Laser Vision Player 22VP931/17

VERSION AH00.....

Service
Service
Service

LaserVision

Service Manual

CONTENTS

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

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

Subject to modification

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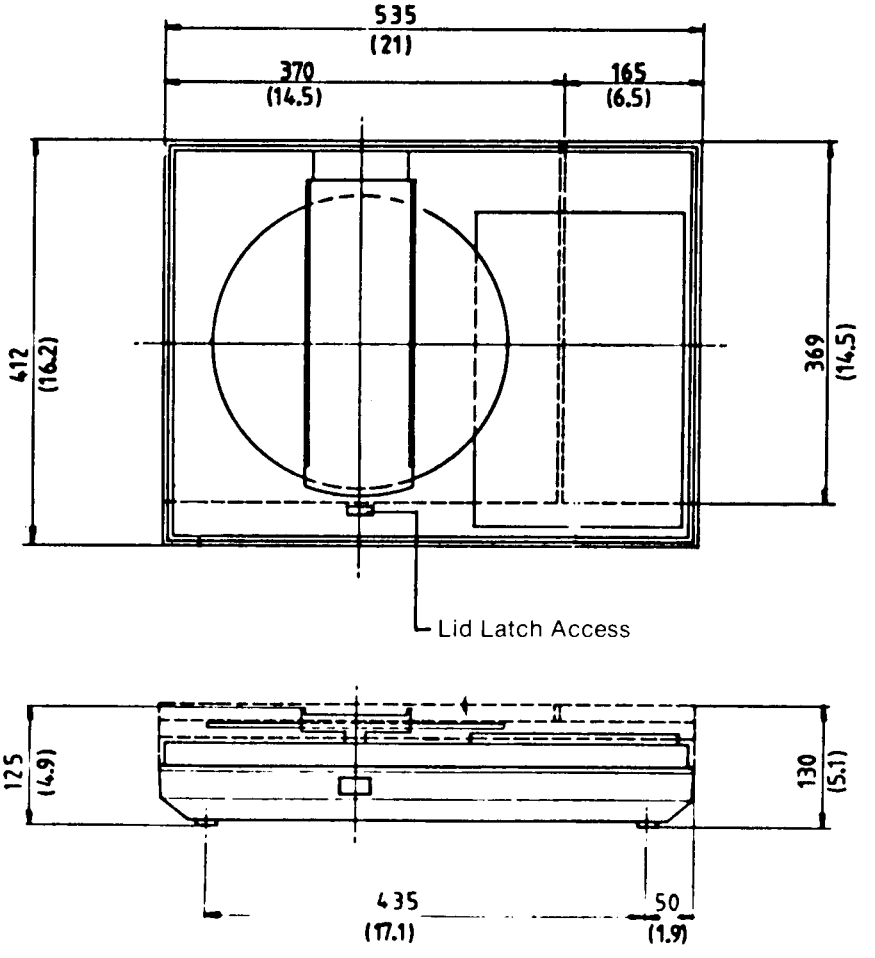
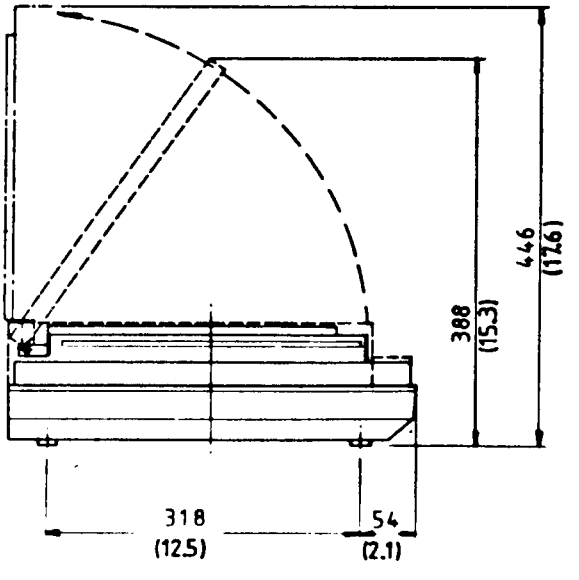
Printed in The Netherlands

CS 94 164

DIMENSIONS





dims. are in **mm**
(inches)

TECHNICAL DATA PLAYER

Mains voltage	: 120/220 V ± 10%
Mains frequency	: 50/60 Hz
Power consumption	: 50 W max.
Fuses	: 2.5 A slow

Appearance and connections:

Dimensions	: 535x412x125 mm
Weight	
Colour	: not applicable
Brand indication	: not applicable
Audio out (L & R)	: Dual R.C.A. phono jack
Video-out	: BNC
Pre-amp.-out (HF audio + video)	: BNC
Computer interface	: Subminiature "D" 25 pins

Video output signal : NTSC

Output level	: $V_o = 1.0 \pm 0.1\ V_{pp}$, into 75 Ω positive video signal
Band width	: 4.2 MHz (—3 dB)
Signal to noise ratio	: > 37 dB, unweighted; disc dependent*
Colour subcarrier frequency	: 3579545 + 50 Hz
Time base instability	: < 20 nsec., except during goto and trick mode

Audio output signal

Output level	: $V_o = 0.65\ V_{rms} \pm 1.5$ dB at 1 kHz - 100% modulation
Bandwidth	: 40 Hz-20 kHz (—3 dB)
Signal to noise ratio	: > 55 dB*
Number of channels	: 2
Channel unbalance	: < 1 dB
Channel crosstalk	: ≤ —55 dB, measured at 1 kHz-100% modulation
Distortion	: < 1%, measured at 1 kHz-100% modulation

Pre-amp. out

Output level	: $70 \pm 20\ mV_{pp}$ into 50 Ω
Bandwidth	: 5 kHz-15 MHz (—3 dB)

Computer interface : Format, 8 bits parallel with handshake TTL compatible

*Carrier to noise ratio of the main carrier of the disc ≥ 60 dB

TECHNICAL DATA DECK

Weight	: approx 3 kg
Supply voltages	: + 12 V ± 5 % — 12 V ± 5%
Current consumption	: < 180 mA
Laser voltage	: ignition ≥ 8.000 V d.c. operation 1150 ± 100 V d.c.
Laser current	: operation 5 ± 0.2 mA
Laser type	: He-Ne Laser 1.5 ± 0.5 mW 632.8 nm
Objective	: 20 x 0.40 N.A.
Disc clamping	: automatically with lid closure
Spindle type	: conical 35 mm auto centring of 8"-12" optical video discs
Inner read out diameter	: ≥ 108 mm
Outer read out diameter	: ≤ 293 mm
Turntable motor	: d.c. motor
— direction of rotation	: counter clockwise seen from the objective
— rotation speed	: 0 ... 2.000 r.p.m.
— start up time	: ≤ 8.5 sec (12" disc)
Slide drive motor	: d.c. motor
— direction of movement	: reversable
— search time	: 5 ± 1 sec (12" disc)
Operating position	: horizontal ± 20°
Allowed ambient temp.	: 15°C<t<60°C acc. spec. 5°C<t<15°C 60°C<t<65°C } working

REMARKS

1. Exchange of the panels

The Video Servo 1 panel and Video Servo 2 panel, have to be adjusted after replacement. The necessary adjustments are B7, B8 and C1 (focus drive, tangential servo and MTF circuit).
The supply panel, control 1 panel, control 2 panel and the deck can be exchanged without any adjustment.

2. Circuit diagrams

a. The voltages indicated in the diagrams have been measured in the "play" mode of the set. The voltages under deviating circumstances are indicated between brackets ().
b. The oscillograms have been measured in the "still" mode, with the colour bar pattern of the test disc as video signal.

3. Printed Circuit Boards

The drawings of th PCBs are accompanied by a component search system, by means of which it is possible to quickly determine the location of the components.
A quadrantal division has been drawn around the PCB and a Table with all the occurring components is given next to the PCB.

For example:
2018 B5 means that capacitor 2018 is located in quadrant B-5.

4. Optical adjustments

The light path in the player consists of very critically adjusted components.
If a deviation has been observed, one should first convince oneself of the fact that the deviation is located in the optical part and not in the electronic circuits in the rest of the set, before making a beginning with the optical adjustments in the deck.
If necessary, replace the complete deck to locate the deviation.

WARNINGS

1. While repairing and measuring in the electric circuits, one should keep in mind that part of the circuit on the supply panel remains under voltage when the set has been switched off (lid open).
   Therefore be sure to always remove the mains plug from the socket outlet before replacing any components.
2. The laser used in this set is a HeNe laser which emits visible light with power of 1 mW and which is classified in the category "class 3B" laser.
   If, during repair in the deck, the objective unit is removed, a parallel laser beam emerges from the objective hole.

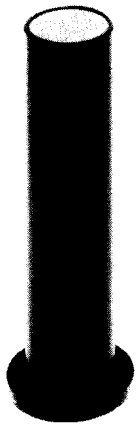
   Avoid looking directly into the laser beam as this might cause permanent injury to the eye.

ADJUSTMENTS

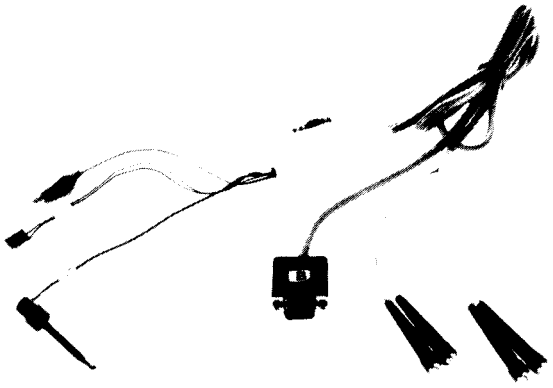
Optical adjustments

For the optical adjustments the following items are required:

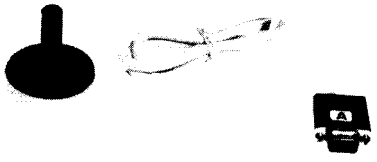
1. Optical adjustments set: 4822 395 30124 (220 V)
   or: 4822 395 30233 (110 V)



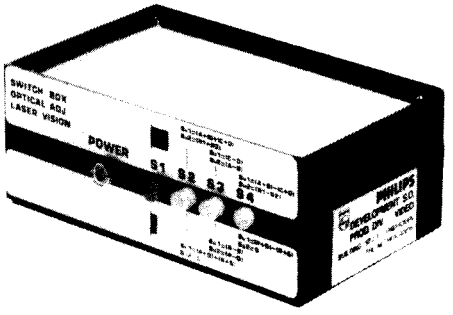
— mirror alignment turret;



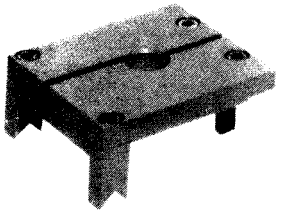
— test lead;



— pupil-filling meter;

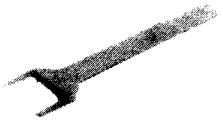


— switch box;



— test jig;

— target block;



— key for adjustment of ¼λ plate;

2. Double-beam oscilloscope.
3. Signal generator, 10 Hz - 100 kHz.
4. Variable d.c. power supply.
5. Set of Torx screwdrivers (4822 395 50145).
6. Test disc 8" (approx. 20 cm dia.) 4822 397 30097.
7. Plug adaptor 4p (C7X-Stocko) 4822 267 40514.

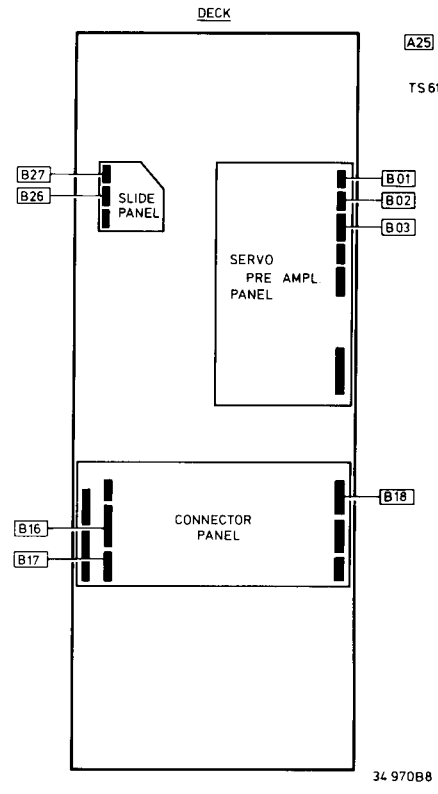
Operations to be carried out prior to optical-path adjustments.

1. Remove the covers (items 143, 153 and 511) and the slide drive mechanism (item 129) as shown in Fig. 1. Remove the deck from the cabinet by undoing the four fixing screws. Place the deck with its rear side on the rear cabinet edge and place cover 143 underneath the front, as indicated in Fig. 2.

2. **Switching on the laser** (servo section of the player inoperative)

— Unplug connectors B16 and B17 on the connector panel of the deck.
— Unplug connectors B26 and B27 on the slide panel of the deck.
— Short-circuit C and E of TS6148 on the power supply panel by means of an insulated test clip.
— Switch on the laser by switching on the player.

POSITION OF CONNECTORS



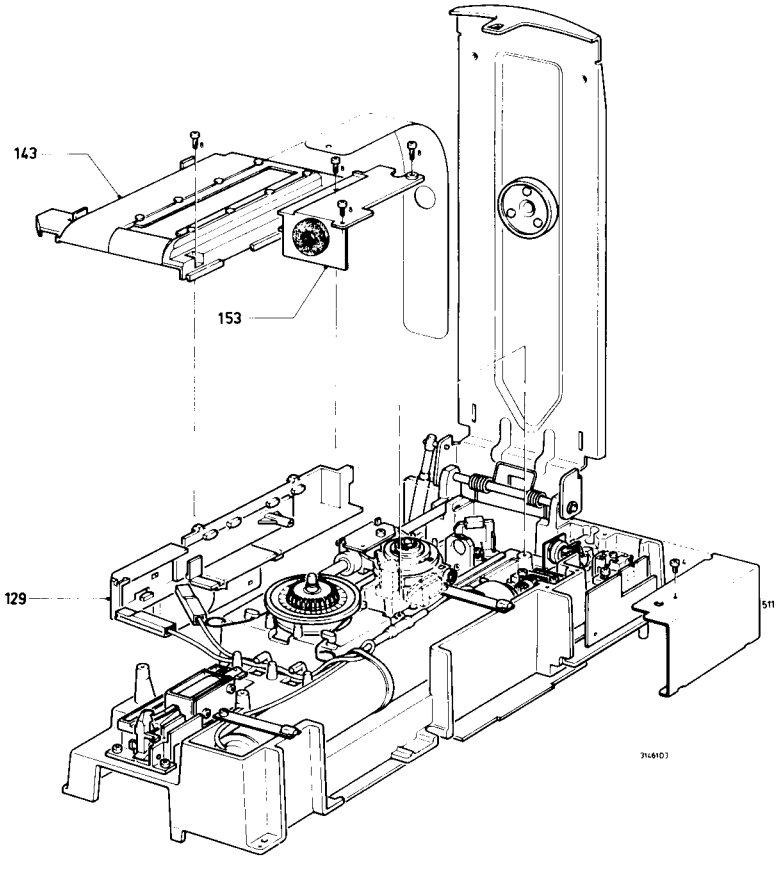


Fig. 1

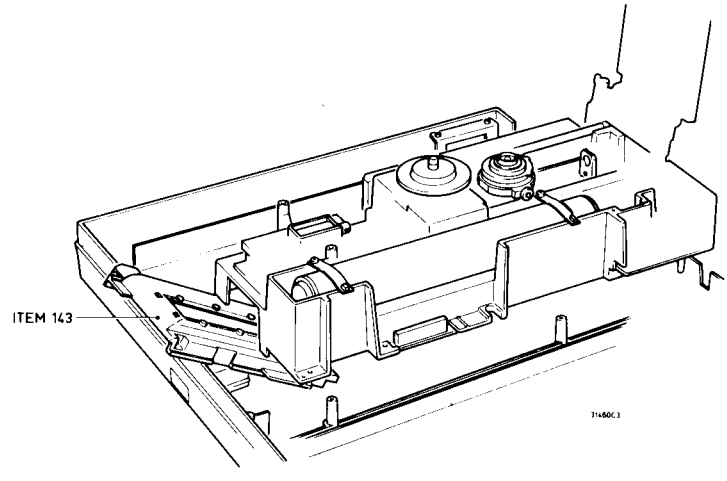


Fig. 2

3. Adjusting the manipulators

The manipulators for the spot lens, the radial and tangential mirrors and the photo-diode are constructed as shown in Fig. 3a. The pivots A and B are integrated in the manipulator material, so that their adjustment range is limited. If the adjustment is such that an upward movement is obtained (turn set-screw clockwise) this will present no problems.
However, if subsequently a downard adjustment is required (turn set-screw anti-clockwise) the pivot will no longer exert an adequate spring force on the manipulator after some turns. In that case it is necessary to re-energize the manipulator by turning the set-screw six turns further anti-clockwise and pressing the manipulator against its stop by means of the screwdriver. After this turn the set-screw clockwise until the manipulator has reached the desired position.
The same procedure must be adopted for the folding mirror, although a different construction is employed (see Fig. 3b).
The pivots A and B are energized by turning set-screw E four turns anti-clockwise and then urging the mirror holder upward against the set-screw.
Pivot C is actuated by turning set-screw D four turns anti-clockwise and pressing the manipulator towards set-screw D.
It is obvious that the range of the manipulator adjustments described above is not unlimited. If it is necessary to repeat the energization of the manipulators more than three times, the entire manipulator must be replaced.

4. Connecting the switch box

— Connect the oscilloscope to the rear of the switch box. Connect the A-channel to BU1 and the B-channel to BU2.
— Connect the pupil-filling meter to the receptacle marked A and the test lead to receptacle B.

5. Removing and mounting the objective unit (see Fig. 4)

Indicate the position of the obj. unit before removing.
The objective holder has been snapped onto the objective magnet and must be removed with care, by tilting the flap as indicated in Fig. 4.
When remounting the objective, one of the three clamping lugs of the objective holder must snap onto the magnet with an audible click.
Check wether the position of the objective is in line with the earlier indicated position.

Caution:

Never look directly into the laser beam when the objective has been removed. The parallel beam may cause permanent eye damage.

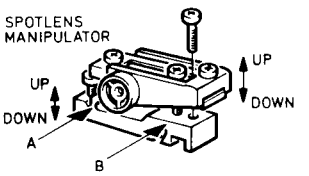


Fig. 3a

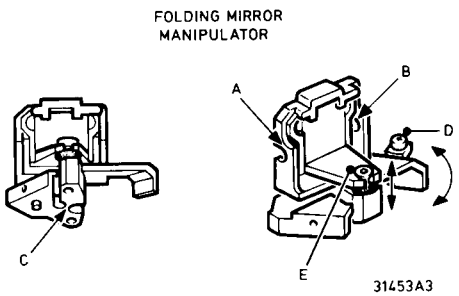


Fig. 3b

CHECK MATRIX OPTICAL ADJUSTMENTS

Check and/or adjust / Replaced part	Grating	Spotlens	¼λ plate	Fold. mir.	Rad. mir. + tang. mir.	Photo diode	objective
Laser	x	x	x	x	x	x	
Grating/spotlens	x	x				x	
¼λ plate			x				
Folding mir.		x		x	x		
Radial mir.					x		
Tangential mir.					x		
Objective							x
Cyl. lens/ph. diode						x	

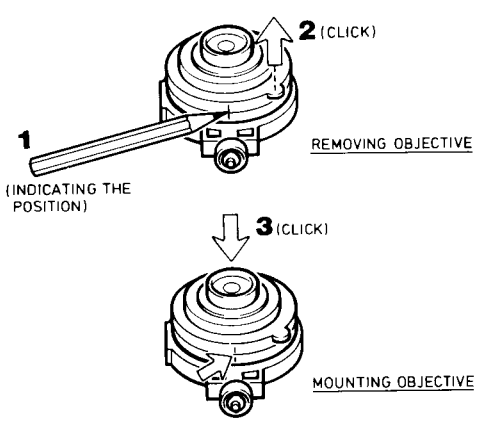


Fig. 4

Adjusting the light path (see Fig. 5)

1. Coarse adjustment of the light path

a. Place the target block into pos. 1 on the deck.

b. Adjust the spot lens with screws A and B (in turn) until the laser beam fills target 1 completely.

c. Place the target block into pos. 2.

d. Adjust the folding mirror with screws D and E (in turn) until the laser beam fills target 2 completley.

e. Remove the objective from the objective slide.

f. Place the test jig onto the slide guide-points above the objective slide.

g. Place the mirror alignment turret into the hole in the jig and adjust the radial and tangential mirrors in the slide by means of screws F and G until the shadow of the crossing of the lines lies within the circle on the frosted glass screen.

h. Proceed with the fine adjustment of the light path as described in 2.

2. Fine adjustment of the light path

a. Remove the objective from the slide and place the test jig on the slide guide-points above the objective slide.

b. Place the pupul-filling meter into the objective holder through the hole in the test jig. The pins on the meter should engage the grooves in the jig.

c. Set both channels of the oscilloscope to 0.5 V/cm (DC) and 0.5-ms time base. Adjust the lines on the oscilloscope to the zero line by means of the shift controls.

d. Switch on the switch box with the "POWER" button and press S1 and S3.

e. Switch on the laser.

f. Move the test jig to the extreme position in the direction of the folding mirror and adjust the spot lens with screws A and B (in turn) until the horizontal lines on the oscilloscope coincide with the zero line in the best possible manner.

g. Move the test jig to the extreme position in the direction of the turntable motor and adjust the folding mirror with screws D and E (in turn) until the lines coincide with the zero line of the oscilloscope in an optimum manner.

h. Repeat adjustments f and g a few times until the deviation of the two lines relative to the zero line is not more than 50 mV when the test jig is moved to and fro.

i. Remove the pupil-filling meter from the test jig and place the mirror-alignment turret on the test jig.

j. Adjust the radial and tangential mirror in the slide by means of screws F and G so that the shadow of the crossing of the lines lies within the circle on the frosted glass screen.

k. Optimize the adjustment of the spot lens with screws A and B, as described in f.

m. Remount the objective.

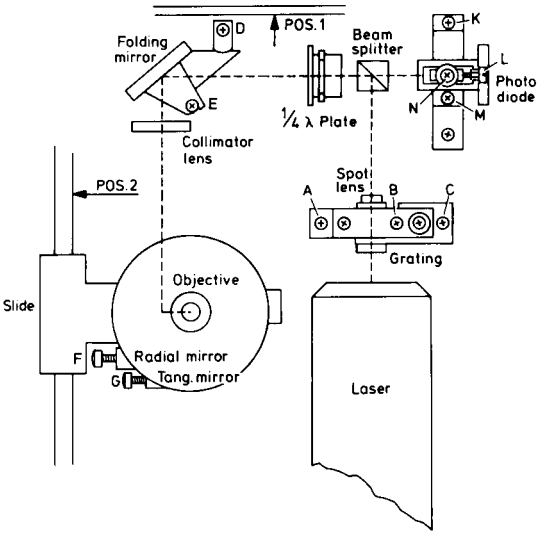


Fig. 5 31457B3

3. Adjusting the photo-diode (X-Y direction)

a. Insert connectors B01, B02 and B03 of the servo-preamp into the receptacles of the test lead.
Insert connector B18 of the test lead into receptacle B18 on the connector panel, using the plug adaptor 4p.
Connect the earth clip to the mass of the deck.
b. Connect the signal generator, the oscilloscope and the d.c. power supply, as shown in Fig. 6.
c. Place the 8" test disc with its unrecorded side on the turntable and bring the objective slide to a position about halfway the disc.
d. Switch on the laser.
e. Switch off S1 and switch on S4 of the switch box.
f. Set the oscilloscope to 0.5 V/div. and a time base of 2 ms.
g. Set the frequency of the signal generator to approx. 30 Hz and adjust the amplitude of the generator signal and the power supply so that the objective starts to oscillate freely and an S-curve is displayed on the oscilloscope screen (beam A). The (R_1 - R_2) signal on beam B should be minimum ($\leq$ 100 mVpp).
The amplitudes and waveform are shown in Fig. 7.
h. Adjust screws K and M in turn so that the amplitude of the S-curve is a maxiumum. If the minimum value of the voltage (1 V)is not reached the components in the light path must be inspected for dust and other contaminants. If necessary, clean these components.
i. Switch on S3 and adjust screws K and M in turn until the amplitude of the difference signals (A-B) and (C-D) is $\leq$ 100 mV.
j. If no S-curve is found S2 must be switched on to display the sum signal (A+B) + (C+D) from the photdiodes. Adjust screws K and M for a maximum sum signal and repeat adjustments g to i inclusive.

4. Adjusting the ¼λ plate

a. Connect the player as described under 3a and 3b (adjust-ment of the photo-diode by means of the S-curve).
b. Switch off S1 and switch on S2 of the switch box.
c. The sum signal (A+B) + (C+D) is displayed on the A-channel of the oscilloscope (see Fig. 8).
d. Adjust the ¼λ plate, using the accessory key, so as to obtain a minimal ripple on the peak of the sum signal.

Remove the connectors from the receptacles of the test lead, refit all the connectors in the player, remove the short circuit of TS6148 and mount the slide drive mechanism, so that the player is restored to the normal operating condition.

5. Adjusting the grating

a. Put on the 8" test disc and switch on the player. Select picture number 17000 (still picture).
b. Unplug connector A25 (slide motor) on the Control 2 panel.
c. Unplug connector B26 (rad. mirror) on the slide panel.
d. Unplug connector B02 on the servo-preamplifier panel and insert this connector into receptacle B02 of the test lead. Connect the test lead to the switch box.
e. Switch off S1 on the switch box and switch on S4, so that the radial difference signal (R1-R2) appears on the B-channel of the oscilloscope.
f. Turn screw C clockwise until the grating lens has approximately reached the extreme position and the oscilloscope displays the radial difference signal for the 2.5 and 1.66 μm track pitch (see Fig. 10). If necessary, search for this signal by manually varying the position of the objective slide by rotating the gear wheel.

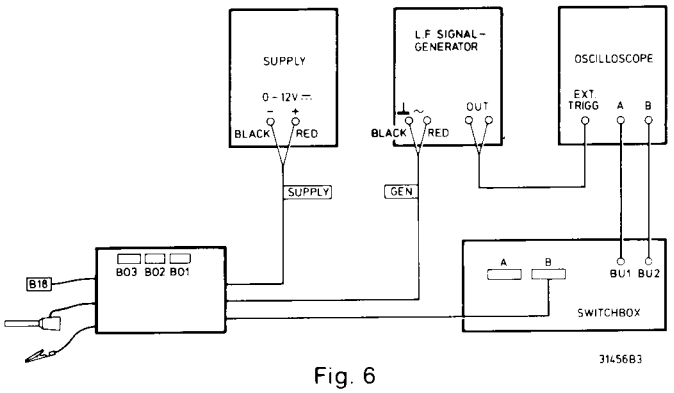


Fig. 6

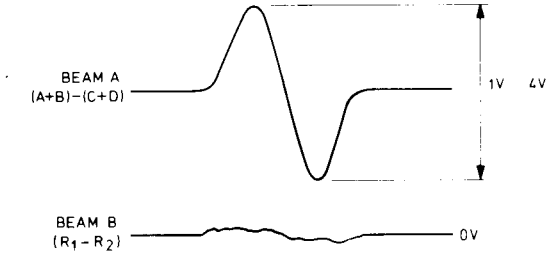


Fig. 7

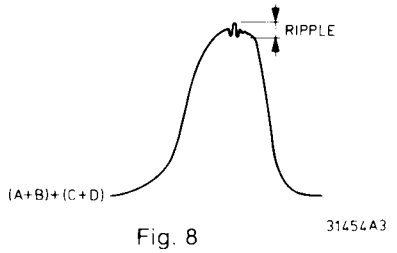


Fig. 8

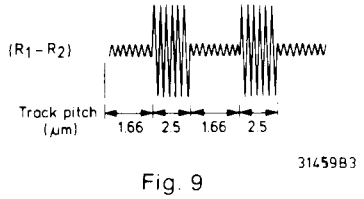


Fig. 9

g. Turn screw C about 3 turns anti-clockwise until the radial difference signal is minimal for both track pitches. The position of the three spots is now exactly in line with the tracks.
h. Move the objective slide until approx. picture number 16000 is displayed (track pitch 1.4 μm).
i. Switch on S2 on the switch box. The radial sum signal (R1 + R2) is now displayed on the oscilloscope.
j. Turn screw C anti-clockwise (about 1 turn) until the signal on the oscilloscope is minimal.
k. Refit connectors B02, A25 and B26 and check the player for correct tracking.

6. Adjusting the photo-diode (Z-direction)

a. Put the 8" test disc on the turntable and switch on the player. Search for a black picture (e.g. 5000).
b. Apply a 1 KHz sinewave signal from the signal generator to point 6-IC6209-2A (focus drive) via 27 kv. The accessory test lead may be used for this purpose. Connect the correspondingly marked terminals to earth and to point 6-IC6209-2A focus-drive. Connect the cable marked "GEN" to the output of the signal generator.
c. Measure the HF signal on C-TS6104 by means of the oscilloscope (approx. 600 mV.).
d. Connect the 1 kHz signal to the other input of the oscilloscope and trigger on this signal.
e. Adjust the amplitude of the signal from the signal generator so that a 1 kHz whistle is just audible from the objective and the oscilloscope displays a HF signal modulated with a 1 KHz sinewave (see Fig. 9).
f. Loosen screw N slightly and adjust the position of the photodiodes with screw L until the amplitudes A of the HF signal have the same values as the amplitudes B.
g. Fasten screw N again.

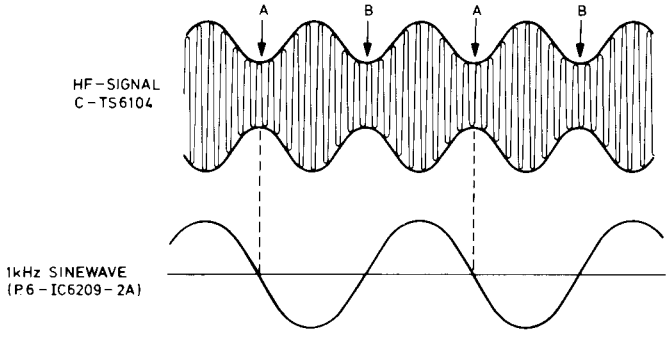


Fig. 10 31455A3

7. Objective

a) Put the 8" test disc on the turntable and switch on the player.
b) Search for picture number 450 (white).
c) Turn the objective unit until the interference patterns at the left and the right side of the picture are minimum.

ELECTRICAL ADJUSTMENTS PLAYER PART (see Fig. 11)

Equipment required for the electrical adjustments:
— Double-beam oscilloscope with delayed time base;
— HF generator (NTSC);
— LF generator;
— Voltmeter (preferably digital);
— Variable d.c. power supply;
— 8" test disc (approx. 20 cm dia.) 4822 397 30097.

A. Power supply panel (circuit diagram A)

1. Switched-mode power supply

— Measure the voltage on point C002 with the voltmeter.
— Adjust this voltage to +12 V (± 120 mV) with R3011.

2. Laser supply

— Measure the voltage on junction point R3066-R3067.
— Adjust this voltage to +5 V (= 5 mA laser current) with R3066.

3. Tacho circuits

— Test disc on player; normal-play mode.
— Measure the voltage on the base of TS 6154.
— Adjust this voltage to +1.69 V with R3112.

B. Video Servo 1 panel (circuit diagram B)

1. Video demodulator 1

— Test disc on player, picture number 8600 (B/W bars), still picture.
— Measure the video signal on point C004 with the oscilloscope.
— Adjust for 1.5 Vp-p video signal with R3075.

2. Video demodulator 2

— Test disc in player, picture no. 8600 (B/W bars), still picture.
— Short-circuit the base of TS 6113 to earth.
— Measure the video signal on point C004 with the oscilloscope.
— Adjust R3051 for a 1.5 Vp-p video signal.
— Remove the short-circuit.

3. HF processor

— Mains switch on, cover open.
— Connect the HF generator to connectors B051 and B053 (earth) via a filter (Fig. 12).
— Set the generator to a frequency of 8 MHz and 20 mVp-p output voltage, unmodulated.
— Connect point C008 to earth.
— Measure the signal on point 5 of IC 6202 by means of the oscillioscope.
— Adjust L5001 for maximum signal amplitude.

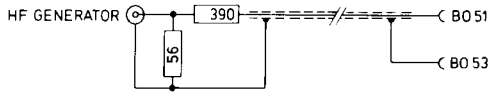


Fig. 12

4. Audio drop-out detector

— Mains switch on, cover open.
— Connect the HF generator to the connectors B051 and B053 (earth) via a filter as shown in Fig. 12.
— Set the generator to a frequency of 400 kHz, unmodulated, and set the RF attenuation to 40 dB.
— Apply a voltage of 8 V d.c. (negative to earth) to point C008.
— Measure the signal on the base of TS 6118 by means of the oscilloscope.
— Adjust L5018 for maximum signal amplitude.

6. 5% detector

— Test disc in the player, normal play mode.
— Measure the signal on the collector of TS6168 by means of the oscilloscope.
— Adjust L5034 for maximum signal amplitude.

7. Focus drive

— Test disc in player, picture number 20000, still picture.
— Via a 100-kohm resistor apply a sinewave-signal having a frequency of 2.1 kHz and an amplitude of 1 Vp-p to point 6 of IC6209-2A.
— Measure the signal on junction R3218-R3219 with channel A of the oscilloscope.
— Set the oscilloscope to X-deflection and apply the 2.1-kHz generator signal to X-input.
— Adjust R3223 so that the left-hand and right-hand side of the Lissajous figure are at the same level (see Fig. 14).

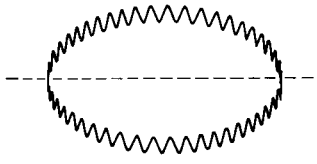


Fig. 14

8. Tangential serve

— Test disc in player, picture number 16500 (blue), still picture.
— Turn potentiometer R3383 fully clockwise. Hazy horizontal bars will now appear in the picture.
— Turn potentiometer R3383 anti-clockwise until these bars just disappear.

C. Video Servo 2 panel (circuit diagram C)

1. MTF circuit

— Connect the HF generator to connectors A011 and A012 (earth).
— Set the frequency to 3.58 MHz and the amplitude to 0.1 V_{p-p}.
— Measure the signal on the emitter of TS6116 by means of the oscilloscope.
— Adjust L5005 for maximum signal amplitude.
— Remove the generator signal.
— Test disc in the player, picture number 180, still picture.
— Connect the oscilloscope to the VIDEO OUT connector (see circuit diagram B) and search for the multiburst signals in the VITS (line 20) by means of the delayed time base.
— Adjust R3057 so that the amplitude of MB IV = MBI (see Fig. 15).

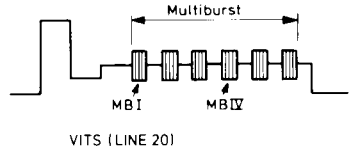


Fig. 15

E. Deck electronics (circuit diagram E)

1. Radial gain (Gain)

— Test disc in the player, still picture.
— Measure the signal on connector B075 by means of the oscilloscope.
— Display the TPI pulse by means of the delayed time base.
— Adjust the pulse width to approx. 95 μsecs. with R3017 (Gain).

2. Radial offset (balance)

— Test disc in the player, still picture.
— Unplug connector A25 (slide motor) on the Control 2 panel.
— Unplug connector B26 (rad. mirror) on the slide panel.
— Connect connector B033 (substrate) to earth via a 180-kohm resistor.
— Measure the "rad. error" signal on connector B072 by means of the oscilloscope (d.c.).
— Adjust R3016 (Balance) so that the signal is symmetrical relative to the zero level (see Fig. 16).
— Remove the 180 kohm resistor and refit connectors A25 and B26.

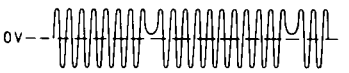
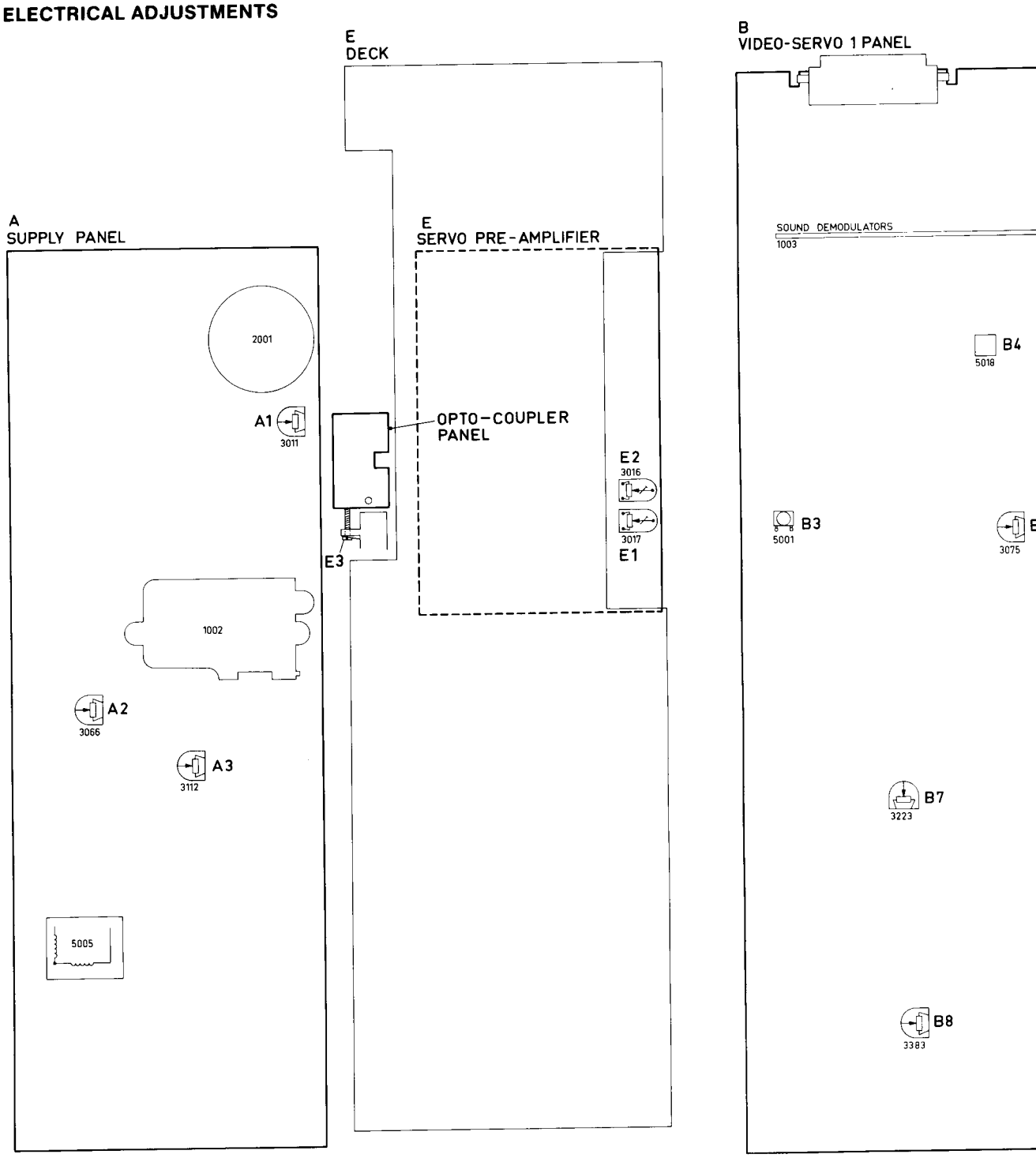


Fig. 16 31458B3

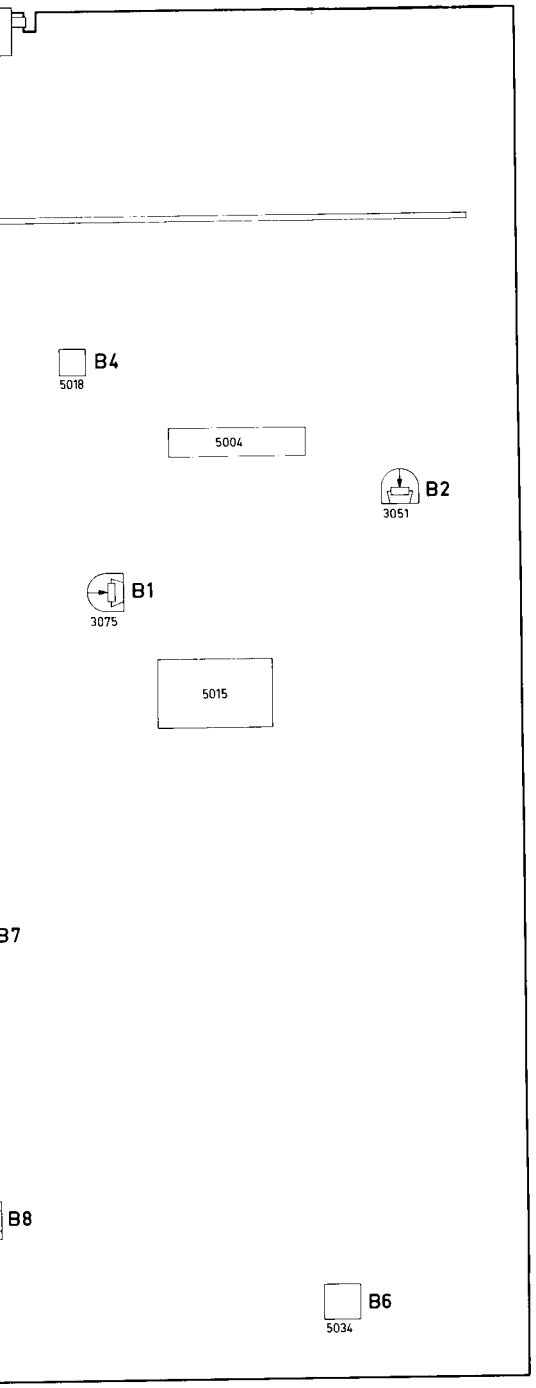
3. Adjusting the slide end-stop (item 122 in exploded view drawing of deck)

— Test disc in the player, picture number > 1000, still picture.
— Press button "scan reverse" and keep it pressed. The objective slide now travels to the centre of the disc until the beginning of the disc is reached.
— Release the "scan reverse" button. The player now shows the lowest possible picture number which must be between 50 and 150. If not, adjust the set-screw of the opto-coupler panel, until the desired range has been reached, repeating above operations.
— Check whether the objective slide travels back from picture number 380 onwards, after pressing button "scan reverse".

ELECTRICAL ADJUSTMENTS



Fi


B4
5018
5004
B2
3051
B1
3075
5015
B7
B8
B6
5034

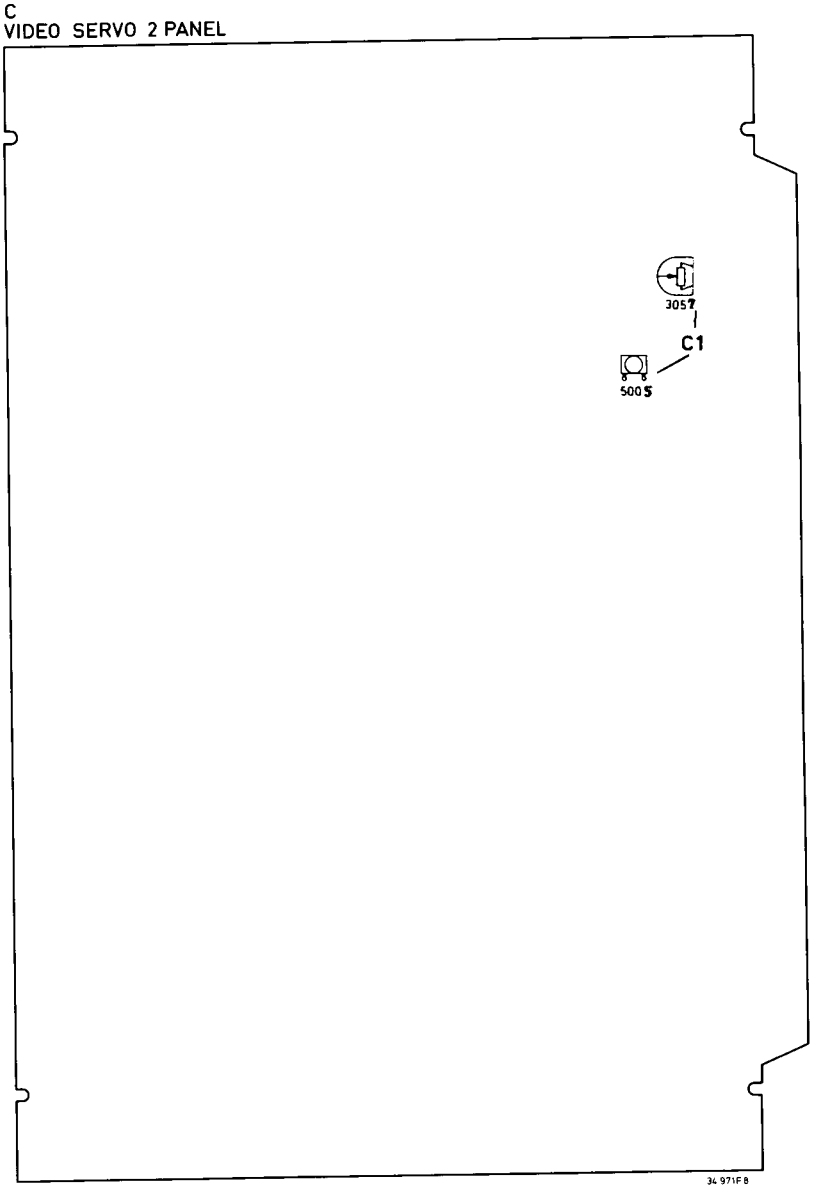
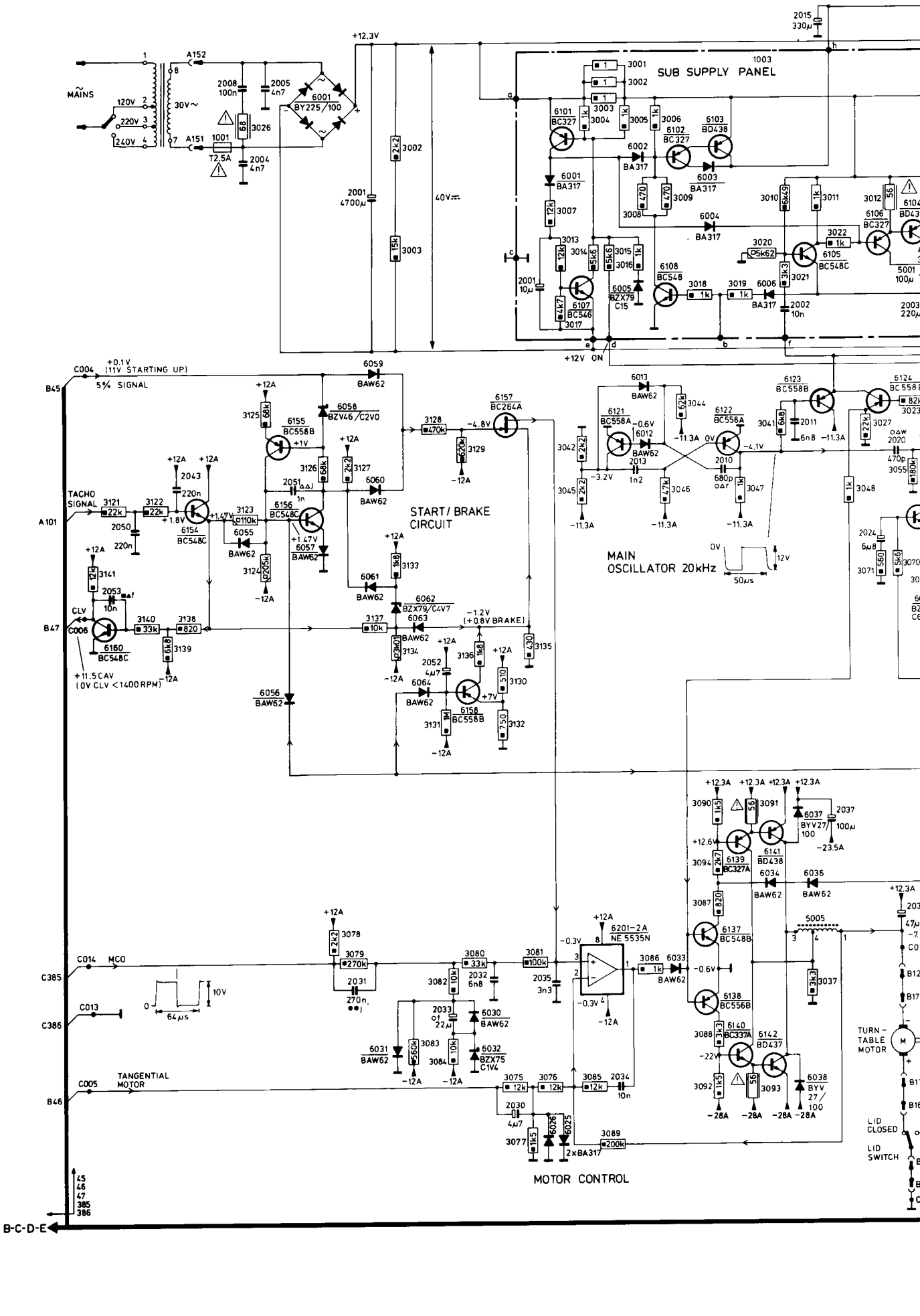
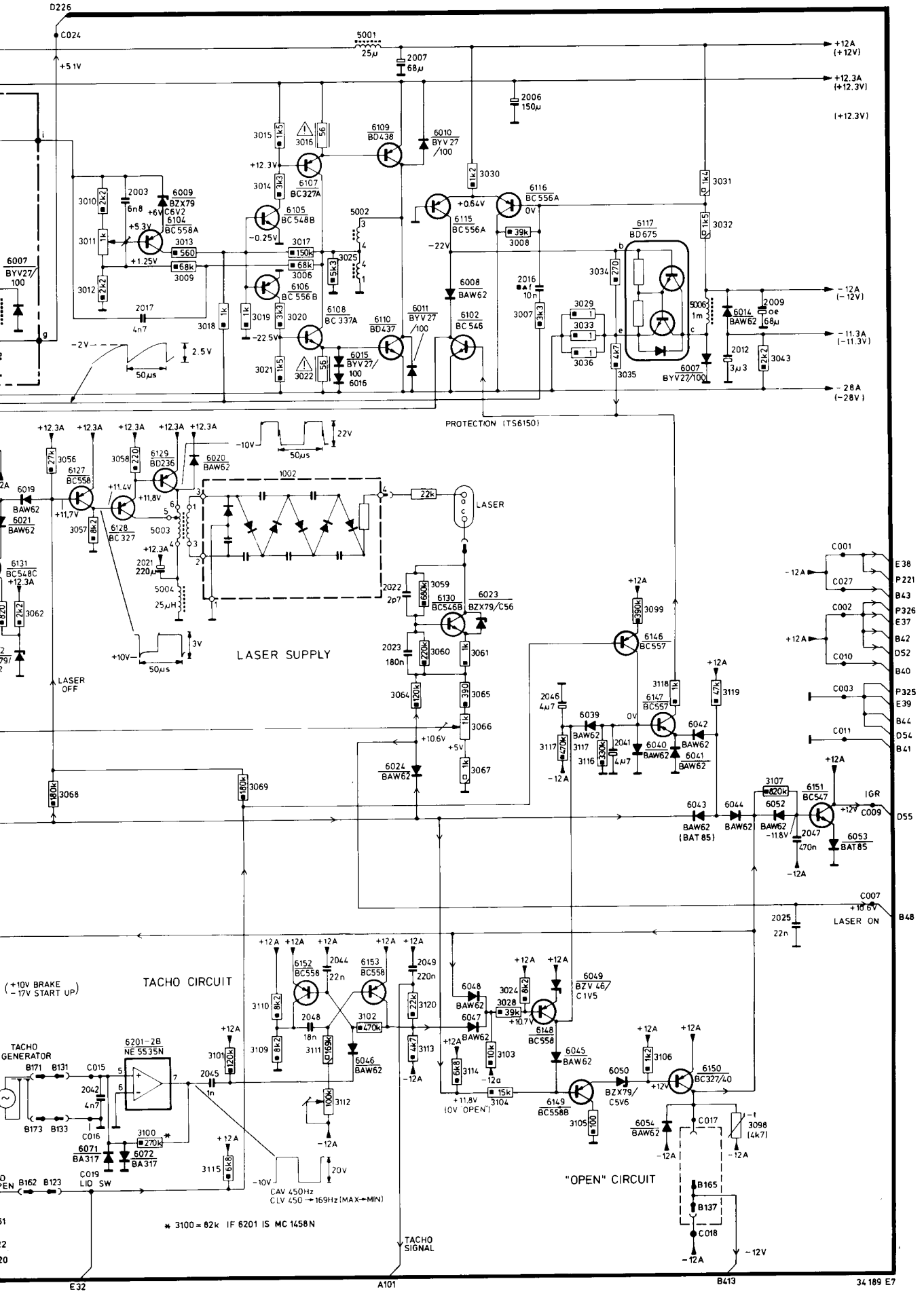

C
VIDEO SERVO 2 PANEL
3057
C1
5005
34 971F B

Fig. 11

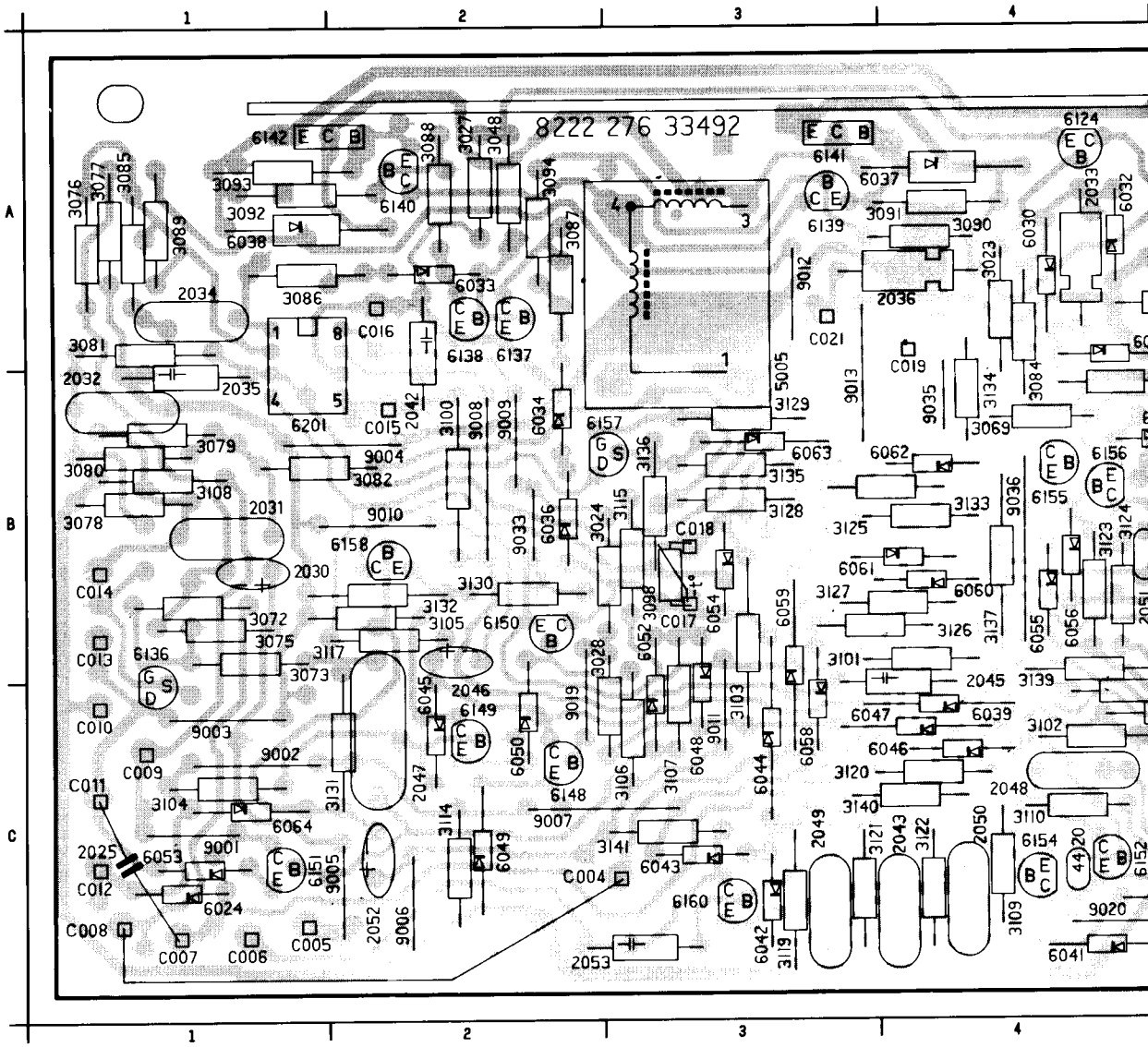
SUPPLY PANEL DIAGRAM A




D226
C024
+5.1V
5001
25µ
2007
68µ
+12A
(+12V)
+12.3A
(+12.3V)
2006
150µ
6109
BD438
6010
BYV27
/100
6107
BC327A
6105
BC548B
6106
BC556B
6108
BC337A
6110
BD437
6011
BYV27
/100
6015
BYV27/
100
6016
6115
BC556A
6116
BC556A
6117
BD675
6008
BAW62
6102
BC546
6007
BYV27/100
6014
BAW62
-12A
(-12V)
-11.3A
(-11.3V)
-28A
(-28V)
6009
BZX79
C6V2
6104
BC558A
6007
BYV27/
100
2003
6n8
2017
4n7
2016
10n
2009
68µ
2012
3µ3
PROTECTION (TS6150)
LASER
LASER SUPPLY
LASER
OFF
6019
BAW62
6021
BAW62
6131
BC548C
6127
BC558
6128
BC327
6129
BD236
6020
BAW62
1002
2021
220µ
2022
2p7
6130
BC546B
6023
BZX79/C56
2023
180n
6024
BAW62
6146
BC557
6147
BC557
6039
BAW62
6040
BAW62
6042
BAW62
6041
BAW62
2046
4µ7
2041
4µ7
6043
BAW62
(BAT 85)
6044
BAW62
6151
BC547
6052
BAW62
6053
BAT 85
2047
470n
C001
C027
C002
C010
C003
C011
E38
P221
B43
P326
E37
B42
DS2
B40
P325
E39
B44
DS4
B41
IGR
C009
D55
C007
+10.6V
LASER ON
B48
2025
22n
TACHO CIRCUIT
(+10V BRAKE
-17V START UP)
TACHO
GENERATOR
B171
B131
B173
B133
C015
C016
C019
LID SW
6201-2B
NE 5535N
6071
BA317
6072
BA317
6152
BC558
6153
BC558
2044
22n
2048
18n
6046
BAW62
6048
BAW62
6047
BAW62
6148
BC558
6045
BAW62
6149
BC558B
6050
BZX79/
C5V6
6150
BC327/40
6049
BZV 46/
C1V5
2049
220n
2045
1n
CAV 450Hz
CLV 450 → 169Hz (MAX→MIN)
* 3100 = 82k IF 6201 IS MC 1458N
"OPEN" CIRCUIT
B165
B137
C018
C017
TACHO
SIGNAL
E32
A101
B413
34 189 E7

SUPPLY PANEL DIAGRAM A

1001	B10	2010	A 8	2023	B 5	2041	C 6	2053	C 2	3011	C 8	3022	A 8	3034	A10	3055	B 5	3066	A 5	3077
1003	B 9	2011	B 7	2024	B 6	2042	B 2	3001	B10	3012	C 9	3023	A 4	3035	A10	3056	B 5	3067	A 5	3078
2001	C 9	2012	B 8	2025	C 1	2043	C 4	3002	B10	3013	A 7	3024	B 2	3036	A10	3057	A 5	3068	B 5	3079
2002	B10	2013	A 8	2030	B 1	2045	C 4	3003	A10	3014	A 6	3026	B10	3041	A 7	3058	A 5	3069	B 4	3080
2003	C 8	2014	B 9	2031	B 1	2046	C 2	3004	B10	3015	A 6	3027	A 2	3042	B 8	3059	C 5	3070	B 6	3081
2004	C10	2015	C 8	2032	B 1	2047	C 2	3005	A 9	3016	A 6	3028	B 2	3043	A 7	3060	B 5	3071	B 6	3082
2005	C10	2016	A 9	2033	A 4	2048	C 4	3006	B 8	3017	A 7	3029	A10	3044	A 8	3061	B 5	3072	B 1	3083
2006	C 9	2017	B 8	2034	A 1	2049	C 3	3007	B 9	3018	A 7	3030	B 9	3045	A 7	3062	B 5	3073	B 1	3084
2007	C 9	2020	B 6	2035	B 1	2050	C 4	3008	A10	3019	A 7	3031	B10	3046	A 7	3063	B 5	3074	C 1	3085
2008	B10	2021	B 7	2036	A 4	2051	B 4	3009	B 8	3020	A 7	3032	B 9	3047	A 7	3064	B 5	3075	B 1	3086
2009	A 9	2022	C 5	2037	A 6	2052	C 2	3010	C 8	3021	A 7	3033	A10	3048	A 2	3065	B 6	3076	A 1	3087
																				3091



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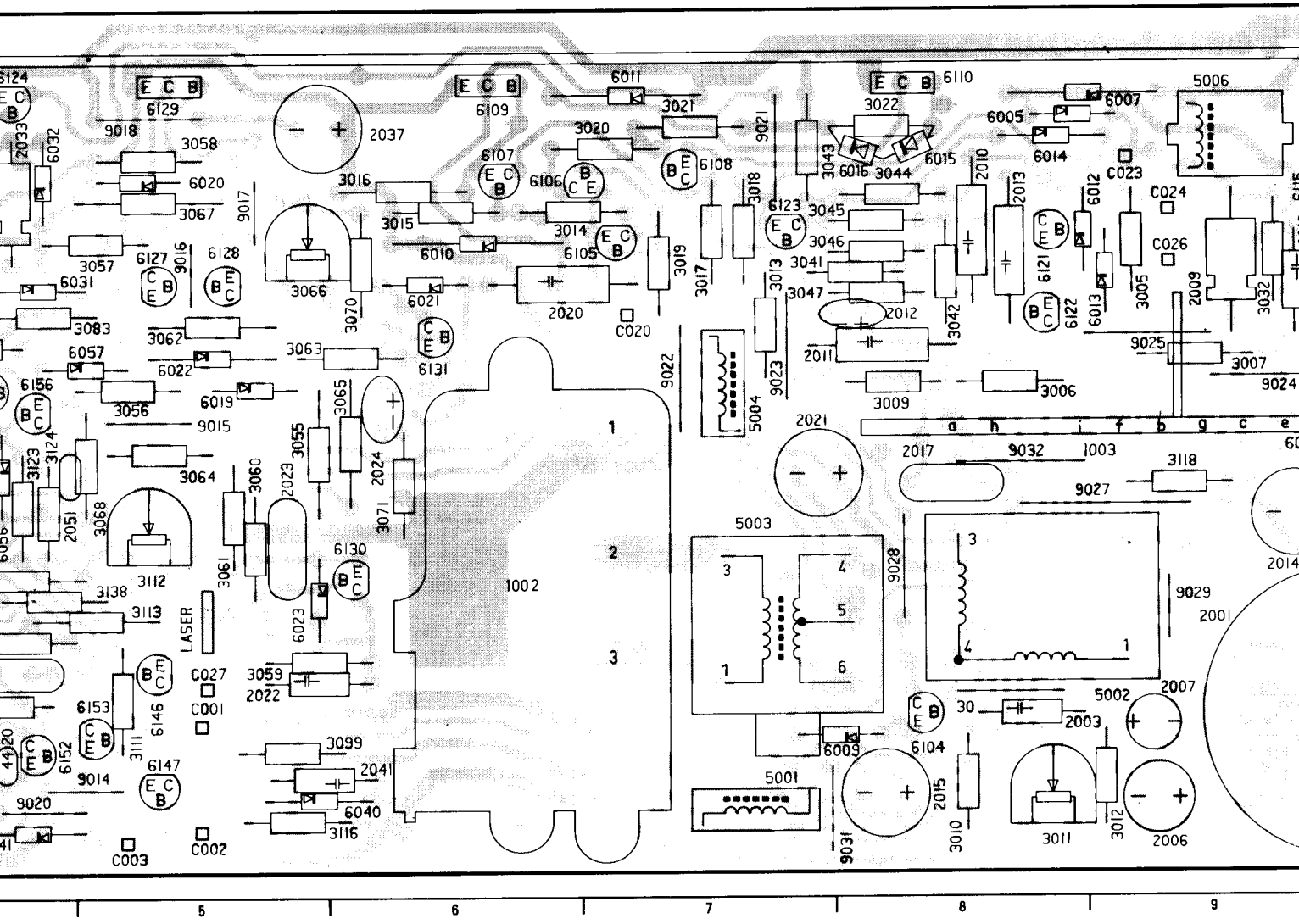
A 5	3078	B 1	3089	A 1	3104	C 1	3115	B 3	3126	B 4	3137	B 4	6001	B10	6015	A 8	6034	B 2	6046	C 4	6058	C 3	6107	A 6	6127
B 5	3079	B 1	3090	A 4	3105	B 2	3116	C 6	3127	B 3	3138	C 5	6002	B 9	6016	A 8	6036	B 2	6047	C 3	6059	B 3	6108	A 7	6128
B 4	3080	B 1	3091	A 4	3106	C 3	3117	B 2	3128	B 3	3139	C 4	6003	B10	6019	B 5	6037	A 4	6048	C 3	6060	B 4	6109	A 6	6129
B 6	3081	A 1	3092	A 1	3107	C 3	3118	B 9	3129	B 3	3140	C 3	6005	A 8	6020	A 5	6038	A 1	6049	C 2	6061	B 3	6110	A 8	6130
B 6	3082	B 2	3093	A 1	3108	B 1	3119	C 3	3130	B 2	3141	C 3	6007	A 9	6021	B 6	6039	C 4	6050	C 2	6062	B 4	6115	A 9	6131
B 1	3083	B 5	3094	A 2	3109	C 4	3120	C 3	3131	C 2	5001	C 7	6008	A10	6022	B 5	6040	C 6	6052	B 3	6063	B 3	6116	A10	6136
B 1	3084	B 4	3099	C 6	3110	C 4	3121	C 3	3132	B 2	5002	C 9	6009	C 8	6023	C 5	6041	C 4	6053	C 1	6064	C 1	6117	A10	6137
C 1	3085	A 1	3100	B 2	3111	C 5	3122	C 4	3133	B 4	5003	B 7	6010	A 6	6024	C 1	6042	C 3	6054	B 3	6102	A10	6121	A 8	6138
B 1	3086	A 1	3101	B 3	3112	B 5	3123	B 4	3134	B 4	5004	B 7	6011	A 7	6030	A 4	6043	C 3	6055	B 4	6104	C 8	6122	B 8	6139
A 1	3087	A 2	3102	C 4	3113	C 5	3124	B 4	3135	B 3	5005	B 3	6012	A 9	6031	A 5	6044	C 3	6056	B 4	6105	A 7	6123	A 7	6140
	3098	B 3											6013	B 9	6032	A 4									



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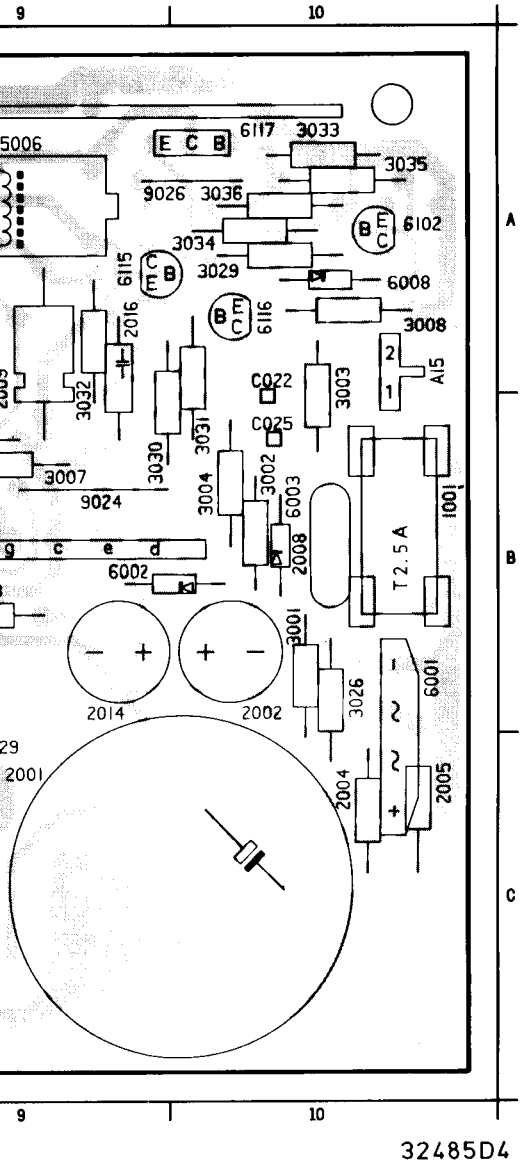
A 5	3078	B 1	3089	A 1	3104	C 1	3115	B 3	3126	B 4	3137	B 4	6001	B10	6015	A 8	6034	B 2	6046	C 4	6058	C 3	6107	A 6	6127
B 5	3079	B 1	3090	A 4	3105	B 2	3116	C 6	3127	B 3	3138	C 5	6002	B 9	6016	A 8	6036	B 2	6047	C 3	6059	B 3	6108	A 7	6128
B 4	3080	B 1	3091	A 4	3106	C 3	3117	B 2	3128	B 3	3139	C 4	6003	B10	6019	B 5	6037	A 4	6048	C 3	6060	B 4	6109	A 6	6129
B 6	3081	A 1	3092	A 1	3107	C 3	3118	B 9	3129	B 3	3140	C 3	6005	A 8	6020	A 5	6038	A 1	6049	C 2	6061	B 3	6110	A 8	6130
B 6	3082	B 2	3093	A 1	3108	B 1	3119	C 3	3130	B 2	3141	C 3	6007	A 9	6021	B 6	6039	C 4	6050	C 2	6062	B 4	6115	A 9	6131
B 1	3083	B 5	3094	A 2	3109	C 4	3120	C 3	3131	C 2	5001	C 7	6008	A10	6022	B 5	6040	C 6	6052	B 3	6063	B 3	6116	A10	6136
B 1	3084	B 4	3099	C 6	3110	C 4	3121	C 3	3132	B 2	5002	C 9	6009	C 8	6023	C 5	6041	C 4	6053	C 1	6064	C 1	6117	A10	6137
C 1	3085	A 1	3100	B 2	3111	C 5	3122	C 4	3133	B 4	5003	B 7	6010	A 6	6024	C 1	6042	C 3	6054	B 3	6102	A10	6121	A 8	6138
B 1	3086	A 1	3101	B 3	3112	B 5	3123	B 4	3134	B 4	5004	B 7	6011	A 7	6030	A 4	6043	C 3	6055	B 4	6104	C 8	6122	B 8	6139
A 1	3087	A 2	3102	C 4	3113	C 5	3124	B 4	3135	B 3	5005	B 3	6012	A 9	6031	A 5	6044	C 3	6056	B 4	6105	A 7	6123	A 7	6140
	3098	B 3											6013	B 9	6032	A 4									

A 6	6124	A 4	6141	A 3	6155	B 4
A 6	6127	A 5	6142	A 1	6156	B 4
A 7	6128	A 5	6146	C 5	6157	B 3
A 6	6129	A 5	6147	C 5	6158	B 2
A 8	6130	B 6	6148	C 2	6160	C 3
A 9	6131	B 6	6149	C 2	6201	B 1
A10	6136	B 1	6150	B 2		
A10	6137	A 2	6151	C 1		
A 8	6138	A 2	6152	C 4		
B 8	6139	A 3	6153	C 5		
A 7	6140	A 2	6154	C 4		



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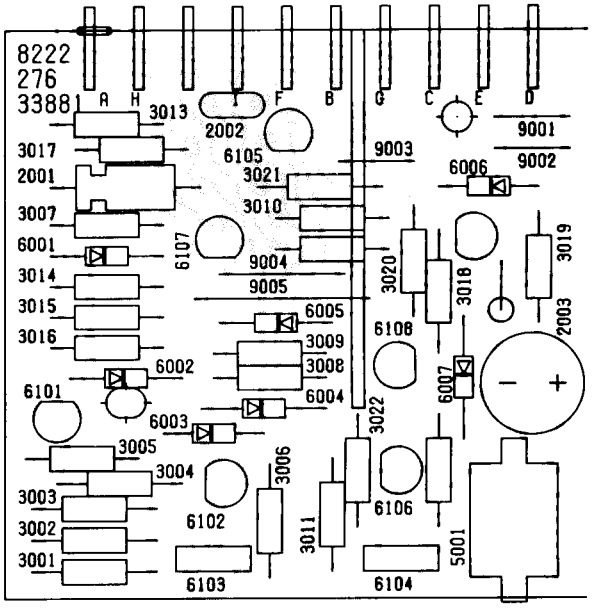
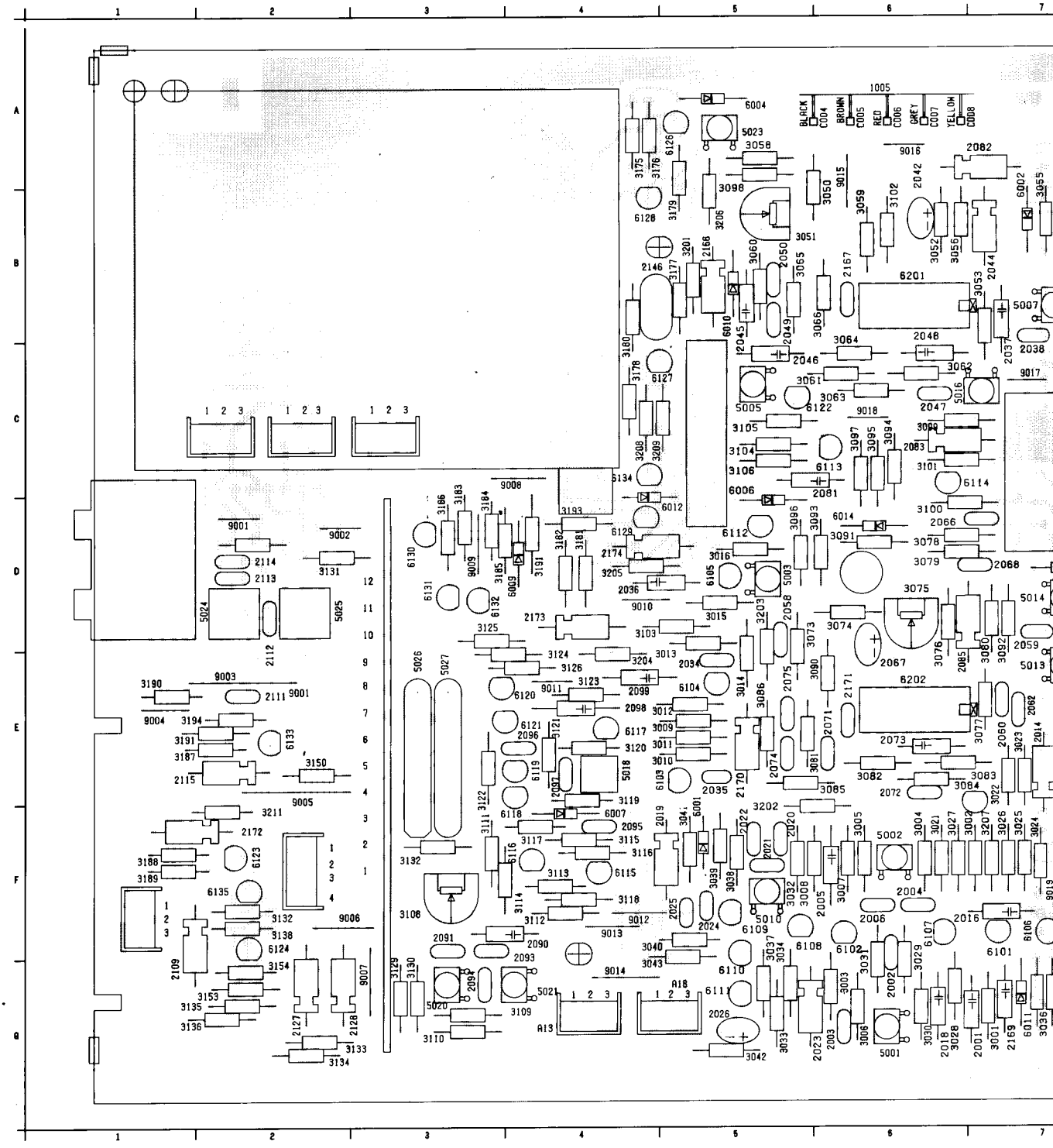
SUB SUPPLY PANEL



AUDIO DEMOD PANEL DIAGRAM B'

1005	A 6	2023	G 6	2058	D 5	2091	F 3	2169	G 7	2201	C10	2231	F12	3011	E 5	3036	G 7	3064	C 6	3094	C 6	3116	F 4	3150	E 2	3193	D 4	3227	F 8	3248	E 8	327
1006	A12	2024	F 5	2059	D 7	2093	F 4	2170	E 5	2202	B11	2232	E13	3012	E 5	3037	F 5	3065	B 5	3095	C 6	3117	F 4	3153	G 2	3194	E 1	3228	G 9	3249	D 9	327
1010	G 8	2025	F 5	2060	E 7	2094	G 3	2171	E 6	2203	B11	2233	D13	3013	E 5	3038	F 5	3066	B 6	3096	D 5	3118	F 4	3154	G 2	3201	B 5	3229	E 9	3250	C 8	329
1011	G 9	2026	G 5	2061	E 7	2095	F 4	2172	F 2	2204	A10	2234	E12	3014	E 5	3039	F 5	3073	D 5	3097	C 6	3119	E 4	3175	A 4	3202	F 5	3230	E 8	3251	D 8	329
1012	G10	2034	E 5	2062	E 7	2096	E 4	2173	D 4	2205	B10	2235	G13	3015	D 5	3040	F 4	3074	D 6	3098	B 5	3120	E 4	3176	A 4	3203	D 5	3231	E 8	3252	D 8	329
1014	G12	2035	E 5	2063	E 7	2097	E 4	2174	D 4	2206	C11	2236	F13	3016	D 5	3041	F 5	3075	D 6	3099	C 6	3121	E 4	3177	B 5	3204	E 4	3232	E 9	3253	C 8	329
2001	G 7	2036	D 4	2064	D 7	2098	E 4	2181	G 8	2207	C10	2240	B12	3021	F 6	3042	G 5	3076	E 6	3100	D 6	3122	E 3	3178	C 4	3205	D 4	3233	E 9	3254	C 8	329
2002	G 6	2037	C 7	2065	D 7	2099	E 4	2182	F 8	2208	C11	2241	C12	3022	E 7	3043	G 4	3077	E 7	3101	C 6	3123	E 4	3179	B 5	3206	B 5	3234	F 9	3255	D 8	329
2003	G 6	2038	C 7	2066	D 6	2107	G 7	2183	D 9	2208	D11	2242	B12	3023	E 7	3050	B 6	3078	D 6	3102	B 6	3124	E 4	3180	C 4	3207	F 7	3235	G 9	3256	E 8	330
2004	F 6	2039	B 7	2067	E 6	2109	G 1	2184	E 9	2209	B11	2243	C12	3024	F 7	3051	B 5	3079	D 6	3103	D 4	3125	D 3	3181	D 4	3208	C 4	3236	G 9	3257	A 9	330
2005	F 6	2040	B 7	2068	D 7	2111	E 2	2185	D 9	2210	F11	2244	C13	3025	F 7	3052	B 6	3080	E 7	3104	C 5	3126	E 4	3182	D 4	3209	C 4	3237	G 9	3260	C 9	330
2006	F 6	2041	B 7	2071	E 6	2112	E 2	2186	F 8	2211	F10	3001	G 7	3026	F 7	3053	B 7	3081	E 5	3105	C 5	3129	G 3	3183	C 3	3211	F 2	3238	F 9	3261	C 9	331
2010	F 7	2042	A 6	2072	E 6	2113	D 2	2187	B 9	2212	D11	3002	F 6	3027	F 6	3054	A 7	3082	E 6	3106	C 5	3130	G 3	3184	D 3	3217	G 8	3239	E 8	3262	C 8	331
2014	E 7	2043	A 7	2073	E 6	2114	D 2	2188	B 8	2213	E11	3003	G 6	3028	G 6	3055	A 7	3083	E 7	3108	F 3	3131	D 2	3185	D 3	3218	F 8	3240	E 8	3263	B 8	331
2015	F 7	2044	B 7	2074	E 5	2115	E 1	2189	D 9	2217	G13	3004	F 6	3029	F 6	3056	B 6	3084	E 6	3109	G 4	3132	F 2	3186	D 3	3219	F 9	3241	E 8	3264	C 9	331
2016	F 6	2045	B 5	2075	E 5	2127	G 2	2190	B 8	2218	G10	3005	F 6	3030	G 6	3058	A 5	3085	E 6	3110	G 3	3132	F 3	3187	E 1	3220	F 8	3242	E 9	3265	C 9	331
2018	G 6	2046	C 5	2081	C 6	2128	G 3	2191	D 9	2219	D12	3006	G 6	3031	G 6	3059	B 6	3086	E 5	3111	F 3	3133	G 3	3188	F 1	3221	D 9	3243	E 9	3266	B 9	331
2019	F 4	2047	C 6	2082	A 7	2146	B 4	2192	D 8	2220	C 8	3007	F 6	3032	F 5	3060	B 5	3090	E 5	3112	F 4	3134	G 2	3189	F 1	3223	F 9	3244	E 9	3267	B 8	331
2020	F 5	2048	B 6	2083	C 6	2166	B 5	2193	C 8	2221	G13	3008	F 5	3033	G 5	3061	C 5	3091	D 6	3113	F 4	3135	G 1	3190	E 1	3224	F 9	3245	D 9	3268	B 8	331
2021	F 5	2049	B 5	2085	C 6	2167	B 6	2194	E 9	2222	F10	3009	E 5	3034	F 5	3062	C 6	3092	E 7	3114	F 4	3136	G 1	3191	E 1	3225	F 9	3246	E 9	3269	A 8	331
2022	F 5	2050	B 5	2090	F 4	2168	F 7	2195	A 9	2230	E12	3010	E 5	3035	G 7	3063	C 6	3093	D 5	3115	F 4	3138	F 2	3191	D 4	3226	F 8	3247	E 9	3270	A 8	331



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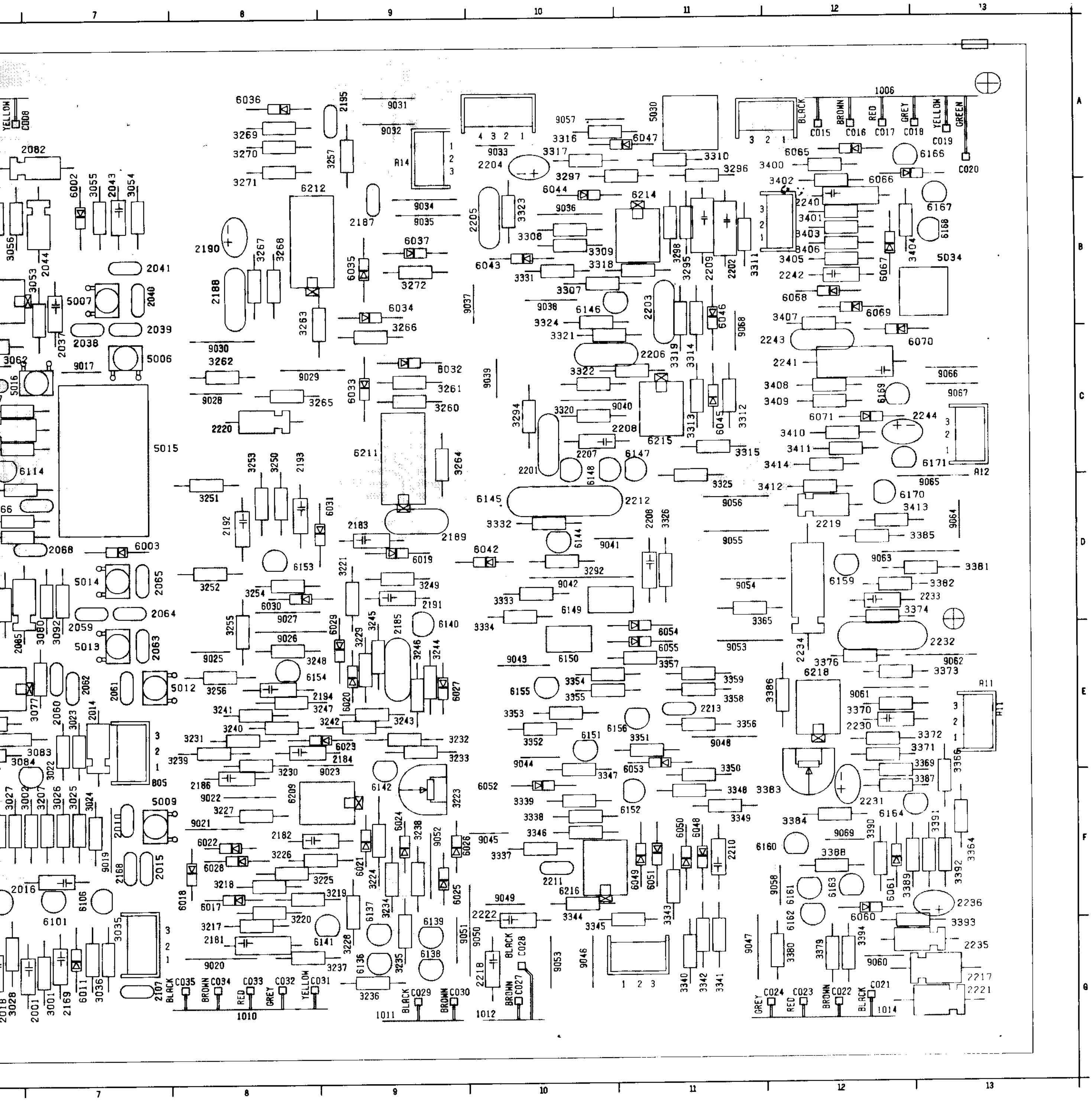
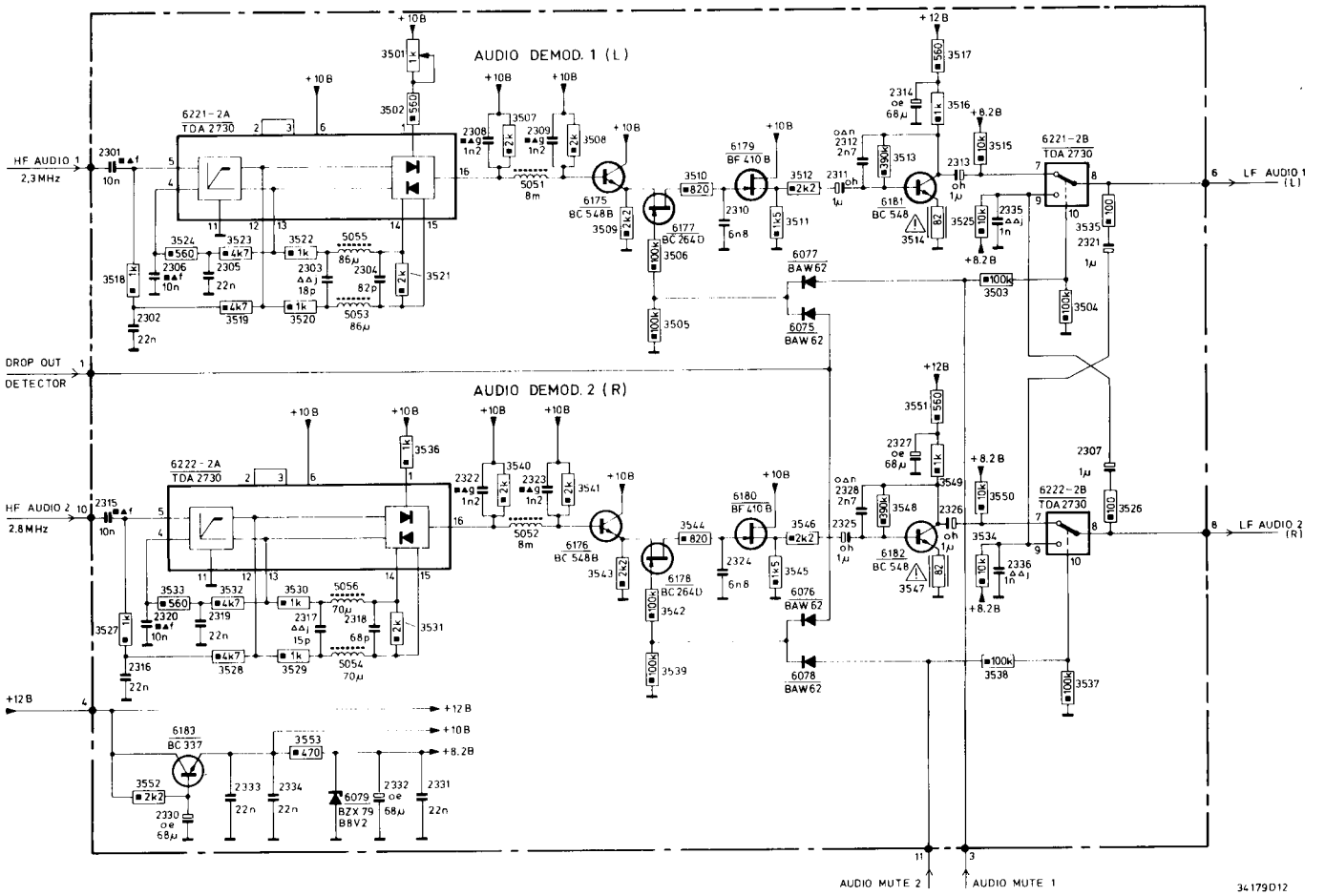
E 9	3270	A 8	3319	C11	3346	F10	3373	E13	3402	B12	5012	E 8	6009	D 4	6033	C 9	6065	A12	6115	F 4	6137	F 9	6161	F12	9002	D 2	9023	E 9	9045	F10	9066	C13		





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2302	B 1	2311	B 2	2320	C 4	2330	C 3	2352	B 6	3505	C 2	3514	A 3	3523	B 1	3532	B 3	3541	B 4	3550	A 4	3565	C 6	3574	C 7	6075	C 3	6178	C 4	6221	B 2
2303	A 1	2312	A 2	2321	B 5	2331	C 3	2353	B 6	3506	C 2	3515	B 2	3524	C 1	3533	C 4	3542	C 4	3551	C 3	3566	C 6	3575	B 7	6076	C 4	6179	B 2	6222	B 4
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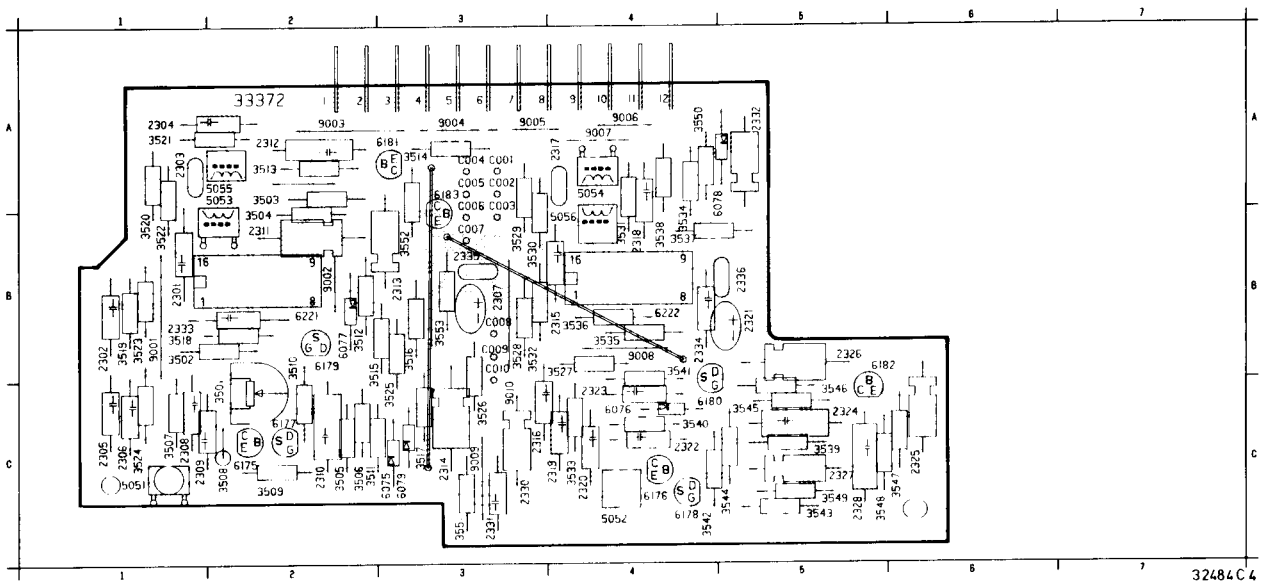
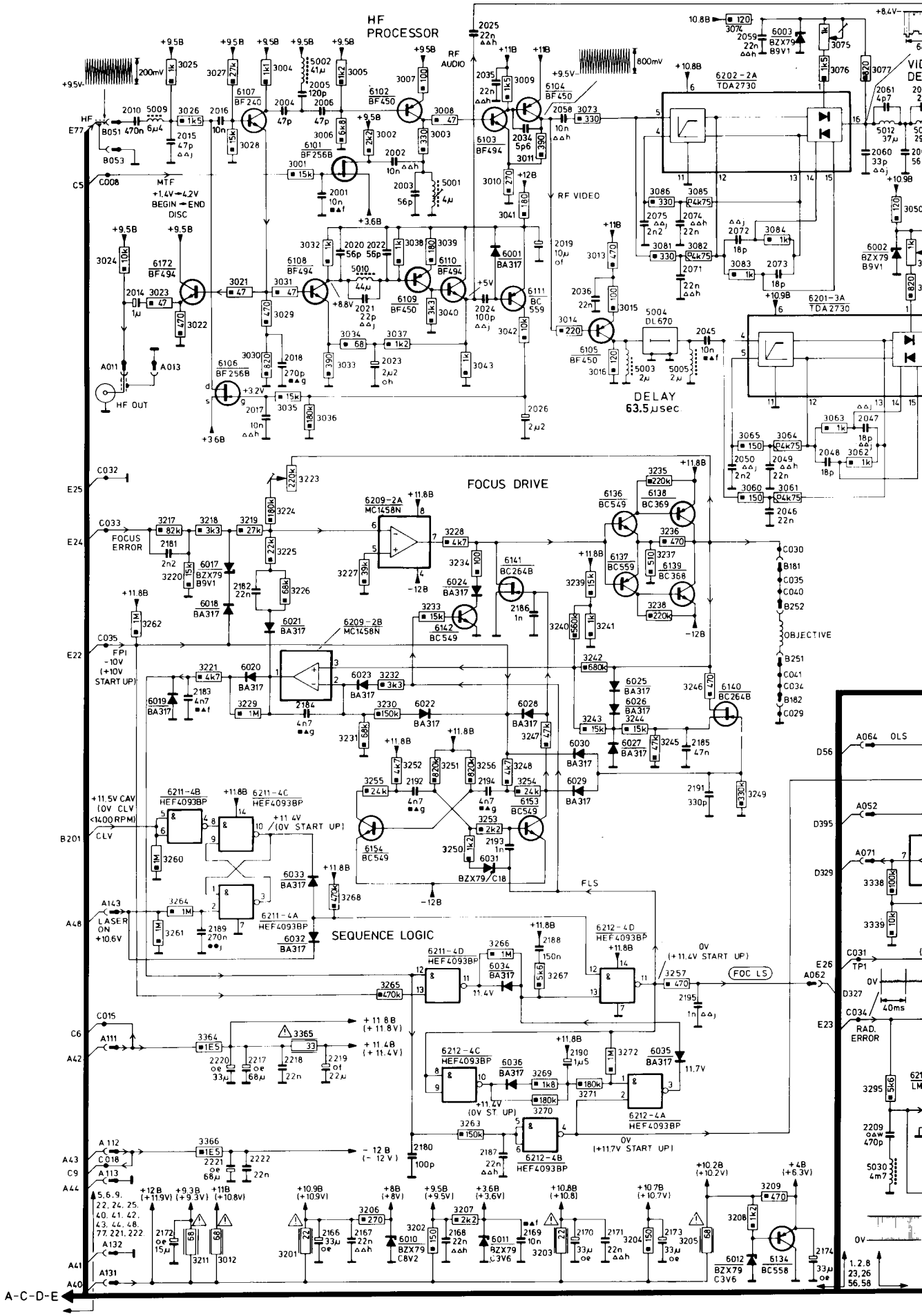
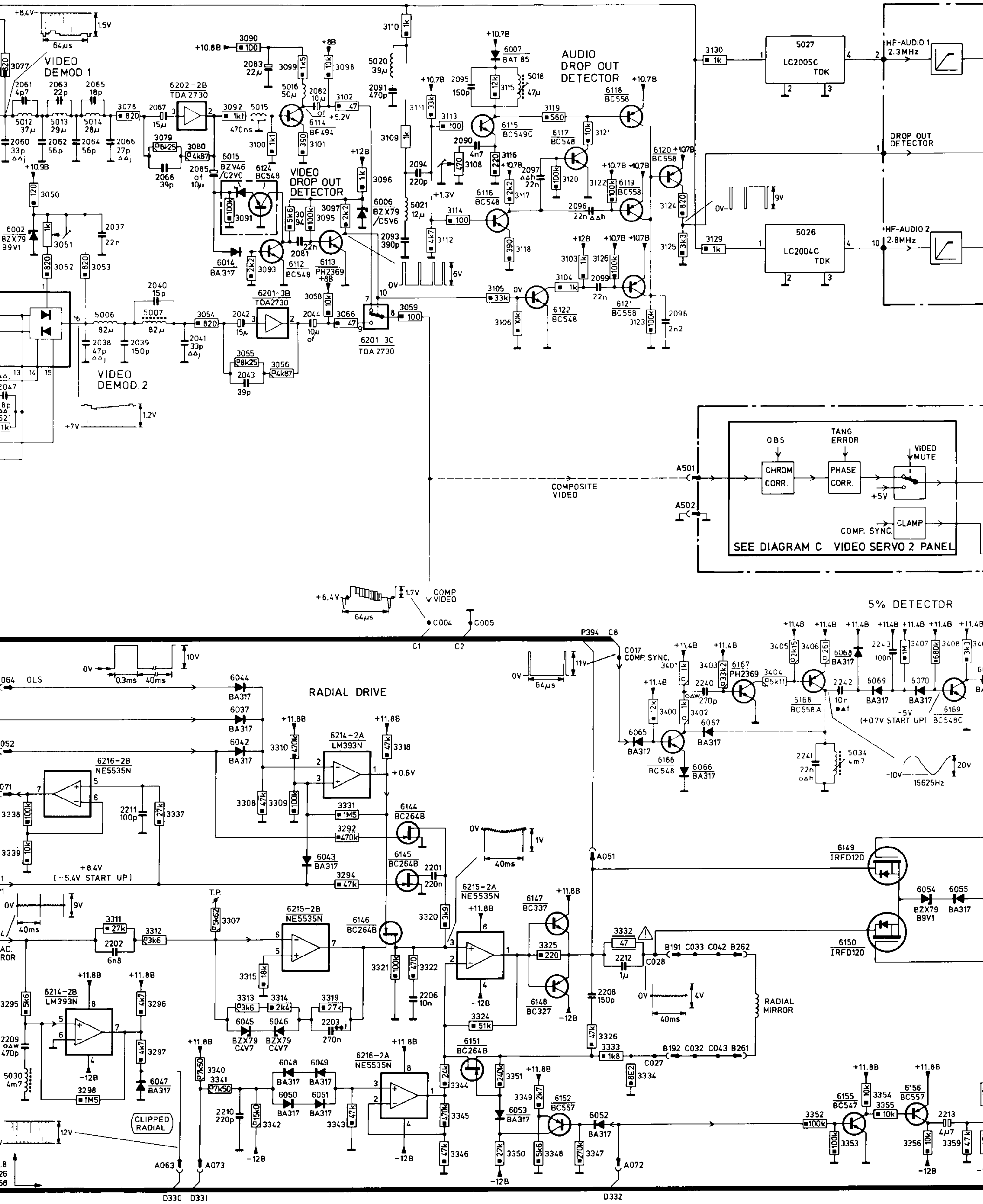
2308	C 1	2317	A 4	2326	B 5	2336	B 5	3502	B 1	3511	C 2	3520	B 1	3529	B 3	3538	B 4	3547	C 6	3562	C 6	3571	C 7	5054	A 4	6175	C 2	6190	B 7		
2309	C 1	2318	B 4	2327	C 5	2350	B 6	3503	A 2	3512	B 2	3521	A 1	3530	B 3	3539	C 5	3548	C 5	3563	C 7	3572	C 7	5055	A 2	6176	C 4	6191	C 7		

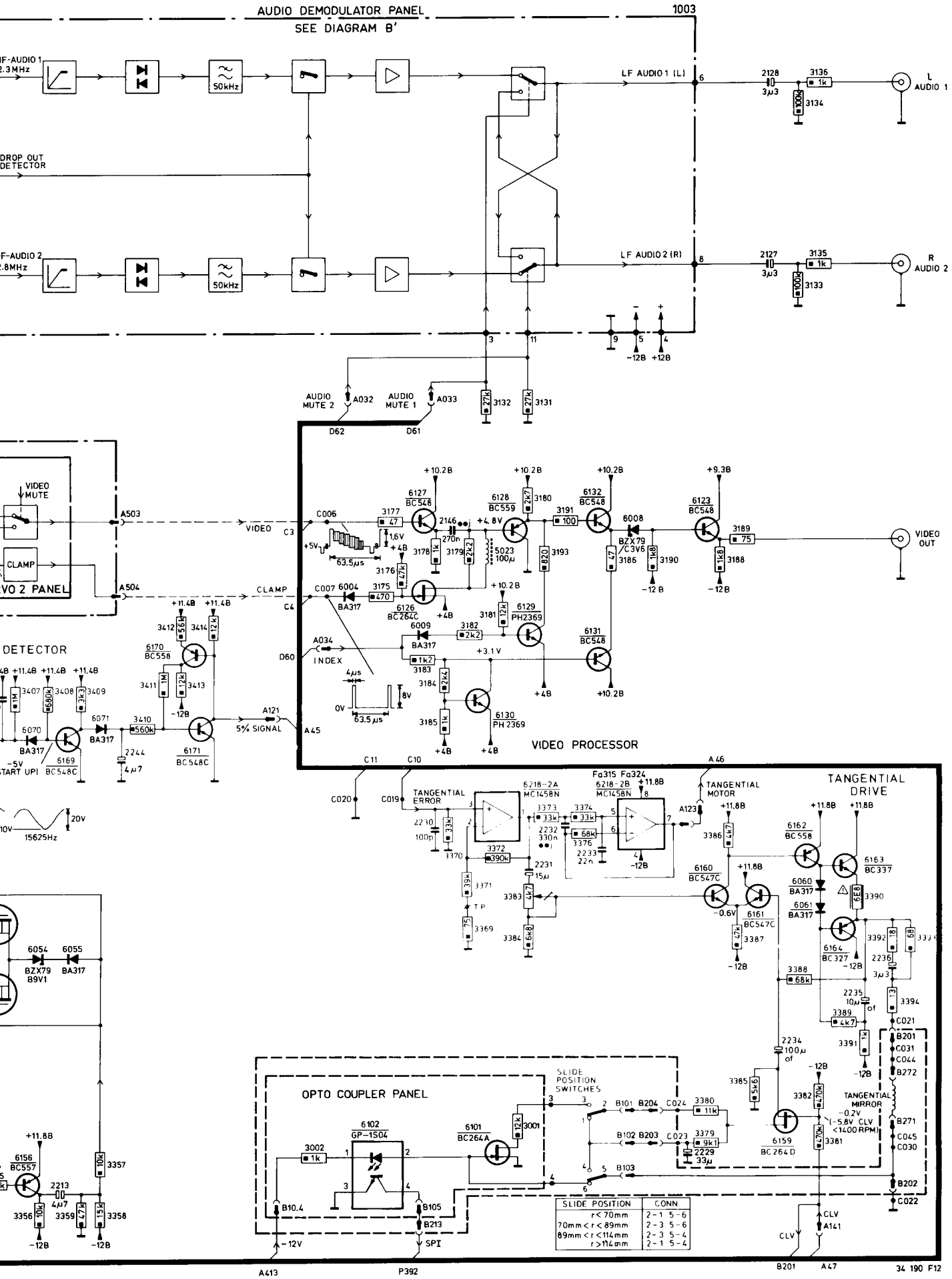


VIDEO SERVO 1 PANEL DIAGRAM B

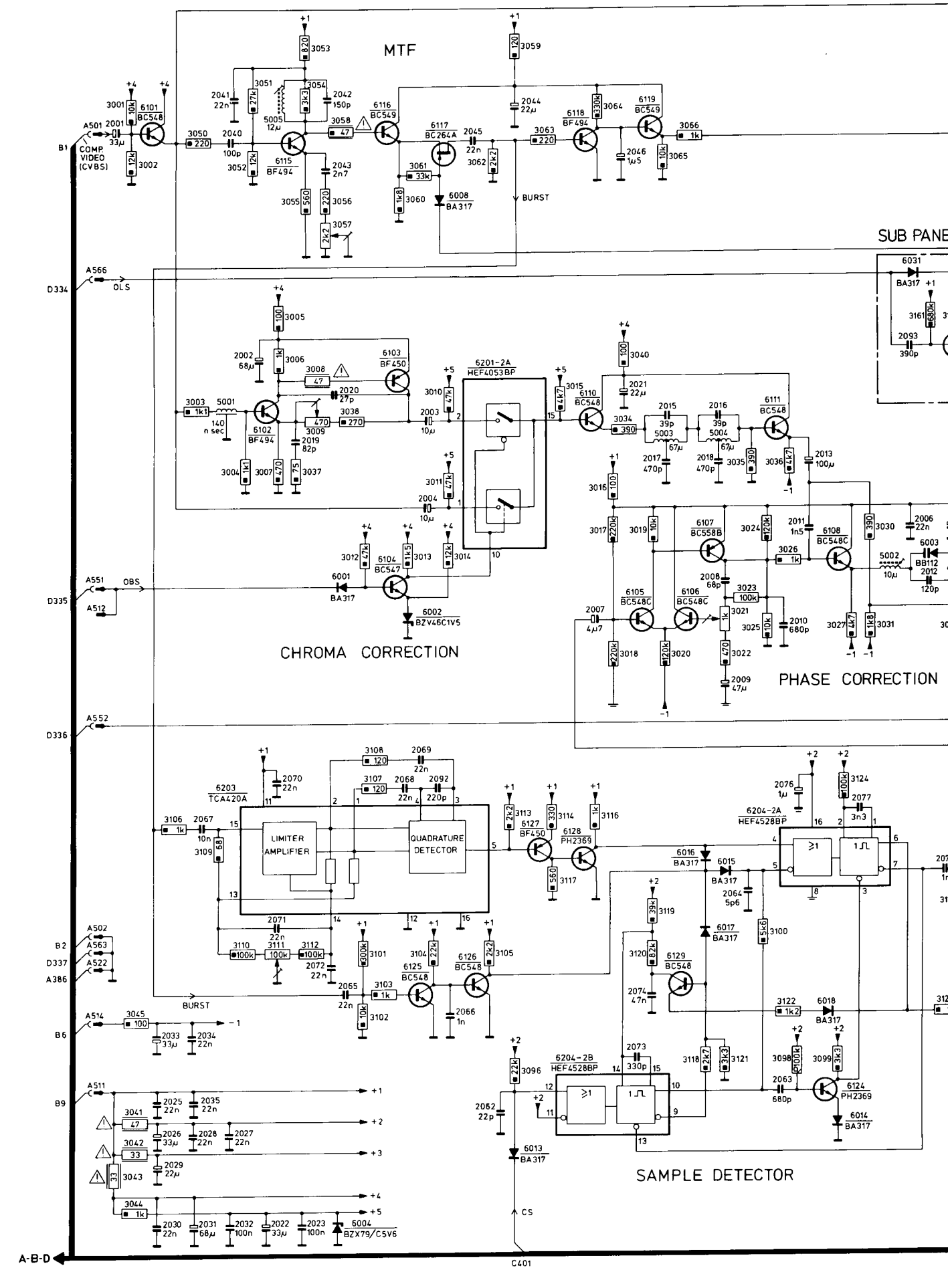


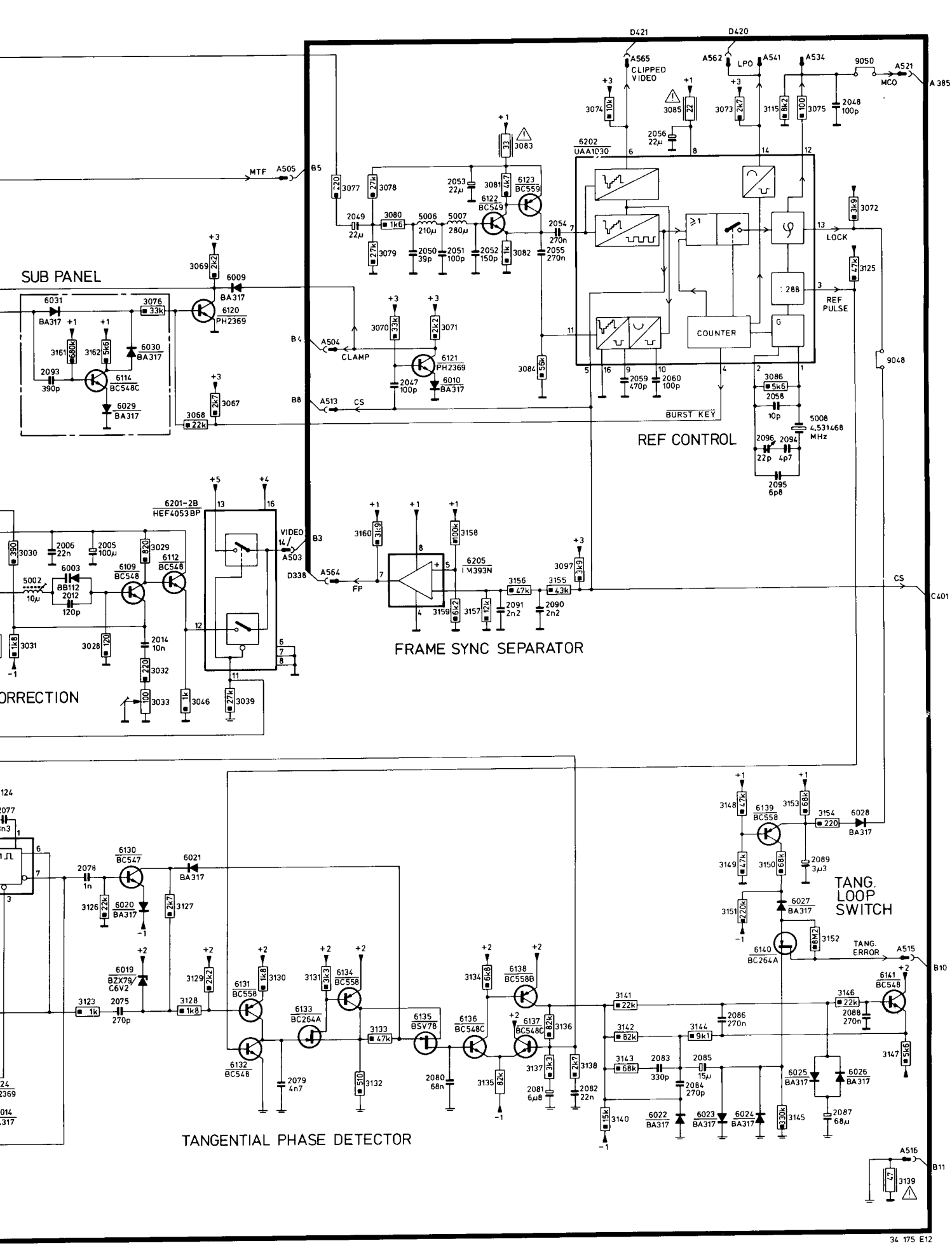


VIDEO DEMOD 1
VIDEO DEMOD. 2
VIDEO DROP OUT DETECTOR
AUDIO DROP OUT DETECTOR
HF-AUDIO 1 2.3MHz
HF-AUDIO 2 2.8MHz
DROP OUT DETECTOR
LC2005C TDK
LC2004C TDK
TDA 2730
6201 3C TDA 2730
COMPOSITE VIDEO
COMP VIDEO
OBS
TANG. ERROR
CHROM CORR.
PHASE CORR.
VIDEO MUTE
CLAMP
COMP. SYNC.
SEE DIAGRAM C VIDEO SERVO 2 PANEL
5% DETECTOR
RADIAL DRIVE
COMP. SYNC.
(+0.7V START UP)
15625Hz
(-5.4V START UP)
RAD. ERROR
CLIPPED RADIAL
RADIAL MIRROR
LM393N
NE5535N
IRFD120

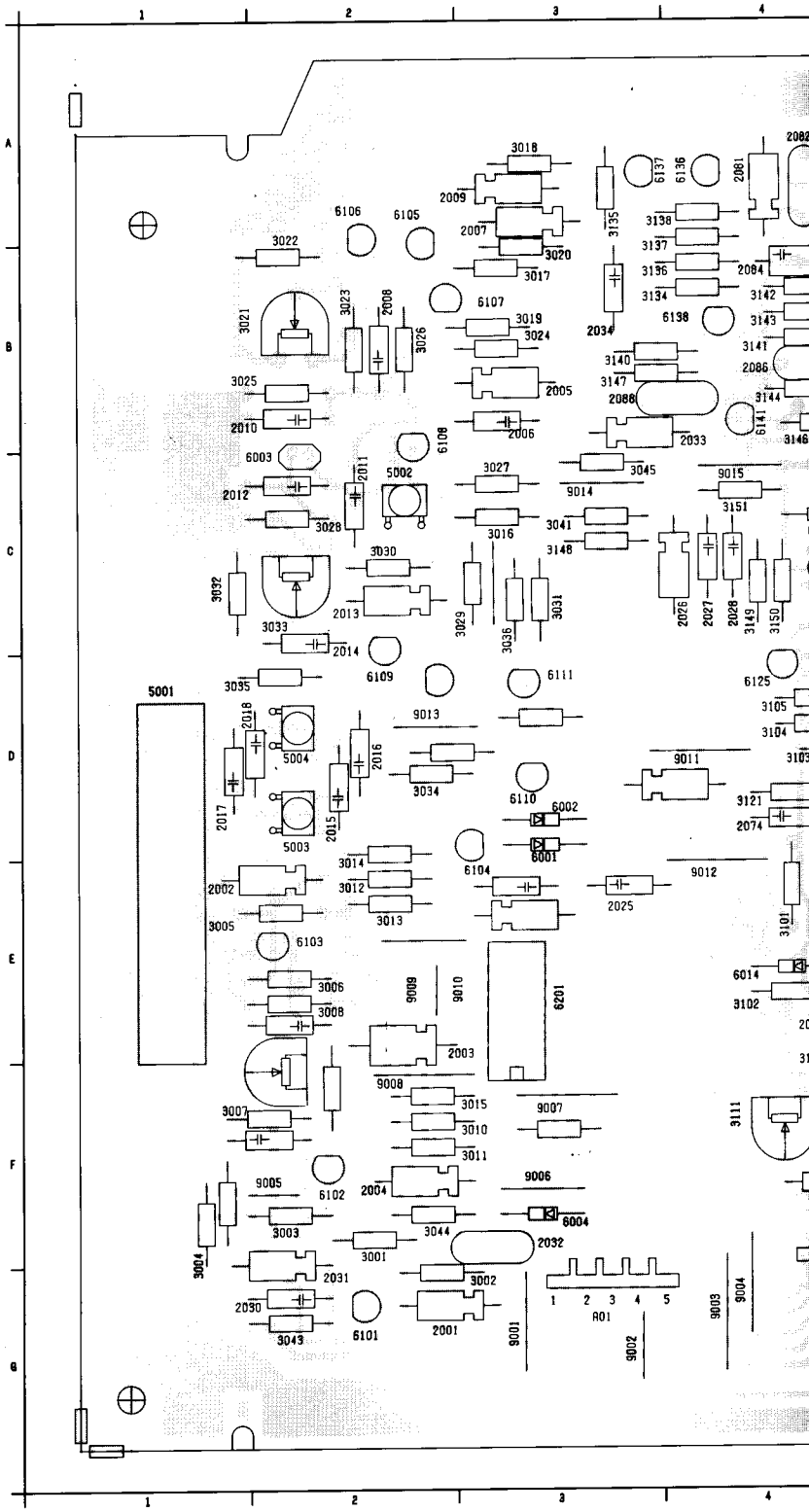

AUDIO DEMODULATOR PANEL
SEE DIAGRAM B'
1003
LF AUDIO 1 (L)
LF AUDIO 2 (R)
L AUDIO 1
R AUDIO 2
DROP OUT DETECTOR
AUDIO MUTE 2
AUDIO MUTE 1
VIDEO MUTE
CLAMP
VIDEO
VIDEO OUT
INDEX
5% SIGNAL
VIDEO PROCESSOR
TANGENTIAL ERROR
TANGENTIAL MOTOR
TANGENTIAL DRIVE
TANGENTIAL MIRROR
OPTO COUPLER PANEL
SLIDE POSITION SWITCHES
SLIDE POSITION | CONN.
r< 70mm | 2-1 5-6
70mm < r < 89mm | 2-3 5-6
89mm < r < 114mm | 2-3 5-4
r >114mm | 2-1 5-4
34 190 F12

VIDEO SERVO 2 PANEL DIAGRAM C




SUB PANEL
REF CONTROL
FRAME SYNC SEPARATOR
TANGENTIAL PHASE DETECTOR
TANG. LOOP SWITCH
ORRECTION
D421
D420
A565
CLIPPED VIDEO
A562
LPO
A541
A534
9050
A521
MCO
A 385
6202 UAA1030
LOCK
REF PULSE
COUNTER
BURST KEY
5008 4,531468 MHz
MTF
A505
CLAMP
A504
CS
A513
VIDEO
A503
A564
6201-2B HEF4053BP
6205 LM393N
C401
TANG. ERROR
A515
A516
34 175 E12

VIDEO SERVO 2 PANEL DIAGRAM C



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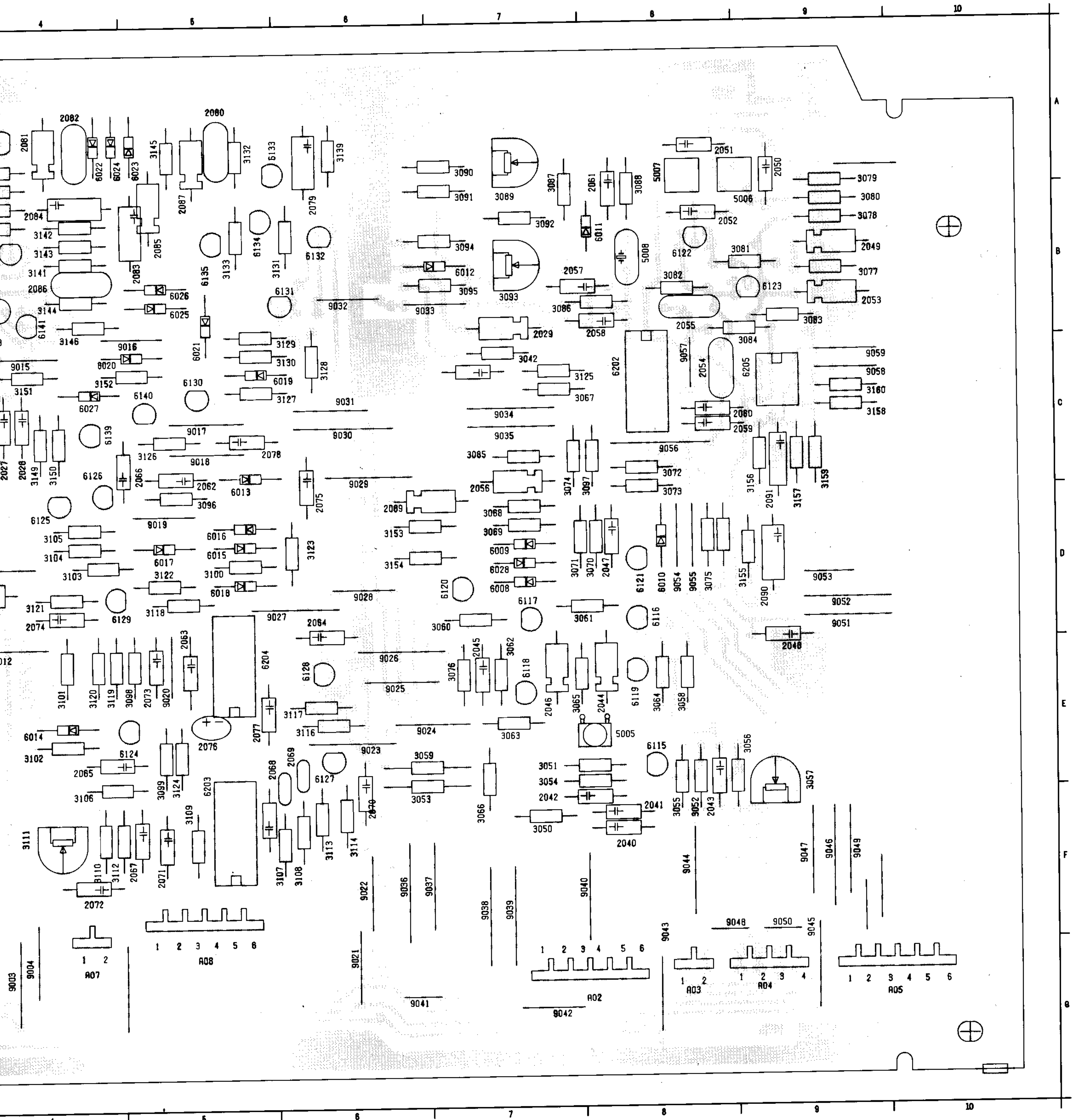
2002	E 1	2016	D 2	2041	F 8	2055	B 8	2069	E 6	2083	B 5	3006	E 2	3021	B 1	3035	D 1	3057	E 8
2003	E 3	2017	D 1	2042	F 7	2056	C 7	2070	F 6	2084	B 4	3007	F 1	3022	A 2	3036	C 3	3058	E 6
2004	F 2	2018	D 1	2043	F 8	2057	B 7	2071	F 5	2085	B 5	3008	E 2	3023	B 2	3041	C 3	3059	E 6
2005	B 3	2025	E 3	2044	E 8	2058	B 8	2072	F 4	2086	B 4	3010	F 3	3024	B 3	3042	C 7	3060	D 7
2006	B 3	2026	C 4	2045	E 7	2059	C 9	2073	E 5	2087	B 5	3011	F 3	3025	B 1	3043	G 2	3061	D 8
2007	A 3	2027	C 4	2046	E 7	2060	C 9	2074	D 4	2088	B 3	3012	E 2	3026	B 2	3044	F 2	3062	E 7
2008	B 2	2028	C 4	2047	D 8	2061	A 8	2075	D 6	2089	D 6	3013	E 2	3027	C 3	3045	C 3	3063	E 7
2009	A 3	2029	B 7	2048	E 9	2062	C 5	2076	E 5	2090	D 9	3014	E 2	3028	C 2	3050	F 7	3064	E 8
2010	B 1	2030	G 1	2049	B 9	2063	D 5	2077	E 5	2091	D 9	3015	F 3	3029	C 3	3051	E 7	3065	E 7
2011	C 2	2031	G 2	2050	A 9	2064	D 6	2078	C 5	3001	F 2	3016	C 3	3030	C 2	3052	F 8	3066	F 7
2012	C 1	2032	F 3	2051	A 8	2065	E 4	2079	B 6	3002	G 3	3017	B 3	3031	C 3	3053	F 6	3067	C 8
2013	C 2	2033	B 4	2052	B 8	2066	C 5	2080	A 5	3003	F 2	3018	A 3	3032	C 1	3054	E 7	3068	D 7
2014	C 2	2034	B 3	2053	B 9	2067	F 5	2081	A 4	3004	F 1	3019	B 3	3033	C 2	3055	F 8	3069	D 7



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C 3	3058	E 8	3072	C 8	3086	B 7	3100	D 5	3114	F 6	3129	C 6	3143	B 4	3157	D 9
C 3	3059	E 6	3073	D 8	3087	A 7	3101	E 4	3116	E 6	3130	C 6	3144	B 4	3158	C 9
C 7	3060	D 7	3074	C 7	3088	A 8	3102	E 4	3117	E 6	3131	B 6	3145	A 5	3159	C 9
G 2	3061	D 8	3075	D 8	3089	B 7	3103	D 4	3118	D 5	3132	A 5	3146	B 4	3160	C 9
F 2	3062	E 7	3076	E 7	3090	A 7	3104	D 4	3119	E 4	3133	B 5	3147	B 3	5001	D 1
C 3	3063	E 7	3077	B 9	3091	B 7	3105	D 4	3120	E 4	3134	B 3	3148	C 3	5002	C 2
F 7	3064	E 8	3078	B 9	3092	B 7	3106	F 4	3121	D 4	3135	A 3	3149	C 4	5003	D 2
E 7	3065	E 7	3079	A 9	3093	B 7	3107	F 6	3122	D 5	3136	B 3	3150	C 4	5004	D 2
F 8	3066	F 7	3080	B 9	3094	B 7	3108	F 6	3123	D 6	3137	B 3	3151	C 4	5005	E 8
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E 7	3068	D 7	3082	B 8	3096	D 5	3110	F 4	3125	C 8	3139	A 6	3153	D 6	5007	A 8
F 8	3069	D 7	3083	B 9	3097	C 8	3111	F 4	3126	C 5	3140	B 3	3154	D 6	5008	B 8

6001	D 3	6018	D 5	6104	E 3	6121	D 8	6135	B 5	9003	G 4	9017	C 5	9031	C 6	9045	F 9	9059	C 9
6002	D 3	6019	C 6	6105	A 2	6122	B 8	6136	A 4	9004	G 4	9018	C 5	9032	B 6	9046	F 9		
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6009	D 7	6023	A 5	6109	D 2	6126	C 4	6140	C 5	9008	F 2	9022	F 6	9036	F 6	9050	F 9		
6010	D 8	6024	A 4	6110	D 3	6127	E 6	6141	B 4	9009	E 2	9023	E 6	9037	F 6	9051	D 9		
6011	B 8	6025	B 5	6111	D 3	6128	E 6	6201	E 3	9010	E 3	9024	E 6	9038	F 7	9052	D 9		
6012	B 7	6026	B 5	6115	E 8	6129	D 4	6202	C 8	9011	D 4	9025	E 6	9039	F 7	9053	D 9		
6013	C 5	6027	C 4	6116	D 8	6130	C 5	6203	E 5	9012	E 4	9026	E 6	9040	F 7	9054	D 8		
6014	E 4	6028	D 7	6117	D 7	6131	B 6	6204	E 5	9013	D 2	9027	D 6	9041	G 6	9055	D 8		
6015	D 5	6101	G 2	6118	E 7	6132	B 6	6205	C 9	9014	C 3	9028	D 6	9042	G 7	9056	C 8		
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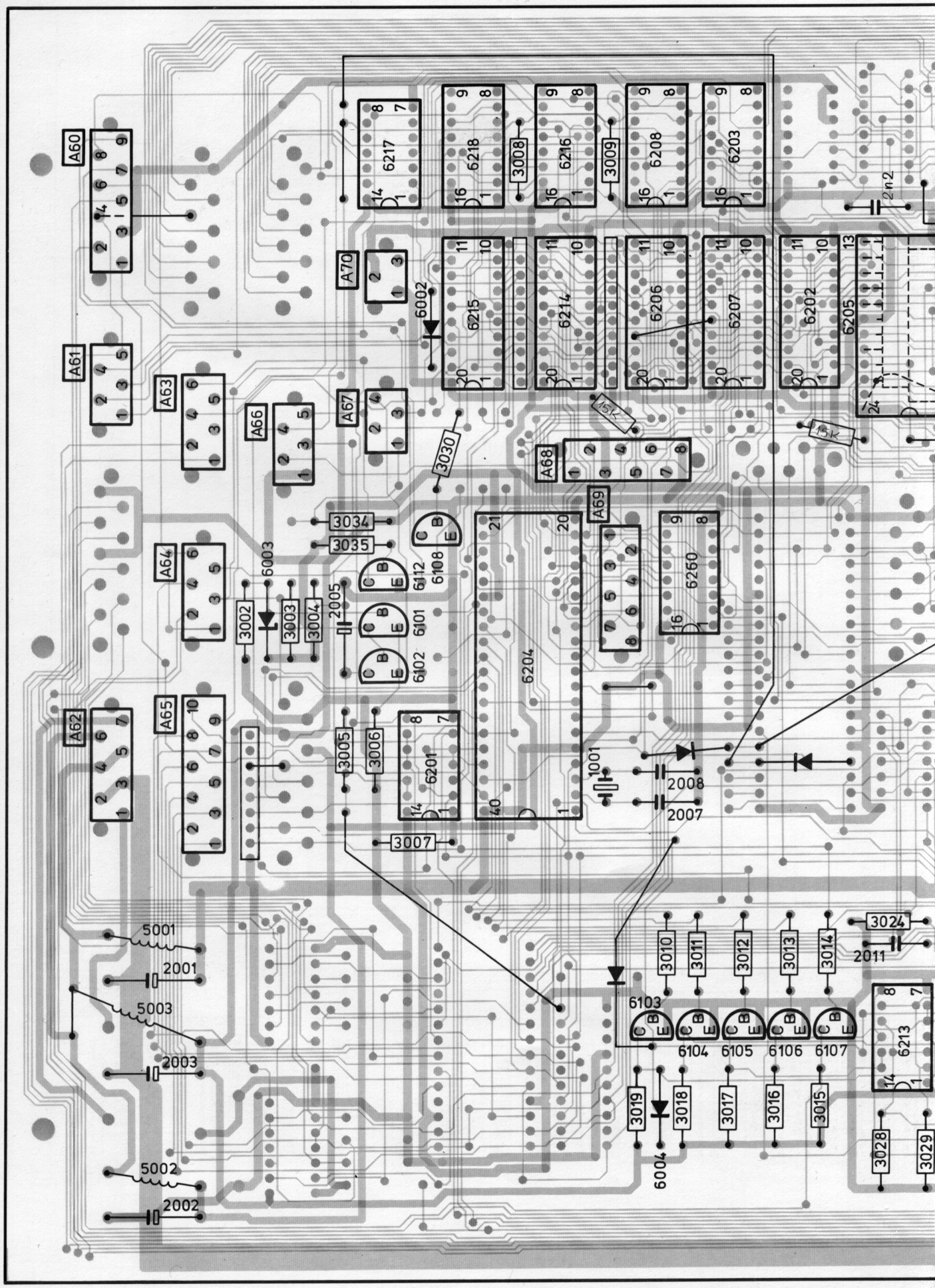
6017	D 5	6103	E 2	6120	D 7	6134	B 5	9002	G 3	9016	C 5	9030	C 6	9044	F 8	9058	C 9		

CS 94 182

CONTROL 1 PANEL DIAGRAM D



CS 94 183

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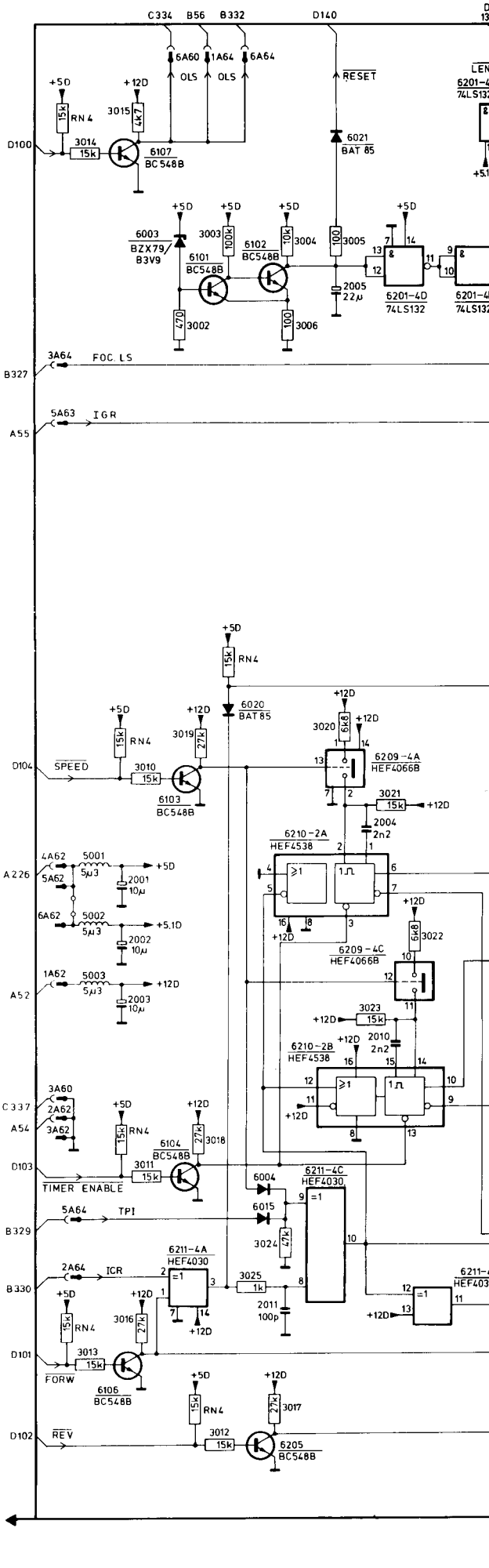
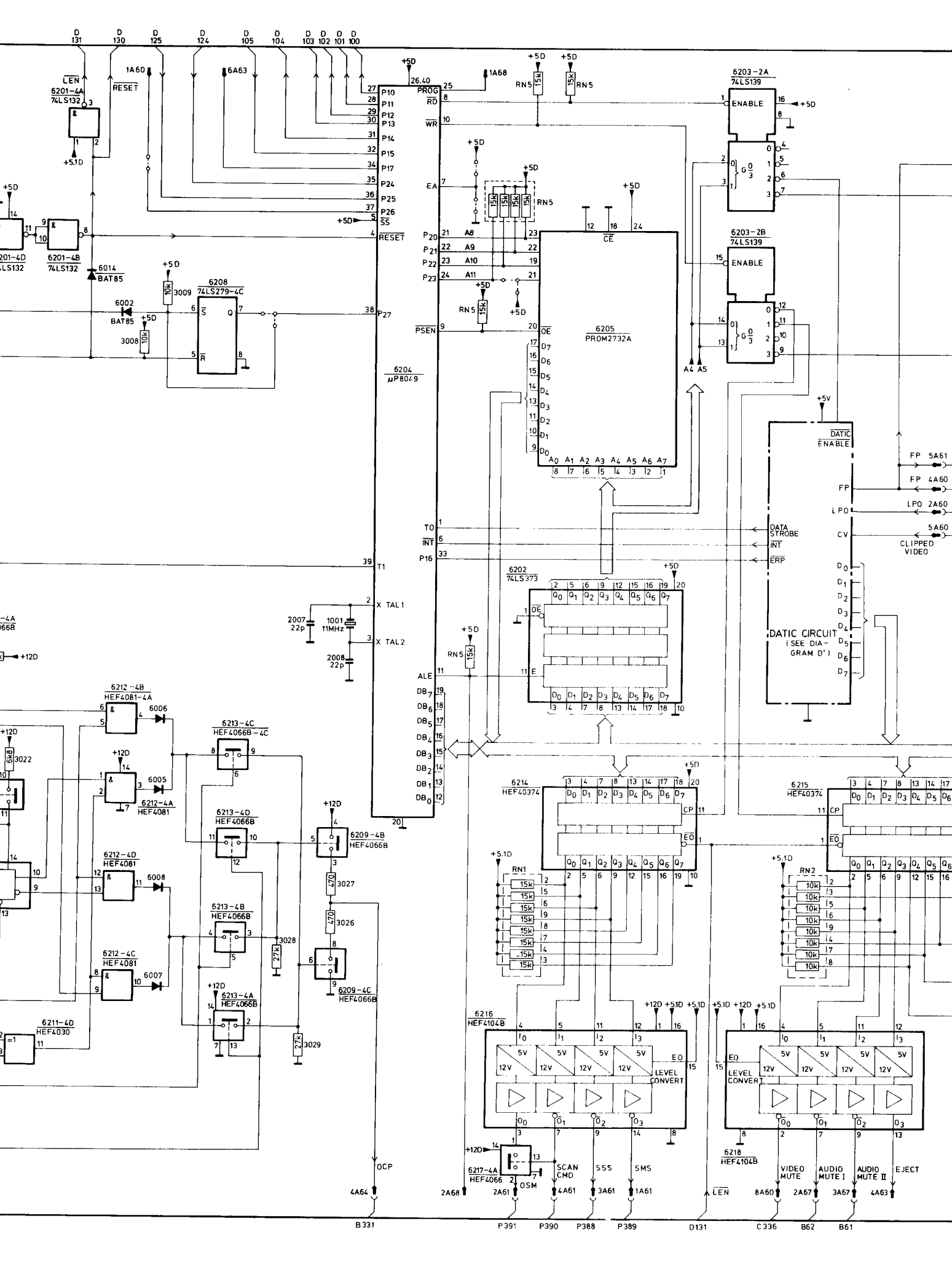
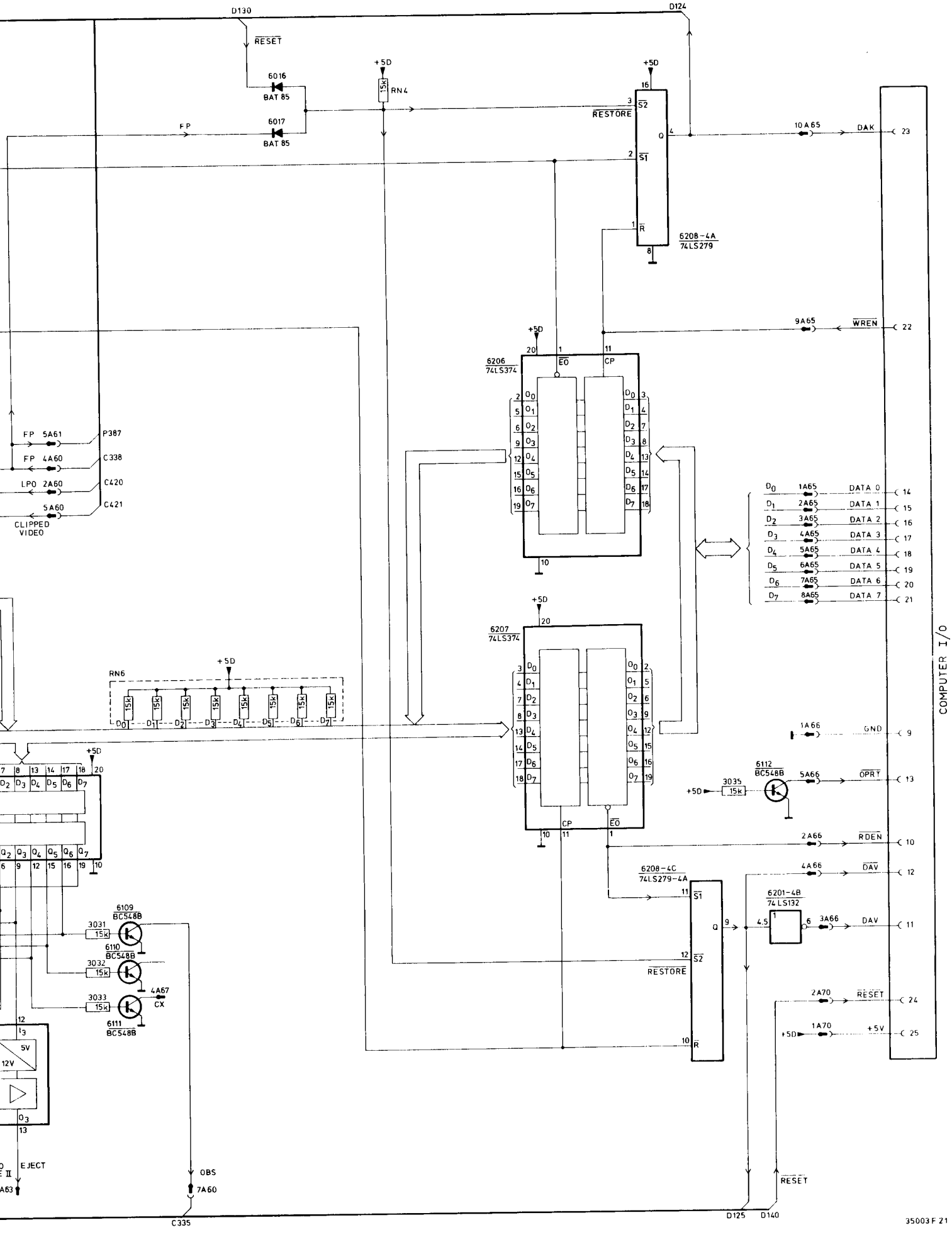
6007
6006
6005

34 983 D8

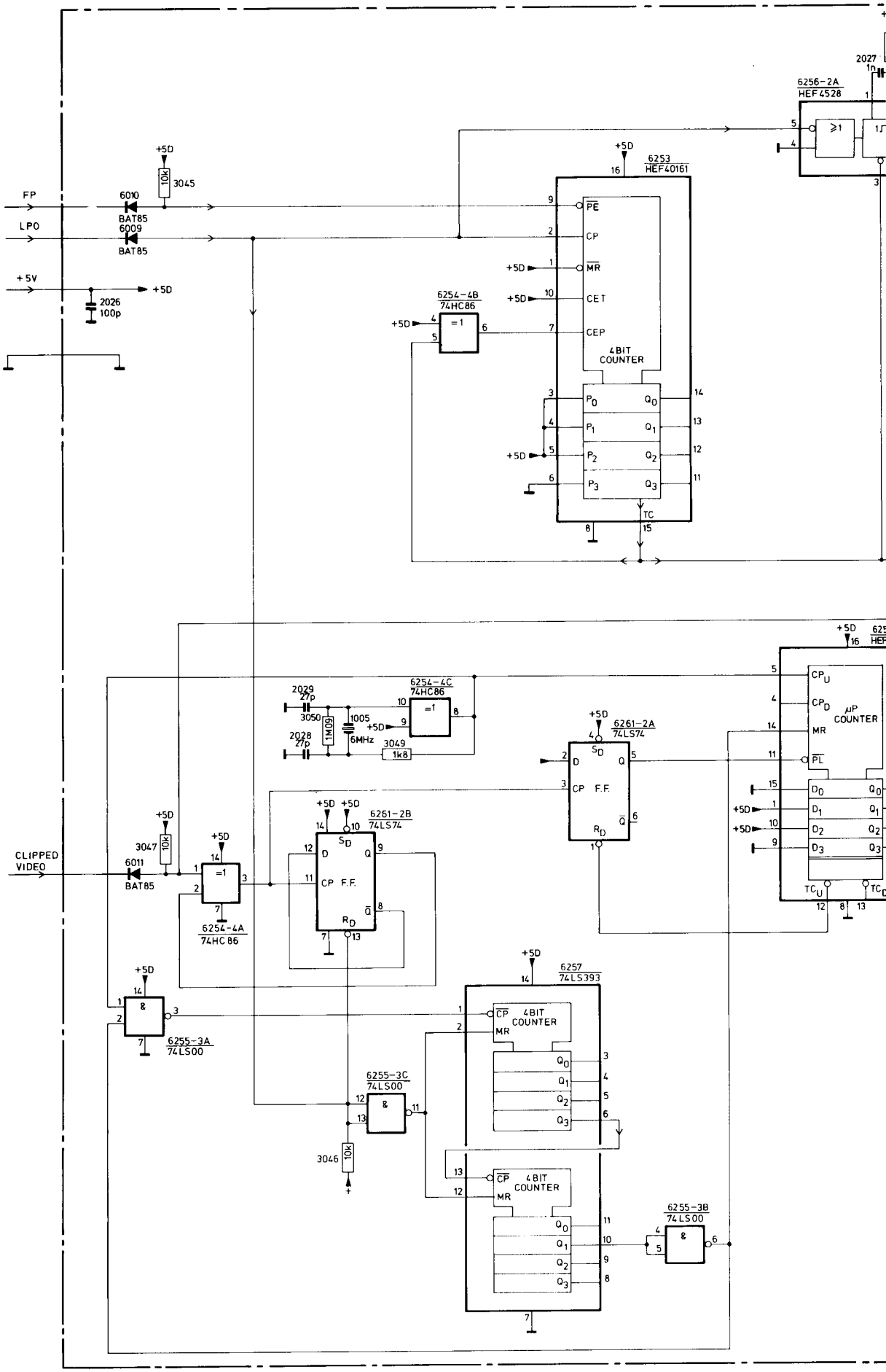
CONTROL 1 PANEL DIAGRAM D

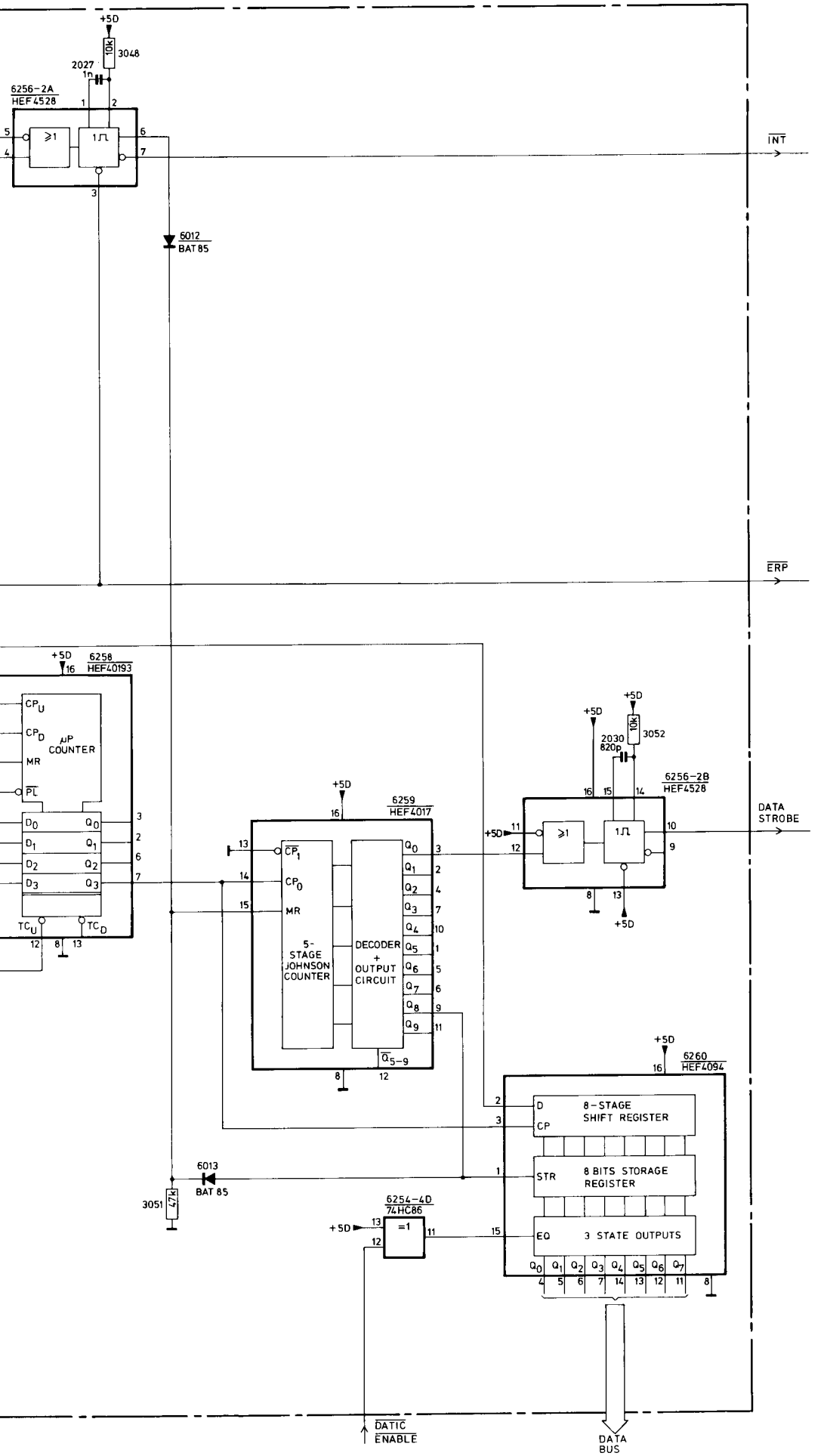



D131 D130 D125 D124 D105 D104 D103 D102 D101 D100
LEN
RESET
6201-4A 74LS132
6201-4B 74LS132
6014 BAT85
6002 BAT85
6208 74LS279-4C
6204 µP8049
6205 PROM2732A
6202 74LS373
6203-2A 74LS139
6203-2B 74LS139
ENABLE
DATIC ENABLE
DATIC CIRCUIT (SEE DIAGRAM D')
DATA STROBE
INT
ERP
FP 5A61
FP 4A60
LPO 2A60
CV 5A60
CLIPPED VIDEO
1001 11MHz
2007 22p
2008 22p
6212-4B HEF4081-4A
6212-4A HEF4081
6212-4C HEF4081
6212-4D HEF4081
6213-4C HEF4066B-4C
6213-4D HEF4066B
6213-4B HEF4066B
6213-4A HEF4066B
6209-4B HEF4066B
6209-4C HEF4066B
6211-4D HEF4030
6214 HEF40374
6215 HEF40374
6216 HEF4104B
6218 HEF4104B
6217-4A HEF4066
LEVEL CONVERT
SCAN CMD
OSM
SSS
SMS
VIDEO MUTE
AUDIO MUTE I
AUDIO MUTE II
EJECT
OCP
LEN
B331
P391
P390
P388
P389
D131
C336
B62
B61


D130
D124
RESET
6016
BAT 85
6017
BAT 85
FP
+5D
15k
RN4
RESTORE
6208-4A
74LS279
10A65
DAK
23
9A65
WREN
22
6206
74LS374
6207
74LS374
RN6
FP 5A61
P387
FP 4A60
C338
LPO 2A60
C420
5A60
C421
CLIPPED
VIDEO
DATA 0
DATA 1
DATA 2
DATA 3
DATA 4
DATA 5
DATA 6
DATA 7
1A66
GND
9
6112
BC548B
5A66
OPRT
13
3035
15k
2A66
RDEN
10
4A66
DAV
12
6208-4C
74LS279-4A
6201-4B
74LS132
3A66
DAV
11
2A70
RESET
24
1A70
+5V
25
6109
BC548B
3031
15k
6110
BC548B
3032
15k
6111
BC548B
3033
15k
4A67
CX
5V
12V
EJECT
OBS
7A60
C335
D125
D140
RESET
COMPUTER I/O
35003 F 21

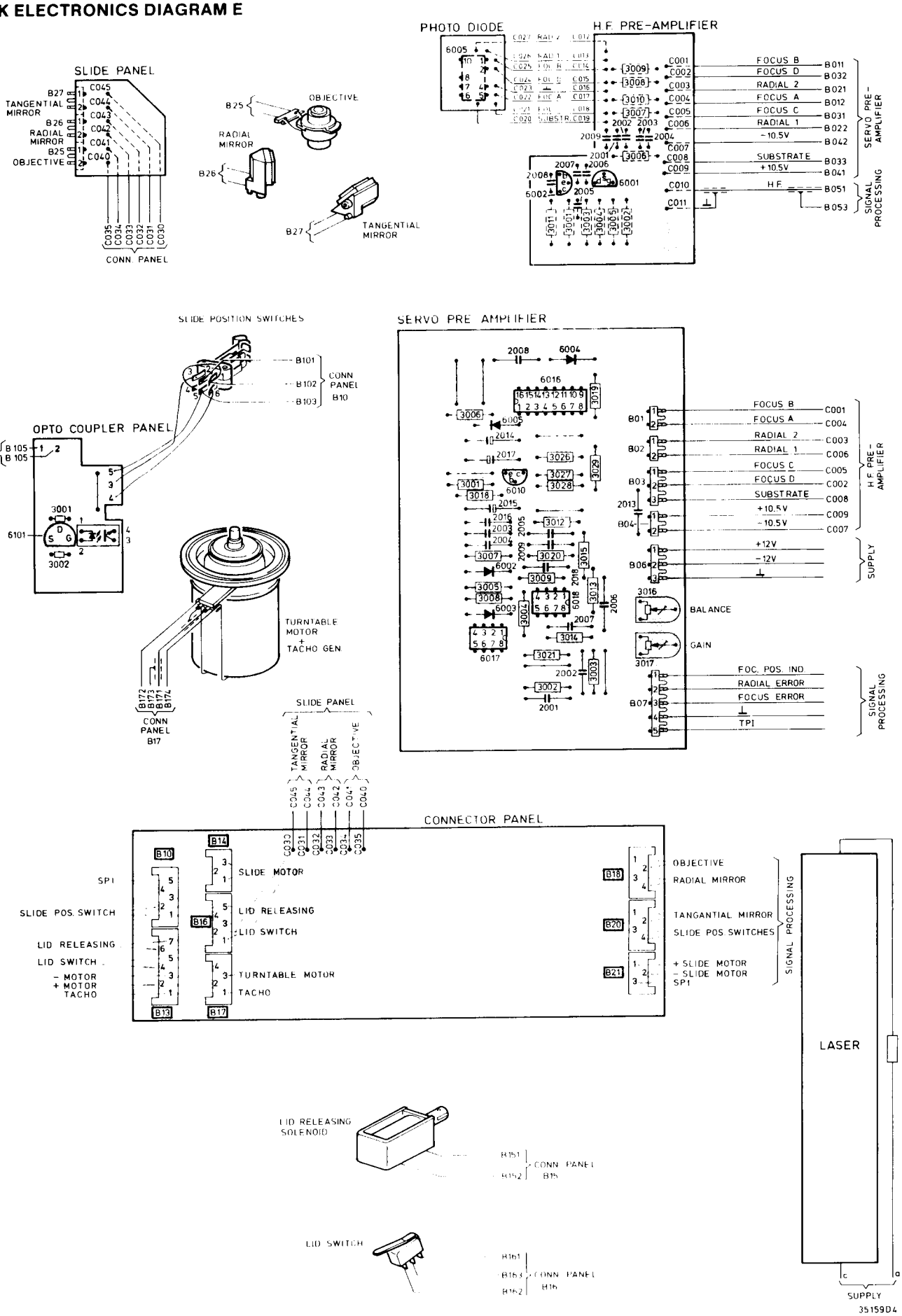
DATIC CIRCUIT DIAGRAM D'



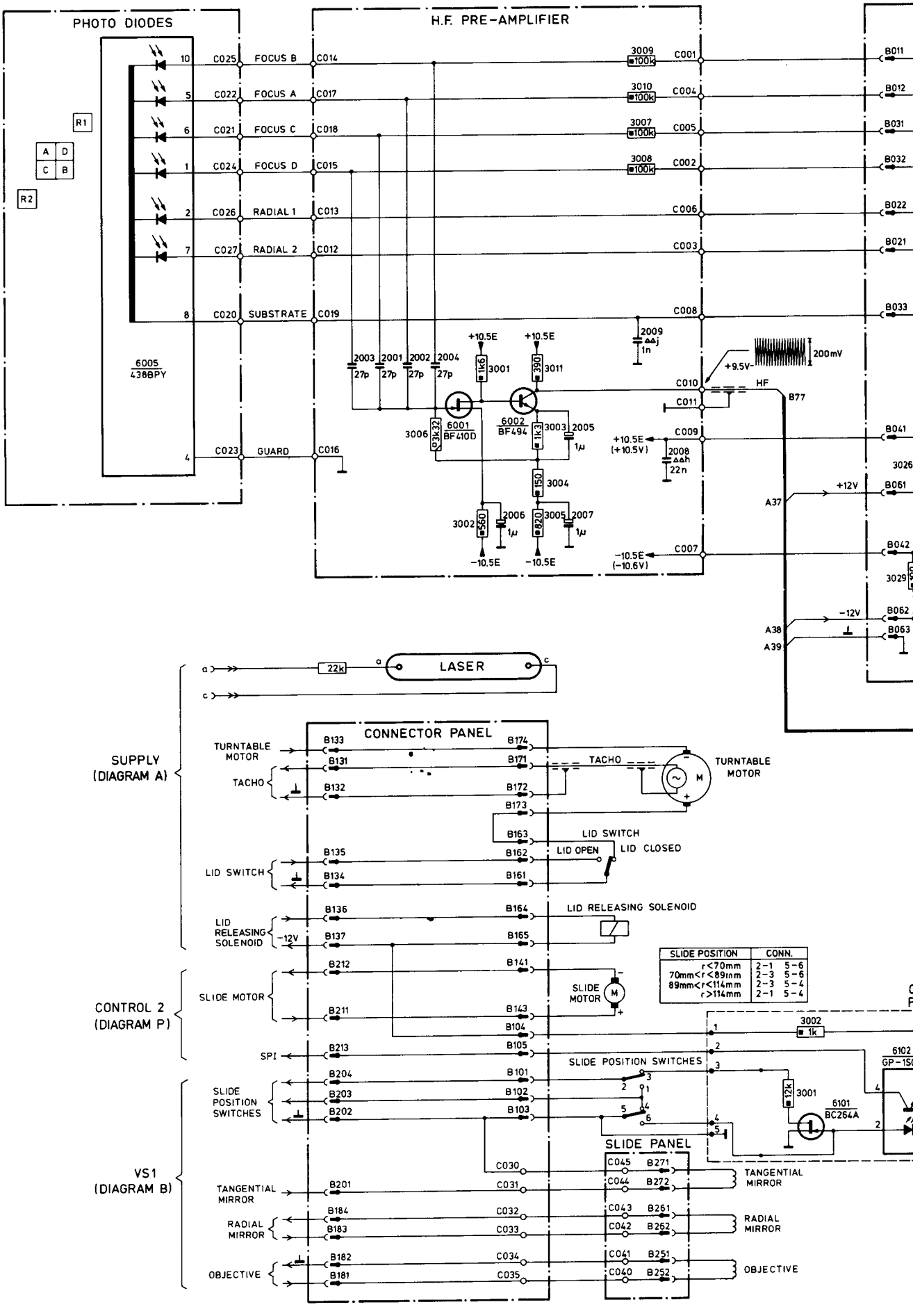

+5D
10k
3048
2027
1n
6256-2A
HEF4528
≥1
1
INT
6012
BAT 85
ERP
+5D
6258
HEF40193
CP_U
CP_D
μP
COUNTER
MR
PL
D0
D1
D2
D3
Q0
Q1
Q2
Q3
TC_U
TC_D
+5D
6259
HEF4017
CP1
CP0
MR
5-
STAGE
JOHNSON
COUNTER
DECODER
+
OUTPUT
CIRCUIT
Q0
Q1
Q2
Q3
Q4
Q5
Q6
Q7
Q8
Q9
Q5-9
+5D
+5D
10k
3052
2030
820p
6256-2B
HEF4528
≥1
1
DATA
STROBE
+5D
6260
HEF4094
D
CP
8-STAGE
SHIFT REGISTER
STR
8 BITS STORAGE
REGISTER
EQ
3 STATE OUTPUTS
Q0
Q1
Q2
Q3
Q4
Q5
Q6
Q7
6013
BAT 85
3051
47k
6254-4D
74HC86
=1
+5D
DATIC
ENABLE
DATA
BUS

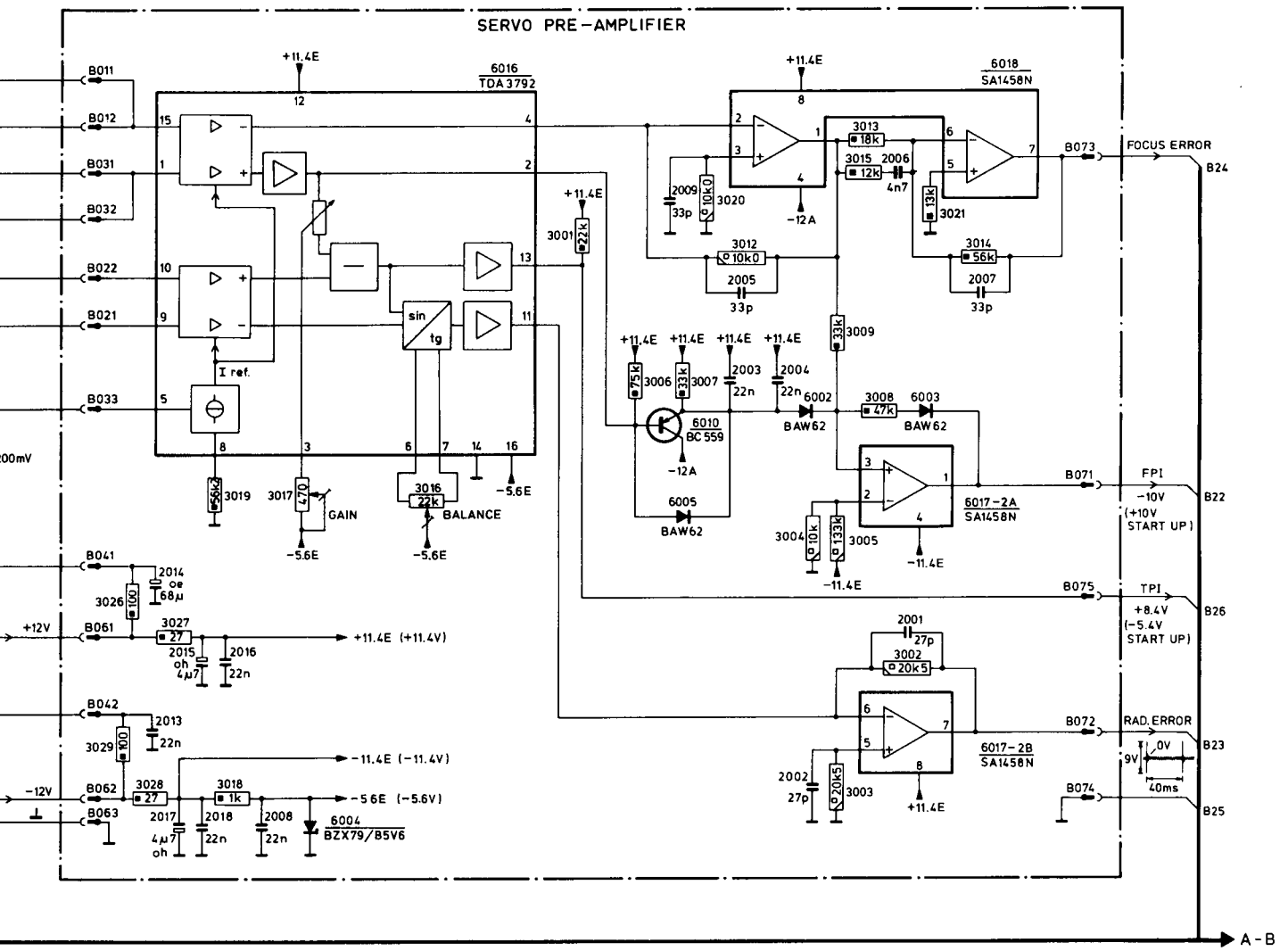
34 989E12

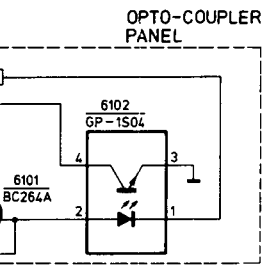
DECK ELECTRONICS DIAGRAM E



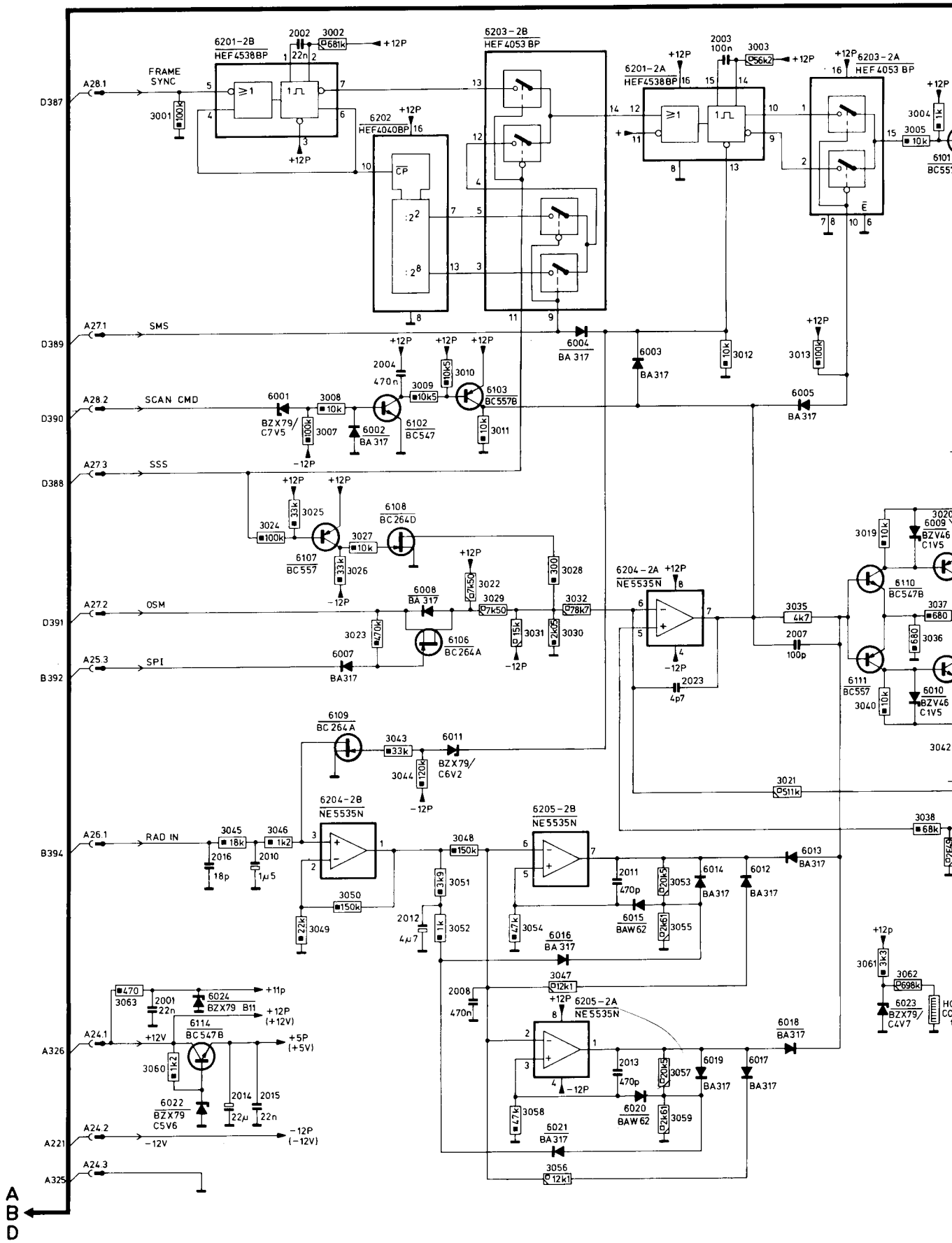
DECK ELECTRONICS DIAGRAM E

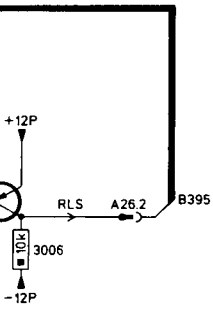


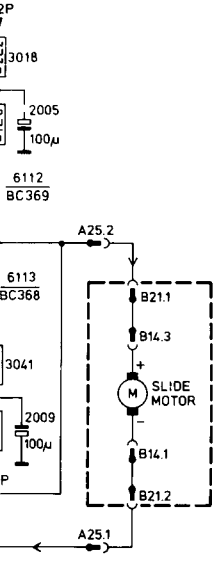

SERVO PRE-AMPLIFIER
6016
TDA 3792
6018
SA1458N
B011
B012
B031
B032
B022
B021
B033
B041
B061
B042
B062
B063
B071
B072
B073
B074
B075
FOCUS ERROR
B24
FPI
-10V
(+10V
START UP)
B22
TPI
+8.4V
(-5.4V
START UP)
B26
RAD.ERROR
0V
9V
40ms
B23
B25
A-B
I ref.
GAIN
BALANCE
6010
BC 559
6005
BAW62
6002
BAW62
6003
BAW62
6017-2A
SA1458N
6017-2B
SA1458N
+11.4E (+11.4V)
-11.4E (-11.4V)
-5.6E (-5.6V)
6004
BZX79/B5V6
+12V
-12V
27383E8/C


OPTO-COUPLER
PANEL
6102
GP-1S04
6101
BC264A

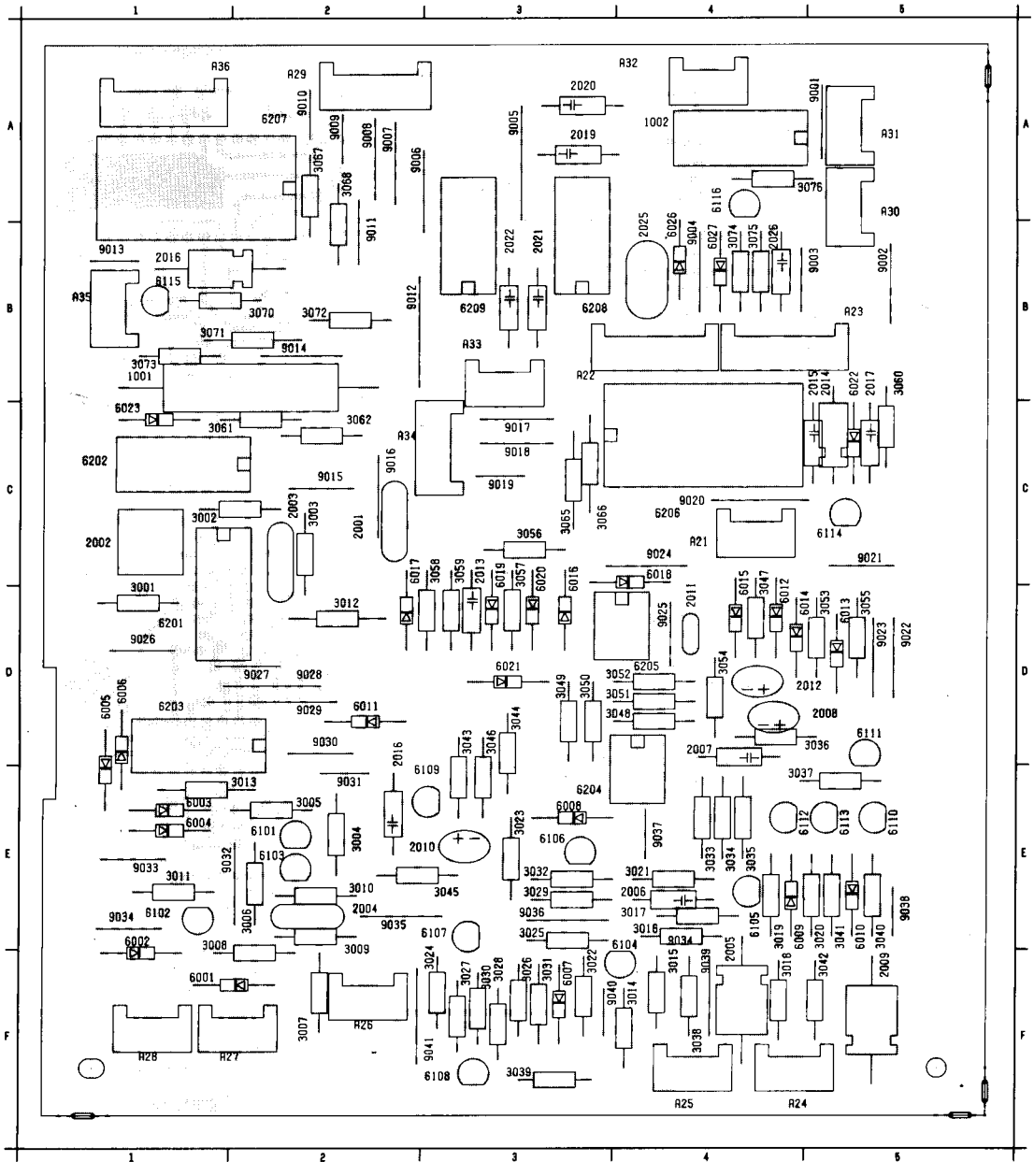
CONTROL 2 PANEL DIAGRAM D





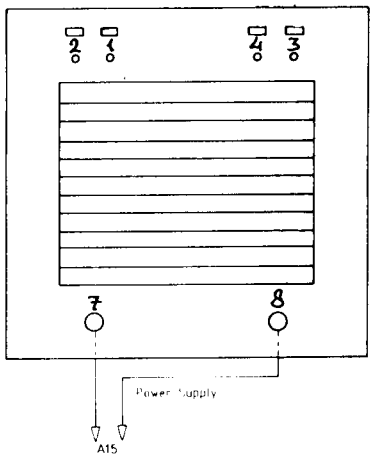


1001	B 1	2014	B 5	3005	E 2	3020	E 5	3035	E 4	3050	D 3	3067	A 2	6007	F 3	6022	B 5	6112	E 4	9002	B 5	9017	C 3	9032	E 1
1002	A 4	2015	B 5	3006	E 2	3021	E 4	3036	D 5	3051	D 4	3068	A 2	6008	E 3	6023	C 1	6113	E 5	9003	B 5	9018	C 3	9033	E 1
2001	C 2	2016	B 1	3007	F 2	3022	F 3	3037	E 4	3052	D 4	3070	B 2	6009	E 4	6026	B 4	6114	C 5	9004	B 4	9019	C 3	9034	E 4
2002	C 1	2016	D 2	3008	E 1	3023	E 3	3038	F 4	3053	D 5	3071	B 1	6010	E 5	6027	B 4	6115	B 1	9005	A 3	9020	C 4	9034	E 1
2003	C 2	2017	B 5	3009	E 2	3024	F 3	3039	F 3	3054	D 4	3072	B 2	6011	D 2	6101	E 2	6116	A 4	9006	A 2	9021	C 5	9035	E 2
2004	E 2	2019	A 3	3010	E 2	3025	E 3	3040	E 5	3055	D 5	3073	B 1	6012	D 4	6102	E 1	6201	D 1	9007	A 2	9022	D 5	9036	E 3
2005	E 4	2020	A 3	3011	E 1	3026	F 3	3041	E 5	3056	C 3	3074	B 4	6013	D 5	6103	E 2	6202	C 1	9008	A 2	9023	D 5	9037	E 4
2006	E 4	2021	B 3	3012	D 2	3027	F 3	3042	F 5	3057	C 3	3075	B 4	6014	D 4	6104	E 4	6203	D 1	9009	A 2	9024	C 4	9038	E 5
2007	D 4	2022	B 3	3013	E 2	3028	F 3	3043	D 3	3058	C 3	3076	A 5	6015	C 4	6105	E 4	6204	E 3	9010	A 2	9025	D 4	9039	F 4
2008	D 5	2025	B 4	3014	F 4	3029	E 3	3044	D 3	3059	C 3	6001	F 1	6016	C 3	6106	E 3	6205	D 4	9011	B 2	9026	D 1	9040	F 3
2009	F 5	2026	B 4	3015	F 4	3030	F 3	3045	E 3	3060	B 5	6002	E 1	6017	C 2	6107	E 3	6206	C 4	9012	B 2	9027	D 2	9041	F 3
2010	E 3	3001	D 1	3016	E 4	3031	F 3	3046	D 3	3061	C 1	6003	E 1	6018	C 4	6108	F 3	6207	A 2	9013	B 1	9028	D 2		
2011	D 4	3002	C 1	3017	E 4	3032	E 3	3047	C 4	3062	C 2	6004	E 1	6019	C 3	6109	F 3	6208	B 3	9014	B 2	9029	D 2		
2012	D 5	3003	C 2	3018	F 4	3033	E 4	3048	D 4	3065	C 3	6005	D 1	6020	C 3	6110	E 5	6209	B 3	9015	C 2	9030	D 2		
2013	C 3	3004	E 2	3019	E 4	3034	E 4	3049	D 3	3066	C 3	6006	D 1	6021	D 3	6111	D 5	9001	A 5	9016	C 2	9031	E 2		

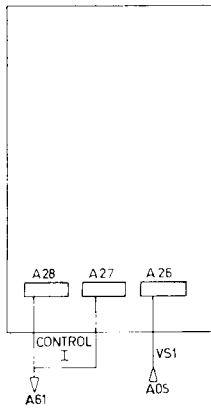


WIRING DIAGRAM

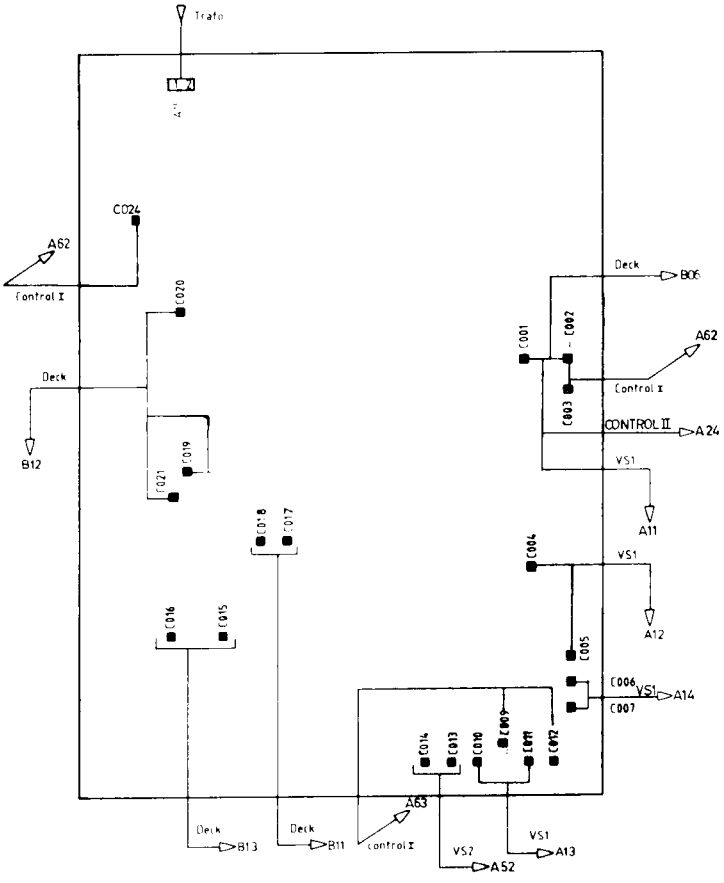
TRAFO



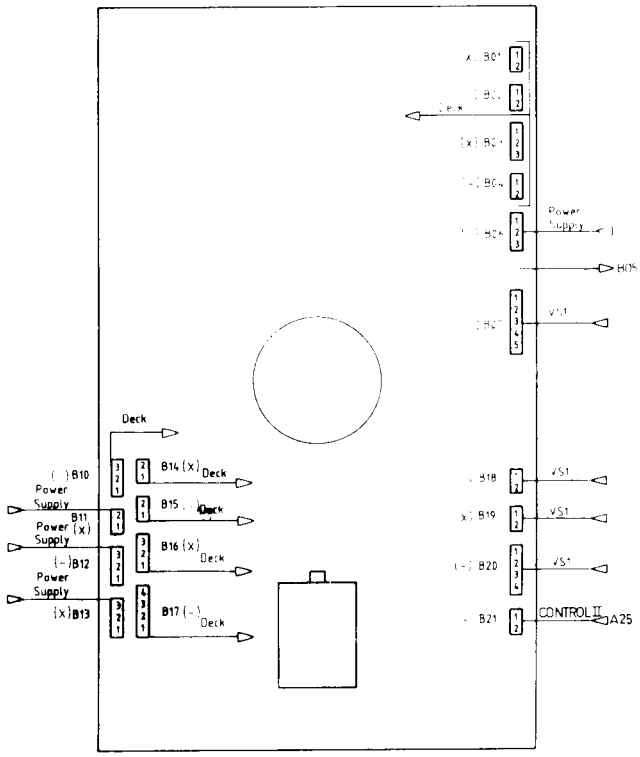
CONTROL 2



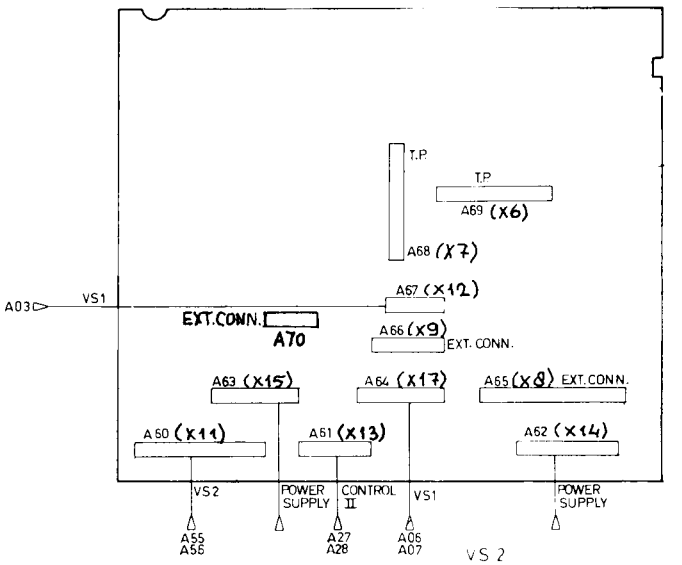
POWER SUPPLY



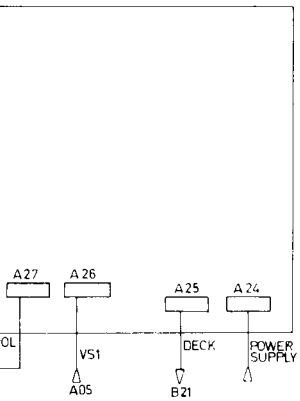
DECK

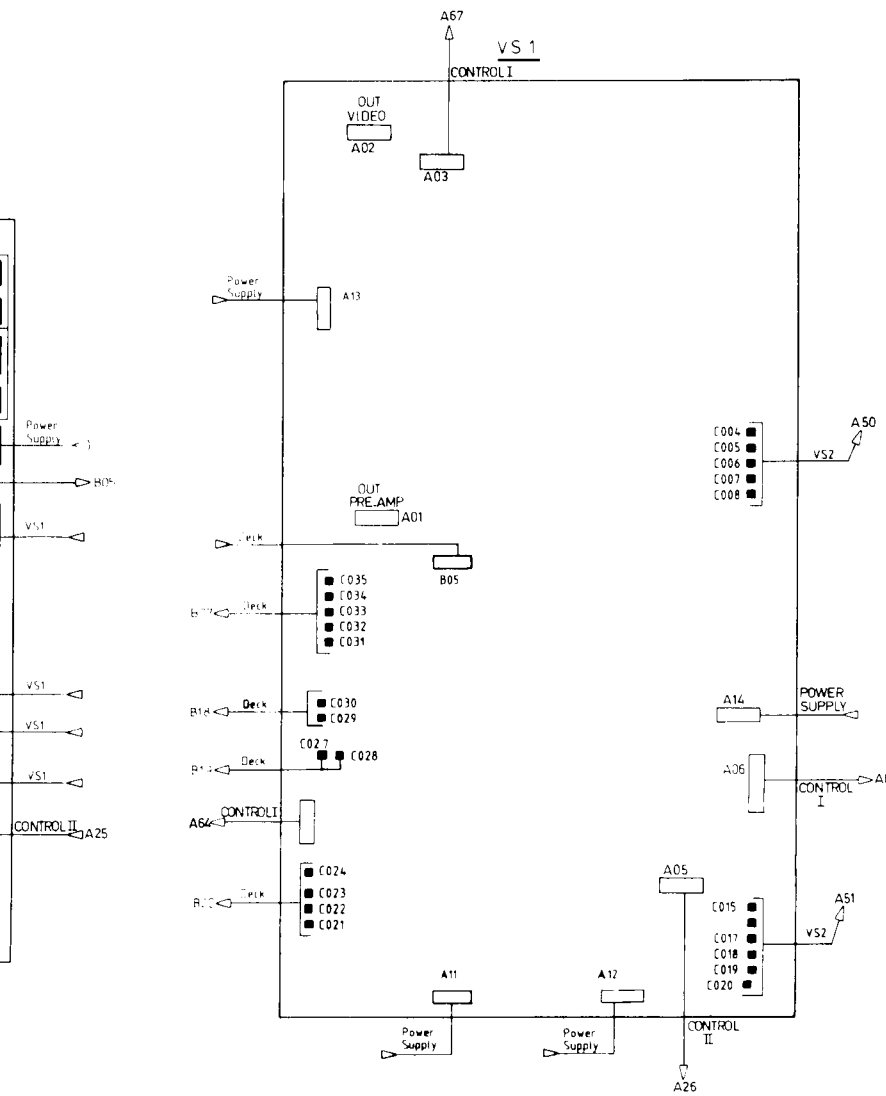


CONTROL 1

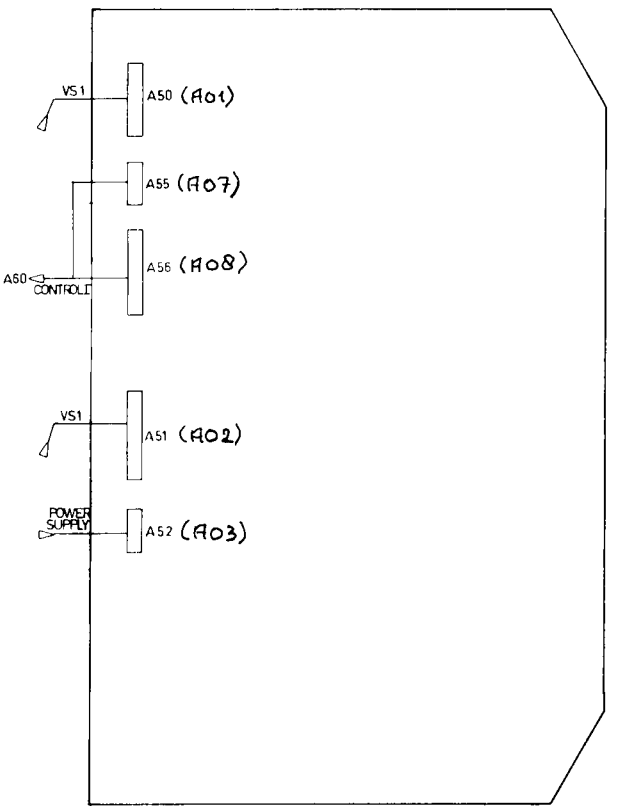


NTROL 2

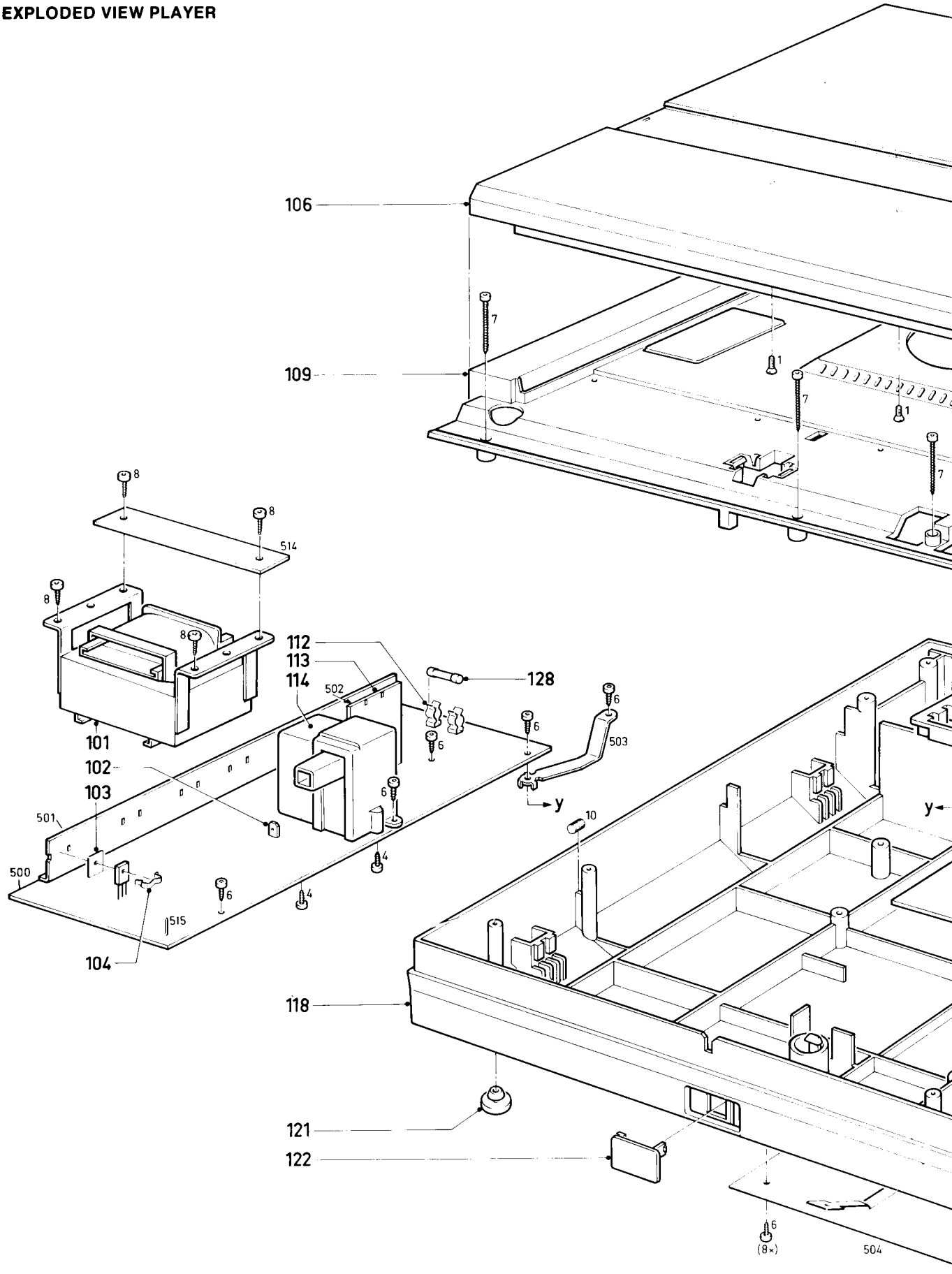


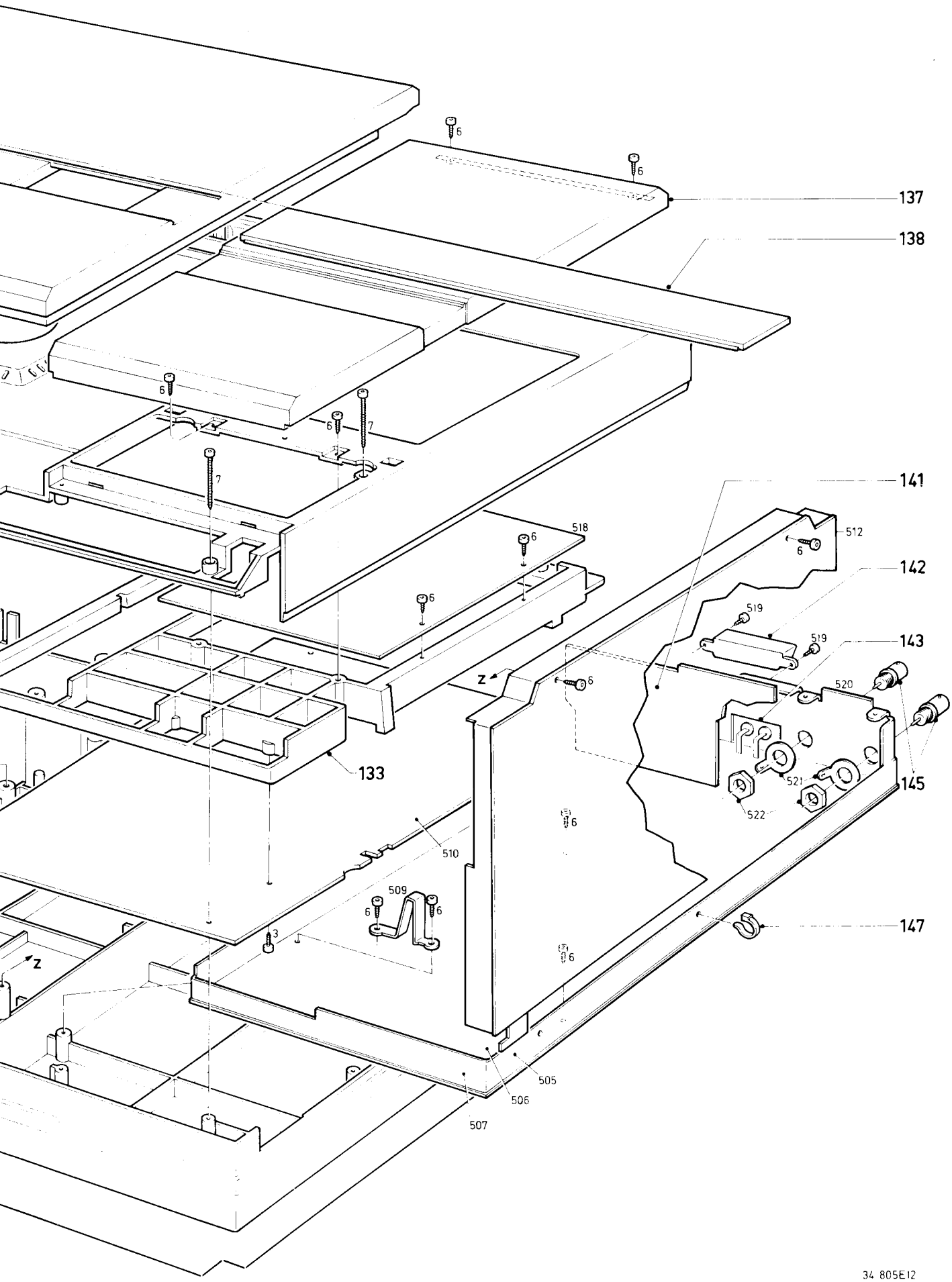


VS 2



EXPLODED VIEW PLAYER




137
138
141
142
143
145
147
133
6
7
518
512
519
520
521
522
510
509
505
506
507
Z

34 805E12

LIST OF MECHANICAL PARTS PLAYER

1	Screw M3x6	4822 502 11064
3	Screw 4Nx3/8"	4822 502 30188
4	Screw 4Nx3/8"	4822 502 30209
5	Screw 4Nx3/8"	4822 502 30219
6	Screw 4Nx1/2"	4822 502 30091
7	Screw 4Nx1 1/4"	4822 502 30248
8	Screw 6Nx5/8"	4822 502 30189
	Screw 4Nx20	4822 502 30325
	Screw 4Nx32	4822 502 30316
10	Stopper	4822 462 40155
101	Mainstransformer	4822 146 30479
102	Connector	4822 268 10134
103	Insulating plate	4822 255 40133
104	Spring clip	4822 255 40128
106	Lid cover	4822 444 60398
109	Sub cabinet	4822 444 40111
112	Fuseholder	4822 492 60063
113	Sub supply panel	4822 214 50364
114	Multiplier	4822 214 50231
118	Cabinet	4822 444 50306
121	Foot	4822 462 40414
122	Window	4822 459 20247
128	Fuse	4822 253 30026
133	Frame	4822 464 50269
137	Cover	4822 444 60399
138	Window	4822 450 60378
141	Audio demodulator	4822 214 50362
142	Computer connect.	5322 267 64057
143	Audio connector	4822 267 30469
145	BNC connector	4822 267 10072
147	Ti rap	4822 401 10632

Service aids

Testdisc 8" NTSC	4822 397 30097
Testdisc 12" NTSC	4822 397 30098
Set with torx screw-driving tools	4822 395 50145
Opt. alignment set 110V	4822 395 30233
Opt. alignment set 220V	4822 395 30124

LIST OF ELECTRICAL PARTS PLAYER

Panels

Supply panel		4822 214 50365
Video Servo 1 panel		4822 214 50361
Video Servo 2 panel		4822 214 50359
Control 1 panel		4822 214 50366
Control 2 panel		4822 214 50363
Sub supply panel		4822 214 50364
Audio demodulator		4822 214 50362

Supply panel

1001	Fuse 2.5 A	4822 253 30026
1002	Multiplier	4822 214 50231
5002,5005	Transformer	4822 146 30484
5003	Transformer	4822 146 20694
5001,5004	Coil 25 uH	4822 158 10573
5006	Coil 1 mH	4822 157 51589
3011,3066	Potm. 1 kE	4822 100 10037
3112	Potm. 100 kE	4822 100 10052
3098	NTC 4.7 kE	5322 116 30239
	Socket 2f top	5322 267 34085

Sub supply panel

5001	Coil 100 uH	4822 156 21251

Video Servo 1 panel

5004	Delay line	4822 320 40105
5015	Delay line	4822 320 40081
5001	Coil 4 uH	4822 156 21236
5002,5010	Coil 44 uH	4822 156 21243
5003,5005	Coil 2 uH	4822 156 21048
5006,5007	Coil 82 uH	4822 158 10472
5009	Coil 6.4 uH	4822 156 21237
5012	Coil 37 uH	4822 156 21052
5013	Coil 29 uH	4822 156 21241
5014	Coil 28 uH	4822 156 21239
5016	Coil 50 uH	4822 156 21244
5018	Coil 47 uH	4822 156 10525
5020	Coil 39 uH	4822 156 21242
5021	Coil 12 uH	4822 156 21238
5023	Coil 100 uH	4822 156 21049
5030,5034	Coil 4.7 uH	4822 156 20917
5026	LC2004C	4822 218 10155
5027	LC2005C	4822 218 10154
	Potmeters	
3051,3075	1 kE	5322 100 10112
3108	470 E	4822 100 10038
3223	220 kE	4822 100 10088
3383	4.7 kE	4822 100 10036

Video Servo 2 panel

5008	Crystal	4822 242 70745
5001	Delay line	4822 320 40104
5002	Coil 10 uH	4822 156 10463
5003,5004	Coil 67 uH	4822 156 21257
5005	Coil 12 uH	4822 156 21238
5006	Coil 210 uH	4822 156 21247
5007	Coil 280 uH	4822 156 21248
	Potmeters	
3009	470 E	4822 100 10038
3021	1 kE	4822 100 10037
3033	100 E	4822 100 10075
3057	2.2 kE	4822 100 10029
3089,3093	22 kE	4822 100 10051
3111	100 kE	4822 100 10052

Control 1 panel

6018	LED CQV80L	4822 130 31984
5005	Crystal	4822 242 70801
5006	Crystal	4822 242 70392
5001/5004	Coil	4822 158 10101
3055.3057	Resistor 15 kE	4822 111 30813
3058	Resistor 10 kE	4822 111 30814
	IC socket 24p	4822 255 40159
	IC socket 40p	5322 255 44217

Audio demodulator

5051,5052	Coil 8 mH	4822 156 20928
5053,5055	Coil 86 uH	4822 156 21246
5054,5056	Coil 70 uH	4822 156 21245
3501	Potmeter 1 k	5322 100 10112

Safety resistors NFR25

6.8 E	4822 111 30504
22 E	4822 111 30517
33 E	4822 111 30522
47 E	4822 111 30526
56 E	4822 111 30528
68 E	4822 111 30531
82 E	4822 111 30533

IC's

HEF40161BP	5322 209 10344
HEF4017 BP	4822 209 10297
HEF4030 BP	5322 209 14124
HEF40374BP	5322 209 10385
HEF4040 BP	5322 209 14269
HEF4053 BP	5322 209 14121
HEF4066 BP	5322 209 14104
HEF4081 BP	4822 209 10269
HEF4093 BP	5322 209 14927
HEF4094 BP	5322 209 14485
HEF4104 BP	4822 209 10273
HEF4528 BP	4822 209 10277
HEF4538 BP	4822 209 10291
LM393N	4822 209 80797
MAB8049HP	4822 209 10405
D 8049PC NEC	4822 209 81976
MC1458N	4822 209 81349
NE5535N	4822 209 81132
NJM4558D	4822 209 80401
NJM4562D	4822 209 81979
N74HC86	4822 209 81923
N74LS00N	5322 209 84823
N74LS74AN	4822 209 80782
N74LS132N	5322 209 85201
N74LS139N	5322 209 85839
N74LS193N	5322 209 85405
N74LS279N	5322 130 42021
N74LS373N	5322 209 86062
N74LS374N	5322 209 85869
N74LS393N	4822 209 80447
TCA420A	4822 209 80278
TDA2730	4822 209 80744
UAA1030	4822 209 80794
2732	4822 209 81924
MM2716Q	4822 209 81975

Transistors

BC264A	5322 130 44476
BC264B	4822 130 41066
BC264C	5322 130 44476
BC264D	5322 130 44656
BC327	4822 130 40854
BC327A	4822 130 42155
BC327/40	4822 130 41327
BC337	4822 130 40855
BC337A	4822 130 42032
BC368	5322 130 44647
BC369	5322 130 44593
BC546	4822 130 41001
BC546B	4822 130 44461
BC547	4822 130 44257
BC547C	4822 130 44503
BC548	4822 130 40938
BC548B	4822 130 40937
BC548C	4822 130 44196
BC549	4822 130 40964
BC549B	4822 130 40936
BC549C	4822 130 44246
BC556A	5322 130 44462
BC556B	4822 130 41691
BC557	4822 130 44256
BC557B	4822 130 44568
BC558	4822 130 40941
BC558A	4822 130 40962
BC558B	4822 130 44197
BC559	4822 130 40963
BD236	4822 130 40917
BD437	4822 130 40982
BD438	4822 130 40995
BD675	5322 130 44786
BF240	4822 130 40902
BF256B	5322 130 44744
BF410B	4822 130 41908
BF450	4822 130 44237
BF494	4822 130 44195
BSV78	5322 130 44093
PH2369	4822 130 41594
IRFD1Z0	4822 130 42154

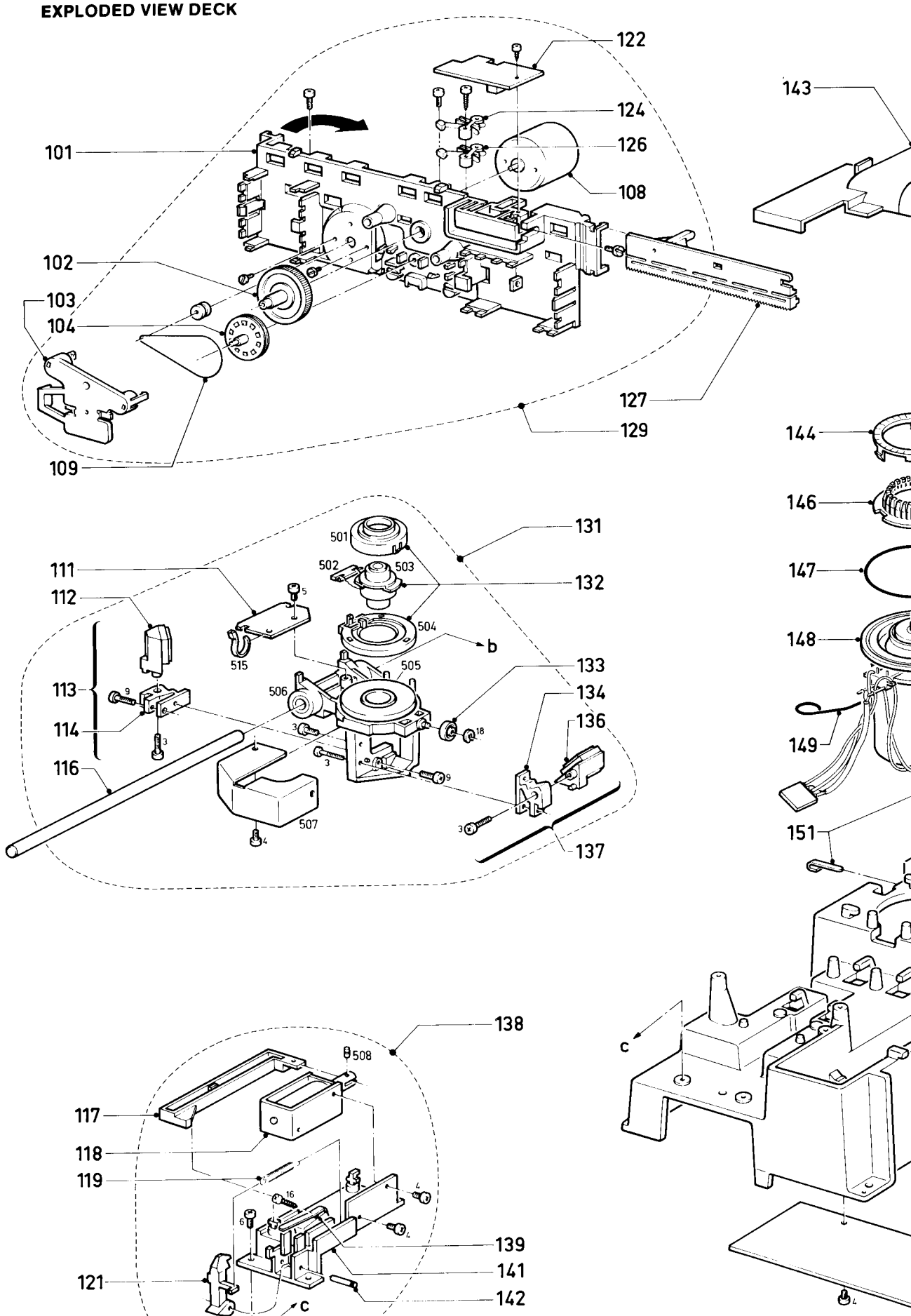
Diodes

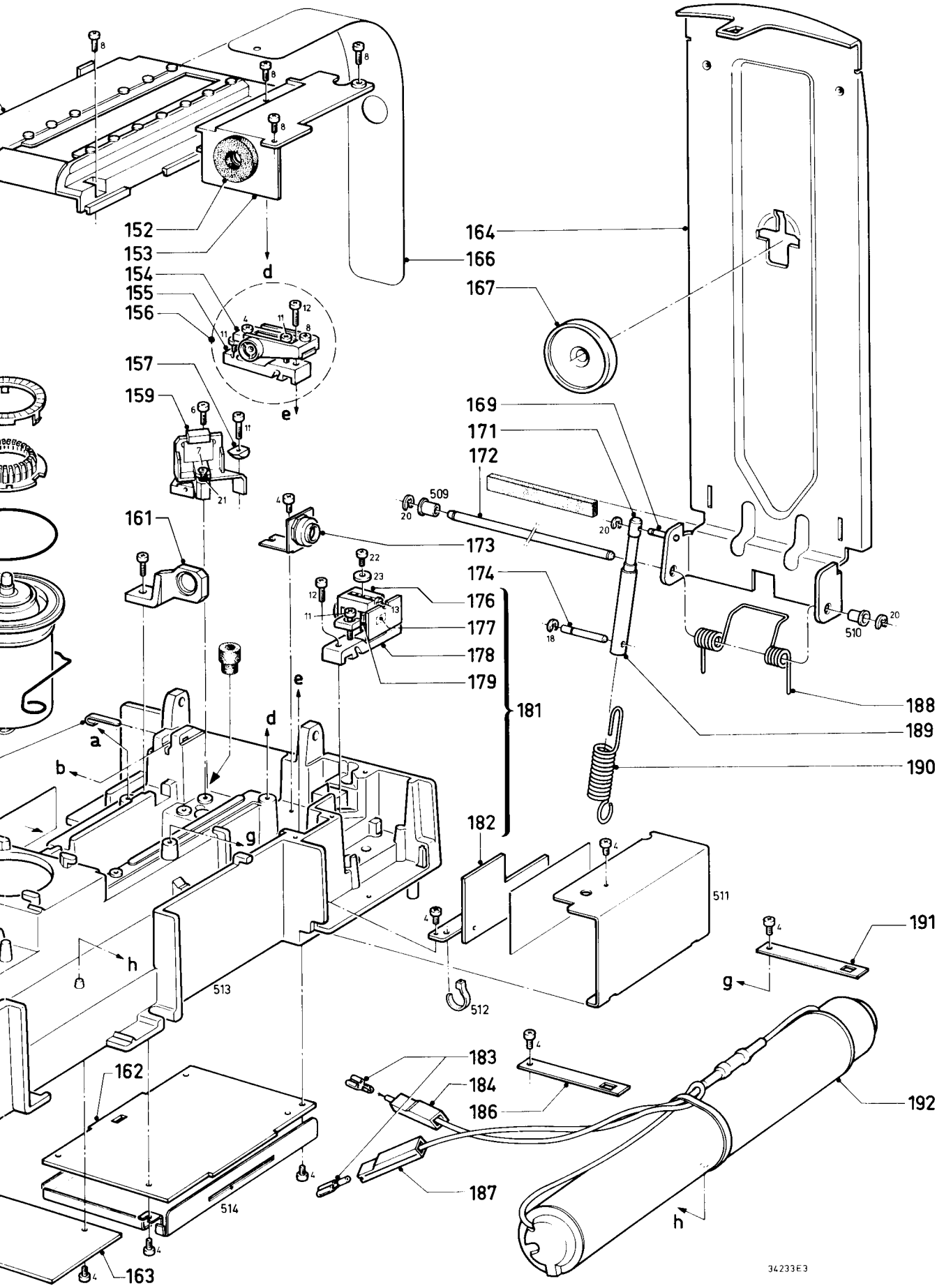
BA317	4822 130 30847
BAT85	4822 130 31983
BAW62	4822 130 30613
BB112	4822 130 32227
BB809	5322 130 31684
BY225/100	4822 130 50312
BYV27/100	4822 130 31982
BZV46/C1V5	5322 130 34865
BZV46/C2V0	4822 130 31248
BZX75/C1V4	4822 130 34047
BZX79/B3V9	4822 130 31981
BZX79/B8V2	4822 130 34382
BZX79/B9V1	4822 130 30862
BZX79/B11	4822 130 34488
BZX79/C3V6	5322 130 34834
BZX79/C4V7	4822 130 34174
BZX79/C5V6	4822 130 34173
BZX79/C6V2	4822 130 34167
BZX79/C7V5	4822 130 30861
BZX79/C8V2	4822 130 34382
BZX79/C15	4822 130 34281
BZX79/C18	4822 130 31024
BZX79/C56	4822 130 34258

Connectors

3P	Top	4822 267 40352
4P	"	4822 267 40353
5P	"	4822 267 40354
6P	"	4822 267 40355
7P	"	4822 267 50285
8P	"	4822 267 50406
9P	"	4822 267 50419
10P	"	4822 267 50332

EXPLODED VIEW DECK

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LIST OF MECHANICAL PARTS DECK

Fixing material

1a	4822 502 11674		Screw M2x5
1	4822 502 11469		Screw M2.5x5
2	4822 502 11549		Screw M2.5x10
3	4822 502 11552		Screw M2.5x16
3a	4822 502 11675		Screw M2.5x16
4	4822 502 11472		Screw M3x5
5	4822 502 11526		Screw M3x5
6	4822 502 11473		Screw M3x8
7	4822 502 11574		Screw M3x8
8	4822 502 11474		Screw M3x10
9	4822 502 11573		Screw M3x10
11	4822 502 11553		Screw M3x15
12	4822 502 11475		Screw M3x16
13	4822 502 11554		Screw M3
13a	4822 502 30307		Screw M4x6
14	4822 502 30048		Screw 4Nx16
15	4822 502 30308		Screw 4Nx16
16	5322 502 84013		Screw 2Nx13
17	4822 505 10471		Nut M2.5
18	4822 530 70043		Retaining ring 2.3
19	4822 532 10847		Ring 2.7x6.5
20	4822 530 70124		Retaining ring 4
21	5322 325 64029		Grommet
22	4822 502 11064		Screw M3x6
23	4822 532 10582		Ring 3.2x9
24	4822 532 50477		Ring

Chassis

101	4822 444 50305		Bracket
102	4822 522 31743		Pulley
103	4822 462 40651		Bracket
104	4822 528 80956		Pulley
108	4822 361 20442	*	Slide drive motor
109	4822 358 30386		Belt
111	4822 214 50263	*	Slide panel
112,			
113	4822 380 20118	*	Radial mirror assy
114	4822 402 60815		Bracket
116	4822 535 91261		Spindle
117	4822 402 60817		Bracket
119	4822 492 32073		Tension spring
121	4822 526 50058		Pawl
122	4822 402 60885	*	Slide stop panel
124,			
126	4822 271 30255	*	Slide position switch
127	4822 522 31742		Rack
129	4822 691 30127		Slide drive assy
131	4822 691 30108		Slide assy
132	4822 256 80046	*	Objective assy
133	4822 528 90376		Wheel
134	4822 402 60815		Bracket
136,			
137	4822 380 20119	*	Tangential mirror assy
138	4822 218 10151		Lid blocking assy
139	4822 271 30322	*	Lid switch
141	4822 464 50183		Bracket
142	4822 535 91259		Spindle
143	4822 444 60396		Dust cover
144	4822 460 20336		Ornamental ring
146	4822 532 60774		Centring ring
147	4822 530 50592		"O"-ring
148	4822 361 30152	*	Turntable motor
149	4822 492 62494		Spring
151	4822 492 62489		Leafspring
152	4822 532 51176		Ring
153	4822 444 30318		Cover
154	4822 492 62488		Leafspring
155	4822 256 90414		Manipulator holder
156	4822 691 30107		Spot lens/grating man. assy
157	4822 535 20046		Wedge
159	4822 380 10019		Folding mirror
160	4822 462 40558		Stop
161	4822 381 10684		Collimating lens
162	4822 214 50261	*	Servo pre-amplifier
163	4822 263 70181	*	Connector panel
164	4822 402 60859		Lid bracket
166	4822 460 10518		Dust strip
167	4822 532 60775		Clamping piece
169	4822 535 70644		Pin
171	4822 360 40107		Plunger
172	4822 535 91582		Spindle
173	4822 381 20067		/4 plate assy
174	4822 535 91263		Spindle
176	4822 492 62493		Flat spring
177	4822 130 31572	*	Photo diode
178	4822 402 60814		Diode manipulator
179	4822 381 40045		Cylinder lens
181	4822 214 50273	*	Photo diode with preamp.assy
182	4822 214 50373	*	H.F. Pre-amplifier
183	4822 268 20079		Laser connector
184	4822 268 40098		Anode connector housing
186	4822 492 62491		Leafspring
187	4822 268 40099		Cathode connector
188	4822 492 41014		Tension spring
189	4822 360 40108		Bush
190	4822 492 32314		Spring
191	4822 492 62491		Leafspring
192	4822 131 41002	*	Laser
	4822 390 20107		Grease for damper item 189

* See also list of electrical parts

LIST OF ELECTRICAL PARTS DECK

Printed panels (only available during production)

H.F. pre-amplifier	4822 214 50373
Servo pre-amplifier	4822 214 50261
Connector panel	4822 263 70181
Slide panel	4822 214 50263
Slide stop panel	4822 402 60885
Laser	4822 131 41002

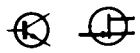
Turntable motor	4822 361 30152
Slide motor	4822 361 20442

Lid switch	4822 271 30322
Slide position switch	4822 271 30255

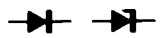
Objective assy	4822 256 80046
Radial mirror assy	4822 380 20118
Tangential mirror assy	4822 380 20119

Photo diode	4822 130 31572
Photo interruptor	4822 130 32114

SA1458N	4822 209 80793
TDA3792	4822 209 81029

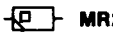


BC264A	5322 130 44476
BC559	4822 130 40963
BF410D	4822 130 41697
BF494	4822 130 44195



BAW62	4822 130 30613
BZX79/B5V6	4822 130 34173

470 E	4822 100 10038
22 kE	4822 100 10051



3.32 kE	5322 116 54005
10 kE	4822 116 51253
20.5 kE	5322 116 55419
56.2 kE	4822 116 51264
133 kE	5322 116 54708
100 kE	4822 116 51268

Servo pre-amplifier

2014	68 uF-16V	4822 124 20689
2015,2017	4.7 uF-63V	4822 124 20726

2001,2002	27 pF-50V	4822 122 10215
2003,2004, 2008,2018	22 nF	4822 122 10188
2005,2007, 2009	33 pF-50V	4822 122 10179
2006	4.7 nF	4822 121 50539

H.F. Pre-amplifier

2001..2004	27 pF-100V	4822 122 30045
2005,2007	1 uF- 25V	4822 124 21457

1 nF 100V	4822 122 30027
22 nF 63V	4822 122 30103

Print connectors

2f-top	4822 267 30339
2f-top	5322 267 34085
3f-top	4822 265 30144
3f-top	4822 268 10133
4f-top	4822 267 40258
5f-top	4822 267 40342
2f-bottom	4822 267 30361
2f-bottom	4822 267 30405
3p-top	4822 267 40352
4p-top	4822 267 40353
5p-top	4822 267 40354
7p-top	4822 267 50285