

Pelican Protector 1600 case: broken handle, crack in top RHS front corner. Shuts ok.  
 3.5" floppy with SDF utilities for Win 95, 98, NT to interface HP 3560A to PC.

HP 3560A analyser with:

- magnetic field sensor, power supply interface and calibrator;
- 2 microphone/preamp modules, power supply interface and calibrator;
- 2 accelerometers and mounting blocks and calibrator.

<p><b>HP 3560A dynamic signal analyser</b>                  S.N. 3324A01242, Option E17                  NiCad battery pack HP P/N 1420-0504, 6V 450mA charge. Bad battery replaced with M+H Nicad pack.                  Analyser self-test passed all ok.                  Bottom left corner of LCD screen damaged (~10% of screen).                  DB9 in-line female to DB9 in-line female 3m extension cable.  <b>No AC adaptor.</b></p>	
<p><b>MAG-03MCMB three axis magnetic field sensor</b>                  Bartington Instruments; s.n. 697;                  Measurement range: +/- 100uT ; 1kHz flat (3kHz -3dB)                  5m extension cable with Hirose RM15TPD10S connectors each end.                  Tripod adaptor. Working ok.</p>	
<p><b>MAG-03 calibrator 350nT p-p (190Hz)</b>                  S.N. 016 ; Bartington Instruments;                  Allows 3 axis locations for sensor.                  Battery indicator green – ok.                  9V battery required.                  Working ok.</p>	
<p><b>MAG-03 PSU</b>                  S.N. 439, dated 1997. Sensor input 10-pin socket. 3x BNC signal outputs (X,Y,Z) +/-10V FS. 9-18Vdc input. On switch. Internal battery and charger. Isolated buffer opamp for each channel with filtering options. Missing 6V 1.1Ah lead-acid backup battery (LCR6V1.3P).                  12.5mVrms output for 350nTp-p calibration. Working ok.</p>	
<p><b>ACOP-4012XX7 microphone/preamp with windscreen</b>                  Serial N. 086-6; ACO Pacific Inc; 1/2" polarised capsule to 1/2" preamp;                  5-pin Lemo socket to suit ACOP9200 interface for 200V polarisation and 28V preamp powering. Working ok.                  0.5 to 200kHz bandwidth.                  5-pin Lemo to 7-pin Lemo plug 2 meter extension lead.</p>	
<p><b>TMS 130C10 with 130P10 ICP condenser microphone and preamp</b>                  S.N. 1064 and 11197; 1/4" pre-polarised tip and combined preamp, with calibrator insert; 10 to 20kHz +/-0.1dB.                  BNC socket. Needs ICP powered interface. Working ok.                  Do not use with 9200 interface (wrong powering options).</p>	

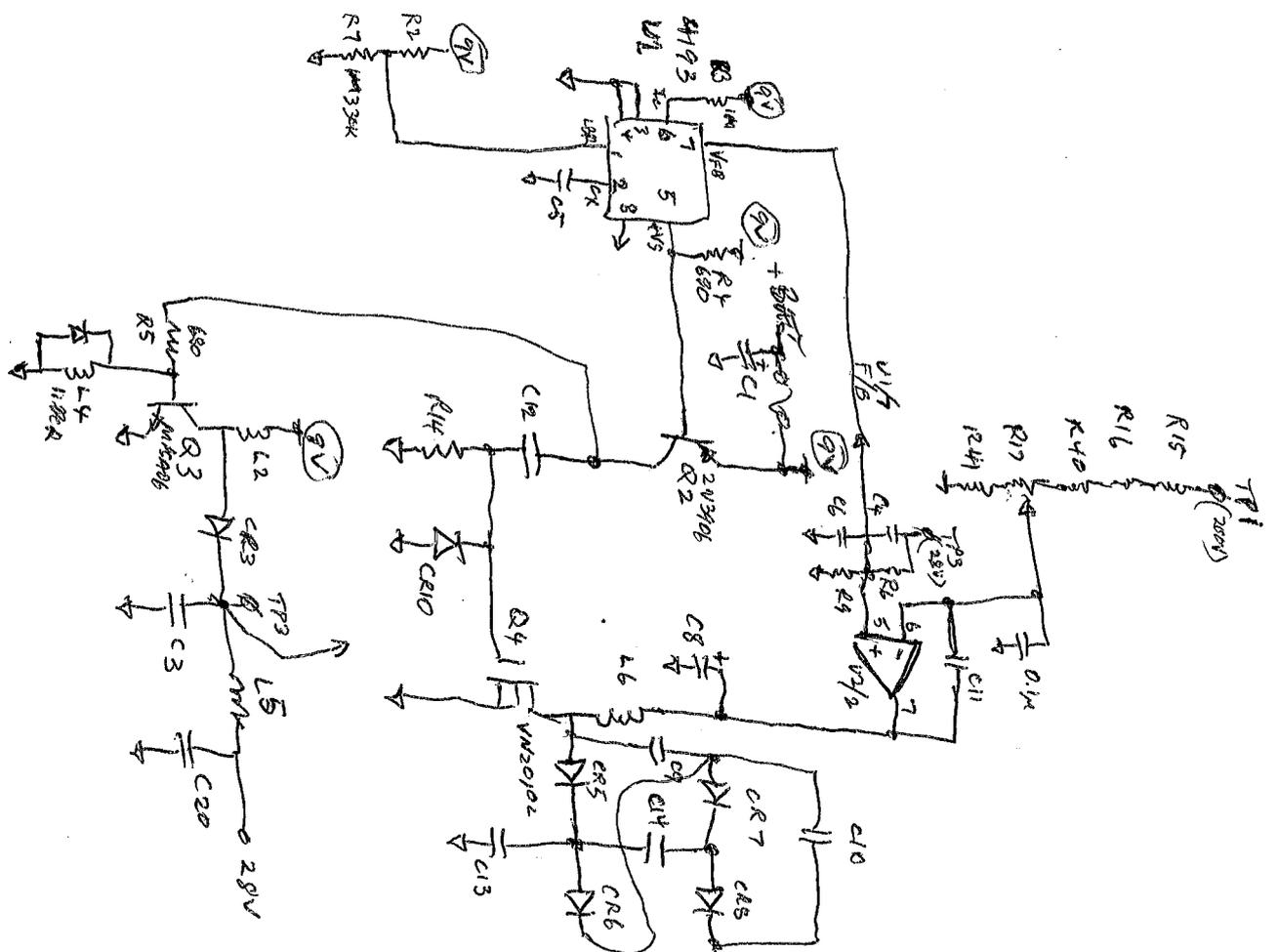
<p><b>ACOP9200XX interface for microphones</b>                  Serial 7-037-1, 9V battery required.                  Power supply pcb generating 28Vdc for preamp and 200Vdc for polarisation. Signal is coupled through 10uF 35V tant. Dual channel. Repaired - bad RC4193 – added SB160 in series with +9V input. BNC to BNC extension leads to HP3560A.                  Working ok.</p>	 A rectangular metal enclosure with a white label on the front panel. The label contains technical specifications and a diagram. There are two BNC connectors on the right side of the unit.
<p><b>CRL 511E calibrator with QC:3 cavity adaptor for 1/2" microphones</b>                  S.N. 024476; Cirrus Research, 94 and 104 dB at 1kHz, IEC942 Class 1L; 9V battery required. Working.                  Added O-ring (1/2 x 3/32) for sealing the cavity side wall to 1/2" microphone.                  1/4" microphone adaptor with TMS130C10/P10.                  Working ok.</p>	 A circular black metal calibrator with a white label. The label reads: "Cirrus research plc", "RL 511E CALIBRATOR", "OFF 104 94", "dB at 1kHz", "IEC 942 (1988) CLASS 1L", "Made in England", and "TATT GOOP".
<p><b>PCB 393A03 Accelerometer ICP</b>                  S.N. 5409.                  1V/g output. +/-5g pk.                  0.5Hz to 2kHz (up to 6kHz).                  210gm weight.                  Mounting block.                  1.5m interface cable, BNC plug to 2-pin plug (97-3106A-10SL-4S).                  Needs ICP powering interface/input selection.                  Working ok.</p>	 A cylindrical metal accelerometer mounted on a square metal mounting block. The accelerometer has a central gold-colored tip.
<p><b>PCB 353B51 Accelerometer ICP</b>                  S.N. 38051.                  500mV/g output. +/-10g pk.                  1Hz to 2kHz (up to 7kHz).                  32gm weight.                  Mounting block.                  Model 003C10 Interface lead to BNC plug.                  Needs ICP powering interface/input selection.                  Working ok.</p>	 A cylindrical metal accelerometer mounted on a square metal mounting block. The accelerometer has a central silver-colored tip.
<p><b>PCB Piezotronics 394B06 calibration shaker</b>                  SN 1073, 9V battery required. Working.                  1 g rms constant vibration at 79.6Hz for a mass up to 85gms max (ie. only suitable for 353B51). Working ok.</p>	 A cylindrical blue and silver shaker with a white label that reads "PIB".
<p><b>ICP power supply interface</b>                  4mA constant current supply for accelerometers and 1/4" Mic. Output to EMU0404. See design sub-folder. Working ok.</p>	 A small metal PCB with various components and a white label. The label has handwritten text: "ICP Power", "INCREASE", "28Vdc 4mA", "EMU0404", "9V BATTERY INPUT", "CENTRAL PN +VE", "OUTPUT".

- Disconnect battery from HP 3560A.

# ACOP 9200 XE INTERFACE

DUAL CHANNEL

PCB SCHEMATIC

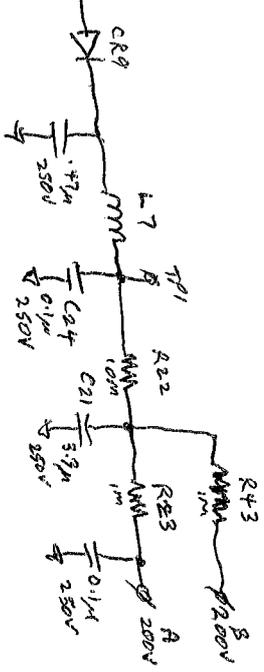
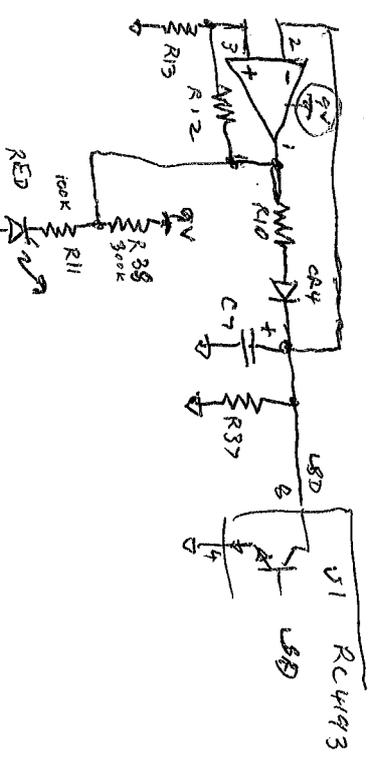


- TP1 200V
- TP2 0V
- TP3 28V

- 2N3906 PNP
- 1N4001 Diode
- 1N4148 Diode

- 1N4002 Diode
- 1N4148 Diode

- V1 RC4193N SWITCHING REG. → 9V supply detector to L8E (pin) turns on L8D (LED)
- V2 MC33172P DUAL OPAMP



ICP constant current supply for applicable sensors (accelerometers and ¼" Mic). Capacitor coupled, and surge protected output to soundcard (EMU0404 USB).

Provides:

- 4mA constant current supply to sensor for powering preamp circuitry.
- coupling capacitor isolation of 4mA supply from soundcard input.
- clipping protection of signal or glitch voltages presented to soundcard input (~±6V), such as from shorted sensor input and charged coupling capacitor.
- clipping protection/isolation of phantom powering from soundcard input back to microphone preamp.
- external 6V or 12V VRLA floating power supply input (preferably with in-line fuse).
- internal in-line diode polarity protection for battery supply.
- internal unregulated 5-13V to regulated 24Vdc non-isolated supply using XL6009 boost converter module.
- Rod Elliott ([sound.whsites.net/project134.htm](http://sound.whsites.net/project134.htm)) 4mA constant current supply circuit that includes capacitor isolation and output clipping protection.
- BNC input and output sockets on die-cast metal box. Enclosure and BNC shield connected to battery negative.

Small dc/dc boost converter module, based on XL6009E1 IC, with trimpot to set the regulated output voltage. Pin 2 enable connected to pin 4 Vin for always-on setup. Output voltage adjust wiper is connected to top end of 10k pot going to Vout, with bottom end of pot connecting to pin 5 Feedback, and to ground via 270 ohm resistor. Input with 220uF 35V main bypass, and smt cap for minimal current loop bypass. Output with smt cap for minimal current loop bypass, and 100uF 50V for main output bypass. XL6009 tab is switch, with tab area oriented away from signal path.

No under-voltage lockout, although normal discharge from a 6V vrla is very low (discharge current would only be high for a fault condition, but no series resistor added to limit battery connection surge and force XL6009 drop-out when overloaded - 25V 10mA load is about 70mA discharge at 5V, so 0.2V drop from 2.7 ohm series resistor). In-line diode to protect from reverse polarity battery/supply.

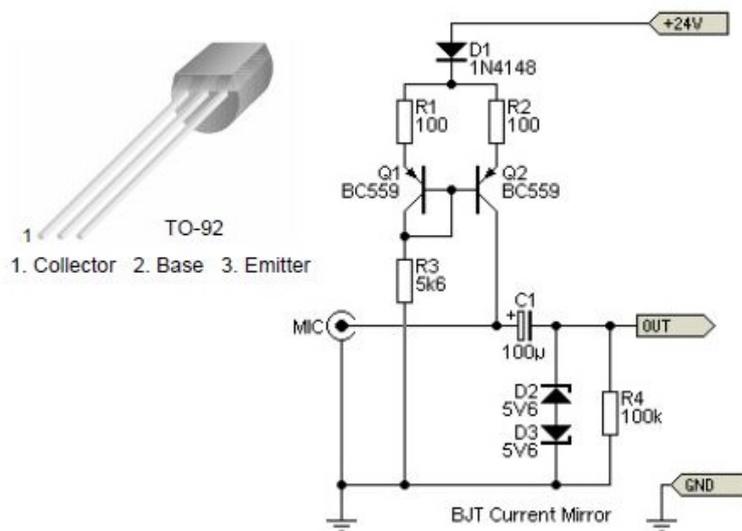
Reversed interface would apply 4mA to soundcard input. EMU0404 USB has 100 ohm in series with back-to-back zener (unidentified), so 0.4V across resistor, and hopefully zener clipping is below Vcc rail, so no anticipated damage.

24Vdc regulation is very good, and no extra RC filtering used. No indication of converter switching frequency in 96kHz bandwidth spectrum of powered sensor responses.

2.1mm pin switched socket for battery/supply connection, with centre pin positive, and negative shell switched.

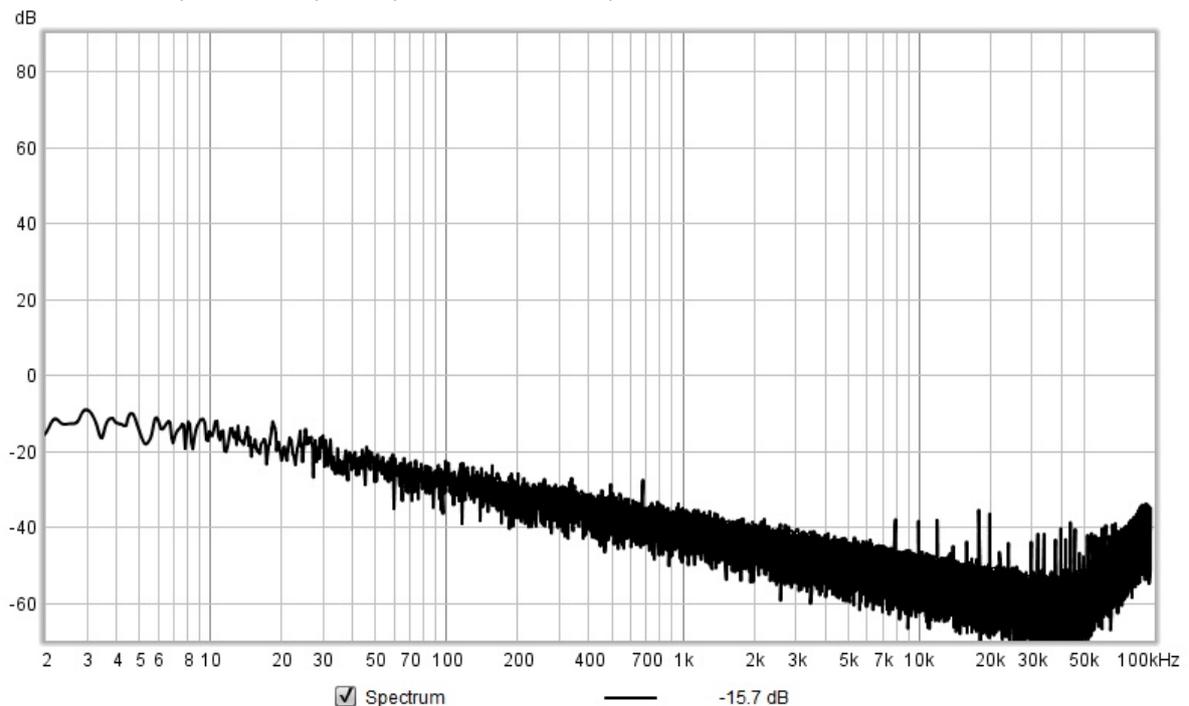
Chassis connected BNC to sensor. Star ground.

Rod Elliott schematic (BC560C matched pair used):



Performance is very good - very minor change in 4mA soon after turn on. No noise floor issues using 600 ohm BNC termination as sensor load.

EMU0404 USB spectrum (noisy channel A) with 1/4" mic sensor (TMS 130C10 with 130P10 ICP condenser microphone and preamp) connected and powered.



Spectrum with 104dB calibrator (Cirrus Research CRL 511E) with > -100dB local noise floor.

