CA3000

Power Amplifer

Service Information

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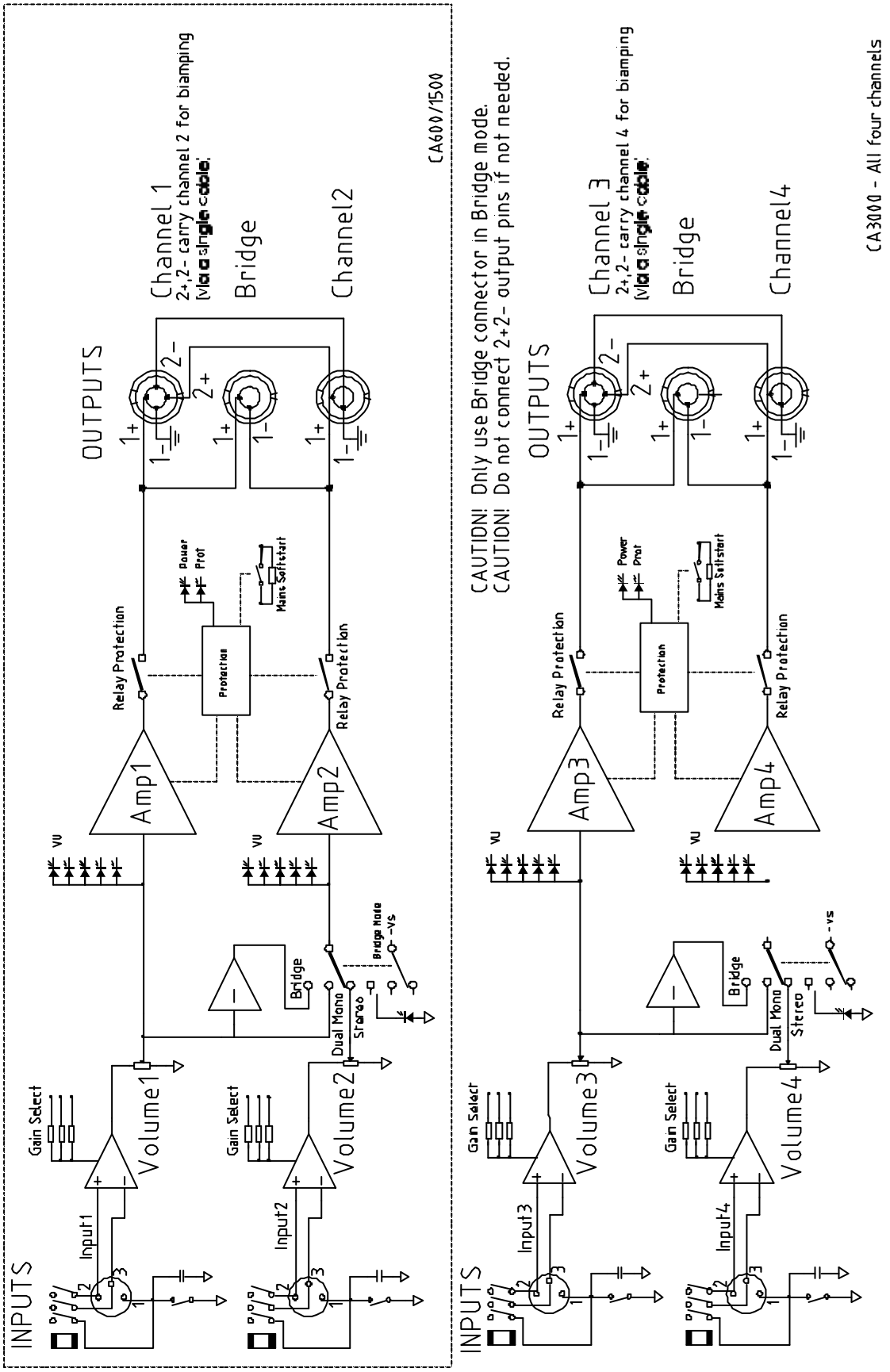
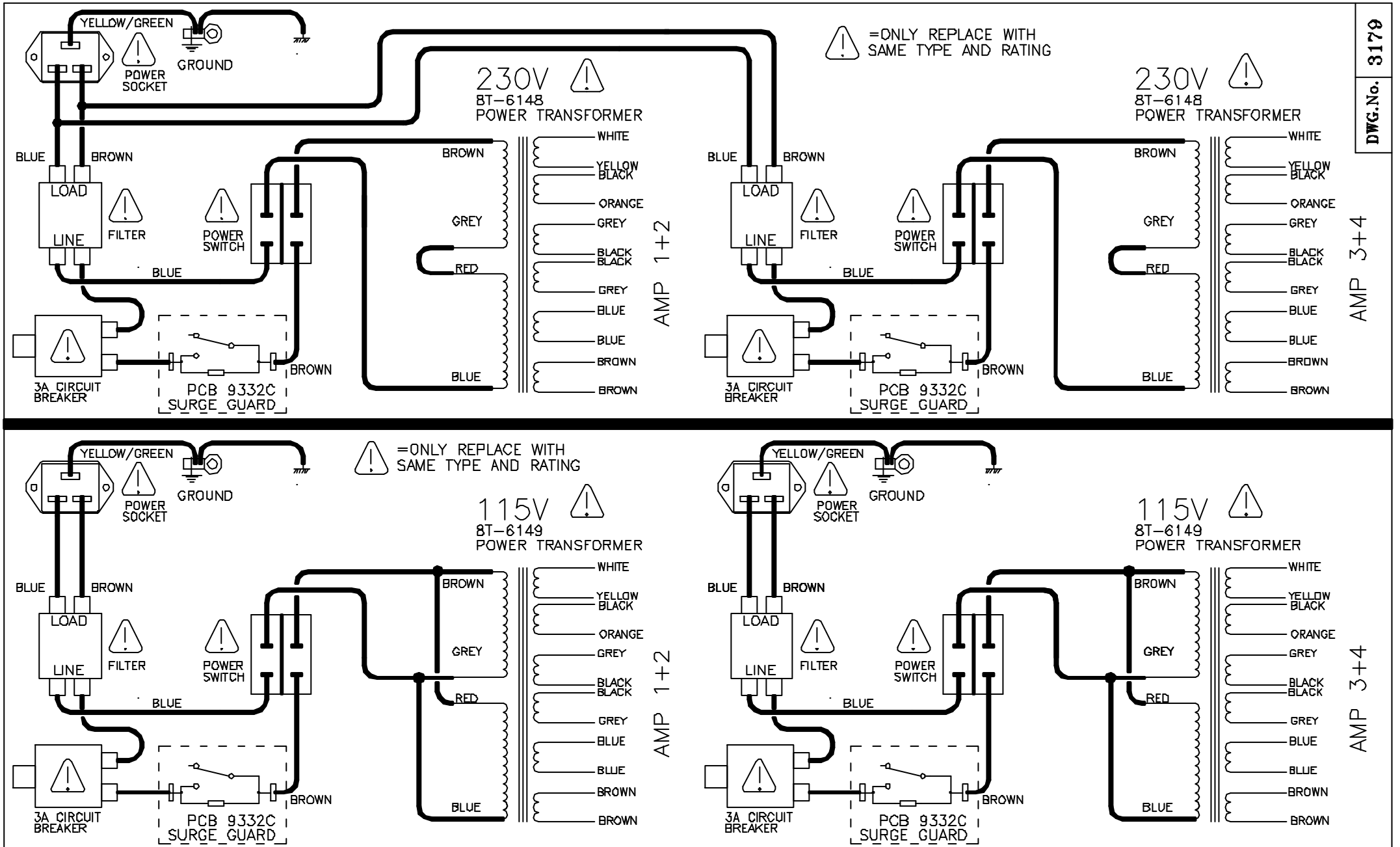
SystemDiagram





DWG.No. 3179

ISSUE	DESCRIPTION	APPD.	DATE

BLT Industries Ltd.

TITLE

MAINS WIRING FOR CA3000 115V/230V

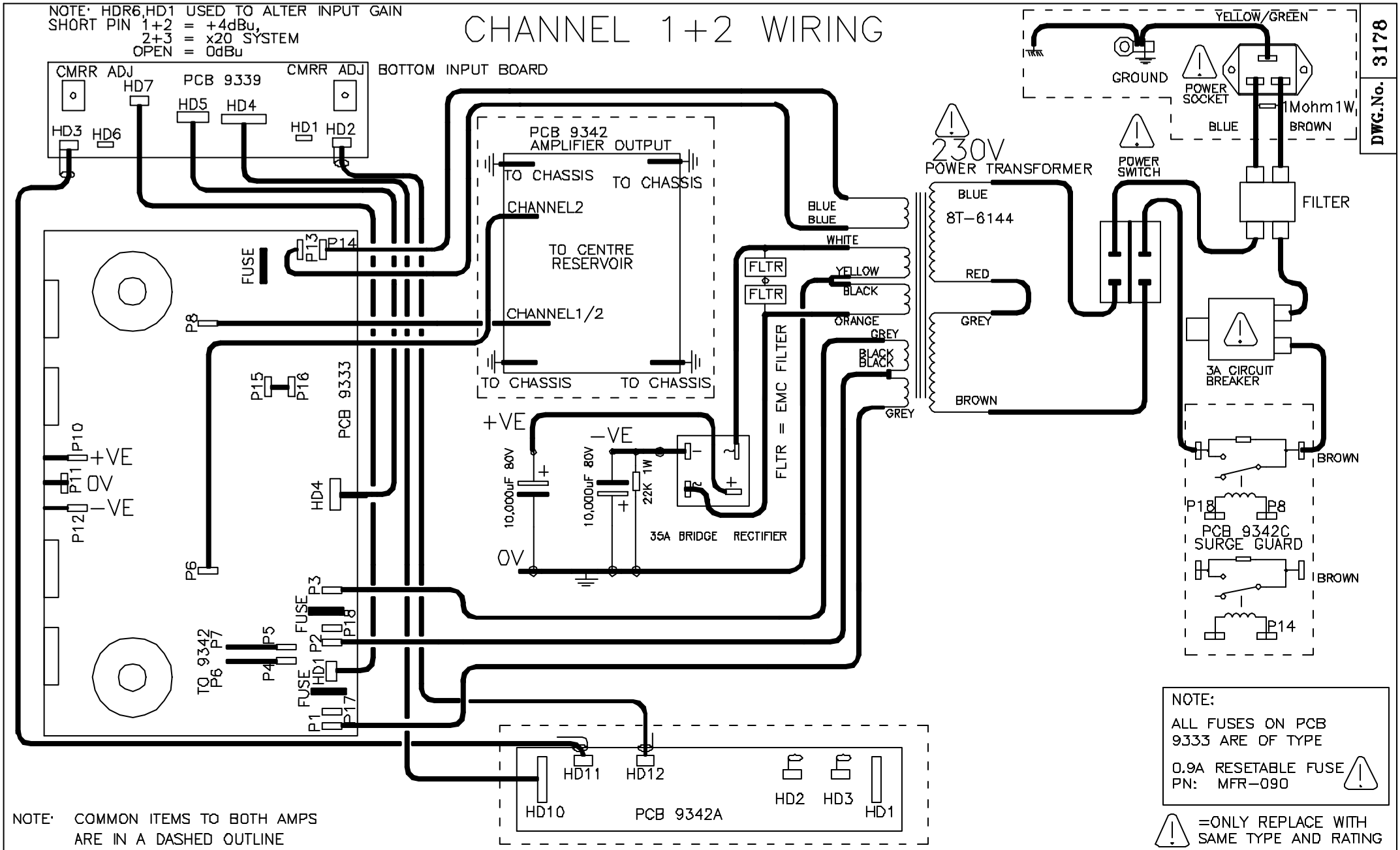
PART No

DRAWN	TRACED	CHECKED	APPROVED	DATE
R.S.T				16/11/00

DRAWING No. 3179

CHANNEL 1+2 WIRING

NOTE: HDR6,HD1 USED TO ALTER INPUT GAIN
SHORT PIN 1+2 = +4dBu,
2+3 = x20 SYSTEM
OPEN = 0dBu



NOTE: COMMON ITEMS TO BOTH AMPS ARE IN A DASHED OUTLINE

NOTE:
ALL FUSES ON PCB 9333 ARE OF TYPE
0.9A RESETABLE FUSE
PN: MFR−090

=ONLY REPLACE WITH SAME TYPE AND RATING

DWG.No. 3178

ISSUE	DESCRIPTION	APPD.	DATE

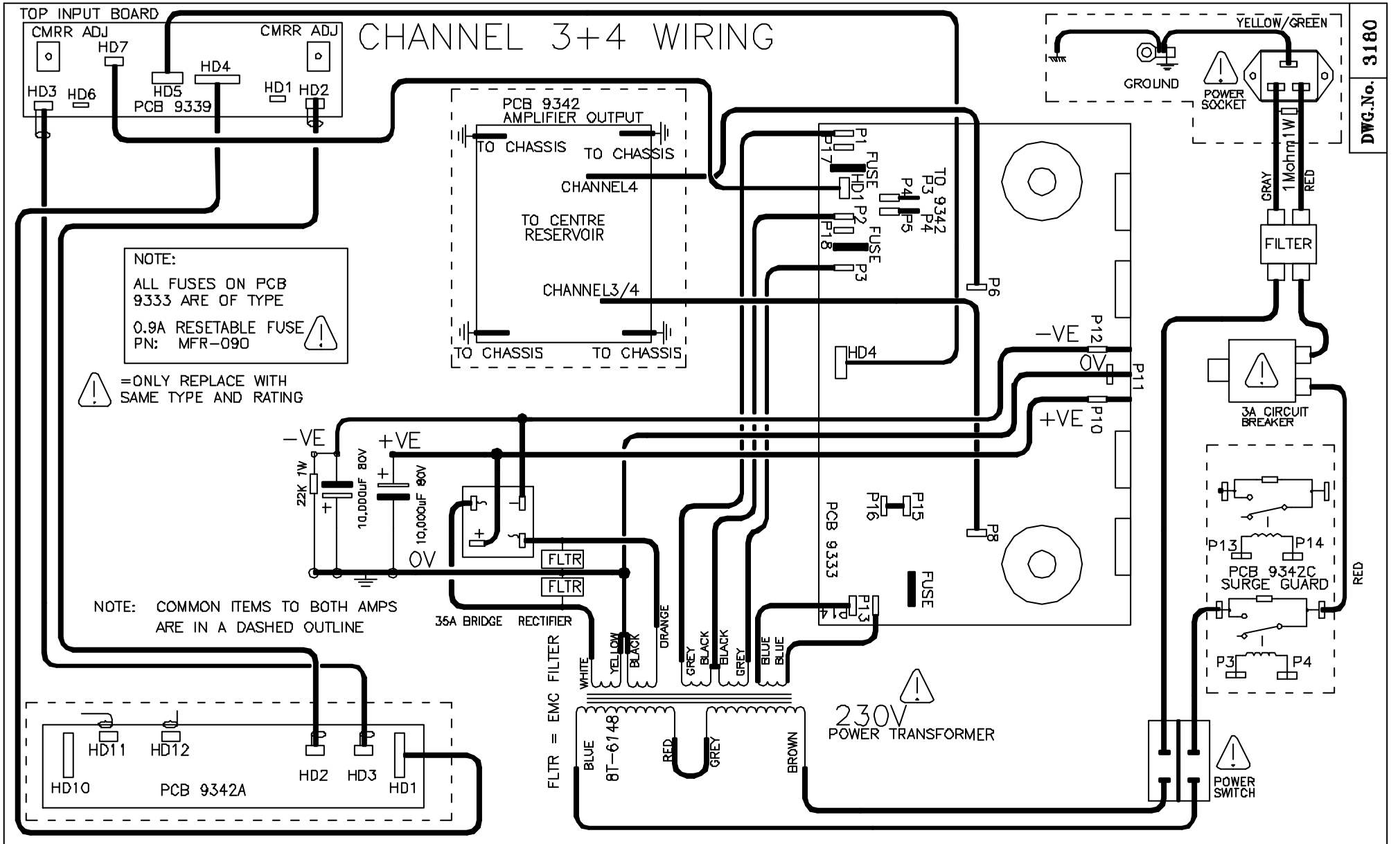
BLT Industries Ltd.

TITLE: CA3000 Service Schematic

PART No

DRAWN	TRACED	CHECKED	APPROVED	DATE
R.S.T				16/11/00

DRAWING No. 3178



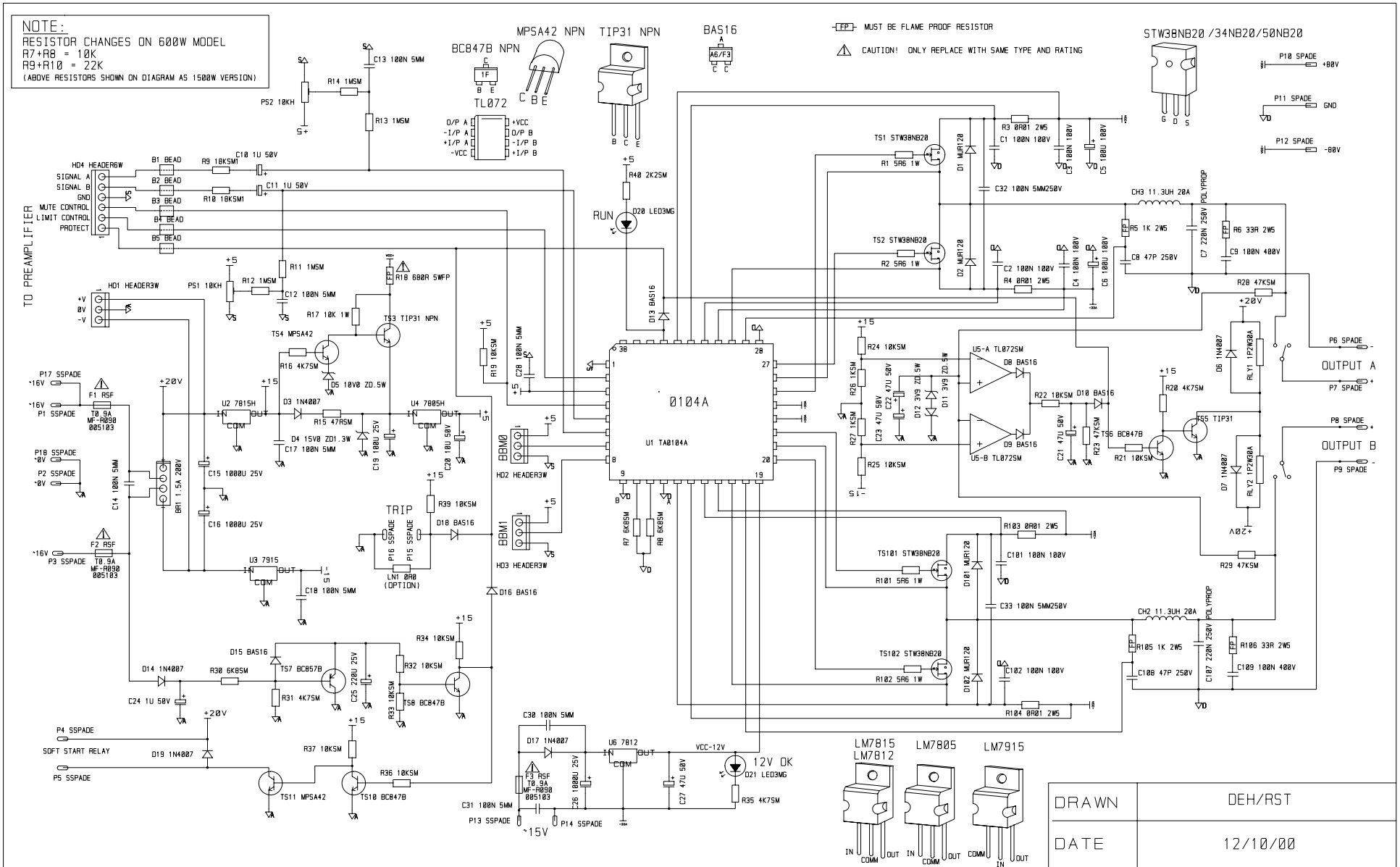
ISSUE	DESCRIPTION	APPD.	DATE

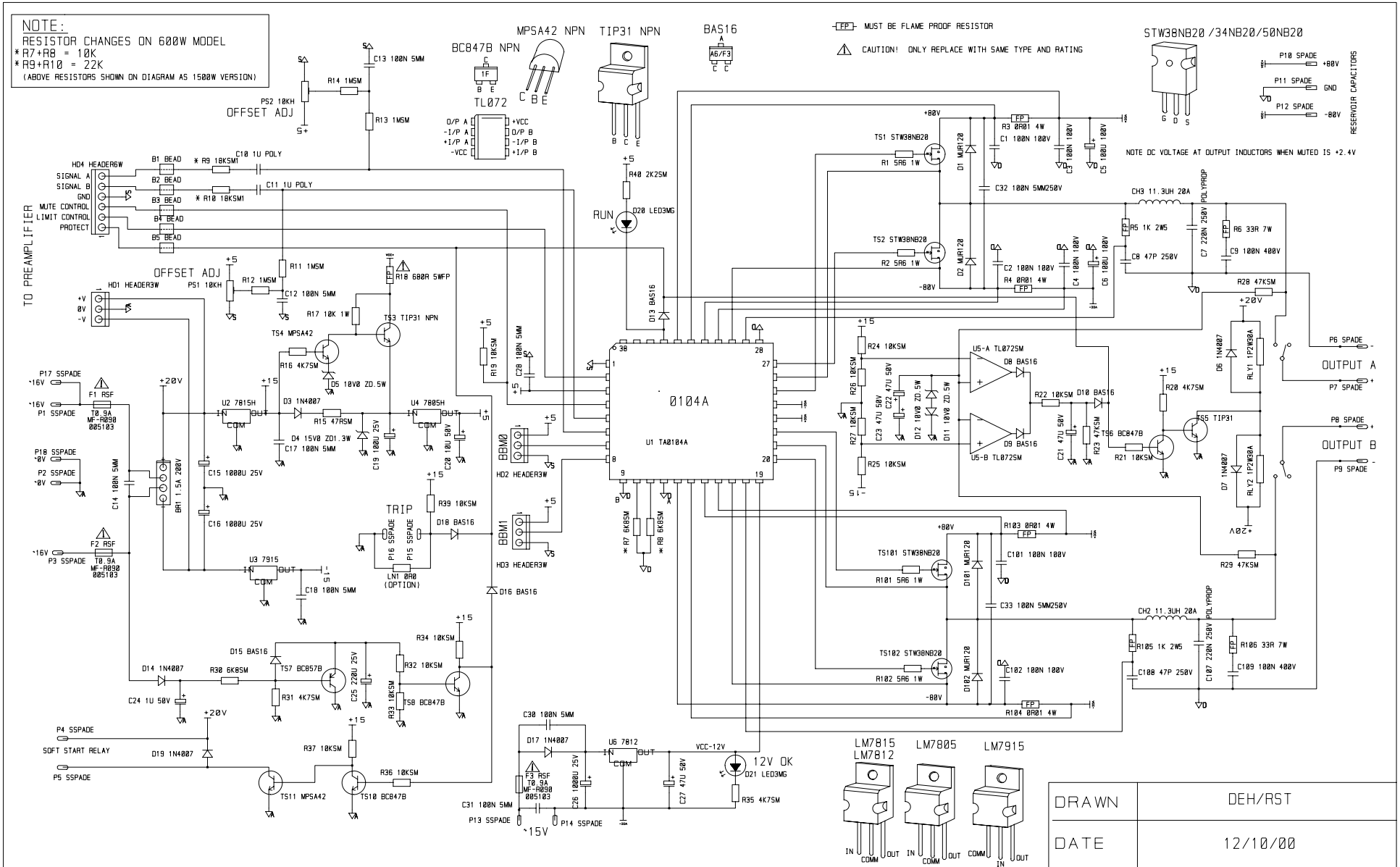
BLT
Industries Ltd.

TITLE
CA3000 Service
Schematic part2
PART No

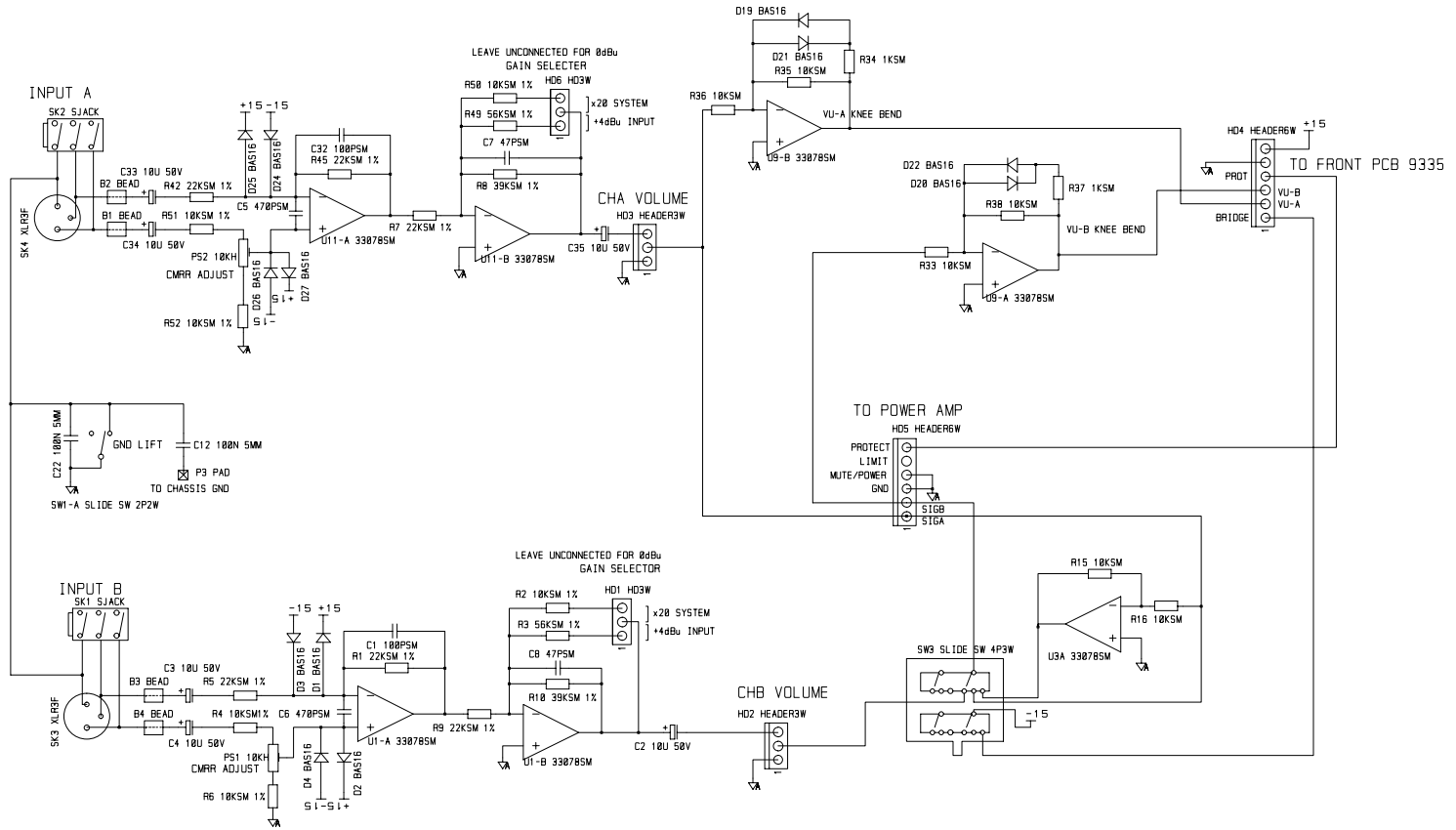
DRAWN	TRACED	CHECKED	APPROVED	DATE
R.S.T				16/11/00

DRAWING No. 3180

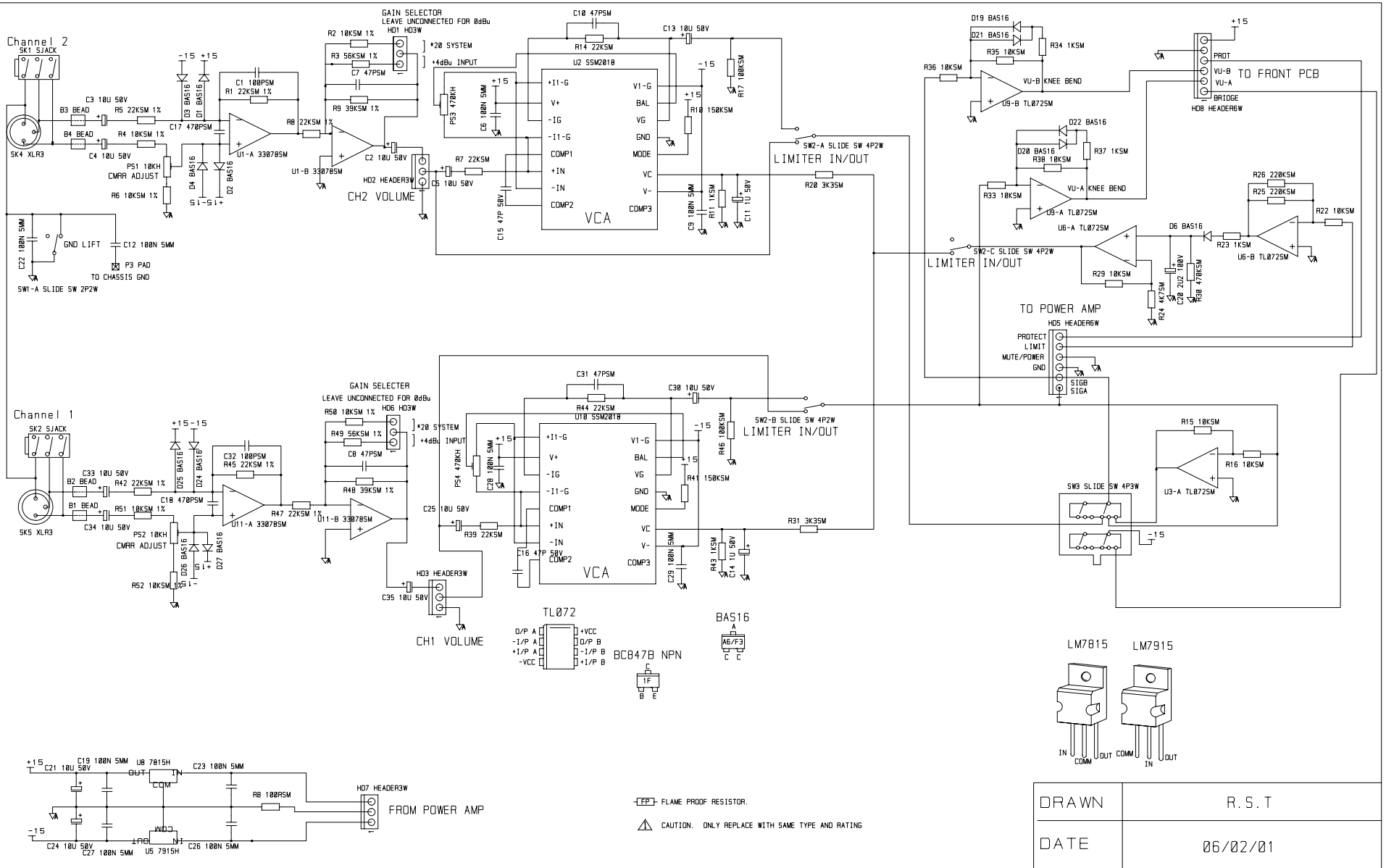

NOTE:
RESISTOR CHANGES ON 600W MODEL
R7+R8 = 10K
R9+R10 = 22K
(ABOVE RESISTORS SHOWN ON DIAGRAM AS 1500W VERSION)
MPSA42 NPN
TIP31 NPN
BAS16
BC847B NPN
TL072
MUST BE FLAME PROOF RESISTOR
CAUTION! ONLY REPLACE WITH SAME TYPE AND RATING
STW38NB20/34NB20/50NB20
P10 SPADE +80V
P11 SPADE GND
P12 SPADE -80V
TO PREAMPLIFIER
HD4 HEADER6W
SIGNAL A
SIGNAL B
GND
MUTE CONTROL
LIMIT CONTROL
PROTECT
HD1 HEADER3W
+V
0V
-V
0104A
U1 TA0104A
OUTPUT A
OUTPUT B
TRIP
RUN
D20 LED3MG
D21 LED3MG
12V OK
VCC-12V
SOFT START RELAY
LM7815
LM7812
LM7805
LM7915
DRAWN
DEH/RST
DATE
12/10/00
TITLE
B1/CA POWER AMP
DRW. NO.
9333_5
ISSUE
TYPE



ISSUE	6 16/01/01 C10,C11 TO BOX POLY TYPE R3/4/103/104 2W5 TO 4WFP					DRAWN	DEH/RST
						DATE	12/10/00
TYPE	R6/106 TO 5W TO 7WFP R26/27 TO 1K TO 10KSM D11/12 TO 3V9 TO 10V					TITLE	B1/CA POWER AMP
						DRW. NO.	9333_6

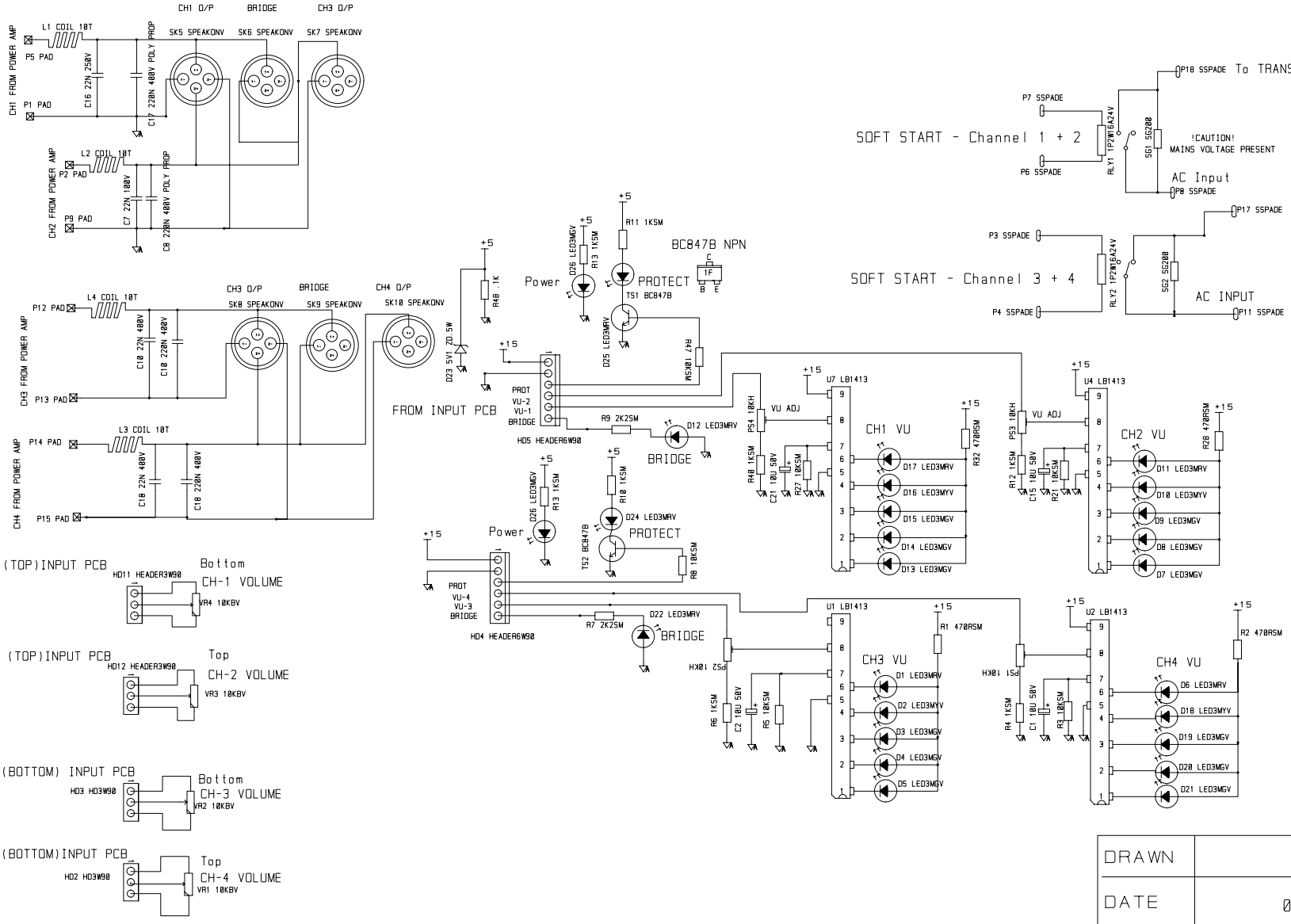


ISSUE	ISSUE 2					DRAWN	RST
						DATE	10/10/00
TYPE	GAIN SELECT STAGE U1B/U11B ADDED HD5 FROM 8W>6W LAYOUT DETAILS					TITLE	CONCEPT POWER AMP INPUT PCB
						DRW. NO.	9339_2



DRAWN	R.S.T
DATE	06/02/01
TITLE	CONCEPT POWER AMP LIMITER INPUT PCB
DRW. NO.	9336_3

ISSUE					
TYPE					

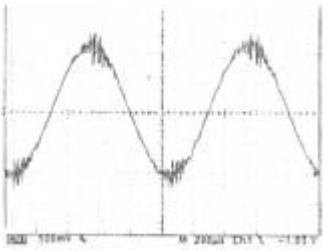


ISSUE						DRAWN	R.J.F
						DATE	02/01/01
						TITLE	CA3000 SPEAKON/VU/LED/SOFTSTART
TYPE						DRW. NO.	9342_4

CA Series Power Amplifiers

Traditionally, Class A and Class A-B amplifiers have dominated the amplifier marketplace. These purely analogue devices have low power efficiency and most integrated circuit Class A-B amplifiers fall short of true high-fidelity audio quality.
Class D amplifiers however, solve the efficiency problem by using switching pulse-width modulation technology. However, this produces audio quality that is far inferior to class A or AB, so efficiency is gained at the expense of audio fidelity. The 'Holy Grail' of amplification: High audio quality AND high power efficiency has long eluded the market. Enter the CA range of power amplifiers delivering audiophile performance and very high efficiency.

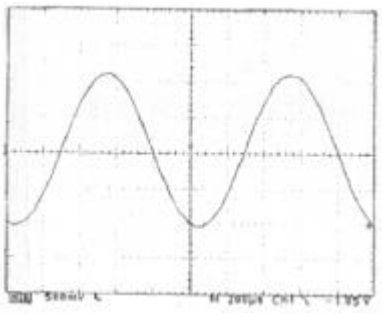
If you have measured the output waveforms of CA amplifiers using traditional equipment and methods, you may have observed an unusual characteristic in the output waveform when the amplifier is driven close its maximum output. This characteristic appears to be a high frequency oscillation near the waveform peaks.
In reality, this apparent oscillation is an audio quality enhancement characteristic of the CA amplifier. The apparent oscillations are well outside the audio bandwidth, and are a unique feature of the digital power processor.



No Filtering on output

As the input signal, to any conventional amplifier is increased, at some point the output of the amplifier will distort/clip i.e. 'Square' off. This is bad news because the for a split second the loudspeaker is not moving at all but still dissipating potentially huge power levels, this is the main cause of (expensive) compression driver failure.
When the CA power amplifier goes into this distortion region, it exhibits high frequency break-up of the peaks as shown above. This is actually the amplifier resetting the control processor overloads at a ***frequency far above the audible range.*** This is not instability or oscillation, nor does it degrade the performance of the amplifier in any way. In addition the CA series power amplifiers also have the ability to run almost rail-to-rail, and thus will not lose negative feedback. In other words, it will retain control of the load at all times.

Measurement of THD%+N
Unless your distortion analyser is designed to reject out of band noise when measuring THD (And very few are), the THD measurement actually reflects harmonic distortion plus any noise present up to the bandwidth of the analyser and so is actually a measurement of THD+N. Since the CA range of amplifiers have energy far outside the audible frequency range (As do inferior class D amplifiers), a test designed for linear amplifiers (such as class A, AB) will not yield valid results when applied to a CA amplifier. A sharp cut-off low-pass filter must be inserted between the amplifiers outputs and the test equipment's inputs prior to making any distortion measurements. Some measurement equipment (Such as Audio Precision2) have high quality low pass filters which can be used to limit the test bandwidth. Using these filters (as shown below) you will achieve what 'looks' like a high quality linear amplifier. Even though there appears to be 'lots going on' outside the audio bandwidth, the CA amplifier is designed to be well within current and future EMC guidelines, and as such is quieter than most linear amplifiers.



Output with 30Khz Low-pass filter

CA3000

10462	CA3000 CARTON	1
10702	SPECIAL MAINS LEAD	1
10959	CA SERIES MANUAL	1
7915/6	CA3000 CHASSIS ASSY	1

CA3000

7915(/6)	**CA3000 CHASSIS ASSY**	**1**
->002022	10000UF 100V CAPACITOR/SAM	4
->002204	680NF 250V 22.9mm	6
->005077	M3x25MM HEX SPACER	4
->005320	CHASSIS MOUNT MAINS FILTER	2
->005321	3A THERMAL RELEASE SWITCH	2
(->005324	5A THERMAL RELEASE SWITCH	2)
->005323	6A FILTERED MAINS INLET	(1/2)
->005510	3MM SOLDER TAG	2
->005511	5MM SOLDER TAG	12
->005512	6mm SOLDER TAG	4
->005558	100mm TIE WRAP	30
->005612	M3*8 METAL SPACER	2
->005632	M3*20 PLASTIC SPACER HEX	4
->005659	SHORT BOARD SPACER 12.7MM	4
->005666	RED P402 KNOB	4
->007906	B1/CA OUTPUT ASSY PCB 9333	-2
->009150	3mm HEX NUT	2
->009151	3mm INT SHAKEPROOF	4
->009152	3*5mm PAN POZI	8
->009160	4mm HEX NUT	27
->009161	4mm INT. SHAKEPROOF	27
->009162	4*12mm PAN POZI	16
->009167	4*8 PAN POZI TAPTE	8
->009171	M5 INT SHAKEPROOF	8
->009173	5*12mm PAN POZI	1
->009181	5mm BRASS HEX NUT	1
->009183	WASHER 10MM O/D X 3 1/2MM	4
->009190	6 WAY END CONNECTOR	8
->009199	3 WAY IDC CONNECTOR	12
->009200	NO 6*3/8 FLANGE POZI	24
->009204	NO 4*1/4 PLASTITE	20
->009217	4mm NUTSERT	14
->009228	3*12 ZINC PAN POZI	2
->009235	4 X 3/8 PAN POZI AB BLK PO	6
->522032	35A BRIDGE RECTIFIER	2
->530027	DPST EQ MAINS SWITCH	2
->540038	EARTH WARNING LABEL	1
->541004	HC25/50 4.8 FASTON	34
->541053	1/4" LG RECEPTACLE	35
->541071	POZI LOCK NYLON BOOT	30
->581001	3*6mm PAN POZI Z/B	10
->582005	4*25 PAN POZI	18
->582007	4*10mm SMALL F/H	12
->586002	M8 * 60 ROOFING BOLT	2
->586023	8mm SHKPRF WASHER	2
->589020	S/A SQUARE RUBBER FOOT20MM	4
->589041	50mm CAPACITOR CLAMP	4
->5P-50036	MX500 CAP STRAP	-2
->->79052	ALUMINIUM SHEET	0.006
->8P-5068	75MM CA HEATSINK EXT	-4
->8P-5073	CA3000 RACK WING	-2
->8P-5074	CA3000 FAC1A	-1
->8P-5075	CA3000 REAR PANEL	-1
->8P-5076	CA3000 FACIA TRIM DRG 3151	-1

CA3000

->8P-5077	CA3000 LID DRG 3158	-1
->8P-9256	CA SERIES HANDLE DWG 3128	-2
->8P-9257	CA SERIES HANDLE SPACER	2
->8P-9259	CA3000 TRIP MOUNTING BRACK	-1
->8T-6148A	CA3000 MAINS TX + CRIMPS 2	-2

CA3000

->007906	**B1/CA OUTPUT ASSY PCB 9333**	**-2**
->->001067	33R 6W(5W)	4
->->001068	5R6 1W 5% WW RESISTOR	8
->->001069	OR01 2W5 5% WIREWOUND RESI	8
->->001070	18KSM 1206 1% RESISTOR	4
->->001300	ORO SHORTING LINK	4
->->001302	47R 5% RESISTOR	2
->->001306	10K 5% RESISTOR	22
->->001309	1M 5% RESISTOR	8
->->001312	4K7 5% RESISTOR	8
->->001315	47K 5% RESISTOR	6
->->001318	6K8 5% RESISTOR	2
->->001327	1K 5% RESISTOR	4
->->001400	10K 1W RESISTOR	2
->->001511	1K 2.5W RESISTOR	4
->->001705	680R 5W RESISTOR	2
->->001920	ZERO OHM RESISTOR	2
->->002004	47UF 50V RADIAL	8
->->002009	1000UF 25V RADIAL	6
->->002013	10UF 50V CAPACITOR	2
->->002014	100UF 35V RADIAL	2
->->002025	1UF 63V RADIAL	4
->->002029	220UF 25V CAPACITOR	2
->->002035	100N 100V 5MM BOX POLY	12
->->002036	100UF 100V RADIAL CAP	4
->->002039	220N 250V POLYPROPYLENE CA	4
->->002041	100N 250V 5MM POLYESTER CA	4
->->002042	1u63V 10% POLYESTER CAP'	4
->->002410	100NF 400V 15MM	4
->->002419	100NF 63V 5mm	16
->->002818	47PF 500V CERAMIC	4
->->003000	1N4007 DIODE	12
->->003007	3V9 .5W ZENER DIODE	4
->->003014	15V 1.3W ZENER	2
->->003017	1.5A 200V BRIDGE	2
->->003018	10V .5W ZENER DIODE	2
->->003022	3mm GREEN LED	4
->->003041	5MM FERRITE BEAD	10
->->003042	BYW100-200-FAST RECOVERY D	8
->->003411	MPSA42/43 TRANSISTOR	4
->->003422	STW38NB20 N CHANNEL MOSFET	8
->->003423	TA0104A TRIPATH DIGITAL AM	2
->->003424	LM7812 12V REGULATOR	2
->->003500	BAS16 DIODE	14
->->003503	BC847B TRANSISTOR	6
->->003504	BC857B TRANSISTOR	2
->->003508	34072 IC (SMD TL072)	2
->->003610	TIP31C TRANSISTOR	4
->->003901	7815 IC VOLT'REGULATOR	2
->->003902	7915 IC VOLT'REGULATOR	2
->->003905	7805 IC	2
->->004019	10K HORIZ PRESET	4
->->005030	HEATSINK TV5	6
->->005036	6 WAY LOCKING HEADER	2

CA3000

->007909	**CA SERIES INPUT PCB 9339 A**	**-2**
->->001071	22K 1206 1% RESISTOR	12
->->001072	39K 1206 1% RESISTOR	4
->->001300	ORO SHORTING LINK	22
->->001303	100R 5% RESISTOR	4
->->001327	1K 5% RESISTOR	4
->->001920	ZERO OHM RESISTOR	4
->->001923	56KSM 1206 1% RESISTOR	4
->->001924	10KSM 1206 1% RESISTOR	24
->->002013	10UF 50V CAPACITOR	16
->->002419	100NF 63V 5mm	12
->->002602	47PF 50V 10% COG	2
->->002603	100PF 50V 10% COG	4
->->002605	470PF 50V 10% COG	4
->->003034	3mm LED YELLOW	4
->->003041	5MM FERRITE BEAD	8
->->003500	BAS16 DIODE	24
->->003509	MC33078 IC	8
->->003901	7815 IC VOLT'REGULATOR	2
->->003902	7915 IC VOLT'REGULATOR	2
->->004019	10K HORIZ PRESET	4
->->005003	STEREO JACK SOCKET	4
->->005030	HEATSINK TV5	4
->->005036	6 WAY LOCKING HEADER	4
->->005054	XLR SOCKET FEMALE	4
->->005063	3 WAY LOCKING HEADER	6
->->005065	3 WAY NON LOCKING	4
->->005610	2 POLE 2 WAY (MX)	2
->->009199	3 WAY IDC CONNECTOR	2
->->009339	PCB ISSUE 2	2
->->530023	4P 3W SLIDE SWITCH	2
->->543508	SHORTING LINK (IDC)	4

CA3000

->007971	**PCB 9342-VU ASSY**	**-1**
->->001003	1K .25W RESISTOR	1
->->001005	2K2 .25W RESISTOR	1
->->001014	10K .25W RESISTOR	1
->->001300	ORO SHORTING LINK	3
->->001305	2K2 5% RESISTOR	1
->->001306	10K 5% RESISTOR	5
->->001311	470R 5% RESISTOR	4
->->001327	1K 5% RESISTOR	7
->->001920	ZERO OHM RESISTOR	3
->->002013	10UF 50V CAPACITOR	4
->->002401	22NF 400V 10MM	4
->->002402	220NF 250V 15MM DIPPED POL	4
->->003011	5V1 .5W ZENER DIODE	1
->->003022	3mm GREEN LED	13
->->003031	SURGE GUARD SCK20-10-8A	2
->->003033	3mm LED RED	8
->->003034	3mm LED YELLOW	4
->->003503	BC847B TRANSISTOR	2
->->003805	LB1413 BARGRAPH DRIVER	4
->->004019	10K HORIZ PRESET	4
->->004110	B10K 27.5MM POT	4
->->005036	6 WAY LOCKING HEADER	2
->->005047	16A 24V RELAY	2
->->005065	3 WAY NON LOCKING	4
->->005686	4.8MM TERMINAL SPADE	10
->->009342	CA3000 VU/SS ARRAY PCB	1
->->571014	10 TURN CHOKE	4
->->530066	SPEAKON SOCKET	6