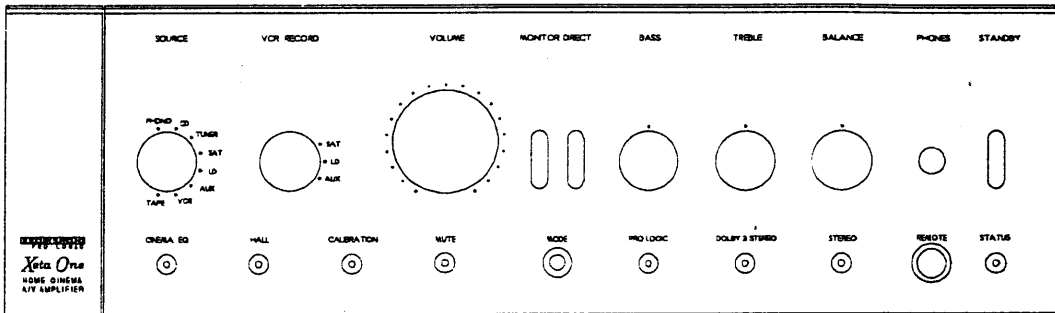


10 August 1995

# ARCAM



## XETA ONE A/V AMPLIFIER SERVICE MANUAL

**ARCAM XETA ONE A/V AMPLIFIER SERVICE MANUAL**

Issue 1 (Paul Newton/Jonathan Goodliffe Sept '94)

Arcam Drawing No. H04/0024

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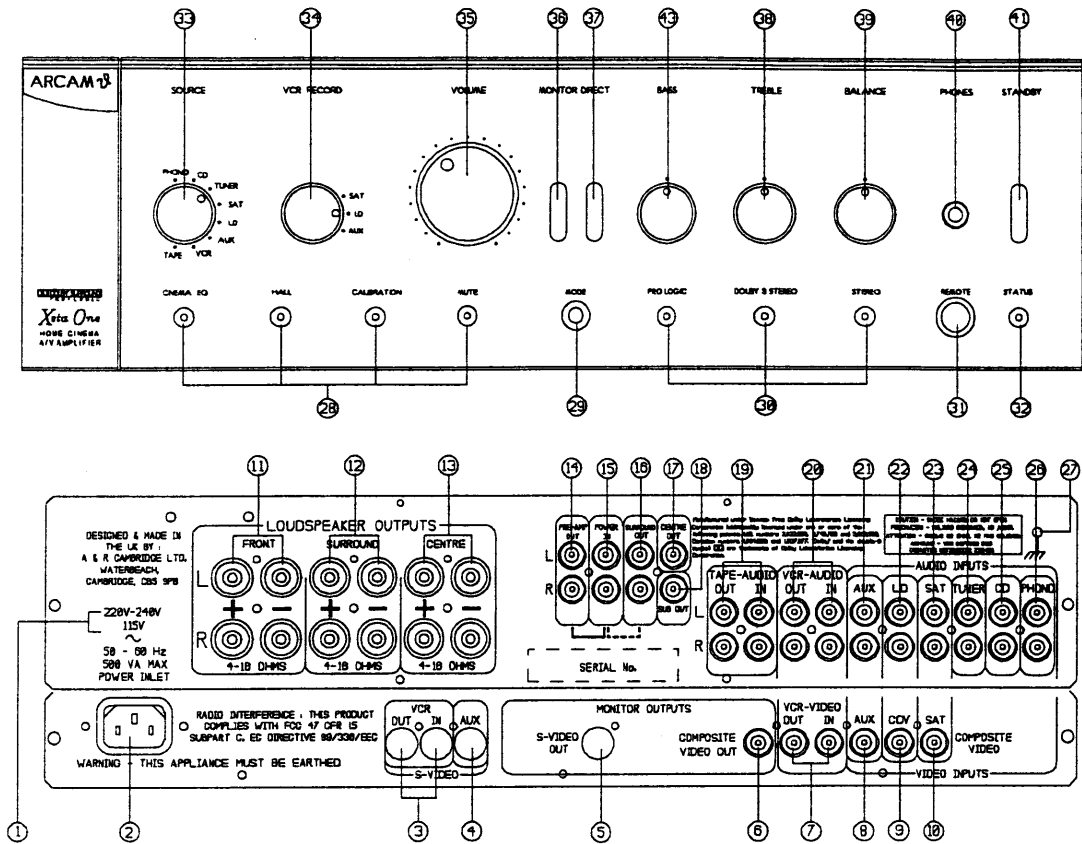
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# ARCAM XETA 1 SERVICE MANUAL



## Front & Rear Views of Xeta One

- 1 Mains supply voltage indicator
- 2 IEC mains input socket .
- 3 S-Video IN/OUT (video signals only).
- 4 AUX IN -Auxiliary/Auxiliary S-Video input.
- 5 S-VIDEO monitor out to TV.
- 6 MONITOR OUTPUT to TV (composite video).
- 7 VCR IN/OUT (video signals only).
- 8 AUX composite video in.
- 9 CDV - composite video in.
- 10 SAT - composite video in.
- 11 FRONT speaker connection terminals.
- 12 SURROUND rear surround speakers connection terminals.
- 13 CENTRE speaker(s) connection terminals.
- 14 PREAMP OUTPUTS (line level).
- 15 POWER AMP INPUTS to front speaker power amplifiers.
- 16 SURROUND OUTPUT (line level).
- 17 CENTRE OUT (line level).
- 18 SUBWOOFER OUT (line level).

## ARCAM XETA 1 SERVICE MANUAL

- 19 TAPE OUT/IN
- 20 VCR OUT /IN audio only
- 21 AUX - This is a line level input which can be connected to the audio outputs of an additional unit, but **NOT** a turntable.
- 22 LD - audio inputs associated with CDV video input..
- 23 SAT -audio inputs associated with SAT video input..
- 24 TUNER input.
- 25 CD input.
- 26 PHONO turntable input. It is compatible with moving magnet (MM) high output moving coil (MC) cartridges.
- 27 GROUND CONNECTION
- 28 CINEMA EQ indicator
- 29 HALL EFFECT indicator.
- 30 CALIBRATION Indicator. Flashes slowly in setup mode.
- 31 MUTE indicator
- 32 MODE SWITCH- selects Stereo, Dolby 3 stereo or Dolby Pro Logic
- 33 PRO LOGIC indicator
- 34 DOLBY 3 STEREO indicator.
- 35 STEREO indicator.
- 36 REMOTE receive window.
- 37 STATUS LED - On switching on, the LED (light emitting diode) indicator below the POWER switch will initially glow amber. After a few seconds, it will glow green.  
  
When the LED glows amber, the speakers are disconnected and an internal protection circuit is activated. When switched into standby via the remote control, the LED will glow red. Switching into standby via the front panel switch will extinguish the LED.
- 38 SOURCE selector.
- 39 VCR RECORD selector
- 40 VOLUME control..
- 41 MONITOR (cassette deck only).
- 42 DIRECT - bypasses the bass, treble and balance controls in stereo and Dolby modes.
- 43 BASS control.
- 44 TREBLE control.
- 45 BALANCE control. Balance will only effect left and right front speakers and headphones.
- 46 HEADPHONES socket.
- 47 STANDBY - Switches the Xeta One fully on or to standby.

## Technical Specification

Continuous power output per channel	
Left + Centre + Right, 8 $\Omega$ , 20Hz - 20kHz	60W each
4 $\Omega$ , 20Hz - 20kHz	90W each
Single front channel, 8 $\Omega$ , 1kHz	80W
4 $\Omega$ , 1kHz	130W
Rear channel, 8 $\Omega$ , 1kHz	40W (2x20W)
4 $\Omega$ , 1kHz	60W (2x30W)
THD, 1kHz, 80% maximum output	0.05%
Peak current rating, front amplifiers	$\pm$ 18Amps
Disc Stage	
Frequency response (RIAA)	$\pm$ 0.7dB, 20Hz - 20kHz
Signal/noise ratio (CCIR)	73dB
Input sensitivity	2mV nominal
Input impedance	47k $\Omega$
Overload margin	35dB
Line Inputs	
Frequency response	$\pm$ 0.5dB, 20Hz - 20kHz
Signal/noise ratio (CCIR)	94dB
Input sensitivity	150mV nominal
Input impedance	10k $\Omega$
Overload margin	24dB
Preamp Outputs	
Nominal output level	700mV
Maximum output level	8V
Output impedance	50 $\Omega$
Frequency response (sub woofer only)	-3dB at 5Hz, 200Hz
Video Section	
Video signal type	PAL and NTSC compatible
Nominal input/output level	
	Composite: 1V P-P, 75 $\Omega$
	S-Video Y: 1V P-P, 75 $\Omega$
	S-Video C: 0.286V P-P, 75 $\Omega$
Maximum input level	2V P-P
Frequency response	5Hz - 10MHz, -3dB
General	
Operating voltage	230V $\pm$ 12%, 115V $\pm$ 12%
Maximum power consumption	600VA
Size (overall) W/D/H mm.	430x315x132
Weight (nett)	10.2kg
(packed)	11.5kg

## Circuit Description

### Input Selection (Circuit Diagram Sheet 8)

The Xeta 1 has 8 inputs, 4 analogue only and 4 for simultaneous audio/video. There is also a VCR audio output and analogue tape output for recording. The phono stage input is based around Z301, a dual op amp, with its associated components providing the required RIAA equalisation. Note it is suitable for MM or high output MC cartridges only.

Switch SW201 is the input selector switch and SW202 is the VCR record switch which outputs the audio from one of the AV inputs to the video recorder audio outputs. The input selector and record selectors are also connected to the microprocessor (Z901) so the microprocessor knows what position the switches are at.

To prevent tape deck feedback howl if the input selector is set to tape whilst recording the micro detects the switch 'breaking' between position 'VCR' and 'tape' and mutes the tape outputs with transistors Q302 & Q303. The input switch is motorised and driven by motor driver Z903 (see circuit diagram page 3) via the microprocessor. The selected audio input signal is fed to the Dolby Pro Logic circuitry (see circuit diagram page 1) via a connecting lead from socket SK7.

The mains switch does not actually switch any mains voltage - it switches a line to the microprocessor to either +5V or 0V to put the Xeta in either 'Standby' or fully on mode.

### Pro Logic Circuitry (Circuit Diagram Sheet 1)

The input signal comes from the selector switch on socket SK7 through an input balance trim circuit formed by i.c.'s, Z15 and Z3. The output from this is fed to an auto balance circuit within the Dolby Pro Logic IC Z5 and also straight through to the output connector SKBA via relay RL3. This is so that the user can bypass the Dolby Pro Logic circuitry when listening to non encoded sources i.e. phono, CD, tuner, etc. The auto balance circuit is used to optimize the left/right balance throughout variations in program material. This feature can be disabled by use of the remote control.

The left, right and centre signals pass out of the Dolby Pro Logic chip to the output connector SKBA. The left & right signals go via the relay RL3 and the centre channel via the voltage controlled amplifier (VCA) formed by Z14 and Z16. The centre channel can be set to wideband, phantom or normal via the remote. Normal is for use with normal centre channel speakers. Phantom mode is used when there is no centre speaker used and the centre signal is split equally between left and right front speakers instead. Wideband should be used when large centre speakers capable of working down to below 50hz are used. The mode is set by the control voltage on pin 36 of the Dolby Pro Logic IC controlled via the microprocessor and Q1 & Q2. The surround signal on pin 39 goes through an electronic switch, Z7, which routes the signal to the hall effect circuit Z8, if required and through the anti alias filter and delay IC, Z6. The anti alias filter prevents spurious beat products occurring due to the sampling process in the time delay circuit. The output from the delay circuit is fed back into the Dolby Pro Logic IC to pass through the low pass filter and noise reduction circuits before passing out of the chip on pin 29.

The left, right, centre and surround signals all then go to the pot board, (see circuit diagram sheet 11) which contains the motorised volume pot driven by the microprocessor and motor driver Z900, and then to the tone control circuitry Z2 & Z102. The tone controls can be bypassed by use of the direct switch SW205. The signal then goes back to the volume pot board.

### **Daughter Board (Circuit Diagram Sheet 11)**

The signal from the volume pot board goes to the daughter board which contains line out buffers and the power amplifiers for the surround speaker outputs. The left, right and surround line out buffers are identical and based around dual op amps Z3-A, Z3-B and Z2-A respectively.

The centre signal goes via Z2-B which is very similar to the other output buffers but also can have "cinema equalization" switched in. This is a low pass filter formed by C19 and R29 and can help improve clarity and reduce sibilance on some program material.

All of the buffers have a mute relay on their outputs to prevent switch on/off thumps via these outputs and to enable the individual outputs, either line or speaker, to be muted separately via the remote control. The surround signal goes off to the surround amplifiers and also to the surround out phono sockets. The surround amplifiers are based around two mono power amplifier I.C.'s Z1 and Z101 (TDA1514).

The left, right and centre line outputs go to their respective line output sockets and then on to the power amplifiers on the mother board (see circuit diagram sheet 7). Note that the left and right preamp outputs are normally connected to the power amp in sockets via 'U' jumper links.

The daughter board also contains the +/-15V regulators (Z500, Z501) for the line out buffers and the +/-25V unregulated supplies for the surround amplifiers, rectified and smoothed by diodes D501-504 and capacitors C501 & C502. The +/-25V supplies are fused to provide over current protection should a fault occur on these amplifiers.

### **Main Amplifier Circuits (Circuit Diagram Sheet 7)**

The left, right and centre amplifiers are 3 identical circuits powered from the +/-37V unregulated DC supplies and +/-15V regulated supplies. The amplifiers all have DC servo's Z401-A, Z501-A and Z601-A and utilize the IRFP240 Mosfet output devices as used in the Arcam D290 and D290P amplifiers. They also have over current and over temperature protection which mutes all the speaker outputs and turns the power on indicator amber.

The protection control circuitry is based around Z1 (TA7317) which also provides switch on delay and muting when headphones are used. The speaker outputs are connected to the amplifiers via two relays RL1-B for left, RL1-A for right and RL2-A for the centre.

### **Video Circuitry and On Screen Graphics (Circuit Diagram Sheet 2)**

IC Z202 is a sync pulse generator programmed by Arcam. Sync pulses are fed in to the sync pulse detector ic Z215-A which inverts them.

The sync pulse generator looks for sync pulses from an external video source by switching the electronic switch Z208-C between composite video and S-VHS signals every other frame. If there are any external pulses these mix with the generated pulses and can be detected by Z202. This detection causes the sync pulse generator to enter it's slave mode and the following sequence of events takes place.

1. Tests to find out if the incoming video signal is composite video or S-VHS or both.
2. If both are present no action is taken. If only one is present then the other video output is muted by the action of logic gate Z216-A acting on switch Z205-A for composite and Z216-C acting on Z209-B for S-VHS.
3. Vertical sync pulses from the external source are then detected.
4. The signal is tested to find out whether it is PAL or NTSC and the E<sup>2</sup>PROM, Z904, is written to. This is so that the next time the unit is switched on it will default to the last signal type it encountered until a different type of signal is detected.
5. The On Screen Display (OSD) is then overlaid on top of the video signal.

If there is no external video source the sync generator times out and begins to generate it's own sync pulses to enable the OSD to be seen on a blank tv screen.

### **Composite Video Switching (Circuit Diagram Sheet 2)**

The required video source is selected by the dual 1 of 4 selector, Z203-A, by the logic levels on the address pins S0 & S1. These control lines come from the microprocessor (Z901). The selected signal is then routed to the video output buffer Z206-A and composite video monitor socket SK4.

If an analogue source has been selected then the output of Z203-A is switched off by taking the inhibit line (pin 6) High.

The electronic switch Z-A is used to switch the video signal going to the buffer between video signal with OSD overlaid on it or just OSD dependant on the voltage on pin 10. The video input signals also go to the VCR record select ic Z207-A and the actual signal going to the video buffer is determined by the logic levels on address lines S0 & S1. The selected source is then routed to the video out buffer Z205-A. This enables recording of one video source whilst watching another.

### **S-VHS Video Switching (Circuit Diagram Sheet 4)**

The S-VHS switching utilises a very similar circuit design to that of the composite video switching.

Z210-A is the source selector with the luminance (Y) & chrominance (C) components of the signal switched separately within the ic. The selected signal then comes out of the ic on pins 13 (Y) and pin 3 (C) and go via the video buffers Z213-A & Z214-A to the S-VHS monitor out socket SK202.

The S-VHS video record output signal is derived from the Aux input and buffered by Z211-A (Y) & Z212-A (C) before going to the VCR Out socket SK201-A.

The voltage on pins 9 & 10 of the electronic switch Z209 A & B determines whether only OSD appears on the S-VHS monitor output or the video signal with the OSD overlaid on top.

Note: In standby only the VCR record outputs are enabled. To monitor video signals on a TV the Xeta One must be fully powered up.



### **Power Supplies (Steering Board) (Circuit Diagram Sheets 5 & 1)**

The video supplies are always live whilst the unit is connected to a live mains socket. They are derived from one of the secondary windings of the frame transformer TX2 via an 8 way jumper lead. The AC is rectified and smoothed by diodes D102 - 104 and capacitors C100, 101, 103, 104 to provide +/- 11v DC and then regulated to +/- 5v by regulators Z101 & Z102.

The other secondary winding is used to provide supplies for the voltage controlled amplifiers and audio ic's around the Pro Logic ic and the digital delay ic (see sheet 1). The AC is rectified and smoothed by diodes D1-D4 and C10 & C11 and then regulated to +/-12v by Z2 & Z4. A +5v supply is derived from the +12v rail by Z9 to power the digital delay ic, Z6.

### **Power Supplies (Mother Board) (Circuit Diagram Sheets 9 & 5)**

The mother board supplies are formed by the large toroidal transformer, TX1, and it's associated circuitry. The AC is rectified and smoothed to provide +/-37v for the power amplifier supply rails and this is then regulated to +/-15v by Z201 & Z202 to power the ic's used in the audio stages.

The mains supply to the transformer is disconnected in standby mode by relay RL1-A. The control line for this relay comes from the microprocessor, Z901, pin 7 via transistor inverter Q901.

### **Resetting the Quiescent Current (IQ) on the main amplifiers**

If the output transistors require replacement at any time the quiescent current should be checked and reset if necessary.

To do this measure the voltage drop across the 0.22ohm resistor on the appropriate amplifier( R437 for left, R537 for centre & R637 for right).

The voltage should be set to 1mV when the unit is cold and with no signal applied.

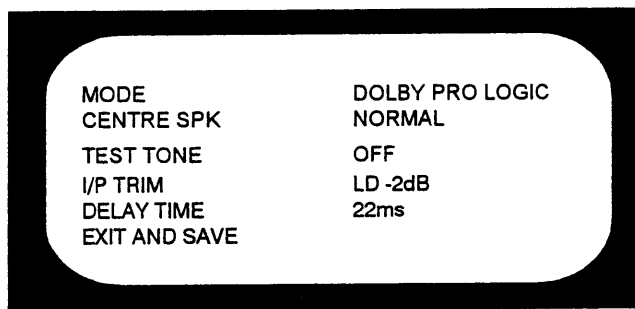
Adjustments should be made with the appropriate preset (RV401 for left, RV501 for centre and RV601 for right) and checked again after 5 minutes with no signal and reset to 1mV if required.

## Set Up Mode : System Balancing

Set up mode allows you to adjust and to store the settings of the Xeta. The customers stored settings can be recalled by pressing "Restore" on the remote control.

If you wish to modify the stored settings then select the setup mode by pressing "Restore" followed quickly by "+" in the mode section of the remote. This will get you into set up mode.

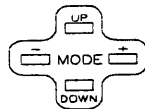
The calibration LED will flash slowly and the TV screen should show a menu screen something like this;



### SET UP MODE

REMOTE

CONTROL



Use the **up** or **down** keys to select the required line, which will be highlighted on selection. Use the - or + keys to adjust the option on the right.

**MODE:** - Use the - or + keys to select the mode you will normally want the unit operating in. Choose between the following options;

Dolby Pro Logic - For full surround sound decoding including rear channel loudspeakers.

Dolby 3 Stereo - AV mode for three front speakers and no rear loudspeakers.

Stereo - For stereo hi-fi use.

**CENTRE SPEAKER** - Do as above, selecting from the following;

Normal - For a standard centre channel loudspeaker.

Phantom - For no centre loudspeaker.

Wideband - For larger centre loudspeakers capable of working down to low frequencies (50Hz or below).

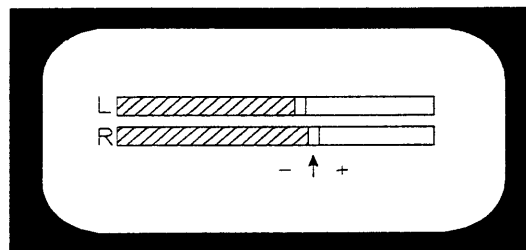
**N.B.** When selecting centre speaker and you have previously selected Stereo mode, the display will show 'NO DOLBY MODE', (later models show 'NO CENTRE MODE'), at the bottom of your TV screen. This also applies in Test Tone mode.

**TEST TONE** - Selecting Test Tone will produce a sequential burst (approx. 2-3 seconds) of noise through your speakers starting with left, centre, right and then rear. You should adjust centre and rear volume via the remote control until you are happy that all loudspeakers sound equally loud at your listening position. This is an ideal test for making sure all your speakers are connected properly. Pressing "+" on the remote advances the sequence immediately. The noise sequence will stop when you move to another menu line.

**I/P TRIM** - Sets the input sensitivity of the Xeta One to optimise the performance of the surround decoding circuits.

The top of your TV screen will look like this:

Showing two peak reading  
Level meters and a 'trim  
volume' setting below

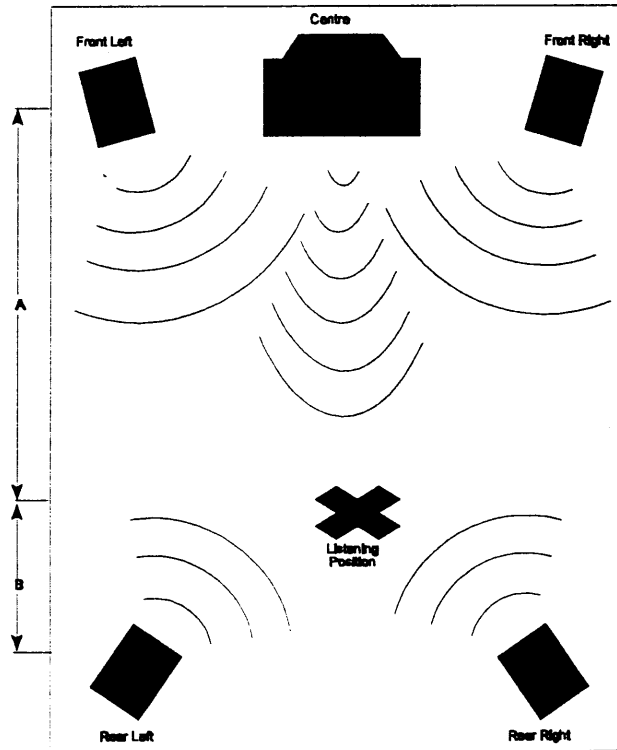
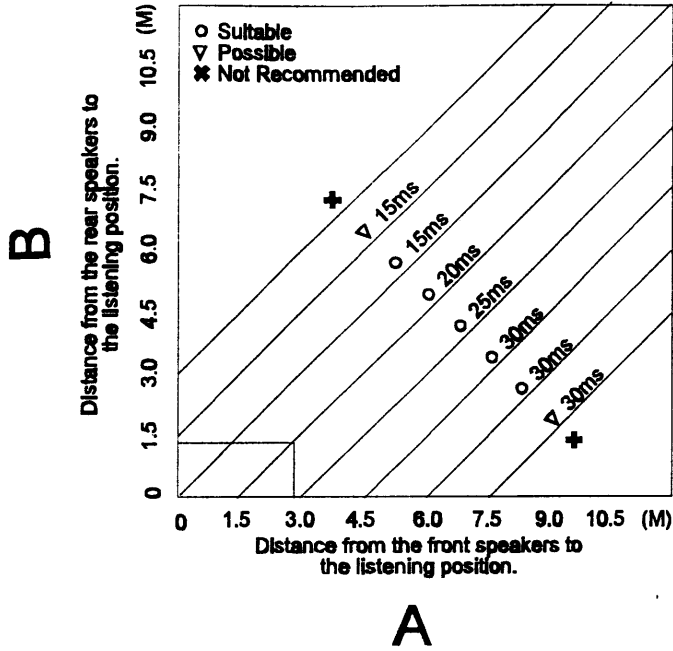


The available variable range is - 24dB to + 6dB.

Aim to peak just into the white bars above the arrow during the loudest parts of music or film for each source (input) you select. The exact setting is not critical. The trim settings are remembered so that when switching between different inputs such as CD, Laser disc, VCR etc. they are all at the same volume. Note that with some low output sources it may not be possible to hit the peak area on the meter, this will not adversely affect the performance.

**DELAY TIME** - Surround information is delayed to the rear channels for psychoacoustic reasons. The range is adjustable between 15 and 30 milliseconds (ms), and is commonly set at 20ms for most installations. The optimum delay time does depend on the listening position. The chart below determines the delay time for your room's size and seating position. For example, when the distance from the front speakers to the listening position is 3 metres and the distance from the rear speakers to the listening position is 1 metre, the optimum delay time will be 20 ms.

Listening position and optimum delay time for playback with Dolby Pro-logic surround



**EXIT AND SAVE**-When everything has been set to your satisfaction press the down key to highlight this line. Press "+" to exit and 'SAVED' will flash up on the display.

The Xeta One settings can be recalled at anytime by pressing "Restore" on the remote control.

### **To Restore the Factory Settings:**

1. Unplug the mains lead from the Xeta One.
  2. Set the input selector to Phono.
  3. Set the VCR Record switch to SAT.
  4. Whilst holding the mode button in plug the mains lead back into the unit.
- The TV screen will display "**RESET!**" and information about the software issue in the unit. To put the unit back into normal operating mode you must unplug the mains supply from the unit and then plug it back in again.

### **Remote Control Commands**

Most functions on the remote control are straightforward and obvious to use. The On Screen Display will confirm their action at the bottom of the screen.

There are a number of functions described below that will allow you to optimise the use of your system. Letters in the left hand column refer to the remote control drawing on page 14.

- Ⓐ INPUT SELECTORS: Switch the amplifier to the selected input by use of the motorised source selector.
- Ⓑ POWER: Switches the amplifier on or off from standby.
- Ⓒ FUNC: Has no function on the Xeta One.
- Ⓓ AUTOBALANCE: With autobalance switched on, active circuitry ensures that the Dolby decoding receives equal levels of left and right signal which is important for proper surround decoding. With videotapes the left and right channels may be mismatched, or may vary along the tape, therefore we recommend that autobalance be used with video tape sources. Switching autobalance off bypasses the active circuitry for autobalance. Signal balancing (if required) must then be done using the balance buttons on the remote. Note that autobalance will not permanently reset a manual balance setting made previously.
- Ⓔ CINEMA: Switching on Cinema EQ (Equalisation) reduces the treble output of the centre channel. Cinema EQ can improve films recorded with excessive treble and sibilance. The front panel CINEMA EQ LED will light when this mode is on.
- Ⓕ MODE keys: UP and DOWN buttons will cycle the Xeta One through the three primary operating modes;
- DOLBY PRO LOGIC feeds sound information through rear speakers and front

speakers (L, R & C). Use this mode for surround encoded sources. Video tapes and discs with surround encoding can be identified by looking for the Dolby Surround logo.

- DOLBY 3 STEREO feeds sound information through front speakers. (L, R & C), but not rear speakers. You should use either this mode or stereo mode for non surround encoded video sources.
- STEREO is real stereo. For optimal hi-fi sound quality the Dolby Surround processing circuits are actually bypassed by relays when switched to stereo. This prevents the stereo signal being affected by unnecessary circuits and retains the maximum fidelity.  
The + and - buttons have no function during normal operation and are used only in Setup Mode.
- Ⓞ HALL: Switches in a reverberation or Hall effect. This feature is useful to enhance non surround encoded sources. The HALL LED on the front panel will indicate when this is on. You can trim the amount of HALL effect by use of the rear +/- level buttons.
- Ⓜ, Ⓞ BALANCE: For manual balancing of the input signal. This function is used to optimise the surround decoding for some sources and is NOT to be used for left-right speaker balance. Use the front panel balance knob for this purpose.
  - To set the input balance make sure that you are in Pro Logic or 3 channel mode and switch Autobalance off. Find a surround encoded source with plenty of speech present. Switch the centre channel off via the remote (the Calibration LED will light). The speech should almost disappear, if not, alter the balance to the left or right by using <BAL and BAL>. Find the position that gives the minimum speech output or "dialogue null" in the centre channel. The input balance is now optimised and you can switch the centre speaker back on for use.
  - The input balance control operates in 1dB steps which are indicated on the On Screen Display. Equal levels are indicated by L=R.
- Ⓜ CENTRE +/-: Trims the level of the centre speaker.
- Ⓞ CENTRE OFF: Switches the centre channel off or on. Useful for setting the dialogue null during manual input balancing.
- Ⓞ DISPLAY: Switches off the On Screen Display. Upon switching back on, the screen will display status information of all functions for your information. This information is displayed for about 6 seconds, or hold the button down to keep the status information displayed for longer. Normal On Screen Display mode is then active.
- Ⓜ REAR +/-: Trims the level of the rear surround speakers.

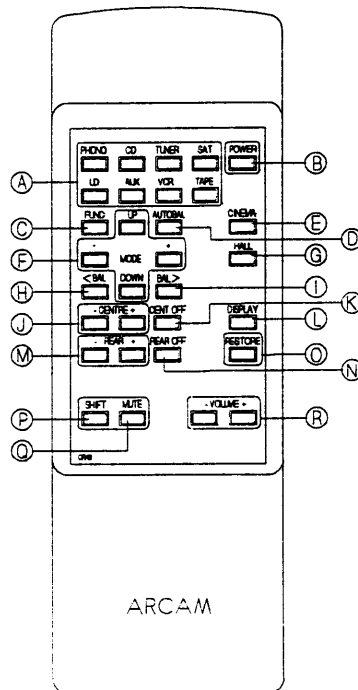
Note: Not all films are encoded for surround identically. It is useful to trim the rear or front levels slightly for some recordings.

- Ⓝ REAR OFF: Switches the rear channel off or on. Useful to demonstrate the effectiveness of the surround effect.
- Ⓞ RESTORE: Restores the amplifier to the condition saved in the setup mode. Useful if centre and rear levels have been adjusted afterwards as it restores them to the saved values. The operating mode and any functions such as Cinema EQ that were saved during setup are also restored.

Note: To enter the setup mode press Restore quickly followed by + (mode), see setup mode selection (page 9) for more details.

- Ⓟ MUTE: Mutes and un-mutes the sound from all channels.
- Ⓠ VOLUME: Master volume control for the amplifier which drives the motorised volume control on the front panel. Note that a volume up or down command from the remote will un-mute the amplifier if Mute is on.
- Ⓡ SHIFT: Has no function on the Xeta One.

Shift can be used simultaneously with the volume, mute, power or input selector buttons to control functions on the Arcam model BB500 external digital to analogue converter unit.



## **Disassembly Procedure**

**Please note there are three main boards in the Xeta One Amplifier :**

- 1) Daughter board - this is the small board at the top of the unit.
- 2) Mother board - this is the board under the daughter board.
- 3) Steering board - this is the board at the bottom of the case and can only be accessed by following the instructions below.

**Looking at the Xeta one from the back :**

- 1) Remove the four cover plate screws two on each side.
- 2) Remove the six screws around the cover plate on the back of the unit.
- 3) Remove the two screws which hold the two back panels together.
- 4) Now the cover can be removed by pulling it away from the front panel.

**Now remove the front panel :**

- 1) Remove all the six knobs on the front panel to avoid cosmetic damage. These will be very tight particularly the volume knob.
- 2) Remove the four front panel screws, two on each side.
- 3) Now the front panel can be removed by pulling it forward away from the sub panel.
- 4) Now remove the lower of the two front sub panel screws, one on each side.

The two back panels can now be hinged apart, giving access to the top side of the steering board in the bottom of the case and access to the bottom side of the mother board (main amplifier).

The mother board can remain as one assembly comprising sub panel, rear panel, rear panel and transformer.

If required the steering board can now be removed by :

- 1) Disconnect the eight way supply connector near the frame transformer.
- 2) Disconnect the other four leads via there connectors.
- 3) Removing the two mains inlet screws on the back panel.
- 4) Remove the three screws at the bottom of the back panel.
- 5) Now in turn squeeze the tops of the six plastic spacers and lift up the board.

The steering board can now be removed from the bottom of the case, together with it's rear panel.

**Removal of the Daughter board :**

- 1) Remove the four connectors.
- 2) Remove the two screws on the top of the heatsink under the damping strip.
- 3) Now in turn squeeze the tops of the four plastic spacers and lift the board upwards.



### Change of Mains Voltage

**WARNING** - the unit **must** be unplugged from the mains when replacing the fuse as the mains inlet and fuse are at mains potential even with the unit switched off.

The Xeta 1 can be set for use on 230v or 115v mains supplies.

The transformer board (see diagram on right) is located under the main board of the Xeta 1. See page 15 (Disassembly Procedure) for instructions to access this board

There are 2 mains fuseholders in the unit - one marked 230v (F1) & the other 115v (F2) and two 4 way connectors also marked 230v (PL1B) and 115v (PL2B).

The fuseholder with the fuse fitted to it and the position of the mains connector determines the working voltage.

To change voltage from 230v to 115v first remove the fuse in the holder marked 230v and fit the correct fuse to the 115v fuseholder. Now pull the connector off the pins of PL1B marked 230v and fit it to the 115v connector (PL2B).

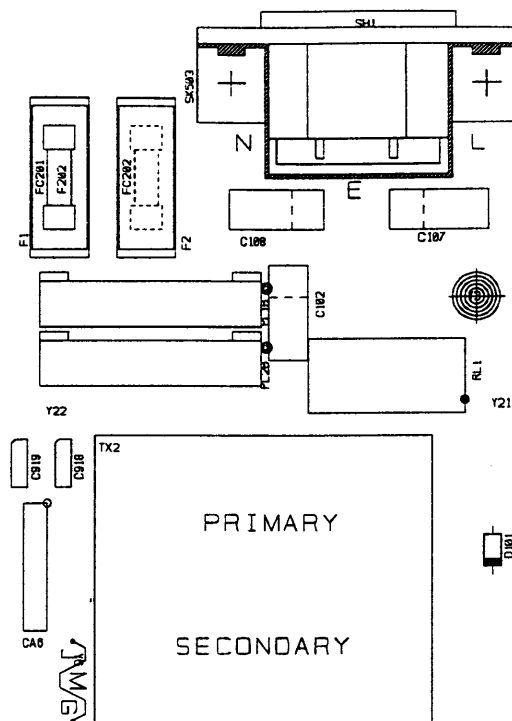
**IMPORTANT:** Ensure that both the fuse and mains connectors are in the correct positions for the required voltage before reconnecting the mains supply.

For 115v to 230v voltage change reverse the procedure above.

The correct fuses are:

1.6 A antisurge for 230v

3.15A antisurge for 115v



## Board Modifications

The following changes were made to the Xeta One before the manual was printed.  
NOTE: None of the changes need to be retrofitted to older units.

### From unit serial number 121 onwards (mother pcb only)

Two 100K bias resistors added between the base of Q302 & Q303 to the -15v rail. This prevents high level input signals being soft clipped by the tape mute circuit.

### From unit serial number 151 onwards

Mother pcb only

Capacitors C400, C500 & C600 changed to 100uF from 22uF. This prevents high level low frequency signals from clipping and causing the mute circuit to operate.

Daughter pcb only

Resistors R21, R22, R23 & R24 changed to 1K0 from 1K8. This gives an extra 4dB of gain after the volume control.

### From unit serial number 191 (approx.) (steering pcb only).

Resistors R68 & R69 changed to 8K2 from 10K. This changes the 0dB input level to 300mV from 430mV.

### From serial number 200 (approx.)

New type mains transformer with electrostatic screen fitted (part no. L901TX issue 5).

### From unit serial number 401 onwards

Steering pcb only

New issue steering pcb introduced (issue 4). New issue software on ic Z202 (issue 2) and Z901 (issue 6). The new pcb layout and software was introduced to prevent Walt Disney copy prohibit codes causing the on screen graphics to distort and wobble. Newer software introduced to issue 7 for issue 3 steering boards and issue 8 for issue 4 boards.

This software enables the mode i.e. ProLogic, Dolby 3, Stereo setting to be set for each input even analogue ones. Earlier software defaults to stereo on analogue inputs and one of the 3 modes for the video sources dependant on the mode chosen in the set up menu.

New software is retrofittable to older Xeta Ones.

Daughter pcb only

Resistors R500, 501, 502, 503, 504 & 505 all changed to fusible type 470R from standard 470R. These were changed to obtain IEC65 approval.

### **No serial number information available**

It was noted that the VCR record audio outputs swapped left and right channels due to an error on the track layout. It only affects the recordings of video sources - normal playback is fine.

To effect a cure, until the circuit board layout could be relaid, the left and right channels output resistors R313 & R315 were fitted crossed over at the ends closest to the output sockets.

Note: This is a problem common to ALL Xeta Ones until issue 6 mother boards.

Burndy post connectors (SK2) for surround speaker outputs removed and cable from the daughter board soldered directly into the board due to difficulty in obtaining these sockets.

Resistors R21, R22, R23 & R24 changed to 1K5 from 1K0. This reduces the extra 4dB of gain after the volume control which reduces the audible hiss level which was found to be objectionable and also enables the Xeta One to meet Dolbys specifications.

### **From serial number 732 approx.**

New issue software for Z901 to issue 9 introduced to comply with Dolby requirements This issue incorporates 2 changes:

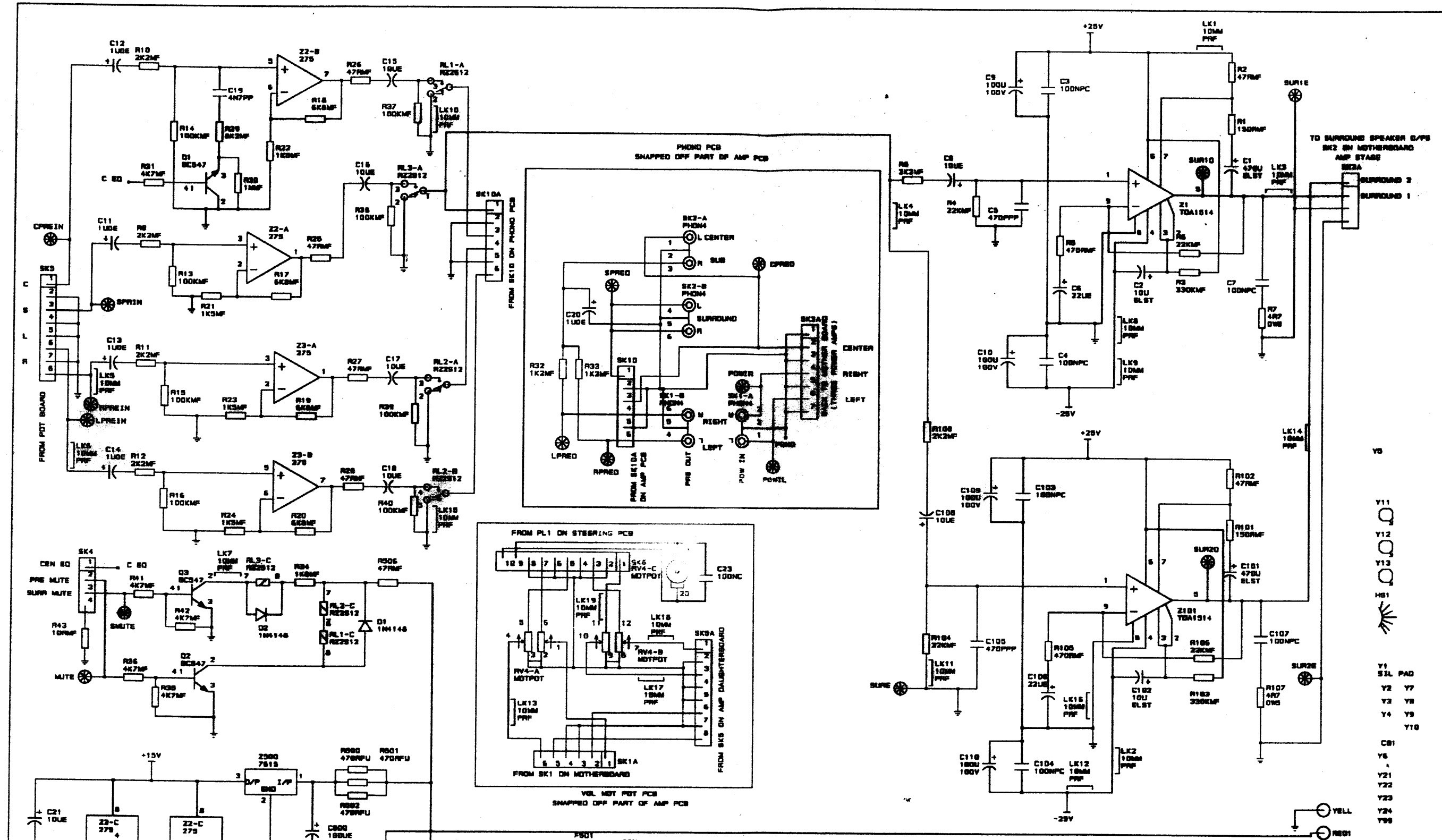
1. It is now not possible to select Dolby 3 Stereo mode with a Phantom centre speaker.
2. The wording on the display was changed from "Dolby 3" to "Dolby 3 Stereo" & "Dolby Pro-Logic" to "Dolby Pro Logic".

There is likely to be very few, if any units, with issue 9 software.

Software issues 10 & 10A followed very quickly after this which incorporated all of issue 9 changes and also changed the timing of the mute control lines to prevent thumps on the preamp outputs when using external power amplifiers. Issue 10 is for issue 4 steering boards and issue 10A is for the older issue 3 boards (serial numbers less than 378).

Note you can tell what issue software is in the Xeta One by resetting the factory settings (see page 12) as the issue is shown on the on screen display.

<b>List of Circuit Diagrams</b>		
<b>No.</b>	<b>Description</b>	<b>Drawing No.</b>
<b>Steering Board</b>		
1	Dolby Pro -Logic Circuitry	L903CT1
2	Composite Video & On Screen Graphics	L903CT2
3	Microprocessor	L903CT3
4	S- Video Switching	L903CT4
5	Power Supplies	L903CT5
6	Display Board	L903CT6
<b>Motherboard</b>		
7	Left/Right/Centre Amplifiers & Muting	L901CT1
8	Input Selection	L901CT2
9	Tone Controls	L901CT3
10	Power Supplies	L901CT4
<b>Daughter Board</b>		
11	Line Out Buffers and Rear Channel Amplifiers	L902CT1



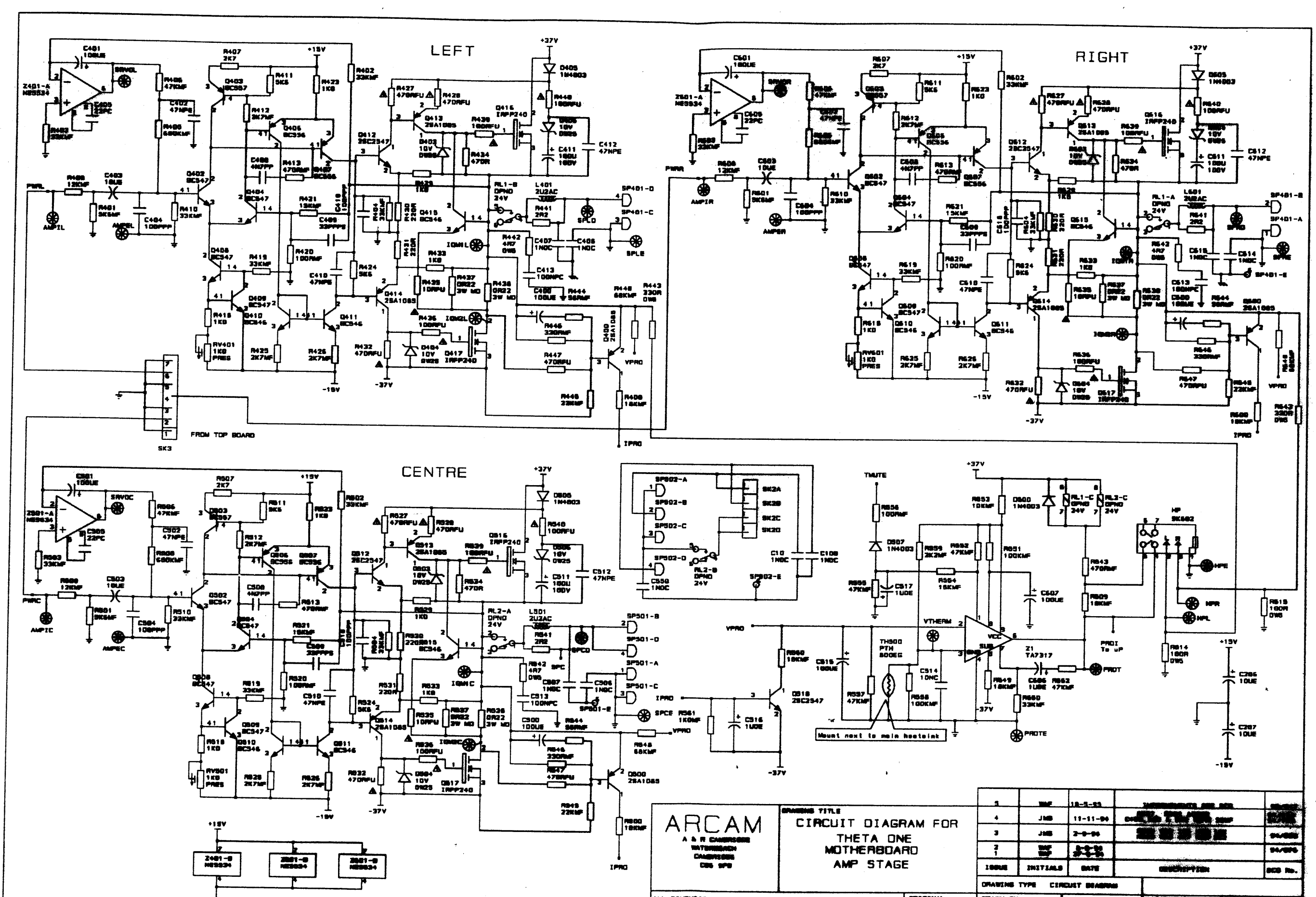
**ARCAM**  
A & R ENGINEERING  
WIMBORNE  
DORSET  
ENGLAND

DRAWING TITLE  
**CIRCUIT DIAGRAM FOR  
THETA ONE  
AMPLIFIER  
DAUGHTER BOARD**

5	JMS	2-1-88	REV 001
4	JMS	18-11-84	REV 000
3	JMS	17-11-84	REV 000
2	JMS	2-8-84	REV 000
1	JMS	2-8-84	REV 000

ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE STATED ORIGINAL SCALE  
TELEPHONE

DRAWN BY	JMS	DATE	9-11-88	CHECKED BY		DATE	
ISSUE	INITIALS	DATE					
DRAWING TYPE				CIRCUIT DIAGRAM			
SHT 1				OF 1			
PART/ONE NO.				L982CT1			



**ARCAM**  
A & R CAMERONS  
WATERBURY  
CAMBRIDGE  
CBS SPS

**CIRCUIT DIAGRAM FOR  
THETA ONE  
MOTHERBOARD  
AMP STAGE**

ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE STATED  
TOLERANCES

ISSUE	INITIALS	DATE	DESCRIPTION	CDG No.
1	JMS	12-2-93	ISSUED FOR REV	94/006
2	JMS	2-9-94	ISSUED FOR REV	94/006
3	JMS	11-11-94	ISSUED FOR REV	94/006
4	JMS	2-9-94	ISSUED FOR REV	94/006

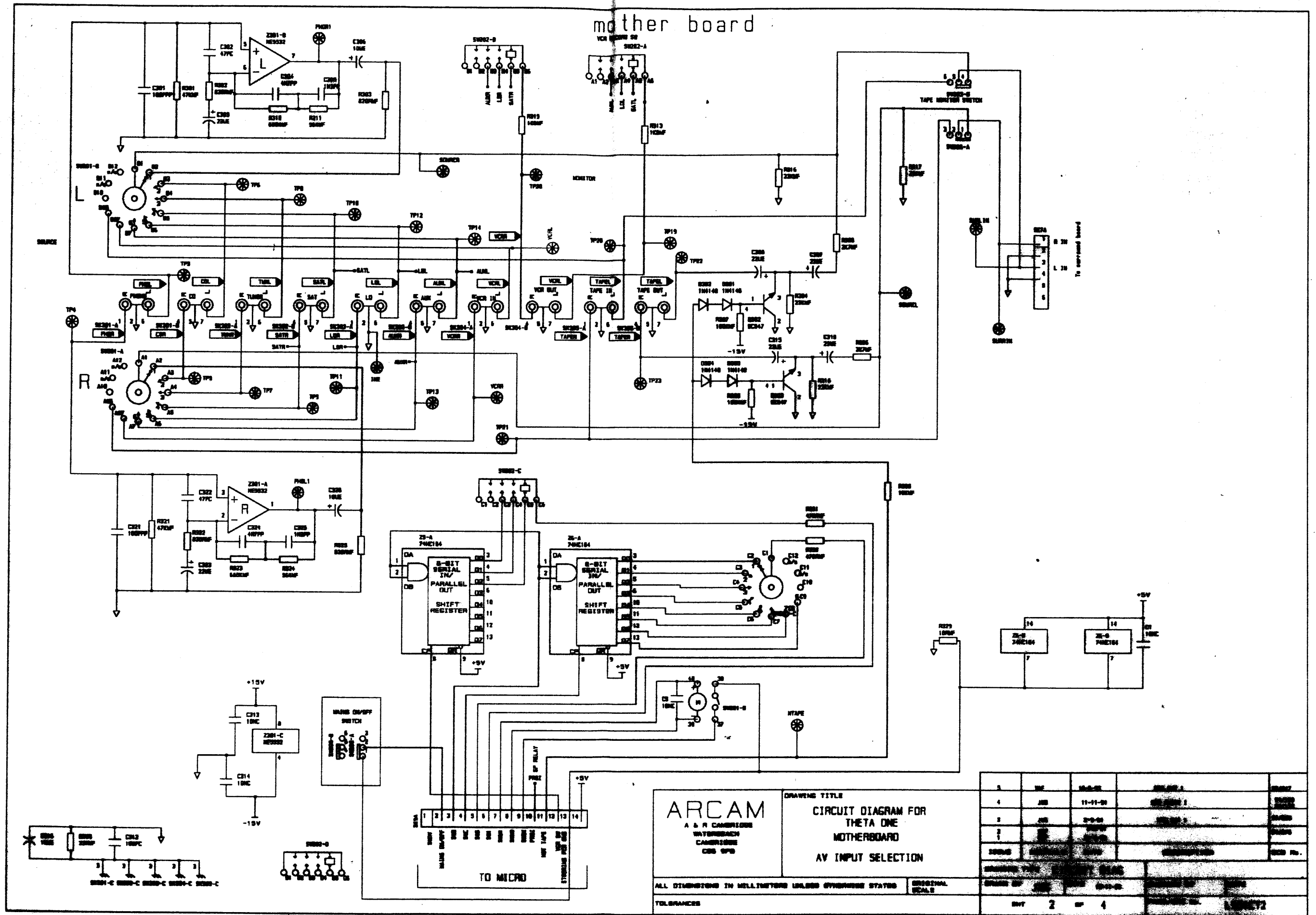
  

DRAWING TYPE	CIRCUIT DRAWING	DRAWN BY	DATE	CHECKED BY	DATE
DWT	1	SP	4	DATE	DATE

PART/CDG No.		<b>L901CT1</b>
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mother board

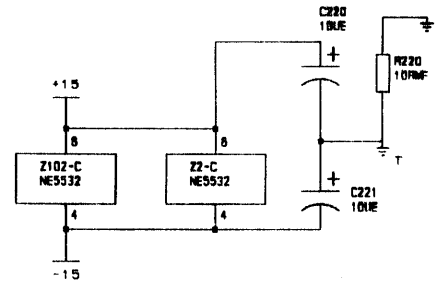
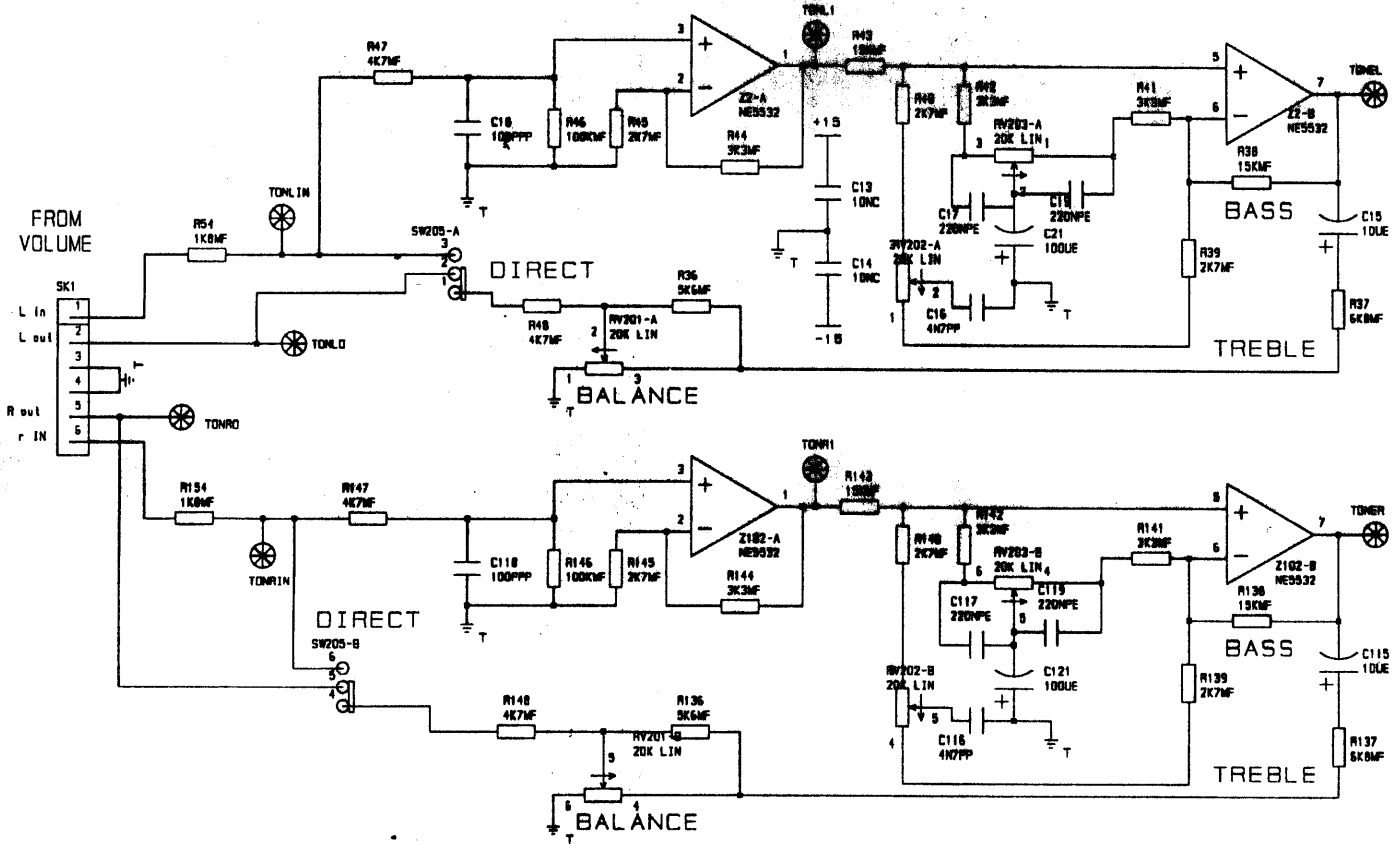


**ARCAM**  
A & R CAMERONS  
WATERBURY  
CAMBRIDGE  
CBS SPB

DRAWING TITLE  
**CIRCUIT DIAGRAM FOR  
THETA ONE  
MOTHERBOARD  
AV INPUT SELECTION**

ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE STATED  
TOLERANCES

1	ME	10-8-82	REV. 1	1000
4	AW	11-11-81	REV. 2	1000
3	AW	2-2-80	REV. 3	1000
1	AW	1-1-79	REV. 4	1000
DRAWING BY		CHECKED BY		DESIGN NO.
DATE		DATE		REV. NO.
REV	2	OF	4	100002



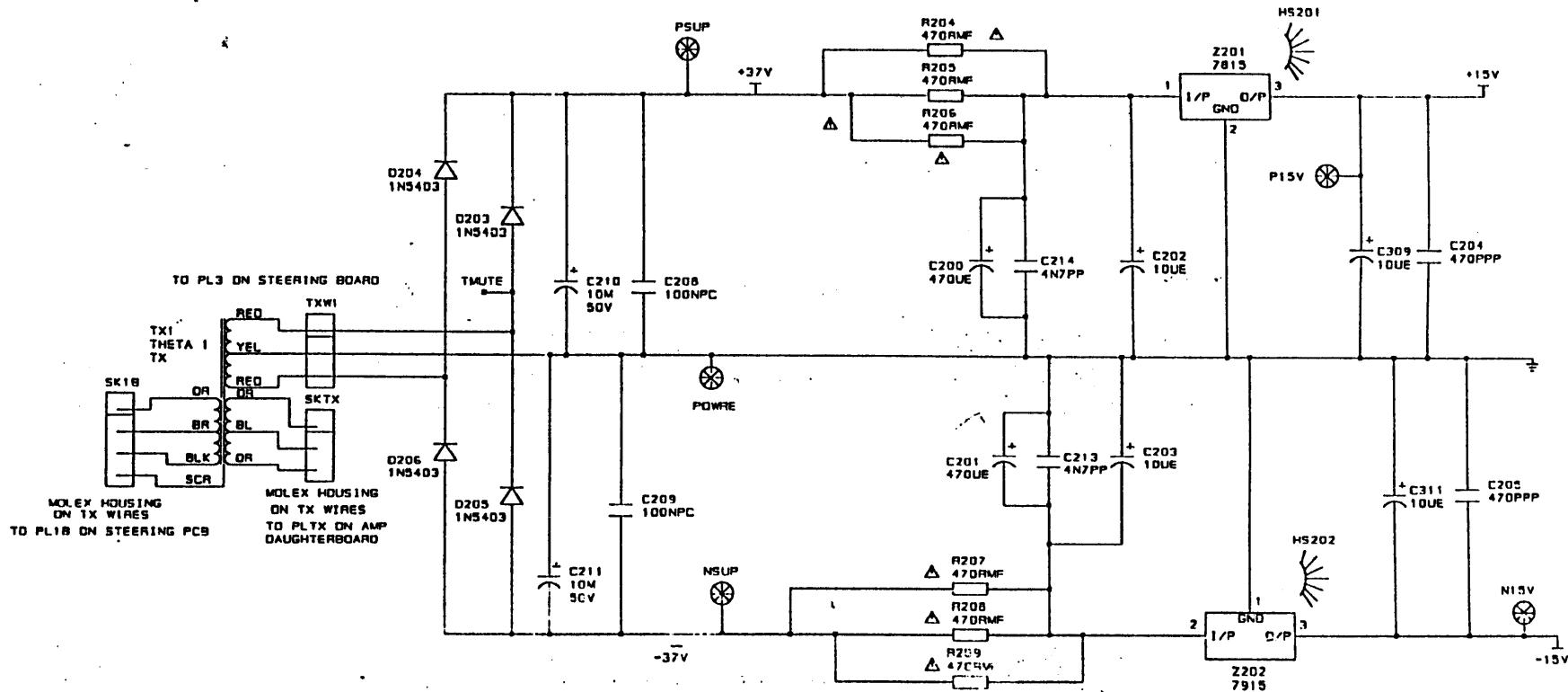
**ARCAM**  
 A & R CAMBRIDGE LTD.  
 WATERBEACH  
 CAMBRIDGE  
 CB5 9PB

DRAWING TITLE  
**CIRCUIT DIAGRAM FOR  
 THETA ONE  
 MOTHERBOARD  
 TONE CONTROL**

ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE STATED ORIGINAL SCALE  
 TOLERANCES

5	WVF	18-8-90	SEE SHT 1	95/007
4	JMG	11-11-94	SEE SHEET 1	94/008
3	JMG	2-9-94	SEE SHT 1	94/008
2	WVF	8-8-94	COMP NOPS CHANGED TO MATCH EACH CDT	94/008
1	WVF	24-6-94		94/008
ISSUE	INITIALS	DATE	DESCRIPTION OF CHANGE	ECO No
DRAWING TYPE		CIRCUIT DIAGRAM	DRAWN WITH REFERENCE TO 888 308	
DRAWN BY		WVF/JMG	DATE 20-7-93	
CHECKED BY			DATE	
PART/ORG No.		L901CT3		





Y1

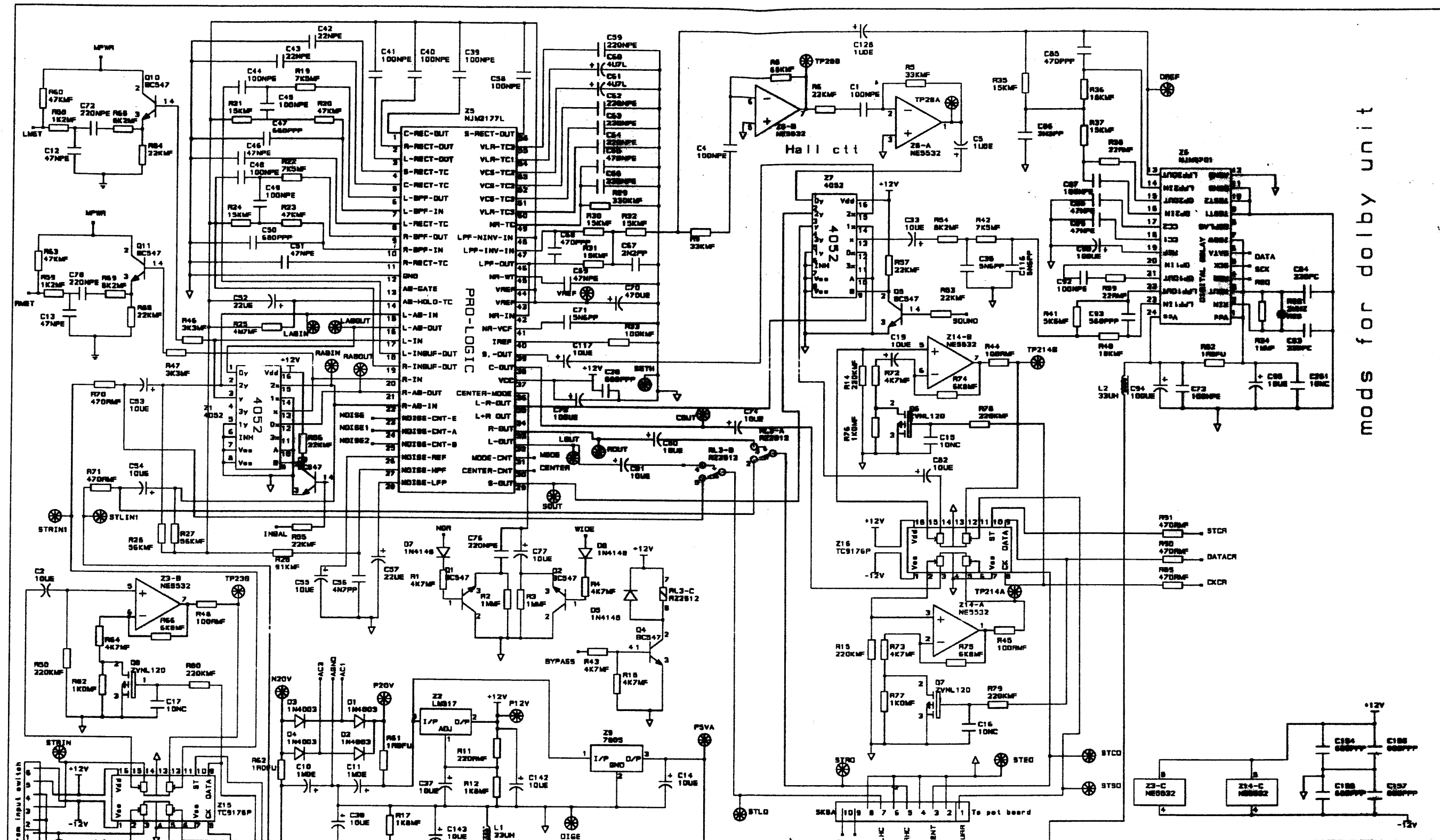
HS1

Y2 Y3 Y6  
Q Q Q

Y10 Y99

Y4 Y11 Y12 Y13 Y14 Y15 Y16 Y17 Y18 Y23Y24  
Y7 Y8 Y9 CB1 CB2 CB3 Y19 Y20 Y21 Y22

<h1 style="text-align: center;">ARCAM</h1> <p style="text-align: center;">A &amp; R CAMBRIDGE LTD. WATERBEACH CAMBRIDGE CB3 9PB</p>		<p>DRAWING TITLE</p> <h2 style="text-align: center;">CIRCUIT DIAGRAM FOR THETA ONE MOTHERBOARD POWER SUPPLY UNIT</h2>		4	JMG	11-11-94	SEE SHEET 1	94/128 94/129
				3	JMG	2-9-94	SEE SHT 1	94/08A
		2	WAF	8-8-94		947076		
		1	WAF	27-6-94				
		ISSUE	INITIALS	DATE	DESCRIPTION OF CHANGE	ECO No		
		DRAWING TYPE CIRCUIT DIAGRAM			DRAWN WITH REFERENCE TO BS 308			
ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE STATED		ORIGINAL SCALE	DRAWN BY WAF/JMG		DATE 21-7-93	CHECKED BY	DATE	
TOLERANCES		SHT 4 OF 4		PART/DRG No. L901CT4				



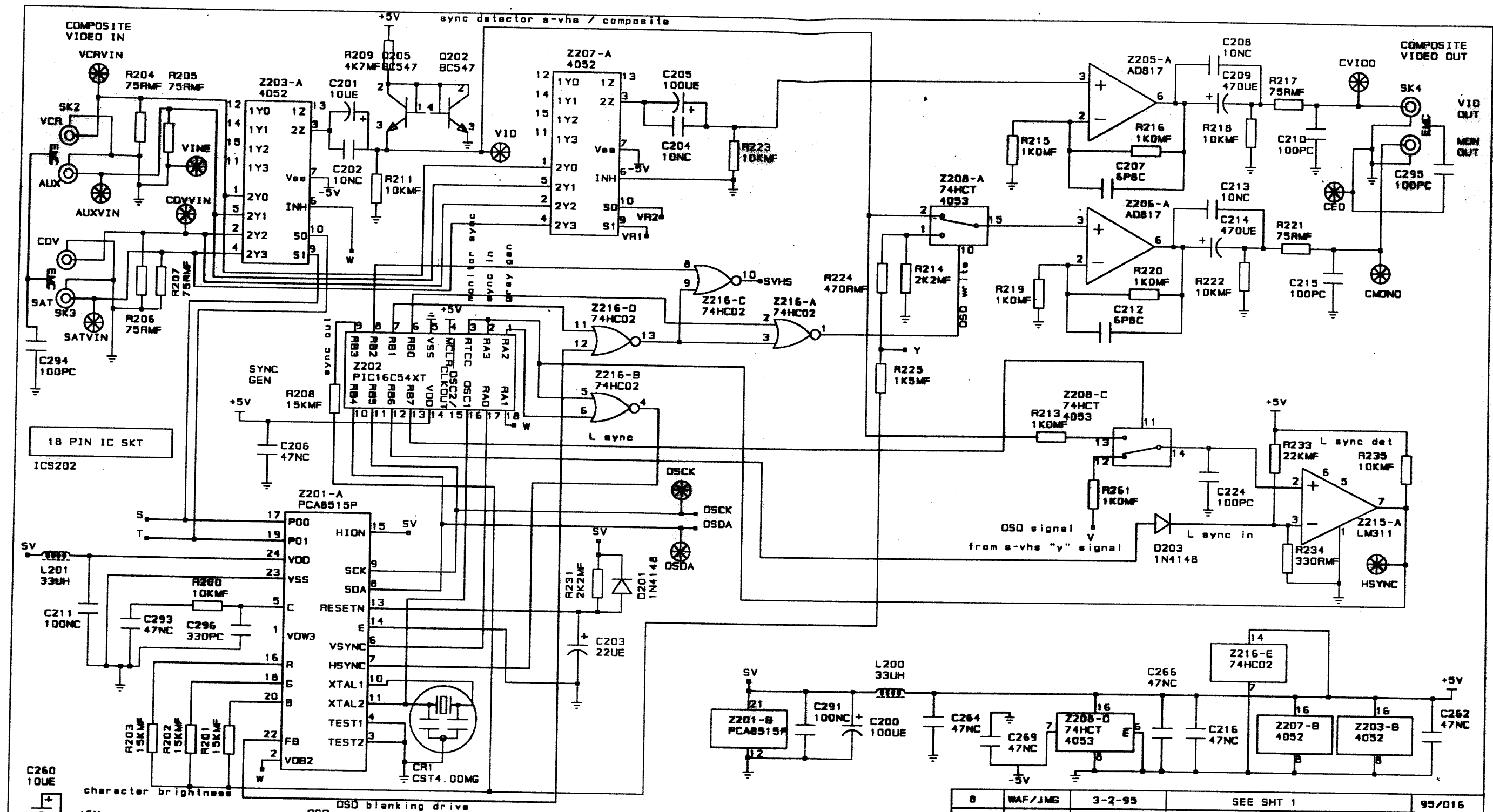
mods for dolby unit

**ARCAM**  
A & P CAMBRIDGE  
WATERBEACH  
CAMBRIDGE  
CB5 9PB

DRAWING TITLE  
**CIRCUIT DIAGRAM FOR  
PROLOGIC  
PART OF  
STEERING PCB**

ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE STATED		ORIGINAL SCALE	DRAWING TYPE <b>CIRCUIT DIAGRAM</b>	
TOLERANCES			DRAWN BY <b>WJP/MS</b>	DATE <b>26/2/80</b>
			DWT <b>1</b>	OF <b>6</b>

8	WJP/MS	26-2-80	ARCAM SUP 50	
7	JMS	01-11-80		
6	JMS			
5	JMS			
4	JMS			
3	JMS			
2	WJP			
1	WJP			
ISSUE		REVISION	DATE	BY
DRAWING TYPE <b>CIRCUIT DIAGRAM</b>				
DRAWN BY <b>WJP/MS</b>		DATE <b>26/2/80</b>		
DWT <b>1</b>	OF <b>6</b>			



**ARCAM**  
 A & R CAMBRIDGE LTD.  
 WATERBEACH  
 CAMBRIDGE  
 CB5 9PB

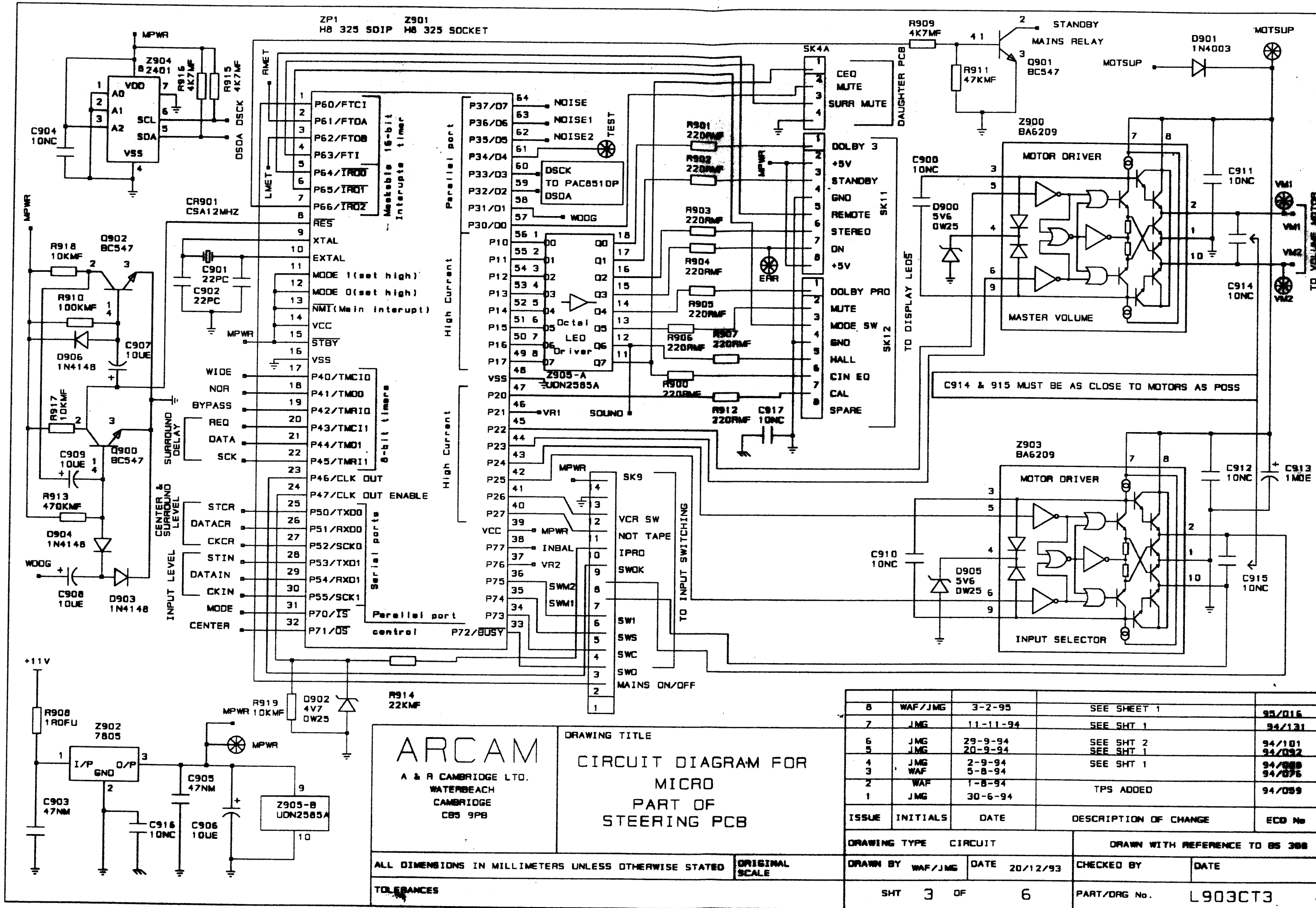
DRAWING TITLE  
**CIRCUIT DIAGRAM FOR  
 THETA 1 STEERING PCB  
 COMPOSITE VIDEO AND  
 OSD GENERATION**

ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE STATED ORIGINAL SCALE  
 TOLERANCES

ISSUE	INITIALS	DATE	DESCRIPTION OF CHANGE	ECB No
8	WAF/JMG	3-2-95	SEE SHT 1	95/016
7	JMG	11-11-94	SEE SHT 1	94/131
6	JMG	29-9-94	MICRO CHANGES	94/101
5	JMG	20-9-94	SEE SHT 1	94/092
4	JMG	2-9-94	SEE SHT 1	94/088
3	WAF	5-8-94	C203 & R231 VALUES CHANGED	94/076
2	WAF	1-8-94	IC216 ADDED	94/059
1	JMG	30-6-94	R212, D200 & D202 REMOVED	

DRAWING TYPE	CCT DIAG	DRAWN WITH REFERENCE TO BS 308	
DRAWN BY WAF/JMG	DATE 11-11-93	CHECKED BY	DATE
SHT 2 OF 6		PART/ORG No.	L903ET2



**ARCAM**  
A & R CAMBRIDGE LTD.  
WATERBEACH  
CAMBRIDGE  
CB5 9PB

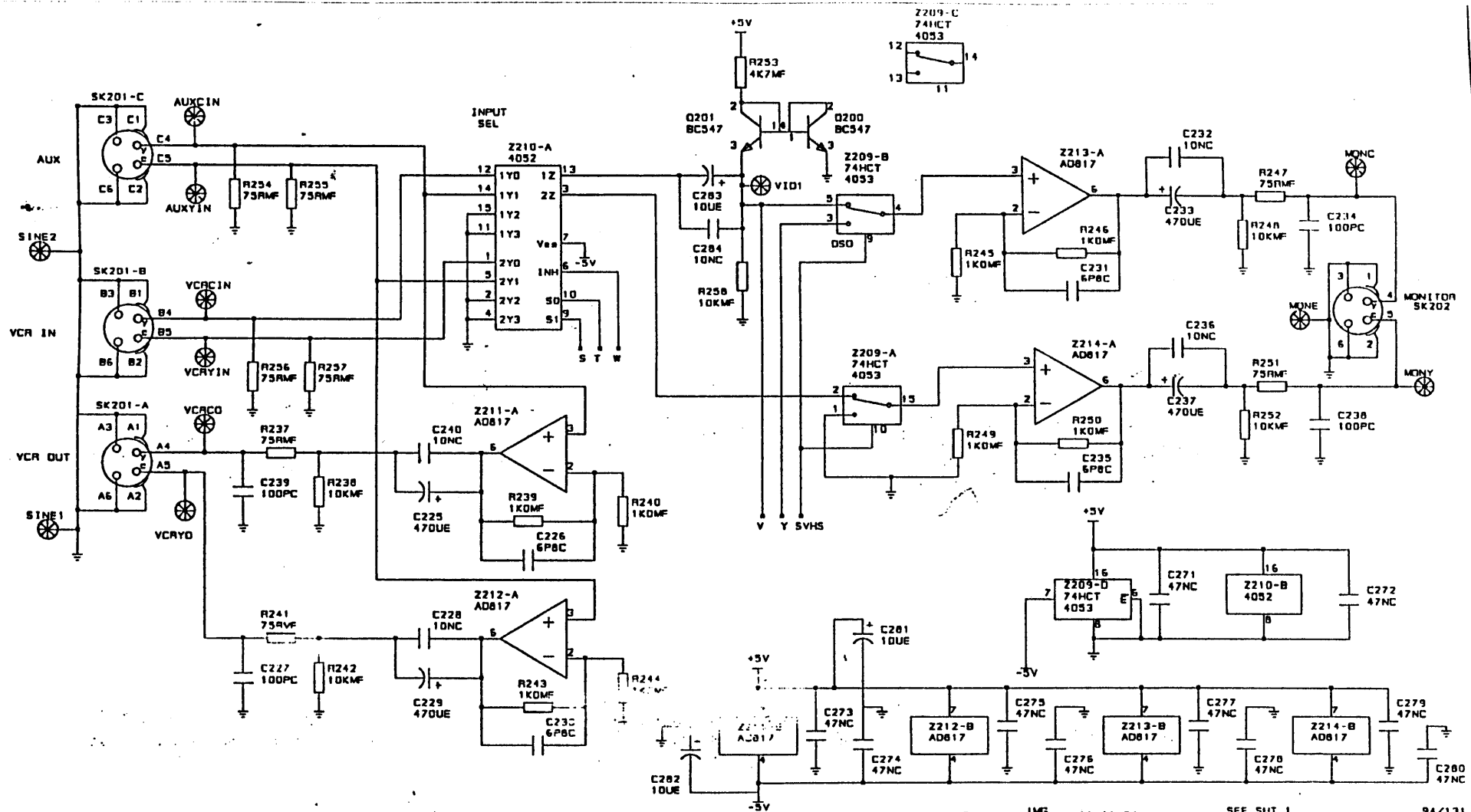
DRAWING TITLE  
**CIRCUIT DIAGRAM FOR  
MICRO  
PART OF  
STEERING PCB**

ISSUE	INITIALS	DATE	DESCRIPTION OF CHANGE	ECD No
8	WAF/JMG	3-2-95	SEE SHEET 1	95/016
7	JMG	11-11-94	SEE SHT 1	94/131
6	JMG	29-9-94	SEE SHT 2	94/101
5	JMG	20-9-94	SEE SHT 1	94/092
4	JMG	2-9-94	SEE SHT 1	94/088
3	WAF	5-8-94	SEE SHT 1	94/076
2	WAF	1-8-94	TPS ADDED	94/059
1	JMG	30-6-94		

DRAWING TYPE		CIRCUIT		DRAWN WITH REFERENCE TO BS 308	
DRAWN BY	WAF/JMG	DATE	20/12/93	CHECKED BY	
SHT 3 OF 6			PART/DRG No. L903CT3		

ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE STATED ORIGINAL SCALE

TOLEANCES

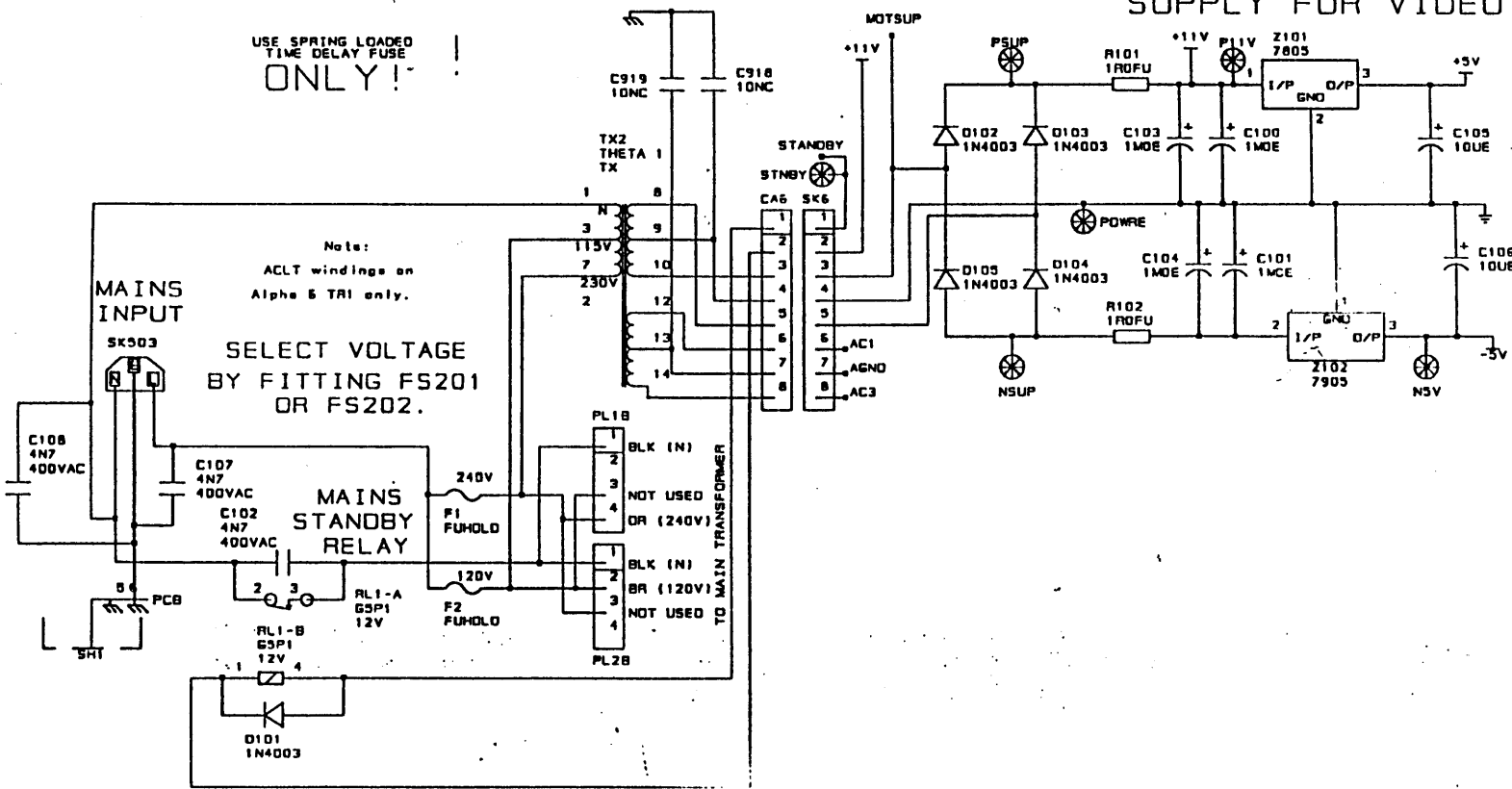


<p><b>ARCAM</b> A &amp; R CAMBRIDGE LTD. WATERBEACH CAMBRIDGE CB5 9PB</p>	DRAWING TITLE		7 JMG 11-11-94		SEE SHT 1	94/131
	CIRCUIT DIAGRAM FOR THETA 1 STEERING PCB S-VHS VIDEO SWITCHING		6 JMG	29-9-94	SEE SHT 1	94/101
			5 JMG	20-9-94	SEE SHT 1	94/092
			4 JMG	2-9-94	SEE SHT 1	94/086
			3 WAF	5-8-94		94/076
		2 WAF	1-8-94	YP ADDED	94/059	
		1 JMG	30-6-94			
		ISSUE	INITIALS	DATE	DESCRIPTION OF CHANGE	ECO No
DRAWING TYPE		DRAWN WITH REFERENCE TO BS JOB				
ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE STATED		ORIGINAL SCALE	DRAWN BY	DATE	CHECKED BY	DATE
TOLERANCES			WAF/JM	20-12-93		
			SHT 4 OF 6		PART/DRG No.	L903CT4

~ F202  
3A15 AS  
For 115V

~ F201  
1A6 AS  
For 230V

USE SPRING LOADED  
TIME DELAY FUSE  
**ONLY!**



Note:  
ACLT windings on  
Alpha 5 TRI only.

SELECT VOLTAGE  
BY FITTING FS201  
OR FS202.

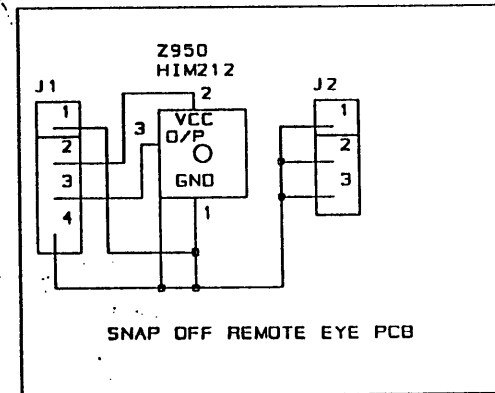
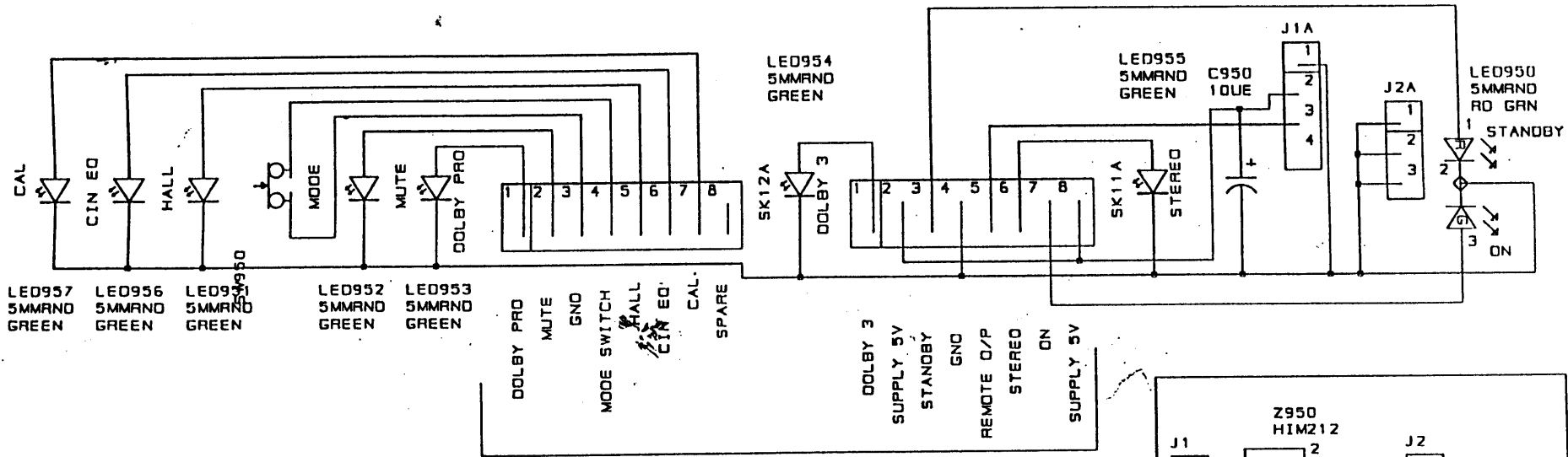
SUPPLY FOR VIDEO

<p><b>ARCAM</b> A &amp; R CAMBRIDGE LTD. WATERBEACH CAMBRIDGE CB5 9PB</p>	DRAWING TITLE		7	JMG	11-11-94	SEE SHT 1	94/131
	CIRCUIT DIAGRAM FOR POWER SUPPLY UNIT FOR STEERING PCB		6	JMG	29-9-94	SEE SHT 2	94/101
			5	JMG	20-9-94	SEE SHT 1	94/D32
			4	JMG	2-9-94	SEE SHT 1	94/088
			3	WAF	5-8-94		94/076
		2	WAF	1-8-94		TP 5 ADDED	94/059
		1	JMG	30-6-94			
		ISSUE	INITIALS	DATE	DESCRIPTION OF CHANGE		ECO No
		DRAWING TYPE CIRCUIT DIAGRAM			DRAWN WITH REFERENCE TO BS 300		
		DRAWN BY WAF/JMG		DATE 21-7-93		CHECKED BY	DATE
ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE STATED		ORIGINAL SCALE		SHT 5 OF 6		PART/DRG No. L903CT5	
TOLERANCES							

Y Y3 Y6 Y9 Y10 Y11 Y12

Y1 Y2 Y3 Y4 Y9B

Y7



TO MICRO

94/131

**ARCAM**  
 A & R CAMBRIDGE  
 WATERBEACH  
 CAMBRIDGE  
 CB5 9PB

DRAWING TITLE  
**CIRCUIT DIAGRAM FOR  
 THETA ONE  
 DISPLAY PCB  
 PART OF STEERING  
 BOARD**

7	JMG	11-11-94	SEE SHT 1	94/131
6	JMG	29-9-94	SEE SHT 2	94/101
5	JMG	20-9-94	SEE SHT 1	94/092
4	JMG	2-9-94	SEE SHT 1	94/088
3	WAF	5-8-94		94/076
2	WAF	1-8-94		94/059
1	JMG	30-6-94		
ISSUE	INITIALS	DATE	DESCRIPTION	ECO No.

ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE STATED

ORIGINAL SCALE

DRAWING TYPE **CIRCUIT** DRAWN WITH REFERENCE TO BS 308

TOLERANCES

DRAWN BY JMG/WF DATE 20-12-93 CHECKED BY DATE  
 SHT 6 OF 6 PART/DRG No. L903CT6