THOMSON MULTI MEDIA

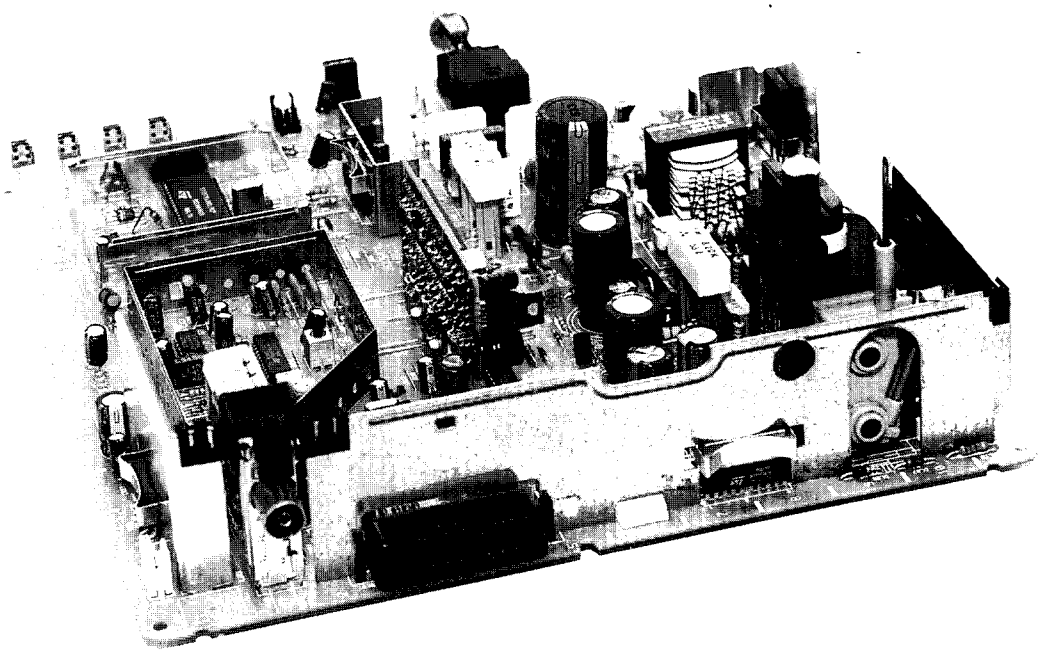
Brandt FERGUSON NORDMENDE SABA TELEFUNKEN THOMSON

TV

SERVICE MANUAL
DOCUMENTATION TECHNIQUE
TECHNISCHE DOKUMENTATION
DOCUMENTAZIONE TECNICA
DOCUMENTACION TECNICA

TX91G

Click for index of pages TX91 TX92



⚠

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 intervención, leer las recomendaciones de seguridad.*

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INDEX

TX91 Chassis

⚠ Indicates critical safety components, and identical components should be used for replacement. Only then can the operational safety be garanteed.

Le remplacement des éléments de sécurité (repérés avec le symbole ⚠) par des composants non homologués selon la Norme CEI 65 entraine la non-conformité de l'appareil. Dans ce cas, la responsabilité du fabricant n'est plus engagée.

Wenn Sicherheitsteile (mit dem Symbol ⚠ gekennzeichnet) nicht durch Original - Ersatzteile ersetzt werden, erlischt die Haftung des Herstellers.

La sostituzione degli elementi di sicurezza (marcati con il segno ⚠) con componenti non omologati secondo la norma CEI 65 comporta la non conformitá dell'apparecchio. In tal caso è "esclusa la responsabilità " del costruttore.

La sustitución de elementos de seguridad (marcados con el simbolo ⚠) por componentes no homologados segun la norma CEI 65, provoca la no conformidad del aparato. En ese caso, el fabricante cesa de ser responsable.

MEASUREMENT CONDITIONS - CONDITIONS DE MESURES - MESSBEDINGUNGEN
CONDIZIONI DI MISURA - CONDICIONES DE MEDIDAS

RECEIVER : On UHF input level : 1 mV, bar test pattern :
- PAL. I standard. 100% white.

Via the scart socket, input level : 1 Vpp, bar test pattern :

Colour, contrast and brightness at mid-position, sound at minimum.
Programme selected : PR 01.

DC voltages measured between the point and earth using a digital voltmeter.

RECEPTEUR : En UHF, niveau d'entrée 1 mV mire de barres
- SECAM. Norm L, Blanc 100%.

Par la prise Péritélévision, niveau d'entrée 1 Vcc. mire de barres.

Couleur, contraste, lumière à mi-course, son minimum.
Programme affecté PR 01.

Tensions continues relevées par rapport à la masse avec un voltmètre numérique.

EMPFÄNGER : Bei UHF Eingangspegel 1 mV, Farbbalken :
- PAL. Norm G, Weiss 100%.

Über die Scartbuchse : Eingangspegel 1 Vss, Farbbalken :

Farbe, Kontrast, Helligkeit in der Mitte des Bereichs, Ton auf Minimum.
Zugeordnetes Programm PR 01.

Gleichspannungen mit einem digitaler Voltmeter zur Masse gemessen.

RICEVITORE : In UHF, livello d'entrata 1 mV, monoscopio par barre :
- PAL. norma G, bianco 100%.

Par la presa SCART, livello d'entrata 1 Vcc, monoscopio per barre :

Colore, Contrasto, Luce a metá corsa, Suono minimo.
Programma designato PR 01.

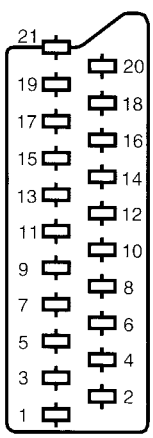
Tensioni continue rilevate rispetto alla massa con un voltametro numerico.

RECEPTOR : En UHF, nivel de entrada 1 mV, mira de barras :
- PAL. norma G, blanco 100%.

Por la toma Peritelevision, nivel de entrada 1 Vpp mira de barra.

Color, Contraste, luz a mitad de carrera, Sonido mínimo.
Programa afectado PR 01.

Tensiones continuas marcadas en relacion a la masa con un voltmetro digital.



NOTE : (MAIN) ... etc. identifies each pcb module.

NOTE : (MAIN) ... etc. repères des platines constituant l'appareil.

HINWEIS : (MAIN) ...usw. Kennzeichnung der Platinen, aus denen das Gerät zusammengesetzt ist.

NOTA : (MAIN) ... ecc. indicazioni delle piastre che costituiscono l'apparecchio.

NOTA : (MAIN) ... etc. marcas de las placas que constituyen el aparato.

		ENGLISH	FRANÇAIS	DEUTSCH	ITALIANO	ESPAÑOL
1	→	AUDIO "R"	AUDIO "D"	AUDIO "R"	AUDIO "D"	AUDIO "D"
2	←	AUDIO "R"	AUDIO "D"	AUDIO "R"	AUDIO "D"	AUDIO "D"
3	→	AUDIO "L"	AUDIO "G"	AUDIO "L"	AUDIO "S"	AUDIO "I"
4	—	AUDIO	AUDIO	AUDIO	AUDIO	AUDIO
5	—	" BLUE "	" BLEU "	"BLAU"	"BLU"	"AZUL"
6	←	AUDIO "L" MONO	AUDIO "G" MONO	AUDIO "L" MONO	AUDIO "S" MONO	AUDIO "I" MONO
7	←	" BLUE "	" BLEU "	"BLAU"	BLU	AZUL
8	←	SLOW SWITCH	COMMUT. LENTE	AV UMSCHALTUNG	"COMMUTAZIONE LENTA"	"CONMUTACION LENTA"
9	—	" GREEN "	"VERT"	"GRÜN"	"VERDE"	"VERDE"
10	NC					
11	←	" GREEN "	"VERT"	"GRÜN"	"VERDE"	"VERDE"
12	NC					
13	—	" RED "	"ROUGE"	"ROT"	"ROSSO"	"ROJA"
14	NC					
15	←	" RED "	"ROUGE"	"ROT"	"ROSSO"	"ROJA"
16	←	FAST SWITCH	COMMUT. RAPIDE	AUSTASTUNG	"COMMUTAZIONE RAPIDA"	"CONMUTACION RAPIDA"
17	⊥	VIDEO	VIDEO	VIDEO	VIDEO	VIDEO
18	—	FAST SWITCH	COMMUT. RAPIDE	AUSTASTUNG	"COMMUTAZIONE RAPIDA"	"CONMUTACION RAPIDA"
19	→	VIDEO	VIDEO	VIDEO	VIDEO	VIDEO
20	←	VIDEO OR "SYNC"	VIDEO SYNCHRO	VIDEO ODER SYNCHRO	VIDEO O SINCRO	VIDEO O SINCRO
21	→	PLUG SCREEN BOX	BLINDAGE PRISE	ABSCHIRMUNG DES STECKERS	ARMATURA DELLA SPINA	BLINDAJE DEL ENCHUFE

→ : OUTPUT - SORTIE - AUSGANG - USCITA - SALIDA

← : INPUT - ENTRÉE - EINGANG - ENTRATA - ENTRADA

— : EARTH - MASSE - MASSE - MASSA - MASA

INFORMATION - INFORMATIONS - INFORMATIONEN - INFORMAZIONE - INFORMACIONES

(GB) Chassis identification table :
1 - Main chassis designation code.
2 - Chassis configuration (modules) and the page number's where they are described.

(F) Le tableau ci-dessous regroupe :
1 - La désignation des chassis
2 - L'environnement électronique de chaque chassis (modules) et le numéro de page où il est décrit.

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

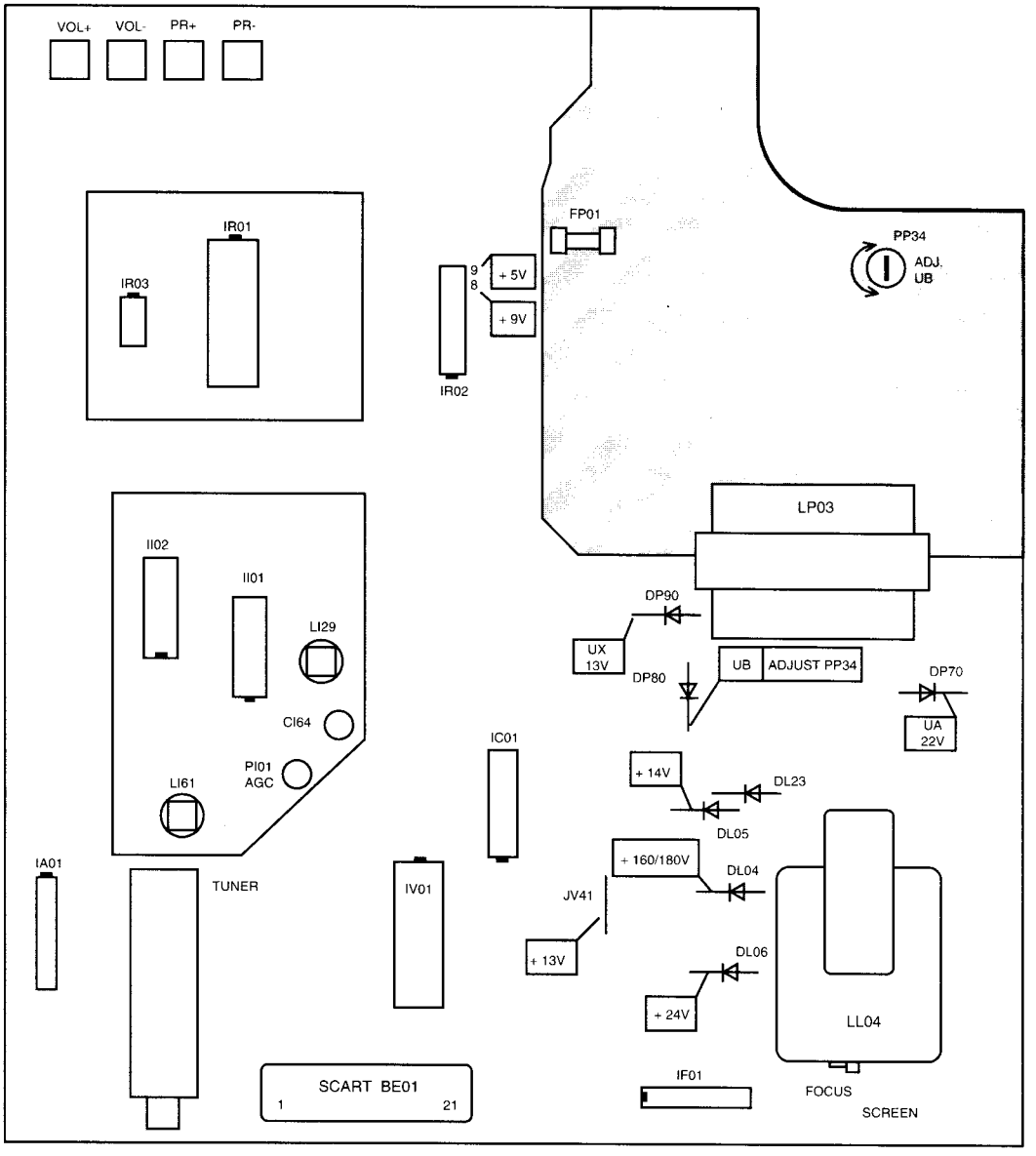
(I) La tabella qui di seguito contiene:
1 - La descrizione dei telai
2 - l'ambiente elettronico di ogni telaio (moduli) e il numero di pagina nella quale è descritto.

(E) El cuadro siguiente agrupa:
1 - La designación de los chasis
2 - El entorno electrónico de cada chasis (módulos) y el número de página donde está descrito.

TX91G Mono

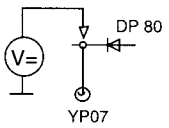
MAIN CHASSIS DESCRIPTION	MAIN CHASSIS ADJUSTMENT	MAIN CHASSIS SCHEMATIC	TEXT PCB	CRT FCB
TX91G 14"	2to5	7to11	12to16	23to24
TX91G 20"	"	"	"	"
TX91G 21"	"	"	"	"
TX91G 2837050Q1 ES	"	"	"	"
TX91G 3110010A1 ES	"	"	"	"
TX91G 3830010Q1 ES	"	"	"	"
TX91G 3830050Q1 ES	"	"	"	"
TX91G 3850010B1 036	"	"	"	"
TX91G 3850050B1 ES	"	"	"	"
TX91G 4620010A1 ES	"	"	"	"
TX91G 4620010Q1 ES	"	"	"	"
TX91G 4620050A1 ES	"	"	"	"
TX91G 4620050Q1 ES	"	"	"	"
TX91G 46200G0A1 PL	"	"	"	"
TX91G 4830010R1 ES	"	"	"	"
TX91G 4830050Q1 ES	"	"	"	"
TX91G 4850050B1 ES	"	"	"	"
TX91G 4850050C1 ES	"	"	"	"
TX91G 63830010Q1 ES	"	"	"	"

LOCATION OF CONTROLS - EMPLACEMENT DES REGLAGES - SERVICE LAGEPLAN - POSIZIONE REGULATORI DI SERVIZIO - SITUACIÓN DE LOS AJUSTES



ADJUSTMENTS - REGLAGES - EINSTELLUNGEN - REGOLAZIONE - AJUSTES

U B — PP 34 — Contrast, brightness and volume to minimum



Screen Size	CRT Vendor / Type N	FBT Vendor / Type N	Min beam current UB adjustment
10"	Samsung 27GDC85X-TC10	Samsung FCV1010-E03	106V+/-0,5V
14"	Thai-CRT (baretube) A34JXV70X	Samsung FCV1410-E18	107V+/-0,5V
	ChungHwa 370KRB22-TC38	Samsung FCV1410-E18	108V+/-0,5V
		Orega 203832HO 204529H0 P1 *G5603-03	108V+/-0,5V
	Polkolor A34EFU13X91	Samsung FCV1410-E18	104V+/-0,5V
		Orega 203832HO 204529Ho P1 *G5603-03	104V+/-0,5V
17"	Philips A41EAM40X01	Samsung FCV1410-E18	110V+/-0,5V
		Orega 203832HO 204529H0 P1 *G5603-00	110V+/-0,5V

Screen Size	CRT Vendor / Type N	FBT Vendor / Type N	Min beam current UB adjustment
20"	Polkolor A48EEV13X01	Samsung FCV2010-E07	115V+/-0,5V
		Orega 203832IO 204529G0 P1 *G5604-00	115V+/-0,5V
	ChungHwa 510UFB22-TC55	Samsung FCV2010-E07	116V+/-0,5V
		Orega 203832IO 204529G0 P1 *G5604-00	116V+/-0,5V
21"	Hitachi A51JSY61X03	Samsung FCV2010-E07	116V+/-0,5V
		Orega 203832IO 204529G0 P1 *G5604-00	116V+/-0,5V
21"	VideoColor A51EBV13X01	Orega 203832IO 204529G0 P1 *G5604-00	116V+/-0,5V
	VideoColor A51EFS43X191	Orega *G5552-00 *G5624-00 *G5605-00	

Hotel Menu
Install menu : 1) Standby
2) Switch of mains
3) " " on " " while pushing program + in front panel

elimination: stby

U G2 / cutoff	SCREEN	Use a peak white pattern. Mode preference: Image Ambiance AV (no Signal, black screen)	highest output CRT V Collector: TT52,TT62,TT72 (Transistor Version) Pin 9, 12, 15 IT01 (IC Version)	Adjust Screen voltage VG2 120V +/- 5V: 20", 14", 15", 17" 145V +/- 5V : 20" & 21" + = 50% B G RED Cutoff level GND
FOCUS	FOCUS	Contrast = 100% Brightness = 0% Test pattern (standard values)		Sharp picture

SERVICE-MODE (GB)

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 Usystem, Focus and Screen voltages.

1. Service Mode Access

1.1 With the RCU, switch the TV set into the "**Standby**" mode.
1.2 Switch "**Off**" the TV set by mains supply switch (wait until LED is dark).
1.3 Whilst depressing the RCU "**Blue (VT)**" button, switch "**On**" the TV set using the mains supply switch.
1.4 Release and press once again the RCU "**Blue (VT)** " button, the following "**Set-Up**" menu should be diplayed."

SET-UP	VIDEO	GEOM
TX91 FM20 - TM		

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

2. Function or Page Selection (GEOM)

2.1 With the RCU Volume "+" and "-" buttons, highlight the menu containing the function to be aligned.
2.2 Press the RCU "**Blue (VT)**" ⇩ or the middle value one ⋈ ⇧ , select a setting or a page (1, 2, 3....).

3. Switching between Service and TV modes

3.1 Whilst in the Service Mode, normal TV controls are disabled, to enable these controls whilst in the Service Mode (i.e. for channel changing etc.) press the"**TV**" button on the RCU. To return to the Service Mode, press the "**Blue (VT)**" button on the RCU.

4. Alignment and storing new function value

4.1 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 Volume "+" and "-" buttons.
4.2 To STORE the functions new value, highlight **MEMO** and press the RCU Volume "+" button.
4.3 The **R-STO(RE)** line allows you to call values stored in NVM with the "-" key.
4.4 Selection the ROM functions downloads the production software default values, these are not very accurate and should only be used in very special cases.
Whilst in the «Service-Mode»,a long press (more than 3s) of the RCU «0» button, will reset the TV to the «factory default conditions».

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.

MODE SERVICE (F)

Le mode service sert au réglage de l'appareil. Toutes les opérations de réglage s'effectuent à l'aide de la télécommande (sauf la tension de système, 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
1.2 Eteindre le téléviseur par l'interrupteur secteur (attendre l'extinction complète du voyant).
1.3 Maintenir la touche bleue enfoncée et mettre simultanément le téléviseur en marche avec l'interrupteur secteur.
1.4 Le menu suivant apparait après avoir appuyé à nouveau sur la touche bleue, (VT).

SET-UP	VIDEO	GEOM
TX91 FM20 - TM		

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

2. Sélection de la fonction ou de la page (GEOM)

Par les touches +/- de la télécommande vous pouvez choisir le menu correspondant: SET- UP,VIDEO ou GEOM et avec la touche bleue (VT) ⇩ ou la touche valeur moyenne ⋈ ⇧ , séléctionner un réglage ou une page (1, 2, 3....).

3. Inversion entre modes service et TV

Les fonctions télévision normales ne sont pas utilisables en mode service. Si elles sont nécessaires en mode service (p. ex. changement de programme), la touche (**TV**) permet de commuter en mode TV. Vous pouvez revenir au mode service en appuyant sur la touche bleue.

4. Réglage des fonctions sélectionnées; mémorisation

La valeur momentanée de la fonction sélectionnée est indiquée sous forme hexadécimale à droite, à coté de la position à régler et peut être modifiée avec la télécommande par la touche **+** ou - .
La ligne MEMO permet de mémoriser les nouvelles valeurs de réglage avec la touche +.
La ligne R-STO(RE) permet de rappeler les valeurs mémorisées en NVM avec la touche "-" .
Les valeurs par défaut du logiciel peuvent être chargées en sélectionnant la fonction ROM . Elles ne constituent cependant qu'une approximation du réglage et ne doivent être utilisées qu'en cas de nécessité.
En mode service une longue pression (plus de 3s) sur la touche «0»reset le TV aux valeurs par défaut des réglages usine.

5. Sortie du mode service

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

SERVICE-MODE (D)

Der Service-Mode wird für den Geräteabgleich benötigt. Alle Einstellungen erfolgen mit der Fernbedienung (bis auf Systemspannung, Fokuseinstellung und Schirmgitterspannung).

1.Service-Mode einschalten

1.1 Mit der Fernbedienung das Fernsehgerät in Stand-by schalten.
1.2 Das Gerät mit dem Netzschalter ausschalten (warten bis LED dunkel ist)
1.3 Die blaue Taste der Fernbedienung gedrückt halten und gleichzeitig das Gerät mit dem Netzschalter einschalten.
1.4 Das folgende Menü erscheint nach erneutem Drücken der blauen Taste

SET-UP	VIDEO	GEOM
TX91 FM20 ---------- TM		

Achtung : Der Service-Mode läßt sich nicht einschalten, wenn an einer Euro-AV-Buchse ein Gerät aktiviert ist, d.h. die Schaltspannung anliegt.

2. Funktionswahl oder Seitenwahl (GEOM)

Mit den Tasten +/- der Fernbedienung können Sie das folgende Menü auswählen: SETUP,VIDEO oder GEOM, und mit der blauen Taste(VT) ⇩ oder der Taste Mittelwert ⋈ ⇧ können Sie eine Einstellung oder eine Seite (1,2,3,....) auswählen.

3. Umschalten zwischen Service- und TV-Betrieb

Im Service-Mode sind die normalen Fernsehfunktionen nicht bedienbar. Werden diese im Service-Mode benötigt (z.B. Programmwechsel), kann mit der Taste (**TV**) in den normalen TV-Betrieb geschaltet werden. Durch Drücken der blauen Taste gelangt man zurück zum Service Mode.

4. Abgleich der gewählten Funktion und Speichern

Der momentane Wert der gewählten Funktion wird hexadezimal rechts neben der abzugleichenden Position angegeben und kann mit der Taste **+** bzw. **-** auf der Fembedienung verändert werden.
Die Änderungen des jeweiligen Menüs können unter MEMO mit der +. Taste gespeichert werden. In der Zeile R-STO(RE) können die in NVM gespeicherten Werte mit der Taste "-" aufgerufen werden.
Im Menüpunkt ROM kann man die Software-Defaultwerte laden.Sie sind aber nur eine grobe Annäherung an den noch vorzunehmenden Abgleich und sollten nur im Notfall verwendet werden.
Im Service-Menü : Durch längeren Druck (mehr als 3 Sek.) wird das Gerät auf die "Factory default werte" zurückgesetzt.

5. Service-Mode verlassen

Zum Verlassen des Service-Mode das Gerät in Stand By schalten oder mit dem Netzschalter ausschalten.

MODO SERVICIO (E)

Se necesita el MODO SERVICIO para ajustar el aparato. Todos los ajustes se hacen con el mando a distancia (a excepción de la tensión del sistema, los ajustes del foco y las tensiones de la rejilla de pantalla).

1. Ajustar el MODO SERVICIO

1.1 Con el mando a distancia conectar a STANDBY el televisor.
1.2 Desconectar el aparato con el interruptor de la red (esperar hasta que el LED se apague).
1.3 Mantener pulsada la tecla azul y conectar el aparato simultáneamente con el interruptor de red.
1.4 El menú siguiente aparece volviendo a pulsar la teda azul.

SET-UP	VIDEO	GEOM
TX91 FM20 ---------- TM		

Atencion : No se puede conectar el MODO SERVICIO cuando en Eurotoma-AV está activado un aparato, es decir, cuando existe tensión de conexión.

2. Selección de las funciones o selección de página (GEOM)

10. Mediante las teclas +/- del telemando usted puede escoger el menú correspondiente: SET-UP, VIDEO o GEOM y con la tecla azul (VT) ⇩ o la tecla valor medio ⋈ ⇧ , seleccionar un ajuste o una página (1, 2, 3....)

SERVICE-MODE (I)

Il Service-Mode è necessario per l'allineamento dell'apparecchio. Tutte le regolazioni si effettuano con il telecomando. (a parte la tensione del sistema, le regolazione del fuoco e le tensioni della griglia schermo).

1. Attivazione del Service-Mode

1.1 Commutare il televisore in stand-by con il telecomando.
1.2 Spegnere l'apparecchio con l'interruttore di rete (attendere finchè il LED è spento).
1.3 Tenere premuto il pulsante blu e accendere contemporaneamente l'apparecchio con l'interruttore di rete.
1.4 Il seguente menu appare non appena si aziona nuovamente il pulsante blu.

SET-UP	VIDEO	GEOM
TX91 FM20 ---------- TM		

Attenzione : Il Service-Mode non si può attivare se è attivato un apparecchio collegato alla presa di peritelevisione AV, cioè se è presente la tensione ausiliaria.

2. Scelta della funzione o selezione pagina (GEOM).

Per i tasti +/- del telecomando, potete scegliere il menu corrispondente: SET-UP, VIDEO o GEOM e con il tasto blu (VT) ⇩ o il tasto valore medio ⋈ ⇧ , una regolazione o una pagina (1, 2, 3, ecc.)

3. Commutazione fra funzione Service-Mode e TV

Nella modalità Service-Mode non si possono attivare le normali funzioni televisive. Se occorre richiamarle in Service-Mode (ad es. se si vuole cambiare il programma), si pud attivare la normale modalità TV con il pulsante (**TV**). Premendo il pulsante blu si riattiva il Service-Mode.

4. Taratura della funzione scelta e memorizzazione

Il valore momentaneo della funzione scelta viene indicato in formato esadecimale a destra, accanto alla posizione da allineare e può essere cambiato con il pulsante + o - del telecomando.
Le modifiche effettuate nel relativo menu si possono memorizzare in MEMO con il pulsante **+**. La linea R-STO(RE) permette di richiamare i valori memorizzati in NVM con il tasto -..
Nell'opzione di menu ROM si possono caricare i valori di default del software. Essi rappresentano però una taratura approssimativa prima di eseguire quella definitiva e si dovrebbero usare solo in caso di emergenza.
Mentre si è nel «Menu Service», una lunga pressione (più di 3s) del tasto «0» riporterà il TV alle «condizioni di default di fabrica».

5. Disattivazione del Service-Mode

Per disattivare il ServiceMode, commutare l'apparecchio in stand-by o spegnerlo con l'interruttore di rete.

3. Conmutar entre funcionamiento Servicio y TV

En el MODO SERVICIO las funciones de televisión normales no pueden operarse. Si se necesitan éstas en MODO SERVICIO (p.ej., cambio de programa), con la tecla (**TV**) puede conmutarse a la operación TV normal.
Pulsando la tecla azul se vuelve al MODO SERVICIO.

4. Ajuste de la función elegida y almacenamiento

El valor momentáneo de la función elegida es indicado de modo hexadecimal a la derecha, al lado de la posición a ajustar, y puede cambiarse con la tecla **+** o bien **-** en el mando a distancia. Los cambios del menú respectivo pueden almacenarse bajo MEMO con la tecla +.
La línea R-STO (RE) permite recuperar los valores memorizados en NVM con la tecla "-".
En el punto de menu ROM se pueden cargar los valores por defecto del software. Sin embargo, son sólo una aproximación basta al ajuste aún a realizar y deben usarse sólo en caso de emergencia.
En modo servicio, si se mantiene pulsada (más de 3 seg.) la tecla «0» toma por defecto los valores de «ajuste en fábrica».

5. Salir del MODO SERVICIO

Conmute el aparato a STANDBY a fin de salir del MODO SERVICIO o desconectar con el interruptor de la red.

TV mono :

SET-UP					
Software code and configuration					
BRAND	1	2	3	NONE	
NORM	B	BD	BLD	BIL	BL I
SUB-VOL	- 2 / 2			1	
- R-STO	+ MEMO			O	ROM

TV stereo :

SET-UP					
Software code and configuration					
BRAND	1	2	3	NONE	
NORM	B	BD	BLD	BIL	BL I
DEC PR04	On			Off	
- R-STO	+ MEMO			O	ROM

VIDEO		
page 1		
SUB-BRT	7 / 7	0

VIDEO *page 2*		
R-DC	00-3F	24
G-DC	00-3F	12

VIDEO *page 3*		
R-DRV	00-3F	1F
G-DRV	00-3F	1E

VIDEO *page 4*		
B-DRV	00-3F	1C
	PEAK	- / +

VIDEO *page 5*		
SUB-COL	-7 / 7	2
- RESTORE	- MEMO	0 ROM

GEOM		
H - PHA	00 - 3F	0E
V - AMP	00 - 7F	02
V - LIN	00 - 0F	33
H - PHA	00 - 3F	29
H - AMP	00 - 3F	15
- R-STO	+MEMO	0 ROM

Test Bar pattern used : 4/3 with geometric circle.
adjust separate for 4/3 and 16/9 format

SET-UP	
BRANDT	**Brand Selection** 1 : TELEFUNKEN 2 : SABA/FERGUSON/ 3 : THOMSON/ NORDMENDE NONE : NON DEFINI
NORM	**Standards** B = BG PAL SECAM (Sound FM 5,5MHz)
	I = I PAL (UK/IRELAND) (Sound FM 6MHz)
	L = L SECAM (France) (Sound AM 6.5MHz)
	D = DKK' SECAM (SOUND FM 6.5 MHZ)
	M = NTSC M (Sound FM 4.5MHz)
DEC PR4 (TX91G stereo)	NICAM From Canal+ decoder On : Enable OFF : Disable The special sound path handling for Canal+ on PRO4
SUB-VOL (TX91G mono)	Volume offset adjustment: V = 50% Ve (AV) = 500mV / 1kHz Adjust SUB-VOL Vs (Z=16Ω) =0,9VRMS

VIDEO		
SUB-BRT ☼ + ◑ + ◑ = 50%		black
R - DC*		grey
G - DC*		grey
R -DRV**		white
G - DRV**		white
B - DRV**		white
PEAK* PEAK**** ☼ + ◑ = 50% ◑ = 100%	**CRT Pin 6,8,11** **Oscillo. or colourimeter**	4/3 / Nits: 10" 600; 14" 15" 550; 17" 28" 490
SUB-COL	**75% PAL Colour-bar Test pattern**	Colour offset adjustment Saturation=100% CRT Pin 11(B) (Oscillo.1)

Notes :

** adjust and stop separate for RF BG, RF L Norm, AV and RGB mode.

*** After PEAK white adjustment control brightness and cut off setting. Repeat the adjustments if necessary.

GEOM		
H - PHA		
V - Amp 50Hz		
H - AMP 60Hz		
V - Pos		
OFFSET		**V- AMP OFFSET ADJUSTMENT**

Table : Software Code

Software Realease code	Description	Version No.
TX91 FM - (YY)	TX91G Europe Mono Software (YY)	(YY) = 10, 11,12 ....20, 21
TX91 FS - (YY)	TX91G Europe Stereo Software (YY)	(YY) = 10, 11,12 ....20, 21
TX91 FAM - (YY)	TX91G Asia Mono Software (YY)	(YY) = 10, 11,12 ....20, 21
TX91 FAS - (YY)	TX91G Asia Stereo Software (YY)	(YY) = 10, 11,12 ....20, 21

TV Configuration Code :

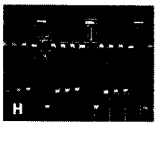
T	TEXT MODULE
S	STEREO MODULE
M	MONO SET

Oscillos.1

blue k (PAL)

correct

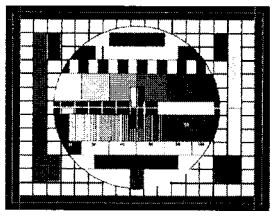
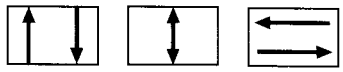
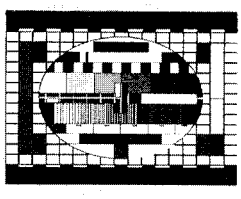
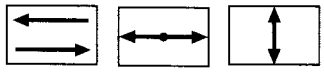
blue k (PAL)

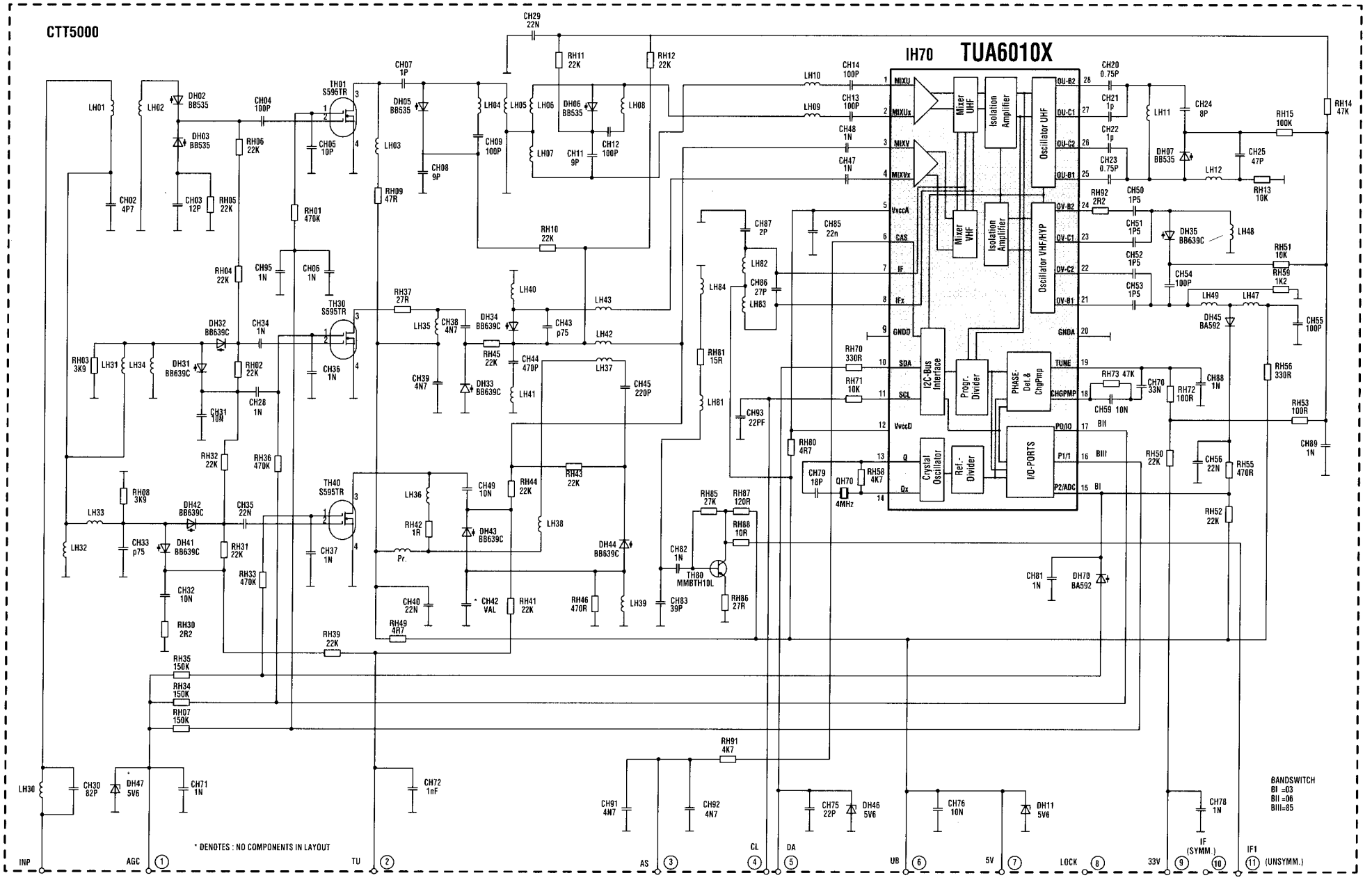


incorrect

GEOMETRY MODE ALIGNMENT - RECEIVER : TV WITH 4/3 TUBE

Signal : 4/3 test pattern 50Hz - 60Hz

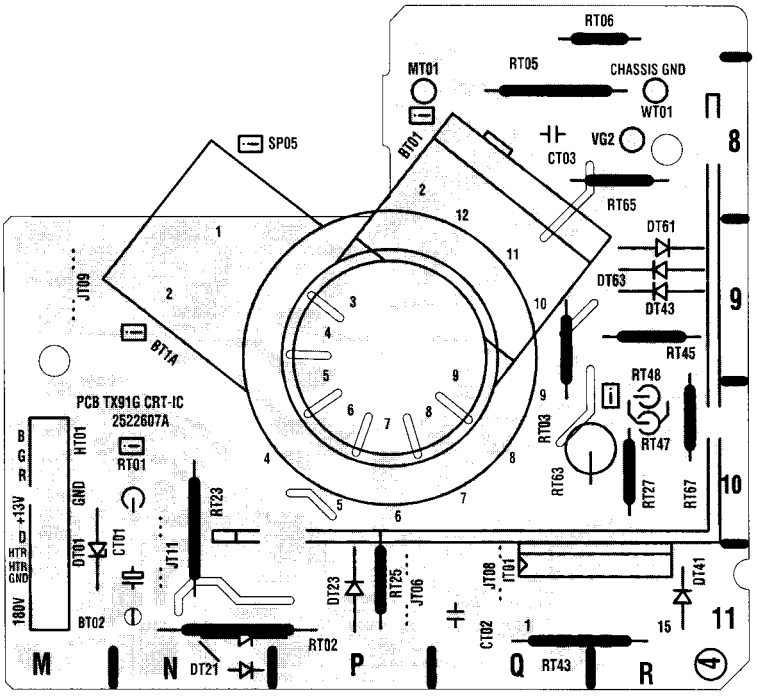
4 / 3 standard mode		overscan V=107% , H=107%  1 - Adjust the horizontal centering 2 - Adjust vertical centering 3 - Adjust picture height to V = 107% - Repeat if necessary with 60 Hz
16 / 9 standard mode		 1 -Adjust horizontal centering (reference : screen edge) 2 - Adjust the vertical amplitude until the oval heigh is 75% of the oval width. - Repeat if necessary with 60 Hz


CTT5000
IH70 TUA6010X
* DENOTES : NO COMPONENTS IN LAYOUT
BANDSWITCH
BI =03
BII =06
BIII=85
INP
AGC
TU
AS
CL
DA
UB
5V
LOCK
33V
IF (SYMM.)
IF1 (UNSYMM.)

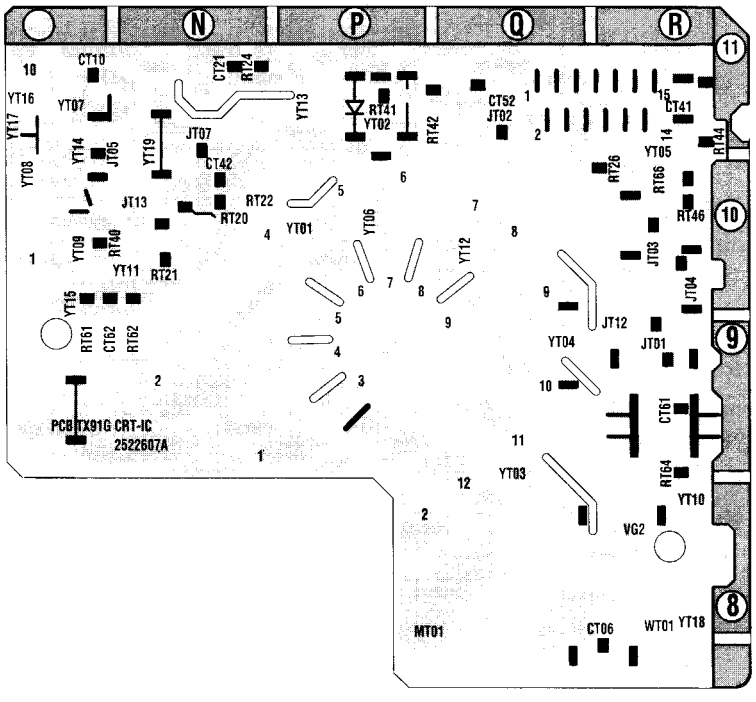
VIDEO AMPLIFIER BOARD - PLATINE AMPLIFICATEUR VIDEO - VIDEOVERSTÄRKERPLATTE - PIASTRA AMPLIFICATORE VIDEO - PLATINA AMPLIFICADOR VIDEO

- INTEGRATED CIRCUIT VERSION -

COMPONENT SIDE - COTE ELEMENTS - BESTÜCKUNGSSEITE
LATO COMPONENTI - LADO COMPONENTES

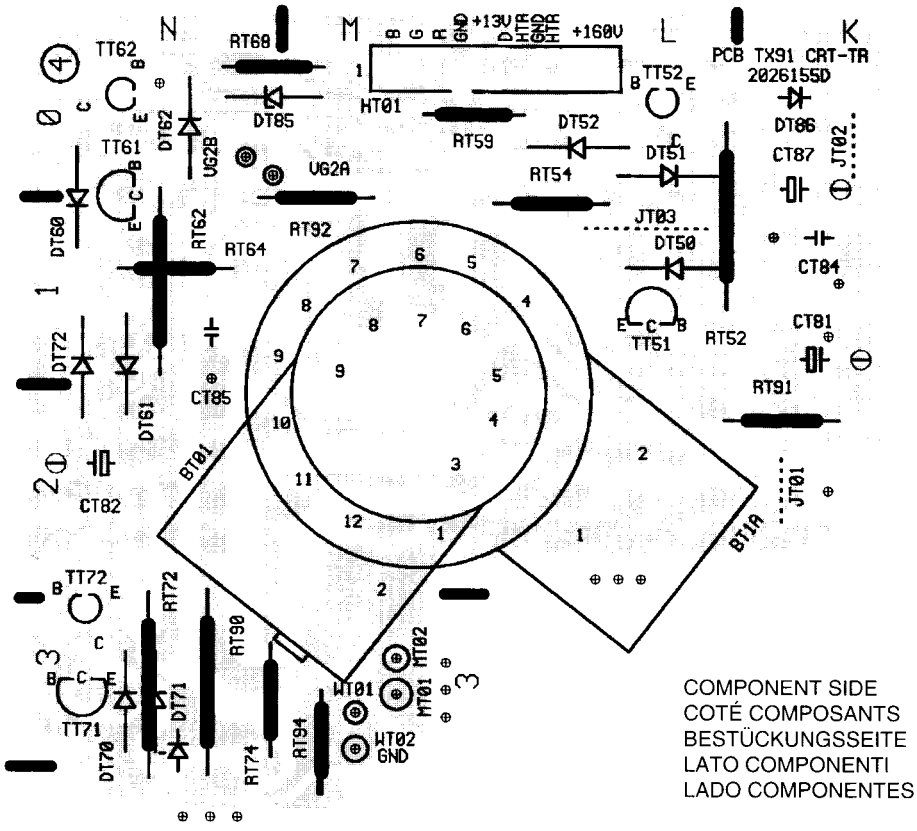


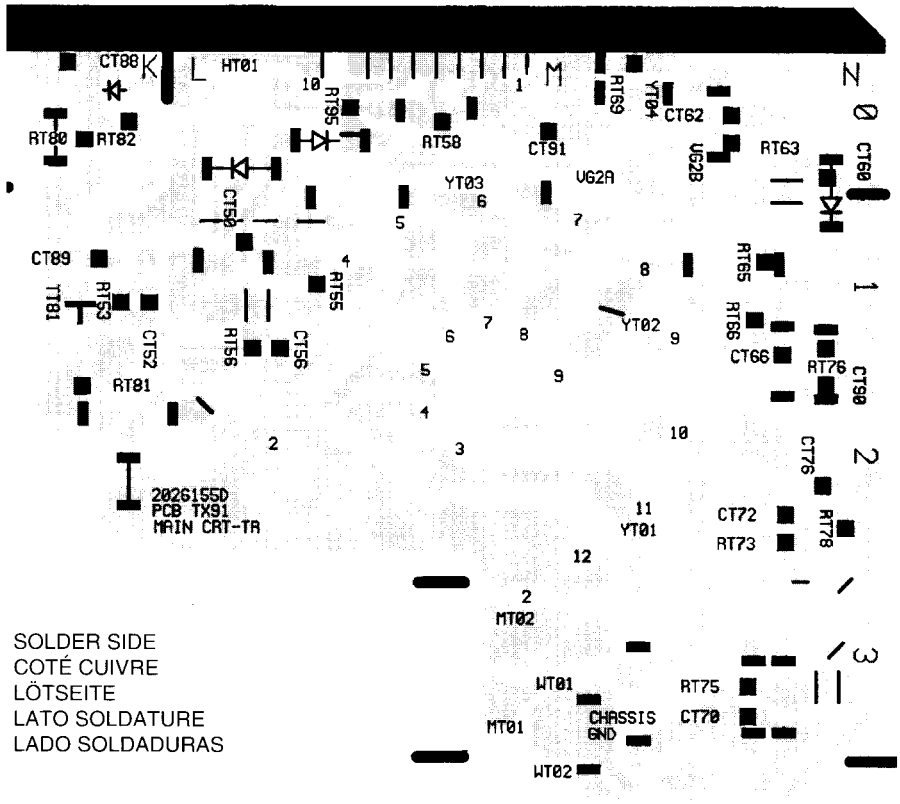
SOLDER SIDE - COTE CUIVRE - LÖTSEITE
LATO SALDATURE - LADO DEL COBRE



VIDEO AMPLIFIER BOARD - PLATINE AMPLIFICATEUR VIDEO - VIDEOVERSTÄRKERPLATTE - PIASTRA AMPLIFICATORE VIDEO - PLATINA AMPLIFICADOR VIDEO

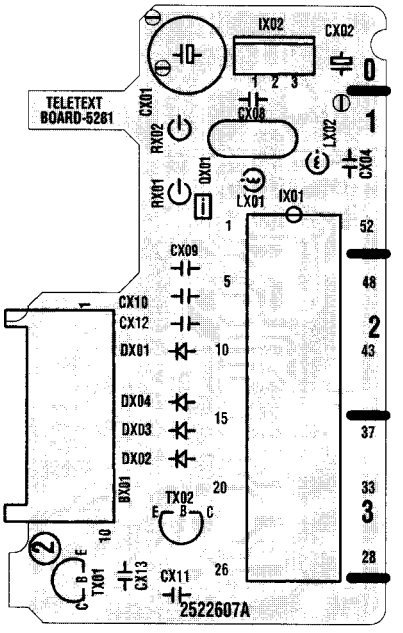
- TRANSISTOR VERSION -



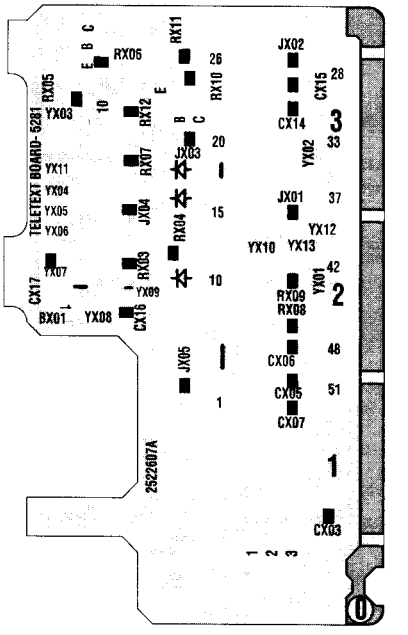


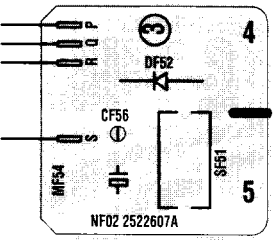
TELETEXT MODULE - MODULE TELETEXTE - VIDEOTEXT MODUL
MODULO TELEVIDEO - MODULO TELETEXTO

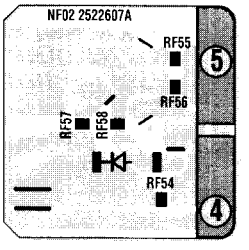
COMPONENT SIDE - COTE ELEMENTS - BESTÜCKUNGSSEITE
LATO COMPONENTI - LADO COMPONENTES

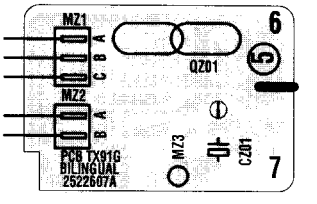


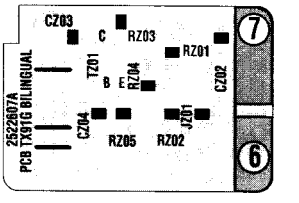
SOLDER SIDE - COTE CUIVRE - LÖTSEITE
LATO SALDATURE - LADO DEL COBRE



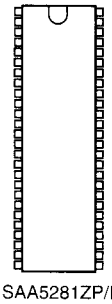




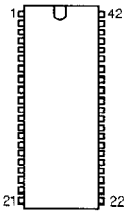




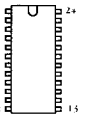
INTEGRATED CIRCUITS AND TRANSISTORS OUTLINE - CIRCUITS INTEGRES ET TRANSISTORS
INTEGRIERTE SCHALTUNGEN UND TRANSISTOREN - CIRCUITI INTEGRATI TRANSISTOR
CIRCUITOS INTEGRADOS Y TRANSISTORES



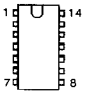
SAA5281ZP/E



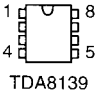
ST92T93J9B1



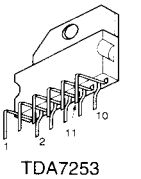
STV8224 A2



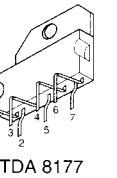
STV8225



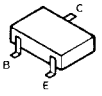
TDA8139
X24C04



TDA7253



TDA 8177

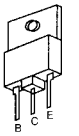


BC 847B
BC 858 B/C
BC857
MMBTH01L
DTC144EK

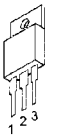
BF 422
BF423
2SC2655

BC 337
BC 548B
BC 558B

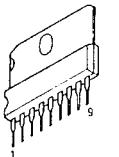
E B C
MPS750P



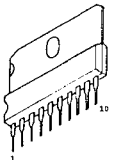
S2055N
BUL512HI
BUH515D



L7805



TEA 5101B



TDA1771

ABBREVIATIONS - ABREVIATIONS - ABKÜRZUNGEN - ABBREVIAZIONI - ABREVIACIONES

● **ABL**	AVERAGE BEAM LIMITATION
● **AF**	AUDIO FREQUENCY
● **BCL**	BEAM CURRENT INFORMATION
● **DEGAUSS / DEG -COIL**	DEGAUSS SIGNAL
● **FB**	FAST BLANKING
● **H**	POSITION FLY BACK PULSE
● **HEATER / HTR**	HEATER VOLTAGE
● **I-CUT**	CUTOFF CURRENT
● **IR**	DATA FROM INFRARED RECEIVER
● **SCL**	SERIAL CLOCK
● **SDA**	SERIAL DATA
● **SIF**	SOUND IF
● **V AMP**	VERTICAL AMPLITUDE
● **VTUNE**	TUNING VOLTAGE
● **V POS**	VERTICAL POSITION
● **VSYNC /-V**	VERTICAL DEFLECTION SIGNAL

THOMSON MULTI MEDIA

90° TELEVISIONS FITTED WITH THE TX91 FRAME STRUCTURE

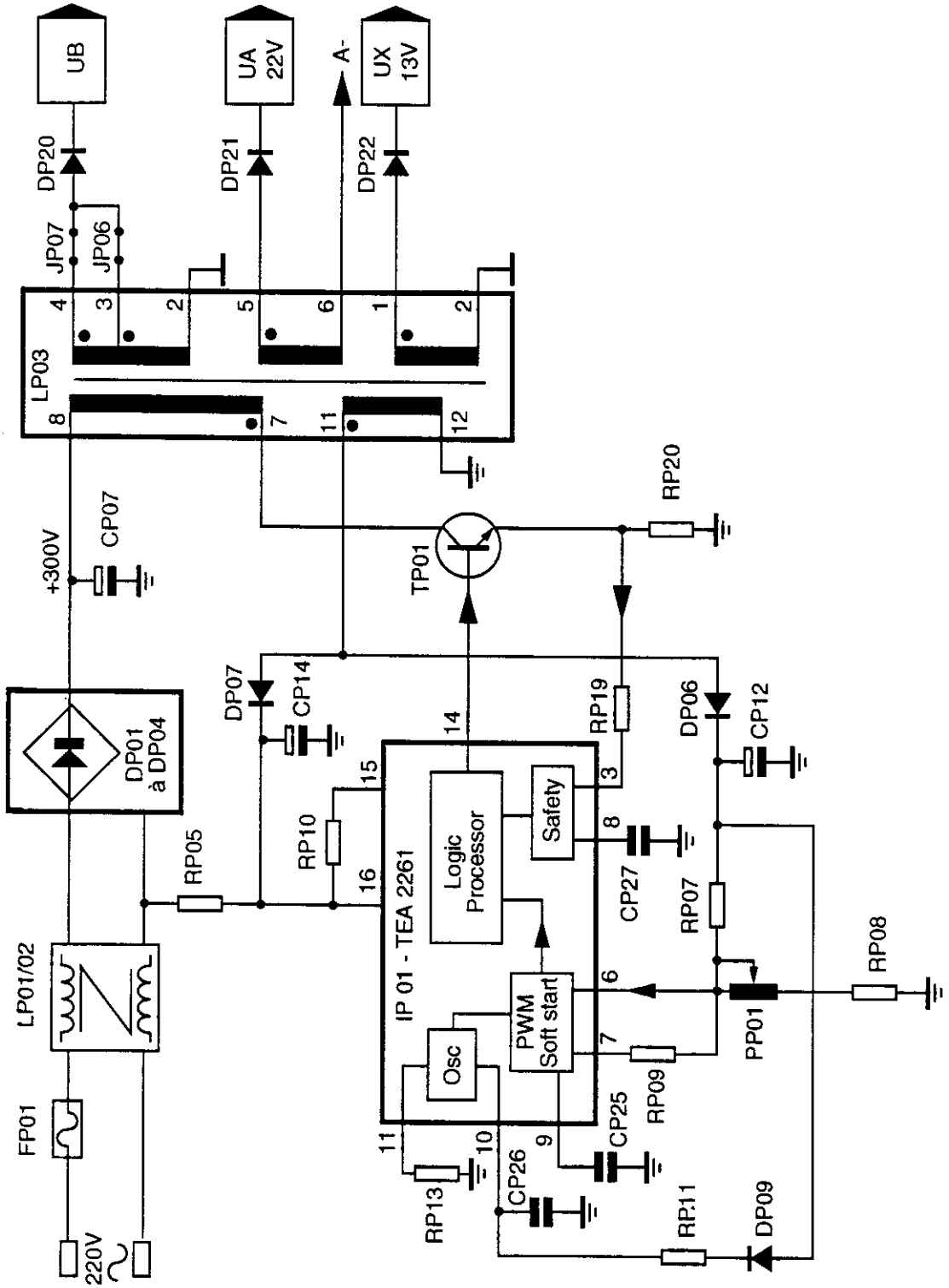
Click here to go to the index page

CFT CENTRE DE FORMATION TECHNIQUE

SOMMAIRE TX91

TX91G Power Supply

POWER SUPPLY



TX 91 G

THOMSON MULTI MEDIA

GENERAL

This is a fly-back type, fixed-frequency chopped power supply carried by an oscillator incorporated into the TEA2261 printed circuit (nominal frequency @ 23, 4 KHz).

Unlike the frame structures previously using this circuit (ICC7, IDC2), the primary regulation mode has been adopted both in standby/suspend mode and in steady state. There is, therefore, only one regulation loop.

The voltage coming from the 11-12 primary winding after rectification and filtering by the DP06-CP12 network is the image of the energy stored in primary as well the energy consumed overall in secondary. This information is therefore adjusted by PP01 and then applied to pin 6 of IP01 to be compared to an internal reference. The consequence for output 14 is a fixed-period and variable cyclic rate strobe which determines the saturation time of the TP01 chopper and therefore the quantity of energy stored.

In standby mode, since the consumption of the secondaries is very low, the regulating device hits the lower limit of the saturation time of the chopper before sufficiently reducing the energy stored. Consequently, there is a BURST mode which injects energy in "packets" and thus makes possible a balance between the energy supplied and the energy consumed.

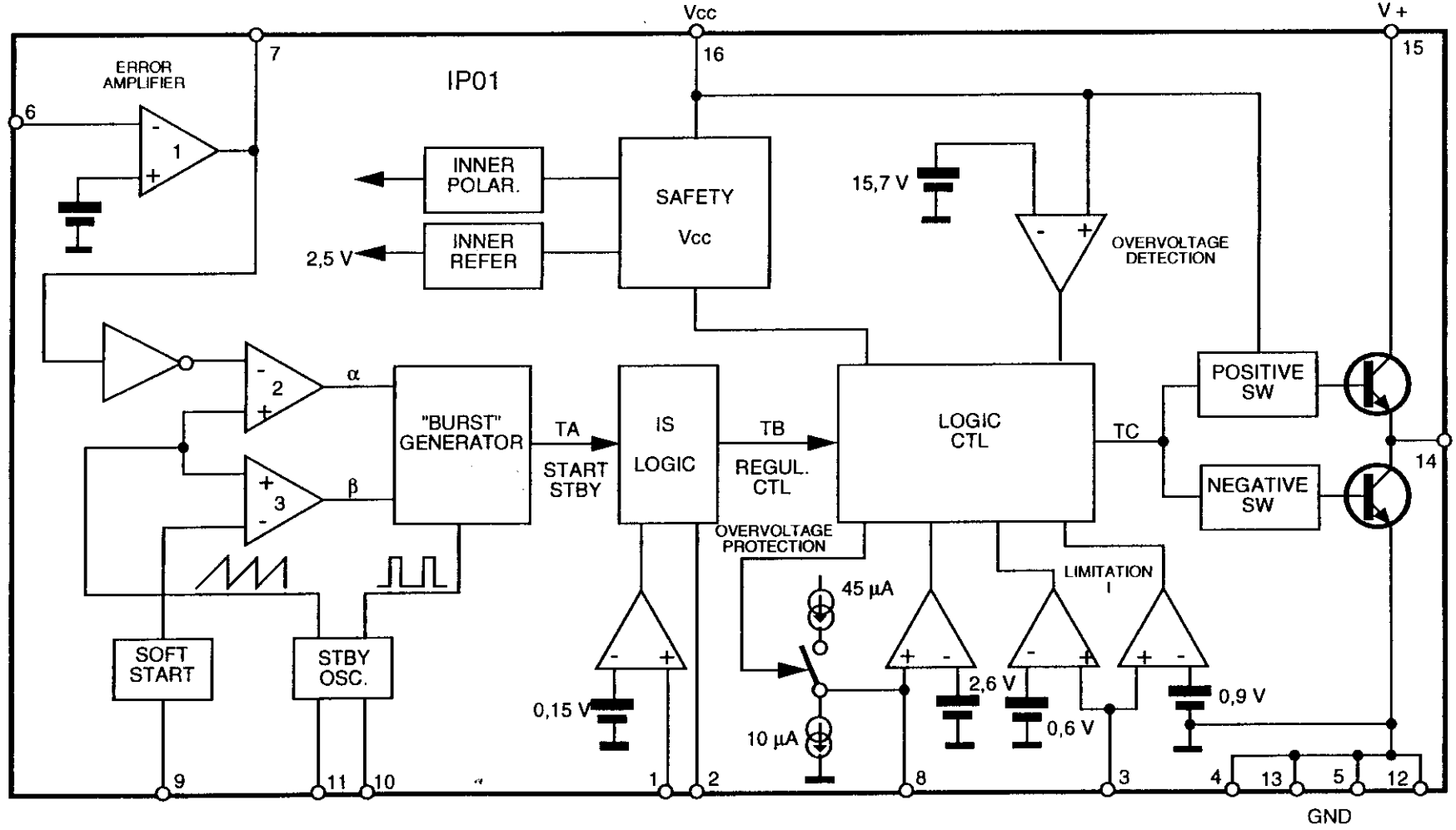
On the secondaries, three windings carry:

- the UB line time base mains voltage (109 to 116V),
- the UA audio mains voltage (22V) which also prefeeds the driver stage (subsequently relayed by the +24V of the BTL),
- the UX standby voltage (13V) intended for supplying the microcontroller unit.

Power Supply: self oscillating.

- P.S : • frequency depends on load   ON MODE: 60khz–80Ukhz
  St.by MODE : 26 Ukhz.

★ Οι σημειώσεις αυτές αφορούν το τροφοδοτικό του TX 91 G



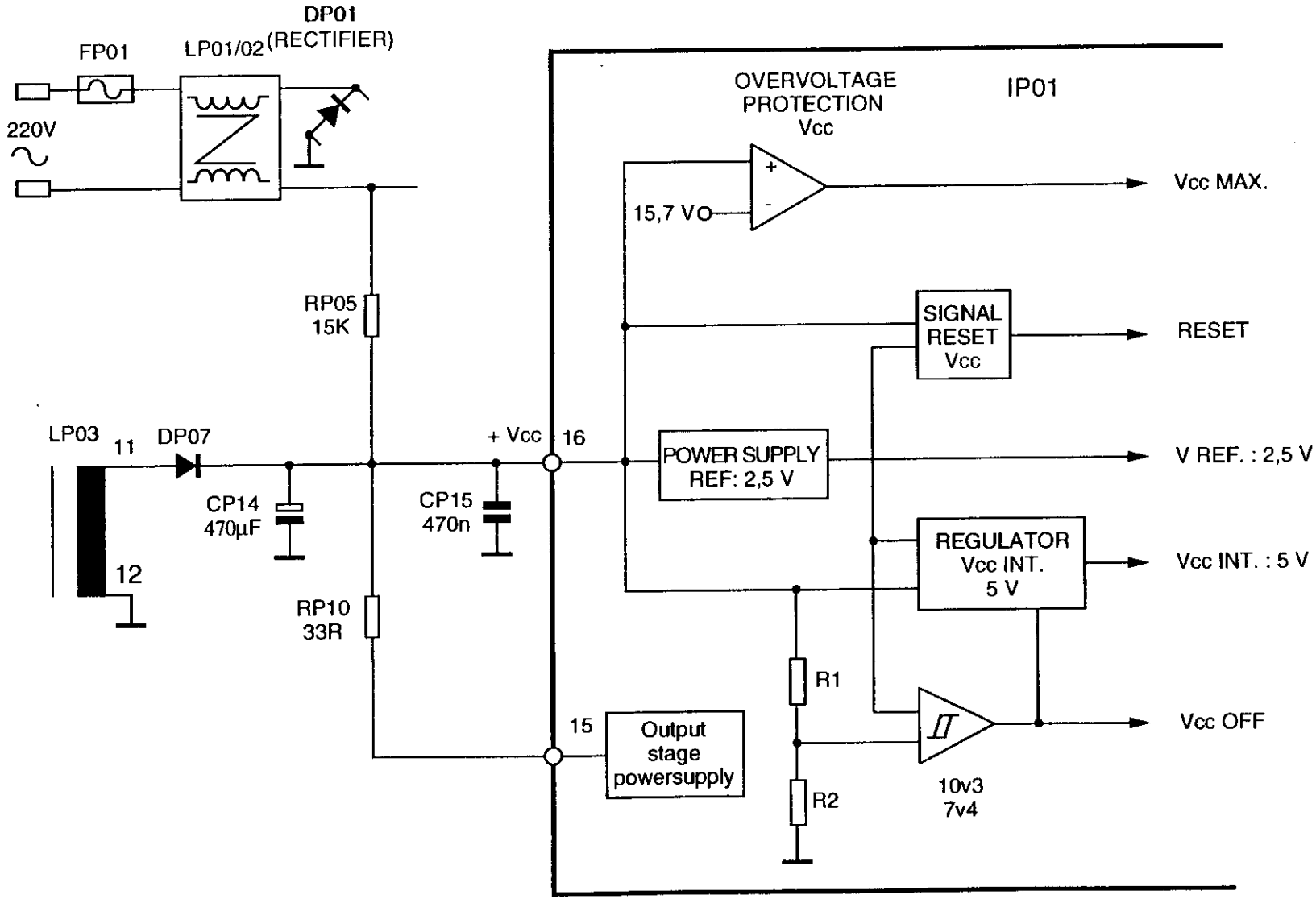
TEA2261 INTEGRATED CIRCUIT

The TEA2261 integrates the different stages necessary for controlling and regulating a chopped power supply. It includes:

- an internal voltage regulating and reference circuit,
- an RC oscillator,
- an error amplifier,
- a pulse width modulator (PWM) and progressive start-up,
- a transformer demagnetisation monitoring device,
- a current threshold limiting detector,
- a logical limitation and safety device management system,
- a high-level stage enabling a power transistor to be coupled directly.

Thanks to the automatic commutation of the BURST mode in the event of low consumption, this circuit ensures a wide range of regulation from a few watts to a value of around 200W.

With this circuit not being used in its complete configuration in the present case, in addition to the afore-mentioned demagnetisation monitoring stage, the secondary regulation input (pin 2) is also connected to the earth.



TEA2261 "POWER SUPPLY

The circuit carries several voltages and a fair amount of service information depending on the development of the dcV No. 16 pin voltage.

As soon as the +dcV reaches about 4.5V, a reference of +2.5V is generated.
For +dcV ≤ 5, 5V, a RESET impulse is developed.
For +dcV ≥ 10, 3V (dcV start), a Vcc int internal supply of 5V is validated. This stabilised voltage enables the circuit to remain very efficient within a wide voltage range in pin 16.
This dcV start also causes a transition to "dcV off" high state, and enables the management logic, limitations and safety devices to be validated so as to authorise impulse output in pin 14 as long as this +dcV remains greater than +dcV stop (7.4V type).

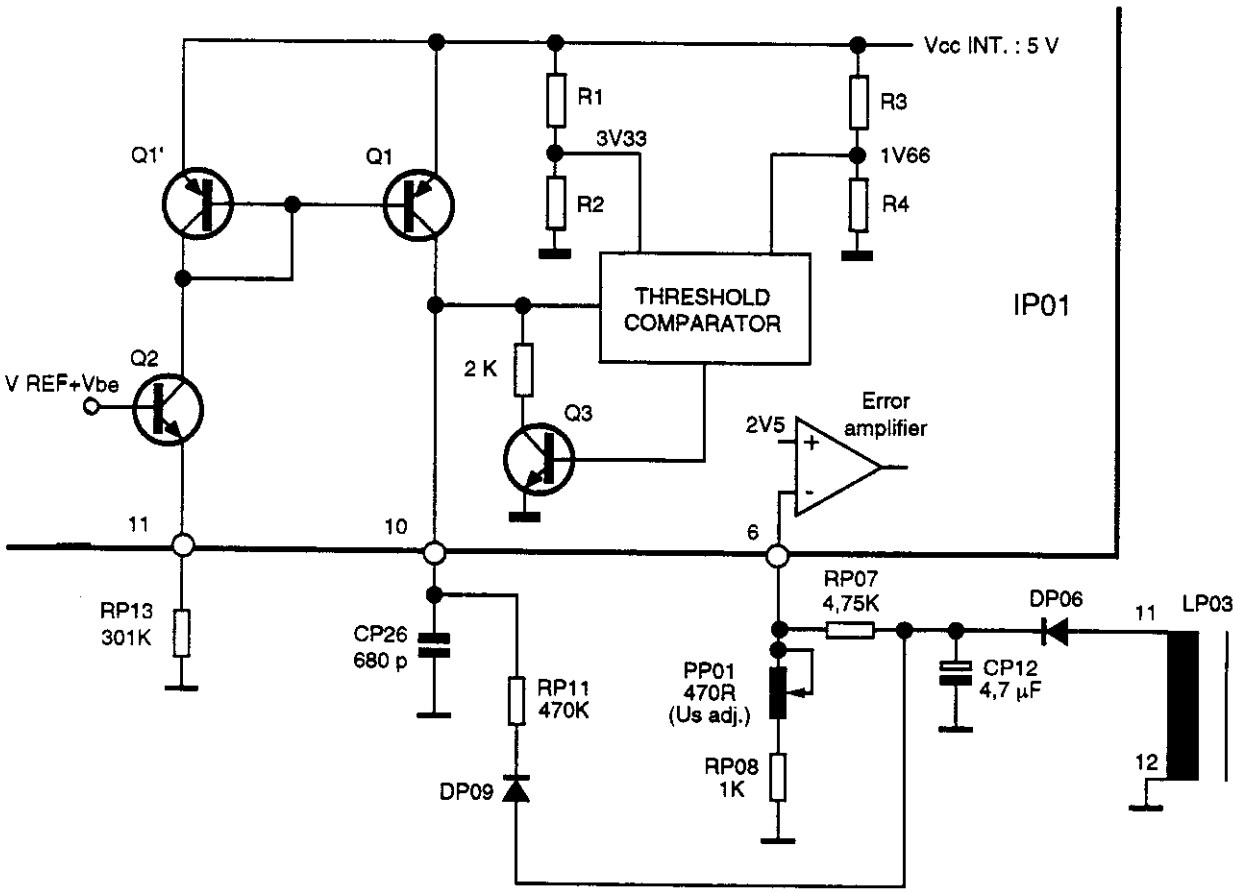
The pin 16 supply comes:

- At start-up, from the single-alternation rectification of the mains by the RP15-CP14-DP01 mesh.

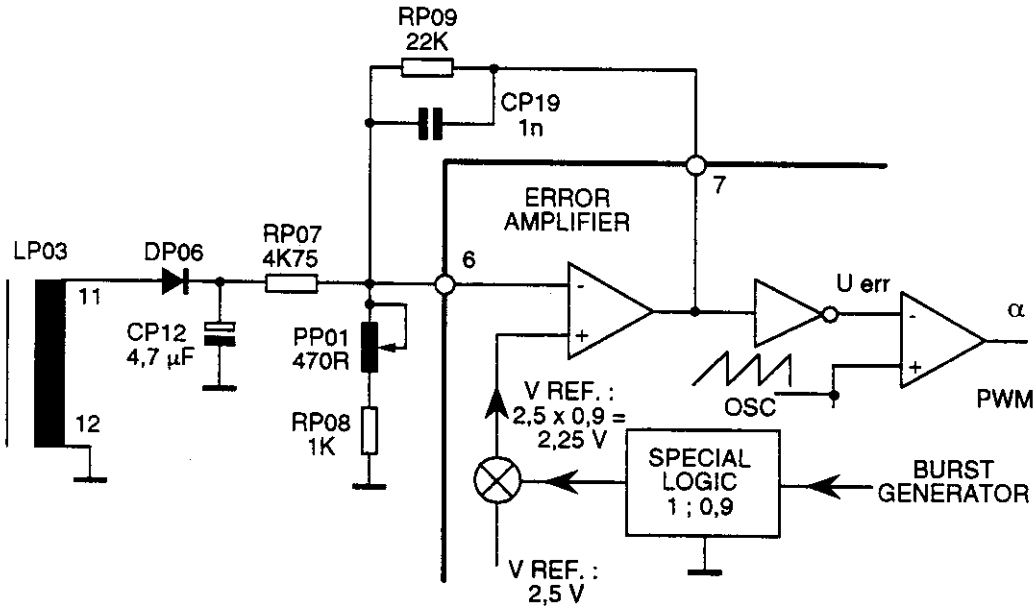
- In steady state and standby mode by the 11-12 winding of LP01 after rectification by the DP07-CP14 cell.

For +dcV ≥ 15, standard 7 dcV, transition to the dcV max. high state and safeguarding of the circuit by control logics.

The RP10 carries the final stage supply (pin15) and fixes its maximum current.



OSCILLATOR AND SWITCHING CIRCUIT



ERROR AMPLIFIER AND REGULATION CIRCUIT

OSCILLATOR

This oscillator determines the commutation frequency of the chopper.
It comprises:

- A Q1, Q1', Q2 current generator whose value is determined by the RP13 resistance (pin 11).

$$I_{charge} = 2.5V / RP13$$

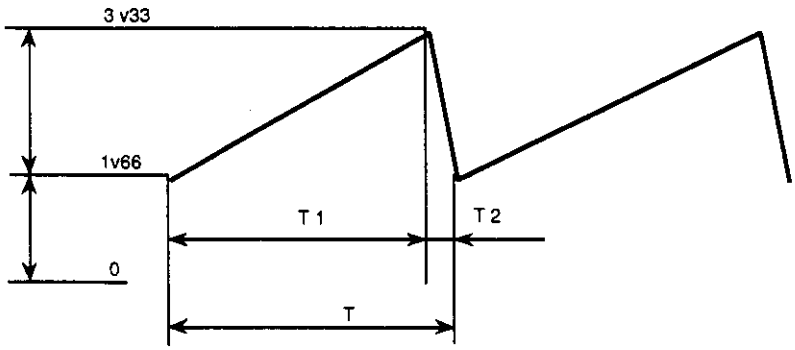
This current charges the CP26 capacitor (pin 10).

- A threshold detector which analyses the CP26 voltage:

1st threshold (dcV int. 2/3 = standard 3.33V): commutation of the Q3 transistor and discharging of CP26 by the 2KΩ internal resistance.

2nd threshold (dcV int. 1/3 = standard 1.66V): blocking of the Q3 transistor Q3 and charging of CP26 by the current generator.

The overall result is a saw tooth.

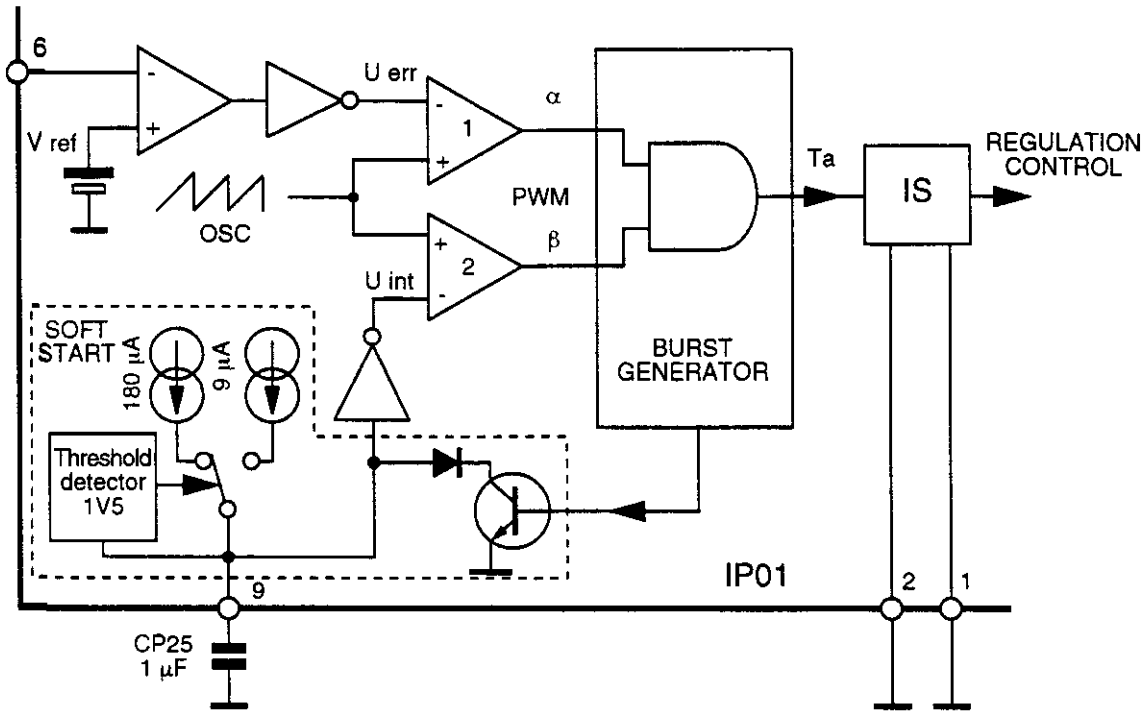


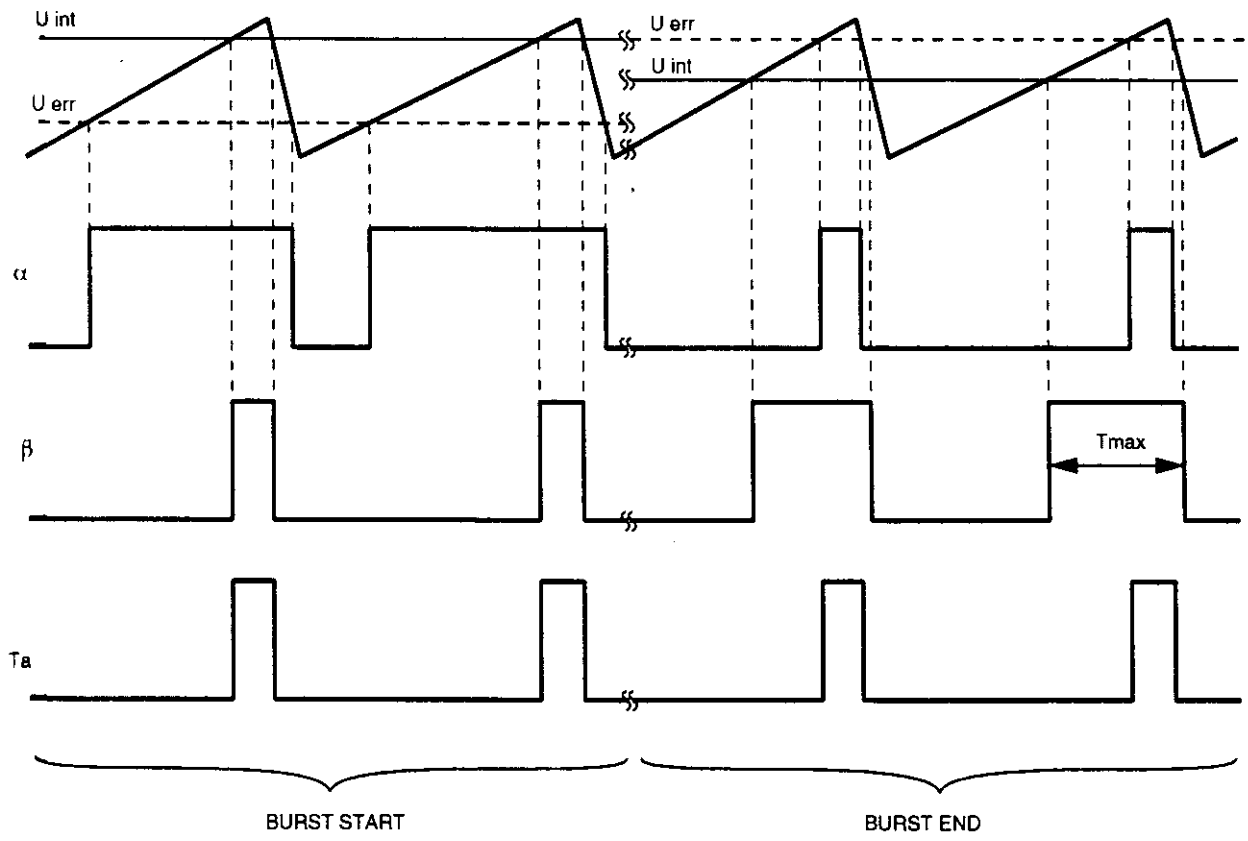
Role of the RP11 resistance.

In the start-up phase, with the secondary voltages being low, there is the risk of the power restoration time exceeding the oscillator's nominal period. The latter therefore starts up with a low frequency (about 2 KHz) due to the high value of RP13. Then the voltage appearing at the CP12 terminals, via RP11, accelerates the charging of CP26 and brings the frequency of the oscillator to its nominal value of 28 KHz.

ERROR AMPLIFIER

This carries out primary regulation by comparing a fraction of the image of the secondaries (11-12 winding, DP06, CP12) with the internal reference and by amplifying the error.
Its gain is determined in a closed loop by the RP09 / RP08 / PP01 components. The adjustable PP01 enables UB to be set (the line time base supply must be monitored in steady state).
The resulting signal is put back into phase with the entry signal by a circuit changing switch before being applied to the PWM modulator.
In BURST mode, the internal reference is commutated between two values (2.5V and 2.25V) so as to configure the loop in overvoltage or undervoltage load (clean stopping and restarting of the regulation loop).

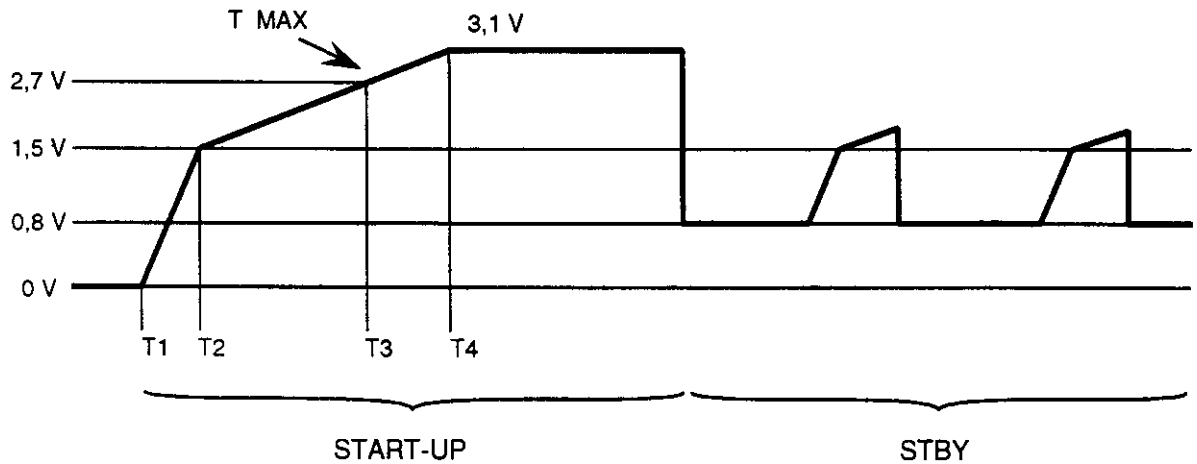

6
V ref
U err
α
1
PWM
β
2
U int
OSC
Ta
IS
REGULATION CONTROL
SOFT START
180 µA
9 µA
BURST GENERATOR
Threshold detector 1V5
IP01
9
2
1
CP25 1 µF


SAW TOOTH pin 10
U int
U err
U err
U int
α
β
Tmax
Ta
BURST START
BURST END

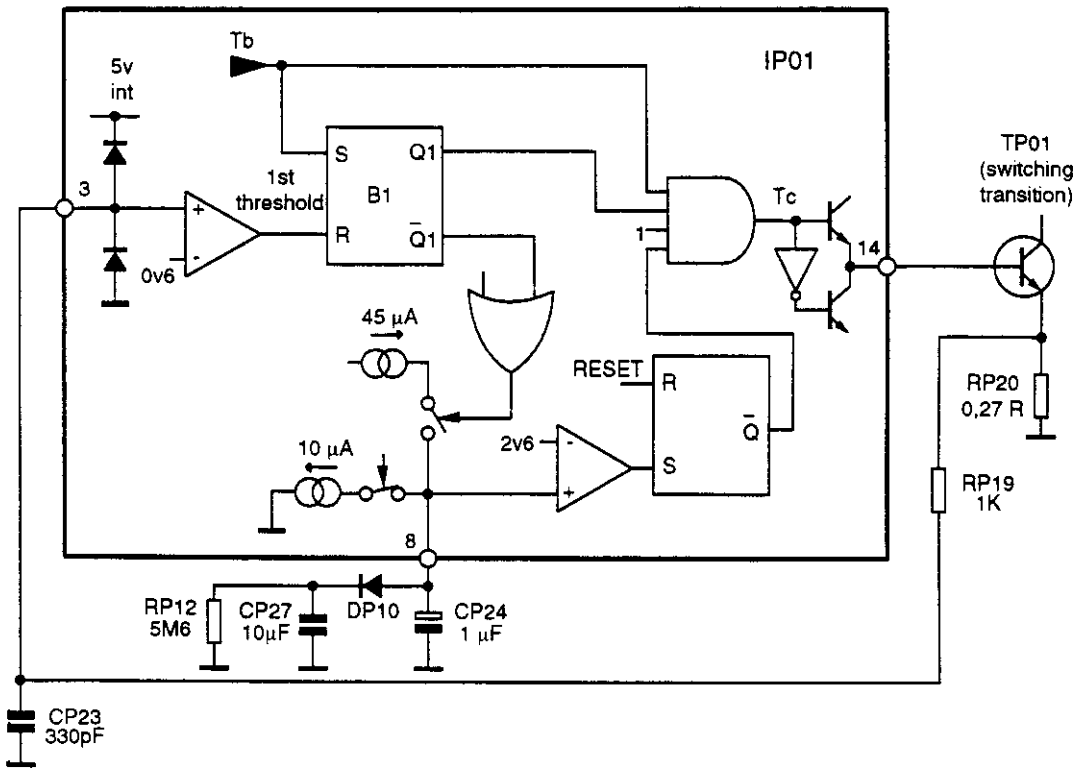
PULSE WIDTH MODULATOR (PWM) AND PROGRESSIVE START-UP

A 1st PWM compares the error voltage to the saw tooth of the oscillator in order to develop a control strobe (α signal).
A second PWM defines the authorised maximum cyclical ratio (60%) by comparing the same saw tooth to an internal voltage (β signal).
A logical "ET" between these two signals carries the narrowest strobe.

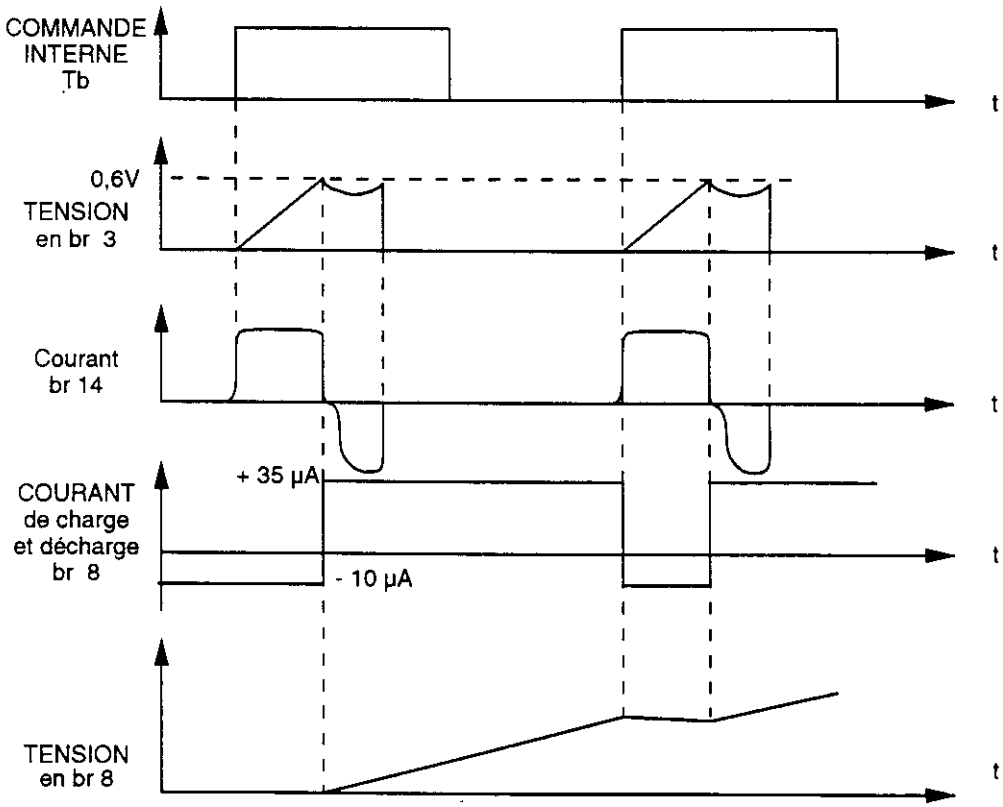
A progressive start-up is ensured when the modulator is put into operation and at the beginning of each burst by monitoring of the internal voltage and therefore of the width of the β signal:
- From T1 to T2, the CP25 capacitor (pin 9) is charged by an internal generator carrying a 180 µA current. There is no current at the CI output.
- At T2, the voltage at the CP25 terminals reaches 1.5V, the charging current changes to 9 µA, strobes appear at pin 14 corresponding to the β signal which widens ($T\beta < T\alpha$).
- Between T2 and T3, the progressive start-up circuit ceases to limit the width of the strobes, the primary regulation loop is established ($T\alpha < T\beta$).
- At T3, the 2.7V typical voltage fixes the maximum cyclic ratio (60%).
- At T4, the CP25 charge stabilises at 3.1V. This voltage will fall back to 800mV at the end of start-up and at the end of each burst.



The signal available at the burst generator output then passes through an IS switching circuit. With this stage intervening only within the framework of a secondary regulation, it is transparent in this application (pins 1 and 2 to the earth).



SAFETY, 1ST THRESHOLD



SAFETY TIMING DIAGRAM, 1ST THRESHOLD

LIMITATIONS AND SAFETY DEVICES

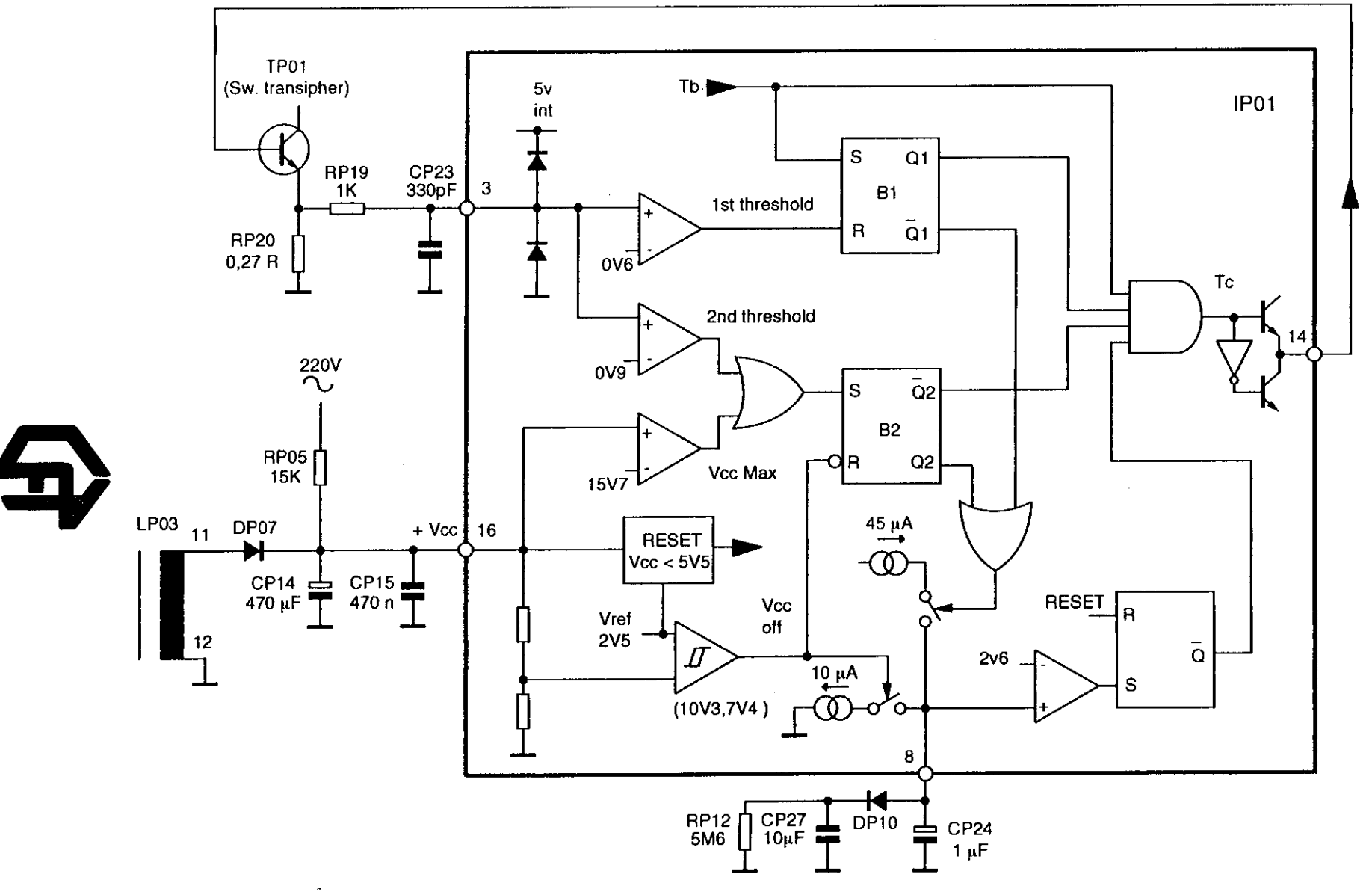
The TEA2261 has 2 types of safety device:
- Current safety device with 2 pin 3 detection thresholds,
- Pin 16 voltage safety device.

CURRENT LIMITATION AND SAFETY DEVICE FOR TP01

The image of the current flowing through TP01 is collected at the RP20 resistance terminals and applied to pin 3 of the TEA2261. A circuit made up of a double threshold comparator then analyses this piece of information.

SAFETY, 1ST THRESHOLD
When the voltage on pin 3 reaches the first threshold of 0.6V, the triggering of the R entrance to the B1 sweep circuit inhibits the Tc control (ET door), the pin 14 impulse of the CI falls to 0 and the current is inverted. TP01 is blocked, you have to wait for the next Tb impulse in order to again validate the ET door and control the commutation transistor (limited to working on a time-by-time basis).

The CP24 (pin 8) is permanently discharged by a 10µA active current generator as soon as the CI starts up (Vcc off = 1). When the first threshold is triggered, the B1 sweep circuit connects (OU door) a 45µA generator to pin 8, hence the charging of CP24 by a current of 45 - 10 = 35mA until the following impulse which modifies the status of the B1 sweep circuit.
Thus, should this phenomenon occur several times running, the CP24 charge reaches 2.6V. This level is detected by a second comparator which definitively inhibits the TP01 control by means of a RS sweep circuit. A general reset is then necessary to start up the circuit again (start/stop mains to obtain dcV ≤ 5.5V).
Should the triggering of the safety device come to a stop before the pin 8 voltage reaches 2.6V, CP24 is discharged and the power continues to be supplied. This makes it possible to avoid spurious releases on momentary overvoltages (arkings, for example). A further safety device against spurious releases is obtained by adding the CP27 / RP12 cell in parallel on CP24 by means of the DP10 diode.



THOMSON MULTI MEDIA

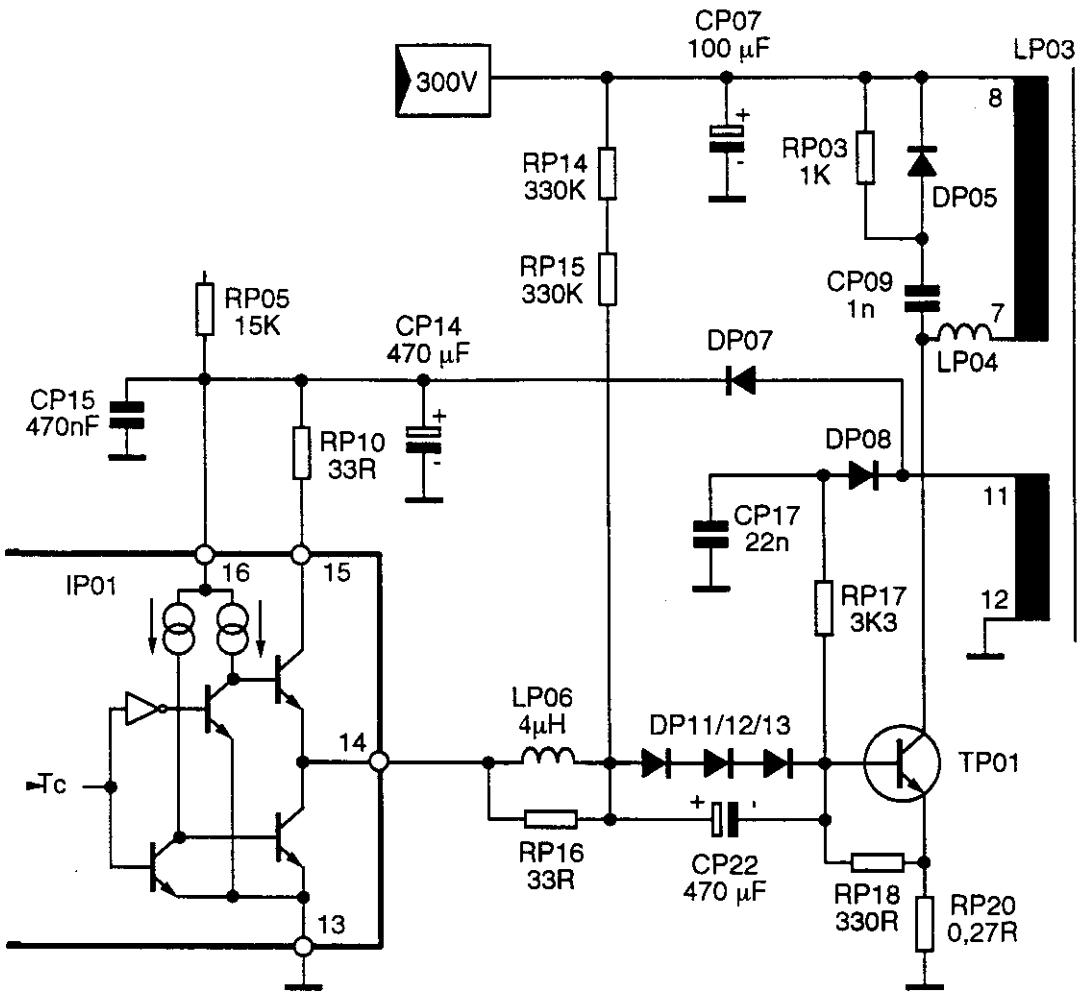
SAFETY, 2ND THRESHOLD

In the event of considerable overvoltage (dc on Us), the primary current may continue to increase despite the action of the first threshold.

A second threshold is then reached (0.9V). In this case, a third comparator activates the B2 sweep circuit, which blocks the Tb impulse (ET door) and triggers the 45µA generator. The TP01 control is inhibited.
The CP24 / CP27 capacitors are then charged at a voltage of 2.6V before the B2 sweep circuit can be reinitialised by dcV off. A general reset is necessary to start up the circuit again (M/A mains).

VOLTAGE SAFETY DEVICE

A voltage greater than 15.7V on pin 16 triggers the B2 sweep circuit by means of a comparator and an OU door. Consequently, we find ourselves once again in the same scenario as with the 2nd threshold, and a general reset is necessary to start up the circuit again.



HIGH-LEVEL STAGE

The high-level stage is made up of a push-pull.
The transistor connected between pins 15 and 14 supplies the basic current for the TP01 control whereas the transistor located between pin 14 and the earth channels a locking reverse current due to the CP22 discharging.
In conduction phase, the RP10 resistance keeps this stage fed (pin 15) at a value less than or equal to 5V while limiting the polarisation current.

TP01 COMMUTATION AID CIRCUITS

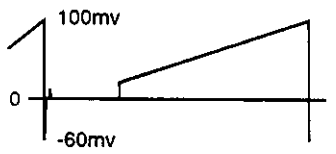
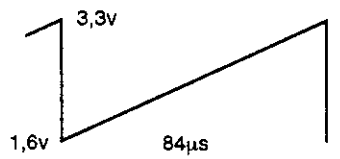
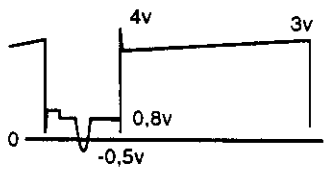
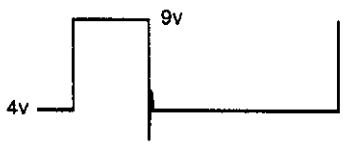
The RP14 and RP15 resistances provide a CP22 preliminary charge right from the moment of charging in order to reinforce the locking reverse current in the start-up phase and at the beginning of each burst. The LP06 self-induction coil ensures the "dI/dt" of this reverse current.
The DP08, CP17, RP17 circuit works in forward with the 11-12 winding so as to polarise the TP01 base negatively outside the control strobes. The aim is the same as for the previous circuit.
The DP05, RP03, CP09 network slows down the increase in the TP01 collector's voltage when it is locked in order to guarantee a minimum peak power and limit the overvoltage point.

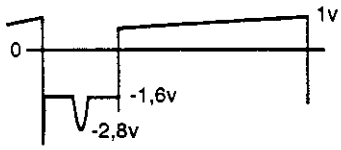
POWER SUPPLY REPAIR METHOD

CONTROL OF THE POWER SUPPLY BY LOW-TENSION METHOD

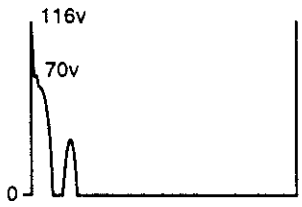
- Discharge the CP07 capacitor
- Connect the «+» of the CP07 and CP14 capacitors
- Supply the television set with a continuous voltage of 12V via the mains plug

SIGNALS AND VOLTAGES ON IP01

PIN	SIGNALS	PIN	SIGNALS
3		6	1,2V
		7	4,2V
		8	0V
10		9	3V
		11	2,5V
		16	9V
14			
15			



TP01 BASE



TP01 COLLECTOR

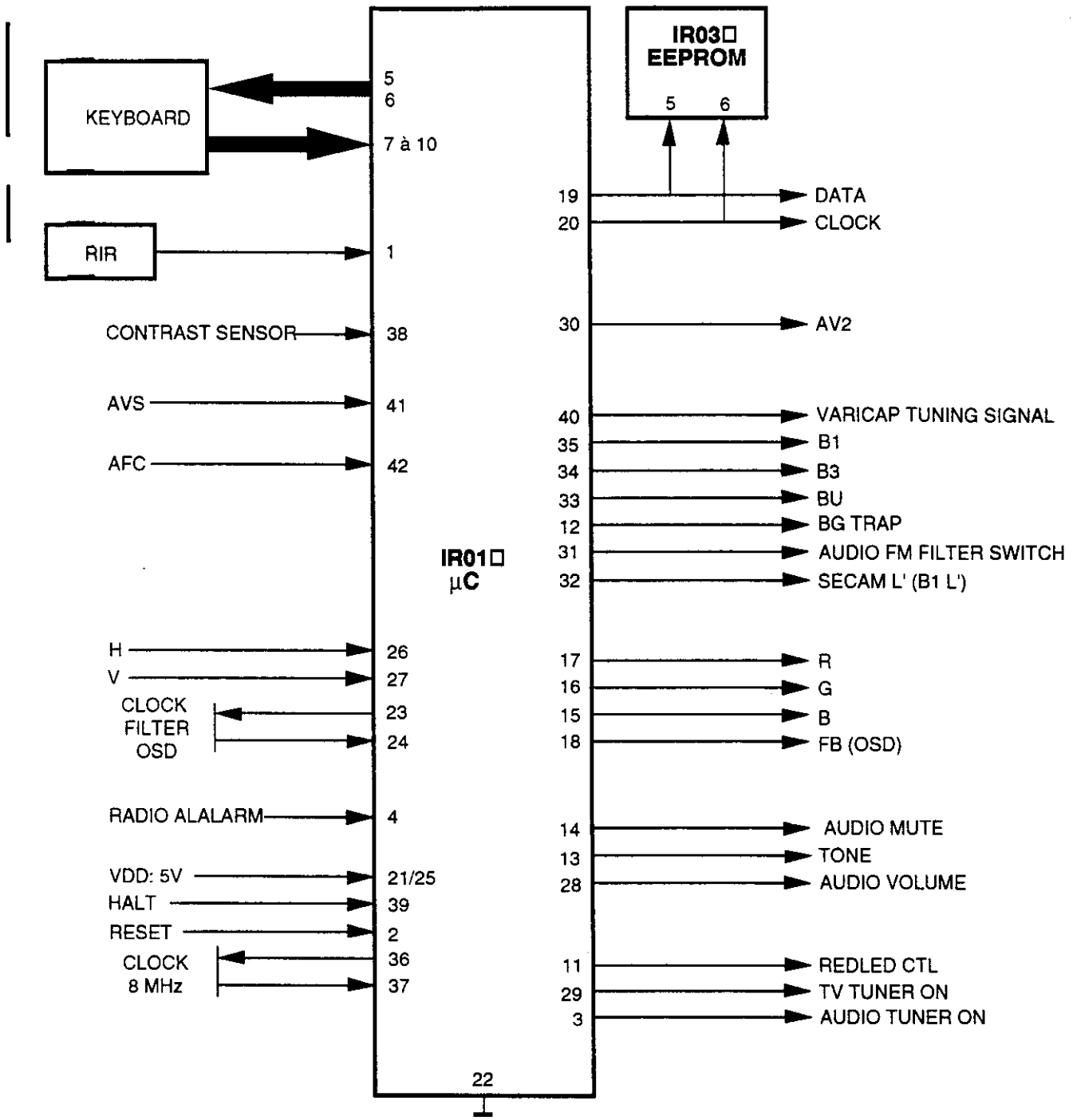
UB = 60V
UA = 10V
UX = 5V

CONTROL OF THE 220V AC POWER SUPPLY WITH A LOAD RESISTANCE

- Disconnect pin 1 from LL05
- Charge UB with a resistance of 300Ω / 40W

In these conditions, UB = 115V.

MANAGEMENT

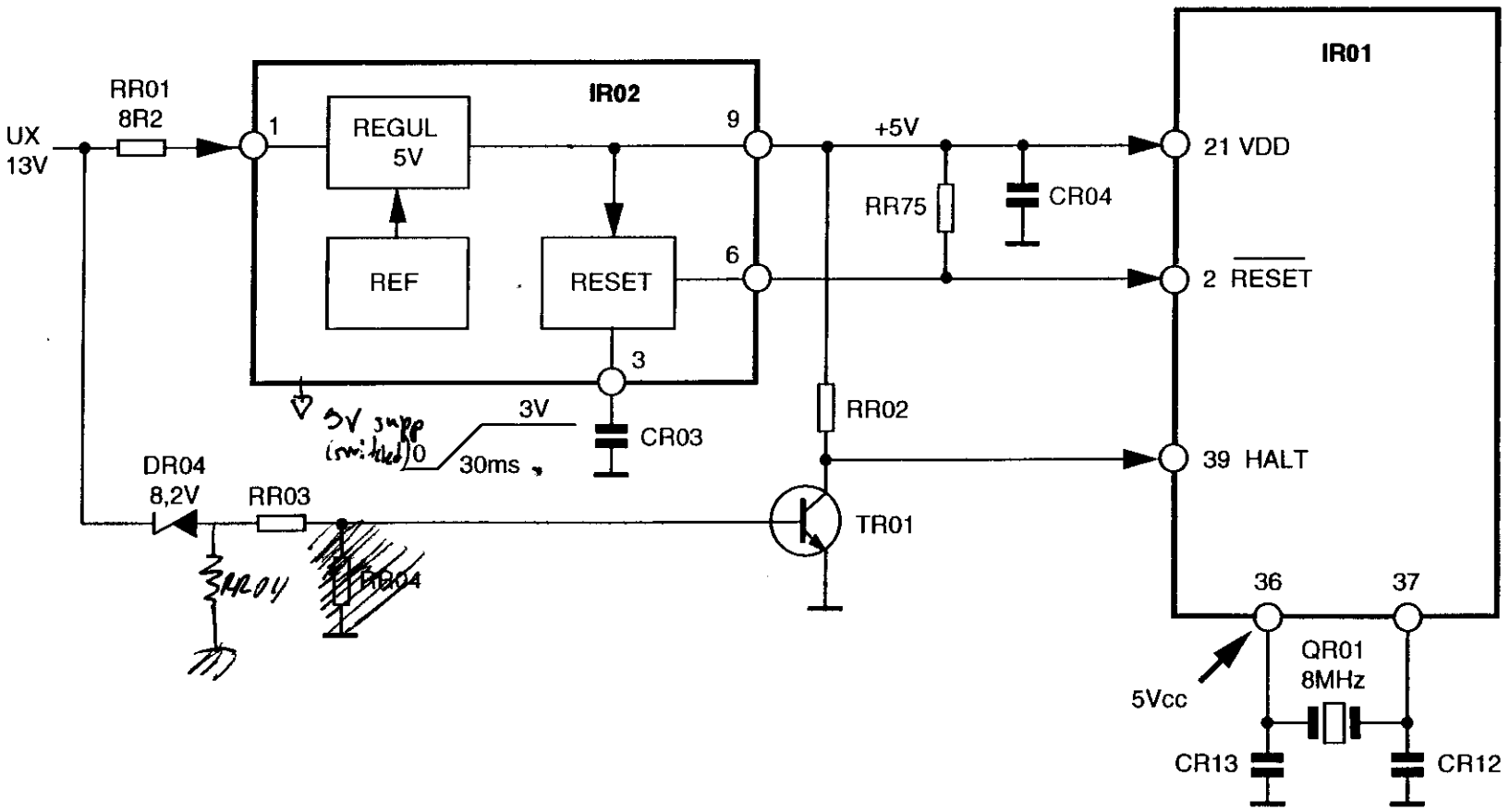

IR03□
EEPROM
5
6
KEYBOARD
5
6
7 à 10
RIR
1
CONTRAST SENSOR
38
AVS
41
AFC
42
IR01□
µC
H
26
V
27
CLOCK
FILTER
OSD
23
24
RADIO ALALARM
4
VDD: 5V
21/25
HALT
39
RESET
2
CLOCK
8 MHz
36
37
22
19
DATA
20
CLOCK
30
AV2
40
VARICAP TUNING SIGNAL
35
B1
34
B3
33
BU
12
BG TRAP
31
AUDIO FM FILTER SWITCH
32
SECAM L' (B1 L')
17
R
16
G
15
B
18
FB (OSD)
14
AUDIO MUTE
13
TONE
28
AUDIO VOLUME
11
REDLED CTL
29
TV TUNER ON
3
AUDIO TUNER ON

GENERAL

This frame structure is managed by a ST929J6B1 microcontroller and an EEPROM memory containing the TV channel parameters, the user controls values, the mechanism for saving information in the event of a mains power cut as well as the service mode.

It performs the following functions:

-management of the remote control unit and front-panel keyboard,
-control of the tuner (bands, voltage standards and synthesis),
-control of the brightness, contrast, colour and volume by an IIC bus,
-standby / switching-on of the television set and radio,
-generation of the characters for incrusting menus on the screen,
-recognition of the wiring of one two SCART plugs by a low and high level when the appliance is switched on (low AV1).



THOMSON MULTI MEDIA

IR01 POWER SUPPLY AND FUNCTIONAL SIGNALS

POWER SUPPLY

The microcontroller, IR01, is fed from the 13V UX coming from the power supply. One part of the double regulator, IR02, receives this 13V UX (pin 1) and enables the IR01 to be fed in 5V (pin 21).

CLOCK

The QR01, 8 MHz, crystal guarantees the stability of the system clock (pins 36 and 37).

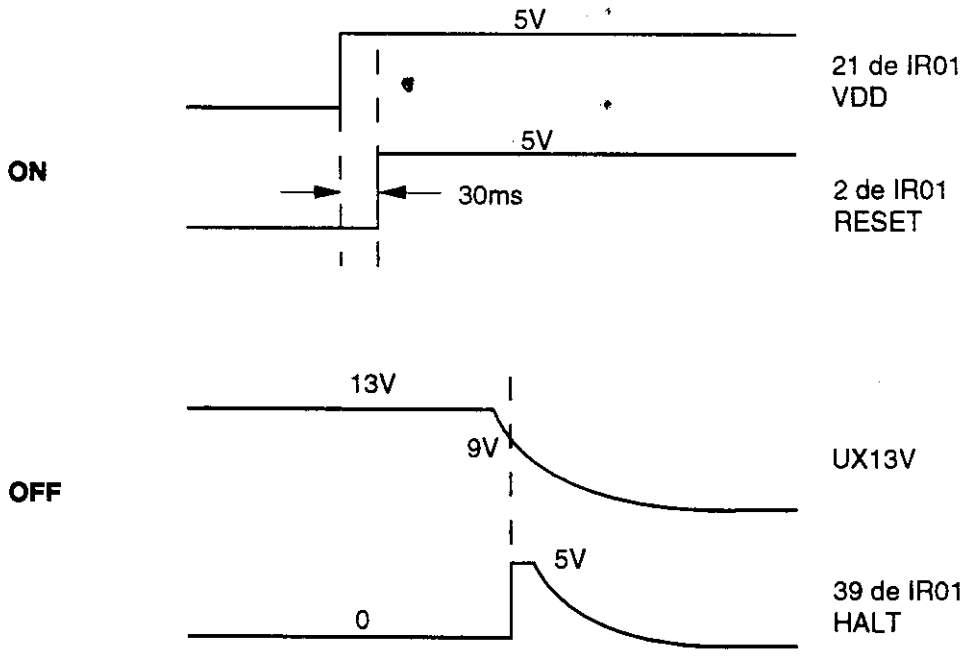
RESET

When the IR02 voltage in 9 has reached 5V, pin 6 of IR02 goes up to the high level after a delay of a few milliseconds given by the CR03 charge (pin 3 of IR02). Pin 2 of IR01 receives the information to RESET.

MAINS POWER CUT DETECTOR

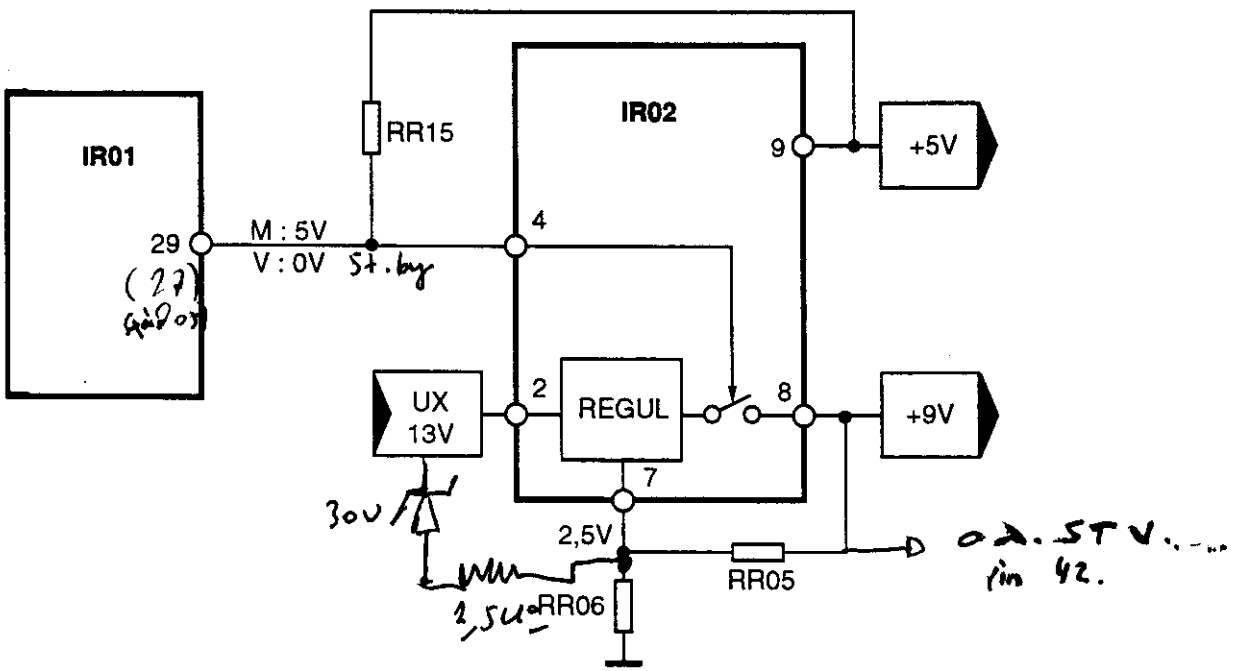
In steady state and standby, pin 39 of IR01, informed by the 13V UX, DR04 and TR01 is at 0V. Should the 13V UX disappear (<9V), TR01 gets locked and brings IR01 to a **HALT**. A programme number and adjustment values saving procedure in EEPROM is triggered.

Α. Το ΤR01 είναι βραχυκυκλ/νο, δεν έχουμε service mode.



TV SET STANDBY AND SWITCHING-ON CONTROL

Pin 29 of IR01 corresponds to an open drain outlet.
When it is switched on, its move up to high state leads to the 9V regulator in IR02 being validated.
The +9V voltage available at outlet 8 of IR02 feeds IV01 (pin 42), and leads to the output of the line power control signals.
The 13V and 24V voltages recovered from the line transformer will enable the television set to be fed completely.



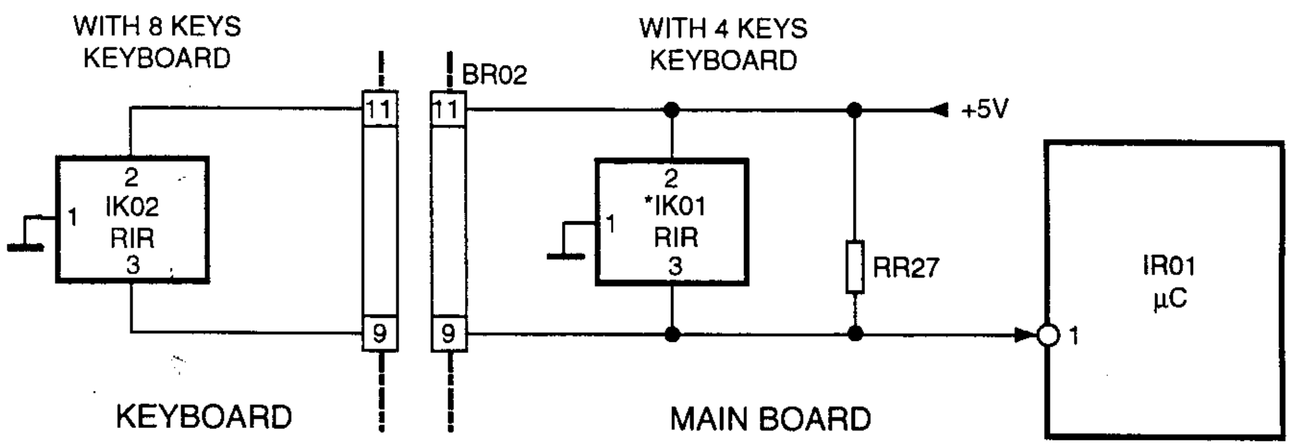
THE EXTERNAL CONTROLS

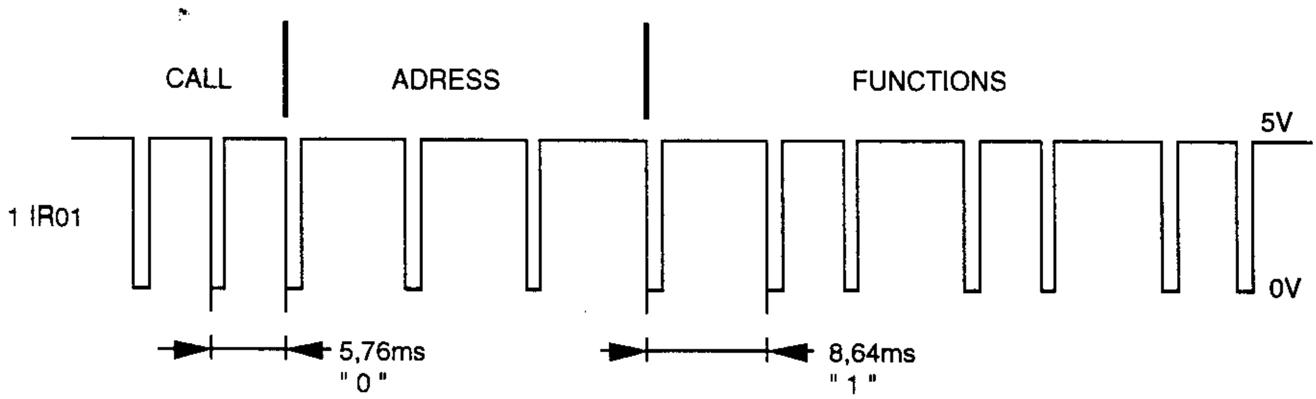
THE REMOTE CONTROL UNIT

The remote control unit function codes (11 bits) arrive at 1 of IR01. They comprise:

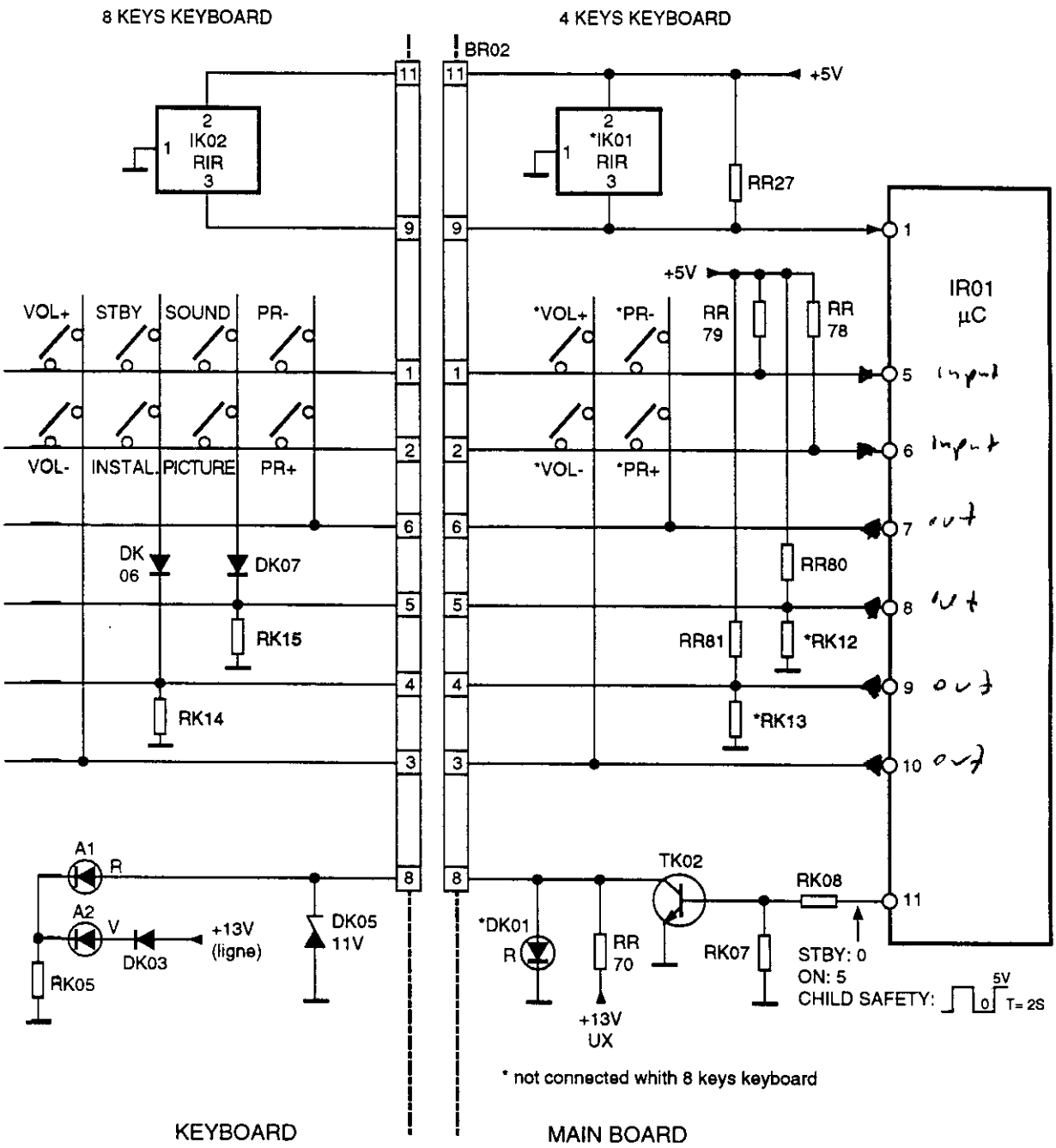
- 2 T1, T0 (00 à 11) call bits
- 3 A2 , A1 , A0 (111 = TV) address bits
- 6 F5 , F4 , F3 , F2 , F1 , F0 function bits which are defined by the key selected.

These codes are repeated every 138 ms.





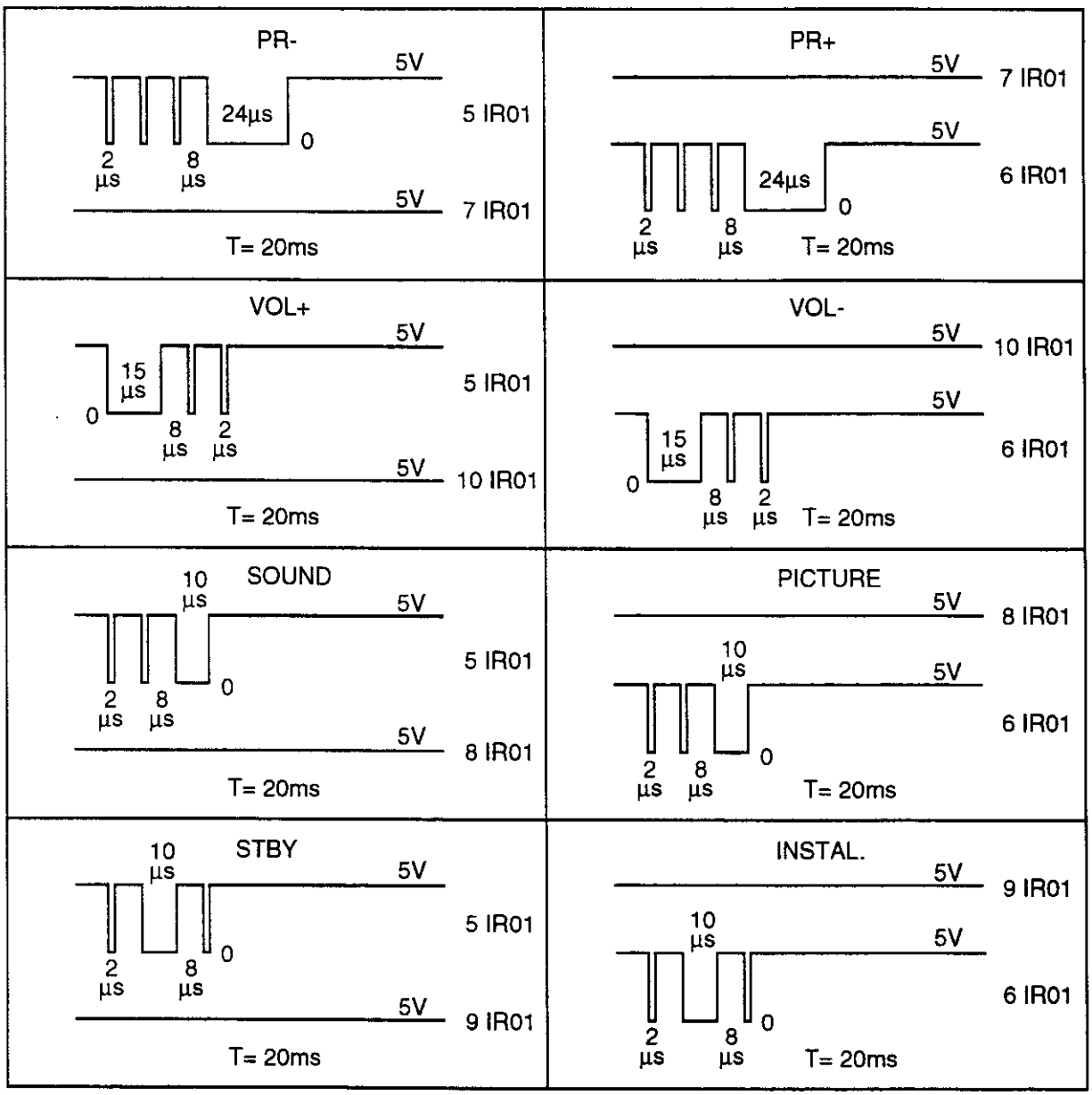
Αν η συχνότητα του κρυστάλλου του I.R01 έχει αλλάξει, ο μPC δεν αναγνωρίζει τις εντολές του τηλεχειριστηρίου.

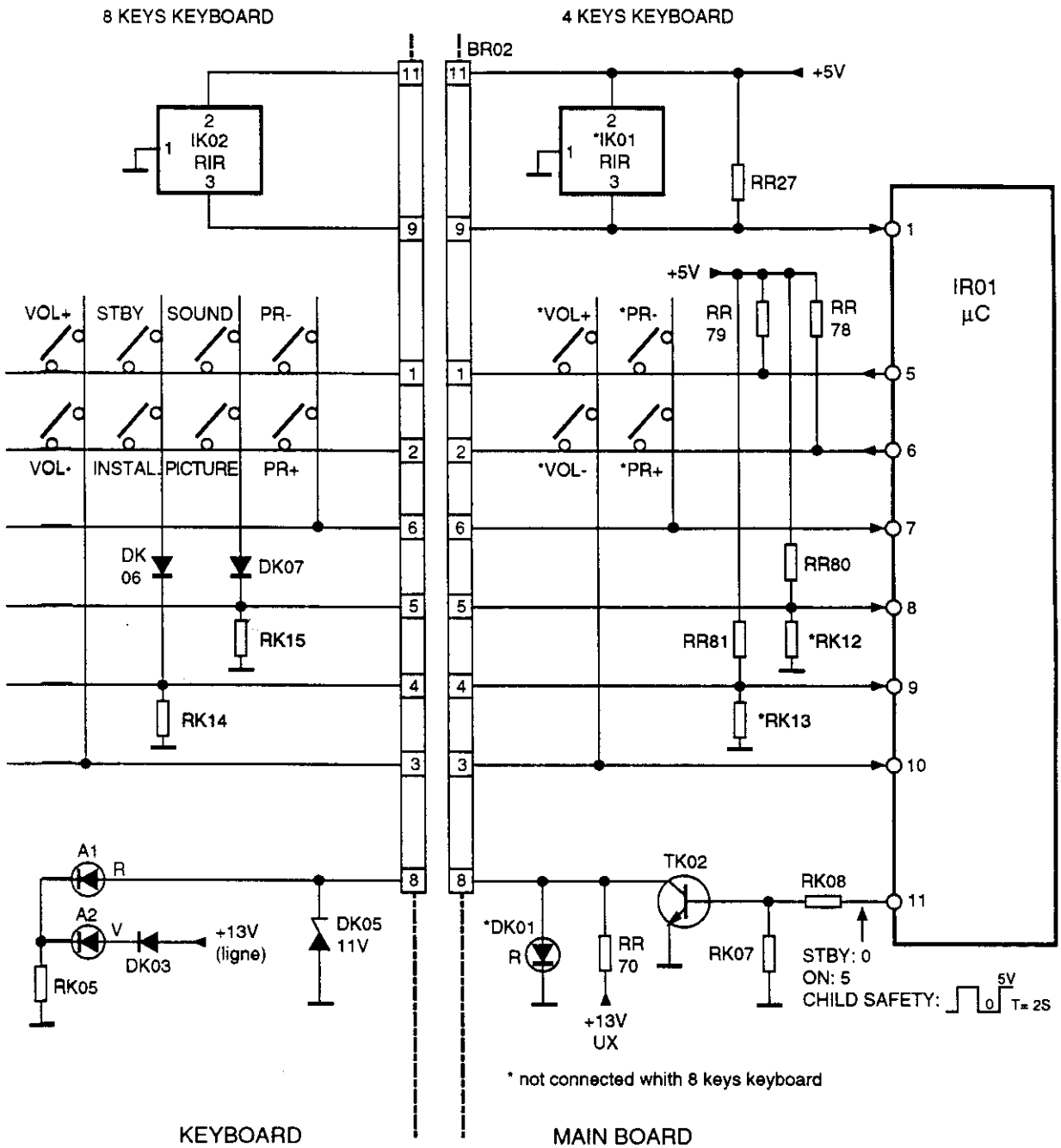


THE KEYBOARD

The keyboard is laid out in a line/column matrix. Pins 5 and 6 are scanning outputs. Pins 7 to 10 are function inputs.
Should no key on the keyboard be pressed, the scanning outputs are permanently in high status, whereas the functions inputs are at low level.
When a key is pressed, a low level appears at the scanning output concerned. Then this output alone gives out a keyboard scanning signal.

KEYBOARD SCANNING SIGNALS





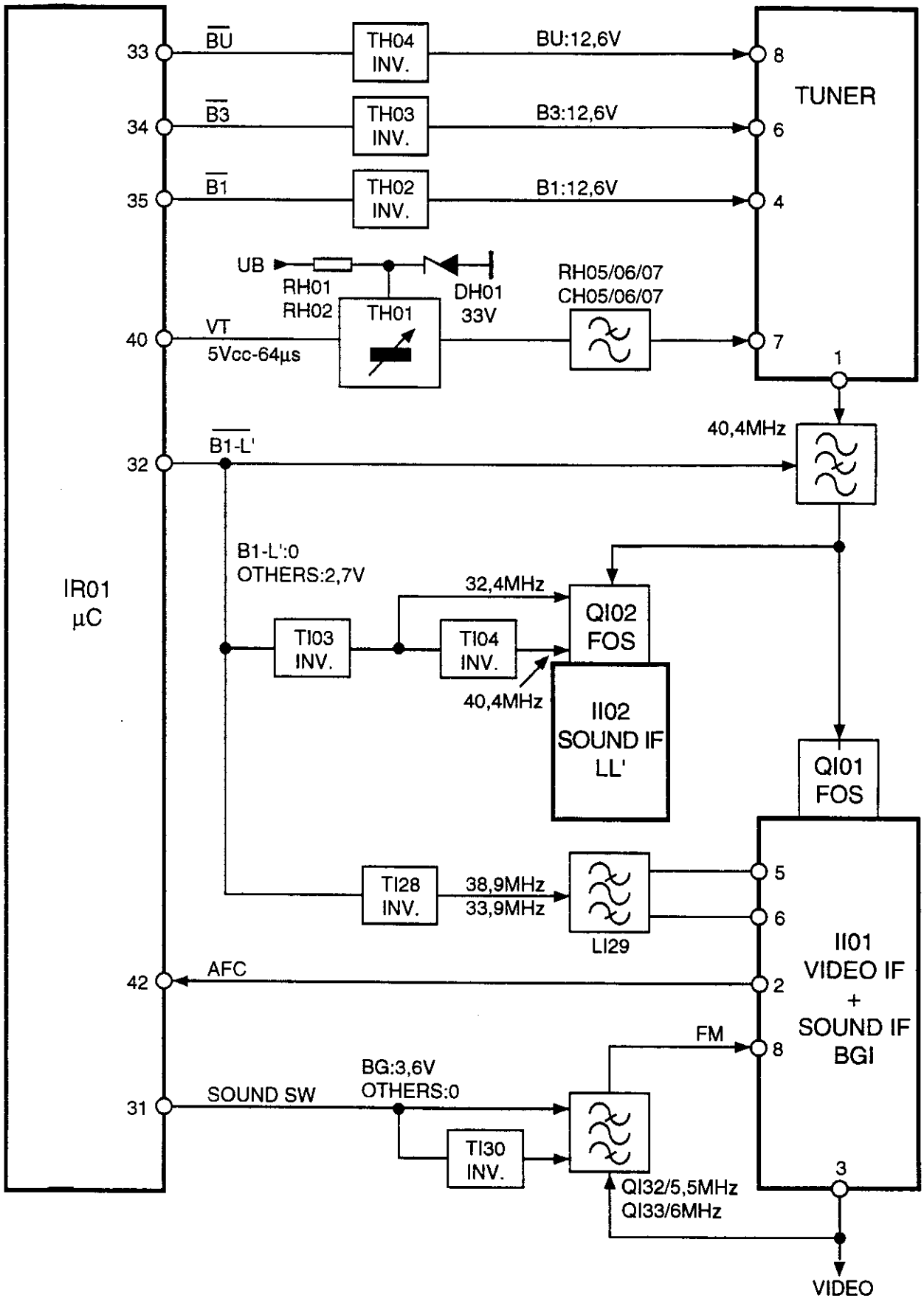
BRAND RECOGNITION

Pins 8 and 9 enable the brand of television set to be recognised. When IR01 is initialised, the levels on these pins are analysed. The brands are differentiated by the RK12/13 or RK14/15 optional resistances.

8 IR01	9 IR01	BRANDS
1	0	TELEFUNKEN
0	1	BRANDT/SABA
1	1	THOMSON

LEDS CONTROLS

With a television set equipped with a 4-key keyboard, a red LED comes on in STANDBY and ON modes from +13V UX on.
With a television set equipped with an 8-key keyboard, a red LED comes on in STANDBY mode from +13V UX on, and a green LED comes on in ON mode from +13V line on.
In child-lock mode, the red LED flashes (T= 2 seconds).
In alarm-clock mode, the red LED flashes (T= 0. 5 seconds).



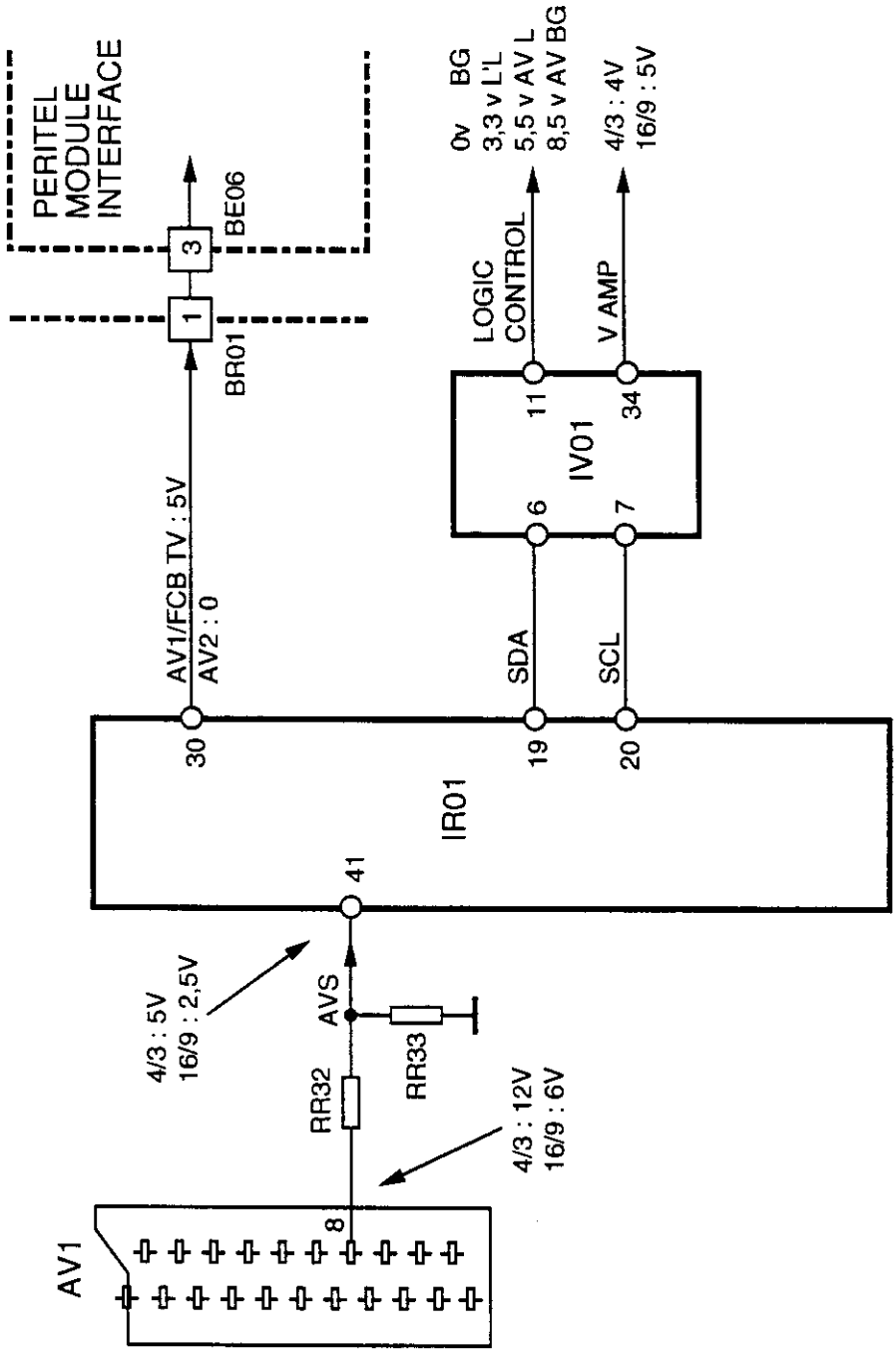
CHANNEL AND STANDARDS MANAGEMENT

Pins 33, 34 and 35 of IR01 manage the tuner reception bands. The Varicap voltage is worked out from the signal available in 40 of IR01 (VT), from the TH01 variable resistance and from the RH05 to RH07/CH05 to CH07 low-pass filter. Automatic frequency control is performed by the picture I.F. II01 (pin 2) and IR01 (pin 42) integrated circuit.

Output 32 of IR01 makes it possible to:

- -take the 40.4 MHz rejector in 1L' band out of operation,
- -set the sound I.F. to 40.4 MHz (1L' band) or 32.4 MHz (other cases),
- -set the image I.F. to 33.9 MHz (1L' band) or 38.9 MHz (other cases).

Output 31 of IR01 selects the QI32 (5.5 MHz) or QI33 (6 MHz) filters for the FM intercarriers.



AV COMMUTATIONS

Pin 41 of IR01 receives the AV1 low-speed switching. IR01 differentiates between a 4/3 video signal and a 16/9 video signal by the value of the continuous voltage on its pin 41.

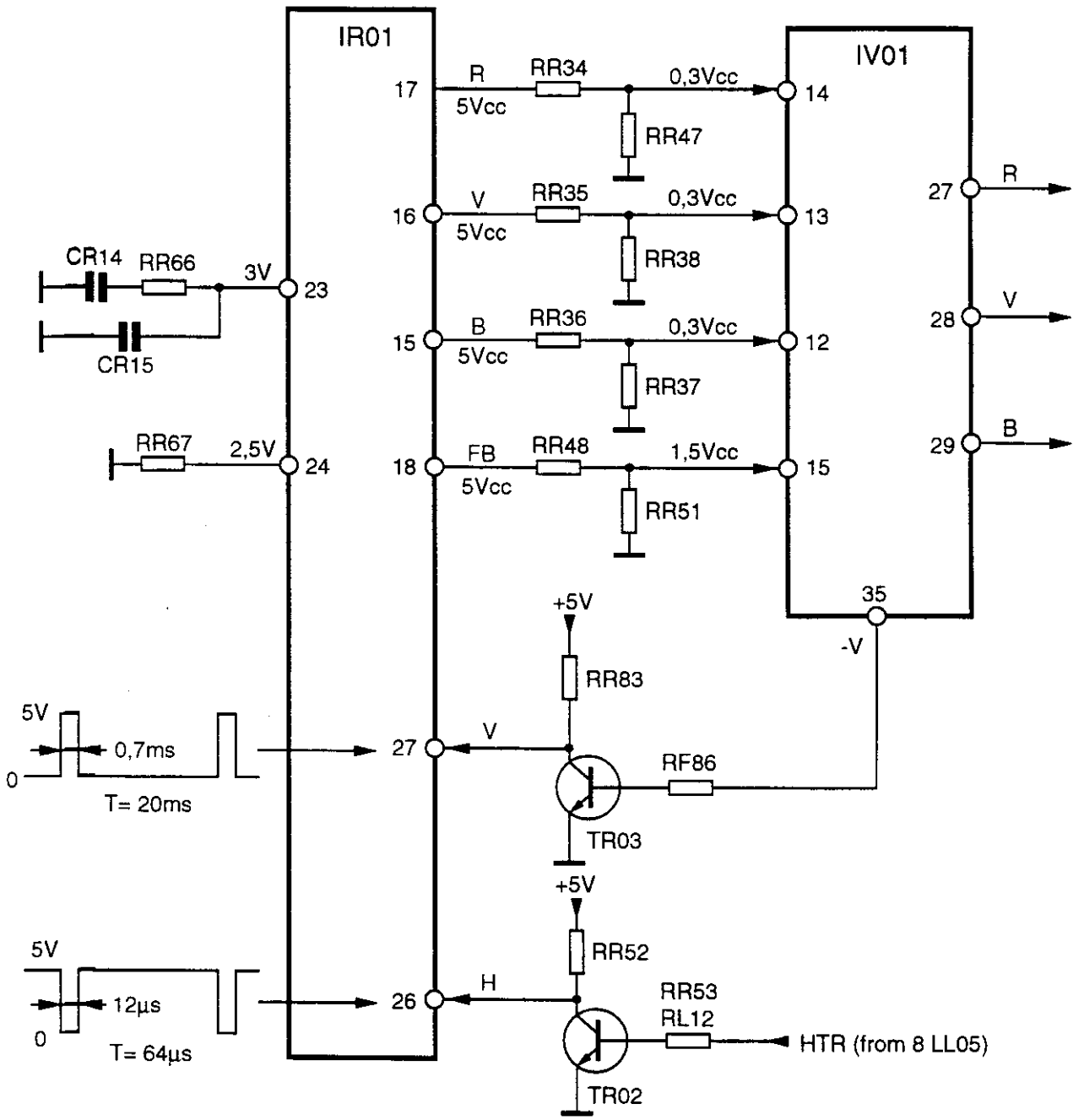
5V = 4/3
2.5V = 16/9

The INTERNAL/EXTERNAL video and audio commutations are performed by the LOGIC CONTROL information coming from output 11 of IV01 and going to 4 of II01 (video) and to 10 of II02 (audio). This piece of information, generated by IR01, is transmitted to IV01 via the IIC bus.

The AV2 output (pin 30 of IR01) enables the video or luminance/chrominance and audio signals coming from the SCART 2 socket to be taken into account.

The video/luminance-chrominance commutation is performed in IV01 under the control of IR01.

The 4/3 to 16/9 format change is performed in IV01 under the control of IR01.



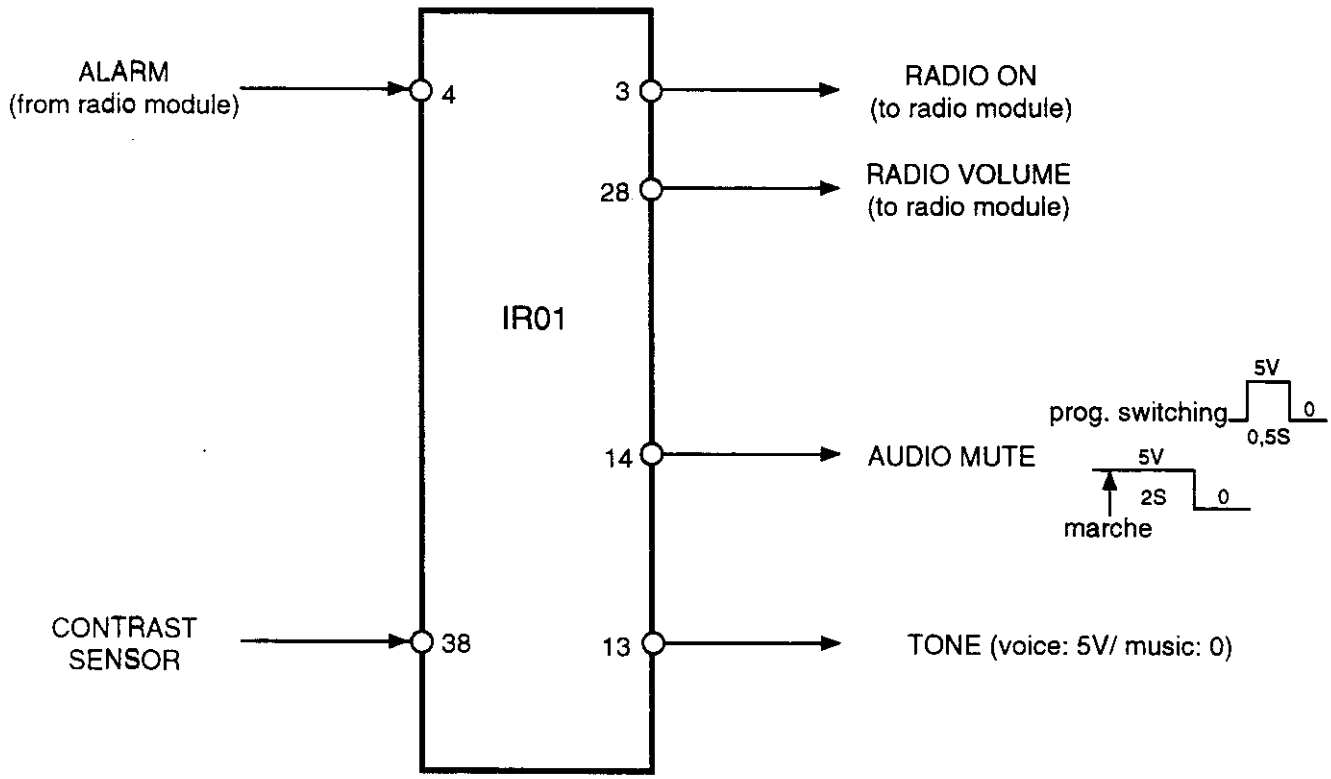
OSD SIGNAL GENERATOR

The IR01 microcomputer supplies the signals necessary for screen display.
Via its pin 18, it delivers the FB incrustation command.
Via its pins 15, 16 and 17, it delivers the RVB signals. These three signals will come and incrust themselves in the TV RVBs via IV01.

The line H return impulses (5Vcc) arrive on pin 26 of IR01. They come from LL05 (pin 8) via the TR02 transistor.
The V raster return impulses (5Vcc) arrive on pin 27 of IR01. They come from IV01 (pin 35) via the TR03 transistor.
These two H and V signals, present both with and without aerial signal, are necessary in order to synchronise the position of the O.S.D. window in relation to television set scannings.

The OSD clock is obtained from a PLL inside IR01 pins 23 and 24). This clock controls a meter inside IR01 which sets the width of the OSD window.

N.B.
Should the H line return impulses be absent, there is no OSD. ωστε μηδενισμός ο μPC..
Should the V raster impulses be absent, the menus turn vertically.



OTHER CONTROLS

PIN 3
This enables the radio to be switched on.

PIN 4
This enables the television or radio alarm to be triggered.

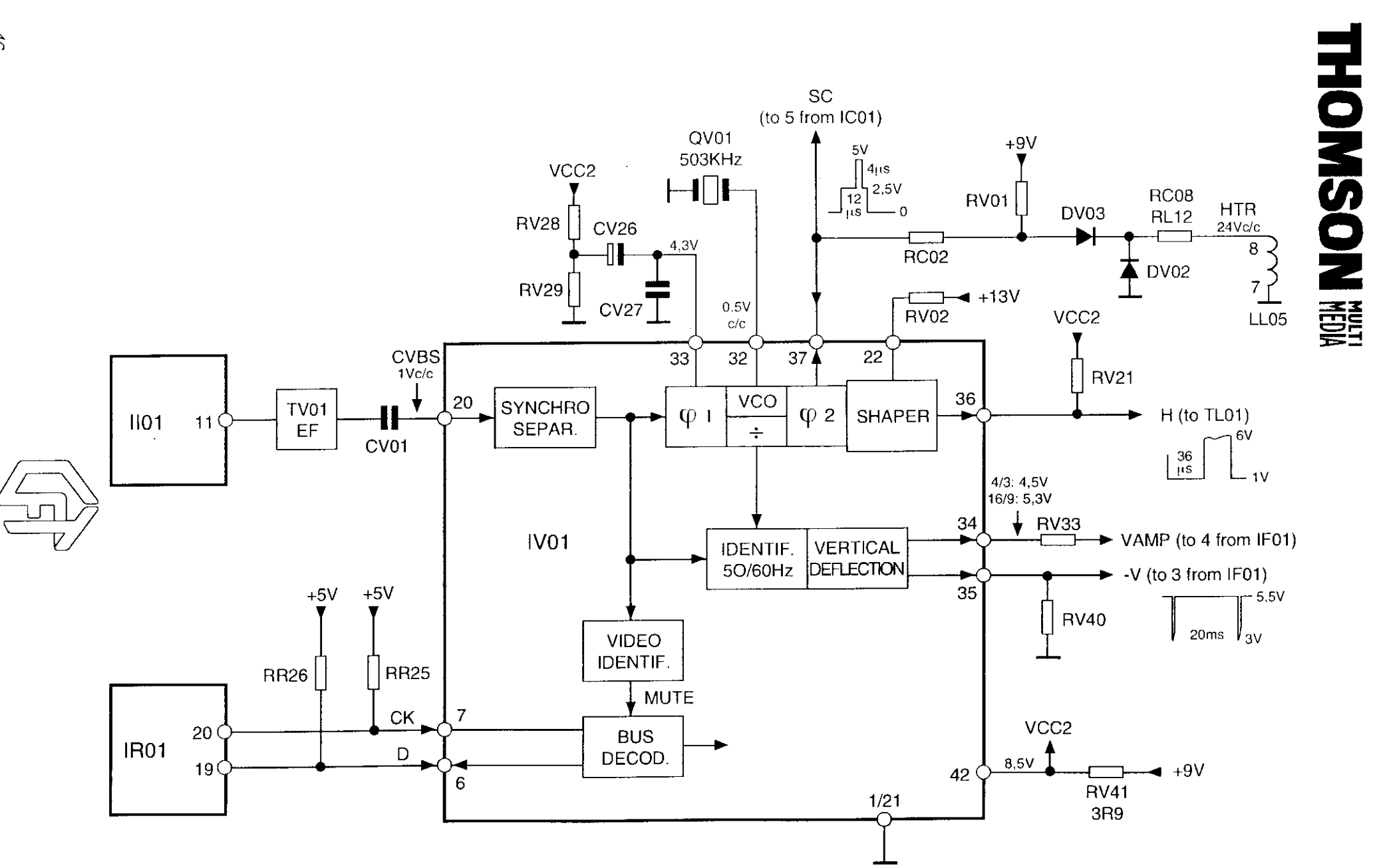
PIN 13
This enables the tone correction filter to be modified (voice: 5V / music: 0).

PIN 14
This triggers the audio mute mechanism during OFF-ON and STANDBY-ON transitions, programme changes and channel searches. This output is active at 5V.

PIN 28
The PWM signal on this output sets the volume of the radio.

PIN 38
This enables the picture contrast to be adjusted depending on the ambient light.

TIME BASES


SC
(to 5 from IC01)
QV01
503KHz
VCC2
RV28
CV26
4,3V
RV29
CV27
0.5V
c/c
5V
4µs
2,5V
12
µs
0
+9V
RV01
DV03
RC08
RL12
HTR
24Vc/c
RC02
DV02
8
7
LL05
RV02
+13V
VCC2
RV21
CVBS
1Vc/c
II01
11
TV01
EF
CV01
20
SYNCHRO
SEPAR.
33
32
37
22
φ 1
VCO
÷
φ 2
SHAPER
36
H (to TL01)
6V
36
µs
1V
IV01
4/3: 4,5V
16/9: 5,3V
34
RV33
VAMP (to 4 from IF01)
IDENTIF.
50/60Hz
VERTICAL
DEFLECTION
35
-V (to 3 from IF01)
RV40
5,5V
20ms
3V
+5V
+5V
RR26
RR25
VIDEO
IDENTIF.
MUTE
IR01
20
19
CK
D
7
6
BUS
DECOD.
VCC2
42
8,5V
+9V
RV41
3R9
1/21

ELABORATION OF THE LINE AND RASTER SIGNALS BY IV01

LINE GENERATION

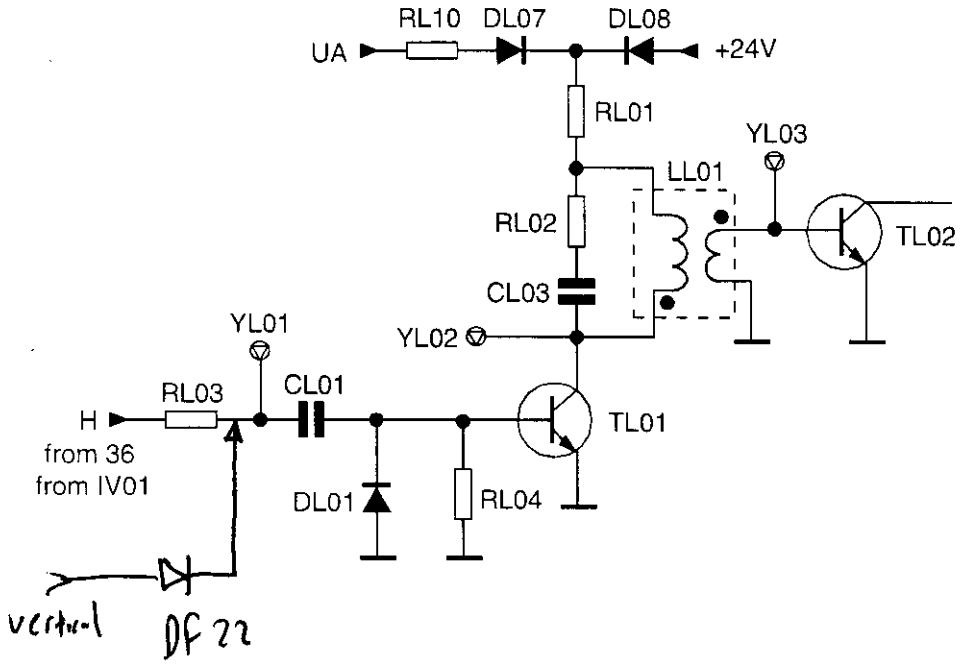
From the CVBS composite video present at input 20 of the circuit, the line synchro is taken to be applied as a reference to a first phase comparator providing a filtered error voltage to pin 33 via the RV28/29 and CV26/27 elements. The error voltage controls a VCO whose 503 kHz central frequency is determined by the QV01 crystal at pin 32. A divide-by-32 counter sends back 15625 Hz, in comparison with the line synchro (PLL loop). The VCO can work according to two modes: either in locked mode via the synchro when a programme is present, or in FREE RUN mode when the television set is only used in OSD. The line time base control signals come from the divide-by-32 counter through a phase shift stage and a formatting stage. These signals marked H are available on pin 36. Phase correction is carried out by the action of a second phase comparator receiving a submultiple of the VCO frequency as well as the line return information via pin 37 of the circuit.
The H output (pin 36) is at the high level as long as the mains voltage (pin 42) is less than 6.8V. The +13V power supply arriving at 22 of IV01 enables the line power transistor conduction time to be extended from 14µs to 36µs.

RASTER GENERATION

A separating stage takes the vertical synchro from the CVBS signal entering pin 20 via the SYNCHRO SEPARATOR. This new signal cyclically validates the raster time base, controlled from a synchronous lines counter on the VCO. -V raster impulses (pin 35) are available at the exit from the raster time base. In the FREE RUN mode, the time base sweep is controlled by the free frequency of the VCO.
The vertical synchro is also used for 50/60 Hz automatic recognition.

MUTE GENERATION

The video identification stage analyses the presence of line synchro and delivers the mute information. This is transmitted to IR01 via the IIC bus. Should there be no line synchro, the television set will go into STANDBY mode after 5 minutes.



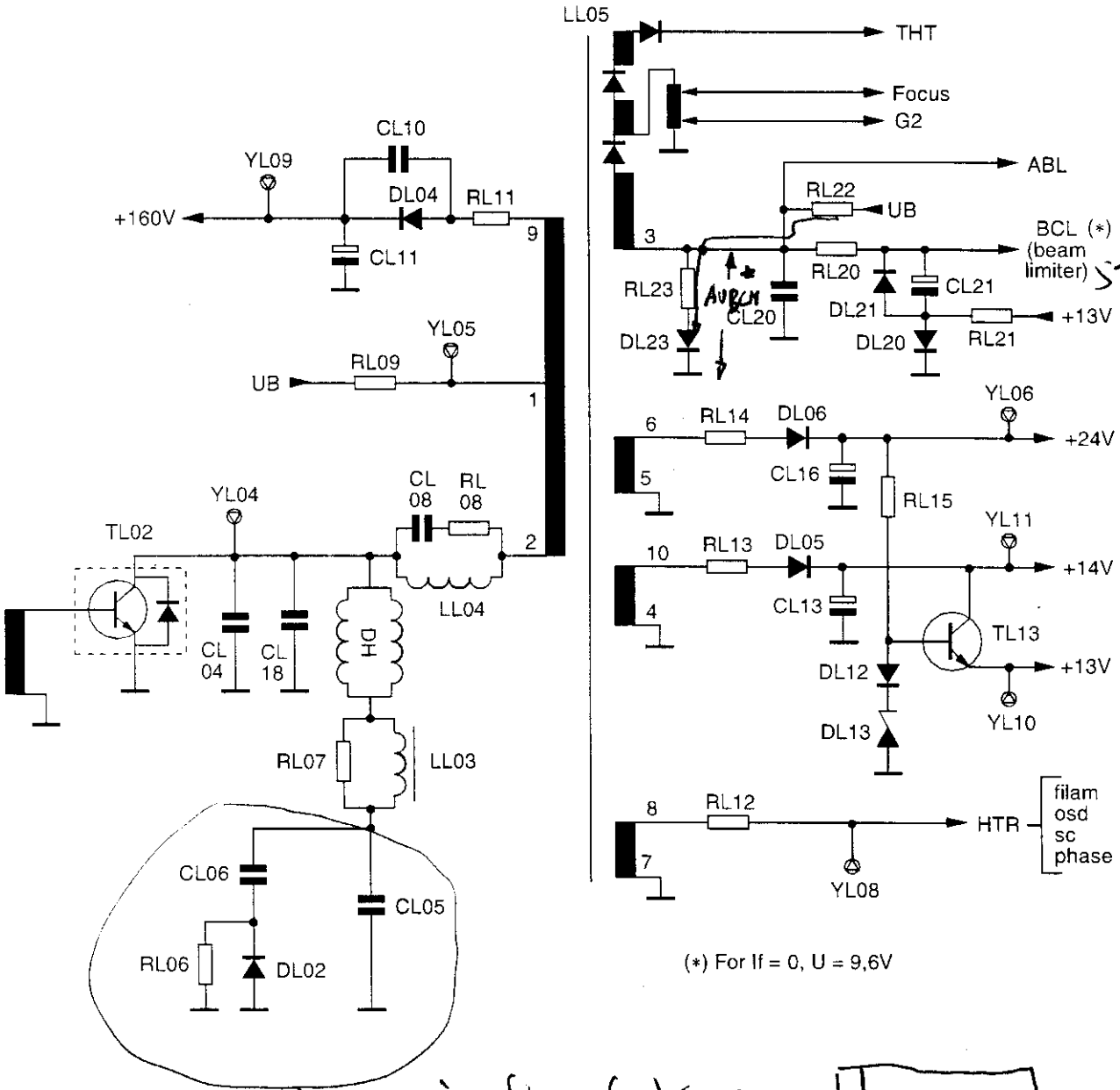
(Αν υπάρξει πρόβλημα στο vertical, ελαττώνεται τάση μέσω της DF 22 που πάει στο Driver.)

LINE TIME BASE CONTROL

The H signal coming from output 36 of IV01 is formatted by RL03/04, CL01 and DL01. The driver stage comprises the TL01 transistor. the RL02/CL03 cell limits the overvoltage surge appearing on the TL01 collector when it blocks.
The LL01 driver transformer, working in alternated mode, saturates the TL02 line power transistor each time the driver stage is blocked.

This part is fed:

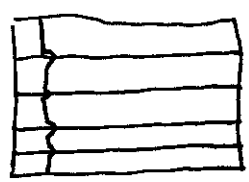
- at start-up by the UA (22V) audio mains voltage via the DL07 diode,
- in steady state by the +24V voltage coming from the THT via the DL08 diode.



(*) For If = 0, U = 9,6V

Au départ à du boutfuf:

★ AVBCM. Average beam current mirror.



THOMSON MULTIMEDIA

LINE POWER STAGE

The THT transformer primary (LL05) is connected between UB and the TL02 line power transistor via the LL04/RL08/CL08 tuned circuit.

The CL04/18 capacitors determine the line return time with the line deflector (T=12µs).

The "S" CL05 capacitor, whose average voltage is equal to UB, supplies power to the horizontal deflector in series with the LL03 linearity self-induction coil and its RL07 reducing resistance.

At the same time on CL05, the CL06/DL02/RL06 circuit makes it possible to deaden the spurious oscillations appearing with each sudden increase in beam current.

We find the following voltages and signals on the LL05 secondaries:

-pin 9, a 75V d.c. line return impulse in positive momentum superimposed on a 100V continuous voltage. A 160V voltage necessary for feeding RVB stages is obtained via RL11 and the DL04 diode.

-pin 10, a 120V d.c. impulse in negative momentum. A 14V voltage is obtained for the TELETEXT panel via RL13 and the DL05 diode.

-pin 6, a 200V d.c. impulse in negative momentum. A voltage of 24V is obtained via RL14 and the DL06 diode. It feeds the IF01 raster sweep circuit as well as the 22V audio (UA) steady state relay for feeding the driver stage.

-pin 8, a 24V d.c. line return impulse in positive momentum (HTR) for service signals (phase and sandcastle), for heating the filament and for the OSD display line synchronisation.

- Once integrated (RL20/CL21), the ABL information (beam current image) drawn at the base of the split diode supplies the BCL medium beam current information (it acts on the IV01 contrast and brightness controls). When there is a sudden beam current increase, the DL20 diode locks and causes the CL21 capacitor to be taken out of operation. Because of this, the reaction on the contrast and light will be quicker.

A 13V voltage is obtained from the 14V, 24V, DL13 and TL13. This feeds IV01 and the H.F./I.F. stages.

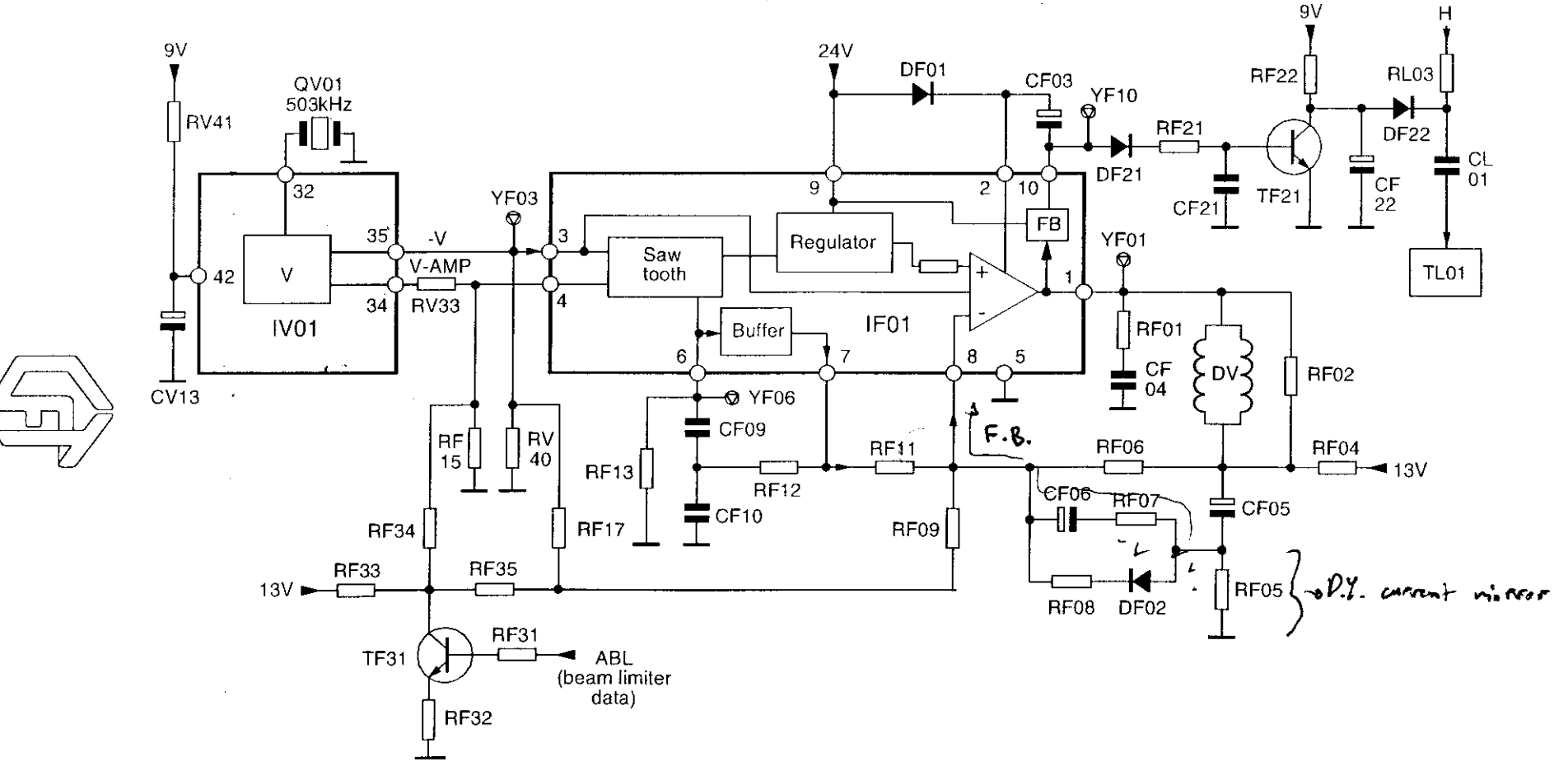
* Για τους από τους μεγαλύτερους A/M υπάρχει η DL20 και RL21 —

* Για 20" οθόνες η RL14 πρέπει να είναι 2,7Ω και

η RL12 " " " " 1Ω

Αν δεν είναι, τις αλλάζουμε στις σωστές τιμές.

CENTRE DE FORMATION TECHNIQUE


9V
RV41
CV13
QV01
503kHz
IV01
V
42
32
35
34
-V
V-AMP
RV33
YF03
3
4
Saw
tooth
Regulator
24V
DF01
CF03
YF10
9
2
10
FB
1
IF01
Buffer
6
7
8
5
YF01
RF01
CF
04
DV
RF02
RF22
9V
RL03
H
DF22
CL
01
TL01
RF21
DF21
CF21
TF21
CF
22
YF06
CF09
RF
15
RV
40
RF13
RF12
RF11
F.B.
RF06
RF04
13V
CF10
RF17
RF09
CF06
RF07
CF05
RF34
RF33
13V
RF35
RF08
DF02
RF05
D.Y. current mirror
TF31
RF31
ABL
(beam limiter
data)
RF32

RASTER TIME BASE

The processing of the raster time base is carried out over two integrated circuits:

- IV01 for developing raster information lasting 10L synchronous of the video signal,
- IF01 for the saw tooth generator and the power stage driving the raster deflector.

The impulse available at pin 35 of IV01 is derived from the 503 kHz oscillator in order to produce a stable period (close to 20 ms) when there is no reception from a transmitter. In the opposite case, the raster synchronisation mechanism fixes the period of this impulse in negative momentum for a duration of 640 µs.
The previous signal is then applied to the IFO1 circuit input (pin 3).

The continuous voltage present at output 34 of IV01 and injected to 4 of IF01 fixes the frame amplitude in 4/3 and 16/9.

This circuit is fed by the 24V voltage coming from the THT. It is applied to pin 9 for the general power supply and to pin 2 for the power stage. An internal flyback stage triggered by the overvoltage appearing on pin 1 at the beginning of the raster return (inductive effect of the raster deflector) commutates pin 10 from 0V to 24V during the whole duration of the partial interlaced picture frame return. The CF10 capacitor charged with 24V during the raster scan then cumulates its charge with the potential of pin 10 to double the high-level stage power supply during this phase (raster deflector inductive effect compensation).

The first stage consists of a saw tooth generator formed by:

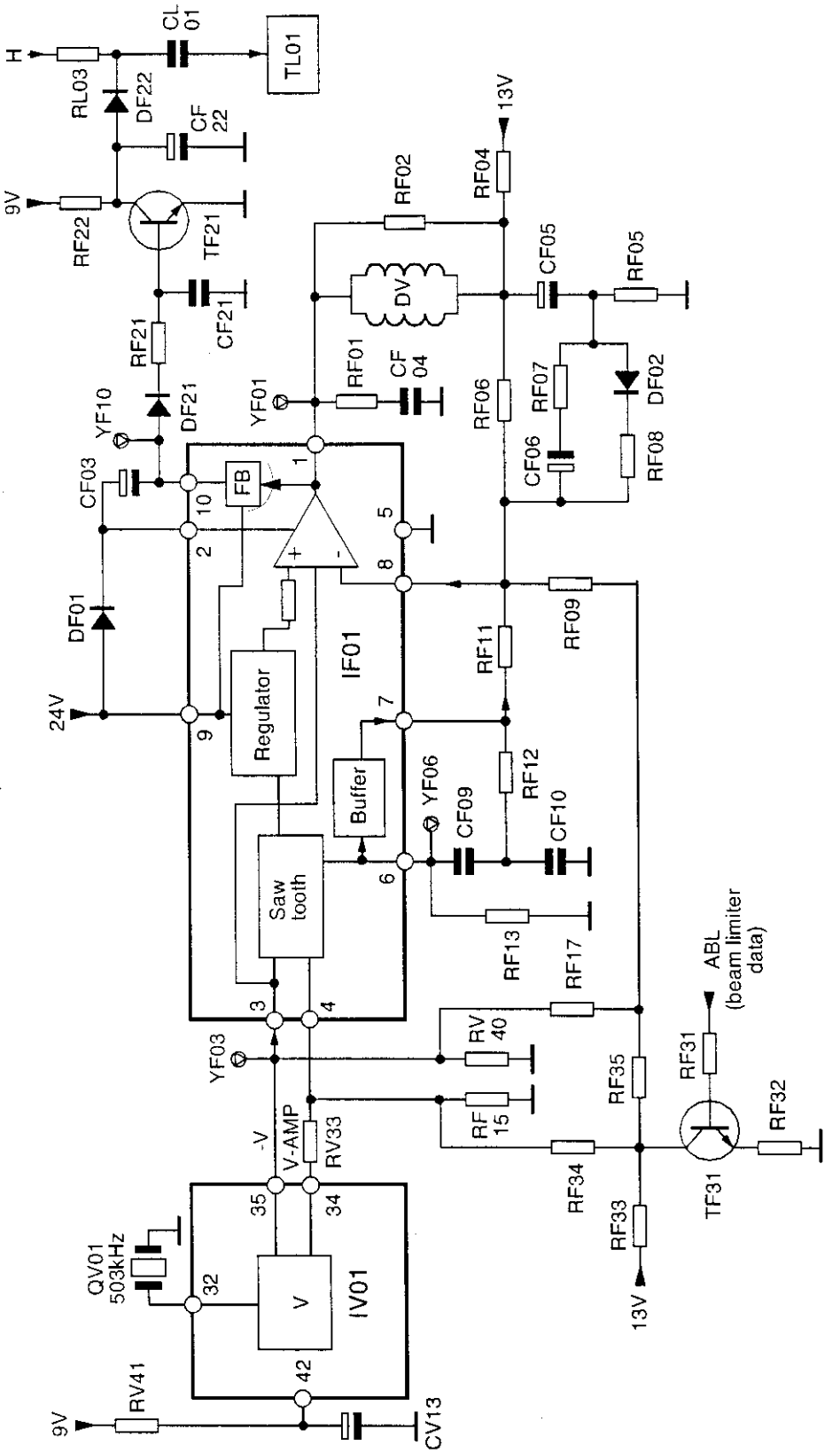
- a current generator whose value is fixed by the RF15 resistance connected to pin 4 of IF01,
- a ramp generator corresponding to the CF09 and CF10 ((pin 6) capacitor loads via the previous current (de6 saw teeth, 8V d.c. in 4/3, 5.2V d.c. in 16/9).

An impedance adapter stage then gives back this signal on pin 7 from where it is directed to:

- the reversing switch input of the power amplifier (pin 8) via RF11,
- the ramp generator capacitors through an integrating network (RF12/CF10 for vertical linearity correction.

RF-15 ... Ramp generator (CF09/10)

... το πλάτος ...



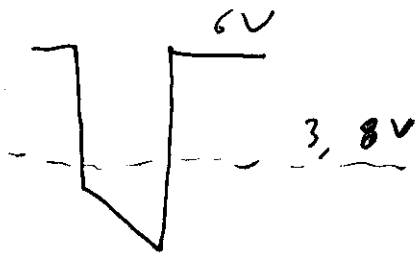
CENTRE DE FORMATION TECHNIQUE

PARTIAL INTERLACED PICTURE FRAME TIME BASE

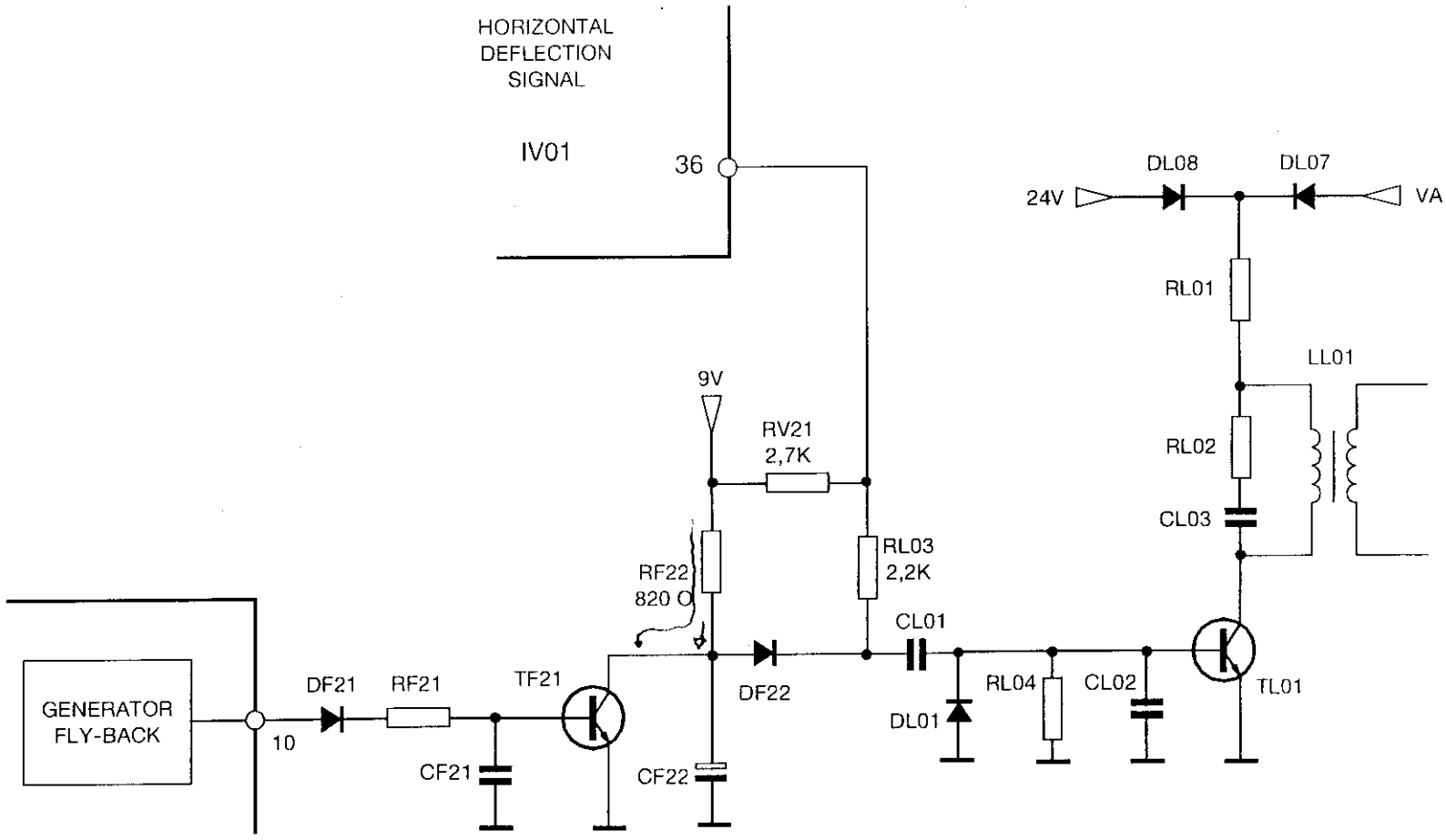
In the end, on pin 1, the power amplifier delivers the current to the vertical deflector, moreover connected to the earth, via the CF05 chemical capacitor and the RF05 measuring resistor.
The RF06 resistor determines the polarisation of the reversing switch input (pin 8), and subsequently the vertical picture shift. The RF07/RF08 /CF06/DF02 network provides the dynamic feedback of the stage.
The set's frequency range is limited by the RF01/CF04 cell.

A dynamic amplitude and picture shift correcting operation is carried out by the TF31 transistor. Indeed, polarised by the ABL medium beam current information, this transistor tends to conduct less when the tube's generating capacity increases. Consequently, via the RF34 and RF35 resistors, it intervenes on the current generator for the amplitude and on the polarisation of the amplifier for the picture shift.

Το vert. position σήματα από το average value του ρεύματος
στην έξοδο και άρα στο pin 8. (feedback). Άρα ρυθμίζουν
την τάση (από 3,8 – 6V) στο pin 8 ρυθμίζοντας το
position (μέσω του pin 35 του IV01)



Το vert. position ρυθμίζει το ρίλμια του
DC level της κινηματογράφησης.


HORIZONTAL
DEFLECTION
SIGNAL
IV01
36
DL08
DL07
24V
VA
RL01
LL01
9V
RV21
2,7K
RL02
CL03
RF22
820 O
RL03
2,2K
CL01
GENERATOR
FLY-BACK
10
DF21
RF21
TF21
DF22
RL04
CL02
TL01
DL01
CF21
CF22

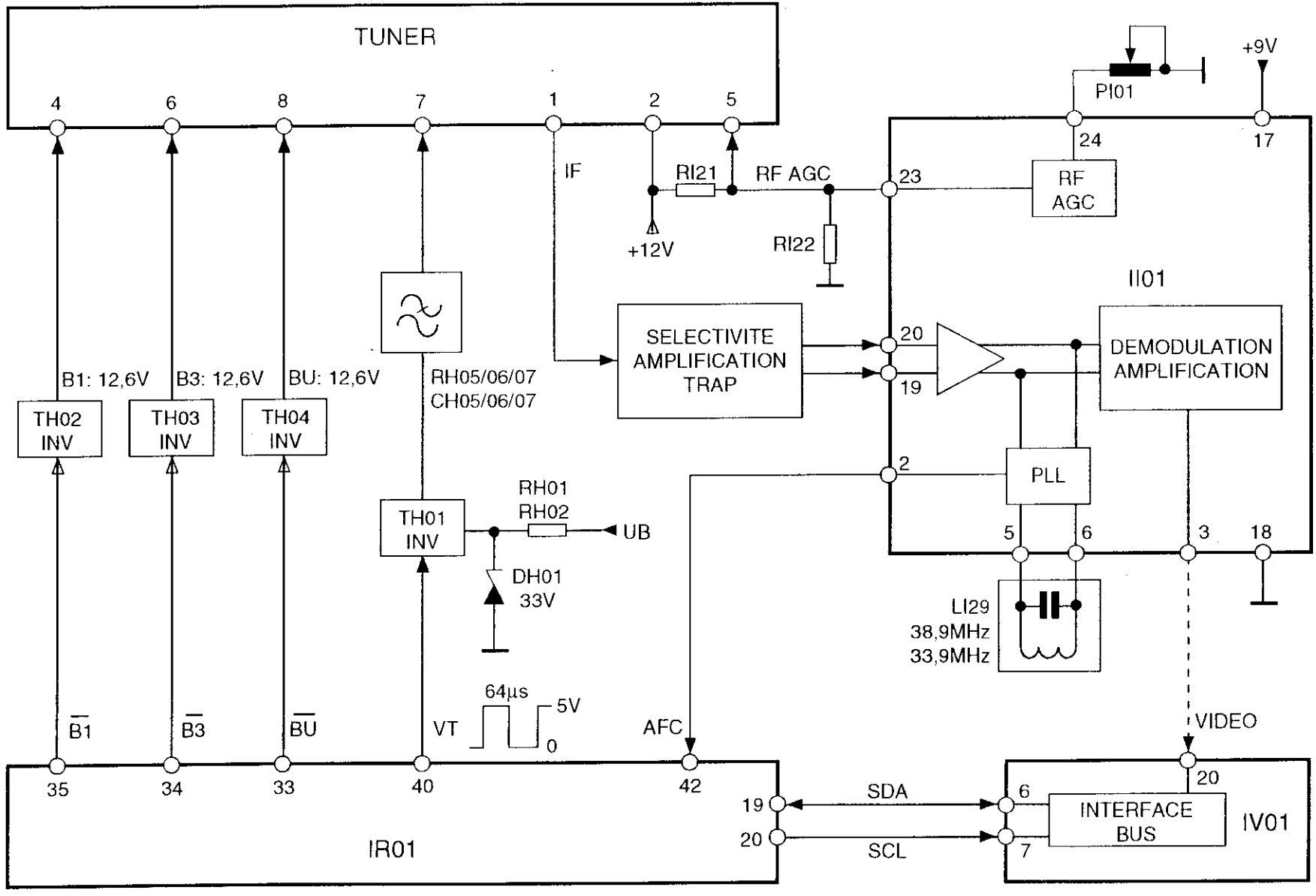
SAFETY

The flyback generator's impulses (pin 10) are rectified by DF21, filtered by CF21 and keep TF21 saturated. Should these impulses disappear (raster power defective), the TF21 locks and, via DF22, brings about a jamming of the line command (H). Because of this, the line power stage stops.
The RF22/CF22 delay time inhibits this safety mechanism at start-up

Οι βλάβες τα οποία κρίσιμα, το κύκλωμα ασφαλείας ενεργοποιείται και μπλοκάρει το ορίζοντιο στάδιο αν έχουμε παλμό στο 10.

Όταν το TF21 είναι saturated, δεν φορτίζει ο CF22.

HF FI


TUNER
4
6
8
7
1
2
5
IF
RI21
RF AGC
+12V
RI22
PI01
+9V
24
17
23
RF AGC
II01
SELECTIVITE AMPLIFICATION TRAP
20
19
DEMODULATION AMPLIFICATION
B1: 12,6V
B3: 12,6V
BU: 12,6V
RH05/06/07
CH05/06/07
TH02 INV
TH03 INV
TH04 INV
2
PLL
RH01
RH02
TH01 INV
UB
5
6
3
18
DH01
33V
LI29
38,9MHz
33,9MHz
64µs
5V
VT
0
AFC
VIDEO
B1
B3
BU
35
34
33
40
42
19
20
SDA
SCL
6
7
INTERFACE BUS
20
IV01
IR01

TUNER

The MTM-MM-4045 is a tuner equipped with a voltage synthesis mechanism. It covers the following frequency ranges:

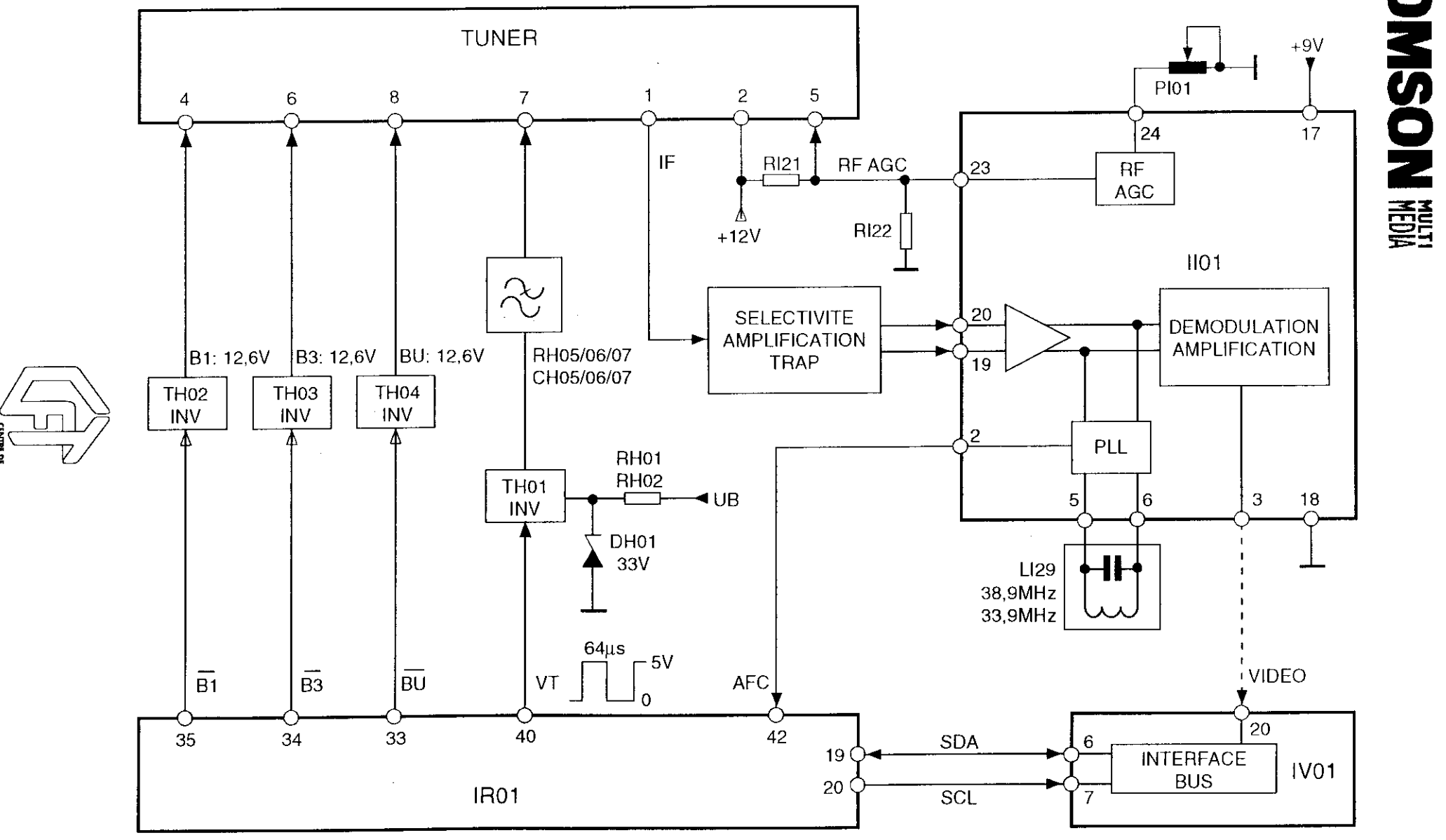
- VL: 45.25 MHz to 112.25 MHz
- VH: 119.25 MHz to 375.25 MHz
- U: 383.25 MHz to 863.25 MHz

In each of these ranges, the Varicap tension progresses from 0.8V to 33V. This Varicap voltage is obtained from the VT signal (period of 64 µs and a variable cyclic ratio) coming from output 40 of IR01.

The following information concerns the pins of the tuner.

PINS	REMARKS
1	I.F. output
2	12V power supply
4	12.6V input in VL (B1)
5	CAG HF input
6	12.6V input in VH (B3)
7	Varicap voltage input (0.8 to 33V)
8	12.6V input in U (BU)

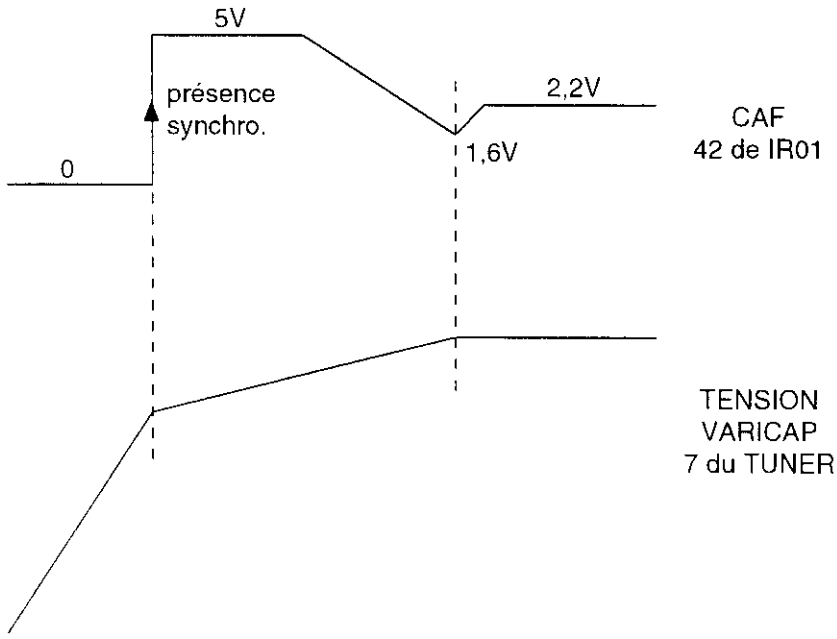
N.B.: pin 4 is at 12V in VH because of the DH09 diode installed in the tuner between its pins 6 and 4.


TUNER
4
6
8
7
1
2
5
IF
RI21
RF AGC
+12V
RI22
PI01
+9V
24
17
23
RF AGC
II01
SELECTIVITE AMPLIFICATION TRAP
20
19
DEMODULATION AMPLIFICATION
B1: 12,6V
B3: 12,6V
BU: 12,6V
TH02 INV
TH03 INV
TH04 INV
RH05/06/07
CH05/06/07
2
PLL
RH01
RH02
TH01 INV
UB
DH01
33V
5
6
3
18
LI29
38,9MHz
33,9MHz
64µs
5V
0
VIDEO
AFC
B1
B3
BU
VT
35
34
33
40
42
19
20
SDA
SCL
6
7
20
INTERFACE BUS
IV01
IR01

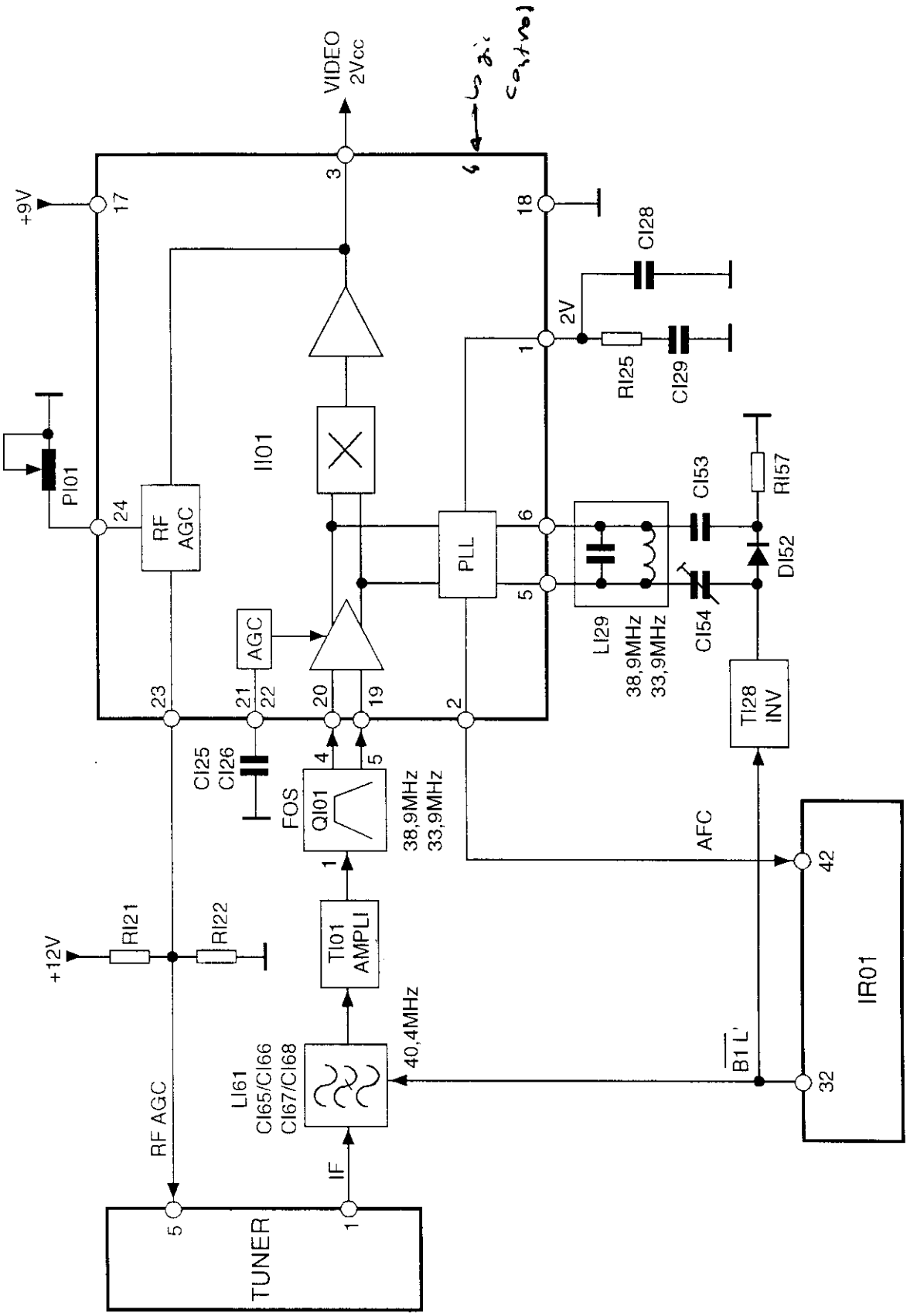
VOLTAGE SYNTHESIS

During a TV channel search, the IR01 µC delivers the VT Varicap diode tuning signal via its output 40. This signal is amplified and reversed by the TH01 transistor. This TH01 transistor is supplied in 33V thanks to the UB voltage and to the DH01 Zener diode. Then a low-pass filter (RH05/06/07, CH05/06/07) transforms this signal into direct-current voltage.

When a transmitter is found, IR01 is informed of this by IV01 (synchro presence) via the 12C bus. A slowing down in the progression of the Varicap voltage should follow. Then, with the "S" of AFC informing pin 42 of IR01, the received transmitter will be fine-tuned.



CHANNELS SEARCH FORWARD

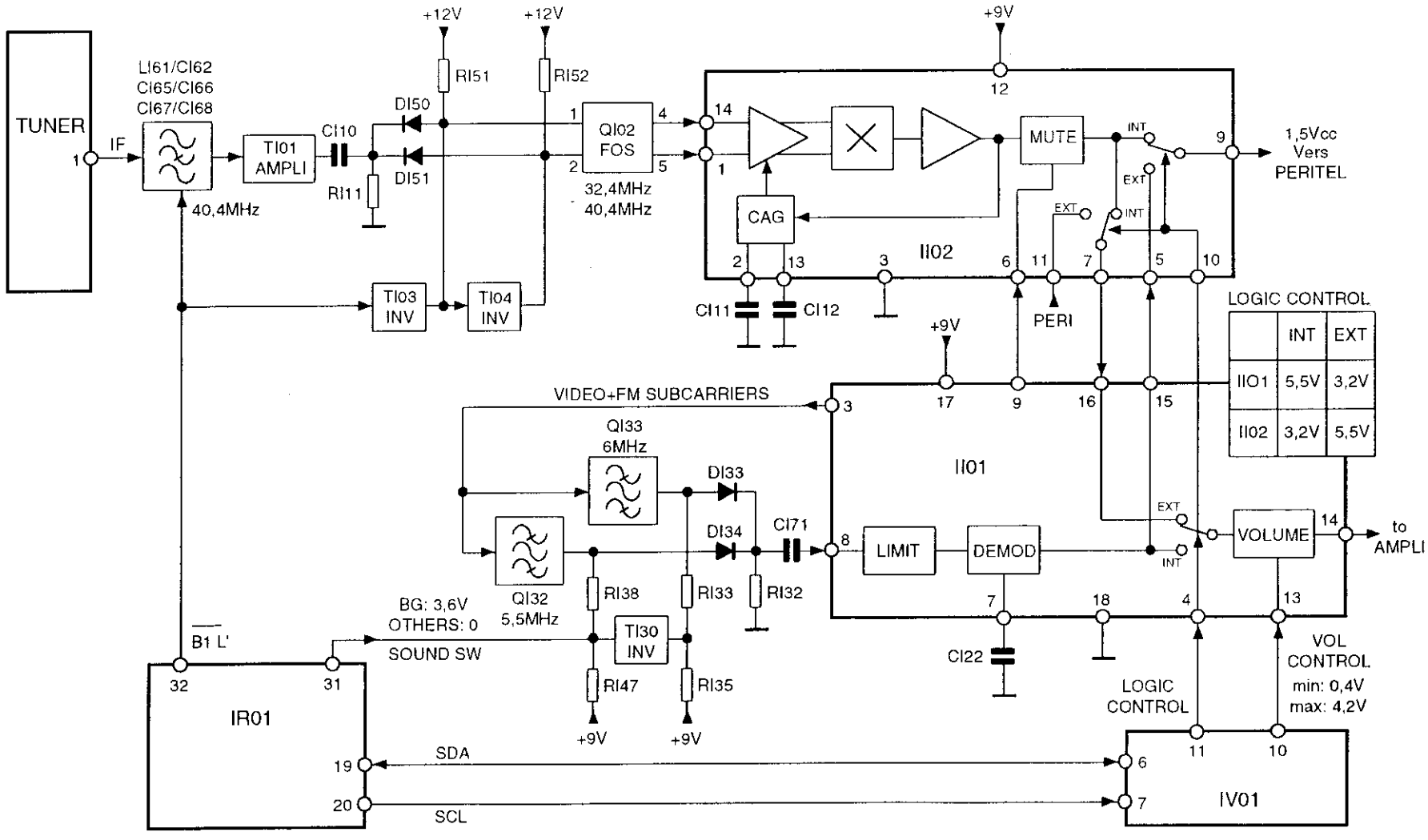


PICTURE INTERMEDIATE FREQUENCY

The II01 integrated circuit (STV8224A), wired to the frame structure, is used for this picture I.F. It includes the (positive and negative) demodulation stages as well as the C.A.Gs.

The QI01 input template has 2 vestigial sidebands, 33.9 MHz for the 1L' band and 38.9 MHz for the other standards and bands.
The tuning frequency of the demodulation spin wheel (LI29) is commutable by output 32 of IR01 via TI28. The latter is 33.9 MHz in 1L' band and 38.9 MHz for the other standards and bands. The CI54 adjustable capacitor is in operation in band 1L'.

At the tuner output, a 40.4 MHz rejector is taken out of service in band 1L'.


TUNER
1
IF
LI61/CI62
CI65/CI66
CI67/CI68
40,4MHz
TI01
AMPLI
CI10
RI11
DI50
DI51
+12V
RI51
+12V
RI52
QI02
FOS
32,4MHz
40,4MHz
TI03
INV
TI04
INV
+9V
12
14
1
CAG
MUTE
INT
EXT
9
1,5Vcc
Vers
PERITEL
2
13
3
II02
6
11
7
5
10
CI11
CI12
PERI
LOGIC CONTROL
INT
EXT
IIO1
5,5V
3,2V
II02
3,2V
5,5V
+9V
VIDEO+FM SUBCARRIERS
3
17
9
16
15
QI33
6MHz
II01
DI33
DI34
CI71
8
LIMIT
DEMOD
VOLUME
14
to
AMPLI
QI32
5,5MHz
RI38
RI33
RI32
7
18
4
13
BG: 3,6V
OTHERS: 0
SOUND SW
TI30
INV
CI22
VOL
CONTROL
min: 0,4V
max: 4,2V
B1 L'
32
31
IR01
RI47
RI35
+9V
+9V
LOGIC
CONTROL
11
10
SDA
19
6
20
SCL
7
IV01

SOUND INTERMEDIATE FREQUENCY

LL' STANDARDS

The II02 integrated circuit (STV8225) with the QI02 template are used. The central frequency of the template is commutated from 40.4 MHz in band 1L' to 32.4 MHz in bands 3, 4, 5 LL'. This commutation is performed by output 32 of IR01, the TI03/04 transistors and the DI50/51 diodes.

BGI STANDARDS

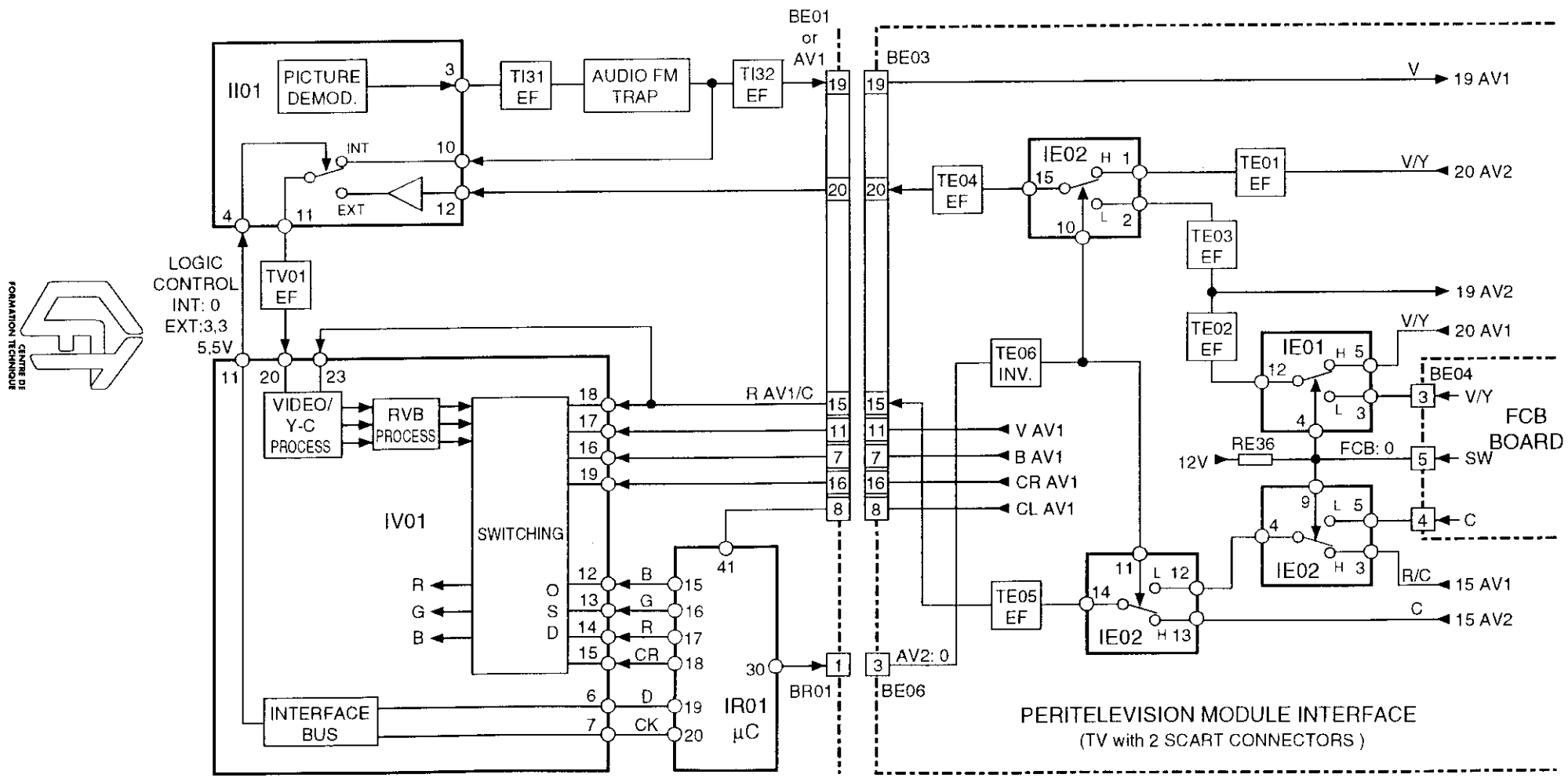
The II01 integrated circuit (STV8224) with the QI32/33 band-pass filters are used. Output 31 of IR01, the TI30 transistor and the DI33/34 diodes will bring the QI32 filter into operation in BG and the QI33 filter in I.

INSTRUCTIONS

The LOGIC CONTROL instruction coming from IR01 via the I2C bus and IV01 carries out the INTERNAL/EXTERNAL audio commutation in II01 and II02.
The volume instruction, coming from IR01 via the I2C bus and IV01, acts in II01.

	Logic control	II01	II02
BG	0 v	INT	EXT FM
LL'	3,2 v	EXT	INT a INT b
LL'	5,5 v	EXT	INT a EXT AV
BG AV	8,5 v	EXT	EXT FM EXT AV

COMMUTATIONS


II01
PICTURE DEMOD.
TI31 EF
AUDIO FM TRAP
TI32 EF
INT
EXT
LOGIC CONTROL
INT: 0
EXT:3,3
5,5V
TV01 EF
VIDEO/ Y-C PROCESS
RVB PROCESS
IV01
SWITCHING
OSD
R
G
B
INTERFACE BUS
IR01 µC
BE01 or AV1
BR01
R AV1/C
V AV1
B AV1
CR AV1
CL AV1
BE03
BE06
AV2: 0
V
19 AV1
V/Y
20 AV2
19 AV2
V/Y
20 AV1
R/C
15 AV1
C
15 AV2
TE04 EF
TE01 EF
TE03 EF
TE02 EF
TE06 INV.
TE05 EF
IE02
IE01
BE04
FCB BOARD
RE36
12V
FCB: 0
SW
PERITELEVISION MODULE INTERFACE
(TV with 2 SCART CONNECTORS)

VIDEO COMMUTATIONS

TV WITH ONE SCART SOCKET

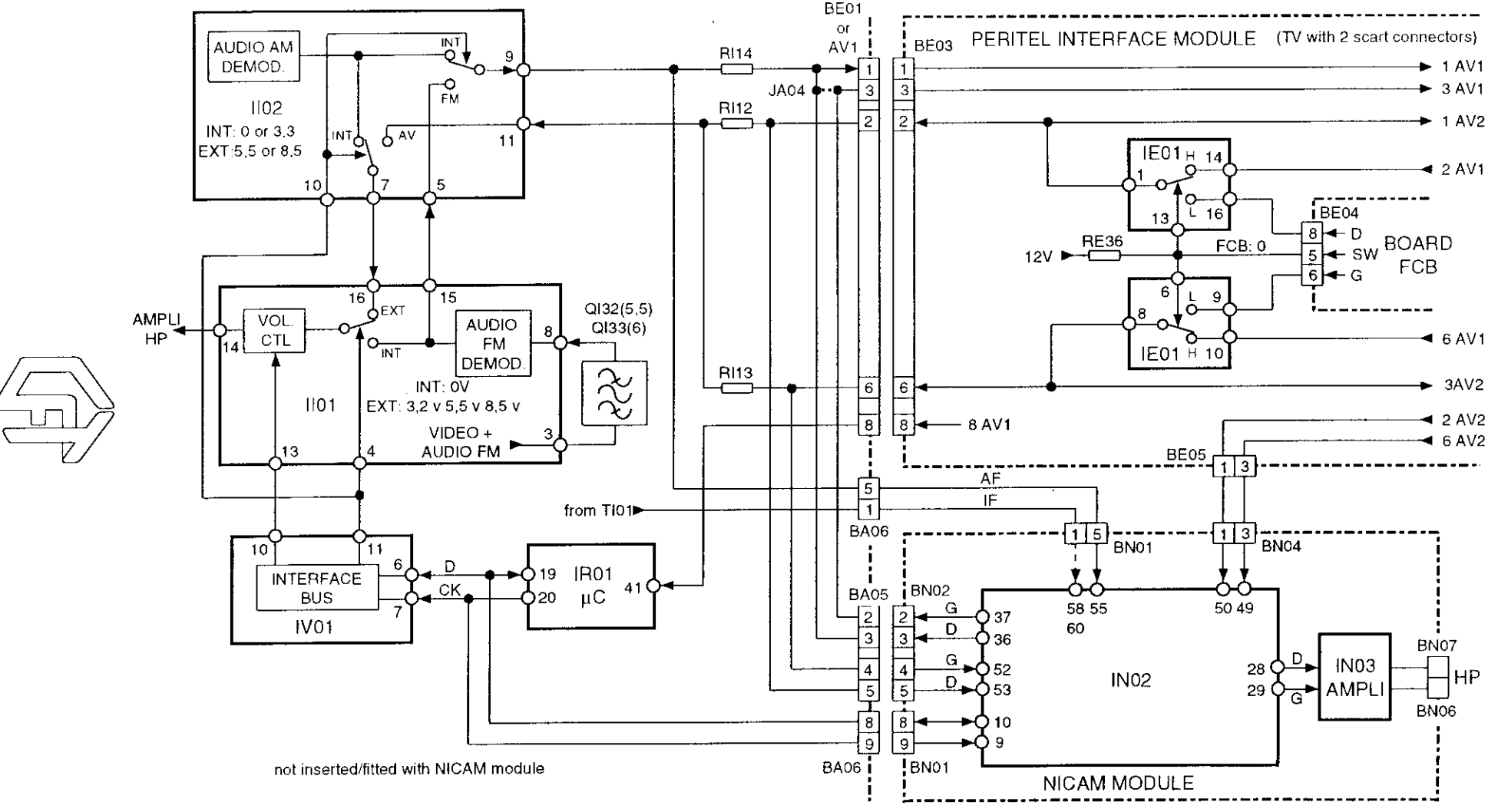
The TV/AV commutation is performed in the II01 integrated circuit by the LOGIC CONTROL information coming from output 11 of IV01.

TV WIITH TWO SCART SOCKETS

The IE01 and IE02 integrated circuits of the SCART INTERFACE module perform the video or Y/C commutations coming from the AV1, AV2 and FCB.
The SW (FCB) and AV2 IR01) information controls the IE01 and IE02 circuits.
The II01 integrated circuit performs the commutation between the video TV and the video/luminance AV (AV1/AV2/FCB) through the LOGIC CONTROL information coming from output 11 of IV01.

RGB COMMUTATIONS

The RGB commutation, TV/OSD or TTX/AV1, is done in IV01. The OSD or TTX (15 of IV01) and AV1 (19 of IV01) quick commutations as well as the IR01 µC via the IIC bus manage these RGB commutations.


AUDIO AM DEMOD.
II02
INT: 0 or 3,3
EXT:5,5 or 8,5
INT
FM
AV
AMPLI HP
VOL. CTL
EXT
AUDIO FM DEMOD.
II01
INT: 0V
EXT: 3,2 v 5,5 v 8,5 v
VIDEO + AUDIO FM
QI32(5,5)
QI33(6)
INTERFACE BUS
IV01
D
CK
IR01
µC
from TI01
BE01 or AV1
BE03
PERITEL INTERFACE MODULE
(TV with 2 scart connectors)
RI14
RI12
RI13
JA04
1 AV1
3 AV1
1 AV2
2 AV1
6 AV1
3AV2
8 AV1
2 AV2
6 AV2
IE01
RE36
12V
FCB: 0
BE04
BOARD FCB
SW
BE05
AF
IF
BA06
BA05
BN01
BN02
BN04
IN02
IN03 AMPLI
BN07
HP
BN06
NICAM MODULE
not inserted/fitted with NICAM module

AUDIO COMMUTATIONS

TV WITH ONE SCART SOCKET

The commutations are performed in the II01 and II02 integrated circuits by means of the LOGIC CONTROL information coming from output 11 of IV01.

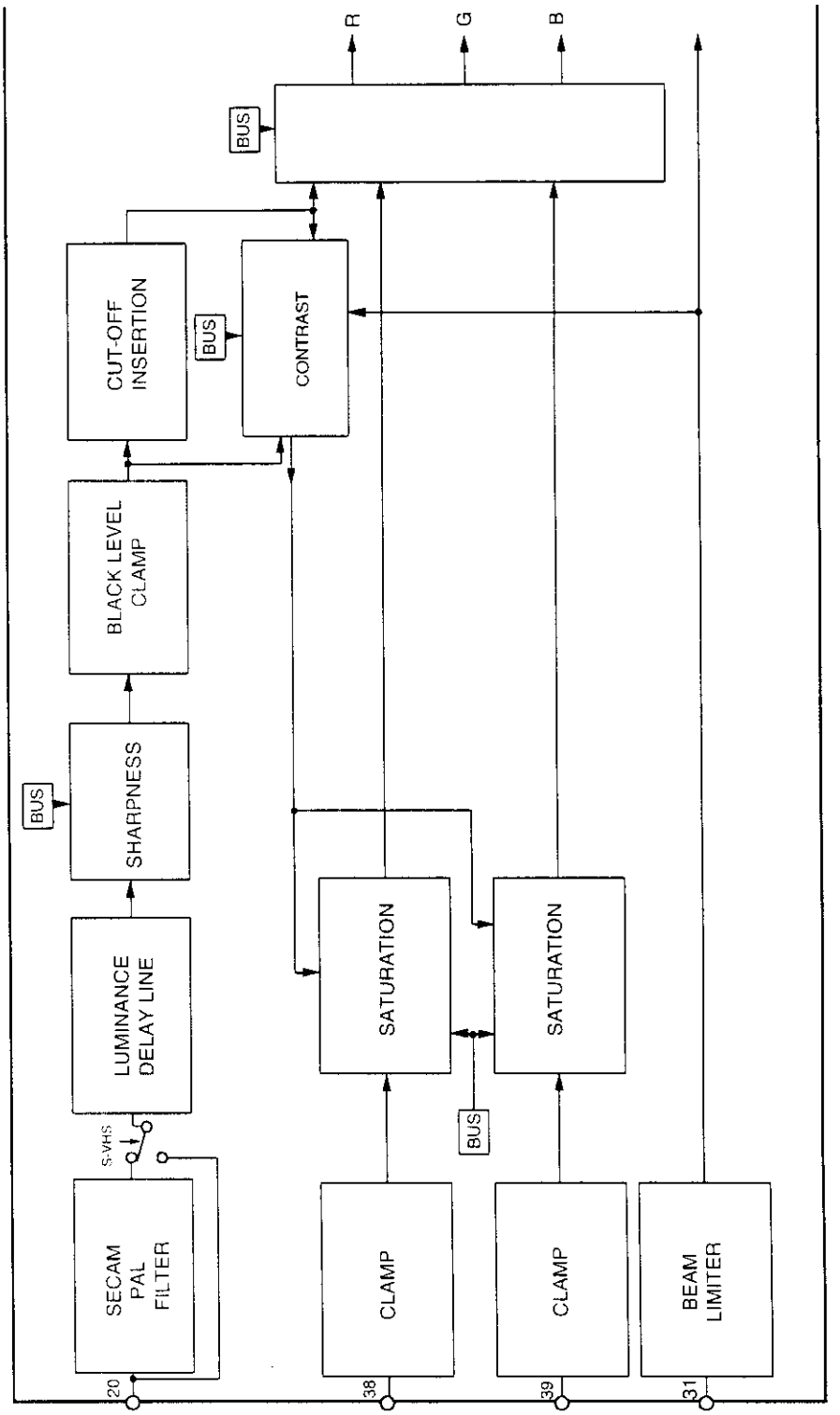
TV WITH ONE SCART SOCKET AND A NICAM MODULE

The commutations are performed in the II02 integrated circuit by means of the LOGIC CONTROL information, and in the IN02 integrated circuit by IR01 via the IIC bus. The audio signal processing part of II01 is not used. The RI12/13/14 are not wired.

TV WITH TWO SCART SOCKETS AND A NICAM MODULE

The IE01 integrated circuit enables the AV1 and FCB audio signals to be taken into account. The II02 integrated circuit, controlled by the LOGIC CONTROL information, selects the TV (AM) audio signal. The IN02 integrated circuit, controlled by IRR01 via the IIC bus, selects the TV (FM or NICAM) audio signal and the AV2 audio signal. The audio signal processing part of II01 is not used. The RI12/13/14 and JA04 are not wired.

LUMINANCE/CHROMINANCE


R
G
B
BUS
CUT-OFF INSERTION
BUS
CONTRAST
BLACK LEVEL CLAMP
BUS
SHARPNESS
LUMINANCE DELAY LINE
S-VHS
SECAM PAL FILTER
SATURATION
BUS
SATURATION
CLAMP
CLAMP
BEAM LIMITER
20
38
39
31

VIDEO CHROMA TREATMENT

INTRODUCTION

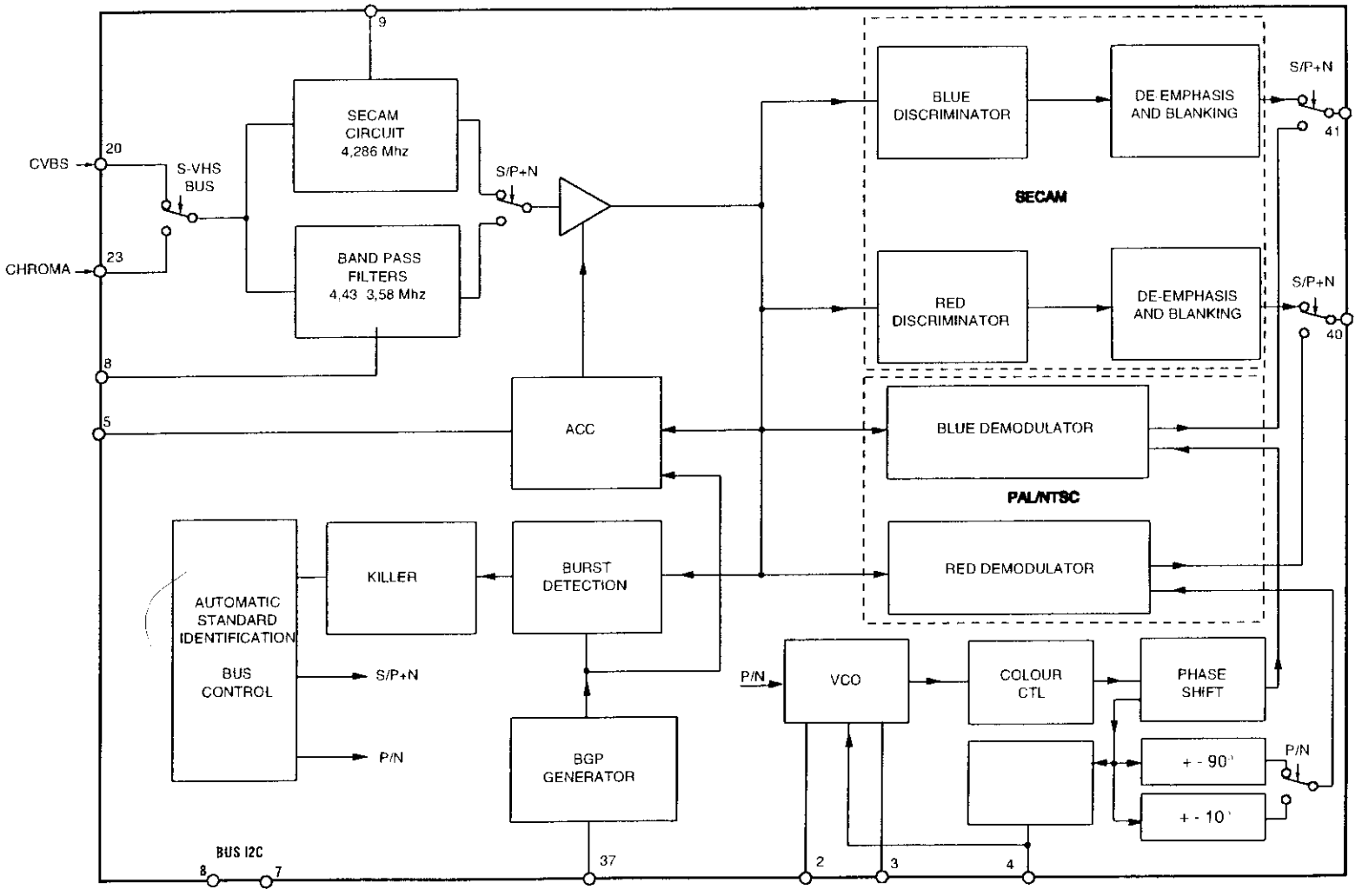
Video chroma treatment is performed by 2 integrated circuits, the STV2118 made by SGS THOMSON, which is a chroma/video/scanning processor associated with the TDA4665 (TX91) or STV2180 (TX92), which generates the chrominance line delay.

The STV2118 has 1 Y/C compatible CVBS input as well as 2 RGB inputs. It is fitted with an automatic cut-off control mechanism and is in contact with the management stage via the 12C bus.
The integrated circuit outputs (RGB) directly drive the amplifier stages on the C.R.T.

The chroma/video part has its own pin 22 power supply.

Television sets marketed in FRANCE are equipped with the STV2118 but, depending on the countries of destination, 2 other integrated circuits (see table) are wired in compliance with the chroma standards used.

	STV 2112	STV 2116	STV 2118
PAL	X	X	X
SECAM	X		X
NTSC		X	X



THOMSON MULTI MEDIA

CHROMINANCE TREATMENT

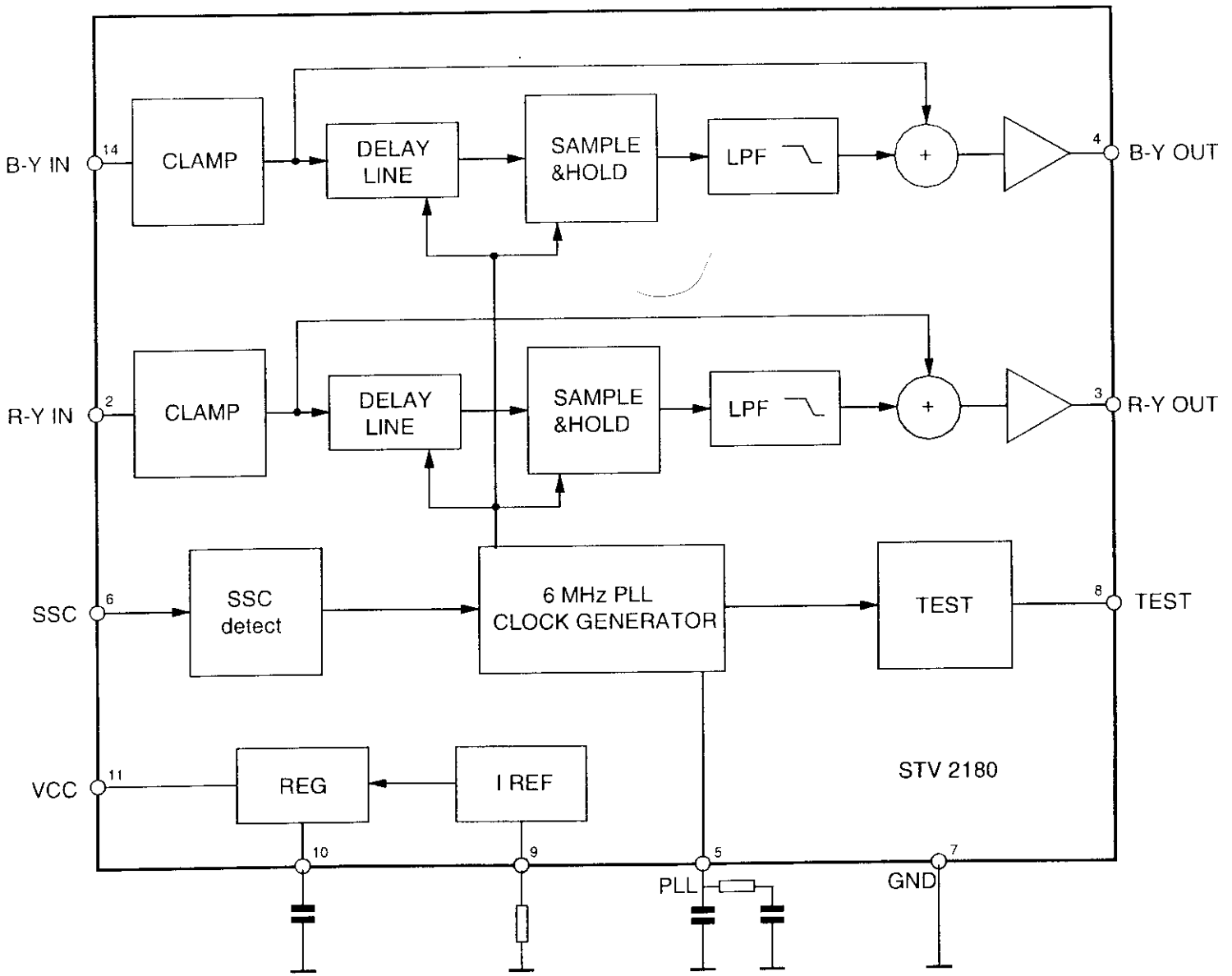
The colour subcarrier comes either from the pin 20 CVBS signal or from pin 23 if the Y/C option has been selected by the user.
The subcarrier passes through a band-pass filter tuned according to the standard sought.
Tuning is performed by a PLL loop, with the CC03 capacitor being the filter for the loop. In the case of SECAM, the band-pass filter (bell) is adjusted by a second PLL loop tuned during the raster returns, with the CC04 capacitor being the filter for this second loop.

The STV2118 functions in automatic standard search mode in compliance with 3 identification cycles:

PAL/NTSC 4, 43 - SECAM - PAL/NTSC3, 58

Each cycle lasts 40 ms, except for SECAM, where 2 sequences of 40 ms are required.
Selecting one of the crystals combined with a pin 4 loop filter enables the VCOs used for identification, the SECAM discriminators or the PAL/NTSC demodulators to be tuned.
During the search operation, the R-Y and B-Y outputs are inhibited.
The demodulation stages are commmuted in compliance with the identified standard:
In the case of SECAM, the subcarrier is then directed towards 2 discriminators. The chroma difference signals are de-emphasised and directed towards the integrated circuit output by a commutation stage.
In PAL and NTSC, after demodulation, the signals are directed towards the same output stage as for SECAM (the CC02 capacitor performs the subcarrier AGC).

The chroma difference signals are available at pin 40 and 41 output and are routed towards the delay lines.



THOMSON MULTI MEDIA

THE CHROMA DELAY LINE

For passing band reasons, the delay of 64 us in chroma treatment is caused after demodulation of the subcarrier.
The principle used is a capacitive network through which the signal is conveyed at the rate of a 3 MHz clock managing load transfers.
This clock is produced thanks to a 6 MHz PLL loop in phase with the SSC.
190 capacities are used to generate a delay of 64 us as well as 192 clock chimes.

$$\frac{1}{3\ \text{Mhz}} = 333\text{ns} \times 192 = 64\text{us}$$

For each R-Y and B-Y signal, a direct channel and a delayed channel are available and the commutation timing of the 2 channels depends on the decoded standard:

- In PAL, an addition is carried out (correction of the phase errors). The output signal doubles in amplitude in relation to the input.

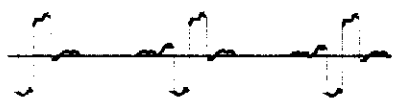
- In SECAM, the delay line enables the input signal to be recopied over 2 consecutive lines.

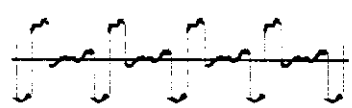
- In NTSC, the delay line is transparent but the amplitude of the signals is doubled.

At the exit to the 2 delay lines, the chroma difference signals are directed towards the video processing unit by pins 38 and 39 of the STV2118A.

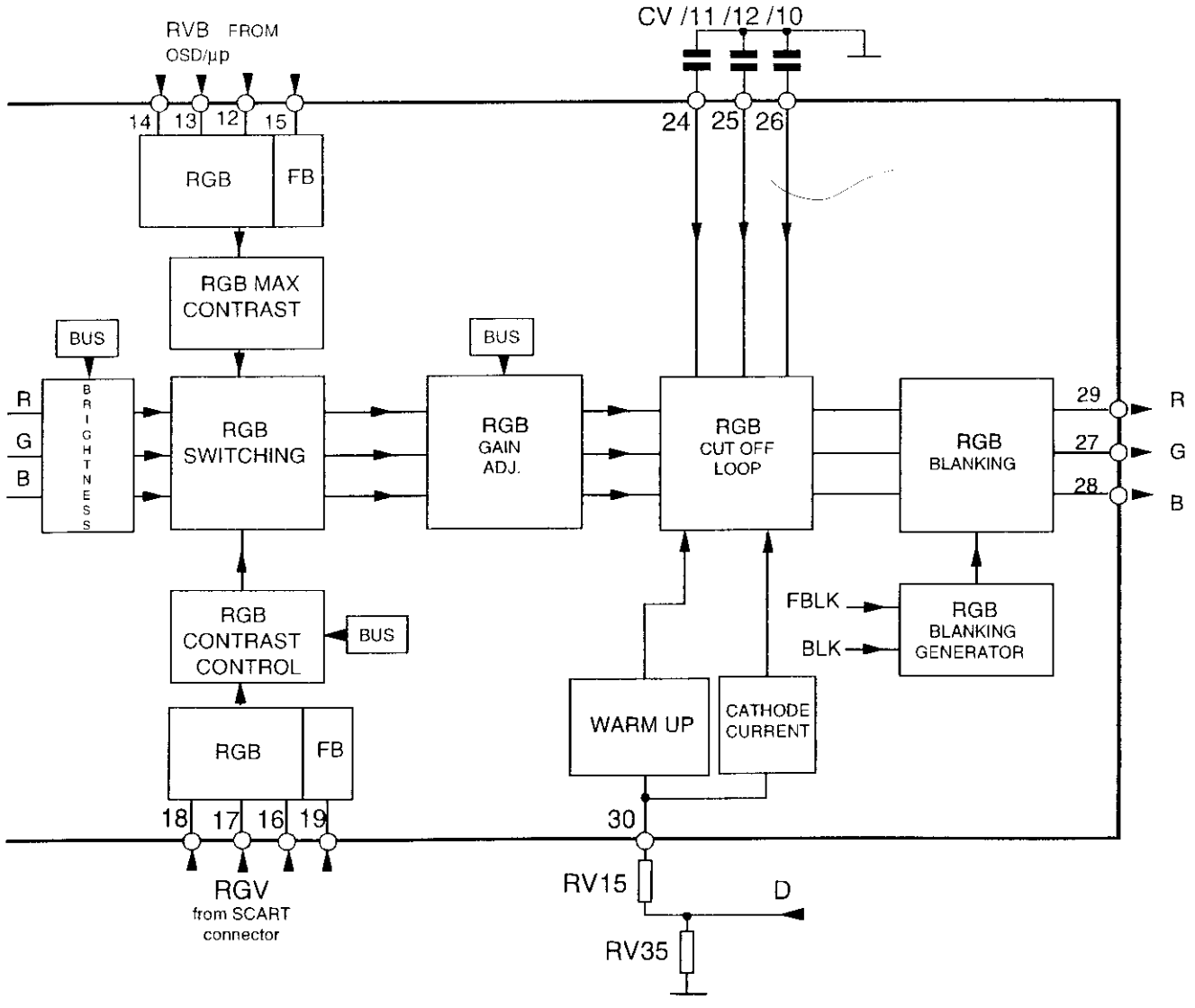
SECAM Input/Output timing

PAL Input/Output timing





CENTRE DE FORMATION TECHNIQUE



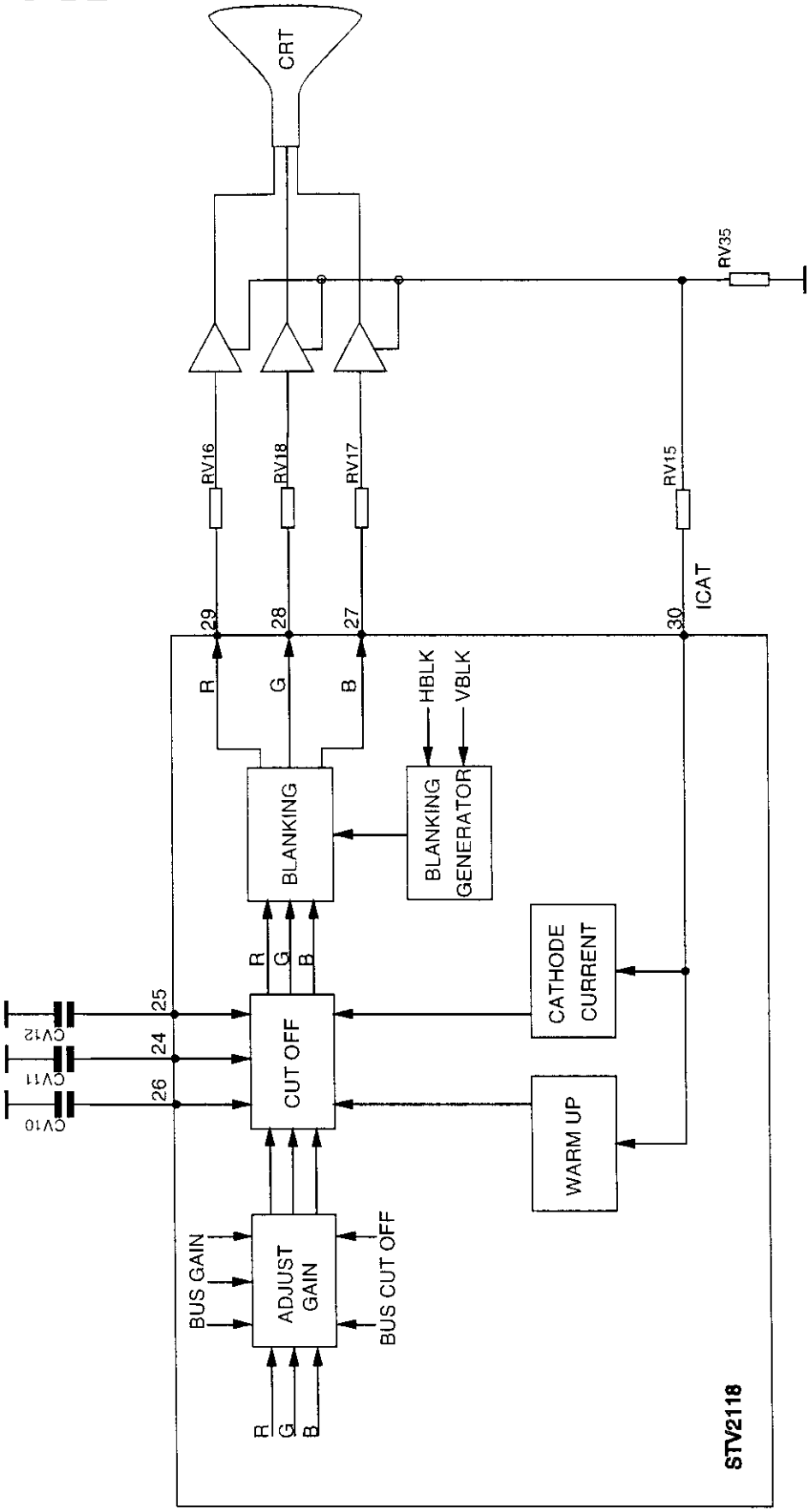
THOMSON MULTI MEDIA

VIDEO PROCESSING

3 inputs towards the processing unit may be selected:

- Y, R-Y, B-Y coming from chroma processing and an interference trap filter for the luminance (interference trap filter disconnected if the Y/C input is selected),
- RGB (1) coming from the microcontroller (OSD menu) or TXT treatment,
- RGB (2) coming from the SCART AV1 connector.

Luminance treatment integrates the Y delay 360 ns in PAL and 460 ns in SECAM) before undergoing an outline or contrast correction. The signal is then matrixed with the chroma difference signals whose amplitude has been determined by saturation adjustment.
Once the light has been set, the RGBs are directed towards the commutation stage, where the external RGBs combined with the FB1 and FB2 are routed.
RGB (1) is always at maximum contrast whereas the contrast of RGB (2) may be adjusted by the user.
All adjustments are carried out by the 12C bus.



AUTOMATIC CUT-OFF CONTROL

The colours are kept at the same temperature by automatic cut-off control.

Via pin 30 ICAT information, the integrated circuit receives information when alive which is the image of the power output of the 3 cathodes. While the cathodes heat up (ICAT less than 1.7 volts), the automatic cut-off control is inhibited (warm-up).

Three measuring lines are inserted during the raster return at RGB matrixing level.
The power output, measured in sequence for these three lines, is compared to an internal reference; the resulting error voltage is used to clamp the signal at output. This voltage is used for the whole duration of the partial interlaced picture frame and is memorised in a clamping capacitor.
CV10 for the red
CV11 for the green
CV12 for the blue

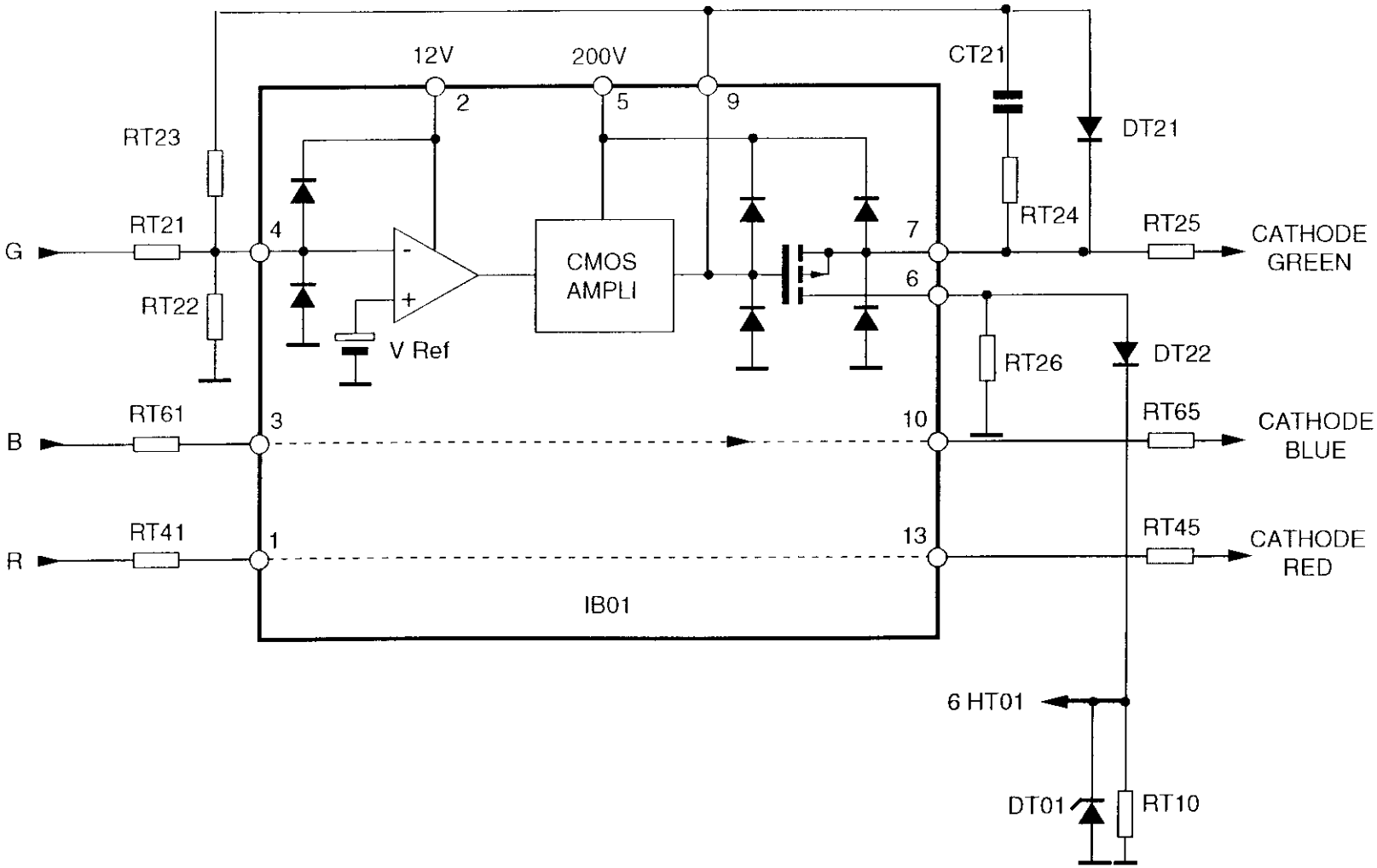
The vertical and horizontal erase stage is inserted at the output of STV2118.
ADJUSTING/SETTING

Two of the 3 reference voltages used for automatic cut-off control may be adjusted by means of the software, with the blue channel being used as a reference.

The amplifier gains are adjustable and enable the maximum value of the white level to be determined.

These settings are accessible in the video menu of the service mode.

PAV


12V
200V
CT21
DT21
RT23
2
5
9
RT21
4
G
RT22
CMOS
AMPLI
7
RT24
RT25
CATHODE
GREEN
6
V Ref
RT26
DT22
RT61
3
10
RT65
B
CATHODE
BLUE
RT41
1
13
RT45
R
CATHODE
RED
IB01
6 HT01
DT01
RT10

THE CRT MODULE WITH TEA5101.

The TEA5101 (IB01) integrated circuit is used. It comprises:

- 3 differential amplifiers whose gain is fixed by an external reverse feedback,
- 3 PMOS transistors which directly supply the control signal for the 3 cathodes (pins 7, 10 and 13) as well as power output information (pins 6, 11 and 14),
- diodes for protection against tube arkings,
- a reference voltage for the differential amplifiers; the 13 volts (pin 2) is used.

The RC cell (RB26 CB26 for the red) limits the pass-band of the stage (5 MHz).
The differential amplifier gain is fixed by RT41 and RT43 for the red channel. RT42 determines the continuous level of the output.

The TB18 transistor limits the ICUT overall information, the amplifier power output image, to 4 volts.

BLACKOUT OF THE SPOT

When the television set is working, CB03 is charged to 150 volts via RB06 and DB04. The G1 grid voltage is close to 0.6 volts.
When it is switched off, when the 200 volts disappears, the CB03 capacitor becomes a voltage generator and polarises the G1 grid at -150 volts.

THE CRT MODULE WITH TEA5101 (TX92)

The TEA5101 (IB01) integrated circuit is used. It comprises:

- 3 differential amplifiers whose gain is fixed by an external reverse feedback,
- 3 PMOS transistors which directly supply the control signal for the 3 cathodes (pins 7, 10 and 13) as well as power output information (pins 6, 11 and 14),
- diodes for protection against tube arkings,
- a reference voltage for the differential amplifiers; the 13 volts (pin 2) is used.

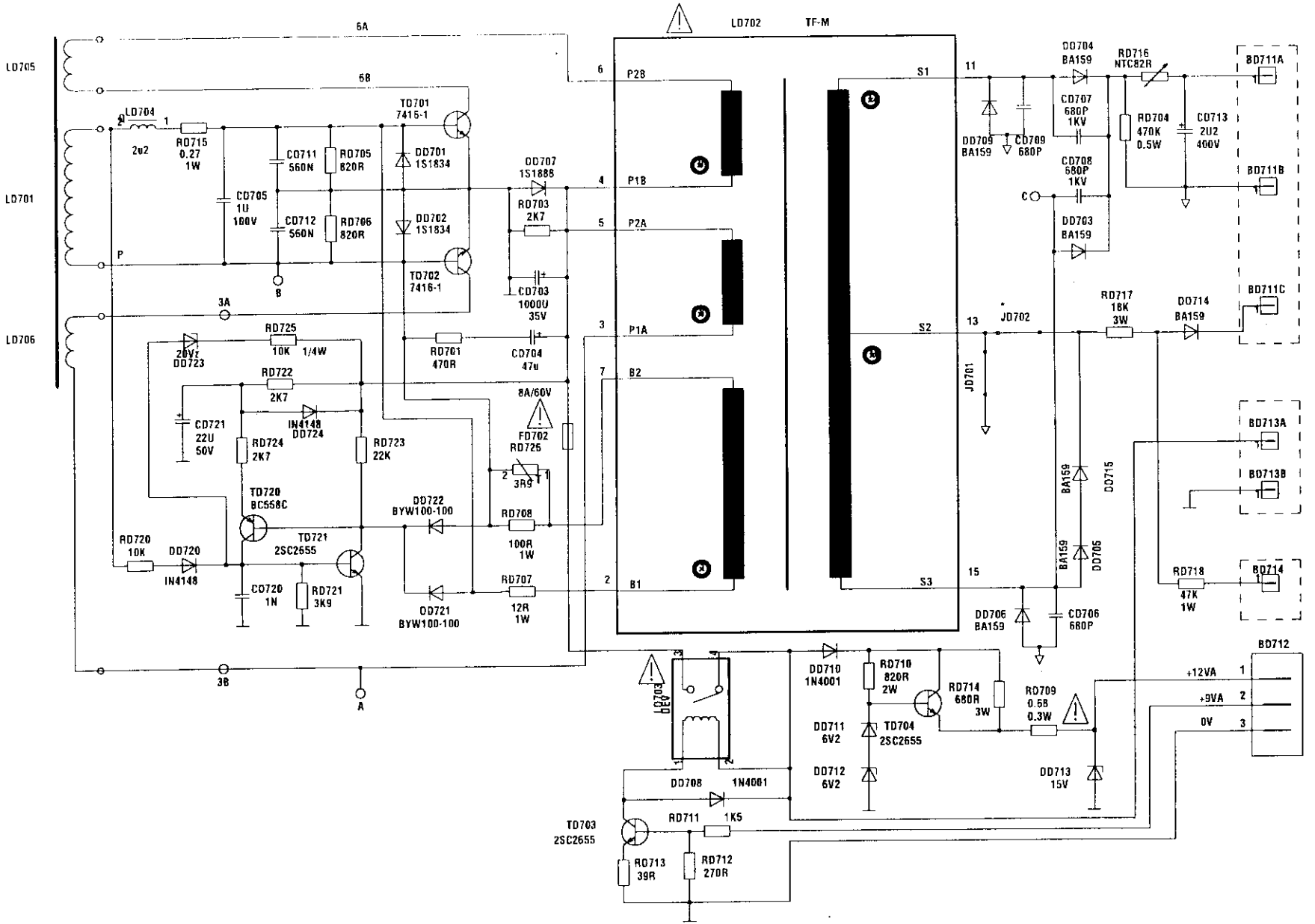
The RC cell (RB26 CB26 for the red) limits the pass-band of the stage (5 MHz).
The differential amplifier gain is fixed by RT41 and RT43 for the red channel. RT42 determines the continuous level of the output.

The TB18 transistor limits the ICUT overall information, the amplifier power output image, to 4 volts.

THOMSON MULTI MEDIA

THE DC-DC CONVERTER

CENTRE DE FORMATION TECHNIQUE

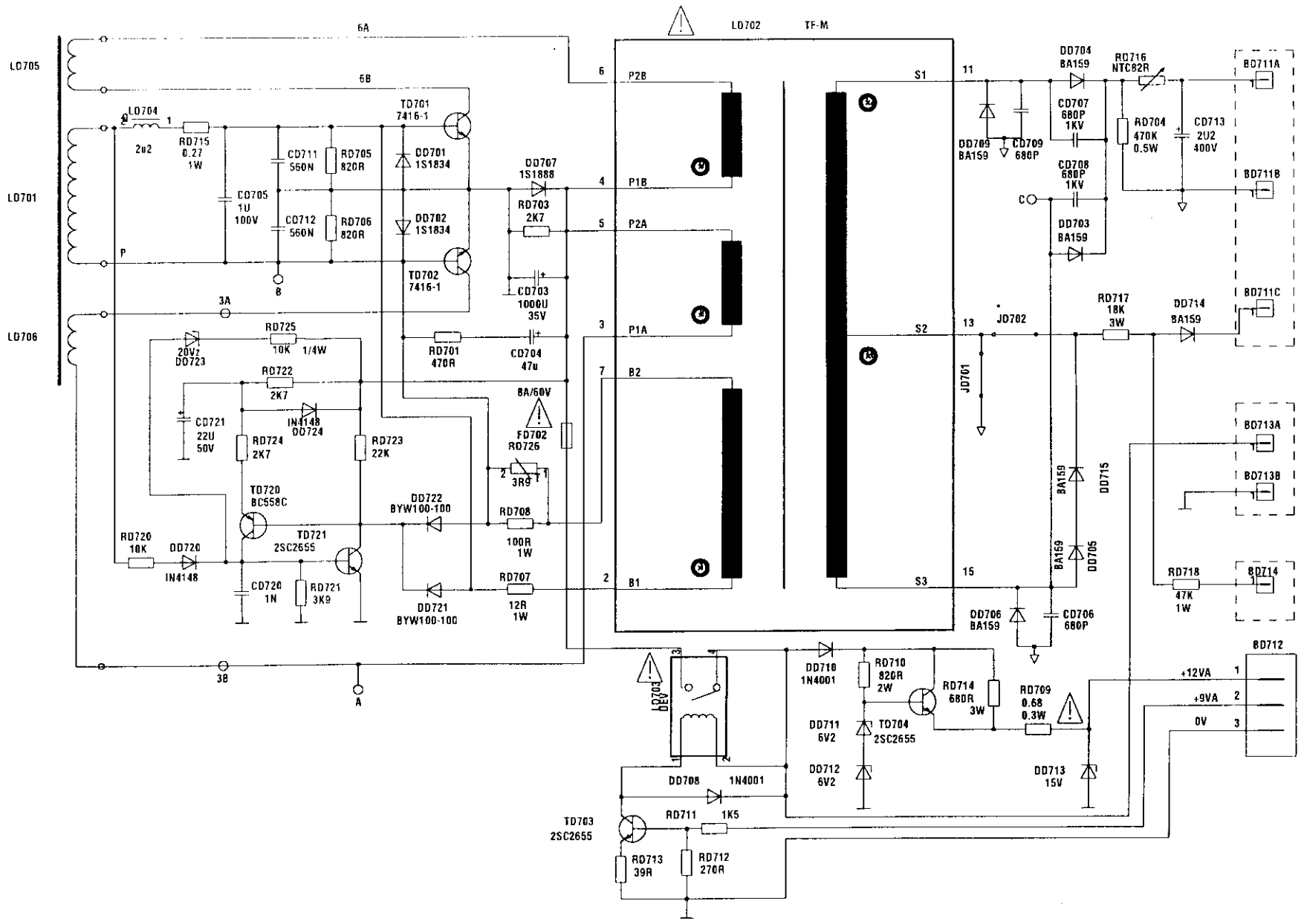

LD705
LD701
LD706
6A
6B
3A
3B
LD704
2u2
RD715 0.27 1W
CD705 1U 100V
CD711 560N
CD712 560N
RD705 820R
RD706 820R
TD701 7415-1
TD702 7416-1
DD701 1S1834
DD702 1S1834
DD707 1S1888
RD703 2K7
CD703 1000U 35V
RD701 470R
CD704 47u
RD725 10K 1/4W
20Vz DD723
RD722 2K7
CD721 22U 50V
IN4148 DD724
RD724 2K7
RD723 22K
TD720 BC558C
TD721 2SC2655
RD720 10K
DD720 IN4148
CD720 1N
RD721 3K9
DD722 BYW100-100
DD721 BYW100-100
8A/60V
FD702 RD725 3R9
RD708 100R 1W
RD707 12R 1W
LD702 TF-M
P2B
P1B
P2A
P1A
B2
B1
S1
S2
S3
DD704 BA159
RD716 NTC82R
DD709 BA159
CD709 680P
CD707 680P 1KV
CD708 680P 1KV
DD703 BA159
RD704 470K 0.5W
CD713 2U2 400V
BD711A
BD711B
BD711C
RD717 16K 3W
DD714 BA159
JD702
JD701
BA159
DD715
BA159
DD705
DD706 BA159
CD706 680P
BD713A
BD713B
RD718 47K 1W
BD714
BD712
+12VA
+9VA
0V
DD710 1N4001
RD710 820R 2W
RD714 680R 3W
RD709 0.68 0.3W
DD711 6V2
DD712 6V2
TD704 2SC2655
DD713 15V
DD708 1N4001
RD711 1K5
TD703 2SC2655
RD713 39R
RD712 270R

INTRODUCTION

In order to be fed at low voltage, 12 or 24 volts, some TX91 frame structure television sets may be equipped with an extra module, the DC-DC converter, whose purpose is to develop a 300V voltage from a 12 or 24 volt source.

BRINGING INTO OPERATION

A +12VA regulated voltage is established from the external 12 or 24 volts by means of the TD704 ballast transistor. It enables the UX frame structure voltage to be relayed and supplies the IR02 regulator. The management stage is thus operational.
When the television set goes from standby mode to normal operating mode, the +9V frame structure current feed to the DC-DC module enables the TD703 transistor, which actuates the LD703 relay, to be saturated. The self-oscillating system of the converter starts up supplied by 12 or 24 volts.



OPERATION

The cycle begins with the conducting of TD702 via CD704 and RD701. A current forms in the 5-3 winding of LD702 and in the LD706 winding, inducing a voltage in LD701 which confirms the saturation of TD702.

When the current passing through TD702 and LD706 reaches a maximum, the voltage induced in LD701 disappears, causing TD02 to block. LD701 generates a voltage, opposite to the previous one, which causes TD701 to be conducted. A new cycle begins with, via TD701, a current being created in the 4-6 winding of LD702 and in the LD705 winding.

The frequency of these cycles varies according to the external mains voltage and the load of the secondary. TD720 and TD721 limit the TD701 and TD702 polarisations.

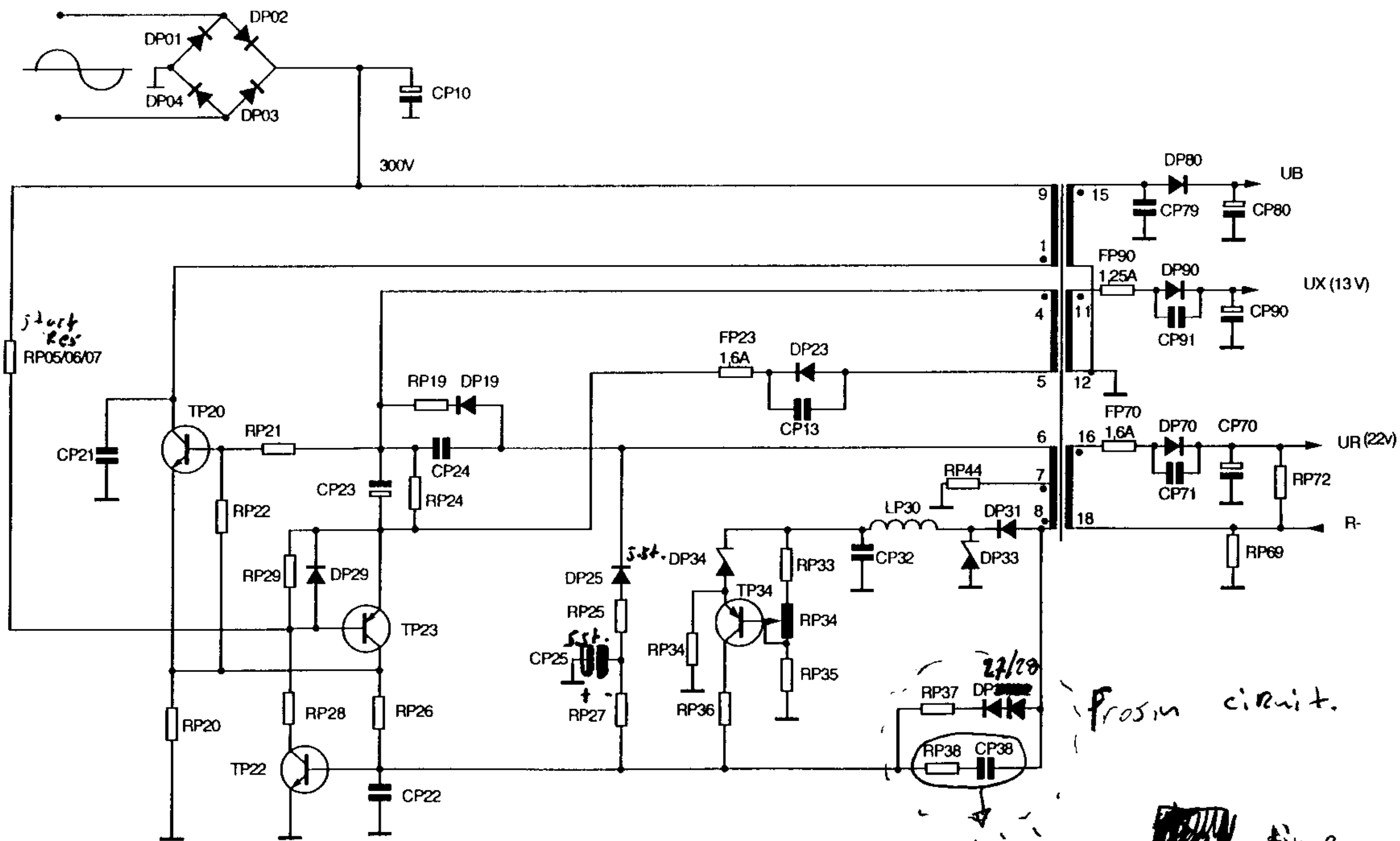
At the secondary, a double-alternation rectification by DD703 and DD704 enables a 300V charge to be obtained which is destined for the chopping feed, as well as a starting voltage to feed the TEA2261 in the start-up phase.

THOMSON MULTI MEDIA

TX91G
POWER SUPPLY

CENTRE DE FORMATION TECHNIQUE

THOMSON MULTIMEDIA



Frosin circuit.

minimum time
Tr on

Χωρίς αυτό τη ... συχνότητα θα πάει στο standby στα 20 (0,2μs

Κανονικά το minimum είναι 0,5 μsec.

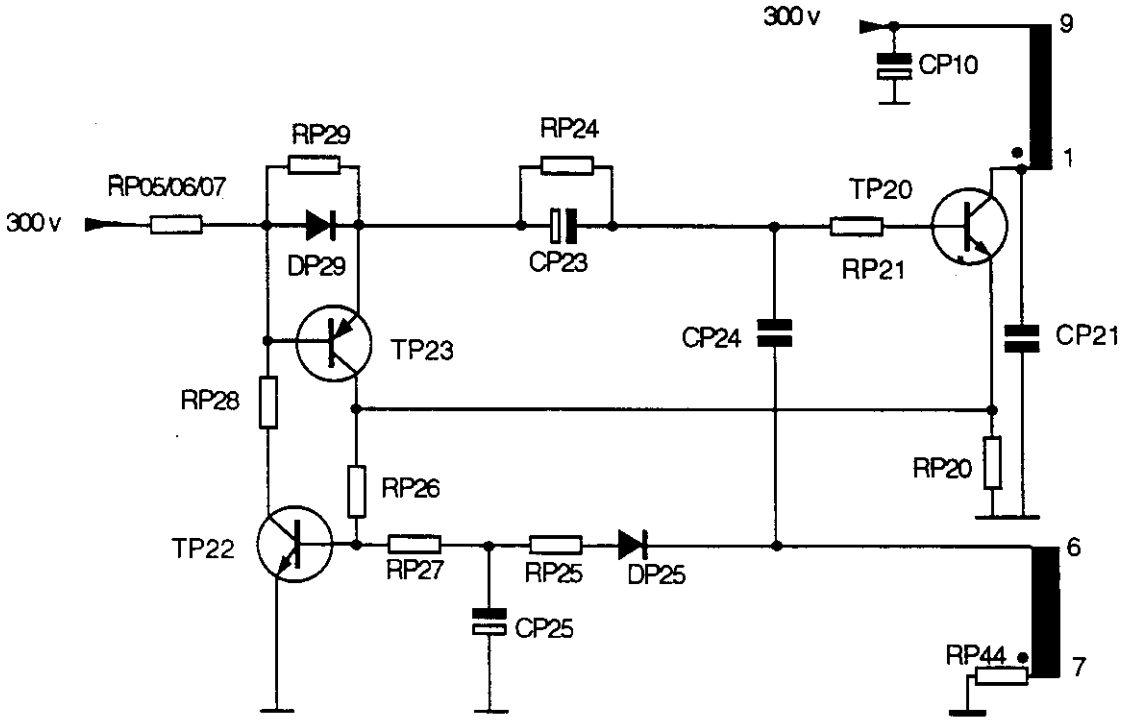
1-GENERAL

The power supply is a **FROSIN** (**FR**ee **O**scillating **S**afe **IN**telligent) one, new in design with discreet components.

The frequency is between 60 kHz and 80 kHz under normal operating conditions.
When not loaded, i.e. on standby, the power supply could increase to more than 100 kHz and, because of this, the switching transistor may be incorrectly deinhibited.
The wiring is such that the quenching frequency in standby mode is reduced to about 26 kHz.
In this way, the frequency is not audible and preserves the switching transistor.

The secondary voltages are similar to those of the TX91, namely UB, UX(13V), UA(22V).

Για έλεγχο στους 12 volts στην πρίζα του 220 και παρακάτω για αυτόματο 100Ω στην RP05/06/07



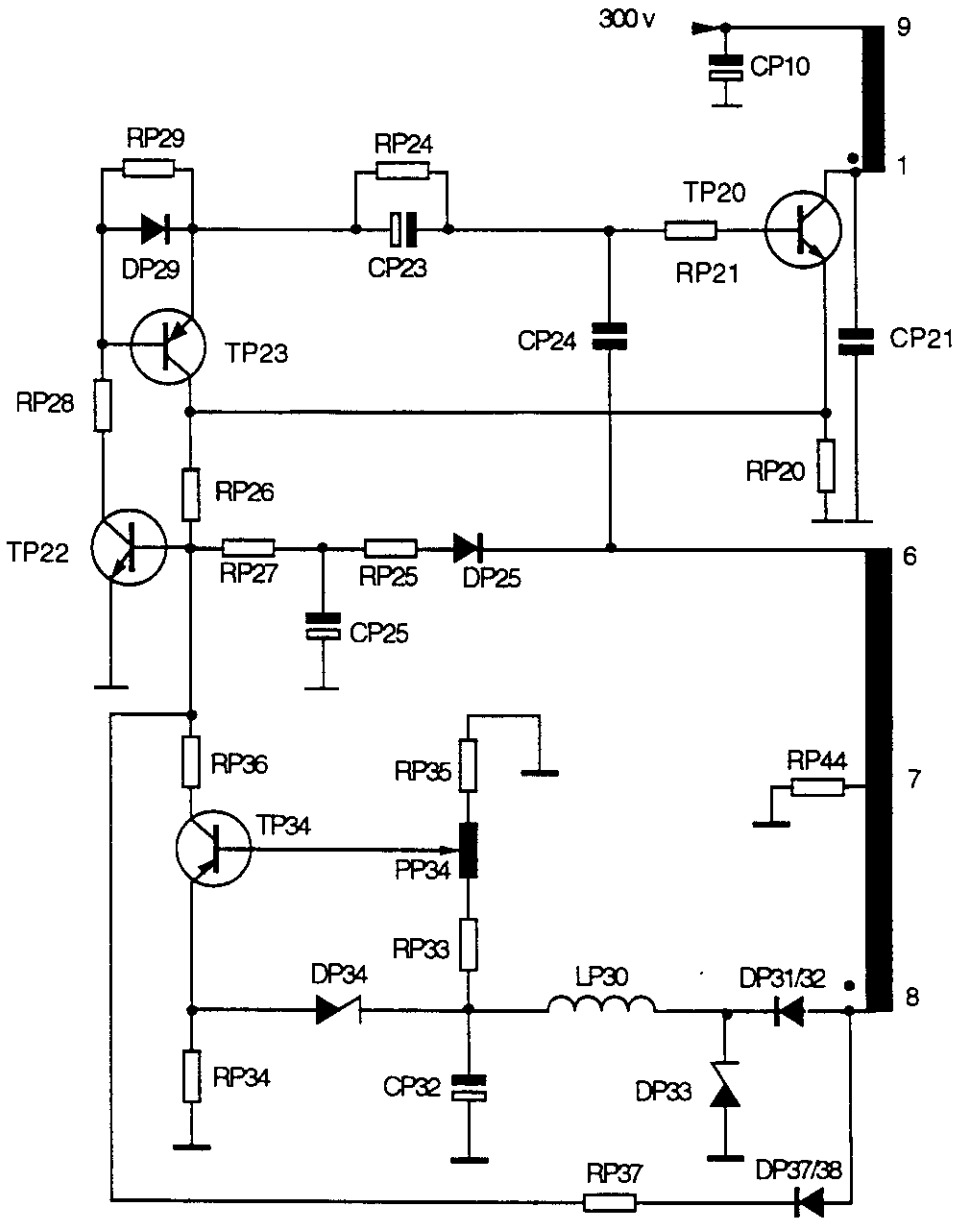
START-UP AND SOFT-START CIRCUIT

OFF to ON function.

The current coming from the 300V through RP05/06/07, RP29 and DP29 as well as the CP23 capacitor generates a TP20 basic current.
The No. 6 winding (forward) and CP24 enables the TP20 transistor to increase the base to transmitter current.

The whole current passes through RP20, and the potential at the terminals of this resistance saturates TP22/23 and blocks TP20 by CP23.

In order to prevent the TP20ne collector current from increasing too quickly, a soft start is performed by the No. 6 winding DP25, RP25, CP25 and RP27.



REGULATION AND FROSIN CONTROL

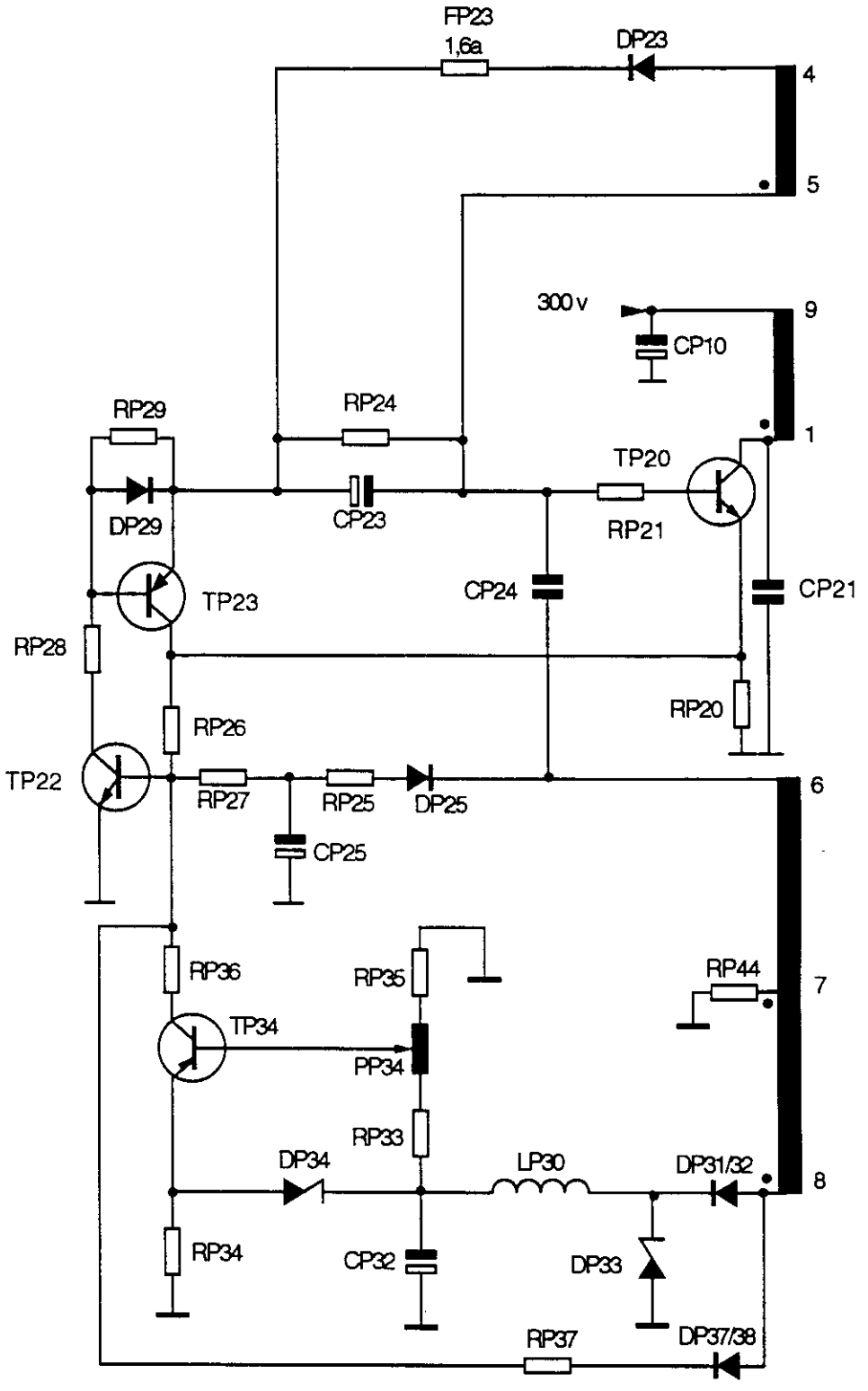
Regulation

The TP34 transistor is mounted in the comparator. Its transmitting potential is fixed by the DP34 Zener diode. The error voltage comes from the No.7/8 winding (which works in FLY-BACK mode) and by the PP34 potentiometer. The U system variation is deducted and applied to the PP34 base, thus correcting the Usystem variation.
The secondary voltages are determined by the PP34 variation.

Once the regulation order has been carried out in this way, it is compared with the voltage of the No. 6 winding, which works in FORWARD mode and determines the polarisation of T22.
The whole of this comparison determines the power consumed by the apparatus.

Frosin controls

The DP37/38 diodes and the RP37 resistor deliver a positive voltage during the FLY-BACK mode, thus prohibiting TP20 from being conducted during the FLY-BACK mode of the power supply.

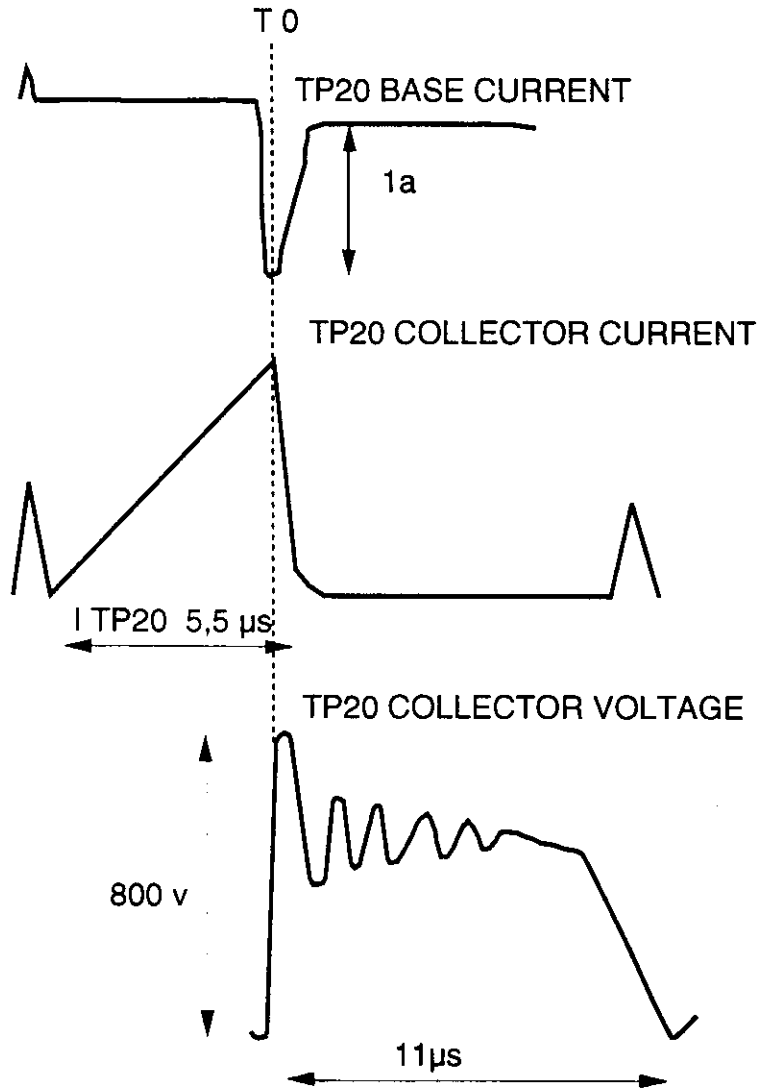

FP23
1,6a
DP23
4
5
300 v
9
CP10
RP29
RP24
1
TP20
DP29
CP23
RP21
CP24
CP21
TP23
RP28
RP20
RP26
TP22
RP27
RP25
DP25
6
CP25
RP36
RP35
RP44
7
TP34
PP34
RP33
DP34
LP30
DP31/32
8
RP34
CP32
DP33
RP37
DP37/38

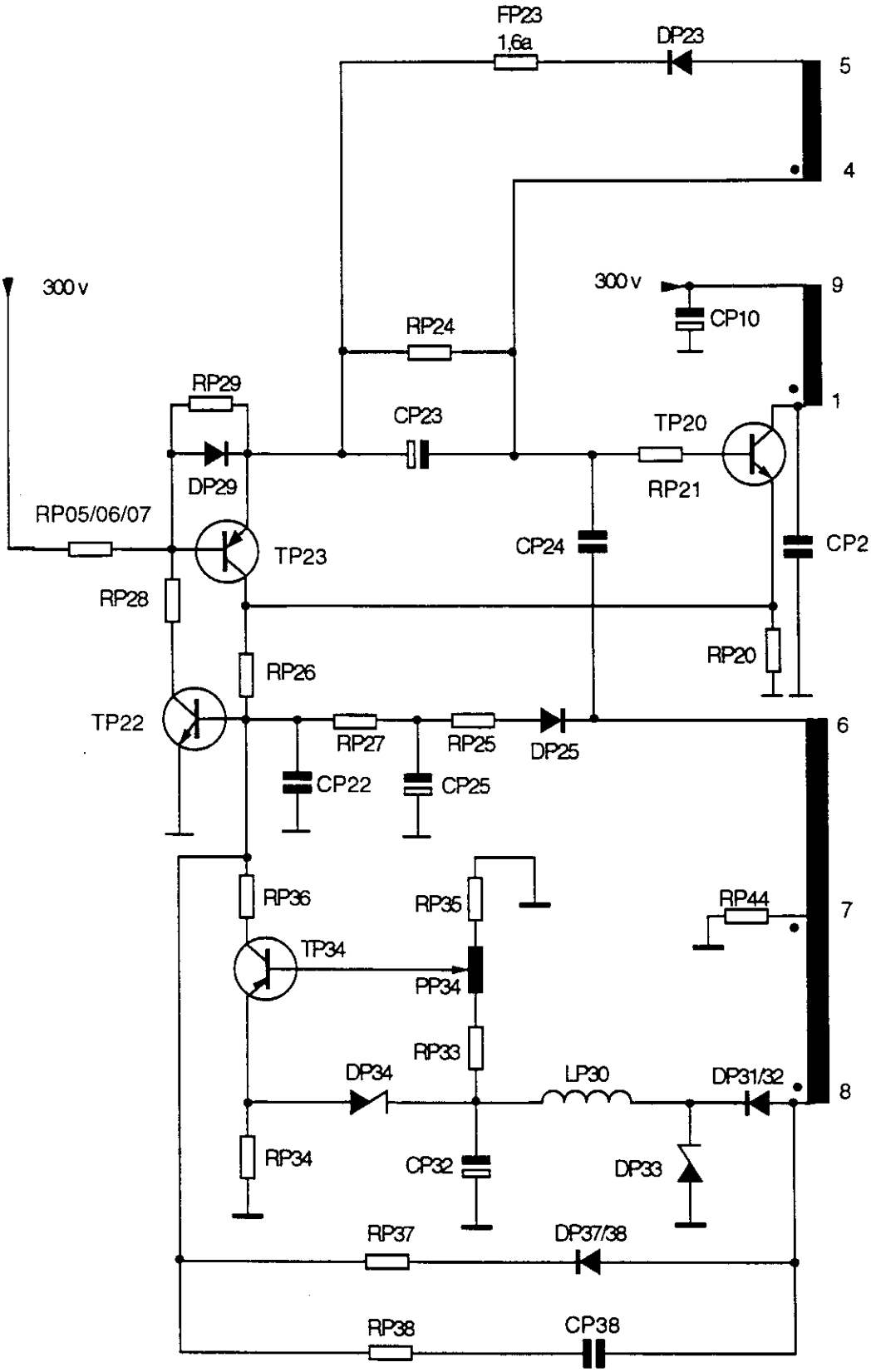
THE TP20 VOLTAGES AND CURRENTS

When the TP22 and TP23 transistors conduct, they discharge the CP23 capacity, thus applying a negative current to the TP20 base. Because of this, the transistor blocks, bringing about a power transfer to the secondaries.

The CP23 charge, performed by the No. 45 winding, which works in FORWARD mode, is therefore very high.

Given below are the voltage and currents linked to the TP20 commutation.





STANDBY FUNCTION

In standby mode, regulation is inhibited, and because of this the oscillatory circuit will stop. The latter is relaunched via CP24 and CP38.

See the oscillogram below.