



AVTECH ELECTROSYSTEMS LTD.

NANOSECOND WAVEFORM ELECTRONICS
SINCE 1975

P.O. BOX 265
OGDENSBURG, NY
U.S.A. 13669-0265

TEL: 888-670-8729 (USA & Canada) or +1-613-226-5772 (Intl)
FAX: 800-561-1970 (USA & Canada) or +1-613-226-2802 (Intl)

info@avtechpulse.com - <http://www.avtechpulse.com/>

BOX 5120, LCD MERIVALE
OTTAWA, ONTARIO
CANADA K2C 3H4

INSTRUCTIONS

MODEL AV-110G-PS-D

0 to ± 200 V, 350 kHz

VARIABLE-GAIN DUAL-CHANNEL

LINEAR AMPLIFIER

SERIAL NUMBER: _____

WARRANTY

Avtech Electrosystems Ltd. warrants products of its manufacture to be free from defects in material and workmanship under conditions of normal use. If, within one year after delivery to the original owner, and after prepaid return by the original owner, this Avtech product is found to be defective, Avtech shall at its option repair or replace said defective item. This warranty does not apply to units which have been disassembled, modified or subjected to conditions exceeding the applicable specifications or ratings. This warranty is the extent of the obligation assumed by Avtech with respect to this product and no other warranty or guarantee is either expressed or implied.

TECHNICAL SUPPORT

Phone: 888-670-8729 (USA & Canada) or +1-613-226-5772 (Intl)

Fax: 800-561-1970 (USA & Canada) or +1-613-226-2802 (Intl)

E-mail: info@avtechpulse.com

World Wide Web: <http://www.avtechpulse.com>

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Manual Reference: T:\instructword\av-110\AV-110G-PS-D,edition3.odt.
Last modified June 19, 2006.
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INTRODUCTION

The AV-110G-PS-D is a variable-gain dual-channel linear amplifier. The gain for each of the two independent channels may be adjusted from +1 to +100. The input range is 0 to $\pm 2V$, and the output range is 0 to $\pm 200V$. The outputs can drive load impedances of 50 k Ω and higher. The amplifier bandwidth is 350 kHz.

HIGH-VOLTAGE PRECAUTIONS

 **CAUTION:** This instrument provides output voltages as high as ± 200 Volts, so extreme caution must be employed when using this instrument. The instrument should only be used by individuals who are thoroughly skilled in high voltage laboratory techniques. The following precaution should always be observed:

- 1) Keep exposed high-voltage wiring to an absolute minimum.
- 2) Wherever possible, use shielded connectors and cabling.
- 3) Connect and disconnect loads and cables only when the amplifier is turned off.
- 4) Keep in mind that all cables, connectors, oscilloscope probes, and loads must have an appropriate voltage rating.
- 5) Do not attempt any repairs on the instrument, beyond the fuse replacement procedures described in this manual. Contact Avtech technical support (see page 2 for contact information) if the instrument requires servicing.

SPECIFICATIONS

| | |
|---------------------------------|---|
| Model: | AV-110G-PS-D |
| Output Amp. (max): | ± 200 Volts |
| Load impedance: | ≥ 50 k Ω |
| Bandwidth: | DC to 350 kHz |
| Voltage gain (variable): | $\times 1$ to $\times 100$ |
| Input range: | 0 to ± 2 Volts (1 k Ω input impedance) |
| Rise time (for max output): | 1 μ s |
| Output power, max. | 0.8 W |
| Dual channel option: | Yes (-D option) |
| DC offset option ¹ : | ± 50 Volts |
| Connectors: | BNC |
| Power: | 100 - 240 Volts, 50-60 Hz |
| Dimensions: | 100 mm x 430 mm x 375 mm (3.9" x 17" x 14.8") |

- 1) To specify the DC offset option, add the suffix -OS to the model number. The sum of the amplitude and the offset must remain within the rated output amplitude range – i.e., this option does not change the minimum or maximum obtainable output voltage.

EUROPEAN REGULATORY NOTES

EC DECLARATION OF CONFORMITY

We Avtech Electrosystems Ltd.
 P.O. Box 5120, LCD Merivale
 Ottawa, Ontario
 Canada K2C 3H4

declare that this pulse generator meets the intent of Directive 89/336/EEC for Electromagnetic Compatibility. Compliance pertains to the following specifications as listed in the official Journal of the European Communities:

EN 50081-1 Emission

EN 50082-1 Immunity

and that this pulse generator meets the intent of the Low Voltage Directive 72/23/EEC as amended by 93/68/EEC. Compliance pertains to the following specifications as listed in the official Journal of the European Communities:

EN 61010-1:2001 Safety requirements for electrical equipment for measurement, control, and laboratory use



DIRECTIVE 2002/95/EC (RoHS)

This instrument is exempt from Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the Restriction of the use of certain Hazardous Substances (RoHS) in electrical and electronic equipment. Specifically, Avtech instruments are considered "Monitoring and control instruments" (Category 9) as defined in Annex 1A of Directive 2002/96/EC. The Directive 2002/95/EC only applies to Directive 2002/96/EC categories 1-7 and 10, as stated in the "Article 2 - Scope" section of Directive 2002/95/EC.

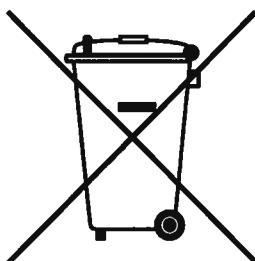
DIRECTIVE 2002/96/EC (WEEE)

European customers who have purchased this equipment directly from Avtech will have completed a "WEEE Responsibility Agreement" form, accepting responsibility for WEEE compliance (as mandated in Directive 2002/96/EC of the European Union and

local laws) on behalf of the customer, as provided for under Article 9 of Directive 2002/96/EC.

Customers who have purchased Avtech equipment through local representatives should consult with the representative to determine who has responsibility for WEEE compliance. Normally, such responsibilities will lie with the representative, unless other arrangements (under Article 9) have been made.

Requirements for WEEE compliance may include registration of products with local governments, reporting of recycling activities to local governments, and financing of recycling activities.



INSTALLATION

VISUAL CHECK

After unpacking the instrument, examine to ensure that it has not been damaged in shipment. Visually inspect all connectors, knobs, and handles. Confirm that a power cord is with the instrument. If the instrument has been damaged, file a claim immediately with the company that transported the instrument.

POWER RATINGS


This instrument is intended to operate from 100 - 240 V, 50 - 60 Hz.

The maximum power consumption is 90 Watts. Please see the “FUSES” section for information about the appropriate AC and DC fuses.

This instrument is an “Installation Category II” instrument, intended for operation from a normal single-phase supply.

CONNECTION TO THE POWER SUPPLY


An IEC-320 three-pronged recessed male socket is provided on the back panel for AC power connection to the instrument. One end of the detachable power cord that is supplied with the instrument plugs into this socket. The other end of the detachable power cord plugs into the local mains supply. Use only the cable supplied with the instrument. The mains supply must be earthed, and the cord used to connect the instrument to the mains supply must provide an earth connection. (The supplied cord does this.)

 **Warning:** Failure to use a grounded outlet may result in injury or death due to electric shock. This product uses a power cord with a ground connection. It must be connected to a properly grounded outlet. The instrument chassis is connected to the ground wire in the power cord.

The table below describes the power cord that is normally supplied with this instrument, depending on the destination region:

| Destination Region | Description | Manufacturer | Part Number |
|---------------------------------------|---|---|--------------|
| Continental Europe | European CEE 7/7 "Schuko" 230V, 50Hz | Volex (http://www.volex.com) | 17850-C3-326 |
| | | Qualtek (http://www.qualtekusa.com) | 319004-T01 |
| United Kingdom | BS 1363, 230V, 50Hz | Qualtek (http://www.qualtekusa.com) | 370001-E01 |
| Switzerland | SEV 1011, 2 30V, 50Hz | Volex (http://www.volex.com) | 2102H-C3-10 |
| Israel | SI 32, 220V, 50Hz | Volex (http://www.volex.com) | 2115H-C3-10 |
| North America, and all other areas | NEMA 5-15, 120V, 60 Hz | Qualtek (http://www.qualtekusa.com) | 312007-01 |

PROTECTION FROM ELECTRIC SHOCK

 Operators of this instrument must be protected from electric shock at all times. The owner must ensure that operators are prevented access and/or are insulated from every connection point. In some cases, connections must be exposed to potential human contact. Operators must be trained to protect themselves from the risk of electric shock. This instrument is intended for use by qualified personnel who recognize shock hazards and are familiar with safety precautions required to avoid possibly injury. In particular, operators should:

1. Keep exposed high-voltage wiring to an absolute minimum.
2. Wherever possible, use shielded connectors and cabling.
3. Connect and disconnect loads and cables only when the instrument is turned off.
4. Keep in mind that all cables, connectors, oscilloscope probes, and loads must have an appropriate voltage rating.
5. Do not attempt any repairs on the instrument, beyond the fuse replacement procedures described in this manual. Contact Avtech technical support (see page 2 for contact information) if the instrument requires servicing. Service is to be performed solely by qualified service personnel.

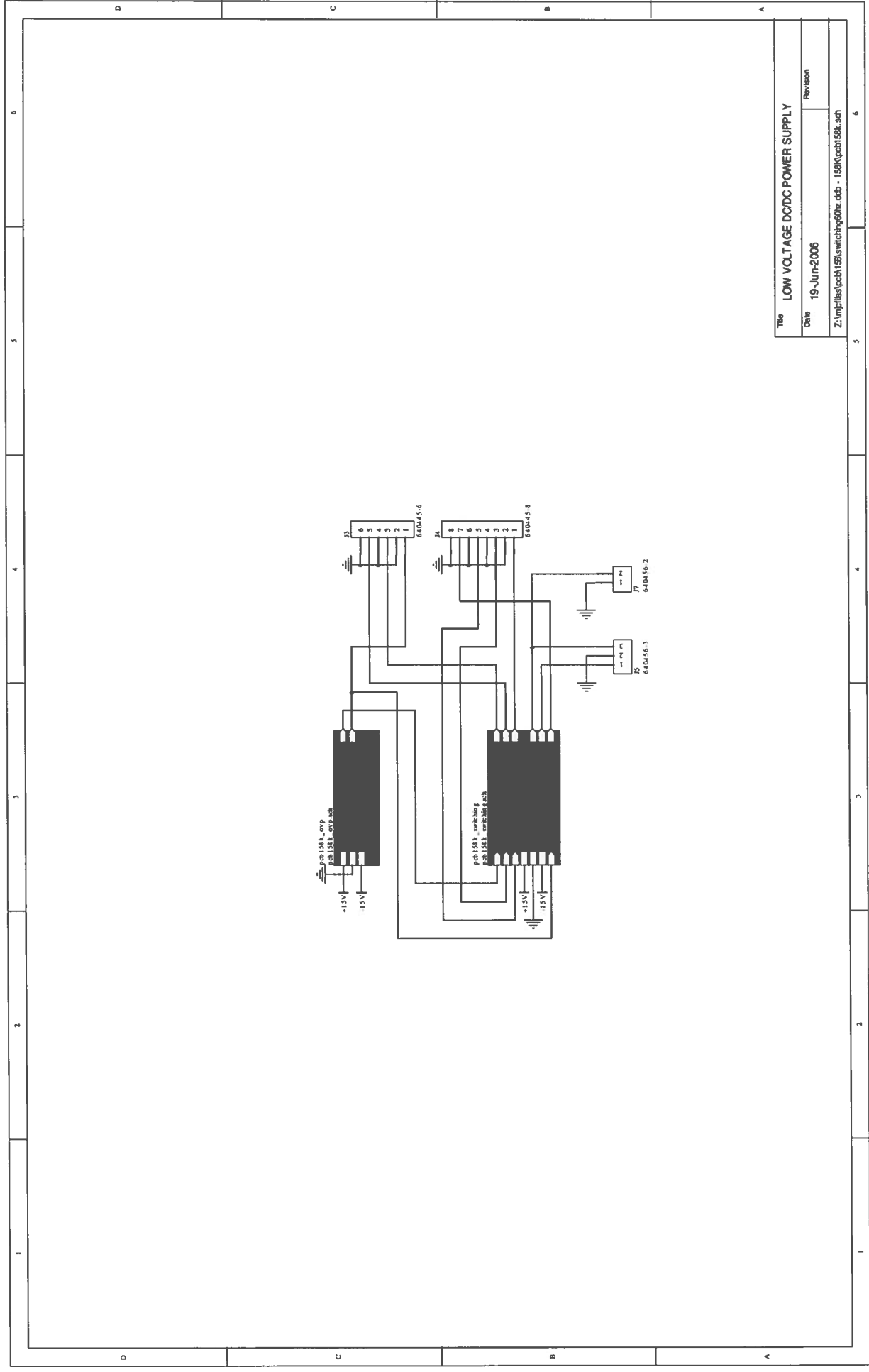
ENVIRONMENTAL CONDITIONS

This instrument is intended for use under the following conditions:

1. indoor use;
2. altitude up to 2 000 m;
3. temperature 5 °C to 40 °C;
4. maximum relative humidity 80 % for temperatures up to 31 °C decreasing linearly to 50 % relative humidity at 40 °C;
5. Mains supply voltage fluctuations up to ± 10 % of the nominal voltage;

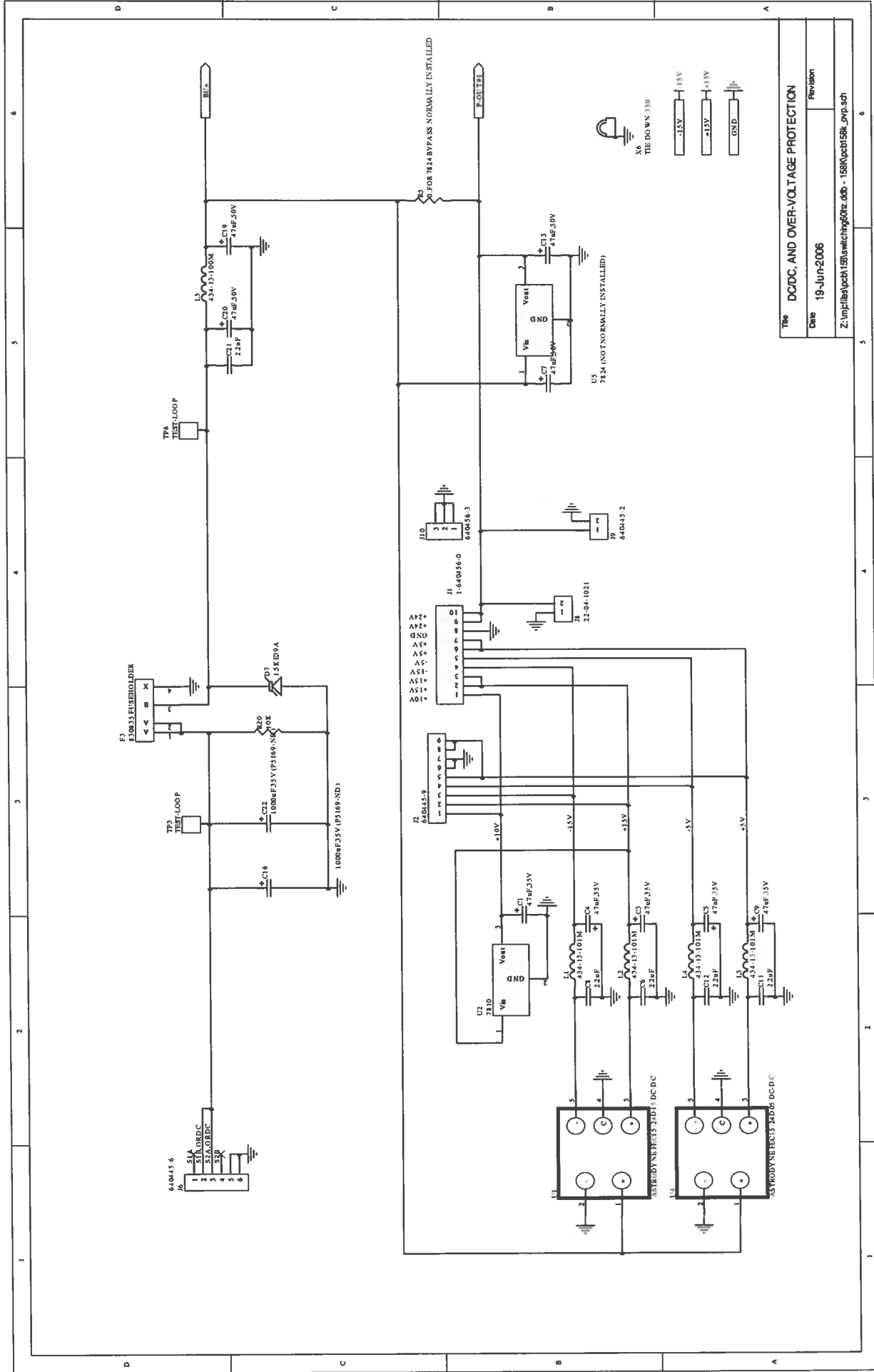
6. no pollution or only dry, non-conductive pollution.

PCB 158K - LOW VOLTAGE POWER SUPPLY, 1/3



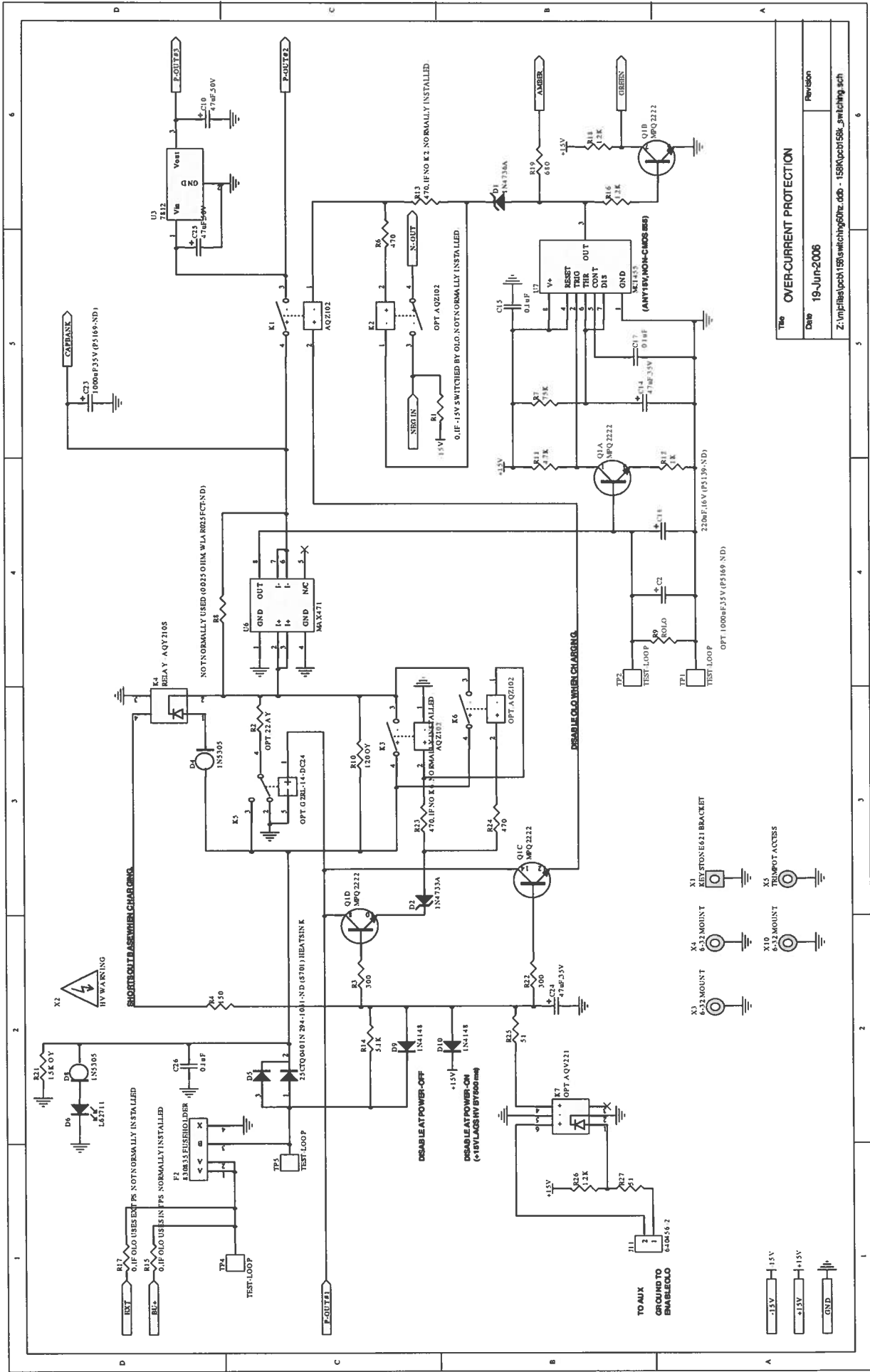
| | |
|--|--------------------------------|
| Title | LOW VOLTAGE DC/DC POWER SUPPLY |
| Date | 19-Jun-2006 |
| Revision | |
| Z:\mp\files\pcb158k\switching60hz.dcb - 158K\pcb158k.sch | |

PCB 158K - LOW VOLTAGE POWER SUPPLY, 2/3

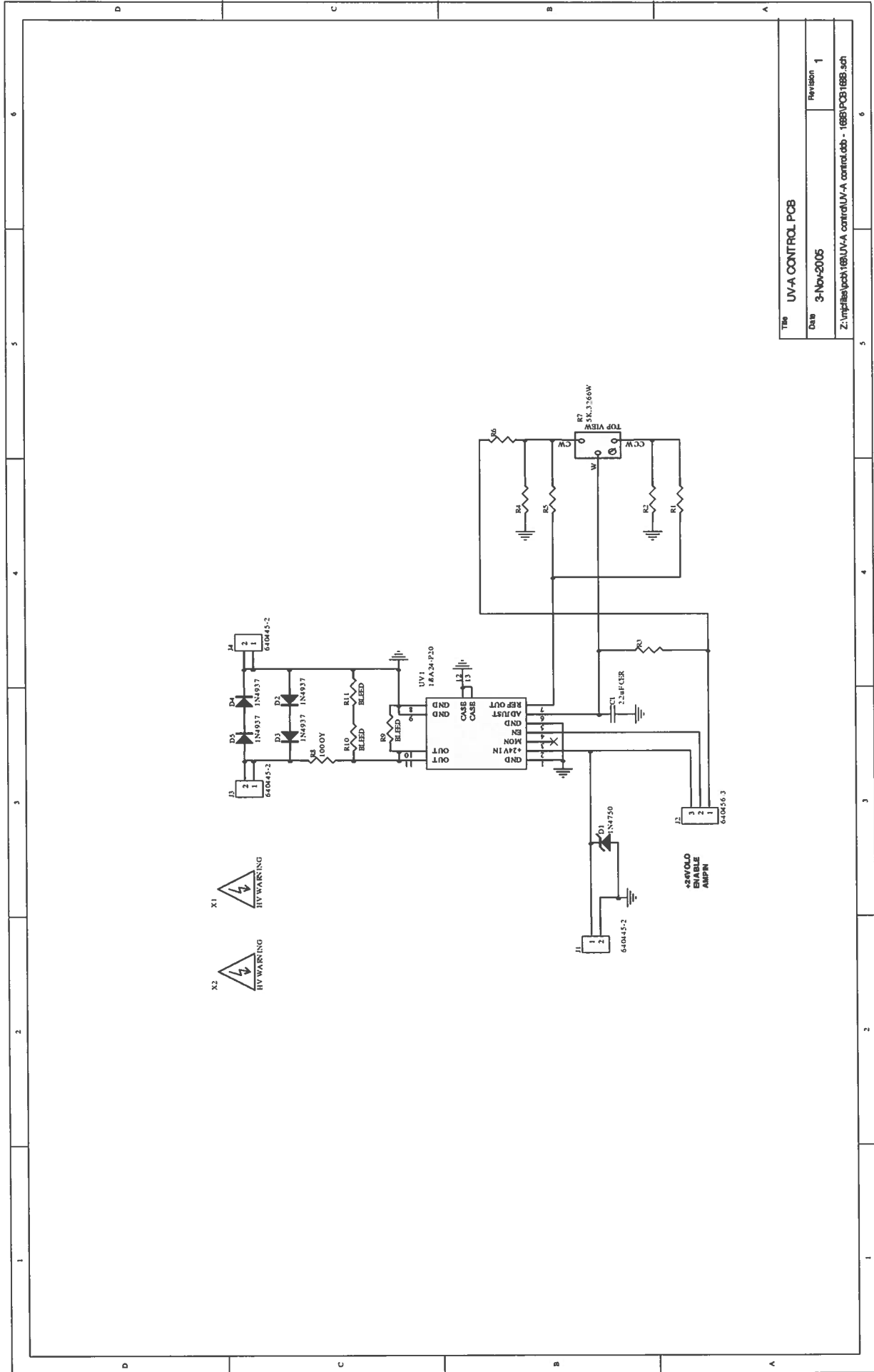


| Title | |
|---|-------------|
| DCDC, AND OVER-VOLTAGE PROTECTION | Revision |
| Date | 19-Jun-2006 |
| Z:\mp\files\pob\158k\switching60hz.ddb - 158k\pcb158k_smp.sch | |

PCB 158K - LOW VOLTAGE POWER SUPPLY, 3/3

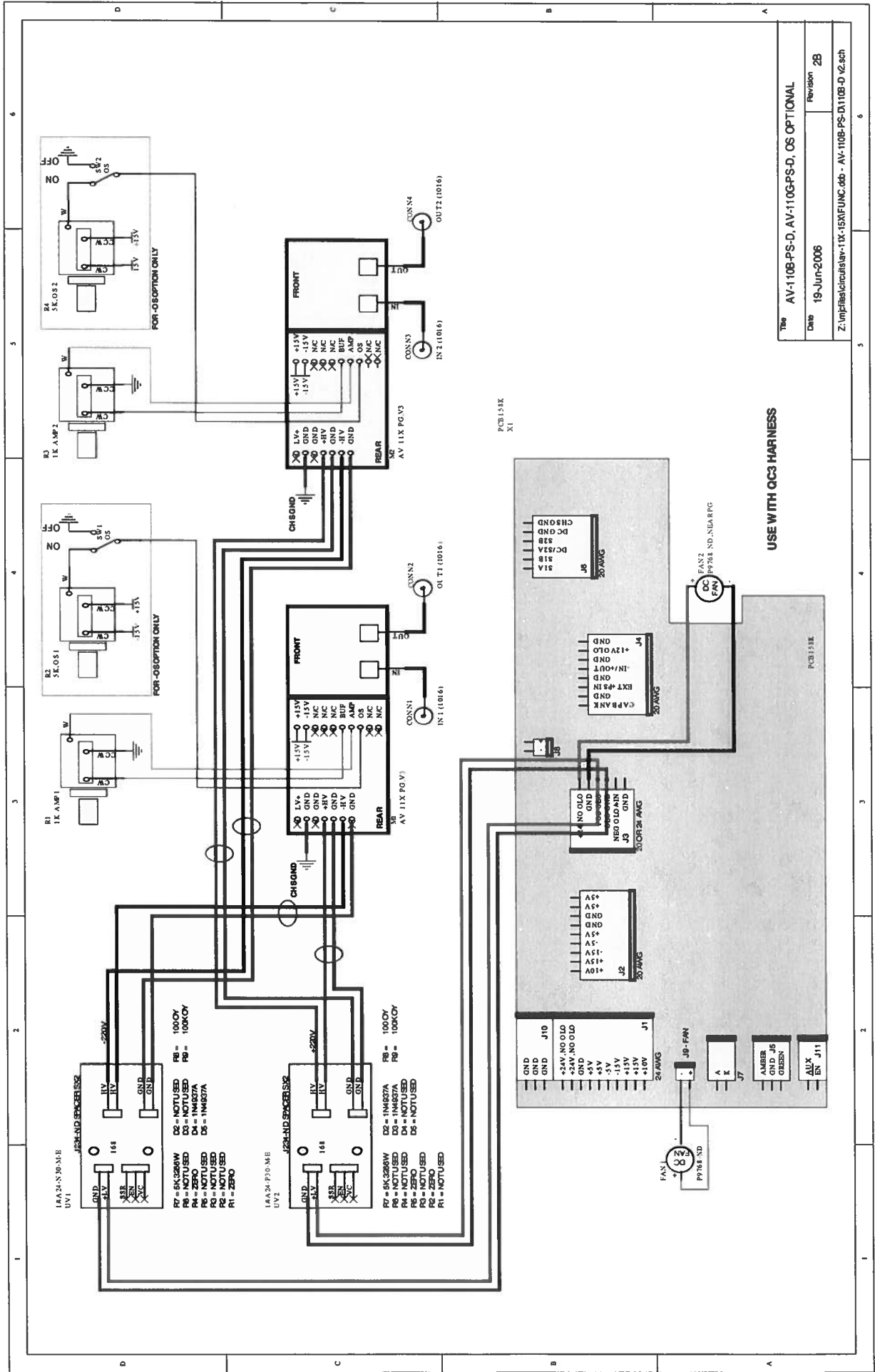


PCB 168B - HIGH VOLTAGE DC POWER SUPPLY



| | |
|--|------------|
| Title UV-A CONTROL PCB | |
| DATE | 3-Nov-2005 |
| Revision 1 | |
| Z:\mp\files\pck\168UV-A control\cb - 168B\PCB 168B.sch | |

MAIN WIRING



| | |
|---|---|
| Title | AV-110B-PS-D, AV-110G-PS-D, OS OPTIONAL |
| Date | 19-Jun-2006 |
| Revision | 2B |
| Z:\mpj\files\circuit\av-11x-15x\FUNC.dwg - AV-110B-PS-D\110B-D 02.sch | |

June 19/06