BARCO

BARCO Projection Systems

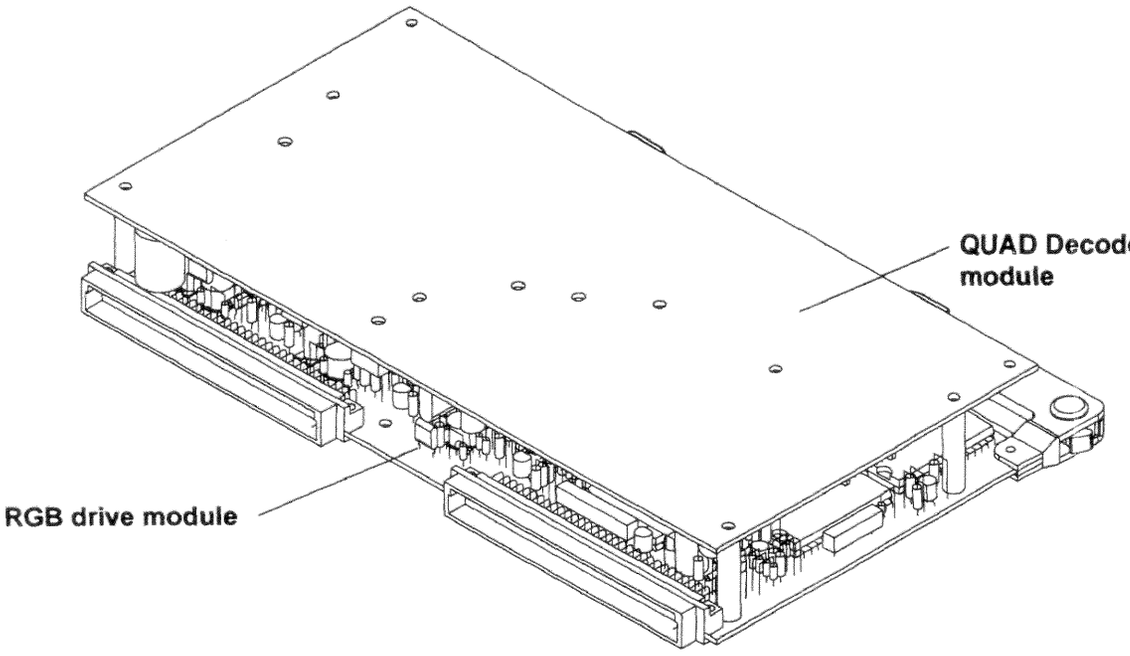
SECTION J

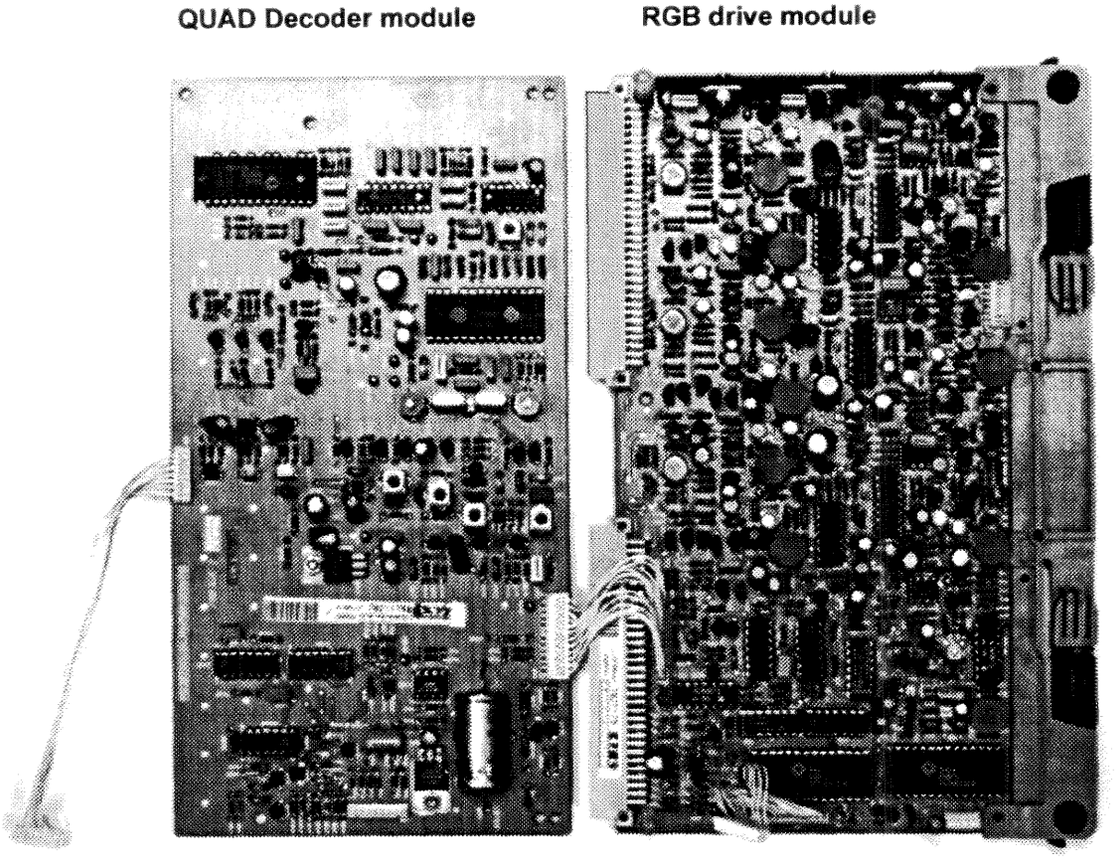
service sheet

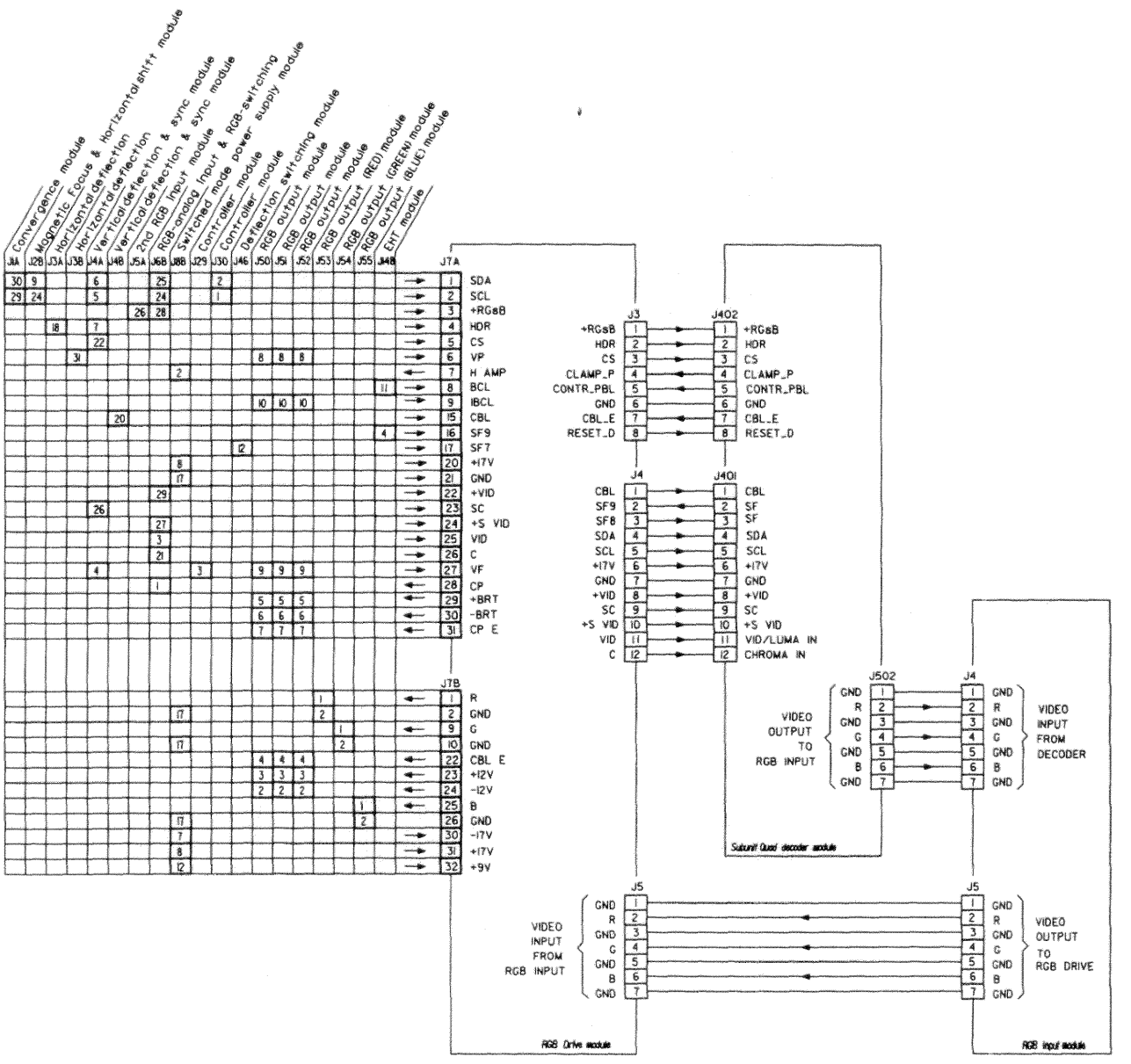
RGB Driver+QUAD Decoder

R7621175

Sub module: Quad decoder R7621175S







Name	Interconnection	Article nr.
RGB DRIVE & DECODER MODULE		76 21175-3
Date	Drawn	Checked
17-11-1993	JVDY	PDGY/JVST

BARCO PROJECTION SYSTEMS

C1	E 3	C414	C 4	D409	B 5	Q206	F 4	R108	E 3	R323	E 6	R492	B 2
C2	E 2	C415	C 4	D410	B 5	Q207	F 5	R109	E 3	R324	E 5	R493	C 2
C3	E 2	C416	C 4	D411	C 5	Q208	F 5	R110	E 3	R325	E 5	R494	C 1
C4	E 2	C417	C 4	D412	D 3	Q209	F 4	R111	E 3	R326	E 5	R495	C 1
C5	E 2	C418	C 4	D413	C 3	Q210	F 4	R112	E 3	R330	E 5	R496	C 1
C6	E 2	C419	B 4	D414	C 3	Q211	F 4	R114	D 3	R331	E 5	R497	B 1
C7	E 2	C420	B 4	D415	B 2	Q212	F 4	R115	E 3	R333	F 5	R498	B 1
C8	E 2	C421	C 4			Q213	G 4	R116	E 3	R334	F 5	R500	D 5
C9	E 2	C422	C 4	IC1	E 1	Q214	F 4	R117	E 3	R335	F 5	R501	D 5
C10	F 2	C423	D 4	IC2	F 1	Q215	E 4	R118	E 4	R336	E 5	R502	D 5
C11	F 3	C424	C 4	IC3	F 2	Q217	F 4	R119	E 3	R337	E 5	R503	D 5
C12	F 6	C425	C 4	IC4	F 2	Q218	G 2	R120	E 3	R338	F 5		
C13	F 6	C426	C 4	IC5	E 2	Q219	F 4	R121	E 3	R339	F 5	S69	E 1
C14	E 6	C427	C 4	IC6	D 2	Q220	E 4	R122	E 4	R340	F 5		
C15	F 6	C428	D 4	IC7	F 2	Q221	E 4	R123	E 4	R341	F 5	SR60	F 6
C16	E 6	C429	B 4	IC8	E 2	Q222	E 4	R124	E 3	R349	F 5	SR61	F 6
C17	E 6	C430	C 3	IC9	F 2	Q223	E 4	R125	E 3	R350	F 5	SR62	E 6
C18	G 2	C431	B 4	IC10	E 2	Q224	E 4	R126	E 3	R352	F 5	SR400	C 5
C19	F 3	C432	B 3	IC11	F 6	Q225	E 4	R130	E 3	R353	F 5	SR401	C 5
C20	E 3	C433	B 3	IC12	F 6	Q226	E 4	R131	E 3	R354	F 5	SR402	B 3
C21	F 2	C434	B 3	IC13	E 6	Q301	E 5	R133	F 3	R355	F 5	SR403	C 2
C22	E 1	C435	C 3	IC101	E 3	Q304	E 5	R134	F 3	R356	E 6	SR404	B 2
C23	F 2	C436	C 3	IC102	E 3	Q305	E 6	R135	F 3	R357	F 5	SR405	C 2
C24	G 5	C437	C 3	IC103	F 3	Q306	F 5	R136	E 3	R358	F 6		
C25	E 2	C438	C 3	IC201	E 4	Q307	F 6	R137	E 3	R359	F 6	XT400	C 3
C26	E 2	C439	C 3	IC202	E 5	Q308	F 6	R138	F 3	R360	F 5	XT401	C 3
C101	D 3	C440	C 3	IC301	E 5	Q309	F 5	R139	F 3	R365	F 5		
C102	D 3	C441	C 3	IC302	E 5	Q310	F 5	R140	F 3	R366	F 5	Z5	F 2
C103	E 3	C442	B 3	IC303	F 5	Q311	F 5	R141	F 3	R367	F 5	Z8	F 2
C104	E 3	C443	C 3	IC400	B 5	Q312	F 5	R149	F 3	R368	G 5	Z20	E 2
C105	D 3	C444	C 3	IC401	C 5	Q313	G 5	R150	F 3	R369	F 5	Z31	E 3
C106	E 4	C445	C 3	IC402	C 5	Q314	F 5	R152	F 3	R370	G 5	Z32	F 3
C107	E 3	C446	B 2	IC403	A 5	Q315	E 5	R153	F 3	R371	E 5	Z101	E 3
C108	E 3	C447	B 2	IC404	B 5	Q317	F 6	R154	F 3	R372	F 5	Z103	F 3
C109	E 3	C448	A 2	IC405	B 4	Q318	F 2	R155	F 3	R374	F 2	Z104	E 3
C110	E 3	C449	B 2	IC406	D 3	Q319	G 5	R156	F 3	R375	F 6	Z105	G 3
C111	E 3	C450	C 2	IC407	B 2	Q320	E 5	R157	F 3	R376	F 5	Z201	E 5
C112	E 3	C451	B 2	IC408	C 2	Q321	D 6	R158	F 4	R377	F 5	Z203	F 4
C113	E 3	C452	D 2	IC409	D 2	Q322	E 6	R159	F 4	R379	F 5	Z205	F 4
C114	E 4	C453	D 2	IC410	B 1	Q323	D 5	R160	F 3	R380	F 5	Z301	E 6
C115	E 4	C454	C 2			Q324	E 5	R165	F 3	R381	D 5	Z303	F 5
C120	E 3	C455	C 2	J1	G 4	Q325	E 5	R166	F 3	R382	E 5	Z304	E 5
C121	F 3	C456	C 2	J2	G 3	Q326	E 6	R167	F 3	R383	E 5	Z305	G 5
C123	E 3	C457	C 2	J3	F 1	Q400	B 6	R168	F 3	R384	D 5	Z400	C 5
C124	E 3	C458	C 2	J4	G 2	Q401	B 6	R169	F 3	R385	E 6	Z401	B 3
C125	F 3	C459	C 2	J5	D 4	Q402	B 6	R170	G 3	R386	E 6	Z402	C 1
C126	F 3	C460	C 2	J253	E 1	Q403	B 5	R171	E 3	R387	F 5	Z403	C 1
C127	F 3	C461	B 2	J254	E 1	Q404	C 4	R172	F 3	R388	E 5	Z404	B 1
C129	E 3	C462	D 2	J255	E 1	Q405	C 4	R174	F 2	R389	F 5	Z405	B 1
C139	F 4	C463	D 2	J256	E 1	Q406	C 4	R175	F 4	R400	B 6		
C140	F 4	C464	C 2	J260	E 1	Q407	B 4	R176	F 3	R401	B 6		
C141	F 4	C465	B 2	J270	D 1	Q408	B 4	R177	F 3	R402	B 6		
C142	F 3	C466	C 2	J271	D 1	Q409	B 4	R178	G 4	R403	B 6		
C143	F 4	C467	C 2	J400	C 6	Q410	B 4	R181	D 3	R404	B 6		
C144	F 3	C468	B 2	J401	C 5	Q411	C 4	R182	E 3	R405	C 6		
C145	F 3	C469	B 2	J402	A 3	Q412	D 3	R183	E 3	R407	C 6		
C146	F 3	C470	C 2			Q413	C 3	R184	E 4	R408	B 6		
C147	F 3	C471	C 2	L101	F 3	Q414	C 3	R185	E 4	R409	B 6		
C148	F 4	C472	B 2	L102	G 4	Q415	C 3	R186	E 4	R410	B 6		
C151	F 3	C473	C 1	L201	F 4	Q416	C 3	R187	F 3	R411	B 5		
C152	G 3	C474	C 1	L202	G 5	Q417	B 3	R188	E 3	R412	B 5		
C201	E 4	C475	C 1	L301	F 5	Q418	B 3	R189	F 3	R413	C 5		
C202	E 4	C476	C 1	L302	G 6	Q419	B 3	R201	D 4	R414	C 5		
C203	E 4	C477	D 1	L400	B 4	Q420	B 3	R202	E 4	R415	B 5		
C204	E 4	C478	C 1	L401	D 4	Q421	B 3	R205	E 4	R416	C 5		
C205	E 4			L402	C 4	Q422	B 3	R206	E 4	R417	C 5		
C206	E 5	D1	F 2	L403	C 4	Q500	D 5	R207	E 4	R418	C 5		
C207	E 4	D2	F 2	L404	C 4	Q501	D 5	R208	E 4	R419	C 5		
C208	E 4	D3	E 2	L405	B 3			R209	E 4	R420	B 5		
C209	E 4	D4	E 2	L406	C 2	R1	E 1	R210	E 4	R421	C 5		
C210	E 4	D5	F 2			R2	E 1	R211	E 4	R422	C 5		
C211	F 4	D6	F 3	MP400	C 5	R3	E 1	R212	E 4	R423	B 5		
C212	E 4	D7	F 3	MP401	C 4	R4	F 2	R214	E 4	R424	C 5		
C213	F 4	D8	E 1	MP402	B 4	R5	F 1	R215	E 4	R425	C 5		
C214	E 5	D9	E 2	MP403	C 3	R6	F 2	R216	E 4	R426	C 5		
C215	E 5	D10	E 2	MP404	B 3	R7	F 2	R217	F 4	R427	C 5		
C220	E 4	D11	E 2	MP405	C 3	R8	E 2	R218	E 4	R428	B 5		
C226	F 4	D13	F 1	MP406	B 2	R9	E 2	R219	E 4	R429	D 4		
C227	F 4	D14	F 1	MP407	B 2	R10	F 2	R220	E 4	R430	C 4		
C229	E 4	D15	F 3	MP408	C 2	R11	E 2	R221	E 4	R431	C 4		
C239	F 4	D16	F 3	MP409	C 2	R12	E 2	R222	E 5	R432	C 4		
C240	F 4	D17	F 3			R13	F 2	R223	E 5	R433	C 4		
C241	F 5	D18	F 3	P103	D 3	R14	F 3	R224	E 4	R434	C 4		
C242	F 4	D19	G 3	P132	F 3	R15	F 3	R225	E 4	R435	C 4		
C243	F 5	D21	F 1	P151	F 3	R16	F 2	R226	E 4	R436	C 4		
C244	F 4	D22	G 2	P203	D 4	R17	E 2	R230	E 4	R437	B 4		
C245	F 4	D24	F 1	P232	F 4	R18	E 2	R238	F 4	R438	B 4		
C246	F 4	D25	F 1	P251	F 4	R19	E 2	R239	F 4	R439	C 4		
C247	F 4	D26	F 1	P257	D 2	R20	E 2	R240	F 4	R440	C 4		
C248	F 5	D27	F 1	P303	D 5	R21	E 3	R241	F 4	R441	C 4		
C251	F 4	D28	G 1	P332	F 5	R23	D 2	R249	F 4	R442	C 4		
C252	F 4	D29	G 1	P351	F 5	R24	F 2	R250	F 4	R443	C 4		
C301	E 5	D71	E 2	P400	C 2	R25	E 2	R252	F 4	R444	C 4		
C302	E 5	D72	F 1			R28	E 2	R253	F 4	R445	B 4		
C303	E 5	D101	D 3	Q1	E 1	R29	E 2	R254	F 4	R446	B 4		
C304	E 5	D102	D 3	Q2	E 2	R30	D 2	R255	F 4	R447	B 4		
C305	E 6	D105	E 3	Q3	E 2	R31	D 2	R256	F 4	R448	C 4		
C306	E 5	D106	E 3	Q4	E 2	R32	E 2	R257	F 4	R449	D 3		
C307	E 5	D107	E 3	Q5	F 3	R33	E 2	R258	F 5	R450	C 3		
C308	E 5	D108	F 3	Q6	F 2	R34	E 2	R259	F 5	R451	C 3		
C309	E 5	D109	G 3	Q7	F 3	R35	E 2	R260	F 4	R452	B 3		
C310	E 5	D110	G 3	Q8	E 3	R36	E 2	R265	F 4	R453	B 3		
C311	E 5	D111	F 3	Q9	E 3	R37	D 3	R266	F 4	R454	B 3		
C312	E 5	D112	G 3	Q10	E 2	R38	D 2	R267	F 4	R455	B 4		
C313	E 5	D113	G 4	Q12	F 2	R39	D 2	R268	G 4	R456	B 4		
C314	E 6	D115	E 3	Q13	F 2	R40	D 2	R269	F 4	R457	B 4		
C315	E 6	D201	E 4	Q14	F 2	R41	D 3	R270	G 4	R458	B 4		
C320	E 5	D202	E 4	Q15	F 2	R42	D 3	R271	E 4	R459	B 4		
C321	F 5	D205	E 4	Q16	F 2	R44	E 2	R272	F 4	R460	B 4		
C323	E 5	D206	F 4	Q17	E 2	R45	F 2	R274	F 2	R461	B 4		
C324	E 5	D207	F 5	Q20	F 1	R50	F 2	R275	F 5	R462	B 4		
C325	F 5	D208	F 4	Q21	F 1	R51	F 2	R276	F 4	R463	A 4		
C326	F 5	D209	G 4	Q22	F 1	R52	F 2	R277	F 4	R464	C 3		
C327	F 5	D210	G 3	Q23	E 5	R53	F 3	R278	G 4	R465	C 3		
C329	E 5	D211	F 4	Q101	E 3	R54	F 2	R281	E 5	R466	C 3		
C339	F 5	D212	G 4	Q104	E 3	R55	G 3	R282	E 5	R467	B 3		
C340	F 6	D213	G 4	Q105	F 4	R56	F 2	R283	E 4	R468	B 3		
C341	F 6	D215	E 4	Q106	F 3	R57	F 2	R284	E 4	R469	B 3		
C342	F 5	D301	E 5	Q107	F 4	R58	G 3	R285	E 4	R470	D 3		
C343	F 5	D302	E 5	Q108	F 4	R59	E 2	R286	E 4	R471	C 3		
C344	F 5	D305	E 5	Q109	F 3	R63	F 2	R288	E 4	R472	C 3		
C345	F 5	D306	E 5	Q110	F 3	R64	F 2	R301	E 5	R473	B 3		
C346	F 5	D307	E 6	Q111	F 3	R65	G 2	R302	E 5	R474	B 3		
C347	F 5	D308	F 5	Q112	F 3	R66	F 1	R305	E 5	R475	B 3		
C348	F 6	D309	G 5	Q113	G 3	R67	G 2	R306	E 5	R476	C 3		
C351	F 5	D310	G 3	Q114	F 3	R68	F 1	R307	E 5	R477	B 3		
C400	C 6	D311	G 5	Q115	E 3	R69	F 1	R308	E 5	R478	B 2		
C401	C 6	D312	G 5	Q117	F 4	R70	E 5	R309	E 5	R479	B 2		
C402	B 6	D313	G 5	Q118	F 2	R75	G 1	R310	E 5	R480	B 2		
C403	B 6	D314	F 5	Q119	G 4	R76	G 1	R311	E 5	R481	B 2		
C404	C 5	D315	E 5	Q120	E 3	R78	E 3	R312	E 5	R482	A 2		
C405	B 5	D400	B 6	Q121	E 3	R79	E 3	R314	E 5	R483	B 3		
C406	B 5	D401	B 6	Q122	D 4	R80	G 1	R315	E 5	R484	C 2		
C407	C 5	D402	B 6	Q123	E 3	R81	G 1	R316	E 5	R485	B 2		
C408	B 5	D403	B 6	Q124	E 3	R82	E 2	R317	E 5	R486	C 2		
C409	B 5	D404	C 6	Q125	E 4	R101	E 3	R318	E 5	R487	C 2		
C410	B 5	D405	B 6	Q126	E 3	R102	D 3	R319	E 5	R488	C 2		
C411	B 5	D406	B 6	Q201	E 4	R105	E 3	R320	E 5	R489	B 2		
C412	C 4	D407	B 6	Q204	F 4	R106	E 3	R321	E 5	R490	B 2		
C413	D 4	D408	B 5	Q205	F 5	R107	E 3	R322	E 5	R491	B 2		

BARCO

To RGB INPUT (J4)

SECAM REFERENCE (R-Y)

SECAM REFERENCE (B-Y)

REFERENCE OSCILLATOR NTSC 3.58

ADJUSTMENT VIDEO SIGNAL RED 0.8Vpp

REFERENCE OSCILLATOR PAL

CHROMA REJECTOR FAL/SECAM/N4

CHROMA REJECTOR NTSC 3.58

CHROMA FILTER PAL/N4

CHROMA FILTER SECAM

ADJUSTMENT VIDEO SIGNAL GREEN 0.8Vpp

ADJUSTMENT VIDEO SIGNAL BLUE 0.8Vpp

FROM RGB INPUT (J5)

ADJUSTMENT BRIGHTNESS PULSE 0.144Vpp (RED)

ADJUSTMENT VIDEO SIGNAL RED 4Vpp

ADJUSTMENT BRIGHTNESS PULSE 0.144Vpp (GREEN)

ADJUSTMENT VIDEO SIGNAL GREEN 4Vpp

ADJUSTMENT BRIGHTNESS PULSE 0.144Vpp (BLUE)

ADJUSTMENT VIDEO SIGNAL BLUE 4Vpp

780368-2

780138-3

TOP

Name: RGB DRIVER + DECODER		Article nr.: 76 21175-3
Date: 12-12-1994	Drawn: JVDY	Checked: PDGY
BARCO PROJECTION SYSTEMS		

780368-2

S VIDEO

VIDEO

CHROMA IN >J401[12]

+SVID >J401[10]

SECAM BANDPASS

PAL/NTSC4,43 BANDPASS

BANDPASS NTSC3,58

CHROMA REJECTION NTSC3,58

CHROMA REJECTION PAL/SECAM/NTSC4,43

STANDARD COLOR BAR
(100/0/75/0)
1Vpp

VID/LUMA IN >J401[11]

SC >J401[9]

CHROMA
200mVpp

IC406
TDA4650

IC409
TDA4661

SECAM

8.867238 MHZ 7.159090 MHZ

(B-Y)

(R-Y)

MP405
WIRE
CONNECT TO GROUND
TO ADJUST THE REFERENCE
OSCILLATORS FOR PAL (C436)
AND FOR NTSC (C435)

>J401[8] +VID

400mVpp

420mVpp

IC410
SC76013

From RGB DRIVER (J4)

J401
1 CBL
2 SCAN FAIL
3 SCAN FAIL
4 SDA
5 SCL
6 +17V
7
8 +VID
9 SC
10 +SVID
11 VID/LUMA IN
12 CHROMA IN

0.25W 0.40W 0.50W 1W 1.5W

L401 L402 L403 L404 L406

L401 L402 L403 L404 L406

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.

(ALL VOLTAGES ARE GIVEN FOR A STANDARD COLOR BAR INPUT SIGNAL : 100/0/75/0 AND 50 % SATURATION)

Modif

BARCO
IC409
TDA4661
IC408
TDA4670
3 LEVEL
SAND CASTLE
1.05Vpp
1.33Vpp
400mVpp
420mVpp
1Vpp
To RGB INPUT &
SWITCHING MODULE (J4)
+12V
+5V
VDD
DEEMPH
SDA
SCL
Name
DECODER
Article nr.
76 21175S-2
Date
21-11-1994
Drawn
JVDY
Checked
JVST
BARCO PROJECTION SYSTEMS
Modifications reserved
Sheet 1
SCHEMATIC NAME: 7621175s.sch SHEET NUMBER: 1 DATE: Dec 21, 1994

COMP.	LOC.	SHEET
C400	F 1	sheet 2
C401	G 1	sheet 2
C402	G 3	sheet 2
C403	G 4	sheet 2
C404	B 3	sheet 2
C405	F 6	sheet 2
C406	F 3	sheet 2
C407	H 1	sheet 2
C408	B 3	sheet 2
C409	D 2	sheet 2
C410	B 4	sheet 2
C411	A 2	sheet 2
C412	E 6	sheet 1
C413	B 1	sheet 1
C414	B 1	sheet 1
C415	B 2	sheet 1
C416	A 2	sheet 1
C417	F 6	sheet 1
C418	F 6	sheet 1
C419	B 5	sheet 1
C420	J 4	sheet 1
C421	B 4	sheet 1
C422	B 3	sheet 1
C423	C 1	sheet 1
C424	C 2	sheet 1
C425	D 1	sheet 1
C426	C 2	sheet 1
C427	C 2	sheet 1
C428	C 1	sheet 1
C429	C 3	sheet 1
C430	C 3	sheet 1
C431	J 4	sheet 1
C432	I6	sheet 1
C433	I5	sheet 1
C434	I4	sheet 1
C435	E 2	sheet 1
C436	E 2	sheet 1
C437	E 2	sheet 1
C438	E 1	sheet 1
C439	E 1	sheet 1
C440	E 2	sheet 1
C441	D 1	sheet 1
C442	G 4	sheet 1
C443	E 2	sheet 1
C444	E 1	sheet 1
C445	D 2	sheet 1
C446	H 6	sheet 1
C447	H 5	sheet 1
C448	H 4	sheet 1
C449	F 6	sheet 1
C450	F 1	sheet 1
C451	F 4	sheet 1
C452	F 2	sheet 1
C453	F 2	sheet 1
C454	F 1	sheet 1
C455	F 1	sheet 1
C456	F 2	sheet 1
C457	E 2	sheet 1
C458	E 1	sheet 1
C459	F 1	sheet 1
C460	E 1	sheet 1
C461	F 6	sheet 1
C462	F 1	sheet 1
C463	F 2	sheet 1
C464	F 2	sheet 1
C465	E 4	sheet 1
C466	I3	sheet 1
C467	I1	sheet 1
C468	D 4	sheet 1
C469	F 4	sheet 1
C470	H 2	sheet 1
C471	H 2	sheet 1
C472	F 5	sheet 1
C473	J 2	sheet 1
C474	I1	sheet 1
C475	I1	sheet 1
C476	I2	sheet 1
C477	G 1	sheet 1
C478	H 1	sheet 1
C479	H 5	sheet 1
D400	F 3	sheet 2
D401	H 4	sheet 2
D402	H 4	sheet 2
D403	G 4	sheet 2
D404	A 3	sheet 2
D405	E 6	sheet 2
D406	G 4	sheet 2
D407	E 6	sheet 2
D408	E 4	sheet 2
D409	G 6	sheet 2
D410	E 4	sheet 2
D411	F 1	sheet 2
D412	D 1	sheet 1
D413	D 2	sheet 1
D414	D 2	sheet 1
D415	F 5	sheet 1
IC400	F 4	sheet 2
IC400	F 4	sheet 2
IC400	D 5	sheet 2
IC400	F 6	sheet 2
IC400	G 2	sheet 2
IC401	G 1	sheet 2
IC402	C 5	sheet 2
IC402	C 5	sheet 2
IC402	F 1	sheet 2
IC403	B 2	sheet 2
IC403	E 2	sheet 2
IC403	G 2	sheet 2
IC404	C 2	sheet 2
IC404	G 2	sheet 2
IC405	E 6	sheet 1
IC406	E 2	sheet 1
IC407	F 6	sheet 1
IC408	I2	sheet 1
IC409	G 2	sheet 1
IC410	E 4	sheet 1
J400	D 1	sheet 2
J401	A 4	sheet 1
J402	J 5	sheet 1
L400	J 3	sheet 1
L401	C 5	sheet 1
L401	D 5	sheet 1
L401	C 1	sheet 1
L402	C 6	sheet 1
L402	D 6	sheet 1
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L403	D 6	sheet 1
L403	C 6	sheet 1
L403	B 3	sheet 1
L404	C 6	sheet 1
L404	D 6	sheet 1
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L405	F 1	sheet 1
L406	D 6	sheet 1
L406	C 6	sheet 1
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MP402F	6	sheet 1
MP403D	1	sheet 1
MP404B	6	sheet 2
MP405D	3	sheet 1
MP406G	3	sheet 1
MP407F	6	sheet 1
MP408H	1	sheet 1
MP409H	2	sheet 1
P400	F 3	sheet 1
Q400	G 4	sheet 2
Q401	G 4	sheet 2
Q402	H 5	sheet 2
Q403	B 3	sheet 2
Q404	B 1	sheet 1
Q405	B 2	sheet 1
Q406	B 2	sheet 1
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Q409	I5	sheet 1
Q410	I4	sheet 1
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Q421	H 4	sheet 1
Q422	G 4	sheet 1
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Q501	B 5	sheet 2
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R402	H 4	sheet 2
R403	G 4	sheet 2
R404	G 3	sheet 2
R405	H 5	sheet 2
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R409	A 1	sheet 2
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R411	F 6	sheet 2
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R424	B 5	sheet 2
R425	D 5	sheet 2
R426	C 5	sheet 2
R427	C 5	sheet 2
R428	A 2	sheet 2
R429	A 1	sheet 1
R430	B 1	sheet 1
R431	B 1	sheet 1
R432	B 1	sheet 1
R433	A 3	sheet 1
R434	A 3	sheet 1
R435	A 2	sheet 1
R436	B 2	sheet 1
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R497	E 4	sheet 1
R498	E 4	sheet 1
R500	A 5	sheet 2
R501	A 5	sheet 2
R502	B 5	sheet 2
R503	B 5	sheet 2
R504	G 4	sheet 1
SR400F	1	sheet 2
SR401E	6	sheet 1
SR402F	1	sheet 1
SR403G	1	sheet 1
SR404E	4	sheet 1
SR405I2		sheet 1
XT400E	2	sheet 1
XT401E	2	sheet 1
Z400	A 4	sheet 2
Z401	H 4	sheet 1
Z402	J 1	sheet 1
Z403	J 1	sheet 1
Z404	E 4	sheet 1
Z405	E 4	sheet 1

780368-2

BARCO

+VID >SHEET1 >J401[8] — R422 10K — R423 4K7

+RGsB >J400[1] — R409 10K — R410 4K7

HDR >J400[2] — R408 560E — R415 470E

CS >J400[3] — R407 10K — C404 4P7

SC >SHEET1 >J401[9] — Z400 5V6 — R419 47K — R418 33K — C410 120P

IC403 74HCT123: R428 2K2 to +5V [RES]; C411 330P; CX; RX/CX

D404 1N4148 — R414 4K7 — R413 4K7 — C408 220K — Q403 BC559C

IC404 MUX 74HCT153: inputs 14, 2, 1, 6, 5, 4, 3, 15, 10, 11, 12, 13; EN; outputs 7, 9; +5V [RES]

IC403 74HCT123: R420 1K8 MF to +5V [RES]; C409 560P; R400 100E — CLMP_P >J400[4]

To RGB DRIVER (J3)

J400: 1 +RGsB; 2 HDR; 3 CS; 4 CLMP_P; 5 CONTR_PBL; 6; 7 CBL_E; 8 RESET_D

+17V — D411 1N4007 — SR400 1E — +17 [RES]

C400 1000M; C401 330P; IC401 IN OUT GND 7805; MP400 +5V [RES]; C407 22M

IC402 LM393

IC400 74HCT32

IC400 74HCT153

IC403 74HCT123

+5V [RES]

D400 BAT85 — R401 2K — C406 27P

IC400 74HCT32: R404 27K; C402 100K; Q400 BC549C; D403 1N4148; R403 15E; D406 1N4148; C403 100K; Q401 BC559C; R412 100K

+17 [RES]: D401 1N4148; R402 10E — CBL_E >J400[7]; D402 1N4148

+5V [RES] — R417 100E — CBL >SHEET1 >J401[1]; D408 1N4148; D410 1N4148

>SHEET1 >J401[3] SCAN FAIL

+5V [RES] / +17V: R500 4K7; R502 15K; R503 100E; R424 220K; Q501 BC550C; Q500 BC549C; R501 2K2

+17V — R426 27K — R427 13K MF

+5V [RES] — R425 15K; R416 15K

IC400 74HCT32

+17 [RES] — R405 22K — CONTR_PBL >J400[5] — Q402 BS170

D405 1N4148; D407 BAT85 — RESET_D >J400[8]; C405 1K; R411 680K; D409 1N4148; R421 560E

3 LEVEL SAND CASTLE

MP404

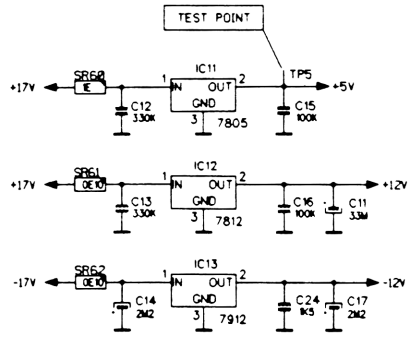
Modifications reserved

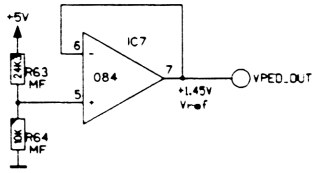
Name	Article nr.
DEC. & TIMING SIGNALS	76 21175S-2
Date: 10-11-1994 — Drawn: JVDY — Checked: JVST/PDGY	

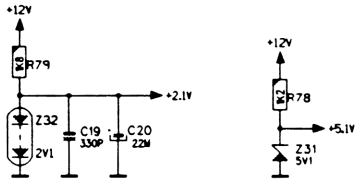
BARCO PROJECTION SYSTEMS

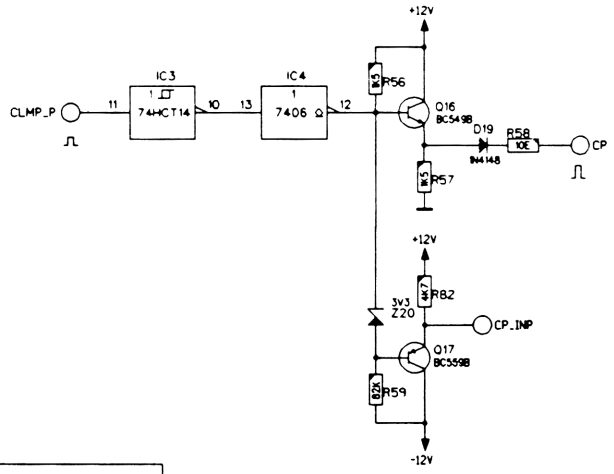
Sheet 2

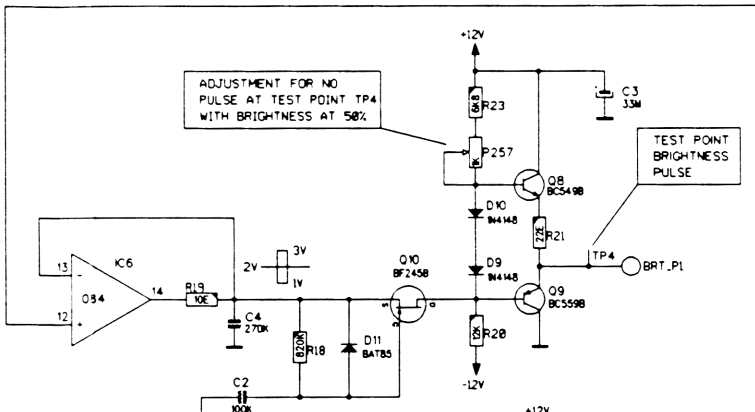
78 0138-3

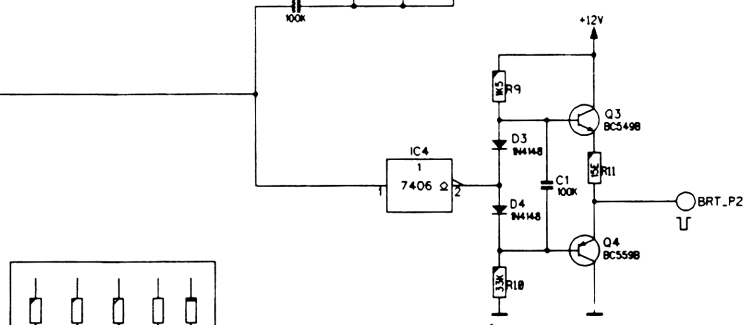


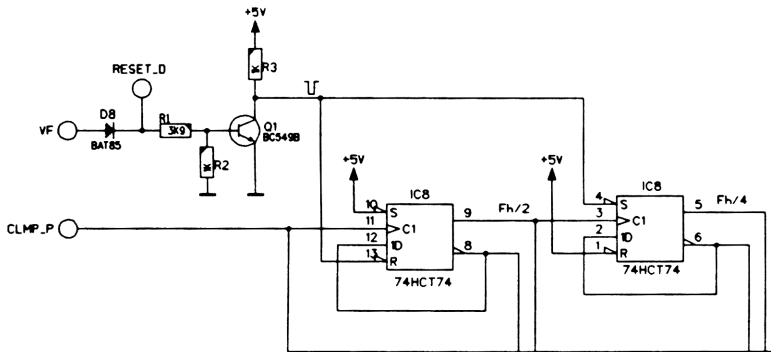


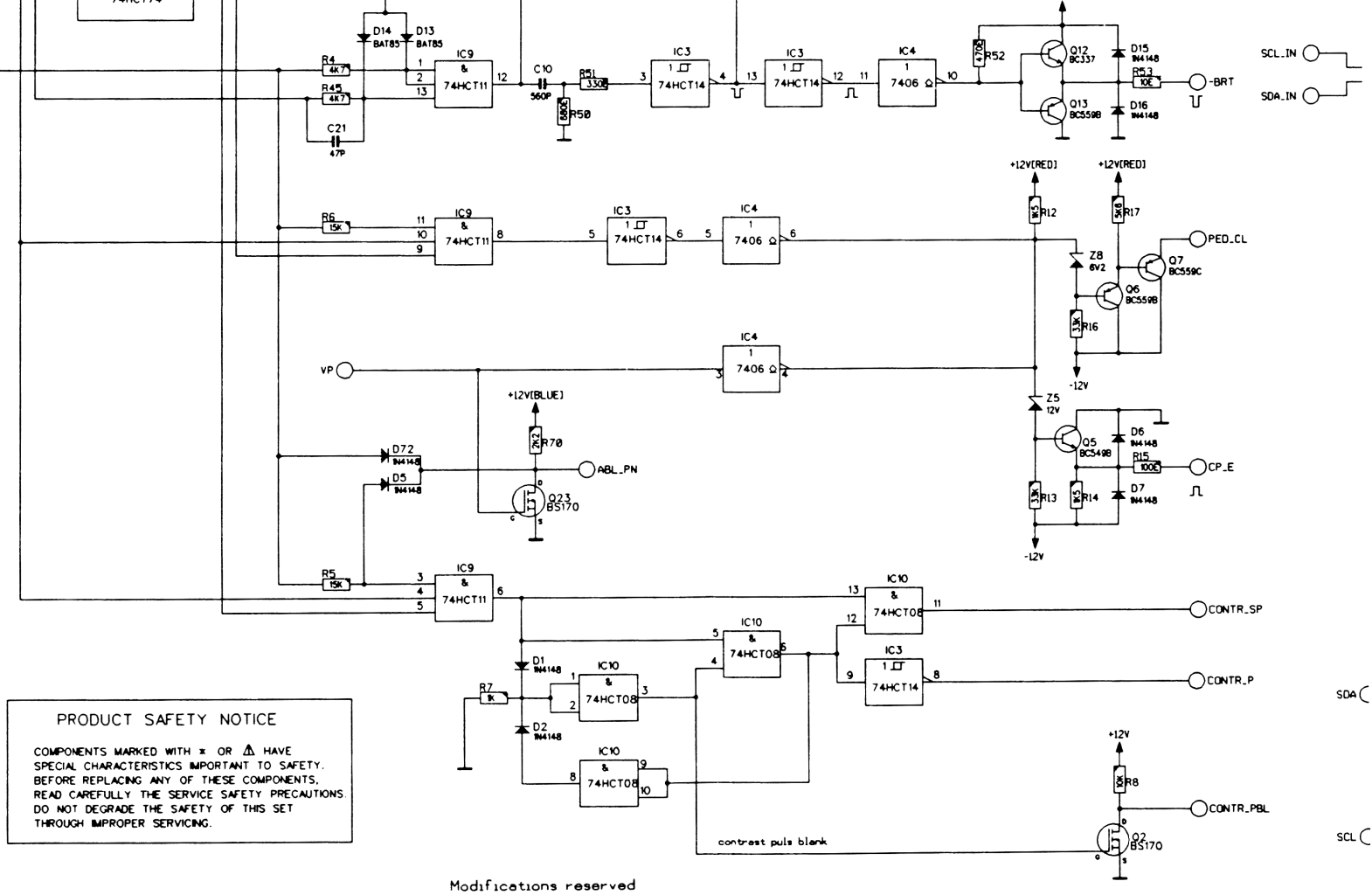


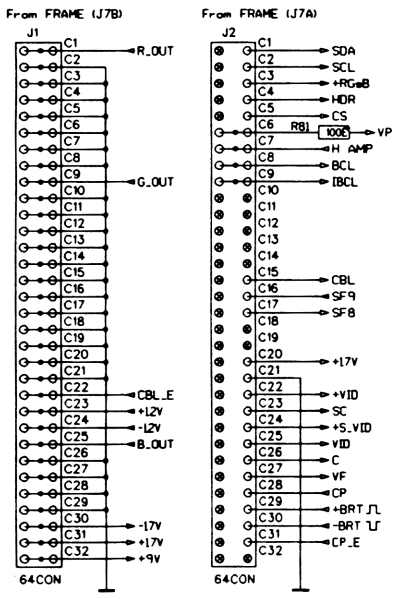






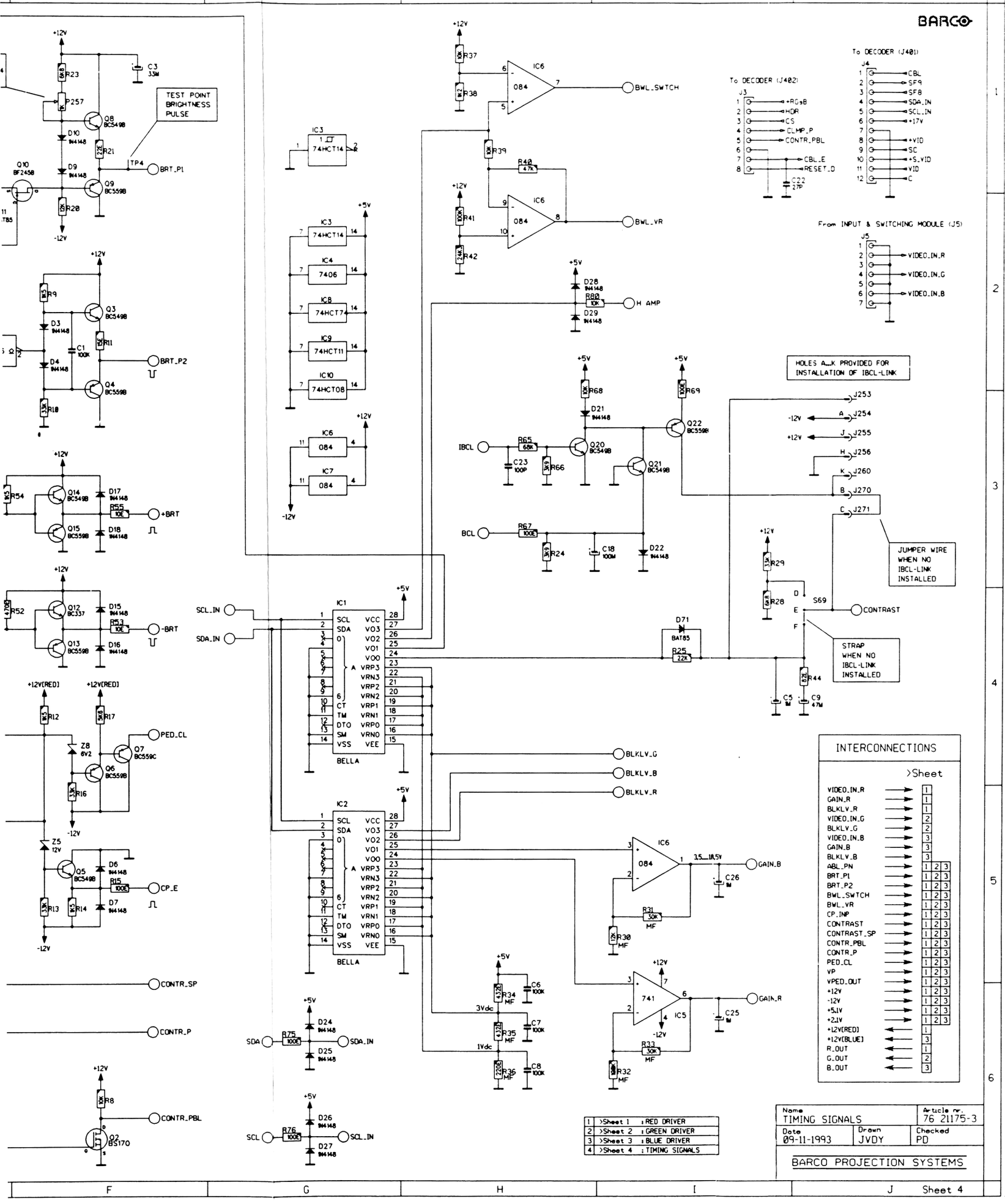






PRODUCT SAFETY NOTICE

COMPONENTS MARKED WITH x 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.



COMP.	LOC.	SHEET
C1	F 2	sheet 4
C2	E 2	sheet 4
C3	F 1	sheet 4
C4	E 1	sheet 4
C5	I 4	sheet 4
C6	H 5	sheet 4
C7	H 6	sheet 4
C8	H 6	sheet 4
C9	J 4	sheet 4
C10	D 4	sheet 4
C11	L 3	sheet 4
C12	A 1	sheet 4
C13	A 1	sheet 4
C14	A 2	sheet 4
C15	B 1	sheet 4
C16	B 1	sheet 4
C17	B 2	sheet 4
C18	I 3	sheet 4
C19	A 2	sheet 4
C20	A 2	sheet 4
C21	C 4	sheet 4
C22	J 1	sheet 4
C23	H 3	sheet 4
C24	B 2	sheet 4
C25	I 6	sheet 4
C26	I 5	sheet 4
C101	A 6	sheet 1
C102	A 5	sheet 1
C103	D 4	sheet 1
C104	E 6	sheet 1
C105	B 4	sheet 1
C106	B 4	sheet 1
C107	D 4	sheet 1
C108	D 3	sheet 1
C109	E 3	sheet 1
C110	D 2	sheet 1
C111	D 1	sheet 1
C112	D 1	sheet 1
C113	C 2	sheet 1
C114	B 2	sheet 1
C115	A 2	sheet 1
C120	E 4	sheet 1
C121	F 4	sheet 1
C123	F 3	sheet 1
C124	G 2	sheet 1
C125	G 3	sheet 1
C126	F 3	sheet 1
C127	E 4	sheet 1
C129	H 1	sheet 1
C139	I 3	sheet 1
C140	A 3	sheet 1
C141	I 2	sheet 1
C142	J 2	sheet 1
C143	I 2	sheet 1
C144	A 4	sheet 1
C145	H 4	sheet 1
C146	H 4	sheet 1
C147	J 2	sheet 1
C148	L 1	sheet 1
C151	K 1	sheet 1
C152	K 4	sheet 1
C153	F 2	sheet 1
C155	B 5	sheet 1
C156	F 2	sheet 1
C157	G 2	sheet 1
C158	D 2	sheet 1
C159	K 4	sheet 1
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C206	B 4	sheet 2
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C211	D 1	sheet 2
C212	D 1	sheet 2
C213	C 2	sheet 2
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C243	I 2	sheet 2
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C346	H 4	sheet 3
C347	J 2	sheet 3
C348	L 1	sheet 3
C351	K 1	sheet 3
C353	F 2	sheet 3
C358	D 2	sheet 3
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D1	D 6	sheet 4
D2	D 6	sheet 4
D3	F 2	sheet 4
D4	F 2	sheet 4
D5	D 5	sheet 4
D6	F 5	sheet 4
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D26	G 6	sheet 4
D27	G 6	sheet 4
D28	H 2	sheet 4
D29	H 2	sheet 4
D71	I 4	sheet 4

COMP.	LOC.	SHEET
D102	D 5	sheet 4
D131	A 6	sheet 1
D202	A 6	sheet 1
D305	D 3	sheet 4
D306	C 2	sheet 1
D307	B 1	sheet 1
D308	J 2	sheet 1
D309	J 2	sheet 1
D310	K 5	sheet 1
D311	L 4	sheet 1
D312	L 3	sheet 1
D313	L 3	sheet 1
D314	K 4	sheet 1
D315	C 5	sheet 3
IC1	G 4	sheet 4
IC2	G 5	sheet 4
IC3	E 4	sheet 4
IC3	D 4	sheet 4
IC3	E 6	sheet 4
IC3	G 2	sheet 4
IC3	G 2	sheet 4
IC3	B 2	sheet 4
IC3	D 1	sheet 4
IC3	D 4	sheet 4
IC4	E 3	sheet 4
IC4	E 4	sheet 4
IC4	E 5	sheet 4
IC4	G 2	sheet 4
IC4	G 2	sheet 4
IC4	E 2	sheet 4
IC4	C 2	sheet 4
IC4	E 4	sheet 4
IC5	I 6	sheet 4
IC6	I 5	sheet 4
IC6	G 3	sheet 4
IC6	G 3	sheet 4
IC6	H 1	sheet 4
IC6	H 1	sheet 4
IC6	E 1	sheet 4
IC7	K 5	sheet 1
IC7	K 5	sheet 2
IC7	K 5	sheet 3
IC7	G 3	sheet 4
IC7	G 3	sheet 4
IC7	C 1	sheet 4
IC8	G 2	sheet 4
IC8	G 2	sheet 4
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IC9	D 4	sheet 4
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IC9	G 2	sheet 4
IC9	D 4	sheet 4
IC10	D 6	sheet 4
IC10	D 6	sheet 4
IC10	E 5	sheet 4
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IC10	G 2	sheet 4
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J255	J 3	sheet 4
J256	J 3	sheet 4
J260	J 3	sheet 4
J270	J 3	sheet 4
J271	J 3	sheet 4
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L102	K 2	sheet 1
L201	A 3	sheet 2
L202	K 2	sheet 2
L301	A 3	sheet 3
L302	K 2	sheet 3
P103	H 6	sheet 1
P132	F 1	sheet 1
P151	H 3	sheet 1
P203	B 6	sheet 2
P232	F 2	sheet 2
P251	H 3	sheet 2
P257	F 1	sheet 2
P303	B 6	sheet 3
P332	F 1	sheet 3
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R14	F 5	sheet 4
R15	F 5	sheet 4
R16	F 5	sheet 4
R17	F 4	sheet 4
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R20	F 2	sheet 4
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R25	I 4	sheet 4
R28	I 4	sheet 4
R29	I 3	sheet 4
R30	I 5	sheet 4
R31	I 5	sheet 4
R32	I 6	sheet 4
R33	I 6	sheet 4
R34	H 6	sheet 4
R35	H 6	sheet 4
R36	H 6	sheet 4
R37	H 1	sheet 4
R38	H 1	sheet 4
R39	H 1	sheet 4
R40	H 1	sheet 4
R41	H 2	sheet 4
R42	H 2	sheet 4
R44	J 4	sheet 4
R45	C 4	sheet 4
R50	D 4	sheet 4
R51	D 4	sheet 4
R52	F 4	sheet 4
R53	F 4	sheet 4
R54	F 3	sheet 4
R55	F 3	sheet 4
R56	C 2	sheet 4
R57	C 2	sheet 4
R58	C 2	sheet 4
R59	C 3	sheet 4
R63	B 1	sheet 4
R64	B 1	sheet 4
R65	H 3	sheet 4
R66	H 3	sheet 4
R67	H 3	sheet 4
R68	H 2	sheet 4
R69	I 2	sheet 4
R70	D 5	sheet 4
R75	G 6	sheet 4
R76	G 6	sheet 4
R78	B 2	sheet 4
R79	A 2	sheet 4
R80	H 2	sheet 4
R81	B 5	sheet 4
R82	C 2	sheet 4
R101	A 6	sheet 1
R102	A 6	sheet 1
R105	B 5	sheet 1
R106	B 5	sheet 1
R107	B 6	sheet 1
R108	D 4	sheet 1
R109	B 5	sheet 1
R110	D 4	sheet 1
R111	B 4	sheet 1
R112	B 4	sheet 1
R114	D 4	sheet 1
R115	E 3	sheet 1
R116	E 2	sheet 1
R117	D 1	sheet 1
R118	C 2	sheet 1
R119	C 2	sheet 1
R120	C 2	sheet 1
R121	B 2	sheet 1
R122	B 1	sheet 1
R123	A 1	sheet 1
R124	A 2	sheet 1
R125	D 3	sheet 1
R126	D 3	sheet 1
R130	E 4	sheet 1
R131	F 3	sheet 1
R133	F 1	sheet 1
R134	G 3	sheet 1
R135	G 3	sheet 1
R136	G 1	sheet 1
R137	G 2	sheet 1
R138	E 4	sheet 1
R139	H 1	sheet 1
R140	H 3	sheet 1
R141	H 1	sheet 1
R149	I 3	sheet 1
R150	H 3	sheet 1
R152	H 2	sheet 1
R153	J 1	sheet 1
R154	H 3	sheet 1
R155	H 3	sheet 1
R156	A 4	sheet 1
R157	I 1	sheet 1
R158	I 2	sheet 1
R159	I 2	sheet 1
R160	J 3	sheet 1
R165	J 1	sheet 1
R166	J 3	sheet 1
R167	J 3	sheet 1
R168	J 3	sheet 1
R169	K 3	sheet 1
R170	K 1	sheet 1
R171	D 6	sheet 1
R172	K 4	sheet 1
R174	L 6	sheet 1
R175	K 2	sheet 1
R176	L 2	sheet 1
R177	K 3	sheet 1
R178	K 4	sheet 1
R181	B 4	sheet 1
R182	C 4	sheet 1
R183	B 5	sheet 1
R184	C 6	sheet 1
R185	C 5	sheet 1
R186	C 4	sheet 1
R187	J 3	sheet 1
R188	D 6	sheet 1
R189	E 1	sheet 1
R190	D 2	sheet 1
R191	K 4	sheet 1
R201	A 6	sheet 2
R202	A 6	sheet 2
R205	B 5	sheet 2
R206	B 5	sheet 2
R207	B 6	sheet 2
R208	B 4	sheet 2
R209	B 5	sheet 2
R210	D 4	sheet 2
R211	B 4	sheet 2
R212	B 4	sheet 2
R214	D 4	sheet 2
R215	J 3	sheet 2
R216	E 2	sheet 2
R217	D 1	sheet 2
R218	C 2	sheet 2
R219	C 2	sheet 2
R220	C 2	sheet 2
R221	B 2	sheet 2
R222	B 1	sheet 2
R223	A 1	sheet 2
R224	A 2	sheet 2
R225	D 3	sheet 2
R226	D 3	sheet 2
R230	E 4	sheet 2
R238	E 4	sheet 2
R239	H 1	sheet 2
R240	H 3	sheet 2
R241	H 1	sheet 2
R249	I 3	sheet 2
R250	H 3	sheet 2
R252	H 2	sheet 2
R253	J 1	sheet 2
R254	H 3	sheet 2
R255	H 3	sheet 2
R256	A 4	sheet 2
R257	I 1	sheet 2
R258	I 2	sheet 2
R259	I 2	sheet 2
R260	J 3	sheet 2
R265	J 1	sheet 2
R266	J 3	sheet 2
R267	J 3	sheet 2
R268	K 3	sheet 2
R269	K 3	sheet 2
R270	K 1	sheet 2
R271	D 6	sheet 2
R272	K 4	sheet 2
R274	L 6	sheet 2
R275	K 2	sheet 2
R276	L 2	sheet 2
R277	K 4	sheet 2
R278	K 4	sheet 2
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R283	G 5	sheet 2
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R286	C 4	sheet 2
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R291	K 4	sheet 2
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R302	A 6	sheet 3
R305	B 5	sheet 3
R306	B 5	sheet 3
R307	B 6	sheet 3
R308	D 4	sheet 3
R309	B 5	sheet 3
R310	D 4	sheet 3
R311	B 4	sheet 3
R312	B 4	sheet 3
R314	D 4	sheet 3
R315	E 3	sheet 3
R316	E 2	sheet 3
R317	D 1	sheet 3
R318	C 2	sheet 3
R319	C 2	sheet 3
R320	C 2	sheet 3
R321	B 2	sheet 3
R322	B 1	sheet 3
R323	A 1	sheet 3
R324	A 2	sheet 3
R325	D 3	sheet 3
R326	D 3	sheet 3
R330	E 4	sheet 3
R331	F 3	sheet 3
R333	F 1	sheet 3
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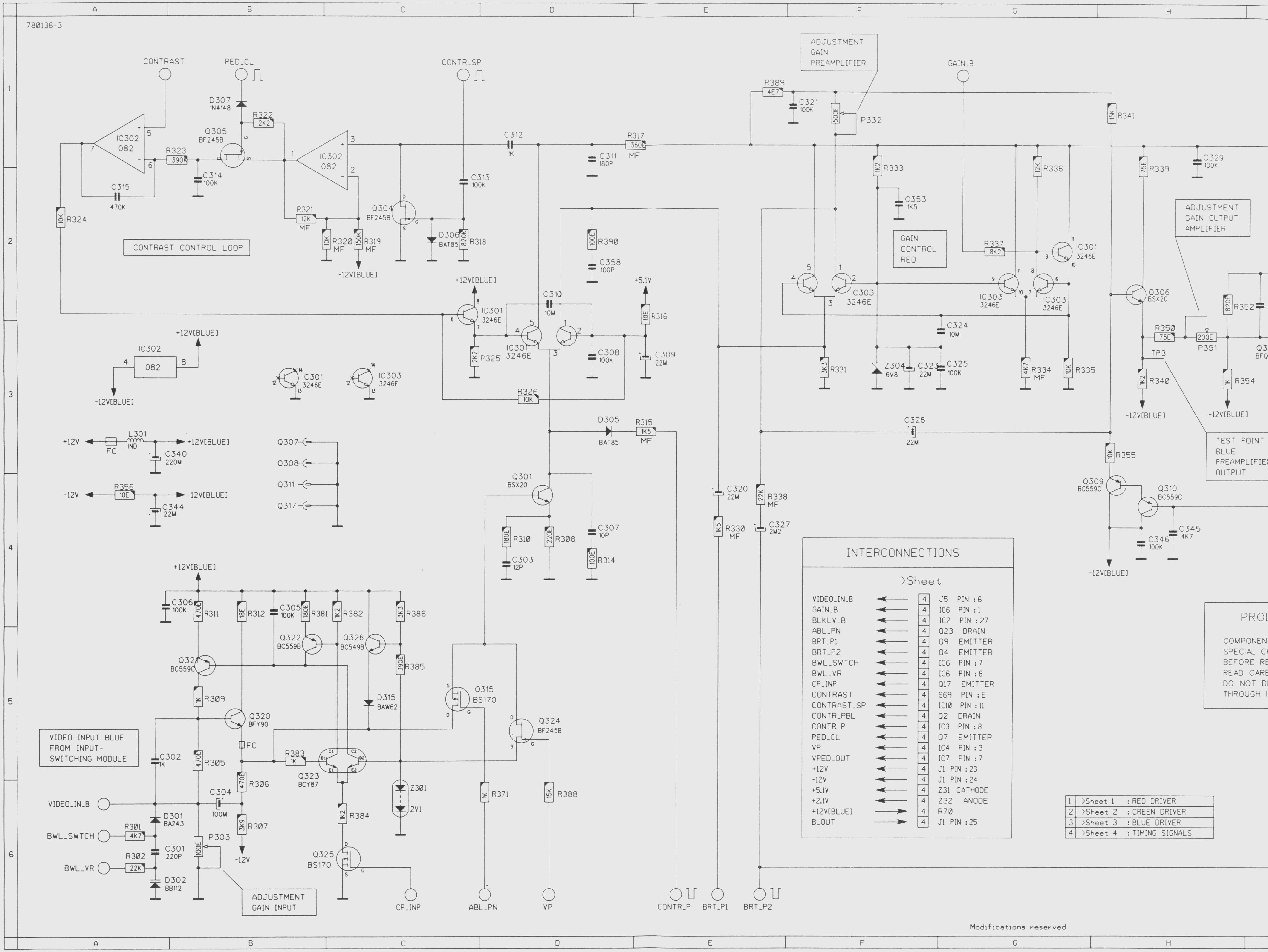
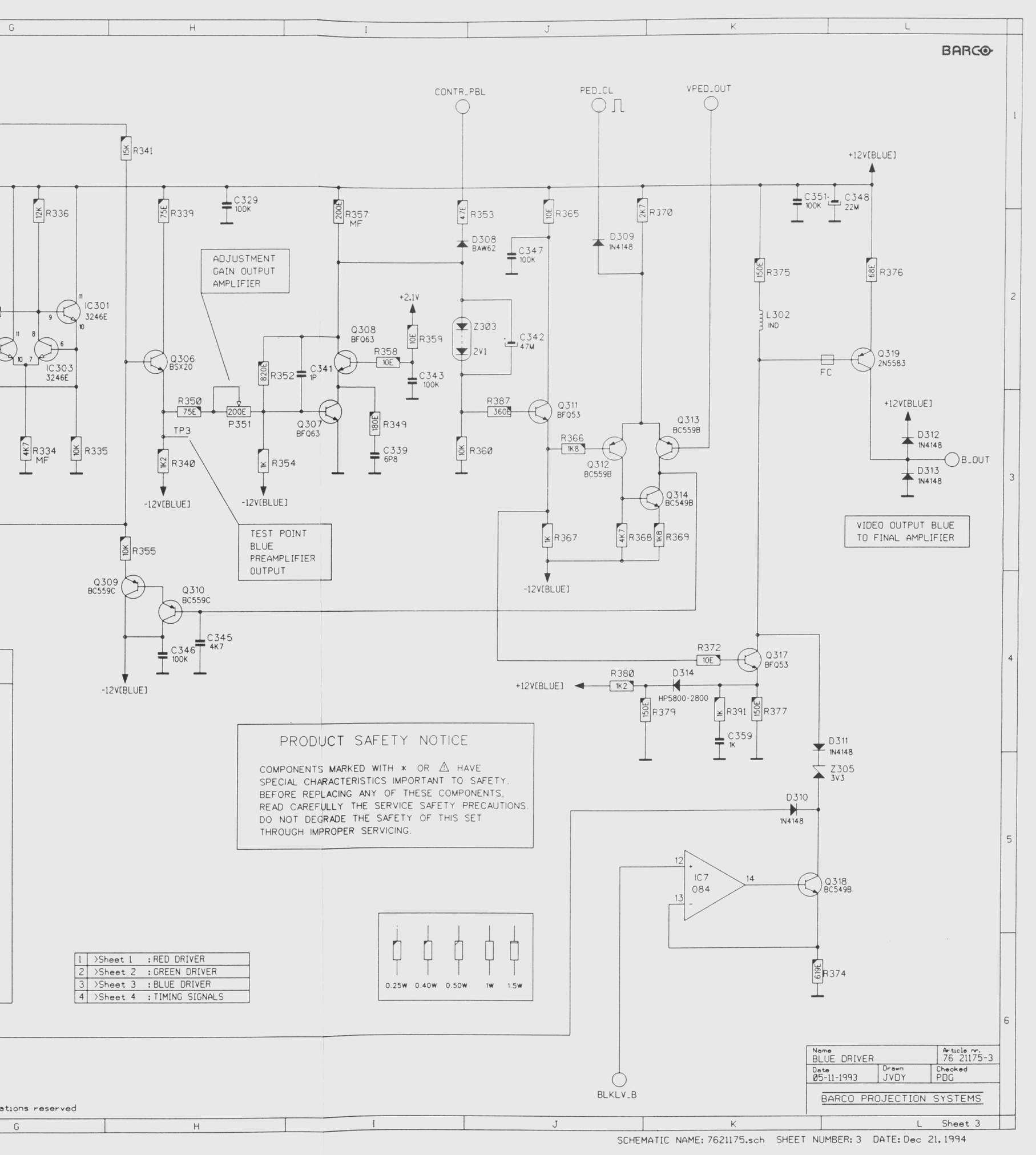
R335	G 3	sheet 3
R336	G 1	sheet 3
R337	G 2	sheet 3
R338	E 4	sheet 3
R339	H 1	sheet 3
R340	H 3	sheet 3
R341	H 1	sheet 3
R349	I 3	sheet 3
R350	H 3	sheet 3
R352	H 2	sheet 3
R353	J 1	sheet 3
R354	H 3	sheet 3
R355	H 3	sheet 3
R356	A 4	sheet 3
R357	I 1	sheet 3
R358	I 2	sheet 3
R359	I 2	sheet 3
R360	J 3	sheet 3
R365	J 1	sheet 3
R366	J 3	sheet 3
R367	J 3	sheet 3
R368	J 3	sheet 3
R369	K 3	sheet 3
R370	K 1	sheet 3
R371	D 6	sheet 3
R372	K 4	sheet 3
R374	L 6	sheet 3
R375	K 2	sheet 3
R376	K 4	sheet 3
R377	K 4	sheet 3
R379	K 4	sheet 3
R380	J 4	sheet 3
R381	B 4	sheet 3
R382	G 4	sheet 3
R383	B 5	sheet 3
R384	G 6	sheet 3
R385	G 5	sheet 3
R386	G 4	sheet 3
R387	J 3	sheet 3
R388	E 6	sheet 3
R389	E 1	sheet 3
R390	D 2	sheet 3
R391	K 4	sheet 3
S69	J 4	sheet 4
SR60	A 1	sheet 4
SR61	A 1	sheet 4
SR62	A 1	sheet 4
TP1	H 3	sheet 1
TP2	H 3	sheet 2
TP3	H 3	sheet 3
TP4	F 1	sheet 4
TP5	B 1	sheet 4
Z5	F 5	sheet 4
Z8	F 4	sheet 4
Z20	C 2	sheet 4
Z31	B 2	sheet 4
Z32	A 2	sheet 4
Z101	C 6	sheet 1
Z103	J 2	sheet 1
Z104	F 3	sheet 1
Z105	L 5	sheet 1
Z201	C 6	sheet 2
Z203	J 2	sheet 2
Z205	L 5	sheet 2
Z301	C 6	sheet 3
Z303	J 2	sheet 3
Z304	F 3	sheet 3
Z305	L 5	sheet 3



INTERCONNECTIONS

Signal	Direction	>Sheet	Connection
VIDEO_IN_B	←	4	J5 PIN :6
GAIN_B	←	4	IC6 PIN :1
BLKLV_B	←	4	IC2 PIN :27
ABL_PN	←	4	Q23 DRAIN
BRT_P1	←	4	Q9 EMITTER
BRT_P2	←	4	Q4 EMITTER
BWL_SWTCH	←	4	IC6 PIN :7
BWL_VR	←	4	IC6 PIN :8
CP_INP	←	4	Q17 EMITTER
CONTRAST	←	4	S69 PIN :E
CONTRAST_SP	←	4	IC10 PIN :11
CONTR_PBL	←	4	Q2 DRAIN
CONTR_P	←	4	IC3 PIN :8
PED_CL	←	4	Q7 EMITTER
VP	←	4	IC4 PIN :3
VPED_OUT	←	4	IC7 PIN :7
+12V	←	4	J1 PIN :23
-12V	←	4	J1 PIN :24
+5.1V	←	4	Z31 CATHODE
+2.1V	←	4	Z32 ANODE
+12V[BLUE]	→	4	R70
B_OUT	→	4	J1 PIN :25

1	>Sheet 1	: RED DRIVER
2	>Sheet 2	: GREEN DRIVER
3	>Sheet 3	: BLUE DRIVER
4	>Sheet 4	: TIMING SIGNALS



SCHEMATIC NAME: 7621175.sch SHEET NUMBER: 3 DATE: Dec 21, 1994

780138-3

CONTRAST

PED_CL

CONTR_SP

D207 1N4148

R222 2K2

Q205 BF245B

IC202 082

R223 390R

C214 100K

C215 470K

R224 10K

CONTRAST CONTROL LOOP

R221 12K MF

R220 10K MF

R219 150K MF

-12V[GREEN]

Q204 BF245B

D206 BAT85

R218 820K

C213 100K

C212 1K

C211 180P

R217 360E MF

500E P232

ADJUSTMENT GAIN PREAMPLIFIER

15K R241

75E R239

C229 100K

ADJUSTMENT GAIN OUTPUT AMPLIFIER

Q206 BSX20

820E R252

R250 75E

200E P251

TP2

1K2 R240

1K R254

-12V[GREEN]

-12V[GREEN]

TEST POINT GREEN PREAMPLIFIER OUTPUT

10K R255

Q209 BC559C

Q210 BC559C

C245 4K7

C246 100K

-12V[GREEN]

+12V[GREEN]

IC202 082

-12V[GREEN]

IC201 3246E

IC201 3246E

+12V[GREEN]

IC201 3246E

C210 10M

+5.1V

10E R216

C208 100K

C209 22M

2K2 R225

R226 10K

D205 BAT85

R215 1K5 MF

C226 22M

+12V

L201 IND

FC

+12V[GREEN]

C240 220M

-12V

R256 10E

-12V[GREEN]

C244 22M

Q207

Q208

Q211

Q217

Q201 BSX20

150E R210

C203 18P

220E R208

C207 10P

100E R214

C220 22M

22K R238 MF

1K5 R230 MF

C227 2M2

+12V[GREEN]

C206 100K

470E R211

18E R212

C205 100K

180E R281

1K2 R282

3K3 R286

Q222 BC559B

Q226 BC549B

Q227 BC559C

390E R285

1K R209

D215 BAW62

Q215 BS170

Q220 BFY90

Q224 BF245B

VIDEO INPUT GREEN FROM INPUT-SWITCHING MODULE

FC

C202 1K

470E R205

R283 1K

Q223 BCY87

470E R206

C204 100M

Z201 2V1

R271 1K

R288 15K

VIDEO_IN_G

D201 BA243

R201 4K7

3K9 R207

BWL_SWTCH

C201 220P

P203 100E

R202 22K

BWL_VR

D202 BB112

-12V

1K2 R284

Q225 BS170

ADJUSTMENT GAIN INPUT

CP_INP

ABL_PN

VP

CONTR_P

BRT_P1

BRT_P2

INTERCONNECTIONS

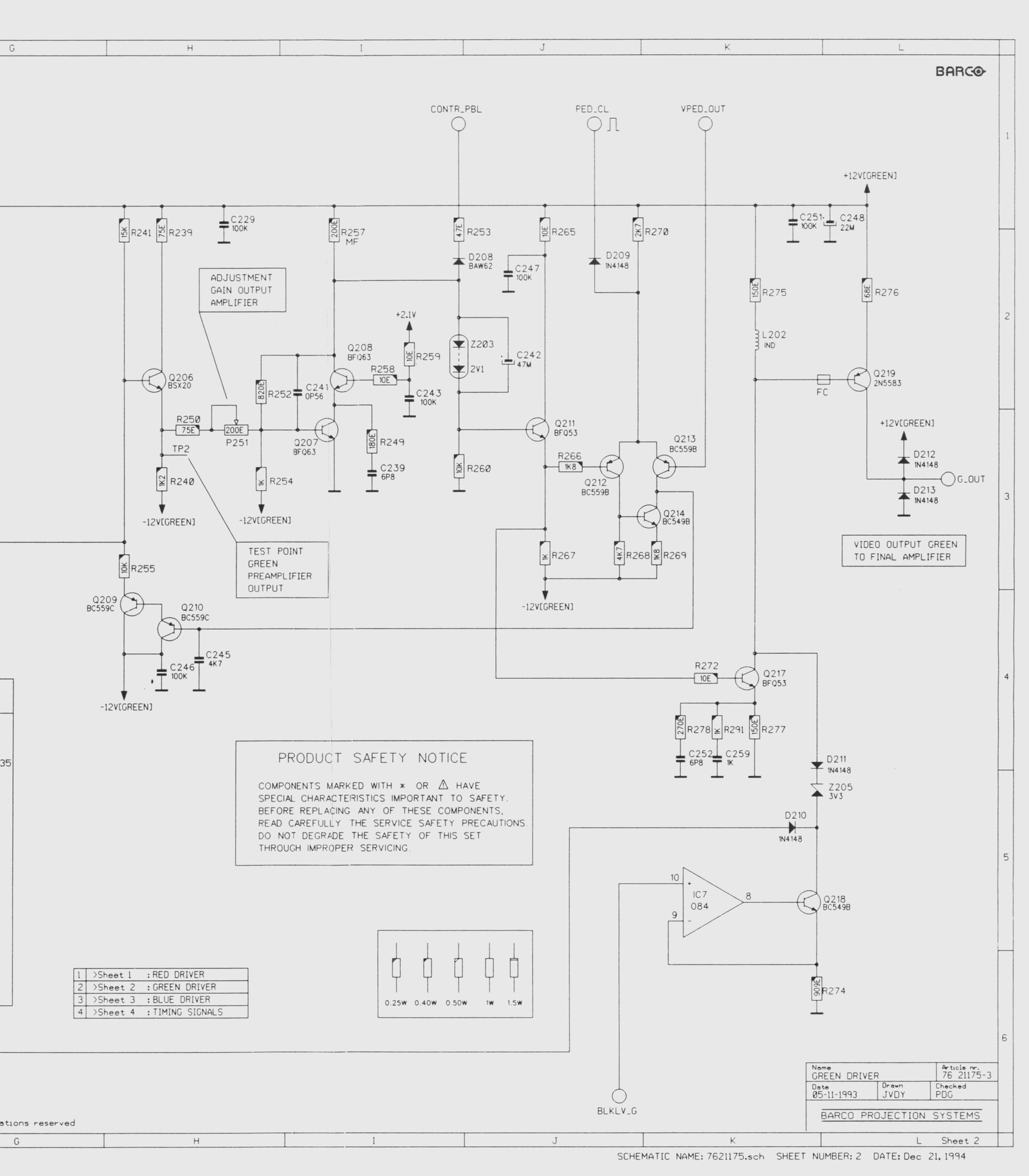
>Sheet

VIDEO_IN_G	←	4	J5	PIN : 4
BLKLV_G	←	4	NODE	R34 & R35
ABL_PN	←	4	Q23	DRAIN
BRT_P1	←	4	Q9	EMITTER
BRT_P2	←	4	Q4	EMITTER
BWL_SWTCH	←	4	IC6	PIN : 7
BWL_VR	←	4	IC6	PIN : 8
CP_INP	←	4	Q17	EMITTER
CONTRAST	←	4	S69	PIN : E
CONTRAST_SP	←	4	IC10	PIN : 11
CONTR_PBL	←	4	Q2	DRAIN
CONTR_P	←	4	IC3	PIN : 8
PED_CL	←	4	Q7	EMITTER
VP	←	4	IC4	PIN : 3
VPED_OUT	←	4	IC7	PIN : 7
+12V	←	4	J1	PIN : 23
-12V	←	4	J1	PIN : 24
+5.1V	←	4	Z31	CATHODE
+2.1V	←	4	Z32	ANODE
G_OUT	→	4	J1	PIN : 9

1	>Sheet 1 : RED DRIVER
2	>Sheet 2 : GREEN DRIVER
3	>Sheet 3 : BLUE DRIVER
4	>Sheet 4 : TIMING SIGNALS

PROD

COMPONENT
SPECIAL CH
BEFORE REF
READ CARE
DO NOT DE
THROUGH IM



780138-3

CONTRAST

PED_CL

CONTR_SP

GAIN_R

ADJUSTMENT GAIN PREAMPLIFIER

IC102 082

D107 1N4148

R122 2K2

Q105 BF245B

R123 390K

C114 100K

C115 470K

R124 10K

CONTRAST CONTROL LOOP

R121 12K MF

R120 10K MF

R119 150K MF

-12V[RED]

Q104 BF245B

D106 BAT85

R118 820K

C113 100K

C112 1K

R117 360E MF

C111 180P

R189 4E7

C121 100K

P132 500E

R141 15K

R133 1K2

C156 1K5

C153 1K5

C157 1K5

R136 12K

R139 75E

C129 100K

GAIN CONTROL RED

R137 8K2

IC101 3246E

IC103 3246E

ADJUSTMENT GAIN OUTPUT AMPLIFIER

Q106 BSX20

R152 820E

R150 75E

P151 200E

TP1

R140 1K2

R154 1K

-12V[RED]

TEST POINT RED PREAMPLIFIER OUTPUT

+12V[RED]

C110 10M

+5.1V

R116 10E

C109 22M

R190 100E

C158 100P

R125 2K2

C108 100K

R126 10K

C124 10M

C125 100K

C123 22M

Z104 6V8

R131 3K3

R134 4K7 MF

R135 10K

C126 22M

R155 10K

Q109 BC559C

Q110 BC559C

C145 4K7

C146 100K

D105 BAT85

R115 1K5 MF

Q101 BSX20

R110 39E

R108 220E

C107 10P

R114 100E

C103 IP5

C120 22M

R138 22K MF

R130 1K5 MF

C127 2M2

IC102 082

L101 IND

FC

C140 220M

+12V

-12V

R156 10E

C144 22M

Q107

Q108

Q111

Q117

INTERCONNECTIONS

>Sheet

VIDEO_IN_R	4	J5	PIN : 2
GAIN_R	4	IC5	PIN : 6
BLKLV_R	4	IC2	PIN : 26
ABL_PN	4	Q23	DRAIN
BRT_P1	4	Q9	EMITTER
BRT_P2	4	Q4	EMITTER
BWL_SWTCH	4	IC6	PIN : 7
BWL_VR	4	IC6	PIN : 8
CP_INP	4	Q17	EMITTER
CONTRAST	4	S69	PIN : E
CONTRAST_SP	4	IC10	PIN : 11
CONTR_PBL	4	Q2	DRAIN
CONTR_P	4	IC3	PIN : 8
PED_CL	4	Q7	EMITTER
VP	4	IC4	PIN : 3
VPED_OUT	4	IC7	PIN : 7
+12V	4	J1	PIN : 23
-12V	4	J1	PIN : 24
+5.1V	4	Z31	CATHODE
+2.1V	4	Z32	ANODE
+12V[RED]	4	NODE R12 & R17	
R_OUT	4	J1	PIN : 1

1	>Sheet 1 : RED DRIVER
2	>Sheet 2 : GREEN DRIVER
3	>Sheet 3 : BLUE DRIVER
4	>Sheet 4 : TIMING SIGNALS

VIDEO INPUT RED FROM INPUT-SWITCHING MODULE

VIDEO_IN_R

BWL_SWTCH

BWL_VR

R101 4K7

R102 22K

C101 220P

D101 BA243

D102 BB112

P103 100E

ADJUSTMENT GAIN INPUT

C102 1K

C104 100M

R105 470E

R106 470E

R107 3K9

-12V

FC

C106 100K

R111 470E

R112 18E

C105 100K

R181 180E

R182 1K2

R186 3K3

Q122 BC559B

Q126 BC549B

Q121 BC559C

R185 390E

R109 1K

C155 1K5

Q120 BFY90

D115 BAW62

Q115 BS170

Q124 BF245B

R183 1K

Q123 BCY87

Z101 2V1

R184 1K2

Q125 BS170

R171 1K

R188 15K

CP_INP

ABL_PN

VP

CONTR_P

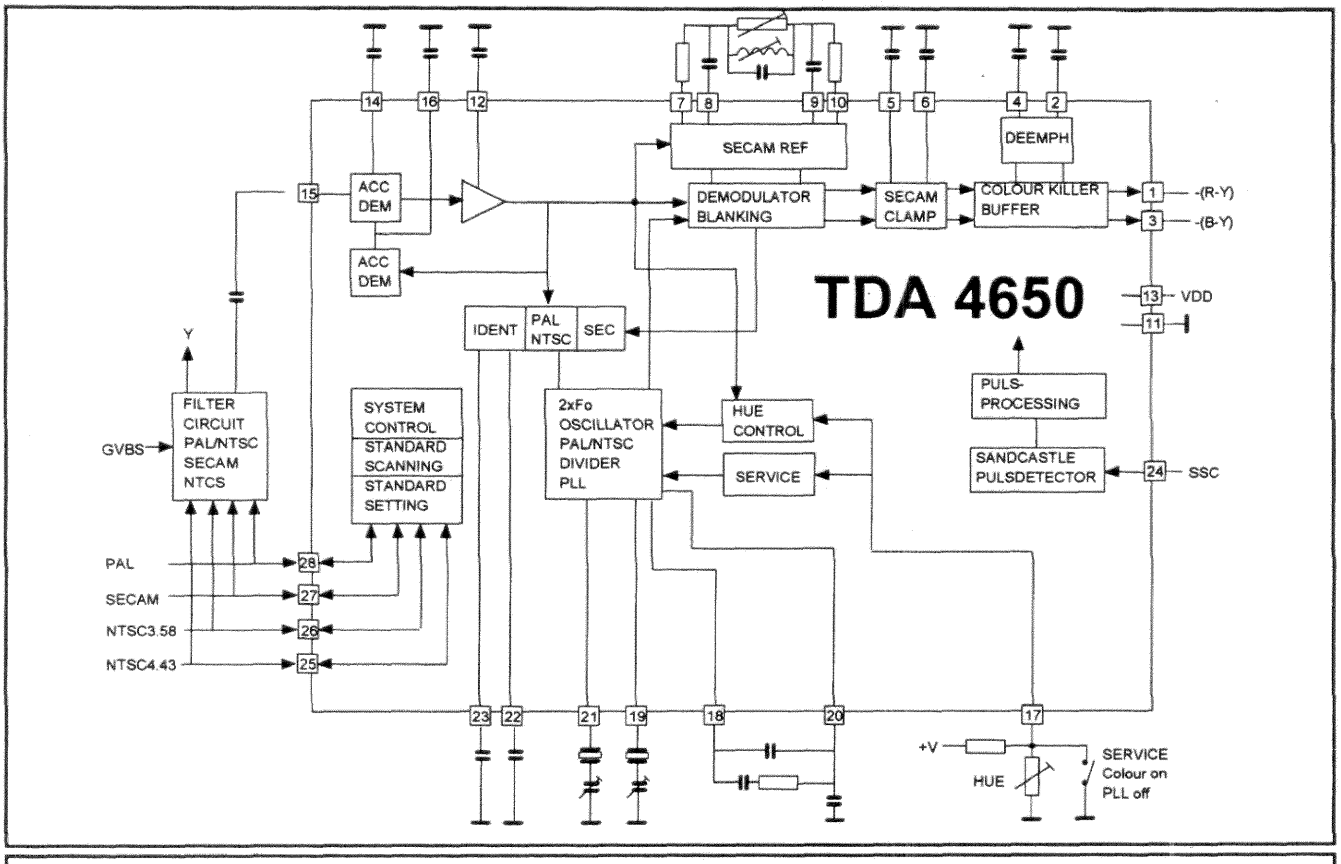
BRT_P1

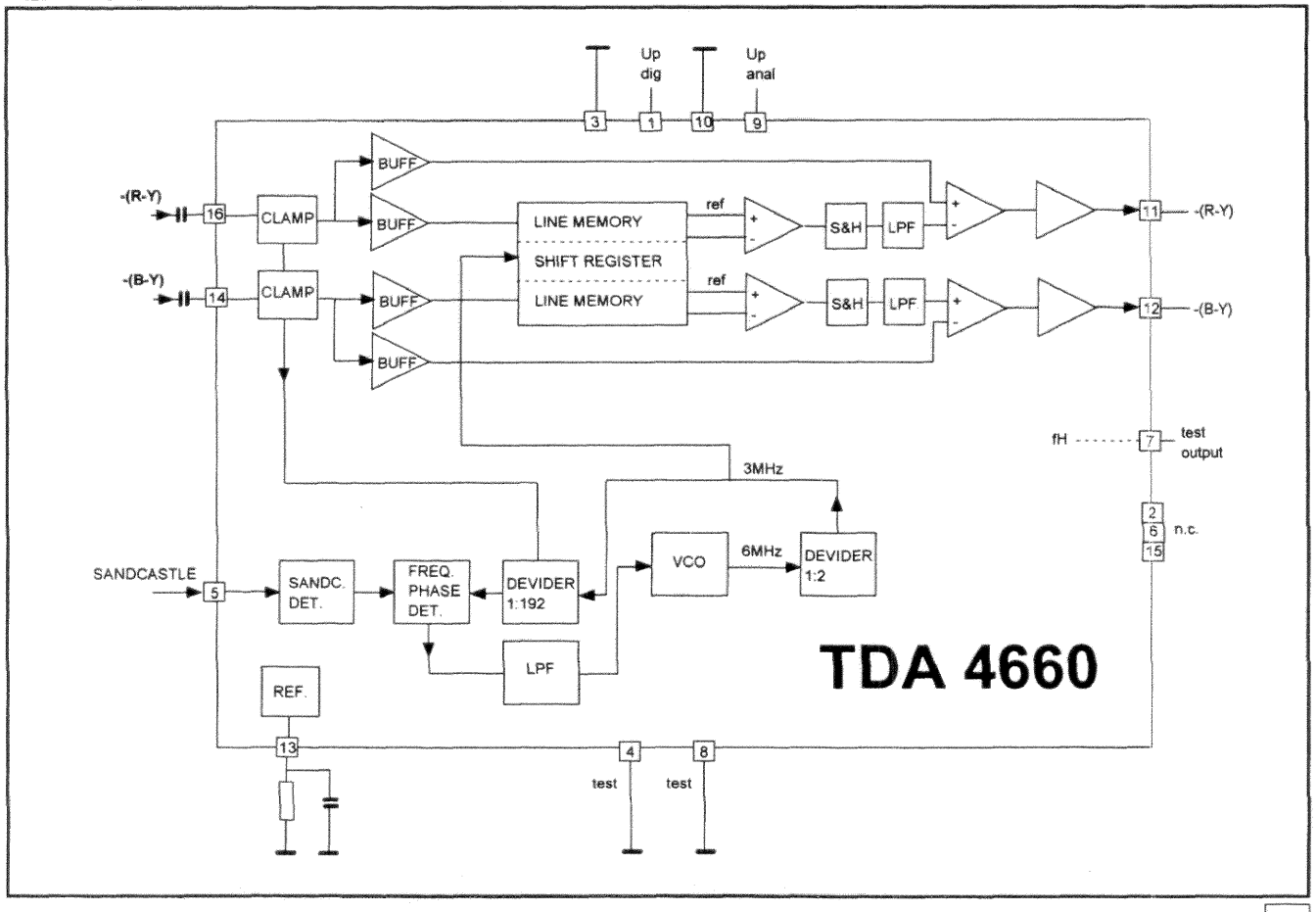
BRT_P2

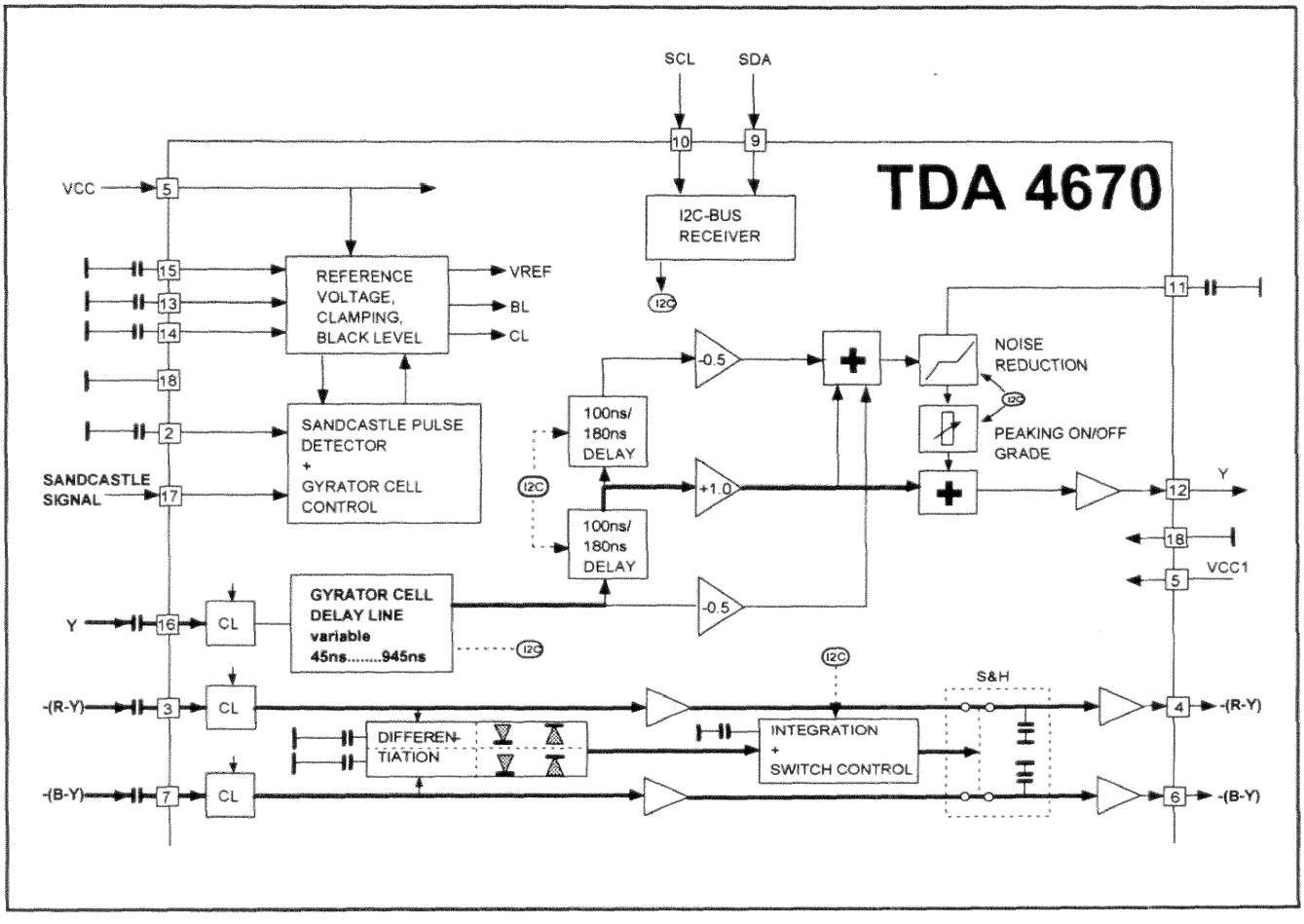
Modifications reserved

1	>Sheet 1 : RED DRIVER
2	>Sheet 2 : GREEN DRIVER
3	>Sheet 3 : BLUE DRIVER
4	>Sheet 4 : TIMING SIGNALS

Name: RED DRIVER		Article nr.: 76 21175-3
Date: 05-11-1993	Drawn: JVDY	Checked: PDG
BARCO PROJECTION SYSTEMS		


TDA 4650
SECAM REF
DEEMPH
ACC DEM
DEMODULATOR BLANKING
SECAM CLAMP
COLOUR KILLER BUFFER
-(R-Y)
-(B-Y)
VDD
IDENT
PAL NTSC
SEC
Y
GVBS
FILTER CIRCUIT PAL/NTSC SECAM NTCS
SYSTEM CONTROL
STANDARD SCANNING
STANDARD SETTING
2xFo OSCILLATOR PAL/NTSC DIVIDER PLL
HUE CONTROL
SERVICE
PULS-PROCESSING
SANDCASTLE PULSDETECTOR
SSC
PAL
SECAM
NTSC3.58
NTSC4.43
+V
HUE
SERVICE
Colour on
PLL off


TDA 4660
Up dig
Up anal
-(R-Y)
-(B-Y)
CLAMP
BUFF
LINE MEMORY
SHIFT REGISTER
ref
S&H
LPF
3MHz
fH
test output
n.c.
SANDCASTLE
SANDC. DET.
FREQ. PHASE DET.
DEVIDER 1:192
VCO
6MHz
DEVIDER 1:2
REF.
test


TDA 4670
SCL
SDA
10
9
VCC
5
I2C-BUS RECEIVER
REFERENCE VOLTAGE, CLAMPING, BLACK LEVEL
VREF
BL
CL
15
13
14
18
2
SANDCASTLE SIGNAL
17
SANDCASTLE PULSE DETECTOR + GYRATOR CELL CONTROL
100ns/ 180ns DELAY
100ns/ 180ns DELAY
I2C
-0.5
+1.0
-0.5
NOISE REDUCTION
PEAKING ON/OFF GRADE
11
12
Y
18
VCC1
5
Y
16
CL
GYRATOR CELL DELAY LINE variable 45ns.....945ns
-(R-Y)
3
CL
DIFFEREN-TIATION
INTEGRATION + SWITCH CONTROL
S&H
4
-(R-Y)
-(B-Y)
7
CL
6
-(B-Y)

Technical description "RGB drive +Quad Decoder"

General.

The red, green and blue signals, arriving from the decoder board, are here adjusted in amplitude (contrast adjustment). A brightness pulse with variable amplitude is inserted as preparation for the brightness control which is done in the power video amplifiers. Besides these "general" adjustments, an individual contrast and brightness is adjusted. These adjustments for red and green are referred to as GAIN_R , GAIN_B and BLKLV_R and BLKLV_B.
For the above contrast and brightness controls, various clamping pulses are generated as discussed hereafter.

A. Generation of clamping and blanking pulses CLMP_P and CBL_E.

a) CLMP_P pulse (sheet 2 of "Decoder + Timing Signals")

This clamping pulse is generated by a one-shot in IC403. The output pin 5 of IC403 "CLMP_P" is sent to the "RGB-driver" main board to generate other pulses (see below) and to pin 5 of the OR-gate in IC400 where it's combined with the CBL (Composite Blanking) coming from the "UN SYNC+VERT DEFL" board. After adding the CLMP_P, a push-pull stage improves the edges , and the total blanking is then referred to as CBL_E (_E = End stages) and applied to the video output power amplifiers.
The width of the CLMP_P is set by the time constant C409/R420, connected to pins 6 and 7 of IC403.
The leading edge or the start of this pulse is important, as it is used to trigger and generate other pulses. The start of this pulse is determined by the mode of the projector.
There are three possible modes : **[Vid/SVideo] [RGBS] and [RGSB.]**

The single one-shot is triggered on a positive transition (active high) of a pulse applied to pin 10. This trigger pulse is the output pin 7 of the MUX (Selector) IC404. The latter has two "selecting pins", 14 and 2 which are high or low. The combination of these levels allows the selection of one of the four input signals.

1. Video / SVideo :

In this case pin 14 of IC404 is set "high " with the +VID voltage and pin 2 is "low". The output pin 7 is now the input signal at "1" (pin 5) or the SC (Sandcastle). The zener diode Z400 of 5.6 volt 'cuts' the lower level of the SC so that only the top of the sandcastle passes the MUX and this top triggers the one-shot. The start of the CLMP_P pulse then coincides with the start of the top pulse (smallest part) of the sandcastle pulse. This is required for a video signal, as this clamping pulse must clamp the backporch of the sync pulse. When using the SC as a reference, clamping on the top of the sync is impossible.

2. RGsB (Sync on Green) :

The inputs on the selecting pins 14 and 2 of IC404 are now reversed, pin 2 is "high" and pin 14 is "low". The output is now the "2" input or the CS (Composite Sync) input.
As the CS pulses are negative, the one shot is triggered on the positive transition, this is the trailing edge of the sync pulse. This prohibits clamping on the top of the sync pulse and the clamping starts just at the end of the sync pulse (note that the sandcastle is .

Note : If the CS signal is absent for some time , i.e., during switching of sources or for any other reason, the ABL circuit can run into trouble since the clamping pulses would be discontinued. Therefore, a transistor Q530 pulls pin 2 of IC401 to ground level to "force" the HDR (see 3 below.) to trigger the one shot. As long as CS pulses are applied at its base, the transistor is blocked. When the signal is not present on the base of the transistor, it inhibits the +RGsB voltage

3. RGBS :

In this case, both selecting pins on IC401 are "low" and the " 0 " input (pin 6) is selected. This input is the output pin 4 of the other one-shot in IC400. The latter causes a delay of the HDR (Hor. Drive) pulse as a compensation for the switching delay of the MOSFETS in the deflection circuit.
The CLMP_P pulse therefore starts a little bit later than the drive pulse.

b) CBL_E (Composite Blanking for the End stages) pulse.

As explained before, the CLMP_P is now added to the CBL generated on the "UN SYNC+VERT DEFL" board. The CBL signal is limited to 5 volts with D408/410 and sent to pin 1 of an OR-gate in IC403. The signal can pass this gate on condition that the other input, pin 2, is "low". There are two conditions to be fulfilled for keeping this pin 2 "low" : no San Fail and +17 volts is not too low (lower than 14V or absent).

c) Blanking under certain conditions (SF and or +17V too low):

Both of the above conditions are permanently monitored with two level detectors of IC402 (LM393).

A portion of the +17 volts is applied on pin 2 and the Scan Fail ("high" when no Scan Fail) voltage to pin 6. Under normal conditions, both of the output pins, 1 and 7, of the level detectors are "low". The output from the OR-gate IC400, pin 11, is then also "low".

If either level detector output goes "high", meaning that there is scan fail or "a too low 17 volts", a permanent "high" would be placed on pin 6 of IC403, and thus a permanent blanking situation would occur. Transistor Q405 would be forward biased, due to the "high" on its base, and CBL_E would remain " high".
The "high" on pin 11 of IC403 is sent to Q408 and the "strobe" input pin 15 of the MUX (IC401). The "high" strobe" input on IC401 places a "low" on pin 9 which would reset the one-shot in IC403.
The "high" at the gate of Q402 causes a low level at its drain to inhibit the CONTR_PBL pulse when there is a permanent blanking.

The same "high" also puts the RESET_D line "high" via D406 in order to reset the RS-Flipflop in IC8 on the main board (see below).

d) Mixing of SC and VF (Vertical Flyback) :

The decoder IC406 (TDA4650) on the decoder sub-unit needs both a SC (at line frequency) and a VF(vertical pulses) combined signal. On the main board of this unit, the VF pulses are applied to the base of Q1. These VF pulses are thus also available at the RESET_D line.
They pass an OR-gate in IC400 (pin 10) and are added to the SC pulses via a diode D409.

B. Generation of pulses for brightness control : CP, CP_INP, -BRT, +BRT, BRT_P1, BRT_P2.

Principle: A brightness pulse with variable amplitude is inserted every two lines so as to control the DC level of the video signal at the cathodes in the video end stages.
Then, either, a contrast pulse is inserted in between the two brightness pulses or no pulse is inserted in order to allow the measurement of the black level for the contrast control loop, with the PED_CL pulse (PEDestal CLamping).
The sequence of these pulses is obtained with(line) dividers by two (2). These dividers are RS-Flipflops with a feedback from the inverted output to the data input.

The CLMP_P pulse, generated on the subunit as discussed previously, is sent to a Schmitt trigger in IC3 (pin 11) for shaping and inversion. An inverter of IC4 pins 13 and 12 , introduces a delay and the CP pulses are made available via a buffer Q16. For clamping purposes of the video inputs a CP_INP pulse with another DC level is obtained with Z10 / Q17 / -12volts.

The output of the RS Flipflop, pin 9 of IC8 is a pulse occurring every two lines and is combined with the CLMP_P pulses in the AND-gate of IC9 (pins 1,2,13) The output pulse at pin 12 is further used as follows :

* is inverted with IC4 (pins 1 - 2) and shaped with a push-pull Q3/Q4 to make a BRT_P2 pulse (with constant amplitude) for the brightness controls in the driver stages.

* to switch on the FET Q10. This switcher transfers the DC level of the OPAMP-buffer IC6 pins 12,13 and 14, to the bases of the push-pull Q8/Q9. This DC-voltage is the brightness voltage delivered by a dig. pot. of IC1 and variable from 1 to 3 volts.

As a result, we get a pulse BRT_P1 with the same width of the BRT_P2 pulse, but, with a variable amplitude, depending on the brightness adjustment. This pulse is used in the brightness control circuit of the driver circuits. Both pulses, have opposite polarity and are used to install the brightness pulse. The amplitude of this installed pulse will then be analysed in the video end stages by means of the + / - BRT pulses.
* the video end stages require two opposite phase pulses - BRT and + BRT. These pulses are generated by two push-pull circuits (Q12/Q13 and Q14/Q15) to improve the rise and fall times and provide sufficient current for the clampers on the end stages.

Note :

During the "ABL control and measurement " time (20 µS), at the end of the vertical flyback time, no brightness control may be done. Therefore, VP pulses are applied to the IC9 AND inputs with D13/D14.

C. Generation of the pulses for Contrast control: CONTR_PBL, CONTR_P, CONTR_SP, PED_CL., ABL_PN

In between two brightness pulses, alternatively a PED_CL pulse and a contrast pulse are generated. The second RS-Flipflop in IC8 divides once again the output pin 9 by 2. The complementary (opposite phased) outputs are applied respectively to pin 9 and 5 of two AND gates of IC9.

The signals at the pins 3, 4 and 5 are multiplied (AND function) and the corresponding output pin 6 (let's say the "CONTR " pulses in the further explanations) is now used to produce three coincident pulses with different widths.

CONTR_PBL (widest pulse): CONTRast Pulse BLank.

This CONTR- pulse is a bit delayed with the AND gate IC10 , pins 1+2, 3, and inverted with Q2.

CONTR_P: (narrower than the above CONTR_PBL pulse)

The original CONTR -pulse is now multiplied with the delayed CONTR_PBL to obtain a smaller pulse, which is now shaped with a Schmitt trigger in IC3 (pins 9 to 8).
CONTR_SP :

The original pulse CONTR is multiplied with the former one and another smaller pulse is created at pin 11 of the AND gate of IC10.

These three pulses, together with the PED_CL pulse, are used in the " contrast control loop" which will be discussed further on in the text.

PED_CL :

The contrast loop needs a "black level" pulse to "check " the value of the black at the moment no contrast pulse nor brightness pulse is inserted.
This PED_CL pulse is generated with the correct DC level by Z8 / Q6 / Q7.

ABL_PN :

There may be no contrast measurement during the ABL time(as ther may be no brightness control neither). Therefore, the video is blocked at the input of the driver (see later) and secondly the contrast pulses are inhibited. The VP pulses are inverted with the Schmitt trigger 1 _> 2 and used as ABL_PN in the video drive stages.

These negative pulses keep pin 3 of IC9 low via D5 to inhibit the contrast pulses.

D. Video drive stages.

It's obvious that the three video drive circuits are more or less identical.
We'll limit the explanations to the blue driver stage.

a) DC Restoration at the input :

The blue video signal is AC coupled to the base of Q320 with C302 and further to the base of Q301 on condition Q315 os "on". The DC level or bias of Q320 and thus of Q301 is amongst others determined by the collector current of Q321. This current is on its turn detrermined by the base-emitter voltage. This is the voltage across the "hold" capacitor C305.
The moment the CP_INP pulse is applied, the differential amplifier Q323 compares the instant video black level with the reference voltage installed by Z301 at the other base. The " hold "capacitor is charged up via the diff. amplifier or discharged through Q322 in order to keep the voltage stable. The moment the "ABL control measurement" is done , Q315 is blocked and the reference level of Z301 is applied to the base of Q301 to implement the black level.
Later on, in the output stages, the cathode current for this level will be measured and the result used to adapt (let's say stabilize) the brightness level of that colour (see ABL of the output stages).

c) Contrast control loop :

The gain of the video signal (=contrast control) is obtained by a current-sharing gain control stage composed of two transistors in IC301 (3246E). The input current (emitter load) is shared between two outputs, depending on the DC control voltage, which is the difference between the two base voltages.

One of these bases is fixed at a reference of 5.1V and decoupled with C309 (= common base configuration), the other base has a voltage which is the result of the transistor-buffer in the same IC (pin 7 of IC301). This DC-voltage is obtained by the "contrast control loop" circuit (sample and hold circuit) as follows:

The negative CONTR_P pulse forward biases D305 and implements a (common, and fixed) emitter current set by R315. At that moment the current is shared between the two transistors.

The collector current through R317 is determined by its base voltage. (Note that this pulse CONTR_P occurs every four lines)

The video across the collector resistor R317 is capacitively coupled with C312 to the sample and hold circuit.
The sampling contrast pulse CONTR_SP (SamPling, smallest of the three contrast pulses) drives the FET Q304 into conduction and inserts a (reference) contrast pulse of zero volts in the video signal. This reference contrast pulse undergoes now the same game of the video signal during the next lines. Two lines later, when there is no brightness nor contrast pulse, the value of this contrast pulse is sampled (checked) with a PED_CL pulse (PED = pedestal pulse).

The PED_CL (PEDestal CLamp) pulse drives the FET Q305 into conduction and applies (transfers) the amplitude of the contrast pulse to the "hold" capacitor C314. This contrast level will depend on the gain of the former differential amplifier in IC301 as discussed.

The DC voltage across the capacitor C314 is now compared with the required CONTRAST voltage from a dig.pot. in IC1(see sheet 4).
Any voltage difference will now be regulated by the feedback system until both voltages on the comparator, pins 12 and 13, are the same. The output of the comparator, pin 14, determines the gain of the video as described earlier.

E. Software controlled gain of the red and blue video signals.

A contrast offset of the red and blue signals can be adjusted by the user (white balance control) , thus, via the software controls.
A variable voltage "Gain R" and " Gain B " is received from two digital potentiometers in IC2 on the subunit (sheet 4). We limit the explanation again to the blue gain control stage.

Two differential amplifiers of IC303 are used for this purpose. The first dif. amp. is a current sharing amplifier and performs the real gain.The second one generates the difference voltage and the obtained voltage is mirrored to the bases of the first one. The collector current of the second DIF AMP can be increased or decreased by "adding" or "deviating" collector current via R337.

Note that the base voltage of the other transistor(s) is fixed with Z304 at 6.8 volts.

As the bases of the two DIF AMP's are coupled, the base differential voltage of the second one is mirrored to the first DIF AMP. The current sharing between the two transistors of the DIF AMP determines the gain (=offset) control of the video signal.

F. Brightness control (insertion of the brightness pulse):

The brightness pulse BRT_P1 (with a variable amplitude) is applied, to the common emitter of the differential amplifier. The negative pulse with constant amplitude (= negative offset) is applied at the base of Q306, an emitterfollower. This negative offset is required to install the brightness pulse always with the same polarity, with respect to the black level of the video.

At the emitterfollower Q306 the brightness pulse has an amplitude determined by the amplitude of the BRT_P1 pulse and the signal is now coupled to the amplifier Q307 via R350 and P351. Potentiometer P351 allows to adjust the amplitude and is consequently a gain control.

The contrast pulses, inserted at the contrast control loop are now "removed" with the CONTR_PBL pulses via R353 and D308.

From this point, the videosignal is DC coupled up to the drive of the crt's, therefore, the DC level stabilisation is very important. The next circuit stabilizes the DC level of the video. This is performed with a feedback system checking the black level at the moment no brightness nor contrast pulse is present. The pulse utilized to accomplish this is the PED_CL pulse via D309 to the emitter of Q313.

The videosignal is applied to a comparator Q312 / Q313. Note that VPED_OUT is the reference voltage of +1.45 volt, applied to the base of Q313.

At the moment a PED_CL pulse is applied to D309, the latter is blocked and the emitter of Q313 is set at 1.45 + 0.6 = 2 volts and then a comparison between the voltages on the bases of Q313 and Q312 occurs. There are two possibilities :

* The instant black level at the base of Q312 is lower than 1.45 volts.
In this case Q312 is forward biased turning on Q314. Q314 discharges C345 (connected to base of Q310) to decrease its voltage.

* The instant black level at the base of Q312 is higher than 1.45 volts. In this case Q314 is biased off and Q313 charges C345, increasing its voltage.

The voltage across the capacitor C345 is transferred to the base of Q306 with the Darlington Q309/Q310 and determines (=stabilizes) the DC level of the videosignal. The high input impedance of the Darlington assures a low current drain on C345 as this measurement only happens every four lines.

G. Black level control of red and blue :

The BLKLV_B voltage (1 - 3 volts) from IC2 is buffered by IC7 pins 12, 13 and 14 and sent to the base of Q318. At the moment a BRT_P2 pulse blocks D310. The collector voltage of Q318 is implemented via a voltage adaptation (Z305) to the collector of Q317 and provides an offset of the brightness pulse.

Q319 delivers the blue video on a 75 Ohm load to the output stage.

Technical description of the "QUAD DECODER"

Introduction.

This Quad decoder subunit uses the set TDA4650 / TDA4660 / TDA4670 for luminance and chrominance processing.

The TDA4650 chip is an improved version of the former TDA 4557. The external components are reduced to a minimum, the alignments are limited by using the electronically tuned delay lines of the TDA4660.

The TDA4660 comprises two horizontal sync locked CCD (Charged Coupled Devices) delay lines working in NTSC as a 'comb filter', as a propagation delay line in PAL and as simple delay line in SECAM.
Cross colour is minimised in SECAM as at the outputs of the colour chip TDA4650 only one colour difference signal at a time is available.

The TDA4670 comprises the luminance delay line, the enhancing or sharpness control and improves the transient of the colour signals. This chip is I2C-bus controlled.

Three connectors realise the connection between the main "RGB - driver" board and this decoder (subunit) board.

A. Video composite.

The video composite arrives at the buffer Q406 where it is AC coupled and available at the emitter on a correct DC level for the switching emitterfollowers.

Luminance flow :

The colour subcarrier is rejected with L404 / C421 for Pal / SECAM and N4 or with L403 / C422, tuned at 3.58 Mhz for NTSC 3.58.
Note that both transistors Q503 and Q502 are blocked in SVideo.

A next buffer Q417 supplies the Yin input of the TDA4670 through the capacitor C468.

In the first stage of this IC the signal is clamped and then reduced to a suitable level for the following delay line. This delay line consists of 13 all-pass cells (tcell = 90 nS) which are built up with gyrators.

This delay time is switchable via the I2C bus. Via software the correct delays for Pal/ Secam and NTSC 3.58Mhz are loaded. A peaking (sharpness control) is incorporated with two selectable centre frequencies (2.6 and 5 Mhz, not available here). This circuit consists of two additional delay cells, two 0.5 gain inverting amplifiers and an adding stage.
For better noise reduction the peaking signal is applied via a coring stage and a switchable amplifier before being added to the main signal. The grade of peaking (enhancing) can be controlled via the I2C bus.

Chrominance :

The chrominance is filtered by one of the chrominance filters Pal / N4 or Secam and applied via C441 to pin 15 of the colour chip TDA4650. In case of N3 the filter L402 is tuned to 3.58 Mhz with C427 .

The IC identifies and demodulates PAL, SECAM, NTSC 3.58 and NTSC 4.43

chrominance signals. The automatic standard recognition, by sequential inquiry of the backporch information, is improved by allowing only Secam when it is 50hz.

The system identification part scans during 4 vertical periods the colour in the sequence Pal / Secam / N3 / N4. Four switched outputs for chrominance filter selection are available at the pins 28 - 25. Note that, by applying an external +9 volts to the appropriated pin the chip can be forced into one colour system.

a) The delay line chip TDA4660 :

The delay line chip consists of :

a) two delay lines of 64 µS based upon a switched capacitor technique (CCD). These have normal delay function for PAL and SECAM, and a comb filter function for NTSC to avoid chrominance cross colour.

b) An internal clock of 3Mhz for the shift register delay lines, derived from a 6Mhz VCO, which is locked to the line frequency with a sandcastle pulse at pin 5. This means that the delay time is automatically adjusted, and no alignment is necessary. A divider by 192 provides a clamp pulse for the input circuits.
Sample and hold low-pass filters behind the delay lines suppress the clock signal. The delayed and un-delayed signals are added and fed to the output pins 11, 12 via a buffer stage.

By adding two subsequent lines in SECAM, and as one of these lines is blanked (line sequential blanking), we get at any time the two colour difference signals at the respective outputs.

b) SECAM .

For SECAM an amplitude limiting circuit is active before quadratic modulation.
The signal amplitude and H/2 content of the colour difference signals (R-Y) and (B-Y) is dependent on the characteristics of the external tuned circuit at pins 7, 8, 9 and 10.
The resonance frequency of this external circuit is adjusted in such way that the demodulated Fo - carrier is zero for the (B-Y), with L406.
Now, by adjusting the quality factor of the circuit with P400, it is possible to get zero output for the (R-Y) Fo carrier (un modulated carrier).
De-emphasis is applied with internal resistors and tuned to the correct value with the capacitors at pins 4 and 2 (C453 and C452).

The colour difference signals are line sequentially (each two lines) blanked to a level equal to the black signal (black) level.

By this measure only one colour signal is available at any time at the output of the colour decoder IC in order to reduce colour crosstalk.

c) PAL / NTSC .

The 8Mhz x-tal is connected at pin 21 and tuned with C436, the 7.2 Mhz x-tal for NTSC 3.58 Mhz is connected at pin 19 and tuned with C435. They can be adjusted to the centre frequency "fo" when the service pin 17 is below the 0.5 volts level (burst off).

The PAL switching stage (correction of the [R-Y] polarity) is disabled in NTSC and on the other hand the phase shifting or Hue is disabled for PAL.

With the delay lines the delayed and un-delayed signals are added to compensate propagation delays in PAL, or in other words to obtain the correct colours (but a bit desaturated).

In NTSC, adding delayed and un-delayed signals means that the luminance is suppressed.

The IC TDA4661 here behave as a 'comb' filter for NTSC.

d) CTI / Saturation control / matrixing .

The (R-Y) and (B-Y) signals are now sent to the CTI chip TDA4670 for improving the transients of these chroma signals. This is performed as follows .

Both colour difference channels consist of a clamping stage at the input, a buffer amplifier, a storage stage and an output amplifier. The storage, which is operated by a differential amplifier, stores the colour difference signal during the transient time of the input signal and then switches rapidly to accept the new signal.

A signal formed by differentiation, full wave rectifying and summing the two colour difference signals is compared with a reference signal. The resultant signal is used to switch the sample and hold circuits.

Note that the colour transient improvement function can be switched off or on by means of the I²C-bus commands (not implemented here).

The colour difference signals are capacitively coupled to IC410 which consists of four I²C controlled potentiometers. Two of these are utilised for the saturation control and one is used for the hue control.

The outputs , -(B-Y) and -(R-Y) are now matrixed with the correct ratio to obtain -(G-Y) and further the addition of Y provides Red, Green and Blue. These RGB signals leave the decoder via a current driver transistor to reach the "RGB INP SW" module.

B. SVideo .

The +SVid voltage forward biases Q404 and Q416 to respectively "accept" the chrominance and luminance signals. This voltage automatically blocks Q405 and Q414 / Q415.
The flow is now the same as described before.

Q407's base does not receive a base voltage when an RGB mode is selected in order to block the current driver outputs for Red, Green and Blue.

ADJUSTMENT PROCEDURE RGB DRIVER+QUAD DECODER 76 21175

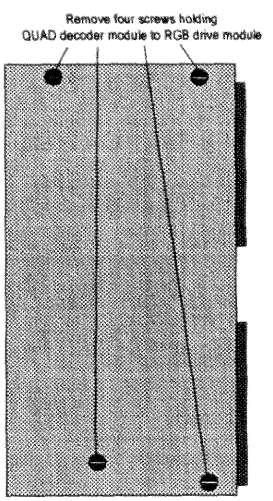
The alignment of the RGB Driver+QUAD Decoder is restricted to the adjustment of :

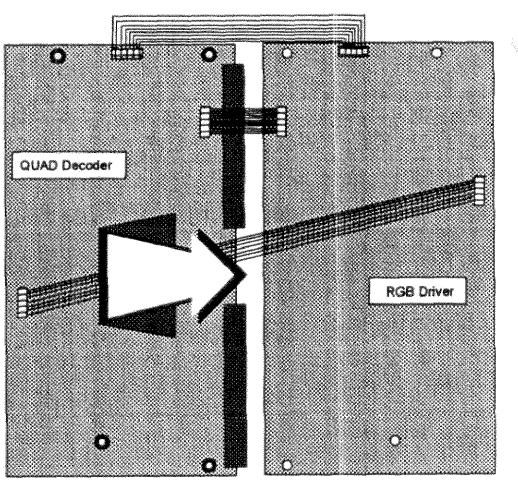
- alignment of the QUAD decoder module (sub board)
- alignment of the RGB DRIVER module (main board)

Alignment of the QUAD decoder 76 21175S (sub board)

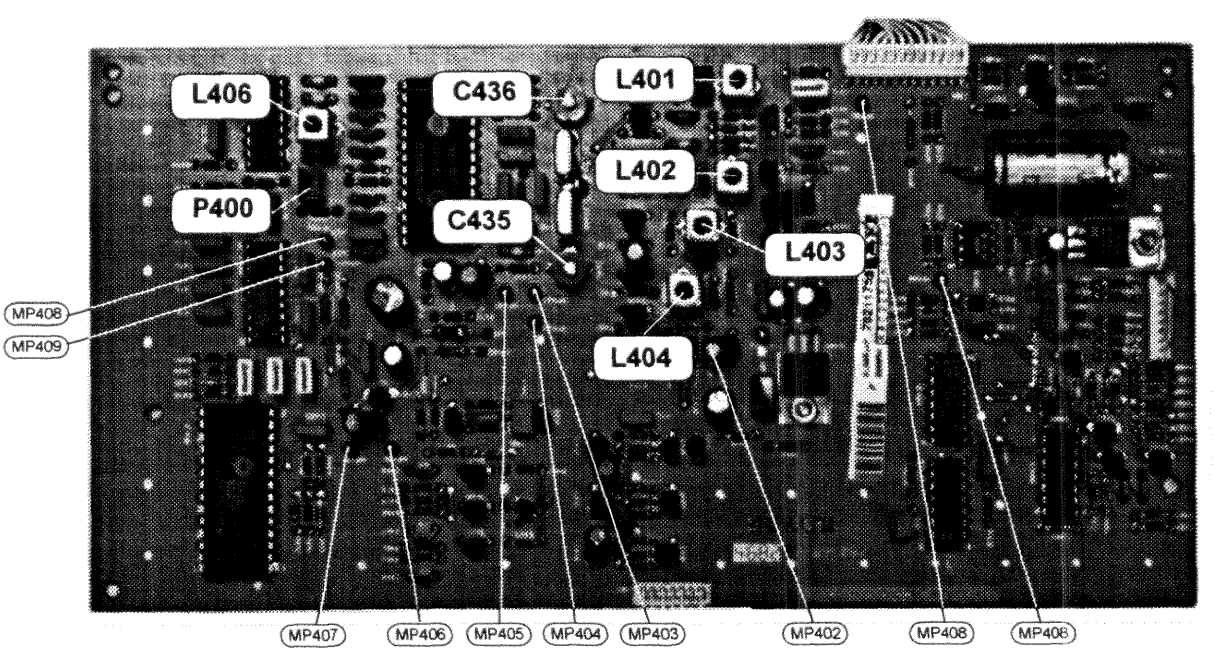
Preparation

- Put the module on the extension boards. Separate the decoder module from the RGB Drive module (removing 4 screws and pulling out two connectors). Rotate the decoder module and reinstall the cable connections, using the extension cables.





Location of controls and measurement points (MP)



- 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 (C436)

- if there is no colour, adjust trimming capacitor C436 until colour is being received.
- short-circuit pin 17 of IC406 to earth (MP405).
- adjust the trimming capacitor C436 for colour zero beat.
- remove the short-circuit.

2. CHROMA REJECTOR (L404) (photo 1)

- connect an oscilloscope to the MP406 (Y Out IC408).
- adjust the core of coil L404 for a minimum of chroma in the video signal.

3. CHROMA FILTER (L402) (photo 2)

- connect the oscilloscope to the MP403 (CRI pin 15 IC406).
- adjust the core of coil L402 for maximum chromasignal.

B. VIDEO INPUT SIGNAL
SECAM COLOUR TEST IMAGE

4. SECAM REFERENCE CIRCUIT (L406 - P400) (photo 3 & 4)

- connect the oscilloscope to the MP409 (pin 7 of IC408).
- adjust L406 so that the level of the (B-Y) signal without colour information is the same as the level during blanking.
- connect the oscilloscope to the MP408 (pin 3 of IC408).
- adjust P400 so that the level of the (R-Y) signal without colour information is the same as the level during blanking.
- If necessary the level in (B-Y) channel has to readjust to zero with the coil.

5. BELL FILTER (L401) (photo 5)

- connect an oscilloscope to the MP403 (CRI pin 15 IC406).
- adjust L401 for a flat amplitude of the signal during two successive lines.

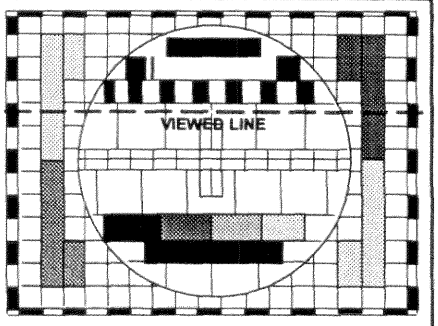
C. VIDEO INPUT SIGNAL
NTSC 3.58 TEST IMAGE

6. REFERENCE OSCILLATOR (C435)

- If there is no colour, adjust trimming capacitor C435 until colour is being received.
- short circuit pin 17 of IC406 to earth (MP405).
- adjust trimming capacitor C435 for a colour zero beat.
- remove the short-circuit.

17. CHROMA REJECTOR (L403) (refer to photo 1)

- connect the oscilloscope to the MP406 (Y Out IC408).
- adjust the core of coil L403 for a minimum of chroma in the video signal.



TEST PICTURE
Viewed line: contrast color bar

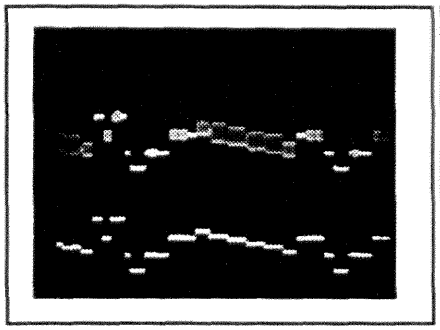


Foto 1
Alignment chroma rejector L504
Upper track: viewed video line
Lower track: Y signal

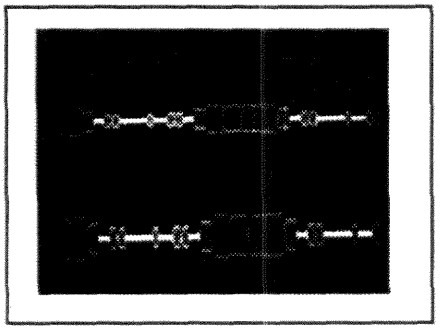


Foto 2
Alignment maximum Chroma L500
Upper track: viewed video line
Lower track: max Chroma signal

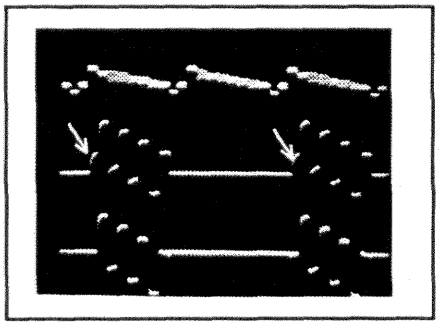


Foto 3
Alignment SECAM Ref circuit L502 (B-Y)
Upper track: viewed video line
Lower track:
1: incorrect setting
2: correct setting

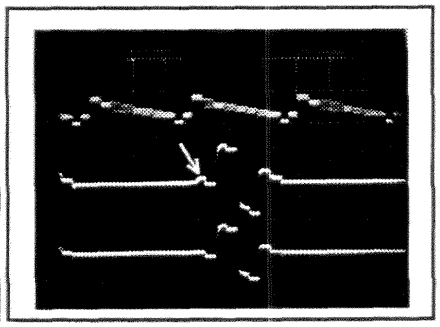


Foto 4
Alignment SECAM Ref circuit P500 (R-Y)
Upper track: viewed video line
Lower track:
1: incorrect setting
2: correct setting

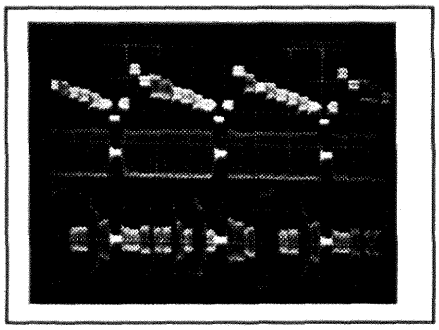
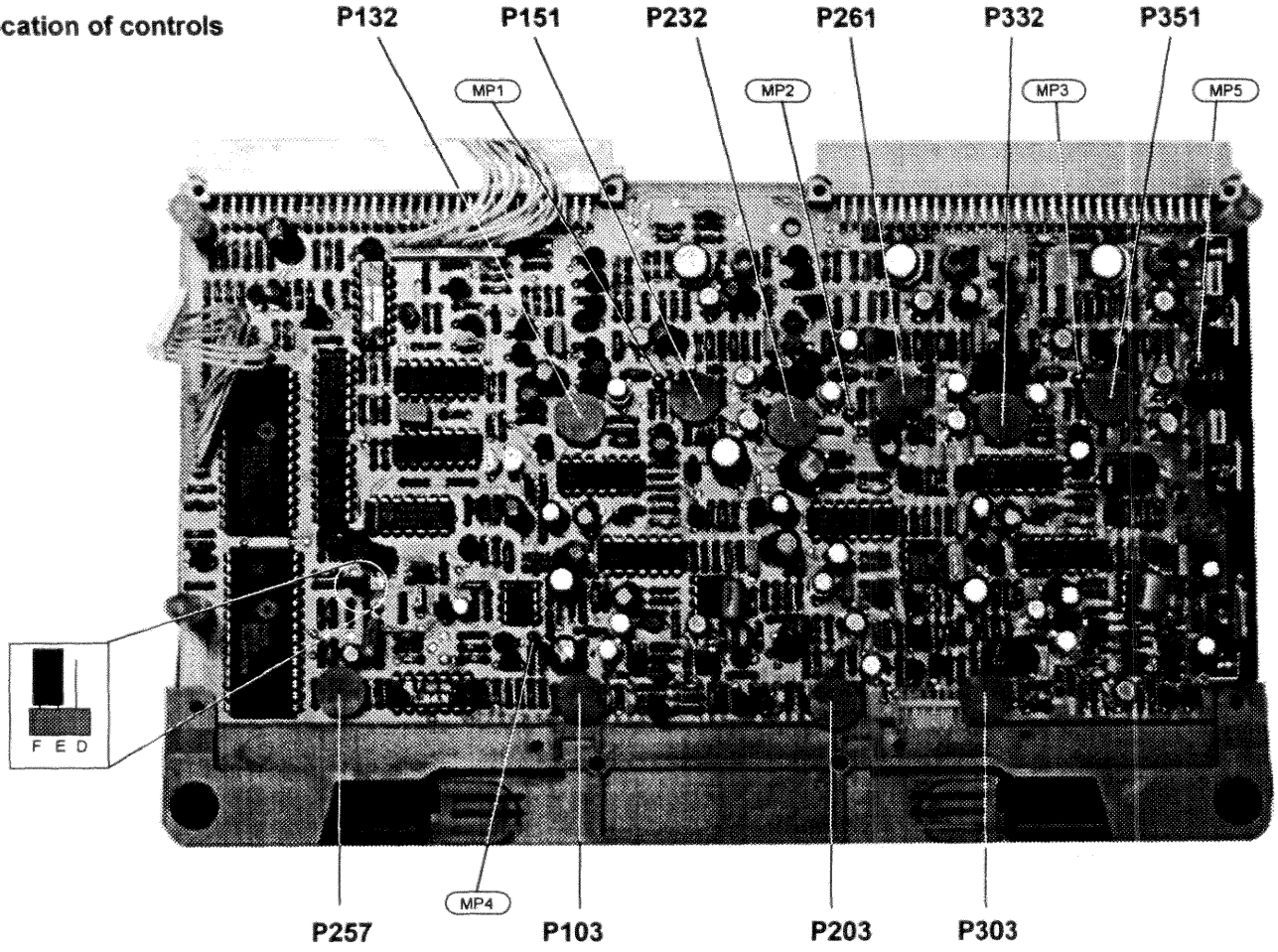


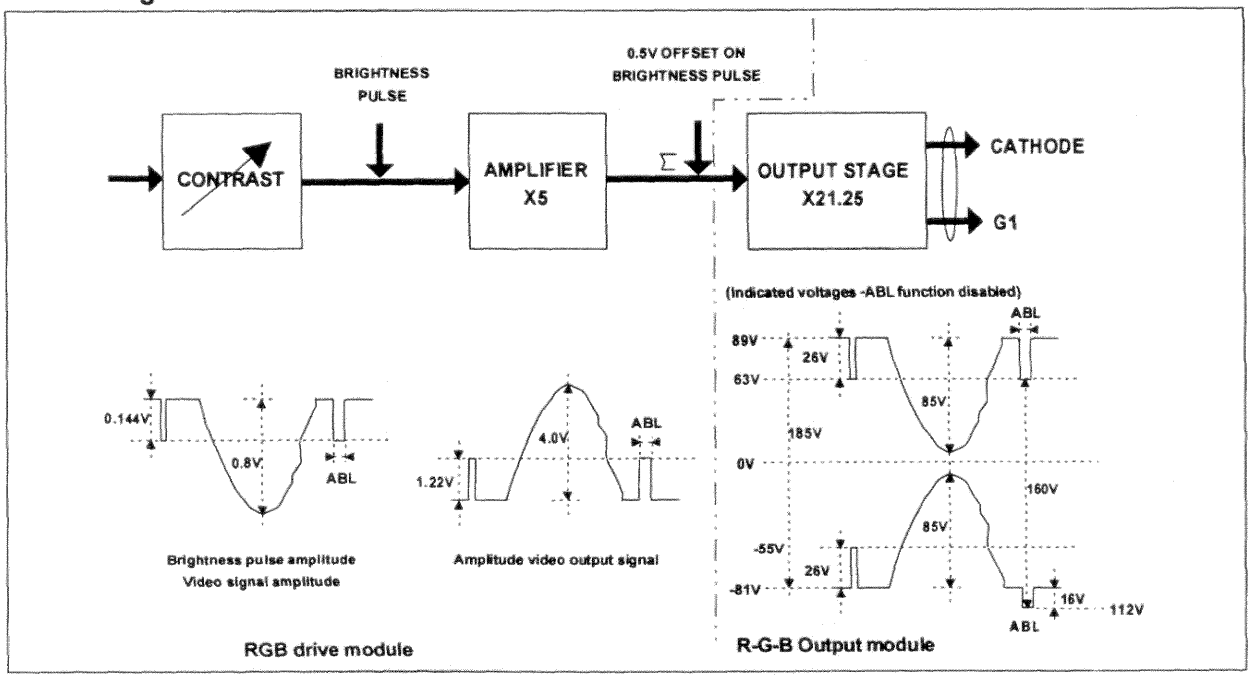
Foto 5
BELL FILTER
Upper track: viewed video line
Lower track:
1: correct setting
2: incorrect setting

Location of the adjustments controls on the Quad decoder and the RGB drive

Location of controls



Principle blockdiagram



Alignment of the RGB Driver 76 21175 (sub module)

Preparation

- Put the module on the extension boards. Separate the decoder module from the RGB Drive module (removing 4 screws and pulling out two connectors). Rotate the decoder module and reinstall the cable connections, using the extension cables. (refer to illustration added for the decoder adjustment)

- Provide a RGB externally generated source with adjustable amplitude to the projector.

- Using the RCU (Remote Control unit), adjust the Brightness to 50% on the bar scale, i.e. mid-position, the Contrast and Red/Blue gain to 99%, i.e. maximum. (refer to installation manual)

Adjustment

Adjustment of P257

- Connect an oscilliscope to the testpoint TP4.
- The signal on the scope must be a horizontal straight line (only DC level). If a pulse appears on the DC level, readjust P257 until there is no pulse.

Important:

The adjustment procedure below requires an amplitude of the R, G and B signal on the input connector J5 of 0.7Vpp .

Important: this voltage must be measured as follows,
- remove connector J5 on the Input RGB-Analog+Switching module 76 17481.
- terminate the R, G and B output with a resistor of 75 Ohm
- adjust input voltage for 0.7Vpp on the 75 Ohm resistors
- remove the resistors and plug in connector J5

Brightness pulse amplitude	P132	red channel
	P232	green channel
	P332	blue channel

Connect the oscilloscope successively to the testpoints TP1, TP2 and TP3 (the base of transistor Q106, Q206 and Q306) and adjust the corresponding potentiometer for a brightness pulse amplitude of 0.144Vpp.

Video signal amplitude	P103	red channel
	P203	green channel
	P303	blue channel

Connect the oscilloscope successively to the testpoints TP1, TP2 and TP3 (the base of transistor Q106, Q206 and Q306) and adjust the corresponding potentiometer for a video amplitude of 0.8Vpp.

Amplitude video output signals	P151	red channel
	P251	green channel
	P351	blue channel**

Connect the oscilloscope successively to contact A1-C1, A9-C9 and A25-C25 of the module connector J1 and adjust the corresponding potentiometer for a video amplitude of 4.0Vpp.

**Adjustment of P351 Blue channel:

When the components R380, R379 and D314 are mounted on the board (actual version) , potentiometer P351 has to be adjusted for a video amplitude of 4.0Vpp, but for an input signal of 0.46Vpp.

This input voltage must be measured as follows,
- remove connector J5 on the Input RGB-Analog+Switching module 76 17481.
- terminate the B output with a resistor of 75 Ohm
- adjust input voltage for 0.46Vpp on the 75 Ohm resistor
- remove the resistor and plug in connector J5

Parts listing R7621175CPL

SIT.	ITEM NO.	DESCRIPTION	QUANTITY
40	R133014	Q ACC MNTG PAD TO18	12
110	R1330291	Q ACC ISO MICA TO220	1
111	R1330292	Q ACC ISO BSHG TO220	1
10	R302108	CORE TUBE 3.5 /1.3 X 3	9
20	R302108	CORE TUBE 3.5 /1.3 X 3	1
30	R302108	CORE TUBE 3.5 /1.3 X 3	3
50	R313729	J PIN TESTEYE	5
121	R3620226	SCR D84 M 3 X 8 SI	3
120	R3661026	NUT D934 M 3 I	3
122	R367502	WSHR D6798 A 3.2 S Z	3
500	R722276	LOCK PJ49 PCB UN CPL	1
	R7621175S	UN RGB PJ51 G1200 DEC MK2	1
100	R802629	HTSNK PJ49 RGB PR_AMP	1
101	R802692	HTSNK PJ49 FIX HTSNK	2
10	R803602	SPR L28 D 6 M 3 P	4
C 1	R112774	C CE MI 100N S 63E2	
C 2	R112774	C CE MI 100N S 63E2	
C 3	R111511	C EL RA 33M M 16E2 85	1
C 4	R113729	C POMERA 270N K 63E2	
C 5	R111546	C EL RA 1M M 50E2 85	
C 6	R112774	C CE MI 100N S 63E2	
C 7	R112774	C CE MI 100N S 63E2	
C 8	R112774	C CE MI 100N S 63E2	
C 9	R111500	C EL RA 47M M 10E2 85	
C 10	R1159101	C PP RA 560P J100E2	
C 11	R111511	C EL RA 33M M 16E2 85	
C 12	R113730	C POMERA 330N K 63E2	
C 13	R113730	C POMERA 330N K 63E2	
C 14	R111548	C EL RA 2M2M 50E2 85	
C 15	R112774	C CE MI 100N S 63E2	
C 16	R112774	C CE MI 100N S 63E2	
C 17	R111548	C EL RA 2M2M 50E2 85	1
C 18	R111477	C EL RA 100M Z 25E2 85	
C 19	R112368	C N750MI 330P J 63E2	
C 20	R111510	C EL RA 22M M 25E2 85	
C 21	R112238	C NPO MI 47P G 63E2	
C 22	R112235	C NPO MI 27P G 63E2	
C 23	R112242	C NPO MI 100P J 63E2	
C 24	R112741	C CE MI 1N5K100E2	
C 25	R1115468	C EL7 RA 1M M 50E1 85	1
C 26	R1115468	C EL7 RA 1M M 50E1 85	1
C101	R112731	C CE MI 220P K100E2	1
C102	R112739	C CE MI 1N K100E2	1
C103	R112205	C P100MI 1P5C 63E2	1
C104	R111466	C EL RA 100M Z 16E2 85	
C105	R112774	C CE MI 100N S 63E2	
C106	R112774	C CE MI 100N S 63E2	1
C107	R112230	C NPO MI 10P G 63E2	1
C108	R112774	C CE MI 100N S 63E2	
C109	R111510	C EL RA 22M M 25E2 85	1
C110	R111678	C EL BRA 10M M 25E2 85	1
C111	R112365	C N750MI 180P J 63E2	
C112	R112739	C CE MI 1N K100E2	
C113	R112774	C CE MI 100N S 63E2	
C114	R113724	C POMERA 100N K 63E2	1
C115	R113732	C POMERA 470N K 63E2	1
C120	R111465	C EL RA 47M M 16E2 85	
C121	R112774	C CE MI 100N S 63E2	
C123	R111510	C EL RA 22M M 25E2 85	
C124	R111678	C EL BRA 10M M 25E2 85	1
C125	R112774	C CE MI 100N S 63E2	
C126	R111510	C EL RA 22M M 25E2 85	
C127	R111548	C EL RA 2M2M 50E2 85	1
C129	R112774	C CE MI 100N S 63E2	1
C139	R112428	C NPO MI 6P8C 63E1	1
C140	R111478	C EL RA 220M M 25E2 85	1
C141	R112422	C NPO MI 2P2C 63E1	1
C142	R111500	C EL RA 47M M 10E2 85	
C143	R112774	C CE MI 100N S 63E2	
C144	R111510	C EL RA 22M M 25E2 85	
C145	R113720	C POMERA 47N K 63E2	
C146	R112774	C CE MI 100N S 63E2	
C147	R112774	C CE MI 100N S 63E2	
C148	R111510	C EL RA 22M M 25E2 85	
C151	R112774	C CE MI 100N S 63E2	
C153	P210122	C# X7R MU 100N K 50 1206	1
C155	P210122	C# X7R MU 100N K 50 1206	1
C156	P210122	C# X7R MU 100N K 50 1206	1
C157	P210122	C# X7R MU 100N K 50 1206	1
C158	P210138	C# COG MU 10P J 50 1206	1
C201	R112731	C CE MI 220P K100E2	1
C202	R112739	C CE MI 1N K100E2	1
C203	R112233	C NPO MI 18P G 63E2	
C204	R111466	C EL RA 100M Z 16E2 85	
C205	R112774	C CE MI 100N S 63E2	
C206	R112774	C CE MI 100N S 63E2	1
C207	R112230	C NPO MI 10P G 63E2	1
C208	R112774	C CE MI 100N S 63E2	
C209	R111510	C EL RA 22M M 25E2 85	
C210	R111678	C EL BRA 10M M 25E2 85	1
C211	R112365	C N750MI 180P J 63E2	
C212	R112739	C CE MI 1N K100E2	
C213	R112774	C CE MI 100N S 63E2	
C214	R113724	C POMERA 100N K 63E2	
C215	R113732	C POMERA 470N K 63E2	1
C220	R111465	C EL RA 47M M 16E2 85	
C226	R111510	C EL RA 22M M 25E2 85	
C227	R111548	C EL RA 2M2M 50E2 85	
C229	R112774	C CE MI 100N S 63E2	1
C239	R112428	C NPO MI 6P8C 63E1	1
C240	R111478	C EL RA 220M M 25E2 85	1
C241	R112400	C P100MI 0P5C 63E1	1
C242	R111500	C EL RA 47M M 10E2 85	
C243	R112774	C CE MI 100N S 63E2	
C244	R111510	C EL RA 22M M 25E2 85	
C245	R113720	C POMERA 47N K 63E2	
C246	R112774	C CE MI 100N S 63E2	
C247	R112774	C CE MI 100N S 63E2	
C248	R111510	C EL RA 22M M 25E2 85	
C251	R112774	C CE MI 100N S 63E2	
C252	R112229	C NPO MI 8P2C 63E2	1
C301	R112731	C CE MI 220P K100E2	1
C302	R112739	C CE MI 1N K100E2	1
C303	R112231	C NPO MI 12P G 63E2	1
C304	R111466	C EL RA 100M Z 16E2 85	
C305	R112774	C CE MI 100N S 63E2	1
C306	R112774	C CE MI 100N S 63E2	1
C307	R112230	C NPO MI 10P G 63E2	1
C308	R112774	C CE MI 100N S 63E2	
C309	R111510	C EL RA 22M M 25E2 85	
C310	R111678	C EL BRA 10M M 25E2 85	1
C311	R112365	C N750MI 180P J 63E2	
C312	R112739	C CE MI 1N K100E2	
C313	R112774	C CE MI 100N S 63E2	

C314	R113724	C POMERA 100N K 63E2	
C315	R113732	C POMERA 470N K 63E2	1
C320	R111465	C EL RA 47M M 16E2 85	
C321	R112774	C CE MI 100N S 63E2	
C323	R111510	C EL RA 22M M 25E2 85	
C324	R111678	C EL BRA 10M M 25E2 85	1
C325	R112774	C CE MI 100N S 63E2	
C326	R111510	C EL RA 22M M 25E2 85	
C327	R111548	C EL RA 2M2M 50E2 85	
C329	R112774	C CE MI 100N S 63E2	1
C339	R112428	C NPO MI 6P8C 63E1	1
C340	R111478	C EL RA 220M M 25E2 85	1
C341	R112403	C P100MI 1P C 63E1	1
C342	R111500	C EL RA 47M M 10E2 85	
C343	R112774	C CE MI 100N S 63E2	
C344	R111510	C EL RA 22M M 25E2 85	
C345	R113720	C POMERA 47N K 63E2	
C346	R112774	C CE MI 100N S 63E2	
C347	R112774	C CE MI 100N S 63E2	
C348	R111510	C EL RA 22M M 25E2 85	
C351	R112774	C CE MI 100N S 63E2	
C352	R112231	C NPO MI 12P G 63E2	
C353	P210122	C# X7R MU 100N K 50 1206	1
C358	P210138	C# COG MU 10P J 50 1206	1
D 1	R131621	D S 1N4148 075150 DO35	
D 2	R131621	D S 1N4148 075150 DO35	
D 3	R131621	D S 1N4148 075150 DO35	
D 4	R131621	D S 1N4148 075150 DO35	
D 5	R131621	D S 1N4148 075150 DO35	
D 6	R131621	D S 1N4148 075150 DO35	
D 7	R131621	D S 1N4148 075150 DO35	
D 8	R1316361	D Y BAT85 030200 DO35	
D 9	R131621	D S 1N4148 075150 DO35	
D 10	R131621	D S 1N4148 075150 DO35	
D 11	R1316361	D Y BAT85 030200 DO35	
D 13	R1316361	D Y BAT85 030200 DO35	
D 14	R1316361	D Y BAT85 030200 DO35	
D 15	R131621	D S 1N4148 075150 DO35	
D 16	R131621	D S 1N4148 075150 DO35	
D 17	R131621	D S 1N4148 075150 DO35	
D 18	R131621	D S 1N4148 075150 DO35	
D 19	R131621	D S 1N4148 075150 DO35	
D 21	R131621	D S 1N4148 075150 DO35	
D 22	R131621	D S 1N4148 075150 DO35	
D 24	R131621	D S 1N4148 075150 DO35	
D 25	R131621	D S 1N4148 075150 DO35	
D 26	R131621	D S 1N4148 075150 DO35	
D 27	R131621	D S 1N4148 075150 DO35	
D 28	R131621	D S 1N4148 075150 DO35	
D 29	R131621	D S 1N4148 075150 DO35	
D 70	R1316361	D Y BAT85 030200 DO35	
D 71	R1316361	D Y BAT85 030200 DO35	1
D 72	R1316361	D Y BAT85 030200 DO35	
D101	R131623	D S BA243 020100 DO35	1
D102	R131826	D V BB112 008 SOD69	1
D105	R1316361	D Y BAT85 030200 DO35	
D106	R1316361	D Y BAT85 030200 DO35	
D107	R131621	D S 1N4148 075150 DO35	
D108	R131628	D S BAW62 075200 DO35	1
D109	R131621	D S 1N4148 075150 DO35	
D110	R131621	D S 1N4148 075150 DO35	
D111	R131621	D S 1N4148 075150 DO35	
D112	R131621	D S 1N4148 075150 DO35	
D113	R131621	D S 1N4148 075150 DO35	
D115	R131628	D S BAW62 075200 DO35	1
D201	R131623	D S BA243 020100 DO35	1
D202	R131826	D V BB112 008 SOD69	1
D205	R1316361	D Y BAT85 030200 DO35	
D206	R1316361	D Y BAT85 030200 DO35	
D207	R131621	D S 1N4148 075150 DO35	
D208	R131628	D S BAW62 075200 DO35	1
D209	R131621	D S 1N4148 075150 DO35	
D210	R131621	D S 1N4148 075150 DO35	
D211	R131621	D S 1N4148 075150 DO35	
D212	R131621	D S 1N4148 075150 DO35	
D213	R131621	D S 1N4148 075150 DO35	
D215	R131628	D S BAW62 075200 DO35	1
D301	R131623	D S BA243 020100 DO35	1
D302	R131826	D V BB112 008 SOD69	1
D305	R1316361	D Y BAT85 030200 DO35	
D306	R1316361	D Y BAT85 030200 DO35	
D307	R131621	D S 1N4148 075150 DO35	
D308	R131628	D S BAW62 075200 DO35	1
D309	R131621	D S 1N4148 075150 DO35	
D310	R131621	D S 1N4148 075150 DO35	
D311	R131621	D S 1N4148 075150 DO35	
D312	R131621	D S 1N4148 075150 DO35	
D313	R131621	D S 1N4148 075150 DO35	
D314	R131635	D Y 5082-2800	1
D315	R131628	D S BAW62 075200 DO35	1
I 1	R132833	U 76013 SC DIP28 P	1
I 2	R132833	U 76013 SC DIP28 P	1
I 3	R137551	U 74HCT14 DIP14 P	1
I 4	R137507	U 7406 DIP14 P	1
I 5	R134104	U 741 LM DIP8 P	1
I 6	R134113	U 084 TL DIP14 P	1
I 7	R134113	U 084 TL DIP14 P	1
I 8	R137548	U 74HCT74 DIP14 P	1
I 9	R137010	U 74HCT11 DIP14 P	1
I 10	R137537	U 74HCT08 DIP14 P	1
I 11	R134001	U 7805 TO220 P	1
I 12	R134002	U 7812 TO220 P	1
I 13	R134016	U 7912 TO220 P	1
I101	R132705	U 3246E CA DIP14 P	1
I102	R134124	U 082 TL DIP8 P	1
I103	R132705	U 3246E CA DIP14 P	1
I201	R132705	U 3246E CA DIP14 P	1
I202	R134124	U 082 TL DIP8 P	1
I301	R132705	U 3246E CA DIP14 P	1
I302	R134124	U 082 TL DIP8 P	1
I303	R132705	U 3246E CA DIP14 P	1
J1	R313525	J EUR2C MBS P64 E1C2S 1,6	1
J2	R313525	J EUR2C MBS P64 E1C2S 1,6	1
J5	R313947	J CT H MBS P 7 M2SN	1
L101	R302108	CORE TUBE 3.5 /1.3 X 3	1
L102	R774271	COIL IF N 6.5 B5ZK D0.2	1
L201	R302108	CORE TUBE 3.5 /1.3 X 3	1
L202	R774271	COIL IF N 6.5 B5ZK D0.2	1
L301	R302108	CORE TUBE 3.5 /1.3 X 3	1
L302	R774271	COIL IF N 6.5 B5ZK D0.2	1
P103	R107003	R TCE H100E M 0W5 S7 TS	1
P132	R107005	R TCE H500E M 0W5 S7 TS	1
P151	R107004	R TCE H200E M 0W5 S7 TS	1
P203	R107003	R TCE H100E M 0W5 S7 TS	1
P232	R107005	R TCE H500E M 0W5 S7 TS	1
P251	R107004	R TCE H200E M 0W5 S7 TS	1
P257	R107006	R TCE H 1K M 0W5 S7 TS	1
P303	R107003	R TCE H100E M 0W5 S7 TS	1
P332	R107005	R TCE H500E M 0W5 S7 TS	1
P351	R107004	R TCE H200E M 0W5 S7 TS	1

PC	R780138	PCD PJ51 G1200 RGB DVR	1
Q 1	R1314295	Q BC549B N SS TO92	
Q 2	R132910	Q BS170 FN SS TO92	1
Q 3	R1314295	Q BC549B N SS TO92	
Q 4	R1314181	Q BC559B P SS TO92	
Q 5	R1314295	Q BC549B N SS TO92	
Q 6	R1314181	Q BC559B P SS TO92	
Q 7	R1314182	Q BC559C P SS TO92	
Q 8	R1314295	Q BC549B N SS TO92	
Q 9	R1314181	Q BC559B P SS TO92	
Q 10	R1314651	Q BF245B FN SS TO92	1
Q 12	R131426	Q BC337 N SS TO92	
Q 13	R1314181	Q BC559B P SS TO92	
Q 14	R1314295	Q BC549B N SS TO92	
Q 15	R1314181	Q BC559B P SS TO92	
Q 16	R1314295	Q BC549B N SS TO92	
Q 17	R1314181	Q BC559B P SS TO92	
Q 20	R1314295	Q BC549B N SS TO92	
Q 21	R1314295	Q BC549B N SS TO92	1
Q 22	R1314181	Q BC559B P SS TO92	1
Q 23	R132910	Q BS170 FN SS TO92	1
Q101	R131491	Q BSX20 .2369 N SS TO18	1
Q104	R1314651	Q BF245B FN SS TO92	1
Q105	R1314651	Q BF245B FN SS TO92	1
Q106	R131491	Q BSX20 .2369 N SS TO18	1
Q107	R132926	Q BFQ63 N SS TO72	1
Q108	R132926	Q BFQ63 N SS TO72	1
Q109	R1314182	Q BC559C P SS TO92	
Q110	R1314182	Q BC559C P SS TO92	
Q111	R132925	Q BFQ53 N SS TO72	1
Q112	R1314181	Q BC559B P SS TO92	
Q113	R1314181	Q BC559B P SS TO92	
Q114	R1314295	Q BC549B N SS TO92	1
Q115	R132910	Q BS170 FN SS TO92	1
Q117	R132925	Q BFQ53 N SS TO72	1
Q118	R1314295	Q BC549B N SS TO92	
Q119	R132911	Q 2N5583 P SS TO39	1
Q120	R132954	Q BFY90 N SS TO72	1
Q121	R132916	Q BS250 FN SS TO92	1
Q122	R1314181	Q BC559B P SS TO92	1
Q123	R132944	Q BCY87 2N SS TO71	1
Q124	R1314651	Q BF245B FN SS TO92	1
Q125	R132910	Q BS170 FN SS TO92	1
Q126	R1314295	Q BC549B N SS TO92	
Q201	R131491	Q BSX20 .2369 N SS TO18	1
Q204	R1314651	Q BF245B FN SS TO92	1
Q205	R1314651	Q BF245B FN SS TO92	1
Q206	R131491	Q BSX20 .2369 N SS TO18	1
Q207	R132926	Q BFQ63 N SS TO72	1
Q208	R132926	Q BFQ63 N SS TO72	1
Q209	R1314182	Q BC559C P SS TO92	
Q210	R1314182	Q BC559C P SS TO92	
Q211	R132925	Q BFQ53 N SS TO72	1
Q212	R1314181	Q BC559B P SS TO92	
Q213	R1314181	Q BC559B P SS TO92	
Q214	R1314295	Q BC549B N SS TO92	
Q215	R132910	Q BS170 FN SS TO92	1
Q217	R132925	Q BFQ53 N SS TO72	1
Q218	R1314295	Q BC549B N SS TO92	
Q219	R132911	Q 2N5583 P SS TO39	1
Q220	R132954	Q BFY90 N SS TO72	1
Q221	R132916	Q BS250 FN SS TO92	1
Q222	R1314181	Q BC559B P SS TO92	
Q223	R132944	Q BCY87 2N SS TO71	1
Q224	R1314651	Q BF245B FN SS TO92	1
Q225	R132910	Q BS170 FN SS TO92	1
Q226	R1314295	Q BC549B N SS TO92	
Q301	R131491	Q BSX20 .2369 N SS TO18	1
Q304	R1314651	Q BF245B FN SS TO92	1
Q305	R1314651	Q BF245B FN SS TO92	1
Q306	R131491	Q BSX20 .2369 N SS TO18	1
Q307	R132926	Q BFQ63 N SS TO72	1
Q308	R132926	Q BFQ63 N SS TO72	1
Q309	R1314182	Q BC559C P SS TO92	
Q310	R1314182	Q BC559C P SS TO92	
Q311	R132925	Q BFQ53 N SS TO72	1
Q312	R1314181	Q BC559B P SS TO92	
Q313	R1314181	Q BC559B P SS TO92	
Q314	R1314295	Q BC549B N SS TO92	
Q315	R132910	Q BS170 FN SS TO92	1
Q317	R132925	Q BFQ53 N SS TO72	1
Q318	R1314295	Q BC549B N SS TO92	
Q319	R132911	Q 2N5583 P SS TO39	1
Q320	R132954	Q BFY90 N SS TO72	1
Q321	R132916	Q BS250 FN SS TO92	1
Q322	R1314181	Q BC559B P SS TO92	1
Q323	R132944	Q BCY87 2N SS TO71	1
Q324	R1314651	Q BF245B FN SS TO92	1
Q325	R132910	Q BS170 FN SS TO92	1
Q326	R1314295	Q BC549B N SS TO92	1
R 1	R101543	R MF H 3K9 F 0W4 E3	
R 2	R101543	R MF H 3K9 F 0W4 E3	
R 3	R101536	R MF H 1K F 0W4 E3	
R 4	R101544	R MF H 4K7 F 0W4 E3	
R 5	R101550	R MF H 15K F 0W4 E3	
R 6	R101550	R MF H 15K F 0W4 E3	
R 7	R101536	R MF H 1K F 0W4 E3	
R 8	R101548	R MF H 10K F 0W4 E3	
R 9	R101538	R MF H 1K5 F 0W4 E3	
R 10	R101554	R MF H 33K F 0W4 E3	
R 11	R101514	R MF H 15E F 0W4 E3	
R 12	R101538	R MF H 1K5 F 0W4 E3	
R 13	R101554	R MF H 33K F 0W4 E3	
R 14	R101538	R MF H 1K5 F 0W4 E3	
R 15	R101524	R MF H100E F 0W4 E3	
R 16	R101554	R MF H 33K F 0W4 E3	
R 17	R101545	R MF H 5K6 F 0W4 E3	
R 18	R101571	R MF H820K F 0W4 E3	
R 19	R101512	R MF H 10E F 0W4 E3	
R 20	R101549	R MF H 12K F 0W4 E3	
R 21	R101516	R MF H 22E F 0W4 E3	
R 22	R1015471	R MF H 7K5 F 0W4 E3	
R 23	R101546	R MF H 6K8 F 0W4 E3	
R 24	R101543	R MF H 3K9 F 0W4 E3	
R 25	R101552	R MF H 22K F 0W4 E3	
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Z 8	R131720	D ZEN 6V2 0W5 C DO35	1
Z 20	R131754	D ZEN 3V3 0W5 C DO35	1
Z 31	R131716	D ZEN 5V1 0W5 C DO35	1
Z 32	R131733	D STB 2V 0W33 DO35	1
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Z104	R131742	D ZEN 6V8 0W5 C DO35	1
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Parts listing R7621175S

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20	R366102	NUT D934 M 3 S Z	2
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C401	R112368	C N750MI 330P J 63E2	1
C402	R112774	C CE MI 100N S 63E2	
C403	R112774	C CE MI 100N S 63E2	
C404	R112226	C NPO MI 4P7C 63E2	1
C405	R112739	C CE MI 1N K100E2	
C406	R112235	C NPO MI 27P G 63E2	
C407	R111510	C EL RA 22M M 25E2 85	
C408	R114102	C POMERA 220N K100E4	1
C409	R1159101	C PP RA 560P J100E2	1
C410	R112243	C NPO MI 120P J 63E2	
C411	R112368	C N750MI 330P J 63E2	
C412	R111548	C EL RA 2M2M 50E2 85	
C413	R113730	C POMERA 330N K 63E2	
C414	R112774	C CE MI 100N S 63E2	
C415	R112774	C CE MI 100N S 63E2	
C416	R111531	C EL RA 10M M 35E2 85	
C417	R111510	C EL RA 22M M 25E2 85	
C418	R113724	C POMERA 100N K 63E2	
C419	R111678	C EL BRA 10M M 25E2 85	
C420	R111477	C EL RA 100M Z 25E2 85	
C421	R1122415	C NPO MI 82P J 63E2	
C422	R112243	C NPO MI 120P J 63E2	
C423	R1159061	C PP RA 390P J100E2	
C424	R112243	C NPO MI 120P J 63E2	
C425	R112774	C CE MI 100N S 63E2	
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C436	R117001	C T 7 -35P 160	1
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C439	R1137161	C POMERA 22N K100E2	
C440	R113730	C POMERA 330N K 63E2	
C441	R112739	C CE MI 1N K100E2	
C442	R1159101	C PP RA 560P J100E2	
C443	R113720	C POMERA 47N K 63E2	
C444	R111546	C EL RA 1M M 50E2 85	
C445	R111546	C EL RA 1M M 50E2 85	
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I400	R137546	U 74HCT32 DIP14 P	1
I401	R134001	U 7805 TO220 P	1
I402	R134114	U 393 LM DIP8 P	1
I403	R137552	U 74HCT123 DIP16 P	1
I404	R137011	U 74HCT153 DIP16 P	1
I405	R134002	U 7812 TO220 P	1
I406	R132828	U 4650 TDA DIP28 P	1
I407	R134032	U 78L05 TO92 P	1
I408	R132830	U 4670 TDA DIP18 P	1
I409	R1328291	U 4661 TDA DIP16 P	1
I410	R132833	U 76013 SC DIP28 P	1
J400	R313928	J CT H MBT P 8 M2SN	1
J401	R313952	J CT H MBS P12 M2SN	1
L400	R306052	CH RA NS 150 UH	1
L401	R3060121	CH RA ES 3.3 UH S7 T	1
L402	R3060241	CH RA ES 10 UH S7 T	1
L403	R3060281	CH RA ES 15 UH S7 T	1
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L405	R3061322	CH AX NS 10 UH	1
L406	R3060241	CH RA ES 10 UH S7 T	1
MP40	R313729	J PIN TESTEYE	1
MP41	R313729	J PIN TESTEYE	1

MP42	R313729	J PIN TESTEYE	1
MP43	R313729	J PIN TESTEYE	1
MP44	R313729	J PIN TESTEYE	1
MP45	R313729	J PIN TESTEYE	1
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MP49	R313729	J PIN TESTEYE	1
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R404	R101553	R MF H 27K F 0W4 E3	
R405	R101552	R MF H 22K F 0W4 E3	
R407	R101548	R MF H 10K F 0W4 E3	
R408	R101533	R MF H560E F 0W4 E3	
R409	R101548	R MF H 10K F 0W4 E3	
R410	R101544	R MF H 4K7 F 0W4 E3	
R411	R101570	R MF H680K F 0W4 E3	
R412	R101560	R MF H100K F 0W4 E3	
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R445	R101560	R MF H100K F 0W4 E3	
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R447	R101512	R MF H 10E F 0W4 E3	
R448	R101534	R MF H680E F 0W4 E3	
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SR44	R1011049	R CFFH 2E2 J 0W25		1
SR45	R1011049	R CFFH 2E2 J 0W25		1
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X401	R306816	X 8.867238 MHZ HC49 S20		1

Z400	R131744	D ZEN 5V6 0W5 C DO35		
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Z402	R131716	D ZEN 5V1 0W5 C DO35		
Z403	R131716	D ZEN 5V1 0W5 C DO35		
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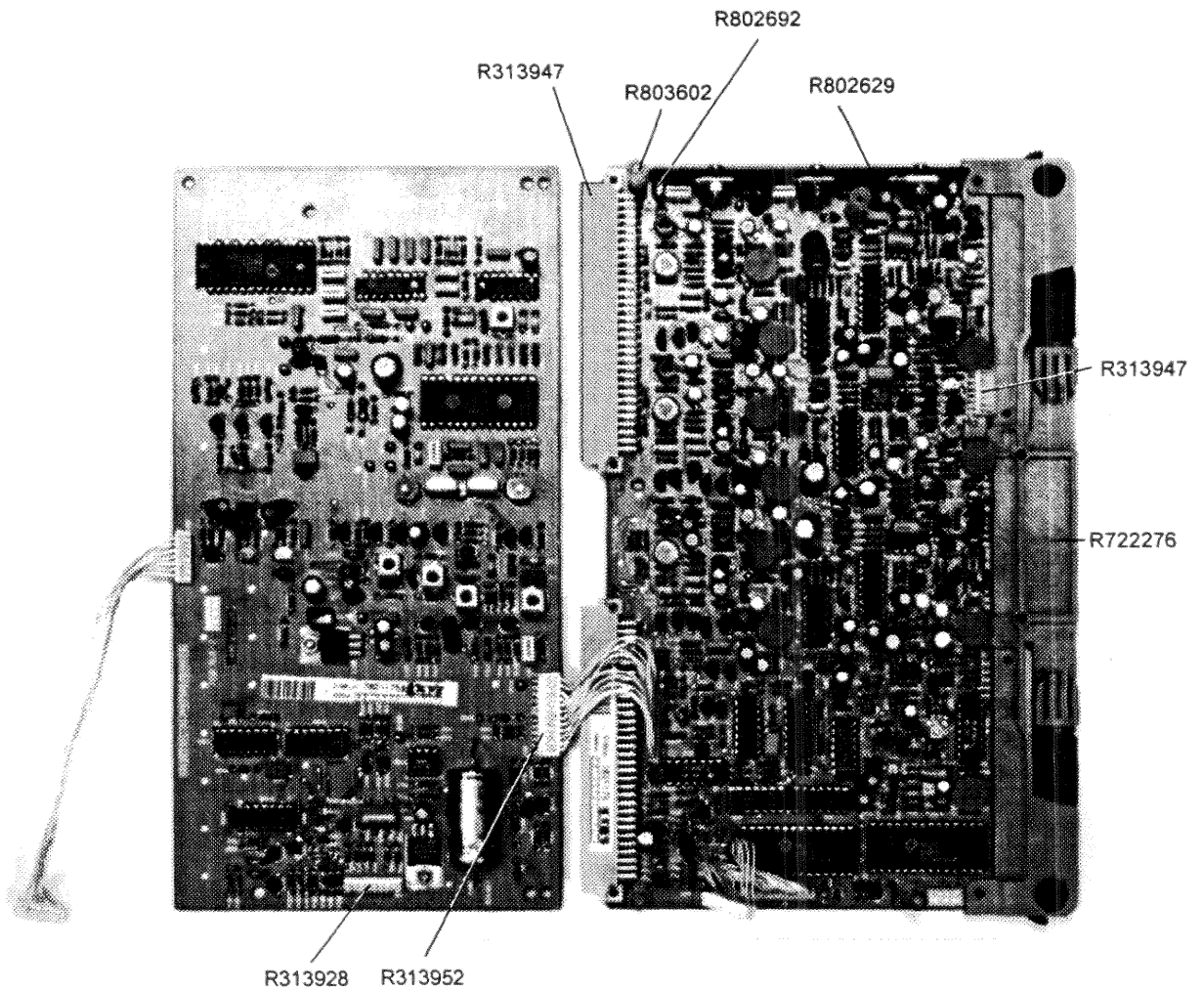
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