10. List of abbrevlations

A1 POWER SUPPLY

DEGAUSS	=	Degaussing
EARTH	=	Earth (ground)
CURR.SENZE	=	Current senze to detect current
OVP	=	over voltage protection
FOLDB	=	foldback
GND_VO	=	Ground to the deflection
NC	=	not connected
VDS	=	140 Volt (95 Volt for 21")

A2 HORIZONTAL

VOD	=	140 Volt (95 Volt for 21")
VDRIVE	=	Vertical drive
VDRIVE+/VD	=	Vertical drive positive side/?
VPROT	=	Protection voltage
VFRAME (+ or -)	=	positive or negative supply voltage for frame amplifier
GND_LINE_SS	=	Ground from SS-panel for line drive
VLOT	=	Voltage from line output transformer
LINEDEFL_LIN	=	Connection for geometry correction panels
LINEDEFL_CS	=	Connection for geometry correction panels

A3 VERTICAL

CRT	=	Cathode ray tube
FRAMEDEFL_R	=	Frame deflection right signal

A4 AUDIO AMPLIFIER

P_GND	=	Audio power ground
L_AFU	=	Left audio signal from AFU module
LR_EXT	=	Surround sound audio signal for reproducing via external surround loudspeakers
R_AFU	=	Right audio signal from AFU module
AUDIO_L	=	Left to DBE module
AUDIO_R	=	Right to DBE module
R_DBE	=	Right from DBE module
S_AFU	=	Surround signal to module
C_AFU	=	Centre signal to module
n.c.	=	not connected
GND_AUDIO	=	Ground
SOUND_SUP	=	Supply voltage of amplifier
GND_SOUND_SUPPLY	=	Ground to the audio amplifier

B1 TUNER + IF (BIMOS_IC)

NTSCM/BG	=	Switching signal
VIDEO_COR_FIL	=	Video correction filter
CVBS_TERR/SAT	=	CVBS Signal from antenna or from sateflite
CVBS_TERR	=	CVBS Signal from antenna
AGC	=	Tuner take over point
SCL	=	IIC clock
SDA	=	IIC data
VT	=	Tuning voltage
IF	=	Intermediair frequency

B2 VIDEO PROCESSING (BIMOS_IC)

FRONT_INPUT	=	Input from seperate controls at front side television
Y_COMB	=	Y (or CVBS) signal to TDA8366
SYNC_TXT	=	Synchronisation signal from Teletext
SVHS_Y_IN	=	Super VHS luminance signal incoming
YBIMOS	=	Luminance signal for TDA8366
CVBS_SC1_INPUT	=	CVBS signal from Euroconnector 1
C_COMB	=	Chroma signal to TDA8366
GNDB	=	Ground B
SVHS	=	Super VHS
PAL/NTSC	=	Video signals PAL or NTSC
B_Y OUT	=	Colour difference signalout
R_Y OUT	=	Colour difference signalout
COMBFILTER	=	Colour separation filter
SYS	=	System switching signal
CVBS_COMB	=	CVBS to combfilter
CVBS_TXT	=	CVBS to Teletext
SYNC_TXT	=	Synchronisation signal to Teletext
SELECT	=	Selection signal for Euroconnectors or separate controls
CVBS/Y_SC2/FRONT_INPUT	=	CVBS/luminance signal from Euroconnector 2/input from seperate controls
CVBS_SC2_OUT	=	CVBS outgoing signal from Euroconnector 2

COMB_ON/OFF	=	DC signal to set the combfilter in the comb or bypass mode
F_SUBC	=	Sub-carrier for combfilter
SAND	=	Sandcastle
CVBS_SECAM	=	CVBS signal to SECAM IC
AGC	=	Automatic gain control
C_FILTER	=	Chroma filter
TUNING	=	Tuning voltage
PLL	=	Phase line lock
Y_OUT	=	Luminance signal out
CTI	=	Colour transient improvement
DELAY	=	Luminance delay
SCL	=	I2C Clock signal
SDL	=	I2C Data signal
G_Y MATRIX	=	RGB luminance matrix
RGB	=	Red Green Blue
GND..	=	Ground ..
B_TXT	=	Blue Teletext
G_TXT	=	Green Teletext
R_TXT	=	Red Teletext
R_SC_INPUT	=	Red input from Euroconnector
G_SC_INPUT	=	Green input from Euroconnector
B_SC_INPUT	=	Blue input from Euroconnector
FBL_OFF	=	Fast blanking off
FBL_IN	=	Fast blanking in
EHT	=	Aquadag voltage
BC_INFO	=	Black current info from CRT panel
R_OSD	=	Red (on screen display) signal
G_OSD	=	Green (on screen display) signal

B3 SYNCHRONISATION (BIMOS IC)

PHASE COMP	=	Phase compensation
HDRIVE	=	Horizontal drive signal
EWD	=	East-west drive
EW_COMP	=	East-west compensation
VDRIVE	=	Vertical drive
HFBL	=	Fast blanking from line deflection

B4 IF SOUND

BG LI STEREO	=	The stereo signal from PAL BGI or SECAM L
BG LI NICAM	=	The nicam signal (digital sound) from PAL BGI or SECAM L
AUD1_TERR_AM	=	First audio input
SIF	=	Sound IF
AM	=	Amplitude modulation
BG DK STEREO	=	System BG DK stereo signal
BG_ST/NIC	=	Nicam signal from system BG stereo

B5 EUROCONNECTOR 1

SNDR_SC1_OUTPUT	=	Euroconnector 1 (right sound) signal from sound module
SNDR_SC1_INPUT	=	Right sound signal from Euroconnector 1 to sound module
B_SC_INPUT	=	Blue signal from Euroconnector input to video module
STATUS1	=	Status signal from Euroconnector input to control module
G_SC_INPUT	=	Green signal from Euroconnector input to video module
R_SC_INPUT	=	Red signal from Euroconnector input to video module
CVBS_SC1_INPUT	=	CVBS (Composite Video Blanking SYNC) from Euroconnector input to video module
FBL_PRESENT	=	Signal full screen external RGB to control module
SNDR_CL_OUTPUT	=	Right sound to CL output from sound module
SNDL_CL_OUTPUT	=	Left sound to CL output from sound module

B6 EUROCONNECTOR 2

C_FRONT	=	Chrominance input from separate controls
FRONT_DETECT	=	Detector if on separate controls video signals are present
CVBS/Y_FRONT_INPUT	=	CVBS or luminance from seperate controls
CVBS/Y_SC2/FRONT_INPUT	=	CVBS from Euroconnector input to video module
SNDR_FRONT_INPUT	=	Sound right from seperate controls
SNDR_SC2/FRONT_INPUT	=	Right sound from Euroconnector 2 input to sound module
SNDR_SC2_OUTPUT	=	Right sound to Euroconnector 2 output from sound module
STATUS2	=	Status signal from Euroconnector 2 input to control module
C_INPUT	=	Chrominance from Euroconnector 2 on front input to video module
CVBS_SC2_OUT	=	CVBS to Euroconnector 2 output from video module

B7 CONTROLS

STANDBY	=	To supply module, switches the set in and out of standby
SDAa	=	To every other module, serial data

List of abbreviations (continued)

VOL MONO	=	To sound module, commands the volume level for mono sets
YUV_ON/OFF	=	To Histogram/black stretch module, switch on & off this module
Comb_ON/OFF	=	To comb filter, switch on & off the comb filter
IRQ	=	From the Satellite or Teletext module, interrupt signal from these modules
SOUND_ENABLE	=	To the Audio Amplifier module switches on and off the amplifier
INT/EXT	=	internal or external switching
VIDEO_COR_FIL	=	To video Correction filter, switches on and off this module
VPULSE	=	From deflection module, vertical pulse for OSD synchronization
HPULSE	=	From deflection module, horizontal pulse for OSD synchronization
FBL_IN	=	Fast blanking signal from control module to video/scan module
FBL_OFF	=	To the Bimos module, switches off the fast blanking from Euroconnector
FBL_PRESENT	=	From the I/O module, detects if there is a full page RGB at the euroconnector or OSD or from an external source

B8 SMALL SIGNAL AUDIO MODULE

SIF	=	Sound IF
CVBS_TERR	=	CVBS from the antenna
AUD1_TERR_AM	=	AM sound
NTSCM/BG	=	Switching signal
SNDR_CL_OUTPUT	=	sound right, constant level output to rear cinches
SNDL_CL_OUTPUT	=	sound left, constant level output to rear cinches
SNDR_SCI_OUTPUT	=	output signal, sound right from euroconnector 1
SNDL_SCI_OUPUT	=	output signal, sound left from euroconnector 1
L/L	=	To Bimos module and Sound module switches between the L and L' system
I/BG	=	To Sound module, selects the audio system
SNDR_SC1_INPUT	=	input signal, sound right to euroconnector 1
SNDR_SC2/FRONT_INPUT	=	input signal, sound left from euroconnector 2, or from seperate controls

B9 TXT

H PULSE	=	From deflection module, horizontal pulse for OSD synchronisation
SCLI	=	Serial clock pulse
SDAI	=	Serial data pulse
BLANK	=	blanking signal
GNDD	=	Ground D
NO NORDIC	=	not used in set for Nordic countries
SYNC	=	synchronisation signal
OSC	=	oscillator
TDATA	=	teletext data signal
TCLK	=	teletext clock signal
PLL	=	Phase lock loop
CF	=	comb filter

C CRT-panel

EHTINFO	=	Voltage related to beam current
AQUADAG	=	earth from the CRT
CUT_OFF	=	signal to align the blacklevel of the RGB signals for the CRT
VSCAVEM	=	Supply voltage for SCAVEM
HEATER	=	Output voltage to the tube heater
FILA_CRT	=	filament for the CRT
VG1_CRT	=	VG1 input to the picture tube
VG2	=	G2 input to the picture tube

D AUDIO-panel

ANA_IN	=	analoge audio in
AUD_TERR_AM	=	audio (am) from the antenna
AUDIO R	=	audio right
AUDIO L	=	aaudio left
NICAM A	=	nicam input A
NICAM B	=	nicam input B
D/A	=	digital to analog converter
DACA_R	=	digital to analog converter for the right signal
DACA_L	=	digital to analog converter for the left signal
SNDR_CL/VL_OUTPUT	=	Right CL/VL audio signal from dolby

SCHEMA J

MAINS_IN	=	220 volt in
GND_LIGHTNING	=	ground
GND_SND	=	ground
SNDR_HEADP_OUTPUT	=	output sound right from the headphone connector
YC	=	luminance or chroma signal
C_FRONT_INPUT	=	chrominance signal from the seperate controls
CVBS/Y_FRONT_INPUT	=	CVBS/ luminance from the seperate controls
VIF	=	Tuner take over point

7. Electrical adjustments

Electrical alignments

Alignment conditions:

All electrical adjustments should be performed under the following conditions:

- Power supply voltage: 240V ± 10%, 50Hz ± 5%.
- Warm-up time: ± 10 minutes
- The voltages and oscillograms are measured in relation to the tuner earth.
- Test probe: RI > 10MΩ; CI < 2,5 pF.

1. Adjustments on the large signal panel

1.1 95V/140V supply voltage

For 21" TV-sets
Connect a volmeter to the cathode of D6567.
With the aid of R3532 adjust the power supply voltage to 95V ± 0,5V.

For sets > 21"
Connect a volmeter to the cathode of D6567.
With the aid of R3559 adjust the power supply voltage to 140V ± 1V.

1.2 VG2 adjustment

Connect a pattern generator displaying a full black picture. Switch the TV-set to the service default mode (see 7.4). Connect an oscilloscope to the picture tube cathodes for red, green and blue (pins 6, 8 en 11 of the picture tube socket). Set the oscilloscope to DC, 50V/div and 2 mS/div. Measure the DC level of the measuring pulses at the end of the frameblanking (see Fig. 7.1) Using the Vg2 potentiometer on the linetransformer (bottom potentiometer) the measuring-pulse with the highest level must be set to +160V ± 2V.

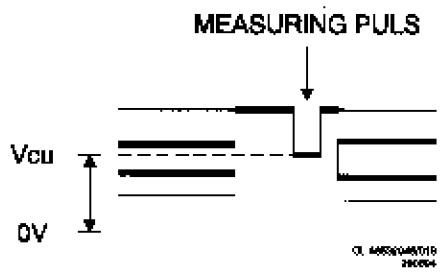


Fig. 7.1

1.3 Focusing

Is aligned using the focuspotentiometer on the linetransformer (top potentiometer).

2. Alignments on the small signal panel

2.1 40.4 MHz IF filter (only for sets with SECAM LL' reception)

Using a signal generator (b.v. PM5326) and a capacitor of 5,6 pF supply a 40,4 MHz signal ton pin 17 of the tuner. Connect an oscilloscope to pin 1 of filter 1016. Switch on the set and set the system selection (installationmenu) to BG. Set L5117 for minimal amplitude. Remove the supplied signal.

2.2 AFC

Switch the set to service default mode (see 7.4).
Using a pattern generator (e.g. PM5518) supply a signal on a frequency of 475,25 MHz.
Align coil L5114 for optimal picture quality.

2.3 Picture demodulator (only for sets with SECAM LL' reception)

Using a signal generator (eg. PM5326) supply a 32,95 MHz signal via a 5,6 pF capacitor to pin 17 of the tuner.
Align the signal level of the generator so that the DC-voltage on pin 5 of the tuner is 5V. Switch on the set and set the system selection (installation menu) to system LL'. Align capacitor C2106 for minimal voltage on pin 5 of the tuner. Remove the supplied signal.

2.4 RF-AGC

If the signal of a strong local transmitter is distorted, align the value for AX (AGC crossover) in the service menu (see 7.4) until the picture is no longer distorted.

2.5 Audio demodulator (not for sets with LL' and NICAM reception possibility)

Using a signal generator (eg. PM5326) supply a 38,9MHz signal via a 5,6 pF capacitor to pin 17 of the tuner. Connect an oscilloscope (2ms/div) to pin 12 of IC7033 (TDA3845). Align coil L5030 for minimal amplitude. Remove the supplied signal.

3 Adjustments in the service menu (see 7.4)

3.1 White balance

Alignment without a colour temperature meter
Connect a pattern generator and select a white picture.
Switch on the servicemenu (see 7.4) and using the ↑↓ keys go to the GD setting.
Using the ←→ keys, set GD to 50.
Go to setting RD, and set it to 57.
Go to setting BD, and set it to 45.
If necessary change the settings for RD and BD for a correct white balance.

Alignment with a colour temperature meter
Switch on the service menu (see 7.4) and go to the GD, RD and BD settings using the ↑↓ keys.
Set all three values to 32 using the ←→ keys.
Connect a pattern generator and select a green field. put the probe onto the screen, and set the meter to NIT (cd/m^2) measurement. Go to the GD adjustment and set it to:

- 21" : 350 NIT ± 10 NIT
- 25/28" black matrix : 270 NIT ± 10 NIT
- 25/28" Blackline-S : 300 NIT ± 10 NIT

Now select a white picture and suing the RD and BD alignments adjust for the following values:

- x = 0.299
- y = 0,308

3.2 Options

Go to the service mode (see 7.4). The following options can be selected using the ↑↓ keys, and can be controlled using the ←→ keys.

- NI : NICAM present (IC7353 = MSP3410)
- UO : UHF only (tuner = U944)
- LL : System secam LL' possible (coil 5117 present).
- TT : Teletext available (IC7702 present)
- ET : East-european teletext.
- E2 : Second Eurocconnector present.

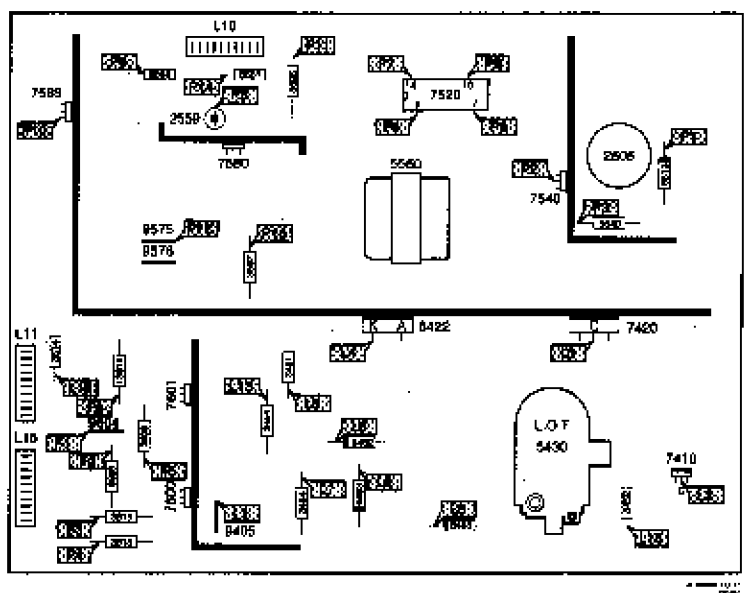
3.3 Geometry adjustments.

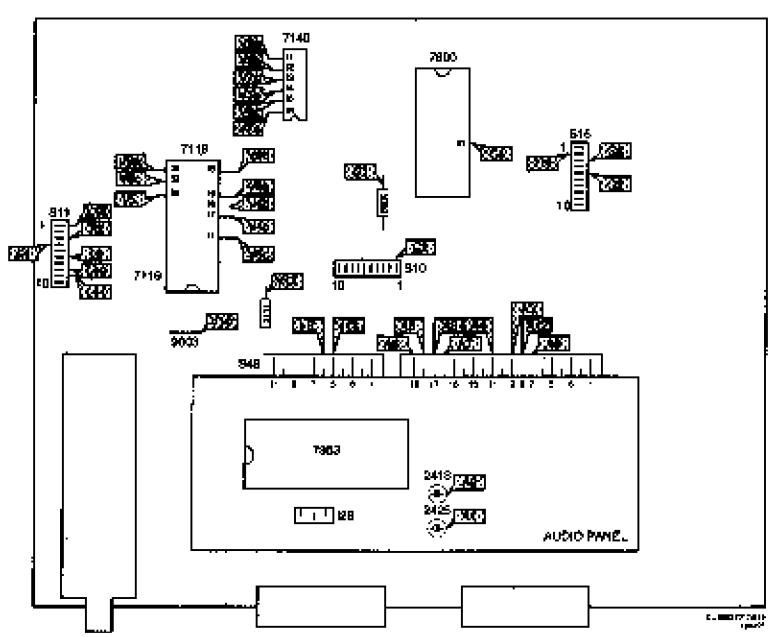
Supply a geometry adjustment pattern.
Go to the service menu (see 7.4). the following adjustments can be selected with the ↑↓ keys, and can be adjusted using the ←→ keys.

- VP : Vertical Shift
  Set this for the correct vertical position.
- VA : Picture height
  Set this for the correct picture height.
- VL : Vertical linearity.
  Set this so that the vertical centre of the picture is at the centre of the tube.
- VS : Vertical S-correction
  Set this so that the height of the squares in the top of the picture equal the height in the bottom of the picture.
- HD : Horizontal shift.
  Set this so that the horizontal centre of the picture is on the centre of the tube.

For sets with a screensize larger than 21", the following alignments can be done as well. For 21" sets these alignments have no function.

- HW : Horizontal Width
  Align the picture width with this.
- HP : East-west correction
  Set this so that the vertical lines at the sides of the screen are straight.
- HC : East-west corner-correction.
  Set this so that the vertical lines are straight in the corners.
- HT : Trapezium correction
  Set this so that the vertical lines are as vertical as possible.





Electrical adjustments

4. Adjustments in the Service menu

4.1 Entering the Service Default Mode (SDM):

- By briefly short-circuiting the pins 1S42 and 1S43 (indicated by the text :"SERVICE" in the service printing) on the SSP panel.
- By transmitting the "DEFAULT" command with the RC-7150 Dealer Service Tool.

Exiting the Service Default Mode (SDM):

- The SDM will only be left by the stand-by command. In case the set is switched "off" and "on" again with the mains switch, the set remains in the SDM.

The Service Default Mode (SDM) is a pre-defined condition for all µC controlled tuning and linear functions:

- Tuning at 475.25 MHz
- Picture settings brightness, colour and contrast at 50% and smart control picture settings disabled
- Sound settings bass, treble and balance at 50%, volume at 25% and smart control sound settings disabled
- Sleeptimer disabled
- Auto switch off disabled (auto switch off feature switches off the set in case for 15 minutes no IDENT (video signal) is received)
- Further the set remains normal controllable

4.2 Entering the Service Alignment Mode (SAM):

- From the SDM by simultaneously pressing the "MENU" and "-" key on the local front control panel.
- From normal operation and SDM by transmitting the "ALIGN" command with the RC7150 Dealer Service Tool.

Exiting the Service Alignment Mode (SAM):

- The SAM will be left by the stand-by command. In case the set is switched "off" and "on" again with the mains switch, the set will come up in the SDM again.

In the Service Alignment Mode (SAM) the following will appear on the screen:

- Software version
- Error code buffer (maximum the last 7 error codes)
- Alignments (see 3.1 and 3.2)
- Options (see 3.2)

4.2a Error code buffer

The error code buffer is written from left to right and contains all errors detected since the last time the buffer is erased.

An example can be:

ERROR: 0 0 0 0 0 0 0:	No error code detected
ERROR: 3 0 0 0 0 0 0:	Error code 03 is last and only detected
ERROR: 5 3 0 0 0 0 0:	Error code 05 is last detected, error code 03 previous detected

- The last error detected (actual) is the error at the left side
- By leaving the SAM with the "standby" function the error buffer is reset.
- By leaving the SAM with the mains switch "off" the error buffer is not reset.

(See table)

4.2b Alignments

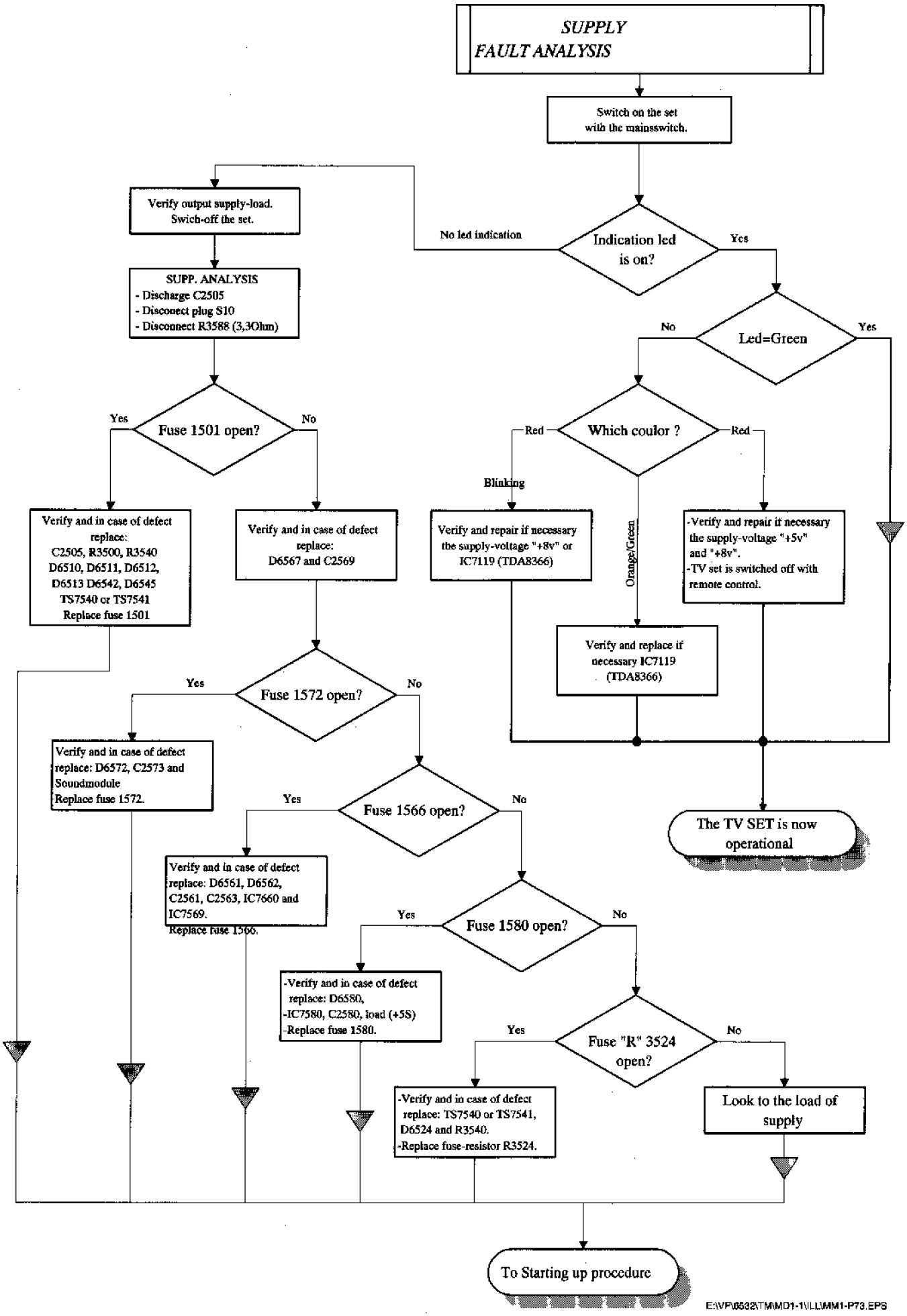
- Selection of the desired alignment by the up/down cursor
- Change of the selected alignment by the left/right cursor
- The following alignments are possible (alignments for geometry are for the 4:3 picture format)
  - * AX: AGC crossover
  - * RD: Red drive
  - * GD: Green drive
  - * BD: Blue drive
  - * VP: Vert shift
  - * VA: Vert amplitude
  - * VL: Vert linearity
  - * VS: Vert S correction
  - * HD: Hor shift
  - * HW: Hor width
  - * HP: E-W parabola
  - * HC: E-W corner
  - * HT: E-W trapezium
- A value between 0 and 63 can be given for all software alignments
- Store (storing the adjusted settings is done immediately)

4.2c Options

- Setting of individual options.
- Selection of the desired "option to be changed" by the up/down cursor
- Change of the selected option by the left/right cursor
- The options are activated immediately after they are changed

Repair facilities

Error code	Error description	Led	Possible defective components
0	No error detected		--
1	TDA8366	Red blinking LED	IC7119
2	MSP3400/3410	--	IC7383
3	I^2C bus error	--	All I^2C-related components
4	Wrong EEPROM	--	IC7685
5	EEPROM defective	--	IC7685
6	Tuner error	--	U1000
7	TXT error	--	IC7701 or IC7702

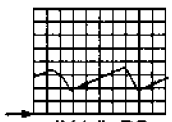

SUPPLY
FAULT ANALYSIS
Switch on the set
with the mainsswitch.
Indication led
is on?
No led indication
Yes
Verify output supply-load.
Swich-off the set.
SUPP. ANALYSIS
- Discharge C2505
- Disconect plug S10
- Disconnect R3588 (3,3Ohm)
Led=Green
No
Yes
Fuse 1501 open?
Yes
No
Which coulor ?
Red
Red
Blinking
Orange/Green
Verify and in case of defect
replace:
C2505, R3500, R3540
D6510, D6511, D6512,
D6513 D6542, D6545
TS7540 or TS7541
Replace fuse 1501
Verify and in case of defect
replace:
D6567 and C2569
Verify and repair if necessary
the supply-voltage "+8v" or
IC7119 (TDA8366)
-Verify and repair if necessary
the supply-voltage "+5v"
and "+8v".
-TV set is switched off with
remote control.
Verify and replace if
necessary IC7119
(TDA8366)
Fuse 1572 open?
Yes
No
Verify and in case of defect
replace: D6572, C2573 and
Soundmodule
Replace fuse 1572.
Fuse 1566 open?
Yes
No
The TV SET is now
operational
Verify and in case of defect
replace: D6561, D6562,
C2561, C2563, IC7660 and
IC7569.
Replace fuse 1566.
Fuse 1580 open?
Yes
No
-Verify and in case of defect
replace: D6580,
-IC7580, C2580, load (+5S)
-Replace fuse 1580.
Fuse "R" 3524
open?
Yes
No
-Verify and in case of defect
replace: TS7540 or TS7541,
D6524 and R3540.
-Replace fuse-resistor R3524.
Look to the load of
supply
To Starting up procedure
E:\VP\6532\TM\MD1-1\ILL\MM1-P73.EPS

STARTING UP PROCEDURE

-Remove L5400 on the line-supply section..
-Connect a load-resister of 200 ohm/100w* to C2569 (VO).
-Connect an external supply +17Vdc via a diode to pin1 IC7520 (see fig)
-Connect a scoop-probe to pin10 IC7520 and verify if the oscilator is working properly.

* The load-resistor can be replaced by a lamp of 220V/100W.

Fig. 2



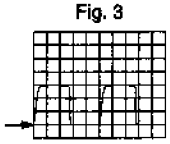
1V / div DC
5µs / div

The signal according fig.2 — No → Verify and replace if necessary the components connected to pin 8, 10, 11 of IC7520.

Yes

Connect a scoop-probe to pin 3 IC7520 and verify the signal.

Fig. 3



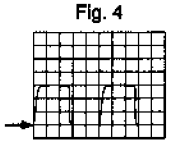
5V / div AC
5µs / div

The signal according fig 3 — No → Verify supply-voltage on pin 2 IC7520.

Yes

Connect a scoop-probe on gate TS7540 or TS7541 and verify the signal.

Fig. 4



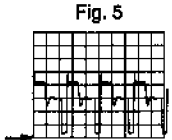
5V / div DC
10µs / div

The signal according fig. 4 — No → Verify and replace if necessary R3518, R3524 and D6524.

Yes

Connect the mains-plug (L01) to a 30Vac or a 42Vdc voltage-supply.
Verify the output voltage (VO) on C2569.
Connect a probe on drain TS7540/41.

Fig. 5



50V / div DC
10µs / div

The signal according fig. 5 — No → Verify that there is no secundary short-circuit.
Verify supply-transformer.

Yes

Increase the mains-voltage till the output voltage (VO) on C2569. reaches:
95Vdc (21") / 140Vdc (25"&28")

If VO is existing these values before the mansvoltage is increasing a little. — No → Increase the mainsvoltage slowly till 220Vac, the output voltage (VO) on C2569 schould be within the specification.

Yes

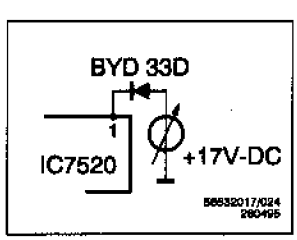
The feedback regulation loop is open

Which picturetube size ? — 90° / 21" → Verify and repair if necessary, R3545, C2530, and the voltage on pin14 IC7520

Which picturetube size ? — 110° / 25", 28" → Verify and repair if necessary, TS7555, TS7556 The voltage on pin14 IC7520 should be 2V5 dc.

Check all output voltages, VO, VS, V8, Vstby

SUPPLY IS NOW OPERATIONAL



E:\VP\8532\TM\MD1-1\ILL\MM1-P74GB.AI

TV set in "Standby "

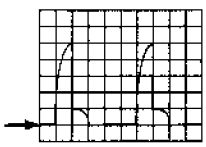
-Switch-off TV set.
-Remove Vo load-resistor (200ohm/ 100W)*
-Resolder R3588 (3,3 ohm)

* The load-resistor can be replaced by a lamp of 220V/100W

Increase slowly mainsvoltage till 30Vac

-Connect a scoop-probe (1Mohm) to the Drain TS7540 or TS7541.
-Switch-on TV set.

Fig. 6



2V / div DC
5µs / div

Voltage according fig.6

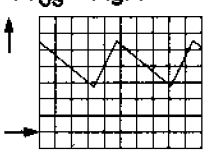
Yes

No

- Switch-off TV set.
- Verify and replace if necessary: TS7592, THY7590, D6591,
- Switch-on TV set.

Increase mains-voltage till 220 Vac

$+V_{OS}$ Fig. 7



5V / div DC
100ms / div

Voltage correct

No

Switch-off TV set

Yes

-Switch-off TV set.
-Remove external supply & diode from pin1 IC7520.
-Switch-on TV set

Verify that supply starts below 160 Vac

-Connect L5400
-If the supply stops working, verify line-output stage.

-Connect plug S10
-Verify on screen a picture, front led should be Green and Red after switch-over to Stand-by

Supply is now operational

E:\VP\6532\TM\MD1-1\ILL\MM1-P75GB.AI

8. Circuit description

POWER SUPPLY (diagram A1)

The MD1.1 power supply is of the Switched Mode Power Supply (SMPS) type and is mains isolated. The control IC7520 (MC44603) gives the pulses for driving FET 7540 (or 7541 depending on the version) with variable duty cycle control at a fixed frequency of nominal 40 kHz in normal operation (at slow-start and overload situation the SMPS runs at lower frequencies than 40 kHz). The MD1.1 SMPS works with a switching FET and an opto-coupler. IC7520 is featured with a slow-start circuitry and has over- and undervoltage-protection of the secondary supply voltages and unloaded and overload (short-circuit) protection.
The main supply output "+VOS" gives a stabilised +95V for 21" and +140V for 25/28" in normal operation. In stand-by the SMPS works in burst mode; the +VOS varies now between approx 5V and 30V DC.
T-on of the power supply depends on the duty-cycle of FET 7540 which is depending on the feedback voltage at pin 14 IC7520. This IC detects the variations of the +VOS (the secondary side of T5550) via 2 possible circuitries depending on the version; primary sensing SMPS (via primary winding 9-8) for 21" and secondary sensing SMPS for 25/28" (via the control circuitry at the secondary side and opto-coupler 7556).
Switching period of FET 7540 is divided in three main areas; T-on, T-off and T-dead:

- During T-on FET 7540 conducts and so the energy extracted from the mains, is stored into the primary winding 4-1 of transformer T5550 with a linear increasing primary current (slope depends on the voltage across C2505). Via T-on regulation the duty cycle of the SMPS and so the +V-out can be controlled.
- During T-off FET 7540 does not conduct and all the energy stored in the transformer is supplied to the load via secondary windings of T5550 and the secondary diodes (in other words; the transformer is demagnetised). The current through the secondary side of the transformer decreases linear with a firm slope (slope depends on the voltage at the secondary side of T5550).
- During T-dead FET 7540 does not conduct and so no energy is extracted or supplied. The period T-dead gives "room" for T-on control.

PRIMARY SIDE

Degaussing: R3506 and R3507 are dual PTCs (2 PTCs in one housing): At switching "on" the set, the PTC is cold so low-ohmic and so the degaussing current is very high. After start-up the PTC heats up and becomes high-ohmic making the degaussing current very low. The PTC becomes heated by the high degaussing current during start up through the serial-PTC part which is connected in series with the mains and the degaussing coil; the PTC remains heated by the parallel-PTC part which is connected in parallel with the mains.
Triac 7507 and winding 5-6: To reduce the power consumption in stand-by the circuitry at winding 5-6 (T5550) and triac 7507 can be used. The circuitry is dimensioned in such a way that at start up and in normal operation triac TS7507 conducts and in stand-by mode TS7507 does not conduct (so there is no degaussing current in stand-by). The voltage across winding 5-6 is rectified by D6507 and smoothed by C2507. In stand-by mode the voltage across the transformer winding 5-6 is that low, that the voltage across C2507 becomes below 2V8 (2V1 + 0V7), so the triac does not conduct any more.
Mains voltage is filtered by L5503, full wave rectified by diodes 6510-6513 (or rectifier bridge 6504 for sets with destination outside Europe) and smoothed by C2505; the DC voltage across C2505 is the DC input voltage for the SMPS at pin 4 of T5550 (300V DC for 220V AC mains).
Start-up: Via the start-up circuitry R3520, R3511, jumper 9523 and R3527 one side of the AC mains is used to start-up IC7520 via the supply pin 1 IC7520 (V_{pin1}).

- As long as IC7520 V_{pin1} has not reached 14V5, the IC7520 does not start up and pin 1 only sinks a typical 0.3 mA.
- As soon as V_{pin1} has reached the 14V5, IC7520 starts working and pin 1 sinks a typical supply current from 17 mA.

The start-up circuitry can not deliver 17 mA, so during IC7520 "not working" the V_{pin1} is increasing and during IC7520 "not working" the V_{pin1} is decreasing by the start-up current. As soon as V_{pin1} has reached the start voltage 14V5, the internal oscillator of IC7520 drives FET 7540 into conduction (see slow-start) and so the power supply automatically starts up
(this power supply is a SMPS (switched mode power supply) but not a SOPS (self oscillating power supply) so directly starts up after the oscillator in IC7520 has been started.
Take over of IC7520: During start-up a voltage across winding 9-8 is built up. At the moment the voltage across winding 9-8 reaches approx +12V, D6525 starts conducting and takes over the supply voltage V_{pin1} of IC7520 (take over current is approx 17 mA).

CONTROL CIRCUITRY PRINCIPLES FOR T-ON CONTROL

Secondary output voltages feedback (pin 14 IC7520): This voltage V_{pin14} is called feedback voltage and is used to control the secondary output voltages. In MD1.1, basically 2 different types of power supplies are used:

- Primary sensing SMPS and error amplifier block in IC7520: For the low-output power sets (21" with lower sound output power) primary sensing is used for secondary output voltage feedback (sensing on the primary side of the SMPS). Only in case of primary sensing the primary sensing circuitry R3545, D6530, C2530, R3529, R3530, R3531 and R3532 is present. In case of primary sensing pin 14 IC7520 is used as error amplifier. This means that the voltage at pin 14 IC7520 should be a 100% reflection of the output voltage +VOS (see IC7520 control). Primary winding 9-8 has the same polarity as all secondary windings which are supplying the load. During T-off all secondary windings are positive, so primary winding 9-8 is positive, D6530 conducts and so charges C2530. The DC voltage across C2530 is the control voltage which is a reference for the secondary output voltages (e.g. the +VOS). Via R3530, R3531 and potentiometer R3532 (for adjusting the +VOS) this DC-voltage is brought to the required level for the error amplifier in IC7520 at pin 14.
- Secondary sensing SMPS and error amplifier around 7555: For the high-output power sets (25/28" with high sound output power) secondary sensing is used for secondary output voltage feedback (sensing on the secondary side of the SMPS). Only in case of secondary sensing the secondary control circuitry (R3555-3556-3557-3558-3559, C2555-2557 and "programmable precision reference" zener 7555) is used. Further the opto-coupler 7556 is used for secondary sensing. In case of secondary sensing the control circuitry around 7555 forms an error amplifier and pin 14 IC7520 is used as an inverter (so not as error amplifier). The error amplifier around 7555 is formed by TS7555, C2557, R3557, R3555, R3558 and R3559. The supply voltage across C2561 is fed via R3554, the diode in the opto-coupler and R3556 to the programmable zener 7555. The SMPS takes care that the voltage at the gate of 7555 is always 2V5, so the +VOS is a stable supply voltage as follows:
  If +VOS remains stable a stable current is flowing through the diode in the opto-coupler and so the current through transistor part, so V_{pin14} IC7520 remains stable, so duty cycle at pin 3 IC7520 remains the same.
  If +VOS wants to increase (decrease of the load), the current through the diode in the opto-coupler and so the current through the transistor part increases, V_{pin14} IC7520 increases and so IC7520 decreases the duty cycle of the SMPS (in practice the control is so fast that V_{pin14} remains constant).
  If +VOS wants to decrease (increase of the load), the current through the diode in the opto-coupler and so the current

through the transistor part decreases, V_{pin14} IC7520 decreases and so IC7520 increases the duty cycle of the SMPS (in practice the control is so fast that V_{pin14} remains constant).

I-prim sensing (pin 7 IC7520): The current sense voltage V_{pin7} is a measurement of the I-prim through FET 7540; the I-prim is converted into a voltage by R3540; the current sense voltage V_{pin7} is used to control the maximum I-prim (see peak current limiting) and indirectly the secondary output voltages (see drawing).

Demagnetisation control (via pin 8 IC7520): Supply winding 9-8 has the same polarity as the secondary windings which are supplying the load. As a result the voltage across this winding is negative during T-on and positive during T-off and oscillating (demagnetising) during T-dead. The so called demagnetisation function (block "DEMAG" in IC7520) at pin 8 IC7520 is used for blocking the output V_{pin3} during T-dead by delaying the switch-on moment of the FET until the demagnetisation of the transformer is completed. In this way the currents and voltages at the moment of switching "on" the FET are controlled.

STABLE LOAD AND INCREASING/DECREASING LOAD (BOTH PRIMARY AND SECONDARY SENSING)

Stable load: The feedback voltage V_{pin14} (and so also the maximum current sense voltage V_{pin7}) remains the same. As a result the T-on and so the duty cycle will remain the same.

Increasing load: The secondary output voltages decrease, the feedback voltage V_{pin14} decreases, the V_{pin3} will be "high" for a longer period (longer T-on so the duty cycle increase) and so the secondary output voltages will be increased (corrected). This will give a new balance between feedback voltage V_{pin14} and the internal 2V5 reference voltage, resulting in a new higher stable duty cycle. As a result of the longer T-on, the maximum I-prim increases, so more energy can be stored in the transformer, so also more energy can be supplied to the load.

Decreasing load: the secondary output voltages increase, the feedback voltage V_{pin14} increases, V_{pin3} will be "high" for a shorter period (shorter T-on so the duty cycle decrease) and so the secondary output voltages will be decreased (corrected). This will give a new balance between feedback voltage V_{pin14} and the internal 2V5 reference voltage, resulting in a new lower stable duty cycle. As a result of the shorter T-on, the maximum I-prim decreases, so less energy can be stored in the transformer, so also less energy can be supplied to the load.

Demagnetisation: In case the demagnetisation of the transformer (T-dead) is not finished yet, the positive edge from the oscillator will be overruled (via buffer block D) as being the starting point of T-on; as a result the T-on will be delayed and so the frequency of the SMPS will go down (lower than 40 kHz). This procedure is used during start-up.

OTHER FEATURES

Peak current limiting is realised by an internal clamp at V_{pin7} at 1V DC; Via this clamp the V_{pin7} can never exceed 1V DC and so the maximum value of I-prim (maximum current through FET 7540) is fixed. In case the load needs more than the maximum power which is fixed by the peak current limiter, the SMPS will go into overload protection (see foldback principle explained at overload protection).

Cycle-by-cycle control: The T-on control is controlled on a cycle-by-cycle basis (because of the flip flop block C in IC7520). This means that in every cycle the T-on is determined again. By doing so the control of the secondary output voltages, peak current limitation and all protections can be very accurate and fast.

Slow-start: As soon as V_{pin1} > 14V5 DC the IC will start-up, but this will be done by a smooth slow-start procedure (both the frequency and the duty cycle will be built up during slow-start). The following 3 phenomena's will take place during start-up:

1. The frequency will slowly increase up to the nominal frequency (40 kHz for normal operation). The frequency of the internal oscillator in IC7520 is controlled by C2531 at pin 10 IC7520 and by R3537 at pin 16 IC7520.
2. The voltage at pin 5 determines the foldback point. As during start-up this V_{pin5} is gradually built-up, the foldback point will also gradually increase (see foldback principle explained at overload protection).
3. The duty cycle will slowly increase beginning at the absolute lowest duty cycle possible. The maximum duty cycle is determined by R3519 in series with R3533 at pin 11 IC7520; At start up this voltage is built up by charging C2533, so the power supply starts up at the lowest possible duty cycle.

Typical values for the SMPS with the MD1.1: In a stable situation V_{pin14} is typical 2V5. The maximum output power for 21" sets is 128W at V_{pin7} = 1V DC (I-prim = 3.7A) and 180W at V_{pin7} = 1V DC (I-prim = 5.5A) for 25/28". The nominal output power for 21" sets is 75W at V_{pin7} = 0V78 DC (I-prim = 2.9A) and 130W at V_{pin7} = 0V86 DC (I-prim = 4.7A) for 25/28".

PROTECTIONS

Overvoltage protection of the secondary voltages: Overvoltage protection can be used in 2 ways in the MD1.1 SMPS:

1. The supply voltage V_{pin1} is after start-up taken over by positive winding 9-8, and so after start up V_{pin1} is a measuring point for the secondary output voltages. After start-up (via an internal switch) this V_{pin1} is internally tapped (voltage divided) to a voltage which can be measured at pin 6 (so V_{pin6} is also a measuring point for the secondary output voltages).
2. In case of a SMPS with primary sensing R3528 is present. By then the voltage from pin 4 of the opto-coupler is also fed to pin 6 IC7520 for an externally controlled overvoltage protection at pin 6 (for a primary sensing SMPS the opto coupler only conducts during stand-by, so overvoltage protection along this way only works in stand-by mode).

As soon as the voltage V_{pin6} > 2V5, the logic in IC7520 will shut down the output at pin 3. This 2V5 threshold at V_{pin6} is equivalent to a V_{pin1} of 16V DC.

In normal operation a +VOS of approx 100V DC for 21" and 150V DC for 25/28" is equivalent to a V_{pin1} of 16V DC giving overvoltage protection. In stand-by a +VOS of approx 30V DC for both 21" and 25/28" sets gives overvoltage protection (see stand-by mode).

After switching "off" because of overvoltage protection, the IC starts up again (see slow-start).

As a result in case of an overvoltage situation of the secondary output voltages is sensed, the SMPS will go into overvoltage protection. In case the overvoltage situation remains present, the SMPS will give overvoltage protection again, slow-start, overvoltage protection, slow-start, etc. In overvoltage protection the SMPS will give a very good audible hick-up mode.

Undervoltage protection of the secondary voltages: If the supply voltage V_{pin1} < 9V DC the output pulse at pin 3 will be shut down. As soon as V_{pin1} < 7V5 the IC7520 will be switched "off" totally.

In normal operation a +VOS of approx 60V DC for 21" and 85V DC for 25/28" is equivalent to a V_{pin1} of 9V DC giving "first" undervoltage protection. In stand-by a +VOS of approx 20V DC for 21" and 25V DC for 25/28" is equivalent to a V_{pin1} of 9V DC giving "first" undervoltage protection. In normal operation a +VOS of approx 45V DC for 21" and 65V DC for 25/28" is equivalent to a V_{pin1} of 7V DC giving "second" undervoltage protection. In stand-by a +VOS of approx 15V DC for 21" and 20V DC for 25/28" is equivalent to a V_{pin1} of 7V DC giving "second" undervoltage protection. As a result in case of an undervoltage situation of the secondary output voltages is sensed, the SMPS will first switch "off" the FET drive pulse at pin 3 IC7520 and then switch "off" the complete IC7520.

In case the IC7520 is switched "off", the SMPS will switch "off". In case the undervoltage situation remains present, the SMPS will give undervoltage protection again, slow-start, undervoltage protection, slow-start, etc. In undervoltage protection the SMPS will give a very good audible hick-up mode.
No load situation: In case the load goes down (e.g. the line goes down because of some failure in the line) this will be detected by IC7520 via I-prim and secondary output voltages sensing. In this case the SMPS will remain normal working.
Overload (short-circuit) protection: If the secondary load becomes too high, I-prim becomes too high which is sensed by the primary current sense voltage V_{pin7}. This voltage $V_{pin\ 7}$ is not allowed to exceed 1V DC by IC7520 and so gives current limiting. As the I-prim is limited, the secondary output voltages will also drop and so supply voltage V_{pin1} will drop. As soon as V_{pin1} < 9V DC the driving pulse at pin 3 will stop.
As a result of these 2 mechanism in case of an overload the secondary voltages will drop very fast (this is called the foldback mechanism; the foldback point can be adjusted by pin 5 IC7520; for MD1.1 this point is adjusted to a maximum tolerable output power of 130W for 21" and 200W for 25/28").
After this foldback, the IC starts up again (see slow-start). In case the overload situation remains present, the SMPS will give foldback again, slow-start, foldback, slow-start, etc; As a result in case of a shortcircuit (or overload) the TV will be in a very good audible hick-up mode.

STANDBY

The STANDBY command from the µC is "low" for stand-by mode and "high" for normal operation. The STANDBY-SUPPLY protection signal is "high" in case a protection is activated; in case of a protection TS7593 conducts, so the power supply will also be switched into stand-by until the protection situation is over.
In normal operation/no protection TS7592 conduct and TS7591 does not conduct. TS7592 conducts, so the voltage at the gate of TH7590 is "low" and so TH7590 does not conduct. TS7591 does not conduct, so the voltage at the anode of D6592 is "high".
In stand-by mode/protection mode TS7592 does not conduct and TS7591 conducts. TS7592 does not conduct, so the voltage at the gate of thyristor TH7590 is charged from the +VOS by R3590 and C2575; TH7590 conduct in stand-by mode. TS7591 conducts so the anode of D6592 is 0V DC.
In stand-by TH7590 conducts. As a result the voltage at the anode of the diode inside the opto-coupler (pin 1 IC7556) will not be supplied any more by the winding 11-12 but by the much greater voltage across winding 15-16. As a result of this an enormous control current will flow through the diode and so through the transistor of the opto-coupler. With this strong feedback, IC7520 will adjust down all secondary voltages drastically.
For the control of the output voltage during stand-by R3591, zener D6592 (in stand-by TS7591 conduct) and the opto-coupler are used. As soon as zener D6592 starts to conduct, the diode and so the transistor in the opto coupler starts to conduct continuously. This continuously conducting transistor in the opto-coupler is used to switch "off" the SMPS. This is realised in two different ways for a SMPS with primary and a SMPS with secondary sensing.

- For SMPS with primary sensing: In case of a SMPS with primary sensing, pin 4 of the opto coupler is also connected to pin 6 IC7520 overvoltage pin (OVP) (this R3528 is only present in primary sensing SMPS). As the transistor is continuously conducting, pin 6 will be charged to 2V5 very fast, giving overvoltage protection and the SMPS will be switched "off".
  After switching "off" the V_{pin1} supply voltage of IC7520 will be built up again via the start-up circuitry and as soon as V_{start} is reached (14V5) the SMPS start again at 40 kHz, switches "off" again, etc → burst mode.
- For SMPS with secondary sensing: In case of a SMPS with secondary sensing, pin 4 of the opto coupler is only connected to pin 14 of the inverter in IC7520. As the transistor is continuously conducting, the control in the IC will reduce the duty cycle at pin 3 back to 0, so switching "off" the SMPS;

After switching "off" the $V_{p\ n1}$ supply voltage of IC7520 will be built up again via the start-up circuitry and as soon as V_{start} is reached (14V5) the SMPS start again at 40 kHz, switches "off" again, etc. → burst mode.
The LED and so the transistor in the opto coupler will be conducting until the voltage across C2561 becomes lower as 16V DC (at 16V DC over C2561 the diode in the opto-coupler and D6592 just remain conducting via the path over R3554, opto-coupler-diode, R3591 and D6592).

SECONDARY SIDE

+VOS for the line output stage is made via the positive winding 17-18 for 21" and winding 15-18 for 25/28", rectifier diode D6567 and smoothing capacitor C2569.
+28S for sound output amplifier is made via the positive winding 13-14, rectifier diodes D6571 (and D6572) and smoothing capacitor C2573.
+13Vs for the CRT-amplifiers and AM sound (and satellite panel) is made via the positive winding 11-12, rectifier diode D6562 and smoothing capacitor C2563.
+8S for the small signal part is derived from the +13Vs via a voltage stabilizer TS7569.
+5STANDBY and POR for the µC (both in normal operation and in stand-by mode) is also made via the positive winding 11-12, rectifier diode D6561, smoothing capacitor C2561 and voltage stabilizer TS7560.
+5S and +5S1 for the satellite panel is made via the positive winding 10-12, rectifier diode D6580 and smoothing capacitor C2580 and voltage stabilizer TS7580.
Power On Reset (POR); In order to ensure that the µC starts up correctly a POR signal (Power On Reset) must be given. The POR procedure consists of keeping the reset pin 33 of the µC "low" for at least 1 msec after switching on the set with the mains switch.
As long as the voltage across C2561 is lower than 9V DC (so also at building up the supply voltage after switching "on" the set) TS7561 conduct as by then both zener 6560 and TS7561 conduct. As TS7561 conducts the POR signal is "high", so at pin 33 of the µC "low" (after inverting by TS7604 at the µC).
Only in case the voltage across C2561 is higher as 9V DC, TS7561 does not conduct any more. As TS7561 does not conduct any more the POR will become "low", so at pin 33 of the µC "low" (after inverting by TS7604 at the µC).
Protections; At the secondary side of the SMPS no special protection circuitries are available except for fusible devices. Items 1500 and 1566 are so called "circuit protectors" which interrupt in case of a too high current.

VIDEO AND SYNC PROCESSING (diagram B2 and B3)

General:IC7119 (TDA8366) is a single-chip video processor with built in IF-detector, luminance and chrominance separator, PAL/NTSC chroma decoder, video controller and horizontal & vertical sync. processor.

IC7119-4A IF DETECTOR

IC7119-4A contains the IF amplifier and the IF detector. The IF signal is present at the output pin 17 of the tuner.
Bandpass filter: The IF bandpass characteristic is determined by the bandpass of the SAW filter 1116. For PAL BG sets a SAW filter with 5.5 MHz bandwidth is used (OFWG3962 33.4

to 38.9 MHz). For BGDK or BGILL' or I-only sets a SAW filter with a bandwidth of 6.5 MHz is used to enable BGILL' reception (OFWK3953 32.4 to 38.9 MHz). Only in sets with LL' or M reception possibility in series with the SAW filter 1116 an additional filter is needed (R3117, C2110, C2111, C2112 and L5117):

- For sets with LL' reception possibility this additional filter is a 40.4 MHz trap filtering out the SECAM L' AM audio carrier (switching signal NTSCM/BG and D6101 and C2159, C2113 are not used).
- For sets with PAL/NTSC M reception possibility this additional filter is used to attenuate the M carrier at 34.4 MHz by the NTSCM/BG switching signal.
  For PAL/NTSC M the NTSCM/BG switching signal is "low", so D6101 does not conduct and so only C2113 is switched in parallel with the additional filter. The frequency range around the 34.4 MHz is not suppressed any more by the additional filter enabling PAL/NTSC M reception enabling M reception.
  For all other systems the NTSCM/BG switching signal is "high", D6101 conduct and so both C2159 and C2113 are switched in parallel with the additional filter.

IF-demodulation frequency: For switching to the other IF-demodulation frequency for the SECAM L' system (33.95 MHz). the demodulation reference circuit 5114 on pins 1 and 2 IC7119-4A can be switched by the switching signal L/L'2:

- For BGILDK reception L/L2' is "low", TS7102 does not conduct and so C2101, C2102 and trimming coil 2106 are not switched in parallel to the reference coil 5114. The total reference circuit at pin 1-2 IC7119-4A is tuned to 38.9 MHz.
- For L' reception L/L2' is "high", TS7102 conducts and so C2101, C2102 and trimming coil 2106 are switched in parallel to the reference coil 5114. The total reference circuit at pin 1-2 IC7119-4A is tuned to 33.95 MHz.

IF demodulation: After the SAW filter (and the additional IF filter) the IF signal is supplied to the IF-detector IC7119-4A pins 46 and 47. This IC7119-4A is suitable for both negative (BGIDK) and positive (LL') modulation controlled by the I^2C bus at pin 5-6 IC7119-4C.

Automatic Gain Control (AGC): Delayed AGC control via the AGC voltage on pin 52 (AGC control is used for decreasing the amplification of the tuner-amplifiers in case the incoming signal on pin 46-47 IC7119-4A becomes too high (above the take-over level)). This take-over point can be adjusted via I^2C in the service menu (see chapter 8 of the service manual). The positive/negative switching of this AGC-control is controlled by pin the I^2C. For negative modulation (BGIDK) the AGC circuit controls at the top-sync level, for positive modulation (LL') the AGC circuit controls at the top-white level. The AGC DC signal from pin 52 IC7119-4A is fed to pin 10 of the tuner and is smoothed by C2006 and R3014. TS7009-7010 are used to reduce the tuner AGC time constant during program switching (from low HF level to high HF level or from high HF level to low HF level).

Automatic Frequency Control (AFC): The AFC is obtained from the reference signal of the IF-detector and is via I^2C fed to the µC. The control is modified internally in IC7119-4A for positive or negative modulation (also via I^2C).

IDENT: As the IF-detector is also connected via I^2C fed to the µC, the IF-demodulator can inform the µC whether it has detected a proper signal. In case the sync processor IC7119-4D has found a proper horizontal sync signal (burst) the IF-detector will inform the µC so the µC can start the micro-search via the AFC loop (in case there is no horizontal sync - so no IDENT - for more than 15 minutes, by then the µC will automatically switch the set to stand-by). The IDENT signal is internally fed to IC7119-4C ensuring stable OSD even without transmitter signal (IC7119-4C can be switched to different time constants).

IC7119-4B SOURCE SELECT AND CHROMINANCE/LUMINANCE/SYNCHRONISATION SEPARATION

Sound trap: The baseband CVBS signal of pin 4 IC7119-4A (nominal amplitude of $2V_{pp}$) also contains the sound signals (2CS FM intercarrier sound or NICAM) at a subcarrier of 5.5/6.0/6.5 MHz. These sound signal are filtered out by the sound trap crystals 1122 and/or 1123; Crystal 1122 is a 5.5 MHz ceramic filter and crystal 1123 is a 6.0 MHz (for PAL/NICAM I) or 6.5 MHz (for PAL/SECAM DK) ceramic filter. The output of this sound trap (CVBS-TERR/SAT) is used for video processing (IC7119) and for CVBS output at pin 19 euroconnector 1 (so euroconnector 1 supplies the CVBS signal coming from the tuner).

CVBS input pins 11 and 15: For CVBS processing inside IC7119-4B two CVBS input pins are a available: CVBS-internal from IF-detector IC7119-4A at pin 11 (see CVBS-internal input mode) and CVBS-external from pin 20 euroconnector 1 at pin 15 (see CVBS-EXT 1 input mode).

SVHS/CVBS input pins 8 and 9: For SVHS operation input pins 8-9 IC7119-4B are used. As an extra CVBS input pin 9 can be used.

Input pin 8 is used as chrominance input pin of IC7119-4B. The chroma signal can be supplied from different sources:

- C-INPUT from pin 15 euroconnector 2 (see SVHS-EXT 2 input mode).
- C-INPUT from SVHS front input panel (see SVHS-EXT 3 input mode).
- C-COMB from the COMB filter which extract C-COMB out of CVBS-COMB (when COMB-filter is present).

Input pin 9 can be used both as a luminance input pin and as an extra CVBS/SYNC input pin of IC7119-4B (see CVBS/SVHS source select). The luminance/CVBS/SYNC signal can be supplied by different sources:

- Y-SC2-INPUT from pin 20 euroconnector 2 (see SVHS-EXT 2 input mode).
- Y-FRONT-INPUT from SVHS front input panel (see SVHS-EXT 3 input mode).
- Y-COMB from the COMB filter which extract Y-COMB out of CVBS-COMB (when COMB-filter is present).
- CVBS playback from pin 20 euroconnector 2 (see CVBS-EXT 2 input mode).
- CVBS playback from CVBS front input panel (see CVBS-EXT 3 input mode).
- CVBS from pin 13 IC7119-4C (see TXT-mode).
- SYNC-TXT signal from the teletext decoder (see TXT-mode).

CVBS and SVHS source select: Source select between CVBS internal and external and SVHS is realised via I^2C control by the µC. There are 3 possibilities:

- In case CVBS-internal is selected, the CVBS-internal signal from pin 11 is passed to the luminance/chrominance/sync separator for further video processing.
- In case CVBS-external is selected there are two possibilities: In case there is no SYNC detected at the Y-SVHS input pin 9 IC7119-4B, the CVBS-external signal from pin 15 is passed to the luminance/chrominance/sync separator for further video processing.

In case there is an SYNC signal at pin 9 IC7119-4B this is detected internally by a SYNC-detector. IC7119-4B switches into SVHS mode enabling SVHS processing. In the SVHS mode the Y and C are directly passed to the video controller IC7119-4C. In case the SVHS mode is selected this is communicated to the µC via I^2C.

- In case a special command is given via the I^2C line, the Y-SVHS input pin 9 can be used as a CVBS input pin. This CVBS signal from pin 9 is passed to the luminance/chrominance/sync separator for further video processing.

CVBS output pin 13: Pin 13 IC7119-4B is a CVBS output pin 13 which has a source select inside IC7119-4C between:

- CVBS-internal from pin 11 IC7119-4B
- CVBS-external from pin 15 IC7119-4B
- CVBS which made internal in IC7119-4B by adding the Y and C signals from the SVHS plug.

The selection is realised via I^2C control from the µC and is completely independent of the source selection for further video processing to the CRT. In the MD1.1-E the selected CVBS output at pin 13 CVBS is always the same source which is used for further video processing.

This means that the signal line CVBS-SC2-OUT which goes to pin 19 from euroconnector 2, always gives the source which is displayed on the TV-screen (WYSIWYG; What You See Is What You Get) except when EXT 3 (front) is selected (by then the CVBS signal from the tuner is present at pin 12 so at pin 19 of euroconnector 2).
The CVBS output signal from pin 13 is supplied to:
- the CVBS-OUT at pin 19 euroconnector 2 (via CVBS-SC2-OUT)
- the TXT-decoder via IC7104-2B upper mode (SELECT 2 "high") via the signal line CVBS-TXT (see TXT-mode).

Luminance/chrominance/sync separation: The selected video signal from the CVBS and SVHS source select is used for:
- SECAM chroma decoding via CVBS output pin 36.
- Sync processing at IC7119-4D (internally fed through inside IC7119).
- Luminance processing inside IC7119-4B; the chrominance signal is filtered out (-20dB) by a chroma-trap (filters out the chrominance, so leaving the luminance part) which is internally calibrated at the subcarrier frequency (4.43 MHz from crystal 1117 on pin 33 IC7119-4B or 3.58 MHz from crystal 1118/1119 on pin 32 IC7119-4B).
- Chrominance processing via a chrominance bandpass filter inside IC7119-4B.

Y-OUT/YBIMOS: The Y-OUT/YBIMOS luminance signal is fed to the delay line IC7140 and (if present) to the CTI/HISTOGRAM or CTI/BLACKSTRETCH panel.

ALL POSSIBLE INPUT MODES

CVBS-internal input mode: In the CVBS-Internal mode the CVBS-internal signal from the tuner is via pin 11 IC7119-4B passed to the luminance/chrominance/sync separator for further video processing.
CVBS-EXT 1 input mode: In the CVBS-external mode the CVBS-SC1-INPUT signal from pin 20 euroconnector 1 is via pin 15 IC7119-4B passed to the luminance/chrominance/sync separator for further video processing.
CVBS-EXT 2 input mode; In the CVBS-EXT 2 mode the CVBS-signal from pin 20 euroconnector 2 is passed via pin 9 IC7119-4B to the luminance/chrominance/sync separator for further video processing. In this mode IC7104-2B is in the lower position (SELECT 2 is "low") and IC7104-2A is in the upper position (SELECT 1 is "high"). Two possibilities:
- The front input panel is not present, IC7875 is not present and so the CVBS signal from euroconnector 2 is directly passed via jumper 4875 to pin 9 IC7119-4C.
- The front input panel is present, the FRONT-DETECT switching signal should be "low" (so IC7875 in the EXT 2 mode, so neither a signal from the SVHS nor the CVBS plug at the front input panel is detected). By then CVBS from pin 20 euroconnector 2 is passed via pin 2, to pin 4, to pin 2 to pin 15 IC7875, and then to pin 9 IC7119-4C.

SVHS-EXT 2 input mode: In the SVHS-EXT 2 mode the SVHS-signal from pin 15 and 20 euroconnector 2 is passed via pin 8 and 9 IC7119-4B to the luminance/chrominance/sync separator for further video processing.
- The C-INPUT signal from pin 15 euroconnector 2 is directly fed to pin 8 IC7119-4C.
- The CBVS-SC2 signal from pin 20 euroconnector 2 can also be used as luminance signal input. This Y signal is fed via IC7104-2B (lower position, so SELECT 2 is "low") and IC7104-2A (upper position, so SELECT 1 is "high"). In case the front input panel is not present, IC7875 is not present and so the Y signal at pin 20 from euroconnector 2 is directly passed via jumper 4875 to pin 9 IC7119-4C. In case the front input panel is present, the FRONT-DETECT switching signal should be "low" (so IC7875 in the EXT 2 mode, so neither a signal from the SVHS or the CVBS plug at the front input panel is detected).

CVBS-EXT 3 input mode; In the CVBS-EXT 3 mode the CVBS-signal from the CVBS cinch input plug at the front input panel is passed via pin 9 IC7119-4B to the luminance/chrominance/sync separator for further video processing. In the CVBS-EXT 3 mode IC7104-2B is in the lower position (SELECT 2 is "low") and IC7104-2A is in the upper position (SELECT 1 is "high"). For CVBS-EXT 3 IC7875 is automatically switched into the EXT 3 mode via the FRONT-DETECT switching signal which is "high" in case a SVHS and/or CVBS is present (see diagram J).
SVHS-EXT 3 input mode: In the SVHS-EXT 3 mode the SVHS-signal from pin 15 and 20 euroconnector 3 is passed via pin 8 and 9 IC7119-4B to the luminance/chrominance/sync separator for further video processing.
- The C-FRONT signal from the C-pin of the SVHS connector is directly fed to pin 8 IC7119-4C.
- The Y-FRONT signal the Y-pin of the SVHS connector is fed via IC7104-2B (lower position, so SELECT 2 is "low") and IC7104-2A (upper position, so SELECT 1 is "high") to pin 8 IC7119-4C.
  For CVBS-EXT 3 IC7875 is automatically switched into the EXT 3 mode via the FRONT-DETECT switching signal which is "high" in case a SVHS and/or CVBS plug is present.

TXT-mode: In the TXT-mode the CVBS-signal from pin 13 IC7119-4B passed via pin 9 IC7119-4B to the sync separator only for synchronizing the RGB-TXT which is inserted at the video controller IC7119-4C (so only for TXT mode IC7104-2A is in the lower position, so SELECT 1 is "low"). CVBS-output pin 13 can come from CVBS-internal or CVBS-external or SVHS. This CVBS-output pin is via IC7104-2B (lower position so SELECT 2 "low") and CVBS-TXT fed to the TXT decoder. In the TXT decoder from CVBS-TXT the RGB-TXT and SYNC-TXT signals are extracted.

CHROMINANCE PROCESSING (IC7119-4B AND IC7113)

Chrominance processing; The chrominance signal originates from IC7119-4B and is internally applied to the PAL/NTSC chroma decoder inside IC7119-4B. For SECAM chroma decoding IC7113 is used which obtains its chroma signal via pin 36 IC7119-4B (see pin 36 description). The PAL/NTSC chroma signal is fed via a pre-amplifier and a burst demodulator to the PAL/NTSC R-Y and B-Y demodulator (all inside IC7119-4B). On bases of the burst this PAL/NTSC chroma demodulator determines whether it is a PAL or a NTSC signal and subsequently decodes it as a PAL or a NTSC R-Y and B-Y signal.
Chrominance reference crystals at pin 33 and 32: At pin 33 a 4.43 MHz reference crystal 1117 for locking the PAL and SECAM chrominance oscillator of both chrominance decoders IC7119-4B and IC7113. At pin 32 a 3.565 or 3.575 MHz reference crystals for locking the PAL/NTSC M or PAL N chrominance oscillator of the chrominance decoder inside IC7119-4B is present on pin 32 IC7119-4B. In case the switching signal SYS1 is "high" crystal 1118 (3.579 MHz) is selected for PAL/NTSC M chrominance decoding, in case SYS1 is "low" crystal 1119 (3.582 MHz) is selected for PAL N chrominance decoding. Selection between pin 33 or pin 32 crystal for a full PAL/NTSC multi set, is realised via I^2C.
Pin 36 is the chroma output for feeding the chroma-signal to the SECAM chroma decoder IC7113.
Bidirectional communication line between pin 31 IC7119-4B and pin 1 IC7113 both IC7119-4B and IC7113 "know" whether a PAL or a SECAM signal is detected:
- On AC level there is a 4.43 calibration signal for calibration of the PLL and chroma cloche filter of IC7113.
- On DC level there is a PAL/SECAM switching line enabling automatic selection of IC7119-4B or IC7113 to supply R-Y and B-Y to the delay line IC7271.
  If IC7119-4B has detected a PAL/NTSC signal, pin 31 IC7119-4B becomes 1V5. By then the demodulated R-Y and B-Y will be fed to the output pins 27 and 28 IC7119-4B and so to the delay line IC7140.

Circuit description

If the set is equipped with NICAM L, the NICAM L module is used and replaces the sound IF circuitry on the small signal panel (the TDA3845 (IC7033) on the small signal panel delivers FM and NICAM BG). The output of the IF sound section is the modulated sound on the different sound carriers.
The audio power amplifiers for driving the left and right loudspeakers are on the large signal panel.

SOUND IF

At pin 17 of the tuner, the video IF output is present. This signal is fed to the IF sound circuitry. There are two different versions of the IF sound circuit:
On the small signal panel The circuit built around the IC7033 TDA3845 for FM/AM/NICAM BG sound on the small signal panel. This circuit is used for all versions except for versions with NICAM LL' sound (France).
The signal from the tuner (38.9 MHz for PAL) is filtered by band pass filters 1030/1031 to eliminate the video components of the signal. The correct filter characteristic is determined by the signals L/L' and NTSCM/BG and the transistors TS7030, TS7031 and TS7032. The IC converts the incoming signal between point 1 and 16 from a base of approximately 39 MHz to the baseband signal. The sound carriers are put at the default position (5.5/5.74 MHz for PAL BG). This sound IF signal arrives at the output pin 12 of the IC. At pin 6 the detected AM sound (system L) is available.
On the NICAM L module The IF circuit is present at the NICAM L module on the small signal panel. In case this module is present, the circuits at the small signal panel around the TDA3845, are not present. The NICAM L module has the same function as the sound IF circuit at the small signal panel, but in this module also the NICAM L sound system can be processed. The circuit consists mainly of the IC7001, TDA9815 that integrates a lot of functionality. A band pass filter filters the IF signal before it enters at pin 1 and 2.
The VCO reference centre frequency is set by L5001 and C2004 between pins 24 and 25. This frequency is set to 2 times 38.9 MHz (77.8 MHz) for systems B, G and L.
The signal L/L' which enters the module at pin 8N20, enters the IC at pin 11 and is used to select between system L and system L' If the voltage level of pin 11 is pulled low, the reference VCO centre frequency is decreased (2 times 33.9 MHz) by activating an internal capacitor. This is necessary for system L'. At pin 20 of the IC, the Sound IF signal leaves the IC for demodulation and decoding by the sound module. At pin 12 the demodulated AM mono sound is available. This mono sound is also fed to the sound module.

AUDIO MODULE

Introduction: The sound module used in the MD1 chassis is a new module built around the MSP3400 or the MSP3410 multi standard sound processor.
The MSP3400/3410 is a one chip solution of sound carrier demodulation, sound processing and source selection.
The MSP3410 is designed to simultaneously perform digital demodulation and decoding of NICAM-coded TV stereo sound as well as demodulation of FM-mono sound. Alternatively, two carrier FM systems according to the German and Korean terrestrial specifications or the satellite specifications can be processed with the MSP3410.
The demodulation of AM sound carriers is not done by the audio module. This is done via the conventional sound IF mixing units.
Next to the above mentioned sound features, the sound module contains a headphone amplifier and can optionally be equipped with the 'Incredible Stereo' circuitry.
The audio module is adjustment free.

EUROPEAN SOUND SYSTEMS COVERED BY THE AUDIO MODULE WITH THE MSP3410:

see table

Note: The AM is not demodulated by the MSP3410 but via the IF unit. Versions with the MSP3400 have the same specification except for the demodulation/decoding of NICAM signals.

The module receives the following sound sources:
- The Sound IF signal (SIF) from the small signal panel enters the audio module at pin 1 of I46. This IF signal contains FM audio signals in mono or stereo and, if present, a QPSK modulated signal for digital NICAM sound.

In case of AM sound (for example system L) the detection is done at the sound IF part on the small signal panel. The mono baseband audio enters the module on pin 7 of I46.
- Baseband audio from the external inputs (euroconnector 1, euroconnector 2/Front). Euroconnector 1 is connected to the SC2 input of the MSP3400/3410, euroconnector 2 is connected to the SC3 input of this IC. The SC1 input is used for Incredible Stereo.
- Optionally satellite IF sound can be provided

The sources are directly fed to the MSP3400/3410 IC for further processing. In the MSP3400/3410, IF demodulation, stereo and NICAM decoding (3410 only), source selection, sound processing (volume, bass, treble...) and output selections are done.
The MSP3400/3410 has three stereo audio output DAC's for three stereo output channels:
- The first DAC (pins 28 and 29) delivers the main sound to be fed directly to the Audio Power Amplifiers. The Headphone Amplifier signal can be derived from the main sound signal (in this case separate headphone volume control is not possible).
- The second DAC (pins 25 and 26) delivers a signal for the constant level output to the audio Cinch outputs or for the headphone with separate volume control.
- The third DAC delivers the recording output signals. The output of this DAC is fed to the two internal record selectors from which the signals are fed to the euroconnectors.

The first record selector output (SC1, pins 36 and 37) delivers a signal for the constant level output if the headphone output has separate volume control. This output is also connected to euroconnector 2 via IC7352 (HEF4053). Besides signals to the euroconnectors and Constant Level outputs, the SC1 output is also used to feed back the signal via the Incredible Stereo circuit in case this circuit is present. After this circuit is passed, the signal is fed to the euroconnector 1 input of the MSP IC so that the signal can be further processed as a normal signal coming from the SC1 input. The SC1 input is only used in case the Incredible Stereo circuit is present, so this input has nothing to do with the physical euroconnector 1 or 2 connectors of the set.
The second record selector output (SC2, pins 33 and 34) delivers the signal to euroconnector 1 and 2 via the HEF4053.
The module delivers sound output to:
- The large signal panel for power amplification of the main left and right channel sound.
- The headphone socket
- The constant level audio cinch connectors
- Euroconnector 1 and 2 audio outputs (euroconnector 2 only in case that two euroconnectors are present on the set).

HEADPHONE AMPLIFIER

The headphone amplifier is built around TS7415, 7420 and 7421 for the right channel and around TS7427, 7430, 7431 for the left channel. Jumpers 4413/4425 are present in case the headphone signal is derived from the main audio signal. In this case no separate headphone volume control is possible. The

'Sound Enable' signal from the headphone socket mutes the main audio power amplifiers in case a headphone is connected. By adding bridge wires 9389 and 9387 the separate volume control for the headphone is possible, as via these bridge wires the second DAC operates as headphone output.

RECORD SELECTION

The most important part of the record selection is done by the MSP3410/3400 internally. The outputs of the internal record selectors are called SCART1 and SCART2 (SC1, SC2 at pins' 36/37 and 33/34). The record selector selects a source to be recorded from, between signals coming from the DAC and signals coming from the other inputs SCART1, 2 or 3 (SC1, SC2 and SC3 at pins 52/53, 49/50 and 46/47).
In practice, the signals delivered to the euroconnector 2 are the same as the displayed signals (What You See Is What You Get). The switch HEF4053 (IC7352) feeds the tuner signal to euro-connector 2 in case the signal from euroconnector 2 is played back. This avoids oscillation of the sound in case a VCR feeds through its incoming signals to its outgoing signals. In all other cases of play back, this switch is in the upper position (SC1 output).

INCREDIBLE STEREO

The Incredible Stereo circuit operates via a smart combination of filtering, mixing left with right channels and phase shifting for specific parts of the audio spectrum The left channel is built around dual amplifier IC7350. Via a filter network the left signal enters the positive input at pin 5. The right channel is added to the left channel after filtering via R3376 at the feedback input at pin 6. The output at pin 7 is fed to the euroconnector 1 input of the MSP3410/3400. The right channel operates via the same way but is built around dual operational amplifier IC7351.

DIVERSITY

The audio module can have a lot of different executions because of the large amount of functionality. The following modular functionality creates different modules:

- One or two euroconnectors
- Incredible Stereo present
- Separate headphone volume control
- Satellite
- Dolby
- NICAM (no NICAM / NICAM BGI / NICAM L)

AUDIO AMPLIFIER

The audio amplifier on the large signal panel is built around the TDA2616 (IC7761). This IC contains two audio power amplifiers. Both left and right speakers are connected to this amplifier. The subwoofer is connected to both left and right loudspeaker outputs of the IC. As long as the signal between two positive outputs is zero as both signals are equal, the signal of the left channel is inverted first by TS7760 before it is amplified. This results in a double signal output to the subwoofer. In order to have a correct phase between the left and right loudspeaker, one of the two loudspeakers is inverted by means of crossed wire to the loudspeaker.
The sound enable line which enters the IC at pin 2, mutes the power amplifier in case that the set is switched to stand-by (anti-plop system with transistor TS7763).
The DBE panel (Dynamic Bass Enhancement) is presently not used.

TV system	Carrier [MHz]	Modulation	Colour system	Country (example)
B/G	5.5/5.74	FM-stereo	PAL	Germany
B/G	5.5/5.85	FM-Mono/NICAM	PAL	Spain
L	6.5/5.85	AM-Mono/NICAM	SECAM	France
I	6.0/6.552	FM-Mono/NICAM	PAL	UK
D/K	6.5	FM-Mono	SECAM	USSR
M	4.5	FM-Mono	NTSC	USA
Satellite	6.5	FM-Mono	PAL	Astra
Satellite	7.02/7.20	FM-Stereo	PAL	Astra

A 4

AUDIO AMPLIFIER

AUDIO PANEL D1

2 L28 P-GND
3 L28 3,15V AUDIO_L 2751 A1
1 L28 A2 3,15V
1 L89 L-AFU
6 L89 LR-EXT 9782
R-AFU
3 L89 AUDIO_R 2752
2 L89 P-GND

FEATURE UNIT PANEL K (RESERVED)

7 L89 S-AFU
5 L89 C-AFU
4 L89 RES
8 L89 NC
9 L89 NC

1L116
4L116 +13A
6L116 GND-AUDIO
7L116
2L116
5L116
3L116 R-DBE

H DBE PANEL (RESERVED)

1L200 SOUND-SUP
5L200
7L200
4L200
2L200
6L200 P-GND
3L200 GND-AUDIO1

9755 RES
2765 *
9756 * SNDR+-SPEAKER 1L38
9751
9750 RES
SNDR--SPEAKER 2L38
P-GND
SNDL--SPEAKER 3L38
P-GND
SNDL+-SPEAKER 4L38
9754 RES
2766 *
9753 RES
SND+-SUBW 1L39
2L39
SND--SUBW 3L39
9752 RES
P-GND

RIGHT
LEFT
MONO / SUBWOOFER

2*12W	2*8W	2*5W
SND01	SND02	SND03
220u	220u	220u
1u	1u	1u
1u	1u	1u
1n	1n	1n
1000u	1000u	1000u
1000u	1000u	1000u
470p	470p	470p
22n	22n	22n
1u	1u	1u
8R2	8R2	8R2
2K2	2K2	2K2
3K3	3K3	3K3
4K3	4K3	4K3
22K	22K	22K
56K	56K	56K
3K3	4K7	8k2
33K	22K	15k
3K3	4K7	8k2
33K	22K	15k
BC548B	BC548B	BC548B
+	+	+

(From A1) +13vs
3754 *
2750 *
GND-AUDIO
3759 *
3757 *
+13A
14V
2789 *
7760 *
9757
3758 *
3,5V
2,9V
9786
GND-AUDIO1 P-GND GND-AUDIO
2760 *
3756 *
GND-AUDIO GND-AUDIO

3760 *
3755 R2S
3764
3762 *

2776 1n
P-GND

SOUND-SUP 30,5V
7761 TDA2616Q/N1
7
15,3V 9
15,4V 3
3761 *
9781
15,3V 8
2756 220u
P-GND
30,5V 2
15,2V 1
2778 *
P-GND
5
P-GND

RES 6751
15,3V 6
30,5V
6750 RES
2755 10 2200
P-GND
4 15,3V

A10
2788 22n
3752 RES
P-GND
A11
9758
2787 *
A1A4 P111
3753 *
P-GND

A1-02 0V
GND-SOUND-SUPPLY
3751 RES
5751 10u
P-GND
3750 RES
28V
SOUND-SUP
A1-01 30,7V
SOUND-SUPPLY
5750 10u

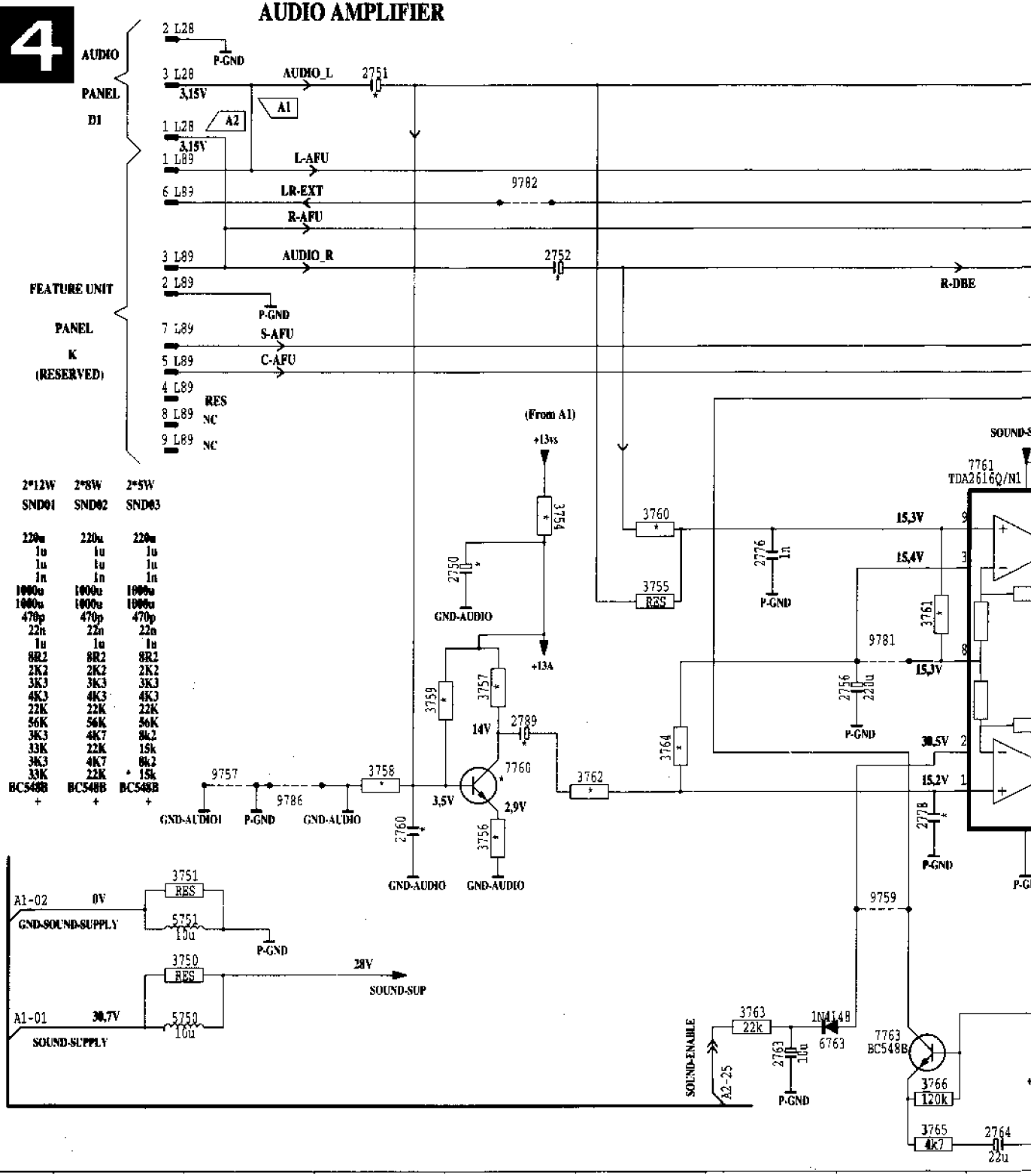
SOUND-ENABLE A2-25
3763 22k
1N4148 6763
2763 10u
P-GND

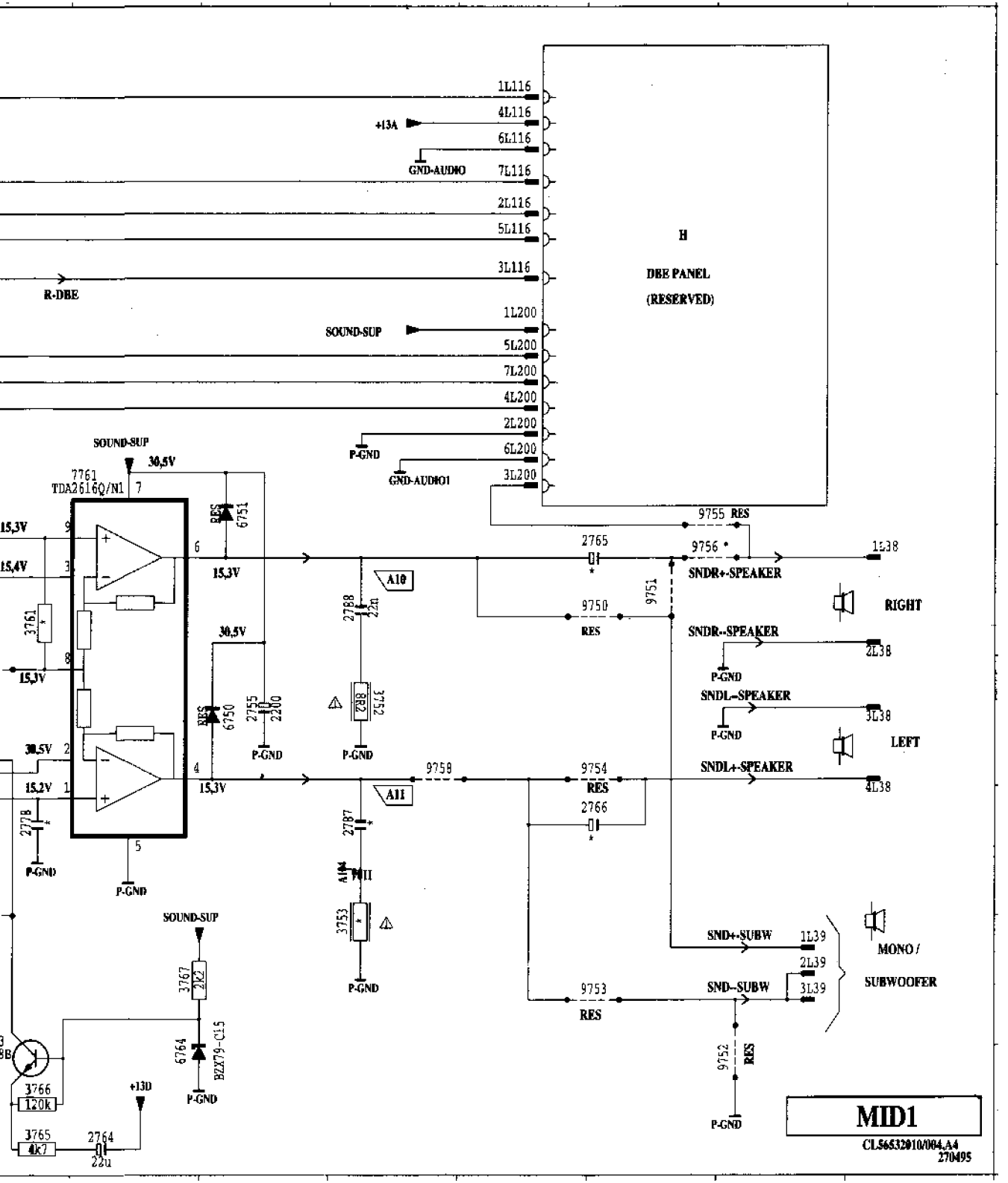
9759
SOUND-SUP
3767 2k2
7763 BC548B
6764 BZX79-C15
P-GND
3766 120k
+13D
3765 4k7
2764 22u

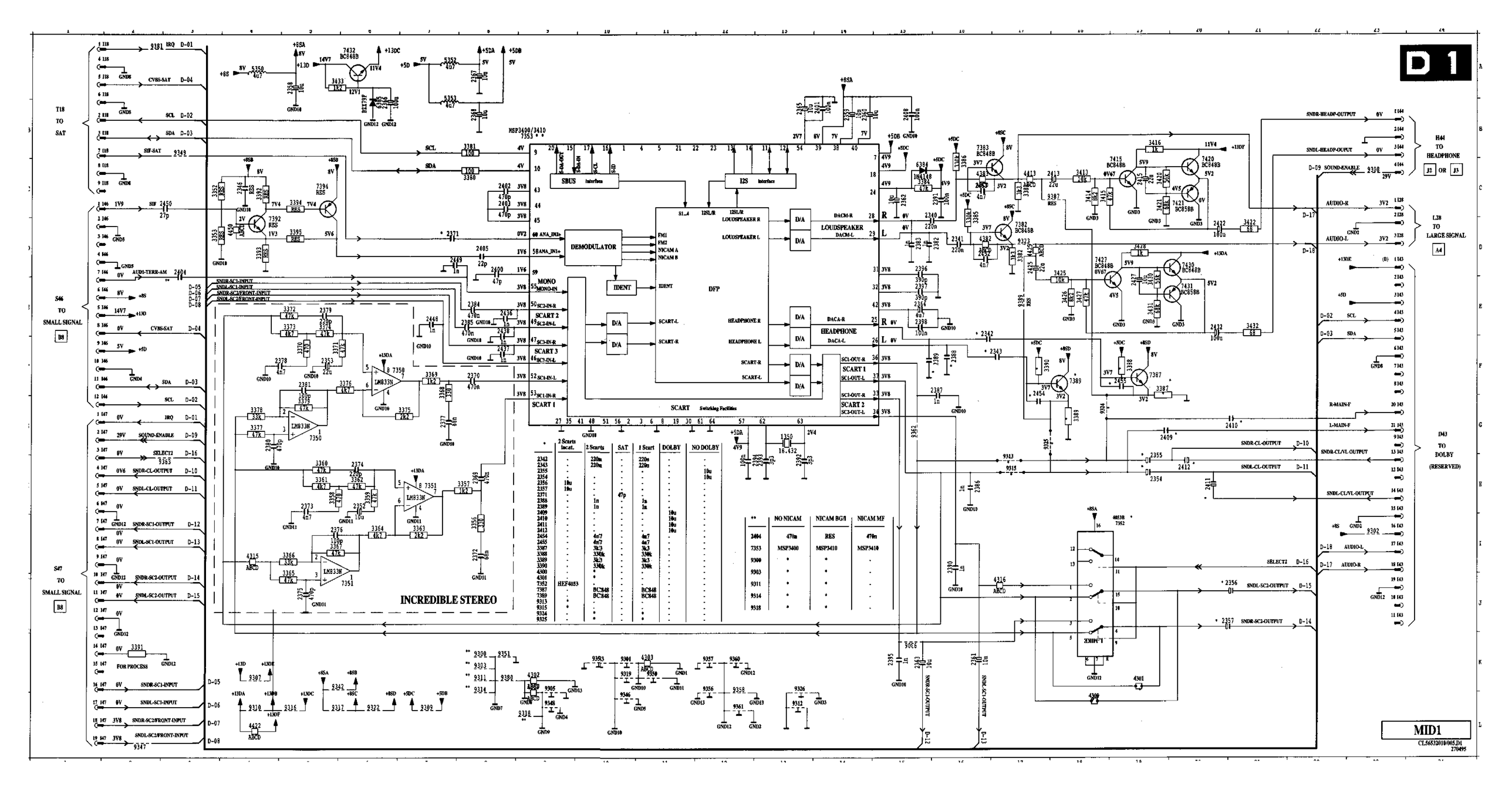
MID1
CL56532010/004.A4
270495

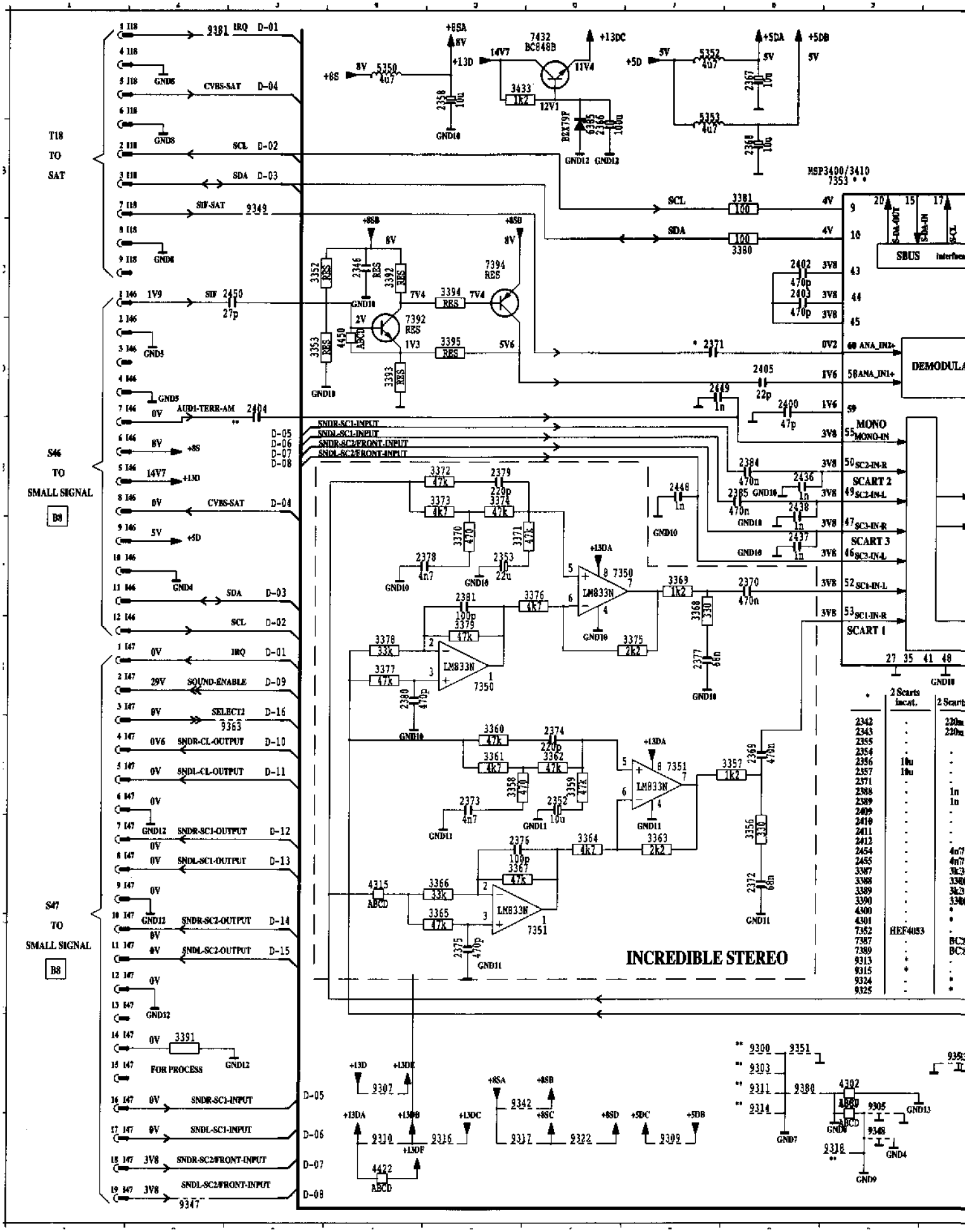
A 4

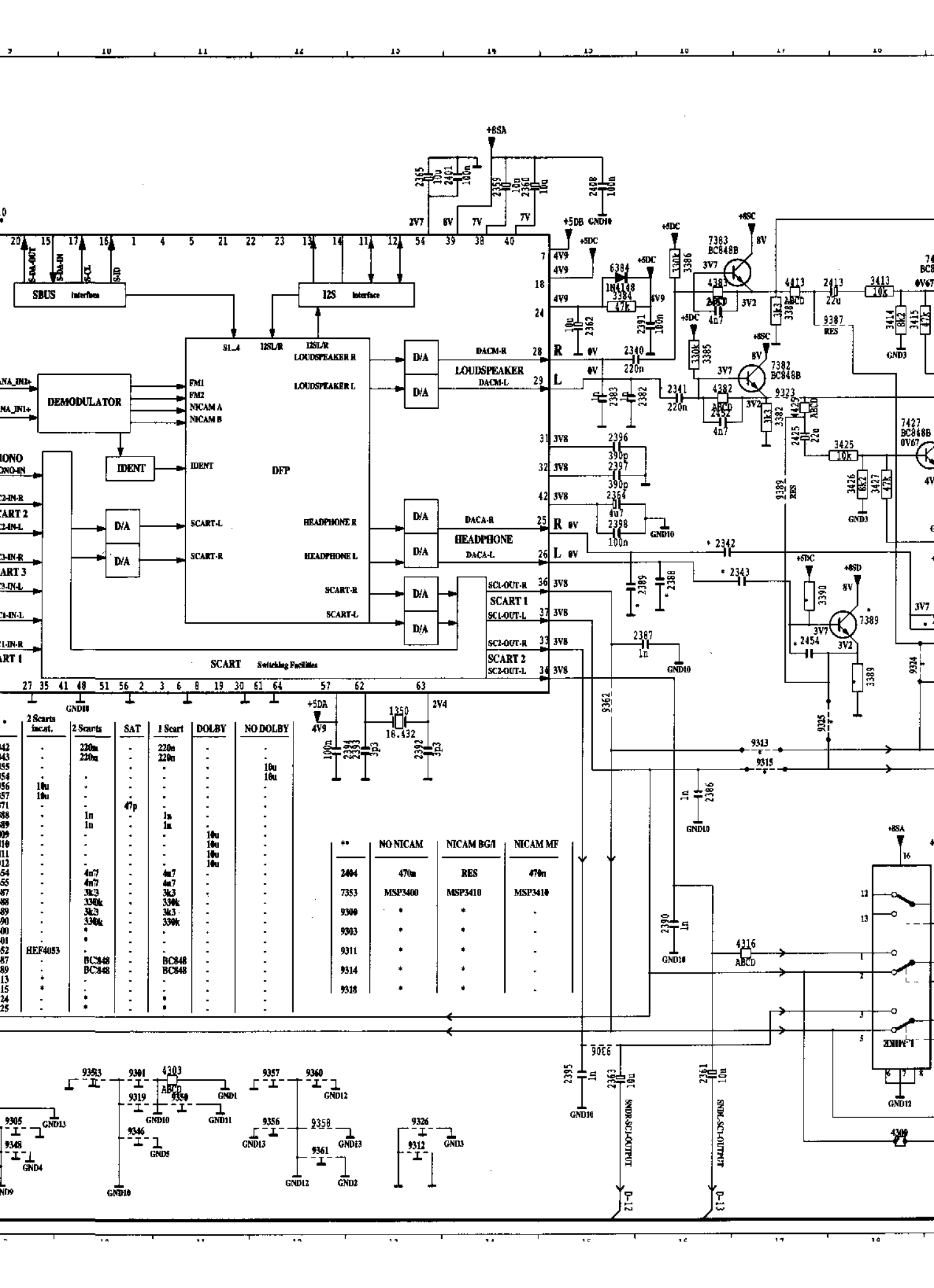
AUDIO AMPLIFIER

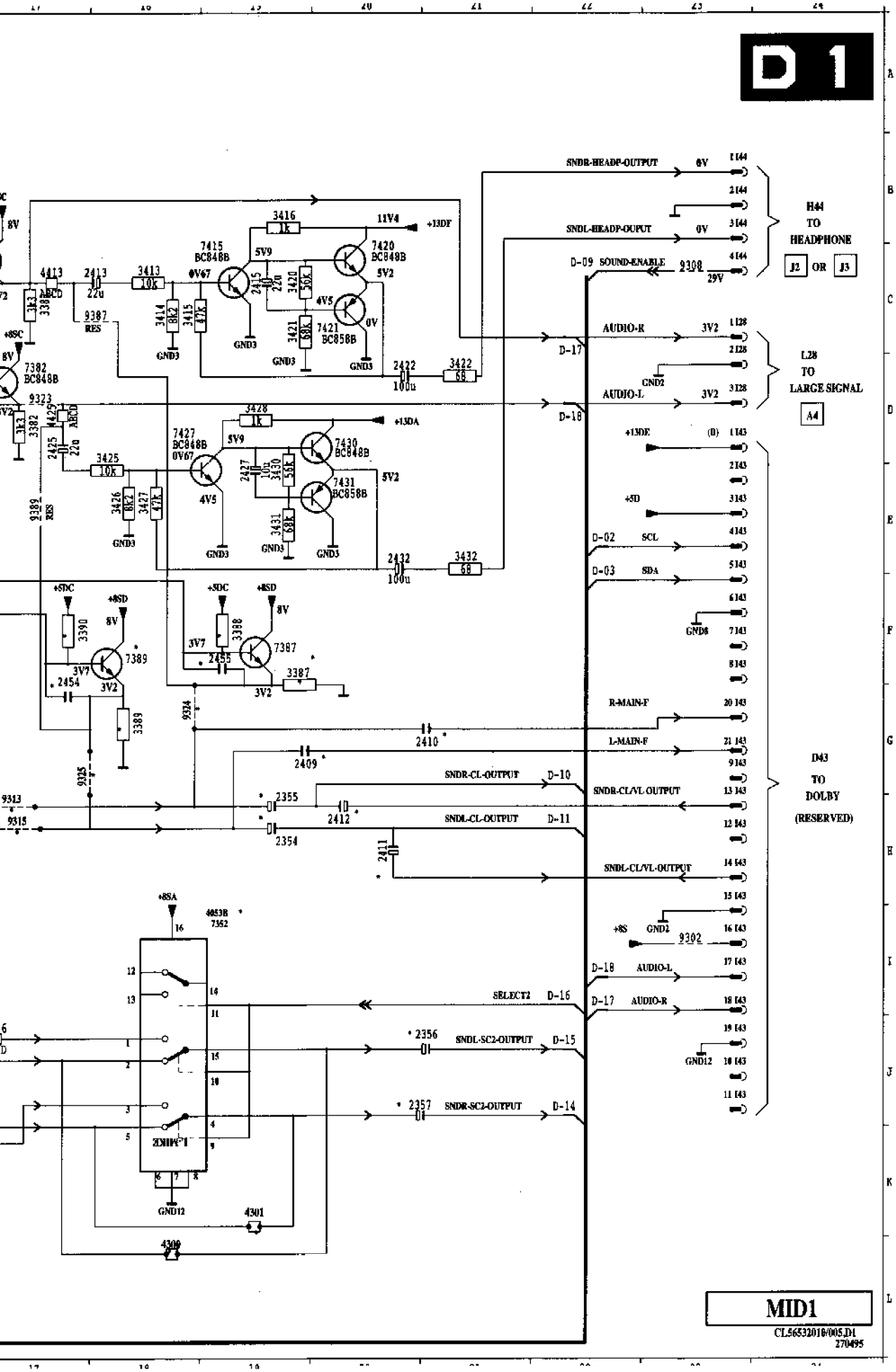


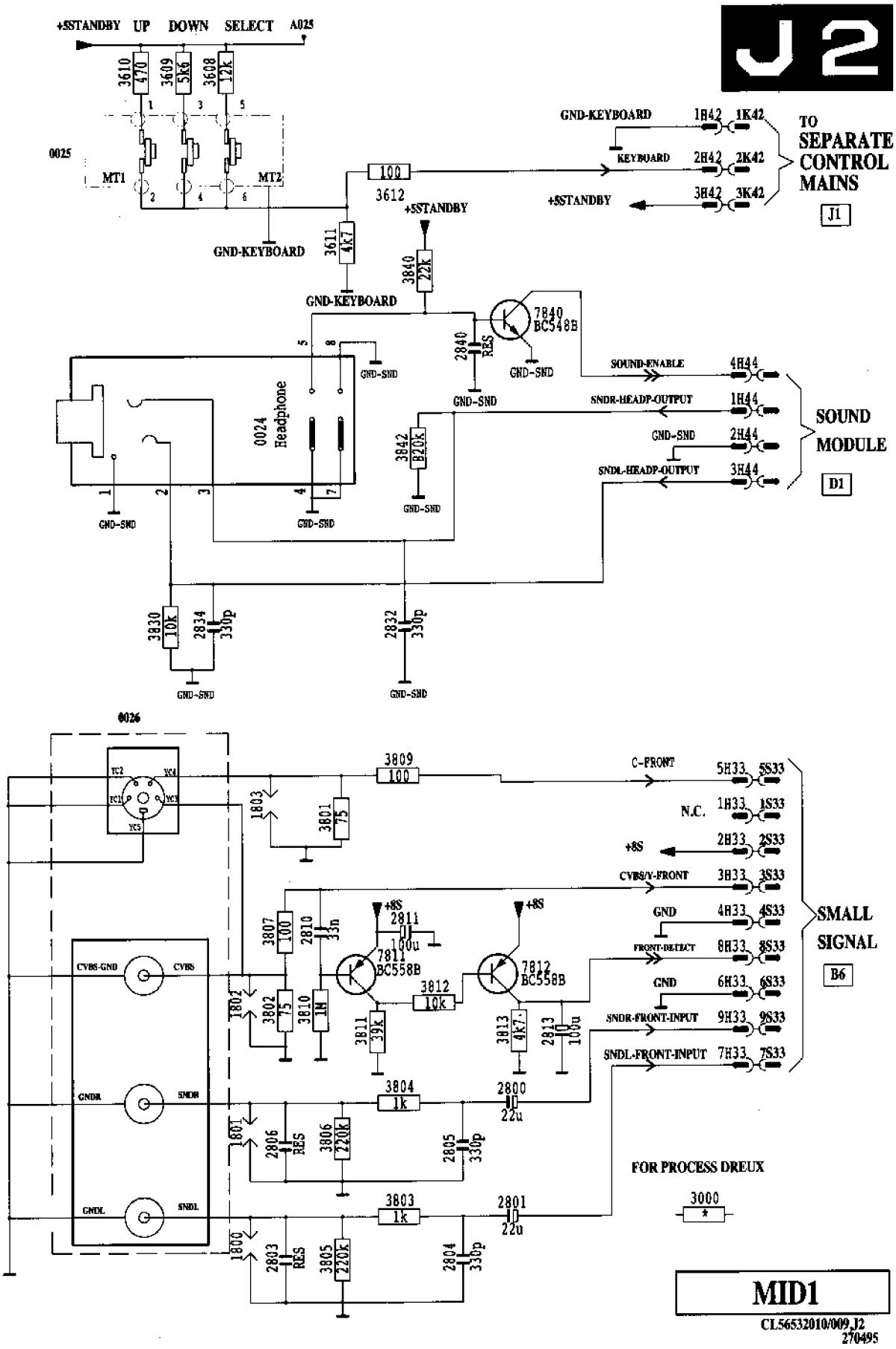

1L116
4L116
+13A
6L116
GND-AUDIO
7L116
2L116
5L116
3L116
R-DBE
H
DBE PANEL
(RESERVED)
1L200
SOUND-SUP
5L200
7L200
4L200
2L200
6L200
P-GND
GND-AUDIO1
3L200
9755 RES
SOUND-SUP
30,5V
7761
TDA2616Q/N1
7
15,3V
9
15,4V
3
3761
8
15,3V
6751
RES
6
15,3V
2765
9756 *
1L38
SNDR+-SPEAKER
A10
2788
22n
9750
RES
9751
RIGHT
SNDR--SPEAKER
2L38
P-GND
SNDL--SPEAKER
3L38
P-GND
LEFT
30,5V
6750
RES
2755
10
2200
P-GND
3752
P-GND
2
15,2V
1
4
15,3V
9759
9754
RES
SNDL+-SPEAKER
4L38
A11
2766
2778
2787
P-GND
A10
A11
3753
P-GND
SOUND-SUP
SND+-SUBW
1L39
2L39
MONO /
SUBWOOFER
3767
2k2
9753
RES
SND--SUBW
3L39
6764
BZX79-C15
9752
RES
P-GND
3766
120k
+13D
3765
4k7
2764
22u
P-GND
MID1
CL56532010/004.A4
270495


D 1
MSP3400/3410
7353 * *
SBUS Interface
I2S Interface
DEMODULATOR
IDENT
DFP
SCART Switching Facilities
LOUDSPEAKER
HEADPHONE
SCART 1
SCART 2
SCART 3
MONO
INCREDIBLE STEREO
MID1
CL56532018/005.D1
270495


T18 TO SAT
S46 TO SMALL SIGNAL B8
S47 TO SMALL SIGNAL B8
IRQ D-01
CVBS-SAT D-04
SCL D-02
SDA D-03
SIF-SAT 9349
SIF 2450 27p
AUD1-TERR-AM 2404
+8S
+13D
CVBS-SAT D-04
+5D
SDA D-03
SCL D-02
IRQ D-01
SOUND-ENABLE D-09
SELECT2 D-16 9363
SNDR-CL-OUTPUT D-10
SNDL-CL-OUTPUT D-11
SNDR-SC1-OUTPUT D-12
SNDL-SC1-OUTPUT D-13
SNDR-SC2-OUTPUT D-14
SNDL-SC2-OUTPUT D-15
FOR PROCESS 3391
SNDR-SC1-INPUT D-05
SNDL-SC1-INPUT D-06
SNDR-SC2/FRONT-INPUT D-07
SNDL-SC2/FRONT-INPUT D-08 9347
+8SA +8SB +13DC +5DA +5DB
7432 BC848B
B2X79F
MSP3400/3410 7353
SCL 3381 100
SDA 100 3380
SBUS interface
ANA_IN2+
ANA_IN1+
DEMODULA
MONO MONO-IN
SC2-IN-R
SC2-IN-L
SCART 2
SC3-IN-R
SC3-IN-L
SCART 3
SC1-IN-L
SC1-IN-R
SCART 1
LM833N 7350
LM833N 7351
INCREDIBLE STEREO
2 Scarts incat.
HEF4053


SBUS interface
I2S interface
DEMODULATOR
FM1
FM2
NICAM A
NICAM B
IDENT
DFP
LOUDSPEAKER R
LOUDSPEAKER L
LOUDSPEAKER
DACM-R
DACM-L
HEADPHONE
DACA-R
DACA-L
SCART-L
SCART-R
HEADPHONE R
HEADPHONE L
SCART 1
SCART 2
SC1-OUT-R
SC1-OUT-L
SC2-OUT-R
SC2-OUT-L
SCART Switching Facilities
D/A
+8SA
+5DB
+5DC
+8SC
+8SD
+5DA
GND10
GND3
GND4
GND5
GND9
GND11
GND12
GND13
GND1
GND2
2 Scarts incat.
2 Scarts
SAT
1 Scart
DOLBY
NO DOLBY
NO NICAM
NICAM BG/I
NICAM MF
HEF4053
BC848
MSP3400
MSP3410
MSP3418
RES
ABCD
SNDCLOCKOUT
SNDDATAOUT
D-12
D-13


D 1
SNDR-HEADP-OUTPUT
SNDL-HEADP-OUTPUT
D-09 SOUND-ENABLE
H44 TO HEADPHONE
J2 OR J3
AUDIO-R
AUDIO-L
L28 TO LARGE SIGNAL
A4
+13DE
+5D
D-02 SCL
D-03 SDA
R-MAIN-F
L-MAIN-F
SNDR-CL-OUTPUT
SNDL-CL-OUTPUT
SNDR-CL/VL-OUTPUT
SNDL-CL/VL-OUTPUT
D43 TO DOLBY (RESERVED)
SELECT2
SNDL-SC2-OUTPUT
SNDR-SC2-OUTPUT
MID1
CL56532016/005.D1
270495


J2
+5STANDBY UP DOWN SELECT A025
3610 470
3609 5K6
3608 12k
0025
MT1
MT2
100
3612
GND-KEYBOARD
3611 4K7
+5STANDBY
3840 22k
GND-KEYBOARD
7840 BC548B
2840 RES
GND-SND
0024 Headphone
3842 820k
GND-KEYBOARD 1H42 1K42
KEYBOARD 2H42 2K42
+5STANDBY 3H42 3K42
TO SEPARATE CONTROL MAINS
J1
SOUND-ENABLE 4H44
SNDR-HEADP-OUTPUT 1H44
GND-SND 2H44
SNDL-HEADP-OUTPUT 3H44
SOUND MODULE
D1
3830 10k
2834 330p
2832 330p
0026
3809 100
1803
3801 75
C-FRONT 5H33 5S33
N.C. 1H33 1S33
+8S 2H33 2S33
CVBS/Y-FRONT 3H33 3S33
GND 4H33 4S33
FRONT-DETECT 8H33 8S33
GND 6H33 6S33
SNDR-FRONT-INPUT 9H33 9S33
SNDL-FRONT-INPUT 7H33 7S33
SMALL SIGNAL
B6
3807 100
2810 33n
2811 100u
7811 BC558B
7812 BC558B
3812 10k
3811 39k
3813 4K7
2813 10 100u
CVBS-GND
CVBS
3802 75
3810 1N
1802
GNDR
SNDR
3804 1k
2800 22u
1801
2806 RES
3806 220k
2805 330p
GNDL
SNDL
3803 1k
2801 22u
1800
2803 RES
3805 220k
2804 330p
FOR PROCESS DREUX
3000
*
MID1
CL56532010/009_J2
270495

B 7

CONTROLS

DESCRIPTION ITEM/BLOCK	BG DK STEREO SYS01	I NICAM SYS06	BG ST/NIC SYS08	OTHERS
3670	-	4k7	4k7	-
4602	JMP	-	-	-

L10 LARGE SIGNAL PANEL A1

L15 LARGE SIGNAL PANEL A2

TMP87CM36 CPU

DATA PROCESSOR

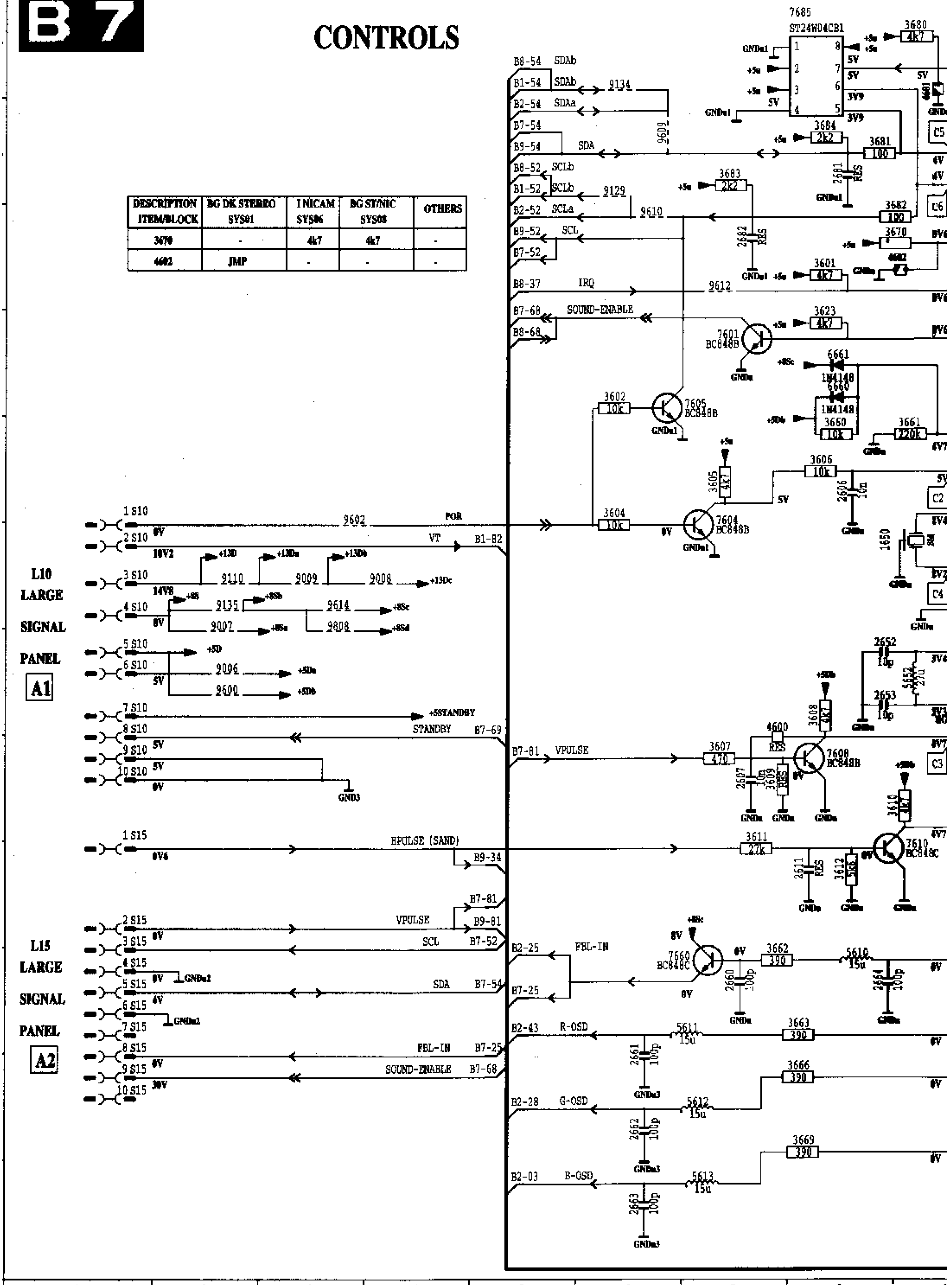
MID1

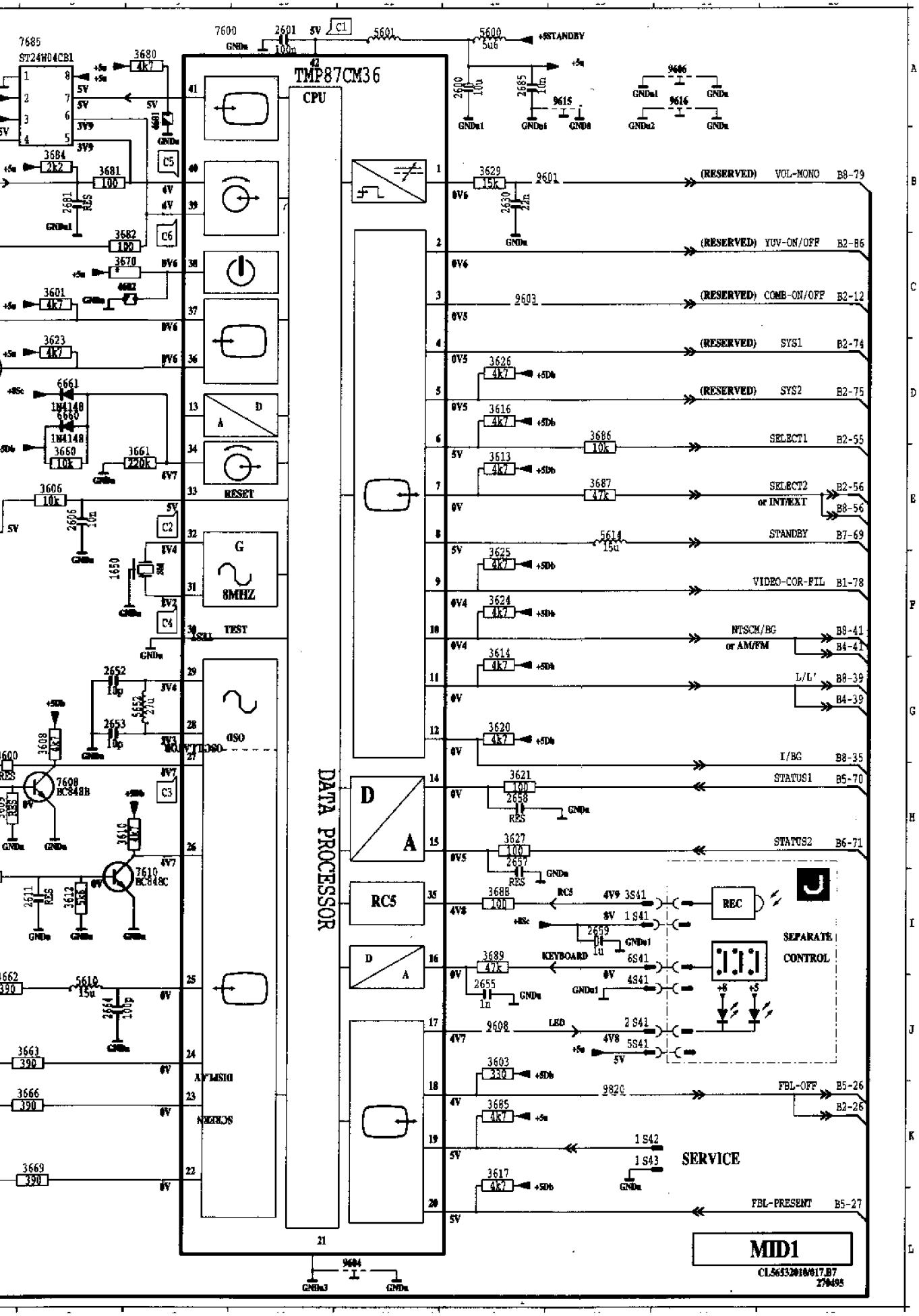
CL56532016017.B7 270495

B 7

CONTROLS

DESCRIPTION ITEM/BLOCK	BG DK STEREO SYS01	I NICAM SYS06	BG ST/NIC SYS08	OTHERS
3670	-	4k7	4k7	-
4602	JMP	-	-	-




TMP87CM36
CPU
DATA PROCESSOR
8MHZ
RESET
TEST
OSD
DISPLAY
SCHEDS
RC5
KEYBOARD
LED
REC
SEPARATE CONTROL
SERVICE
(RESERVED) VOL-MONO B8-79
(RESERVED) YUV-ON/OFF B2-86
(RESERVED) COMB-ON/OFF B2-12
(RESERVED) SYS1 B2-74
(RESERVED) SYS2 B2-75
SELECT1 B2-55
SELECT2 B2-56
or INT/EXT B8-56
STANDBY B7-69
VIDEO-COR-FIL B1-78
NTSCM/BG B8-41
or AM/FM B4-41
L/L' B8-39
B4-39
I/BG B8-35
STATUS1 B5-70
STATUS2 B6-71
FBL-OFF B5-26
B2-26
FBL-PRESENT B5-27
MID1
CL56532010/017.B7
270495

ITEM/BLOCKS	CRT03:BLS	CRT04:25&28"BM	CRT05:21"NNBM
2300	390p	330p	270p
2320	330p	390p	270p
2340	390p	270p	220p
3129	180K	150K	390K
3302	150	150	220
3322	150	150	220
3342	180k	150k	390k
3360	120	100	100
3369	120	100	100
3370	120	100	100
3399	1k	680	100
5381	33u	27u	33u

S40
SMALL SIGNAL
B2

SCAVEM
(RESERVED)

L24
LARGE SIGNAL
A2

TO L.O.T
FROM A

FOR PROCESS DREUX

MID1

CL5653210/007.C
270495

B5

EUROCONNECTOR 1

+8Va
8V
6800 EZX79C27
6801 EZX79C27
130

B8-65 SNDR-SC1-OUPUT
C 3800 330
3802 220k
2800 1n
1800

B8-61 SNDL-SC1-OUPUT
C 3801 330
3803 220k
2801 1n
1801

C 3812 4K7 — 1802 — 2812 330p — SNDR-SC1-INPUT B8-87
1803
C 3813 4K7 — SNDL-SC1-INPUT B8-60
C 3815 330 — B-SC-INPUT B2-04
C 3816 6k8 — STATUS1 B7-70
3814 75 — 2813 330p — 2817 330p — 3817 4K7 — 3832 1K8 — GNDA

+8Sa
9801
3805 10
+8Va
2805 10 — 2806 220 — RES

C 3819 330 — G-SC-INPUT B2-29
3818 75 — 3833 1K8 — GNDA
C 3820 330 — R-SC-INPUT B2-44
3834 1K8 — GNDA

CVBS-TERR/SAT
B1-19
3806 470
7805 BC548B
3807 RES — GND5
3808 220
C 3810 68 — 1V4
FBL1
C 3821 100 — 9816 — 0V
3824 75 — 3825 75
3826 120 — 0V — 3827 330 — FBL-IN B2-25
7826 BC848B — 0V7 — 3828 1k — FBL-OFF B7-26
GNDu
C 3822 330 — 9819 CVBS-SC1-INPUT B2-16
3823 75
6830 BAT85
3830 22k — 3831 2k2 — 0V — 7830 BC848C — FBL-PRESENT B7-27
5V
2830 10u — GNDu
0V

+8Sb 8V 3837 RES
2837 RES — 6835 RES — RES — 6836 RES
132
SNDR-CL-OUTPUT B8-64
C 3835 330 — 3888 220k — 2835 1n — R
SNDL-CL-OUTPUT B8-59
C 3836 330 — 3889 220k — 2836 1n — L
3 4

9005
9004
9805
9810
9811

MID1
CL56532010/015,B5
270495

B6

EXT 3

J SEPARATE CONTROL FRONT

SVHS
CVBS
R
L

FRONT-DETECT
CVBS/Y-FRONT-INPUT
SNDR-FRONT-INPUT
SNDL-FRONT-INPUT
5 S33
8 S33
3 S33
2 S33
9 S33
4 S33
7 S33
1 S33
6 S33

+8Sb 3875 220 — 2875 100n
HEF4053B 7875
4875 4876 4877
C 3879 100 — 9804 — 2878 220n — 2879 220n
9807
3881 RES — 3882 RES — 3883 RES — 3880 RES — 2880 RES

C-FRONT B6-46
CVBS-SC2 B6-17
B2-21 CVBS/Y-SC2/FRONT-INPUT
B8-67 SNDR-SC2/FRONT-INPUT
9806 B8-63 SNDL-SC2/FRONT-INPUT

EUROCONNECTOR 2

+8Sd
2842 RES
6840 RES — 6841 RES
131

B8-66 SNDR-SC2-OUTPUT
C 3840 330 — 3842 220k — 2840 1n — 1805
B8-62 SNDL-SC2-OUTPUT
C 3841 330 — 3843 220k — 2841 1n — 1804

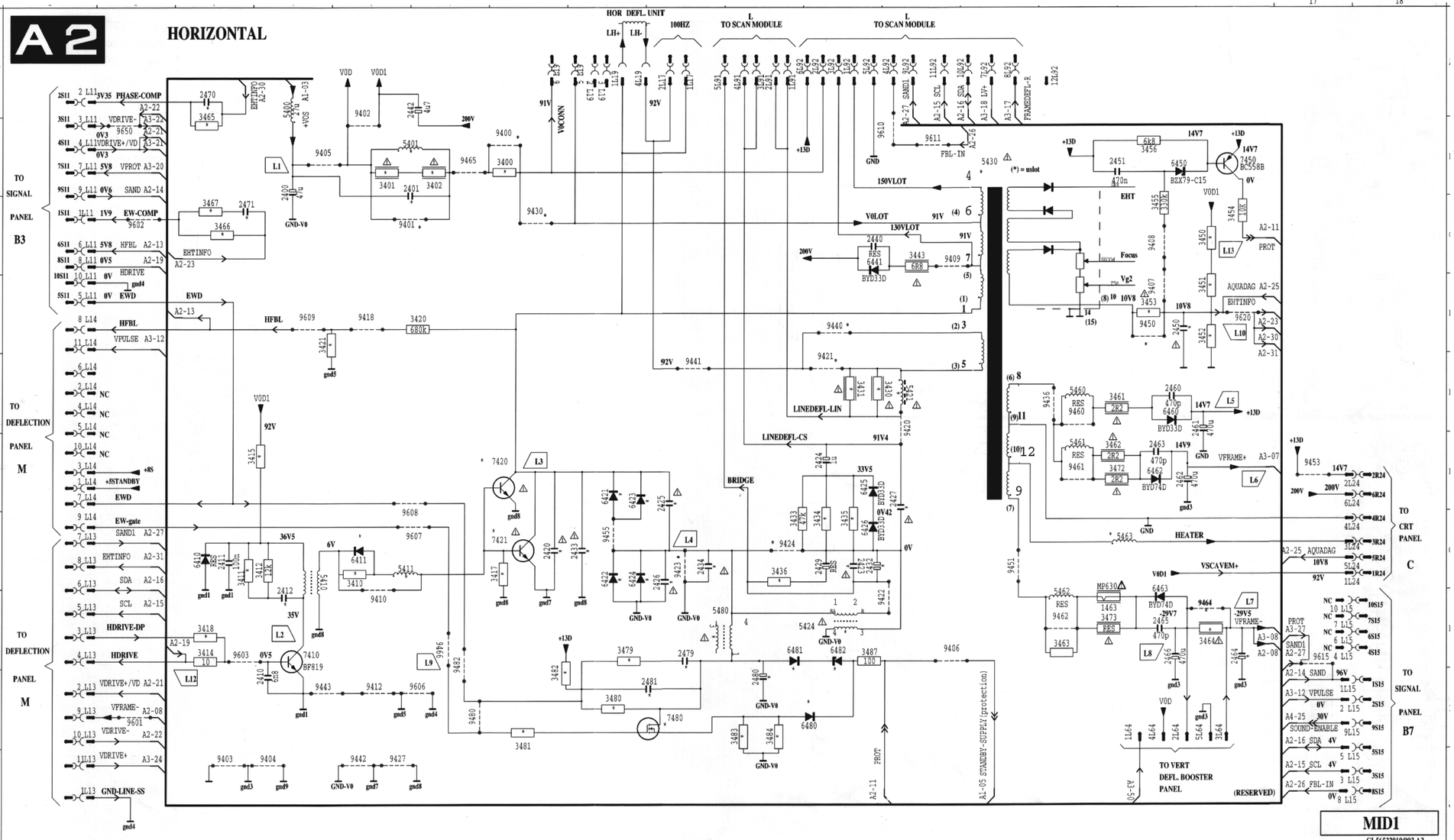
SNDR
C 3855 4K7 — 1807 — 2855 330p — 3856 220k — 2856 22u
SNDL
C 3857 4K7 — 1806 — 2857 330p — 3858 220k — 2858 22u
C 3859 6k8 — STATUS2 B7-71
2860 100n — 3860 4K7

+8Sd
3847 10
3850 470 — 2847 10 22u
CVBS-SC2-OUT
B2-13 9137
3848 470
7850 BC848B — 7851 BC858B
3851 820 — 2852 RES
C 3853 68 — 6850 BZX79C27
3852 680
C 3865 82
C 3866 330 — 9868 — 9818 — 9122 — C-INPUT B2-11
C-FRONT B6-46
C 3869 75
CVBS-SC2 B6-17

MID1
CL56532010/016,B6
270495

A2

HORIZONTAL



L01 140V DC 25*/
95V DC 21*

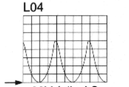
L05 14V DC

L06 14V DC

L07 29V DC

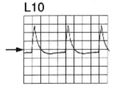
L08 -29V DC

L04



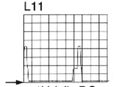
20V / div AC
5ms / div

L10



2V / div AC
5ms / div

L11



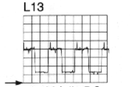
1V / div DC
10µs / div

L12



0.2V / div DC
20µs / div

L13



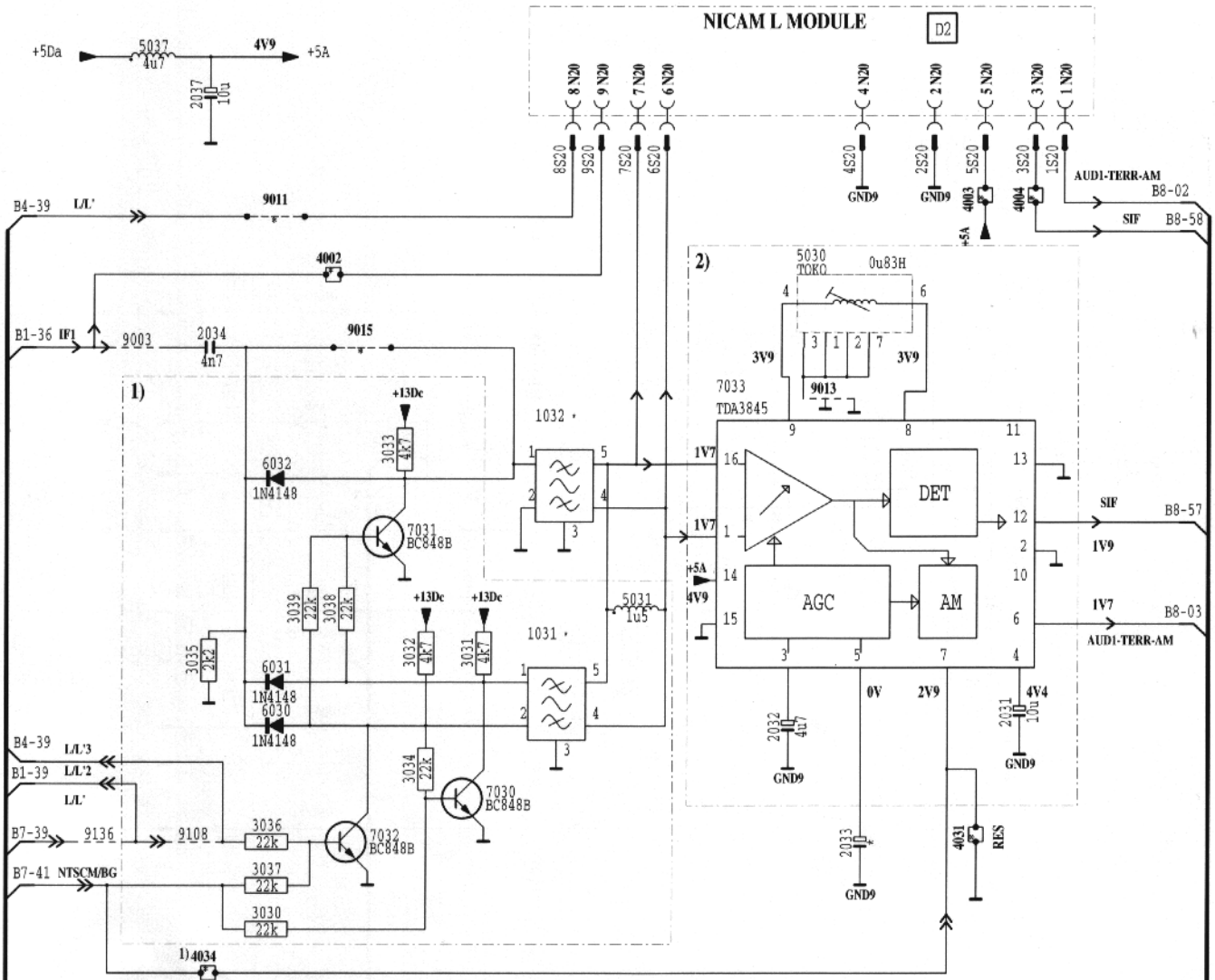
0.1V / div DC
20µs / div

→ = 0V

	28" 16/9 CRT 00	24" 16/9 CRT 01	29"SF CRT 02	28" BLS CRT 03	25/28"BM CRT 04	21"BM CRT 05	25"SF CRT 06
2401	-		-	-	-	10n	-
2412	1n	1n	1n	1n	1n	1n	-
2420	1n5	1n5	1n5	-	-	res	-
2423	470n	470n	470n	470n	390n	-	-
2425	11n	12n	13n	12n	8n2	11n	-
2426	27n	27n	27n	27n	22n	-	-
2427	470n	470n	680n	390n	390n	680n	
2432	-	-	-	-	-	res	
2433	-	-	-	1n5	1n5	1n5	1n5
2434	-	-	-	-	-	-	res
2450	100n	100n	100n	100n	100n	100n	-
2464	-	-	-	-	-	1000u	-
2470	-	-	-	-	res	-	-
2471	-	-	-	-	res	-	-
2479	res	-	-	-	-	-	-
2480	4u7	4u7	4u7	4u7	4u7	-	-
2481	470p	470p	470p	470p	470p	-	-
3400	-	-	-	-	-	res	
3401	-	-	-	-	-	22R	
3402	-	-	-	-	-	22R	
3410	-	-	-	-	-	-	res
3411	4k7	4k7	4k7	4k7	4k7	4k7	
3415	5k6	5k6	4k7	6k8	5k6	2k2	
3417	47	47	47	47	res	res	
3418	-	-	-	-	-	-	res
3421	-	-	-	5k6	5k6	10k	
3430	-	-	-	3k3	3k3	2k7	
3431	-	-	-	3k3	3k3	2k7	
3434	-	-	-	68k	68k	39k	
3435	-	-	-	68k	68k	39k	
3436	res	res	res	res	res	-	
3450	39k	39k	39k	39k	68k	39k	
3451	39k	39k	39k	39k	47k	39k	
3452	18k	18k	18k	27k	27k	39k	
3453	-	-	-	-	-	-	res
3464	-	-	-	-	-	5R6	
3465	-	-	-	680k	15M	2M2	
3466	-	-	-	820k	560k	680k	
3467	-	-	-	res	-	-	
3479	-	-	-	-	-	-	res
3480	100k	100k	100k	68k	68k	-	
3481	1k	1k	1k	1k	1k	-	
3482	82k	82k	82k	82k	82k	-	
3482	4R7	4R7	4R7	4R7	4R7	-	
3484	4R7	4R7	4R7	4R7	4R7	-	
5401	-	-	-	-	-	15u	
5411	res	res	res	res	res	res	
5421	LC90	LC90	LC90	LC90	AT4042/97	AT4042/97	
5424	BA COIL	BA COIL	BA COIL	BA COIL	BA COIL	-	
5430	CML16P	CML16P		CML16	USLOT+	USLOT+	
5463				22u	22u	33u	
5480	+	+	+	+	+	-	
6411	res	res	res	res	res	res	
6421	-	-	-	-	-	-	BY359F-1500
6422						-	BY229F-600
6423	BY228/20	BY228/20	BY228/20	BY228/20	BY228/20	res	
6424	BYW95C/20	BYW95C/20	BYW95C/20	BYW95C/20	BYW95C/20	-	
6480	1N4148	1N4148	1N4148	1N4148	1N4148	-	
6481	1N4148	1N4148	1N4148	1N4148	1N4148	-	
6482	BZX79C39	BZX79C39	BZX79C39	BZX79C39	BZX79C39	-	
7420	BU2508AF	BU2508AF	BU2508AF	BU2508AF	BU2508AF	BU2506AF	
7421	-	-	-	-	-		
7480	MTP3055	MTP3055	MTP3055	MTP3055	MTP3055		
9400	+	+	+	+	+	+	
9401	+	+	+	+	+	+	
9421	-	-	+	-	-	-	
9423	-	-	-	-	-	+	
9424	-	-	-	-	-	-	
9430	-	+	+	+	+	+	
9440	+	+	+	+	+	+	
9450	+	+	+	+	+	+	
9464	+	+	+	+	+	+	

B 4 IF SOUND

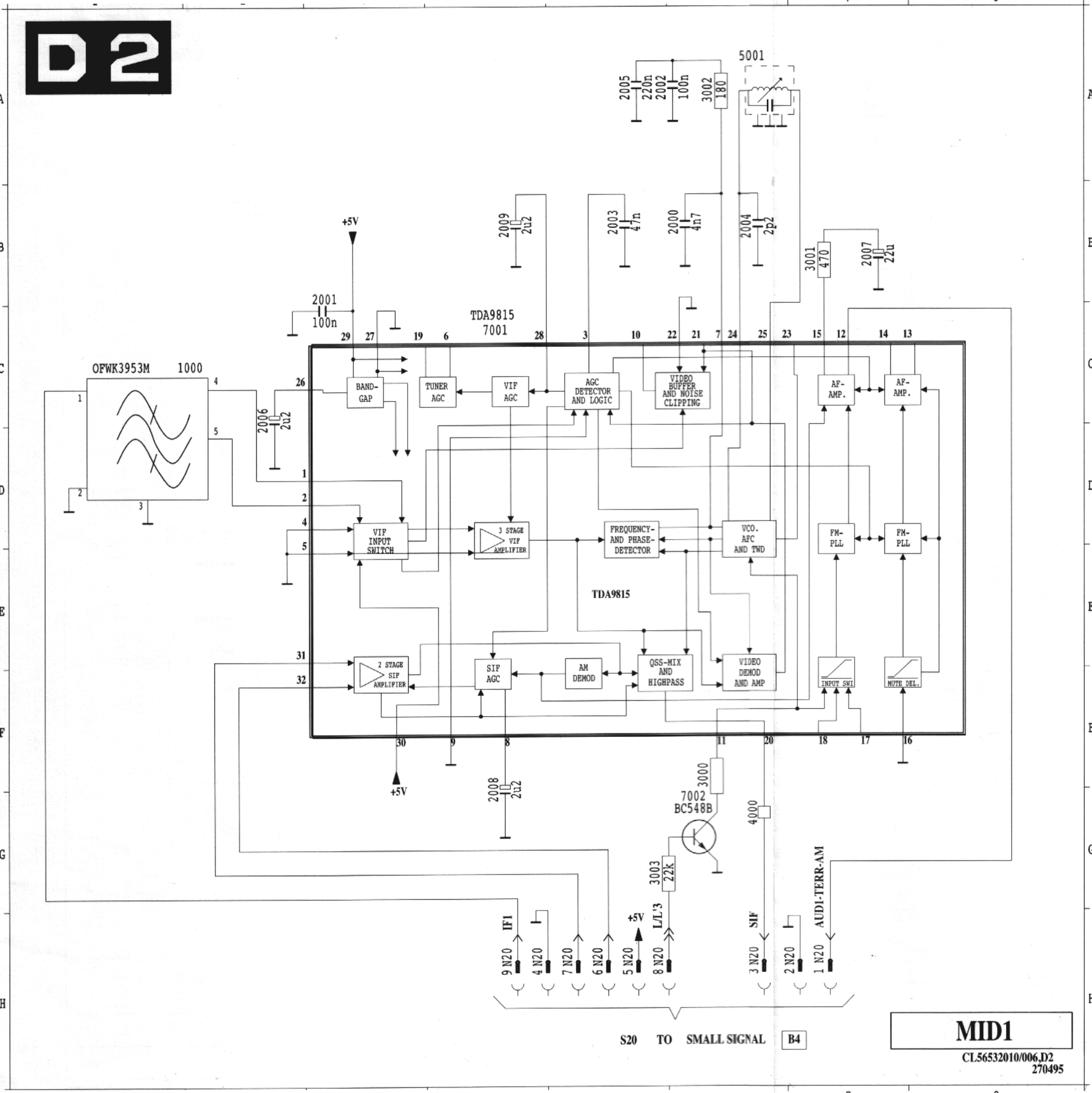
1) SYS03 AND SYS04 ONLY (BG LI STEREO and BG LI NICAM)
2) EXCEPT ON SYS04 (BG LI NICAM)



DESCRIPTION ITEM\BLOCK	BG DK STEREO SYS01	BG LI STEREO SYS03	BG LI NICAM SYS04	I NICAM SYS06	BG ST/NIC SYS08
1031	-	OFWL9453	OFWK9453	-	-
1032	OFWK9260	OFWG9251	OFWG9353	OFWK9260	OFWG9251
2033	-	2u2	-	-	-
4002	-	-	+	-	-
4003	-	-	+	-	-
4004	-	-	+	-	-
9011	-	-	+	-	-
9015	+	-	-	+	+

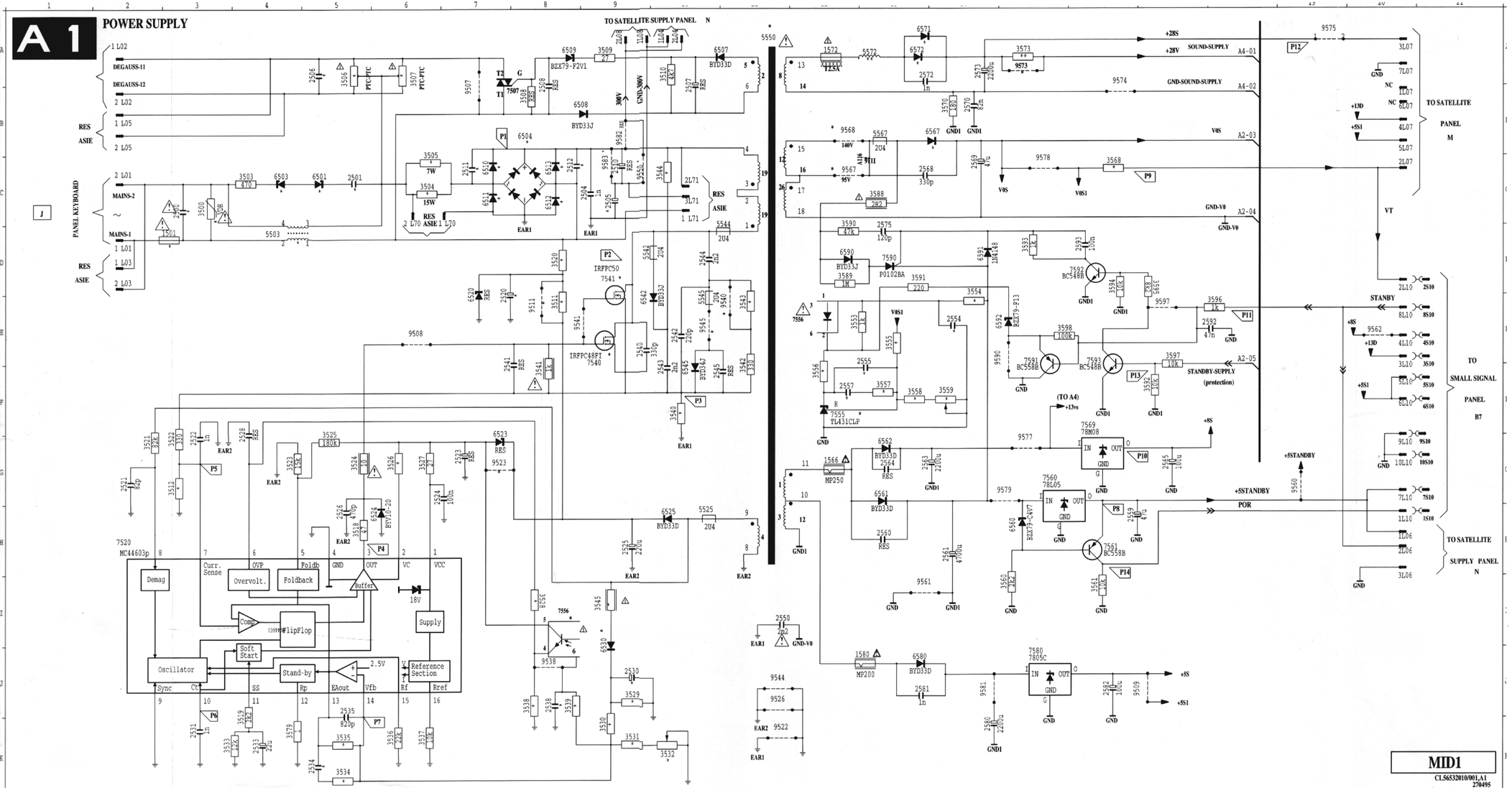
MID1

CL56532010/014,B4
270495

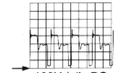

D2
5001
2005
220n
2002
100n
3002
180
+5V
2009
2u2
2003
47n
2000
4n7
2004
2p2
3001
470
2007
22u
2001
100n
TDA9815
7001
29 27 19 6 28 3 10 22 21 7 24 25 23 15 12 14 13
OFWK3953M 1000
1 2 3 4 5
2006
2u2
26
BAND-GAP
TUNER AGC
VIF AGC
AGC DETECTOR AND LOGIC
VIDEO BUFFER AND NOISE CLIPPING
AF-AMP.
AF-AMP.
1
2
4
5
VIF INPUT SWITCH
3 STAGE VIF AMPLIFIER
FREQUENCY- AND PHASE-DETECTOR
VCO. AFC AND TWD
FM-PLL
FM-PLL
TDA9815
31
32
2 STAGE SIF AMPLIFIER
SIF AGC
AM DEMOD
QSS-MIX AND HIGHPASS
VIDEO DEMOD AND AMP
INPUT SWI
MUTE DEL.
30 9 8 11 20 18 17 16
+5V
2008
2u2
3000
7002
BC548B
4000
3003
22k
IF1
+5V
L/L'3
SIF
AUD1-TERR-AM
9 N20
4 N20
7 N20
6 N20
5 N20
8 N20
3 N20
2 N20
1 N20
S20 TO SMALL SIGNAL
B4
MID1
CL56532010/006,D2
270495

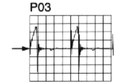
A 1

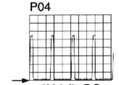
POWER SUPPLY

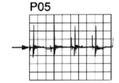


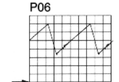
*	25/28"EU SUP 01	21" AS/E SUP 02	25/28"ASIE SUP 03	21"EU SUP 04
1501	2A5	3A15	3A15	2A5
2500	470n	470n	470n	470n
2501	33n	33n	33n	33n
2505	220u	220u	330u	220u
2506	100n	100n	100n	100n
2511	2n2	2n2	2n2	2n2
2512	2n2	2n2	2n2	2n2
2520	-	100u	-	100u
2530	-	-	-	4u7
2534	-	1n	-	1n
2538	2n2	2n2	2n2	2n2
2554	100n	100n	100n	-
2555	res	-	res	-
2557	33n	-	33n	-
3500	1MA/387V	1MA/387V	1MA/387V	1MA/387V
3504	-	res	res	-
3505	1R5	-	-	1R5
3506	22R	22R	22R	22R
3507	-	22R	22R	-
3511	-	1k	-	1k
3512	2k2	res	1k8	-
3520	18k	18k	18k	18k
3526	100R	100R	100R	100R
3528	-	10k	-	10k
3529	-	1k2	-	1k2
3530	-	24k	-	24k
3531	-	8k2	-	8k2
3532	-	10k	-	10k
3534	-	68k	-	68k
3535	10k	-	10k	10k
3538	1k	1k	1k	1k
3539	10k	10k	10k	10k
3540	R22	R22	R22	R27
3543	330R	-	-	330R
3544	22k	22k	22k	22k
3545	-	33R	-	33R
3554	100R	100R	100R	100R
3555	160k	-	160k	-
3556	100R	-	100R	-
3557	100k	-	100k	-
3558	2k7	-	2k7	-
3559	470R	-	470R	-
3568	100k	68k	100k	68k
5503	+	+	+	+
5550	+	+	+	+
6501	c15	c15	c15	c15
6503	c15	c15	c15	c15
6504	-	D35BA60	D35BA60	-
6510	1N5061	-	-	1N5061
6511	1N5061	-	-	1N5061
6512	1N5061	-	-	1N5061
6513	1N5061	-	-	1N5061
6530	-	1N4148	-	1N4148
6567	BY229F-800	BY229F-800	BY229F-800	BYD74G
6571	-	-	-	BYD74B
6572	BYV28-200	BYV28-200	BYV28-200	-
7540	-	-	-	+
7541	+	+	+	-
7555	+	-	+	-
7556	+	+	+	+
9511	+	-	+	-
9523	+	+	+	+
9540	-	+	+	-
9550	+	+	+	+
9567	-	+	-	+
9568	+	-	+	-
9583	+	+	+	+
**	2x10W SND 01	2xW SND 02	2x5W SND 03	
3572	1u	1R	1R	
5572	1u	2u2	18u	
9531	+	-	-	

P02

100V / div DC
10µs / div

P03

0.2V / div DC
5µs / div

P04

2V / div DC
10µs / div

P05

50mV / div AC
10µs / div

P06

0.5V / div DC
5µs / div

P01 300V DC
P07 2V5 DC
P08 +5V DC
P09 140V DC 25"
95V DC 21"
P10 +8V DC
P11 5V DC
0V DC
P12 28V DC
P13 0V = not in protection

→ = 0V

J3

2K104 MAINS1-IN
1K104 MAINS2-IN
MAIN-SWITCH
MAINS-1
MAINS-2
2K101 1L01
1K101 2L01
TO LARGE SIGNAL PANEL A1
3520 4M7
3521 4M7
1805
1804
0022
K100
TO SMALL SIGNAL PANEL B1
GND-LIGHTNING
MAINSSWITCH PANEL

UP DOWN SELECT
+5u
3610 470
3609 5k6
3608 12k
0025
MT1 MT2
GND-KEYBOARD
3611 4k7
100
3612
GND-KEYBOARD

1600 TFMS 5300
Vs
OUT
GND
GND-KEYBOARD
2600 RES
3600 100
+5u
2601 100u
GND-KEYBOARD
RESERVED
VDD
VSS
INFRARED RECEIVER
3601 1k
RC5
GND-KEYBOARD
KEYBOARD
6H41 6S41
+8S 1H41 1S41
3H41 3S41
4H41 4S41
+5u 5H41 5S41
LED 2H41 2S41
TO SMALL SIGNAL PANEL
+5u +8S
3604 100
3602 180
RED GREEN
6601
3605 100
6600 BZX79-C4V7
GND-KEYBOARD

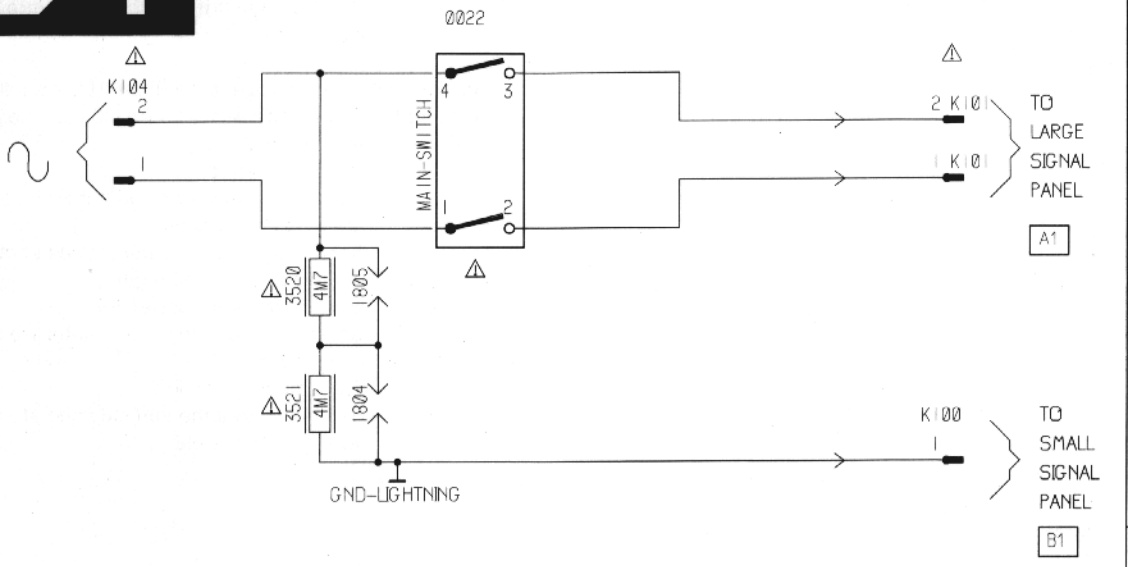
+5u
3840 22k
2840 RES
7840 BC548B
SOUND ENABLE
4H44
GND-SND 2H44
TO SOUND MODULE D1
SNDR-HEADP-OUTPUT 1H44
SNDL-HEADP-OUTPUT 3H44
0024 Headphone
3830 10k
2834 330p
3842 10k
2832 330p

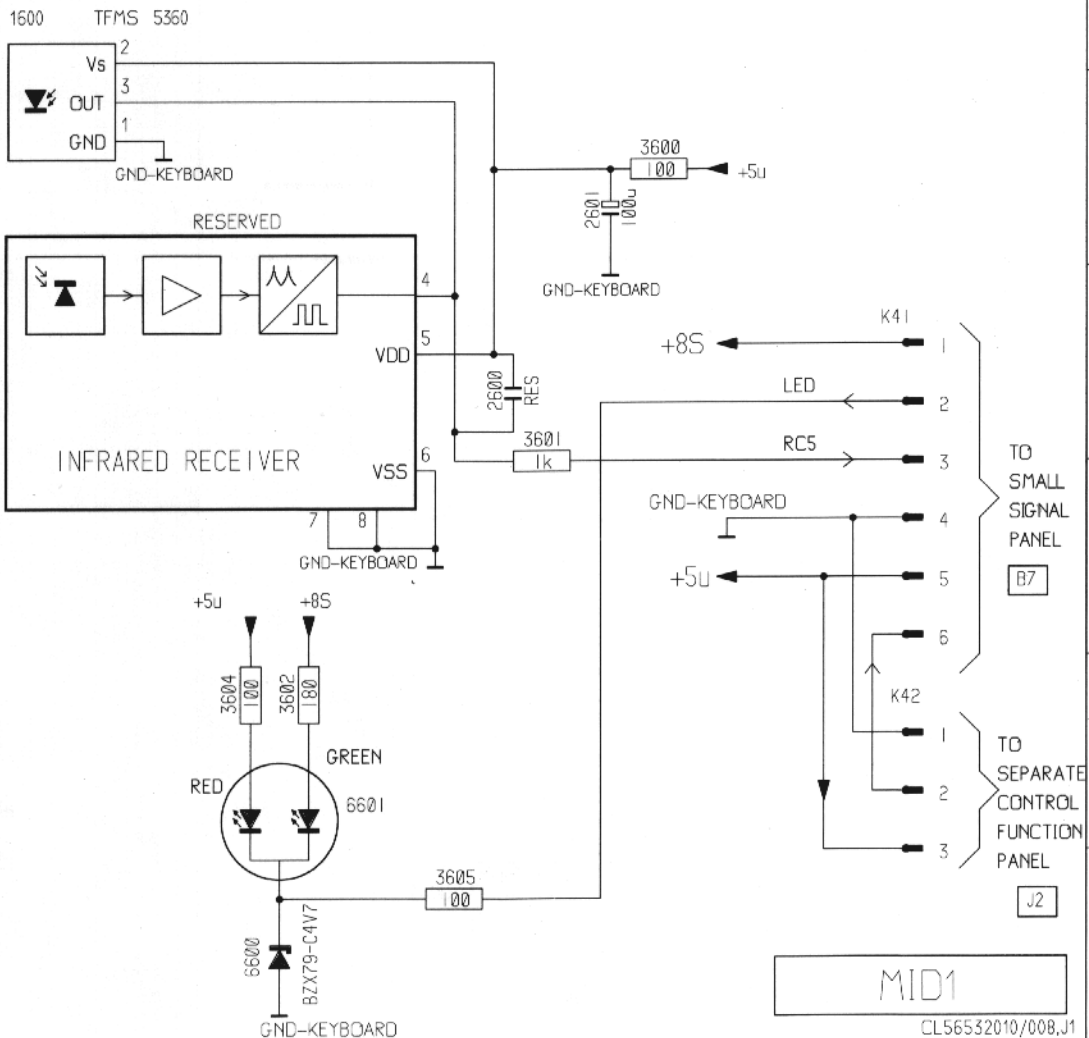
0026
YC2 YC4 YC1 YC3 YC5
9801
3809 330
3801 75
C-FRONT 5H33 5S33
+8S 2H33 2S33
CVBS/Y-FRONT 3H33 3S33
GND-CVBS/Y-FRONT 4H33 4S33
6H33 6S33
FRONT-DETECT 8H33 8S33
NC 1H33 1S33
TO SMALL SIGNAL PANEL B6
GND-CVBS CVBS
9800
1802
3807 100
2810 33n
2811 100u
7811 BC558B
3802 75
3810 820k
3811 39k
3812 10k
7812 BC558B
3813 4k7
2813 2u2
GND-SNDR R
1801
3806 220k
3804 1k
2805 330p
2800 22u
SNDR-FRONT-INPUT 9H33 9S33
GND-SNDL L
1800
3805 220k
3803 1k
2804 330p
2801 22u
SNDL-FRONT-INPUT 7H33 7S33
TRIPLE CINCH
0027

FOR PROCESS DREUX
3000 X
1k FRT00 without front connexion
4k7 FRT01 with front connexion
*

MID1
CL56532010/010,J3
270495

J 1



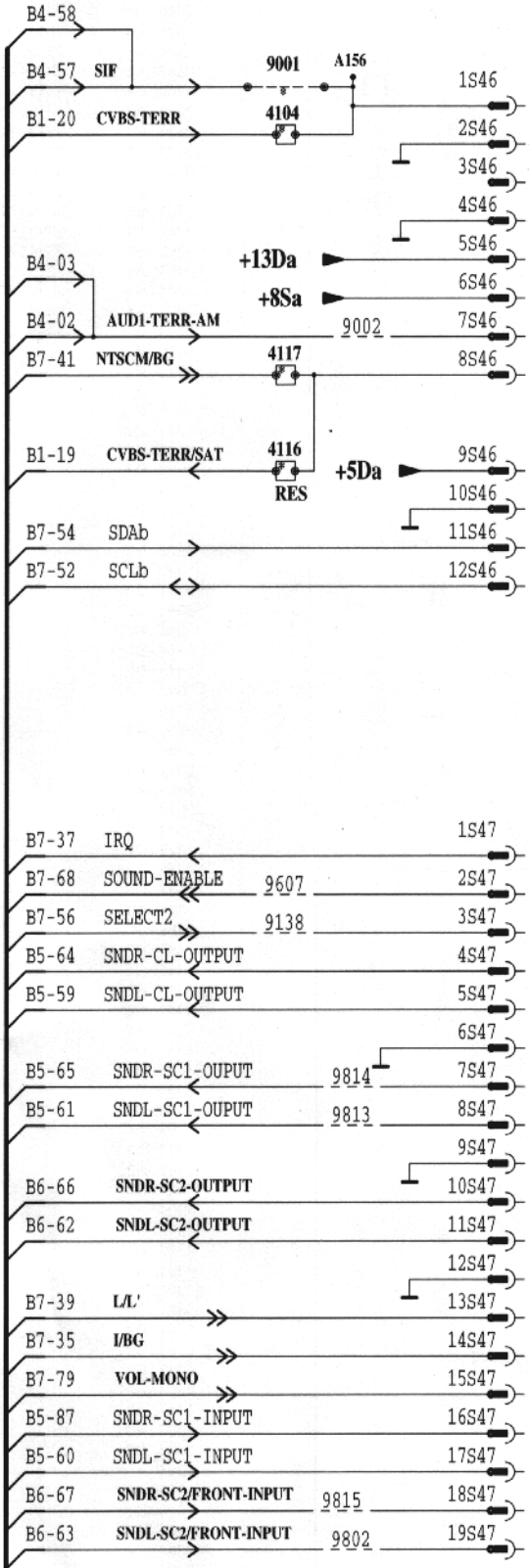


MID1

CL56532010/008,J1
270495

B 8 SMALL SIGNAL AUDIO MODULE

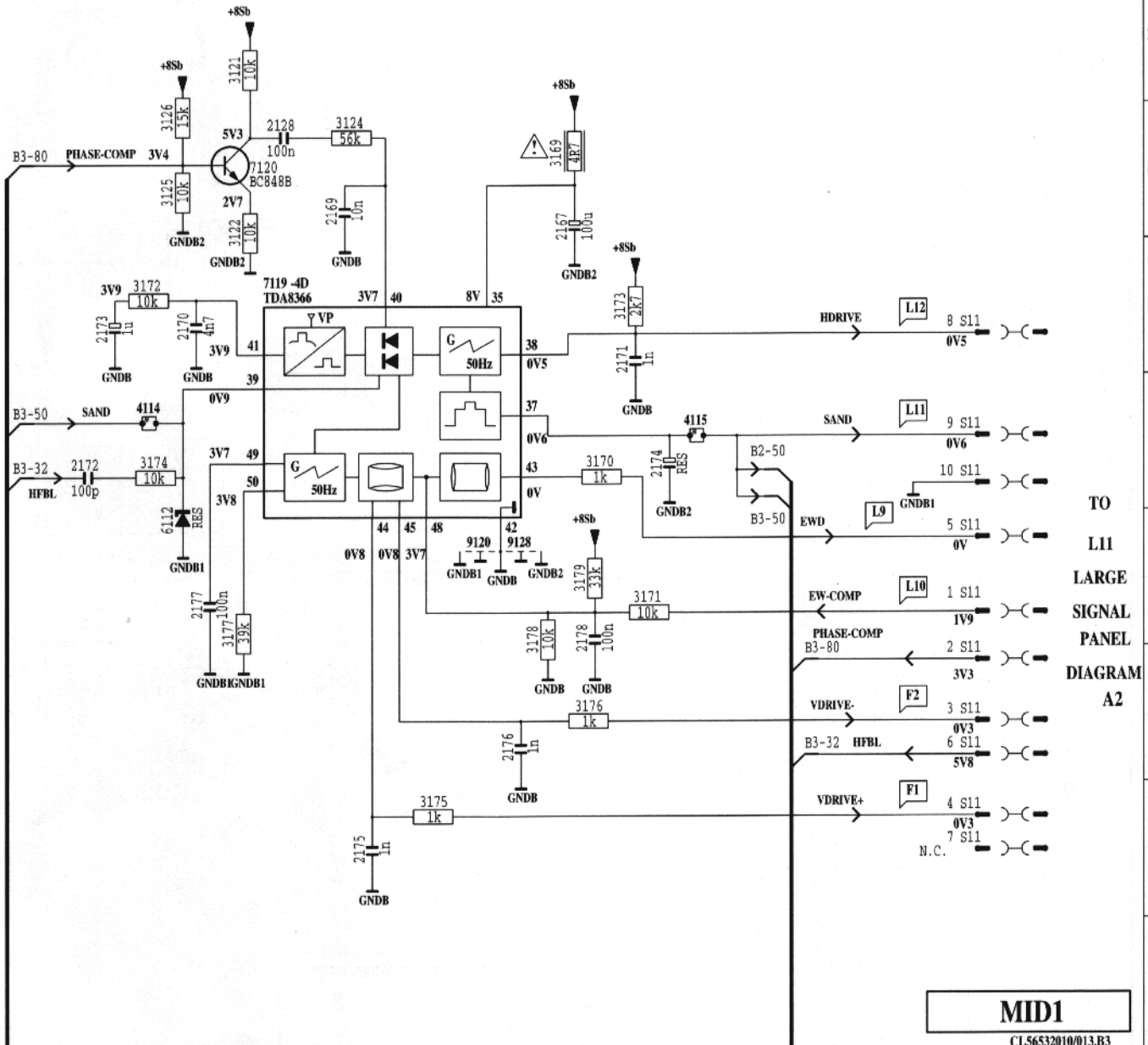
D MODULE AUDIO ITT



MID1

CL56532010/018,B8
270495

B3 SYNCHRONISATION



MID1

CL56532010/013,B3
270495

B9 TXT

TELETEXT EXTENTION

(RESERVED)

	7701	
ITEM	CF72306	CF72416
2703	10n	22n
2712	-	22n
3704	10k	jmp
4701	JMP	-
4702	-	jmp

*

MID1

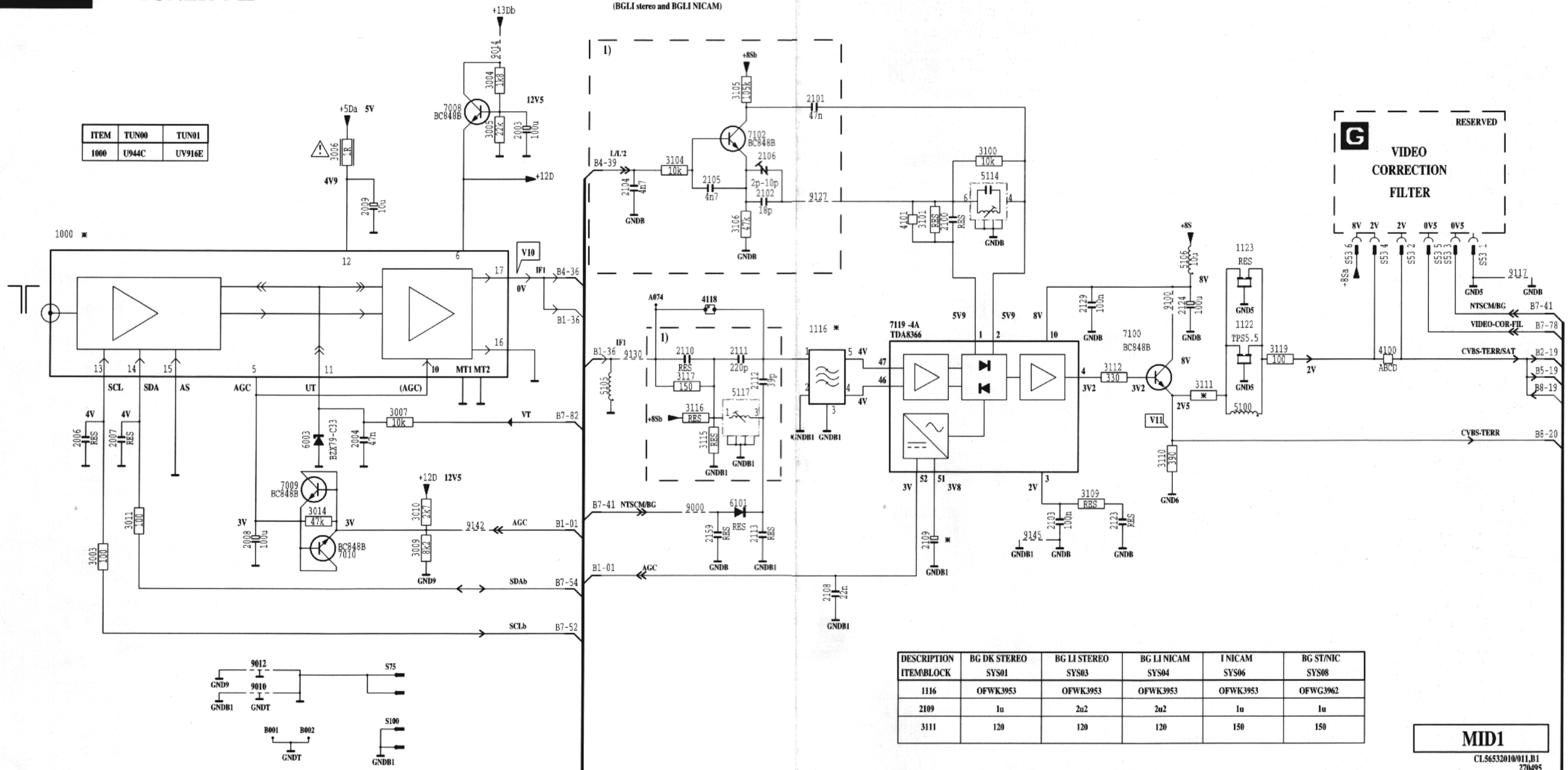
CL56532010/019.B9
270495

B 1

TUNER + IF

ITEM	TUN00	TUN01
1000	U944C	UV916E

1) SYS03 and SYS04 only
(BGLI stereo and BGLI NICAM)



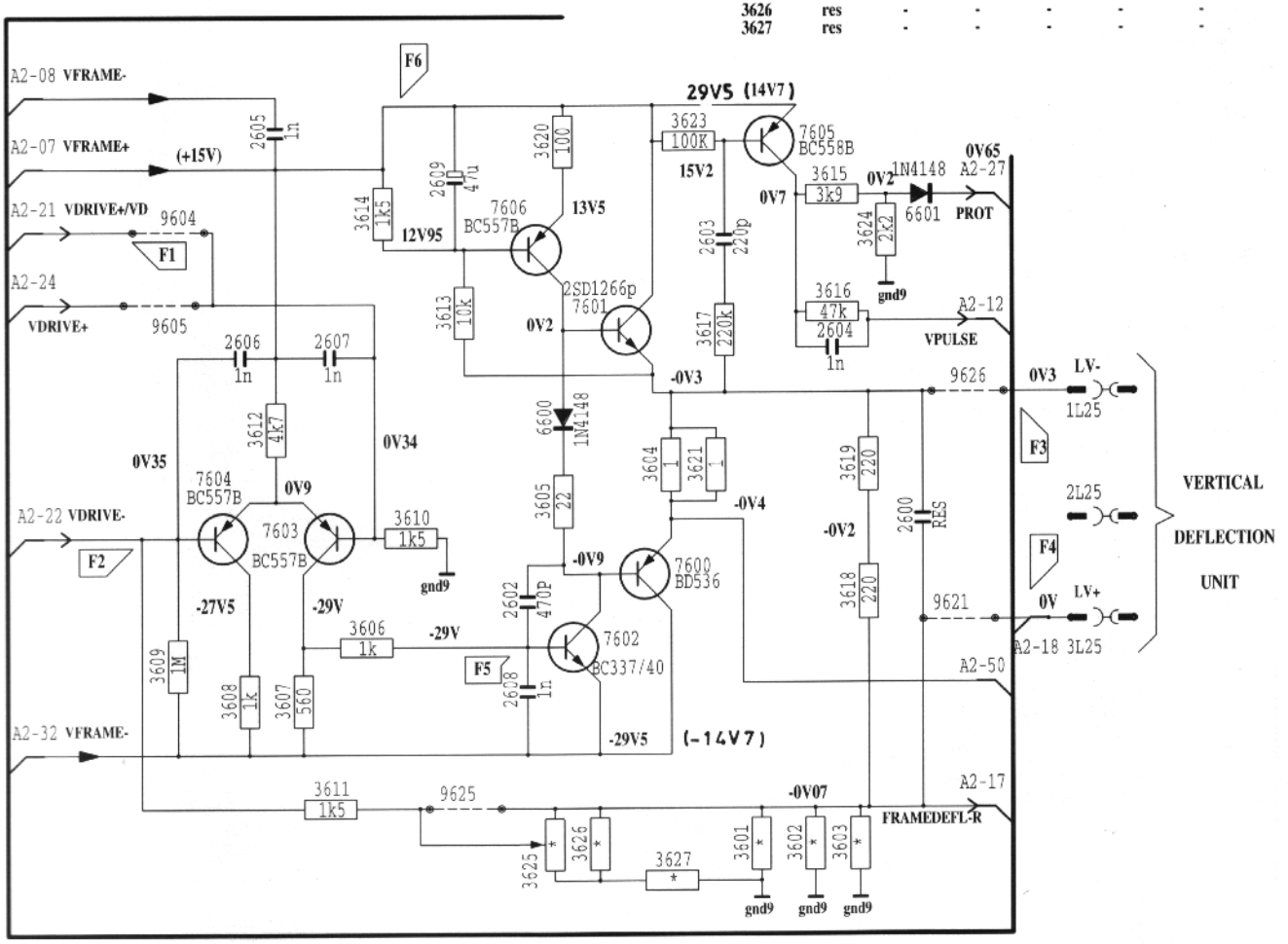
DESCRIPTION ITEM\BLOCK	BG DK STEREO SYS01	BG LI STEREO SYS03	BG LI NICAM SYS04	I NICAM SYS06	BG ST/NIC SYS08
1116	OFWK3953	OFWK3953	OFWK3953	OFWK3953	OFWG3962
2109	1u	2u2	2u2	1u	1u
3111	120	120	120	150	150

MID1

CL56532010/011,B1
270495

A3 VERTICAL

	28"16/9 CRT00	24"16/9 CRT01	29"SF CRT02	28"BLS CRT03	25/28"BM CRT04	21"BM CRT05
3601	1	1	1	1R5	2R2	3R3
3602	1	1	1	1R5	2R2	3R3
3603	res	res	1R5	3R9	2R7	3R3
3625	res	-	-	-	-	-
3626	res	-	-	-	-	-
3627	res	-	-	-	-	-

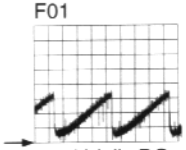


21" ; (....)

MID1

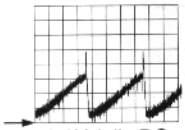
CL56532010/003,A3
270495

F01



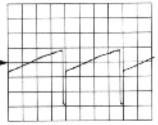
0.2V / div DC
5ms / div

F02



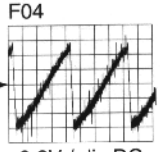
0.2V / div DC
5ms / div

F03



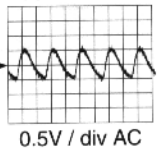
10V / div AC
5ms / div

F04



0.2V / div DC
5ms / div

F05



0.5V / div AC
10ms / div

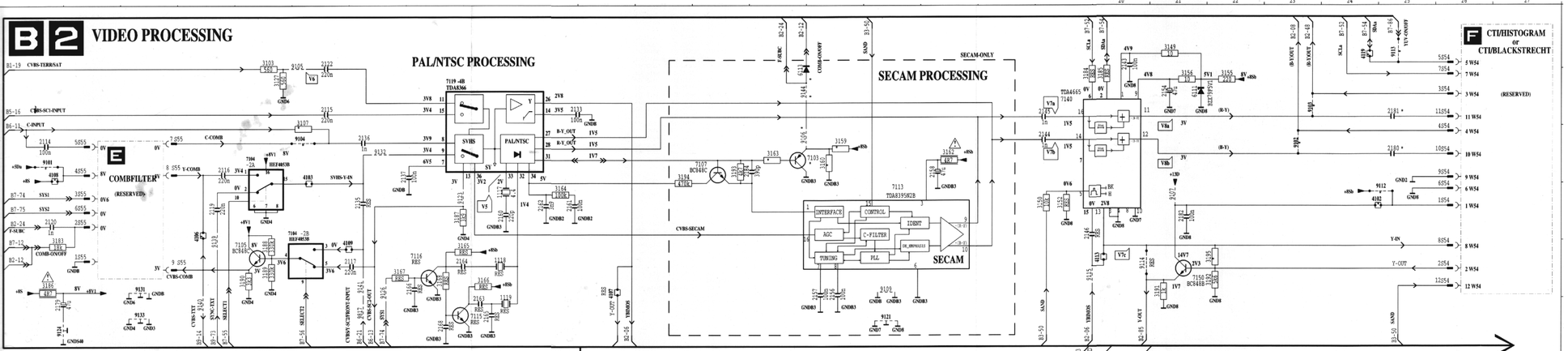
F06

15V DC 21"

30V DC 25"/28"

→ = 0V

B2 VIDEO PROCESSING



DESCRIPTION ITEM/BLOCK	COMBFILTER CMB800	NO COMBFILTER CMB801	CTI PCT00	NO BLACKSTRETCH + NO CTI PCT02
2180			220n	-
2181			220n	-
3107	-	470		
3159	22k	-		
3160	12k	-		
3163	2k7	-		
3195			-	1k
4102			+	-
4106	-	+		
4108	-	-		
4119	-	-	-	-
6113	-	-		
7103	BC858	-		
9101	+	-		
9102			-	+
9103			-	+
9104	+	-		
9106	+	-		
9112			-	-
9113			-	-
9144	+	-		

