

X1215/16 (ABOVE SERIAL NUMBER 2000)

Cartridge Disk Drive Unit
Vol. IV: Diagrams



**Data
Systems**

1.1 GENERAL

The key to logic refers to the logic circuits on the printed circuit boards (figure 4-1). The voltage levels used in the CDD are +5V for a logic "1" and 0V for a logic "0". Each printed circuit board has a 64 pin female connector on which pin 2 is used for +5V and pins 4, 14, 26, 40, 52 and 64 are used for logical earth. The logic used in the CDD is generally called TTL (Transistor - Transistor Logic) consisting of integrated circuits.

These integrated circuits are contained in "dual in line" packages with 14 pin or 16 pin connections (figure 4-1A). Discrete component circuits containing separate resistors, capacitors, transistors or diodes are also sometimes used.

Figure 4-1B shows the organisation of component location on the printed circuits boards.

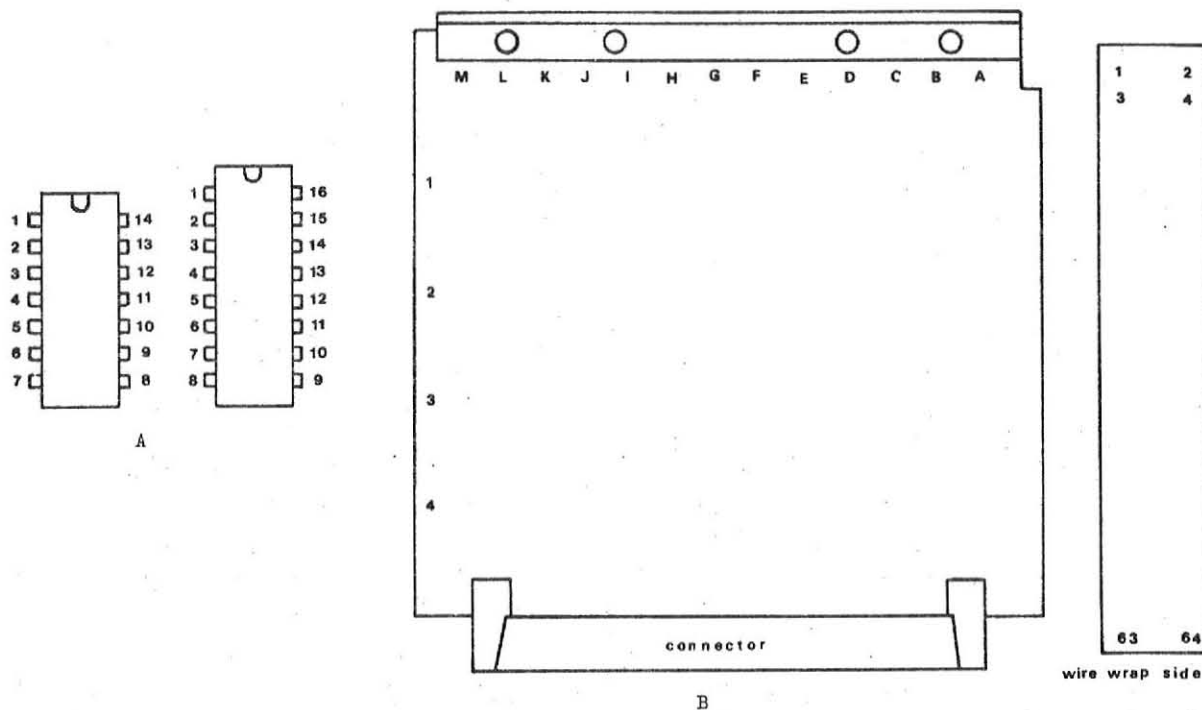


Figure 4-1

1.2 LOGIC SYMBOLS

A00 - SN 7400
A03 - SN 74132
A04 - SN 7410
A06 - SN 7420
A07 - SN 7413
A08 - SN 7430
A10 - SN 7403
A11 - SN 7438
A12 - SN 74400
A18 - SN 7408
A24 - SN 74401

AL400 - SN 7483
AL404 - SN 7482

AMPO1 - μ A 723
AMPO2 - μ A 741-TBA 221
AMPO5 - μ A 710
AMPO6 - μ A 711
AMPO7 - μ A 733

CNT00 - SN 74197
CNT01 - SN 74191

DOO - SN 7474
DO1 - SN 7475

EOR00 - SN 7486
LATO1 - 74279
NOO - 7404

NO1 - SN 7405
NO2 - SN 7416
NO3 - SN 7414

OS00 - SN 74123
OS01 - SN 74121

REC07 - SM 1414

OQ 651 N2
OQ 652 N2
OQ 653 N1

SN 75452

TBA 2218

μ A 760

AO	AREA AROUND EVEN TRACK	E0CC	END OF CLEANING CYCLE
A12	AREA BETWEEN ODD AND EVEN TRACK	EP	END OF POSITIONING
ABO THR 7	ADDRESS AND CONTROL BUS BITS 0 THR 7	EPM	ENERGISE PACK MOTOR
AM	ADDRESS MARKER	EPZO	RESET EP
ANER	ANALOGUE ERROR	EPZ1	SET EP
ANOF	ANALOGIC OFF-SET	EPZD	END OF POSITIONING
AOP	AREA AROUND EVEN TRACK PULSE	ER	ERASE ENABLE
AT	ATTENTION	ERC	ERASE CURRENT
		ERE	ERASE ENABLE COMMAND
BIR	BRUSH IN RETRACTED	ESC	END OF STOP CYCLE
BIRA	CLEANING BRUSH IN RETRACTED ACTIVE	ESSC	END OF START/STOP CYCLE
BIRN	CLEANING BRUSH IN RETRACTED NOT ACTIVE	ETP	EVEN TRACK PULSE
BPDA	BLOCKADE POSITIONER DRIFTS AWAY	EWEC	ERASE AND/OR WRITE COMMAND
BWC	BLOCKADE WITH CURRENT	EXC	EXCHANGE CARTRIDGE
CA	CLEANING CYCLE ALLOWED	FNE	FIRST SEEK NORMAL END
CAO THR 7	CYLINDER ADDRESS REGISTER BITS 0 THR 7	FNEZO	RESET FNE
CAE	CYLINDER ADDRESS REGISTER EXTENDED	FENZ1	SET FNE
CAS	CYLINDER ADDRESS SELECT	FSF	FIRST SEEK
CCEXC	CONTROL COMMON EXCHANGE CARTRIDGE		
CDF3	CARRY DIFFERENCE BIT 3	HO	HEAD REGISTER BIT 0
CDF7	CARRY DIFFERENCE BIT 7	H1	HEAD REGISTER BIT 1
CDFE	CARRY DIFFERENCE EXTENDED		
CDS	CHECK DISK SPEED		
CHE		HS	HEAD SELECT
CFUD			
CID	CARRIAGE IN PACK	IC1	INDEX CARTRIDGE 1
CL	CLAMP LOCK ENERGIZED	IC2	INDEX CARTRIDGE 2
CME	CLEANING MOTOR ENERGIZED	IF1	INDEX FIXED DISK 1
CMEZO	RESET CME	IF2	INDEX FIXED DISK 2
CMEZ1	SET CME	IFX	INDEX FIXED DISK
CON	ON CYLINDER	INS	INITIATE NORMAL SEEK
CONG	ON CYLINDER	IO	INTEGRATOR OUT
COSX	COSINE X MEANDER SIGNAL	IPC	INDEX PULSE CARTRIDGE
CP	CURRENT POSITIONER	IPCP	INDEX PULSE CARTRIDGE PREPARATION
CRE	CYLINDER REGISTER EXTENDED BIT	IPF	INDEX PULSE FIXED DISK
CROTHR7	CYLINDER REGISTER BIT 0 THR 7	IPFP	INDEX PULSE FIXED DISK PREPARATION
CS	CYLINDER SELECT COMMAND	IRDC	INTERNAL READ CLOCK
CTS	CONTROL SELECT COMMAND	IS	INITIATE A SEEK
CUAS		ISPC	INDEX SECTOR PULSE CARTRIDGE
		ISPF	INDEX SECTOR PULSE FIXED DISK
DCO THR 7	DECREMENT COUNTER BITS 0 THR 7	IW	INITIAL WAIT
DCOD THR 70	DECREMENT COUNTER BIT 0 DECREMENTED	IWZ1	SET IW
	DECREMENT COUNTER BIT 7 DECREMENTED		
DCE	DECREMENT COUNTER EXTENDED BIT	LED	
DCEE	DECREMENT COUNTER EXTENDED BIT TO ELECTRONIC PART	LHC	LOWER HEAD CARTRIDGE
		LHF	LOWER HEAD FIXED DISK
DCP	DECREMENT COUNTER PREPARATION		
DE	DECELERATE	MAD	MAXIMUM AT DA-CONVERTER
DEB	DE-ENERGIZE EMERGENCY BRAKE	MC	MASTER CLEAR
DEO	DECREMENT COUNTER EQUAL ONE	MNC	MECHANICAL ON CYLINDER
DETON	DETECT TRACK ONE NEGATIVE	MOD	MECHANICAL ON CYLINDER DETECT
DETZO	EXT DETECT TRACK ONE NEGATIVE FLIP-FLOP		
DEZ	DECREMENT COUNTER EQUAL ZERO	NCD	NEGATIVE COSINE X MEANDER SIGNAL
DEZO	RESET DECREMENT COUNTER		DEMODULATED
DFO THR 7	DIFFERENCE BITS 0 THR 7	NOF	NEGATIVE OFF-SET
DFD	DIRECTION IS FORCED FORWARD	NS	NORMAL SEEK
DFPZD	DIRECTION IS FORCED FORWARD	NSD	NEGATIVE SINE X MEANDER SIGNAL DEMODULATED
DFPZO	RESET DFF	NSP	NORMAL SEEK COMMAND PREPARATION
DFPZ1	SET DFF	NSTD	NEGATIVE SPEED TRANSDUCER
DID	DATA IN DANGER	POF	POSITIVE OFF-SET
DIPC	DETECT INDEX PULSE CARTRIDGE R	OPT	OFF-SET SIGNAL
DIPF	DETECT INDEX PULSE FIXED DISK	OPZ	OPTICAL ZERO
DMR	DIFFERENCE BETWEEN MOMENTARY AND REQUIRED SPEED	OPZRW	OPTICAL ZERO
		OTP	ODD TRACK PULSE
DNC	DRIVE NEGATIVE CURRENT	OWE	ONLY WRITE
DOF	DECREMENT ONE STEP FORCED		
DPC	DRIVE POSITIVE CURRENT	PAT	PREPARATION ATTENTION
DPN	DE-ENERGIZE PACK MOTOR	PATT	PREPARATION ATTENTION TRIGGER
		PATZO	RESET PAT
DRS	DRIVER SIGNAL	PATZ1	SET PAT
		PCD	POSITIVE COS X MEANDER DEMODULATED
EC	ENABLE COUNT	PDA	POSITION DRIFTS AWAY OR NO MEANDER SIGNAL
EDC	ENABLE DATA TO DECREMENT COUNTER		
EEE	EVEN END POSITION TO ELECTRONIC PART	PEEN	PREPARATION EVEN END POSITION NEXT
		PEXC	PREPARATION EXCHANGE OF CARTRIDGE
EIP	ENABLE INDEX PULSE	PLSL	PLURAL SELECTION
ELER"	ELECTRONIC ERROR (READ/WRITE)	PMD	PACK MOTOR DE-ENERGISED
EMB	EMERGENCY BRAKE	PME	PAK MOTOR ENERGISE

PMZ1	SET PME	TDFB	TEST POINT SIGNAL DFF
POC	POWER ON/OFF CLEAR	TDMR	TEST POINT SIGNAL DMR
POCT	POWER ON/OFF CLEAR TEST	TDRS	TEST DRIVER SIGNAL DRS
PODC	PREPARATION ON CYLI DER	TPS	TEST POSITIONING SERVO
PONO	POSITIONER OVER TRACK ONE NEGATIVE	TPWEV	TEST WRITE ERASE VOLTAGE
PS	POSITIONING SERVO	TRZ	TRACK ZERO
PSD	POSITIVE SINE X MEANDER SIGNAL DEMODULATED	TRSM	TEST RESISTOR DIODE MATRIX
PSTD	POSITIVE SPEED TRANSDUCER	TWSIW	TEST WINDOW SPEED IN WINDOW
RC	READ CONTROL	UHC	UPPER HEAD CARTRIDGE
RD1,2	READ DATA FROM PRE-AMPLIFIER	UHF	UPPER HEAD FIXED DISK
RDDA	READ DATA	UNS	UNSAFE
RDE	READ DATA ENABLE	UNSZ1	SET UNS
RE	READ ENABLE COMMAND	UR	UNIT READY
REDET	RESET DETECT BRACK ONE NEGATIVE FLIP-FLOP	URI	UNIT READY INDICATOR
REPS	RESET END OF POSITION SIGNAL	USA1	UNSAFE 1
RER	RECOVERABLE ERROR	USA2	UNSAFE 2
RERZO	RESET RER	USA3	UNSAFE 3
RERZ1	SET RER	USAF	UNSAFE FLIP-FLOP
RETN	RETRACTED SWITCH NOT ACTIVE	USAZ1	SET USA
REW	READ AND ERASE OR WRITE ENABLE	USL	UNIT SELECT
RP	RETRACTED POSITION	UZO	RESET UNSAFE
RTO	READY TO OPERATE	VPC	VOLTAGE PROPORTIONAL TO CURRENT THROUGH POSITIONER COIL
RUS	RESET UNSAFE	WDRW	WRITE DATA RETURN WIRE
RWC	REDUCE WRITE CURRENT	WOC	WAIT FOR ON CYLINDER MULTIVIBRATOR
RZ	RETURN TO ZERO	WPI	WRITE PROTECT INDICATOR
RZC	RETURN TO ZERO COMMAND	WR	WRITE ENABLE
RZS	RETURN TO ZERO SEEK	WRDA	WRITE DATA
S	START FLIP-FLOP	WRC1	WRITE CURRENT 1
SAL	START ALLOWED	WRC2	WRITE CURRENT 2
SAR	STOPPED AND IN RETRACTED	WRE	WRITE ENABLE COMMAND
SBD	START/STOP BUTTON DOWN	WSIW	TO WINDOW SPEED IN WINDOW
SBP	START/STOP BUTTON PRESSED	WTC	WITHIN TRACK CENTRE
SBU	START/STOP BUTTON UP		
SCX"	SINE X AND COSINE X		
SD	PACK SPEED DROPS DURING NORMAL SEEK		
SDEB	SPEED DROPS OR EMERGENCY BROKE		
SEMB	SET EMB		
SINX	SINE X		
SIW	SPEED IN WINDOW		
SLOW	SLOW		
SM	SLOW MOTION FLIP-FLOP		
SMZ1	SET SLOW MOTION FLIP-FLOP		
SMZD	SLOW MOTION		
SMZH	SLOW MOTION		
SPC	SECTOR PULSE CARTRIDGE		
SPCP	SECTOR PULSE CARTRIDGE PREPARATION		
SPF	SECTOR PULSE FIXED DISK		
SPFP	SECTOR PULSE FIXED DISK PREPARATION		
SR	SLOW REVERSE		
START	START		
STL	SEEK CONTINUES TOO LONG		
SUS	SET UNSAFE		
SZO	RESET START FLIP-FLOP		
TC	TRACK COUNT FLIP-FLOP		
TC01-12	TIME COUNTER BIT 01 TILL BIT 12		
TC08	TIME COUNTER BIT 08		
TC101	TIME COUNTER BITS 10 AND 11		
TC1112	TIME COUNTER BITS 11 AND 12		
TCZ	TRACK CENTRE ZERO		
TCZO	RESET TIME COUNTER		

The diagrams in this section are arranged in the following way:

Fig.	Abbr.	Card	Name	Card location	
4-2	CUP	3L58	Control-Unsafe-Position	6	
4-3	DBC	2M41	Dust-Bin Card	9	
4-4	DC	2L99	Decrement-Counter	5	
4-5	FI	3L54	Fault-Indicator	7	
4-6	IC	2L00	Interface Card	8	
4-7	IC	3L00	Interface Card	8	
4-8	LAT	2M24	Limiter Amplifier Temp.	11	(X1216)
4-9	Meander		Meander Card		
4-10	PA	1A28	Power Amplifier	1	
4-11	RR	2M63	Read-Recovery	10	
4-12	RW	5M03	Read-Write		(X1215)
4-13	RW	6M03	Read-Write		(X1216)
4-14	SE	2M26	Servo-Electronic	3	
4-15	SS	3L57	Start-Stop	2	
4-16	P.C.		Power Card		
4-17	S.C.A.	2L28	Service Card A		
4-18	S.C.B.	2L29	Service Card B		
4-19	D.P.	1M87	Driver Print		

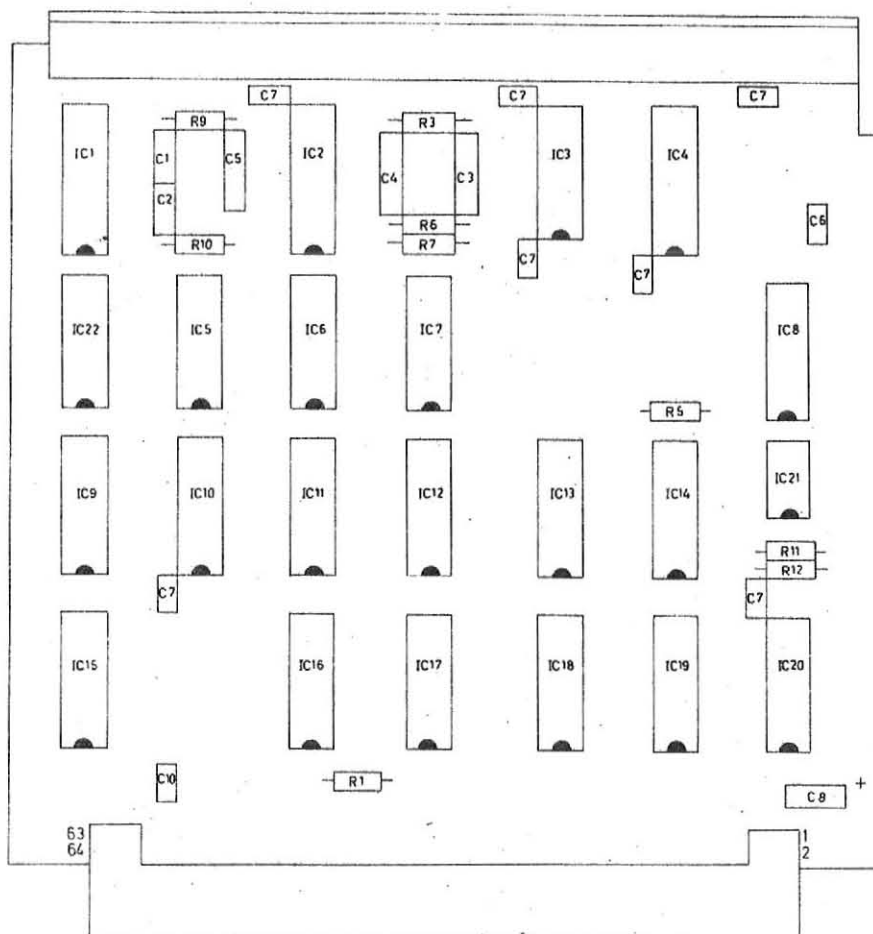
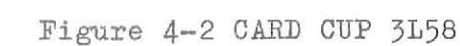


Figure 4-2A CARD CUP 3L58
COMPONENT SURVEY



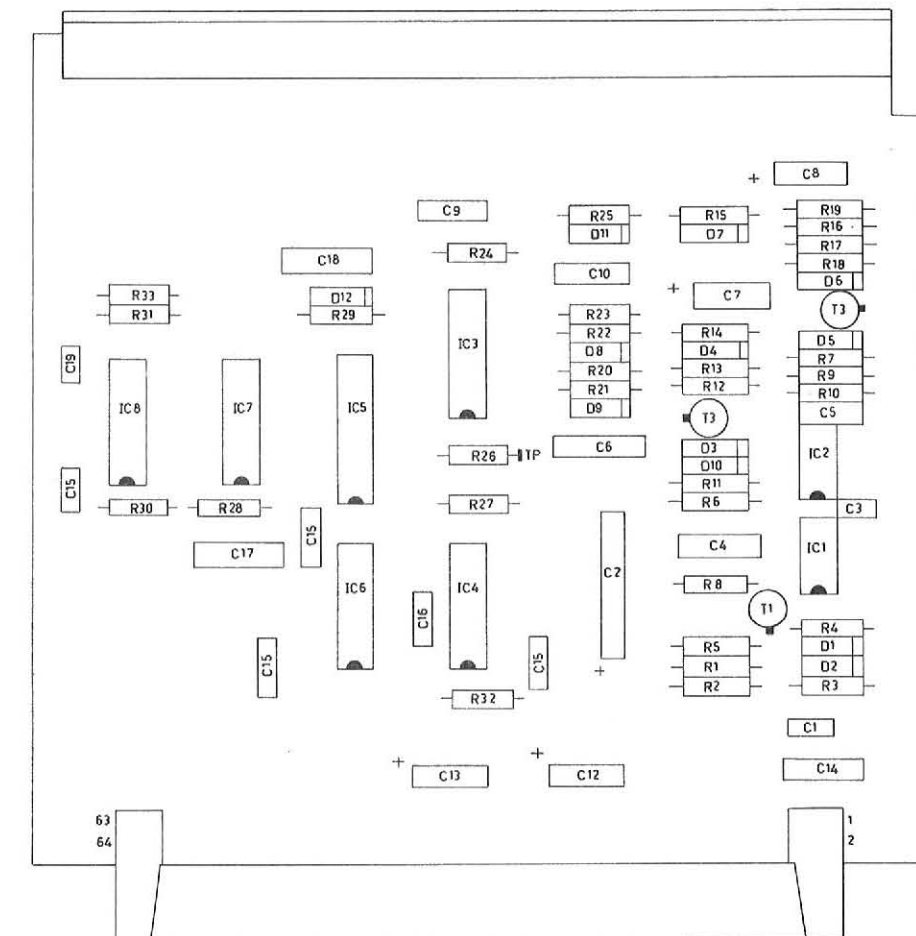


Figure 4-3A CARD DBC 2M41
COMPONENT SURVEY

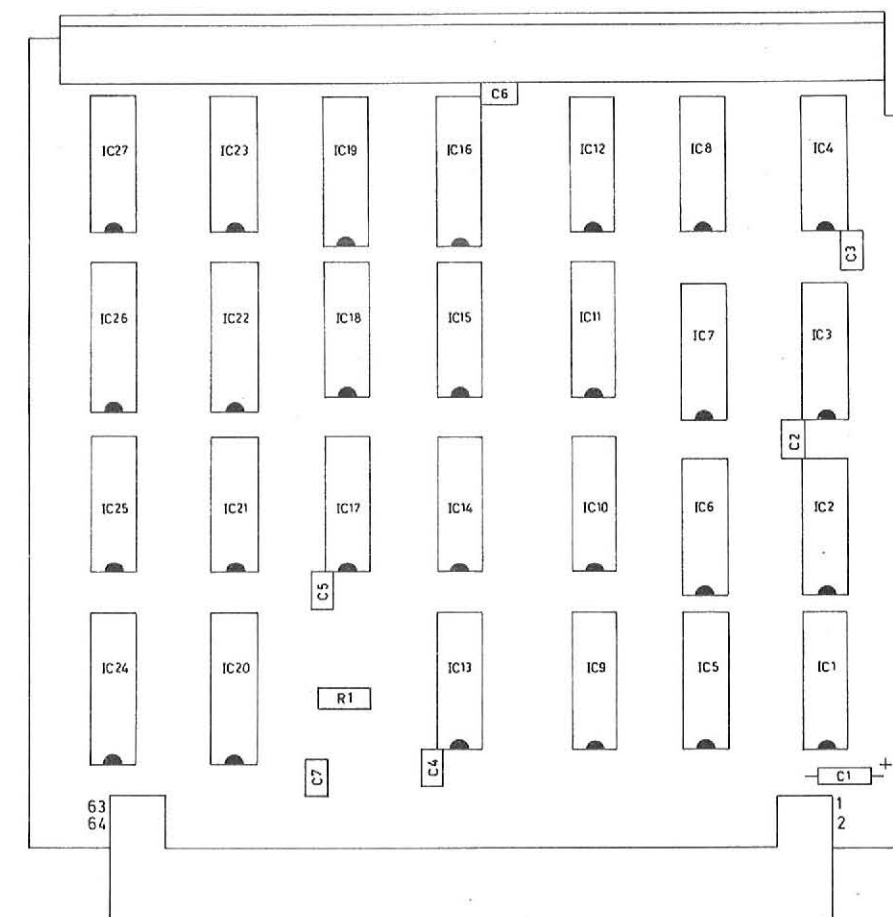


Figure 4-4A CARD D.C. 2L99
COMPONENT SURVEY

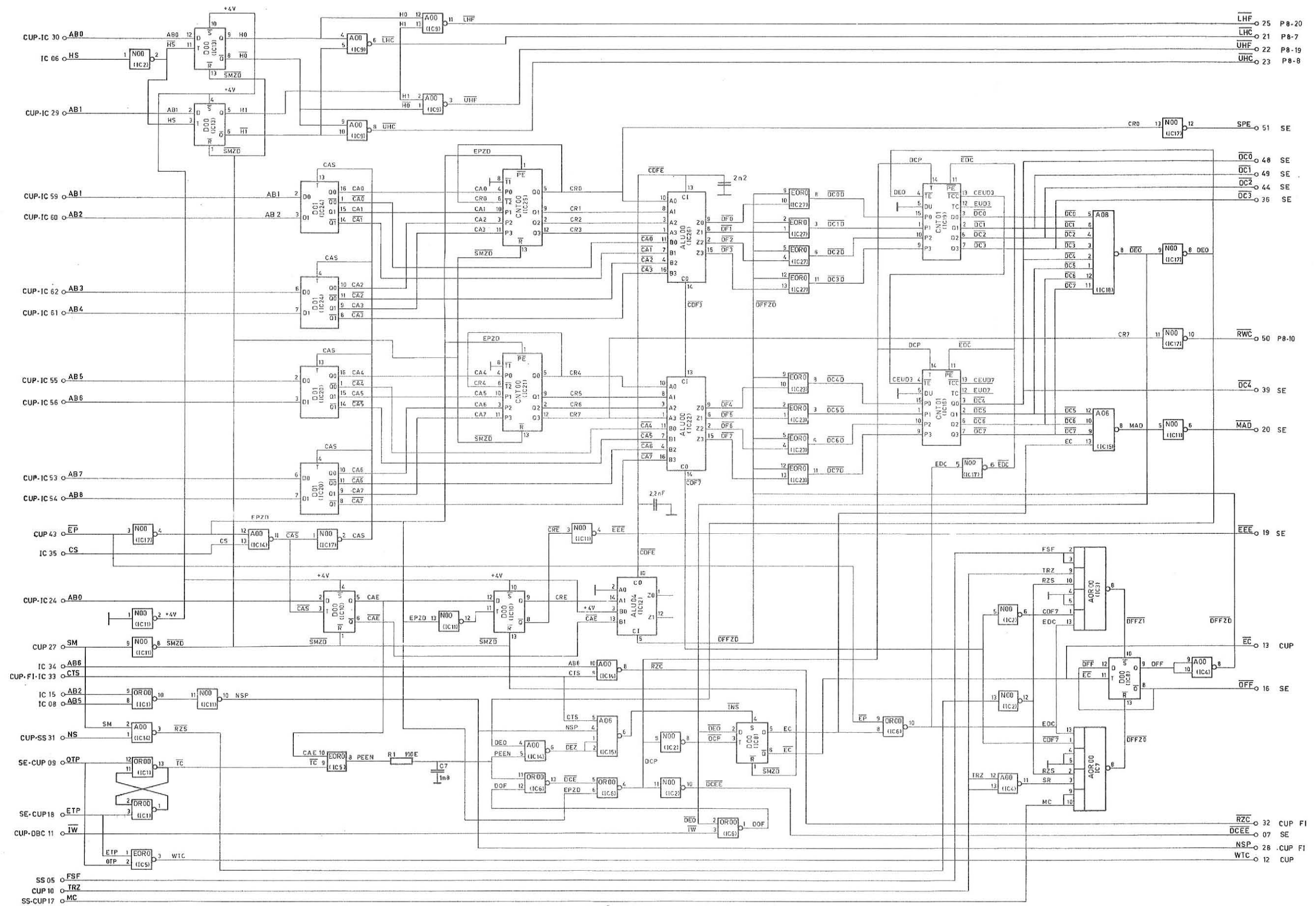


Figure 4-4 CARD D.C. 2L99

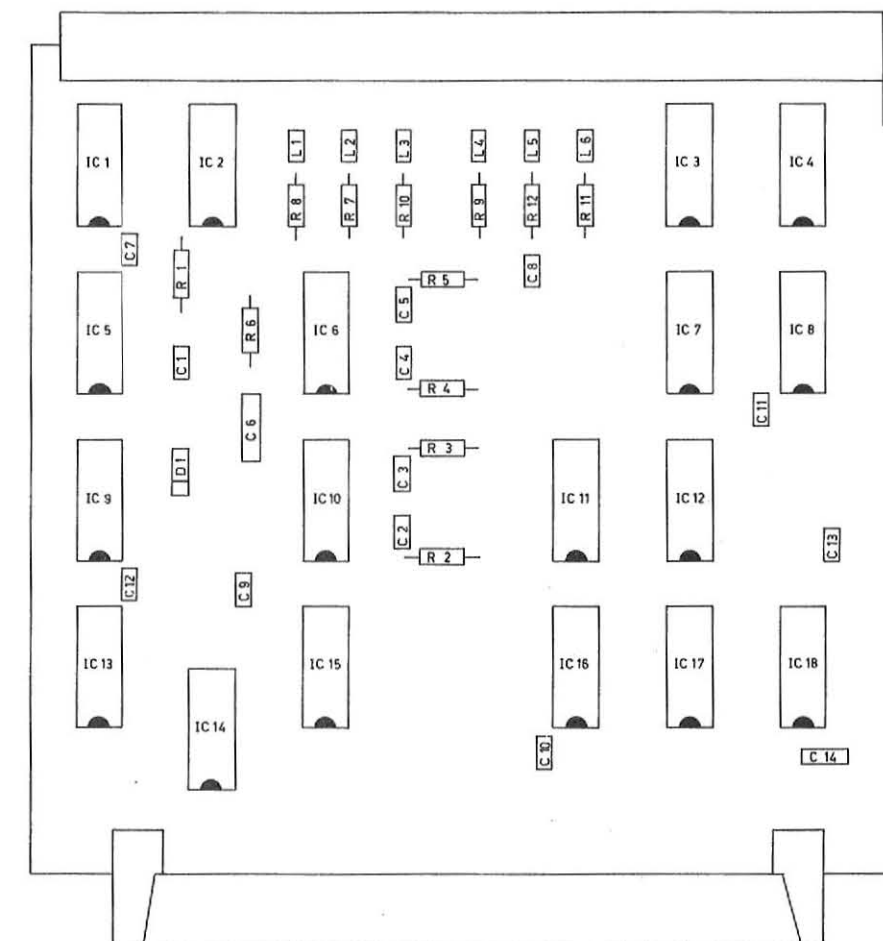


Figure 4-5A CARD FI 3L54
COMPONENT SURVEY

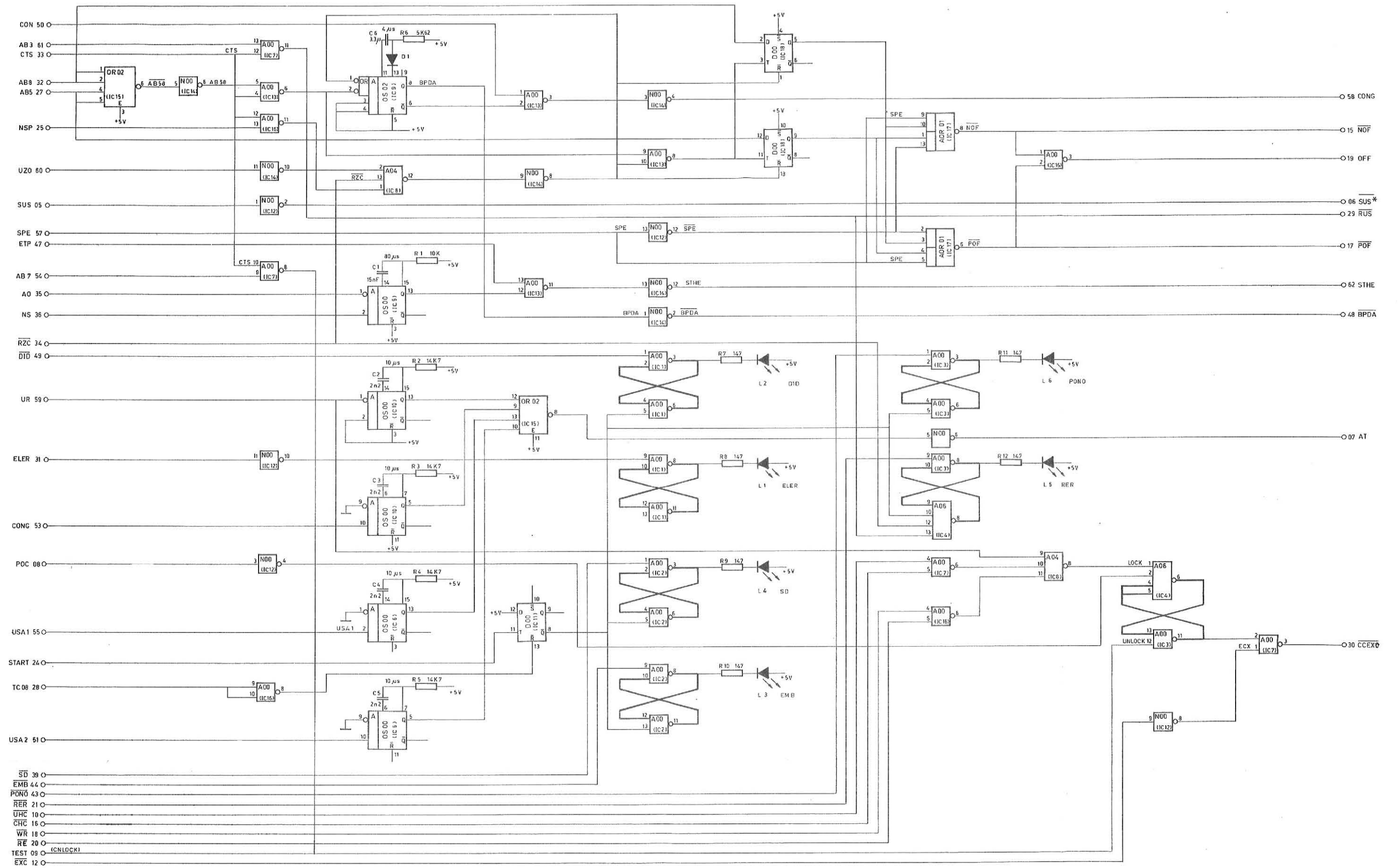


Figure 4-5 CARD FI 3L54

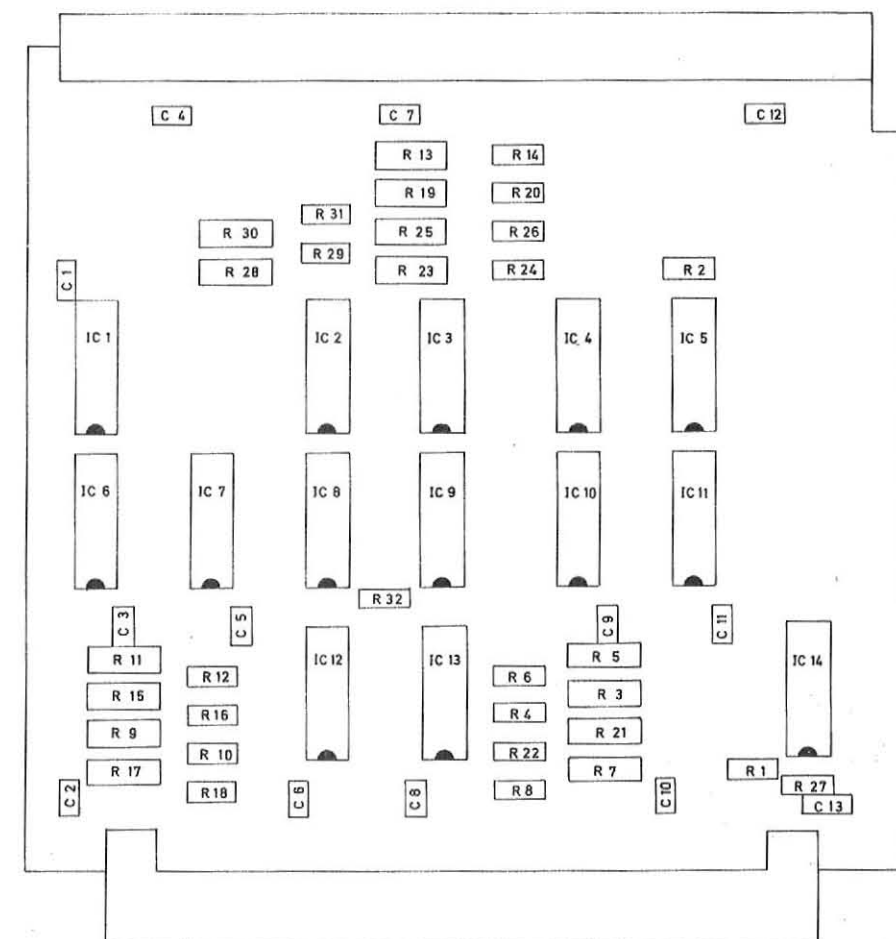


Figure 4-6A CARD IC 2L00
COMPONENT SURVEY

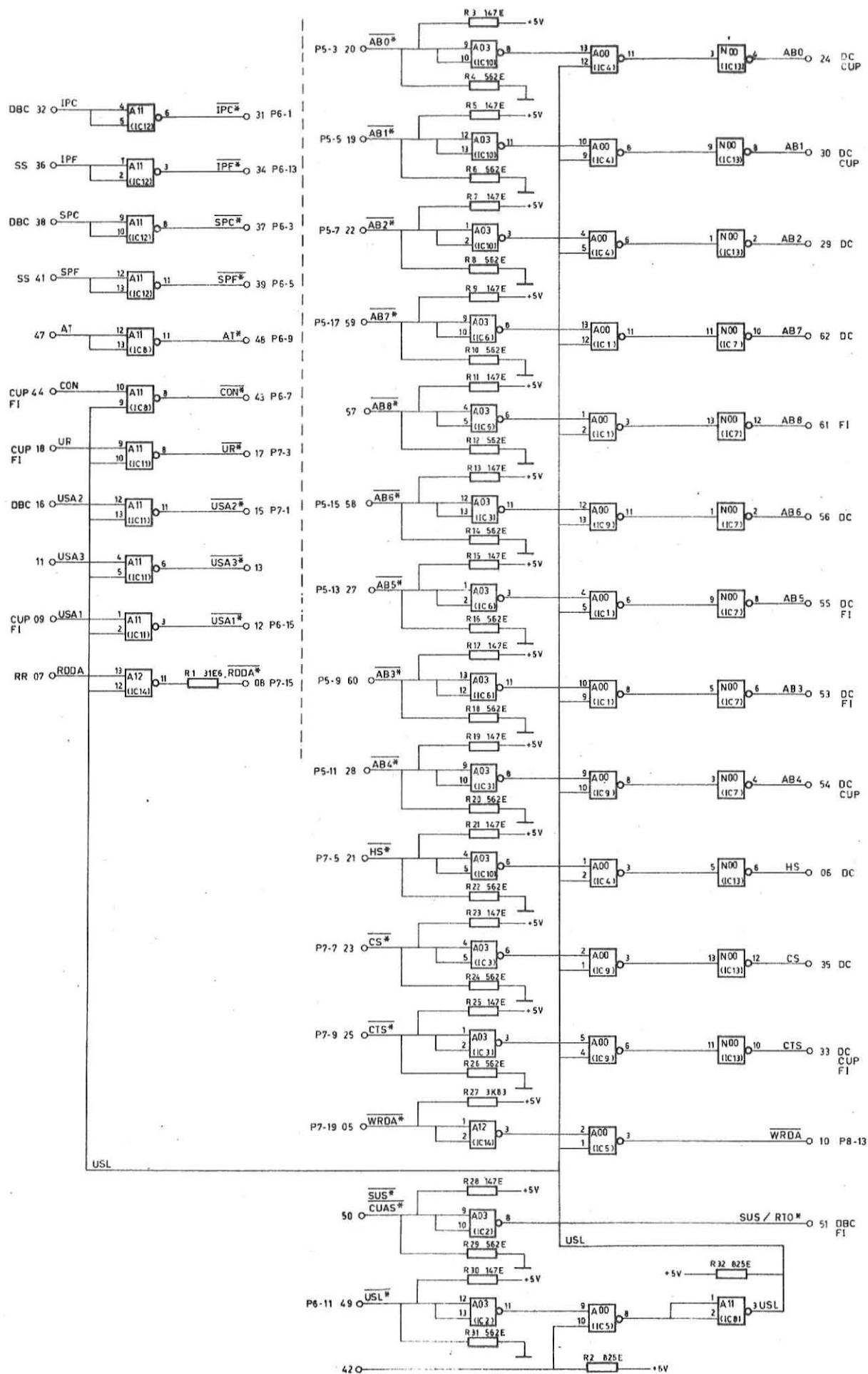


Figure 4-6 CARD IC 2L00

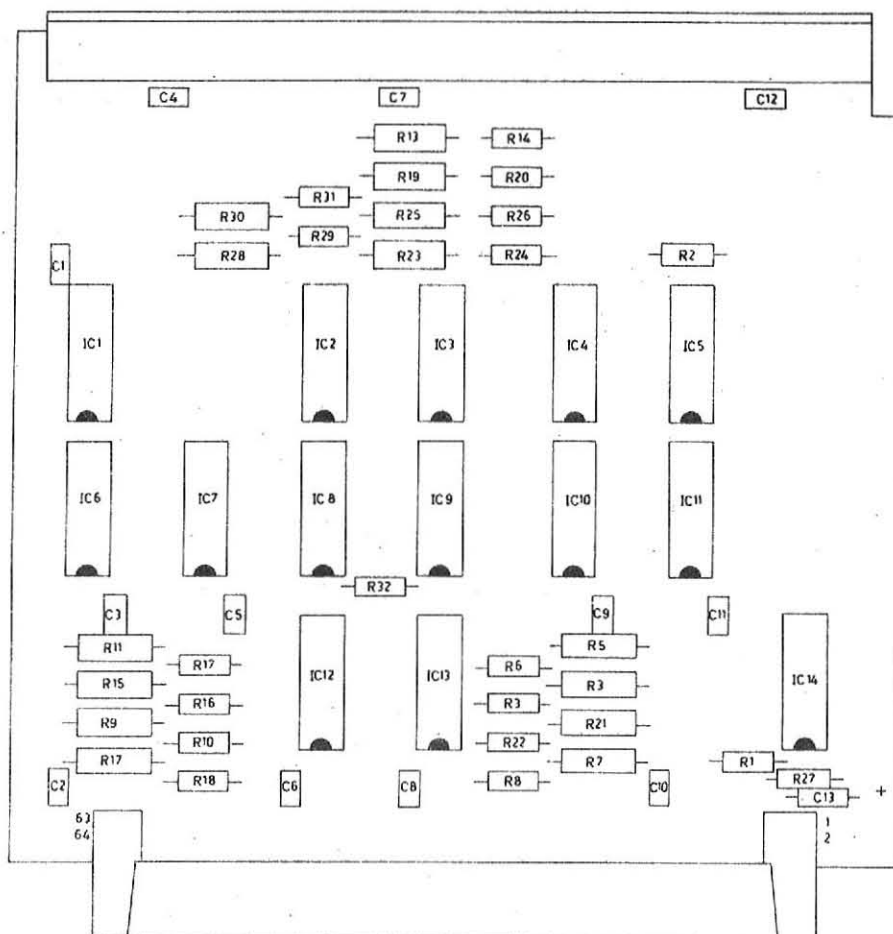


Figure 4-7A CARD IC 3L00
COMPONENT SURVEY

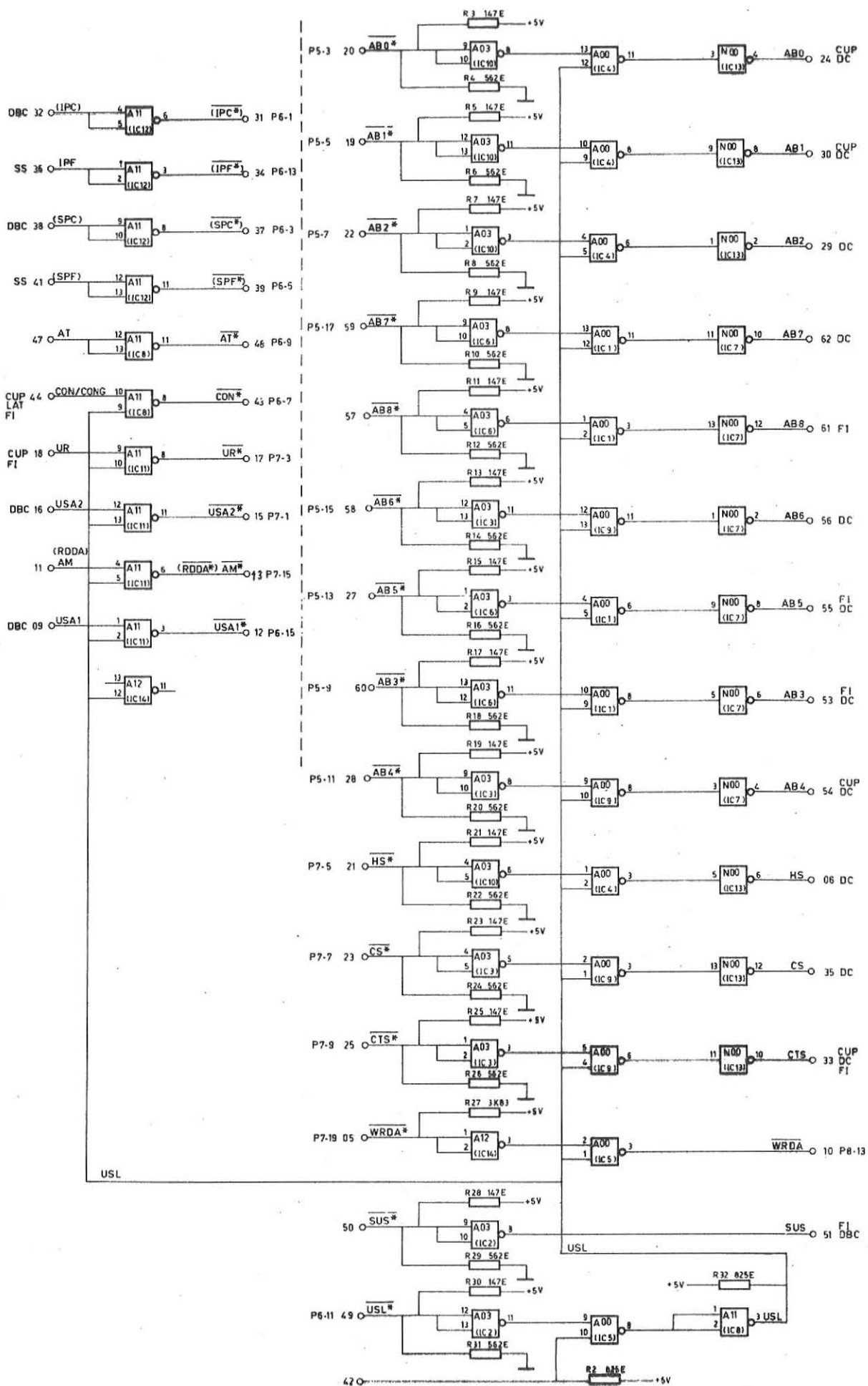


Figure 4-7 CARD IC 3L00

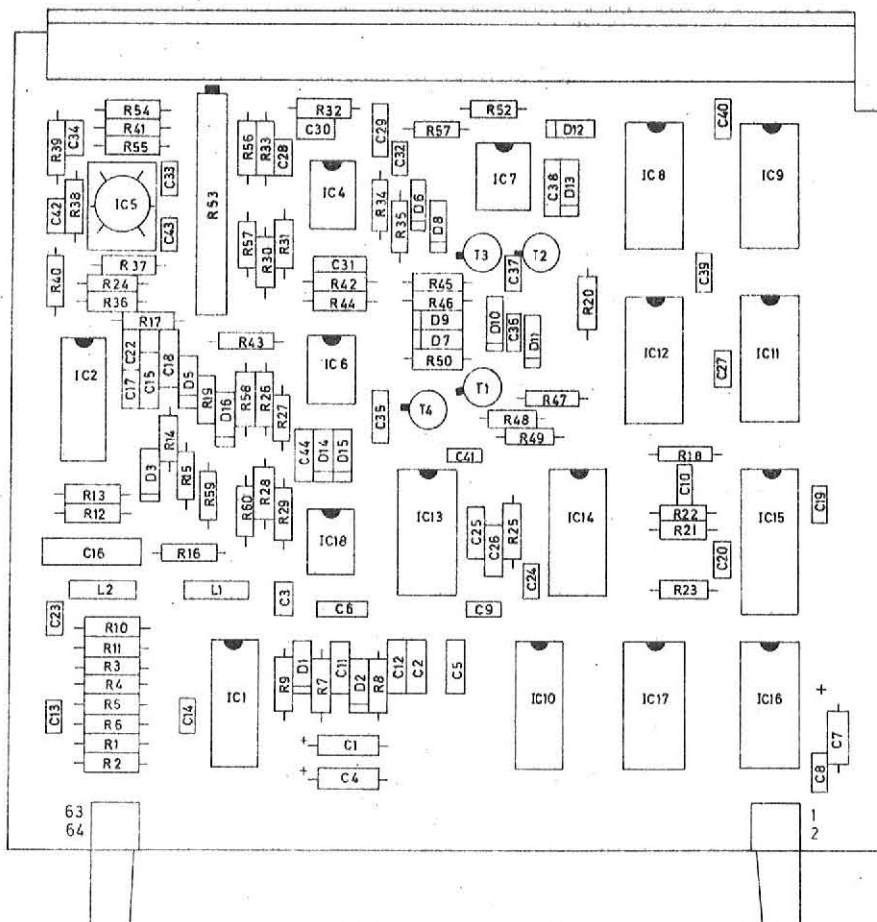


Figure 4-8A CARD LAT 2M24
COMPONENT SURVEY

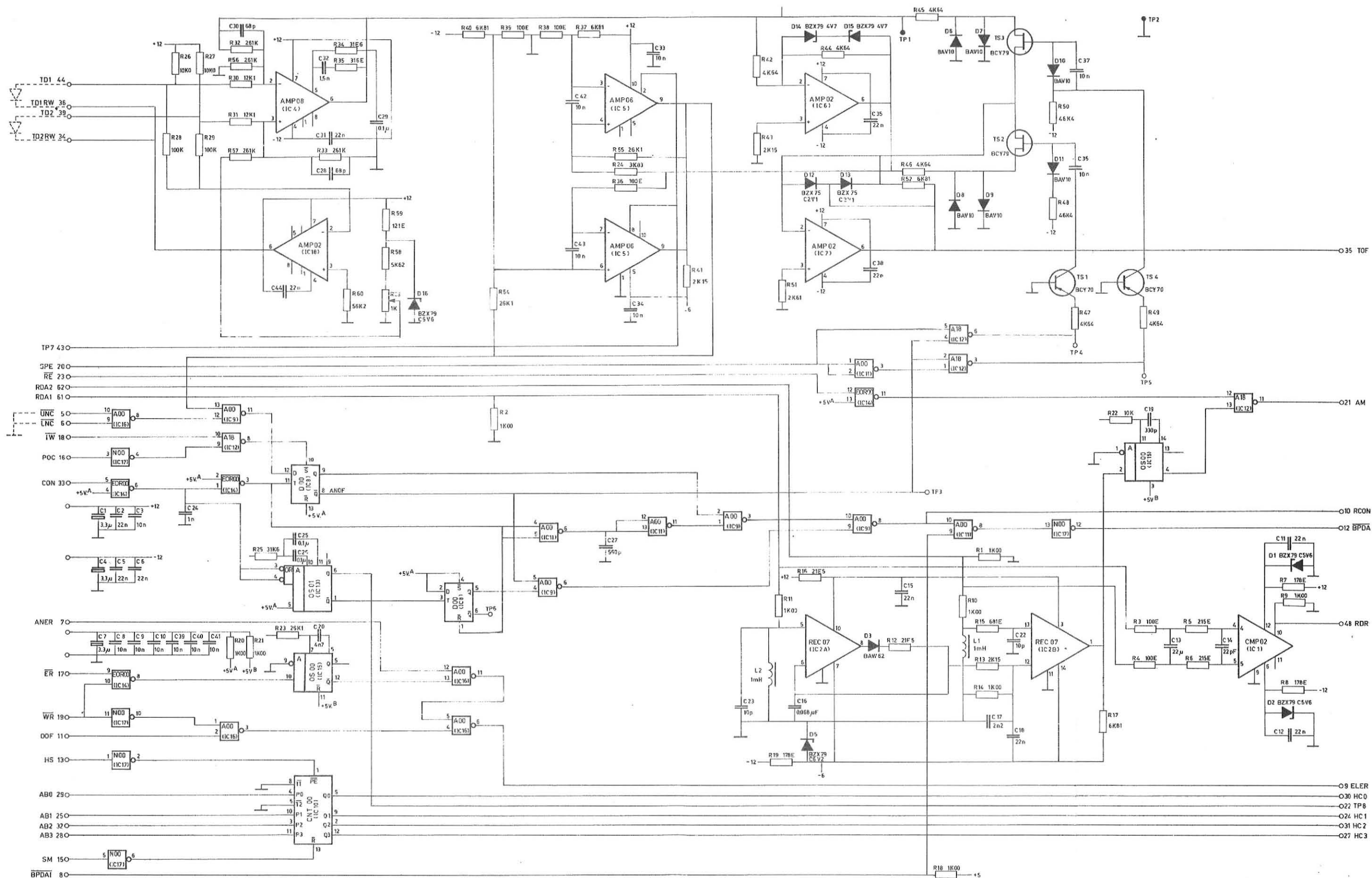


Figure 4-8 CARD LAT 2M24

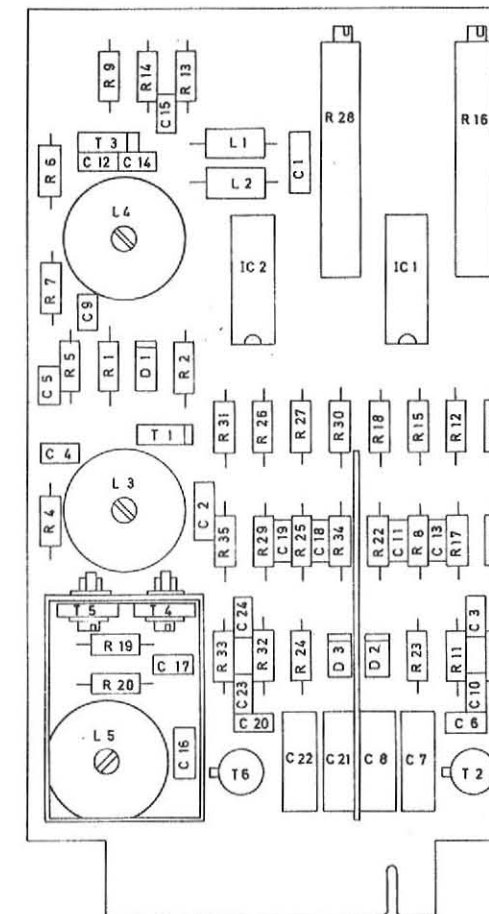


Figure 4-9A CARD MEANDER CARD
COMPONENT SURVEY

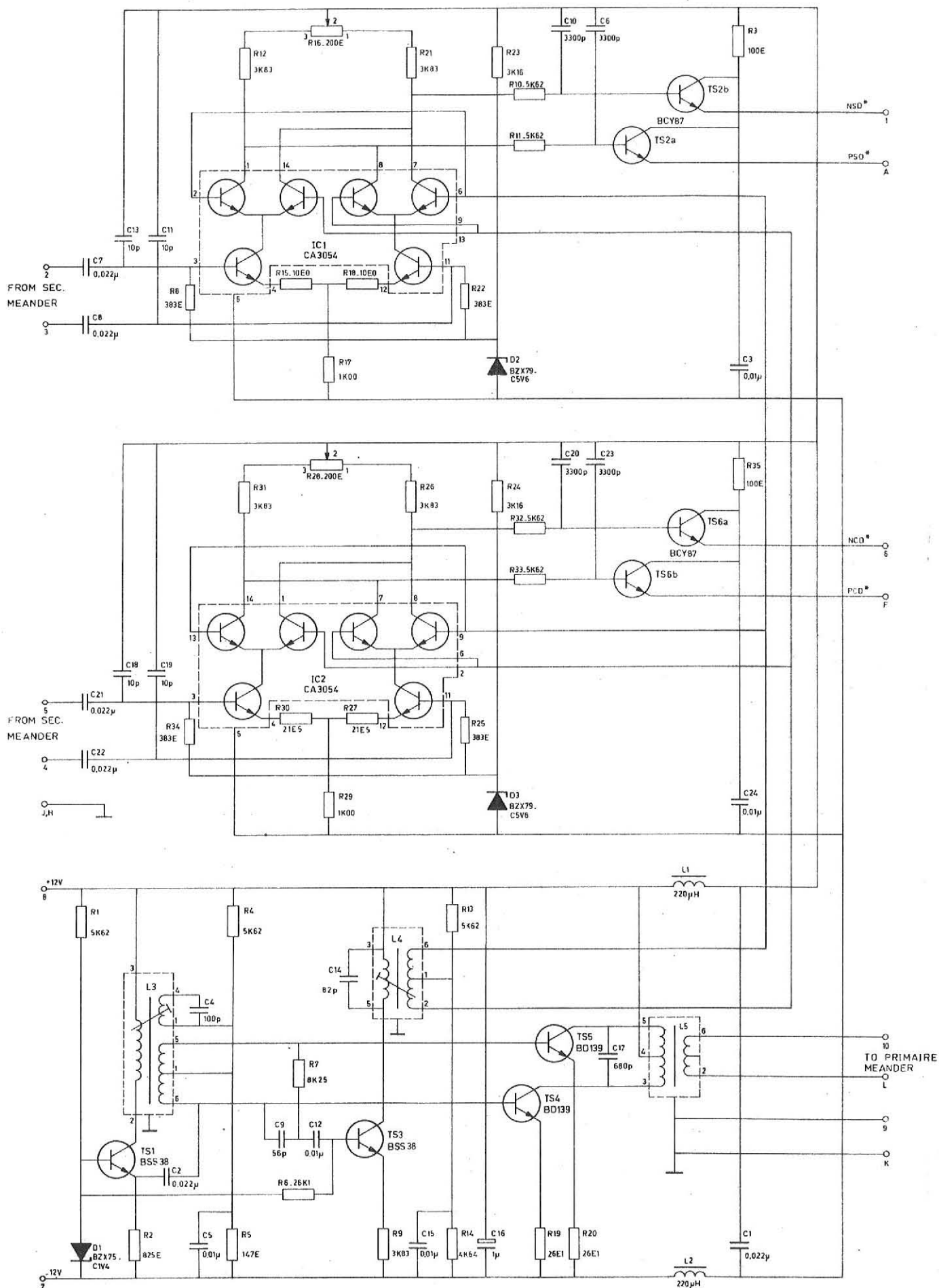


Figure 4-9 CARD MEANDER CARD

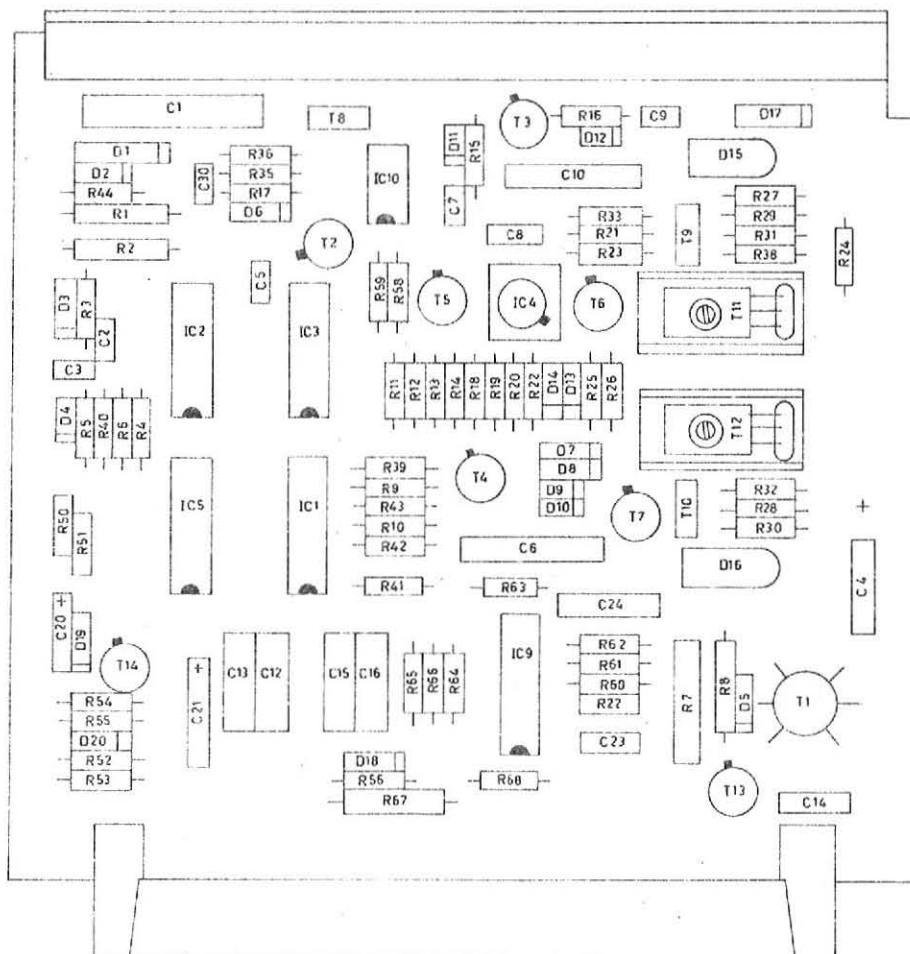


Figure 4-10A CARD PA 1A28
COMPONENT SURVEY

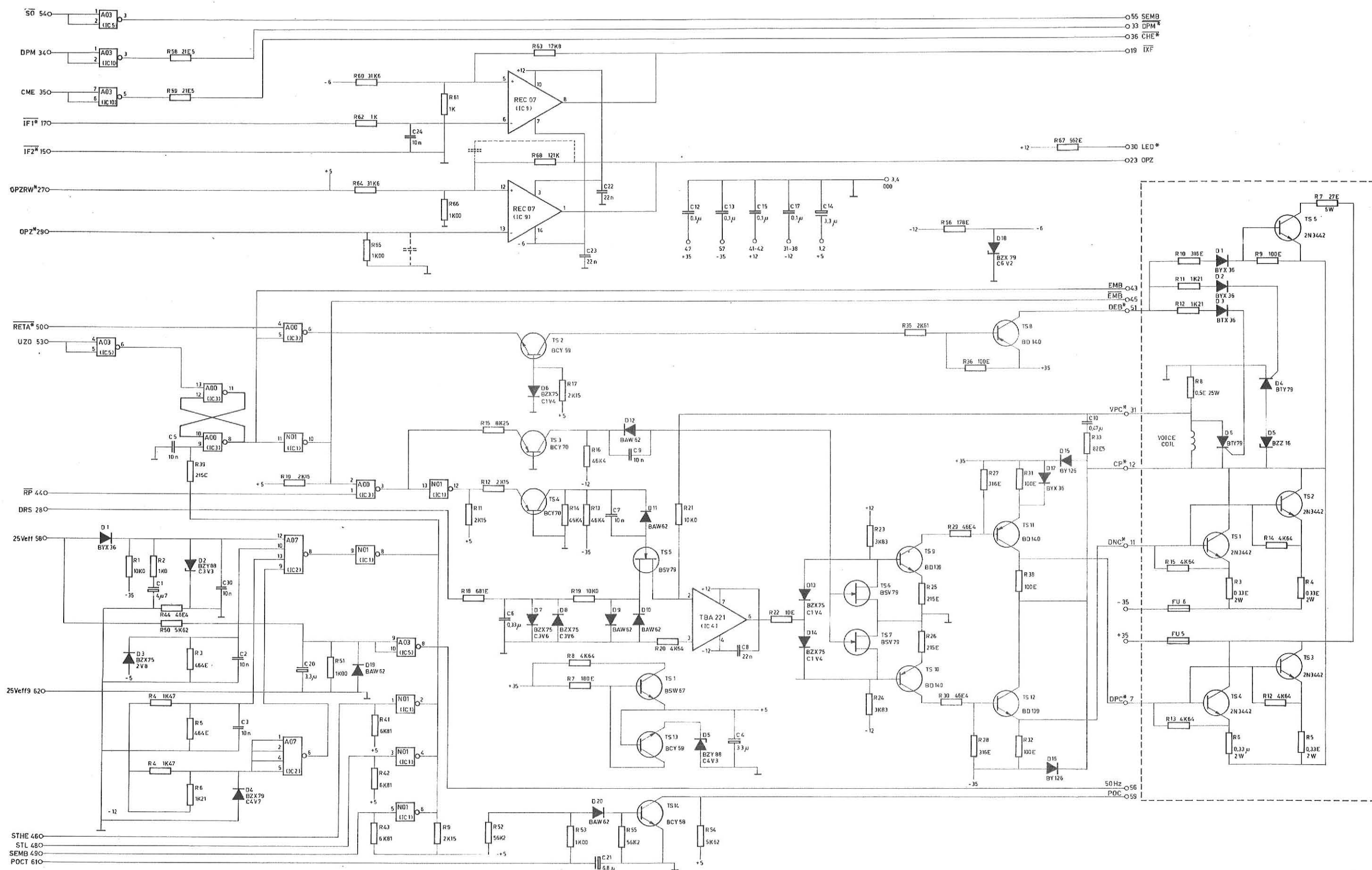


Figure 4-10 CARD PA 1A28

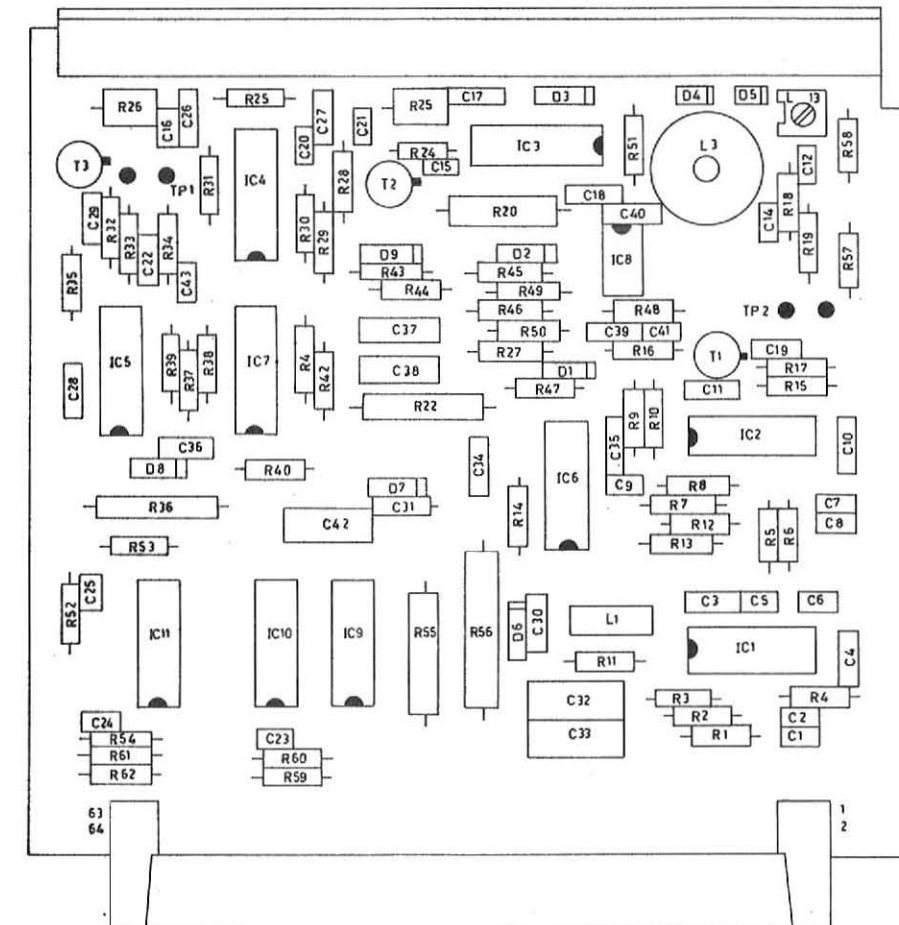


Figure 4-11A CARD R.R 2M63
COMPONENT SURVEY

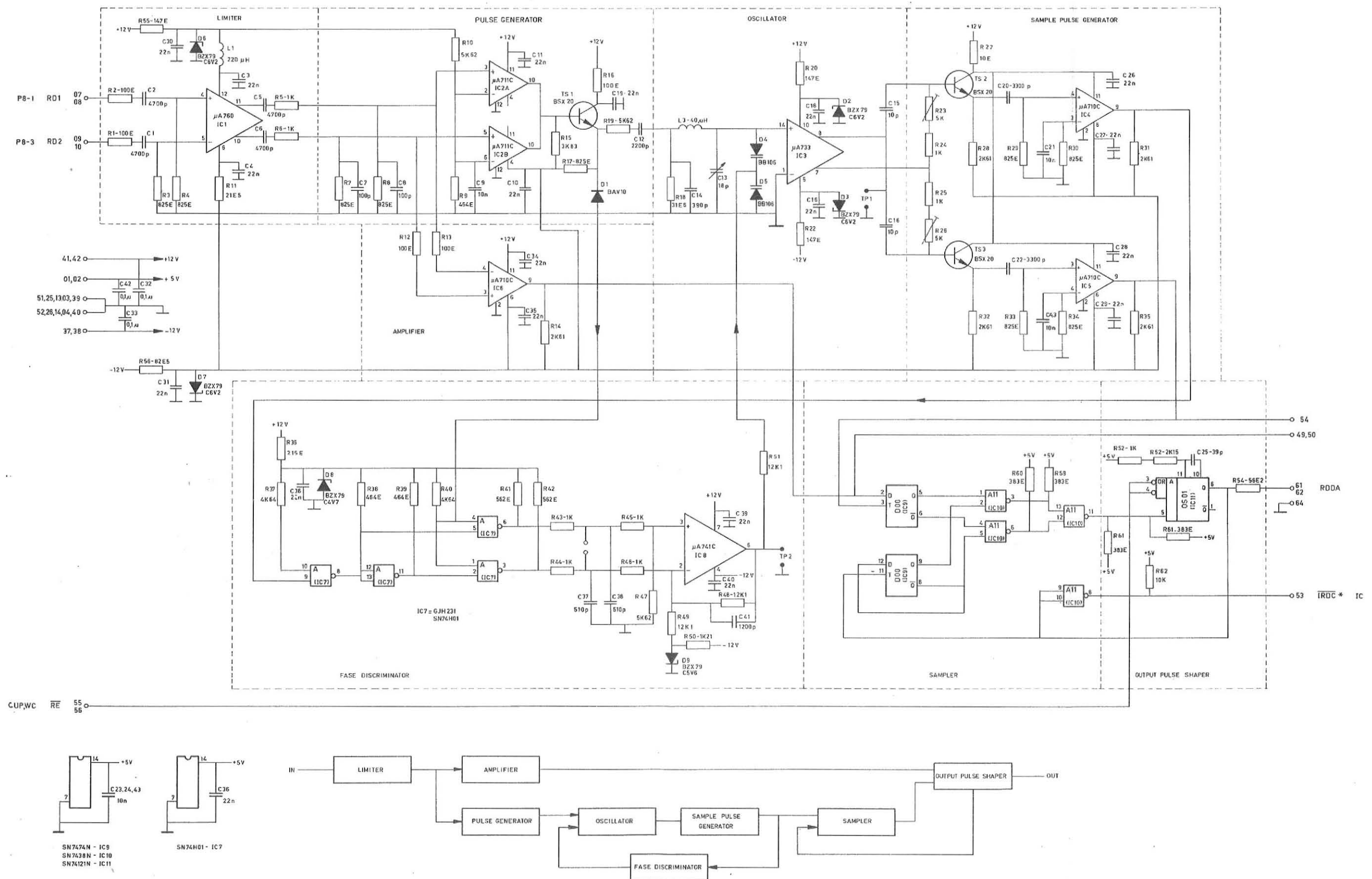


Figure 4-11 CARD R.R. 2M63

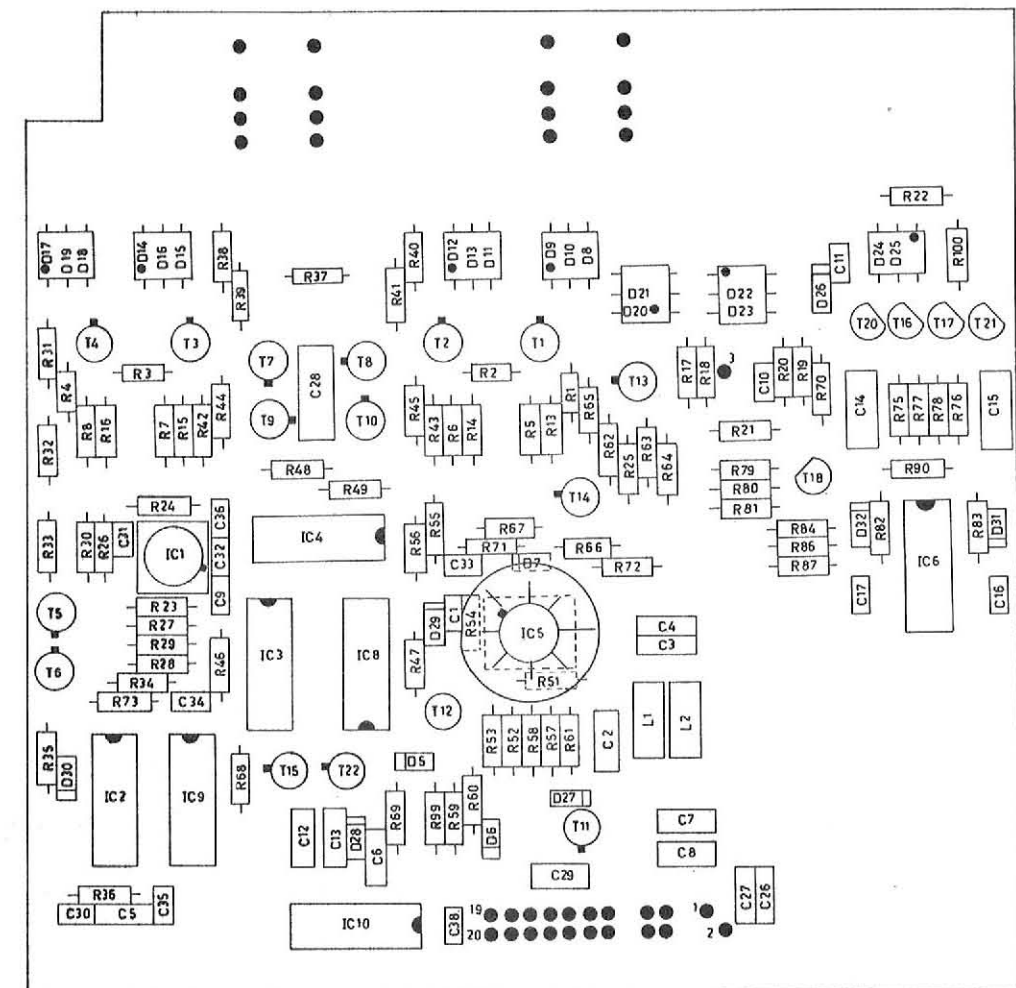


Figure 4-12A CARD R.W 5M03
COMPONENT SURVEY

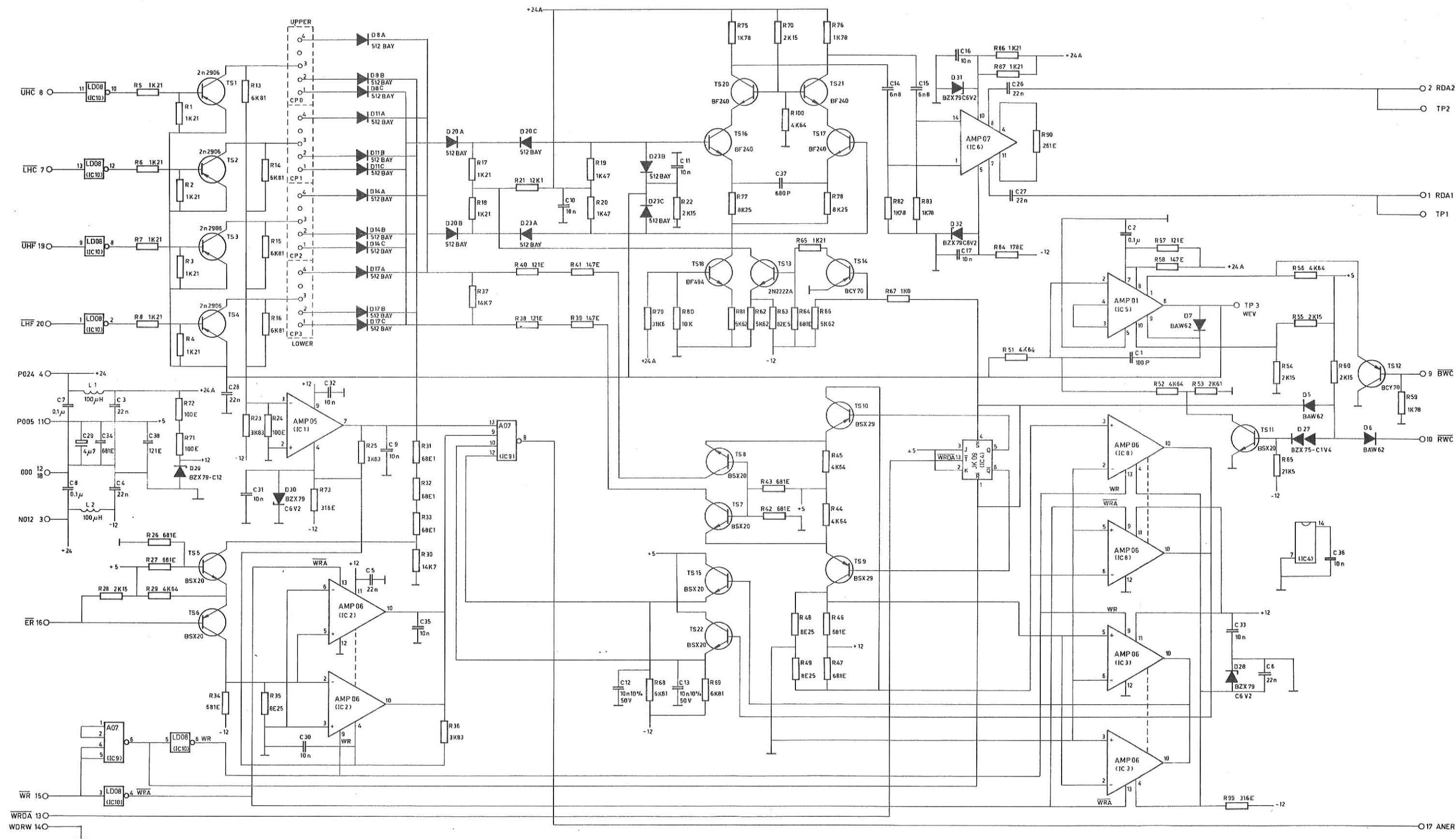


Figure 4-12 CARD R.W. 5M03

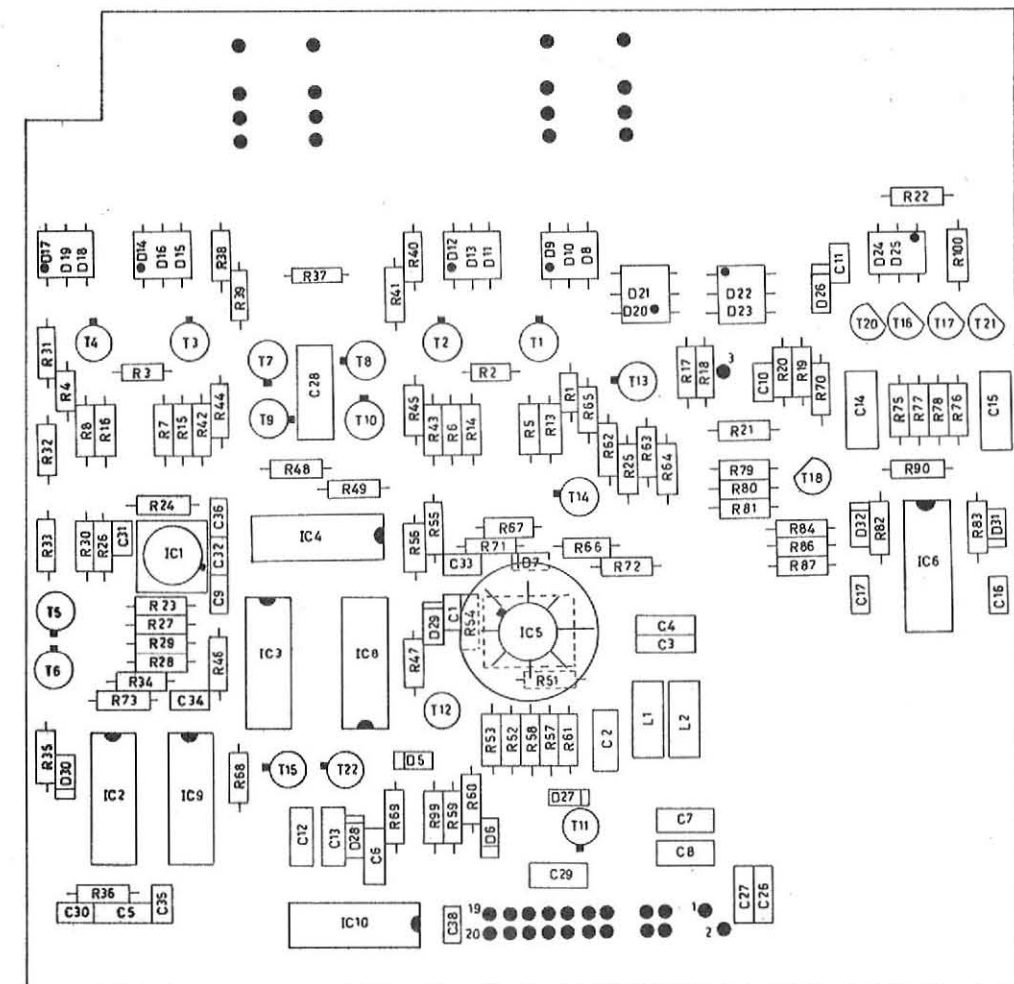


Figure 4-13A CARD R.W 6M03
COMPONENT SURVEY

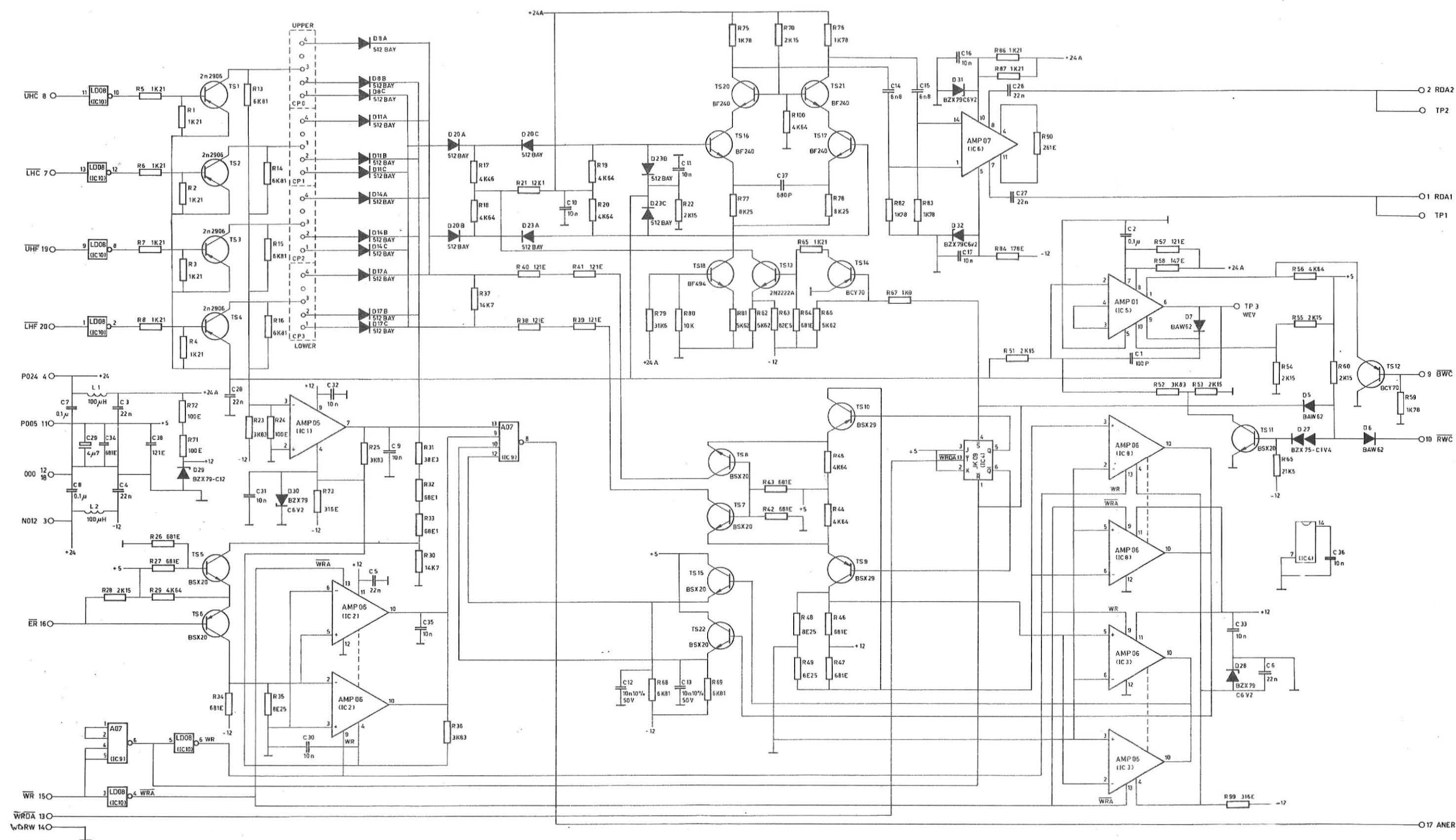


Figure 4-13 CARD R.W. 6M03

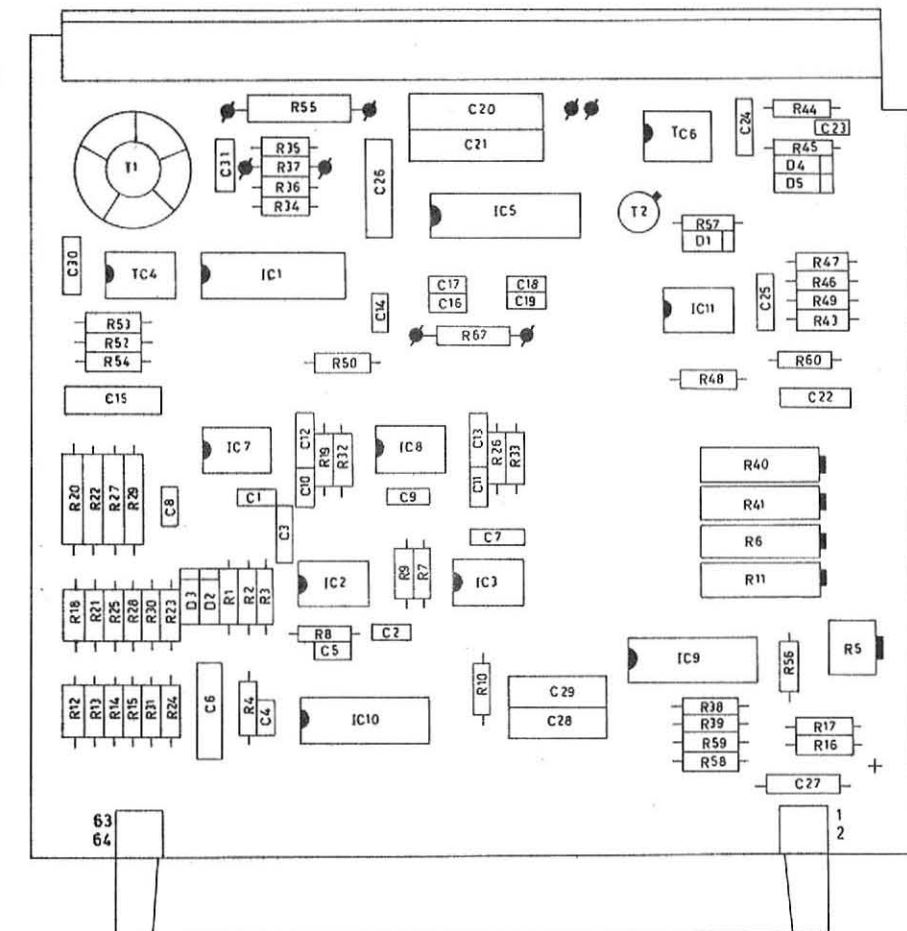


Figure 4-14A CARD S.E. 2M26
COMPONENT SURVEY

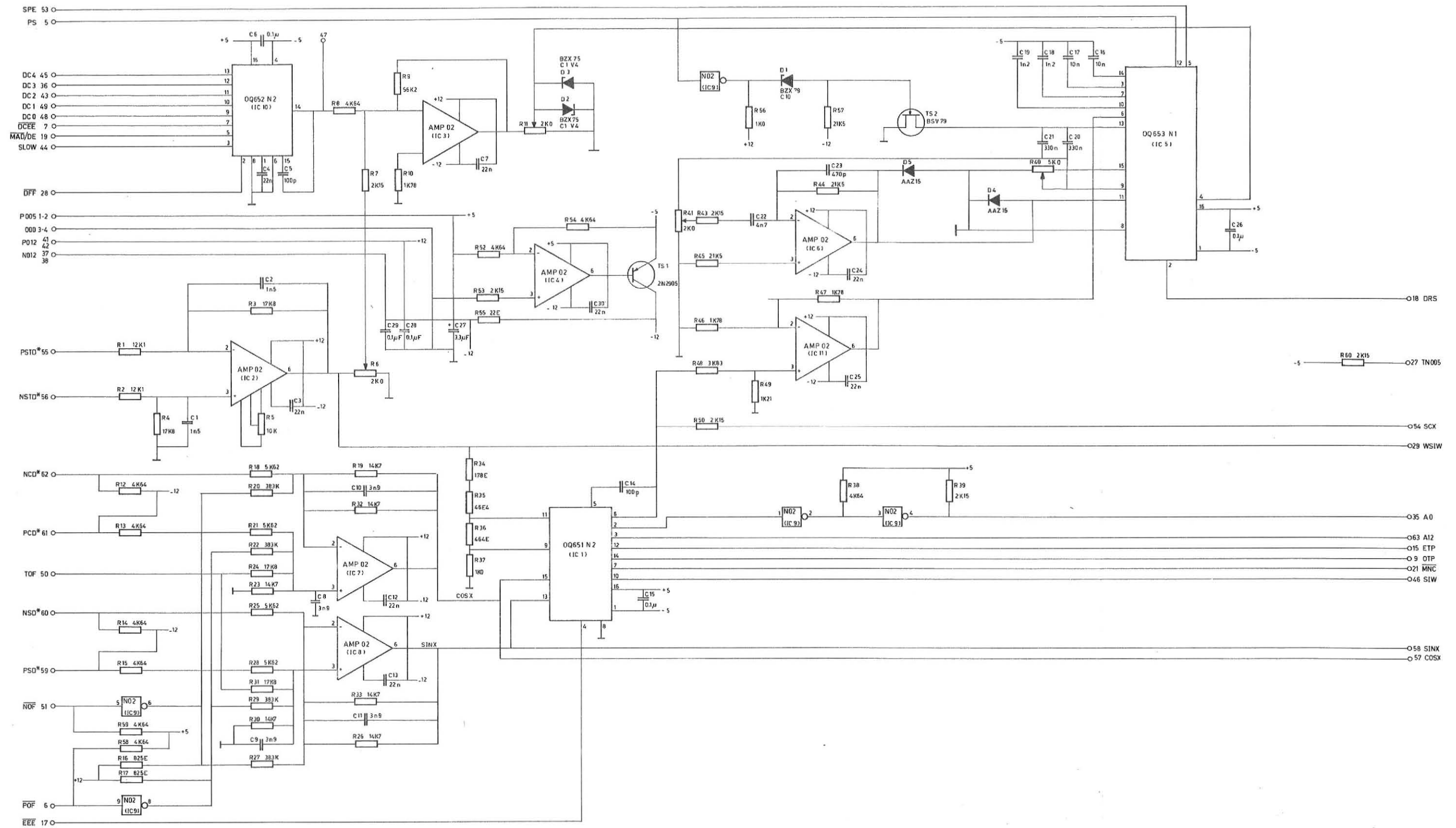


Figure 4-14 CARD S.E. 2M26

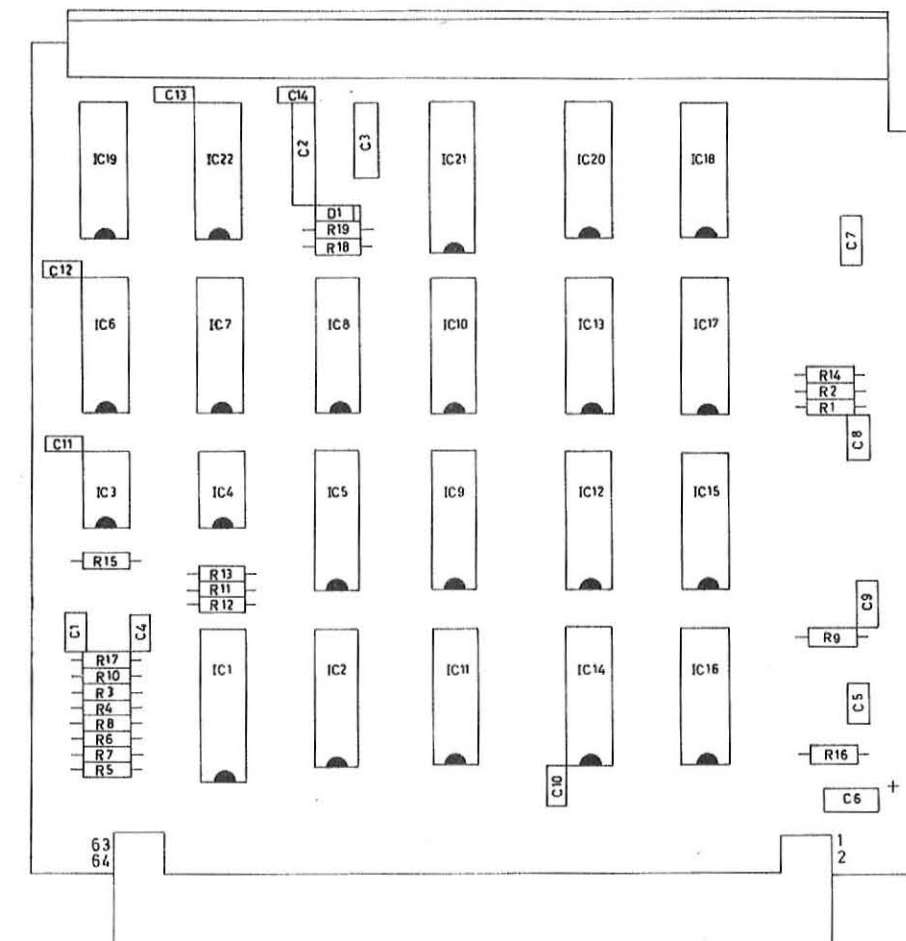


Figure 4-15A CARD S.S. 3L57
COMPONENT SURVEY

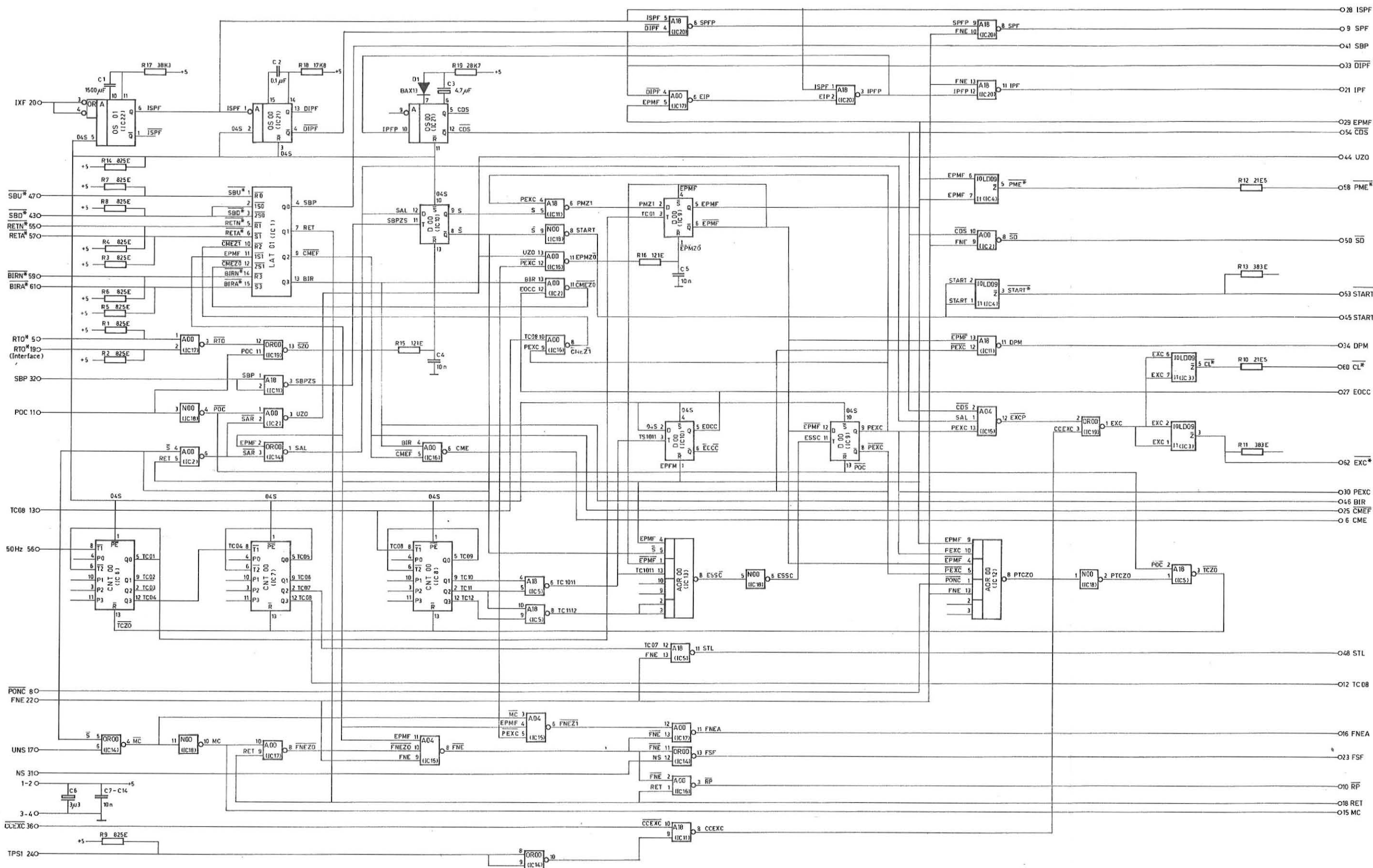


Figure 4-15 CARD S.S. 3157

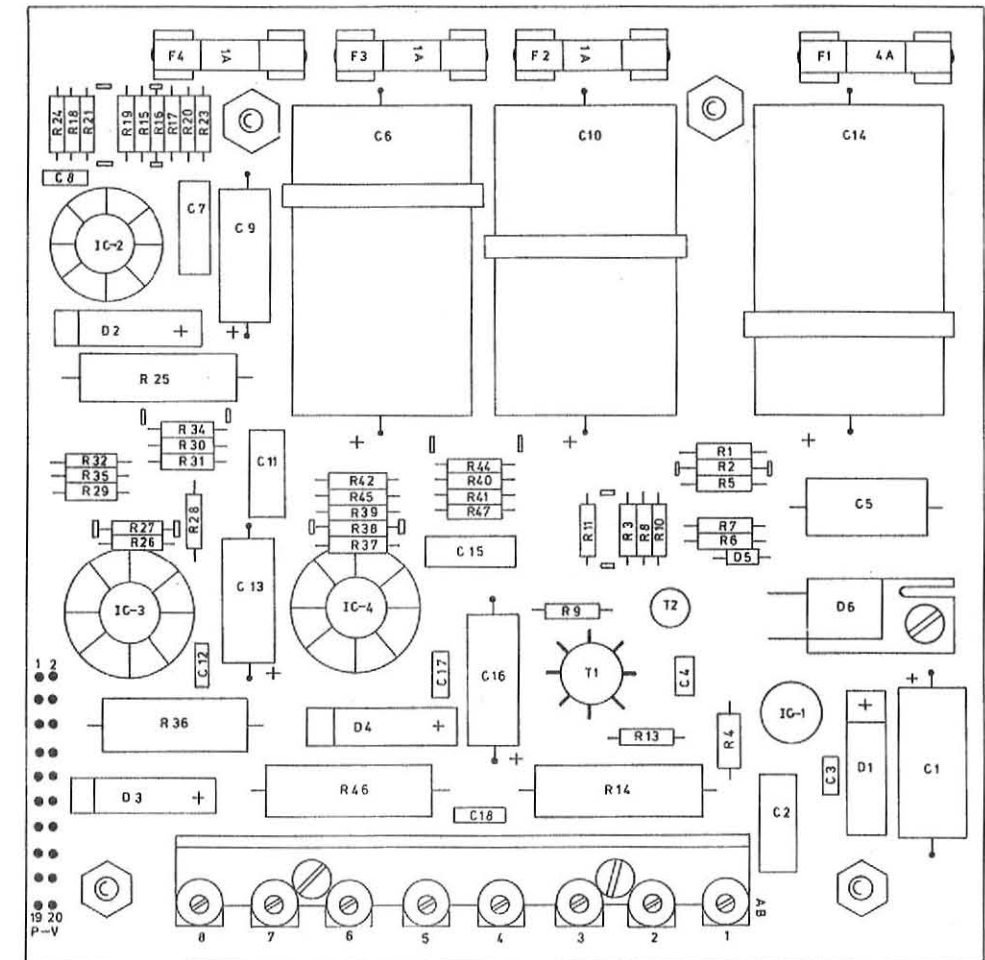


Figure 4-16A CARD POWER CARD
COMPONENT SURVEY

* THE DIODE D5, CAPACITOR C AND TRANSISTORS 2N3442 ARE NOT ON THE PRINT

Ra = 1K78 - 12K1

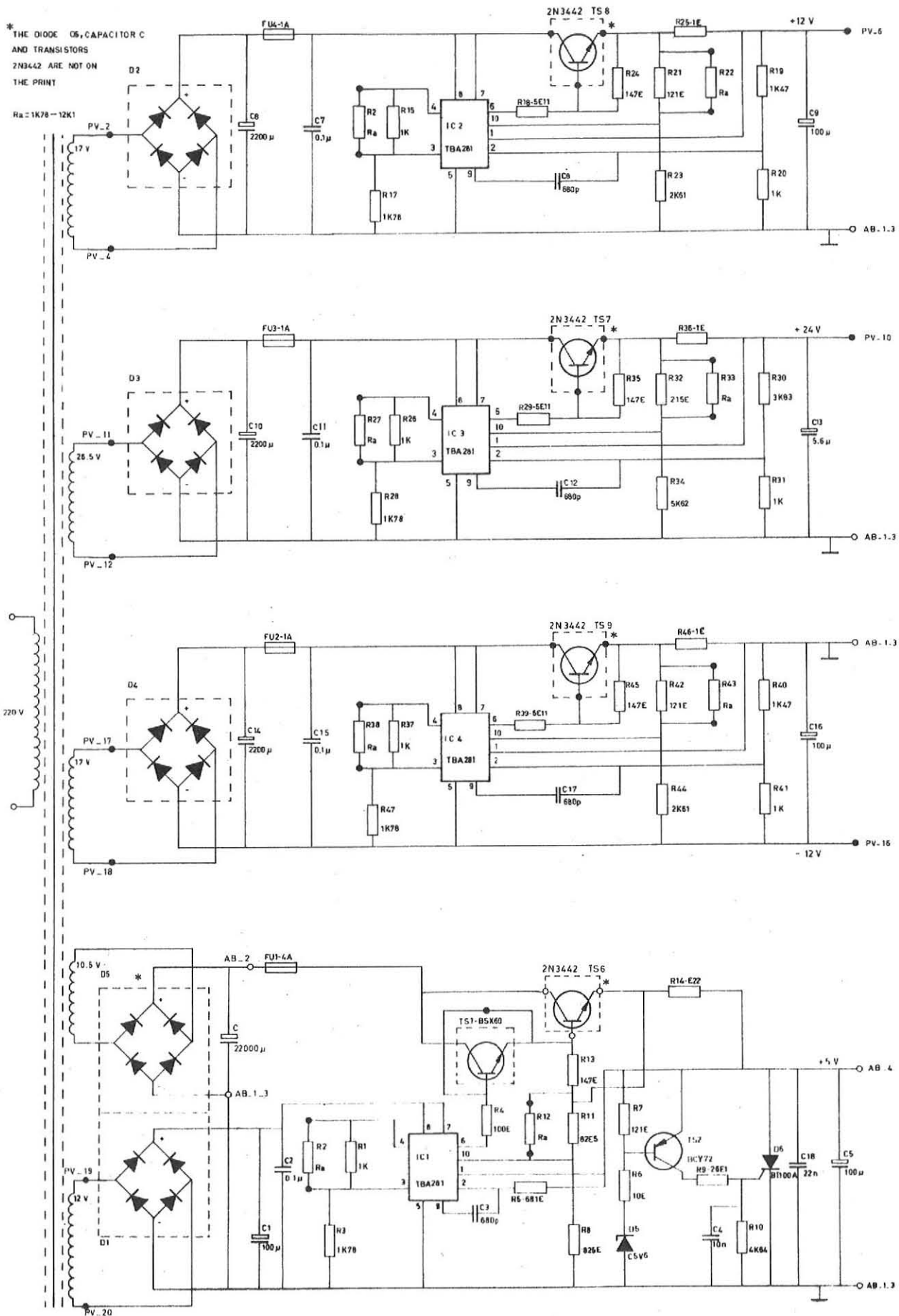


Figure 4-16 CARD POWER CARD

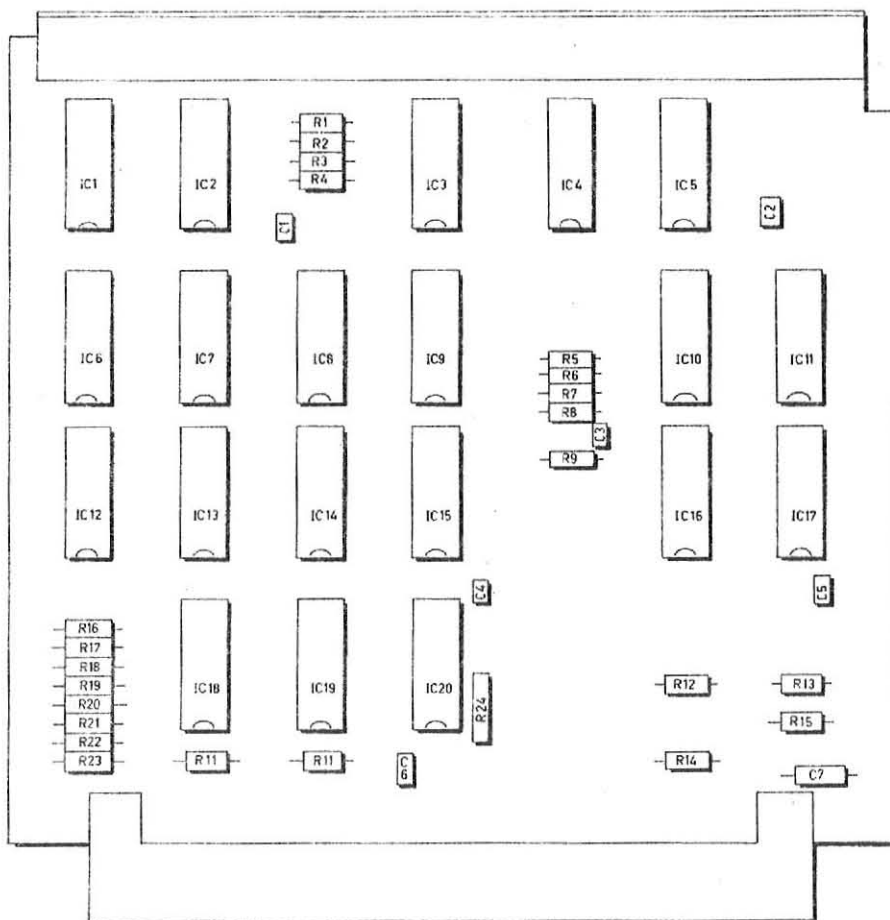


Figure 4-17A CARD SERVICE CARD
(A) 2L28 COMPONENT SURVEY

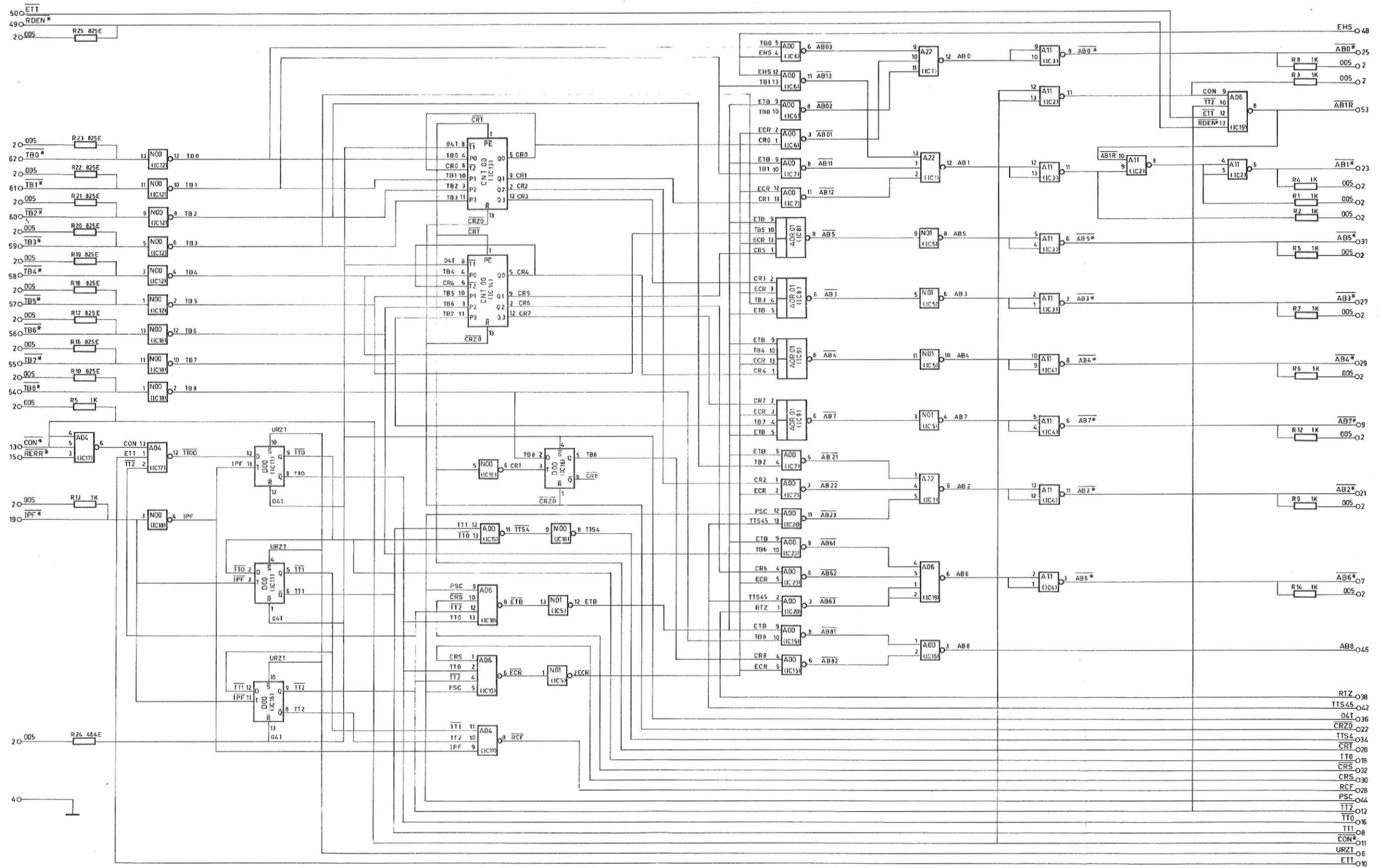


Figure 4-17 CARD SERVICE CARD (A) 2L28

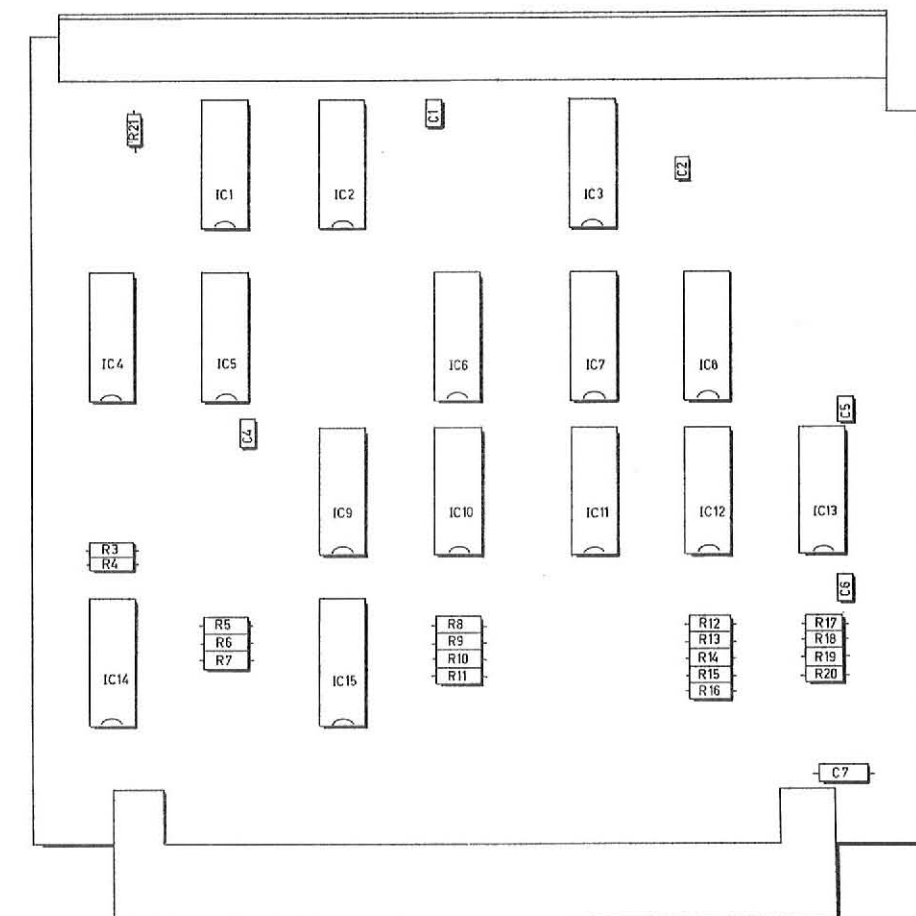


Figure 4-18A CARD SERVICE CARD (3)
2L29 COMPONENT SURVEY

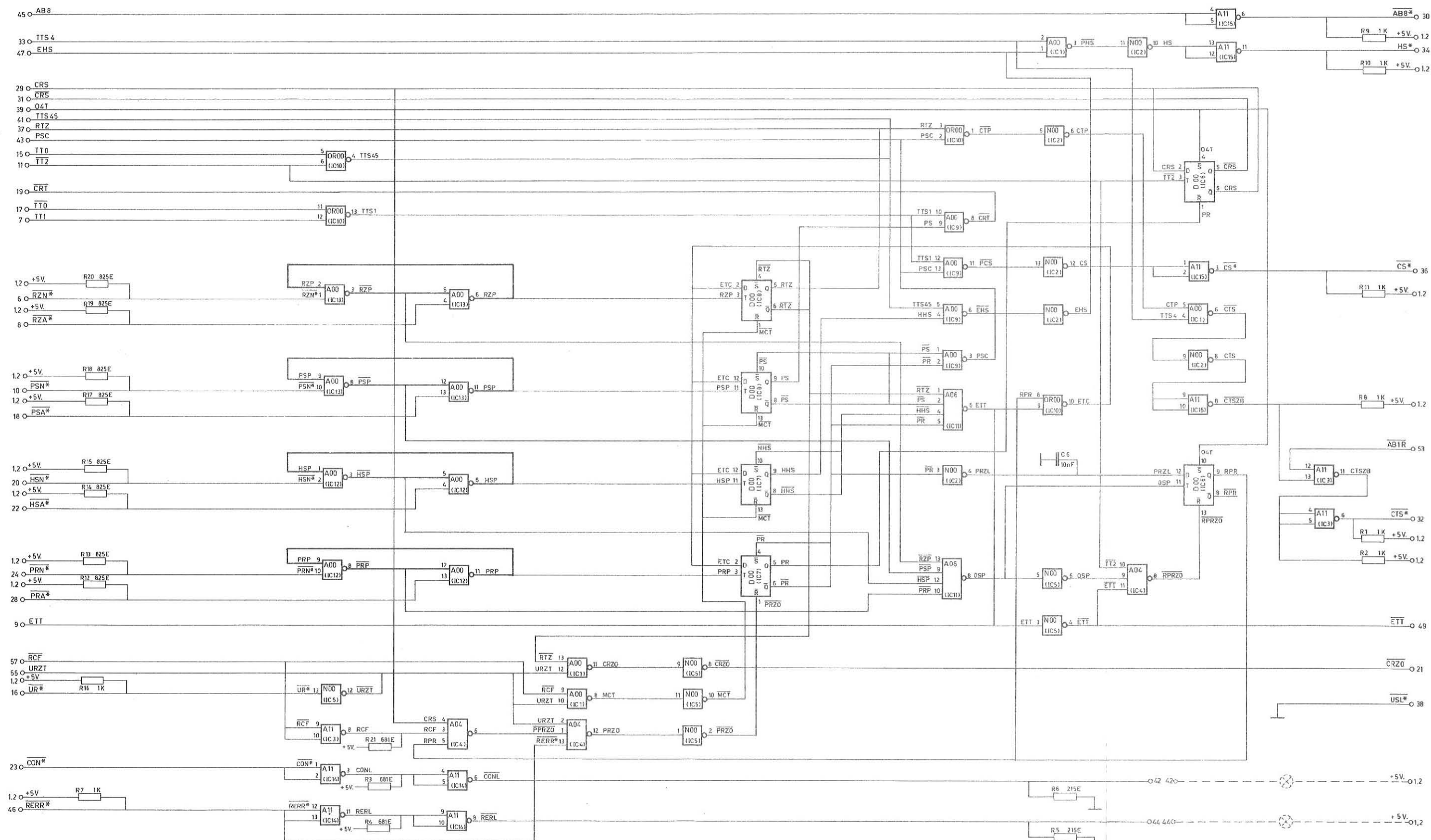


Figure 4-18 CARD SERVICE CARD (3) 2L29

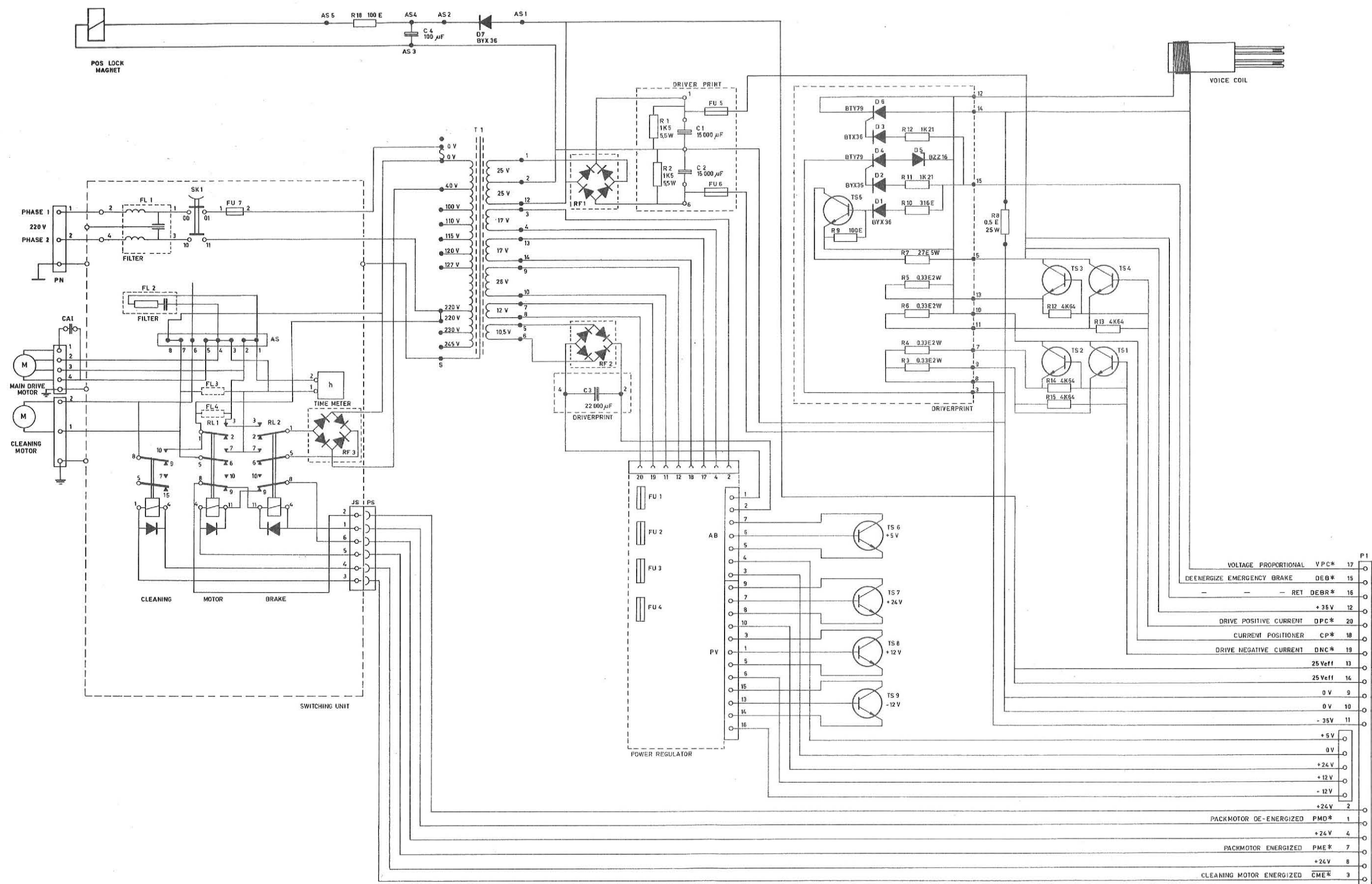


Figure 4-19 POWER SUPPLY AND DISTRIBUTION