03	DWG. NO.	REV
CHK	JCM	8/27/03	1302062	A0
REL	JCM	8/27/03	SCALE ---	SHEET 1 OF 2

REV	ECO	DATE	APV

- NOTES:
- ALL SINGLE WIRE IS 18AWG UNLESS OTHERWISE NOTED.
 - VALUES FOR VR1, VR2 AND VR3 ARE PART OF VOLTAGE SELECTION KITS.
 - THIS CONNECTION MUST BE EQUIPPED WITH LONGER GROUND PIN (MAKE FIRST BREAK LAST).





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 (!ST) 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:

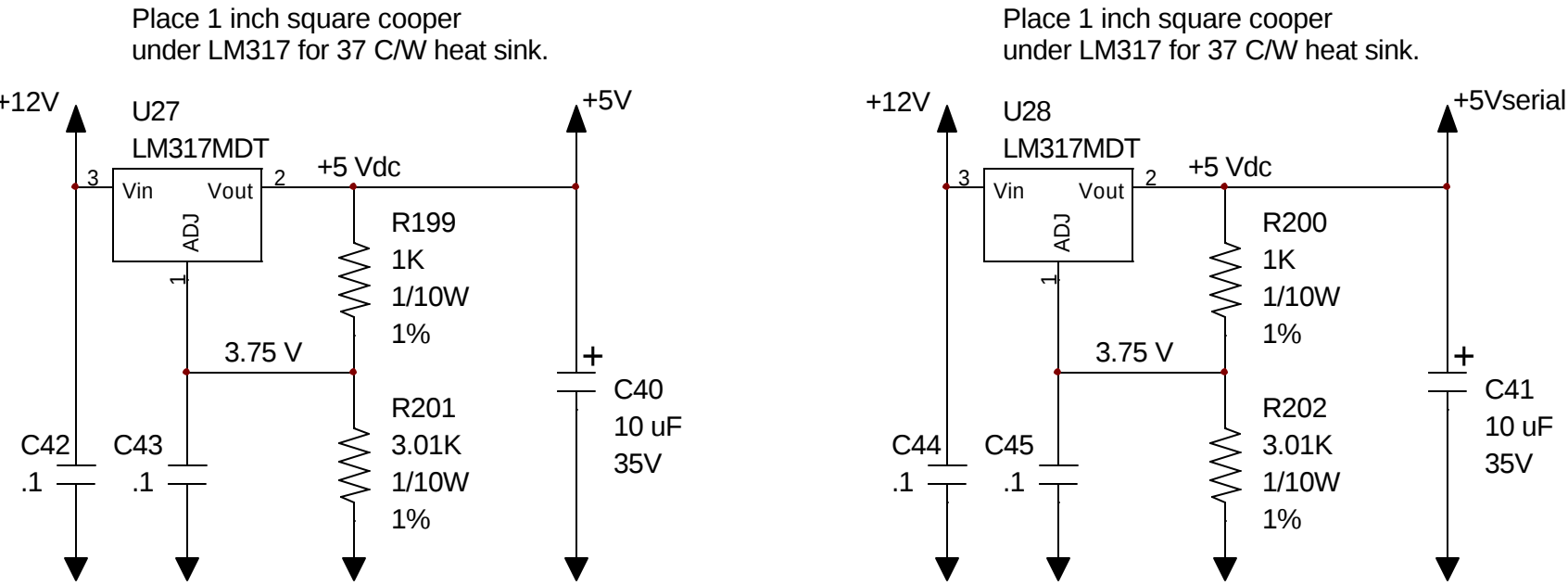
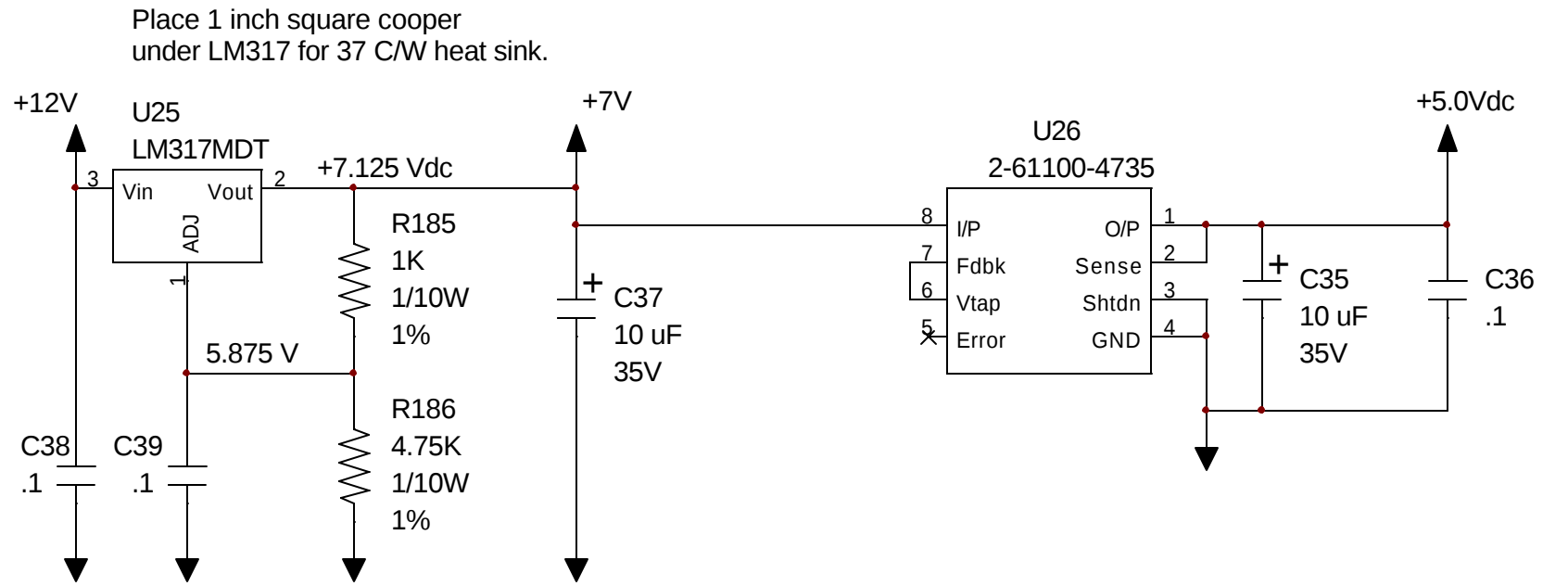
Each analog input is expected to be between 0 and 5 Vdc. If a signal exceeds 5.1 Vdc, a 0.225 Watt zenor diode clamps the signals voltage. Most signals are calibrated at their source however two dual serial potentiometer ICs are used to calibrate four signals. For these four circuits, the input value 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.

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).

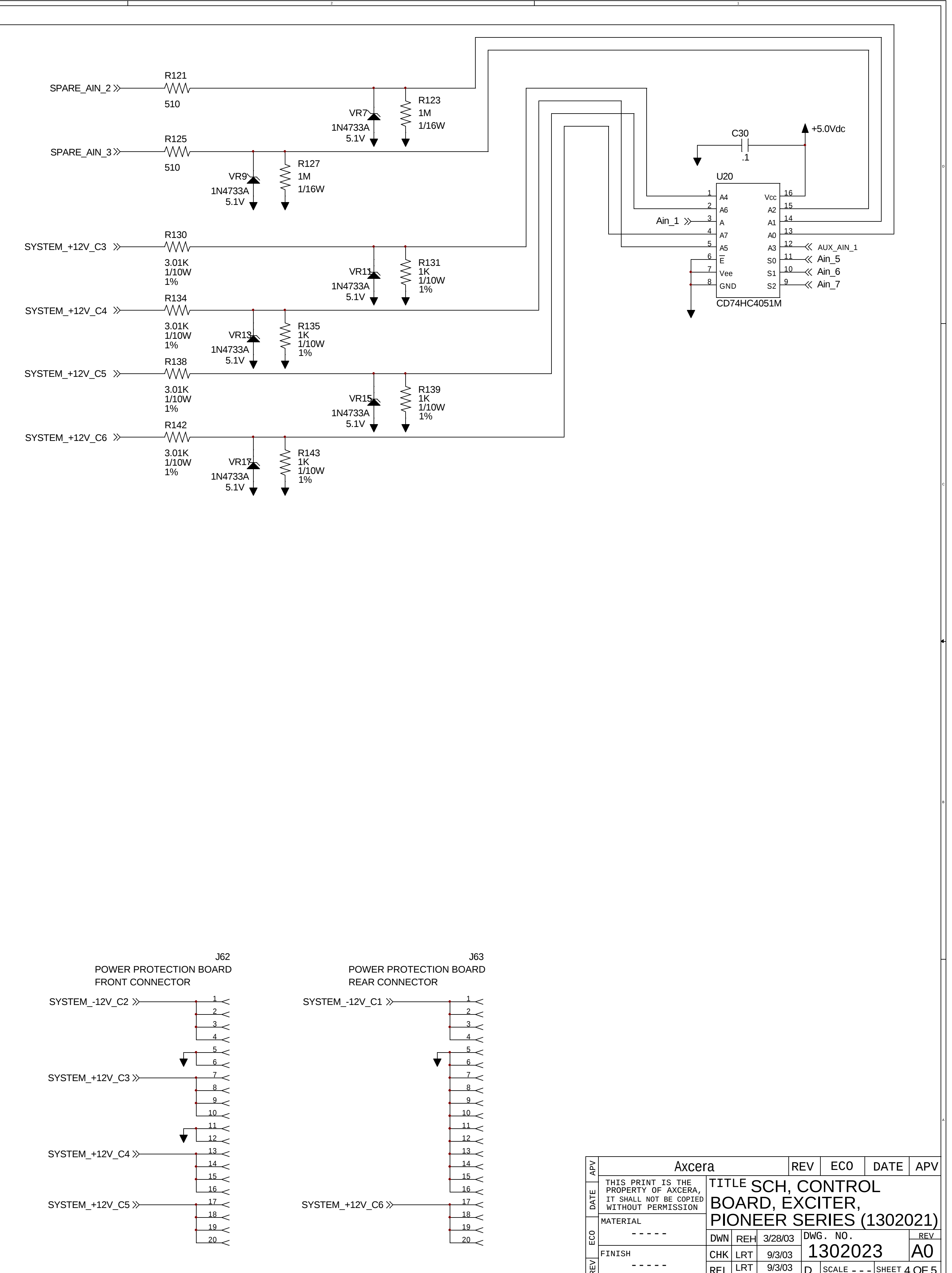
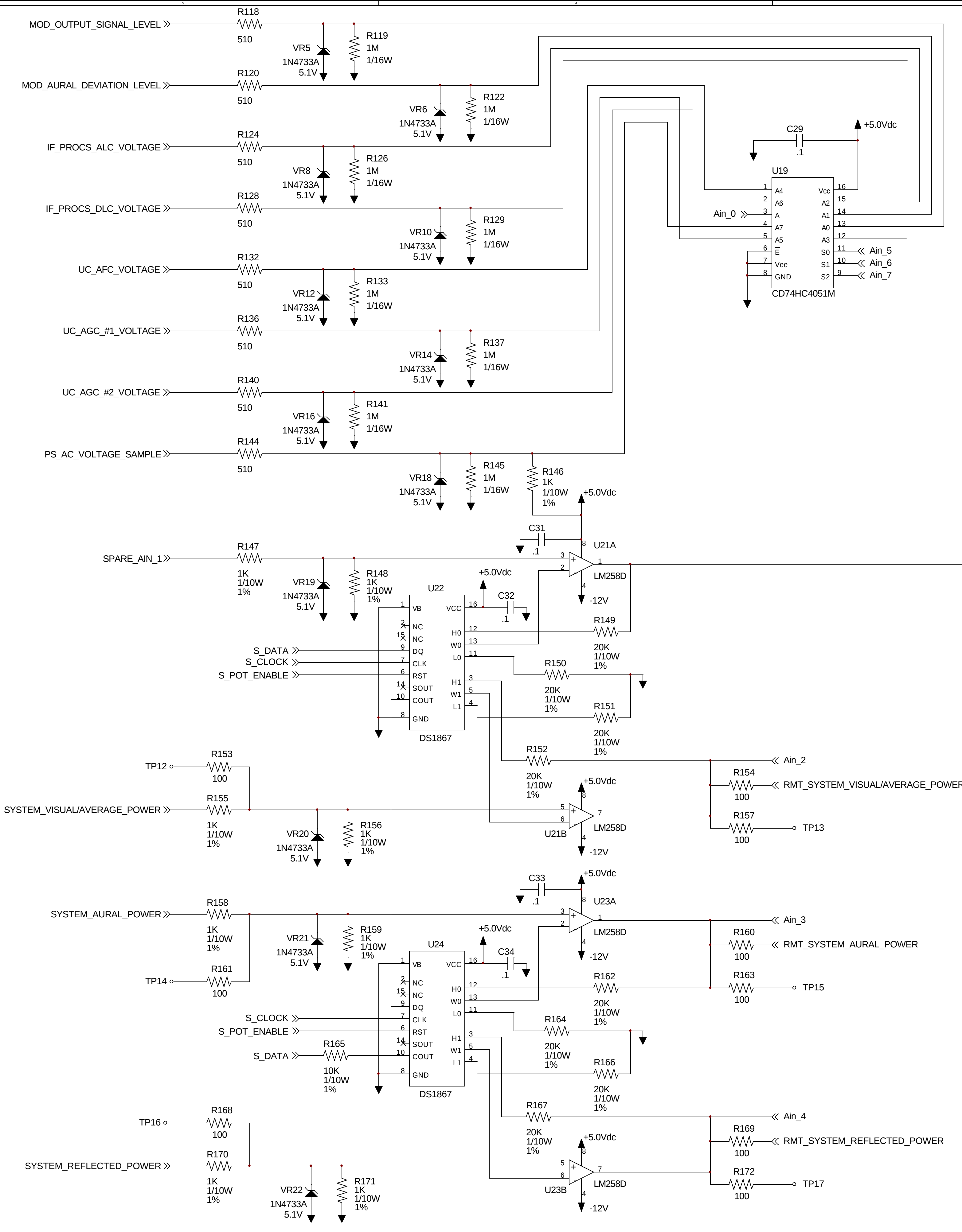
PAGE 5:

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.

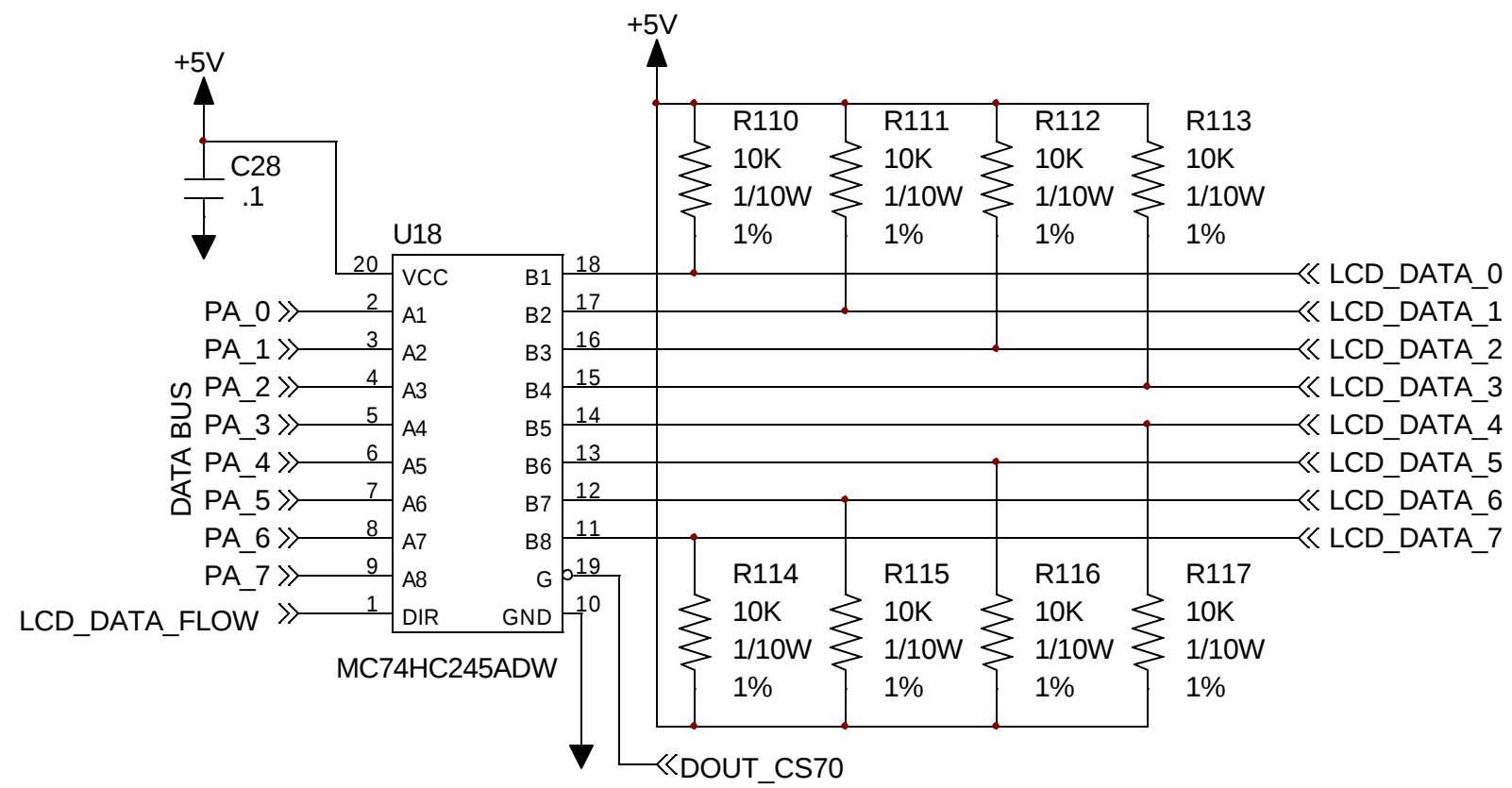
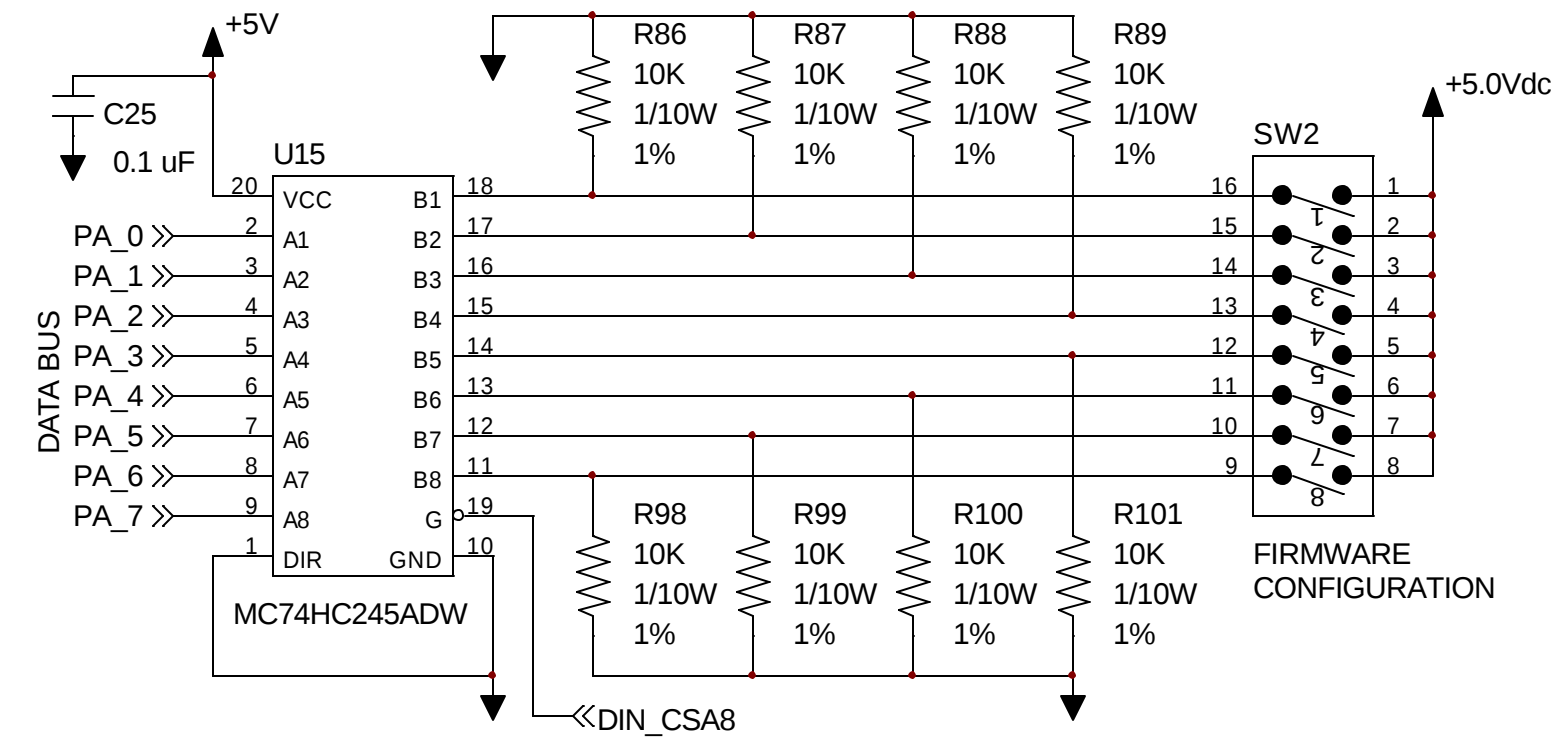
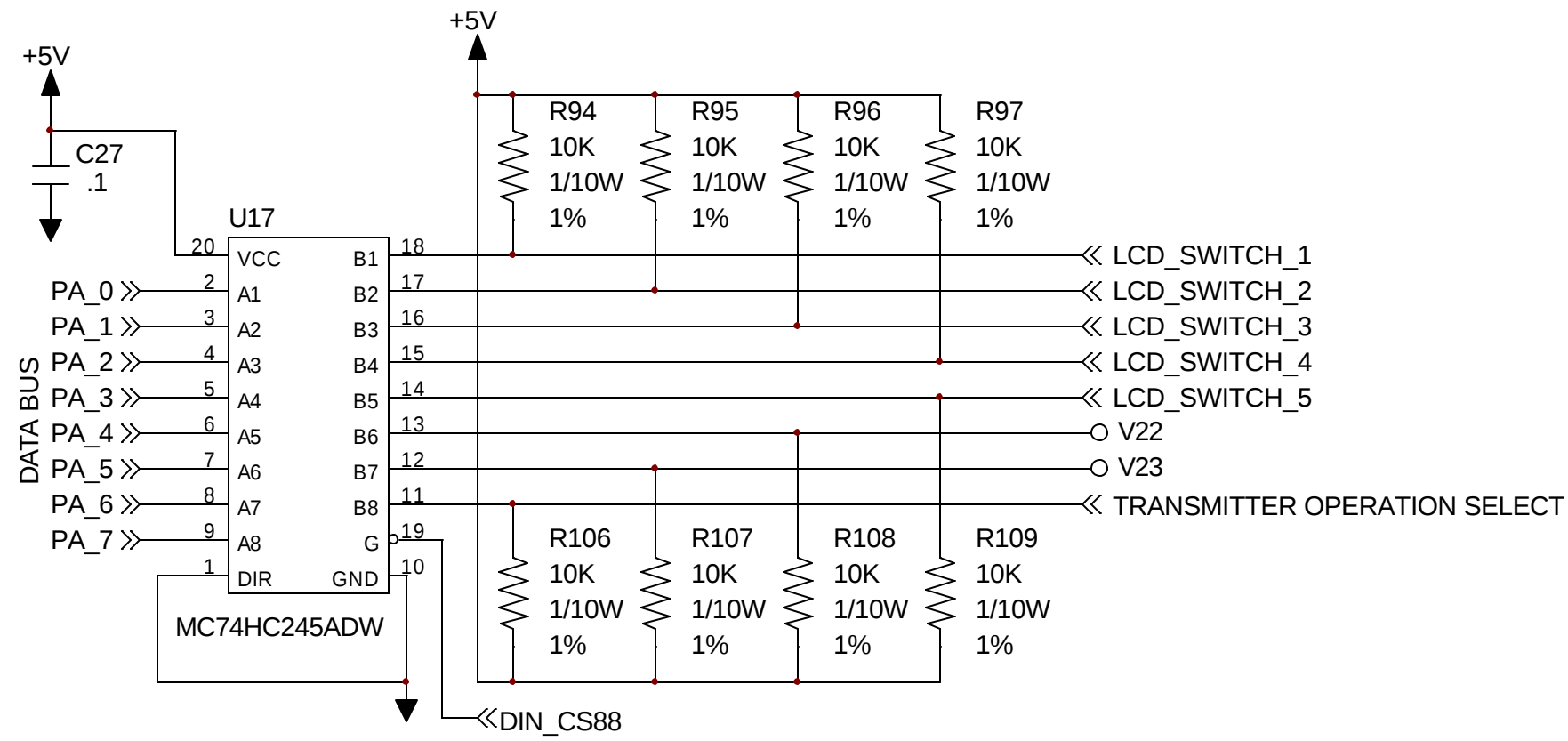
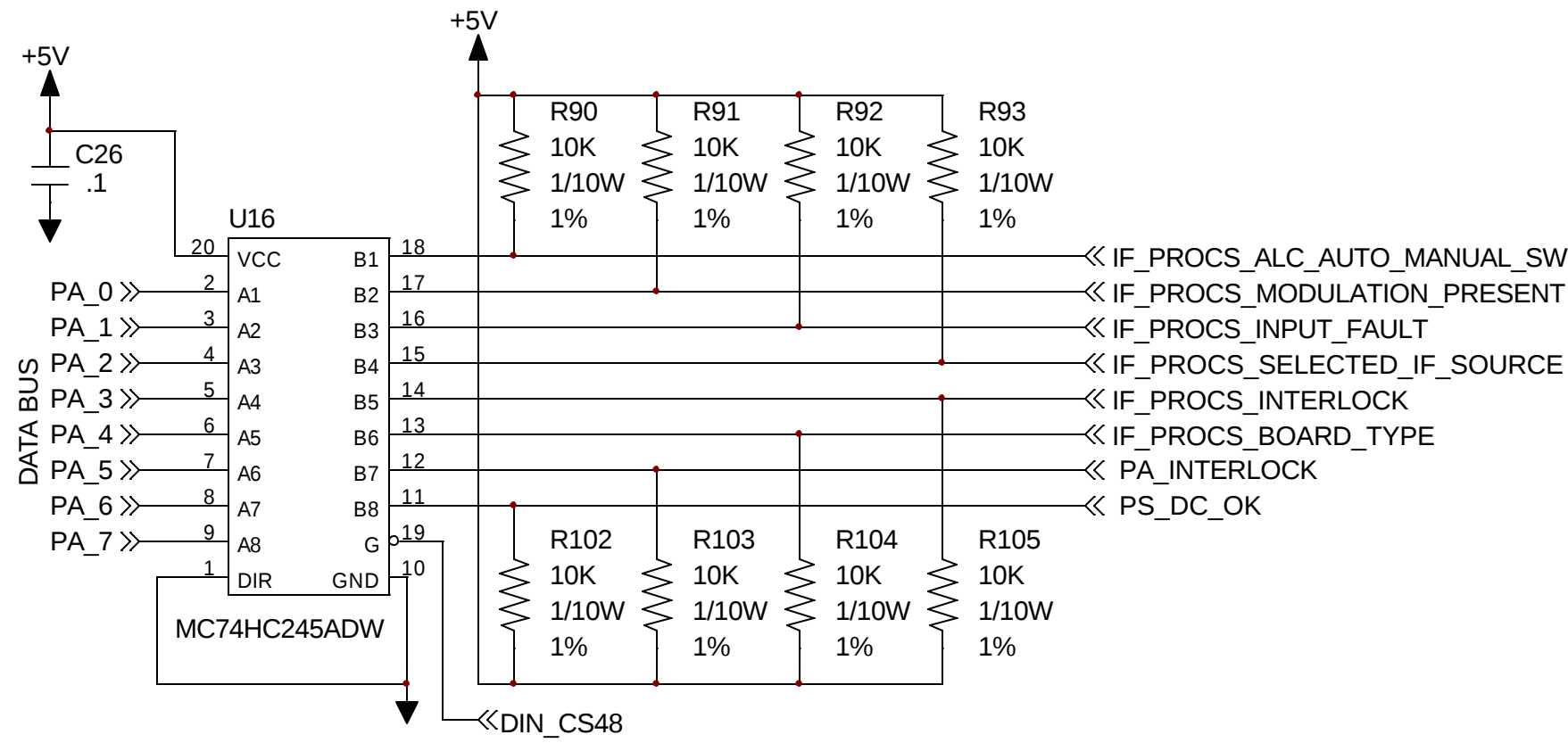
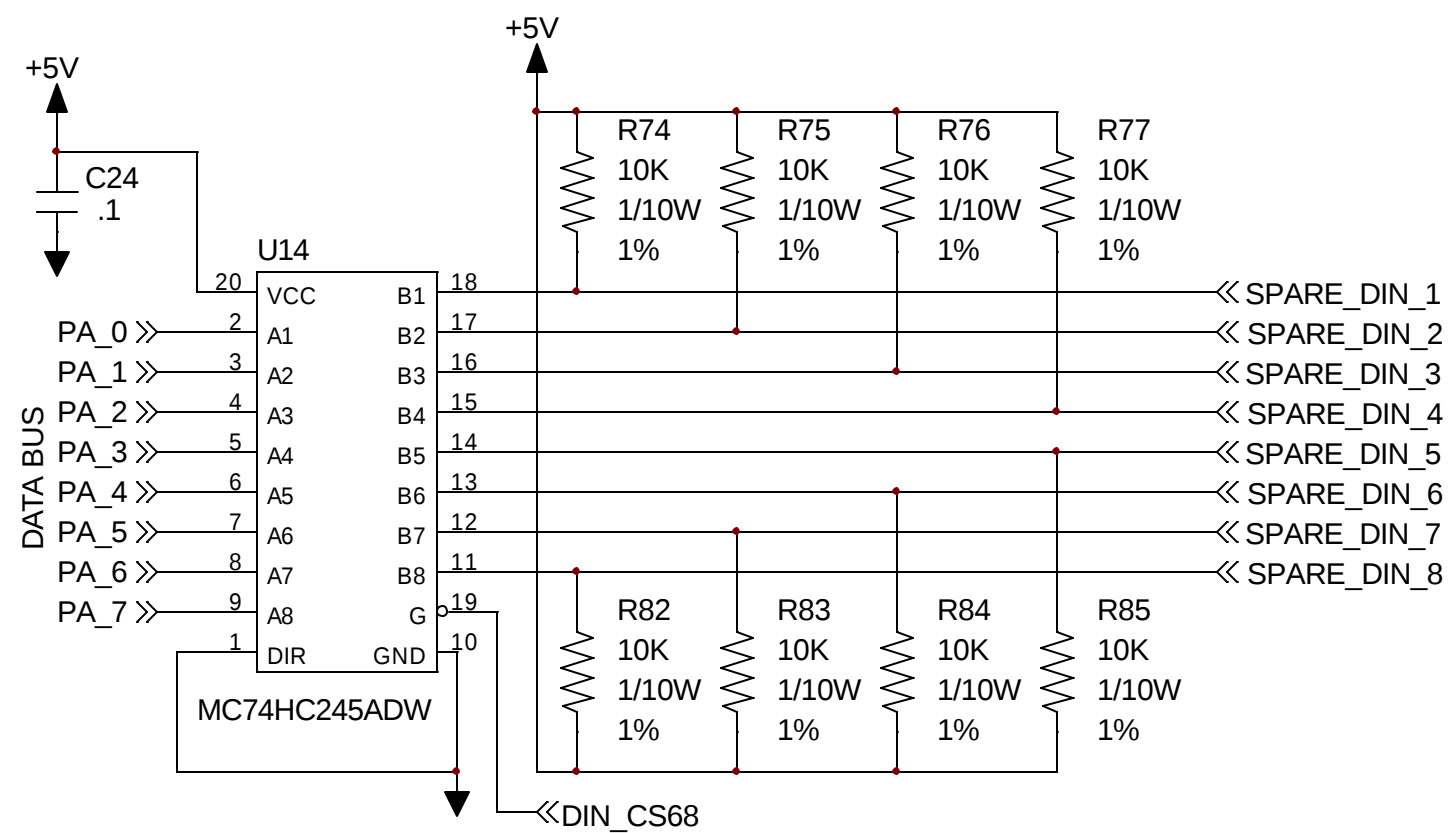
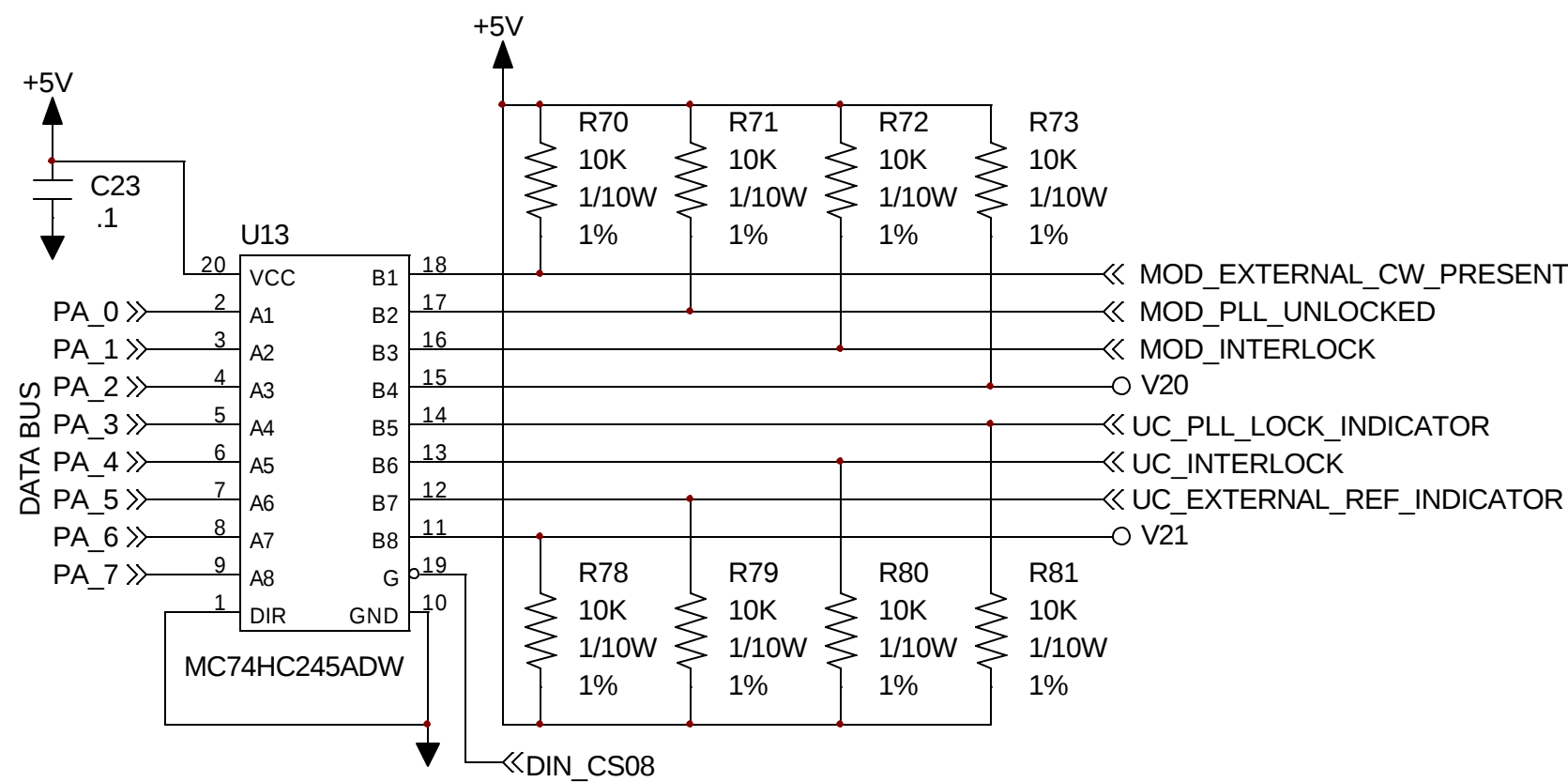
Several voltage regulators are used to power the board. Seven volts is typically applied to board LEDs and to the input of a precision 5.0 volt regulator. The 5.0 volt regulator is used for analog circuits and the microcontroller analog reference voltage. Another two 5 volt regulator circuits are used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



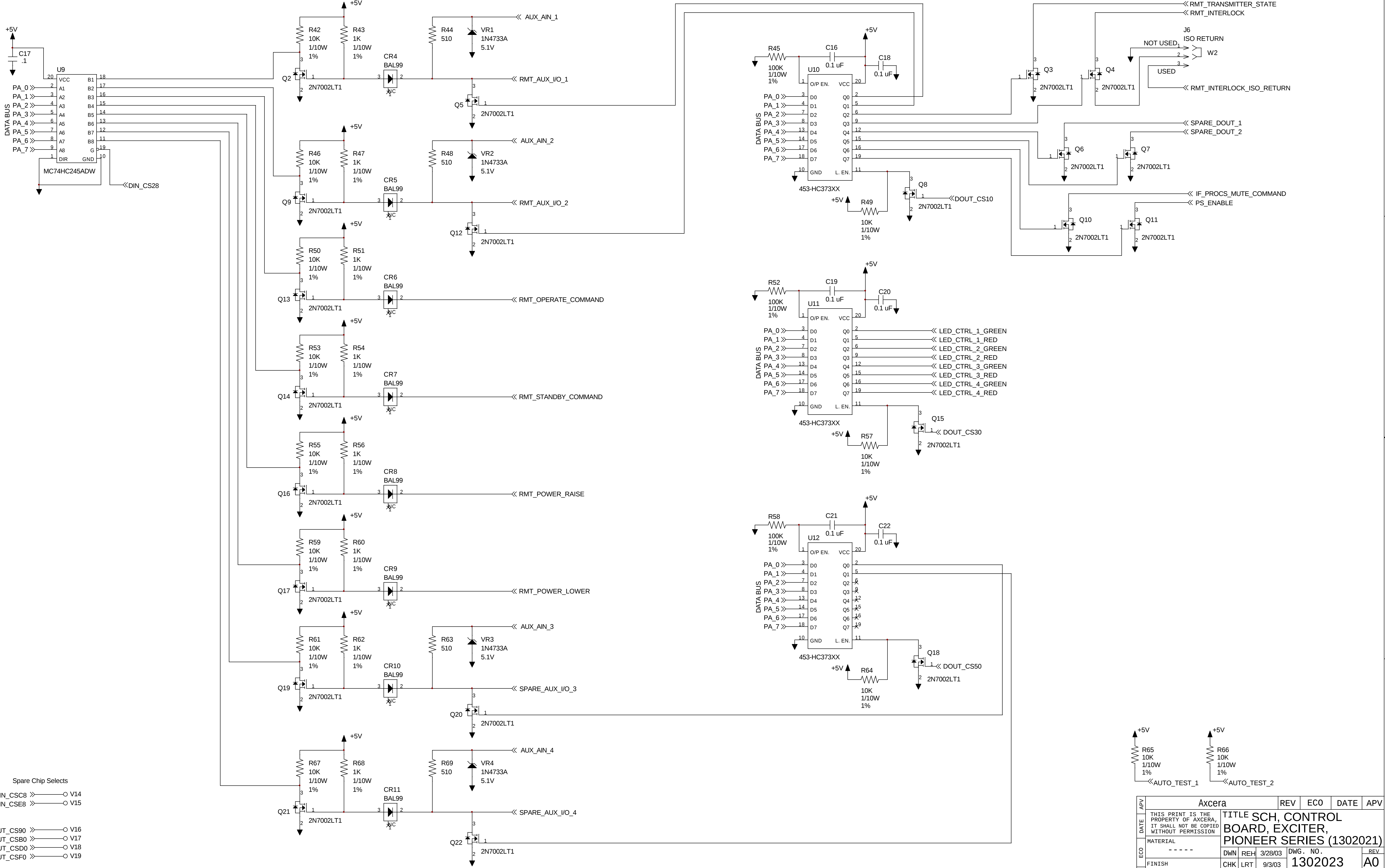
APV	Axcera				REV	ECO	DATE	APV
DATE	THIS PRINT IS THE PROPERTY OF AXCERA, IT SHALL NOT BE COPIED WITHOUT PERMISSION				TITLE SCH, CONTROL BOARD, EXCITER, PIONEER SERIES (1302021)			
ECO	MATERIAL				DWN	REH	3/28/03	DWG. NO.
REV	FINISH				CHK	LRT	9/3/03	1302023
					REL	LRT	9/3/03	D
					SCALE - - - SHEET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



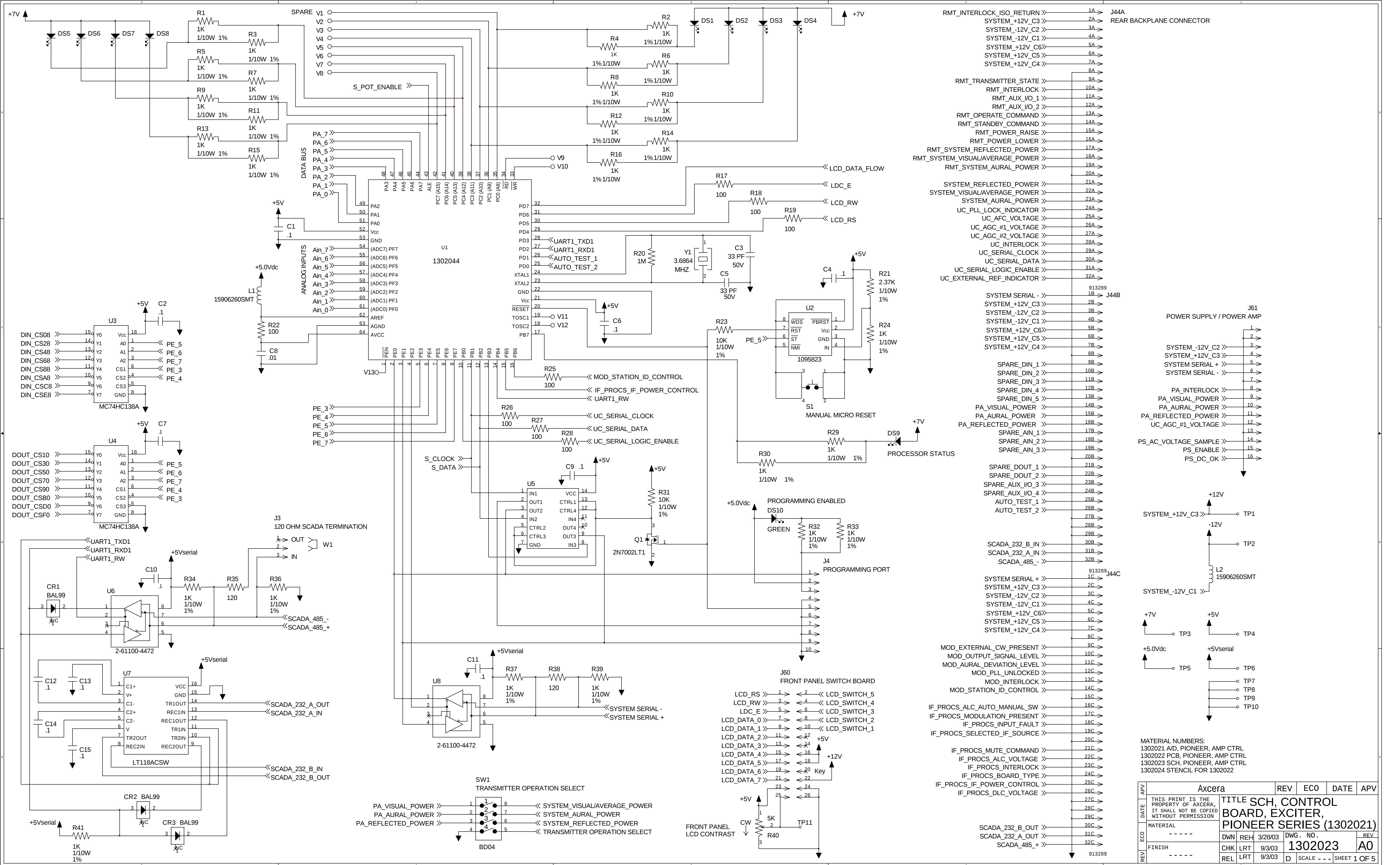
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3	3	9/3/03	1302023
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5	5	9/3/03	1302023
6	6	9/3/03	1302023
7	7	9/3/03	1302023
8	8	9/3/03	1302023
9	9	9/3/03	1302023
10	10	9/3/03	1302023
11	11	9/3/03	1302023
12	12	9/3/03	1302023
13	13	9/3/03	1302023
14	14	9/3/03	1302023
15	15	9/3/03	1302023
16	16	9/3/03	1302023
17	17	9/3/03	1302023
18	18	9/3/03	1302023
19	19	9/3/03	1302023
20	20	9/3/03	1302023



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	A0
			REL		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	A0
			REL	LRT	9/3/03	D	SCALE - - - SHEET 2 OF 5

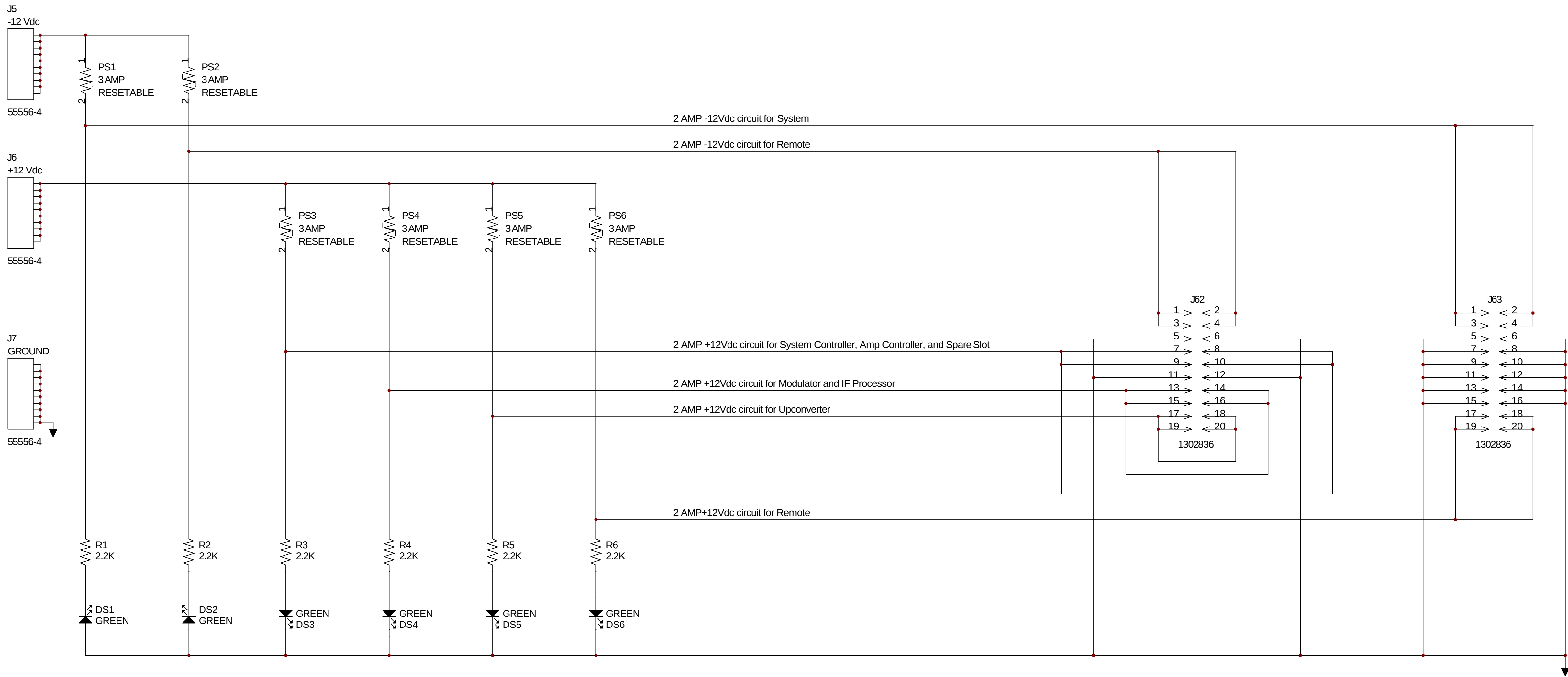
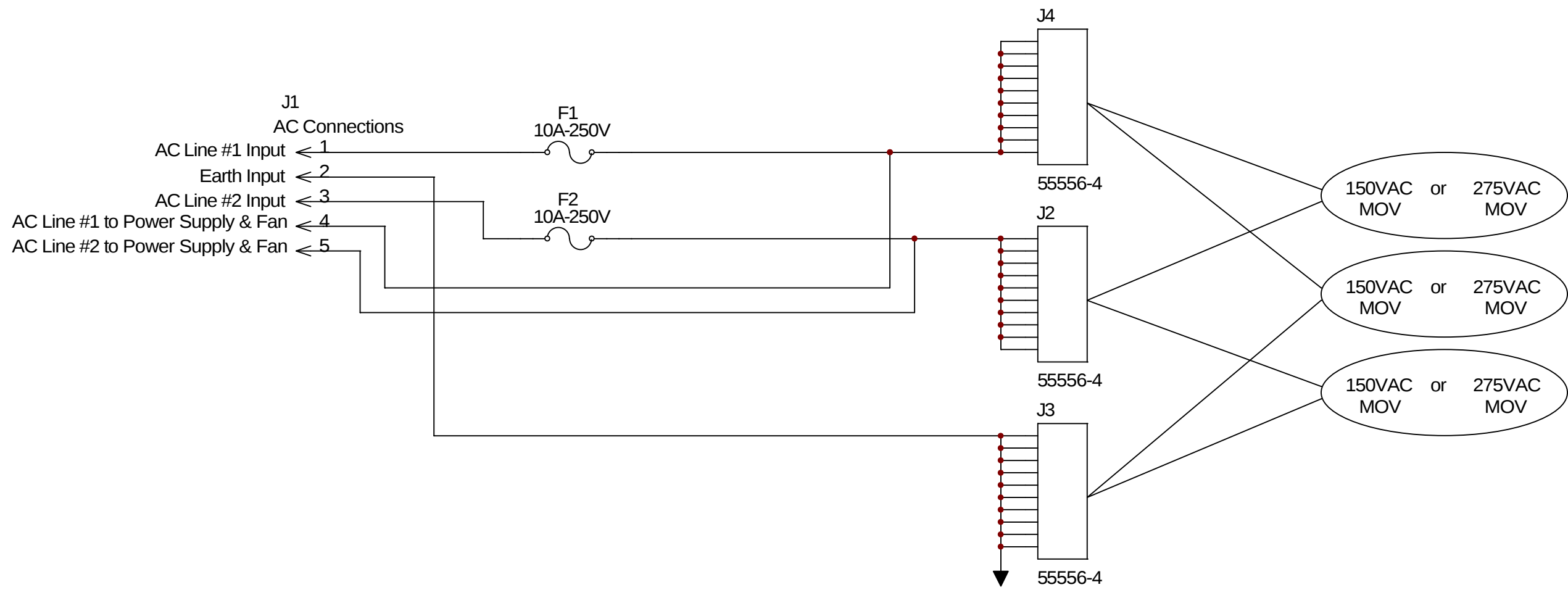


MATERIAL NUMBERS:
1302021 A/D, PIONEER, AMP CTRL
1302022 PCB, PIONEER, AMP CTRL
1302023 SCH, PIONEER, AMP CTRL
1302024 STENCIL FOR 1302022

REV	APV	DATE	REV	ECO	DATE	APV
---	---	---	---	---	---	---
---	---	---	---	---	---	---
---	---	---	---	---	---	---
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TITLE SCH, CONTROL BOARD, EXCITER, PIONEER SERIES (1302021)

CHK	LRT	9/3/03	DWG. NO.	REV
REL	LRT	9/3/03	1302023	A0
---	---	---	SCALE ---	SHEET 1 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

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)						
MATERIAL									
ECO			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

