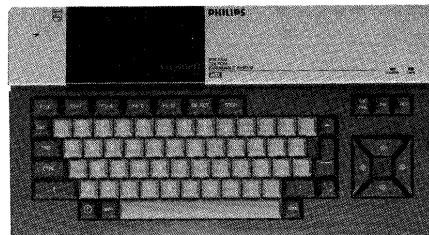


Service  
Service  
Service



37 800 A

# Service Manual

Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified be used.

See also:  
REPAIR METHOD VG8020

**(GB) SPECIFICATION**

Micro processor	: Z80A
Memory	: 32k ROM 16k video RAM 64k user RAM
Video display processor	: TMS9929A
Sound processor	: YM2149
Interfaces	: RF output - 75 Ω (UHF channel E36) Monitor output Audio cassette recorder 2 joysticks 2 cartridge slots
Keyboard	: 73 keys QWERTY
Power supply voltage	: 220 V± 10%, 50 Hz

**(NL) SPECIFICATIE**

Micro processor	: Z80A
Geheugen	: 32k ROM 16k video RAM 64k gebruikers RAM
Video display processor	: TMS9929A
Geluidsprocessor	: YM2149
Interfaces	: RF uitgang - 75 Ω (UHF kanaal E36) Monitor uitgang Audio cassette recorder 2 handbedieningen 2 cartridge sleuven
Toetsenbord	: 73 toetsen QWERTY
Voedingsspanning	: 220 V± 10%, 50 Hz

**(F) CARACTERISTIQUES TECHNIQUES**

Micro processeur	: Z80A
Mémoire	: 32k ROM 16k RAM vidéo 64k RAM utilisateur
Processeur vidéo	: TMS9929A
Processeur son	: YM2149
Interfaces	: Sortie RF - 75 Ω (Canal UHF E36) Sortie monitor Audio cassette 2 poignées 2 "slots" cartouche
Clavier	: 73 touches QWERTY
Tension d'alimentation	: 220 V± 10%, 50 Hz

**(D) TECHNISCHE DATEN**

Micro Prozessor	: Z80A
Speicher	: 32k ROM 16k video RAM 64k Gebräuchers-RAM
Video Prozessor	: TMS9929A
Tone Prozessor	: YM2149
Schnittstellen	: RF Ausgang - 75 Ω (UHF-Kanal E36) Monitor Ausgang Audio Kasette Recorder 2 Handbedienungen 2 Kassettenschlitze
Tastatur	: 73 Tasten QWERTY
Versorgungsspannung	: 220 V± 10%, 50 Hz

**(I) DATA TECNICI**

Microprocessore	: Z80A
Memoria	: 32k ROM 16k RAM vidéo 64k RAM utilizzatori
Processore display video	: TMS9929A
Processore suono	: YM2149
Interfacce	: Uscita RF - 75 Ω (Canale UHF E36) Uscita monitor Registratore audio a cassetta 2 leve manuali 2 scanelature per cartuccia
Tastiera	: 73 tasti QWERTY
Tensione di alimentazione	: 220 V± 10%, 50 Hz

Documentation Technique Service Dokumentation Documentazione di Servizio Huolto-Ohje Manual de Servicio Manual de Servicio



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4822 727 15228

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**GB** WARNING

The cassettes should be exchanged with the set switched off.

**Adjustments**

**VDP clock frequency**

- Connect via a 10:1 probe a frequency meter to 37U30.
- Adjust TC1 for a frequency of 445.32 kHz.

**Power supply voltage**

- Adjust on the supply PCB VR1 for a voltage of 5 V across the output (C3).

**NL** WAARSCHUWING

Het uitwisselen van cartridges dient plaats te vinden bij een uitgeschakeld apparaat.

**Instellingen**

**VDP klokfrequentie**

- Sluit via een 10:1 probe een frequentiemeter aan op 37U30.
- Regel TC1 af op een frequentie van 445,32 kHz.

**Voedingsspanning**

- Stel op het voedingsspanningspaneel VR1 in op een spanning van 5 V over de uitgang (C3).

**F** ATTENTION

Le remplacement de cartouches doit avoir lieu lorsque l'appareil est hors service.

**Réglages**

**Fréquence d'horloge VDP**

- A travers une sonde 10:1, brancher un fréquencemètre sur 37U30.
- Ajuster TC1 à une fréquence de 445,32 kHz.

**Tension d'alimentation**

- Sur la platine de tension d'alimentation, ajuster pour une tension de 5 V sur la sortie (C3).

**D** WARNUNG

Cassetten müssen bei ausgeschaltetem Gerät ausgewechselt werden.

**Einstellungen**

**VDP-Taktfrequenz**

- Über einen Taster 10:1 einen Frequenzmesser an 37U30 schalten.
- TC1 auf eine Frequenz von 445,32 kHz einstellen.

**Versorgungsspannung**

- An der Versorgungsspannungsplatte VR1 auf eine Spannung von 5 V an dem Ausgang (C3) einstellen.

**D** AVVERTIMENTO

La sostituzione delle cartucce deve farsi quando l'apparecchio è fuori servizio.

**Regolazioni**

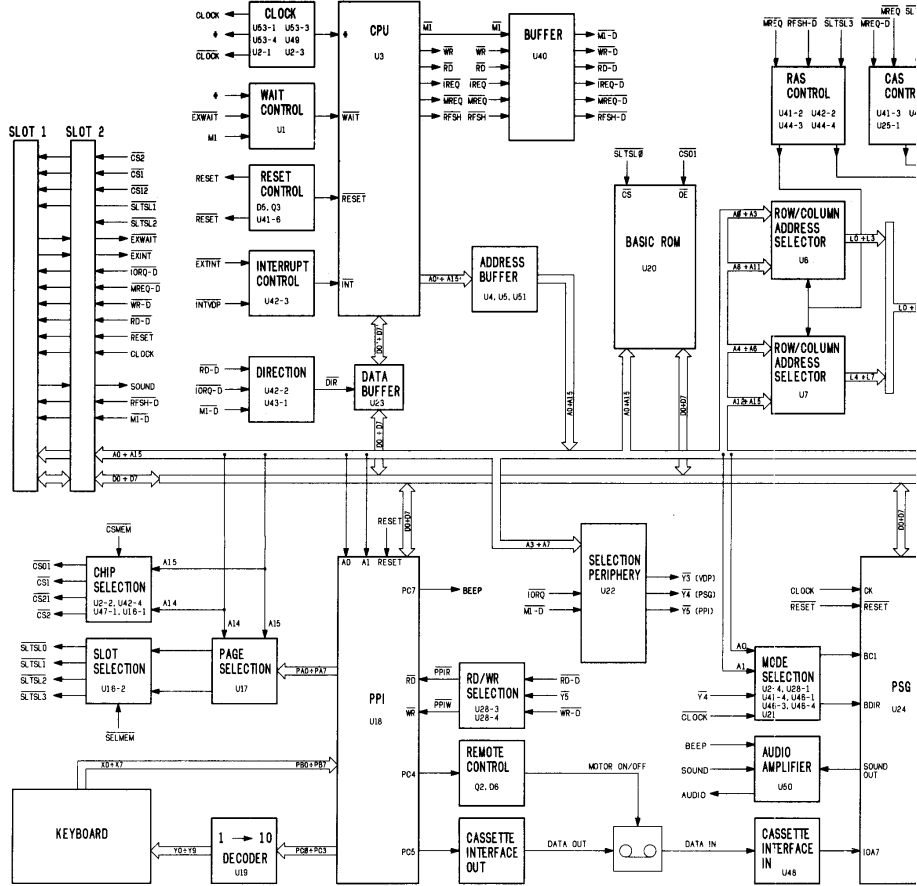
**Frequenza d'orologio VDP**

- Tramite una sonda 10:1 collegare un frequenziometro su 37U30.
- Regolare TC1 per una frequenza di 445,32 kHz.

**Tensione di alimentazione**

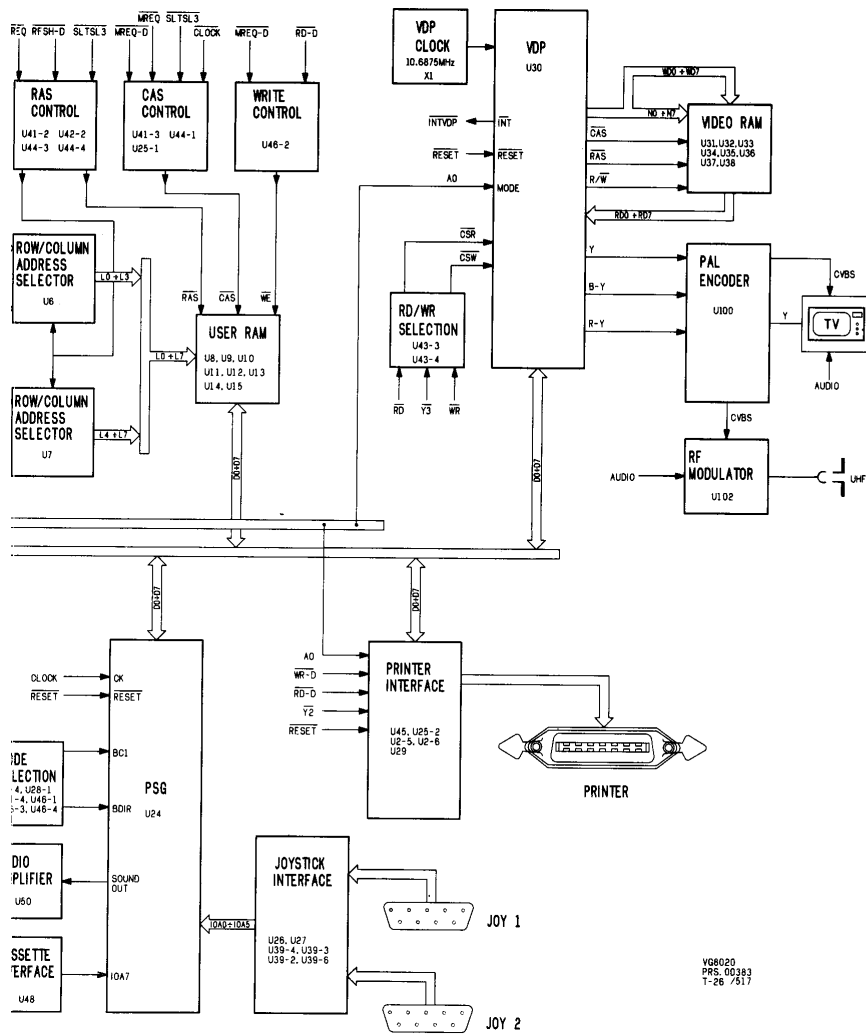
- Sulla piastra di tensione di alimentazione, regolare per una frequenza di 5 V sull'uscita (C3).

**FUNCTIONAL DIAGRAM**



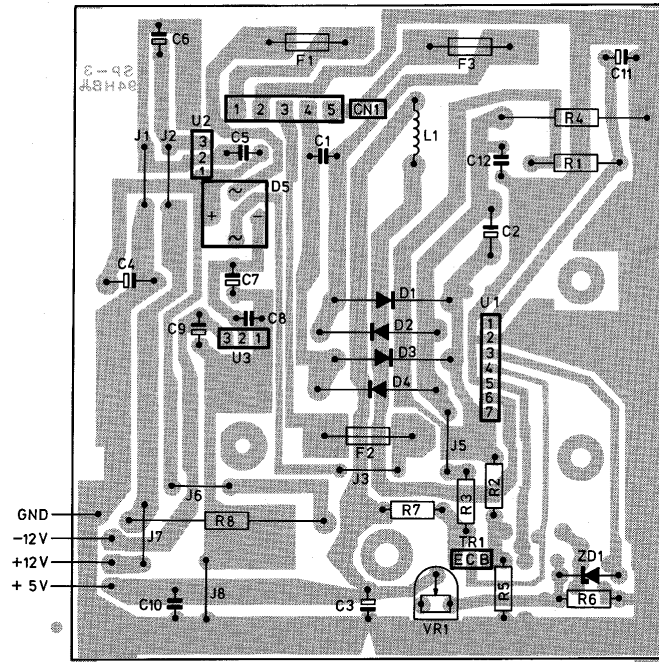
**SPECIFICATIONS OF IC'S**

Position	Type	Description	Function	
U1	74LS74	2x D-FF	WAIT	U30
U2	74HC368	6x inverter	CLOCK, CS12, printer, mode P.S.G.	U31-U38
U3	Z80A	μ-processor	C.P.U.	U39
U4,U5	74LS367	6x tri-state buffer	Address buffer	U40
U6,U7	74LS157	2x 4-bit selector	Row/column address selector	U41
U8-U15	4864P-3	RAM	User RAM	
U16	74LS139	2x 1→4 decoder	Chip and slot selection	U42
U17	74LS153	2x 4→1 multiplexer	Page selection	U43
U18	8255AC-5	P.P.I.	Programmable peripheral interface	U45
U19	74LS145	1→10 decoder	Keyboard	U46
U20	HN613256PS41	ROM	BIOS	U47
U21	74LS74	2x D-FF	Mode P.S.G.	U48
U22	74LS138	1→8 decoder	Periphery selection	U49
U23	74LS245	8x bidirectional buffer	Data buffer	U50
U24	YM-2149	P.S.G.	Programmable sound generator	U51
U25	74LS74	2x D-FF	CAS, printer interface	U52
U26	74LS157	2x 4 bit-selector	Position joystick 1-2 selector	U53
U27	74LS157	2x 4 bit-selector	Trigger joystick 1-2 selector	
U28	74LS32	4x OR	PPIR, PPTW, Mode P.S.G.	
U29	74LS273	8x D-FF	Printer interface	

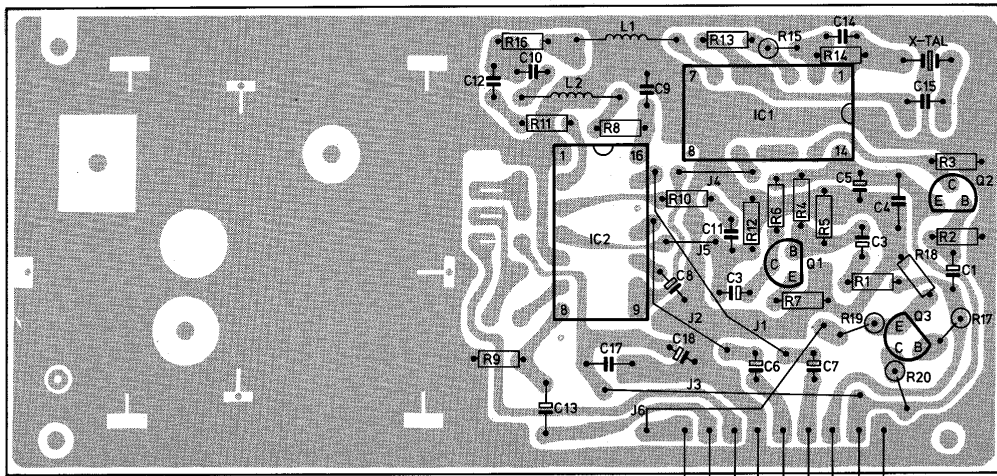


V68020  
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U30	TMS9929A	V.D.P.	Video display processor
U31-U38	4816	RAM	Video RAM
U39	7407	6x buffer	TRG-A1, TRG-A2, TRG-B1, TRG-B2
U40	74LS367	6x tri-state buffer	Control lines buffer
U41	74LS368	6x inverter	RESET, SELMEM, MUX, CAS, Selection periphery, Mode P.S.G.
U42	74LS08	4x 2-AND	WE, CS01, DIR-data buffer, INT
U43	74LS32	4x 2-OR	CSR, CSW, selection periphery, DIR-data buffer
U45	74LS138	1-8 decoder	Printer interface
U46	74LS02	4x 2-NOR	BC1, BDIR, WE
U47	74LS00	4x 2-NAND	CS12, page selection
U48	UPC311C	Voltage comparator	Cassette interface in
U49	74LS74	2x D-FF	Clock
U50	NJM4558D	OPAMP	Audio amplifier
U51	74LS367	6x tri-state buffer	Address buffer
U52	4050	6x buffer	Keyboard
U53	74LS00	4x 2-NAND	Clock

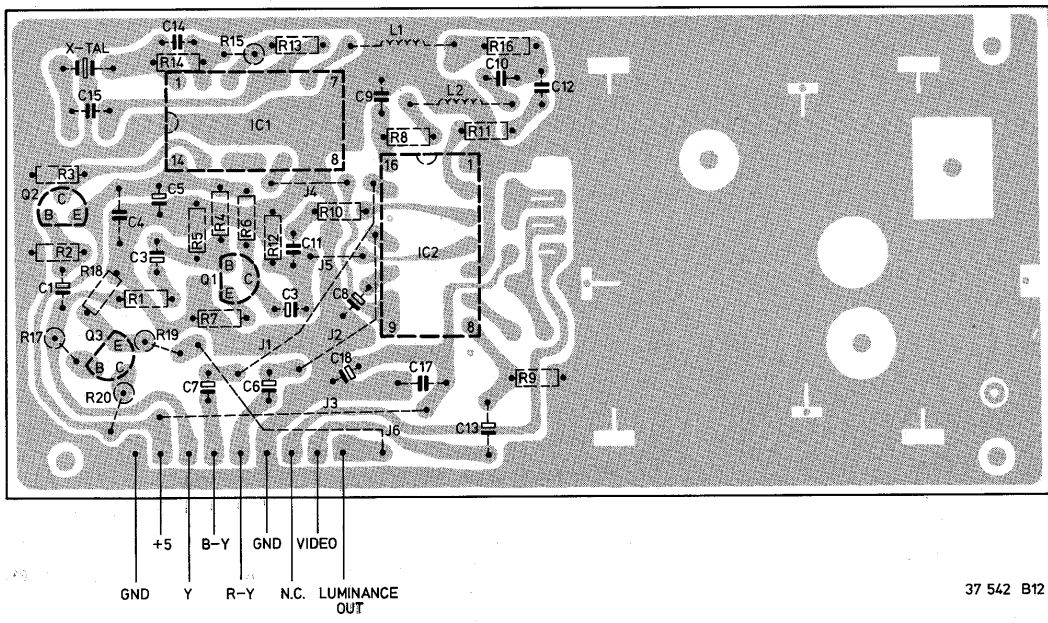
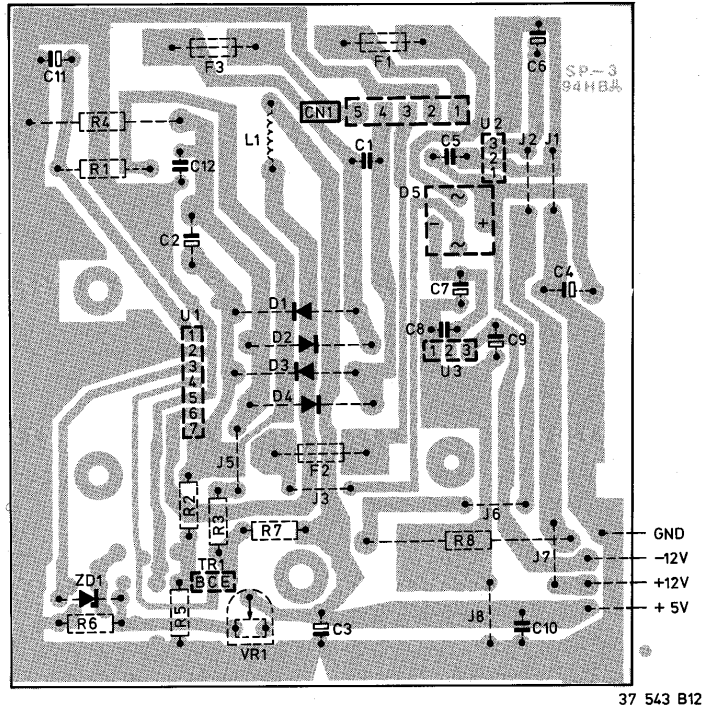


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








VIDEO GND B-Y +5  
LUMINANCE OUT N.C. R-Y Y GND 37 539 B12







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
**MAIN PRINTED BOARD**

					
U1	74LS74AP	4822 209 80782	Q2	2SA720	4822 209 11045
U2	74HC368	4822 209 11044	Q3	2SC2603	4822 130 42545
U3	Z80A	4822 209 10569			
U4,U5	74LS367AP	5322 209 85558	RA1,RA2	8x10k	4822 116 90189
U6,U7	74LS157P	5322 209 81521	RA3	8x4k7	4822 116 90191
U8--U15	4864P-3	5322 209 81241	RA4	8x10k	4822 116 90189
U16	74LS139P	5322 209 14876			
U17	74LS153P	5322 209 85488	C4	4.7 $\mu$ - 25 V	4822 124 10497
U18	8255AC-5	4822 209 10902	C6	0.022 $\mu$ - 50 V	4822 121 42417
U19	74LS145P	4822 209 81083	C22	4.7 $\mu$ - 25 V	4822 124 10497
U20	HN613256PS41	4822 209 11043	C71	0.022 $\mu$ - 50 V	4822 121 42417
U21	74LS74AP	4822 209 80782	C80	1500 p - 50 V	4822 121 42416
U22	74LS138P	5322 209 85647	C81	1000 p - 50 V	4822 121 42421
U23	74LS245	5322 209 82215	TC1	25 p trimmer	4822 125 50271
U24	YM-2149	4822 209 11039	  		
U25	74LS74AP	4822 209 80782	L1	22 $\mu$	4822 156 10788
U26,U27	74LS157AP	5322 209 81521	X1	10.6875 MHz	4822 242 71136
U28	74LS32P	5322 209 85311	X2	14.31818 MHz	4822 242 71137
U29	74LS273P	5322 209 85792	D1--D6	1S2076	4822 130 31304
U30	TMS-9929A	4822 209 11038			
U31--U38	4816AP-7	4822 209 11041			
U39	7407P	5322 209 84077			
U40	74LS367AP	5322 209 85558			
U41	74LS368AP	4822 209 81433			
U42	74LS08P	5322 209 84995			
U43,U44	74LS32P	5322 209 85311			
U45	74LS138P	5322 209 85647			
U46	74LS02P	5322 209 85312			
U47	74LS00P	5322 209 84823			
U48	UPC311C	5322 209 85503			
U49	74LS74AP	4822 209 80782			
U50	NJM4558D	4822 209 80401			
U51	74LS367AP	5322 209 85558			
U52	4050BP	4822 209 11042			
U53	74LS00P	5322 209 84823			


**POWER SUPPLY**

					
U101	Power supply	4822 216 92255	R4	0.22 $\Omega$ - 2 W	4822 113 31015
			R8	56 $\Omega$ - 3 W	4822 113 31016
U1	STK-770	4822 209 83127	VRT	500 $\Omega$ potm.	4822 101 90157
U2	7812	4822 209 83128			
U3	7912A	5322 209 81856	C5	0.01 $\mu$ - 50 V	4822 121 90038
 			C8	0.01 $\mu$ - 50 V	4822 121 90038
Q1	2SC2603	4822 130 42545	<b>Various</b>		
D1--D4	S2V-10	4822 130 32814	L1	150 $\mu$ - 3A	4822 158 10736
ZD1	HZ2CL	4822 130 32818	T1	Transformer	4822 146 21012

**PAL ENCODER**

		
U100	PAL encoder	4822 212 10216

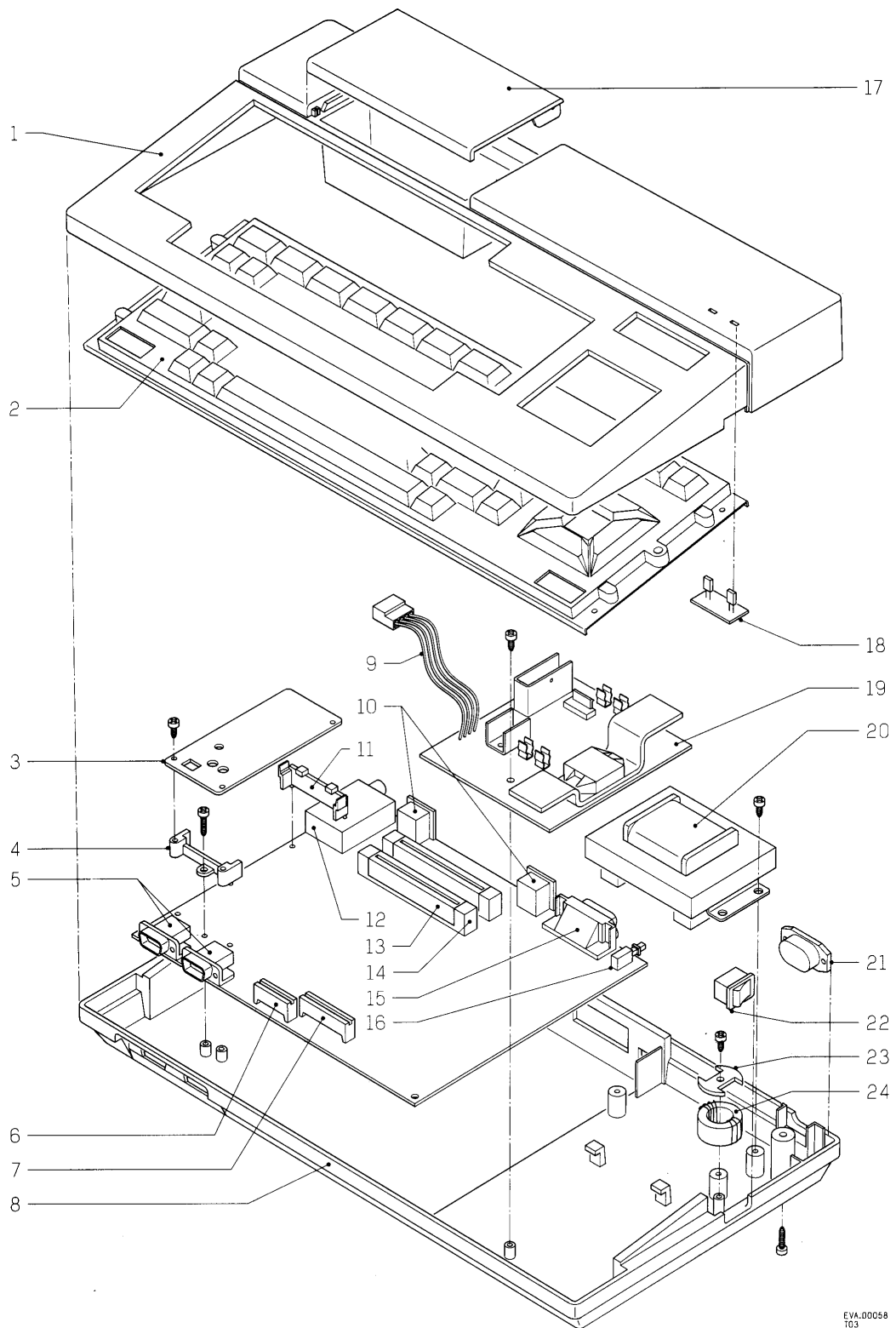
**MODULATOR**

		
U102	RF modulator	4822 212 10215

## MECHANICAL PARTS LIST

1	4822 432 10532	Top case cabinet
2	4822 219 80639	Keyboard
3	4822 212 10216	PAL encoder
4	4822 404 60186	PAL front bracket
5	4822 267 50553	Joystick connector
6	4822 267 50549	Connector keyboard (8p)
7	4822 267 50551	Connector keyboard (12p)
8	4822 432 10533	Bottom case cabinet
9	4822 267 40589	Connector with cord
10	4822 267 50548	Connector (8p)
11	4822 404 60187	PAL rear bracket
12	4822 212 10215	RF modulator
13	4822 267 70151	Connector 2x25 fold
14	4822 462 30268	ROM pack guide
15	4822 267 50554	Connector printer
16	4822 276 11502	Reset switch
17	4822 432 91738	Slot cover
18	4822 212 10214	LED PCB assembly
19	4822 216 92255	Power supply unit
20	4822 146 21012	Transformer
21	4822 265 20264	Connector (2p)
22	4822 277 10832	Mains switch
23	4822 404 60188	Coil bracket
24	4822 158 10735	Troidal filter





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**SYMBOLS USED IN CIRCUIT DIAGRAMS**

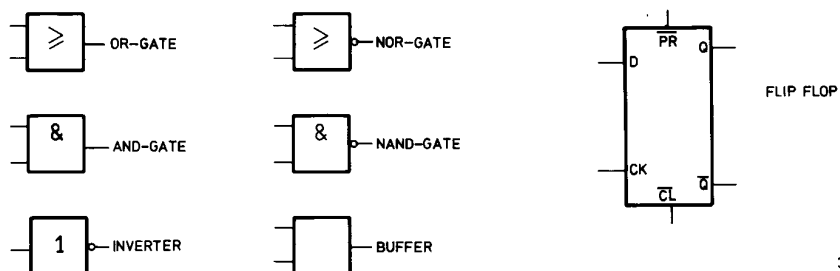
SYMBOL	TYPE	$t_{amb}^{70^\circ P}$	TOLERANCE	SERIES	RANGE 2322...
	SFR16	0.2	10Ω - 1M 5%	E24	180
	SFR25	0.33	1Ω - 10M 5%	E24	181
	SFR30	0.5	1Ω - 10M 5%	E24	182
	CR52	0.67	1Ω - 1M 5%	E24	213
	MR25	0.4	1Ω - 1M 1% (2%)	E24	151
	MR30	0.5	1Ω - 1M 1% (2%)	E24	152
	VR37	0.5	220k - 33M 5%	E24	242
	VR68	1	100k - 68M 5%	E24	244

SYMBOL	TYPE	VOLTAGE DC	TOLERANCE	RANGE 2222...
	POLYESTER FLATFOIL	SEE NOTE	10%	342 ÷ 352 365 ÷ 368
	PLATE CERAMIC	SEE NOTE	DEPENDING ON CAPACITY	629 ÷ 683
	ELCO MINIATURE SINGLE	SEE NOTE	-10+50%	015 ÷ 033 041 ÷ 043
	ELCO SINGLE ENDED	SEE NOTE	± 20%	035

**NOTE :**

<b>*</b>	f = 25V	g = 40V	h = 63V	j = 100V	k = 125V	l = 150V	m = 160V	n = 160V	o = 200V	p = 250V	q = 300V	r = 350V	s = 400V	t = 500V	u = 600V	v = 630V	w = 630V	x = 1000V	y = 1600V	z = 1600V	A = 1.6V	B = 6V	C = 12V	D = 15V	E = 20V	F = 35V	G = 50V	H = 75V	I = 80V
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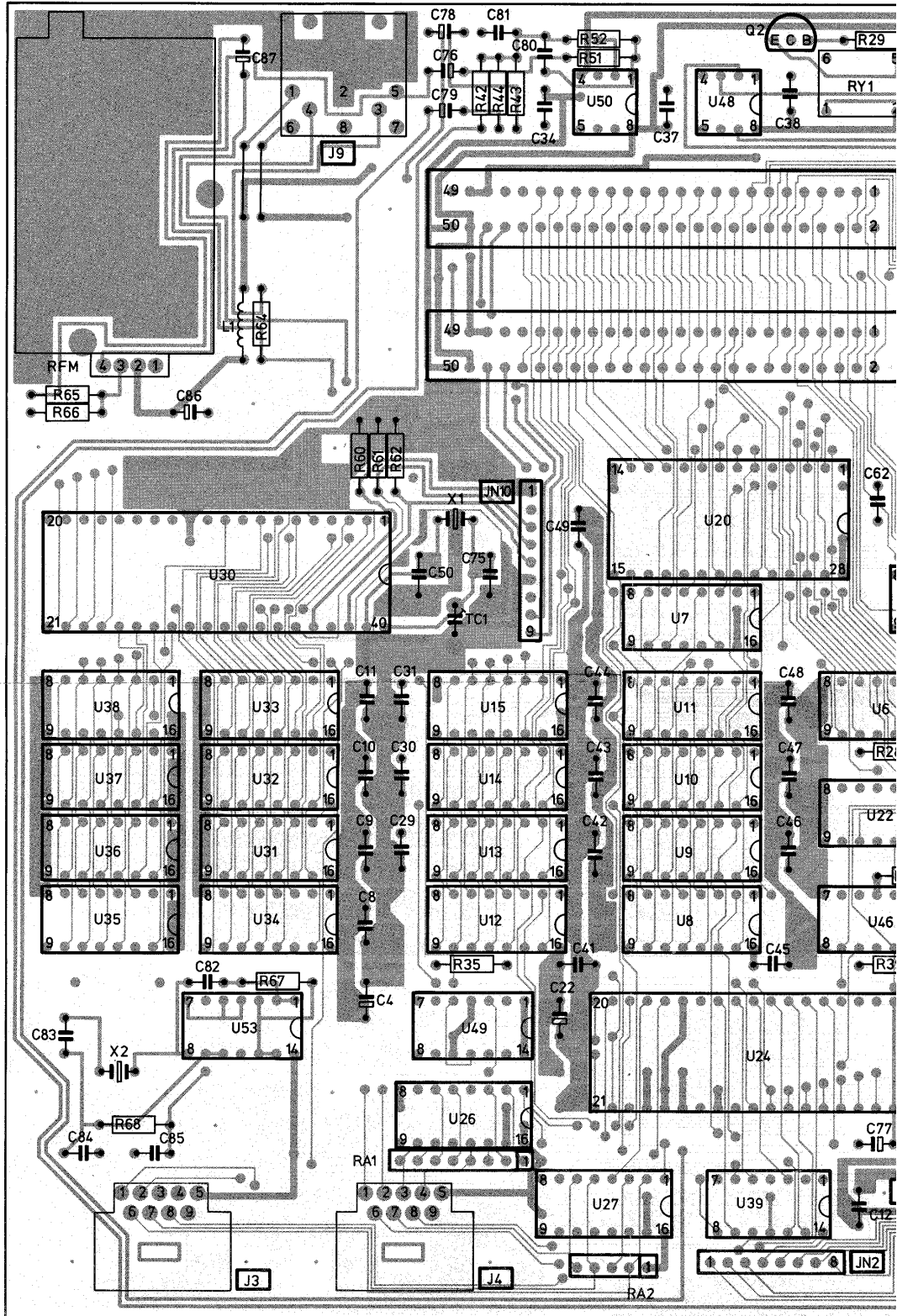
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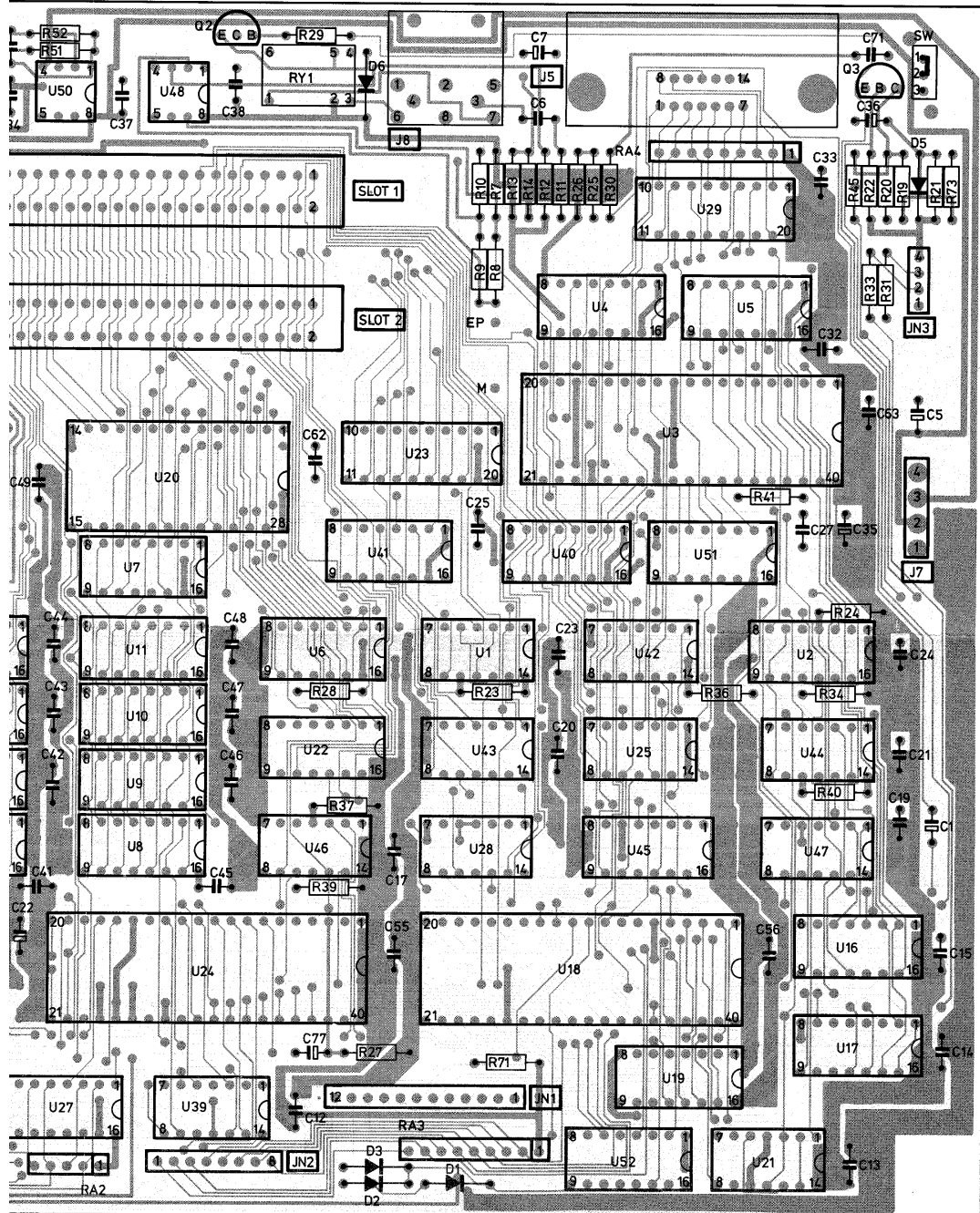
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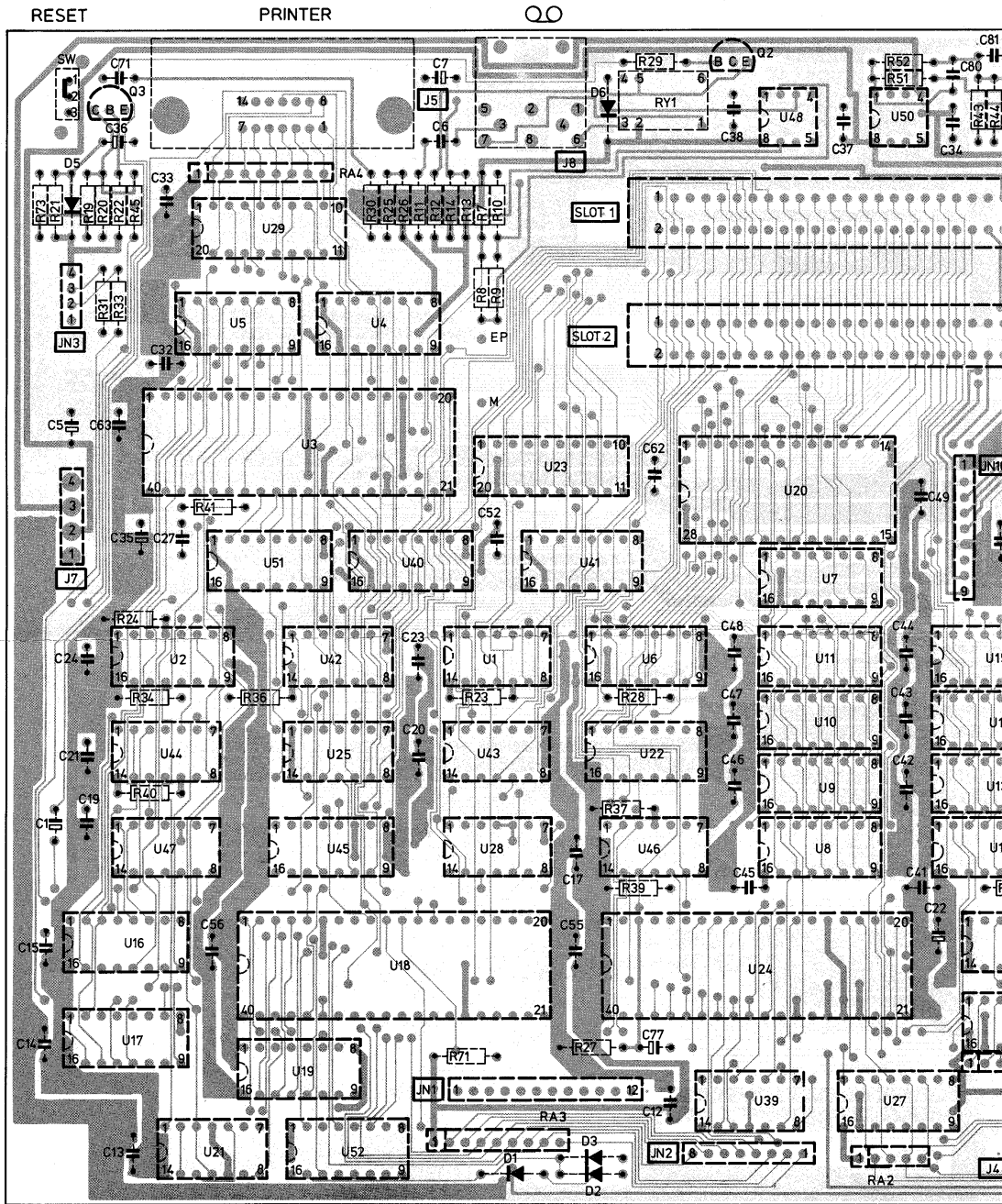


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PRINTER

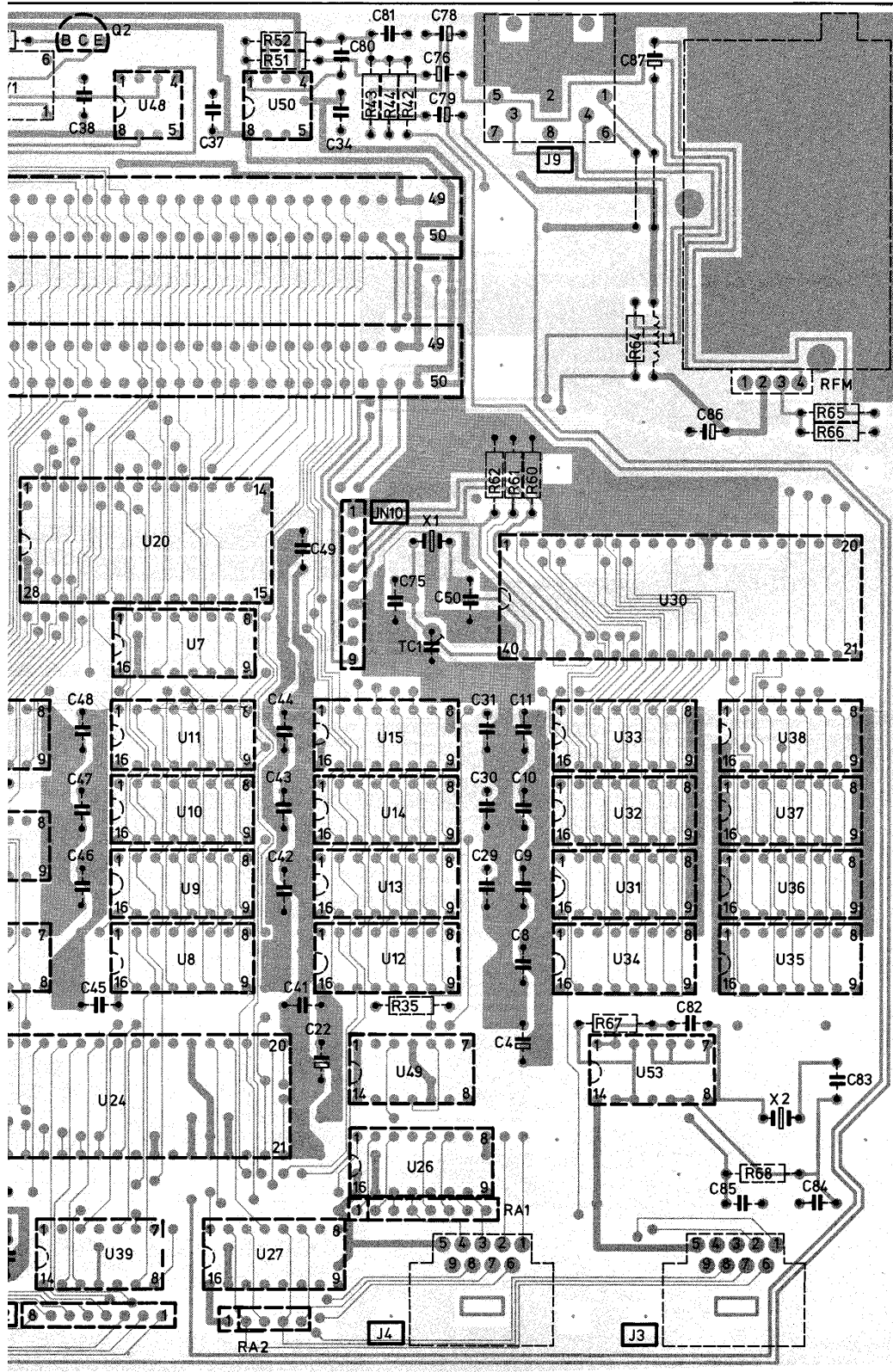
RESET





AUDIO/VIDEO

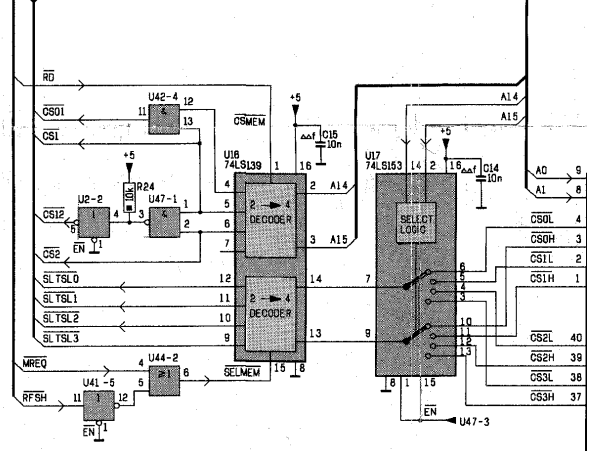
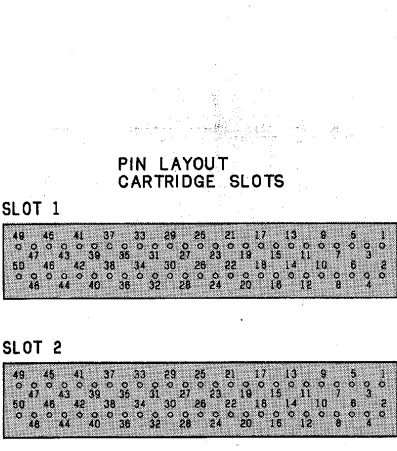
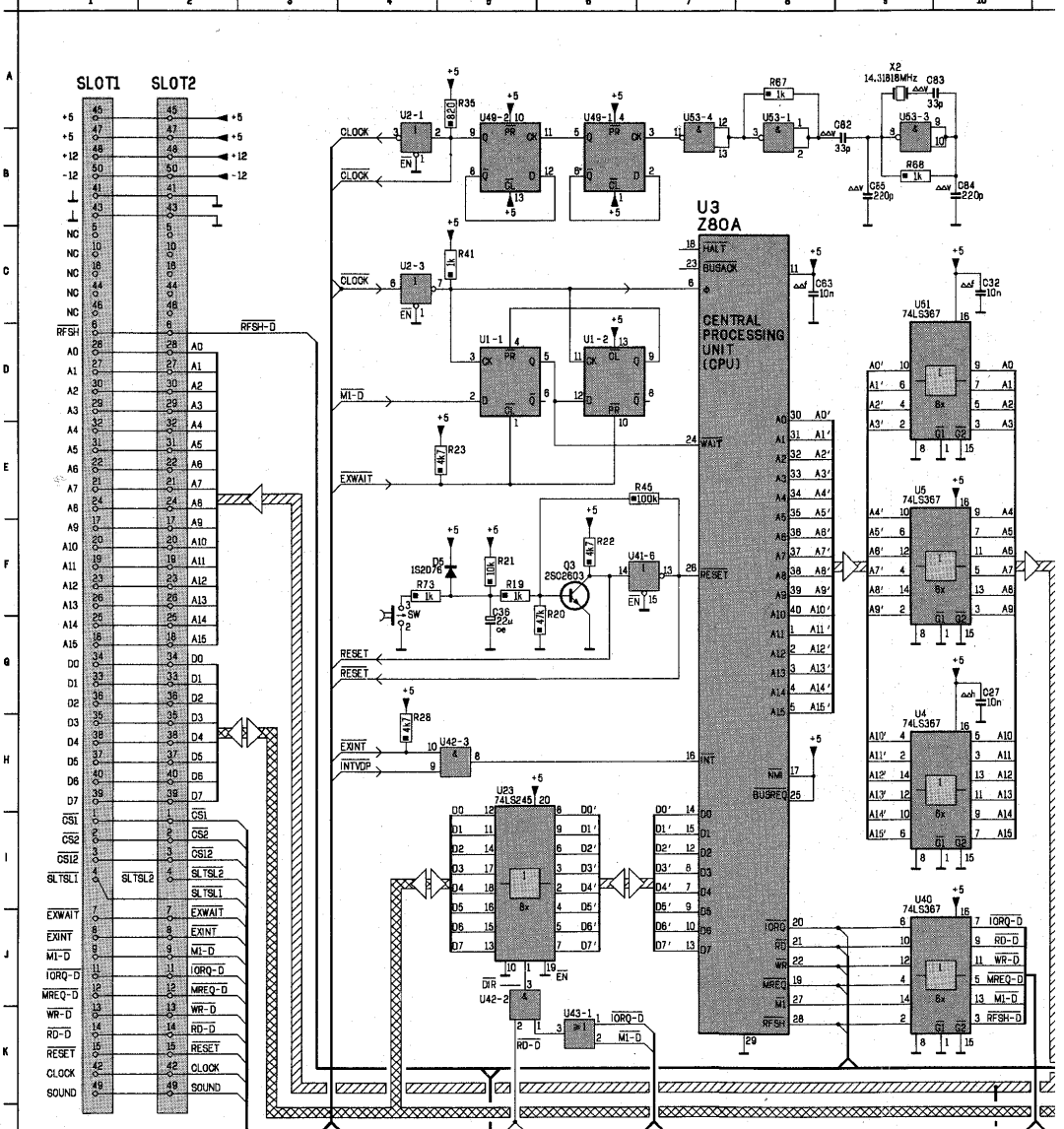
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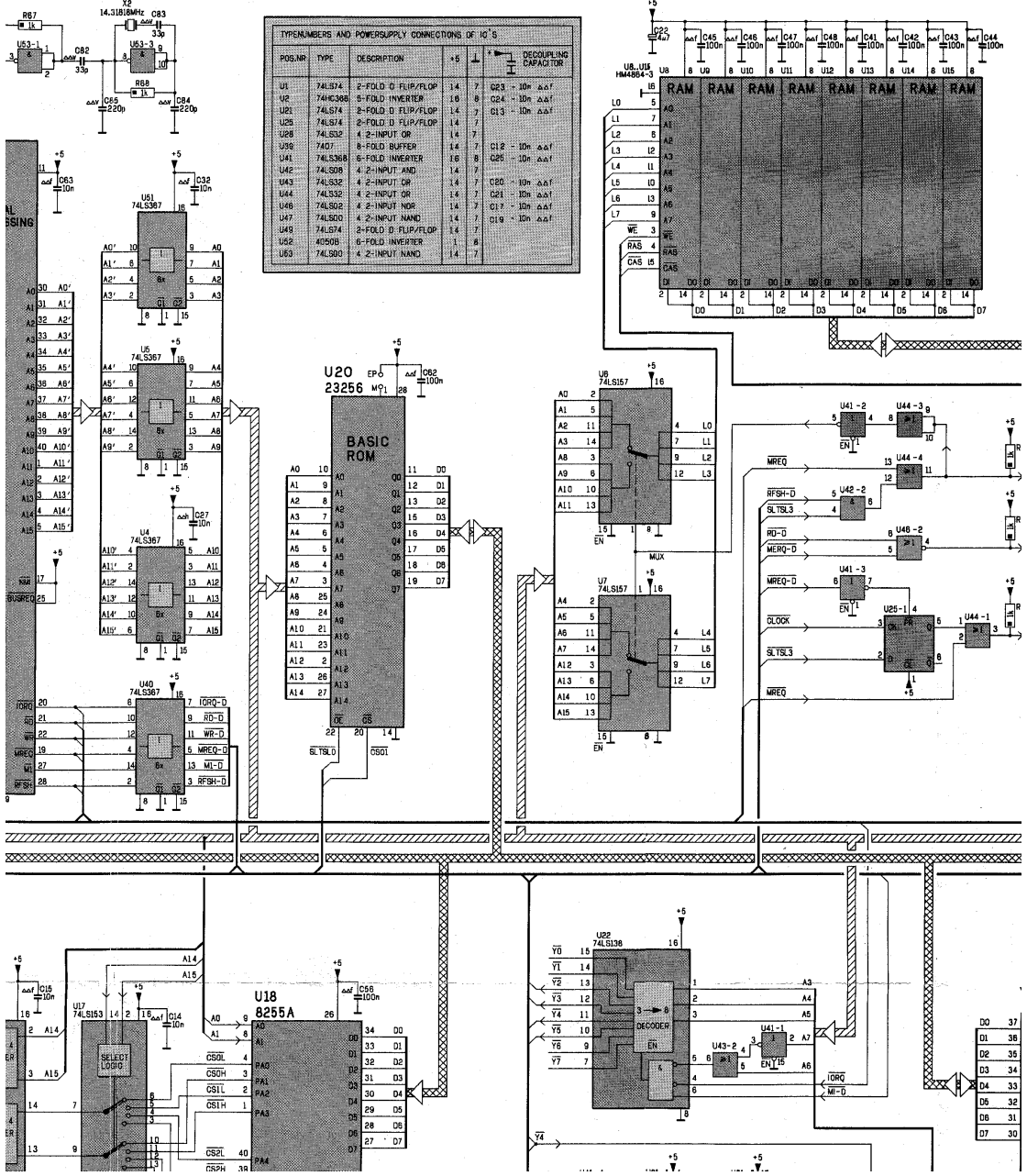
37 544 D12



C1	E31	C10	O32	C13	C36	C17	C35	C29	R29	C33	V29	C4	R25	C44	R20	C5	H31	C6	V16	C7	F33	C79	R17	C82	R9	C9	R27	O2	O
C11	T13	C11	R28	C14	N10	C18	C36	C3	C33	C34	S18	C4	R32	C45	R16	C5	R34	C6	F33	C7	S95	C8	R26	C83	R10	C9	F36	O3	Y
C1	O36	C11	F34	C15	F32	C2	C32	C3	P32	C35	F91	C4	R35	C46	R17	C5	R31	C8	R33	C71	T19	C8	E36	C84	R10	C9	S33	O3	G
C10	R27	C12	G35	C15	G32	C22	R16	C31	R30	C37	T18	C42	R19	C48	R18	C55	M22	C63	C	C77	S20	C80	R18	C86	M35	O1	O35	O5	F
C10	G35	C12	G35	C16	G35	C27	G10	C32	C10	C38	U18	C43	R19	C49	R24	C56	M12	C7	C78	U17	C78	C81	T19	C87	K34	O2	Y8	O5	G

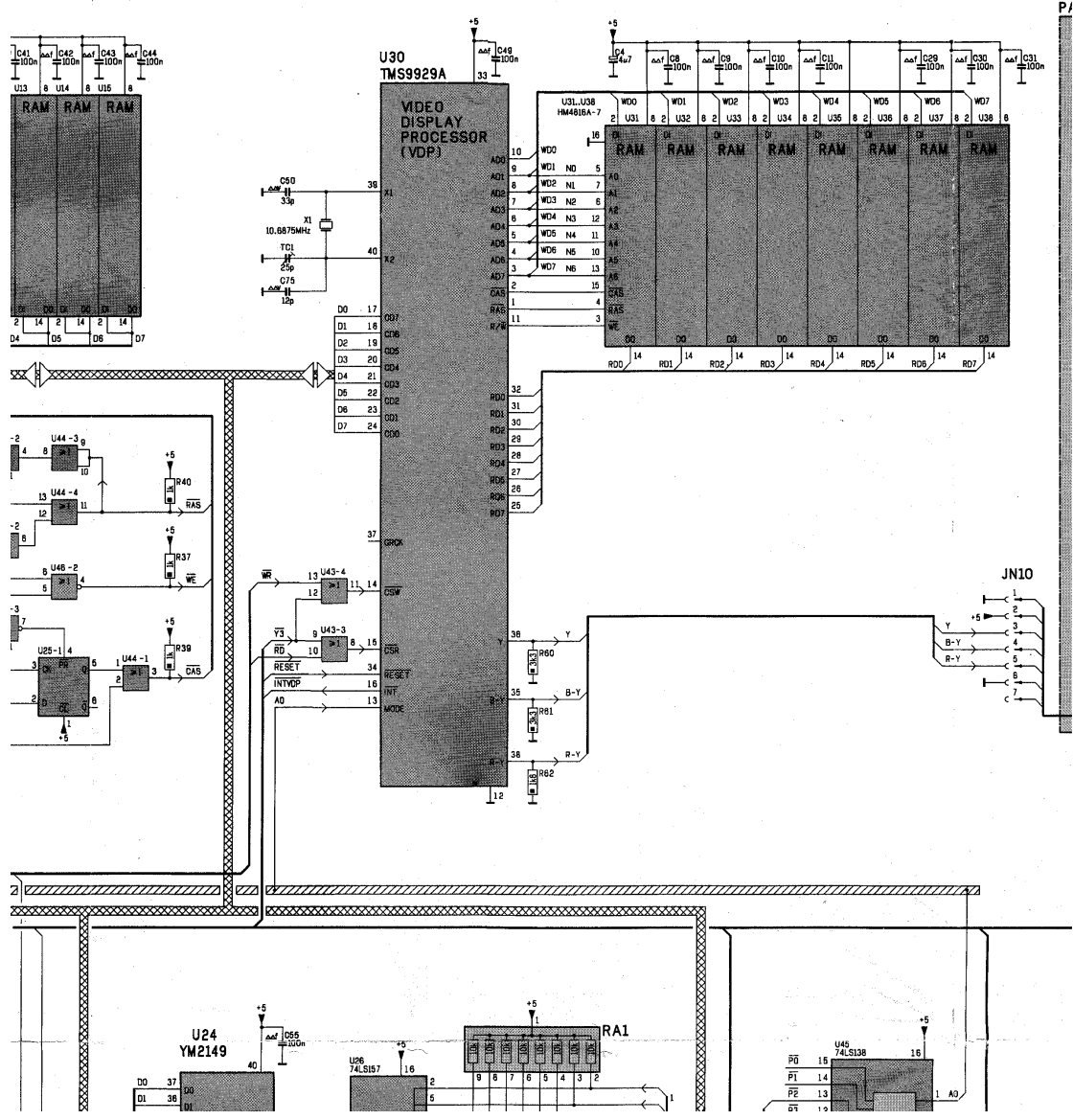


F33	C79	R17	C82	A 9	C9	A27	D2	Q36	D6	U14	IC1	G34	L1	L35	Q3	B32	R11	V17	R14	M17	R19	F 5	R21	F 5	R27	T20	R31	P31	R39	H20	R43	O18	R52	R18
S35	C8	R29	C89	R10	C9	F36	D3	Y 8	F1	Q36	IC1	E33	L100	Q38	Q3	F 6	R11	F35	R14	G32	R19	B32	R22	F 6	R28	H 4	R39	S14	R4	C32	R44	R18	R6	C33
T13	C8	F36	C84	R10	C9	S33	D3	Q36	F2	Q36	F2	G34	O1	C33	R1	C31	R12	U17	R15	G32	R2	E32	R23	F 6	R29	V13	R34	U20	R4	Q35	R45	E 7	R6	F33
O21	C8	S34	C85	B 9	D1	X 8	O4	Q35	F3	N36	IC2	C34	O1	C33	R1	O34	R12	O33	R16	O35	R2	O35	R24	N 6	R3	E32	R35	H 5	R40	P20	R5	D32	R60	H23
S20	C80	R10	C86	R35	O1	Q35	D5	F 5	IC1	G34	O1	C34	O2	D32	R10	V17	R13	V17	R17	R31	R20	F 6	R25	I13	R3	P34	R38	T20	R41	C 5	R5	P35	R61	L25
W17	C81	T19	C87	K34	D2	Y 9	D5	Q35	IC1	G33	L1	O33	O2	U15	R10	C34	R13	G33	R10	B32	R20	R32	R26	I14	R30	T13	R37	O20	R42	S19	R51	T17	R62	U25



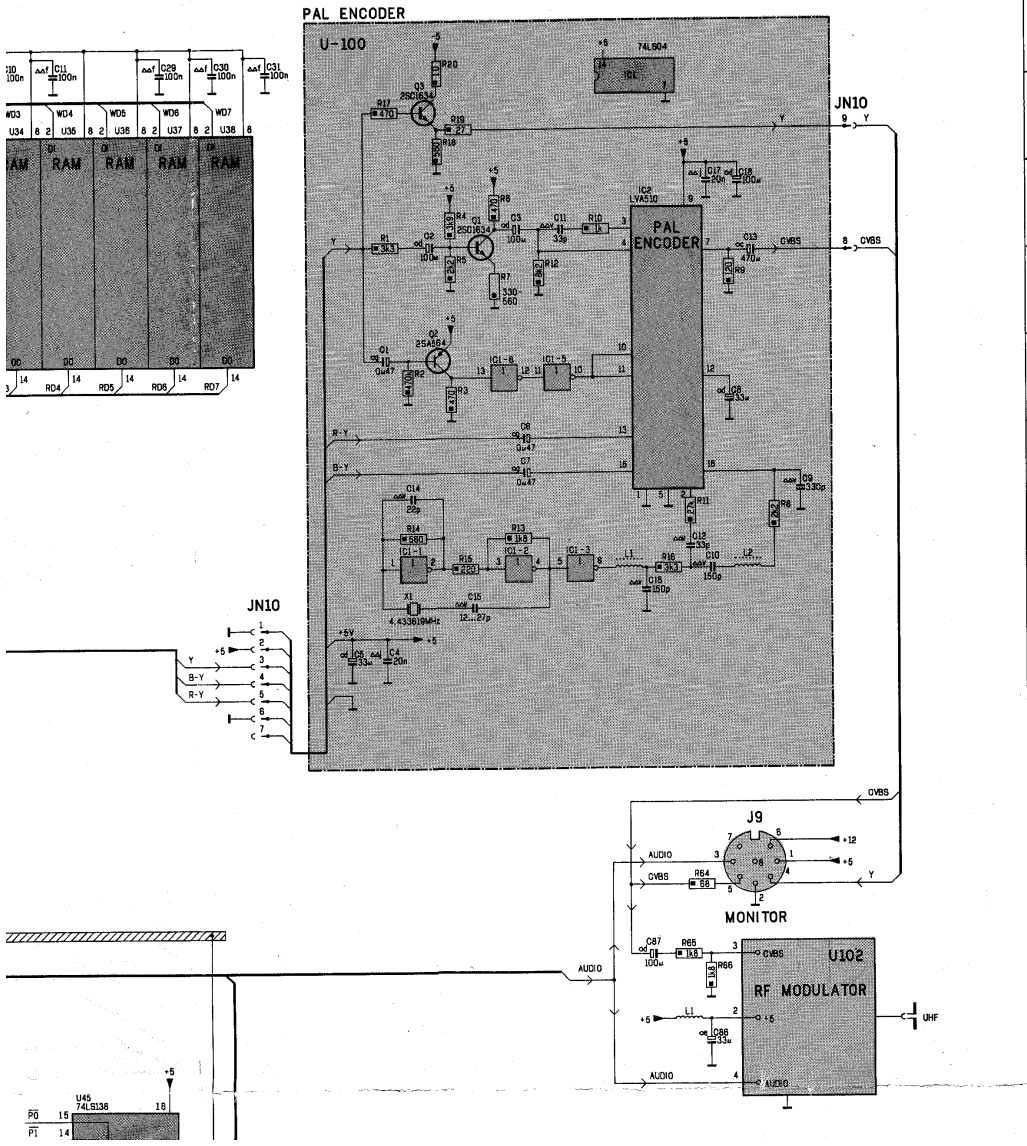


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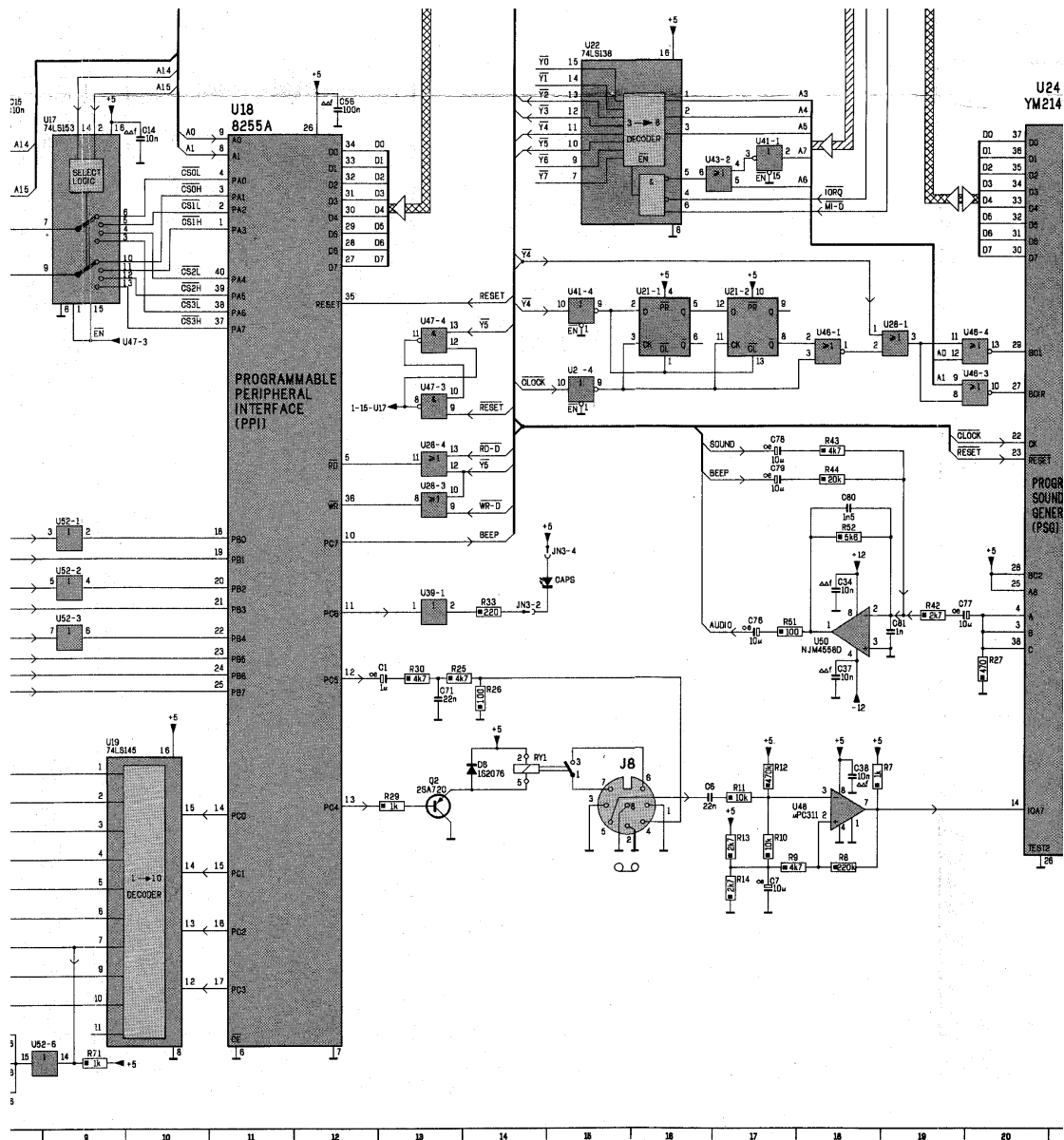


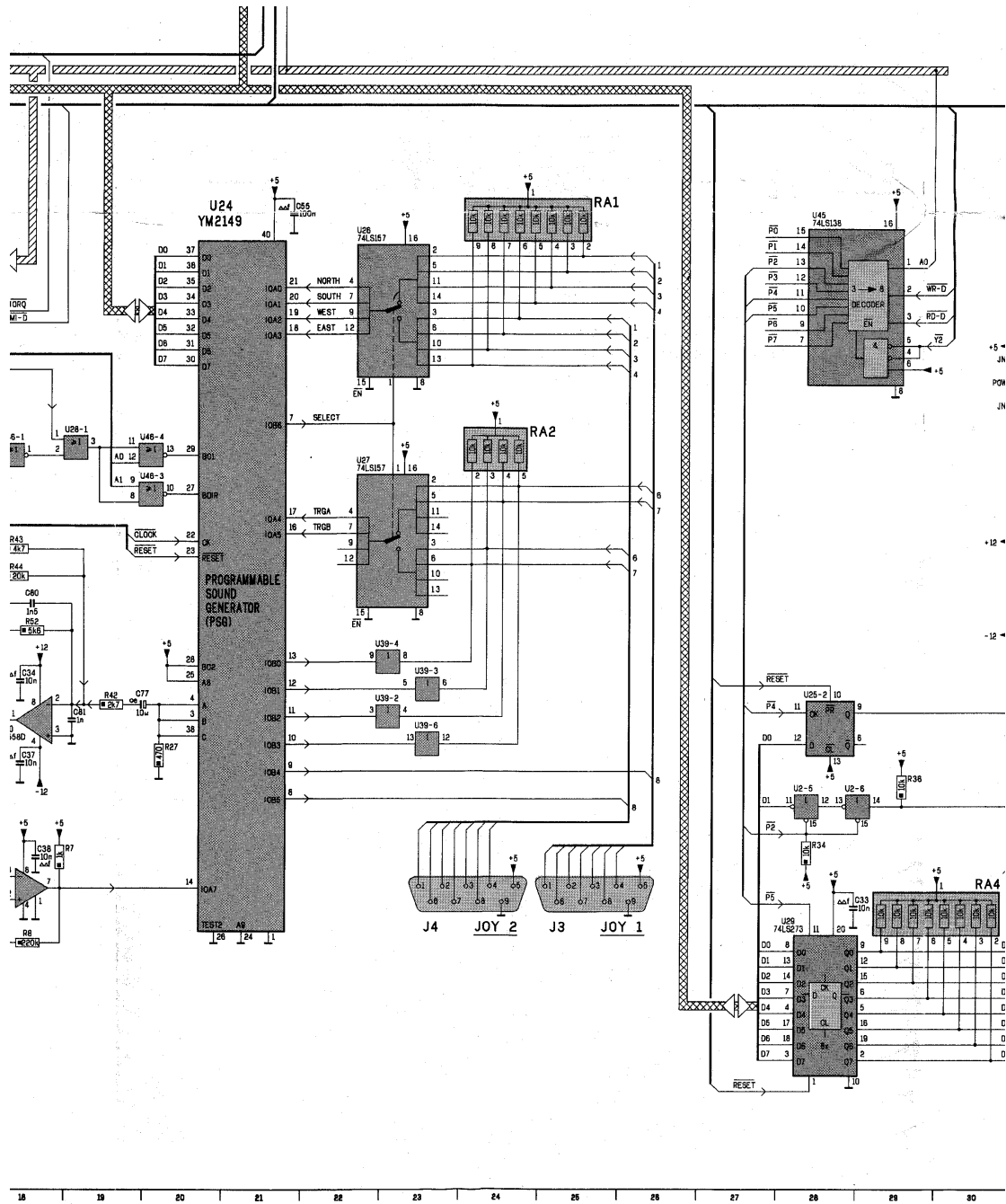
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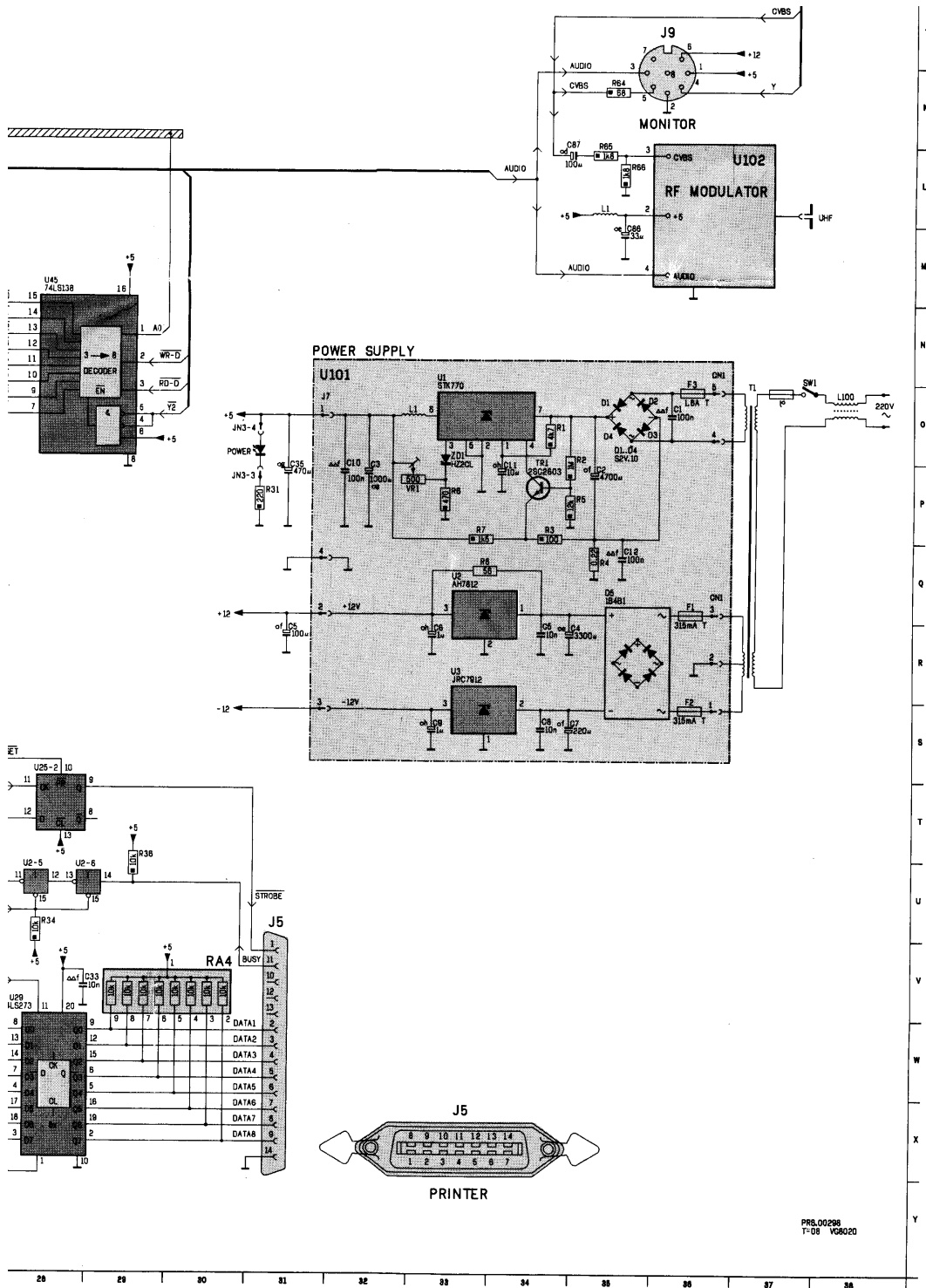
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