

THOMSON MULTI MEDIA

Brandt FERGUSON **NORDMENDE** SABA TELEFUNKEN THOMSON

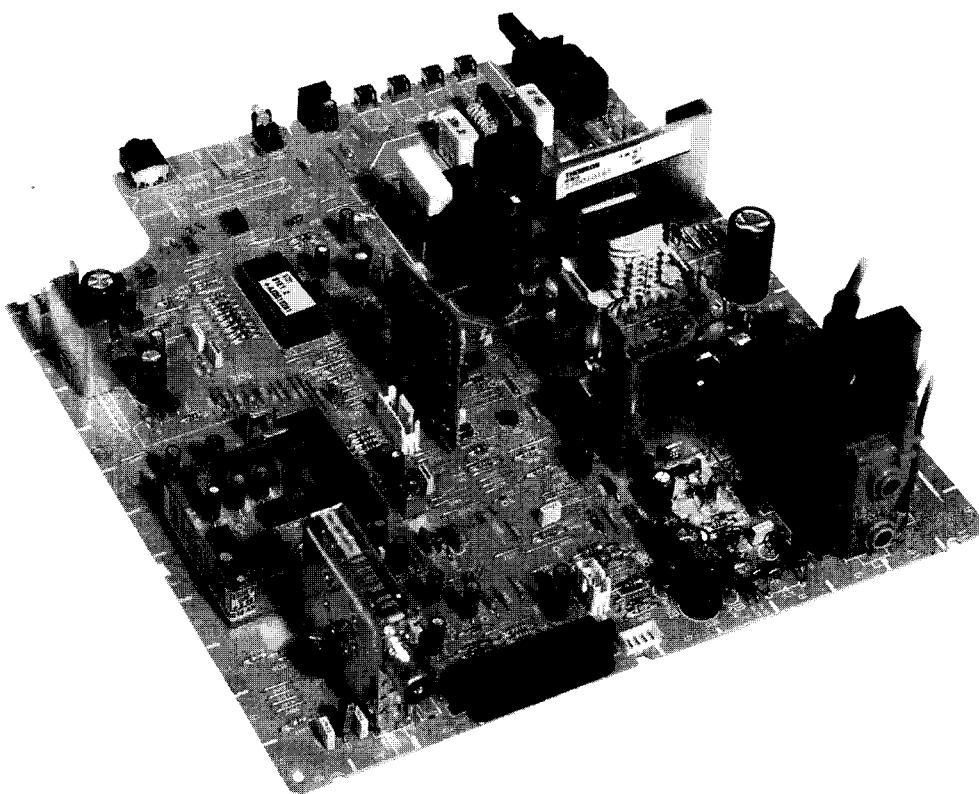
TV



SERVICE MANUAL
DOCUMENTATION TECHNIQUE
TECHNISCHE DOKUMENTATION
DOCUMENTAZIONE TECNICA
DOCUMENTACION TECNICA

TX807

Go to page number two for index of pages



WARNING : Before servicing this chassis read the safety recommendations.
ATTENTION : Avant toute intervention sur ce châssis, lire les recommandations de sécurité.
ACHTUNG : Vor jedem Eingriff auf diesem Chassis, die Sicherheitsvorschriften lesen.
ATTENZIONE : Prima di intervenire sullo chassis, leggere le norme di sicurezza.
IMPORTANTE : Antes de cualquier intervencidn, leer las recomendaciones de seguridad.

Code: 350 588 40 -0298 /23M -TX807 Print. ROSSELS PRINTING : 01 53 01 11

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Information

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[Basic schematic diagram](#)

[Chassis printed circuit board](#)

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Picture tube matching

[TX807 FULL CIRCUIT DESCRIPTION](#)

INFORMATION - INFORMATIONS - INFORMATIONEN - INFORMAZIONE - INFORMACIONES

(GB) The table hereafter groups:

- 1 - The electronic chassis configuration (modules) and schematic diagram page numbers.
- 2 - The chassis configuration.

(F) Le tableau ci-dessous regroupe :

- 1 - L'environnement électronique de chaque chassis (modules) et le numero de page où il est décrit.
- 2 - La designation des chassis

(D) Die nachstehende Tabelle umfaßt:

- 1 - Die elektronischen Baugruppen (Module) der Chassis und die Seitenzahl auf der sie beschrieben werden
- 2 - Die Chassisbezeichnung

(I) La tabella qui di seguito contiene:

- 1 - l'ambiente elettronico di ogni telaio (moduli) e il numero di pagina nella quale è descritto.
- 2 - La descrizione dei telai

(E) El cuadro siguiente agrupa:

- 1 - El entorno electrónico de cada chasis (módulos) y el numero de página donde está descrito.
- 2 - La designación de los chasis

TX807 Mono 14" - 20" - 21"

DESCRIPTION	ADJUSTMENT SCHEMA	MAIN PC3	MAIN PC3	CRT P C B	DVT	TUNER
Pages	4 to 8	9 to 14	15 to 19	20	21	22
Chassis TX807 VST - VOLTAGE SYNTHESIS - SYNTHESE DE TENSION - SPANNUNGSSYNTHESE - SINTESI DI TENSIONE - SINTESIS DE TENSION						
T807 V01270001 OPL V01 NO00031 V01 NO05091 V01 N705091	T807 V212700010 V21 N700031 V21 N705031 V21 N705091	T 8 0 7 V312000010 V31200001 OPL V31 NO00031 V31 NO05031 V31 NO05091 V36C000030	T 8 0 7 V412000000 V41 NO00031 V41 N00003A V41 NO00091 V48N005091			



 Use Isolating mains transformer
Utiliser un transformateur isolateur du secteur
Trenntrafo verwenden
Utilizar un transformador aislador de red
Utilizzare un trasformatore per isolarvi dalla rete

ADJUSTMENTS - REGLAGES - EINSTELLUNGEN - REGOLAZIONE - AJUSTES

U G2 I cutoff	SCREEN	Peak white pattern. 	 highest output CRT v Collector: TT52, TT62, TT72	Adjust Screen voltage VG2 120v +/- 5v: 14" 145v +/- 5V: 20" & 21" Cutoff level GND — '
FOCUS	LL05	 Contrast= 100% Brightness = 0% Test pattern (standard values)		Sharp picture
(MAIN) SYSTEM VOLTAGE +UB		 Colour-Bar Test pattern W = 100% Mire de barres couleur blanc = 100% Farbbalken W = 100% Monoscopio delle barre colorate bianco = 100% Mira en color blanco = 100% AV1		14" : 105 v +/- 1.5V 20" - 21" : 115.5 v +/- 1.5V
SERVICE-MODE		MODE SERVICE		

It is necessary to enter the Service Mode in order to carry out alignment of the TV set. Most adjustments can be made with the RCU, except the Focus and Screen voltages.

1. Service Mode Access

- 1 With the RCU, switch the TV set into the "Standby" mode.
- 2 Switch "Off" the TV set by mains supply switch (wait until LED is dark).
- 3 Whilst pressing the "Magenta (text)" button on the RCU switch "On" the TV set using the mains switch.
Continue to press the "Magenta (text)" button until the Service-setup Sub-menu appears.

VT01	1BIL	2BD	3B	4I	5DI	>1
FFI						OFF

Important : The Service Mode cannot be entered if any equipment is connected to the Scart socket, i.e. pin 8 switching voltage present.

2. Service Menu

2.1 Navigation

- Press the / buttons to select the menu line.
- Press the / buttons to make adjustments or selection of a menu item.

2.2 Service Sub-Menus

- Service Set-up Sub-menu • IF Sub-menu Video Sub-menu
Geometry Sub-menu Hotel Menu

2.3 Activation of Service Sub-Menus

To navigate around the Service sub-menu, press the "Magenta" button on the RCU, to step through the sub-menus in the following order:

... No Menu → Service Set-up Sub-Menus → Service IF Sub-Menus → Service Geometry Sub-Menus → Service Video Sub-Menus → Hotel Menu → No Menu → Service Set-up Sub-Menus ... etc.

3. Alignment and storing new function value

- 3.1 The current value of the selected function is displayed in a hexadecimal form to the right of the function name. This value is adjusted by means of the RCU / buttons.
- 3.2 To "STORE" the functions new value whilst in any of the Service Sub-menus, press the "OK" button on the RCU.
- 3.3 To leave the Service Sub-menu press the "Exit" button on the RCU.

4. Temporary exit from Service Mode

- 4.1 To temporarily leave the Service Mode, press the "Exit" button on the RCU. To access the everyday menus, press the "Menu" button on the RCU.
- 4.2 To return to the Service Mode, press the "Magenta" button on the RCU.

5. Leaving the Service Mode

- 5.1 To leave the Service mode either, switch the TV set into "Standby" or switch "Off" the mains supply.

Le mode service sert au réglage de l'appareil. Toutes les opérations de réglage s'effectuent à l'aide de la télécommande (sauf les réglages de Focus et de tension de grille-écran).

1. Accès au mode service

- 1.1 Commuter le téléviseur en position de veille avec la télécommande.
- 2 Eteindre le téléviseur par l'interrupteur secteur (attendre l'extinction complète du voyant).
- 3 Maintenir la touche "Magenta (text)" enfoncée et mettre simultanément le téléviseur en marche avec l'interrupteur secteur. Ne pas relâcher la touche "Magenta (text)" jusqu'à apparition du sous-menu de Service Setup.

VT01	1BIL	2BD	3B	4I	5DI	>1
FFI						OFF

Attention : Le mode service n'est pas accessible si un appareil est connecté à la prise péritélévision.

2. Menu Service

2.1 Déplacement

- Appuyer sur la touche / pour sélectionner une ligne de menu.
- Appuyer sur la touche / pour un réglage ou une sélection d'une option.

2.2 Sous-Menus du mode service

- Sous-Menu Setup • Sous-Menu FI • Sous-Menu Video
Sous-Menu Geometrie • Menu Hotel

2.3 Sélection d'un Sous-Menu

En mode service des courtes pressions sur la touche "Magenta" permet la sélection d'un sous-menu dans l'ordre suivant :

... Pas de Menu → Sous-menu Setup → Sous-menu FI → Sous-menu Géométrie → Sous-menu Video → Hotel Menu 3
Pas de Menu 3 Sous-menu Setup

3. Réglage des fonctions sélectionnées; mémorisation

- 3.1 La valeur momentanée de la fonction sélectionnée est indiquée sous forme hexadécimale à droite, à côté de la position à régler et peut être modifiée avec la télécommande par la touche / .
- 3.2 Dans un sous-menu (Service Setup / FI / Geometrie / Video) appuyer sur la touche "OK" pour mémoriser la nouvelle valeur de réglage en NVM (EEPROM).
- 3.3 Appuyer sur la touche "Exit" pour sortir d'un sous-menu.

4. Temporary exit from Service Mode

- 4.1 Utiliser la touche "Exit" de la télécommande.
Le menu utilisateur peut-être accessible via la touche "Menu".
- 4.2 Pour entrer à nouveau dans le Menu Setup utiliser la touche magenta.

5. Sortie du mode service

- 5.1 Pour sortir du mode service, commuter le téléviseur en position de veille ou le mettre hors service par l'interrupteur secteur.

ALIGNEMENT PROCEDURE • PROCESSUS DE REGLAGES • ABGLEICH • VISUALIZZAZIONE DEL VA CHASSIS TX807 VST • VOLTAGE SYNTHESIS • SYNTHÈSE DE TENSION • SPANNUNGSSYNTHESE • SINTESI DI TENSION

SET-UP SUB-MENU									
VN01									
1BIL	2BD	3B	4I	5DI	>1				
FFI	OFF								

IF SUB-MENU									
AFC									
IFPL	00-7F	< X . >		68					
L'FA	00-7F			75					
AGC	00-3F			19					

GEOMETRY SUB-MENU									
HSH	00-3F	45							
VA50	00-3F	20							
VA60	00-3F	36							
VSH	00-3F	59							

Test Bar pattern used : 4/3 with a geometric circle.
Mire utilisée : 4/3 avec un cercle de géométrie.
Benötigtes Testbild : 4/3 mit geometrischem Kreis.
Formato Testo utilizzato : 4/3 con cerchio geometrico
Mira utilizada : 4/3 con círculo geometrico

SET-UP			
FT01			
1st menu line : 1ère ligne du menu : Menüzeile : 1º riga menu : 1ª línea de/ menú :		Software code	
Code	Norm	Teletext IC	
VN01	BG//LL' BG/DKK' I,DK/I,BG	12k ROM VST • No Text. Europe market	
VN02	BG/DKK'	12k ROM VST No Text. Asia market	
VT01	BG//LL' BG/DKK' I,DK/I,BG	16k ROM VST ST text. Europe market	
VT02	BG/DKK'	16k ROM VST • ST text. Asia market	
VP01	BGIDUU' I,DK,I,BG	16k ROM VST • Philips text. Eastern Europe market	
VP01	BGIDUU' I,DK,I,BG	16k ROM VST • Greek text. Europe market	
1BIL 2BD 3B 4I 5DI 1			
Standard			
1	BIL	BG / I / LL	
2	BD	BGIDUU'	
3	B	BG	
4	I	I	
5	DI	DK / I	
ROM Default Value :			
TX 807 Europe : 1BIL			
FFI	For TX807 Asia only. TX807 Europe : FFI = Off		

VIDEO

AFC

4FC Status display • Visualise l'état de AFC
4FC Status Display Stato display AFC
Estado del CAF.

Display	AFC Status
< x . >	Fosc. too low
x < . >	
< . x >	Fosc. too high
< . > x	

IFPL	IF PLL adj. VCO • 38.9MHz
L'FA	IF PLL adjustment chassis (LL) VCO 33.9MHz

chassis TX807

PAL or SECAM colours bars signal

Y109

Tuner

IF

38.9 MHz / 33.9 MHz
15mV

I • IFPL

Signal : PAL BG or SECAM L 38.9 MHz / 15mV
-TV : Norm BG or L : Program Menu

UK◀ EURO, FR

VL

EURO : norm BG

FR : norm LL'

II • L'FA (For BGHILL' set)

Signal : SECAM L' : 33.9 MHz / 15mV
-TV : Norm L' : Program Menu

-Adjust IFPL (or L'FA) until the indicator (x) is within the brackets : < x . >.

• Régler IFPL ou L'FA pour que le curseur (x) soit dans la fenêtre AFC : < x . >.

• IFPL (oder L'FA) einstellen wenn der indikato (x) innerhalb der Ulammern ist : < x . >

• Regolare IFPL (o L'FA) in modo che l'indicatore (x) rimanga all'interno delle parentesi : < x . >.

• Ajustar IFPL (o L'FA) hasta que el cursor (x) esté entre los símbolos : < x . >.

ROM Default Value : IFPL : 3F • L'FA : 3F

AGC

Minimum noise- Minimum de bruit
• Geräuschminimum • Rumore minim
Minimo ruido

203.25 MHz/BIII
3mV

Y110

IF(V)

antenna input

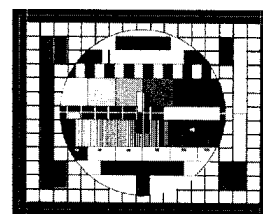
Monitor IF output :
38.9 MHz

• Set AGC to 00

• Adjust AGC for maximum gain of IF signal.

ROM Default Value : AGC : 1F

GEOM		
HSH		
VA 50		 50 Hz
VA 60		 60 Hz
VSH		
ROM Default Value :		
HSH : 20		
VA50: 18		
VA 60 : 20		
VSH : 1A		



overscan V=107%

ORE DELLA REGOLAZIONE • PROCEDIMIENTO DE ALINEACION E - SINTESIS DE TENSION

VIDEO SUB-MENU

RED	00 - 3F	45
GRN	00 - 3F	20
BLU	00 - 3F	36
PEAK	< - + >	

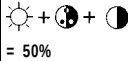
Perform the G2 and the Focus settings beforehand.
Effectuez au préalable les réglages de G2 et de focus.
Stellen Sie zuvor G2 und "Focus" ein.
Effettuare le regolazioni G2 e del Fuoco innanzitutto.
Ejecuta de antemano los ajustes G2 y "Focus".

HOTEL MENU

HOTEL ON	
MAX	 I

VIDEO

RED'



= 50%

Grey scale
test pattern

white=100%



weiß, white

GRN'

BLU*

ROM Default Value :

RED : 1F

GRN : 1F

BLU : 1F

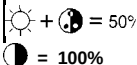
PEAK



CRT
Pin 6,8,11

Oscillo. or
colorimeter

PEAK WHITE
ADJUSTMENT



= 50%

● = 100%

Sets	Nits	Vpp
14"	450	70
20"	490	-
21"	490	-

HOTEL

HOTEL

ON : Available
Validation
Vorhanden
Opción activa
Opzione attivata

OFF: Not available
Non validé
Nicht vorhanden
Opzione non attivata
Opción inactiva

MAX

The hotel mode ("MAX")
is used to keep the volume
down and allow adjustment5
to the picture only.

Le mode hotel (iigne "MAX")
permet de limiter le volume
et d'avoir accès seulement
aux réglages image

Der Hotel-Modus ("MAX")
wird nur verwendet, um die
Lautstärke zu begrenzen
und um Bildeinstellungen
vorzunehmen.

Il modo hotel ("MAX")
consente di bloccare
il volume e di accedere alla
sola regolazione dell'
immagine.

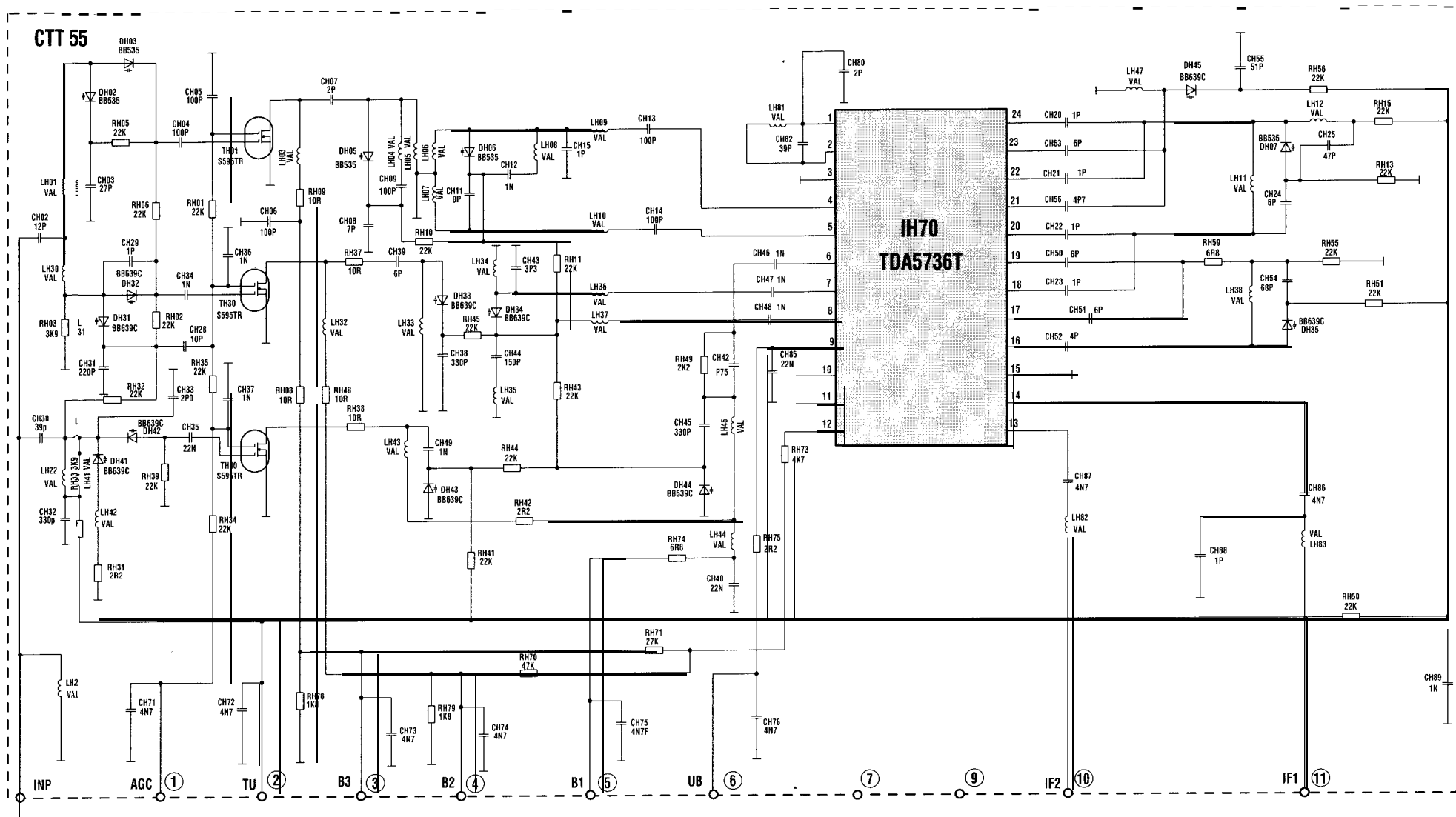
El modo hotel ("MAX")
permite mantener el
volumen bajo y acceder
solamente al ajuste de
imagen

Notes :

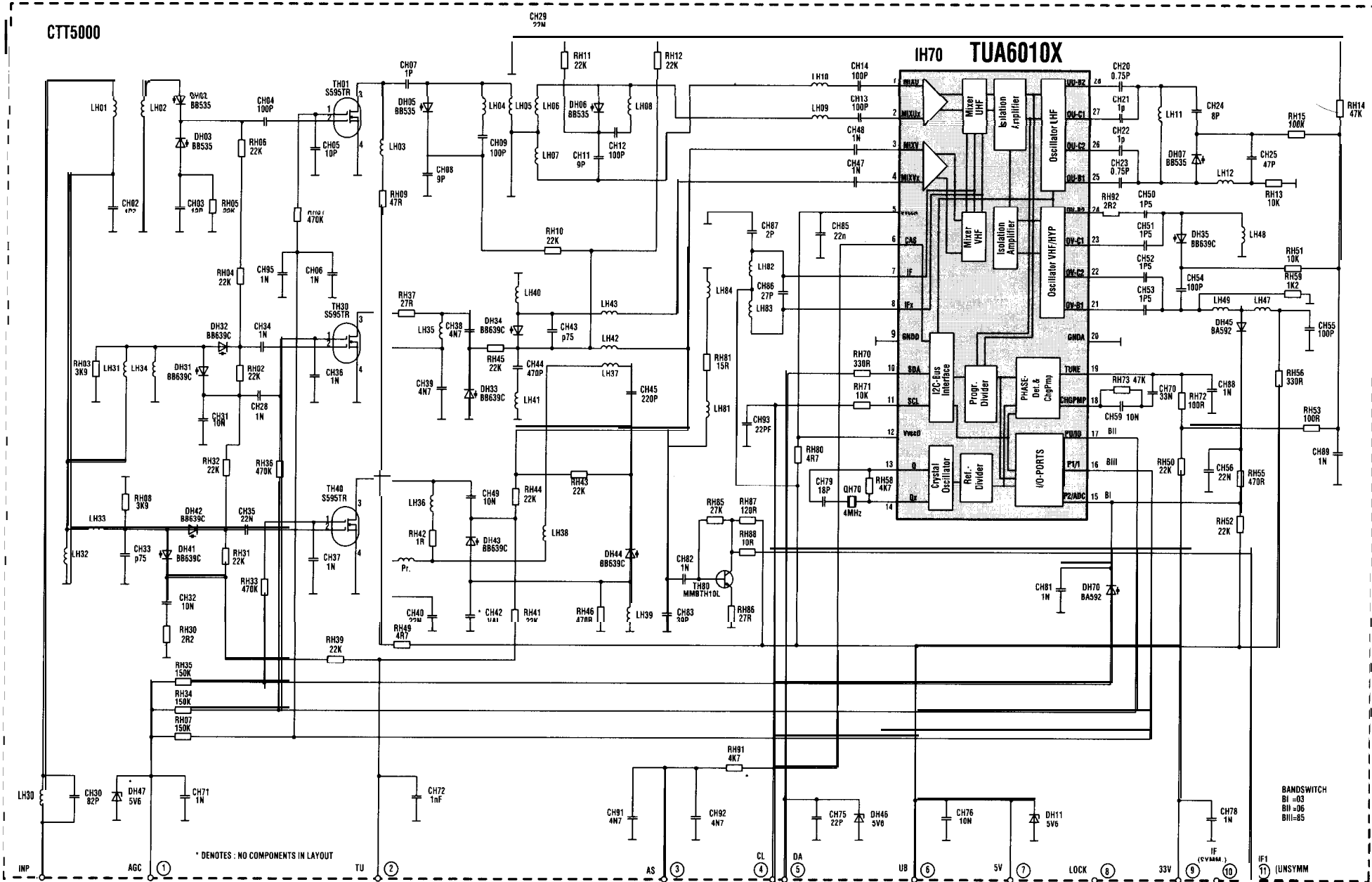
- * Adjust separate for PAL / SECAM and NTSC/AV
- * Régler séparément pour PAL / SECAM et NTSC/AV
- * Den Abgleich der Videowerte für PAL, SECAM, NTSC/AV
getrennt durchführen.
- * Regolare separatamente in PAL, SECAM, NTSC/AV.
- * Realice los ajustes en PAL, SECAM, NTSC/AV por separado

TUNER CTT5045

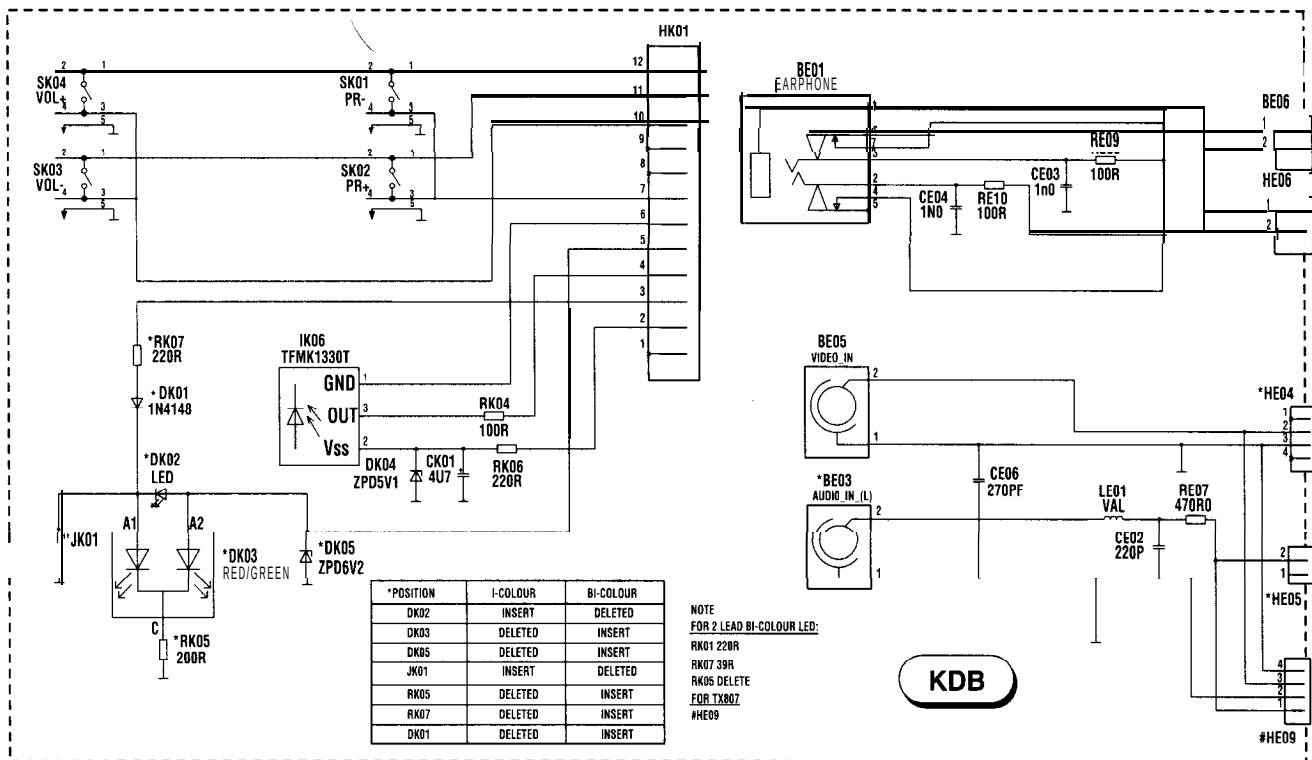
(TENSION SYNTHESIS - SYNTHESE DE TENSION - SPANNUNGSSYNTHESE -
 SINTESI DI TENSIONE - SINTESIS DE TENSION)



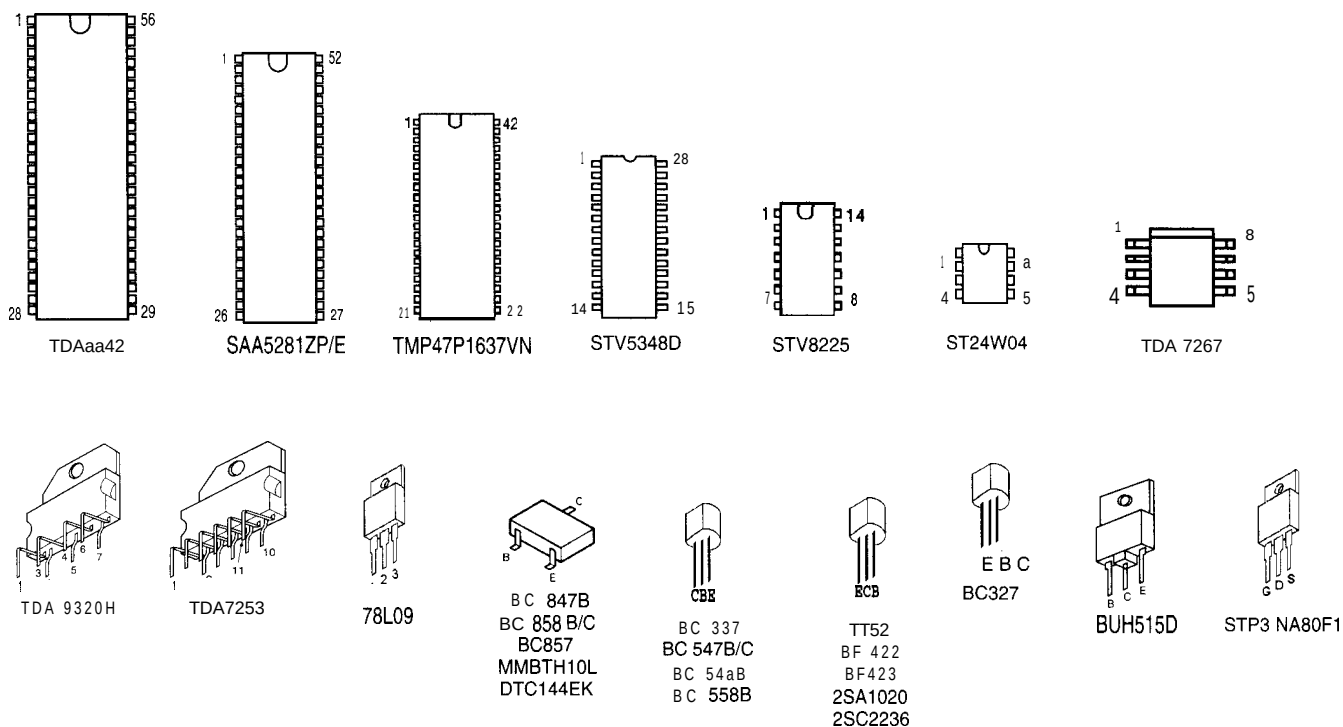
TUNER CTT5000
(FREQUENCY SYNTHESIS - SYNTHESE DE FREQUENCE - FREQUENZSYNTHESE -
SINTESI DI FREQUENZA - SINTESIS DE FRECUENCIA)



KEYBOARD MODULE - PLATINE CLAVIER - TASTATURPLATTE - PISATRA COMANDI - PLATINA TECLADO

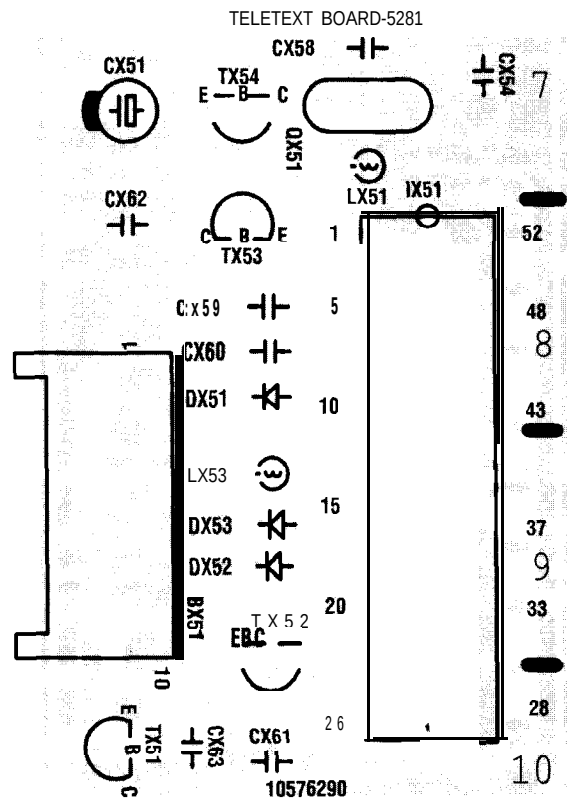
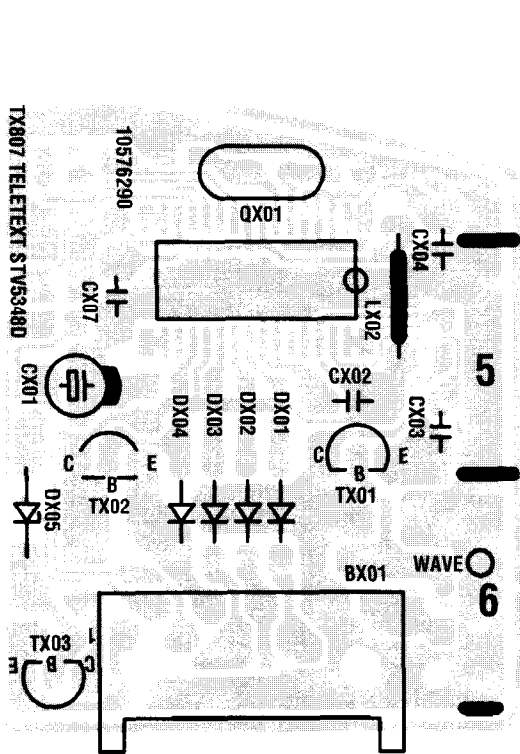


INTEGRATED CIRCUITS AND TRANSISTORS OUTLINE - CIRCUITS INTEGRES ET TRANSISTORS INTEGRIERTE SCHALTUNGEN UND TRANSISTOREN - CIRCUITI INTEGRATI TRANSISTOR CIRCUITOS INTEGRADOS Y TRANSISTORES

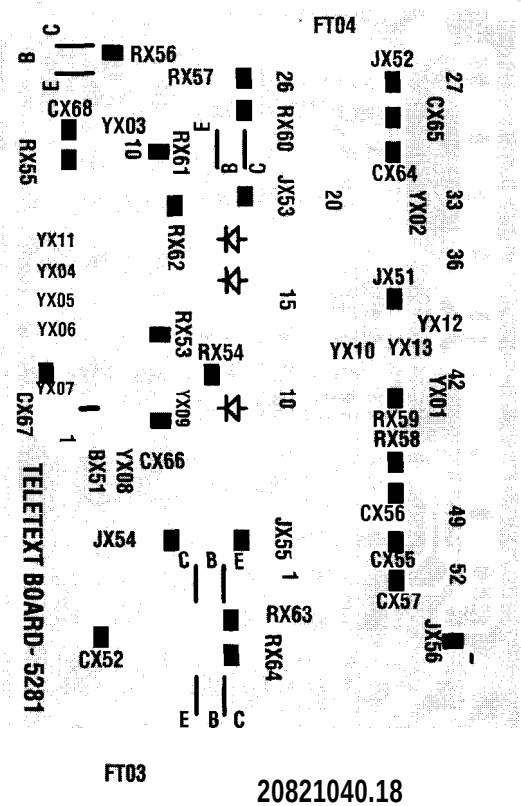
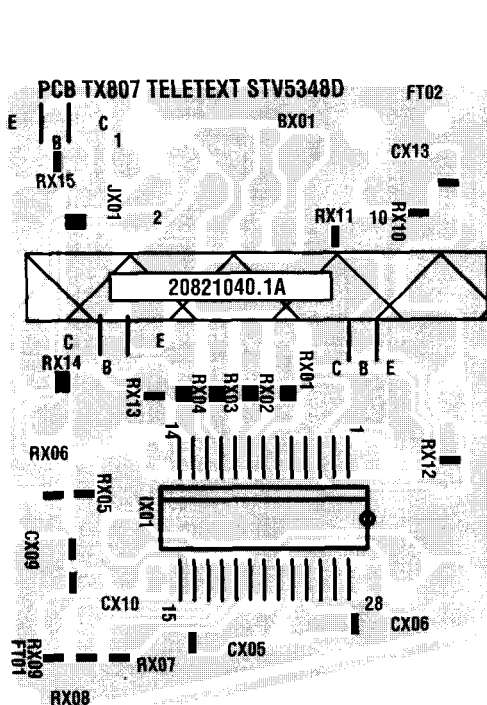


TELETEXT MODULE • MODULE TELETEXTE • VIDEOTEXT[®] MODUL
MODULO TELEVIDEO • MODULO TELETEXT0

COMPONENT SIDE • CÔTÉ COMPOSANTS • BESTÜCKUNGSSEITE •
LATO COMPONENT1 • LADO COMPONENTES



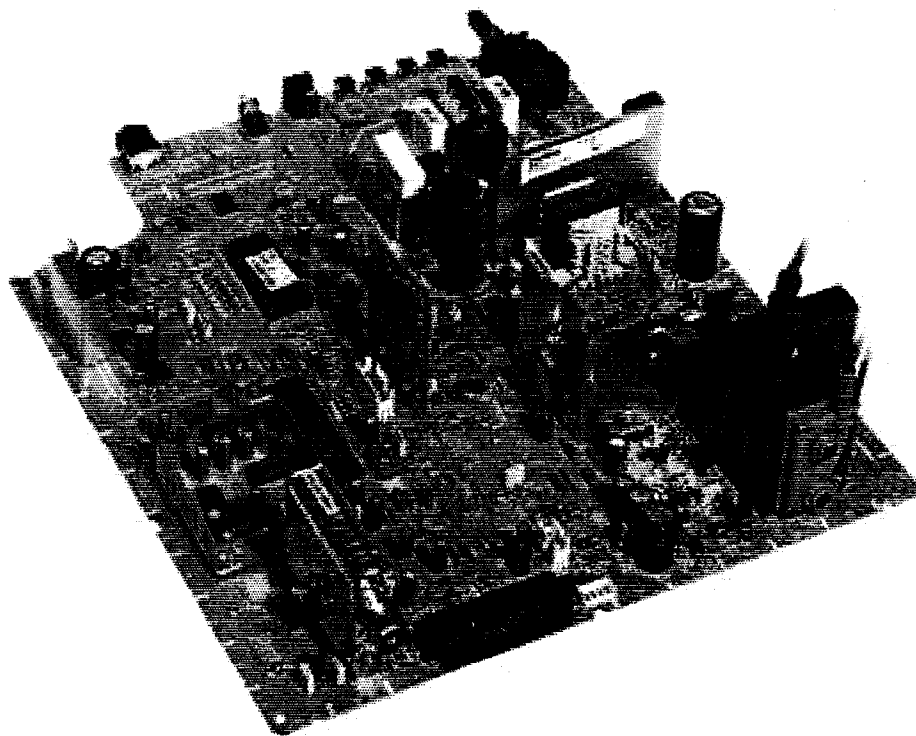
SOLDER SIDE • CÔTÉ SOUDURES • LÖT SEITE • LATO SALDATURE • LADO SOLDADURAS



THOMSON TELEFUNKEN SABA *Brandt*

LE PRINCIPE ET LA MAINTENANCE DES TELEVISEURS, CHASSIS TX807

[CLICK HERE FOR INDEX OF MAINTENANCE MANUAL](#)



Code : 350 608 70 - 05/98 - PRINCIPE ET MAINTENANCE TELEVISEURS, CHASSIS TX807.

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POWER SUPPLY

CONTENTS

GENERAL

CONDUCTION OF TP20 SWITCHING POWER SUPPLY

BLOCKING OF TP20 SWITCHING POWER SUPPLY

SOFT START

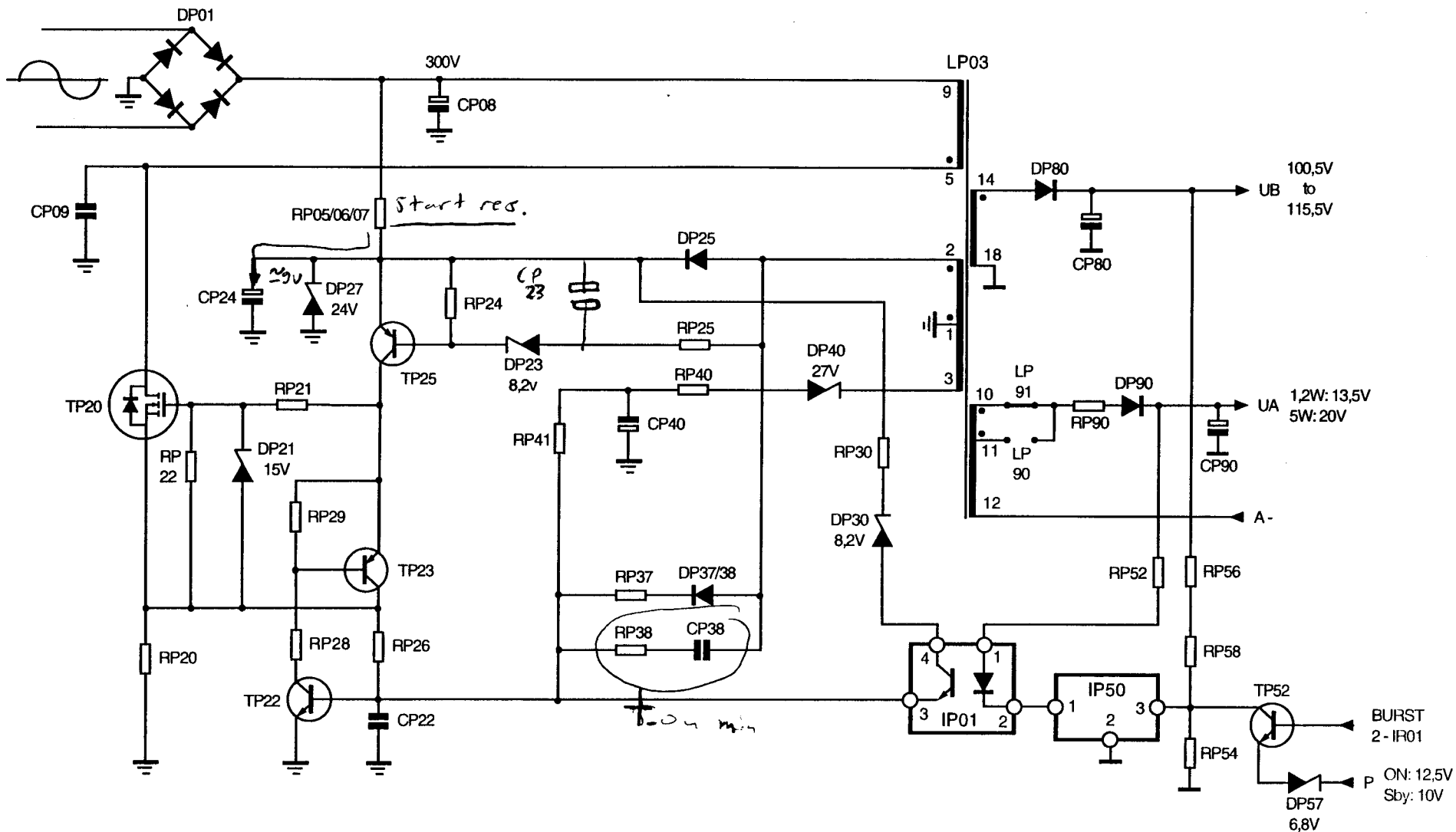
POWER SUPPLY BEHAVIOUR IN STANDBY

REGULATION

SAFETY

DEMAGNETISATION

TROUBLESHOOTING



GENERAL

It is a FROSIN (FRee Oscillating Safe INtelligent) auto-oscillating switching power supply. The ac supply voltage is in the range 180 to 265V.

When operating, switching frequency is of the order of 70kHz for a power consumption of 45W. In standby, power consumption is less than 2W.

TURNING ON OF TP20 SWITCHING POWER SUPPLY

The ac supply voltage, which is rectified and filtered by DP01 and CP08, is applied to the switching transistor TP20 via the 9-5 coil of LP03. Simultaneously, the capacitor CP24 is charged by RP05, RP06 and RP07. When the voltage on the terminals of CP24 reaches about 9V (threshold of the zener diode DP23), the transistor TP25 becomes conducting and turns on the switching transistor TP20. The zener diode DP21 limits the TP20 grid/supply voltage.

TURNING OFF OF TP20 SWITCHING POWER SUPPLY

The voltage on the terminals of RP20, when high enough, turns on TP22 then TP23. Consequently, the TP20 grid current is diverted to ground via TP23, RP28 and RP20. TP20 is turned off. Inverting polarity on the terminals of LP03 results in the following:

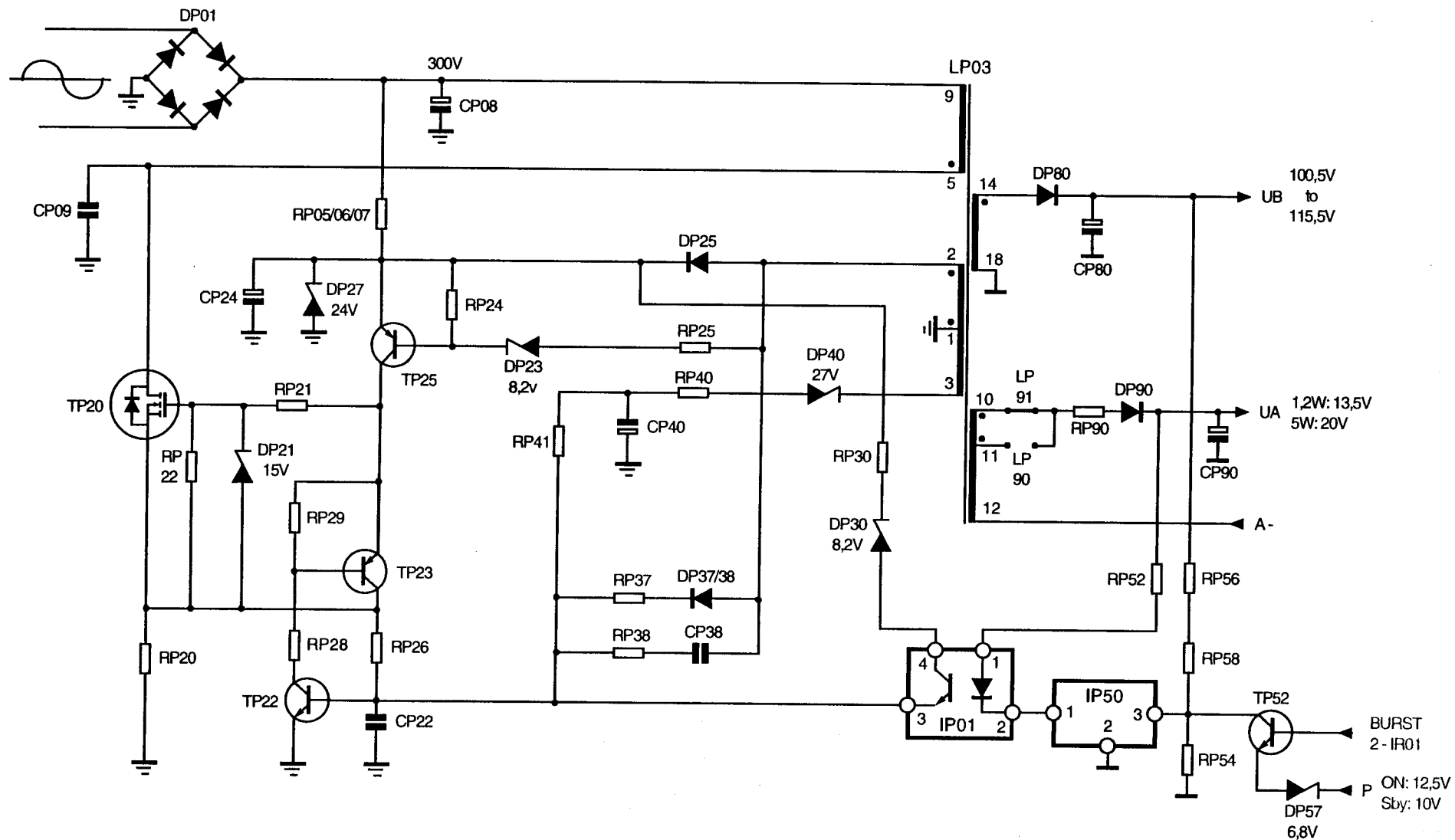
- TP25 turned off.
- Charging of CP24 via 2 of LPO3 and DP25.
- Recuperation of energy in the secondary coils.
- Activation of regulation.
- Charging of CP40 via DP40 (soft start circuit).
- TP22/23 maintained turned on via DP37/38 and RP37 (FROSIN circuit).

SOFT START

The negative voltage, rectified and filtered by DP40/CP40, delays the instant at which TP22/23 turns on and consequently the instant at which TP20 is turned off. At the start, this negative voltage is zero. TP22 is controlled by RP20. Later, the negative voltage appears and increases, delaying control of TP22/23. The conducting time of TP20 therefore becomes longer and longer.

NOTES:

ω



FROSIN CIRCUIT

During the energy restitution phase, the transistors TP22/23, maintained turned on by network 2 of LPO3, DP37/38 and RP37, ensure that TP20 is turned off. At the end of demagnetisation, the voltage sent to the collector of TP20 falls and CPO1 charging starts an oscillation cycle with the primary coil of LP03. Consequently, the collector voltage of TP20 continues to fall when it reaches 300V.

The new TP20 saturation command occurs when TP20 has a collector voltage close to 0, an effect obtained by the delay resulting from the negative voltage applied to 2 of LP03. This limits power losses due to TP20 switching, and the efficiency of this power supply is thus increased to 81% in operation (38% in standby).

This delay results from the discharge time of TP22/23 (related to FROSIN circuit DP37/38, RP37 by control of saturation current) and the charge time of CP23 via RP25 when Pin 2 of LPO3 becomes negative.

POWER SUPPLY BEHAVIOUR IN STANDBY

In standby, because the energy required by the secondary coils is low, the saturation time for TP20 tends to a value below 1 μ s, a value too low to affect power supply efficiency in this mode. A minimum conduction time circuit (Ton min) has therefore been added to TP20 using the components CP38/RP38.

In steady state, the regulation photo-transistor IP01 cannot alone perform saturation of TP22/23 and consequently the turning off of TP20.

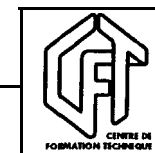
The assistance of the following is required:

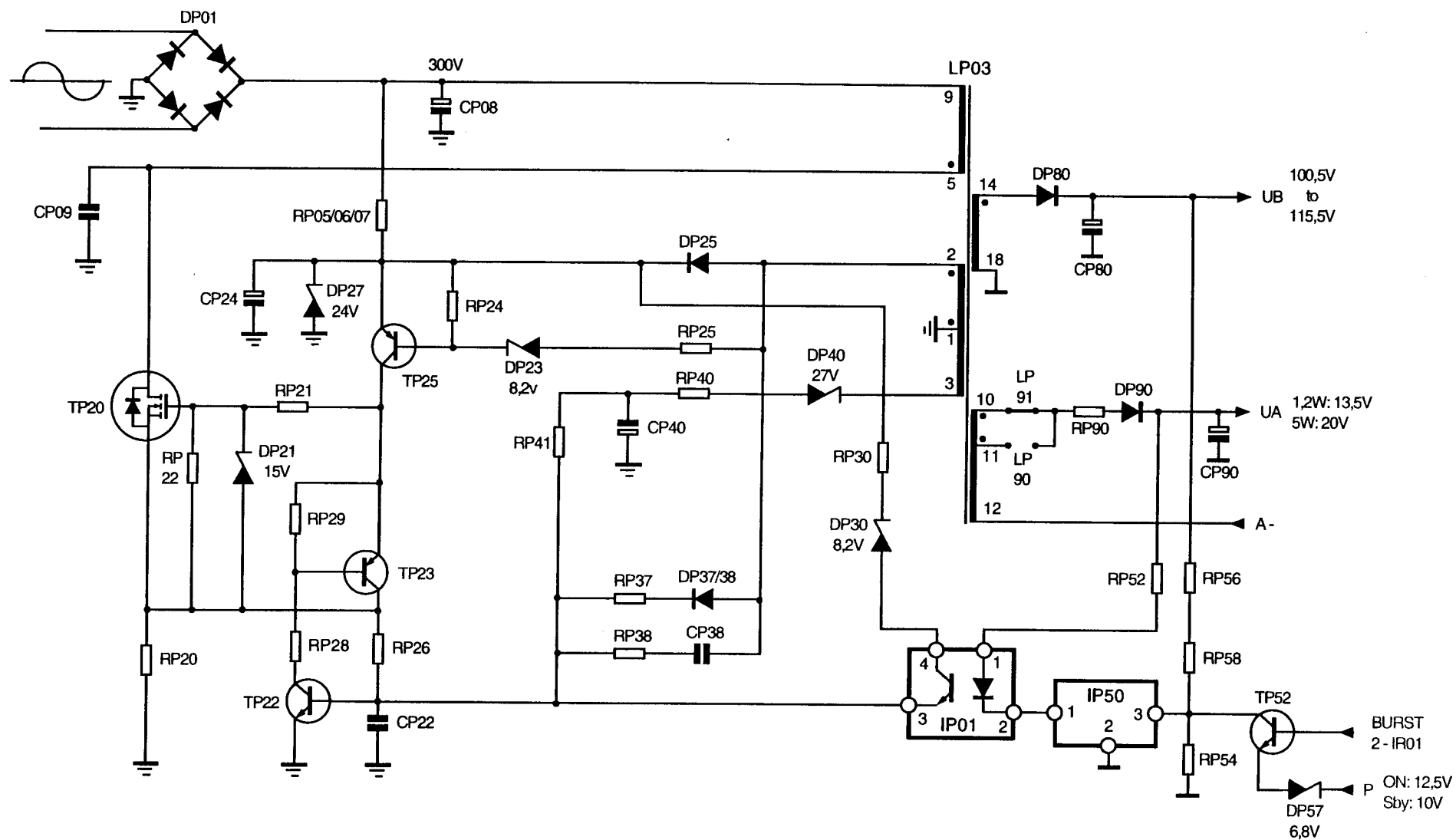
- The positive voltage produced on the terminals of RP20 in the storage phase.
- The positive voltage supplied by the FROSIN circuit (DP37/38, RP37) in the restitution phase.

In standby mode, due to the effect of the Ton min circuit, the energy stored becomes greater than the small requirements of the secondary coils. Consequently, the secondary voltages increase during energy restitution phases. The conduction of IP01 is then such that it is alone sufficient to maintain TP22/23 saturated over several LPO3/CPO9 oscillation cycles.

The Ton min results from the negative impulse obtained from the voltage induced in 2 of LPO3 (negative when TP20 is conducting) and the charging of CP38 via RP38. This impulse maintains TP22 turned off for a minimum time.

In standby, the management microcontroller (IR01) re-starts the power supply for 350 μ s approximately every 1 ms (BURST signal which turns off the transistor TP52). Due to this signal, the regulation becomes operative and the voltages U_{an3} and U_B increase. This voltage increase is necessary when the television is switched on (VCC greater than 6.6V at 12 of IV01). The ON command (20 of IR01) arrives during these impulses. The transistor TP52 is locked on (V base = 0, V emitter = 5.5V).





REGULATION

The voltages UA and UB are regulated.

UA informs the anode of the **IP01** photo-transducer diode.

UB informs the error amplifier **IP50** (pin 3). The resulting error voltage is applied to the **IP01** photo-transducer cathode. It should be noted that an increase of UE results in a reduction in the voltage on the photo-transducer cathode.

The conductivity of the photo-transducer transistor is proportional to the current passing through the photo-transducer diode.

The voltage on the terminals of CP24, via RP30, DP30 and the photo-transducer transistor is applied to the base of TP21.

The components RP54/56/58 and DP30 set the regulation range.

When the energy recuperated from LPO3 is low, the voltage on the terminals of CP24 is insufficient to make DP30 conducting. Consequently, the conductivity of TP20 increases and recuperated energy is increased.

SAFETY

The zener diode DP27 limits the grid voltage of the TP20 switching supply.

The zener diode DP21 limits the grid-supply voltage of the TP20 switching supply.

The zener diode DP40 limits the conducting time of the TP20 switching supply in the event of overcharging or regulation malfunction (the soft start voltage will become less and less negative).

The transistor TP52 acts as an overvoltage protection. When UA (P) is too high TP52 is turned off via the zener diode DP57. Therefore, more current passes through **IP01** and consequently TP20 is less conducting.

The resistor RP90 protects against overvoltages on UA.

DEMAGNETISATION (SICABLE)

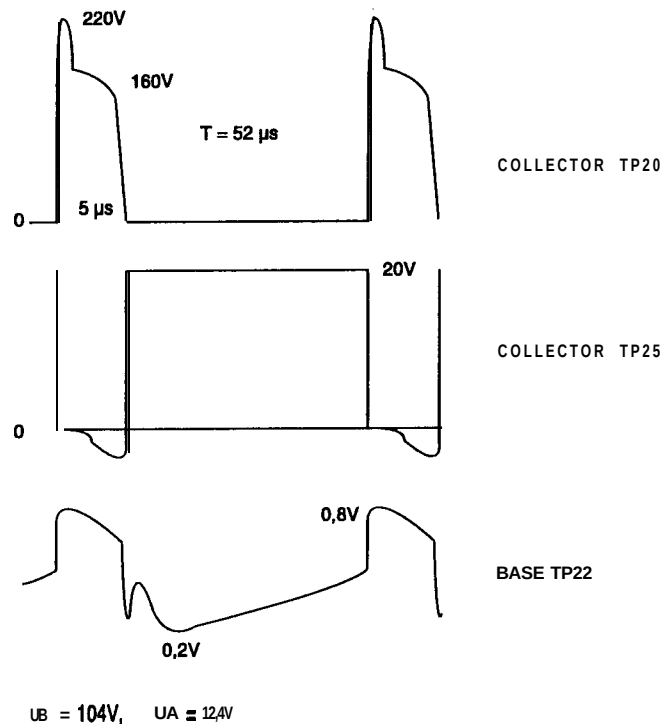
The voltage VP (12V) recuperated from the line transformer is used. When this voltage appears (television ON), the transistor TP71 saturates during the charge time of CP71 (5 to 10 seconds). It causes the contacts of relay **SP01** to be closed thus activating the demagnetisation loop.

NOTES:

POWER SUPPLY TROUBLESHOOTING

LOW VOLTAGE

- Discharge the capacitor CP08.
- Shunt the resistors RPO5 to RPO7 with a 10-K resistor.
- Connect point 9 of LPO3 to the common point of **RP05/CP06**.
- Connect the base of TP52 to ground (to avoid any instabilities).
- Connect the base of TR08 (JR24) to ground (forced to standby to avoid any instabilities).
- Supply 12V DC via point 9 of LP03.



220V ALTERNATING

De-solder point 1 of LL05.

Connect the base of TP52 to ground (to avoid any instabilities at the start).
Supply 220V AC.

TP20 collector: 580Vcc, $T = 20 \mu s$
 $U_B = 104V$

Without cutting the supply, load U_B with a 220V/ 75W bulb.

TP20 collector: 580Vcc, $T = 10 \mu s$
 $U_B = 104V$

MANAGEMENT

CONTENTS

THE MICROCONTROLLER AND ITS ENVIRONMENT

POWERSUPPLY AND FUNCTIONAL SIGNALS

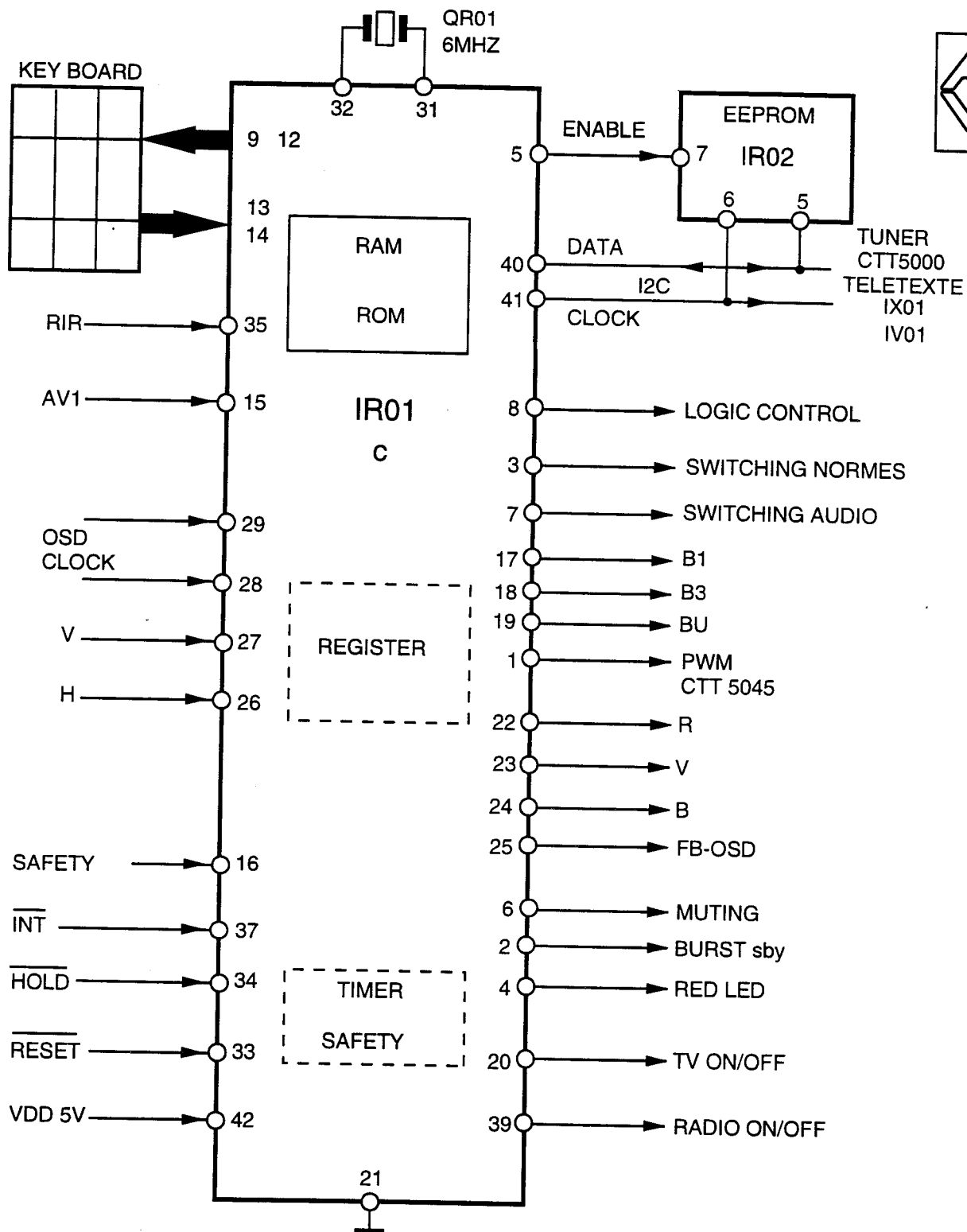
STANDBY/ON COMMAND

EXTERNAL COMMANDS

CHANNEL AND STANDARDS MANAGEMENT

OSD SIGNAL GENERATOR

OTHER COMMANDS



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THOMSON MULTIMEDIA

GENERAL

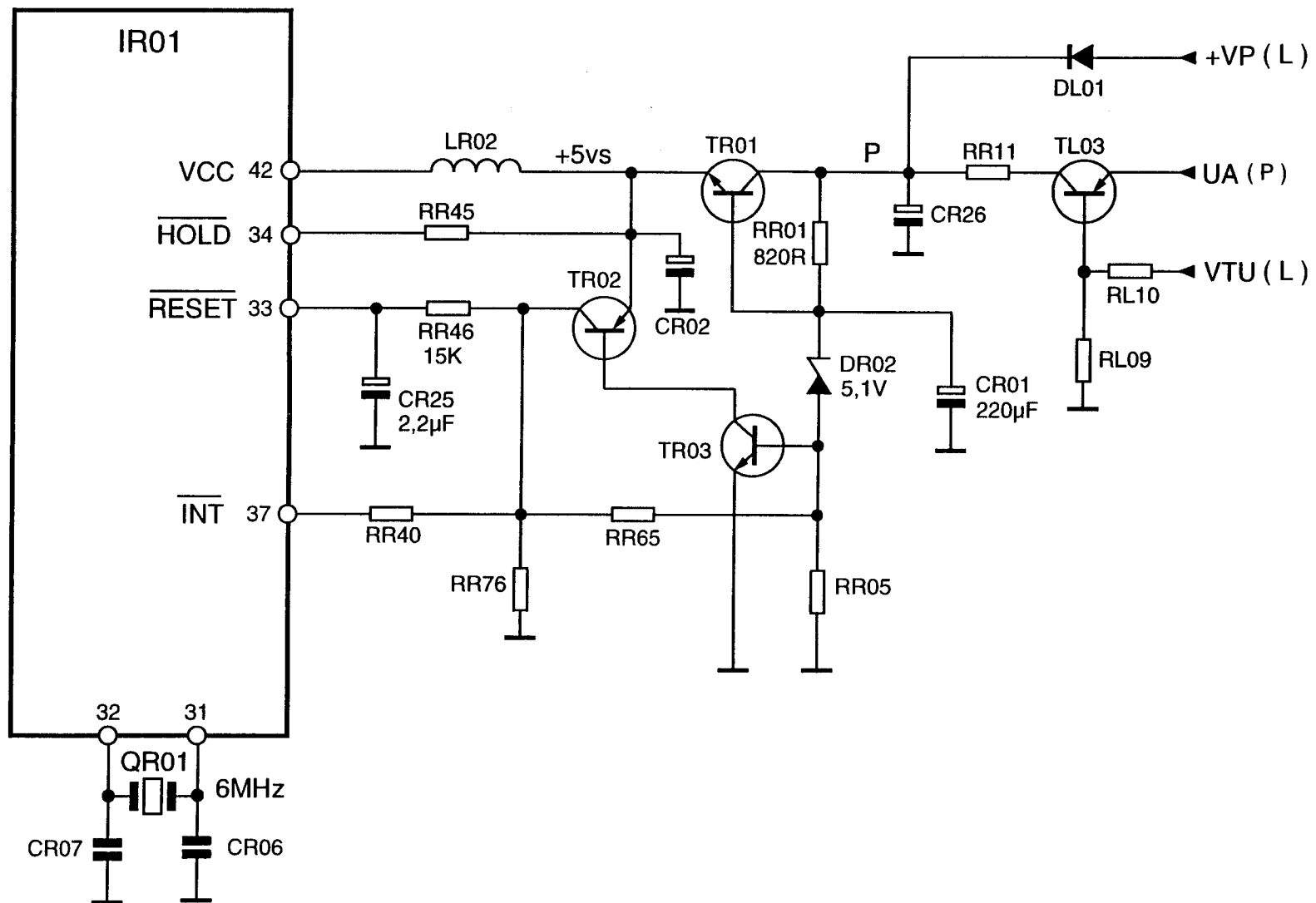
Management of TX807 rack is ensured by a 4-bit microcontroller, the TMP47C1637.

Its clock speed is 6MHz.

It is associated with an EEPROM memory, IR02, for the storage of user parameters, the service mode and backup in the event of mains power failure.

It performs the following functions:

- . Remote control and keyboard management.
- Standby or switching on the television or radio.
- . Standards switching.
- Voltage or frequency synthesis.
- . Volume, brightness, contrast and colour regulation.
- . OSD signal generation.
- . Power supply control in standby mode.
- . Watchdog circuit for monitoring the time bases.



POWER SUPPLY AND FUNCTIONAL SIGNALS

POWER SUPPLY

The microcontroller, **IR01**, is supplied with 5V (pin 42), from the voltage P and the stabilisation circuit **TR01/DR02**.

The origin of the voltage P is:

- . the voltage UA (15V during operation and 9V in standby) at start-up because VTU= 0 and then TL03 is saturated.
- . the voltage +VP (12.5V) in steady state because VTU= 86V and then TL03 is blocked.

CLOCK

Its 6MHz clock is obtained from the quartz oscillator **QR01** (pins 31 and 32 of **IR01**).

RESET

The reset time constant is composed of **RR46** and **CR25**. The components **TR02**, **TR03** and **DR02** activate this time constant when the **IR01** supply voltage is sufficient. The transistors **TR02** and **TR03** are turned on when the voltage on the terminals of **CR01** is close to 5.8V (**DR02** threshold + **TR03** vbe).

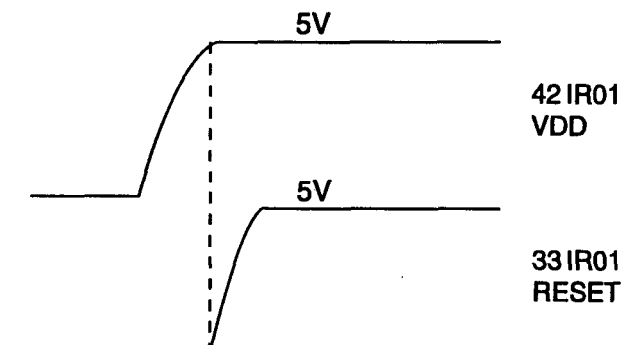
AC SUPPLY FAILURE DETECTION

In the event of mains supply failure, the voltage P drops. This turns off the transistors **TR03/IR02** and causes the voltage to drop to 0 on pin 37 of **IR01**. The microcontroller saves in the EEPROM the parameters necessary for switching the television on.

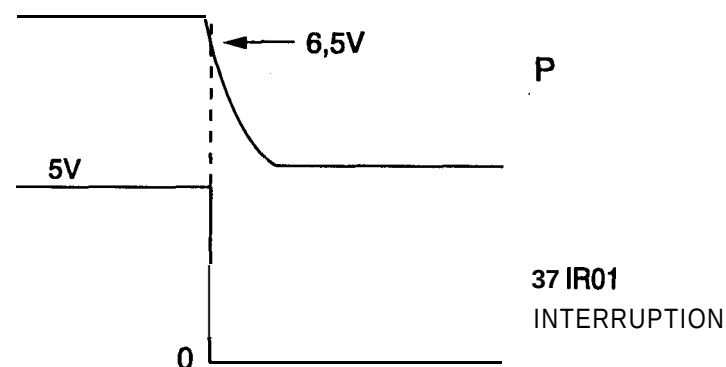
HOLD

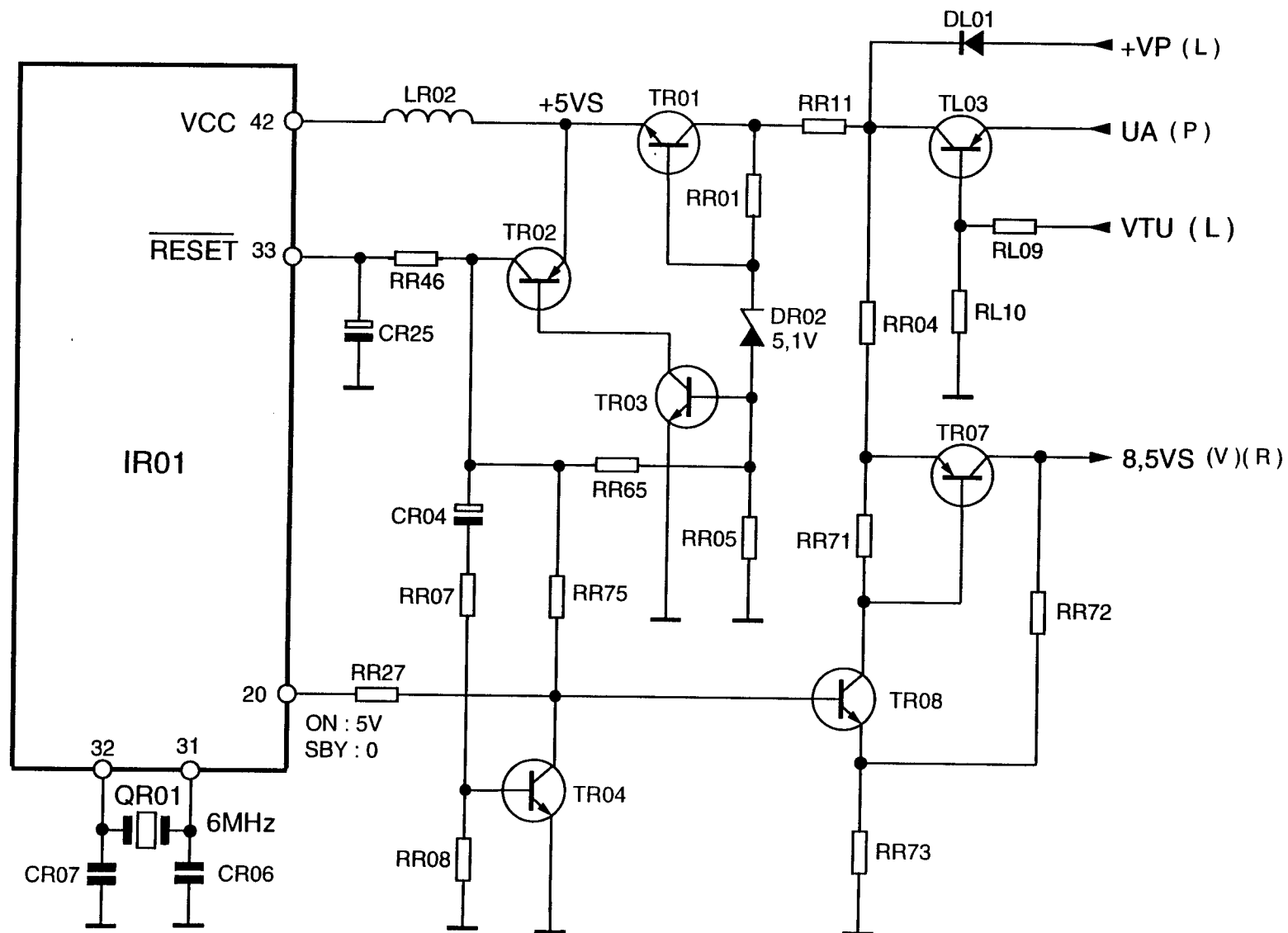
This input (pin 34) monitors the microcontroller supply voltage. If this voltage falls below 4.5V, the television switches to standby.

MISE SOUS TENSION



COUPURE SECTEUR





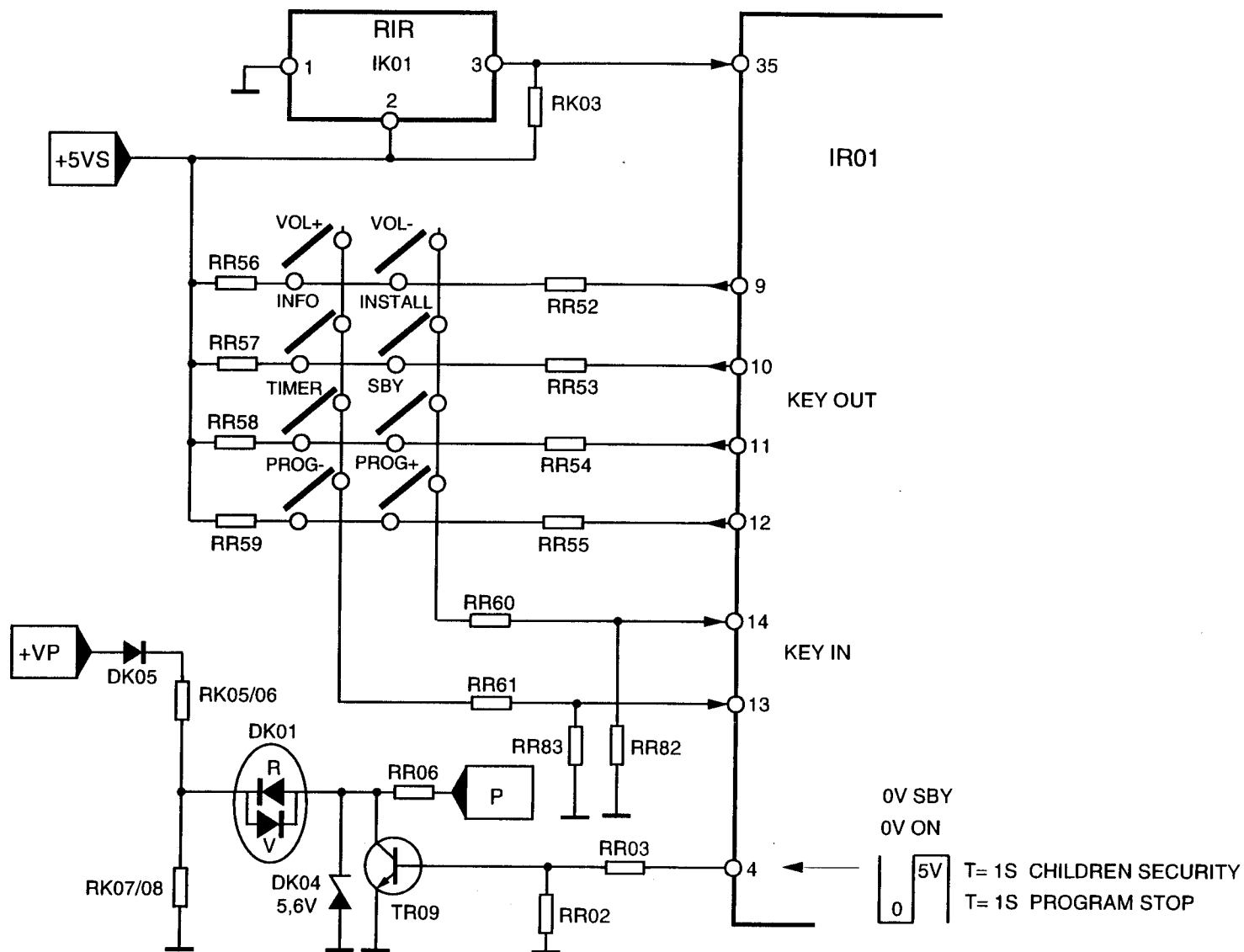
TV ON/STANDBY COMMAND

Output 20 of **IR01** corresponds to an open drain output.

When the television is switched on, it passes to a high level resulting in the saturation of TR08 and TR07. A +8.5VS voltage appears on the collector of TR07 and supplies the integrated circuit IV01 (pin 37). The time base command signals **mu** are output from IV01.

The voltage +VP (**12.5V**), recuperated from a secondary coil of the line transformer via the diode **DL01**, takes over from the voltage UA.

During the reset, the time constant **CR04/RR07** and the transistor TR04 suppress the 5Vcc positive impulse present on output 20 of IR01.



EXTERNAL COMMANDS

THE KEYBOARD

depending on rack version, the keyboard comprises 4 or 8 keys. It is organised in a line/column matrix.

The outputs (pins 9 to 12) provide, in standby, negative signals with a period of approximately 40ms. The function inputs, pins 13 and 14, are in a low level in the absence of key operation.

When a key is pressed, a high level (pin 9) or sweep signals (pins 10 to 12) are transmitted to an input function.

REMOTE CONTROL

The emitted codes arrive at 35 of IR01. They are repeated every 80ms.

They are composed of 12-bit serial words.

- 4 address bits.
- 1 call bit.
- 7 function bits.

FRONT PANEL LED

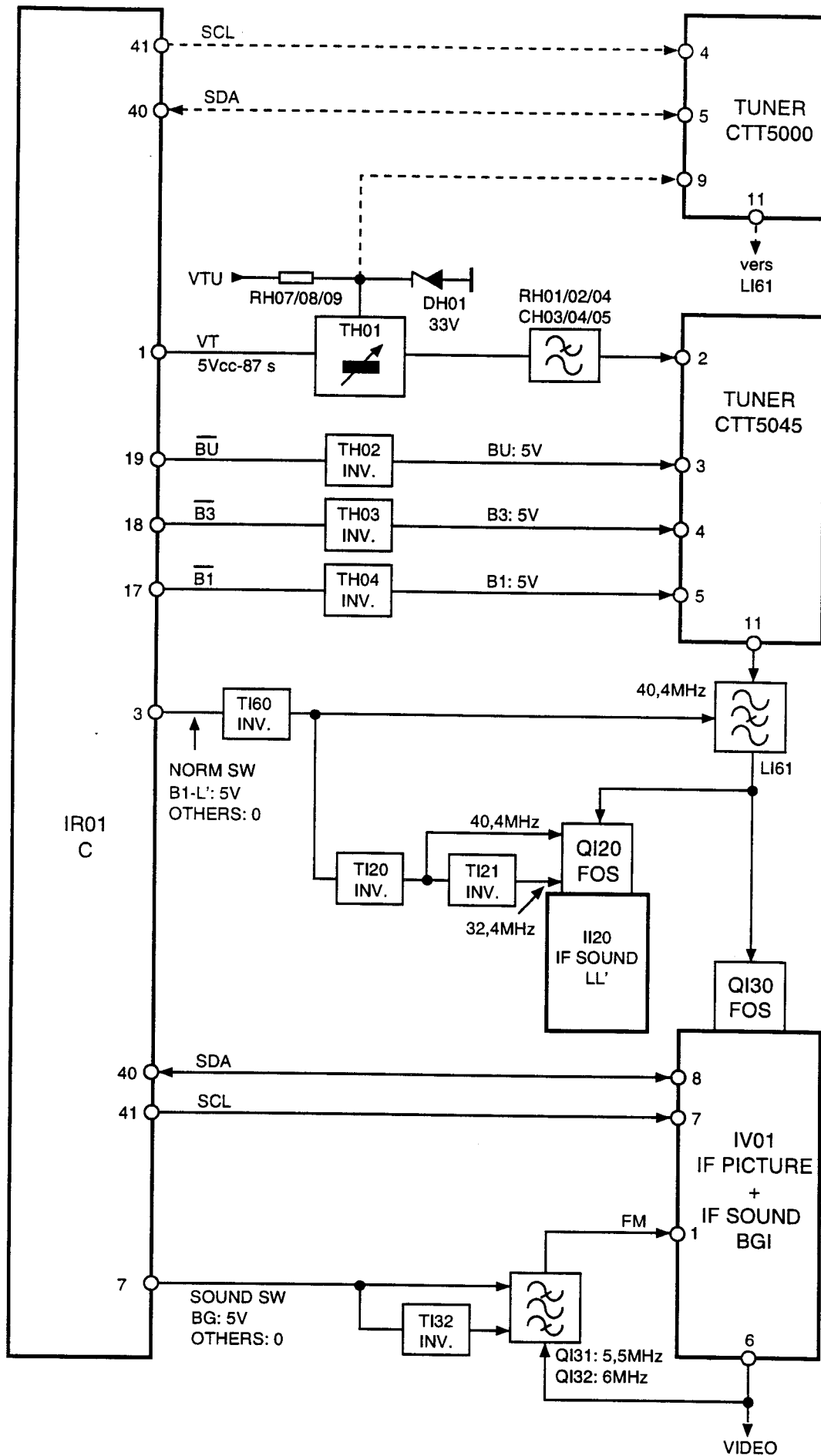
This indicator light consists of a two-colour LED (RED-GREEN).

During operation, the green LED is powered from +VP (12.5V) originating from the line transformer.

In standby, the red LED is powered from UA (9V) originating from the main power supply. This UA voltage, switched by transistor TL03, gives the voltage P.

In electronic key, programmable stop and safety modes, it cycles between 2 states:

- In electronic key mode, the red LED flashes (T = 1 second).
- In programmable stop mode, the red LED flashes (T = 1 second).
- In time base safety mode, it flashes red/green in alternance.



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MULTIMEDIA

VOLTAGE SYNTHESIS TELEVISIONS (CTT5045 tuner)

CHANNEL AND STANDARDS MANAGEMENT

The pins 17, 18 and 19 of **IR01** manage the tuner reception bands. The varicap voltage is composed from the signal available at 1 of **IR01** (VT), the variable resistor **RH01** and the low-pass filter **RH01/02/04/CH03** at **CH05**. Automatic frequency control is performed by the integrated circuit **IV01** and informs **IR01** via the bus IIC

Output 3 of **IR01** allows:

- The disabling of the **40.4MHz** rejecter in the **1L'** band.
- To tune the sound FI to **40.4MHz** (1 **L'** band) or **32.4MHz** (other case).

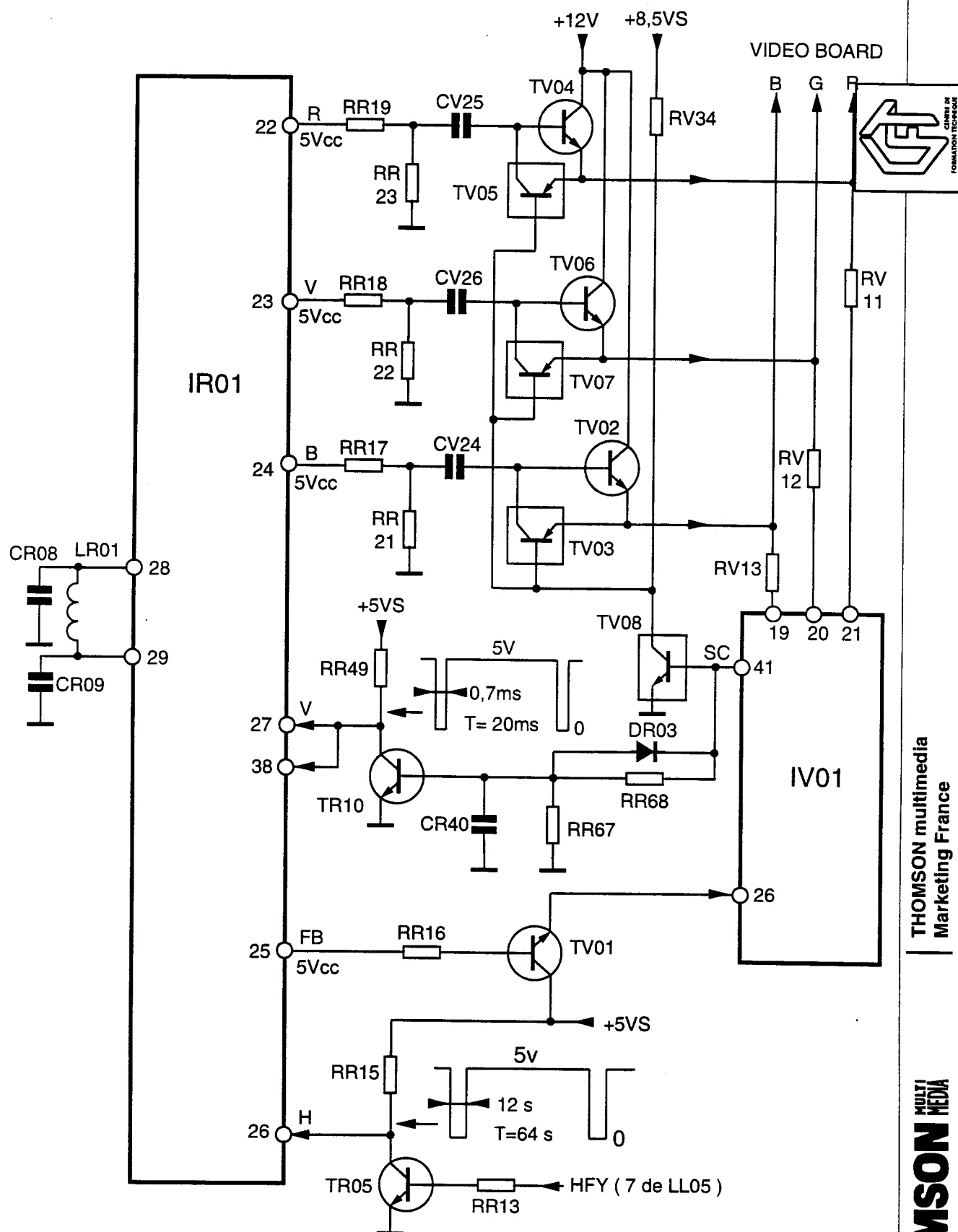
output 7 of **IR01** selects the filters **QI31** (5.5MHz) or **QI32** (6MHz) for the FM audio carriers.

FREQUENCY SYNTHESIS TELEVISIONS (CTT5000 tuner)

CHANNEL AND STANDARDS MANAGEMENT

The bus IIC informs the tuner for channels and standards management. The 33V voltage for the varicap diodes arrives at 9 of the tuner.

Pins 3 and 7 of **IR01** play the same role.



OSD SIGNAL GENERATOR

The microcontroller **IR01** produces the necessary signals for the display of menu! on the screen.

Via pin 25, it delivers the encrustation command, FB (fast blanking). This results via the transistor **TV01**, in input 26 of **IV01** being informed and allows the RVB outputs of **IV01** (pins 19 to 21) to be cleaned.

Using pins 22 to 24, it delivers the RVB signals. These signals are amplitude adjusted, black level corrected using the burst port impulse and sent to the RVB amplifier. The transistors **TV08**, **TV03**, **TV05** and **TV07** perform signal alignment.

A clock having a speed close to 7MHz (pins 28 and 29) sets the encrustation frame width. It is enabled in OSD mode only.

The line return impulse (HFY) taken from point 7 of the line transformer **LL05** arrives at pin 26 via the transistor **TR05**.

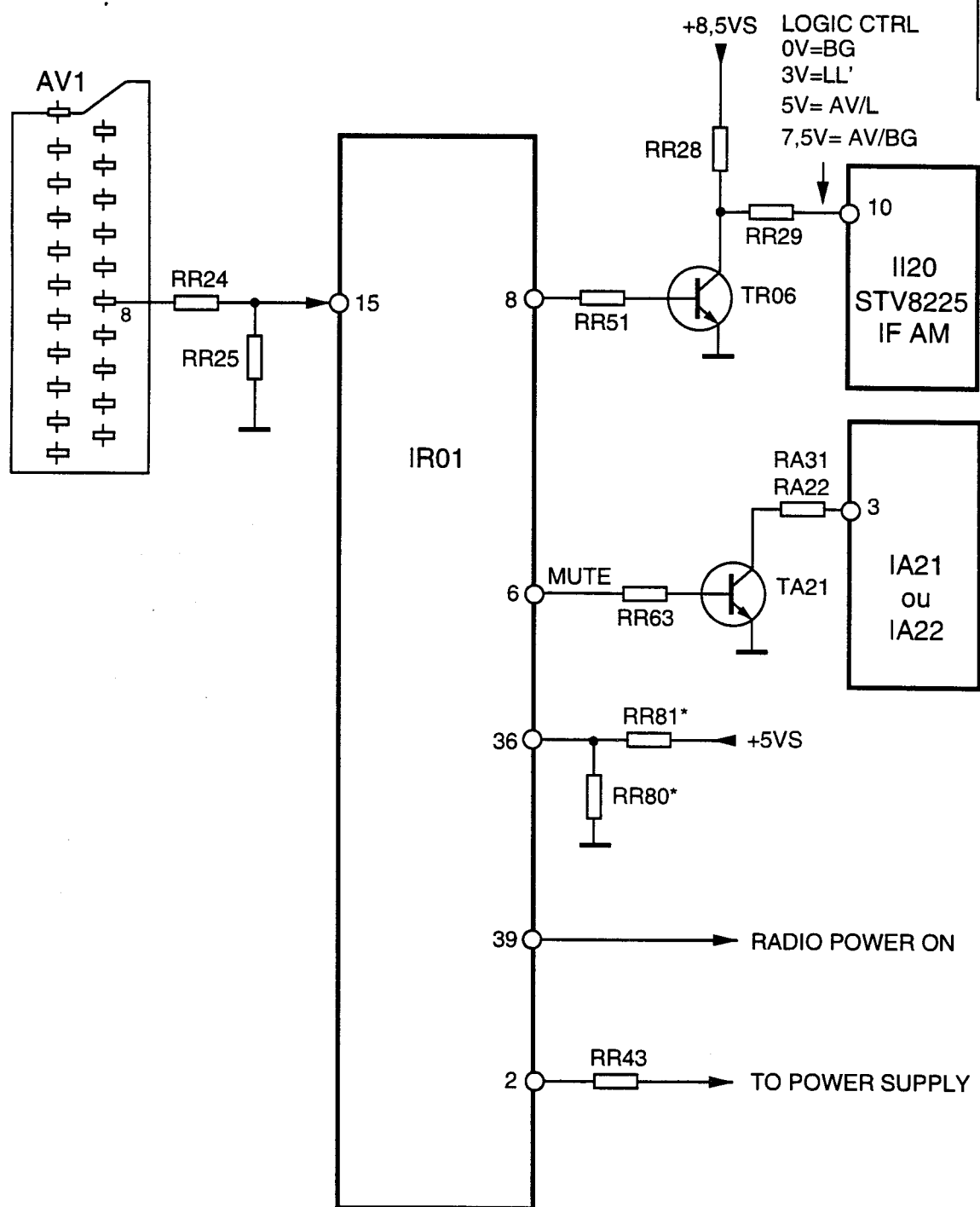
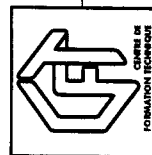
A raster return impulse arrives on pin 27. It is obtained by integrating the sand castle (**RR67/RR68/CR40**), available at 41 of **IV01**, and by the shaping transistor **TR10**.

These two signals H and V, present with and without video signal, are required for setting the position of the OSD window with respect to the television raster.

NOTES:

If the line return impulses are absent, there is no OSD.

If the raster return impulses are absent from 27 or 38, the microcontroller **IR01** will no longer perform functions and consequently the screen will remain black.



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THOMSON MULTI MEDIA

OTHER COMMANDS

Pin 15: receives the slow switching from the peritel connector **AV1** .

Pin 8: performs switching of internal/external audio sources in 1120, via the transistor TR06.

Pin 6: audio MUTE, it is enabled at 5V.

For 36cm televisions (pin 36 of **IR01** grounded by a 10K resistor), mute is **enable**d when the television is switched on or switched to standby. For the other cases mute is performed by the software in **IV01** .

For 51 and 55cm televisions (pin 36 of **IR01** at 5V by a 10K resistor), mute is enabled when the television is switched on, channel is changed, in the absence of a signal and when switched to standby.

Pin 39: certain televisions incorporate an FM radio. This output allows the radio to be switched on.

Pin 2: command bursts for the main power supply are generated in standby mode

TIME BASE

CONTENTS

LINE GENERATION

RASTER GENERATION

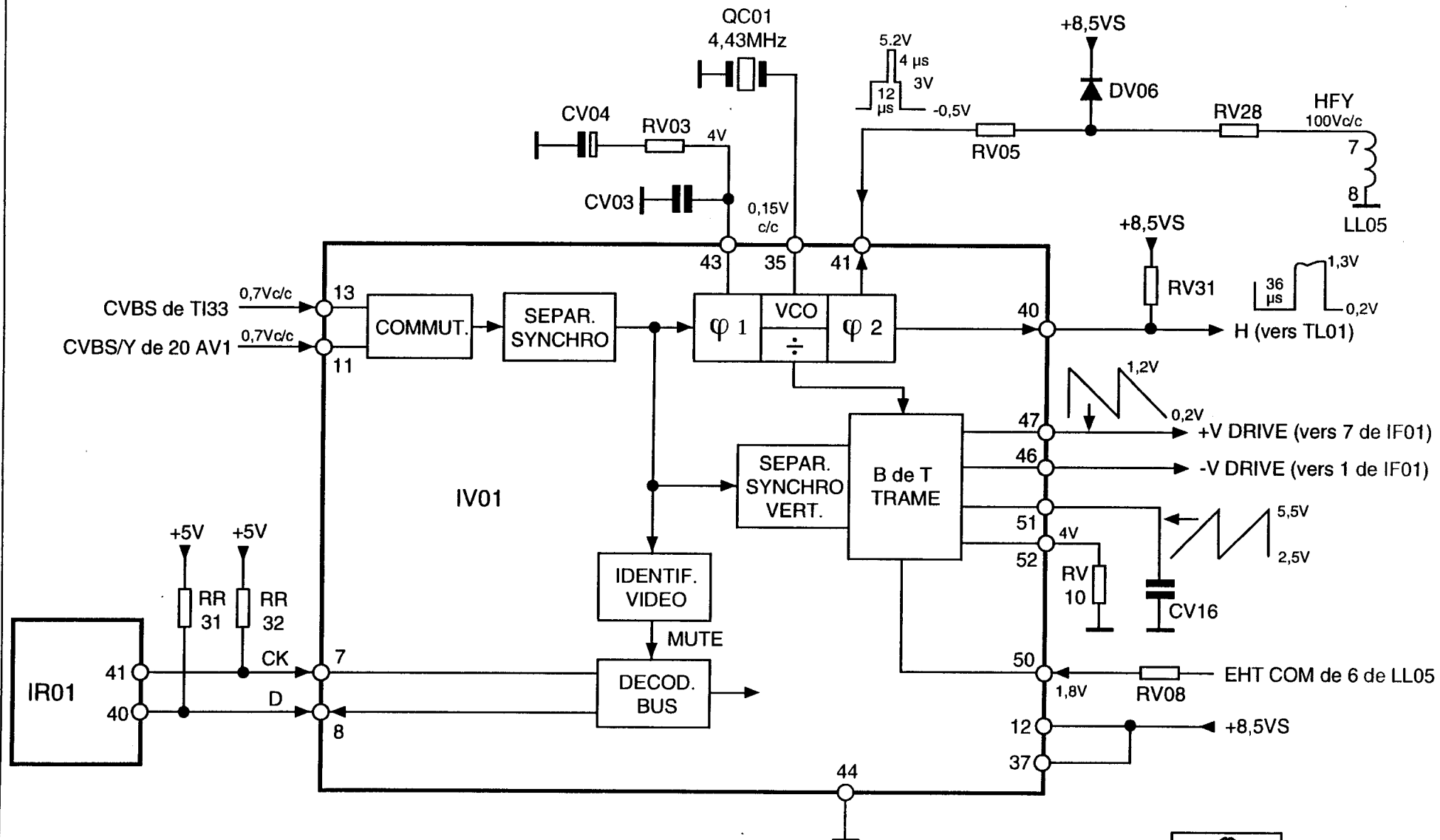
MUTE GENERATION

LINE TIME BASE COMMAND

LINE POWER STAGE

RASTER POWER

SAFETY



LINE GENERATION

The integrated circuit IV01 is used. A VCO + divider assembly controlled by the 4.43MHz quartz oscillator (pin 35) supplies a line frequency signal. A first phase comparer, which receives the line synchronisation from the incident video signal, locks the divider. The filtre anti-chasse components of this comparer are RV03, CV04 and CV03 (pin 43).

A second phase comparer ensures entry into the static phase. This second comparer receives line return impulses, originating from the pin 7 of the line transformer (LL05) via pin 41 of IV01.

The line signal is available on output 40 of IV01.

RASTER GENERATION

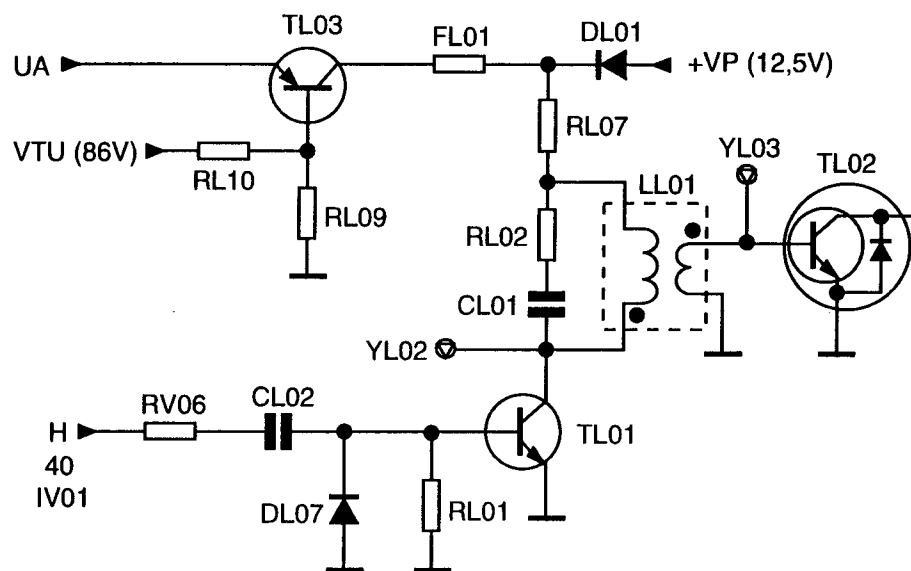
The integrated circuit IV01 is used. A ramp generator (pins 51 and 52 of IV01) and a vertical divider, triggered by a line signal and reset by the raster synchronisation, provides a raster sawtooth signal. This signal is available on pins 47 and 46 of IV01.

A vertical amplitude compensator (6.3% per volt), depending on beam current, is obtained from the information EHT COM (1V at 2.8V) which arrives on pin 50 of IV01.

MUTE GENERATION

The video identification stage analyses the presence of the line synchro and delivers mute information. This is transmitted to IR01 via the bus IIC. In the absence of line synchro, the television switches to standby after 5 minutes.

NOTES:



LINE TIME BASE COMMAND

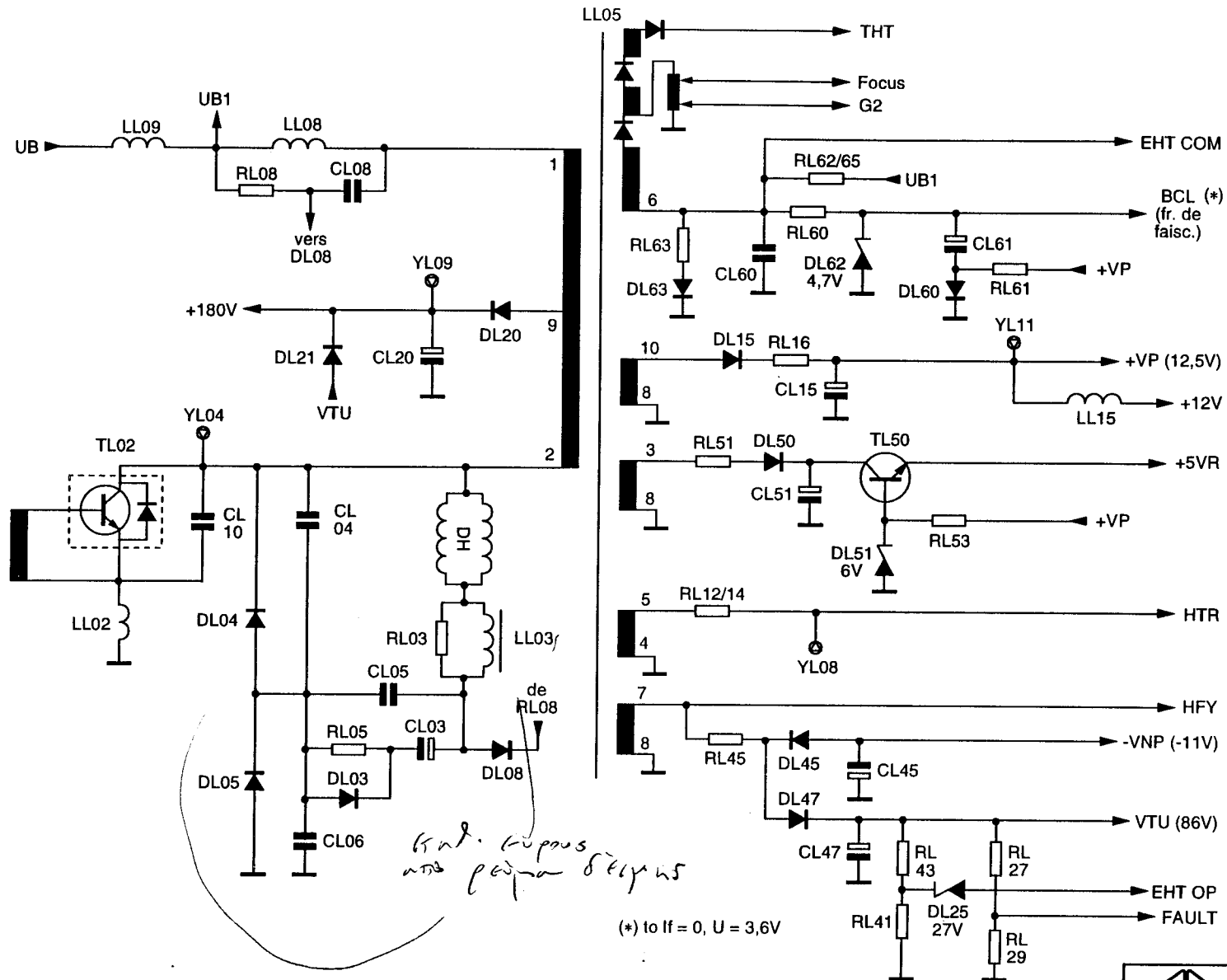
The signal H, originating from the output 40 of IV01, is shaped by RL01, CL02 and DL07. The driver stage is composed of the transistor TL01. The cell RL02/CL01 limits the overvoltage peak which appears on the collector of TL01 when it is turned off.

The driver transformer LL01, operating in alternating mode, ensures saturation of the line power transistor TL02 each time the driver stage is turned off.

Power supply to this part is ensured:

- At startup, by the audio supply voltage UA, via the transistor TL03. Because the voltage VTU, originating from the THT, is absent, TL03 is saturated.
- In steady state, by the voltage +VP originating from the THT via the diode DL01.

NOTES:



LINE POWER STAGE

The primary coil of the transformer THT (LL05) is connected between UB and the line power transistor TL02 via the optional circuit LL08/RL08/CL08 (curtain effect suppression).

The capacitors CL04/10 and the line deviator determine the line return time ($T=12\mu s$).

The capacitor of "S" CL05, whose average voltage is equal to UB, supplies the energy to the horizontal deviator which is in series with the linearity self-inductance coil LL03 and its damper resistor RL03.

In parallel on CL05, the optional circuit CL03/DL03/RL05 allows damping of the interference oscillations which occur in the event of a sudden increase in the beam current. The optional diode DL08 improves horizontal framing.

The modulator, with diodes DL04, DL05 and CL06 minimises pumping due to the weak THT regulation.

The following voltages and signals are present on the secondary coils of LL05:

-Pin 9, a positive 80Vc/c line return impulse superimposed on UB. By DL20, a 180V voltage required for supplying the RVB stages is obtained.

-Pin 10, a negative 120Vc/c impulse. By DL15, a 12.5V voltage (raster) and a 12V voltage (general power supply) are obtained.

-Pin 3, a negative 70Vc/c impulse. By DL50, a 7V voltage is obtained. This voltage is brought to 5V (teletext HF) via the stabilisation TL50, DL51 validated by +VP.

-Pin 5, a positive 24Vc/c impulse (HTR) for filament heater.

-Pin 7, a positive 100Vc/c impulse for:

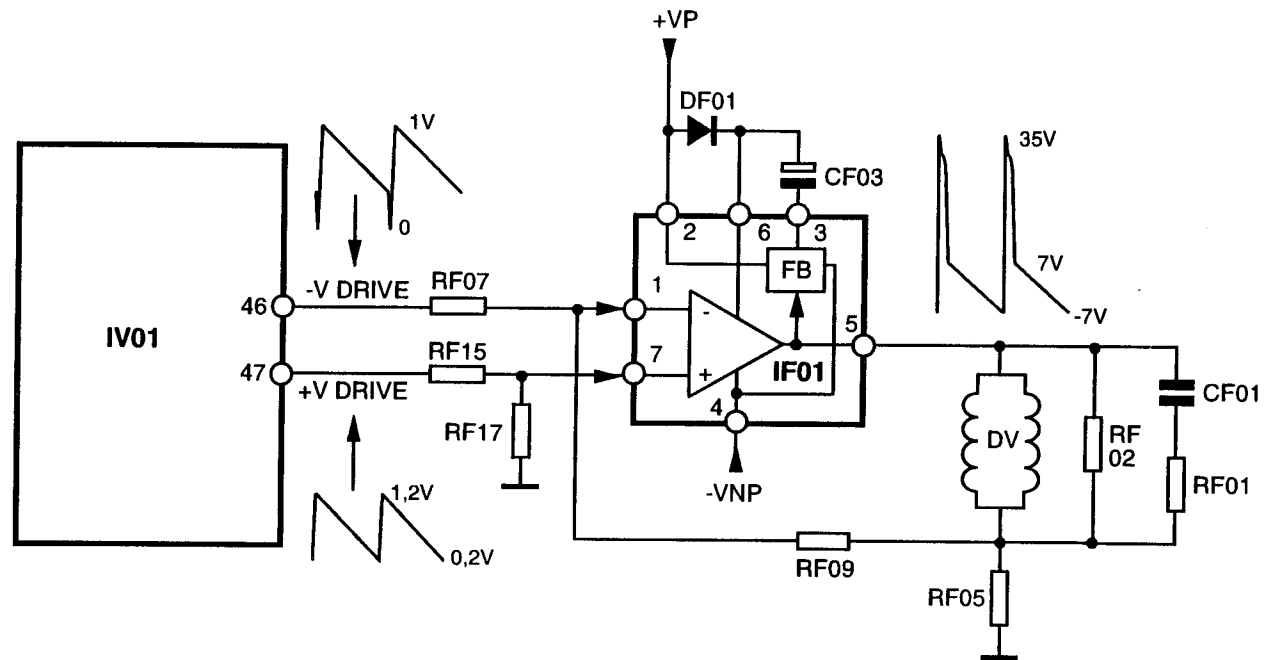
- Service signals (phase and sandcastle).

- The OSD line synchronisation.

- Obtaining the voltage -VNP (raster) after rectification by DL45.

- Obtaining the voltage VTU (varicap, TL03 and safety) after rectification by DL47.

- The information EHT COM (beam current image) taken from the foot of the split diode supplies, after integration (RL60/CL61), the average beam current BCL (this acts on IV01 contrast and brightness commands). In the event of a sudden increase in beam current, the diode DL60 is turned off and disables the capacitor CL61. Consequently, the reaction on contrast and brightness will be faster.



RASTER POWER

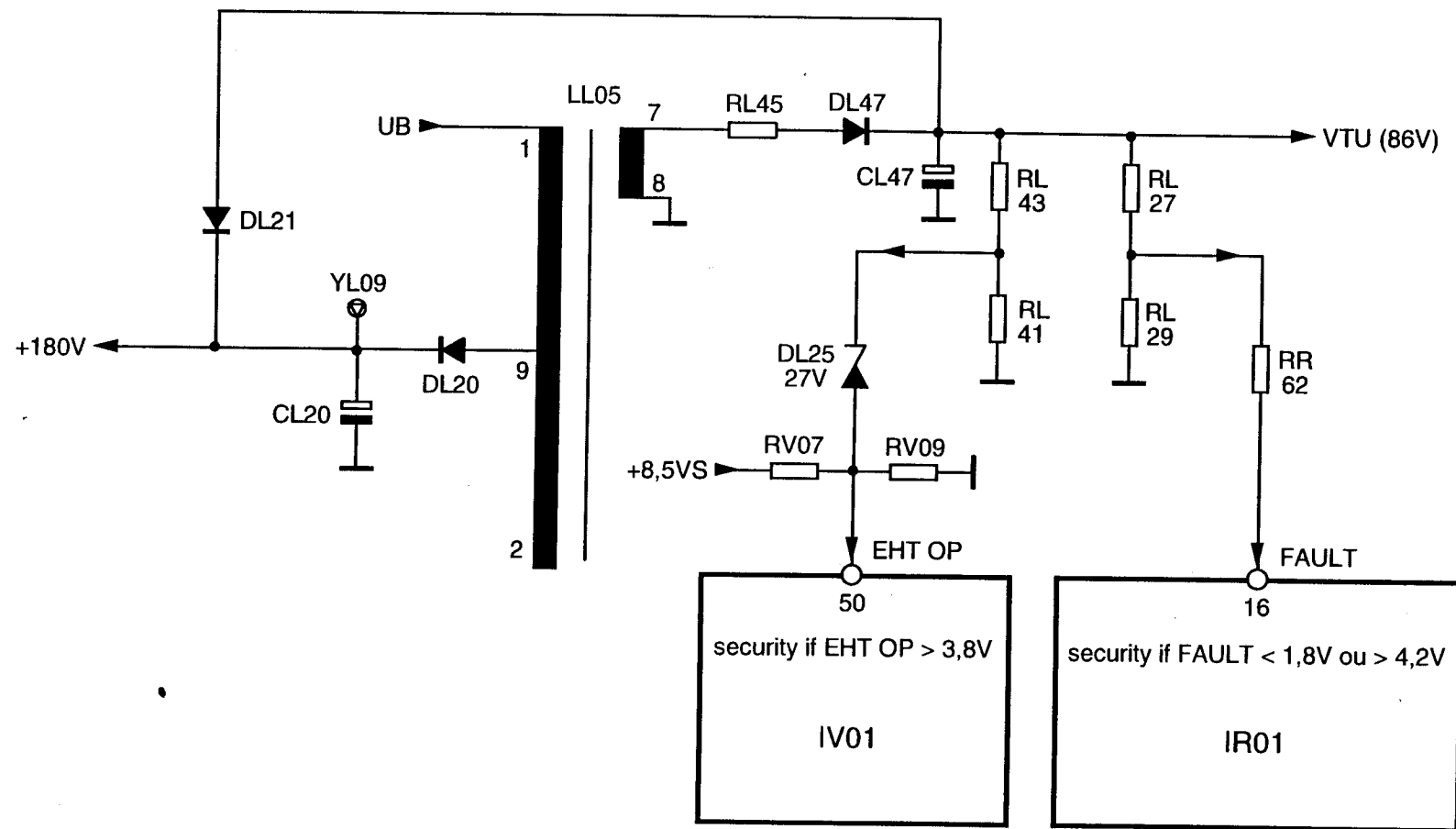
The raster power amplifier, IF01, receives on its inputs 1 and 7 the raster sawtooth signal from pins 46 and 47 of IV01.

IF01 is supplied by the voltages +VP (12.5V) and -VNP (-11V), originating from the THT, during the raster outward scan. Furthermore, during this time, the capacitor CF03 is charged to VP + VNP. On the raster return scan, IF01 is supplied by VP + the charge on CF03 and by -VNP. This allows compensation for the self-inductance effect of the deviator.

The pin 5 of IF01 delivers the current to the raster deviator. Connected in series with deviator, the resistor RF05 develops the current image at its terminals for the counter-reaction of the amplifier IF01.

The components RF01 and CF01 limit the frequency range. The resistor RF02 damps line oscillations originating from the line deviator.

NOTES:



SAFETY

In the event of an absence or overvoltage of the +180V signal, due to the intervention of the diode DL21, The VTU voltage falls (This may result in resistor RL45 being cut).

In the event of damping on the THT (disconnection of line deviator ...), the VTU voltage falls.

In both of these cases, the FAULT signal falls below 1.8V causing the following reaction:

- STANDBY: 6 seconds, ON: 6 seconds, STANDBY: 6 seconds, etc.

If the problem disappears, the television remains on.

In the event of an increase in the VTU voltage of about 20%, the signal EHT OP reaches 3.8V causing the following reaction:

- STANDBY: 3 seconds, ON: 1.5 seconds, STANDBY: 3 seconds, etc.

If the problem disappears, the television remains on.

In the event of an increase in the VTU voltage of about 40%, the FAULT signal reaches 4.2V causing the following reaction:

- STANDBY: 6 seconds, ON: 6 seconds, STANDBY: 6 seconds, etc.

If the problem disappears, the television remains on.

NOTES:

HF/FI

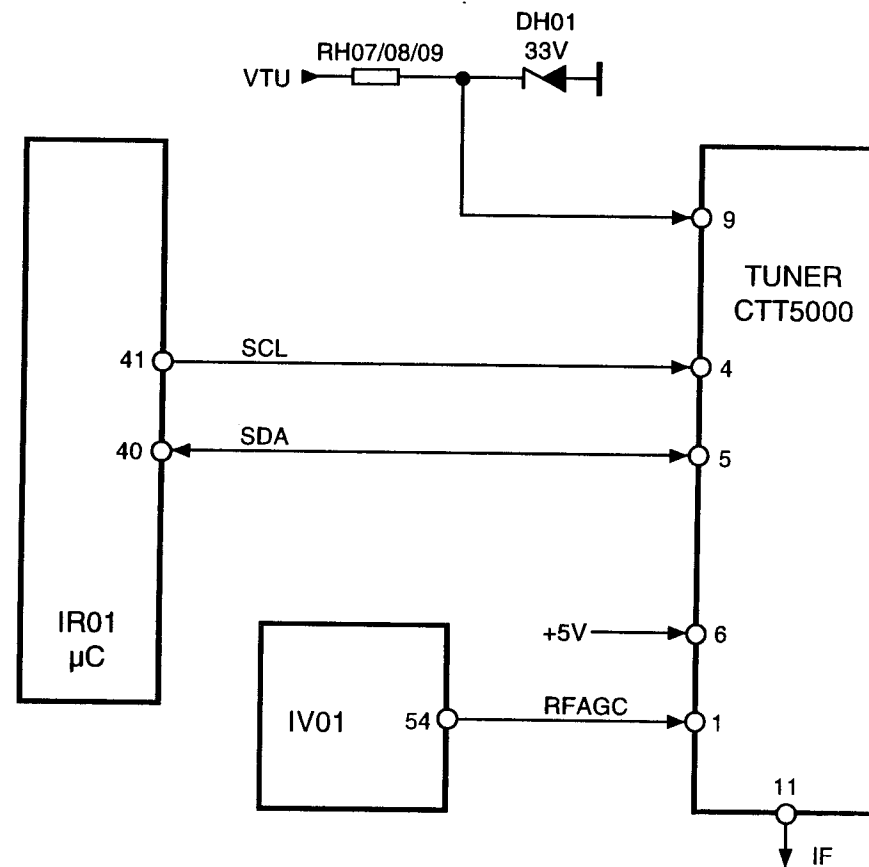
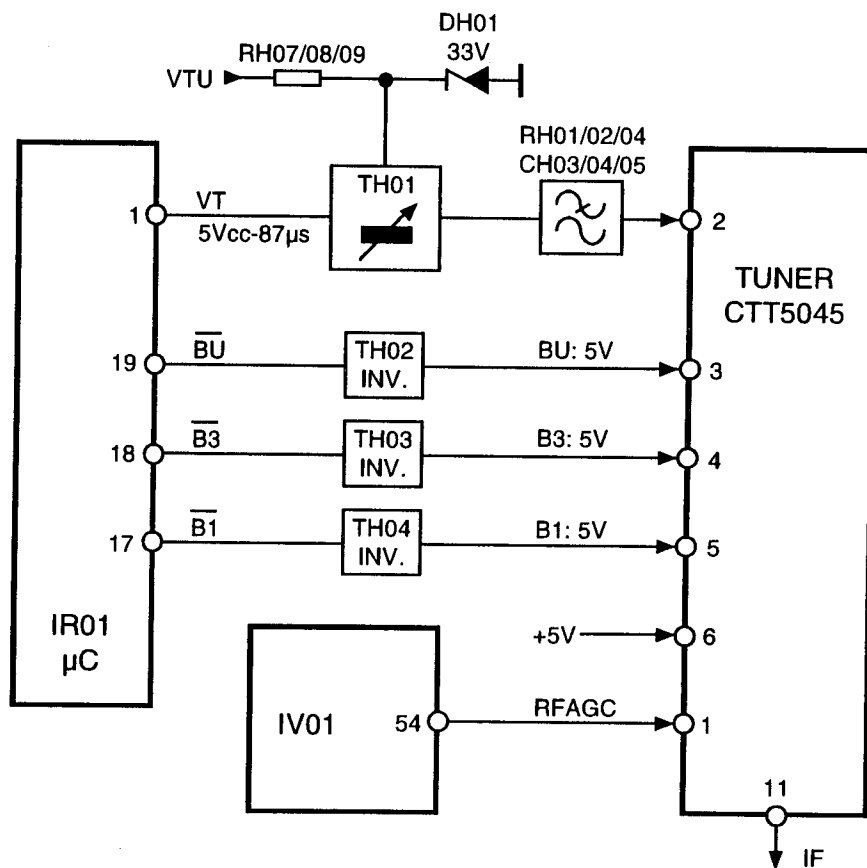
CONTENTS

TUNERS

VOLTAGE SYNTHESIS

IMAGE FI

SOUND FI



CTT5045 TUNER

The CTT5045 is a tuner equipped with a voltage synthesiser. It covers the following frequency ranges:

- VL: 45.25MHz to 140.25MHz
- V: 147.25MHz to 423.25MHz
- U: 431.25MHz to 863.25MHz

The varicap voltage, in each of these ranges, varies from 0.8V to 33V. This varicap voltage is obtained from the VT (period close to 87µs and variable cyclic ratio) originating from output 1 of IR01.

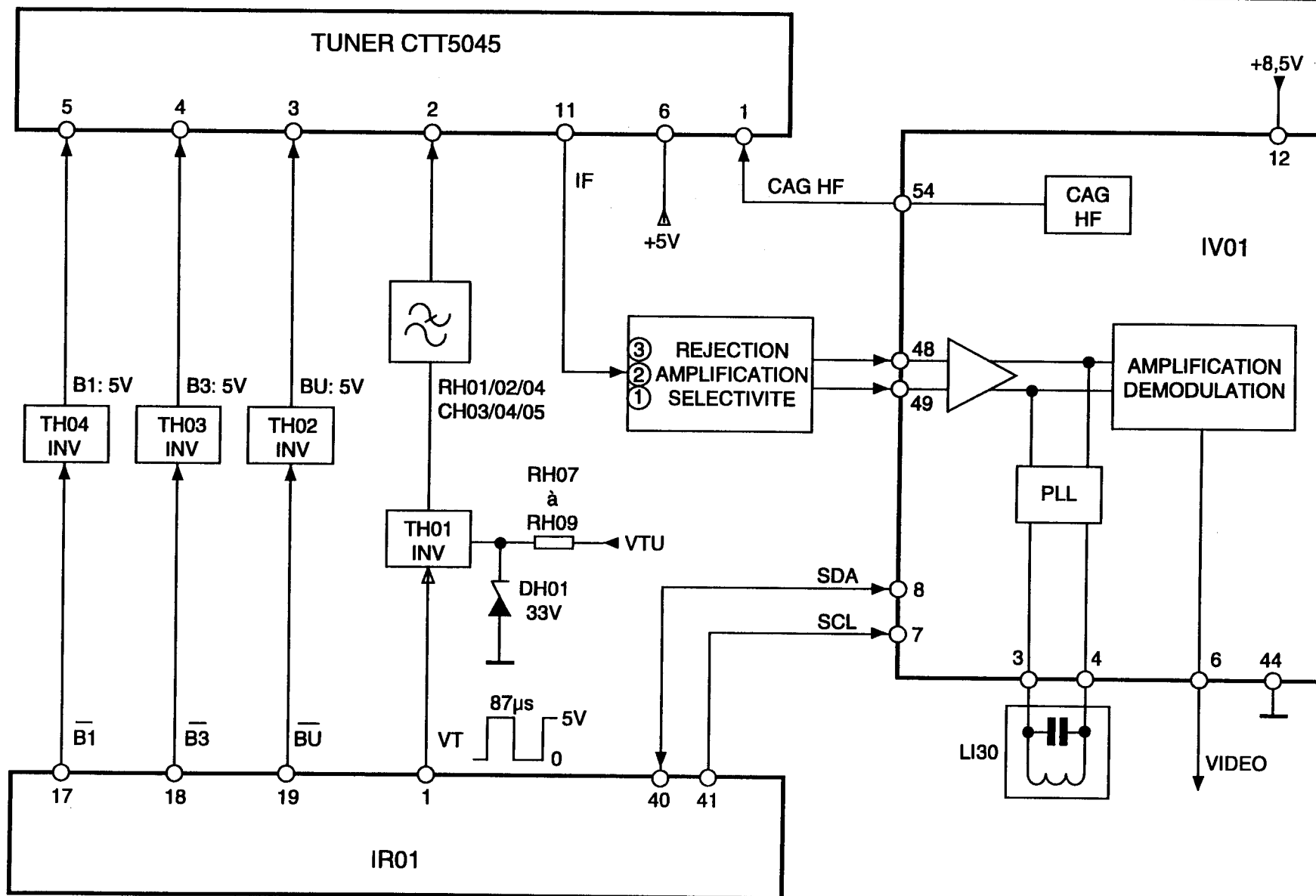
The information output on the tuner's pins is as follows:

PIN	REMARKS
1	CAG HF input
2	Varicap voltage input
3	5V input at U (BU)
4	5V input at VH (B3)
5	5V input at VL (B1)
6	5V supply
11	FI output

CTT5000 TUNER

The CTT5000 is a tuner equipped with a frequency synthesiser. It is controlled by the microcontroller IR01, via the bus IIC, for standards switching and channel management. It covers the following frequency ranges:

- VL: 48.25MHz to 112.25MHz
- VH: 119.25MHz to 399.25MHz
- U: 407.25MHz to 863.25MHz



VOLTAGE SYNTHESISER

During TV channel searching, the microcontroller IR01 produces via output 1 the tuning signal, VT, for the varicap diodes. This is amplified and inverted by the transistor TH01. The transistor TH01 receives a 33V supply due to the voltage VTU and the zener diode DH01. A low-pass filter (RH01/02/04, CH03/04/05) then transforms this signal into a dc voltage.

When a transmitter is found, IR01 is informed by IV01 (presence of synchro.) via the bus I2C. A slowing down in the progression of the varicap voltage should then occur. Then, with the "S" of CAF informing IR01 by the bus IIC, fine tuning on the received transmitter will be performed.

NOTES:

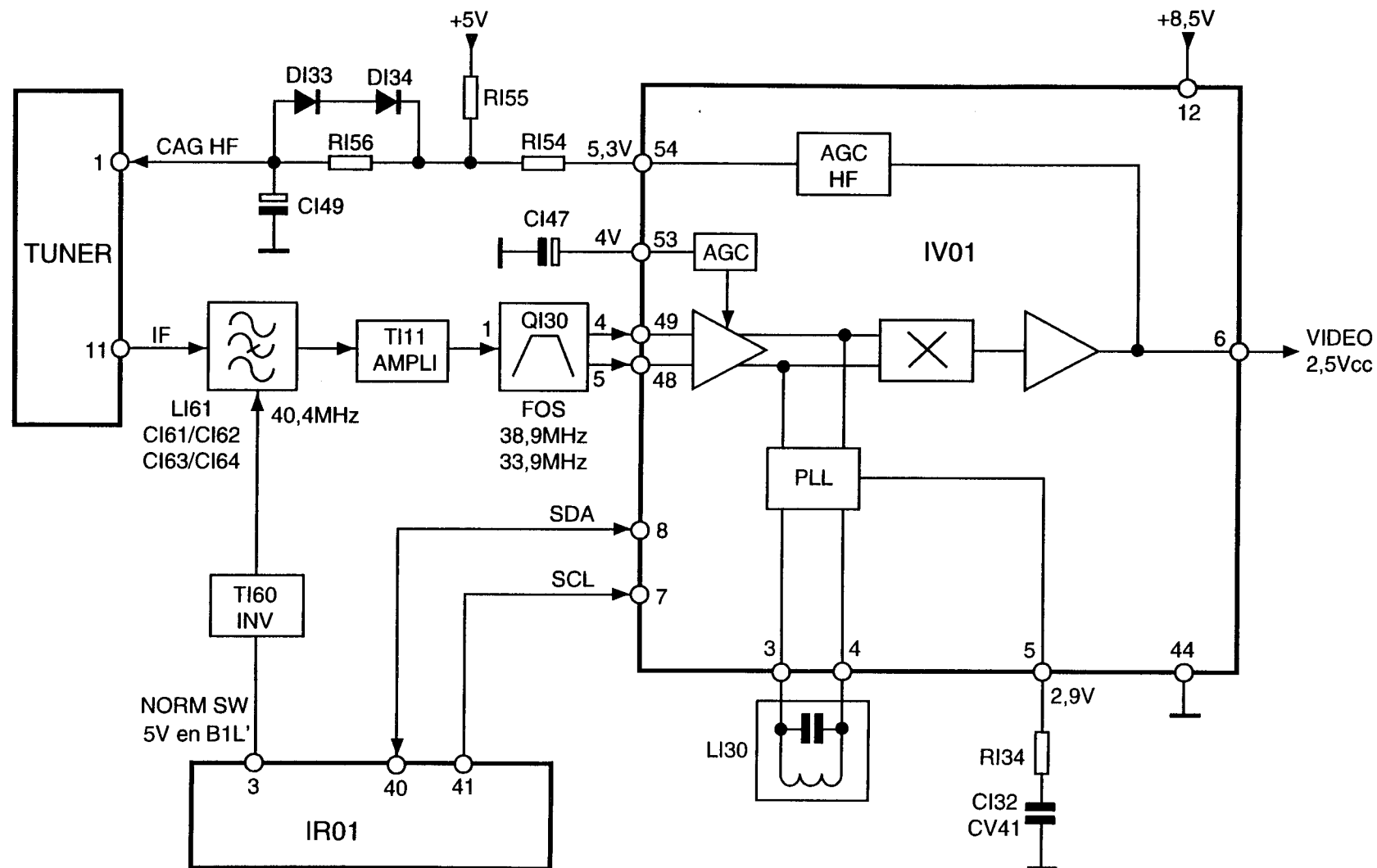


IMAGE INTERMEDIATE FREQUENCY

The integrated circuit IV01 is used for this image FI. It comprises the demodulation stages (positive and negative) and the CAGs. Standards switching is transmitted to IV01 by the bus IIC.

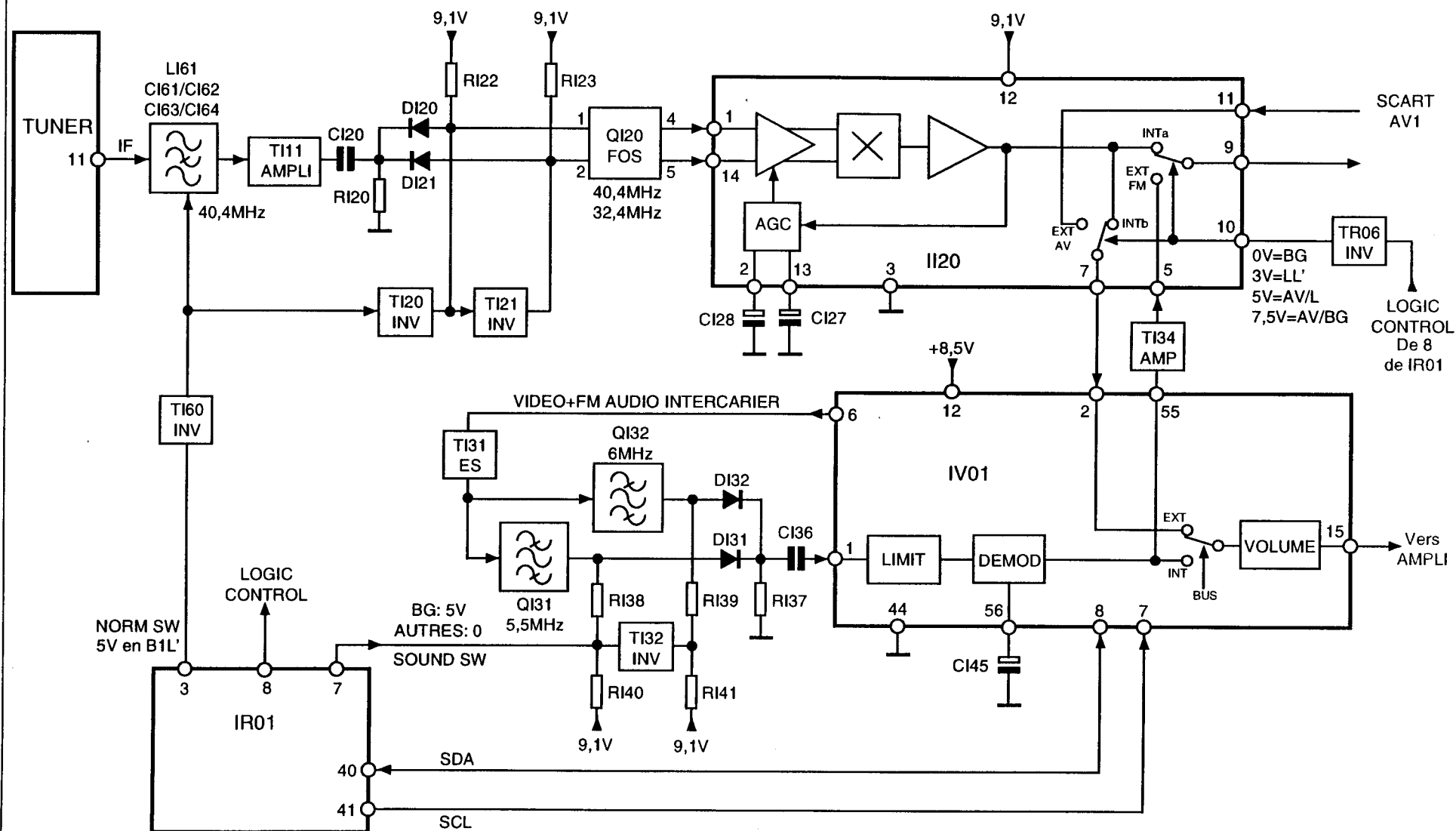
The gabarit d'entrée QI30 has 2 NYQUIST flancs, 33.9MHz for the 1 L' band and 38.9MHz for the other standards and bands.

The tuning frequency of the demodulation volant (LI30) is regulated via the bus IIC. It is 33.9MHz in the 1 L' band and 38.9MHz the other standards and bands.

At the tuner output, a 40.4MHz rejecter is disabled in the 1 L' band.

Regulation of HF CAG is performed by IR01 (service mode) and informs IV01 via the bus IIC. The diodes DI33/DI34 improve CAG response in the event of large variations in the video signal.

NOTES:



SOUND INTERMEDIATE FREQUENCY

LL' STANDARDS

The integrated circuit II20 (STV8225) with the gabarit QI20 are used. The central frequency of the gabarit is switched from 40.4MHz in the 1L' band to 32.4MHz in the 3,4,5 LL' band. Output 3 of IR0, the transistors TI60/20/21 and the diodes DI20/21 perform this switching.

BGI STANDARDS

The integrated circuit IV01 (TDA8842) with the bandpass filters QI31/32 are used. Output 7 of IR01, the transistor TI32 and the diodes DI31/32 will enable the filter QI31 for BG and QI32 for I.

COMMANDS

The LOGIC CONTROL command, originating from pin 8 of IR01, ensures external/internal audio switching in II20.

IR01, via its bus IIC, ensures external/internal audio switching and volume control in IV01.

	LOGIC CONT.	IV01	II20
BG	0	INT	EXT FM
LL'	3V	EXT	INT a INT b
AV LL'	5V	EXT	INT a EXT AV
AV BG	7,5V	EXT	EXT FM EXT AV

NOTES:

VIDEO PROCESSING

CONTENTS

GENERAL

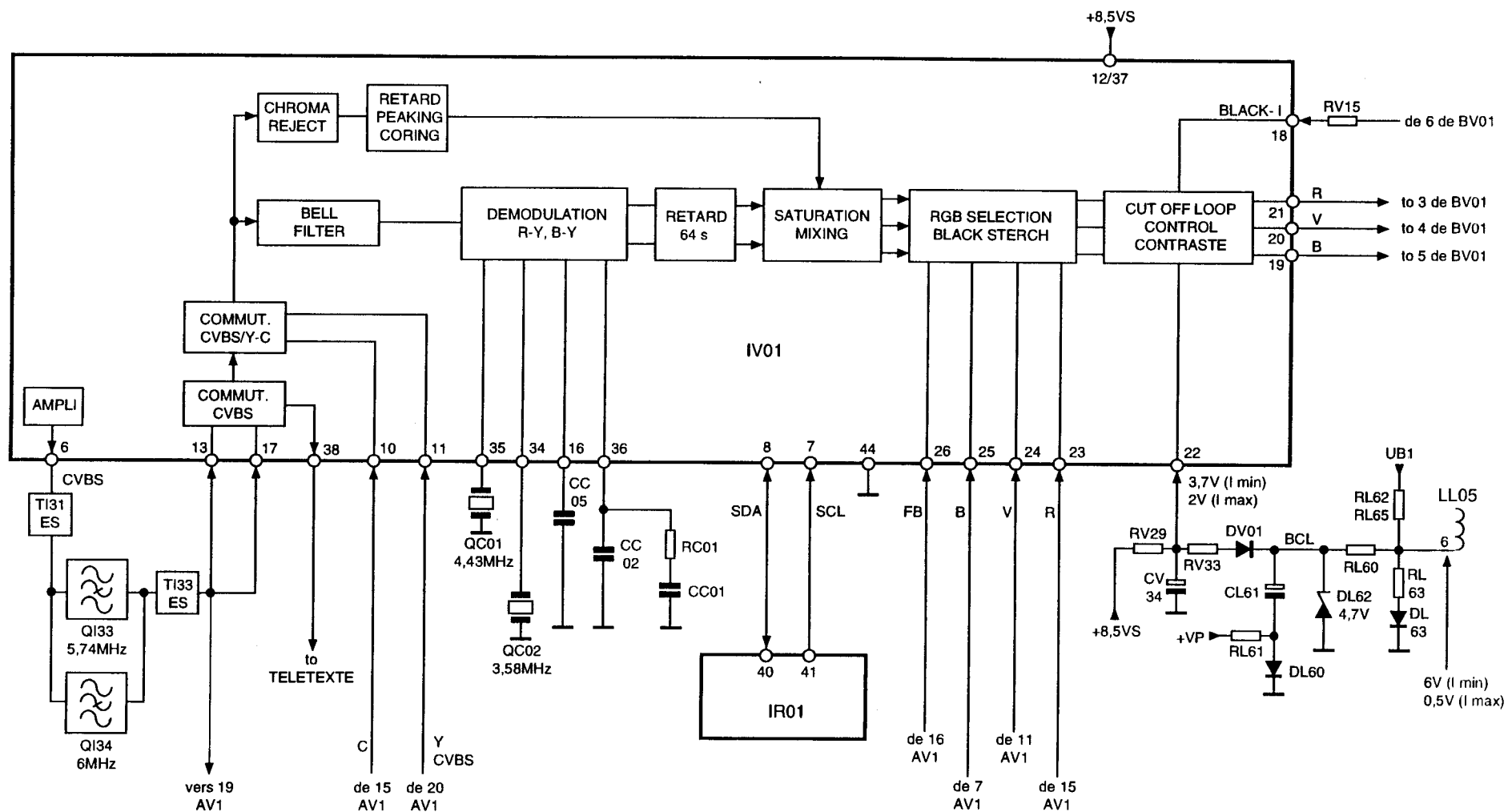
LUMINANCE PROCESSING

CHROMINANCE PROCESSING

RVB PROCESSING

BEAM BRAKE

TUBE SERVO-CONTROL



GENERAL

Luminance, chrominance and RVB processing is performed by the integrated circuit IV01. All regulation and commands to this integrated circuit are made via the bus IIC. All frequencies required for this video processing (luminance delay, bell, bandpass, R-Y and B-Y demodulator) are obtained by VCO/PLL whose 4.43MHz (PAL/SECAM) and 3.58MHz (NTSC) quartz oscillators are references.

This circuit has two video inputs, a video or luminance input and a chrominance input.

The pins 13 and 17 receive the video signal originating from the FI stages, via the FM audio inter-carrier rejecters (QI33 and QI34).

The pin 11 receives the video or luminance signal originating from input 20 of the peritel connector AV1.

The pin 10 receives the chrominance signal originating from input 15 of the peritel connector AV1.

LUMINANCE PROCESSING

The video signal, available after the switches CVBS and CVBS/Y-C, is directed to the chrominance rejecter, the delay (110ns), the peaking and coring stage, and finally informs the RVB matrixing circuit.

The peaking and coring stage improves the luminance signal transitions without increasing noise.

CHROMINANCE PROCESSING

The SECAM or PAL or NTSC chrominance sub-carriers, extracted from the video signal and shaped by the bell circuit (SECAM) or the bandpass filter (PAL and NTSC), are transmitted to the R-Y and B-Y demodulators.

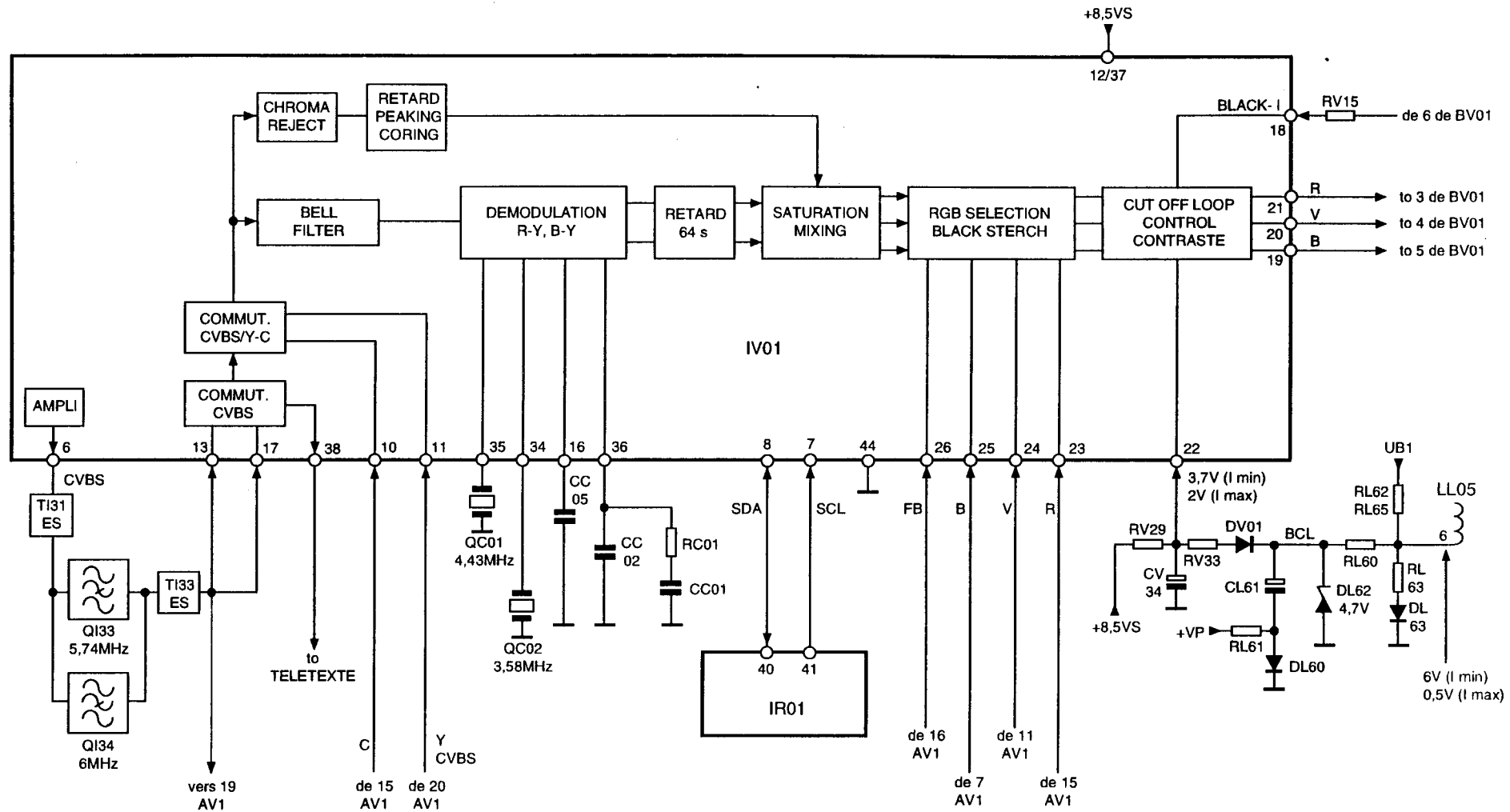
Chrominance identification is performed automatically.

The delay circuit (1 line) with summing circuit are incorporated in IV01.

After saturation regulation, the R-Y and B-Y signals are sent to the RVB matrixing stage.

NOTES:

51



RVB PROCESSING

The RVBs obtained after matrixing are switched with the RVBs from the peritel entering 23, 24 and 25 of IV01. The rapid switching signal, FB (pin 26), authorises the acceptance of these peritel RVBs. Their level must be close to 800mV.

The black extension circuit increases contrast, in the case of an image containing only a few small dark areas.

Regulation of brightness and contrast is performed on these RVBs. On outputs 19 to 21 of IV01, the black level varies from 2.2V to 3.2V depending on brightness setting and the white level varies from 3.2V to 4.2V depending on contrast setting.

BEAM BRAKE

The pin 22 of IV01 receives the beam current information, originating from point 6 of the line transformer. If the voltage on this pin falls, the contrast then the brightness are reduced.

The components CL61, RL61 and DL60 perform the switching between peak beam brake and average beam brake.

CUT-OFF WARNING

Measurement of cut-off currents is performed over 4 lines after raster return (20 to 23 and 333 to 336).

For lines 20 and 333, the tube leakage current is measured.

For lines 21 to 23 and 334 to 336, the cut-off current for the RVB guns is measured. For these measurements, the RVB and IV01 outputs deliver impulses whose peaks are at around 3V.

The pin 18 of IV01 receives these measurement currents.

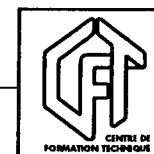
NOTES:

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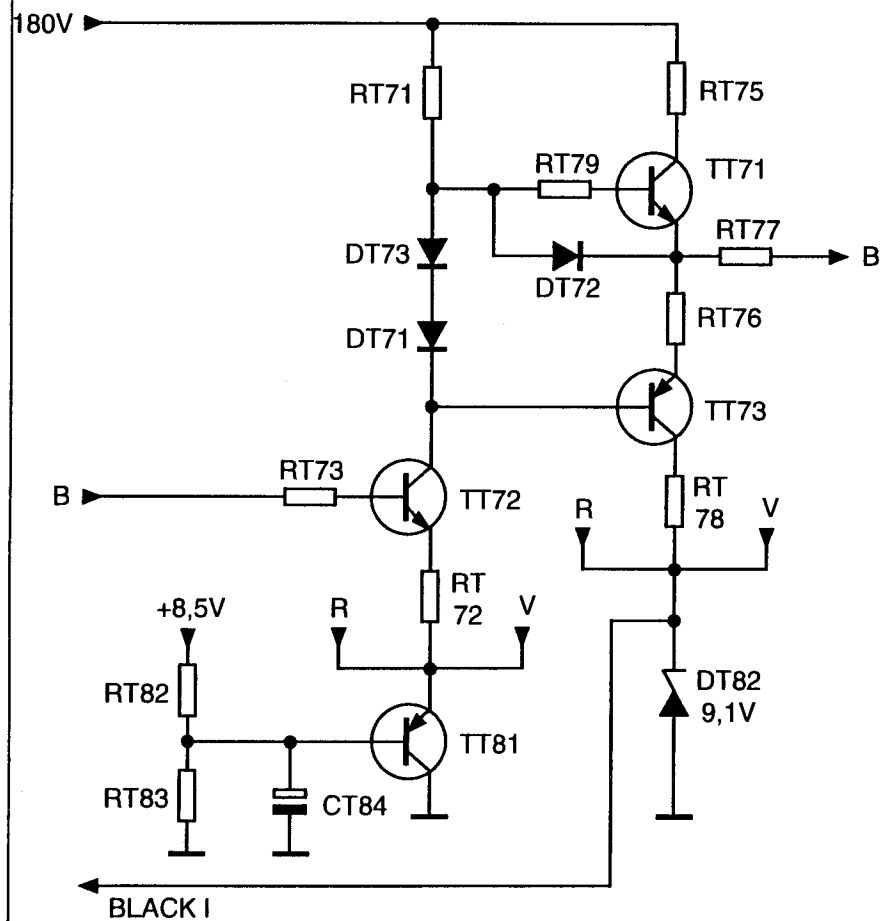
RVB AMPLIFIERS

CONTENTS

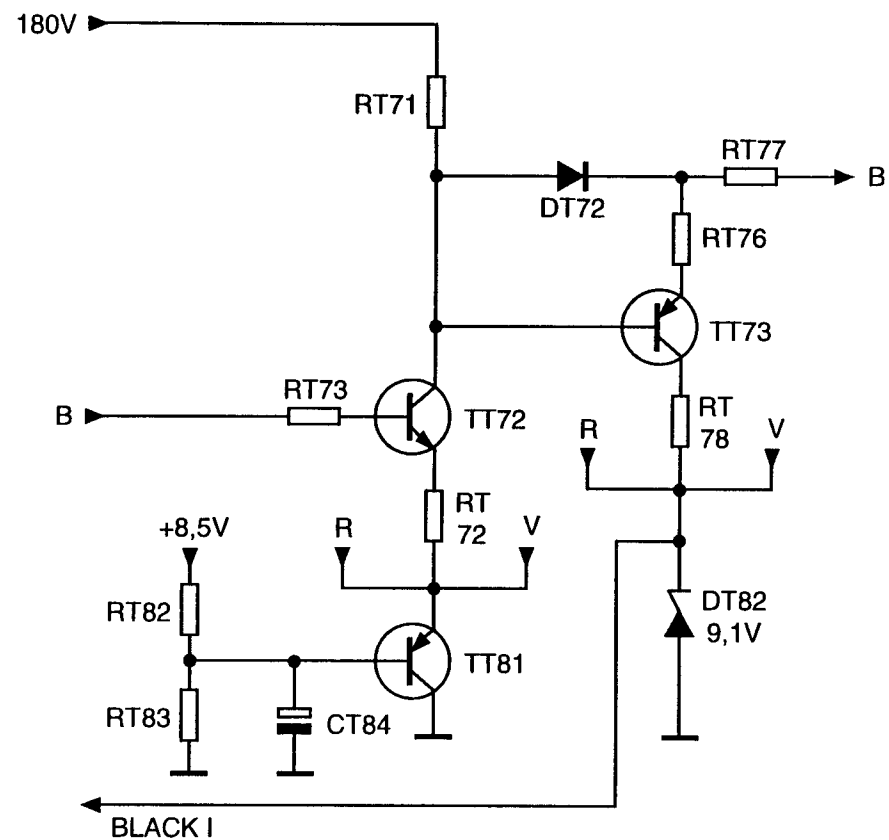
RVB AMPLIFIERS



CRT 51 / 55 cm



CRT 36 cm



RVB AMPLIFIERS

The three amplifiers are similar.

The 10-transistor version equips 51 and 55cm tubes. The 7-transistor version equips 36cm tubes.

For the 10-transistor versions, the transistors TT51, TT61 and TT71 improve response time.

The reference voltage, obtained by TT81 and its associated components, determines the operating point of the three amplifier.

The transistors TT53, TT63 and TT73 sample the tube cut-off current (BLACKI) for tube servo-assistance. The zener diode DT82 provides overvoltage protection.

NOTES:

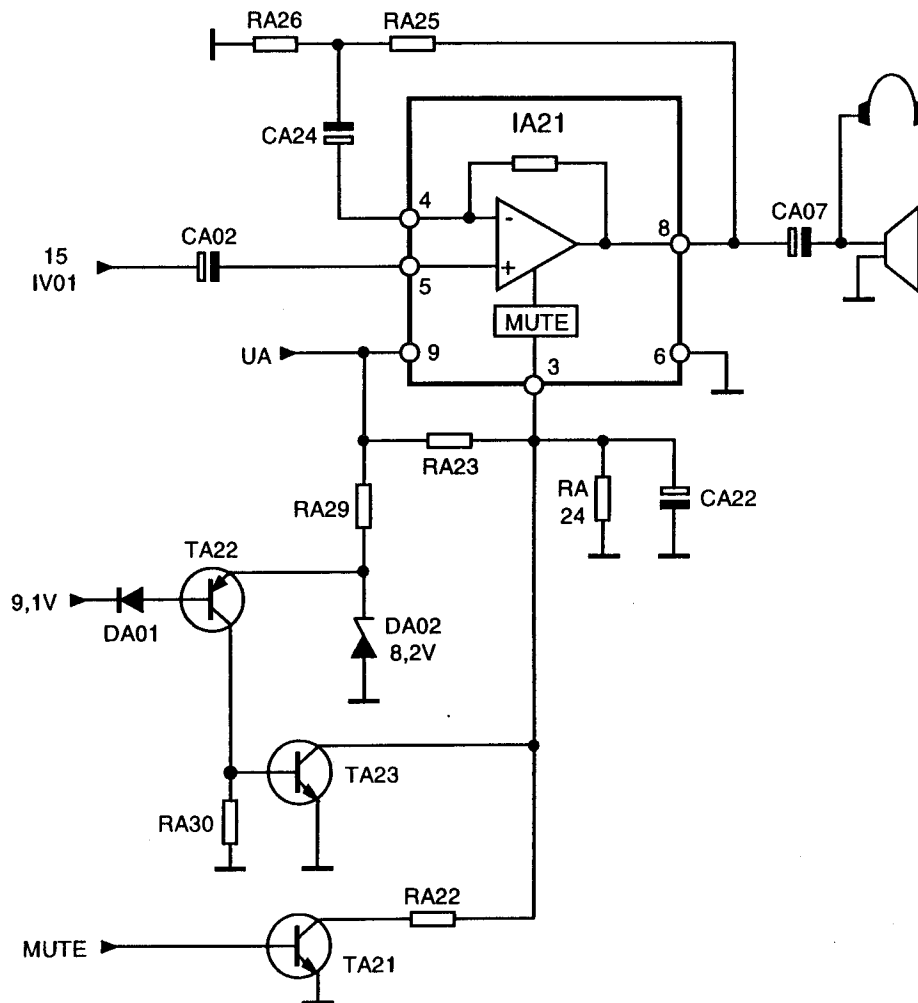
AUDIO POWER AMPLIFIER

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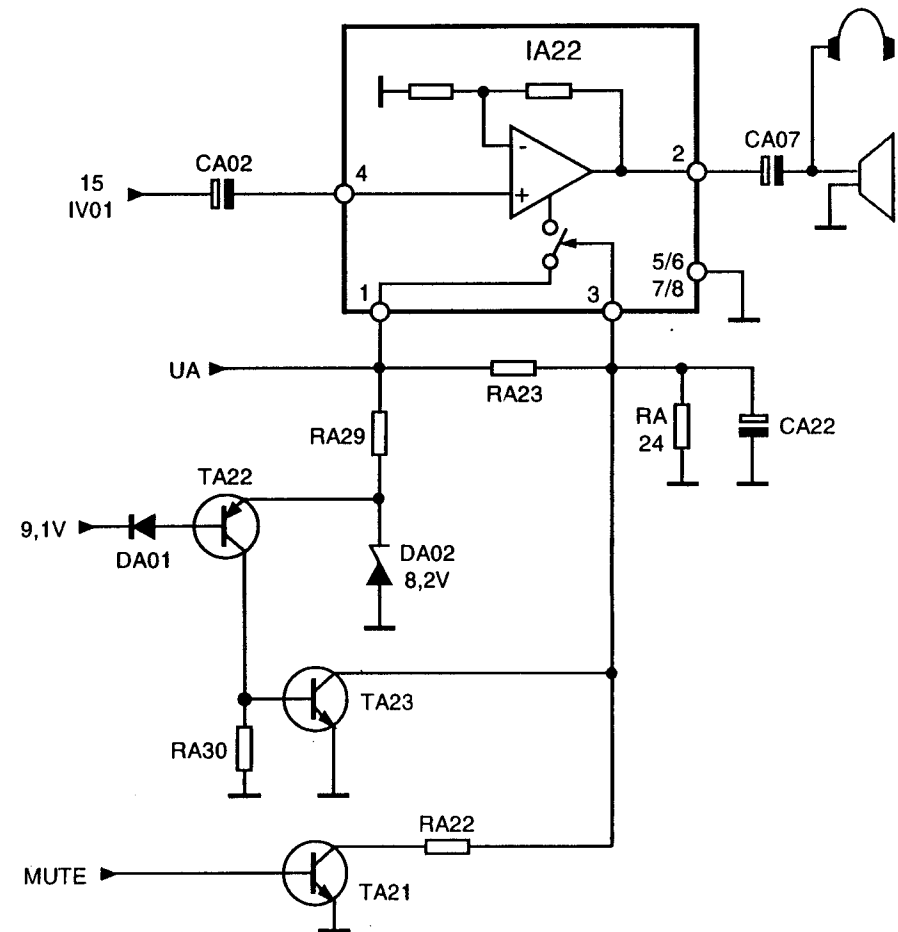
POWER AMPLIFIER, 3W AND 5W

POWER AMPLIFIER, 1.2W

CRT 36 cm, Audio Power = 3W
 CRT 51, 55 cm, Audio Power = 5W



CRT 36 cm, Audio Power = 1,2W



3W AND 5W POWER AMPLIFIER

The integrated circuit IA21 (TDA7252), powered by the voltage UA, is used. It receives, on pin 5, the audio signal originating from output 15 of IV01. The components RA25, RA26 and CA24 determine the gain of this 26dB amplifier.

The transistor TA21, controlled by output 6 of the management microcontroller (MUTE: 5V), allows audio mute when the television is switched on, channel is changed, television is switched to standby or when there is no signal.

The transistors TA22 and TA23 allow audio mute when the television is switched off. Because the 9.1V voltage disappears quickly, these two transistors saturate and connect pin 3 of IA21 to ground.

1.2W POWER AMPLIFIER

The integrated circuit IA22 (TDA7267), powered by the voltage UA, is used. It receives, on pin 4, the audio signal originating from output 15 of IV01. The gain of this amplifier is determined by a resistor network in the integrated circuit.

The transistor TA21, controlled by output 6 of the management microcontroller (MUTE: 5V), allows audio mute when the television is switched on or switched to standby.

The transistors TA22 and TA23 allow audio mute when the television is switched off. Because the 9.1V voltage disappears quickly, these two transistors saturate and connect pin 3 of IA22 to ground.

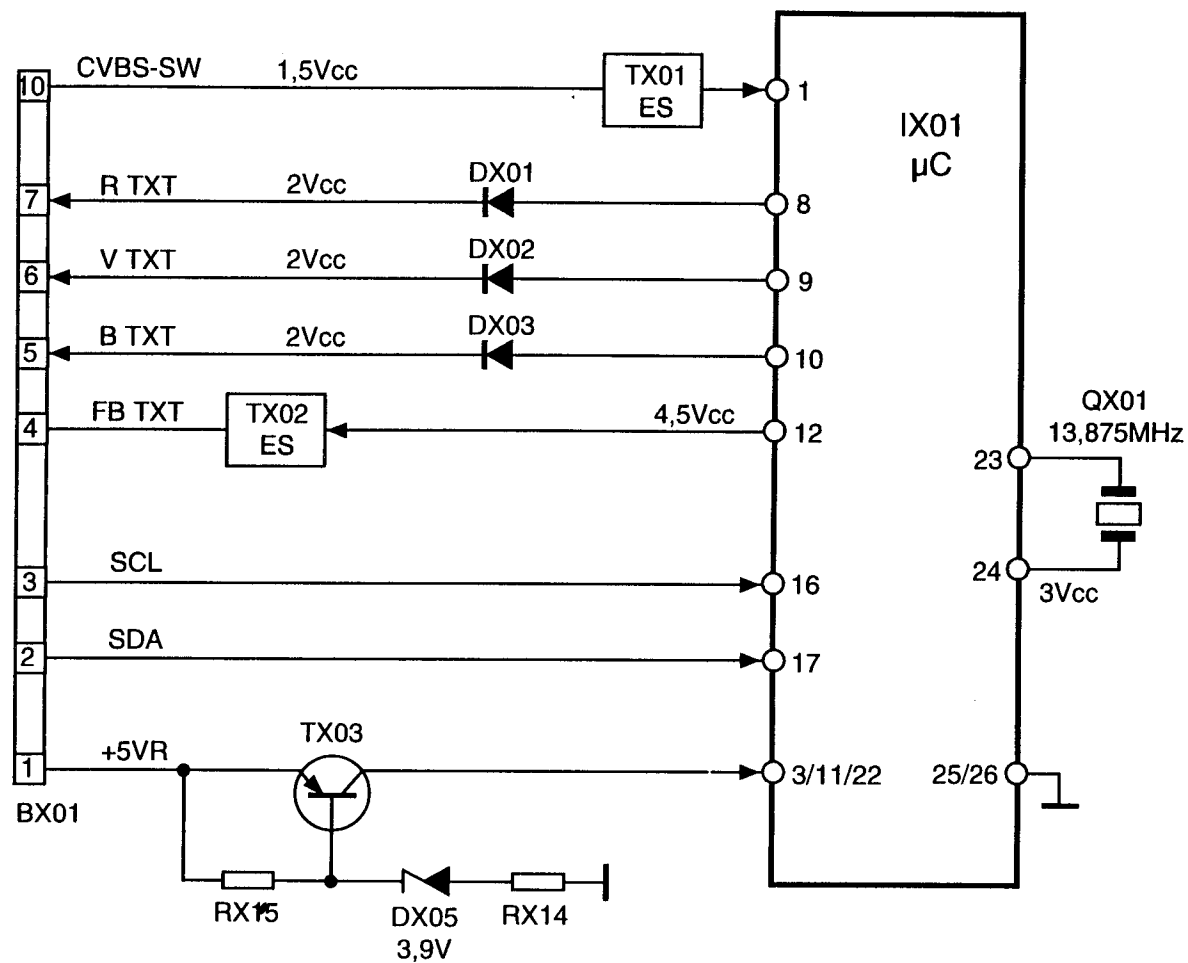
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TELETEXT

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TELETEXT PROCESSING



TELETEXT PROCESSING

TELETEXT is managed entirely by the microcontroller IX01.

The IX01 is powered by a 5V supply via the stabilising circuit TX03/DX05, controlled by a 13.875MHz clock, and has a data link to IR01 via the bus IIC.

IX01 is a combined teletext slicer and decoder. The slicer separates teletext data from the video signal. The IX01 processing unit checks, selects and saves requested data in the internal RAM. One page of data typically occupies 1K octet of memory. The IX01 has a capacity for 8 pages of teletext.

The R, V and B signals are output via pins 8 to 10 of IX01. The rapid switching signal, FB (pin 12), accompanies the R, V and B signals.

NOTES: