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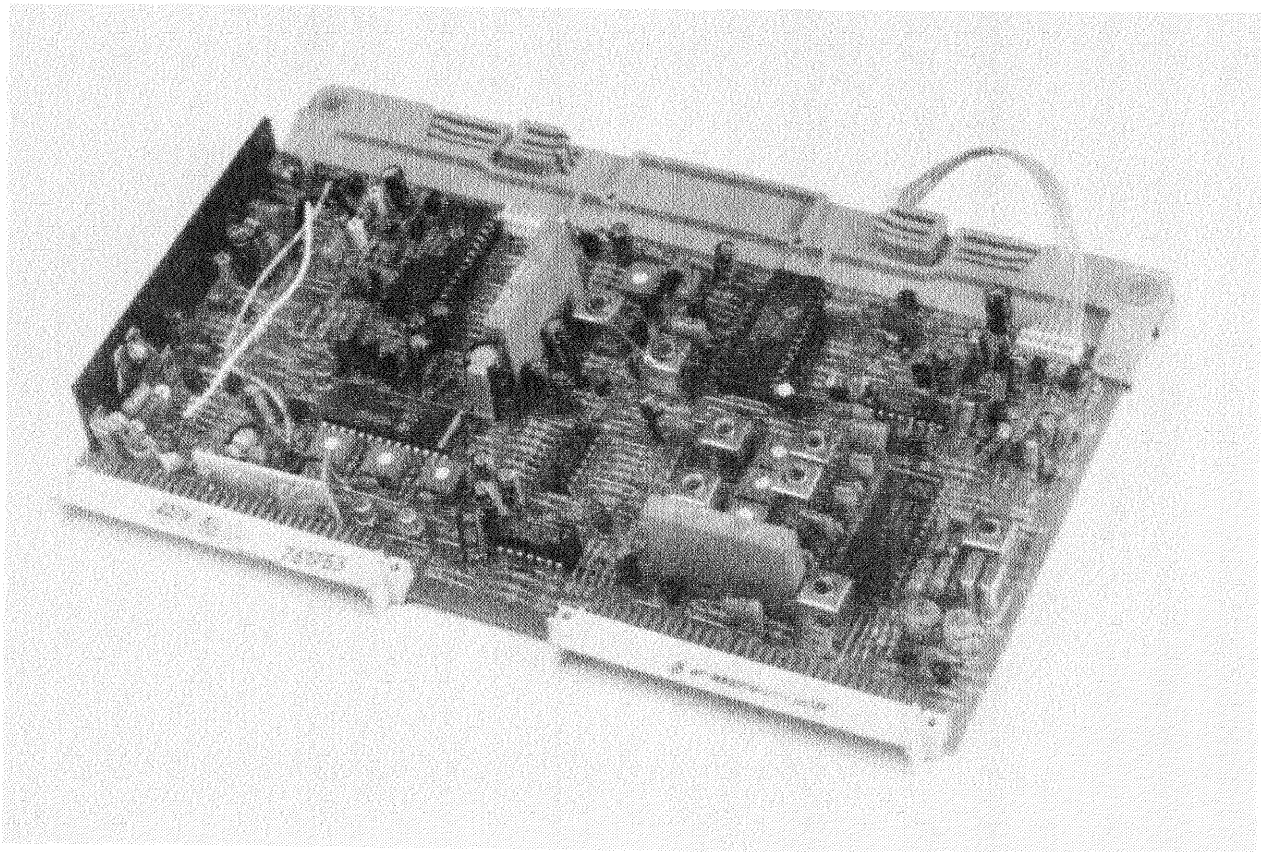
# BARCO

BARCO Projection Systems

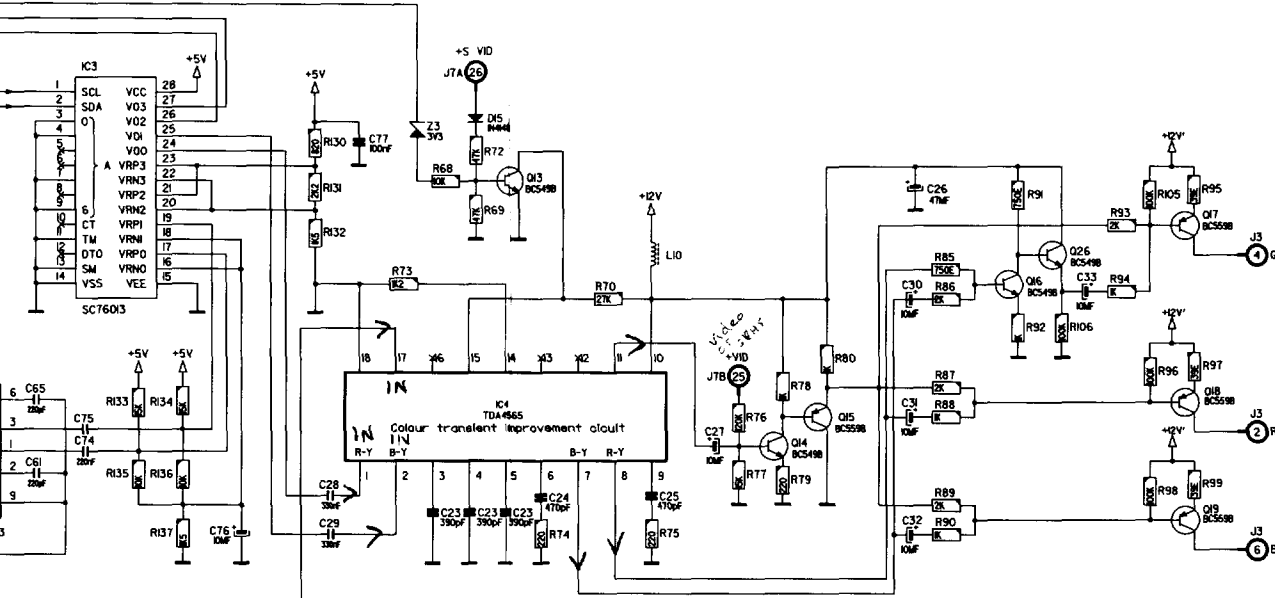
SECTION **G**

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service sheet

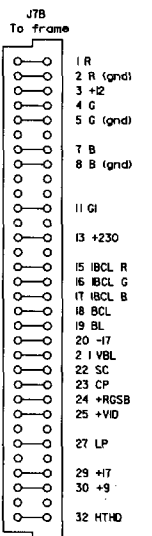
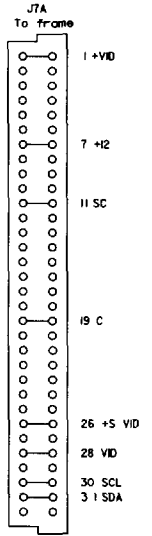


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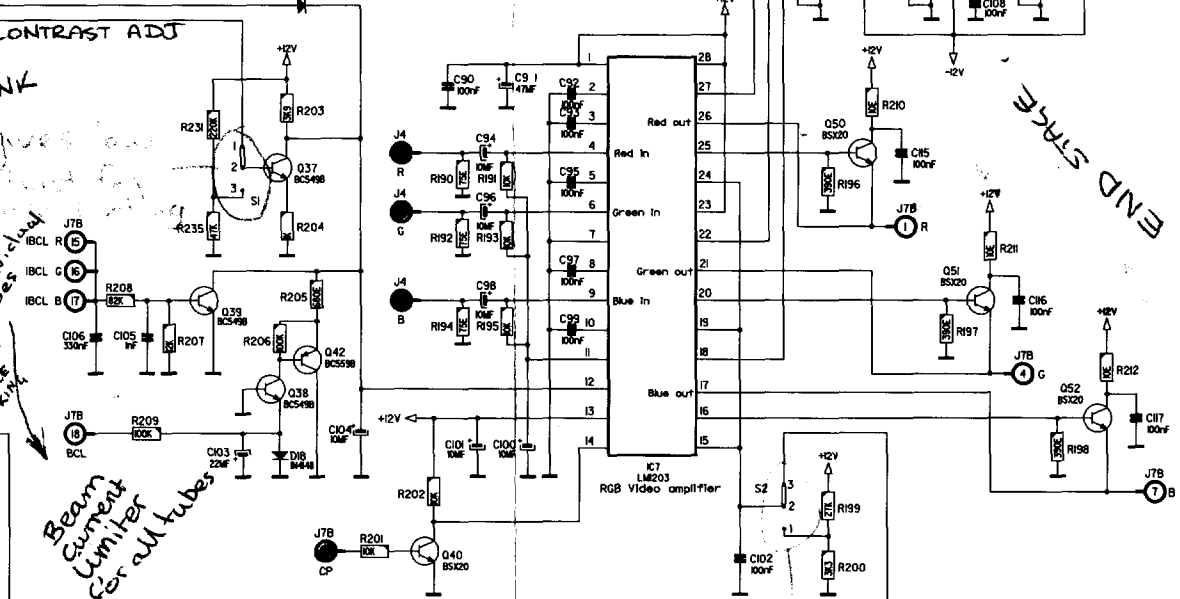


IC9 POLLS THE I/Ps 28, 27, 26, 25 until it finds the correct I/P

TO RGB SWITCHING BOARD TO STUFF TEXT & X HATCH ON IT

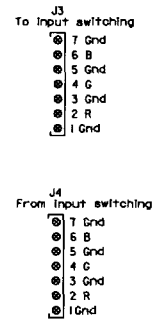
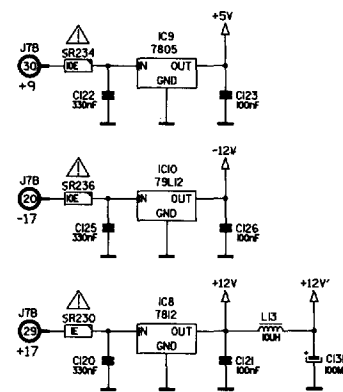


CONTRAST ADJ  
Beam Current Limiter for all tubes  
GIVES LOW BRIGHTNESS FOR PROJECTION.

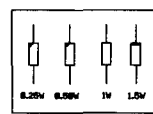


BRIGHTNESS ADJ

GIVES LOW BRIGHTNESS FOR PROJECTION.



**PRODUCT SAFETY NOTICE**  
COMPONENTS MARKED WITH \* OR Δ HAVE SPECIAL CHARACTERISTICS IMPORTANT TO SAFETY BEFORE REPLACING ANY OF THESE COMPONENTS, READ CAREFULLY THE SERVICE SAFETY PRECAUTIONS. DO NOT DEGRADE THE SAFETY OF THIS SET THROUGH IMPROPER SERVICING.

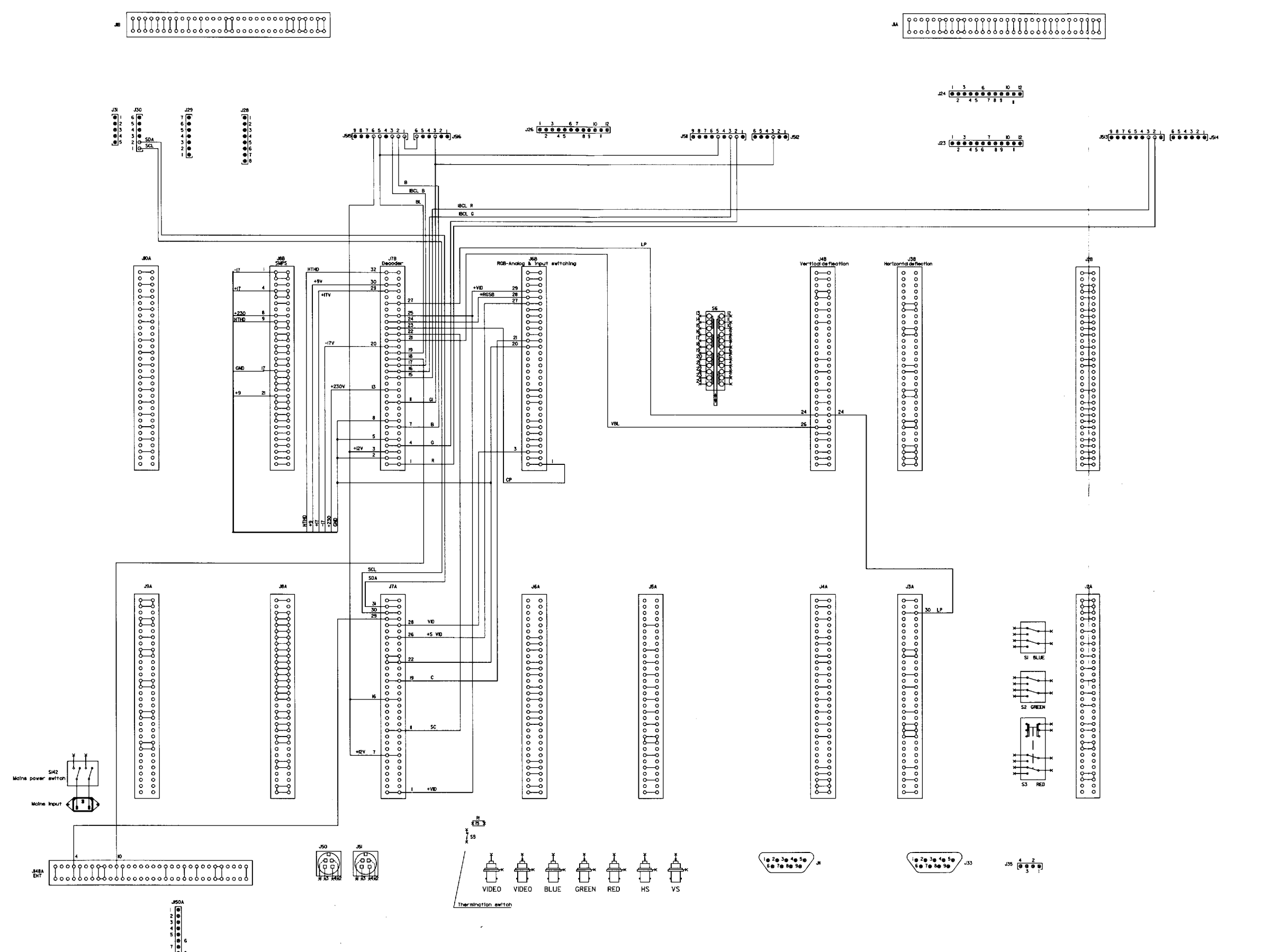


Model	Decoder	Article No.
21/08/1991	POOE	761753
	CSN	

BARCO PROJECTION SYSTEMS

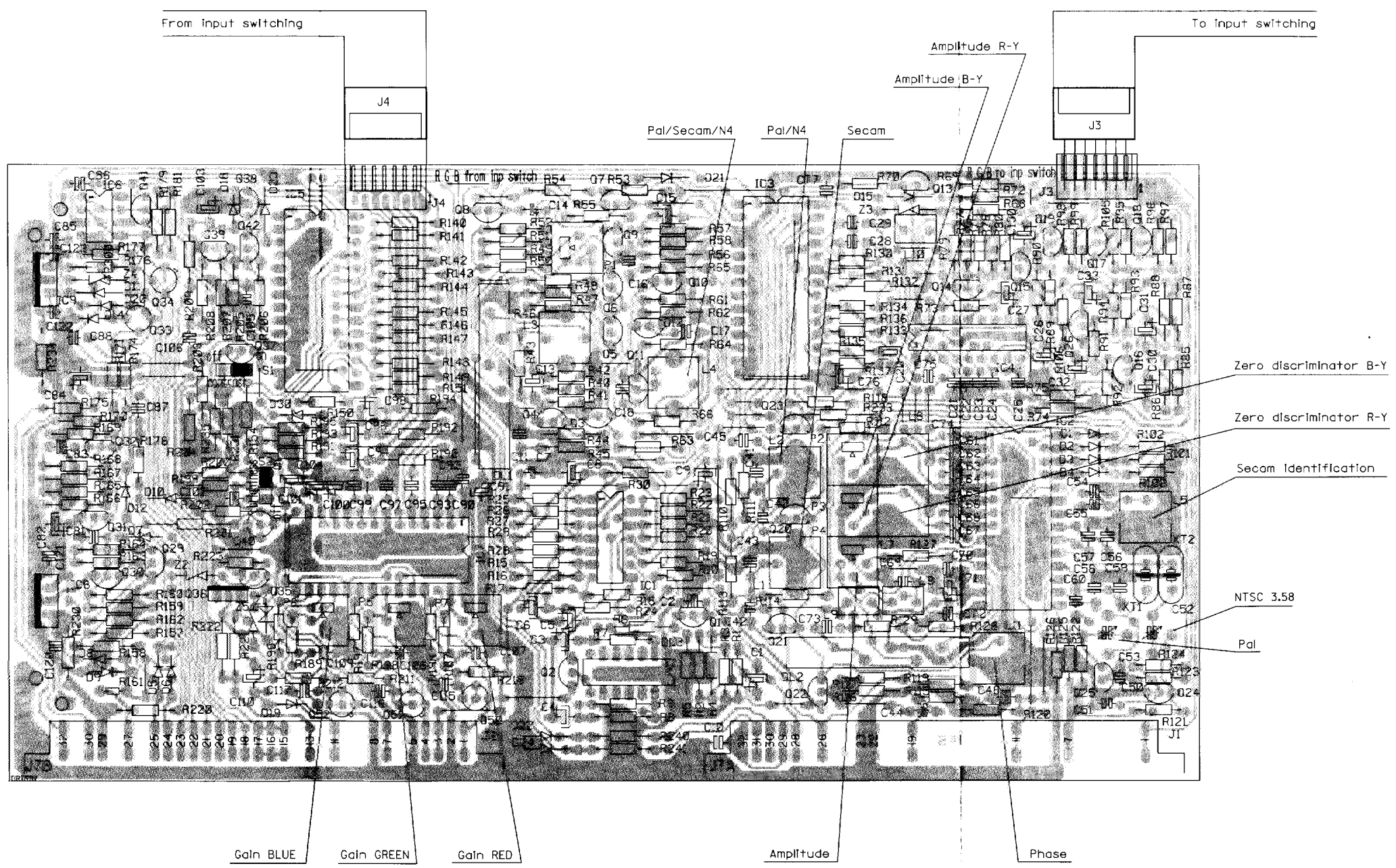
Main frame interconnection  
Decoder module

BRACO

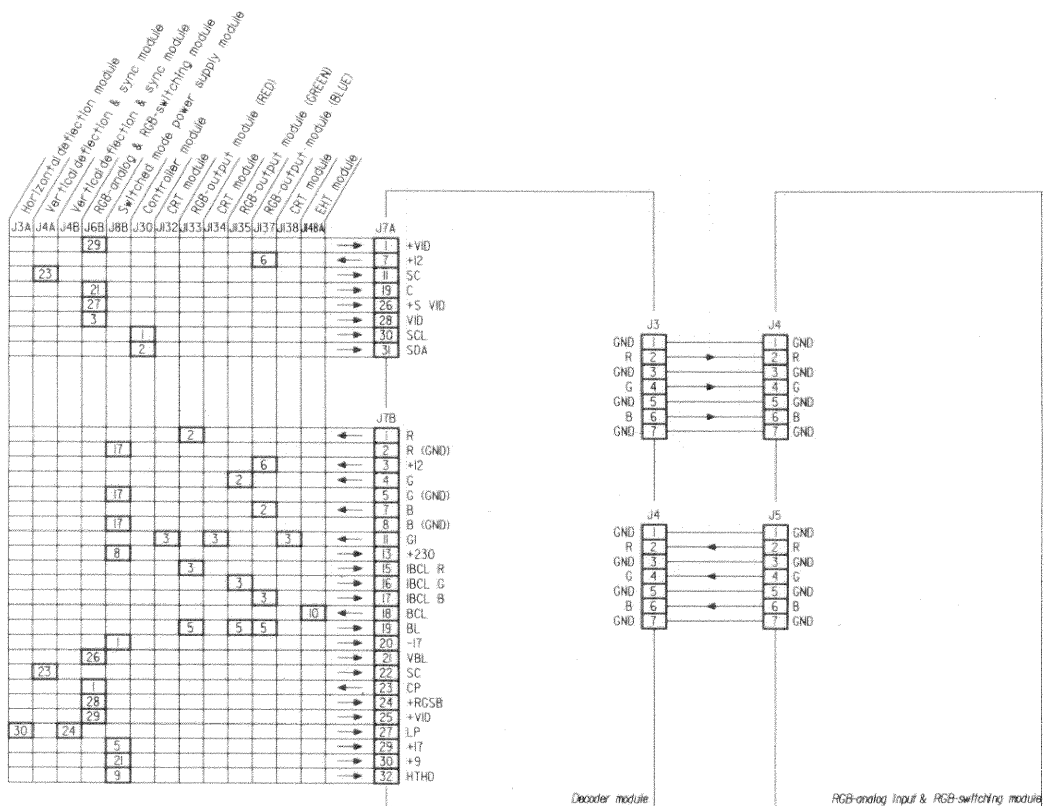


Interconnection Decoder	SC 153
Rev. 1/75	1/75
BRACO PRODUCTION SYSTEMS	

Modifications reserved



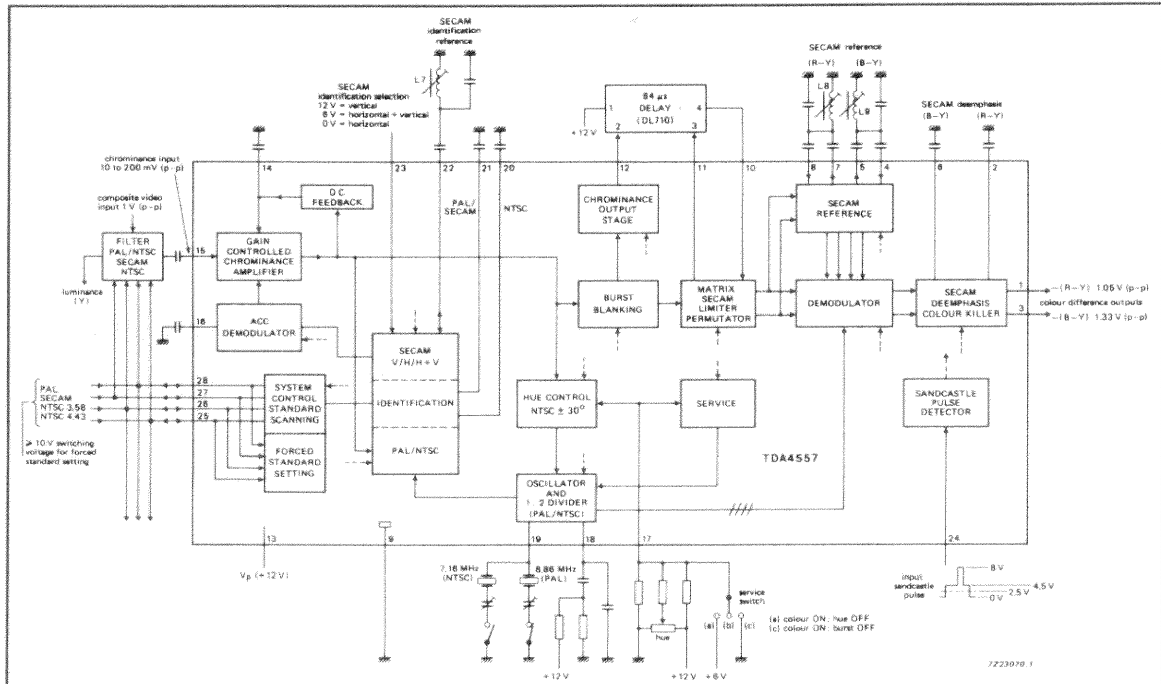
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C9	D 4	K9	B 3	R80	F 3
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C25	F 4	L8	E 4	R98	F 3
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C28	E 3	L11	F 4	R101	G 4
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C31	F 3	P2	E 4	R106	F 3
C32	F 3	P3	E 4	R107	E 4
C33	F 3	P4	E 4	R108	E 4
C40	E 4	P5	E 4	R109	E 4
C41	E 4	P6	C 4	R110	E 4
C42	E 4	P7	C 4	R111	E 4
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D22	D 5	R60	E 3	R207	B 3
D23	D 5	R61	E 3	R208	B 3
D24	D 5	R62	E 3	R209	B 3
D30	C 4	R63	E 3	R210	B 3
		R64	E 3	R211	B 3
		R65	E 3	R212	B 3
		R66	E 4	R213	B 3
		R67	E 3	R214	B 3
		R68	E 3	R215	B 3
		R69	E 3	R216	B 3
		R70	E 3	R217	B 3
				R218	B 3
				R219	B 3
				R220	B 3
				R221	B 3
				R222	B 4
				R223	B 4
				R224	B 4
				R225	B 4
				R226	B 4
				R227	B 4
				R228	B 4
				R229	B 4
				R230	B 4
				R231	B 4
				R232	B 4
				R233	B 4
				R234	B 4
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				R239	B 4
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				R241	B 4
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				R246	B 4
				R247	B 4
				R248	B 4
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				R250	B 4
				R251	B 4
				R252	B 4
				R253	B 4
				R254	B 4
				R255	B 4
				R256	B 4
				R257	B 4
				R258	B 4
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				R260	B 4
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				R262	B 4
				R263	B 4
				R264	B 4
				R265	B 4
				R266	B 4
				R267	B 4
				R268	B 4
				R269	B 4
				R270	B 4
				R271	B 4
				R272	B 4
				R273	B 4
				R274	B 4
				R275	B 4
				R276	B 4
				R277	B 4
				R278	B 4
				R279	B 4
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				R281	B 4
				R282	B 4
				R283	B 4
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				R285	B 4
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				R288	B 4
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				R356	B 4
				R357	B 4
				R358	B 4
				R359	B 4
				R360	B 4
				R361	B 4
				R362	B 4
				R363	B 4
				R364	B 4
				R365	B 4
				R366	B 4
				R367	B 4



Name interconnection Decoder module		Article nr. 761753
Date 15/09/1990	Drawn PG	Checked CS
BARCO PROJECTION SYSTEMS		

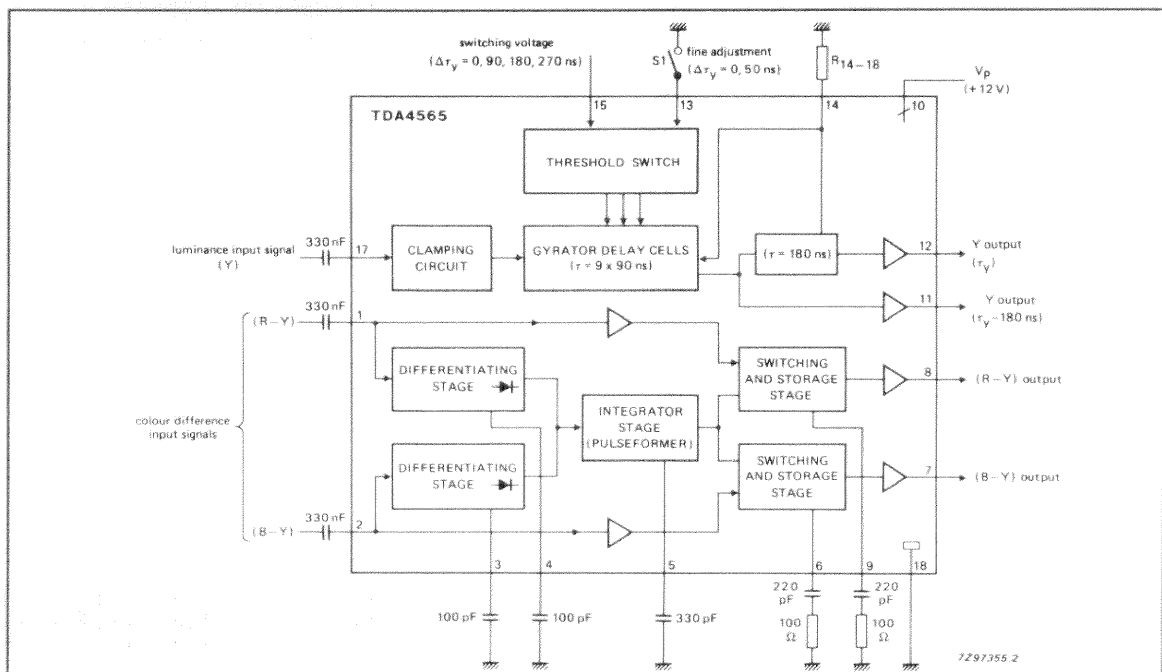
## MULTISTANDARD DECODER TDA4557

The TDA4557 is a monolithic integrated multistandard colour decoder for PAL, SECAM, NTSC3.58MHz and NTSC4.43MHz standards.



## COLOUR TRANSIENT IMPROVEMENT CIRCUIT TDA4565

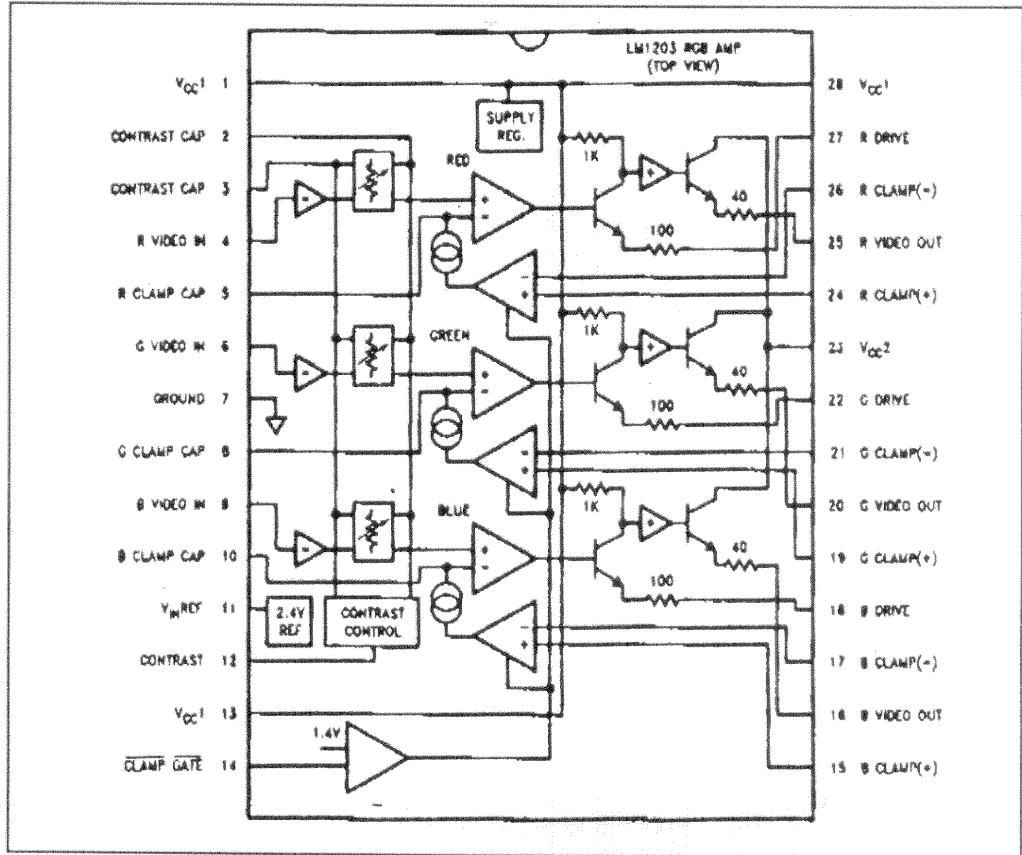
The TDA4565 is a monolithic integrated circuit for colour transient improvement (CTI) and luminance delay line in gyrator technique in colour decoders.





RGB VIDEO AMPLIFIER SYSTEM LM1203

The LM1203 is a wideband video amplifier system intended for high resolution RGB color monitor applications. In addition to three matched video amplifiers, the LM1203 contains three gated differential input black level clamp comparators for brightness control, three matched attenuators circuits for contrast control. Each video amplifier contains a gain set or "Drive" node for setting maximum system gain ( $A_v = 4$  to  $10$ ) as well as providing trim capability. The LM1203 also contains a voltage reference for the video inputs.



4X7 BIT DIGITAL POTMETER (DPM) WITH I<sup>2</sup>C BUS

The interface circuit is an integrated circuit in a 28-pins dual-in-line package. It features 4 programmable 7-bits DPM-outputs each with a unity gain buffer, a VrefP and VrefN input, and an I<sup>2</sup>C-bus slave receiver with 7 programmable address bits. Each DPM can be programmed separately by a 7-bit word into 128 steps.

SCL	1	28	VCC
SDA	2	27	V03
A0	3	26	V02
A1	4	25	V01
A2	5	24	V00
A3	6	23	VRP3
A4	7	22	VRN3
A5	8	21	VRP2
A6	9	20	VRN2
CT	10	19	VRP1
TM	11	18	VRN1
DT0	12	17	VRP0
SM	13	16	VRN0
VSS	14	15	VEE

**INTRODUCTION :**

- Put the decoder PCB on extension circuit boards and connect the yellow wires to the RGB-switch module by means of two extension wires.
- Switch the projector in the VIDEO MODE. Select source 1.
- Connect to the VIDEO input e.g. an electronic colour test video signal (see photo)

**A. VIDEO INPUT SIGNAL :***PAL COLOUR TEST IMAGE***1. REFERENCE OSCILLATOR (C53)**

- if there is no colour, adjust trimming capacitor C53 until colour is being received.
- short-circuit pin 17 of Ic2 to earth.
- adjust the trimming capacitor C53 for colour zero beat.
- remove the short-circuit.

**2. CHROMA REJECTOR (L4) (photo 1)**

- connect an oscilloscope to the junction R66/C20 (Y signal).
- adjust the core of coil L4 for a minimum of chroma in the video signal.

**3. CHROMA FILTER (L2) (photo 2)**

- connect the oscilloscope to the emitter of Q20. (Or Q23)
- adjust the core of coil L2 for maximum chromasignal.

**4. DELAY LINE MATRIX (L11 - P4) (photos 3,4)**

- connect the oscilloscope to the capacitor C74 (Pin 1 of Ic2 R-Y signal).
- adjust L11 (DELAYED PHASE ADJUST) and P4 (DELAYED AMP. ADJUST) as shown in photos 3 and 4
- note the amplitude of the (R-Y) signal.
- connect the oscilloscope to the capacitor C75 (Pin 3 of Ic2 B-Y signal).
- note the amplitude of the (B-Y) signal.

**B. VIDEO INPUT SIGNAL:***SECAM COLOUR TEST IMAGE***5. BELL FILTER (L1) (photo 5)**

- connect an oscilloscope to the emitter of Q21. (Or Q23)
- adjust L1 for a flat amplitude of the signal during two successive lines.

**6. (B-Y) DISCRIMINATOR (L6 - P2) (photo 6)**

- connect oscilloscope to the capacitor C75. (pin 3 of Ic2)
- adjust L6 so that the level of the (B-Y) signal without colour information is the same as the level during blanking.
- adjust P2 to obtain the same amplitude of (B-Y) as in point 4.



7. (R-Y) DISCRIMINATOR (L7-P3) (photo 7)

- connect the oscilloscope to the capacitor C74. (pin 1 of Ic2)
- adjust L7 so that the level of the (R-Y) signal without colour information is the same as the level during blanking.
- adjust P3 to obtain the same amplitude of (R-Y) as in point 4.

8. SECAM IDENTIFICATION (L5)

- connect the voltmeter between pins 21 and 20 of IC 2 (TDA 4557).
- adjust the core of coil L5 for a maximum voltage reading with a correct colour reproduction.

**C. VIDEO INPUT SIGNAL :**

*NTSC 3.58 TEST IMAGE*

9. REFERENCE OSCILLATOR (C52)

- If there is no colour, adjust trimming capacitor C52 until colour is being received.
- short circuit pin 17 of Ic2 to earth.
- adjust trimming capacitor C52 for a colour zero beat.
- remove the short-circuit.

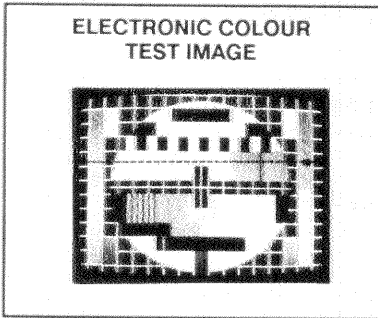
10. COMB FILTER(L3 ,P1)

- connect the oscilloscope to the emitter junction of Q10.(R66, C20Y signal).
- adjust the core of coil L3 and P1 for a minimum chroma in the video signal.

**D. GAIN OF RED, GREEN AND BLUE**

6. RGB AMPLIFICATION (P5 - P6 - P7)

- connect an analog RGB source to the projector of 0.7V ptp (neglecting the sync) and select source 4.
- disconnect the IBCL circuit by short circuiting R207 and C103. (or plug out the fuse on the EHT 761742 module)
- turn contrast to maximum position.
- adjust the potentiometers "GAIN" P5, P6 and P7 for a R, G and B output amplitude of 4V on J7. (Can also be measured on R1 of the output module.)



Viewed VIDEO LINE for the alignment of:

- Pal Delay decoder
- Chroma rejector
- Chroma filter

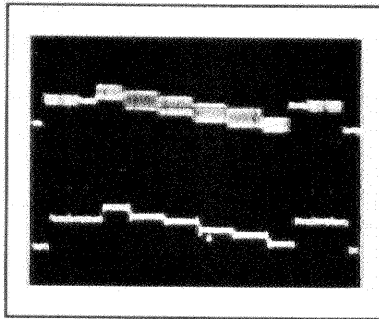


Foto 1  
Alignment chroma rejector L4  
Upper track: viewed video line  
Lower track: Y signal R66 /C20 0.8 V pp

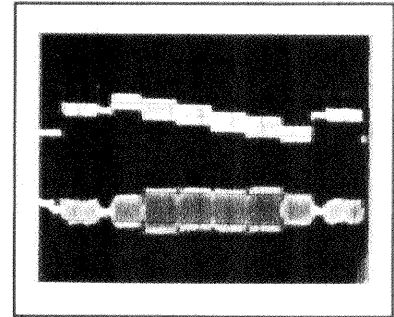
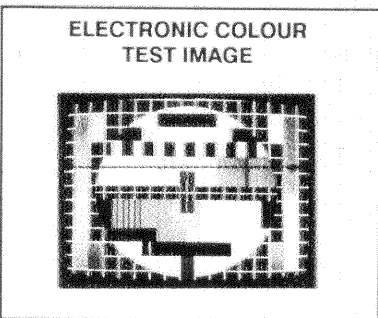


Foto 2  
Alignment maximum Chroma L1  
Upper track: viewed video line  
Lower track: Chroma on E Q20 120 mVpp



Viewed VIDEO LINE for the alignment of:

- Bell filter
- (B-Y) discriminator
- (R-Y) discriminator

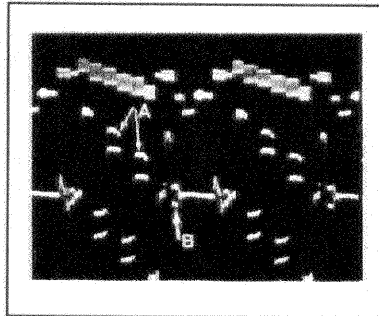


Foto 3:  
Alignment of the PAL DELAY  
Upper track: viewed video line  
Lower track: incorrect PHASE (A) and AMPLITUDE (B) setting

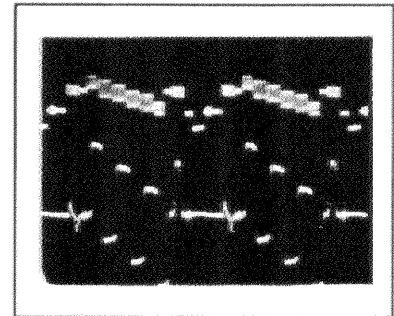


Foto 4:  
Alignment of the PAL DELAY  
Upper track: viewed video line  
Lower track: correctly aligned PAL DELAY

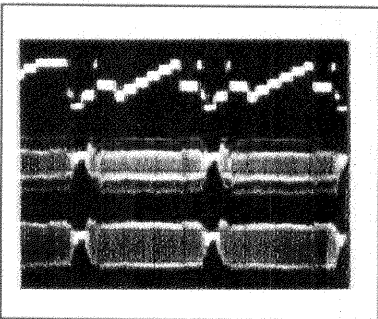


Foto 5  
BELL FILTER  
Upper track: incorrect setting  
Lower track: correct setting

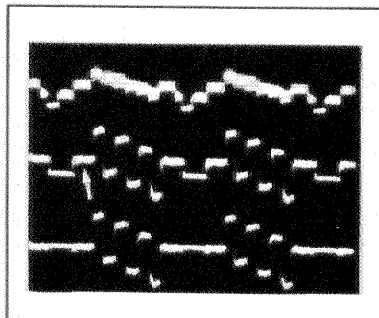


Foto 6  
(B-Y) DISCRIMINATOR L6/P2  
Upper track: viewed video line  
Lower track:  
1: incorrect PHASE setting  
2: correct PHASE setting

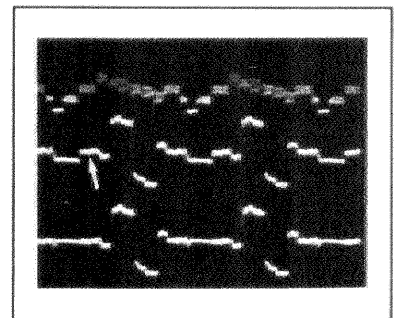


Foto 7  
(R-Y) DISCRIMINATOR L7/P3  
Upper track: viewed video line  
Lower track:  
1: incorrect PHASE setting  
2: correct PHASE setting

**INTRODUCTION.**

The video composite or S-VHS signal is firstly split into luminance and chrominance to be handled separately.

The luminance undergoes an enhancing or sharpness control, the colour is rejected and proceeding then to the IC4, containing the luminance delay line.

The chrominance is passing the correct bandpass filter and reaching pin 15 of the quad decoder chip TDA4557.

The NTSC 3.58 Mhz is passing a comb filter before entering pin 15.

The colour difference signals are then regulated in amplitude by two potentiometers in IC3 and equally reaching IC4.

With Y, R-Y and B-Y the colours R, G and B are matrixed and leave now the decoder for the RGB switching module.

Coming back to this board, the brightness and contrast controls are applied in order to prepare the signals for the RGB power drivers.

Furthermore on this board, the CP clamping pulse is formed to be utilised in the brightness control and on the RGB switching board.

Finally, the blanking pulses for the horizontal retrace time, and the adjusted left / right blankings (by the user) are combined with the vertical blanking pulses produced on the UN SYNC + VERT deflection board to get a total blanking pulse train which is sent to the RGB driver output boards.

We analyse now these items more in detail.

**I. VIDEO COMPOSITE  
FLOW.**

Enhancing.

The video composite arrives at the base of the buffer Q1 and feeds the delay line DL3. The mid-tap of this delay line supplies the base of the buffer Q2 .

The latter now sends the signal to the chrominance bandpass filters PAL/N4 and Secam, and equally to a buffer in IC1.

The output 13 of the DL3 is delayed twice as much as the pin 8 output, and obviously at the node C3/C4 we obtain the sum of the non delayed and the delayed output.

This signal is now sent to the emitter (pin 13) of a transistor in IC1 . At the emitter of the same transistor we apply the half delayed video and because this transistor is the common emitter resistor of the differential pair, we get the difference at the collector; or, the pin 5 output of IC1.

Finally, this signal needs now to be added to the half delayed one, and, this happens in the third transistor of IC1. The fourth transistor behaves again as a buffer and supplies the comb filter, and colour rejector in the base of Q11.

The amount of enhancing is made adjustable with the a DC voltage to be applied at the bases of the differential pair.

NTSC 3.58 Mhz comb filter.

This comb filter is based on the principle that the phase of the colour subcarrier is 180° phase shifted each two lines.

So, by adding two subsequent lines, the chrominance subcarrier can be eliminated. On the other hand, by subtracting the luminance can be eliminated.

To perform above we require a delay line with the right line period of the NTSC 3.58 Mhz, and for a perfect elimination amplitude and phase must be correct as well. These are aligned with P1 and L3 respectively.

As the DL750 has two opposite phase outputs, the buffer Q7 provides the chrominance only and the buffer Q8 the luminance only signals.

The luminance is then proceeding to IC4 via an insulating capacitor C20.

## II. CHROMINANCE FLOW.

The multistandard decoder chip IC2 is checking sequentially the information on the back porch of the horizontal sync.

As soon the right system is identified, the appropriated output Pal/Secam/N4 or N3 output is put at a high level.

This output now activates the right chrominance bandpass filter and oscillator (exact crystal).

A detailed description of the flow in the chip would take too long, we therefore limit to the essential items.

The tint control (hue) being adjusted in IC3 is supplying pin 17.

The SC (sandcastle) together with the vertical blanking (VBL) are added and supply the input pin 24 (see blanking for above mixing).

The chrominance delay line is only operative for secam and Pal, and, for the latter the phase and amplitude of delayed / non delayed is aligned with L8 and P4 respectively.

In Secam, the (R-Y) amplitude and Zero point of the frequency discriminators are aligned with P3 and L7. The same is valuable for P2 and L6.

Finally, the -(R-Y) and -(B-Y) signals come available at the pins 3 and 11 and proceed to the digital potentiometers in IC3, where the amplitudes are regulated via the I2C bus information (controller board).

In IC4, the chrominance signals undergoes an improvement of the transitions and leave again at 7 and 8.

**III. COLOUR MATRIXING.**

The (B-Y) and (R-Y) signals are added on the base of Q16. This adding is according a well determined ratio to get the (G-Y) at the collector of Q16 and after a buffering we find it back on the base of Q17.

On the same base is equally applied the Y-signal through R93 as to obtain G at the open collector of Q17.

The same applies to obtain the R (red) and B (blue) signal.

These signals now are sent to the RGB SW board where the INS and pixel informations are added (see this board).

The R, G and B signals are then coming back to the contacts 2, 4 and 6 of the J4 connector and are introduced to the LM1203.

**IV. BRIGHTNESS AND  
CONTRAST CON-  
TROLS.****a) Contrast :**

The contrast voltage is adjusted in IC5 and delivered to the base of Q37 (the pins 1 and 2 are shorted when leaving the factory). For service reasons, the pins 2 and " may be shorted, applying a fixed voltage in stead of the voltage from the digital potentiometer.

The voltage that reaches pin 12 can be limited by following :

- the IBCL info, we remind that this voltage is coming from the RGB Output boards and is the result of the beam current of the crtÆs.
- the BCL info, this is a negative voltage coming from the EHT transformer via the EHT board (HVL). this voltage is the result of the sum of the three crtÆs as it is proportional with the current generated by the EHT
- the presence of D30 means that the voltage cannot drop below the node voltage R146/R147.

**b) Brightness :**

The brightness voltage at the VO1 output of IC5 is immediately reaching the pins 15, 19, 24.

Here again, the pins 3 and 2 are shorted ex factory, and for service facilities the engineer can short 1-2 in order to apply the voltage at the divider R199/ R200.

The CP pulse, available from the collector of Q32, is equally applied to pin 14 of the IC for the brightness control.

**IV. CLAMPING PULSE CP.**

This CP pulse, utilised by the brightness control and the DC restoration of the green on the RGB Switching board, is formed as follows:

1. In the VID, S-VHS and RGSB mode ( sync pulses in the blanking time) :

Note that in the S-VHS mode, the +VID line is equally æhighÆ( see RGB SWITCHING board).

Here, the original sandcastle pulse (SC) may be used in order to clamp on the backporch of the sync.

In either case, the tr Q30 is saturated, eliminating the line pulses to drive the Q31 transistor.

The SC, arriving at J7A (11), is divided by R164/R163 and as the emitter is set at a threshold with R165/R166 only the smaller top pulse of the SC is found on the collector Q31.

2. In the TTL and RGBS mode:

The original sandcastle is now fully applied to the base of Q31, because Q30 is blocked.

On the collector of the latter we find now a wider pulse which is differentiated by C83/R169.

A small pulse, coinciding with the start of the blanking time is available on the collector of Q32.

#### **V. LEFT / RIGHT BLANKING .**

Capacitor C88 is charged up from the +HTHD line and discharged through Q33 each time a pulse is sent to its base.

The sawtoothed waveform is the input for two level detectors in IC6.

Two digital potentiometers in IC5 feed the other inputs and determine the duration of the blanking pulses at the parallel connected outputs. The pulses are buffered with Q41 and leave the board on the emitter.

#### **VI. COMPOSITE BLANKING.**

The VBL pulses, sum of the top/bottom and vertical retrace blanking pulses, are mixed with the LP pulses taken from the node D8/D9 and both are applied to the base of Q34 via a zener Z4 and the divider R176/R177 where they are amplified and mixed with the previous left/right blanking.

The total composite blanking is then leaving the decoder board to reach the RGB OUTPUT board.

#### **VII. SPOT SUPPRESSION AT SWITCHING OFF .**

At switching off the projector the +17volts decreases faster than the +230 volts.

The sudden voltage drop at the collector of Q36 is transferred to :

- the base of Q41 via D40 and C111 to blank via the cathodes (RGB outputs). (note : this voltage is limited to 15 volts with Z5)
- the G1 via the capacitor C110 , this voltage jump is limited to (150 + 15)volts with Z1 and Z5.





ITEM NO.	SIT.	DESCRIPTION	ITEM NO.	SIT.	DESCRIPTION
11 1510	C..	CAP ELPR 22M M5 25	11 2365	C.80	CAP N750MI 180P J5 63
11 1531	C..1	CAP ELPR 10M M5 35	11 2387	C.81	CAP N152MI 470P J5 63
11 2774	C..2	CAP CE MI 100K U5 63	11 1531	C.82	CAP ELPR 10M M5 35
11 1531	C..3	CAP ELPR 10M M5 35	11 2365	C.83	CAP N750MI 180P J5 63
11 1531	C..4	CAP ELPR 10M M5 35	11 1571	C.84	CAP ELPR 2M2 M5 350
11 1531	C..5	CAP ELPR 10M M5 35	11 2774	C.85	CAP CE MI 100K U5 63
11 1531	C..6	CAP ELPR 10M M5 35	11 2774	C.86	CAP CE MI 100K U5 63
11 1500	C..7	CAP ELPR 47M M5 10	11 2774	C.87	CAP CE MI 100K U5 63
11 1531	C..8	CAP ELPR 10M M5 35	11 4085	C.88	CAP POMEPO 330K K5 63
11 1531	C..9	CAP ELPR 10M M5 35	11 2774	C.90	CAP CE MI 100K U5 63
11 2774	C.10	CAP CE MI 100K U5 63	11 1468	C.91	CAP ELPR 470M Z5 16
11 2774	C.11	CAP CE MI 100K U5 63	11 2774	C.92	CAP CE MI 100K U5 63
11 1531	C.13	CAP ELPR 10M M5 35	11 2774	C.93	CAP CE MI 100K U5 63
11 1500	C.14	CAP ELPR 47M M5 10	11 1531	C.94	CAP ELPR 10M M5 35
11 1531	C.15	CAP ELPR 10M M5 35	11 2774	C.95	CAP CE MI 100K U5 63
11 3730	C.16	CAP POME 330K K5 63	11 1531	C.96	CAP ELPR 10M M5 35
11 3732	C.17	CAP POME 470K K5 63	11 37121	C.97	CAP POME 10K K5 100
11 22415	C.18	CAP NPO MI 82P J5 63	11 1531	C.98	CAP ELPR 10M M5 35
11 1531	C.20	CAP ELPR 10M M5 35	11 2774	C.99	CAP CE MI 100K U5 63
11 22395	C.21	CAP NPO MI 56P G5 63	11 1531	C100	CAP ELPR 10M M5 35
11 22395	C.22	CAP NPO MI 56P G5 63	11 1531	C101	CAP ELPR 10M M5 35
11 2368	C.23	CAP N750MI 330P J5 63	11 2774	C102	CAP CE MI 100K U5 63
11 2387	C.24	CAP N152MI 470P J5 63	11 1466	C103	CAP ELPR 100M Z5 16
11 2387	C.25	CAP N152MI 470P J5 63	11 1476	C104	CAP ELPR 47M Z5 25
11 1476	C.26	CAP ELPR 47M Z5 25	11 2739	C105	CAP CE MI 1K K5 63
11 1531	C.27	CAP ELPR 10M M5 35	11 3730	C106	CAP POME 330K K5 63
11 3730	C.28	CAP POME 330K K5 63	11 2774	C109	CAP CE MI 100K U5 63
11 3730	C.29	CAP POME 330K K5 63	11 1571	C110	CAP ELPR 2M2 M5 350
11 1531	C.30	CAP ELPR 10M M5 35	11 1510	C111	CAP ELPR 22M M5 25
11 1531	C.31	CAP ELPR 10M M5 35	11 2774	C115	CAP CE MI 100K U5 63
11 1531	C.32	CAP ELPR 10M M5 35	11 2774	C116	CAP CE MI 100K U5 63
11 1531	C.33	CAP ELPR 10M M5 35	11 2774	C117	CAP CE MI 100K U5 63
11 2739	C.40	CAP CE MI 1K K5 63	11 3730	C120	CAP POME 330K K5 63
11 2364	C.41	CAP N750MI 150P J5 63	11 2774	C121	CAP CE MI 100K U5 63
11 2739	C.42	CAP CE MI 1K K5 63	11 3730	C122	CAP POME 330K K5 63
11 59061	C.43	CAP PP RA 390P J5 100	11 2774	C123	CAP CE MI 100K U5 63
11 3730	C.44	CAP POME 330K K5 63	11 3730	C125	CAP POME 330K K5 63
11 2234	C.45	CAP NPO MI 22P G5 63	11 2774	C126	CAP CE MI 100K U5 63
11 2366	C.48	CAP N750MI 220P J5 63	11 1546	C130	CAP ELPR 1M M5 50
11 2739	C.50	CAP CE MI 1K K5 63	11 1466	C131	CAP ELPR 100M Z5 16
11 2739	C.51	CAP CE MI 1K K5 63	11 2774	C401	CAP CE MI 100K U5 63
11 7001	C.52	CAP TRIM 7 -35P 160	11 2774	C402	CAP CE MI 100K U5 63
11 7001	C.53	CAP TRIM 7 -35P 160			
11 2365	C.54	CAP N750MI 180P J5 63	13 1621	D.1	DIODE 1N4148 SWITCH
11 2739	C.55	CAP CE MI 1K K5 63	13 1621	D.2	DIODE 1N4148 SWITCH
11 37161	C.56	CAP POME 22K K5 100	13 1621	D.3	DIODE 1N4148 SWITCH
11 37161	C.57	CAP POME 22K K5 100	13 1621	D.4	DIODE 1N4148 SWITCH
11 3730	C.58	CAP POME 330K K5 63	13 1621	D.5	DIODE 1N4148 SWITCH
11 3720	C.59	CAP POME 47K K5 63	13 1621	D.6	DIODE 1N4148 SWITCH
11 3730	C.60	CAP POME 330K K5 63	13 1621	D.7	DIODE 1N4148 SWITCH
11 2366	C.61	CAP N750MI 220P J5 63	13 1621	D.8	DIODE 1N4148 SWITCH
11 2240	C.62	CAP NPO MI 68P J5 63	13 1621	D.9	DIODE 1N4148 SWITCH
11 2243	C.63	CAP NPO MI 120P J5 63	13 1636	D.10	DIODE BAT43 BAT85 SCHOTTKY
11 2234	C.64	CAP NPO MI 22P G5 63	13 16217	D.11	DIODE 1N4148 V SWITCH
11 2366	C.65	CAP N750MI 220P J5 63	13 16217	D.12	DIODE 1N4148 V SWITCH
11 2234	C.66	CAP NPO MI 22P G5 63	13 1644	D.13	DIODE 1N4001 RECTIFIER
11 2243	C.67	CAP NPO MI 120P J5 63	13 1621	D.14	DIODE 1N4148 SWITCH
11 2240	C.68	CAP NPO MI 68P J5 63	13 1621	D.15	DIODE 1N4148 SWITCH
11 2763	C.69	CAP CE MI 10K U5 63	13 1621	D.18	DIODE 1N4148 SWITCH
11 3728	C.70	CAP POME 220K K5 63	13 1646	D.19	DIODE 1N4007 RECTIFIER
11 1476	C.71	CAP ELPR 47M Z5 25	13 1621	D.20	DIODE 1N4148 SWITCH
11 37161	C.72	CAP POME 22K K5 100	13 1621	D.21	DIODE 1N4148 SWITCH
11 2763	C.73	CAP CE MI 10K U5 63	13 1621	D.22	DIODE 1N4148 SWITCH
11 4102	C.74	CAP POMEFF 220K K 100	13 1621	D.23	DIODE 1N4148 SWITCH
11 4102	C.75	CAP POMEFF 220K K 100	13 1621	D.24	DIODE 1N4148 SWITCH
11 1531	C.76	CAP ELPR 10M M5 35	13 1636	D.30	DIODE BAT43 BAT85 SCHOTTKY
11 2774	C.77	CAP CE MI 100K U5 63	13 1948	D.40	DIODE BYD33D RECTIFIER



ITEM NO.	SIT.	DESCRIPTION	ITEM NO.	SIT.	DESCRIPTION
13 16217	D.41	DIODE 1N4148 V SWITCH	13 14295	Q.21	TSTR BC549B,
30 6529	DL.1	DELAY LINE P DL750	13 14295	Q.22	TSTR BC549B,
30 6511	DL.2	DELAY LINE M P/S DL710,DL711	13 14295	Q.23	TSTR BC549B,
30 6528	DL.3	DELAY LINE TAP 400US	13 14295	Q.24	TSTR BC549B,
13 2134	I..1	IC 3046 331TBA	13 14295	Q.25	TSTR BC549B,
13 2728	I..2	IC 4557 TDA MULTI STD DEC	13 14295	Q.26	TSTR BC549B,
13 2833	I..3	IC 76013 SC (1989) DMP I2C	13 14295	Q.29	TSTR BC549B,
13 2773	I..4	IC 4560/65 TDA	13 14295	Q.30	TSTR BC549B,
13 2833	I..5	IC 76013 SC (1989) DMP I2C	13 14295	Q.31	TSTR BC549B,
13 4114	I..6	IC 393	13 14181	Q.32	TSTR BC559B,BC309B
13 2826	I..7	IC 1203 RGB DRIVER	13 1491	Q.33	TSTR BSX20,2N2369
13 4002	I..8	IC 7812	13 1491	Q.34	TSTR BSX20,2N2369
13 4032	I..9	IC 78LO5	13 14295	Q.35	TSTR BC549B,
13 4034	I.10	IC 79L12	13 1471	Q.36	TSTR BF458
13 4034	I402	IC 79L12	13 14295	Q.37	TSTR BC549B,
31 3525	J1..	CONN EURO MBS P64	13 14295	Q.38	TSTR BC549B,
31 3525	J2..	CONN EURO MBS P64	13 14295	Q.39	TSTR BC549B,
31 3947	J3..	CONN CT-MT MBS P 7 2	13 1491	Q.40	TSTR BSX20,2N2369
77 3310	L..1	COIL N27,5 K5 D0,14 IF32	13 14181	Q.41	TSTR BC559B,BC309B
77 4212	L..2	COIL N40 C5 D0,125PALREC	13 14181	Q.42	TSTR BC559B,BC309B
77 4211	L..3	COIL N56 K5 D0,125 PHASE	13 1491	Q.50	TSTR BSX20,2N2369
77 4211	L..4	COIL N56 K5 D0,125 PHASE	13 1491	Q.51	TSTR BSX20,2N2369
77 4212	L..5	COIL N40 C5 D0,125PALREC	13 1491	Q.52	TSTR BSX20,2N2369
77 4212	L..6	COIL N40 C5 D0,125PALREC	10 1130	R.1	RES CF 330E J 0W25
77 4212	L..7	COIL N40 C5 D0,125PALREC	10 1156	R.2	RES CF 47K J 0W25
30 6024	L..8	CHOKE RA NS 10 UH	10 1156	R.3	RES CF 47K J 0W25
30 6052	L..9	CHOKE RA NS 150 UH	10 1112	R.4	RES CF 10E J 0W25
30 6052	L.10	CHOKE RA NS 150 UH	10 1140	R.5	RES CF 2K2 J 0W25
77 4212	L.11	COIL N40 C5 D0,125PALREC	10 11284	R.6	RES MF 200E F 0W25
30 61322	L.12	CHOKE AX NS 10 UH	10 1148	R.7	RES CF 10K J 0W25
30 61322	L.13	CHOKE AX NS 10 UH	10 1148	R.8	RES CF 10K J 0W25
10 6726	P..1	TRIMPOT CEMH 1K K 0W50	10 11284	R.9	RES MF 200E F 0W25
10 6727	P..2	TRIMPOT CEMH 2K K 0W50	10 1130	R.10	RES CF 330E J 0W25
10 6727	P..3	TRIMPOT CEMH 2K K 0W50	10 1154	R.15	RES CF 33K J 0W25
10 6724	P..4	TRIMPOT CEMH 200E K 0W50	10 1154	R.16	RES CF 33K J 0W25
10 6725	P..5	TRIMPOT CEMH 500E K 0W50	10 1137	R.17	RES CF 1K2 J 0W25
10 6725	P..6	TRIMPOT CEMH 500E K 0W50	10 1140	R.18	RES CF 2K2 J 0W25
10 6725	P..7	TRIMPOT CEMH 500E K 0W50	10 1140	R.19	RES CF 2K2 J 0W25
78 0016	PC..	PC PJ 49 DEC 761753	10 1161	R.20	RES CF 120K J 0W25
13 1948	Q..	DIODE BYD33D RECTIFIER	10 1154	R.21	RES CF 33K J 0W25
13 14295	Q..1	TSTR BC549B,	10 1134	R.22	RES CF 680E J 0W25
13 1411	Q..2	TSTR BC549C,BC239C	10 1124	R.23	RES CF 100E J 0W25
13 14295	Q..3	TSTR BC549B,	10 1148	R.24	RES CF 10K J 0W25
13 14295	Q..4	TSTR BC549B,	10 1134	R.25	RES CF 680E J 0W25
13 14181	Q..5	TSTR BC559B,BC309B	10 1128	R.26	RES CF 220E J 0W25
13 14181	Q..6	TSTR BC559B,BC309B	10 1133	R.27	RES CF 560E J 0W25
13 14181	Q..7	TSTR BC559B,BC309B	10 1138	R.28	RES CF 1K5 J 0W25
13 14181	Q..8	TSTR BC559B,BC309B	10 1160	R.29	RES CF 100K J 0W25
13 14181	Q..9	TSTR BC559B,BC309B	10 1143	R.30	RES CF 3K9 J 0W25
13 14295	Q.10	TSTR BC549B,	10 1132	R.40	RES CF 470E J 0W25
13 14295	Q.11	TSTR BC549B,	10 1132	R.41	RES CF 470E J 0W25
13 14295	Q.12	TSTR BC549B,	10 1128	R.42	RES CF 220E J 0W25
13 14295	Q.13	TSTR BC549B,	10 1134	R.43	RES CF 680E J 0W25
13 14295	Q.14	TSTR BC549B,	10 1132	R.44	RES CF 470E J 0W25
13 14181	Q.15	TSTR BC559B,BC309B	10 1128	R.45	RES CF 220E J 0W25
13 14295	Q.16	TSTR BC549B,	10 1138	R.46	RES CF 1K5 J 0W25
13 14181	Q.17	TSTR BC559B,BC309B	10 1138	R.47	RES CF 1K5 J 0W25
13 14181	Q.18	TSTR BC559B,BC309B	10 1144	R.48	RES CF 4K7 J 0W25
13 14181	Q.19	TSTR BC559B,BC309B	10 1134	R.49	RES CF 680E J 0W25
13 14295	Q.20	TSTR BC549B,	10 1134	R.50	RES CF 680E J 0W25
			10 1134	R.51	RES CF 680E J 0W25
			10 1134	R.52	RES CF 680E J 0W25
			10 1144	R.53	RES CF 4K7 J 0W25
			10 1132	R.54	RES CF 470E J 0W25
			10 1132	R.55	RES CF 470E J 0W25
			10 1138	R.56	RES CF 1K5 J 0W25

ITEM NO.	SIT.	DESCRIPTION
10 1150	R.57	RES CF 15K J 0W25
10 1144	R.58	RES CF 4K7 J 0W25
10 1160	R.61	RES CF 100K J 0W25
10 1160	R.62	RES CF 100K J 0W25
10 1122	R.63	RES CF 68E J 0W25
10 1134	R.64	RES CF 680E J 0W25
10 1150	R.65	RES CF 15K J 0W25
10 1140	R.66	RES CF 2K2 J 0W25
10 1148	R.68	RES CF 10K J 0W25
10 1156	R.69	RES CF 47K J 0W25
10 1153	R.70	RES CF 27K J 0W25
10 1156	R.72	RES CF 47K J 0W25
10 1137	R.73	RES CF 1K2 J 0W25
10 1128	R.74	RES CF 220E J 0W25
10 1128	R.75	RES CF 220E J 0W25
10 1161	R.76	RES CF 120K J 0W25
10 1150	R.77	RES CF 15K J 0W25
10 1136	R.78	RES CF 1K J 0W25
10 1128	R.79	RES CF 220E J 0W25
10 1136	R.80	RES CF 1K J 0W25
10 11354	R.85	RES MF 820E F 0W25
10 11403	R.86	RES MF 2K F 0W25
10 11403	R.87	RES MF 2K F 0W25
10 11364	R.88	RES MF 1K F 0W25
10 11403	R.89	RES MF 2K F 0W25
10 11364	R.90	RES MF 1K F 0W25
10 11364	R.91	RES MF 1K F 0W25
10 11364	R.92	RES MF 1K F 0W25
10 11403	R.93	RES MF 2K F 0W25
10 11364	R.94	RES MF 1K F 0W25
10 1119	R.95	RES CF 39E J 0W25
10 1160	R.96	RES CF 100K J 0W25
10 1119	R.97	RES CF 39E J 0W25
10 1160	R.98	RES CF 100K J 0W25
10 1119	R.99	RES CF 39E J 0W25
10 1144	R100	RES CF 4K7 J 0W25
10 1144	R101	RES CF 4K7 J 0W25
10 1144	R102	RES CF 4K7 J 0W25
10 1160	R105	RES CF 100K J 0W25
10 1136	R106	RES CF 1K J 0W25
10 1142	R110	RES CF 3K3 J 0W25
10 1138	R111	RES CF 1K5 J 0W25
10 1150	R112	RES CF 15K J 0W25
10 1140	R113	RES CF 2K2 J 0W25
10 1150	R114	RES CF 15K J 0W25
10 1130	R115	RES CF 330E J 0W25
10 1150	R116	RES CF 15K J 0W25
10 1148	R117	RES CF 10K J 0W25
10 1150	R118	RES CF 15K J 0W25
10 1140	R119	RES CF 2K2 J 0W25
10 1148	R121	RES CF 10K J 0W25
10 1148	R122	RES CF 10K J 0W25
10 1148	R123	RES CF 10K J 0W25
10 1148	R124	RES CF 10K J 0W25
10 1144	R125	RES CF 4K7 J 0W25
10 1148	R126	RES CF 10K J 0W25
10 1127	R127	RES CF 180E J 0W25
10 1137	R128	RES CF 1K2 J 0W25
10 1131	R129	RES CF 390E J 0W25
10 1135	R130	RES CF 820E J 0W25
10 1140	R131	RES CF 2K2 J 0W25
10 1138	R132	RES CF 1K5 J 0W25
10 1150	R133	RES CF 15K J 0W25
10 1150	R134	RES CF 15K J 0W25
10 1148	R135	RES CF 10K J 0W25
10 1148	R136	RES CF 10K J 0W25
10 1138	R137	RES CF 1K5 J 0W25

ITEM NO.	SIT.	DESCRIPTION
10 1140	R140	RES CF 2K2 J 0W25
10 1138	R141	RES CF 1K5 J 0W25
10 1141	R142	RES CF 2K7 J 0W25
10 1146	R143	RES CF 6K8 J 0W25
10 1138	R144	RES CF 1K5 J 0W25
10 1135	R145	RES CF 820E J 0W25
10 1140	R146	RES CF 2K2 J 0W25
10 1144	R147	RES CF 4K7 J 0W25
10 1135	R148	RES CF 820E J 0W25
10 1135	R149	RES CF 820E J 0W25
10 1144	R150	RES CF 4K7 J 0W25
10 1140	R151	RES CF 2K2 J 0W25
10 1142	R154	RES CF 3K3 J 0W25
10 1148	R157	RES CF 10K J 0W25
10 1152	R158	RES CF 22K J 0W25
10 1136	R159	RES CF 1K J 0W25
10 1144	R160	RES CF 4K7 J 0W25
10 3248	R161	RES MO 10K J 1W50
10 1136	R162	RES CF 1K J 0W25
10 1147	R163	RES CF 8K2 J 0W25
10 1142	R164	RES CF 3K3 J 0W25
10 1138	R165	RES CF 1K5 J 0W25
10 1136	R166	RES CF 1K J 0W25
10 1142	R167	RES CF 3K3 J 0W25
10 1136	R168	RES CF 1K J 0W25
10 1136	R169	RES CF 1K J 0W25
10 1136	R170	RES CF 1K J 0W25
10 1136	R171	RES CF 1K J 0W25
10 1144	R172	RES CF 4K7 J 0W25
10 1164	R174	RES CF 220K J 0W25
10 1152	R175	RES CF 22K J 0W25
10 1144	R176	RES CF 4K7 J 0W25
10 1136	R177	RES CF 1K J 0W25
10 1143	R178	RES CF 3K9 J 0W25
10 1148	R179	RES CF 10K J 0W25
10 1148	R181	RES CF 10K J 0W25
10 1139	R187	RES CF 1K8 J 0W25
10 1139	R188	RES CF 1K8 J 0W25
10 1139	R189	RES CF 1K8 J 0W25
10 11231	R190	RES CF 75E J 0W25
10 1148	R191	RES CF 10K J 0W25
10 11231	R192	RES CF 75E J 0W25
10 1148	R193	RES CF 10K J 0W25
10 11231	R194	RES CF 75E J 0W25
10 1148	R195	RES CF 10K J 0W25
10 1131	R196	RES CF 390E J 0W25
10 1131	R197	RES CF 390E J 0W25
10 1131	R198	RES CF 390E J 0W25
10 1153	R199	RES CF 27K J 0W25
10 1142	R200	RES CF 3K3 J 0W25
10 1148	R201	RES CF 10K J 0W25
10 1148	R202	RES CF 10K J 0W25
10 1143	R203	RES CF 3K9 J 0W25
10 0136	R204	RES CF V 1K J5 0W25
10 1134	R205	RES CF 680E J 0W25
10 0160	R206	RES CF V 100K J5 0W25
10 1149	R207	RES CF 12K J 0W25
10 1159	R208	RES CF 82K J 0W25
10 1124	R209	RES CF 100E J 0W25
10 1112	R210	RES CF 10E J 0W25
10 1112	R210	RES CF 10E J 0W25
10 1112	R211	RES CF 10E J 0W25
10 1112	R211	RES CF 10E J 0W25
10 1112	R211	RES CF 10E J 0W25
10 1112	R212	RES CF 10E J 0W25
10 01129	R212	RES CFFV 10E J5 0W25
10 1142	R220	RES CF 3K3 J 0W25
10 1168	R221	RES CF 470K J 0W25

# QUAD DECODER + RGB AMPLIFIER MODULE

76 1753

ITEM NO.	SIT.	DESCRIPTION	ITEM NO.	SIT.	DESCRIPTION
10 1157	R222	RES CF 56K J 0W25	13 1788	Z...	DIODE ZENER 15V BZX79C15
10 1136	R223	RES CF 1K J 0W25	13 1771	Z.1	DIODE ZENER150V 0W5 C
10 12009	R230	RES CFFUL 1E J 0W50	13 17215	Z.2	DIODE ZENER 13V 0W5 B
10 1152	R231	RES CF 22K J 0W25	13 1754	Z.3	DIODE ZENER 3V3 0W5 C
10 1140	R233	RES CF 2K2 J 0W25	13 1766	Z.4	DIODE ZENER 18V 0W5 B
10 11129	R234	RES CFFUL 10E J 0W25	13 1788	Z.5	DIODE ZENER 15V BZX79C15
10 1156	R235	RES CF 47K J 0W25	31 33921	0010	CONN JUMP FMT P 2 2,5
10 11129	R236	RES CFFUL 10E J 0W25	13 3039	0020	SPACER L 8 D 4 D1,2 CER
10 1124	R240	RES CF 100E J 0W25	13 3036	0030	SPACER L 6 D 6 D2,4 CER
10 1124	R241	RES CF 100E J 0W25	31 3253	0040	CONN IC FBT P28 15
10 11129	R401	RES CFFUL 10E J 0W25	80 2629	0100	HEATSINK PJ 49 RGB PRE AMP
31 3286	S..1	CONN WAFER MBT P 3 2,5	80 2692	0110	HEATSINK PJ 49 FIX HEATSINK
31 3286	S..2	CONN WAFER MBT P 3 2,5	36 20226	0120	SCREW DIN84 M 3 X 8 MP-
30 6816	XT.1	X-TAL 8,867 238 MHZ	36 61026	0121	NUT DIN934 M 3 HEXAGONAL
30 6849	XT.2	X-TAL 7,159 090 MHZ PCM 5MM	36 7502	0122	WASHER DIN6798 A 3,2

# QUAD DECODER + RGB AMPLIFIER MODULE

76 1753



ART.NO.	DESCRIPTION	QUANTITY	ART.NO.	DESCRIPTION	QUANTITY
10 01129	RES CFFV 10E J5 0W25	1	13 4002	IC 7812	1
10 11129	RES CFFUL 10E J 0W25	3 *	13 4032	IC 78L05	1
10 11403	RES MF 2K F 0W25	4	13 4034	IC 79L12	2
10 12009	RES CFFUL 1E J 0W50	1 *	13 4114	IC 393	1
10 3248	RES MO 10K J 1W50	1			
10 6724	TRIMPOT CEMH 200E K 0W50	1	30 6024	CHOKE RA NS 10 UH	1
10 6725	TRIMPOT CEMH 500E K 0W50	3	30 6052	CHOKE RA NS 150 UH	2
10 6726	TRIMPOT CEMH 1K K 0W50	1	30 61322	CHOKE AX NS 10 UH	2
10 6727	TRIMPOT CEMH 2K K 0W50	2	30 6511	DELAY LINE M P/S DL710,DL711	1 *
			30 6528	DELAY LINE TAP 400US	1 *
11 1571	CAP ELPR 2M2 M5 350	2	30 6529	DELAY LINE P DL750	1 *
11 7001	CAP TRIM 7 -35P 160	2	30 6816	X-TAL 8,867 238 MHZ	1 *
			30 6849	X-TAL 7,159 090 MHZ PCM 5MM	1 *
13 1411	TSTR BC549C,BC239C	1			
13 14181	TSTR BC559B,BC309B	12	31 3253	CONN IC FBT P28 15	1
13 14295	TSTR BC549B,	23	31 3286	CONN WAFER MBT P 3 2,5	2
13 1471	TSTR BF458	1	31 33921	CONN JUMP FMT P 2 2,5	1
13 1491	TSTR BSX20,2N2369	6	31 3525	CONN EURO MBS P64	2 *
13 1621	DIODE 1N4148 SWITCH	17	31 3947	CONN CT-MT MBS P 7 2	1 *
13 16217	DIODE 1N4148 V SWITCH	3			
13 1636	DIODE BAT43 BAT85 SCHOTTKY	2	36 7699	RIVET CHOBERT D2,38 I6,35	4 *
13 1644	DIODE 1N4001 RECTIFIER	1	36 20226	SCREW DIN84 M 3 X 8 MP-	1
13 1646	DIODE 1N4007 RECTIFIER	1	36 61026	NUT DIN934 M 3 HEXAGONAL	1
13 17215	DIODE ZENER 13V 0W5 B	1	36 7502	WASHER DIN6798 A 3,2	1
13 1754	DIODE ZENER 3V3 0W5 C	1			
13 1766	DIODE ZENER 18V 0W5 B	1	72 2276	LOCKING PCB BOARD	1 *
13 1771	DIODE ZENER150V 0W5 C	1			
13 1788	DIODE ZENER 15V BZX79C15	2	77 3310	COIL N27,5 K5 D0,14 IF32	1
13 1948	DIODE BYD33D RECTIFIER	2	77 4211	COIL N56 K5 D0,125 PHASE	2
13 2134	IC 3046 331TBA	1	77 4212	COIL N40 C5 D0,125PALREC	5
13 2728	IC 4557 TDA MULTI STD DEC	1			
13 2773	IC 4560/65 TDA	1	78 0016	PC PJ 49 DEC 761753	1
13 2826	IC 1203 RGB DRIVER	1			
13 2833	IC 76013 SC (1989) DMP I2C	2	80 2629	HEATSINK PJ 49 RGB PRE AMP	1 *
13 3036	SPACER L 6 D 6 D2,4 CER	6 *	80 2692	HEATSINK PJ 49 FIX HEATSINK	1 *
13 3039	SPACER L 8 D 4 D1,2 CER	1			

\* NUMBERS REFERRING TO PICTURE

