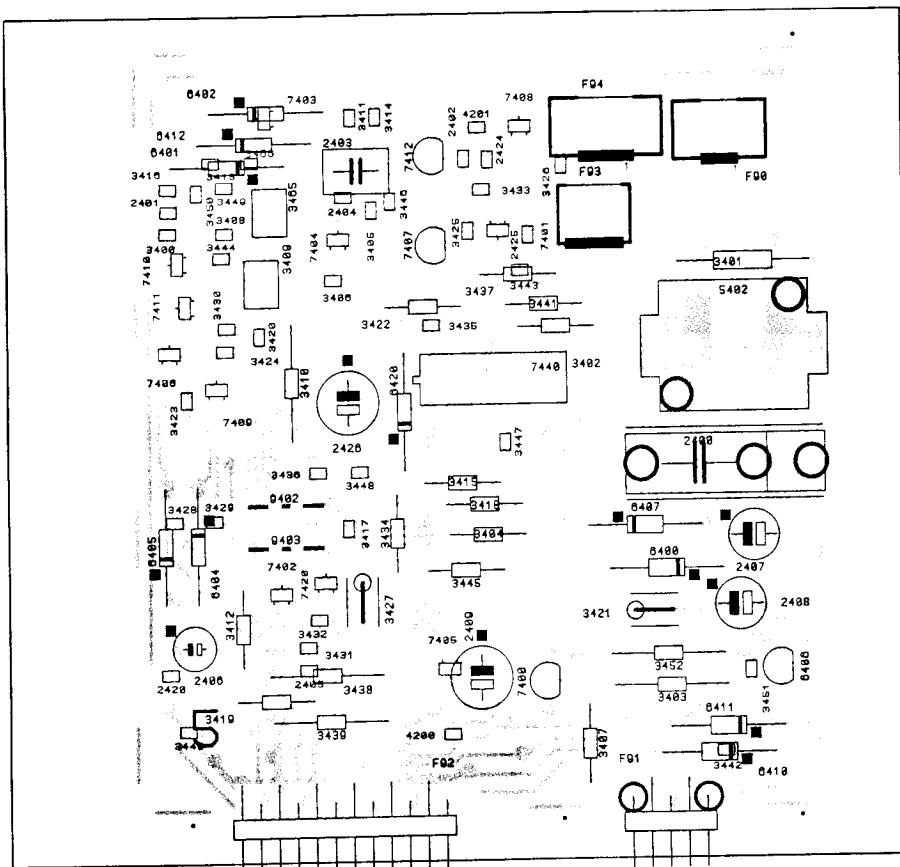
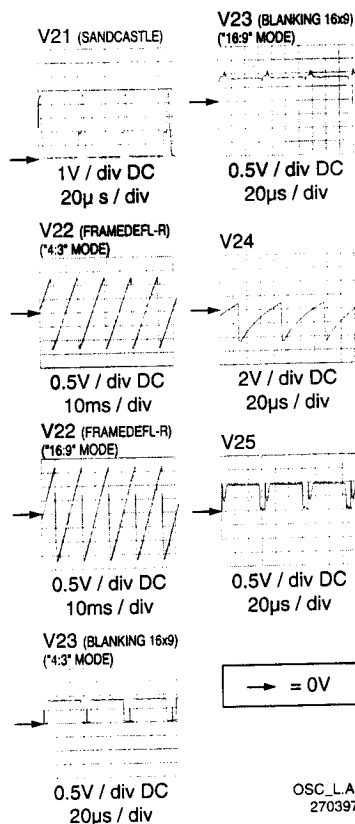
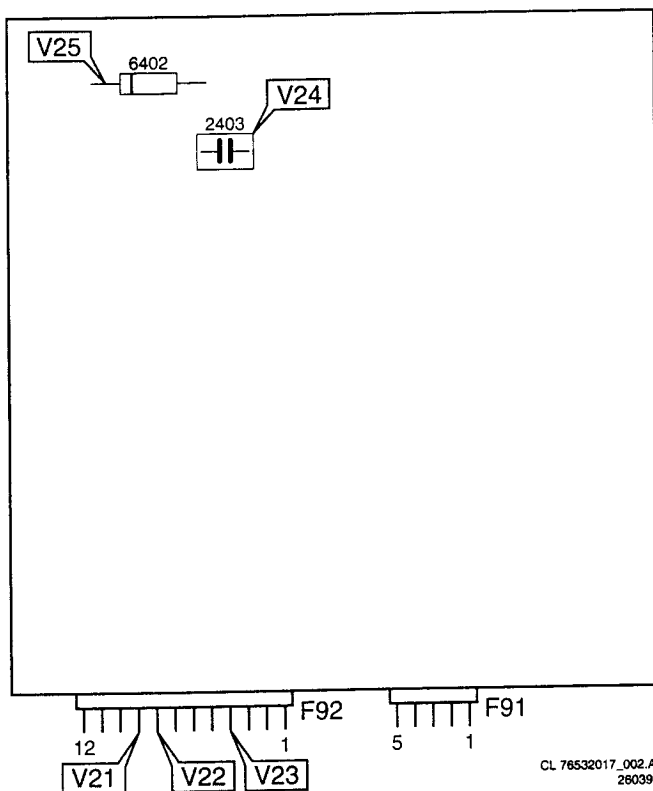


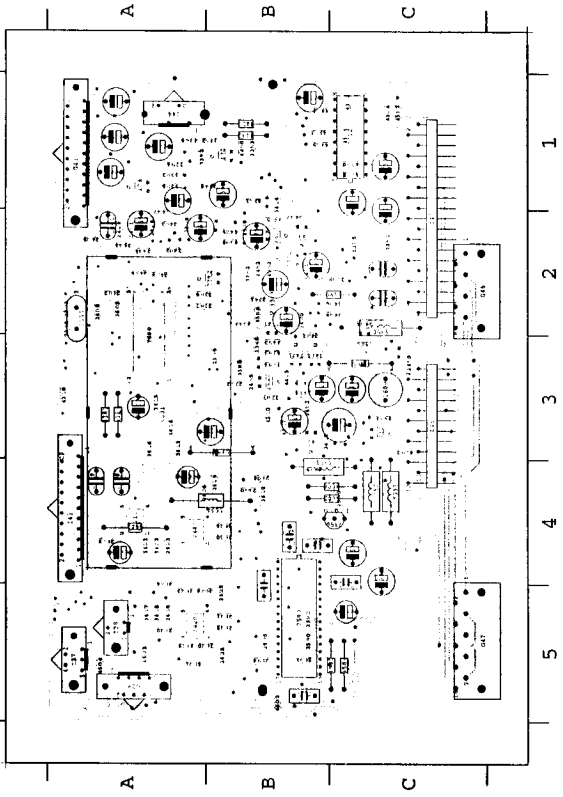
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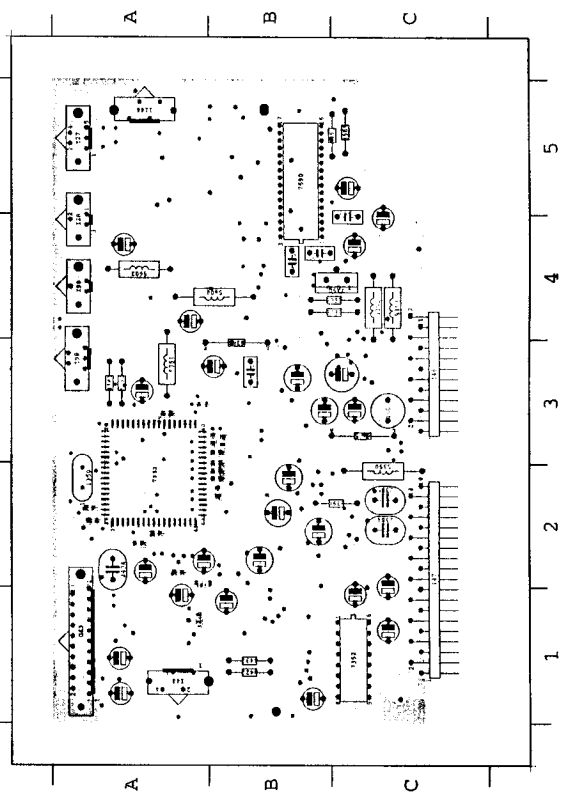
For Service Manuals Contact
MAURITRON TECHNICAL SERVICES
 8 Cherry Tree Rd, Chinnor
 Oxon OX9 4QY
 Tel: 01844-351694 Fax: 01844-352554
 Email: enquiries@mauritron.co.uk



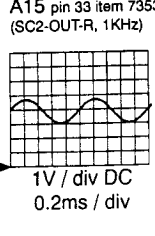
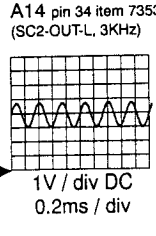
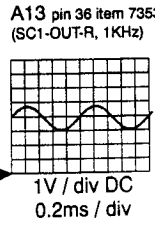
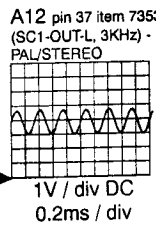
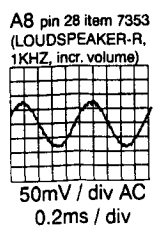
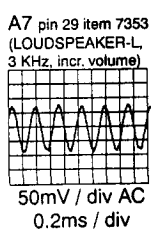
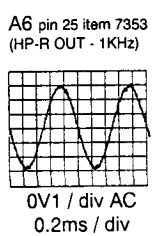
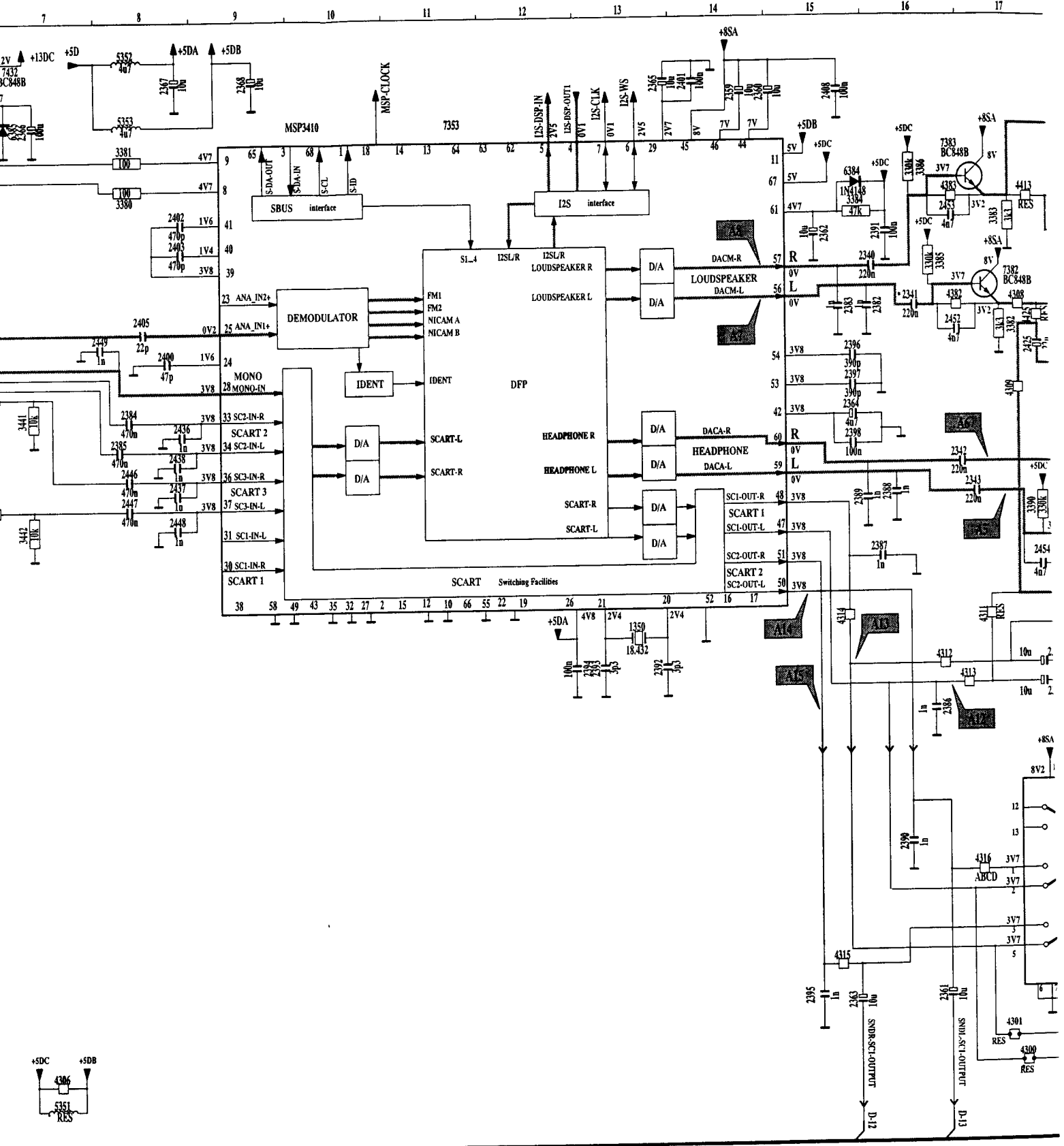
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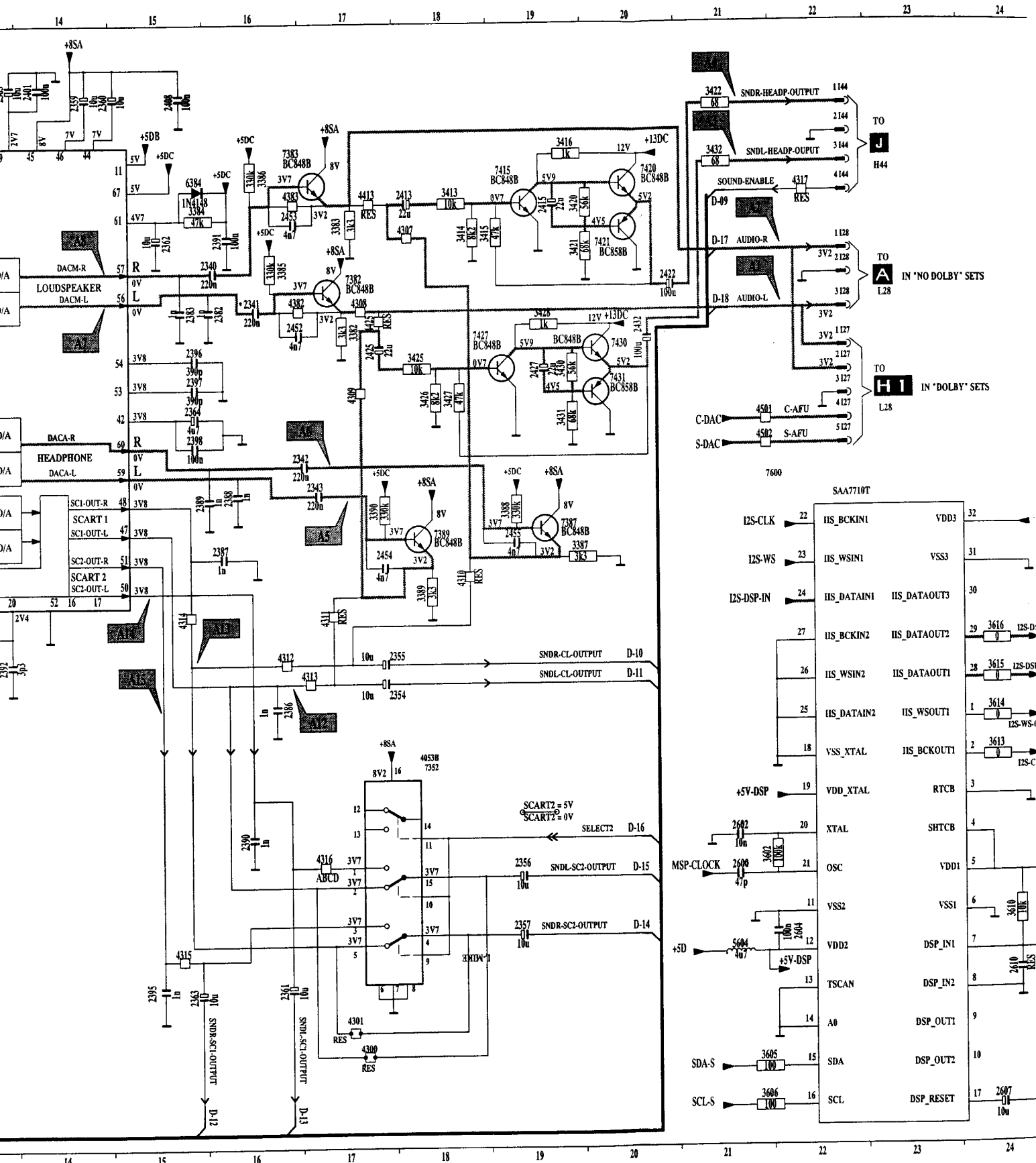
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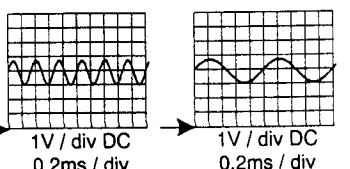
Module audio (Dolby)



→ = 0V
OSC_PCDR



A14 pin 34 item 7353 (SC2-OUT-L, 3KHz)
A15 pin 33 item 7353 (SC2-OUT-R, 1KHz)



→ = 0V
OSC_P_CDR

8. Alignments

See Service Manual MD1.2E AA for a description of the basic alignments for the MD1.2E AA software.

Software version:
M12BAx-4.x
M12COx-3.2
M12COx-4.0
M12COx-3.2

4:3 sets (NO flashing LED procedure, replaced by M12COx-4.0)
4:3 sets (WITH flashing LED procedure, replaces M12COx-3.2)

In the Service Default and Service Alignment Mode widescreen sets switch to WideScreen format. All the geometry alignments also have to be made in the WideScreen mode.

In this supplement the additional options for 16:9 and Dolby Pro Logic sets with the following software are described:

M12COx-5.1
M12DOx-1.0
(or later)
16:9 sets (also suitable for 4:3 sets)
Dolby Pro Logic sets (4:3 and 16:9)

8.1 Options and alignments

HI Histogram option. This option is not used and is not selectable.
WB Format detection for 4:3, 14:9 or 16:9 picture (16:9 sets only) and Dolby Pro Logic sound (Dolby Pro Logic sets only) by the teletext IC.
Y Automatic detection on
N Automatic detection off
Automatic 16:9 detection via the Scart cable also functions if 'WB N' is set.
Picture tube aspect ratio
Y 16:9 picture tube
N 4:3 picture tube
If '16 N' is set, parameters 'WB', 'RT', 'SS', 'D1', 'D2', 'D3' and 'D4' automatically become blue and are made non-selectable.

* In Dolby Pro Logic sets the WB option can be selected independently of the 16 option, as the automatic sound detection can also be switched on and off in this manner.

RT Rotation coil (picture tilt)
Y Rotation coil present; An option to tilt the picture appears under the YELLOW key in the operating menu.
N No rotation coil present.

D1 HD-value deviation in 4:3, Zoom 14:9 and Zoom 16:9 in relation to WideScreen mode.

D2 HD-value deviation in SuperWide (panorama) format in relation to WideScreen mode.

Supplement MD1.2E 14

D3 HP-value deviation in 4:3, Zoom 14:9 and Zoom 16:9 in relation to WideScreen mode.

D4 HP-value deviation in SuperWide (panorama) format in relation to WideScreen mode.

The alignment settings are dependent on picture tube format:

Picture tube format	20"	24"	28"	32"
D1	12	9	9	8
D2	2	3	3	5
D3	10	9	9	8
D4	7	9	9	8

SS Picture dimension and rotation coil dependent setting.

SS	Picture tube / rotation coil
1	32" with rotation coil
2	28" with rotation coil
3	24" with rotation coil
4	32" without rotation coil
5	28" without rotation coil
6	24" without rotation coil

9. Circuit description

16:9 Module circuit description

4 functions are located on the 16:9 module:

- Blanking line and frame
- Picture rotation
- Panorama mode
- Line DC shift

IC 7440 (fC control of functions) controls the picture rotation, panorama mode switching and the blanking enable signal.

9.1 Line and frame blanking (Fig. 9.1 & 9.2)

9.1.1 Line blanking (Horizontal blanking)

Horizontal blanking is used to completely blank-out the left and right bars in case of 4:3 or 14:9 view-mode. This is realised by making a wider fast blanking pulse FBI (signal A). This wider pulse is created by starting the pulse earlier (indicated by extra pulse-width '3') and delaying the pulse stop (indicated by a additional pulse '2'). The delay on the blanking pulse (time slot '2') causes blanking at the left side of the picture, the earlier start of pulses causes blanking at the right side of the picture. The corrected (= widened) FBI pulse is supplied to the video controller pin 24 IC7119-4C that controls the blanking of the RGB-outputs.

A 0V at the 'BLANKING 16:9' line (connector F92-4) blanks the video signal. This is the case when TS7405 is conducting.

9.1.1.1 Blanking during the normal sandcastle pulse (1)

During the normal sandcastle pulse the picture has to be blanked; if the base of TS7420 is high (sandcastle present), TS7420 and TS7402 are conducting. In this way the collector of TS7403 is connected to ground by D6401. This will force TS7404 out of conduction and TS7405 in conduction. If TS7405 is conducting the picture will be blanked.

9.1.1.2 Blanking the left side of the picture (2)

To blank the left side of the picture, the sandcastle pulse has to be present longer. If TS7402 is conducting, C2404 is discharged (resetted). If the sandcastle pulse at the base of TS7420 is gone, TS7402 will block and C2404 is charged via R3413, R3449 and R3450. This will create a sawtooth shaped voltage over C2404. This Voltage is also present at the collector of TS7403. The picture is blanked till the voltage on the collector of TS7404 is 0V7 higher than the voltage on the emitter of TS7404. During the time that TS7404 is out of conduction the picture is blanked. By regulating the voltage on the emitter of TS7404 with R3409 (if present), the time to blank the left-side of the picture can be adjust.

9.1.1.3 Blanking the right side of the picture (3)

To blank the right of the picture, the sandcastle pulse has to start earlier; Because the positive charged side of C2403 (the side connected to C2404) is connected to ground, the sawtooth on point B is shifted to a negative voltage. Now the voltage on the negative point (C) will increase (following point B). This goes on until the voltage on point C is 0V7.

Then TS7403 starts to conduct and TS7404 will block; the picture will be blanked. So prior to the normal sandcastle pulse, point C exceeds the 0V7 and starts to blank the picture.

9.1.2 Frame-blanking (vertical blanking)

Vertical blanking is used to avoid vertical overscan (scanning against the top and bottom of the CRT, outside the visible area) in 14:9 and 16:9 WIDESCREEN view-mode. Scanning outside the visible area should be avoided since it influences the EHT-INFO (and thus white limiting), leading to unwanted contrast reduction. It can even lead to EHT-losses (line output stage loaded to heavy) and röntgen-radiation. The vertical blanking is controlled by the sawtooth on pin 8F92. This sawtooth is symmetrical around 0V. The value of the sawtooth is shifted between 0V and 1V4 by capacitor C2406. In normal conditions (writing of the picture) TS7406 and TS7409 are conducting. This will cause a voltage drop over R3423 and force TS7411 in conduction. This will bring TS7410 and TS7404 in conduction. No blanking will take place at this moment because the base of TS7405 is 'low'. If the sawtooth voltage becomes very high or very low TS7409 or TS7406 are driven out of conduction. If the sawtooth voltage is higher than the emitter-voltage of TS7409, TS7409 is blocked. Consequently, there is no voltage drop across R3424 and TS7411 is out of conduction. TS7410 and TS7404 are also out of conduction. Now the base of TS7405 is supplied by R3417; TS7405 goes in conduction, resulting in blanking of the picture.

9.2 Frame rotation

To compensate the frame rotation caused by the earth magnetism, a frame rotation circuitry can be applied. The circuitry compensates the earth magnetism with an equal but opposite magnetic force. For this purpose a coil is fitted to the picture tube through which a current flows; the strength and direction of this current is adjustable. This circuitry is situated on the 16:9 module around IC 7440 and the circuitry with TS7401, TS7407, TS7408 and TS7412.

Operation

IC7440 is an I/O-expander. Left or right tilting is realised by driving TS7407 (and thus TS7408) or TS7412 (and thus TS7401) (more or less) into conduction. Combinations of driving both TS7407 and TS7412 are also possible.

In total there are 9 states:

The other 7 states of the 16 states true table are not valid as they do not give other correction states:

- 0000 = 0101 = 1010 = 1111 → 0101, 1010 and 1111 not used
- 1110 = 0100 et 1101 = 1000 → 1110 and 1101 not used
- 1011 = 0001 et 0111 = 0010 → 1011 and 0111 not used

Side A or B represent an upward correction on the left or right side of the picture (direction depends on the polarity of the deflection coil).

A	B	C	D	Correction
0	0	0	0	No correction at all
0	1	0	0	Small correction to side A
1	0	0	0	Medium correction to side A
1	1	0	0	High correction to side A
0	0	0	1	Small correction to side B
0	0	1	0	Medium correction to side B
0	0	1	1	High correction to side B
0	1	1	0	Small correction to side A corrected by medium correction to side B, so in total a very small correction to side B (smaller than at 0001)
1	0	0	1	Medium correction to side A corrected by small correction to side B, so in total a very small correction to side A (smaller than at 0100)

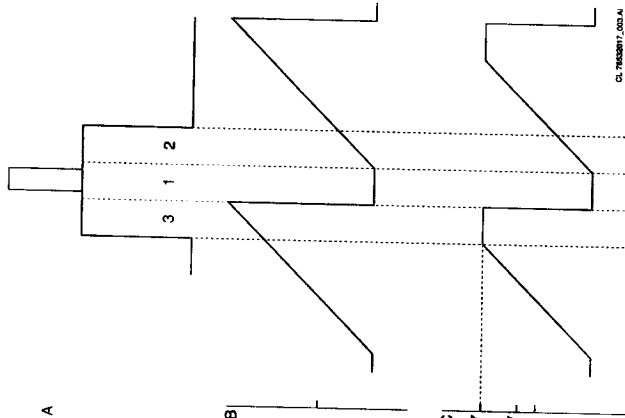


Fig. 9.1

9.3 Panorama mode

An additional capacitor (C2400) is added to the diode modulator by thyristor 6406. This is controlled by transistor TS7400 which is controlled by the I/O expander. In this way the S-correction can be installed. In SUPERWIDE mode C2400 is disconnected from the diode-modulator. This results in more deflection at the edges of the screen than in the middle of the screen.

When transistor TS7400 is conducting, T6406 can not be triggered. This means that C2400 is not added to the diode modulator. When flyback takes place, a part of the flyback-pulse is present at the gate of the thyristor. This will trigger the thyristor and C2400 is added to the diode modulator. During the first part of the line scan the thyristor is conducting. In the second part of the scan, the current changes direction and C2400 is added to the diode modulator by diode 6410.

9.4 DC-shift

In case of bad centring of the picture, a DC-current can be injected in the line network through LS402. The direction of the current can be chosen by connecting pin 2F90 to 3F90 or to 1F90. If this is not enough, an extra DC shift module can be added on connector F94.

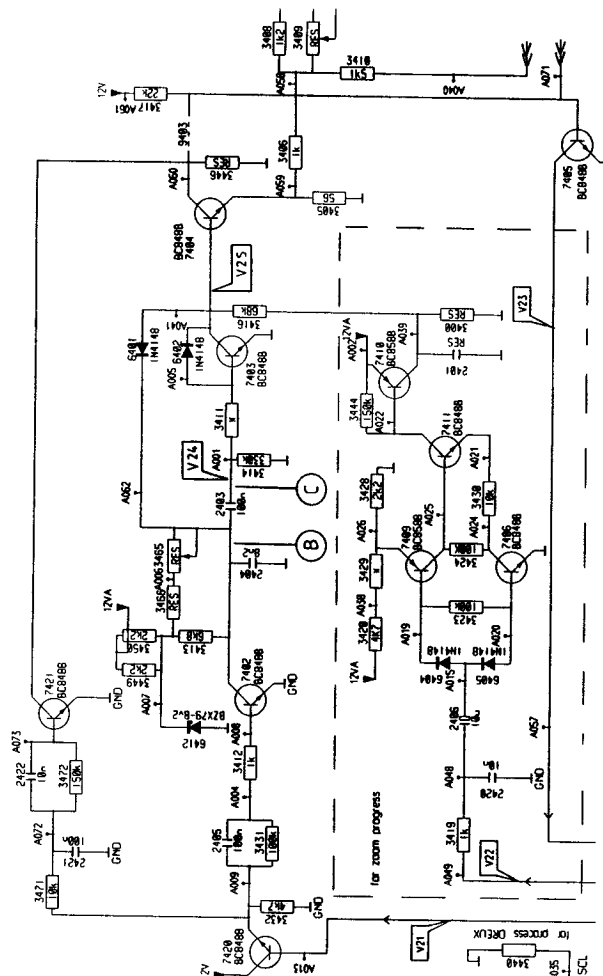


Fig. 9.2