BARCO

BARCO Projection Systems

SECTION L

service sheet

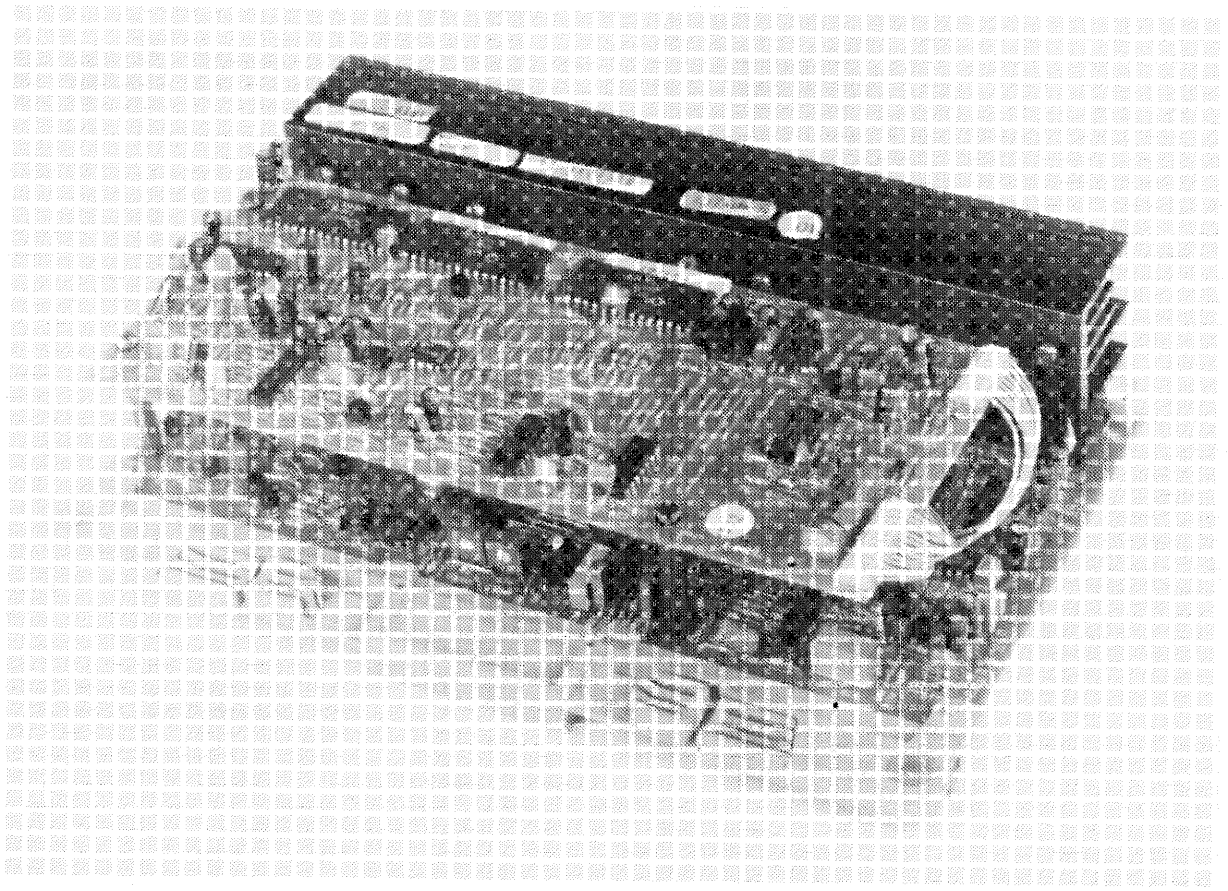
Noordlaan 5 B-8720 Kuurne - Belgium Telex 85.305 Tel. (056)36.82.11 Telefax (056)35.16.51

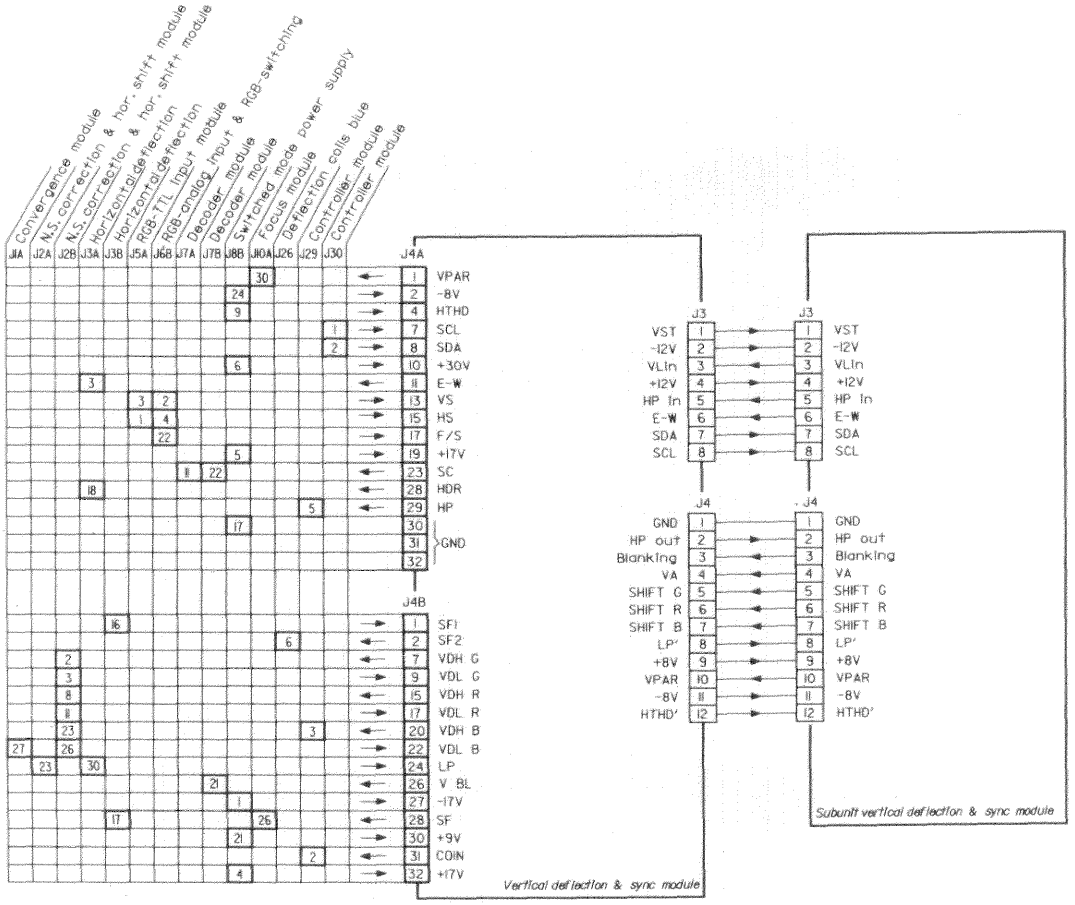
VERTICAL DEFLECTION + SYNC MODULE

SUB-MODULE VERTICAL DEFLECTION + SYNC

76 1768

76 1769

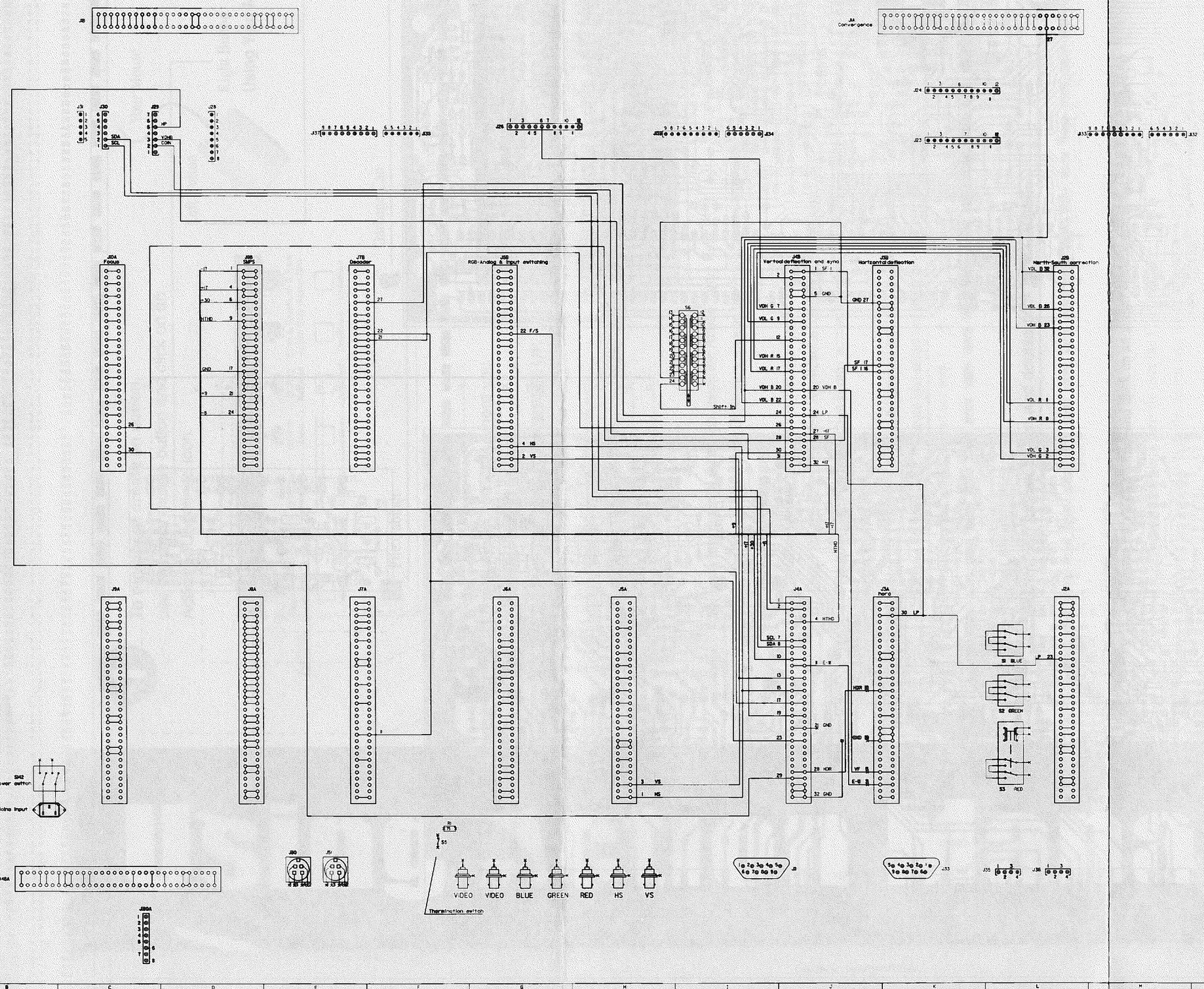




Name	Article nr.
Interconnection Vertical defl. & sync module	761768-761769
Date 15/09/1990 / Drawn PG / Checked CT	

BARCO PROJECTION SYSTEMS

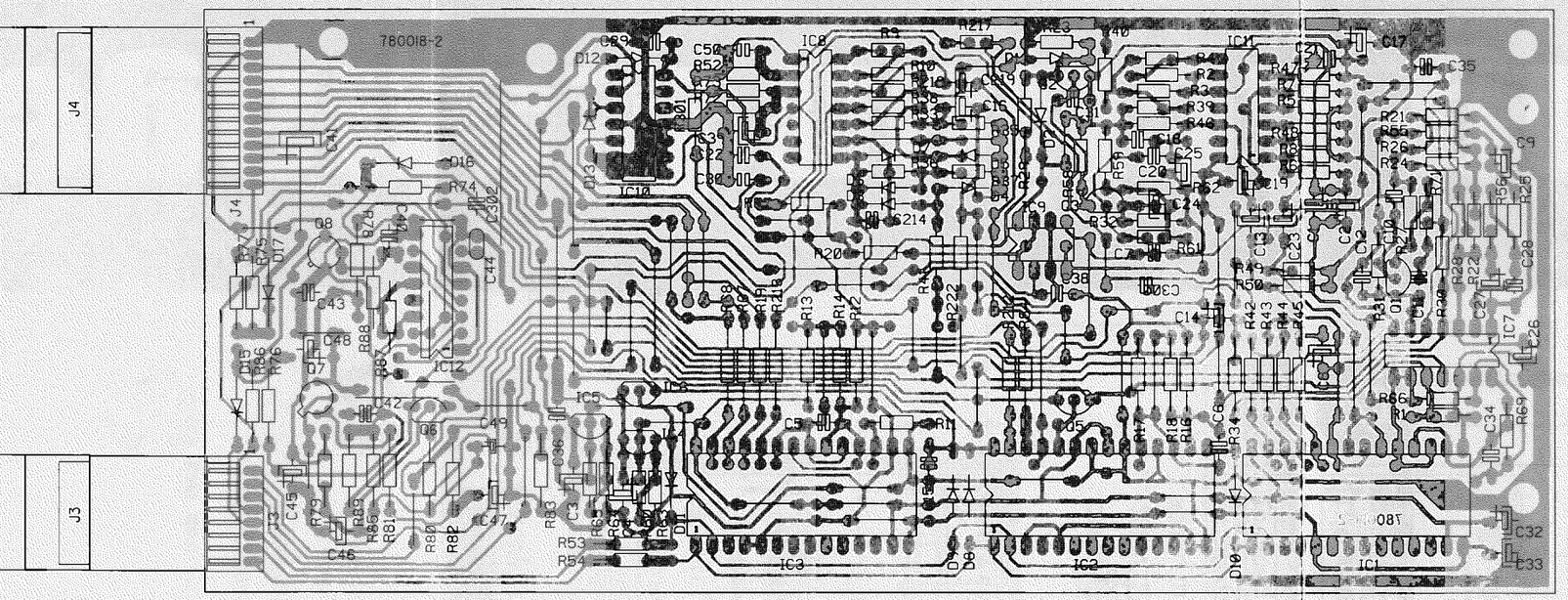
Main frame interconnection
Vertical deflection and synchronisation module

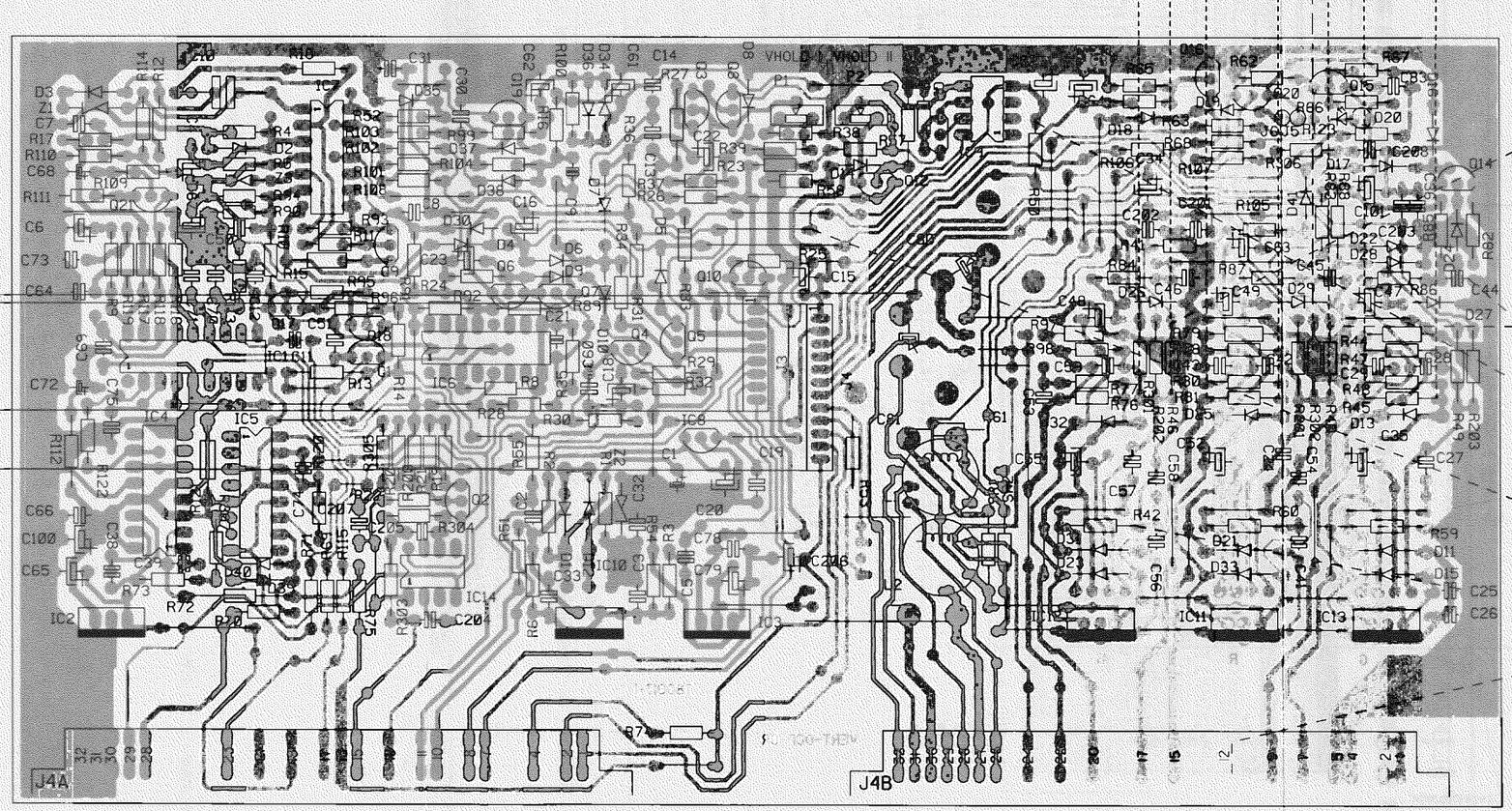


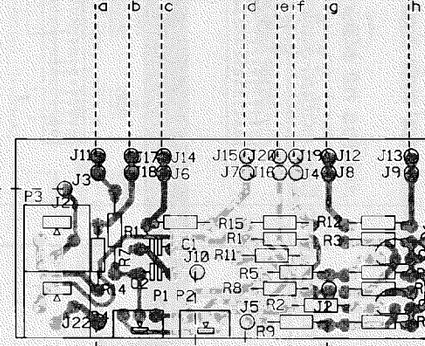
COMP.	LOC.
C1	H 4
C1	F 2
C1	D 5
C2	G 4
C2	F 2
C2	D 5
C3	D 3
C3	D 5
C4	D 3
C4	B 4
C5	D 2
C5	D 5
C6	F 2
C6	B 4
C7	E 2
C7	B 4
C8	F 2
C8	C 4
C9	G 1
C9	D 4
C10	F 2
C10	B 4
C11	F 2
C11	C 5
C12	F 2
C12	C 4
C13	F 2
C13	D 4
C14	F 2
C14	D 4
C15	E 3
C15	E 4
C16	E 1
C16	D 4
C17	F 1
C18	F 1
C18	D 5
C19	F 2
C19	D 5
C20	F 1
C20	D 5
C21	F 1
C21	D 4
C22	D 1
C22	D 4
C23	F 2
C23	C 4
C24	F 2
C24	F 5
C25	F 1
C25	G 5
C26	G 2
C26	G 6
C27	G 2
C27	G 5
C28	G 2
C28	G 5
C29	D 1
C29	F 5
C30	D 1
C30	C 4
C31	E 1
C31	C 4
C32	G 3
C32	D 5
C33	G 3
C33	D 5
C34	G 2
C34	F 4
C35	G 1
C35	F 5
C36	D 2
C36	G 4
C37	E 4
C38	E 2
C38	B 5
C39	D 1
C39	B 5
C40	G 2
C41	C 1
C41	F 5
C42	C 2
C42	F 5
C43	C 2
C43	F 5
C44	C 2
C44	G 4
C45	C 3
C45	F 4
C46	C 3
C46	F 4
C47	C 3
C47	F 4
C48	C 2
C48	E 4
C49	C 2
C49	F 4
C50	D 1
C50	B 4
C51	C 5
C52	F 5
C53	E 5
C54	F 5
C55	E 5
C56	F 5
C57	F 5
C58	F 5
C59	E 5
C60	D 5
C61	D 4
C62	D 4
C63	F 4
C64	B 4
C65	B 5
C66	B 5
C67	B 4
C68	B 4
C69	B 5
C70	B 4
C71	B 4
C72	B 5
C73	B 4
C74	C 5
C75	B 5
C78	D 5
C79	D 5
C80	E 4
C81	E 5
C82	E 4
C83	F 4
C100	B 5
C101	F 4
C200	F 4
C202	F 4
C203	F 4
C204	C 6
C205	C 5
C206	E 5
C207	C 5
C208	F 4
C214	E 2
C219	E 1
C300	F 2
C302	C 2
D1	E 1
D1	D 5
D2	E 1
D2	C 4
D3	E 2
D3	B 4
D4	E 2
D4	C 4
D5	E 1
D5	D 4
D6	E 1
D6	D 4
D7	E 1
D7	D 4
D8	E 3
D8	D 4
D9	E 3
D9	D 4
D10	F 3
D10	D 5
D11	D 3
D11	G 5
D12	D 1
D12	D 5
D13	D 2
D13	F 5
D14	E 4
D15	C 2
D15	G 5
D16	C 1
D16	G 4
D17	C 2
D17	F 4
D18	F 4
D19	F 4
D20	F 4
D21	F 5
D22	F 4
D23	E 5
D24	G 4
D25	F 5
D26	F 4
D27	G 4
D28	F 4
D29	F 4
D30	C 4
D31	E 5
D32	E 5
D33	F 5
D34	D 4
D35	C 4
D36	D 4
D37	C 4
D38	C 4
D39	C 5
D40	C 5
D41	F 4
IC1	F 3
IC1	C 5
IC2	E 3
IC2	B 6
IC3	D 3
IC3	D 6
IC4	D 2
IC4	B 5
IC5	D 2
IC5	C 5
IC6	D 2
IC6	C 5
IC7	G 2
IC7	C 4
IC8	D 1
IC8	D 5
IC9	E 2
IC9	E 4
IC10	D 2
IC10	D 5
IC11	F 1
IC11	F 6
IC12	C 2
IC12	E 6
IC13	F 6
IC14	C 5
J1	H 4
J1	D 6
J2	H 4
J2	E 6
J3	G 4
J3	C 3
J3	D 5
J4	H 4
J4	C 2
J4	E 5
J5	H 4
J5	F 4
J6	C 4
J6	F 4
J7	H 4
J8	H 4
J9	H 4
J10	H 4
J11	C 4
J12	H 4
J13	H 4
J14	C 4
J15	H 4
J16	H 4
J17	G 4
J18	G 4
J19	H 4
J20	H 4
J21	C 4
J22	C 4
L1	E 5
L2	E 5
P1	G 4
P1	D 4
P2	H 4
P2	E 4
P3	G 4
P4	G 4
Q1	H 4
Q1	F 2
Q1	C 5
Q2	H 4
Q2	E 1
Q2	C 5
Q3	E 2
Q3	D 4
Q4	D 5
Q5	E 2
Q5	D 5
Q6	C 2
Q6	C 4
Q7	C 2
Q7	D 4
Q8	C 2
Q8	D 4
Q9	C 4
Q10	D 4
Q11	E 4
Q12	E 4
Q14	G 4
Q15	F 4
Q16	F 4
Q17	C 5
Q18	C 5
Q19	D 4
Q20	F 4
Q21	B 4
R1	H 4
R1	F 2
R1	D 5
R2	H 4
R2	F 1
R2	D 5
R3	H 4
R3	F 1
R3	D 5
R4	H 4
R4	F 1
R4	C 4
R5	H 4
R5	F 1
R5	C 4
R6	H 4
R6	F 1
R6	D 6
R7	G 4
R7	F 1
R8	H 4
R8	F 1
R8	D 5
R9	H 4
R9	E 1
R9	B 4
R10	H 4
R10	E 1
R10	C 4
R11	H 4
R11	E 2
R11	C 4
R12	H 4
R12	E 2
R12	B 4
R13	G 4
R13	D 2
R13	C 5
R14	G 4
R14	E 2
R14	C 5
R15	H 4
R15	C 4
R16	F 2
R16	D 4
R17	F 2
R17	B 4
R18	F 2
R18	C 4
R19	D 2
R19	C 5
R20	D 2
R20	C 5
R21	F 1
R21	C 5
R22	G 2
R22	C 5
R23	E 1
R23	D 4
R24	F 1
R24	C 4
R25	G 2
R25	D 4
R26	F 1
R26	D 4
R27	F 2
R27	D 4
R28	G 2
R28	C 5
R29	E 2
R29	D 5
R30	G 2
R30	D 5
R31	F 2
R31	D 4
R32	E 2
R32	D 5
R33	E 1
R33	D 4
R34	F 2
R34	D 4
R35	E 1
R35	D 5
R36	E 1
R36	D 4
R37	E 2
R37	D 4
R38	E 1
R38	E 4
R39	F 1
R39	D 4
R40	E 1
R40	F 5
R41	E 2
R41	F 4
R42	F 2
R42	F 5
R43	F 2
R43	E 4
R44	F 2
R44	F 5
R45	F 2
R45	F 5
R46	F 1
R46	F 5
R47	F 1
R47	F 5
R48	F 1
R48	F 5
R49	F 2
R49	G 5
R50	F 2
R50	E 4
R51	C 5
R52	D 1
R52	C 4
R53	D 3
R53	E 5
R54	D 3
R54	D 5
R55	F 1
R55	D 5
R56	G 2
R56	E 4
R57	D 2
R57	E 4
R58	E 2
R58	E 4
R59	E 1
R59	G 5
R60	D 3
R60	F 5
R61	F 2
R61	E 5
R62	F 2
R62	F 4
R63	D 3
R63	F 4
R64	D 3
R64	E 4
R65	D 3
R65	F 4
R66	F 2
R66	F 4
R67	D 2
R67	F 4
R68	D 2
R68	F 4
R69	G 2
R69	C 5
R70	C 6
R71	G 2
R71	C 5
R72	D 1
R72	B 6
R73	D 1
R73	B 5
R74	C 2
R74	D 6
R75	C 2
R75	C 5
R76	C 2
R76	F 5
R77	C 2
R77	F 5
R78	C 2
R78	F 5
R79	C 3
R79	F 5
R80	C 3
R80	F 5
R81	C 3
R81	F 5
R82	C 3
R82	G 4
R83	D 3
R83	F 4
R84	E 2
R84	F 4
R85	C 3
R85	G 4
R86	C 2
R86	G 4
R87	C 2
R87	F 4
R88	C 2
R88	F 4
R89	C 3
R89	D 4
R90	C 4
R91	C 4
R92	C 4
R93	C 4
R94	C 4
R95	C 4
R96	C 4
R97	E 5
R98	E 5
R99	C 4
R100	D 4
R101	C 4
R102	C 4
R103	C 4
R104	C 4
R105	F 4
R106	E 4
R107	F 4
R108	C 4
R109	B 4
R110	B 4
R111	B 4
R112	B 5
R113	C 4
R114	B 4
R115	C 5
R116	B 4
R117	B 4
R118	B 4
R119	B 4
R120	C 5
R121	B 5
R122	B 5
R123	F 4
R200	C 5
R201	F 5
R202	F 5
R203	G 5
R212	E 2
R213	D 2
R217	E 1
R218	E 1
R222	E 2
R301	D 1
R301	F 5
R302	F 5
R303	C 6
R304	C 5
R305	C 5
R306	F 4
R307	C 5
SR1	E 5
SR2	E 5
Z1	B 4
Z2	D 5
Z3	C 4

KEY for L4-B

BARCO

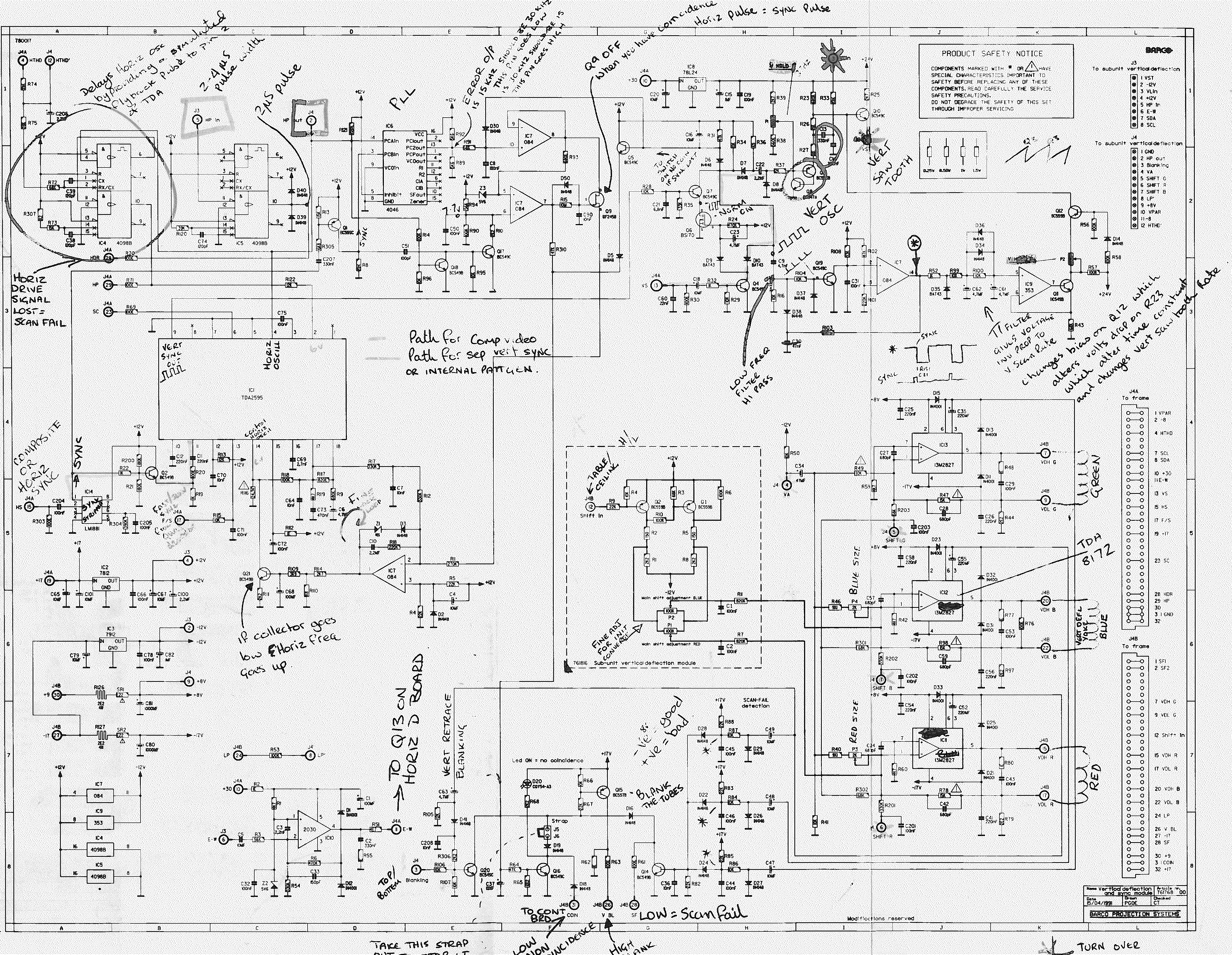






Name: Interconnection Vertical deflection		Article nr.: 76 1768-76 1769
Date: 15/09/1990	Drawn: PG	Checked: CT
BARCO PROJECTION SYSTEMS		

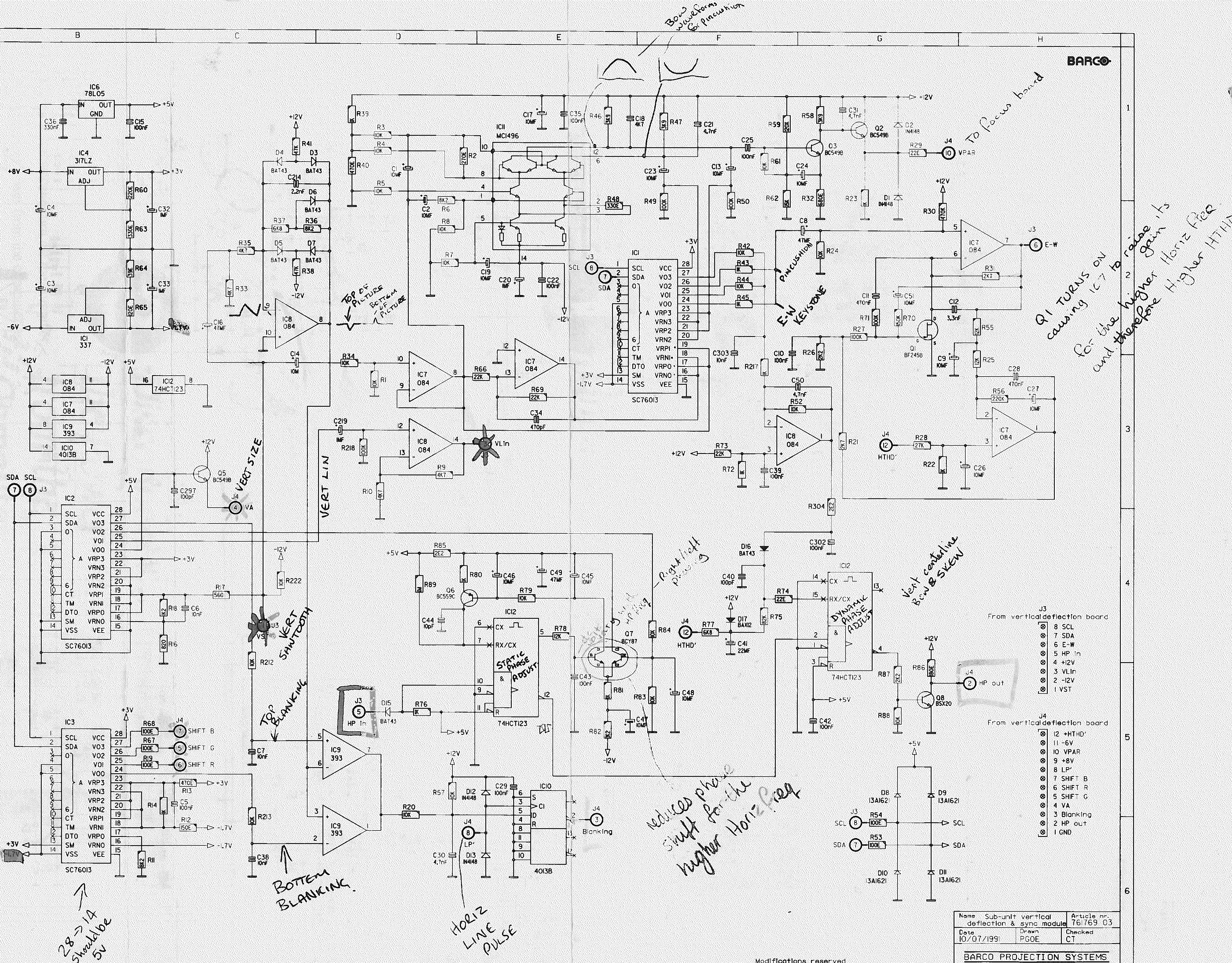
COMP.	LOC.	COMP.	LOC.
C1	D 7	Q1	D 2
C2	D 8	Q2	B 4
C3	C 8	Q3	I 2
C4	E 6	Q4	H 3
C5	C 8	Q5	G 2
C6	D 5	Q6	G 2
C7	D 5	Q7	H 2
C8	E 2	Q8	I 2
C9	H 3	Q9	G 2
C10	D 5	Q10	I 1
C11	B 4	Q11	K 3
C12	B 4	Q12	K 2
C13	I 1	Q14	G 8
C14	I 2	Q15	G 7
C15	H 1	Q16	F 8
C16	G 1	Q17	E 2
C18	G 3	Q18	E 3
C19	H 1	Q19	I 3
C20	G 1	Q20	E 8
C21	G 2	Q21	C 5
C22	H 2		
C23	H 2	R1	G 5
C24	I 7	R1	C 7
C25	J 4	R2	G 5
C26	J 5	R2	C 7
C27	I 4	R3	C 8
C28	J 5	R3	G 5
C29	K 5	R4	G 5
C30	H 3	R4	E 6
C31	I 3	R5	G 5
C32	C 8	R5	E 5
C33	D 8	R6	H 5
C34	I 4	R6	D 8
C35	J 4	R7	H 6
C36	G 8	R8	G 5
C37	E 8	R8	D 3
C38	A 2	R9	D 5
C39	A 2	R9	G 5
C41	J 8	R10	G 5
C42	J 7	R10	E 2
C43	K 7	R11	H 6
C44	H 8	R11	E 5
C45	H 7	R12	E 5
C46	H 8	R13	D 2
C47	H 8	R14	E 2
C48	H 7	R15	F 2
C49	H 7	R16	H 3
C50	E 2	R17	D 4
C51	D 2	R18	D 5
C52	J 7	R19	B 5
C53	K 6	R20	B 4
C54	J 7	R21	B 5
C55	J 5	R22	B 4
C56	J 6	R23	I 1
C57	I 6	R24	H 2
C58	J 5	R25	I 1
C59	J 6	R26	I 1
C60	G 3	R27	I 2
C61	K 3	R28	G 2
C62	J 3	R29	H 3
C63	E 7	R30	G 3
C64	C 5	R31	H 1
C65	A 6	R32	H 3
C66	B 6	R33	I 1
C67	B 6	R34	H 1
C68	C 5	R35	G 2
C69	C 4	R36	H 1
C70	C 4	R37	H 2
C71	C 5	R38	H 1
C72	C 5	R39	H 1
C73	D 5	R40	I 7
C74	B 2	R41	I 8
C75	C 3	R42	J 6
C78	B 6	R43	K 3
C79	A 6	R44	K 5
C80	B 7	R46	I 6
C81	B 7	R47	J 5
C82	B 6	R48	K 4
C90	F 2	R49	I 4
C100	B 6	R50	H 4
C101	A 6	R51	D 8
C201	J 8	R52	J 3
C202	J 6	R53	C 7
C203	J 5	R54	C 8
C204	A 5	R55	D 8
C205	B 5	R56	K 2
C206	A 1	R57	L 3
C207	D 3	R58	L 2
C208	E 8	R59	I 5
		R60	J 7
D1	D 7	R61	G 8
D2	E 6	R62	F 8
D3	D 5	R63	G 8
D5	G 2	R64	F 8
D6	H 2	R65	F 8
D7	H 2	R66	F 7
D8	H 2	R67	F 7
D9	H 3	R68	F 7
D10	H 3	R69	B 3
D11	J 4	R70	B 2
D12	D 8	R71	B 3
D13	J 4	R72	A 2
D14	L 2	R73	A 2
D15	J 4	R74	A 1
D16	G 7	R75	A 1
D18	F 8	R76	K 6
D19	F 8	R77	K 6
D20	F 7	R78	J 7
D21	J 7	R79	K 8
D22	H 7	R80	K 7
D23	J 5	R82	G 8
D24	H 8	R83	H 7
D25	J 7	R84	H 7
D26	H 8	R85	H 8
D27	H 8	R86	H 8
D28	H 7	R87	H 7
D29	H 7	R88	H 7
D30	E 1	R89	E 2
D31	J 6	R90	E 2
D32	J 5	R91	E 1
D33	J 6	R92	E 1
D34	J 2	R93	F 2
D35	J 3	R94	E 2
D36	J 2	R95	E 3
D37	I 3	R96	E 3
D38	H 3	R97	K 6
D39	C 2	R98	J 6
D40	C 2	R99	J 3
D41	E 8	R100	J 3
D50	F 2	R101	I 3
		R102	I 2
IC1	C 4	R103	I 3
IC2	A 5	R104	I 3
IC3	A 6	R105	E 8
IC4	A 2	R106	E 8
IC4	A 8	R107	E 8
IC4	A 8	R108	I 2
IC5	C 2	R109	C 5
IC5	A 8	R110	D 5
IC5	A 8	R111	C 6
IC6	D 1	R112	C 5
IC7	J 3	R113	C 4
IC7	D 5	R114	D 5
IC7	F 1	R115	C 5
IC7	F 2	R116	C 5
IC7	A 7	R117	D 4
IC7	A 7	R118	C 4
IC8	G 1	R119	D 5
IC9	K 3	R120	B 2
IC9	B 7	R121	D 1
IC9	A 7	R122	C 3
IC10	D 8	R126	A 6
IC11	J 7	R127	A 7
IC12	J 6	R200	B 4
IC13	J 4	R201	I 7
IC14	A 5	R202	I 6
		R203	J 5
J3	L 1	R301	I 6
J4	L 1	R302	I 7
		R303	A 5
P1	H 1	R304	A 5
P1	G 6	R305	D 2
P2	K 3	R306	E 8
P2	G 6	R307	A 2
P3	I 7	R310	F 2
P4	I 6		
		SR1	B 6
		SR2	B 7
		Strap	F 8
		Z1	D 5
		Z2	C 8
		Z3	E 2



780017
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
BARCO
To subunit verticaldeflection
To frame
IC1 TDA2595
IC6 4046
IC4 4098B
IC5 4098B
IC14 LM1881
IC2 7812
IC3 7912
IC8 78L24
IC10 2030
IC11 13M2827
IC12 13M2827
IC13 13M2827
IC9 353
IC7 084
SCAN-FAIL detection
Led ON = no coincidence
761816 Sub-unit verticaldeflection module
Main shift adjustment BLUE
Main shift adjustment RED
Modifications reserved
Name Vertical deflection and sync module
Article nr. 761768 00
Date 15/04/1991
Drawn PGOE
Checked CT
BARCO PROJECTION SYSTEMS
Delays Horiz osc by providing a simulated flyback pulse to pin 2 of TDA
2-4µS pulse width
2µS pulse
PLL
ERROR O/P IS 15KHZ
Q9 OFF when you have coincidence
Horiz Pulse = Sync Pulse
VERT OSC
VERT SAW TOOTH
Horiz Drive Signal Lost = Scan Fail
Path for Comp video
Path for sep vert sync or INTERNAL PATTERN
Composite or Horiz sync
SYNC
VERT SYNC OUT
HORIZ OSCILL
If collector goes low Horiz Freq goes up
TO Q13 ON HORIZ D BOARD
VERT RETRACE BLANKING
BLANK THE TUBES
-Ve = good +Ve = bad
LOW = Scan Fail
LOW FREQ FILTER HI PASS
changes bias on Q12 which alters volts drop on R23 which alter time constant and changes vert saw tooth rate
TDA 8172
BLUE SIZE
RED SIZE
GREEN
BLUE
RED
VERT DEFL YOKE
FINE ADJ FOR INIT CONVERGE
TABLE/CEILING
TURN OVER
TAKE THIS STRAP

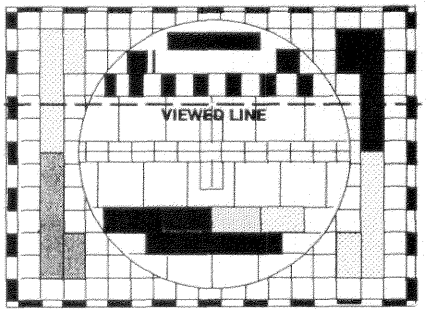
780018

COMP.	LOC.	COMP.	LOC.
C1	D 1	R1	D 3
C2	D 2	R2	D 1
C3	B 2	R3	D 1
C4	B 2	R4	D 1
C5	C 5	R5	D 1
C6	C 4	R6	D 2
C7	C 5	R7	D 2
C8	G 2	R8	D 2
C9	G 3	R9	D 3
C10	F 2	R10	D 3
C11	G 2	R11	B 6
C12	G 2	R12	C 6
C13	F 1	R13	C 5
C14	C 2	R14	B 5
C15	B 1	R16	C 4
C16	C 2	R17	C 4
C17	E 1	R18	C 4
C18	E 1	R19	B 5
C19	E 2	R20	D 5
C20	E 2	R21	G 3
C21	F 1	R22	G 3
C22	E 2	R23	G 1
C23	F 1	R24	G 2
C24	F 1	R25	H 3
C25	F 1	R26	G 2
C26	H 3	R27	G 2
C27	H 3	R28	G 3
C28	H 3	R29	G 1
C29	E 5	R30	G 2
C30	D 6	R31	H 2
C31	G 1	R32	G 1
C32	C 2	R33	C 2
C33	C 2	R34	D 3
C34	E 3	R35	C 2
C35	E 1	R36	C 2
C36	B 1	R37	C 2
C38	C 6	R38	C 2
C39	F 3	R39	D 1
C40	F 4	R40	D 1
C41	F 4	R41	C 1
C42	G 5	R42	F 2
C43	E 5	R43	F 2
C44	D 4	R44	F 2
C45	E 4	R45	F 2
C46	E 4	R46	E 1
C47	E 5	R47	F 1
C48	F 5	R48	E 1
C49	E 4	R49	F 1
C50	F 3	R50	F 1
C51	G 2	R52	F 3
C214	C 1	R53	G 6
C219	D 3	R54	G 5
C297	C 3	R55	H 2
C302	G 4	R56	H 3
C303	F 2	R57	D 5
		R58	G 1
D1	G 1	R59	F 1
D2	G 1	R60	B 1
D3	C 1	R61	F 1
D4	C 1	R62	F 1
D5	C 2	R63	B 2
D6	C 1	R64	B 2
D7	C 2	R65	B 2
D8	G 5	R66	D 3
D9	G 5	R67	B 5
D10	G 6	R68	B 5
D11	G 6	R69	E 3
D12	D 5	R70	G 2
D13	D 6	R71	G 2
D15	D 5	R72	F 3
D16	F 4	R73	F 3
D17	F 4	R74	F 4
		R75	F 4
IC1	B 2	R76	D 5
IC1	E 2	R77	F 4
IC2	B 3	R78	E 4
IC3	B 5	R79	E 4
IC4	B 1	R80	D 4
IC6	B 1	R81	E 5
IC7	B 3	R82	E 5
IC7	H 2	R83	E 5
IC7	H 3	R84	F 4
IC7	D 3	R85	D 4
IC7	B 3	R86	G 5
IC7	E 3	R87	G 5
IC8	B 3	R88	G 5
IC8	C 2	R89	D 4
IC8	F 3	R212	C 4
IC8	D 3	R213	C 5
IC8	B 3	R217	F 3
IC9	B 3	R218	D 3
IC9	B 3	R222	C 4
IC9	D 5	R304	G 3
IC9	D 6		
IC10	B 3		
IC10	B 3		
IC10	E 5		
IC11	E 1		
IC12	C 3		
IC12	C 3		
IC12	E 4		
IC12	G 4		
J3	H 4		
J4	H 5		
Q1	G 2		
Q2	G 1		
Q3	G 1		
Q5	C 3		
Q6	D 4		
Q7	E 4		
Q8	G 5		

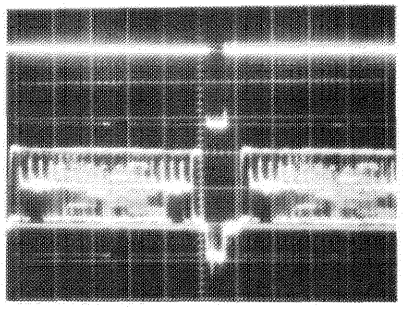


Name	Article nr.
Sub-unit vertical deflection & sync module	761769 03
Date 10/07/1991 · **Drawn** PGOE	**Checked** CT

BARCO PROJECTION SYSTEMS

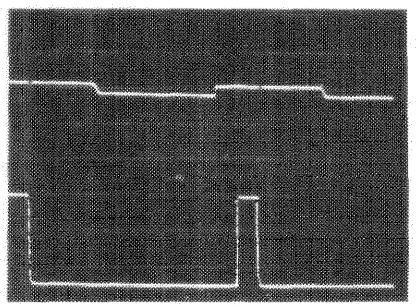


TEST PICTURE
Viewed line: contrast color bar



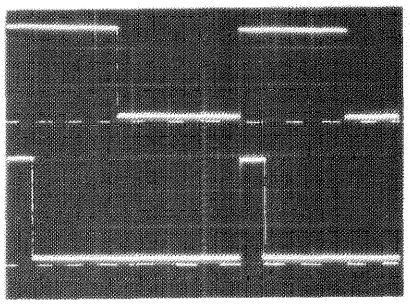
Y1 0.5V/DIV (10:1) X 10us/DIV
Y2 20mV/DIV (10:1)

B CH1 10Vpp A CH2 0.6Vpp



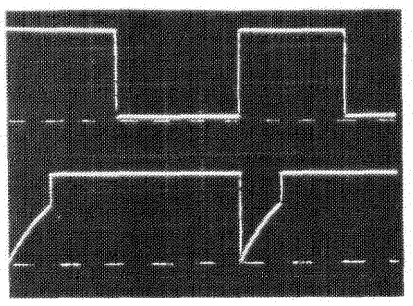
Y1 1V/DIV (10:1) X 10us/DIV
Y2 0.5V/DIV (10:1)

C CH1 5Vpp D CH2 12Vpp



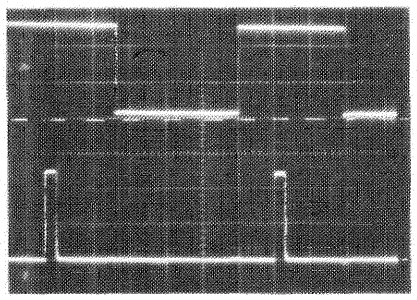
Y1 0.5V/DIV (10:1) X 10us/DIV
Y2 0.2V/DIV (10:1)

D CH1 12Vpp E CH2 5.6Vpp



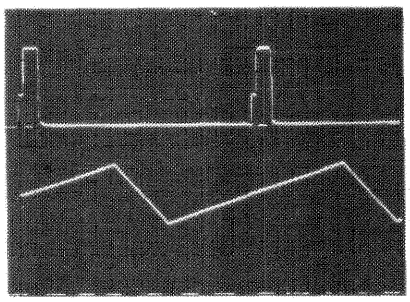
Y1 0.5V/DIV (10:1) X 10us/DIV
Y2 0.5V/DIV (10:1)

D CH1 12Vpp F CH2 12Vpp



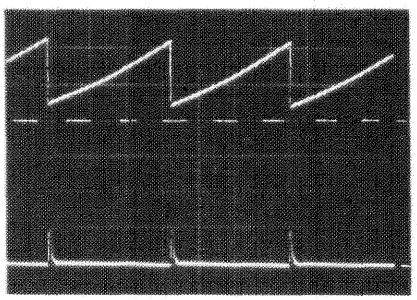
Y1 0.5V/DIV (10:1) X 10us/DIV
Y2 0.5V/DIV (10:1)

D CH1 12Vpp G CH2 12Vpp



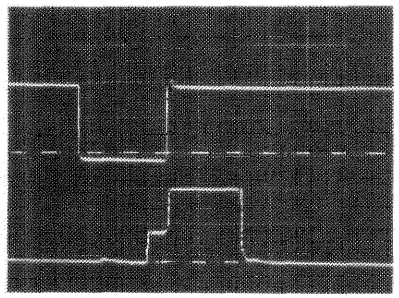
Y1 0.5V/DIV (10:1) X 10us/DIV
Y2 0.2V/DIV (10:1)

H CH1 10Vpp I CH2 3.6Vpp



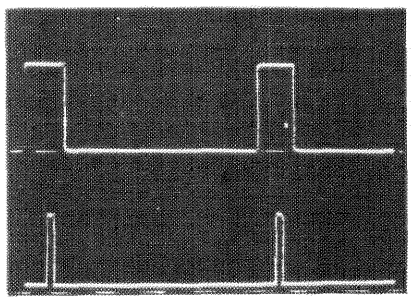
Y1 0.2V/DIV (10:1) X 5ms/DIV
Y2 1V/DIV (10:1)

R26 - R27 CH1 3.6Vpp J CH2 9Vpp



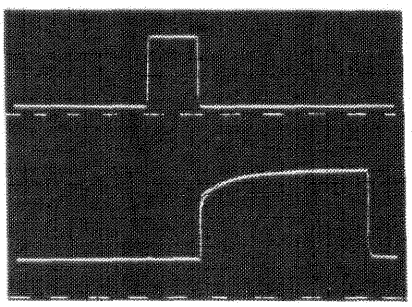
Y1 0.5V/DIV (10:1) X 2us/DIV
Y2 0.5V/DIV (10:1)

B CH1 10Vpp H CH2 10Vpp



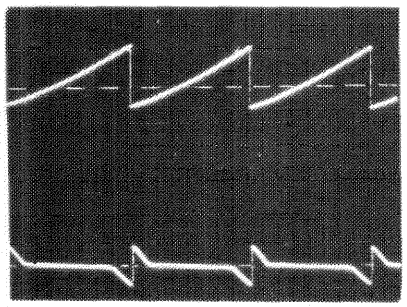
Y1 0.5V/DIV (10:1) X 10us/DIV
Y2 0.5V/DIV (10:1)

pin11 IC4 CH1 12Vpp K CH2 10Vpp



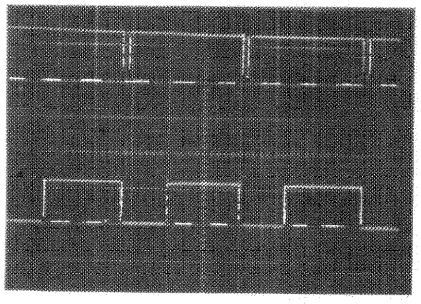
Y1 0.5V/DIV (10:1) X 1us/DIV
Y2 0.5V/DIV (10:1)

L CH1 10Vpp M CH2 12.5Vpp



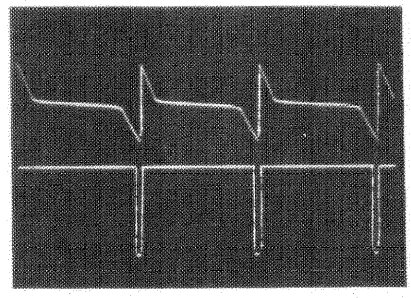
Y1 0.2V/DIV (10:1) X 5ms/DIV
Y2 0.2V/DIV (10:1)

N CH1 3.6Vpp O CH2 2.2Vpp



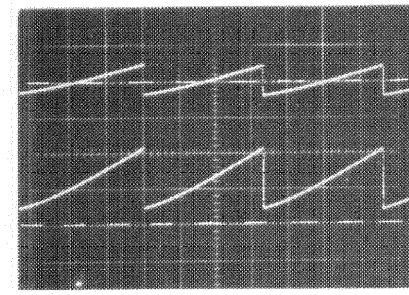
Y1 1V/DIV (10:1) X 5ms/DIV
Y2 1V/DIV (10:1)

D6-D7 CH1 11Vpp R52-R99 CH2 11Vpp



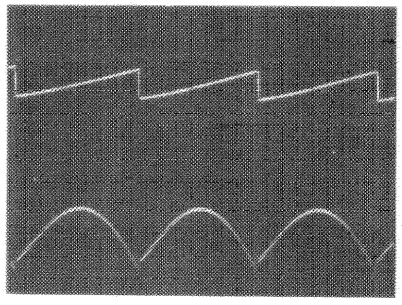
Y1 0.1V/DIV (10:1) X 5ms/DIV
Y2 1V/DIV (10:1)

◇O CH1 2.2Vpp ◇P CH2 25Vpp



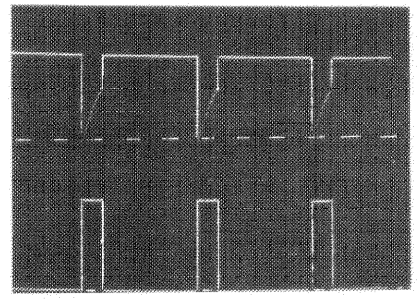
Y1 0.2V/DIV (10:1) X 5ms/DIV
Y2 0.2V/DIV (10:1)

pin8 IC7 CH1 1.6Vpp ◇N CH2 3.6Vpp



Y1 0.2V/DIV (10:1) X 5ms/DIV
Y2 50mV/DIV (10:1)

pin8 IC7 CH1 1.6Vpp ◇Q CH2 900mVpp



Y1 0.5V/DIV (10:1) X 20us/DIV
Y2 0.5V/DIV (10:1)

◇F CH1 12Vpp pin6 IC4 CH2 12Vpp

Schematic references

<A> pin 2 IC14
<B> pin 1 IC14
<C> b Transistor Q18
<D> pin 3 IC6
<E> pin 13 IC6
<F> pin 2 IC4
<G> pin 2 IC1
<H> pin 6 IC1
<I> pin 16 IC1
<J> pin 9 IC1
<K> pin 10 IC4
<L> pin 11 IC5
<M> pin 10 IC5
<N> e Transistor Q10
<O> pin 8 IC8
<P> pin 1/7 IC9
<Q> pin 6 IC11

Adjustment procedure 'VERTICAL DEFLECTION+SYNC MODULE'

Introduction

The following adjustments are provided on the main module:

a. Vertical oscillator adjustment

on the lowest frequency P1
on the highest frequency P2

Important: the following adjustments are provided on the main module in order to correct the Vert. Shift range and the Vert. Amplitude of the red and blue picture after replacement of the respective picture tubes.

b. Vertical amplitude adjustment

Blue picture P4
Red picture P3

c. Vertical Shift adjustment

Blue picture P2
Red picture P1

Vertical oscillator adjustment

P1 adjustment on the **lowest Vert. frequency 50 Hz**

- Projector has to operate on a signal with 50 Hz frame frequency
- Turn the potentiometer P2 in its mid-position
- Adjust P1 for synchronisation of the picture

P2 adjustment on the **highest Vert. frequency 100 Hz**

- Projector has to operate on a signal with 100 Hz frame frequency
- Adjust P2 for synchronisation of the picture

Vertical shift adjustment

Preparation

- Projector has to operate on a signal with standard line- and frame frequency.
- Adjust for the red and blue picture, by means of the RCU800 (refer to owner's manual of the projector), the Vert. Shift adjustments in their mid-position (refer to bar scale 50).

Adjustment

Adjust the Vert. Shift for red and blue separately for vertical coincidence of the horizontal center line with green.

Vertical amplitude Red-Blue

Adjust the Vert. Amplitude for Red and Blue separately for same amplitude as the green picture.

INTRODUCTION.

On this board and its subunit we find the sync separator, the autolock circuits for driving the line and vertical oscillators, the vertical power output stages and the preparation of the waveforms for the east-west correction.

The horizontal drive pulses for the Mosfet switchers in the horizontal deflection are equally prepared on this board.

A Barco designed IC, comprising four (4) digital potentiometers, is utilised for the adjustment of the amplitude of the waveforms, or, for some dc controls.

This IC, customer made for Barco, is driven by a I2C (serial data) from the microprocessor on the controller board.

I.THE VERTICAL OSCILLATOR.

a) Sawtooth oscillator:

The vertical sawtooth relaxation oscillator is built up around Q3 and Q8.

The +28 volts from the Switched Mode Power Supply is stabilised at 24 volts by IC8 and charges the capacitors C13, C14. As soon the emitter voltage of Q3 reaches the voltage set by P1 (V HOLD I) the transistor starts conducting and Q8 is doing the same.

A very rapid discharge of the capacitors occurs and the cycle can start again.

b) Synchronisation of the vertical oscillator.

1) By means of the composite sync :

The composite video or composite sync is applied to pin 2 of IC14, a sync separator. The composite sync output, pin 8, is proceeding to the IC1 via a buffer Q2, and to the base of Q1.

The output pin 9 is providing vertical pulses which are now sent to the base of Q7. If we assume that the switcher Q6 is conducting (see later), the negative pulses on the collector of Q7 can trigger the vertical oscillator.

The vertical oscillator can equally be triggered by means of the vertical pulses VS introduced directed to the projector (see RGB Switching board).

2) By means of the vertical pulses, if applied separately.

These vertical pulses enter the board at C13/A13 of the J1 connector and arrive on the base of Q4.

The negative pulses on the collector trigger the oscillator now via D18/D7.

To prevent triggering via Q7 the fet Q6 is blocked as follows.

The negative pulses at the collector of Q4 cause a decrease via D9 of the voltage at the gate of Q6 in order to block the latter. Note that these pulses are integrated by C23 and arrive on the gate via D9.

c) Barco made IC : 4 x digitally controlled potentiometer .

The voltage or waveform, applied between VRP and VRN is adjustable in 128 steps and is available at the output VO. The corresponding pins are eg. VRP1, VRN1 and VO1.

We find 4 of such potentiometers in one chip, and there are three of these on the subunit : IC1, IC2 and IC3 , which we will meet in the explanation.

The status of the output is controlled by the SCL (Serial Clock) and SDA (Serial Data) lines which are connected to the microprocessor on the controller board.

The address, arriving via the data SDA line is identified by a hardware addressing of the slave (the address pins are differently connected).

Obviously, as there are 4 potentiometers, the address is followed by a slave-address to drive the requested potentiometer.

d) Vertical Linearity control.

The shape of the sawtooth can be adapted by means of a feedback of a regulated sawtooth to the capacitor C14 via R33. This sawtooth is the result of the dig. potentiometer VRP1/VRN1/VO1 in IC2 on the subunit.

Indeed,the sawtoooth at the emitter of Q10 leaves the board and arrives on the subunit at contact J3(4), where it is applied, amongst others, to pin 19 of IC2 (VRP1).

The adjusted output, pin 25 (or VO1) is now sent to a bufferstage in IC8 and leaves the subunit at contact J3(3) to arrive again at the motherboard.

The sawtooth influences the charging behaviour of C14 through R33, acting consequently as a linearity control.

e) The vertical autolock circuit.

This circuit is built up around Q19 / OP AMP in TL084 / 353 (IC9).

The vertical sync pulses are picked up at the collector of Q7 and differentiated by C9/R16. The named differentiation produces a negative folowed by a positive pulse and it is this positive pulse that triggers the transistor Q19.

The output of the OP AMP, acting as a comparator, is fed back to the base of the transistor in order to prevent it from retriggering after a trigger.

The non-inverting input is pulled up to the +12 Volts line by R108 and a capacitor C31 is connected to ground. When no trigger pulses are applied to the base, the pin 12 is at +12 volts and obviously the output is equally at 12 volts.

Whenever a trigger pulse (vertical pulse) is applied on the base, the capacitor is discharged via Q19, and the output pin 14 switches at -12 volts.

This negative voltage now is slightly delayed by C38 and keeps the base low via D38 to prevent it from being retriggered. The capacitor C31 charges up again to the +12 volts and from the moment the voltage equals the voltage of the inverting input, the output switches high again.

When the next trigger occurs, the cycle starts over again.

The time between two consecutive pulses determines the time the output is high as the time the output is low is invariable and determined by the time constant C31/R108.
The duty cycle of this squared waveform depends on the time between two consecutive pulses.

This squared waveform is now clamped at ground as only to allow the positive part to charge the capacitors C62/ C61. D34 and D36 provide a rapid change in both directions of the voltage across these capacitors.

The resulting voltage at the input of the buffer IC9 (353) is proportional with the vertical period, and consequently a measure of the vertical frequency.

When the vertical frequency increases, the voltage on C61 decreases, which results in a less conducting Q11 and obviously a decrease of the charging current by Q12.

The Vert HOLD II (P2) allows an adjustment of the gain and thus of the highest frequency that must be locked by this system.

f) Vertical output stages - Vertical shift - Vertical amplitude.

The vertical sawtooth at the emitter of Q10 is leaving the board and reaches the subunit to be applied at IC2 (VRN0 and VRP0). The output is VO0 (pin 24) and is coming back to the board at J4 (4). It is now capacitively coupled to the inverting inputs of the power amplifiers IC11/IC12/IC13 together with a DC-voltage (Vertical Shift voltage).

These DC voltages are adjusted in IC3 of the subunit (outputs 25,26,27).

When the green raster is moved on the screen, the red and blue rasters move equally allowing a precise and rapid adjustment.

The amplified sawtoothed output currents flow in the respective scan coils and find their way back to ground via de feedback resistors R44/R97/R79.

The amplitude of the waveforms across these resistors is proportional to the vertical amplitude and can obviously be utilised as feedback for stabilisation of the amplitude.

The TDA8172 allows a short vertical retrace time by doubling the supply voltage during the retrace time.

During the flyback the voltage across the capacitors C35, C55 and C52 is switched in series with the supply voltage of +8 volts . As a result, the voltage during flyback is 8 + (8+17) = 33 volts.

This increased supply voltage garuantees a short flyback time.

g) Vertical scan fail detection.

The flyback pulses at the pins 6 of the output amplifiers are all three AC coupled to a parallel detector. The diodes are conducting when the pulses arrive and keep obviously the voltages on the capacitors low.

As soon one of the output stages fails, the voltage on the corresponding capacitor increases and via the diode the base of Q14 gets enough voltage and switches on. Its collector drops to ground level and the contacts A28/ C28 of the J2 connector are equally at ground level (Scan Fail).

On the other hand, the diode D16 and the saturated Q14 cause a permanent conduction of the Q15 transistor and means a permanent blanking or cut-off of the three crt's.

Vertical blanking pulses are leaving the board and are derived from the flyback pulses at the pin 6 of the red output stage.

Tr Q20 drives Q15 and the VERT BL pulses leave at A,C(26) of the module to the decoder.

II. EAST - WEST CORRECTION.

a) Trapezoidal distortion correction :

The sawtooth waveform (VST) , being applied to the buffer IC7 via C14, is inverted by an inverter stage in IC7, in order to dispose of two opposite phase ramps.

These are now introduced to a digital potentiometer in IC1 (pins 16/17 or VRN0 and VRP0). The correponding output is VO0 and via R45 the regulated sawtooth reaches the adder- amplifier TL084, pin 5.

Note that a parabolic shaped waveform is added by R43.

b) Parabolic or pincushion distortion correction :

The parabolic waveform is obtained by means of the multiplier IC11.

The waveform at pin 8 of IC7, is reaching the pins 10 and 1 through the capacitors C1 and C2. The opposite phase outputs of pins 6 and 12 are then capacitively coupled to the pins VRN2 and VRP2 of IC1.

The output VO2 is now applied, together with the previously discussed sawtooth output to the adder.

c) Frequency depending correction :

The gain of the OP AMP in IC7 is variable and depends on the divider R31/ Q1. The Fet Q1 is biased by the output of an OP AMP in IC7 (pin 1).

The integrated output of the EW-correction, pin 7, is applied to the Miller integrator input pin 2 and the other input receives a portion of the +V voltage.

An increase of the line frequency is equally an increase of the +HTHD, thus

an increase of pin 3 voltage.

This results in a more conducting fet Q1 and an increase of the gain of the OP AMP. The pin 2 follows this increase up to the moment both pins 2 and 3 have equal voltage.

By this measure we obtain an increase of the east-west correction for the higher frequencies.

d) Power amplifier :

The sum of the corrections is now sent back to the motherboard to be amplified by the TDA2030 before reaching the 'hor. defl.' board to modulate the scan voltage for horizontal deflection.

III. MIDLINE CORRECTION (BOW AND SKEW).

The midline bow and skew corrections are mixed up with the phase control of the picture. These corrections change in a dynamic way the the phase of the picture as to correct the vertical lines.

The sum of sawtooth and parabolic, added via R44 and R42, are sent to an OP AMP in IC8 and from there led to pin 15 of the monoflop in IC12.

This mopnoflop is triggered by the horizontal square wave from pin 4 of the TDA2595 (HP in).

Triggering happens on the positive transition of the squared waveform, and the time constant of the monoflop is depending on :

- the corrections sent via D16, the dynamic correction of the phase.

- the scan voltage +HTHD voltage; in order to decrease the correction at higher frequencies (see below).

The output pulse at pin 4 is a pulse that is now used to trigger a next monoflop which now will introduce a variable delay as a DC phase shift.

IV. PHASE ALIGNMENT.

The phase of the picture is adjusted by introducing a variable delay of the horizontal drive pulses.

The adjustment range over the whole frequency range must be proportional with the line period.

If we have for example a 6uS range at 15 Khz, this represents 64/6=10% phase shift.

The same 6uS at 90 Khz means 11/6 = 50% (!).

Consequently, the range must be much lower for 90 khz compared with 15 khz, or, the range much be tracked with the line frequency.

This now happens automatically.

The dc-voltage at VO2 (pin 26 of IC2) for the phase shift is sent to a voltage comparator Q7. The other transistor in Q7 receives the integrated horizontal

drive pulses, thus a dc voltage related to the line period.

The difference, present between the two collectors, is now the base-emitter voltage of Q6. The latter, as we can see, charges the capacitor C44 and part of the time constant of the monoflop in IC12 with the line period.

The width of the output pulse is adapted by the current generator as long as the dc voltages at the bases of Q7 are not the same.

This means now that the width of the pulse (=the phase shift) is becoming smaller for the higher frequencies in order to decrease the range for these frequencies.

The pulse train at pin 12 is sent to the motherboard of the unit, more precisely to the trigger input of the monoflop in IC5. This monostable now produces a horizontal drive pulse with a constant width (> 2uS) that will drive the Mosfets on the 'un hor defl.' board.

V. HORIZONTAL OSCILLATOR - HORIZONTAL AUTOLOCK.

a) Horizontal autolock :

The sync separator IC4 serves Q1 with a composite sync.

The amplified sync is then split to the PLL (IC6) and transistor Q17. The oscillator in the TDA2595 is locked to its exact frequency by a PLL, but the latter has a very limited lock range of approx. 1.2 khz only and cannot lock the range from 15 to 92 khz.

An extra PLL is utilised, the 4046 (IC6).

This IC consists of two phase comparators, and a VCO.

For this application the second phase comparator only is used.

The signal input (pin 14) is the line oscillator of the TDA2595 (squared hor. drive output of the TDA2595) and the comparator input (pin 3) is the horizontal pulses buffered by Q1. The corresponding output is pin 13.

Note that it is a three-level output and thus a pulsed information. If the output is open (in the locked state) the voltage is set at 6 volts with R92/89. On the other hand, pin 6 of IC7 is set at 7.7 volts with R94/R90.

In the locked state, the fet (behaving as a switcher) Q9 is blocked, because the output pin 7 of the voltage comparator in IC7 is low. Indeed, the PLL output is 6 volts, thus pin 5 is lower than pin 6 and the output in low.

b) Line oscillator lower than the horizontal sync :

If we assume that the local oscillator frequency is lower than the hor. sync pulses, then , the voltage on C8 decreases (pull down state). This voltage is now buffered and sent to pin 5 of IC7. But, because of the zener Z3, this voltage cannot decrease and stays at approximately 6 volts.

The other pin 6 is initially at 7.7 volts (divider R90/R94). This voltage now decreases because the transistor Q17 discharges the capacitor C50 as

follows:

The squared hor. drive of pin 4 switches on and off Q18.

When the frequency of the local line oscillator is different from the hor sync (as we assumed), these pulses arrive on the base of Q17 at the moment Q18 is not saturated.

These hor sync pulses switch on Q17 and C50 is discharged. The voltage at pin 6 drops and becomes lower than the other input pin 5. The output pin 7 switches high.

The gate of the mosfet Q9 is now positive and Q9 conducts to connect the output pin 8 of the PLL (IC7) to the inverting input pin 2 of the next integrating OP AMP. The decreasing voltage output of the PLL in inverted by IC7 and transistor Q21 draws more current out of pin 14 of the TDA2595 in order to increase the frequency of the line oscillator.

As the line oscillator is increasing, the PLL output increases equally.

This continues up to the moment there is coincidence between the hor drive and the hor sync at the base of Q17.

Once coincidence is reached, the voltage at pin 6 is again 7.7 volts and the state of the Mosfet Q9 changes to a blocked position.

From now onwards the PLL in the TDA2595 takes over and adjusts until the exact frequency and phase is reached. Therefore, the pin 17 output is sent to the same pin 2 of the integrating OP AMP.

In the locked state of the PLL of the TDA2595 this PLL output is at 6 volts.

As pin 3 of the integrating OP AMP is biased at 6 volts, the action via the OP AMP continues up to the moment the oscillator is locked .

Any change in frequency is now compensated or corrected by the PLL of the TDA2595.

c) Line oscillator higher than the hor sync :

A similar explanation is valuable now, allthough, in this case the PLL's output is increasing now. The zener Z3 cannot perform its zener function and the pin 5 follows the PLL output voltage.

Again, because there is no coincidence, the voltage at pin 6 is decreasing and the fet Q9 is unblocked to drive and correct the line oscillator.

VI. ADJUSTABLE TOP/ BOTTOM BLANKING.

The subunit generates blanking pulses for an adjustable blanking of the top and the bottom of the picture.

To achieve a high accuracy, or, on other terms to dispose of a steep ramp, the sawtooth is passed into a so-called 'dead band response amplifier' built up around an OP AMP in IC8.

The sawtooth is entered at pin 9 of IC8. The output is inverted and the ramp

is steeper at the start and at the end.

Two clipping levels are installed by clamping circuits in order to obtain a complete feedback between these levels.

As soon the first clipping level is reached, the output is invariable. and obviously no change anymore in the output is noticed.

The resulting waveform is is now led to two level detectors in IC9.

The clipping levels are regulated by the potentiometers in IC2 and IC3.

VII. SIMULATION OF THE FLYBACK PULSE FOR THE PLL OF THE TDA2595.

By means of the monoflops in IC4 a simulated line (flyback) pulse is generated. The first monoflop introduces a small delay for the pulse and the second one standardises the width.

The introduced delay is usefull to mislead the PLL and consequently to allow a negative phase shift.

VIII. BLANKING - COINCIDENCE.

In the event of a non coincidence, the transistor Q16 gets in complete saturation.

This results in :

- Led D20 comes on to show the non coincidence situation.

- if the strap is in postion, the transistor Q15 is equally in saturation and causes a permanent blanking of
the three crt's.

By removing the named strap, the picture is no more blanked at non-coincidence.

Part listing main module 76 1768

ITEM NO.	SIT.	DESCRIPTION
76 1769		UN VER+SYN PJ 49 GR800
76 1816		UN VER+SYN PJ 49 *800 SHIFT
11 37121	C...	C POMEFF 10K K5 100
11 3724	C..1	C POMEFF 100K K5 63
11 1487	C..1	C ELPR 100M Z5 40
11 3724	C..2	C POMEFF 100K K5 63
11 3730	C..2	C POMEFF 330K K5 63
11 2743	C..3	C CE MI 2K2 K5 63
11 1531	C..4	C ELPRMI 10M M5 35
11 1680	C..5	C ELRABI 10M V 40
11 1550	C..6	C ELPRMI 4M7 M5 50
11 37121	C..7	C POMEFF 10K K5 100
11 3724	C..8	C POMEFF 100K K5 63
11 2762	C..9	C CE MI 4K7 U5 63
11 37121	C..A	C POMEFF 10K K5 100
11 3890	C.10	C PETPFP 2M2 K 100
11 3728	C.11	C POMEFF 220K K5 63
11 3728	C.12	C POMEFF 220K K5 63
11 4085	C.13	C POMEPO 330K K5 63
11 4085	C.14	C POMEPO 330K K5 63
11 1546	C.15	C ELPRMI 1M M5 50
11 1531	C.16	C ELPRMI 10M M5 35
11 1531	C.18	C ELPRMI 10M M5 35
11 3724	C.19	C POMEFF 100K K5 63
11 1531	C.20	C ELPRMI 10M M5 35
11 5936	C.21	C PP RA 6K8 J5 63
11 1548	C.22	C ELPRMI 2M2 M5 50
11 1550	C.23	C ELPRMI 4M7 M5 50
11 2737	C.24	C CE MI 680P K5 63
11 3728	C.25	C POMEFF 220K K5 63
11 3728	C.26	C POMEFF 220K K5 63
11 2737	C.27	C CE MI 680P K5 63
11 2737	C.28	C CE MI 680P K5 63
11 3724	C.29	C POMEFF 100K K5 63
11 3720	C.30	C POMEFF 47K K5 63
11 4079	C.31	C POMEPO 100K M5 63
11 3724	C.32	C POMEFF 100K K5 63
11 2284	C.33	C N150MI 150P J5 63
11 1476	C.34	C ELPR 47M Z5 25
11 1488	C.35	C ELPR 220M Z5 40
11 37121	C.36	C POMEFF 10K K5 100
11 1678	C.37	C ELPRBI 10M M5 25
11 2363	C.38	C N750MI 120P J5 63
11 2363	C.39	C N750MI 120P J5 63
11 3728	C.41	C POMEFF 220K K5 63
11 2737	C.42	C CE MI 680P K5 63
11 3724	C.43	C POMEFF 100K K5 63
11 3724	C.44	C POMEFF 100K K5 63
11 3724	C.45	C POMEFF 100K K5 63
11 3724	C.46	C POMEFF 100K K5 63
11 1531	C.47	C ELPRMI 10M M5 35
11 1531	C.48	C ELPRMI 10M M5 35
11 1531	C.49	C ELPRMI 10M M5 35
11 3724	C.50	C POMEFF 100K K5 63
11 2362	C.51	C N750MI 100P J5 63
11 1488	C.52	C ELPR 220M Z5 40
11 3724	C.53	C POMEFF 100K K5 63
11 3728	C.54	C POMEFF 220K K5 63
11 1488	C.55	C ELPR 220M Z5 40
11 3728	C.56	C POMEFF 220K K5 63
11 2737	C.57	C CE MI 680P K5 63
11 3728	C.58	C POMEFF 220K K5 63
11 2737	C.59	C CE MI 680P K5 63
11 37161	C.60	C POMEFF 22K K5 100
11 1550	C.61	C ELPRMI 4M7 M5 50
11 1550	C.62	C ELPRMI 4M7 M5 50
11 1550	C.63	C ELPRMI 4M7 M5 50
11 4068	C.64	C POMEPO 10K M5 63
11 1531	C.65	C ELPRMI 10M M5 35
11 3724	C.66	C POMEFF 100K K5 63
11 1531	C.67	C ELPRMI 10M M5 35
11 1477	C.68	C ELPR 100M Z5 25
11 5926	C.69	C PP RA 2K7 J5 63
11 37121	C.70	C POMEFF 10K K5 100
11 3724	C.71	C POMEFF 100K K5 63
11 1477	C.72	C ELPR 100M Z5 25
11 4087	C.73	C POMEPO 470K M5 63
11 2363	C.74	C N750MI 120P J5 63
11 3724	C.75	C POMEFF 100K K5 63
11 3724	C.78	C POMEFF 100K K5 63
11 1531	C.79	C ELPRMI 10M M5 35
11 1626	C.80	C ELRA 1000M T 40
11 1626	C.81	C ELRA 1000M T 40
11 1546	C.82	C ELPRMI 1M M5 50
11 2743	C.83	C CE MI 2K2 K5 63
11 1548	C100	C ELPRMI 2M2 M5 50
11 1531	C101	C ELPRMI 10M M5 35
11 3724	C201	C POMEFF 100K K5 63
11 3724	C202	C POMEFF 100K K5 63
11 3724	C203	C POMEFF 100K K5 63
11 3724	C204	C POMEFF 100K K5 63
11 3724	C205	C POMEFF 100K K5 63
11 1571	C206	C ELPR 2M2 M5 350
11 3730	C207	C POMEFF 330K K5 63
11 37121	C208	C POMEFF 10K K5 100
13 1621	D...	D 1N4148 SWITCH
13 1644	D..1	D 1N4001 50V/1A
13 1621	D..2	D 1N4148 SWITCH
13 1621	D..3	D 1N4148 SWITCH
10 1156	D..4	R CF H 47K J 0W25
13 1621	D..5	D 1N4148 SWITCH
13 1621	D..6	D 1N4148 SWITCH
13 1621	D..7	D 1N4148 SWITCH
13 1621	D..8	D 1N4148 SWITCH
13 1636	D..9	D BAT43,(85) SCHOTTKY
13 1621	D..A	D 1N4148 SWITCH
13 1636	D.10	D BAT43,(85) SCHOTTKY
13 1644	D.11	D 1N4001 50V/1A
13 1644	D.12	D 1N4001 50V/1A
13 1644	D.13	D 1N4001 50V/1A
13 1621	D.14	D 1N4148 SWITCH
13 1644	D.15	D 1N4001 50V/1A
13 1621	D.16	D 1N4148 SWITCH
13 1621	D.18	D 1N4148 SWITCH
13 1621	D.19	D 1N4148 SWITCH
13 1662	D.20	D LED D3 RED
13 1644	D.21	D 1N4001 50V/1A
13 1621	D.22	D 1N4148 SWITCH
13 1644	D.23	D 1N4001 50V/1A
13 1621	D.24	D 1N4148 SWITCH
13 1644	D.25	D 1N4001 50V/1A
13 1621	D.26	D 1N4148 SWITCH
13 1621	D.27	D 1N4148 SWITCH
13 1621	D.28	D 1N4148 SWITCH
13 1621	D.29	D 1N4148 SWITCH
13 1621	D.30	D 1N4148 SWITCH
13 1644	D.31	D 1N4001 50V/1A
13 1644	D.32	D 1N4001 50V/1A
13 1644	D.33	D 1N4001 50V/1A
13 1621	D.34	D 1N4148 SWITCH

ITEM NO.	SIT.	DESCRIPTION
13 1636	D.35	D BAT43,(85) SCHOTTKY
13 1621	D.36	D 1N4148 SWITCH
13 1621	D.37	D 1N4148 SWITCH
13 1621	D.38	D 1N4148 SWITCH
13 1621	D.39	D 1N4148 SWITCH
13 1621	D.40	D 1N4148 SWITCH
13 1621	D.41	D 1N4148 SWITCH
13 2762	I..1	U 2595 TDA HOR COMB
13 4002	I..2	U 7812 +12V/1A STAB
13 4016	I..3	U 7912 -12V/1A STAB
13 73325	I..4	U 4098B 2XMONOST MULTIV
13 73325	I..5	U 4098B 2XMONOST MULTIV
13 7602	I..6	U 4046B PLL
13 4113	I..7	U 084 JFET QUAD OPAMP
13 4025	I..8	U 78L24 +24V/0A1 STAB
13 4116	I..9	U 353 JFET DUAL OPAMP
13 2751	I.10	U 2030V TDA 12W AUD AMP
13 2827	I.11	U 8172 TDA VERT DEFL OUTP
13 2827	I.12	U 8172 TDA VERT DEFL OUTP
13 2827	I.13	U 8172 TDA VERT DEFL OUTP
13 2817	I.14	U 1881 LM VID SYNC SEPAR
31 3525	J1..	J EURO MBS P 64
31 3525	J2..	J EURO MBS P 64
10 7530	P..1	R MCE V100K K 0W5 M10TS3299W
10 6825	P..1	R TCE V500E K 0W5 S10SS3386H
10 7530	P..2	R MCE V100K K 0W5 M10TS3299W
10 6833	P..2	R TCE V100K K 0W5 S10SS3386H
10 6727	P..3	R TCE H 2K K 0W5 S10TS3386P
10 6727	P..4	R TCE H 2K K 0W5 S10TS3386P
78 0017	PC..	PCB PJ 49 VER *800 761768
13 14181	Q..1	Q BC559B P 30 / 0A1
13 14182	Q..1	Q BC559C P 30 / 0A1
13 14181	Q..2	Q BC559B P 30 / 0A1
13 14295	Q..2	Q BC549B N 30 / 0A1
13 14181	Q..3	Q BC559B P 30 / 0A1
13 1411	Q..4	Q BC549C N 30 / 0A1
13 1411	Q..5	Q BC549C N 30 / 0A1
13 2910	Q..6	Q BS170 FN 60 / 0A5
13 1411	Q..7	Q BC549C N 30 / 0A1
13 14072	Q..8	Q BC547A N 45 / 0A1
13 14651	Q..9	Q BF245B FN 30 / 6
13 1411	Q.10	Q BC549C N 30 / 0A1
13 14295	Q.11	Q BC549B N 30 / 0A1
13 14181	Q.12	Q BC559B P 30 / 0A1
13 14295	Q.14	Q BC549B N 30 / 0A1
13 14131	Q.15	Q BC557B P 45 / 0A1
13 1411	Q.16	Q BC549C N 30 / 0A1
13 1411	Q.17	Q BC549C N 30 / 0A1
13 14295	Q.18	Q BC549B N 30 / 0A1
13 1411	Q.19	Q BC549C N 30 / 0A1
13 1411	Q.20	Q BC549C N 30 / 0A1
13 14295	Q.21	Q BC549B N 30 / 0A1
10 1144	R..1	R CF H 4K7 J 0W25
10 1126	R..2	R CF H150E J 0W25
10 1100	R..2	R CF H 1E J 0W25 211
10 1157	R..3	R CF H 56K J 0W25
10 1152	R..4	R CF H 22K J 0W25
10 1126	R..5	R CF H150E J 0W25
10 1152	R..5	R CF H 22K J 0W25
10 1165	R..6	R CF H270K J 0W25
10 1171	R..7	R CF H820K J 0W25
10 1136	R..8	R CF H 1K J 0W25

ITEM NO.	SIT.	DESCRIPTION	
10 1134	R..9	R CF H680E J 0W25	
10 1142	R..A	R CF H 3K3 J 0W25	
10 1155	R..B	R CF H 39K J 0W25	
10 1140	R.10	R CF H 2K2 J 0W25	
10 1165	R.11	R CF H270K J 0W25	
10 1166	R.12	R CF H330K J 0W25	
10 1150	R.13	R CF H 15K J 0W25	
10 11473	R.14	R MF H 9K1 G 0W25	
10 1160	R.14	R CF H100K J 0W25	
10 1284	R.15	R CF H 10M K 0W5	
10 1148	R.16	R CF H 10K J 0W25	
10 1166	R.17	R CF H330K J 0W25	
10 1164	R.18	R CF H220K J 0W25	
10 1136	R.19	R CF H 1K J 0W25	
10 1124	R.20	R CF H100E J 0W25	
10 1127	R.21	R CF H180E J 0W25	
10 1136	R.22	R CF H 1K J 0W25	
10 1170	R.23	R CF H680K J 0W25	
10 1168	R.24	R CF H470K J 0W25	
10 1141	R.25	R CF H 2K7 J 0W25	
10 1150	R.26	R CF H 15K J 0W25	
10 1115	R.27	R CF H 18E J 0W25	
10 1148	R.28	R CF H 10K J 0W25	
10 1148	R.29	R CF H 10K J 0W25	
10 1130	R.30	R CF H330E J 0W25	
10 1156	R.31	R CF H 47K J 0W25	
10 1133	R.32	R CF H560E J 0W25	
10 1152	R.33	R CF H 22K J 0W25	
10 1148	R.34	R CF H 10K J 0W25	
10 1154	R.35	R CF H 33K J 0W25	
10 1138	R.36	R CF H 1K5 J 0W25	
10 1149	R.37	R CF H 12K J 0W25	
10 1133	R.38	R CF H560E J 0W25	
10 1141	R.39	R CF H 2K7 J 0W25	
10 11484	R.40	R MF H 10K F 0W25	
10 1148	R.41	R CF H 10K J 0W25	
10 1146	R.42	R CF H 6K8 J 0W25	
10 1158	R.43	R CF H 68K J 0W25	
10 2604	R.44	R MF H 2E2 F 0W4	MK2
10 1124	R.45	R CF H100E J 0W25	
10 11484	R.46	R MF H 10K F 0W25	
10 11504	R.47	R MF H 15K F 0W25	
10 1100	R.48	R CF H 1E J 0W25	211
10 11484	R.49	R MF H 10K F 0W25	
10 1148	R.50	R CF H 10K J 0W25	
10 1108	R.51	R CF H 4E7 J 0W25	SK2
10 1136	R.52	R CF H 1K J 0W25	
10 1160	R.53	R CF H100K J 0W25	
10 1163	R.54	R CF H180K J 0W25	
10 1100	R.55	R CF H 1E J 0W25	211
10 1160	R.56	R CF H100K J 0W25	
10 1160	R.57	R CF H100K J 0W25	
10 1160	R.58	R CF H100K J 0W25	
10 1146	R.59	R CF H 6K8 J 0W25	
10 1146	R.60	R CF H 6K8 J 0W25	
10 1124	R.61	R CF H100E J 0W25	
10 1136	R.62	R CF H 1K J 0W25	
10 1124	R.63	R CF H100E J 0W25	
10 1156	R.64	R CF H 47K J 0W25	
10 1147	R.65	R CF H 8K2 J 0W25	
10 1148	R.66	R CF H 10K J 0W25	
10 1152	R.67	R CF H 22K J 0W25	
10 1140	R.68	R CF H 2K2 J 0W25	
10 1124	R.69	R CF H100E J 0W25	
10 1124	R.70	R CF H100E J 0W25	
10 1124	R.71	R CF H100E J 0W25	
10 1158	R.72	R CF H 68K J 0W25	
10 1150	R.73	R CF H 15K J 0W25	

ITEM NO.	SIT.	DESCRIPTION	
10 1155	R.74	R CF H 39K J 0W25	
10 1155	R.75	R CF H 39K J 0W25	
10 1124	R.76	R CF H100E J 0W25	
10 1100	R.77	R CF H 1E J 0W25	211
10 11504	R.78	R MF H 15K F 0W25	
10 2604	R.79	R MF H 2E2 F 0W4	MK2
10 1100	R.80	R CF H 1E J 0W25	211
10 1124	R.81	R CF H100E J 0W25	
10 1152	R.82	R CF H 22K J 0W25	
10 1152	R.83	R CF H 22K J 0W25	
10 1148	R.84	R CF H 10K J 0W25	
10 1152	R.85	R CF H 22K J 0W25	
10 1148	R.86	R CF H 10K J 0W25	
10 1148	R.87	R CF H 10K J 0W25	
10 1152	R.88	R CF H 22K J 0W25	
10 1145	R.89	R CF H 5K6 J 0W25	
10 1160	R.90	R CF H100K J 0W25	
10 1158	R.91	R CF H 68K J 0W25	
10 1145	R.92	R CF H 5K6 J 0W25	
10 1134	R.93	R CF H680E J 0W25	
10 1157	R.94	R CF H 56K J 0W25	
10 1148	R.95	R CF H 10K J 0W25	
10 1148	R.96	R CF H 10K J 0W25	
10 2604	R.97	R MF H 2E2 F 0W4	MK2
10 11504	R.98	R MF H 15K F 0W25	
10 1148	R.99	R CF H 10K J 0W25	
10 1148	R100	R CF H 10K J 0W25	
10 1164	R101	R CF H220K J 0W25	
10 1156	R102	R CF H 47K J 0W25	
10 1148	R103	R CF H 10K J 0W25	
10 1148	R104	R CF H 10K J 0W25	
10 1149	R105	R CF H 12K J 0W25	
10 1148	R106	R CF H 10K J 0W25	
10 1148	R107	R CF H 10K J 0W25	
10 1154	R108	R CF H 33K J 0W25	
10 1143	R109	R CF H 3K9 J 0W25	
10 1139	R110	R CF H 1K8 J 0W25	
10 1140	R111	R CF H 2K2 J 0W25	
10 1100	R112	R CF H 1E J 0W25	211
10 1149	R113	R CF H 12K J 0W25	
10 1141	R114	R CF H 2K7 J 0W25	
10 1148	R115	R CF H 10K J 0W25	
10 24378	R116	R MF H 24K3 F 0W25	MK2
10 1135	R117	R CF H820E J 0W25	
10 1160	R118	R CF H100K J 0W25	
10 1144	R119	R CF H 4K7 J 0W25	
10 1154	R120	R CF H 33K J 0W25	
10 1228	R121	R CF H220E J 0W5	
10 1149	R122	R CF H 12K J 0W25	
10 1147	R123	R CF H 8K2 J 0W25	
10 3600	R126	R WW H 0E10K 4W	206-8
10 3600	R127	R WW H 0E10K 4W	206-8
10 1127	R200	R CF H180E J 0W25	
10 1166	R201	R CF H330K J 0W25	
10 1166	R202	R CF H330K J 0W25	
10 1160	R203	R CF H100K J 0W25	
10 1160	R301	R CF H100K J 0W25	
10 1160	R302	R CF H100K J 0W25	
10 1124	R303	R CF H100E J 0W25	
10 1167	R304	R CF H390K J 0W25	
10 1146	R305	R CF H 6K8 J 0W25	
10 1136	R306	R CF H 1K J 0W25	
10 1137	R307	R CF H 1K2 J 0W25	
10 11917	SR.1	R CFFH E22J 0W4	
10 11917	SR.2	R CFFH E22J 0W4	
13 1768	Z..1	D ZENER 7V5 0W5 B	
13 1734	Z..2	D ZENER 5V6 0W5 B	
13 1734	Z..3	D ZENER 5V6 0W5 B	

Part listing submodule 76 1816

ITEM NO.	SIT.	DESCRIPTION
31 3366		J CIS MBS P 1 L8,7 RL
11 3724	C..1	C POMEFF 100K K5 63
11 3724	C..2	C POMEFF 100K K5 63
10 7530	P..1	R MCE V100K K 0W5 M10TS3299W
10 7530	P..2	R MCE V100K K 0W5 M10TS3299W
10 6727	P..3	R TCE H 2K K 0W5 S10TS3386P
10 6727	P..4	R TCE H 2K K 0W5 S10TS3386P
78 0103	PC..	PCB PJ 49 VER *800 SUB 761816
13 14181	Q..1	Q BC559B P 30 / 0A1
13 14181	Q..2	Q BC559B P 30 / 0A1

ITEM NO.	SIT.	DESCRIPTION
10 1140	R..1	R CF H 2K2 J 0W25
10 1126	R..2	R CF H150E J 0W25
10 1158	R..3	R CF H 68K J 0W25
10 1148	R..4	R CF H 10K J 0W25
10 1126	R..5	R CF H150E J 0W25
10 1160	R..6	R CF H100K J 0W25
10 1171	R..7	R CF H820K J 0W25
10 1140	R..8	R CF H 2K2 J 0W25
10 1152	R..9	R CF H 22K J 0W25
10 1160	R.10	R CF H100K J 0W25
10 1171	R.11	R CF H820K J 0W25
10 1124	R.12	R CF H100E J 0W25
10 1124	R.13	R CF H100E J 0W25
10 11473	R.14	R MF H 9K1 G 0W25
10 11473	R.15	R MF H 9K1 G 0W25

VERTICAL DEFLECTION + SYNC MODULE 76 1768

SUB-MODULE VERTICAL DEFLECTION + SYNC 76 1769

Spare Parts main module 76 1768

ART.NO.	DESCRIPTION	QUANTITY
10 11917	R CFFH E22J 0W4	2
10 2604	R MF H 2E2 F 0W4 MK2	3
10 3600	R WW H 0E10K 4W 206-	*2
10 6727	R TCE H 2K K 0W5 S10TS3386	2
10 6825	R TCE V500E K 0W5 S10SS3386	*1
10 6833	R TCE V100K K 0W5 S10SS3386	*1
10 7530	R MCE V100K K 0W5 M10TS3299	2
11 1571	C ELPR 2M2 M5 350	1
11 3890	C PETPFP 2M2 K 100	1
13 14072	Q BC547A N 45 / 0A1	1
13 1411	Q BC549C N 30 / 0A1	8
13 14131	Q BC557B P 45 / 0A1	1
13 14181	Q BC559B P 30 / 0A1	4
13 14182	Q BC559C P 30 / 0A1	1
13 14295	Q BC549B N 30 / 0A1	5
13 14651	Q BF245B FN 30 / 6	1
13 1621	D 1N4148 SWITCH	26
13 1636	D BAT43,(85) SCHOTTKY	3
13 1644	D 1N4001 50V/1A	11
13 1662	D LED D3 RED	*1
13 1734	D ZENER 5V6 0W5 B	2
13 1768	D ZENER 7V5 0W5 B	1
13 2751	U 2030V TDA 12W AUD AM	1
13 2762	U 2595 TDA HOR COM	1
13 2817	U 1881 LM VID SYNC SEPA	1
13 2827	U 8172 TDA VERT DEFL OUT	3
13 2910	Q BS170 FN 60 / 0A5	1
13 4002	U 7812 +12V/1A STA	1
13 4016	U 7912 -12V/1A STA	1
13 4025	U 78L24 +24V/0A1 STA	1
13 4113	U 084 JFET QUAD OPAM	1
13 4116	U 353 JFET DUAL OPAM	*1
13 73325	U 4098B 2XMONOST MULTI	2
13 7602	U 4046B PL	1
31 3276	J MODU MBT P 10 R2,5	1
31 33921	J JUMP FMT P 2 0.1	1
31 3525	J EURO MBS P 64	2
36 20216	SCREW DIN84 M 3 X 6 MP-	14
36 21229	SCREW DIN7985 M 3 X 8 TWOLO	3
36 7502	WASHER DIN6798 A 3,2	13
36 7699	RIVET CHOBERT D2,38 L6,35	1
71 23023	WASHER DIA 3,25X 7 T0,5 BA	1
76 1769	UN VER+SYN PJ 49 GR800	1
76 1816	UN VER+SYN PJ 49 *800 SHIFT	1
80 2628	FIX PJ 49 TSTR SPRING 1X HOR	*6
80 2644	HEATSINK PJ 49 VER	*1
80 2645	HEATSINK PJ 49 VER FIX LATH	1
80 2779	Q INSULAT SHEET 125X30	1
80 3299	SPACER L37 H 5,5 M3 M	*4

Spare Parts Submodule 76 1816

ART.NO.	DESCRIPTION	QUANTITY
10 6727	R TCE H 2K K 0W5 S10TS3386	2
10 7530	R MCE V100K K 0W5 M10TS3299	2
13 14181	Q BC559B P 30 / 0A1	2
31 3366	J CIS MBS P 1 L8,7 RL	1

*** NUMBRES REFERRING TO PICTURE**

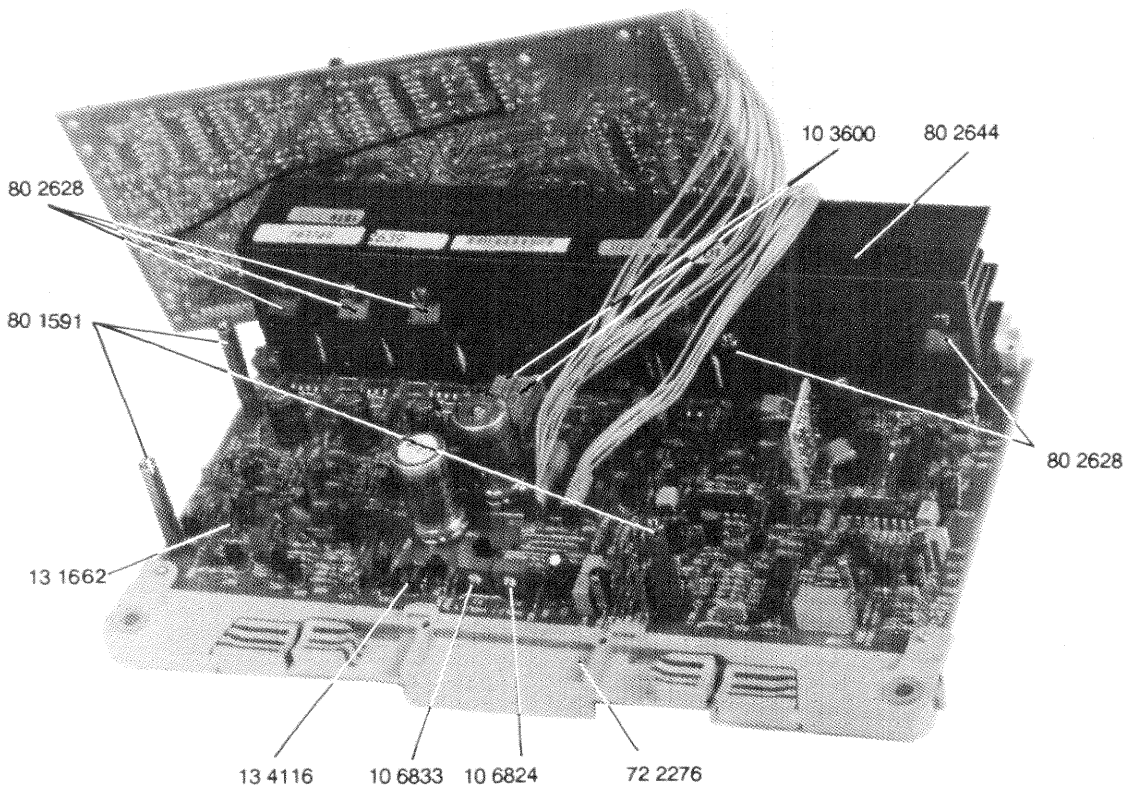
Part listing sub module 76 1769

ITEM NO.	SIT.	DESCRIPTION
11 1531	C...	C ELPRMI 10M M5 35
11 2362	C...	C N750MI 100P J5 63
11 37121	C...	C POMEFF 10K K5 100
11 3724	C...	C POMEFF 100K K5 63
11 1531	C..1	C ELPRMI 10M M5 35
11 1531	C..2	C ELPRMI 10M M5 35
11 1531	C..3	C ELPRMI 10M M5 35
11 1531	C..4	C ELPRMI 10M M5 35
11 3724	C..5	C POMEFF 100K K5 63
11 37121	C..6	C POMEFF 10K K5 100
11 37121	C..7	C POMEFF 10K K5 100
11 1500	C..8	C ELPRMI 47M M5 10
11 1531	C..9	C ELPRMI 10M M5 35
11 3724	C.10	C POMEFF 100K K5 63
11 3732	C.11	C POMEFF 470K K5 63
11 3819	C.12	C PO PO 3K3 J5 63
11 1531	C.13	C ELPRMI 10M M5 35
11 1531	C.14	C ELPRMI 10M M5 35
11 3724	C.15	C POMEFF 100K K5 63
11 1476	C.16	C ELPR 47M Z5 25
11 1531	C.17	C ELPRMI 10M M5 35
11 27475	C.18	C CE MI 4K7 K5 63
11 1531	C.19	C ELPRMI 10M M5 35
11 1546	C.20	C ELPRMI 1M M5 50
11 27475	C.21	C CE MI 4K7 K5 63
11 3724	C.22	C POMEFF 100K K5 63
11 1531	C.23	C ELPRMI 10M M5 35
11 1531	C.24	C ELPRMI 10M M5 35
11 3724	C.25	C POMEFF 100K K5 63
11 1531	C.26	C ELPRMI 10M M5 35
11 1531	C.27	C ELPRMI 10M M5 35
11 3732	C.28	C POMEFF 470K K5 63
11 3724	C.29	C POMEFF 100K K5 63
11 2747	C.30	C CE MI 4K7 K5 63
11 27475	C.31	C CE MI 4K7 K5 63
11 1546	C.32	C ELPRMI 1M M5 50
11 1546	C.33	C ELPRMI 1M M5 50
11 2735	C.34	C CE MI 470P K5 63
11 3724	C.35	C POMEFF 100K K5 63
11 3730	C.36	C POMEFF 330K K5 63
11 37121	C.38	C POMEFF 10K K5 100
11 1531	C.39	C ELPRMI 10M M5 35
11 2442	C.40	C NPO MI 100P G2 63
11 1230	C.41	C ELAX 22M T 160
11 3724	C.42	C POMEFF 100K K5 63
11 3724	C.43	C POMEFF 100K K5 63
11 2430	C.44	C NPO MI 10P G2 63
11 1531	C.45	C ELPRMI 10M M5 35
11 1531	C.46	C ELPRMI 10M M5 35
11 1531	C.47	C ELPRMI 10M M5 35
11 1531	C.48	C ELPRMI 10M M5 35
11 1500	C.49	C ELPRMI 47M M5 10
11 2747	C.50	C CE MI 4K7 K5 63
11 2743	C214	C CE MI 2K2 K5 63
11 1546	C219	C ELPRMI 1M M5 50
13 1621	D..1	D 1N4148 SWITCH
13 1621	D..2	D 1N4148 SWITCH
13 1636	D..3	D BAT43,(85) SCHOTTKY
13 1636	D..4	D BAT43,(85) SCHOTTKY
13 1636	D..5	D BAT43,(85) SCHOTTKY
13 1636	D..6	D BAT43,(85) SCHOTTKY
13 1636	D..7	D BAT43,(85) SCHOTTKY
13 1621	D..8	D 1N4148 SWITCH
13 1621	D..9	D 1N4148 SWITCH

ITEM NO.	SIT.	DESCRIPTION
13 1621	D.10	D 1N4148 SWITCH
13 1621	D.11	D 1N4148 SWITCH
13 1621	D.12	D 1N4148 SWITCH
13 1621	D.13	D 1N4148 SWITCH
13 1636	D.15	D BAT43,(85) SCHOTTKY
13 1636	D.16	D BAT43,(85) SCHOTTKY
13 1639	D.17	D BAX12 SWITCH
13 2833	I..1	U 76013 SC DPM+IICBUS
13 2833	I..2	U 76013 SC DPM+IICBUS
13 2833	I..3	U 76013 SC DPM+IICBUS
13 4028	I..4	U 317LZ +1+37V/0A1 STAB
13 4029	I..5	U 337LZ -1-37V/0A1 STAB
13 4032	I..6	U 78LO5 +05V/0A1 STAB
13 4113	I..7	U 084 JFET QUAD OPAMP
13 4113	I..8	U 084 JFET QUAD OPAMP
13 4114	I..9	U 393 DUAL VOLT COMP
13 7397	I.10	U 4013B 2X D FLIP FLOP
13 27655	I.11	U 1496 MC BAL MOD DEMOD
13 7552	IC12	U 74HCT123 2XRETR M MULTIV
31 3948	J3..	J CT-MT MBS P 8 R2
31 3952	J4..	J CT-MT MBS P 12 R2
78 0018	PC..	PCB PJ 49 VER *800 SUB 761769
13 14651	Q..1	Q BF245B FN 30 / 6
13 14295	Q..2	Q BC549B N 30 / 0A1
13 14295	Q..3	Q BC549B N 30 / 0A1
13 14295	Q..5	Q BC549B N 30 / 0A1
13 14182	Q..6	Q BC559C P 30 / 0A1
13 2944	Q..7	Q BCY87 DUAL N 40 / 0A2
13 1491	Q..8	Q BSX20,2369 N 15 / 0A2
10 1124	R...	R CF H100E J 0W25
10 1162	R...	R CF H150K J 0W25
10 1148	R..1	R CF H 10K J 0W25
10 1129	R..2	R CF H270E J 0W25
10 1148	R..3	R CF H 10K J 0W25
10 1148	R..4	R CF H 10K J 0W25
10 1148	R..5	R CF H 10K J 0W25
10 1147	R..6	R CF H 8K2 J 0W25
10 1148	R..7	R CF H 10K J 0W25
10 1148	R..8	R CF H 10K J 0W25
10 1144	R..9	R CF H 4K7 J 0W25
10 1144	R.10	R CF H 4K7 J 0W25
10 1147	R.11	R CF H 8K2 J 0W25
10 1126	R.12	R CF H150E J 0W25
10 1132	R.13	R CF H470E J 0W25
10 1136	R.14	R CF H 1K J 0W25
10 1135	R.16	R CF H820E J 0W25
10 1133	R.17	R CF H560E J 0W25
10 1137	R.18	R CF H 1K2 J 0W25
10 1124	R.19	R CF H100E J 0W25
10 1148	R.20	R CF H 10K J 0W25
10 1141	R.21	R CF H 2K7 J 0W25
10 1136	R.22	R CF H 1K J 0W25
10 1136	R.23	R CF H 1K J 0W25
10 1148	R.24	R CF H 10K J 0W25
10 1149	R.25	R CF H 12K J 0W25
10 1140	R.26	R CF H 2K2 J 0W25
10 1160	R.27	R CF H100K J 0W25
10 1153	R.28	R CF H 27K J 0W25
10 1116	R.29	R CF H 22E J 0W25

ITEM NO.	SIT.	DESCRIPTION
10 1168	R.30	R CF H470K J 0W25
10 1141	R.31	R CF H 2K7 J 0W25
10 1134	R.32	R CF H680E J 0W25
10 1144	R.33	R CF H 4K7 J 0W25
10 1148	R.34	R CF H 10K J 0W25
10 1144	R.35	R CF H 4K7 J 0W25
10 1147	R.36	R CF H 8K2 J 0W25
10 1146	R.37	R CF H 6K8 J 0W25
10 1156	R.38	R CF H 47K J 0W25
10 1136	R.39	R CF H 1K J 0W25
10 1132	R.40	R CF H470E J 0W25
10 1156	R.41	R CF H 47K J 0W25
10 1148	R.42	R CF H 10K J 0W25
10 1136	R.43	R CF H 1K J 0W25
10 1148	R.44	R CF H 10K J 0W25
10 1136	R.45	R CF H 1K J 0W25
10 1143	R.46	R CF H 3K9 J 0W25
10 1143	R.47	R CF H 3K9 J 0W25
10 1130	R.48	R CF H330E J 0W25
10 1160	R.49	R CF H100K J 0W25
10 1160	R.50	R CF H100K J 0W25
10 1148	R.52	R CF H 10K J 0W25
10 1124	R.53	R CF H100E J 0W25
10 1124	R.54	R CF H100E J 0W25
10 1149	R.55	R CF H 12K J 0W25
10 1164	R.56	R CF H220K J 0W25
10 1148	R.57	R CF H 10K J 0W25
10 1143	R.58	R CF H 3K9 J 0W25
10 1161	R.59	R CF H120K J 0W25
10 1128	R.60	R CF H220E J 0W25
10 1148	R.61	R CF H 10K J 0W25
10 1150	R.62	R CF H 15K J 0W25
10 1130	R.63	R CF H330E J 0W25

ITEM NO.	SIT.	DESCRIPTION	
10 1119	R.64	R CF H 39E J 0W25	
10 1125	R.65	R CF H120E J 0W25	
10 1152	R.66	R CF H 22K J 0W25	
10 1124	R.67	R CF H100E J 0W25	
10 1124	R.68	R CF H100E J 0W25	
10 1152	R.69	R CF H 22K J 0W25	
10 1160	R.71	R CF H100K J 0W25	
10 1136	R.72	R CF H 1K J 0W25	
10 1152	R.73	R CF H 22K J 0W25	
10 1116	R.74	R CF H 22E J 0W25	
10 1159	R.75	R CF H 82K J 0W25	
10 1136	R.76	R CF H 1K J 0W25	
10 1146	R.77	R CF H 6K8 J 0W25	
10 1149	R.78	R CF H 12K J 0W25	
10 1148	R.79	R CF H 10K J 0W25	
10 1136	R.80	R CF H 1K J 0W25	
10 1136	R.81	R CF H 1K J 0W25	
10 1137	R.82	R CF H 1K2 J 0W25	
10 1148	R.83	R CF H 10K J 0W25	
10 1148	R.84	R CF H 10K J 0W25	
10 1104	R.85	R CF H 2E2 J 0W25	181
10 1127	R.86	R CF H180E J 0W25	
10 1140	R.87	R CF H 2K2 J 0W25	
10 1148	R.88	R CF H 10K J 0W25	
10 1172	R.89	R CF H 1M J 0W25	
10 1148	R212	R CF H 10K J 0W25	
10 1148	R213	R CF H 10K J 0W25	
10 1136	R217	R CF H 1K J 0W25	
10 1160	R218	R CF H100K J 0W25	
10 1148	R222	R CF H 10K J 0W25	



Spare Parts Submodule 76 1769

ART.NO.	DESCRIPTION	QUANTITY	ART.NO.	DESCRIPTION	QUANTITY
11 27475	C CE MI 4K7 K5 63	3	13 2944	Q BCY87 DUAL N 40 / 0A2	1
			13 4028	U 317LZ +1+37V/0A1 STA	1
13 14182	Q BC559C P 30 / 0A1	1	13 4029	U 337LZ -1-37V/0A1 STA	1
13 14295	Q BC549B N 30 / 0A1	3	13 4032	U 78LO5 +05V/0A1 STA	1
13 14651	Q BF245B FN 30 / 6	1	13 4113	U 084 JFET QUAD OPAM	2
13 1491	Q BSX20,2369 N 15 / 0A2	1	13 4114	U 393 DUAL VOLT COM	1
13 1621	D 1N4148 SWITCH	8	13 7397	U 4013B 2X D FLIP FLO	1
13 1636	D BAT43,(85) SCHOTTKY	7	13 7552	U 74HCT123 2XRETR M MULTI	1
13 1639	D BAX12 SWITCH	1			
13 27655	U 1496 MC BAL MOD DEMO	1	31 3948	J CT-MT MBS P 8 R2	*1
13 2833	U 76013 SC DPM+IICBU	*3	31 3952	J CT-MT MBS P 12 R2	*1

* NUMBERS REFERRING TO PICTURE