

Service  
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# Service Manual

FT 980

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Safety regulations required 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 Huolto-Ohje Manual de Servicio Manual de Servicio



Subject to modification

4822 725 22677

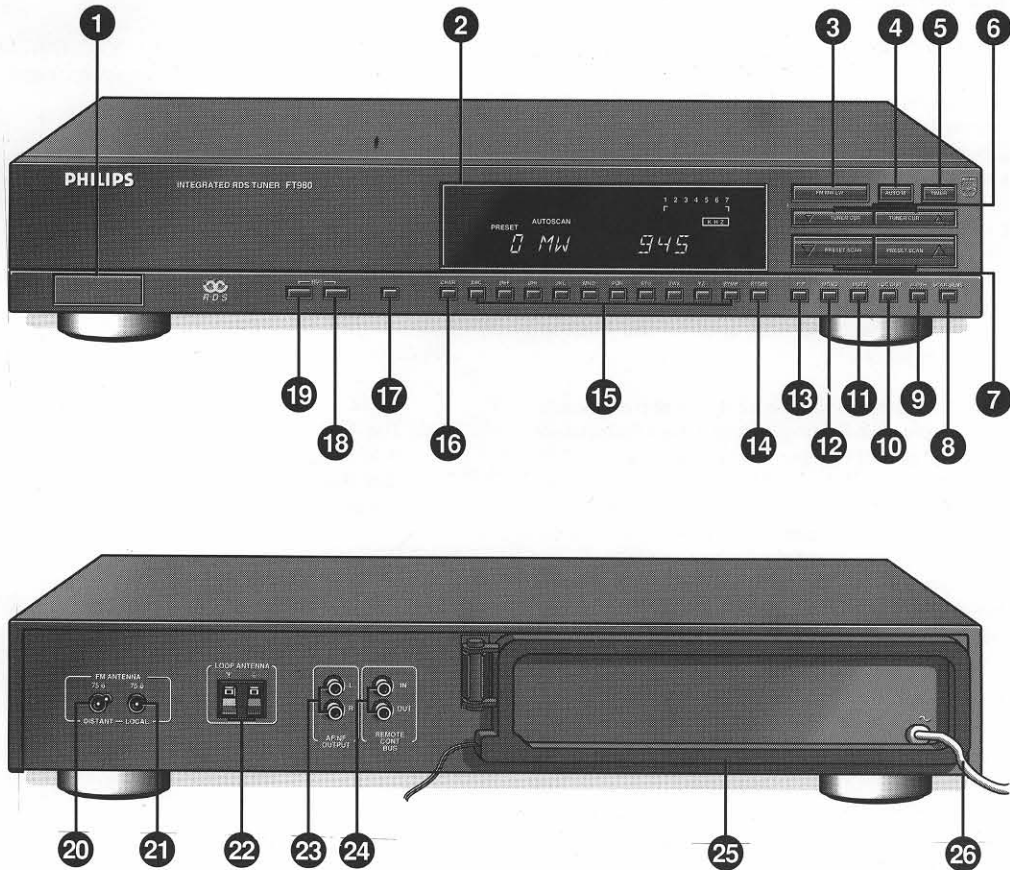
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**PHILIPS**

Published by  
Philips Consumer Service

SPECIFICATION	Nominal value		Typical value		
<b>General</b>					
Mains voltage	: 220 V-240 V ~		: 220 V-240 V ~		
Mains frequency	: 50-60 Hz		: 50-60 Hz		
Dimensoins (W x H x D)	: 420 x 67/86x334		: 420 x 67/86x334		
<b>Tuner: FM section</b>					
Tuning range	: 87.5 MHz to 108 MHz		: 87.5 MHz to 108 MHz		
Aerial inputs	: 75 Ω coaxial LOCAL/DX		: 75 Ω coaxial		
Frequency response	: 30-12500 Hz +0.5 dB -2 dB		: 10-15000 Hz +1.5 dB		
Sensitivity	mono	: 1.2 μV 26 dB S/N at 98 MHz, 75 Ω	: 0.8 μV at 98 MHz, 75 Ω		
	stereo	: 50 μV 50 dB S/N Δf=75 kHz	: 35 μV 50 dB S/N Δf=75 kHz		Selectivity
	width / narrow	: > 56 dB / > 76 dB	: > 65 dB / > 86 dB		Suppression
	IF - AM	: 100 dB - 50 dB	: 120 dB - 55 dB		
	pilot tone	19 kHz / 38 kHz: > 55 dB / > 60 dB	: > 60 dB / > 80 dB		
	image				
	frequency	: 80 dB (at 98 MHz)	: 86 dB		
ation (1 kHz)	mono	: 40 dB	: 50 dB / 44 dB width / narrow		Channel separation
D	width / narrow	: 0.1% / 0.25%	: 0.08% / 0.15%		Distortion T.H.D.
	stereo				
	width / narrow	: 0.3% / 0.7%	: 0.15% / 0.4%		Signal/noise ratio
	mono	: 84 dB IEC bewertet	: 86 dB		Output
	stereo	: 77 dB IEC bewertet	: 78 dB		
		: 295 mV at Δf = 22.5kHz	: 370 mV		
<b>section</b>					
	MW	: 528 kHz - 1605 kHz	: 528 kHz - 1605 kHz		Tuner: AM section
	LW	: 150 kHz - 283 kHz	: 150 kHz - 283 kHz		Wave ranges
	MW (1 MHz)	: 2.3 mV/m 26 dB S/N (Loop-Ant.)	: 1.8 mV/m 26 dB S/N		
	LW (261 kHz)	: 5.8 mV/m	: 5.2 mV/m		Sensitivity
		: 26 dB for 9 kHz off resonance	: 30 dB for 9 kHz off resonance		Selectivity
	IF	: 47 dB	: 55 dB		Suppression
		: 350 mV	: 400 mV		Output
<b>section</b>					
		: EEPROM	: EEPROM		Tuner: Digital
	FM / MW / LW	: 50 kHz / 25 kHz / 9kHz / 1 kHz (Auto / Man.)	: 50 kHz / 25 kHz / 9kHz / 1 kHz (Auto / Man.)		Memory
	FM / MW / LW	: 59 / 59 / 59 random / sequentill	: 59 / 59 / 59 random / sequentill		Tuning steps
					Presets



## FRONT PANEL

- ① **ON/OFF button** - press in to switch the unit on; press again to switch off
- ② **display showing:**  
LW (Long Wave), MW (Medium Wave) or FM - the selected waveband  
AUTOSCAN - automatic tuning mode  
AUTOSCAN HIGH - automatic tuning at increased sensitivity  
TUNED - when a station is found and correctly tuned to STEREO or MONO - FM stereo or mono reception  
STORE - when the memory has been opened to store a preferred station  
The tuned frequency in 'MHz' (for FM) or 'kHz' (for MW and LW)  
1 to 59 - the number of the selected preset station  
The name of the station. If you have tuned to a transmitter with RDS signal, the name given by the station will appear automatically. For the other transmitters you can program a name yourself.  
DISTANT or LOCAL - the selected aerial  
MUTING - during silent tuning  
TIMER - the timer program is activated  
— — - the bandwidth  
1 > to 7 > - the signal strength  
DIMMER - you can now adjust the display brightness
- ③ **waveband buttons** - to select LW, MW or FM band
- ④ **AUTO/MAN button** - to select automatic or manual tuning *and* to adjust the display brightness
- ⑤ **TIMER button** - to program 3 stations for use with an external timer
- ⑥ **TUNER  $\Delta$   $\nabla$  buttons** - press  $\Delta$  to tune towards the higher end of the selected band and press  $\nabla$  to tune towards the lower end of the selected band
- ⑦ **PRESET SCAN/CURSOR  $\Delta$   $\nabla$  buttons** - to call up preset stations in ascending  $\Delta$  or descending order  $\nabla$  *and* to move the cursor when programming a name
- ⑧ **SCAN.SENS button** - to select a higher tuning sensitivity when tuning automatically to FM transmitters
- ⑨ **WIDTH button** - to select the bandwidth (wide or narrow) for FM stations

- ⑩ **LOC/DIST button** - to select the aerial connected to the socket LOCAL or to the socket DISTANT
- ⑪ **MUTE button** - for silent tuning
- ⑫ **MONO button** - for mono reception
- ⑬ **F/P button** - to enter directly the tuning frequency
- ⑭ **STORE button** - for opening the memory to store a preferred station *and* to enter a name into the memory
- ⑮ **figure/alphabet buttons:**  
figures - 0 to 9  
letters - A to Z  
symbols - /, +, <, -, >, ✕  
space - —
- ⑯ **CHAR. button** - for opening the memory to program a name
- ⑰ **1-2 button** - to switch between 1- and 2-digit number entry
- ⑱ **RDS DISPLAY button** - to select between the name and the frequency of a station
- ⑲ **RDS AF button** - to display the alternative frequencies of the tuned station

## BACK PANEL

- ⑳ **FM-ANTENNA DISTANT** - socket for connection of:  
— a roof-mounted FM aerial with an impedance of 75 ohms  
— the supplied wire aerial (to the centre pin)
- ㉑ **FM-ANTENNA LOCAL** - socket for connection of:  
— the Community or Cable Antenna System, impedance 75 ohms
- ㉒ **LOOP ANTENNA** - terminals for connection of:  
— the MW/LW loop aerial  
— an external AM aerial,  $\Upsilon$  for the aerial wire and  $\perp$  for the ground wire
- ㉓ **AF/NF OUTPUT** - output sockets for connecting the tuner to an amplifier
- ㉔ **REMOTE CONTROL** - RC-5 remote control input/output sockets
- ㉕ **loop aerial** - for MW/LW reception
- ㉖ **mains lead**

# SERVICE TEST PROGRAMME.

## SWITCHING ON THE TEST PROGRAMME.

The microprocessor contains a testprogramme. The tuner can be brought in the test mode by simultaneously pressing the keys DISPLAY and AF while switching on the set. The display now shows the version of the software.

## TESTFUNCTIONS.

**CLEAR DISPLAY:** by pressing the MONO key, all segments and labels of the display are extinguished. The display remains in this state until another test function button is pressed.

**FULL DISPLAY:** By pressing the FP button all labels and segments of the display are lighting up and remain illuminated until another test function is activated.

**TEST DISPLAY:** Pressing the key MUTE activates a special display test consisting of the consecutive display of various brightness levels, symbols, figures and letters. After completion of this sequential programme, the display shows again the software alphanumeric data.

**OPTION TEST:** By pressing the LOCAL/DISTANT key, the display will show the selected diode option: EUR, EUR LW USA.

**SOFTWARE VERSION:** By pressing any key, except MONO, FP MUTE and LOCAL/DISTANT, SCAI SENS the display shows the version of the software. (VER 3-XX).

Each of the above functions can be interrupted by activating another test function key.

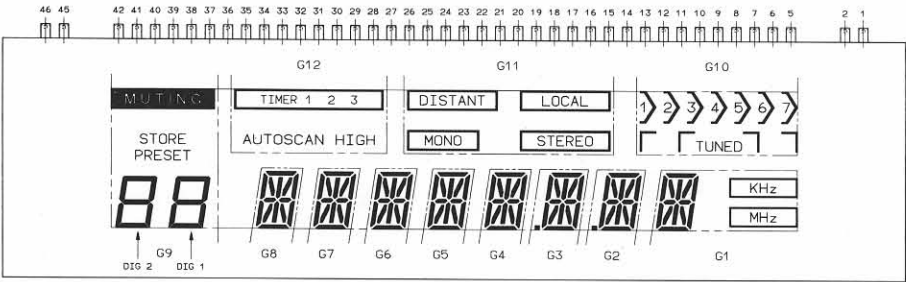
**LEAVING THE TEST MODE:** By switching off and on, or by pressing the button SCAN SENS.

**Note:** The test programme will not start if the microprocessor is defective, or if a few other basic conditions are not met. Therefore, it is recommended that you first check the supply voltage the clock signal and the reset pulse in case of a defect.

**TEST PORTS:** Microprocessor IC: pin 43: RDS-Synchronisation With RDS voltage=5V/ without RDS=0V.  
Microprocessor IC: pin 42: RDS-Valid block. When a valid block is read: 5V/ otherwise 0V.  
Microprocessor IC: pin 3: EEPROM-write. During EEPROM-writing: 5V/ otherwise 0V.

µC-PIN	DISPLAY-PIN	
	1	FILAMENT 1
	2	FILAMENT 1
	3	NO PIN
	4	//
20	5	S 1
19	6	S 2
18	7	S 3
17	8	S 4
37	9	S 5
36	10	S 6
35	11	S 7
34	12	S 8
33	13	S 9
16	14	G 1
15	15	G 2
14	16	G 3
13	17	G 4
22	18	G 5
23	19	G 6
	20	N C
	21	N C
	22	N C
	23	N C
	24	N C
	25	N C
	26	N C
	27	N C

µC-PIN	DISPLAY-PIN	
24	28	G 7
25	29	G 8
26	30	G 9
27	31	G 10
28	32	G 11
29	33	G 12
32	34	S 10
31	35	S 11
30	36	S 12
09	37	S 13
08	38	S 14
07	39	S 15
06	40	S 16
11	41	S 17
10	42	S 18
	43	NO PIN
	44	NO PIN
	45	FILAMENT 2
	46	FILAMENT 2



	G12 PIN33	G11 PIN32	G10 PIN31	G9 PIN30	G8 PIN29	G7 PIN28	G6 PIN19	G5 PIN18	G4 PIN17	G3 PIN16	G2 PIN15	G1 PIN14
S 1 PIN 5	AUTO SCAN		FBI MUTE	DIG 1a	a	a	a	a	a	a	a	a
S 2 PIN 6	HIGH			1b	b	b	b	b	b	b	b	b
S 3 PIN 7	TIMER +FRAME			1c	c	c	c	c	c	c	c	c
S 4 PIN 8	1 (TIMER)			1d	d	d	d	d	d	d	d	d
S 5 PIN 9	2 (TIMER)			1e	e	e	e	e	e	e	e	e
S 6 PIN 10	3 (TIMER)			1f	f	f	f	f	f	f	f	f
S 7 PIN 11				1g	g	g	g	g	g	g	g	g
S 8 PIN 12	STEREO	NARROW T T	PRESET							DP (DECIMAL POINT)	DP (DECIMAL POINT)	MHz
S 9 PIN 13			DIG 2a	h	h	h	h	h	h	h	h	h
S 10 PIN 34			2b	i	i	i	i	i	i	i	i	i
S 11 PIN 35			2c	k	k	k	k	k	k	k	k	k
S 12 PIN 36			2d	m	m	m	m	m	m	m	m	m
S 13 PIN 37			2e	n	n	n	n	n	n	n	n	n
S 14 PIN 38			2f	p	p	p	p	p	p	p	p	p
S 15 PIN 39			2g	r	r	r	r	r	r	r	r	r
S 16 PIN 40	MONO	WIDE T T	STORE									KHz
S 17 PIN 41	LOCAL	TUNED	MUTE									
S 18 PIN 42	DISTANT	1234567										



ELECTRICAL ADJUSTMENTS AND CHECKS

General

- For the HF adjustments, the injected signals should be kept as small as possible.
- Connect the frame aerial in case AM is used.
- The AM IF amplifier is adjusted with a wobulator signal of approx 600 kHz having a sweep of 250 kHz at a rhythm of 50 Hz.

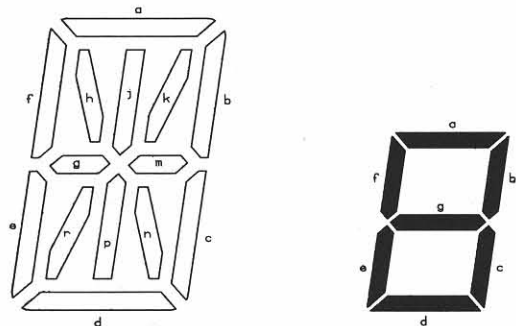
Measuring equipment used

- Power-supply equipment
- Oszilloscope
- DC voltmeter
- AC millivoltmeter
- Distortion meter

ELUCIDATIONS

- 1 Place the top of the response curve in the centre of the screen by displacing the wobulating frequency.
- 2 Adjust for maximum height and symmetry.
- 3 Adjust for minimum THD distortion on the distortion meter.
- 4 Before adjustment turn the potentiometer to its extreme clockwise position.
- 5 Before adjustment turn the potentiometer to its extreme counterclockwise position.
- 6 Adjust the left and the right channel to the same minimum level.

- Measuring point
- Trimming element



SERVICING HINTS

1. ESD



All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically.  
When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance. Keep components and tools also at this potential. See Service Information A86 - 1000 for this.

2. Display DP 601

The outputs of the display drivers are not protected against external overvoltages! When testing the display with external voltages. you should interrupt the connections with IC 601.

3. Warning

If the set is connected to mains voltage, there is a risk of shock-hazard voltages after the set is deaced.

4. FM IF offset

The ceramic resonators (F2 - F6) have different intermediate frequencies as a result of tolerances. Dependent on the IF, a jumper has to be closed or a jumper has to be opened. B0 - B3 (see table). The resonators have been provided with a colour code.

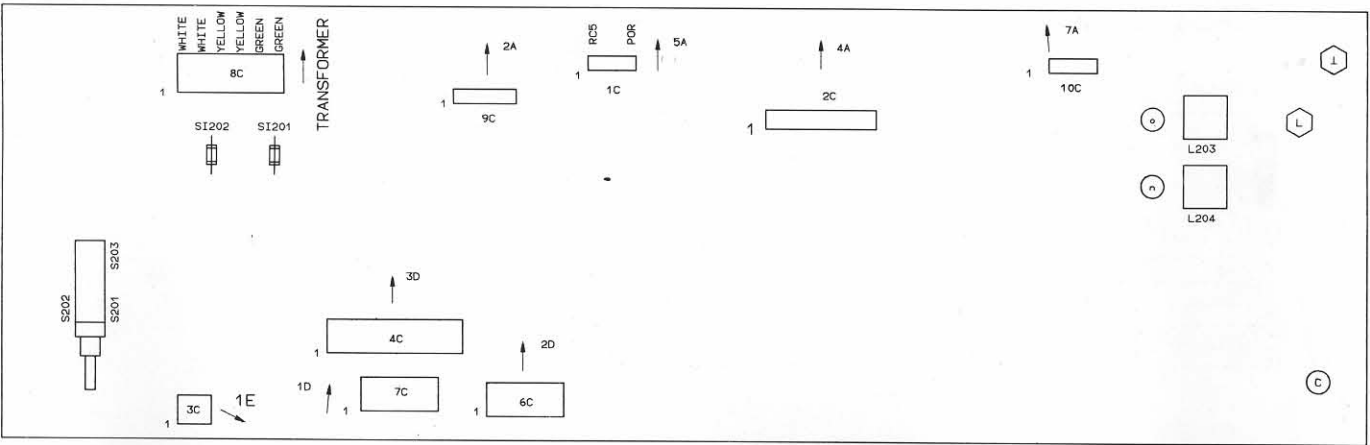
5. Ceramic resonators F2 - F6






When replacing one of the ceramic resonators, take care that the colour codes of all three resonators are the same.

FM-IF program





IF (MHz)	Jumper				Filter color
	B 3	B 2	B 1	B 0	
10.6500	0	1	0	0	Black
10.6750	0	1	1	0	Blue
10.7000	1	0	0	0	Red
10.7225	1	0	1	0	Orange
10.7500	1	1	0	0	White

0 = jumper open      1 = jumper closed









SK... WAVE RANGE SWITCH	 → SIGNAL	 TO	DISPLAY TUNE IN	REMARKS DETUNE	 ADJUST	 OSCILLOSCOPE OR A.C. METER	 D.C. METER INDICATOR
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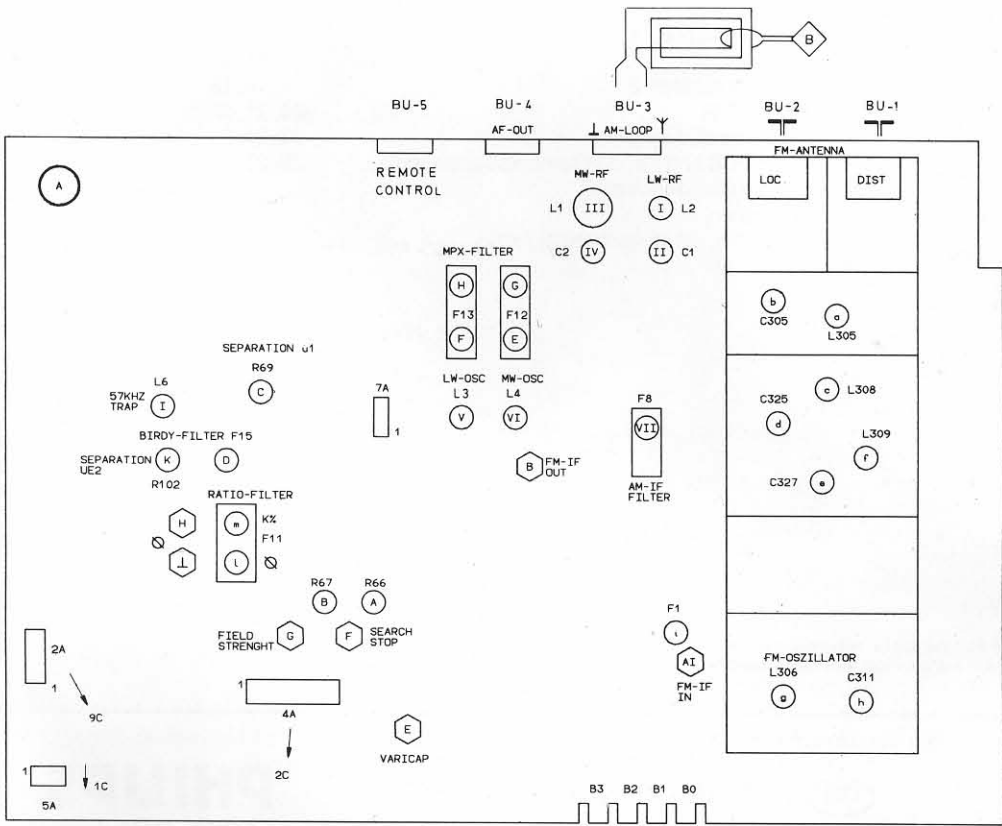
AM-RF (Oscillator)






MW			Display 531 kHz		 L 4		 1,1 V =
LW			Display 153 kHz		 L 3		 1,8 V =

AM-RF-IF








MW	1449 kHz 1 kHz mod. m=30 %		Display 1449 kHz		  C 2 F 8	BU-4 max. ~	
	558 kHz 1 kHz mod. m=30 %		Display 558 kHz		 L 1		
LW	261 kHz 1 kHz mod. m=30 %		Display 261 kHz		 C 1		
	162 kHz 1 kHz mod. m=30 %		Display 162 kHz		 L 2		

† Repeat -Herhalen -Répéter -Wiederholen -Ricominciare -Repetera -Gentage -Gjentagelse -Toista







SK... WAVE RANGE SWITCH	 SIGNAL	 TO	DISPLAY TUNE IN	REMARKS DETUNE	 ADJUST	 OSCILLOSCOPE OR A.C. METER	 D.C. METER INDICATOR
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FM-IF/TH.D.

FM Distant Stereo	10,7 MHz				 F 1	 max. ~ + sym.	
	108 MHz $\Delta f = 75 \text{ kHz}$ 1 mV	BU-1 (A) DX	Display 108,00 MHz		 F 11		 0V $\pm$ 8 mV
					 F 11	BU-4 min. distortion 	





FM-RF (Oscillator)






FM Distant			Display 108,00 MHz		 C311		 8,5 V =
			Display 87,50 MHz		 L 306		 2,5 V =

FM-RF









FM Distant	106 MHz 1 kHz mod. $\Delta f = 75 \text{ kHz}$	BU-1 (A) DX	Display 106,00 MHz		 C 305	BU-4 max. ~	
	88 MHz 1 kHz mod. $\Delta f = 75 \text{ kHz}$		Display 88,00 MHz		 C 325		
					 C 327		
					 L 305		
					 L 308		
					 L 309		

FM -FIELDSTRENGTH IND -SEARCH STOP

FM Distant	98 MHz 1 mV	BU-1 (A) DX	98,00 MHz		 R 67		 1.5 V $\pm$ 0.05 V
	98 MHz 15 $\mu$ V				 R 66		 0.7 V $\pm$ 0.05 V

SK... WAVE RANGE SWITCH	 SIGNAL	 TO	DISPLAY TUNE IN	REMARKS DETUNE	 ADJUST	 OSCILLOSCOPE OR A.C. METER	 D.C. METER INDICATOR
-------------------------------	---	---	--------------------	-------------------	---	--	--

FM -STEREO DECODER CROSSTALK

FM Distant Stereo  Width: narrow	106 MHz L mod. 1kHz	BU-1 (A) DX	106.00 MHz		 R 69 	BU-4-R min. ~ 	
	106 MHz R mod. 1kHz					BU-4-L min. ~ 	
FM Distant Stereo  Width: wide	106 MHz L mod. 1kHz				 R 102 	BU-4-R min. ~ 	
	106 MHz R mod. 1kHz					BU-4-L min. ~ 	




57 kHz WAVE TRAP

FM Distant Stereo Mute off	57 kHz approx. 50 mV				 L 6	 min. ~	
-------------------------------------	-------------------------	---	--	--	--	---	--





ADJACENT CHANNAL FILTER

FM Distant Stereo Mute off	114 kHz approx. 100 mV				 F 15	 min. ~	
-------------------------------------	---------------------------	---	--	--	---	---	--

FM -PILOT -FILTERS

FM Distant Stereo Mute off	19 kHz approx. 100 mV				 F 12  F 13	BU-4 min ~ 19 kHz	
	38 kHz approx. 100 mV					BU-4 min ~ 38 kHz	

RDS -DEMODULATOR

FM Distant	56.4 kHz (50 Hz) approx. 4 mV				 L 203	 max. ~	
	57.7 kHz (50 Hz) approx. 4 mV				 L 204		

# RDS DESCRIPTION

**RDS** = RADIO DATA SYSTEM. The RDS signal accompanies the program and is an additional information for FM broadcasting stations.  
The most important informations are.

**PI CODE** = program identification. This is an uniform 16 Bit code for all stations broadcasting the same program e. g. all NDR 2 stations.  
Example: Germany FR = D Area coverage: traffic area B = B Program: NDR 2 = 33 => EX Code DB 21

D	B	2	1
1	5	9	13
1	1	0	1
1	0	1	1
0	0	1	0
0	0	0	0
0	0	0	1

Bit  
1....4 country code e. g. "D" for Germany  
"A" for Azstria  
"4" for Switzerland  
5....8 area code e. g. similar to the VF area code  
9....16 program index e. g. "57" for "HR 3"

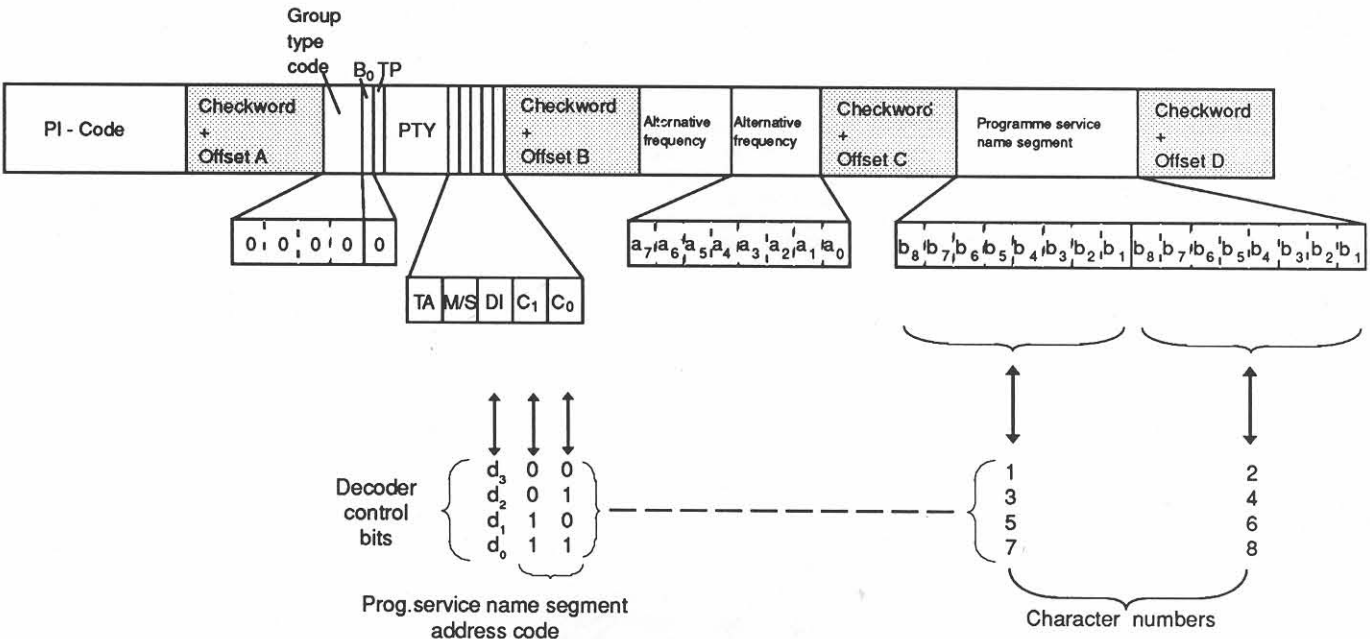
**TP CODE** = traffic program  
= traffic program code. This information indicates whether the adjusted program broadcasts trsfic announcements.  
**TA CODE** = traffic annouement  
= traffic annouement code. Is broadcasted during traffic annouements.

**PS CODE** = program service name. Transmission of the program name into clear code by 8 addressed ASCII signs.

**AF CODE** = alternative frequencies. Each station is broadcasting a number of alternative frequencies which can be used in case of need, e. g. failure of transmitter.

**DATA FRAME:**  
The data are transmitted serially, without start and stop bits. For a later decoding, recognition of errors and correction of errors, a check word of 10 bits is adhered to each data word of 16 bits. This data word of 26 bits is named "block". Four "blocks" are forming one "group". The total information is composed of a file of groups. The combination of the single groups can be tuned to special program aims. Thereby the repetition rates of the sigle informations are different.

**WAY OF MODULATION**  
The digital signal is bi-phase coded and band limited by an exactly defined filter before it AM modulates a supressed 57 kHz carrier. This way of modulation corresponds toa 2 phase PSK modulation with a phase shift of  $\pm 90$  degrees.



**RDS DEMODULATOR:**  
Although the technical resources for the demodulation are considerable higher than e. g. for an VF-decoder, the actual expense of component parts and the waste of alignment is nearly comparable due to a specially developed IC. During the development of the IC 203 (LA 2231) it was considered to bring the alignment time to a minimum. This was succeeded so far, that the real demodulator needs no alignment. A big problem of the RDS demodulation is the low deviation of the actually 1,2 kHz, against the VF deviation of 3,5 kHz and the useful deviation of 20-75 kHz. It is possible that the program of stations which are far away and therefore recieved with a low field strength can be haerd with a satisfying quality, but the RDS signal can, however, disappear in the background noise and it is no more possible to demodulate it. The RDS demodulation is also complicated at the

appearance of disturbances caused by multipath reception (multipath disturbances).  
The RDS signal is taken from the signal path of the modulation. In order to avoid disturbances caused by the useful modulation, they must be separated. This is essebially done by two single circuits which are decoupled by OP2 in IC 202 and are shifted by -600 Hz/+700 Hz to the carrier frequency of 57 kHz. This filtering effect is support by OP1 wired up for an active high-pass. As the RDS signal is a PSK modulation, the total information is included in the phase relationship of the zero passages. IC 203 supplies a demodulated RDS signal, composed of the RDS clock (pin 18) with 1187,5 Hz and the RDS data signal (pin 17). Both signals will be passed to the microcomputer (IC 201) for the further software processing.



T1 5322 130 44647 BC368  
T2 4822 130 42121 2SK30  
T3 4822 130 44196 BC548C  
T6+T8 4822 130 44197 BC558B  
T11 4822 130 40937 BC548B

T12 4822 130 40937 BC548B  
T15 4822 130 44197 BC558B  
T16 4822 130 40937 BC548B  
T17 4822 130 40937 BC548B  
T18 4822 130 60163 2SC1047C

T19 4822 130 60163 2SC1047C  
T21 4822 130 40937 BC548B  
T22 4822 130 41124 BC560B  
T23 4822 130 41096 BC550C  
T24 4822 130 40937 BC548B

T141 4822 130 40902 BF240  
T142 4822 130 40937 BC548B  
T143 4822 130 44197 BC558B  
T144 4822 130 40902 BF240  
T145 4822 130 44197 BC558B

T146 4822 130 40902 BF240  
T147 4822 130 40902 BF240  
T201 4822 130 40937 BC548B  
T202 4822 130 40937 BC548B  
T203 4822 130 44197 BC558B

T204 4822 130 40937 BC548B  
T205 4822 130 44197 BC558B  
T206 4822 130 40937 BC548B  
T207 4822 130 40937 BC548B  
T210 4822 130 40937 BC548B

T301 4822 130 61298 2SK544E  
T302 4822 130 41817 BF982-I  
T303 4822 130 40902 BF240  
T304 4822 130 61298 2SK544E  
T305 4822 130 40902 BF240

T306 5322 130 42626 BF440



R35 4822 116 53666 SAF.RES. 47 OHM 5%  
R66 4822 100 20694 100K LIN.  
R67 4822 100 20694 100K LIN.  
R69 4822 100 20694 100K LIN.  
R102 4822 100 20694 100K LIN.

R141 4822 116 82473 SAF.RES. 33 OHM 5%  
R153 4822 116 82473 SAF.RES. 33 OHM 5%  
R158 4822 116 82473 SAF.RES. 33 OHM 5%  
R163 4822 116 82473 SAF.RES. 33 OHM 5%  
R167 4822 116 82473 SAF.RES. 33 OHM 5%

R172 4822 116 82473 SAF.RES. 33 OHM 5%  
R176 4822 116 82473 SAF.RES. 33 OHM 5%  
R181 4822 116 53666 SAF.RES. 47 OHM 5%  
R182 4822 116 53666 SAF.RES. 47 OHM 5%  
R323 4822 116 53666 SAF.RES. 47 OHM 5%

R327 4822 116 53666 SAF.RES. 47 OHM 5%  
R332 4822 111 30511 SAF.RES. 12 OHM 5%



F1 4822 157 62292 FILTER  
F2+F6 4822 157 62297 FM-IF 10.7MHZ  
F8 4822 242 72289 AM-IF 450KHZ  
F11 4822 157 62302 FILTER 335  
F12 4822 156 11104 19KHZ PILOT FILTER

F13 4822 156 11104 19KHZ PILOT FILTER  
F15 4822 214 51727 LPF

L1 4822 156 11094 MW-RF  
L2 4822 156 11095 LW-RF  
L3 4822 156 11091 LW-OSC.  
L4 4822 156 11089 MW-OSC.  
L5 4822 157 53632 CHOKE 39MH

L6 4822 157 62293 COIL  
L10 4822 157 53628 2.2UH 10%  
L202 4822 157 62309 100UH  
L203 4822 157 62294 7X7  
L204 4822 157 62294 7X7

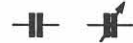
L301 4822 157 62299 3.3UH 10%  
L302 4822 157 62299 3.3UH 10%  
L303 4822 157 62299 3.3UH 10%  
L304 4822 157 62299 3.3UH 10%  
L305 4822 156 11099 FM-RF

L306 4822 156 11096 FM-OSC.  
L307 4822 157 60206 CHOKE  
L308 4822 156 11098 FM-RF  
L309 4822 156 11097 FM-RF  
L311 4822 157 53631 1.5UH 5%

L312 4822 157 53628 COIL 2.2UH  
L601 4822 157 62301 100UH 10%

P301 4822 526 10406 FERRITE CORE  
P302 4822 526 10406 FERRITE CORE

Q1 4822 242 72294 7.2MHZ  
Q2 4822 242 72295 456KHZ  
(STEREO-DEC)  
Q201 4822 242 73603 8MHZ  
Q202 4822 242 73604 456KHZ  
Q601 4822 242 73605 CRYSTAL 640KHZ



C1 4822 125 50332 7.5-50PF LW-RF  
C2 4822 125 50329 4.5-20PF MW-RF  
C12 4822 122 33562 36PF N150 2%  
C13 4822 122 33562 36PF N150 2%  
C22 4822 122 33568 68PF N750 2%

C23 4822 122 33567 4.7PF 0.25PF N750  
C24 4822 122 33564 150PF N150 2%  
C26 4822 122 33572 390PF N1500 2%  
C45 4822 126 10809 100PF N750 2%  
C46 4822 126 10809 100PF N750 2%

C62 4822 122 33569 180PF N750 2%  
C66 4822 122 33569 180PF N750 2%  
C105 4822 126 10808 220PF N750 2%  
C106 4822 126 10811 180PF N750 5%  
C108 4822 126 10809 100PF N750 2%

C122 4822 126 10808 220PF N750 2%  
C123 4822 126 10808 220PF N750 2%  
C305 4822 125 50329 4.5-20PF FM-RF  
C311 4822 125 50386 3-10PF FM-OSC.  
C312 4822 126 10813 1.8PF 0.25PF N150

C316 4822 122 33559 10PF N150 2%  
C322 4822 122 33559 10PF N150 2%  
C325 4822 125 50329 4.5-20PF FM-RF  
C327 4822 125 50329 4.5-20PF FM-RF  
C332 4822 122 33564 150PF N150 2%

C334 4822 122 33557 4.7PF 0.25PF N150



D1 5322 130 34052 1N4151  
D2 5322 130 34052 1N4151  
D3+D6 4822 130 81002 SVC321  
D7+D9 5322 130 34052 1N4151  
D12+D20 5322 130 34052 1N4151

D136 5322 130 34052 1N4151  
D141+D144 4822 130 30971 BA243  
D200 5322 130 34052 1N4151  
D201 5322 130 34052 1N4151  
D202 4822 130 82109 9.1C 0.5W

D203 4822 130 31353 BAT42/43  
D209+D217 5322 130 34052 1N4151  
D218+D221 4822 130 31353 BAT42/43  
D222 4822 130 31438 1N4001  
D223 4822 130 81005 5.1C 0.5W

D224 4822 130 82108 ZPY24  
D225+229 4822 130 31438 1N4001  
D230 4822 130 31353 BAT42/43  
D231 5322 130 34052 1N4151  
D232 5322 130 34052 1N4151

D233 4822 130 31438 1N4001  
D234 5322 130 34052 1N4151  
D300+D302 4822 130 34189 BAV20  
D303+D306 4822 130 80638 BA282  
D307 4822 130 81003 KV1310

D308 4822 130 81003 KV1310  
D309 4822 130 81003 KV1310  
D310 4822 130 34189 BAV20  
D311 4822 130 81003 KV1310  
D601 4822 130 82109 9.1C 0.5W



IC1 4822 209 73435 LC7217  
IC2 4822 209 73434 LA3401  
IC3 4822 209 71785 LA1266  
IC4 5322 130 42221 7812  
IC5 4822 209 61801 TA7061BP

IC201 4822 209 62432 MC68HC11A8  
IC202 4822 209 62435 RC4560  
IC203 4822 209 62433 LA2231 DIP/24S  
IC204 4822 209 80891 MC78M05CT  
IC205 4822 209 71898 M51957A

IC601 4822 209 62434 UPD7537 ACU-221

#### Miscellaneous

LA1 4822 134 40915 LAMP 5V 60MA  
AND CAP

DP6014822 130 90837 DISPLAY

SI201 4822 253 30017 FUSE 500MA/T  
SI202 4822 070 32001 FUSE 200MA/T



# RF + IF PANEL

9

8

7

6

5

4

## solder side

F

E

D

C

B

A

IC 3

1	= 1.0V	2.4V
2	= 2.4V	1.0V
3	= 2.4V	1.0V
4	= 0V	
5	= 10.8V	12V
6	= 12V	
7	= 12V	
8	= 0V	
9	= 3.9V	3.4V
10	= 2.5V	
11	= 2.5V	
12	= 3.2V	
13	=	
14	= 1.5V	
15	= 1.5V	
16	=	
17	= 0V	
18	= 2.5V	1.1V
19	= 1.5V	
20	= 0V	11.3V
21	= 3.9V	3.7V
22	= 3.9V	3.7V
23	= 3.4V	3.7V
24	= 2.8V	2.3V

T 7

E	= 12V
B	= 12V 0V 12V
C	= 12V

T 146

E	= 3V
B	= 3.6V
C	= 9.7V

T 6

E	= 12V
B	= 12V 12V 0V
C	= 12V

T 1

E	= 0V
B	= 0.7V
C	= 0V

T 147

E	= 2.85V	3V
B	= 3.45V	3.6V
C	= 10.6V	10.4V

T 24

E	= 0V
B	= 0.7V MUTE
C	= 0V MUTE

T 15

E	= 11.3V
B	= 10.6V MUTE
C	= 11.2V MUTE

59353-680.00(01)2L

T 144

E	= 3.4V	0V
B	= 4V	0V
C	= 9V	12V

T 302

S	= 0.4V
D	= 11.6V
G2	= 2.5V
G1	=

T 305

E	= 0.65V
B	= 1.2V
C	= 8.6V

T 306

E	= 9.2V
B	= 8.6V
C	= 1.7V

T 303

E	= 5V
B	= 5.6V
C	= 11.3V

T 304

G	=
S	= 0V
D	= 10.3V

T 301

G	=
S	= 0V
D	= 10.3V

T 141

E	= 3V
B	= 3.6V
C	= 10V

T 143

E	= 12V
B	=
C	= 12V 0V

T 145

E	= 12V
B	=
C	= 0V 12V

T 142

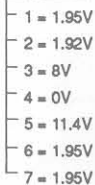
E	= 0V
B	= 0.7V 0V
C	= 0V 12V

T 8

E	= 12V
B	= 0V 12V
C	= 12V 0V

IC 1

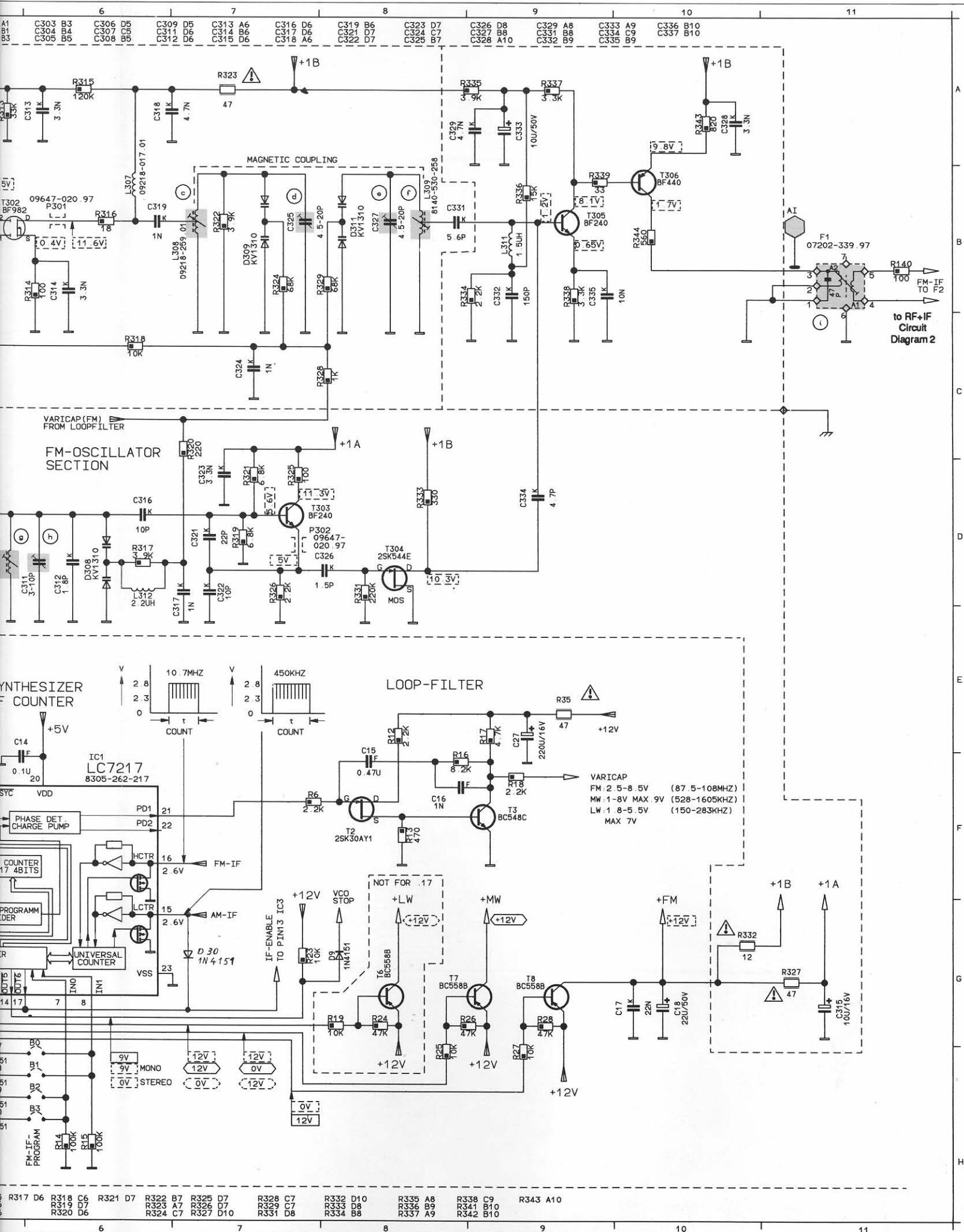
1	= 2.9V
2	= 0V?
3	= 0V?
4	= 0V?
5	= 6V?
6	=
7	= 0V?
8	= 0V?
9	= 0V 12V
10	=
11	=
12	= 12V 0V



2	A1	B1	C337	B7	R097	F5
3	A4	B3	D001	B7	R098	F5
4	5A	A1	D002	E6	R099	C2
5	6A	F5	D003	E6	R100	E2
6	7A	D3	D004	E6	R101	C2
7	8A	F1	D005	D4	R102	D2
8	9A	F1	D006	D4	R103	D2
9	C001	E7	D007	D6	R104	D3
10	C002	E6	D008	B6	R105	C1
11	C005	E7	D009	B6	R106	C1
12	C006	E6	D012	E4	R107	C1
13	C007	E7	D014	E2	R108	C1
14	C008	E6	D015	E2	R109	C1
15	C009	E6	D016	C2	R110	E4
16	C010	E6	D017	A7	R111	C2
17	C011	E6	D018	A7	R112	C2
18	C012	B4	D019	A6	R120	E6
19	C013	A4	D020	A6	R121	E7
20	C014	A4	D021	E1	R122	E1
21	C015	A3	D022	E1	R127	E1
22	C016	A3	D023	E1	R128	E1
23	C017	A7	D024	B2	R130	F6
24	C018	A7	D029	A2	R130	F4
25	C019	D5	D030	F1	R140	B7
26	C022	D4	D032	F1	R142	B7
27	C023	D4	D033	F1	R143	B7
28	C024	D4	D034	F2	R143	B7
29	C025	D5	D040	F1	R144	B6
30	C026	D4	D050	F1	R145	B7
31	C027	A5	D136	D3	R146	B7
32	C028	D3	D137	D3	R147	B7
33	C033	C5	D142	C5	R148	B6
34	C034	C4	D143	D5	R149	B6
35	C035	C4	D144	D5	R151	B6
36	C036	C5	D300	F8	R152	C5
37	C037	B4	D302	E8	R153	C5
38	C038	D6	D303	E7	R155	C5
39	C039	D6	D303	E7	R155	C5
40	C041	D5	D304	E9	R156	B6
41	C042	C5	D305	E8	R157	B6
42	C043	C4	D306	E8	R158	C6
43	C044	B6	D307	D8	R159	C6
44	C045	B6	D308	D8	R160	C6
45	C046	B5	D309	C5	R161	C5
46	C047	C4	D310	F8	R162	C5
47	C048	B4	D311	C8	R163	B6
48	C049	B6	F001	B7	R164	D7
49	C050	D2	F002	B7	R165	D7
50	C051	D2	F003	B7	R166	D7
51	C052	D2	F004	D6	R166	D7
52	C053	D2	F005	D6	R167	D7
53	C054	D3	F006	D5	R168	D7
54	C055	D3	F007	C5	R169	D6
55	C056	D2	F008	C6	R170	D6
56	C057	D2	F009	C6	R171	D6
57	C058	E2	F010	C4	R172	D5
58	C059	D3	F011	C3	R173	D5
59	C062	C3	F012	E5	R174	D5
60	C063	E2	F013	E4	R175	D5
61	C066	C3	F015	D2	R177	C5
62	C068	C3	F016	D2	R178	C5
63	C069	C3	F002	E2	R189	D5
64	C069	C3	F003	C5	R180	C4
65	C070	F4	F004	A2	R181	D4
66	C071	E3	F005	C3	R182	D4
67	C072	E4	F006	A2	R183	C3
68	C073	E4	F007	A2	R184	C3
69	C093	A3	L002	F7	R185	C3
70	C094	A2	L003	D4	R186	C3
71	C096	A1	L004	D4	R187	C3
72	C100	E7	L005	C5	R188	C3
73	C101	L06	D2	R189	C3	
74	C102	L06	D2	R190	C3	
75	C103	F5	L301	F8	R192	B3
76	C104	F2	L302	F9	R193	C2
77	C105	C1	L303	E7	R194	B2
78	C106	D2	L305	D8	R300	F8
79	C107	C2	L305	E8	R301	F8
80	C108	C2	L306	D8	R302	F8
81	C109	C4	L307	D8	R303	F8
82	C110	C2	L308	C8	R304	F8
83	C111	C4	L309	C8	R305	E9
84	C112	C4	L312	A8	R306	F7
85	C113	C4	L331	B8	R307	E9
86	C114	P1	P001	B8	R308	E9
87	C115	C3	Q001	F6	R309	B8
88	C116	C4	R001	F6	R310	F8
89	C117	C3	R002	E6	R311	A7
90	C118	C3	R003	E6	R312	D7
91	C120	C3	R004	E6	R313	D8
92	C121	B2	R005	E6	R314	D7
93	C122	B2	R006	E6	R315	D9
94	C123	B2	R007	B4	R317	A8
95	C125	A1	R008	B4	R318	D7
96	C126	A2	R009	B4	R319	A8
97	C130	F3	R011	B4	R320	A7
98	C132	F1	R012	A4	R321	A7
99	C133	F1	R013	A4	R322	B6
100	C133	F1	R014	A5	R323	D9
101	C134	F1	R015	A5	R324	C8
102	C135	F2	R016	A3	R325	A8
103	C137	C4	R017	A4	R326	A5
104	C138	B7	R018	A4	R327	A7
105	C139	B7	R019	A4	R328	A7
106	C140	B7	R021	D4	R329	C8
107	C141	C5	R022	D5	R331	A9
108	C143	C6	R023	B6	R332	A8
109	C144	C5	R024	E6	R333	A9
110	C145	D7	R025	B5	R334	A9
111	C146	D5	R026	B5	R335	A9
112	C148	D5	R027	B5	R336	A9
113	C149	D5	R028	B6	R337	B8
114	C150	D7	R035	A3	R338	B8
115	C160	D6	R041	D4	R339	B8
116	C300	F8	R042	B3	R341	B8
117	C301	F8	R043	C5	R342	B7
118	C302	F8	R044	C5	R343	B7
119	C303	E9	R055	C3	R344	B7
120	C304	F8	R056	C5	T001	F6
121	C305	F8	R057	C5	T002	A4
122	C306	A7	R058	B5	T003	A4
123	C307	F8	R059	B5	T004	A4
124	C308	D6	R061	E1	T007	B8
125	C309	A7	R062	B5	T008	B6
126	C310	E8	R063	B5	T011	C4
127	C311	A8	R064	C5	T012	D4
128	C312	A8	R065	C5	T015	E4
129	C313	D7	R066	B3	T016	F4
130	C314	D7	R067	B3	T017	C3
131	C316	A8	R068	E2	T018	C3
132	C317	A8	R069	D3	T019	C3
133	C318	D9	R073	C3	T022	C1
134	C319	D9	R074	D2	T023	C1
135	C320	D7	R075	C3	T024	F4
136	C321	A8	R076	C3	T025	E1
137	C322	A9	R078	E3	T114	C5
138	C323	A8	R079	C3	T141	B7
139	C324	C5	R080	F4	T142	B6
140	C325	C5	R081	B2	T143	B6
141	C326	B8	R082	C3	T144	B6
142	C327	B8	R086	C3	T146	D7
143	C328	B8	R087	E2	T147	D5
144	C329	B8	R088	E4	T301	A7
145	C331	C8	R089	E4	T302	D8
146	C332	B9	R090	E4	T303	A8
147	C333	B9	R091	E4	T304	A8
148	C334	B9	R092	C3	T305	B8
149	C335	B8	R094	F5	T306	B8
150	C336	B7	R095	F5		







# RF + IF PANEL

1 2 3 4 5 6

## component side

- IC 2
- 1 = 3.2V
  - 2 = 3.2V
  - 3 = 3.2V
  - 4 = 3.2V
  - 5 = 5.5V
  - 6 = 3.2V
  - 7 = 3.2V
  - 8 = 5.5V
  - 9 = 3.2V
  - 10 = 0V 5.5V
  - 11 = 0V 2.8V
  - 12 = 0V
  - 13 = 0.5V STEREO 5V MONO 5V
  - 14 = 5V 0V
  - 15 = 0V 4V MUTE
  - 16 = 2.8V
  - 17 = 2.7V STEREO 9.4V
  - 18 = 2.9V 5.4V
  - 19 = 2.9V 5.4V
  - 20 = 4V 7.5V
  - 21 = 1.8V MONO
  - 22 = 12V

- T 18
- E = 2.4V
  - B =
  - C = 10.5V

- T 22
- E = 12V
  - B = 11.3V ?
  - C = 12V ?

- T 21
- E = 0V
  - B = 0.7V ?
  - C = 0V ?

- T 23
- E = 0.4V
  - B = 0.9V
  - C = 11.3V ?

- T 19
- E = 2.4V
  - B = 2.7V
  - C = 10.5V

- IC 5
- 1 = 1.95V
  - 2 = 1.92V
  - 3 = 8V
  - 4 = 0V
  - 5 = 11.4V
  - 6 = 1.95V
  - 7 = 1.95V

- T 12
- E = 3.9V 3.7V
  - B = 4.4V
  - C = 3.4V 3.7V

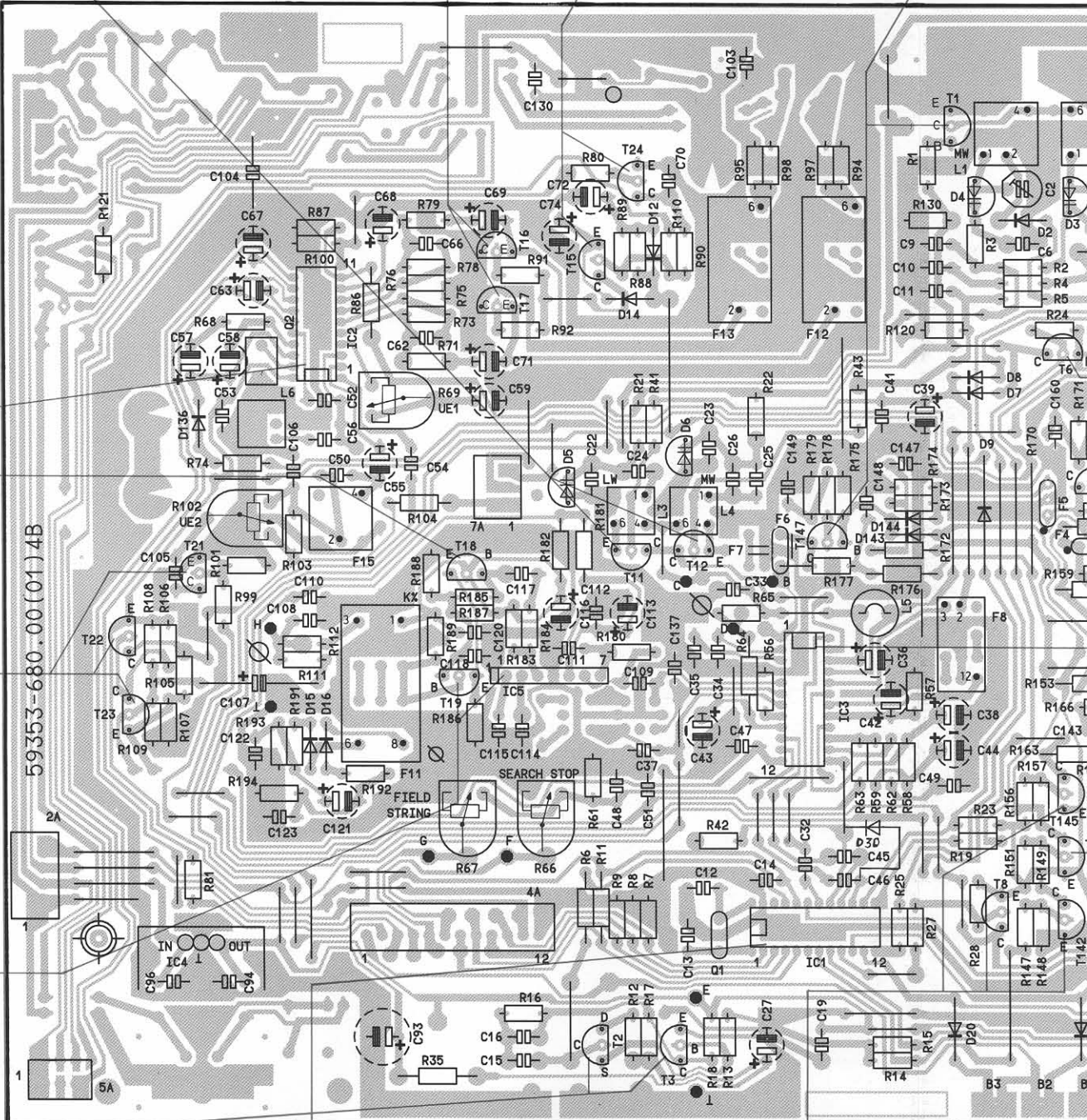
- T 11
- E = 3.9V 3.7V
  - B = 4.4V
  - C = 3.4V 3.7V

- T 16/ T 17
- E = 0V MUTE
  - B = 0.7V MUTE
  - C = 0V

- T 15
- E = 11.3V
  - B = 10.6V MUTE ?
  - C = 11.2V MUTE ?

- T 24
- E = 0V
  - B = 0.7V MUTE
  - C = 0V MUTE

- T 147
- E = 2.85V 3V
  - B = 3.45V 3.6V
  - C = 10.6V 10.4V



- T 2
- S =
  - D = 12V ?
  - G =

- T 3
- E = 0V
  - B =
  - C = 2.5V-8.5V FM

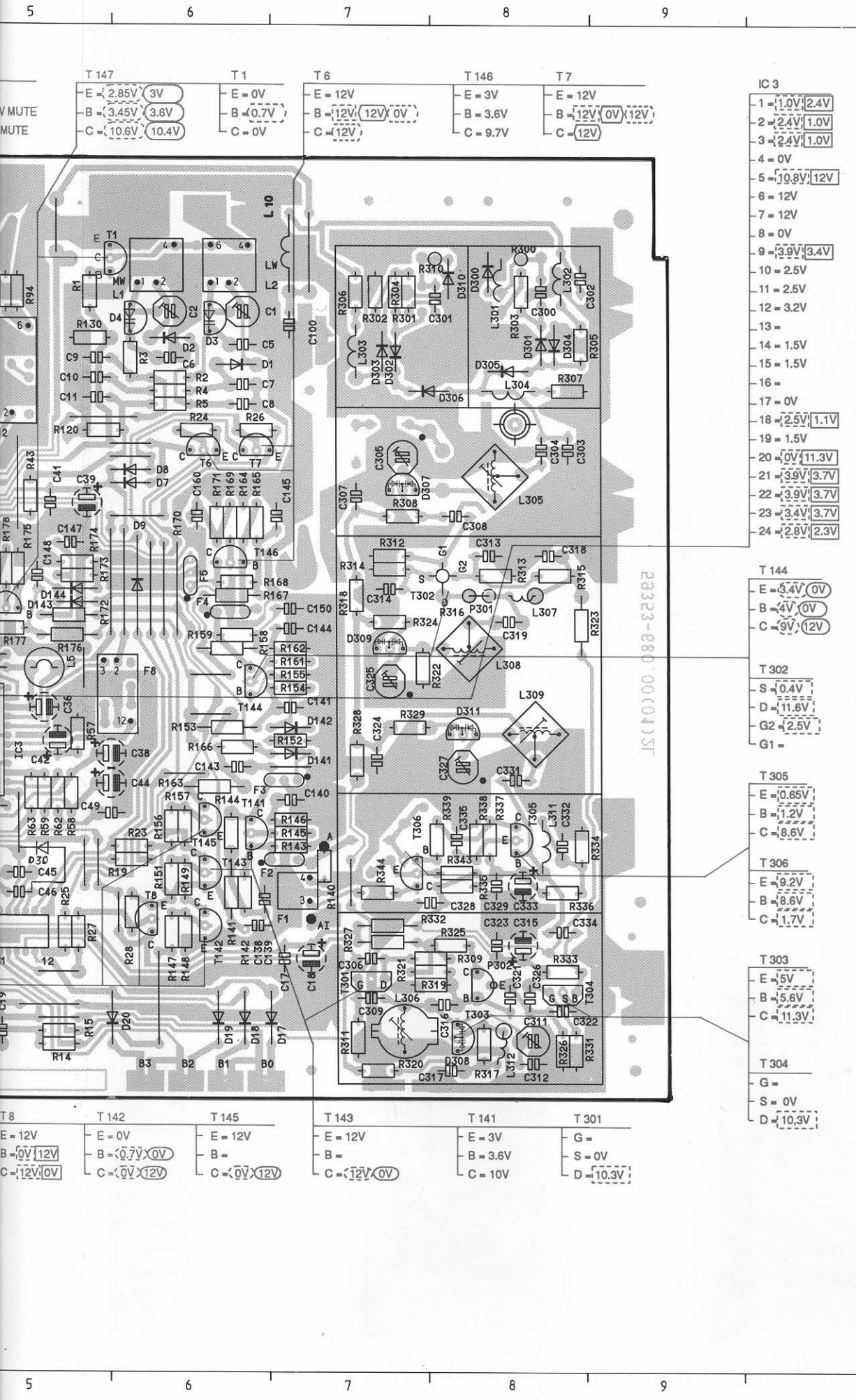
- IC 1
- 1 = 2.9V
  - 2 = 0V ?
  - 3 = 0V ?
  - 4 = 0V ?
  - 5 = 6V ?
  - 6 =
  - 7 = 0V ?
  - 8 = 0V ?
  - 9 = 0V 12V
  - 10 = ?
  - 11 = ?
  - 12 = 12V 0V 12V

- 13 = 12V 12V 0V
- 14 = 9V 9V MONO 0V STEREO
- 15 = 0V
- 16 = 0V
- 17 = 6V ?
- 18 = 0V 13V
- 19 = 3V 10V
- 20 = 6V
- 21 =
- 22 =
- 23 = 0V
- 24 = 2.9V

- T 8
- E = 12V
  - B = 0V 12V
  - C = 12V 0V

- T 142
- E = 0V
  - B = 0.7V 0V
  - C = 0V 12V

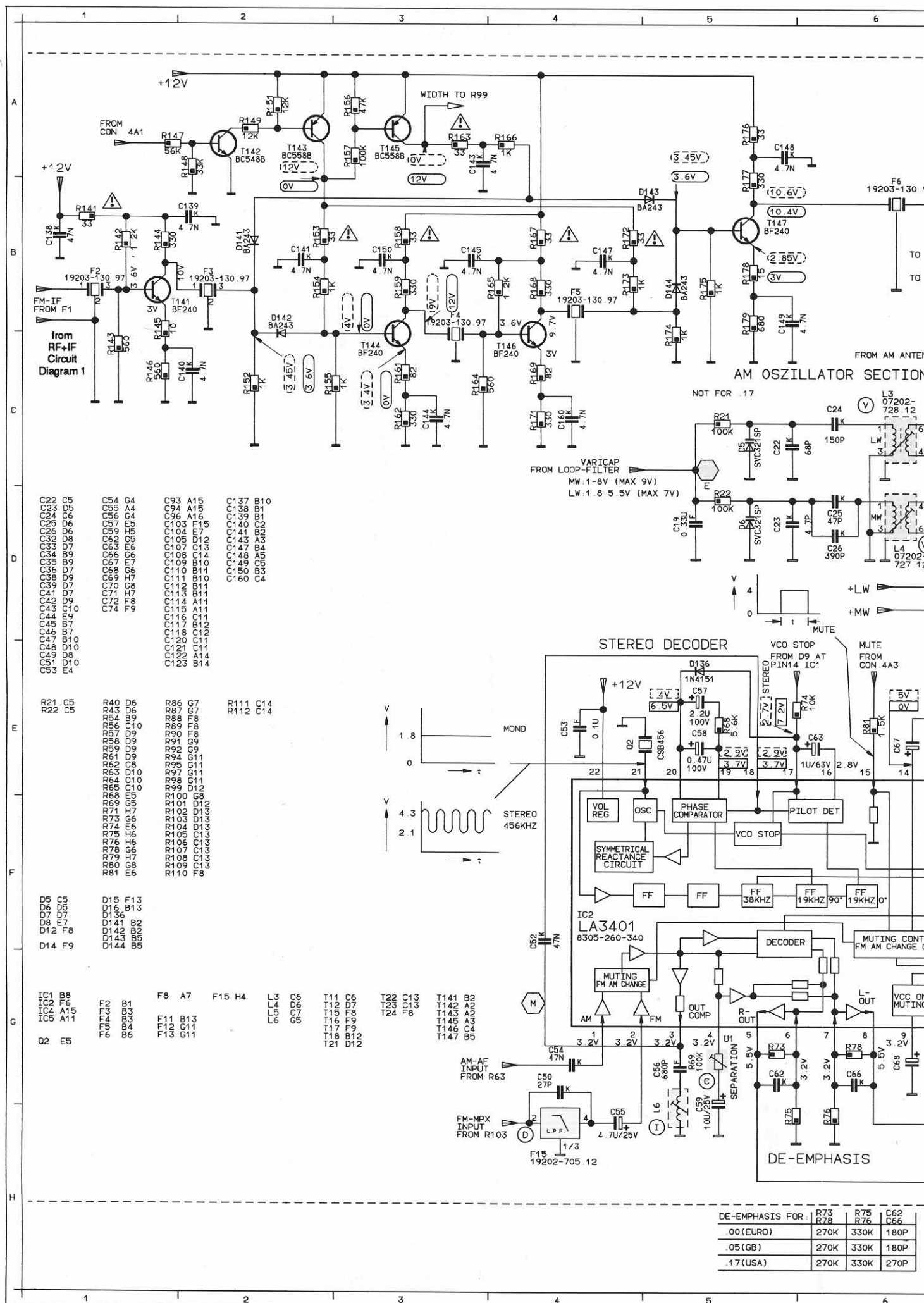
1 2 3 4 5 6



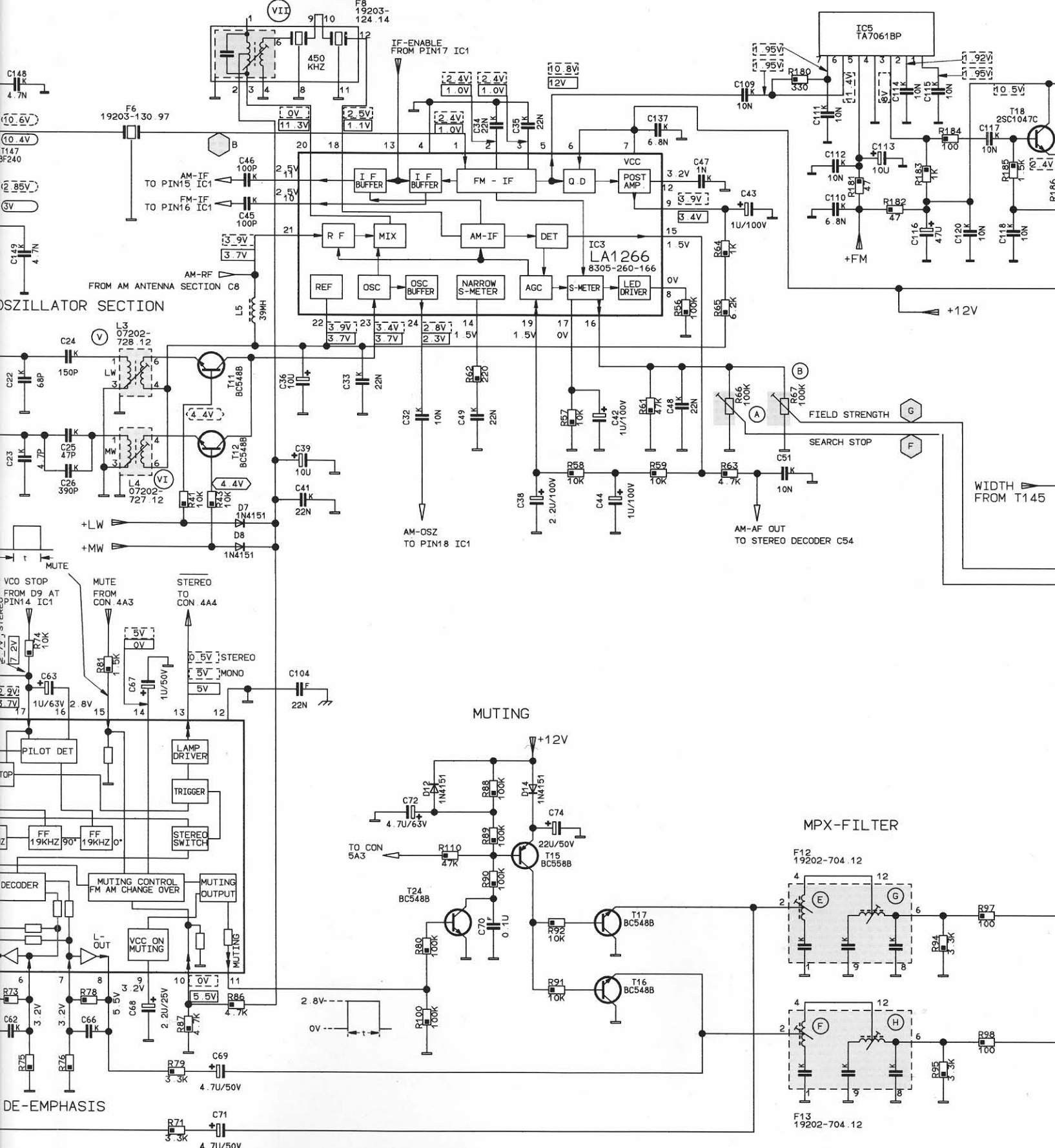
2A	B1	C337	B7	R097	F5
4A	B3	D001	E7	R098	F5
5A	A1	D002	E6	R099	C2
6A	F5	D003	E6	R100	E2
7A	D3	D004	E6	R101	C2
8A	F1	D005	E4	R102	C2
9A	F1	D006	D4	R103	D2
C001	E7	D007	D6	R104	D3
C002	E6	D008	D6	R105	C1
C003	E7	D009	D6	R106	C1
C004	E7	D010	D6	R107	C1
C005	E7	D011	D6	R108	C1
C006	E7	D012	E4	R109	C1
C007	E7	D013	E4	R110	C1
C008	E7	D014	E4	R111	C2
C009	E6	D015	C2	R112	C2
C010	E6	D016	C2	R113	C2
C011	E6	D017	A7	R114	C2
C012	E6	D018	A7	R115	C2
C013	B4	D019	A6	R116	E6
C014	A4	D020	A6	R117	E1
C015	B5	D021	E1	R118	E1
C016	A3	D022	E1	R119	E1
C017	A7	D023	E1	R120	E1
C018	A7	D024	B2	R121	E6
C019	A5	D025	A2	R122	F4
C020	D4	D026	F1	R123	B7
C021	D4	D027	F1	R124	B7
C022	D4	D028	F1	R125	B7
C023	D4	D029	F1	R126	B7
C024	D4	D030	F2	R127	B7
C025	D5	D031	F1	R128	B6
C026	D4	D032	F1	R129	B6
C027	A5	D033	F1	R130	B6
C028	B5	D034	F1	R131	B6
C029	C5	D035	F1	R132	B6
C030	C4	D036	F1	R133	B6
C031	C4	D037	F1	R134	B6
C032	C4	D038	F1	R135	B6
C033	C4	D039	F1	R136	B6
C034	C4	D040	F1	R137	B6
C035	C4	D041	F1	R138	B6
C036	C4	D042	F1	R139	B6
C037	B4	D043	F1	R140	B6
C038	C6	D044	F1	R141	B6
C039	C6	D045	F1	R142	B6
C040	D5	D046	F1	R143	B6
C041	D5	D047	F1	R144	B6
C042	D5	D048	F1	R145	B6
C043	C4	D049	F1	R146	B6
C044	B6	D050	F1	R147	B6
C045	B5	D051	F1	R148	B6
C046	B5	D052	F1	R149	B6
C047	C4	D053	F1	R150	B6
C048	B4	D054	F1	R151	B6
C049	B4	D055	F1	R152	B6
C050	D2	D056	F1	R153	B6
C051	D2	D057	F1	R154	B6
C052	D2	D058	F1	R155	B6
C053	D2	D059	F1	R156	B6
C054	D2	D060	F1	R157	B6
C055	D2	D061	F1	R158	B6
C056	D2	D062	F1	R159	B6
C057	D2	D063	F1	R160	B6
C058	D2	D064	F1	R161	B6
C059	D2	D065	F1	R162	B6
C060	D2	D066	F1	R163	B6
C061	D2	D067	F1	R164	B6
C062	D2	D068	F1	R165	B6
C063	D2	D069	F1	R166	B6
C064	D2	D070	F1	R167	B6
C065	D2	D071	F1	R168	B6
C066	D2	D072	F1	R169	B6
C067	D2	D073	F1	R170	B6
C068	D2	D074	F1	R171	B6
C069	D2	D075	F1	R172	B6
C070	F4	D076	F1	R173	B6
C071	E3	D077	F1	R174	B6
C072	E4	D078	F1	R175	B6
C073	E4	D079	F1	R176	B6
C074	E4	D080	F1	R177	B6
C075	E4	D081	F1	R178	B6
C076	E4	D082	F1	R179	B6
C077	E4	D083	F1	R180	B6
C078	E4	D084	F1	R181	B6
C079	E4	D085	F1	R182	B6
C080	E4	D086	F1	R183	B6
C081	E4	D087	F1	R184	B6
C082	E4	D088	F1	R185	B6
C083	E4	D089	F1	R186	B6
C084	E4	D090	F1	R187	B6
C085	E4	D091	F1	R188	B6
C086	E4	D092	F1	R189	B6
C087	E4	D093	F1	R190	B6
C088	E4	D094	F1	R191	B6
C089	E4	D095	F1	R192	B6
C090	E4	D096	F1	R193	B6
C091	E4	D097	F1	R194	B6
C092	E4	D098	F1	R195	B6
C093	E4	D099	F1	R196	B6
C094	E4	D100	F1	R197	B6
C095	E4	D101	F1	R198	B6
C096	E4	D102	F1	R199	B6
C097	E4	D103	F1	R200	B6
C098	E4	D104	F1	R201	B6
C099	E4	D105	F1	R202	B6
C100	E4	D106	F1	R203	B6
C101	E4	D107	F1	R204	B6
C102	E4	D108	F1	R205	B6
C103	E4	D109	F1	R206	B6
C104	E4	D110	F1	R207	B6
C105	E4	D111	F1	R208	B6
C106	E4	D112	F1	R209	B6
C107	E4	D113	F1	R210	B6
C108	E4	D114	F1	R211	B6
C109	E4	D115	F1	R212	B6
C110	E4	D116	F1	R213	B6
C111	E4	D117	F1	R214	B6
C112	E4	D118	F1	R215	B6
C113	E4	D119	F1	R216	B6
C114	E4	D120	F1	R217	B6
C115	E4	D121	F1	R218	B6
C116	E4	D122	F1	R219	B6
C117	E4	D123	F1	R220	B6
C118	E4	D124	F1	R221	B6
C119	E4	D125	F1	R222	B6
C120	E4	D126	F1	R223	B6
C121	E4	D127	F1	R224	B6
C122	E4	D128	F1	R225	B6
C123	E4	D129	F1	R226	B6
C124	E4	D130	F1	R227	B6
C125	E4	D131	F1	R228	B6
C126	E4	D132	F1	R229	B6
C127	E4	D133	F1	R230	B6
C128	E4	D134	F1	R231	B6
C129	E4	D135	F1	R232	B6
C130	E4	D136	F1	R233	B6
C131	E4	D137	F1	R234	B6
C132	E4	D138	F1	R235	B6
C133	E4	D139	F1	R236	B6
C134	E4	D140	F1	R237	B6
C135	E4	D141	F1	R238	B6
C136	E4	D142	F1	R239	B6
C137	E4	D143	F1	R240	B6
C138	E4	D144	F1	R241	B6
C139	E4	D145	F1	R242	B6
C140	E4	D146	F1	R243	B6
C141	E4	D147	F1	R244	B6
C142	E4	D148	F1	R245	B6
C143	E4	D149	F1	R246	B6
C144	E4	D150	F1	R247	B6
C145	E4	D151	F1	R248	B6
C146	E4	D152	F1	R249	B6
C147	E4	D153	F1	R250	B6
C148	E4	D154	F1	R251	B6
C149	E4	D155	F1	R252	B6
C150	E4	D156	F1	R253	B6
C151	E4	D157	F1	R254	B6
C152	E4	D158	F1	R255	B6
C153	E4	D159	F1	R256	B6
C154	E4	D160	F1	R257	B6
C155	E4	D161	F1	R258	B6
C156	E4	D162	F1	R259	B6
C157	E4	D163	F1	R260	B6
C158	E4	D164	F1	R261	B6
C159	E4	D165	F1	R262	B6
C160	E4	D166	F1	R263	B6
C161	E4	D167	F1	R264	B6
C162	E4	D168	F1	R265	B6
C163	E4	D169	F1	R266	B6
C164	E4	D170	F1	R267	B6
C165	E4	D171	F1	R268	B6
C166	E4	D172	F1	R269	B6
C167	E4	D173	F1	R270	B6
C168	E4	D174	F1	R271	B6
C169	E4	D175	F1	R272	B6
C170	E4	D176	F1	R273	B6



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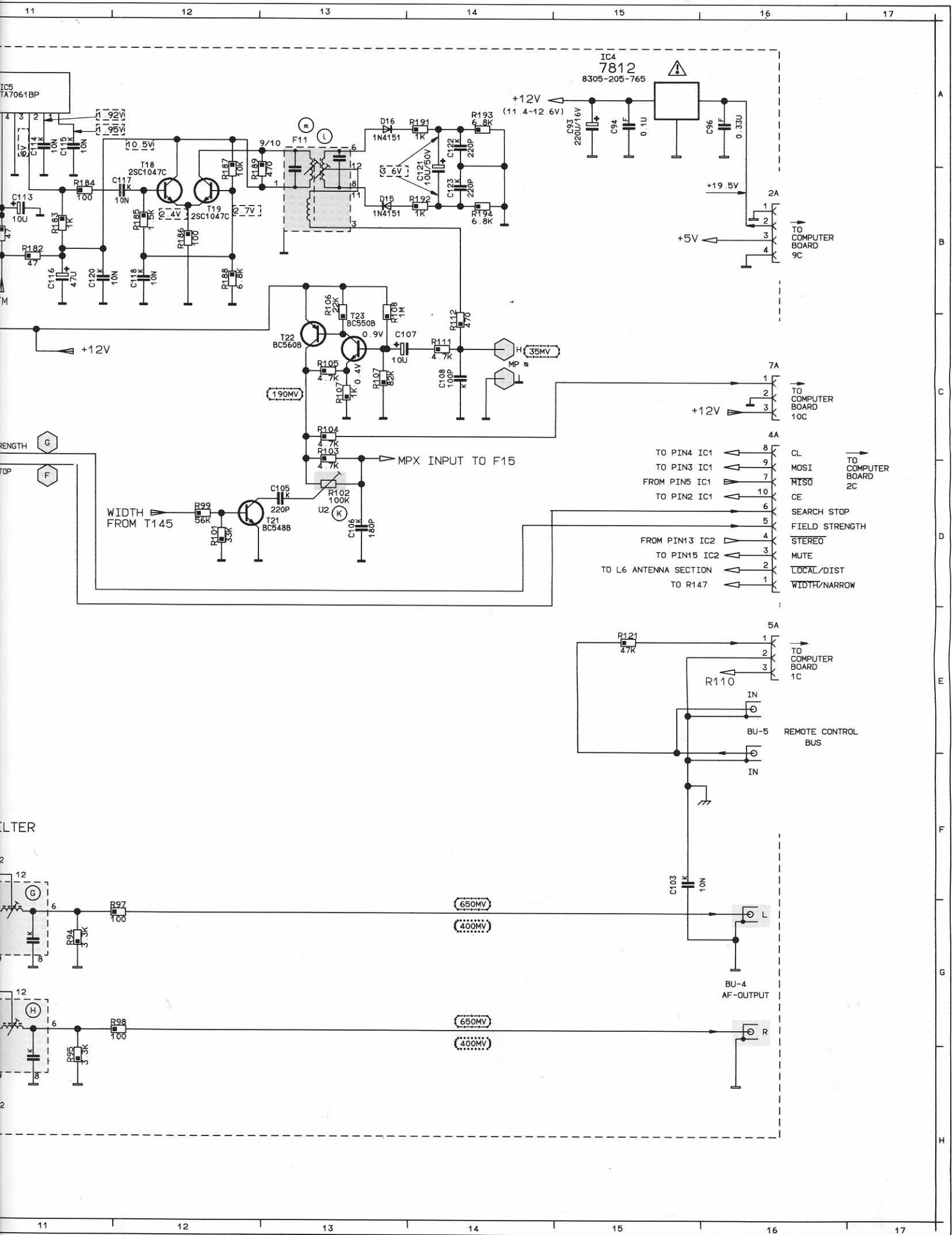


AM-RF/IF AND FM-IF



RESISTOR VALUES

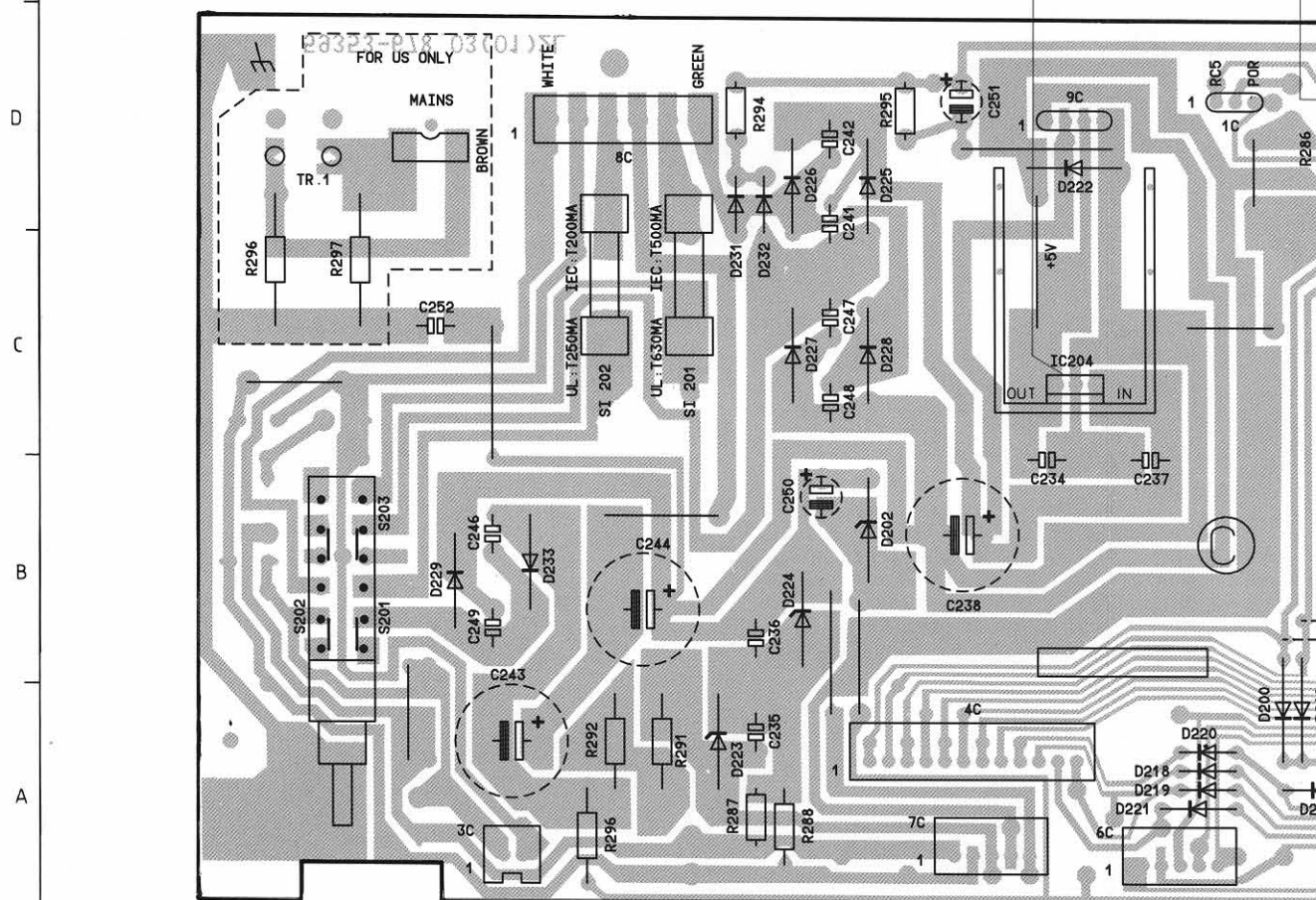
RESISTOR	VALUE	RESISTOR	VALUE	RESISTOR	VALUE
R73	270K	R75	330K	C62	180P
R74	270K	R76	330K	C63	180P
R75	270K	R77	330K	C64	180P
R76	270K	R78	330K	C65	270P



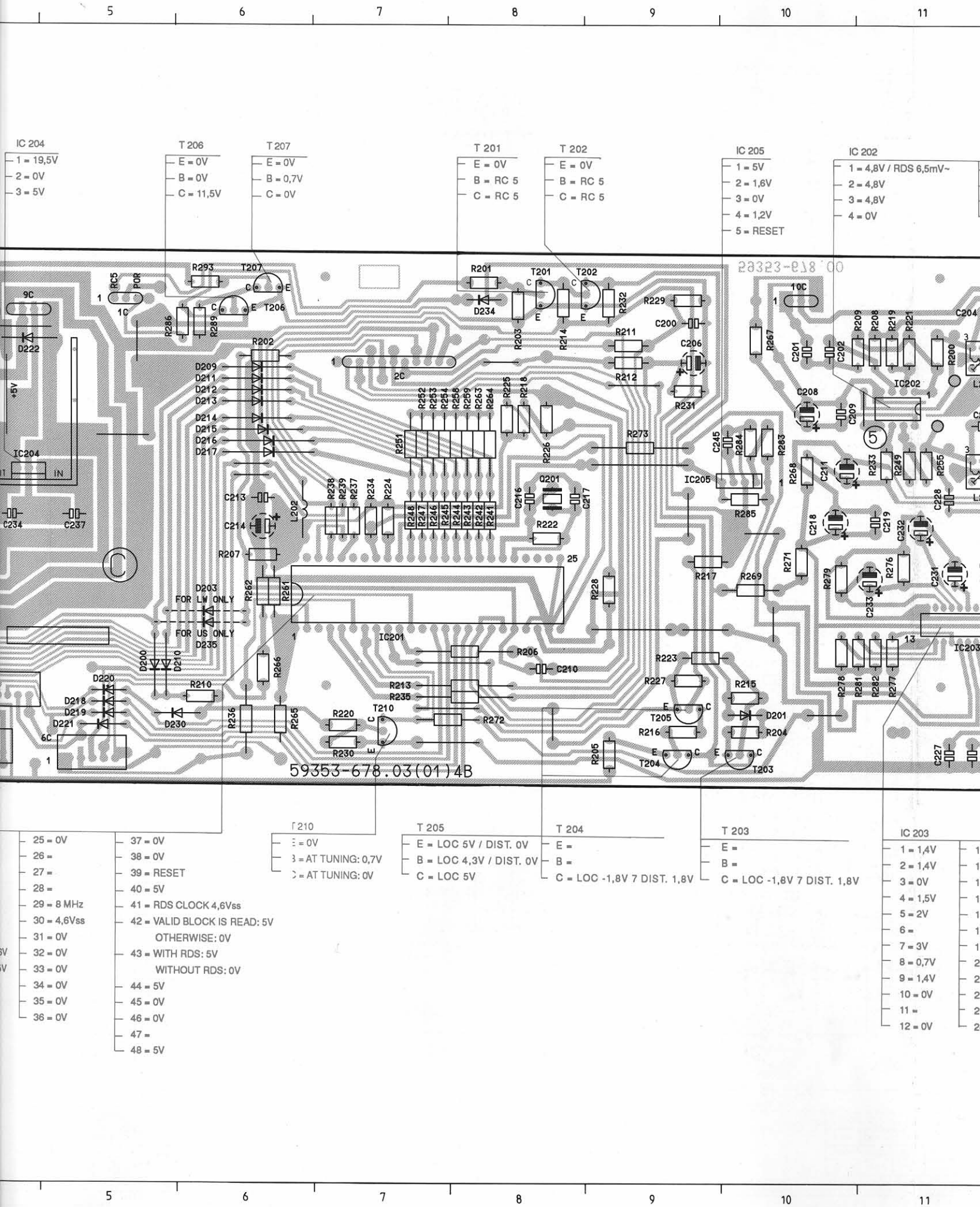
IC 204

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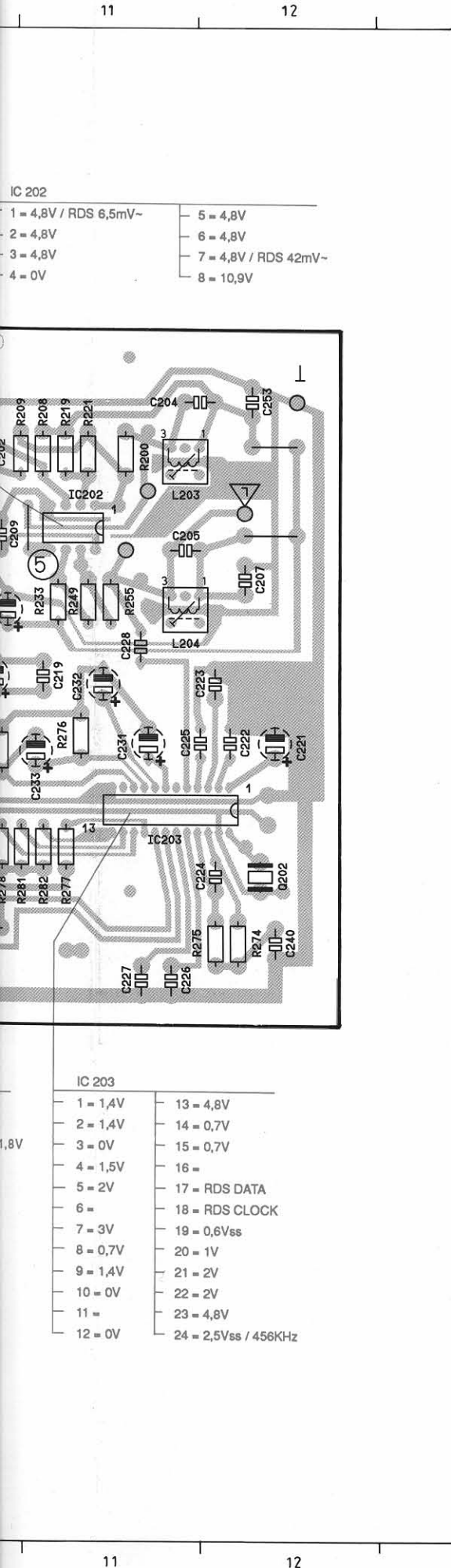
— 1 = 19,5V  
— 2 = 0V  
— 3 = 5V



IC 201			
1 = 0V	13 = 5V	25 = 0V	37 = 0V
2 = 0V	14 = 5V	26 =	38 = 0V
3 = EEPROM WRITNG 5V	15 = 5V	27 =	39 = RE
OTHERWISE 0V	16 = 5V	28 =	40 = 5V
4 = 0V	17 =	29 = 8 MHz	41 = RD
5 = MUTE OF 0V	18 =	30 = 4,6Vss	42 = VAL
MUTE ON 5V	19 =	31 = 0V	OT
6 = 5V	20 = STEREO ON 0,6V	32 = 0V	43 = WIT
7 = RC 5	STEREO OFF 5V	33 = 0V	WI
8 = RDS DATA 4,6Vss	21 = 0V	34 = 0V	44 = 5V
9 = LOC 5V / DIST. 0V	22 = 2V	35 = 0V	45 = 0V
10 = WIDE 0V / NARROW 5V	23 = 0V	36 = 0V	46 = 0V
11 = 0V	24 = 5V		47 =
12 =			48 = 5V

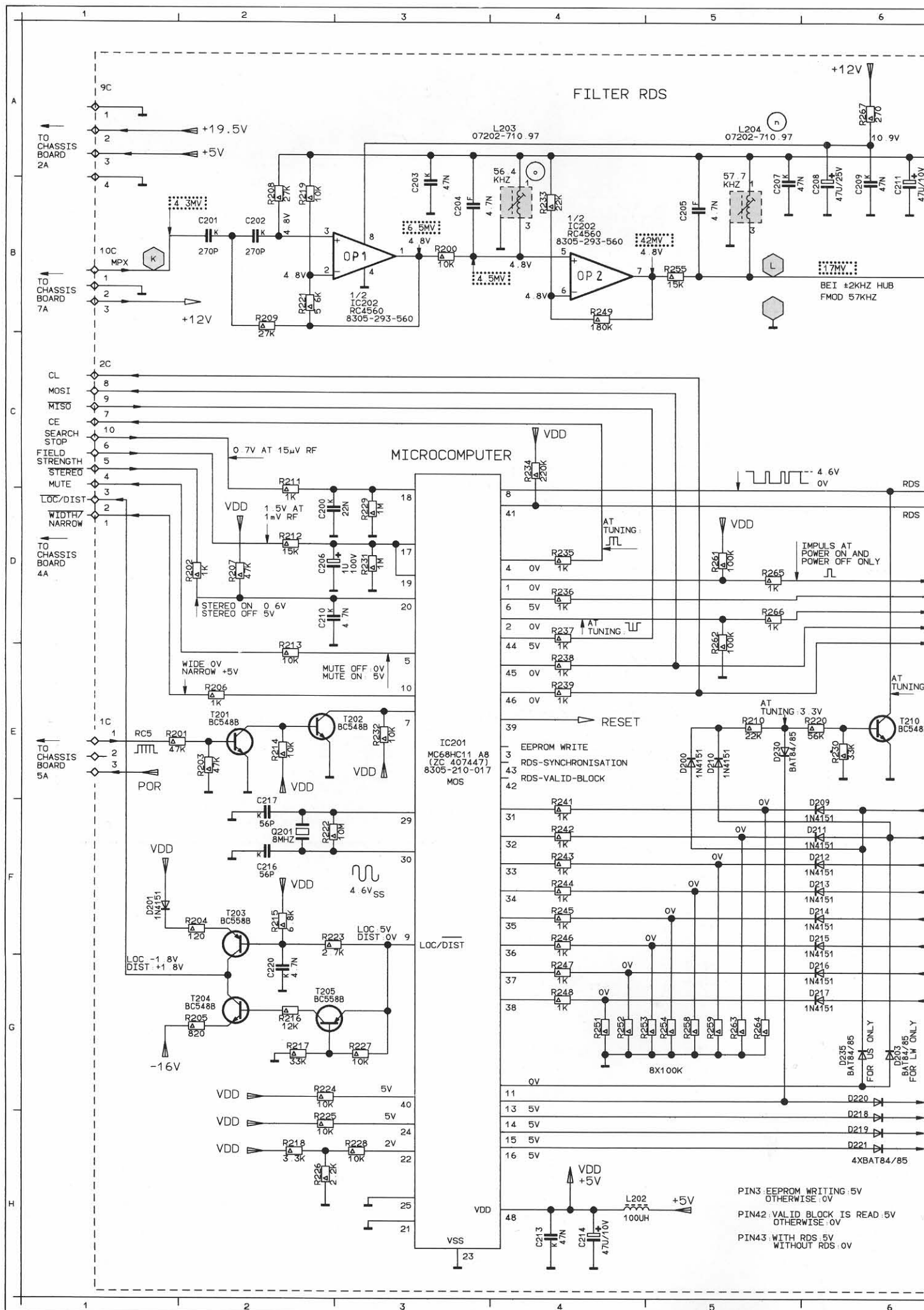


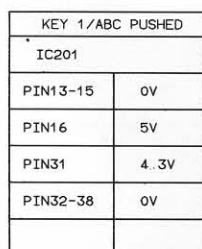
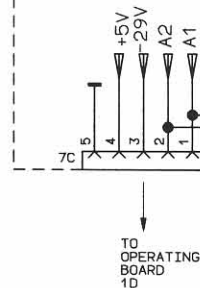
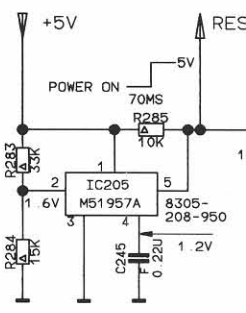
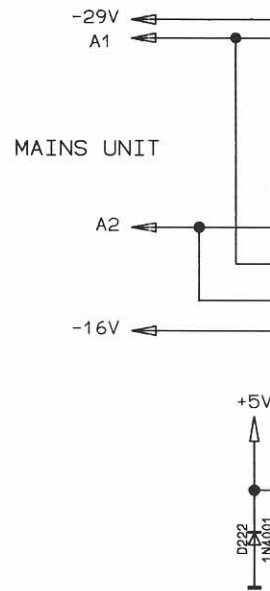






-23-





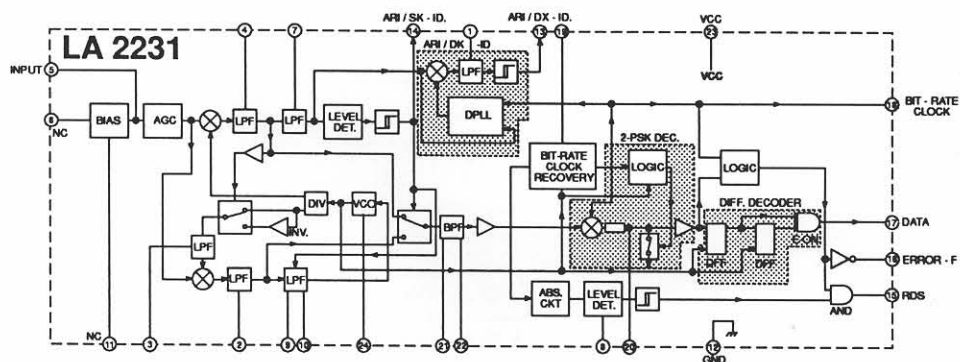
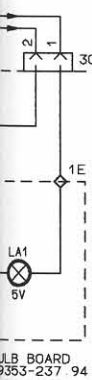
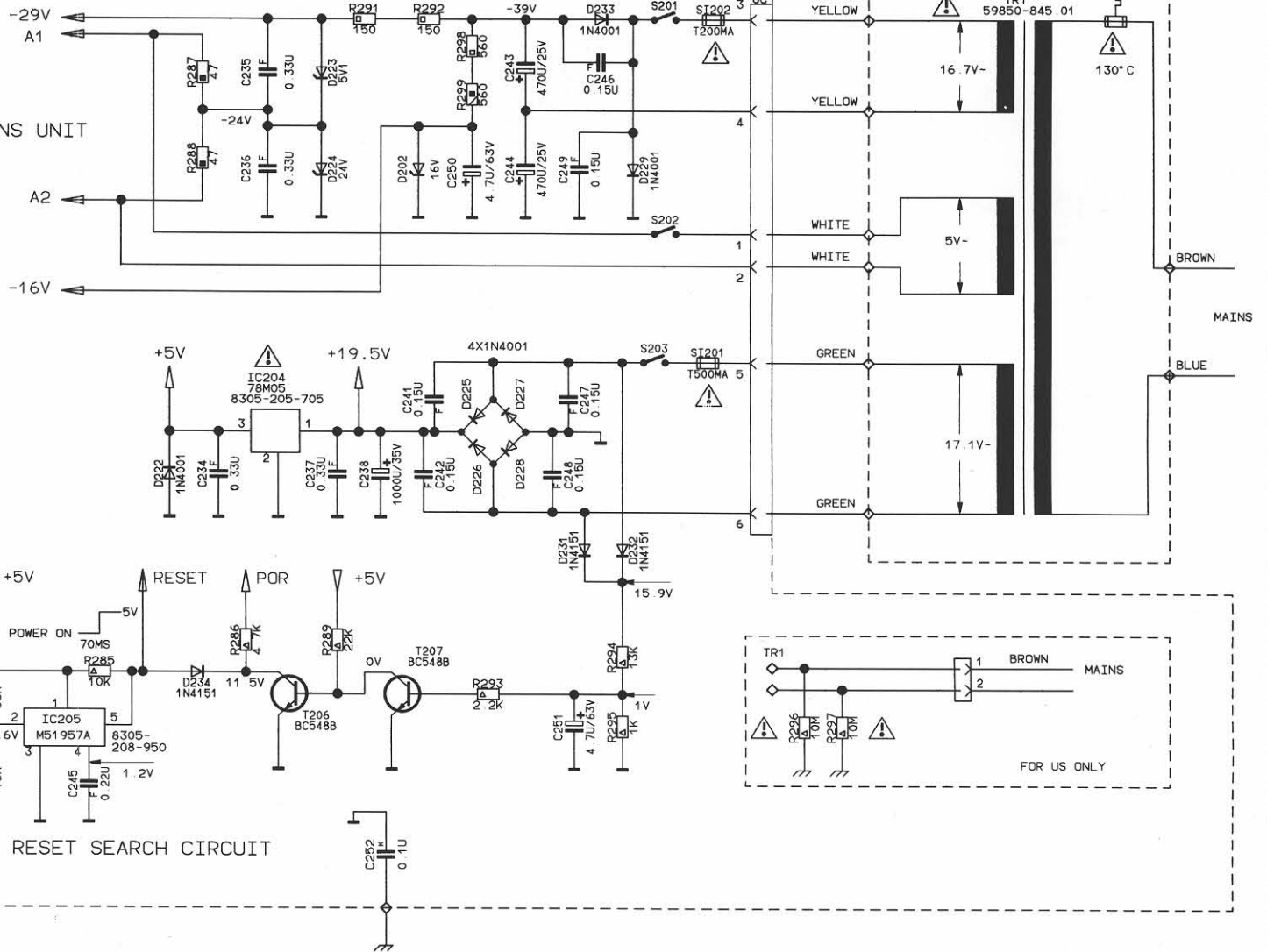
IC201 E3	T201 E3	D201 E3
IC202 B3	T202 F3	D202 F3
IC203 B8	T203 F0	D203 F0
IC204 C12	T204 G2	D204 G2
IC205 D11	T205 G2	D205 G2
	T206 D12	D206 D12
	T207 D13	D207 D13
	T210 E6	D210 E6
LA1 F11		D221 F11
		D222 F11
		D223 F11
L201		D224 F11
L202 H4		D225 H4
L203 A4		D226 A4
L204 B5		D227 B5
	D200 E5	D228 E5
	D201 F2	D229 F2
Q201 F2	D202 B13	D230 B13
Q202 A7	D209 E5	D231 E5
	D211 E5	D232 E5
SI201 C14	D212 F6	
SI202 A14	D213 F6	
	D210 E5	
	D230 E5	

```
PROM WRITING:5V
HERWISE:0V

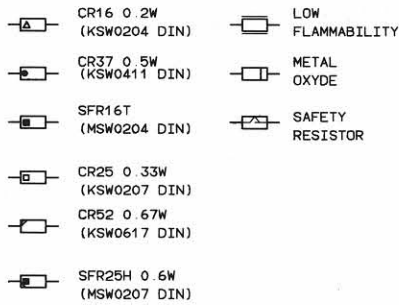
VALID BLOCK IS READ:5V
OTHERWISE:0V

WITH RDS:5V
WITHOUT RDS:0V
```

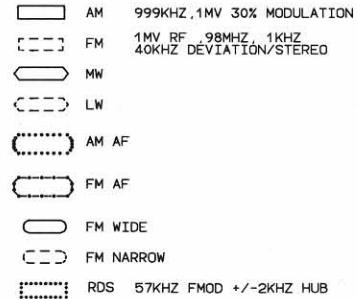
WITH RDS : 5V  
WITHOUT RDS : 0V



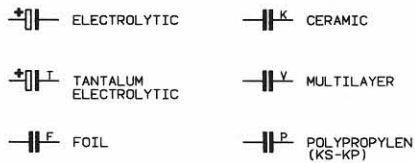
IC201 E3	T201 E3	D214 F5	G200 D3	C223 C7	C246 A14	R200 B3	R225 H2	R252 G4	R278 A9
IC202 B3	T202 E5	D215 F5	G201 B3	C224 C7	C247 A14	R201 B3	R226 H2	R253 G5	R279 C9
IC203 B8	T203 F2	D216 F5	G202 B2	C225 B8	C248 C14	R202 D3	R227 H3	R254 G6	R280 A9
IC204 C12	T204 G2	D217 F5	G203 B3	C226 A8	C249 B14	R203 E5	R228 H3	R255 B5	R282 A10
IC205 D11	T205 G2	D218 G6	G204 B3	C227 A8	C250 B14	R204 F2	R229 D3	R256 G5	R283 D11
	T206 D12	D219 G6	G205 B5	C228 B8	C251 D14	R205 B3	R230 B3	R257 G6	R284 D11
	T207 D13	D220 G6	G206 D2		C252 F13	R206 B3	R231 G3	R258 G6	R285 D12
	T210 E6	D221 G6	G207 B5			R207 D12	R232 E3	R259 D5	R286 D15
LA1 F11		D222 C12	G208 B6	C231 C8		R208 B3	R233 B4	R262 G5	R287 A12
		D223 C13	G209 B6	C232 C8		R209 B3	R234 D4	R263 G5	R288 B12
		D224 B13	G210 D3	C233 C8		R210 B3	R235 D4	R264 G5	R289 A13
		D225 C13	G211 B6	C234 C12		R211 D12	R236 D4	R265 D5	R290 A13
		D226 C13	G212 A8	C235 A12		R212 D12	R237 D4	R266 D5	R291 A13
L201 H4		D227 C14	G213 A4	C236 B12		R213 D12	R238 E4	R267 A6	R292 A13
L202 A4		D228 C14	G214 A4	C237 B12		R214 D12	R239 A6	R268 A6	R293 A13
L204 B5		D229 B14	G215 A4	C238 C13		R215 F12	R240 E4	R269 A7	R294 A13
	D200 E5	D230 F2	G216 F2	C240 A8		R216 G3	R241 F4	R270 A7	R295 D14
	D201 F2	D231 D12	G217 F2	C241 B3		R217 G3	R242 F4	R271 A7	R296 D15
Q201 F2	D202 B13	D232 D12	G218 B3	C242 C13		R218 G3	R243 F4	R272 C7	R297 D15
Q202 A7	D209 E5	D233 D12	G219 B6	C243 A14		R219 B3	R244 F4	R273 C7	R298 A13
	D211 F5	D234 D12	G220 G2	C244 A14		R220 E6	R245 F4	R274 F4	R299 A13
SI201 C14	D212 F5	D235 G6	G221 C7	C245 E12		R221 B3	R246 G4	R275 A8	
SI202 A14	D213 F5		G222 C7			R222 B3	R247 G4	R276 C9	
	D210 E5					R223 G3	R248 G4	R277 A9	
	D230 E5					R224 G2	R249 G4		



VOLTAGES ARE MEASURED WITH 220V  
DC-VOLTAGES ARE MEASURED AGAINST GROUND



# CAPACITOR



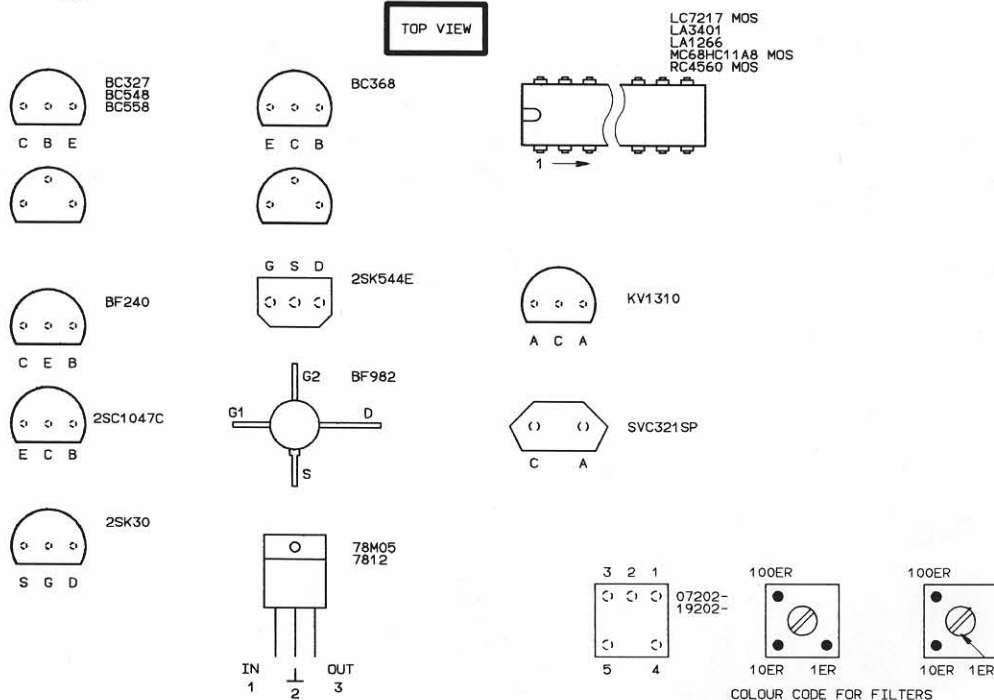
ATTENTION!  
OBSERVE MOS COMPONENTS HANDLING  
INSTRUCTIONS WHEN SERVICING!

▲ ABSOLUTELY NECESSARY FOR THE SAFETY OF THE SET, THESE COMPONENTS  
MEET THE SAFETY REQUIREMENTS ACCORDING TO VDE OR IEC, RESP.  
AND MUST BE REPLACED BY PARTS OF SAME SPECIFICATION ONLY

⬡ MEASUREMENT POINT

○ ALIGNMENT POINT

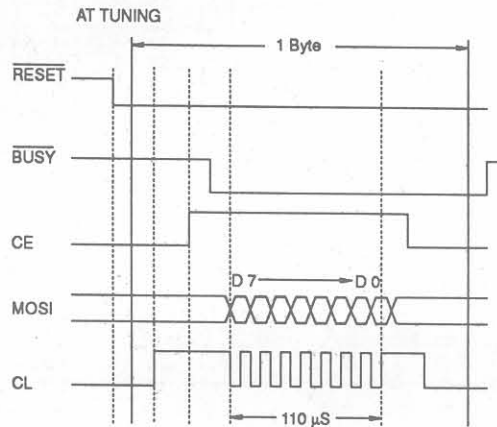
## TOP VIEW



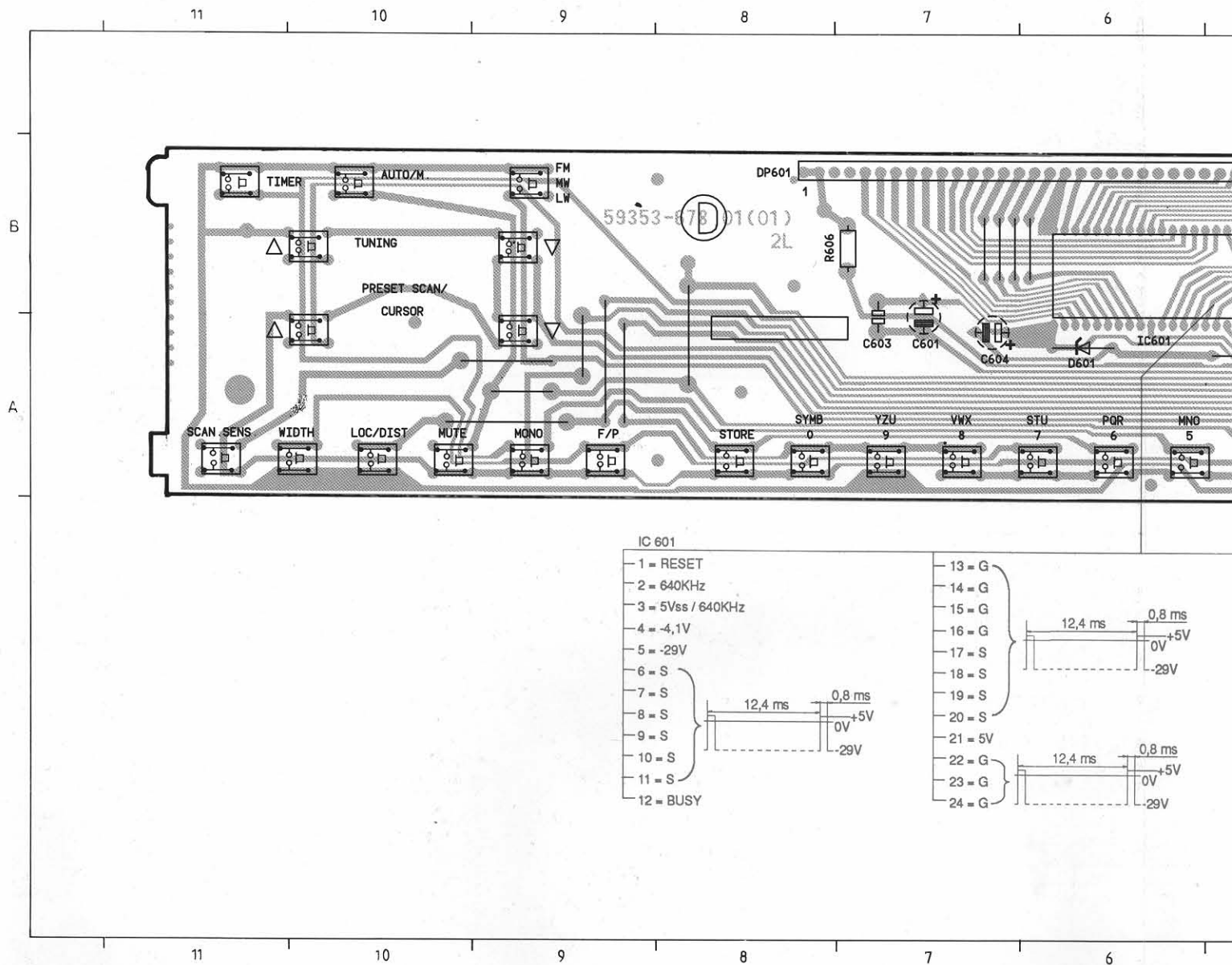
OPERATI

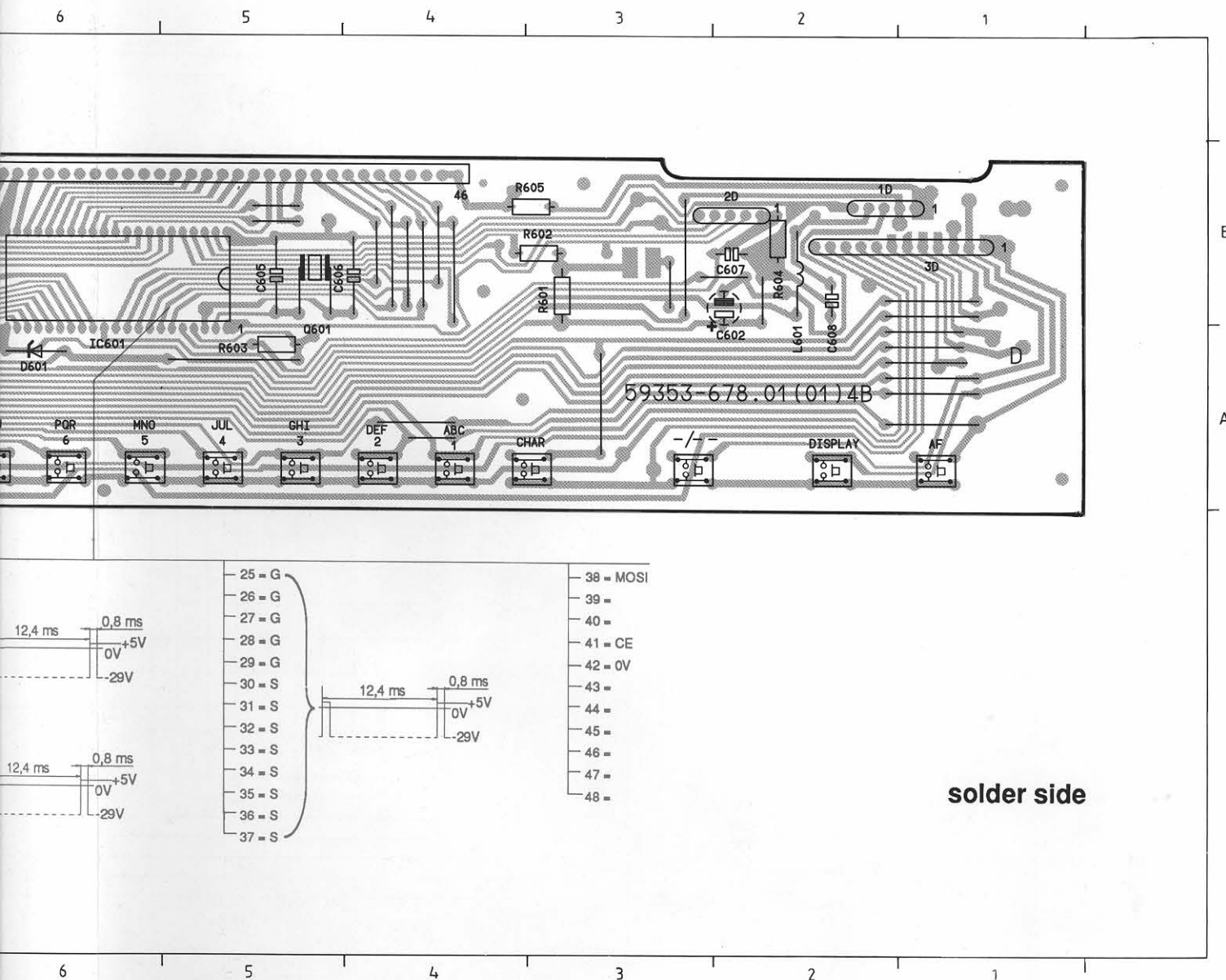
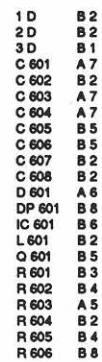
B

A

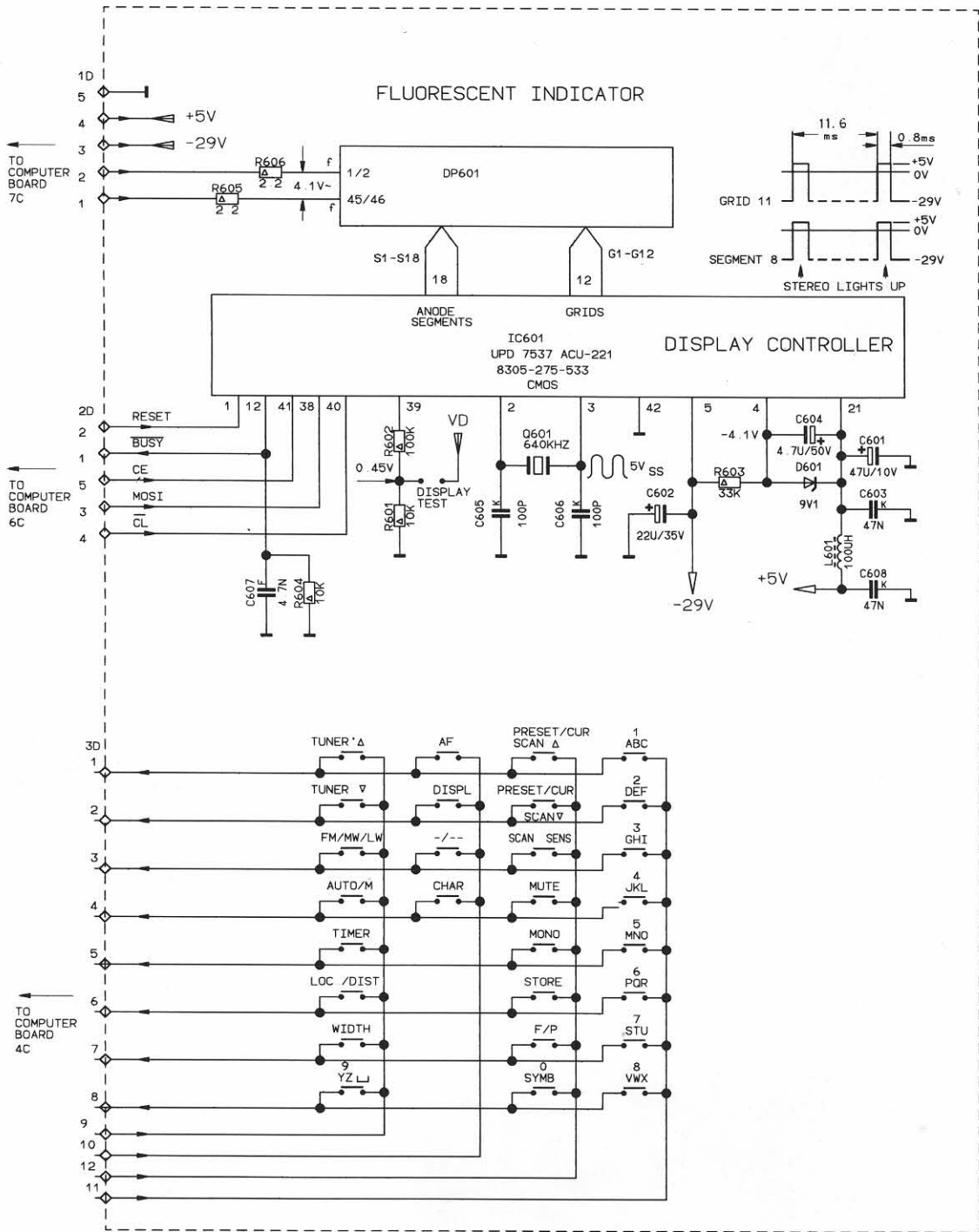


## OPERATING PANEL



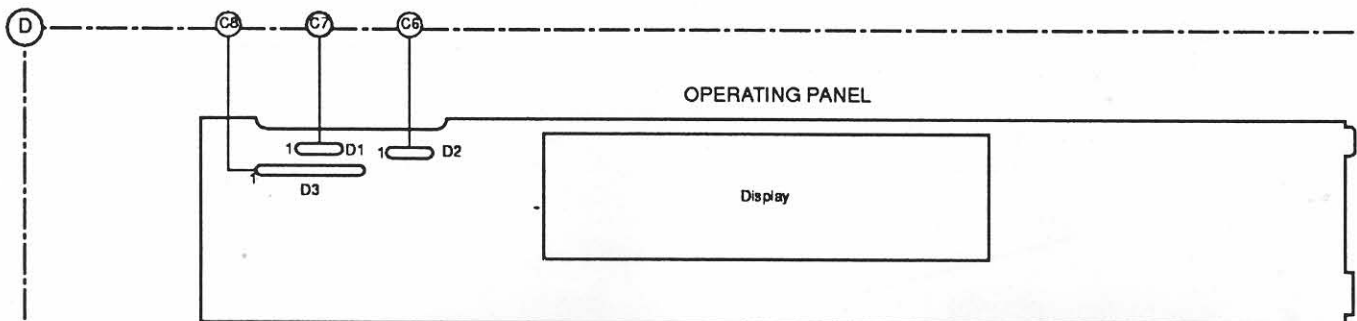
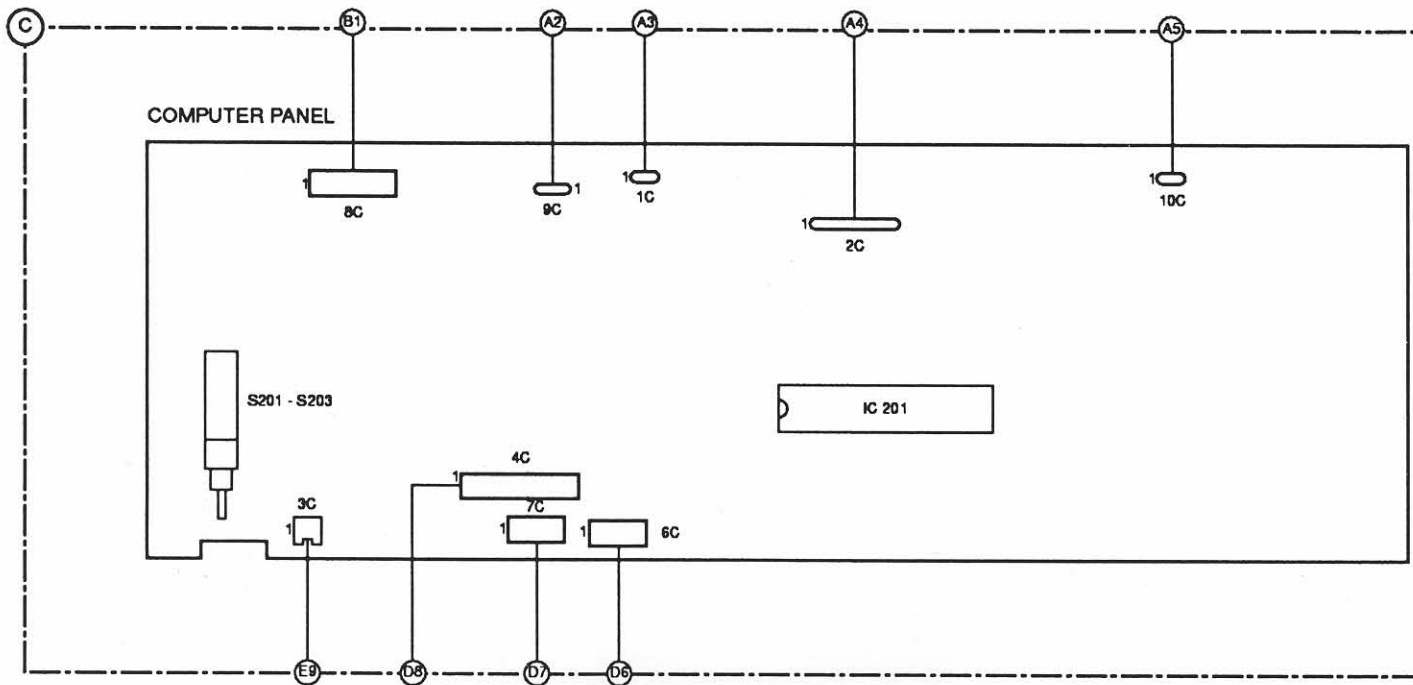
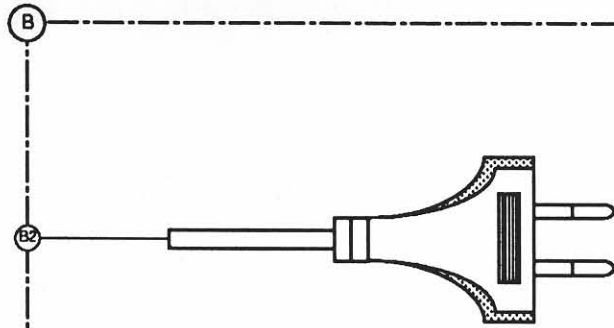
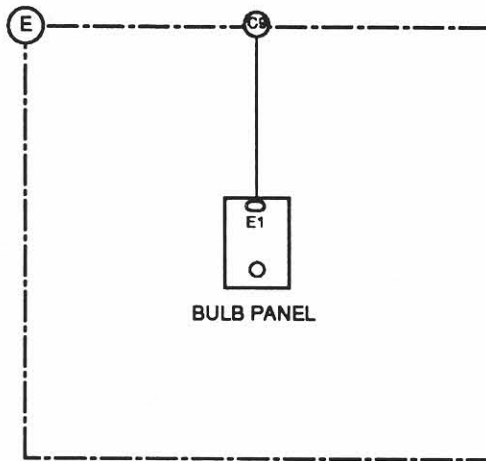


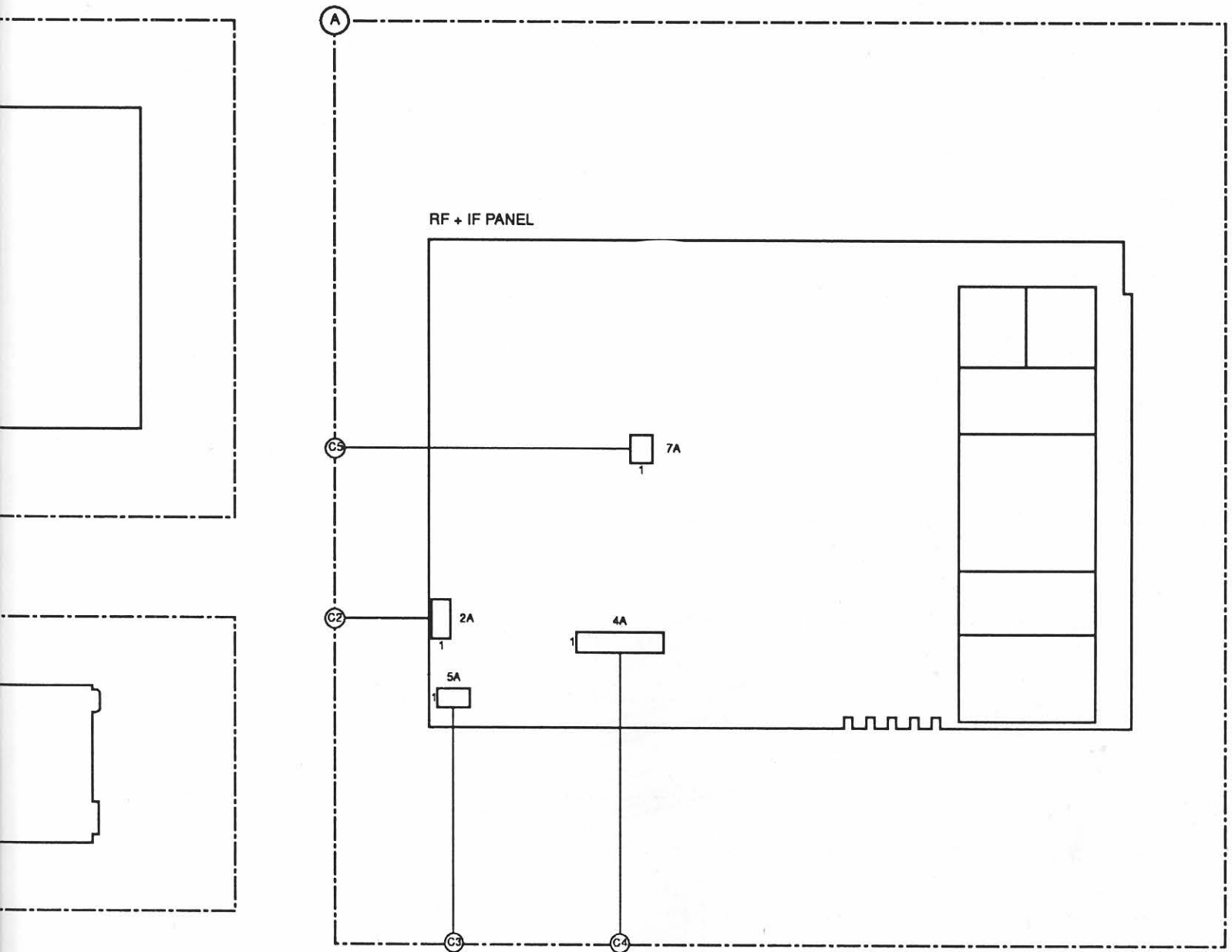
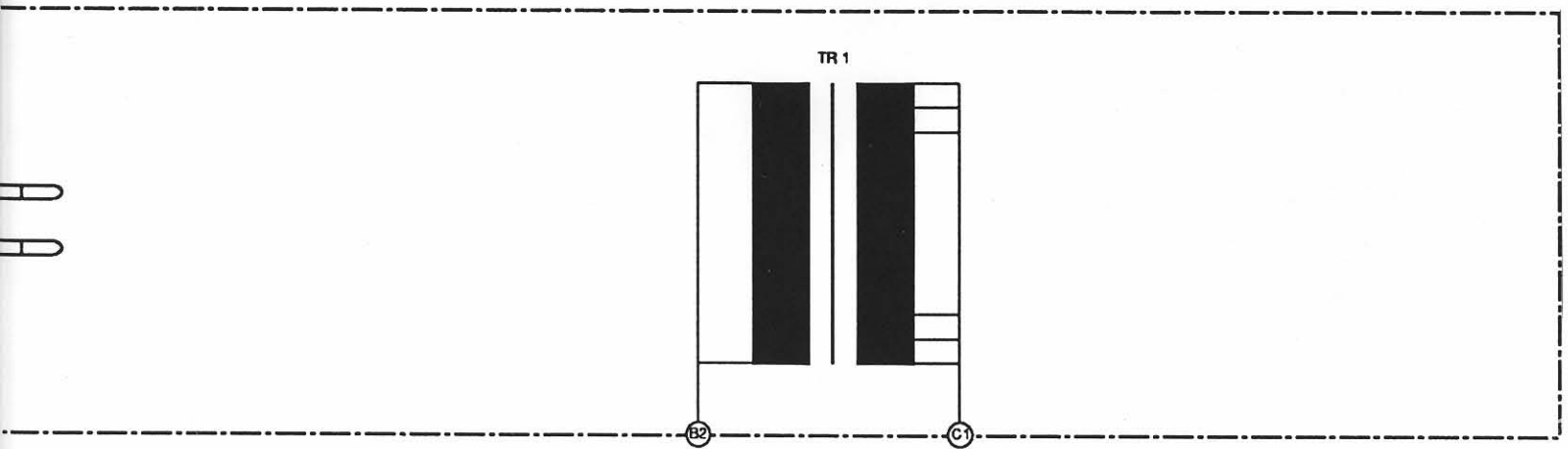




- |          |         |         |
|----------|---------|---------|
| DP601 B3 | R601 D3 | C601 D5 |
| IC601 C3 | R602 C3 | C602 D4 |
|          | R603 D4 | C603 D5 |
|          | R604 D2 | C604 C5 |
| Q601 C3  | R605 B2 | C605 D3 |
| D601 D4  | R606 B2 | C606 D3 |
| L601 D5  |         | C607 D3 |
|          |         | C608 D5 |

# WIRING DIAGRAM





## LIST OF MECHANICAL PARTS

401	4822 404 21103
402	4822 492 51723
403	4822 410 60658
404	4822 459 10803
406	4822 426 51412

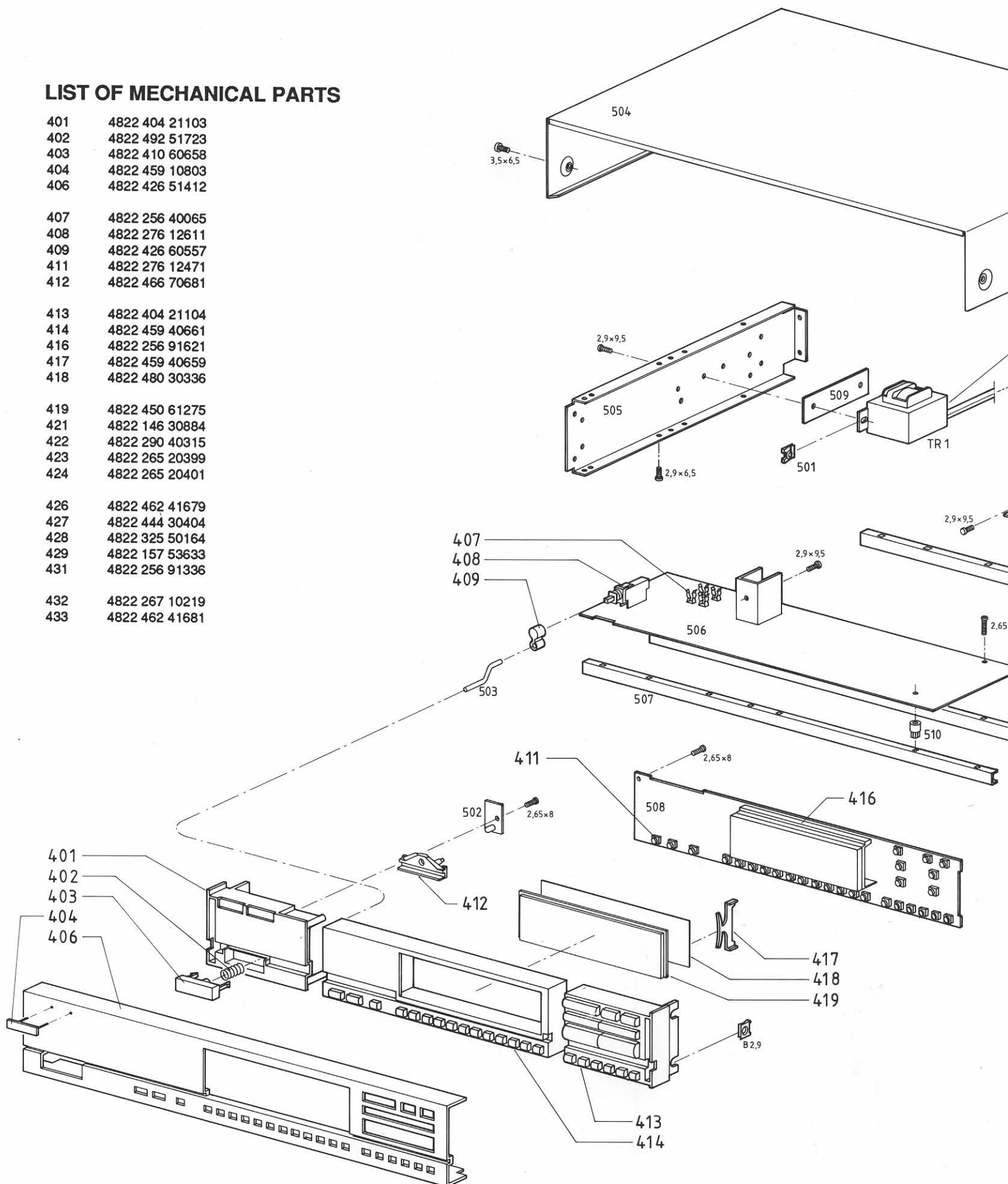
407	4822 256 40065
408	4822 276 12611
409	4822 426 60557
411	4822 276 12471
412	4822 466 70681

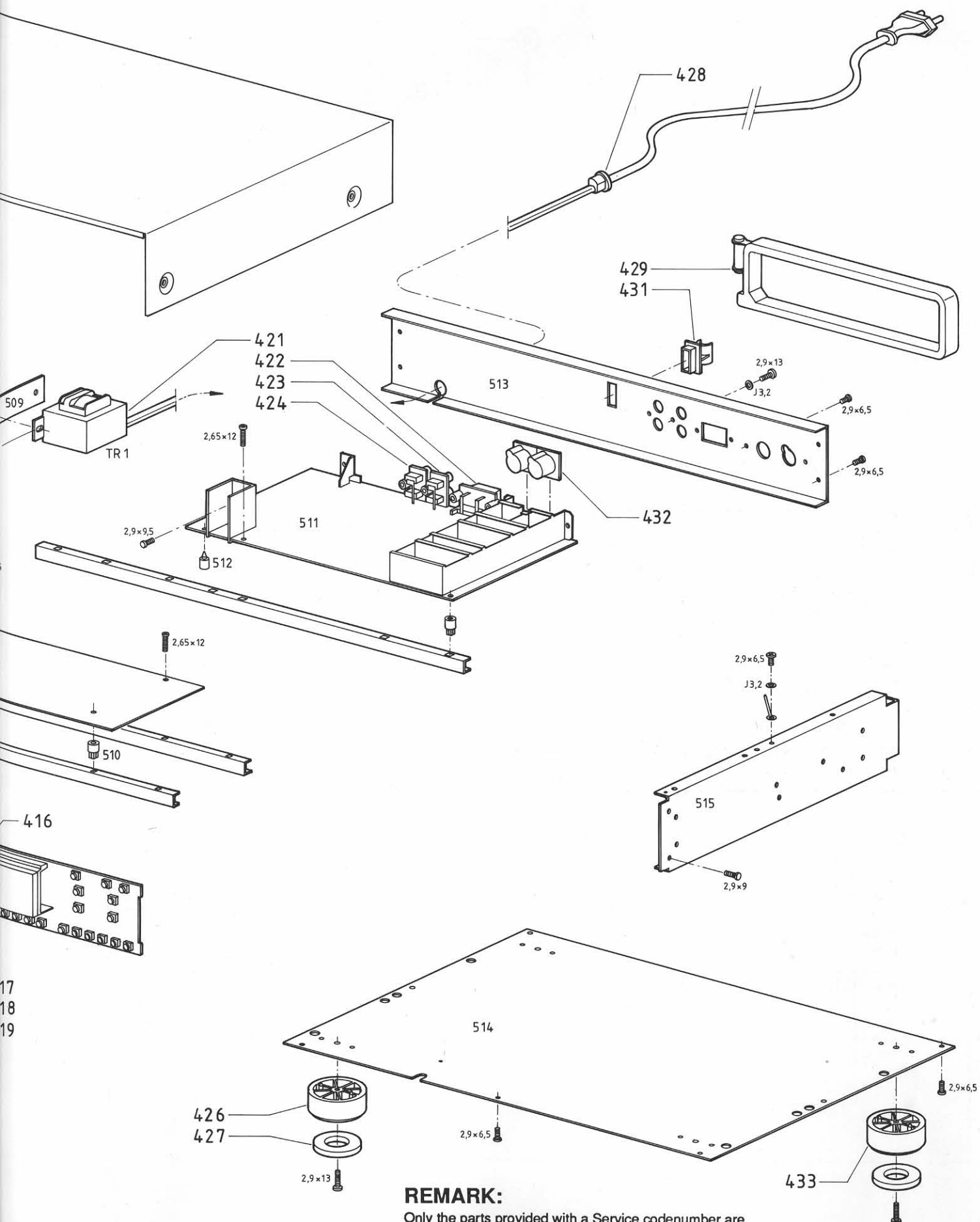
413	4822 404 21104
414	4822 459 40661
416	4822 256 91621
417	4822 459 40659
418	4822 480 30336

419	4822 450 61275
421	4822 146 30884
422	4822 290 40315
423	4822 265 20399
424	4822 265 20401

426	4822 462 41679
427	4822 444 30404
428	4822 325 50164
429	4822 157 53633
431	4822 256 91336

432	4822 267 10219
433	4822 462 41681





**REMARK:**

Only the parts provided with a Service codenumber are available as Service spare parts.