BARCO

BARCO Projection Systems

SECTION **M**

service sheet

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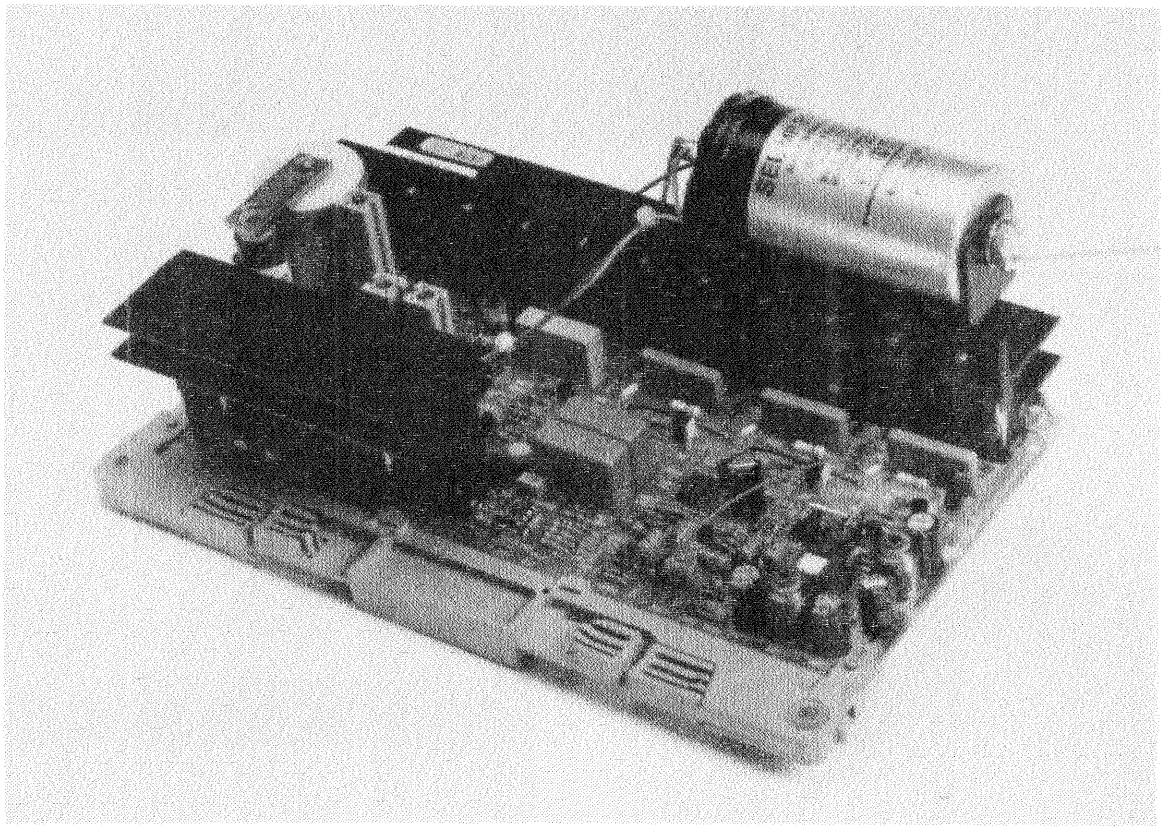
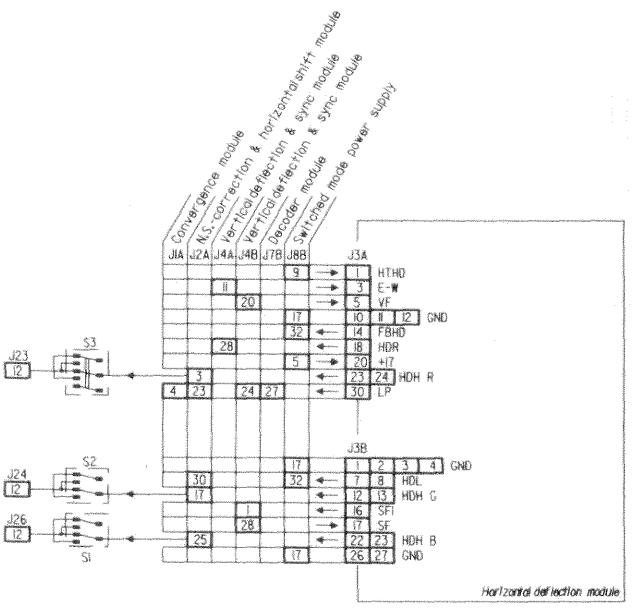
HORIZONTAL DEFLECTION MODULE 76 1766





Name Interconnection Horizontal deflection module			Article nr. 761766
Date 15/09/1990	Drawn PG	Checked KC	
BARCO PROJECTION SYSTEMS			

Main frame interconnection
Horizontal deflection module

BARCO

J8

J1 J30 J29 J28

J37 J38 J26 J35 J34 J24 J23 J33 J32

J10A J9 SMPS J7B J6B

+17 4
NTHD 9
GND 17
FBHD 32

S6

J48 Vertical deflection
1 SF 1
20 VDH B
24 LP
28 SF

J3B Horizontal deflection
GND 27
SF 17
SF 1 16
26 GND
22 HDH R
12 HDH G
7 HDL
1 GND

J2B North-South correction

J4A
8 E-W
28 HDR

J3A
HDR 18
GND 10
VF 5
E-W 3
30 LP
23 HDH R
20 +17
14 FBHD
12 GND
1 NTHD

J2A
HDL 32
HDH R 27
HDL R 25
LP 23
S1 BLUE
HDL G 19
HDH G 17
S2 GREEN
HSI 12
GND 8
HDL R 8
HDH R 3
S3 RED

J5A J6A J7A J8A J9A

S42
Mains power switch
Mains input

J48A

J50 J51
R 33 KN2 R 33 KN2

J50A

N
L
S5
Termination switch
VIDEO VIDEO BLUE GREEN RED HS VS

J1

J33

J35 J36

Modifications reserved

Name	Interconnection Horizontal deflection	Article nr.	78078
Date	08/07/1998	Drawn	PGDE
		Checked	KC

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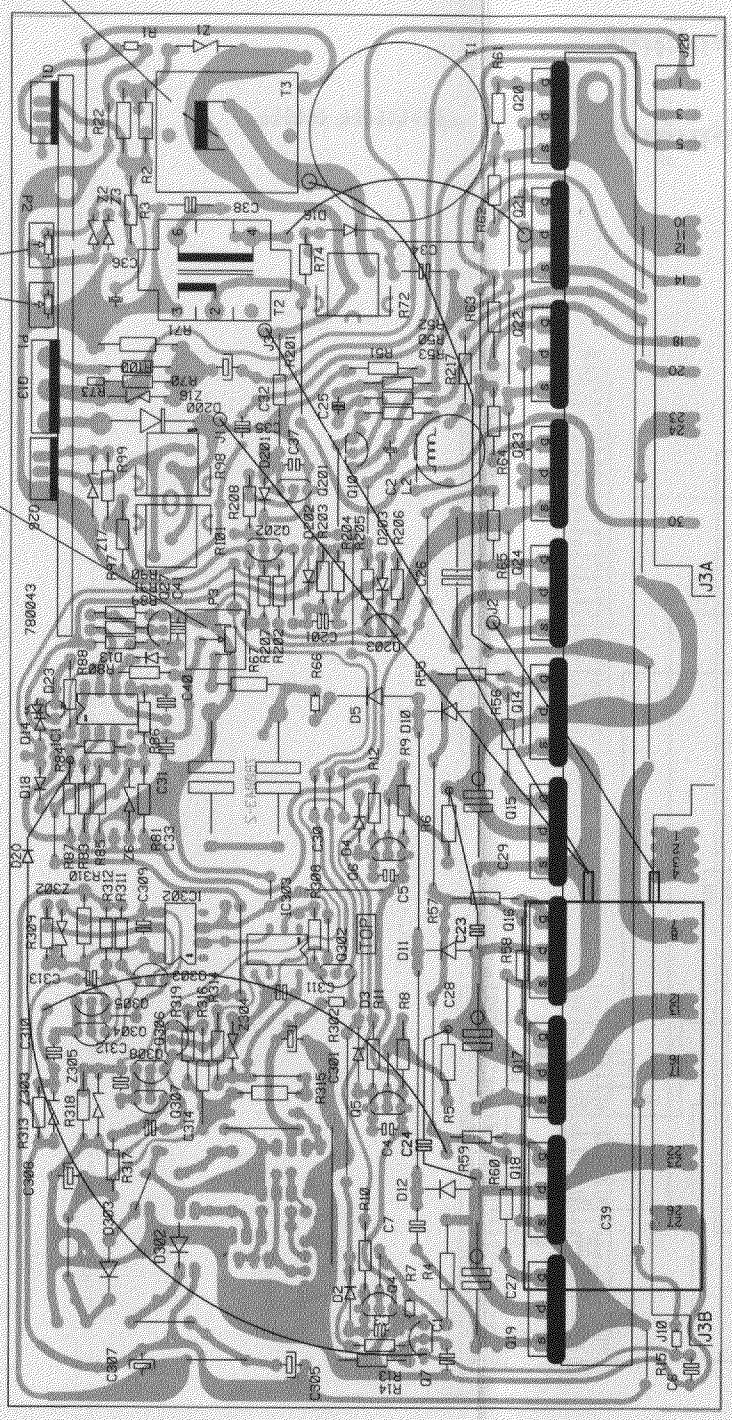


COMP.	LOC.	COMP.	LOC.
C1	B 3	R1	G 2
C2	E 3	R2	F 2
C3	B 3	R3	F 2
C4	C 3	R4	B 3
C5	C 3	R5	C 3
C6	B 4	R6	D 3
C7	B 3	R7	B 3
C23	C 3	R8	C 3
C24	C 3	R9	D 3
C25	E 2	R10	B 3
C26	E 3	R11	C 3
C27	B 3	R12	D 3
C28	C 3	R13	B 3
C29	D 3	R14	B 3
C30	D 2	R15	B 4
C31	D 2	R22	F 2
C32	E 2	R50	F 3
C33	D 2	R51	F 3
C34	F 3	R52	F 3
C35	E 2	R53	F 3
C36	F 2	R55	D 3
C37	E 2	R56	D 3
C38	F 2	R57	C 3
C40	D 2	R58	C 3
C41	E 2	R59	B 3
C201	E 3	R60	B 3
C301	C 3	R61	G 3
C305	B 2	R62	F 3
C307	B 2	R63	F 3
C308	B 1	R64	E 3
C309	C 2	R65	E 3
C310	C 1	R66	D 2
C311	C 3	R67	D 2
C312	C 2	R70	F 2
C313	C 1	R71	F 2
C314	C 2	R72	F 3
		R74	F 2
D2	B 3	R80	D 2
D3	C 3	R81	D 2
D4	D 3	R83	D 2
D5	D 3	R84	D 1
D10	D 3	R85	D 2
D11	C 3	R86	D 2
D12	B 3	R87	D 2
D13	D 2	R88	D 2
D14	D 1	R89	E 2
D15	F 2	R90	E 2
D18	D 1	R91	E 2
D23	D 1	R97	E 2
D200	E 2	R98	E 2
D201	E 2	R99	E 2
D202	E 2	R100	F 2
D203	E 3	R101	E 2
D303	B 2	R201	F 2
		R202	D 2
IC1	D 1	R203	E 2
IC302	D 2	R204	E 3
IC303	C 2	R205	E 3
		R206	E 3
J1	E 2	R207	D 2
J2	E 3	R208	E 2
J3	F 2	R217	F 1
J10	B 4	R302	C 3
J20	G 4	R308	D 2
		R309	C 1
L2	E 3	R310	D 2
		R311	C 2
P1	F 1	R312	C 2
P2	F 1	R313	C 1
P3	E 2	R314	C 2
		R315	C 2
Q1	G 1	R316	C 2
Q4	B 3	R317	B 2
Q5	C 3	R318	C 2
Q6	D 3	R319	C 2
Q7	B 3		
Q10	E 3	T1	G 3
Q13	F 1	T2	F 2
Q14	D 3		
Q15	D 3	Z1	G 2
Q16	C 3	Z2	F 2
Q17	C 3	Z3	F 2
Q18	B 3	Z6	D 2
Q19	B 3	Z16	E 2
Q20	G 3	Z17	E 2
Q21	F 3	Z302	D 1
Q22	F 3	Z303	C 1
Q23	E 3	Z304	C 2
Q24	E 3	Z305	C 2
Q26	E 1		
Q27	E 2		
Q201	E 2		
Q202	E 2		
Q203	D 3		
Q302	C 3		
Q303	C 2		
Q304	C 2		
Q305	C 2		
Q306	C 2		
Q307	C 2		
Q308	C 2		

Name	Horizontal deflection	Article nr.
Date 19/07/1991	Drawn PGOE	Checked KC

BARCO PROJECTION SYSTEMS

78 0043

BARCO

PRODUCT SAFETY NOTICE

COMPONENTS MARKED WITH * OR ⚠ 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

0.25W 0.5oW 1W 1.5W

Adjustment horizontal linearity @ 15 KHz

VERT RATE SAWTOOTH

MAGNETICALLY COUPLED ADJUSTING DC CURRENT THROUGH T1 ADJUSTS LIN IN T3

E-W correction

VERT FLY BACK

Linearity controls

used to detect flyback on C39

wire 30cm.

ON time CONSTANT

OVER I TURNS ON

Over-current protection

SELF-RESETTING

NORM ON

FROM SYNC VERT DEFL

HORIZ DRIVE

Scan fail detection

NORM OFF

LOW = SCAN FAIL

COMP.	LOC.	COMP.	LOC.
C1	H 3	R1	C 4
C2	G 4	R2	B 4
C3	H 2	R3	B 4
C4	H 3	R4	G 2
C5	H 4	R5	G 3
C6	I 3	R6	G 3
C7	J 7	R7	G 2
C23	G 6	R8	G 3
C24	I 6	R9	G 4
C25	C 4	R10	G 1
C26	I 7	R11	G 2
C27	I 7	R12	G 3
C28	H 7	R13	H 2
C29	G 7	R14	H 3
C30	J 7	R15	I 2
C31	K 7	R22	B 4
C32	A 2	R50	C 4
C33	J 7	R51	C 4
C34	F 6	R52	C 4
C35	A 4	R53	D 4
C36	B 4	R55	E 7
C37	D 3	R56	F 7
C38	E 6	R57	G 7
C39	B 3	R58	G 7
C40	K 6	R59	H 7
C41	K 7	R60	I 7
C201	E 3	R61	E 7
C301	C 6	R62	F 7
C302	D 6	R63	G 7
C308	D 6	R64	G 7
C309	B 7	R65	H 7
C310	D 7	R66	J 6
C311	B 8	R67	J 6
C312	C 8	R70	A 2
C313	D 7	R71	A 2
C314	D 8	R72	B 1
		R73	A 2
D2	H 2	R74	F 6
D3	H 2	R80	K 7
D4	H 3	R81	K 5
D5	J 6	R83	K 5
D10	J 6	R84	K 5
D11	J 6	R85	K 6
D12	J 7	R86	K 6
D13	K 7	R87	L 5
D14	L 6	R88	L 5
D16	F 6	R89	K 7
D18	L 5	R90	L 7
D20	J 3	R91	L 7
D23	L 5	R97	A 4
D200	B 2	R98	A 4
D202	D 3	R99	A 4
D203	E 3	R100	A 2
D302	C 6	R101	A 4
D303	C 5	R201	D 3
		R202	E 3
IC1	J 5	R203	E 3
IC1	J 5	R204	D 3
IC1	K 5	R204	D 3
IC1	K 6	R204	E 3
IC302	B 7	R205	F 3
IC303	B 8	R206	E 3
		R207	E 4
L2	G 4	R208	D 3
		R300	C 6
P1	B 4	R308	A 8
P2	B 4	R309	C 7
P3	J 7	R310	C 6
		R311	C 7
Q1	C 4	R312	C 6
Q4	G 2	R313	D 7
Q5	G 3	R314	C 8
Q6	G 4	R315	C 7
Q7	I 2	R316	C 7
Q10	D 4	R317	C 7
Q13	B 2	R318	D 8
Q14	F 7	R319	I 5
Q15	F 7		
Q16	G 7	SR217	G 4
Q17	H 7		
Q18	H 7	T1	B 3
Q19	I 7	T2	E 6
Q20	F 8	T3	B 1
Q21	F 8		
Q22	G 8	Z1	B 3
Q23	H 8	Z2	B 4
Q24	H 8	Z3	B 4
Q26	A 4	Z6	K 6
Q27	K 7	Z16	A 2
Q202	E 3	Z17	A 4
Q203	F 3	Z302	D 7
Q302	A 7	Z303	D 7
Q303	C 7	Z304	B 8
Q304	C 7	Z305	D 8
Q305	C 7	Z306	A 8
Q306	C 8		
Q307	C 8		
Q308	C 8		

TROUBLESHOOTING
1. check VDD on OPTOS
2. check pulse at
3. check Z305 Z303 should be 5.6 -VE = no signal or ZENER KNACKED

LIMITS THE to prevent mosfets driving pulses also keeps drive pulses @ 17V PK WRT GRND

HORIZ LINE PULSE

33 dalloc Yoke Red

33 green

33 Blue

Used to monitor 17 line scan fail IF 17V falls below 6.2V

Hold down deflection ON IF PICTURE TOO WIDE

Adjustment picture width limiter

SHORTS HORIZ DRIVES NEXT SCAN FAIL

NORM ON OFF = FAIL LOCKS INTO SCAN FAIL

Under-voltage protection

Over-voltage protection

HOLDS VDD ABOVE THE LOW LINE TO PREVENT POWER DOWN

J3A To frame

1	HTHD
3	E-W
5	VF
10	
11	GND
12	
14	FBHD
18	HDR
20	+17
23	HDH R
24	
30	LP

J3B To frame

1	
2	GND
3	
4	
7	HDL
8	
12	HDH G
13	
16	SF
17	
22	HDH B
23	
26	GND
27	

Name	Horizontal deflection module	Artwork no. 761766 01
Date 15/04/1991	Drawn PGOE	Checked KC

BARCO PROJECTION SYSTEMS

HORIZONTAL DEFLECTION MODULE 76 1766

Introduction

The following adjustments are provided on the main board:

a: Overvoltage protection (=scan hold down) P3

b: Horizontal linearity adj. at 15 kHz
at 22 kHz and
at 50 kHz

Overvoltage protection

Preparation
Switch **OFF** the projector
Adjust P3 to its physical minimum (turning anti-clockwise)
Adjust P2 "MAX HOR. AMPL." on the SM Power Supply to its physical minimum (turning anti-clockwise).

Adjustment
Switch **ON** the projector.
With respect to chassis ground, measure the dc voltage at resistor R66.
Adjust P2 on the SM Power Supply for 1850Vdc.
Adjust P3 (turning clockwise) until the scan hold down LED D23 lights up. (Projector in hold down)
Reduce the HOR. AMPL. P2 setting (turning anti-clockwise)

Restart the projector (power switch Off/On)
Adjust P2 as explained in the adjustment procedure of the SM Power Supply (refer to corresponding service scheet)

Horizontal linearity

1. Adjust the core of the linearity coil using a 15 kHz input source.
2. Adjust P2 using a 22 kHz input source.
3. Adjust P1 using a 50 kHz input source.
   Note: If a 50 kHz input source is not available, then any source between 50-64 kHz may be used.

INTRODUCTION.

On this board we find the Mosfet switchers to generate the currents through the scan coils.

In order to obtain a very short retrace time with a relative low scan voltage, and, as a Mosfet only may have 1000 volts across its drain-source, we find two switchers in series.

The drive pulses for the top switchers may not be related to ground level and consequently, a special drive pulse preparation is necessary.

Furthermore, we find the required protection circuits like æscan hold downÆ and scan failure.

PREPARATION OF THE DRIVE PULSES.

The horizontal deflection uses two Mosfets in series in order to be capable of handling about 2000 volts pulses with a flyback time of less than 2 uS.

Two drive pulses on different voltage level are required.

The bottom Mosfet is driven by a pulse train referred to ground level, whereas the top Mosfets are driven by a pulse train referred to the mid point of the two series connected mosfets.

The drive pulses, prepared on the un sync+vert defl board, are sent to the amplifier-shaper Q10. At the collector these pulses are buffered by Q302 and feed the series connected opto-couplers IC302/IC303.

A switched mode power supply around IC301, drives a Mosfet Q301, producing two same voltages .

One of the windings produces a floating voltage that will be referred to the node of the two mosfet switchers is .The other winding produces a voltage referred to ground to reproduce the 'low' drive pulse.

Note that this voltage is equally used as feedback for the switched mode power supply on this board..

Obviously, the High drive pulses are reaching the gate-source of the top-Mosfets and the Low drive pulses are driving the bottom Mosfet switchers.

The 20 volts zenerdiodes ptotect the gate-sources from exceeding the maximum tolerable voltage.
And on the other hand clamp the pulses at -0.6volts.

MODULATION OF THE SCAN VOLTAGE (EAST - WEST CORRECTION).

The +HTHD voltage from the Switched Mode Power Supply is modulated in Q13 by means of the East-West correcting waveform.

As the change of voltage on the capacitor C39 (buffer) is maximum during the vertical retrace time, there exists a risk that this change of voltage is not fully performed during this short period of time.

A vertical flyback pulse VF saturates Q26 at each vertical retrace and discharges the buffer capacitor C39 to the same voltage. By this measure, there is a minimum interaction of the bottom correction on the top of the picture.

HORIZONTAL LINEARITY CONTROL.

The horizontal linearity coil is line frequency dependent and can obviously not give full satisfaction for the whole frequency range. A modulation of the coil, on other terms a 'tracking' with the line frequencies is really a need.

A second coil is now magnetically coupled with the linearity coil T3.
The current flowing in the above tracking coil is the drain-source current of Q1.

The gate voltage of Q1 is the +HTHD voltage, thus a voltage that increases linearly with the line frequency.

Now, in the bias of this gate we find some three zeners and two adjustable resistors.
It is obvious that the zeners cannot perform a 'zener' function as long the applied voltage is below the zener level.

The Z1 (33V) stabilises a 33 volts as soon the +HTHD is beyond the 33 volts or the line frequency beyond the 15khz.

The next step is reached when Z3 starts stabilising.

From that moment onwards, the voltage across P2 is stabilised at 6.2 volts and the current through P2 is no more contributing to the drain-source current.

Obviously, the next sdtep is reached when Z2 stabilises and from then onwards, the resitors R2/R3/R22 determione the gate voltage and thus the drain-source current.

As a conclusion, we see that the required current for the modulating coil is not increasing linearly with the line frequency, but rather exponentially.

The total frequency range is divided into three ranges, whereas ewg of these ranges has a well determined correcting current.

PROTECTION CIRCUITS.

a) Overcurrent protection :

If for some reason, the sum of the currents in the scan coils exceeds a well-determined level, the drive is inhibited as follows:

The wire J1-J3, in series with the three scan coils, acts as a small resistor and its extremities are connected to the base-emitter of Q201. When the 0.6 V level is obtained, Q202 starts conducting and triggers the monoflop Q202/ Q203.
The switched on Q202 inhibits the drive pulses via D202, and, the deflection is interrupted for some rasters (=time constant of the monoflop).

b) Overvoltage protection (=scan hold down) :

The flyback pulses on each of the series connected Mosfets are checked by a rectifier network consisting of a diode and common decoupling capacitors.

The resulting voltage is divided by R67/P3 and sent to the voltage comparator IC1.

The threshold level is set by the zener diode Z6 at 6.2 volts. At the moment pin 6 exceeds this threshold, the output pin 7 switches low and consequently :

1. The drive is inhibited through D14.
2. The input is kept high as transistor Q27 is blocked and D13 conducting via R89.
3. The red LED D23 is lit in order to show the occurred fault.
4. As the deflection is stopped, there is horizontal scan fail and as a result the appropriated circuit (see further) will drop the EHT voltage and blank the three crt's, to prevent damage to the phosphors.

c) Too low drive protection :

It is imperative that the Mosfets are fully switched on as to show a minimum resistance for the deflection circuit.

The amplitude of the drive pulse depends on the amplitude of the voltage produced by the IC301 switched mode power supply.

This voltage , being divided by R319/R320 is used as SAFE info and applied to pin 3 of the voltage detector IC1.

If this voltage is too low, the output pin 1 gets a low and inhibits the horizontal drive via D18.

d) Horizontal scan failure detection:

The flyback pulses HDH G, R and B are all three applied on a divider and the base of a transistor. As long pulses with sufficient amplitude are available , the collector voltage of all transistors Q4-Q6 are low and cannot saturate Q7. It proves to be the opposite, when one or more flybackpulses are absent.

FEEDBACK TO THE SMPS.

The scan voltage +HTHD has to 'follow ' the line frequency in order to stabilise the horizontal width of the picture.

The amplitude of the line flyback pulses is proportional with the horizontal scan amplitude.When, by means of a looped feedback system one can stabilise the amplitude of these flyback pulses, the horizon,tam width is stable as well.

These pulses are rectified by D16 and the +FBHD voltage is linked with the switched mode power supply (see description SMPS).

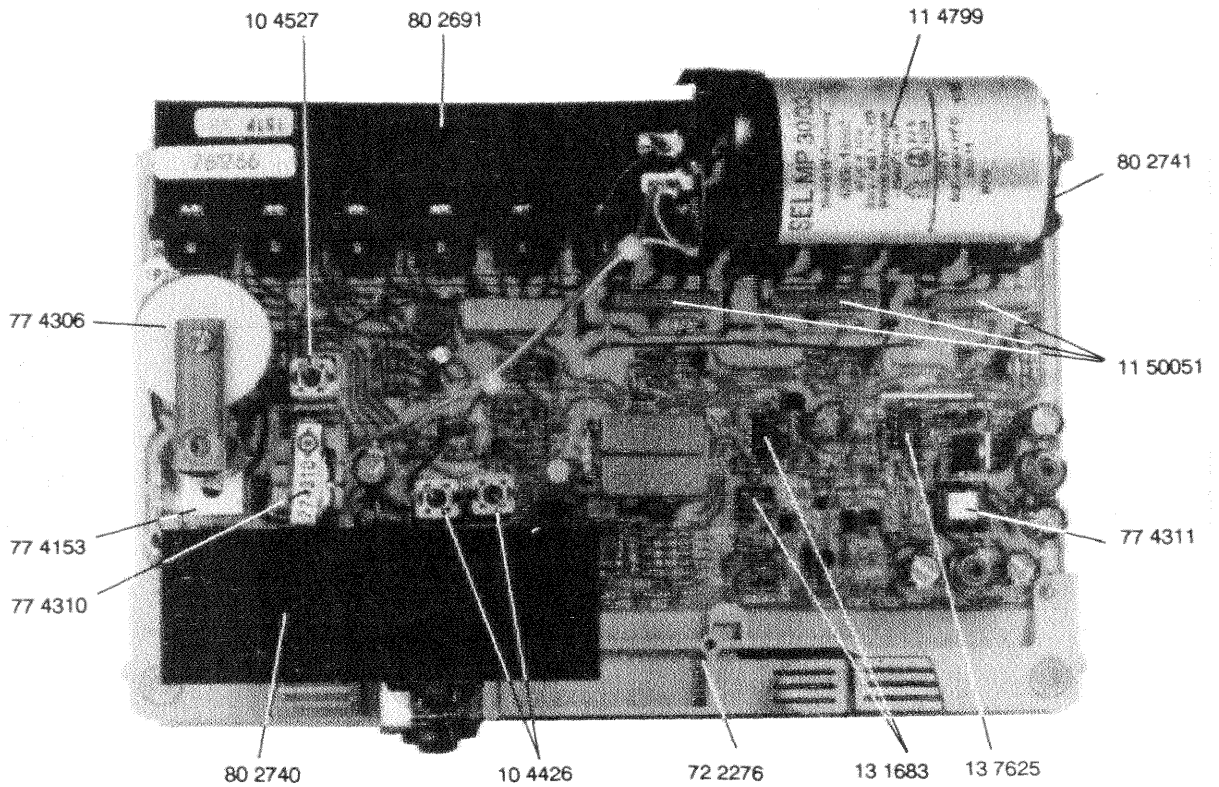
ITEM NO.	SIT.	DESCRIPTION
11 37161	C..1	C POMEFF 22K K5 100
11 1477	C..2	C ELPR 100M Z5 25
11 2747	C..3	C CE MI 4K7 K5 63
11 2747	C..4	C CE MI 4K7 K5 63
11 2747	C..5	C CE MI 4K7 K5 63
11 37161	C..6	C POMEFF 22K K5 100
11 2094	C..7	C CE DI 220P K 750
11 4106	C.23	C POMEFF 1M K 100
11 4106	C.24	C POMEFF 1M K 100
11 2741	C.25	C CE MI 1K5 K5 63
11 1714	C.26	C PPMEPO 8K2 J 1500
11 17674	C.27	C PPMEPO 2K7 J 1600
11 50564	C.27	C PPMEPO 2K7 J 1500
11 17674	C.28	C PPMEPO 2K7 J 1600
11 50564	C.28	C PPMEPO 2K7 J 1500
11 17674	C.29	C PPMEPO 2K7 J 1600
11 50564	C.29	C PPMEPO 2K7 J 1500
11 4603	C.30	C POHVPO 100K M 1000
11 2242	C.31	C NPO MI 100P J5 63
11 1569	C.32	C ELPRMI 10M M5 250
11 4603	C.33	C POHVPO 100K M 1000
11 4154	C.34	C POMEFF 22K K 400
11 37121	C.35	C POMEFF 10K K5 100
11 1487	C.36	C ELPR 100M Z5 40
11 2739	C.37	C CE MI 1K K5 63
11 4100	C.38	C POMEFF 100K K 100
11 4799	C.39	C PAMERA 30M K AC300
11 59141	C.40	C PP RA 820P J5 100
11 2387	C.41	C N152MI 470P J5 63
11 2387	C201	C N152MI 470P J5 63
11 1479	C301	C ELPR 470M Z5 25
11 3720	C303	C POMEFF 47K K5 63
11 1479	C307	C ELPR 470M Z5 25
11 1479	C308	C ELPR 470M Z5 25
11 3730	C309	C POMEFF 330K K5 63
11 3732	C310	C POMEFF 470K K5 63
11 3730	C311	C POMEFF 330K K5 63
11 3732	C312	C POMEFF 470K K5 63
11 3732	C313	C POMEFF 470K K5 63
11 3732	C314	C POMEFF 470K K5 63
13 1621	D..2	D 1N4148 SWITCH
13 1621	D..3	D 1N4148 SWITCH
13 1621	D..4	D 1N4148 SWITCH
13 1906	D..5	D BYV96E
13 1906	D.10	D BYV96E
13 1906	D.11	D BYV96E
13 1906	D.12	D BYV96E
13 1621	D.13	D 1N4148 SWITCH
13 1621	D.14	D 1N4148 SWITCH
13 1637	D.16	D BA158 SWITCH
13 1621	D.18	D 1N4148 SWITCH
13 1662	D.23	D LED D3 RED
13 1621	D.C1	D 1N4148 SWITCH
13 1906	D.C1	D BYV96E
13 1952	D200	D BYW96E 1000V/3A FSR
13 1621	D201	D 1N4148 SWITCH
13 1621	D202	D 1N4148 SWITCH
13 1621	D203	D 1N4148 SWITCH
13 1906	D303	D BYV96E
13 4114	I..1	U 393 DUAL VOLT COMP
13 1683	I302	U 2601 HCPL OPTOCOUPL
13 1683	I303	U 2601 HCPL OPTOCOUPL
31 3525	J10.	J EURO MBS P 64
31 3525	J20.	J EURO MBS P 64

ITEM NO.	SIT.	DESCRIPTION
77 3215	L..2	COIL CHOKE SMP
10 6828	P..1	R TCE V 5K K 0W5 S10SS3386H
10 6832	P..2	R TCE V 50K K 0W5 S10SS3386H
10 6736	P..3	R TCE H500K K 0W5 S10TS3386P
78 0043	PC..	PCB PJ 49 HOR *800 761766
13 2593	Q..1	Q BUZ74A FN 500 / 2A
13 1411	Q..4	Q BC549C N 30 / 0A1
13 1411	Q..5	Q BC549C N 30 / 0A1
13 1411	Q..6	Q BC549C N 30 / 0A1
13 1411	Q..7	Q BC549C N 30 / 0A1
13 1411	Q.10	Q BC549C N 30 / 0A1
13 2945	Q.13	Q BDV65C DN 120 /20A
13 2918	Q.14	Q IXTH12N100 F 1000 /12A
13 2951	Q.14	Q IXTH11N100 F 1000 /11A
13 2918	Q.15	Q IXTH12N100 F 1000 /12A
13 2951	Q.15	Q IXTH11N100 F 1000 /11A
13 2918	Q.16	Q IXTH12N100 F 1000 /12A
13 2951	Q.16	Q IXTH11N100 F 1000 /11A
13 2918	Q.17	Q IXTH12N100 F 1000 /12A
13 2951	Q.17	Q IXTH11N100 F 1000 /11A
13 2918	Q.18	Q IXTH12N100 F 1000 /12A
13 2951	Q.18	Q IXTH11N100 F 1000 /11A
13 2918	Q.19	Q IXTH12N100 F 1000 /12A
13 2951	Q.19	Q IXTH11N100 F 1000 /11A
13 2918	Q.20	Q IXTH12N100 F 1000 /12A
13 2951	Q.20	Q IXTH11N100 F 1000 /11A
13 2918	Q.21	Q IXTH12N100 F 1000 /12A
13 2951	Q.21	Q IXTH11N100 F 1000 /11A
13 2918	Q.22	Q IXTH12N100 F 1000 /12A
13 2951	Q.22	Q IXTH11N100 F 1000 /11A
13 2918	Q.23	Q IXTH12N100 F 1000 /12A
13 2951	Q.23	Q IXTH11N100 F 1000 /11A
13 2918	Q.24	Q IXTH12N100 F 1000 /12A
13 2951	Q.24	Q IXTH11N100 F 1000 /11A
13 2593	Q.26	Q BUZ74A FN 500 / 2A
13 1411	Q.27	Q BC549C N 30 / 0A1
13 2552	Q201	Q BF423 P 250 / 50
13 14295	Q202	Q BC549B N 30 / 0A1
13 1411	Q203	Q BC549C N 30 / 0A1
13 1411	Q302	Q BC549C N 30 / 0A1
13 2910	Q303	Q BS170 FN 60 / 0A5
13 1424	Q304	Q BC338 N 25 / 0A8
13 14311	Q305	Q BC327 P 45 / 0A5
13 2910	Q306	Q BS170 FN 60 / 0A5
13 1424	Q307	Q BC338 N 25 / 0A8
13 14311	Q308	Q BC327 P 45 / 0A5
10 3640	R..1	R WW H220E J 4W
10 1254	R..2	R CF H 33K J 0W5
10 1129	R..3	R CF H270E J 0W25
10 4678	R..4	R HV H 10M J 0W5 3500
10 4678	R..5	R HV H 10M J 0W5 3500
10 4678	R..6	R HV H 10M J 0W5 3500
10 1139	R..7	R CF H 1K8 J 0W25
10 1139	R..8	R CF H 1K8 J 0W25
10 1139	R..9	R CF H 1K8 J 0W25
10 1151	R.10	R CF H 18K J 0W25
10 1151	R.11	R CF H 18K J 0W25
10 1151	R.12	R CF H 18K J 0W25
10 1156	R.13	R CF H 47K J 0W25
10 1143	R.14	R CF H 3K9 J 0W25
10 1124	R.15	R CF H100E J 0W25
10 1254	R.22	R CF H 33K J 0W5

ITEM NO.	SIT.	DESCRIPTION
10 1130	R.50	R CF H330E J 0W25
10 1164	R.51	R CF H220K J 0W25
10 1168	R.52	R CF H470K J 0W25
10 1151	R.53	R CF H 18K J 0W25
10 1116	R.55	R CF H 22E J 0W25
10 1116	R.56	R CF H 22E J 0W25
10 1116	R.57	R CF H 22E J 0W25
10 1116	R.58	R CF H 22E J 0W25
10 1116	R.59	R CF H 22E J 0W25
10 1116	R.60	R CF H 22E J 0W25
10 1116	R.61	R CF H 22E J 0W25
10 1116	R.62	R CF H 22E J 0W25
10 1116	R.63	R CF H 22E J 0W25
10 1116	R.64	R CF H 22E J 0W25
10 1116	R.65	R CF H 22E J 0W25
10 11008	R.66	R CFFH 1E J 0W25 0207
10 4690	R.67	R HV H 33M J 0W5 3500
10 1148	R.70	R CF H 10K J 0W25
10 3158	R.71	R MO H 68K J 0W7
10 4527	R.72	R WW V150E K17W
10 11249	R.73	R CFFH100E J 0W25
10 11209	R.74	R CFFH 47E J 0W25
10 1152	R.80	R CF H 22K J 0W25
10 1136	R.81	R CF H 1K J 0W25
10 1143	R.83	R CF H 3K9 J 0W25
10 1156	R.84	R CF H 47K J 0W25
10 1147	R.85	R CF H 8K2 J 0W25
10 1152	R.86	R CF H 22K J 0W25
10 1148	R.87	R CF H 10K J 0W25
10 1144	R.88	R CF H 4K7 J 0W25
10 1156	R.89	R CF H 47K J 0W25
10 1144	R.90	R CF H 4K7 J 0W25
10 1156	R.91	R CF H 47K J 0W25
10 1152	R.97	R CF H 22K J 0W25
10 4426	R.98	R WW V120E K11W
10 1116	R.99	R CF H 22E J 0W25
10 11369	R100	R CFFH 1K J 0W25
10 4426	R101	R WW V120E K11W
10 1136	R201	R CF H 1K J 0W25
10 1156	R202	R CF H 47K J 0W25
10 1131	R203	R CF H390E J 0W25
10 1149	R204	R CF H 12K J 0W25
10 1152	R205	R CF H 22K J 0W25
10 1136	R206	R CF H 1K J 0W25
10 1160	R207	R CF H100K J 0W25
10 1154	R208	R CF H 33K J 0W25
10 11907	R217	R CFFH E10J 0W4
10 11947	R300	R CFFH E47K 0W4
10 1135	R308	R CF H820E J 0W25
10 1134	R309	R CF H680E J 0W25
10 1232	R310	R CF H470E J 0W5
10 1139	R311	R CF H 1K8 J 0W25
10 11169	R312	R CFFH 22E J 0W25
10 1136	R313	R CF H 1K J 0W25
10 1134	R314	R CF H680E J 0W25
10 1232	R315	R CF H470E J 0W5
10 1139	R316	R CF H 1K8 J 0W25
10 11169	R317	R CFFH 22E J 0W25
10 1136	R318	R CF H 1K J 0W25
10 1147	R319	R CF H 8K2 J 0W25
77 4306	T1..	TRANSF PJ 49 LIN CTRL
77 4153	T1E.	COIL LIN PJ 45 HOR DATA HR45
77 4310	T2..	TRANSF PJ 49 HOR DEFL
13 1790	Z..1	D ZENER 33V 1W C
13 1735	Z..2	D ZENER 10V 0W5 C
13 1720	Z..3	D ZENER 6V2 0W5 C
13 1720	Z..6	D ZENER 6V2 0W5 C
13 1707	Z.16	D ZENER 47V 1W3 C
13 1730	Z.17	D ZENER 20V 0W5 C
13 1716	Z302	D ZENER 5V1 0W5 C
13 1730	Z303	D ZENER 20V 0W5 C
13 1716	Z304	D ZENER 5V1 0W5 C
13 1730	Z305	D ZENER 20V 0W5 C
13 1740	Z306	D ZENER 12V 0W5 C

HORIZONTAL DEFLECTION MODULE 76 1766

ART.NO.	DESCRIPTION	QUANTITY	ART.NO.	DESCRIPTION	QUANTITY
10 11008	R CFFH 1E J 0W25 0207	1	10 4678	R HV H 10M J 0W5 3500	3
10 11169	R CFFH 22E J 0W25	2	10 4690	R HV H 33M J 0W5 3500	1
10 11209	R CFFH 47E J 0W25	1	10 6736	R TCE H500K K 0W5 S10TS3386	1
10 11249	R CFFH100E J 0W25	1	10 6828	R TCE V 5K K 0W5 S10SS3386	1
10 11369	R CFFH 1K J 0W25	1	10 6832	R TCE V 50K K 0W5 S10SS3386	1
10 11907	R CFFH E10J 0W4	1			
10 11947	R CFFH E47K 0W4	1	11 1569	C ELPRMI 10M M5 250	1
10 3158	R MO H 68K J 0W7	1	11 1714	C PPMEPO 8K2 J 1500	1
10 3640	R WW H220E J 4W	1	11 17674	C PPMEPO 2K7 J 1600	3
10 4426	R WW V120E K11W	*2	11 2094	C CE DI 220P K 750	1
10 4527	R WW V150E K17W	*1	11 4154	C POMEFF 22K K 400	1



11 4603	C POHVPO 100K M 1000	2	13 1662	D LED D3 RED	1
11 4799	C PAMERA 30M K AC300	*1	13 1683	U 2601 HCPL OPTOCOUP	*2
11 50564	C PPMEPO 2K7 J 1500	*3	13 1707	D ZENER 47V 1W3 C	1
			13 1716	D ZENER 5V1 0W5 C	2
13 1411	Q BC549C N 30 / 0A1	8	13 1720	D ZENER 6V2 0W5 C	2
13 1424	Q BC338 N 25 / 0A8	2	13 1730	D ZENER 20V 0W5 C	3
13 14295	Q BC549B N 30 / 0A1	1	13 1735	D ZENER 10V 0W5 C	1
13 14311	Q BC327 P 45 / 0A5	2	13 1740	D ZENER 12V 0W5 C	1
13 1621	D 1N4148 SWITCH	10	13 1790	D ZENER 33V 1W C	1
13 1637	D BA158 SWITCH	1	13 1906	D BYV96E	6

HORIZONTAL DEFLECTION MODULE 76 1766

ART.NO.	DESCRIPTION	QUANTITY
13 1952	D BYW96E 1000V/3A FSR	1
13 2552	Q BF423 P 250 / 50	1
13 2593	Q BUZ74A FN 500 / 2A	2
13 2910	Q BS170 FN 60 / 0A5	2
13 2918	Q IXTH12N100 F 1000 /12A	11
13 2945	Q BDV65C DN 120 /20A	1
13 2951	Q IXTH11N100 F 1000 /11A	11
13 3039	SPACER L 8 D 4 D1,2 CE	1
13 3063	Q MICA INSULAT SOT-93	2
13 4114	U 393 DUAL VOLT COM	1
31 3220	R WW V HOLDER H10	1
31 3224	R WW V HOLDER H25	2
31 3525	J EURO MBS P 64	2
36 20216	SCREW DIN84 M 3 X 6 MP-	2
36 20236	SCREW DIN84 M 3 X10 MP-	1
36 21229	SCREW DIN7985 M 3 X 8 TWOLO	20
36 6988	NUT INS SOUTHCO SHEET EDGE M3	2
36 7502	WASHER DIN6798 A 3,2	4
36 7699	RIVET CHOBERT D2,38 L6,35	1
76 1766A	UN HOR PJ 49 GR800	1
76 1766D	UN HOR PJ 49 GR800	1

ART.NO.	DESCRIPTION	QUANTITY
77 3215	COIL CHOKE SMP	*1
77 4153	COIL LIN PJ 45 HOR DATA HR45	*1
77 4306	TRANSF PJ 49 LIN CTRL	*1
77 4310	TRANSF PJ 49 HOR DEFL	*1
80 2628	FIX PJ 49 TSTR SPRING 1X HOR	3
80 2665	FIX PJ 49 CORE LINEARITY	1
80 2686	FIX PJ 49 TSTR SPRING 1X M3	3
80 2691	HEATSINK PJ 49 HOR A GRAPHICS	*1
80 2740	HEATSINK PJ 49 HOR B GRAPHICS	*1
80 2741	HEATSINK PJ 49 HOR FIX CAP	*1
80 2751	COIL LIN PJ 49 POSITION	1
80 2758	HEATSINK PJ 49 HOR I FIX	1
80 2777	FIX PJ 49 TSTR SPRING 2X M3	4
80 2783	Q INSULAT SHEET 30X220	1
80 2827	CORE LINEARITY (802739+802626	1
80 2920	Q INSULAT SHEET 28X16	1

*** NUMBERS REFERRING TO PICTURE**