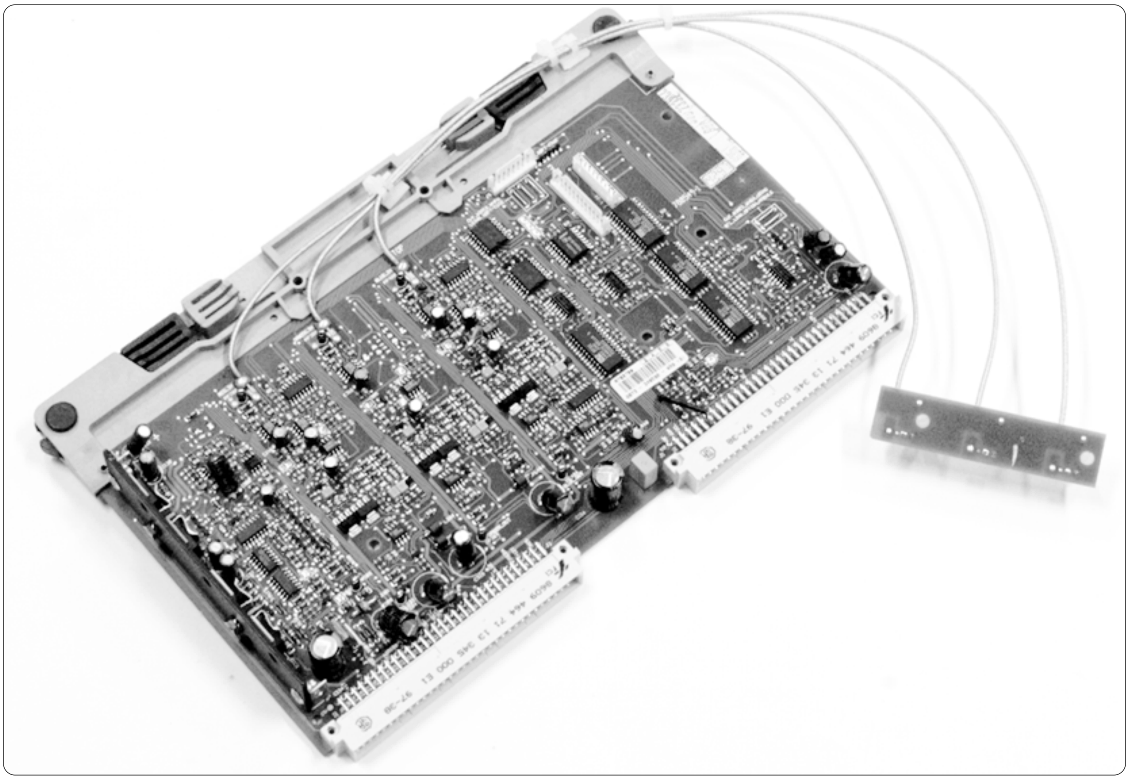
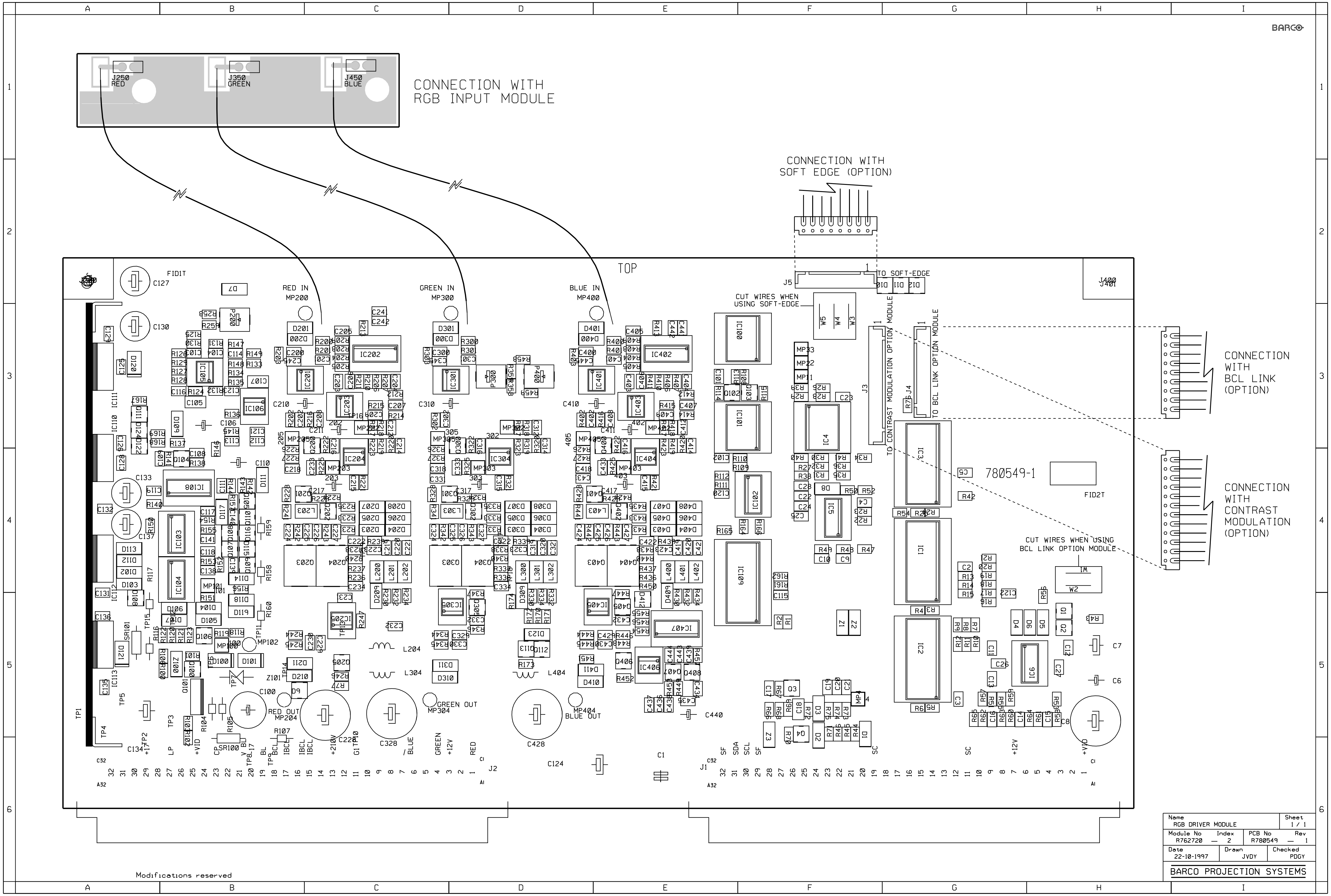
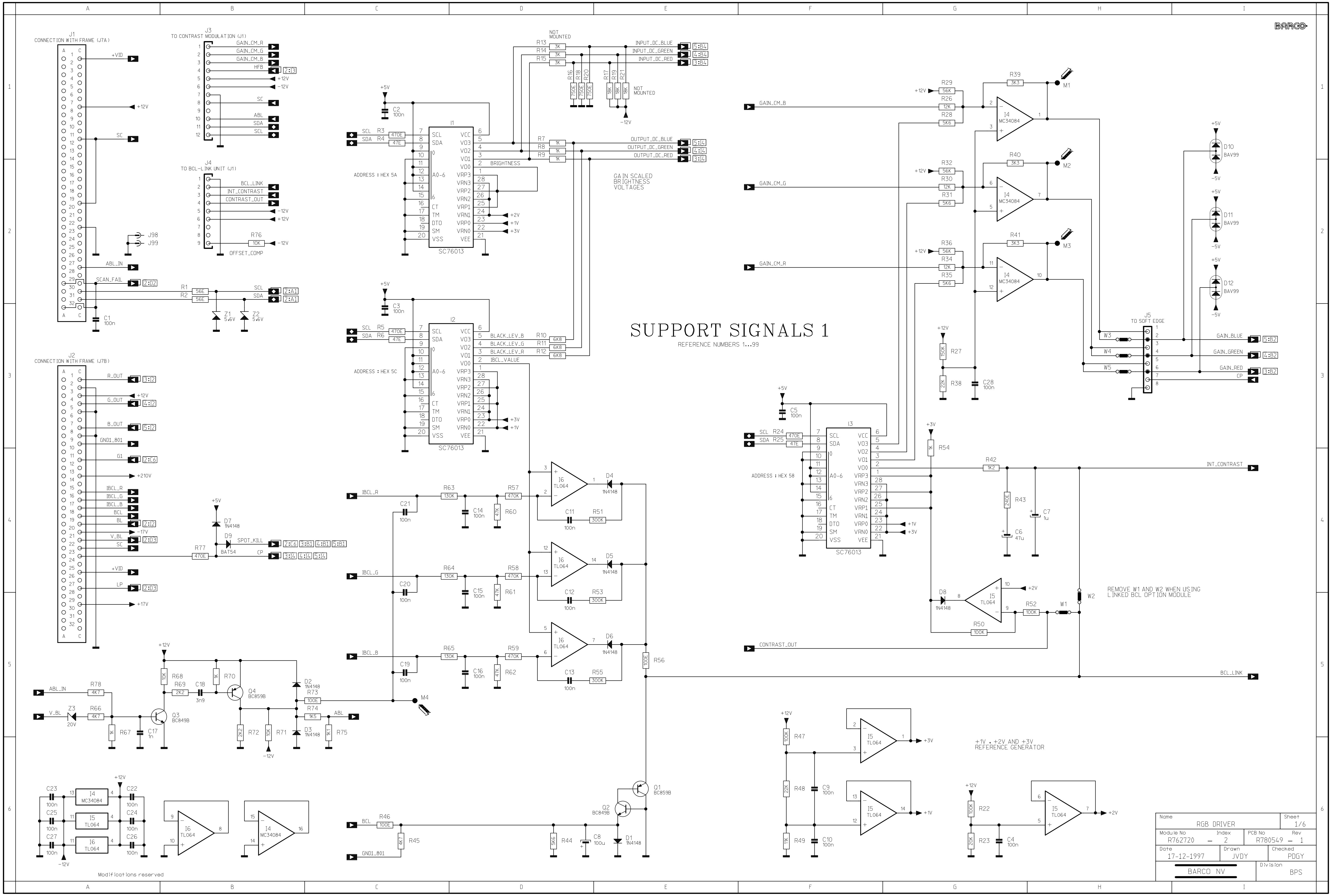
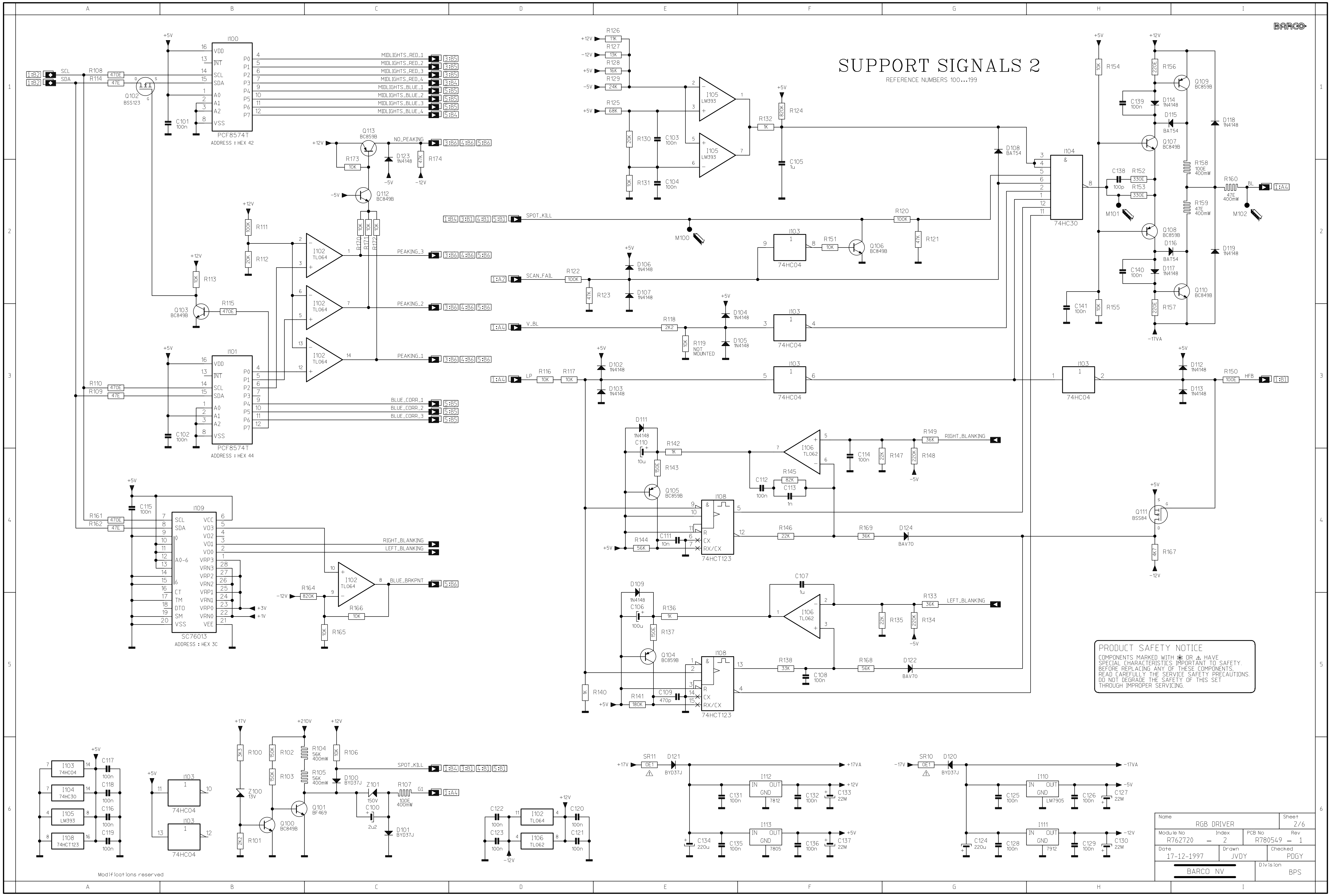
R-G-B Driver R762720

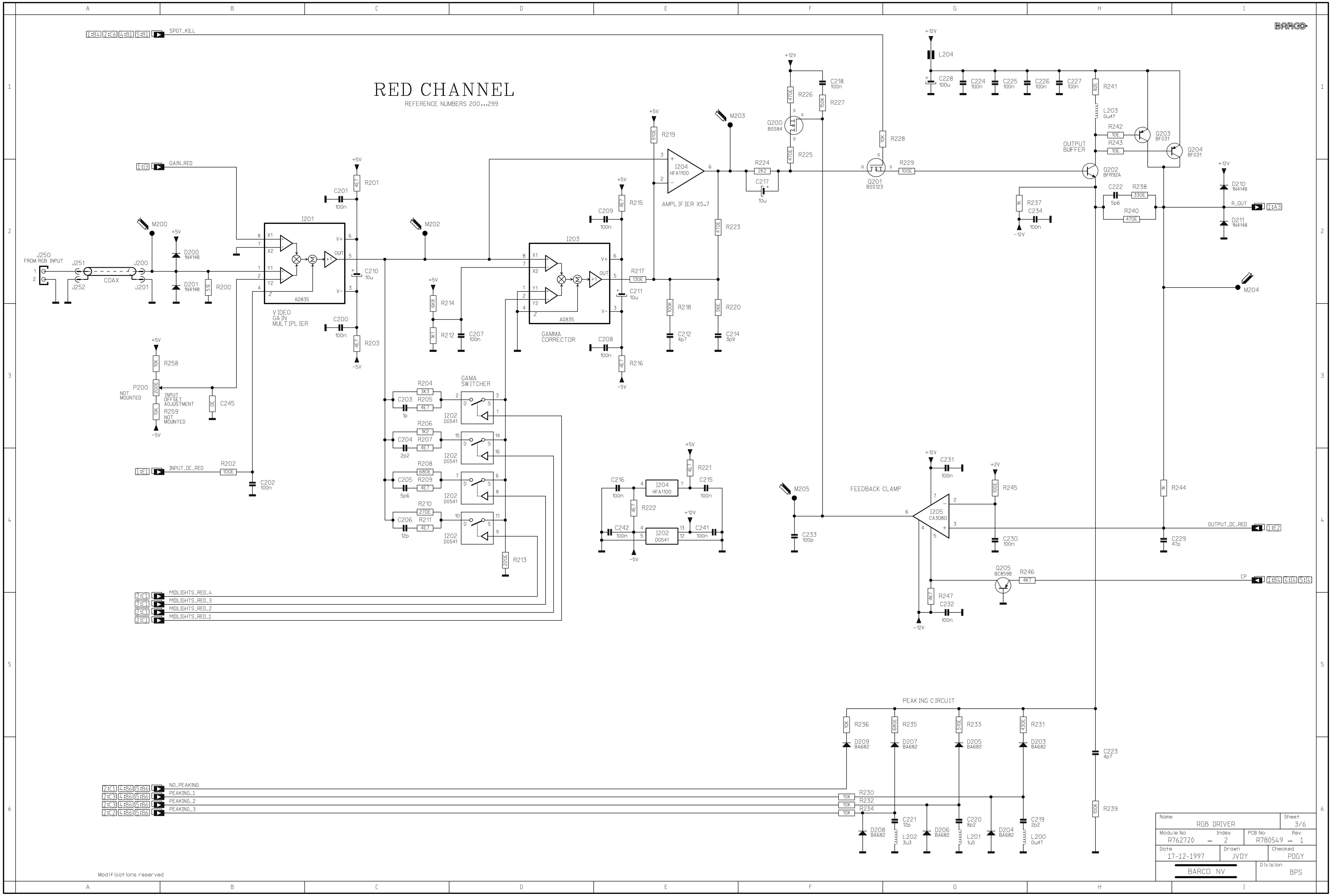


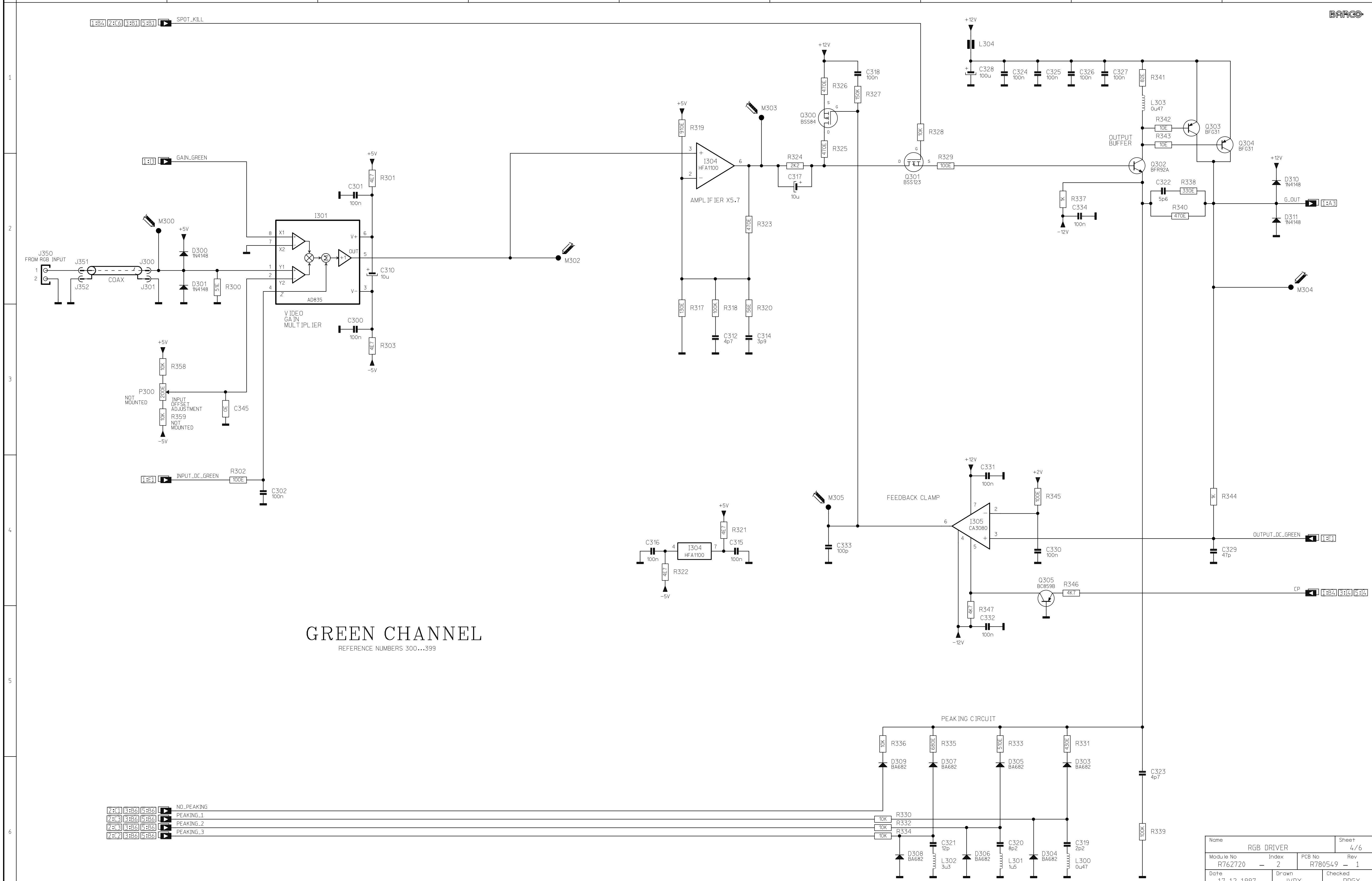

BARCO
CONNECTION WITH
RGB INPUT MODULE
J250
RED
J350
GREEN
J450
BLUE
CONNECTION WITH
SOFT EDGE (OPTION)
TOP
RED IN
MP200
GREEN IN
MP300
BLUE IN
MP400
CUT WIRES WHEN
USING SOFT-EDGE
TO SOFT-EDGE
TO CONTRAST MODULATION OPTION MODULE
TO BCL LINK OPTION MODULE
CONNECTION
WITH
BCL LINK
(OPTION)
CONNECTION
WITH
CONTRAST
MODULATION
(OPTION)
780549-1
CUT WIRES WHEN USING
BCL LINK OPTION MODULE
RED OUT
GREEN OUT
BLUE OUT
Modifications reserved
Name
RGB DRIVER MODULE
Sheet
1 / 1
Module No
R762720
Index
2
PCB No
R780549
Rev
1
Date
22-10-1997
Drawn
JVDY
Checked
PDGY
BARCO PROJECTION SYSTEMS



SUPPORT SIGNALS 1
REFERENCE NUMBERS 1...99
J1
CONNECTION WITH FRAME (J7A)
J2
CONNECTION WITH FRAME (J7B)
J3
TO CONTRAST MODULATION (J1)
J4
TO BCL-LINK UNIT (J1)
J5
TO SOFT EDGE
GAIN SCALED
BRIGHTNESS
VOLTAGES
ADDRESS : HEX 5A
ADDRESS : HEX 5C
ADDRESS : HEX 58
SC76013
MC34084
TL064
NOT MOUNTED
REMOVE W1 AND W2 WHEN USING
LINKED BCL OPTION MODULE
+1V , +2V AND +3V
REFERENCE GENERATOR
Modifications reserved
Name RGB DRIVER
Sheet 1/6
Module No R762720
Index 2
PCB No R780549
Rev 1
Date 17-12-1997
Drawn JVDY
Checked PDGY
Division BPS
BARCO NV


BARCO
SUPPORT SIGNALS 2
REFERENCE NUMBERS 100...199
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.
Modifications reserved
Name
RGB DRIVER
Sheet
2/6
Module No
R762720
Index
2
PCB No
R780549
Rev
1
Date
17-12-1997
Drawn
JVDY
Checked
PDGY
BARCO NV
Division
BPS


BARCO
RED CHANNEL
REFERENCE NUMBERS 200...299
SPOT_KILL
GAIN_RED
INPUT_DC_RED
J250 FROM RGB INPUT
COAX
VIDEO GAIN MULTIPLIER
AD835
GAMMA CORRECTOR
AMPLIFIER X5.7
HFA1100
GAMA SWITCHER
DG541
INPUT OFFSET ADJUSTMENT
NOT MOUNTED
OUTPUT BUFFER
R_OUT
FEEDBACK CLAMP
CA3080
OUTPUT_DC_RED
CP
MIDLIGHTS_RED_4
MIDLIGHTS_RED_3
MIDLIGHTS_RED_2
MIDLIGHTS_RED_1
PEAKING CIRCUIT
NO_PEAKING
PEAKING_1
PEAKING_2
PEAKING_3
Modifications reserved
Name RGB DRIVER
Sheet 3/6
Module No R762720
Index 2
PCB No R780549
Rev 1
Date 17-12-1997
Drawn JVDY
Checked PDGY
BARCO NV
Division BPS

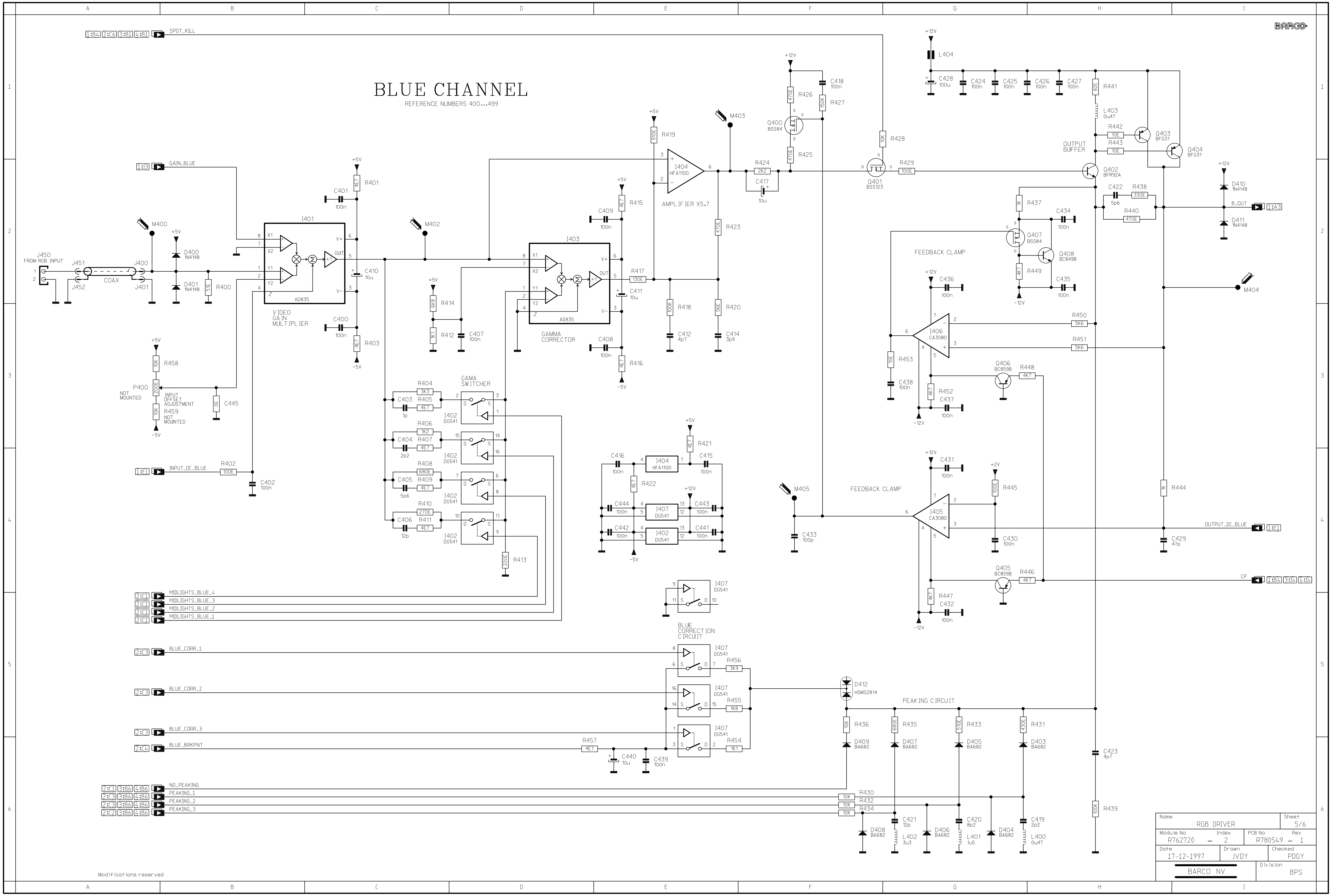


GREEN CHANNEL

REFERENCE NUMBERS 300...399

Name			Sheet
RGB DRIVER			4/6
Module No	Index	PCB No	Rev
R762720	2	R780549	1
Date	Drawn	Checked	
17-12-1997	JVDY	PDGY	
BARCO NV		Division	BPS

Modifications reserved


BLUE CHANNEL
REFERENCE NUMBERS 400...499
SPOT_KILL
GAIN_BLUE
INPUT_DC_BLUE
J450 FROM RGB INPUT
COAX
VIDEO GAIN MULTIPLIER
AD835
GAMMA CORRECTOR
AMPLIFIER X5.7
GAMA SWITCHER
INPUT OFFSET ADJUSTMENT
NOT MOUNTED
OUTPUT BUFFER
FEEDBACK CLAMP
B_OUT
OUTPUT_DC_BLUE
CP
MIDLIGHTS_BLUE_4
MIDLIGHTS_BLUE_3
MIDLIGHTS_BLUE_2
MIDLIGHTS_BLUE_1
BLUE CORRECTION CIRCUIT
BLUE_CORR_1
BLUE_CORR_2
BLUE_CORR_3
BLUE_BRKPNT
PEAKING CIRCUIT
NO_PEAKING
PEAKING_1
PEAKING_2
PEAKING_3
Modifications reserved
Name RGB DRIVER
Sheet 5/6
Module No R762720 Index 2
PCB No R780549 Rev 1
Date 17-12-1997
Drawn JVDY
Checked PDGY
BARCO NV
Division BPS

COMP.	LOC.	SH.
C1	A3	1
C2	C1	1
C3	C3	1
C4	G6	1
C5	F3	1
C6	G4	1
C7	H4	1
C8	D6	1
C9	F6	1
C10	F6	1
C11	D4	1
C12	D5	1
C13	D5	1
C14	D4	1
C15	D4	1
C16	D5	1
C17	A5	1
C18	B5	1
C19	C5	1
C20	C4	1
C21	C4	1
C22	A6	1
C23	A6	1
C24	A6	1
C25	A6	1
C26	A6	1
C27	A6	1
C28	G3	1
C100	C6	2
C101	B1	2
C102	B3	2
C103	E1	2
C104	E2	2
C105	F2	2
C106	E5	2
C107	F4	2
C108	F5	2
C109	E5	2
C110	E3	2
C111	E4	2
C112	F4	2
C113	F4	2
C114	F4	2
C115	A4	2
C116	A6	2
C117	A6	2
C118	A6	2
C119	A6	2
C120	D6	2
C121	D6	2
C122	D6	2
C123	D6	2
C124	G6	2
C125	G6	2
C126	H6	2
C127	H6	2
C128	G6	2
C129	H6	2
C130	H6	2
C131	E6	2
C132	F6	2
C133	F6	2
C134	E6	2
C135	E6	2
C136	F6	2
C137	F6	2
C138	H2	2
C139	H1	2
C140	H2	2
C141	H3	2
C200	C3	3
C201	C2	3
C202	B4	3
C203	C3	3
C204	C3	3
C205	C4	3
C206	C4	3
C207	D3	3
C208	E3	3
C209	E2	3
C210	C2	3
C211	E2	3
C212	E3	3
C214	E3	3
C215	E4	3
C216	E4	3
C217	F2	3
C218	F1	3
C219	H6	3
C220	G6	3
C221	G6	3
C222	H2	3
C223	H6	3
C224	G1	3
C225	G1	3
C226	H1	3
C227	H1	3
C228	G1	3
C229	H4	3
C230	G4	3
C231	G4	3
C232	G5	3
C233	F4	3
C234	H2	3
C241	E4	3
C242	E4	3
C245	B3	3
C300	C3	4
C301	C2	4
C302	B4	4
C310	C2	4
C312	E3	4
C314	E3	4
C315	E4	4
C316	E4	4
C317	F2	4
C318	F1	4
C319	H6	4
C320	G6	4
C321	G6	4
C322	H2	4
C323	H6	4
C324	G1	4
C325	G1	4
C326	H1	4
C327	H1	4
C328	G1	4
C329	H4	4
C330	G4	4
C331	G4	4
C332	G5	4
C333	F4	4
C334	H2	4
C345	B3	4
C400	C3	5
C401	C2	5
C402	B4	5
C403	C3	5
C404	C3	5
C405	C4	5
C406	C4	5
C407	D3	5
C408	E3	5
C409	E2	5
C410	C2	5
C411	E2	5
C412	E3	5
C414	E3	5
C415	E4	5
C416	E4	5
C417	F2	5
C418	F1	5
C419	H6	5
C420	G6	5
C421	G6	5
C422	H2	5
C423	H6	5
C424	G1	5
C425	G1	5
C426	H1	5
C427	H1	5
C428	G1	5
C429	H4	5
C430	G4	5
C431	G4	5
C432	G5	5
C433	F4	5
C434	H2	5
C435	H2	5
C436	G2	5
C437	G3	5
C438	G3	5
C439	E6	5
C440	E6	5
C441	E4	5
C442	E4	5
C443	E4	5
C444	E4	5
C445	B3	5
D1	E6	1
D2	B5	1
D3	B5	1
D4	E4	1
D5	E4	1
D6	E5	1
D7	B4	1
D8	G5	1
D9	B4	1
D10	I1	1
D11	I2	1
D12	I2	1
D100	C6	2
D101	C6	2
D102	E3	2
D103	E3	2
D104	E3	2
D105	E3	2
D106	E2	2
D107	E2	2
D108	G1	2
D109	E4	2
D111	E3	2
D112	I3	2
D113	I3	2
D114	H1	2
D115	H1	2
D116	H2	2
D117	H2	2
D118	I1	2
D119	I2	2
D120	G6	2
D121	E6	2
D122	G5	2
D123	C2	2
D124	G4	2
D200	B2	3
D201	B2	3
D203	H6	3
D204	G6	3
D205	G6	3
D206	G6	3
D207	G6	3
D208	F6	3
D209	F6	3
D210	I2	3
D211	I2	3
D300	B2	4
D301	B2	4
D303	H6	4
D304	G6	4
D305	G6	4
D306	G6	4
D307	G6	4
D308	F6	4
D309	F6	4
D310	I2	4
D311	I2	4
D400	B2	5
D401	B2	5
D403	H6	5
D404	G6	5
D405	G6	5
D406	G6	5
D407	G6	5
D408	F6	5
D409	F6	5
D410	I2	5
D411	I2	5
D412	F5	5
I1	C1	1
I2	C3	1
I3	F3	1
I4	G1	1
I4	G2	1
I4	G2	1
I4	B6	1
I4	A6	1
I5	F6	1
I5	H6	1
I5	G5	1
I5	F6	1
I5	A6	1
I6	A6	1
I6	D4	1
I6	D5	1
I6	B6	1
I6	D4	1
I100	B1	2
I101	B3	2
I102	D6	2
I102	C2	2
I102	C3	2
I102	C3	2
I102	C4	2
I103	A6	2
I103	H3	2
I103	F3	2
I103	F3	2
I103	F2	2
I103	B6	2
I103	B6	2
I104	H1	2
I104	A6	2
I105	A6	2
I105	E1	2
I105	E1	2
I106	D6	2
I106	F5	2
I106	F4	2
I108	A6	2
I108	E5	2
I108	E4	2
I109	B4	2
I110	H6	2
I111	H6	2
I112	F6	2
I113	F6	2
I201	B2	3
I202	E4	3
I202	D3	3
I202	D4	3
I202	D4	3
I202	D4	3
I203	D2	3
I204	E4	3
I204	E2	3
I205	G4	3
I301	B2	4
I304	E4	4
I304	E2	4
I305	G4	4
I401	B2	5
I402	E4	5
I402	D3	5
I402	D4	5
I402	D4	5
I402	D4	5
I403	D2	5
I404	E4	5
I404	E2	5
I405	G4	5
I406	G3	5
I407	E4	5
I407	E5	5
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I407	E4	5
I407	E5	5
J1	A1	1
J2	A3	1
J3	B1	1
J4	B2	1
J5	H3	1
J98	A2	1
J99	A2	1
J200	A2	3
J201	A2	3
J250	A2	3
J251	A2	3
J252	A2	3
J300	A2	4
J301	A2	4
J350	A2	4
J351	A2	4
J352	A2	4
J400	A2	5
J401	A2	5
J450	A2	5
J451	A2	5
J452	A2	5
L200	H6	3
L201	G6	3
L202	G6	3
L203	H1	3
L204	G1	3
L300	H6	4
L301	G6	4
L302	G6	4
L303	H1	4
L304	G1	4
L400	H6	5
L401	G6	5
L402	G6	5
L403	H1	5
L404	G1	5
M1	H1	1
M2	H2	1
M3	H2	1
M4	C5	1
M100	E2	2
M101	H2	2
M102	I2	2
M200	A2	3
M202	C2	3
M203	E1	3
M204	I2	3
M205	F4	3
M300	A2	4
M302	D2	4
M303	E1	4
M304	I2	4
M305	F4	4
M400	A2	5
M402	C2	5
M403	E1	5
M404	I2	5
M405	F4	5
P200	A3	3
P300	A3	4
P400	A3	5
Q1	E6	1
Q2	E6	1
Q3	B5	1
Q4	B5	1
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Q101	C6	2
Q102	A1	2
Q103	B3	2
Q104	E5	2
Q105	E4	2
Q106	F2	2
Q107	H1	2
Q108	H2	2
Q109	I1	2
Q110	I2	2
Q111	H4	2
Q112	C2	2
Q113	C1	2
Q200	F1	3
Q201	F2	3
Q202	H2	3
Q203	H1	3
Q204	I1	3
Q205	G4	3
Q300	F1	4
Q301	F2	4
Q302	H2	4
Q303	H1	4
Q304	I1	4
Q305	G4	4
Q400	F1	5
Q401	F2	5
Q402	H2	5
Q403	H1	5
Q404	I1	5
Q405	G4	5
Q406	G3	5
Q407	G2	5
Q408	H2	5
R1	B2	1
R2	B2	1
R3	C1	1
R4	C1	1
R5	C3	1
R6	C3	1
R7	D1	1
R8	D1	1
R9	D1	1
R10	D3	1
R11	D3	1
R12	D3	1
R13	D1	1
R14	D1	1
R15	D1	1
R16	D1	1
R17	E1	1
R18	D1	1
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R41	G2	1
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R43	G4	1
R44	D6	1
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R46	C6	1
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R62	D5	1
R63	C4	1
R64	C4	1
R65	C5	1
R66	A5	1
R67	A5	1
R68	B5	1
R69	B5	1
R70	B5	1
R71	B5	1
R72	B5	1
R73	C5	1
R74	C5	1
R75	C5	1
R76	B2	1
R77	B4	1
R78	A5	1
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R103	B6	2
R104	C6	2
R105	C6	2
R106	C6	2
R107	C6	2
R108	A1	2
R109	A3	2
R110	A3	2
R111	B2	2
R112	B2	2
R113	B2	2
R114	A1	2
R115	B3	2
R116	D3	2
R117	D3	2
R118	E3	2
R119	E3	2
R120	G2	2
R121	G2	2
R122	D2	2
R123	E2	2
R124	F1	2
R125	E1	2
R126	E1	2
R127	E1	2
R128	E1	2
R129	E1	2
R130	E1	2
R131	E2	2
R132	F1	2
R133	G5	2
R134	G5	2
R135	G5	2
R136	E5	2
R137	E5	2
R138	F5	2
R140	D5	2
R141	E5	2
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R143	E4	2
R144	E4	2
R145	F4	2
R146	F4	2
R147	G4	2
R148	G4	2
R149	G3	2
R150	I3	2
R151	F2	2
R152	H2	2
R153	H2	2
R154	H1	2
R155	H3	2
R156	H1	2
R157	H3	2
R158	I2	2
R159	I2	2
R160	I2	2
R161	A4	2
R162	A4	2
R164	C4	2
R165	C5	2
R166	C5	2
R167	H4	2
R168	F5	2
R169	F4	2
R170	C2	2
R171	C2	2
R172	C2	2
R173	C2	2
R174	C2	2
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R209	C4	3
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R211	C4	3
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R213	D4	3
R214	C3	3
R215	E2	3
R216	E3	3
R217	E2	3
R218	E3	3
R219	E1	3
R220	E3	3
R221	E4	3
R222	E4	3
R223	E2	3
R224	F2	3
R225	F1	3
R226	F1	3
R227	F1	3
R228	G1	3
R229	G2	3
R230	F6	3
R231	H5	3
R232	F6	3
R233	G5	3
R234	F6	3
R235	G5	3
R236	F5	3
R237	G2	3
R238	H2	3
R239	H6	3
R240	H2	3
R241	H1	3
R242	H1	3
R243	H1	3
R244	H4	3
R245	G4	3
R246	G4	3
R247	G5	3
R258	B3	3
R259	B3	3
R300	B2	4
R301	C2	4
R302	B4	4
R303	C3	4
R317	E3	4
R318	E3	4
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R320	E3	4
R321	E4	4
R322	E4	4
R323	E2	4
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R325	F1	4
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R327	F1	4
R328	G1	4
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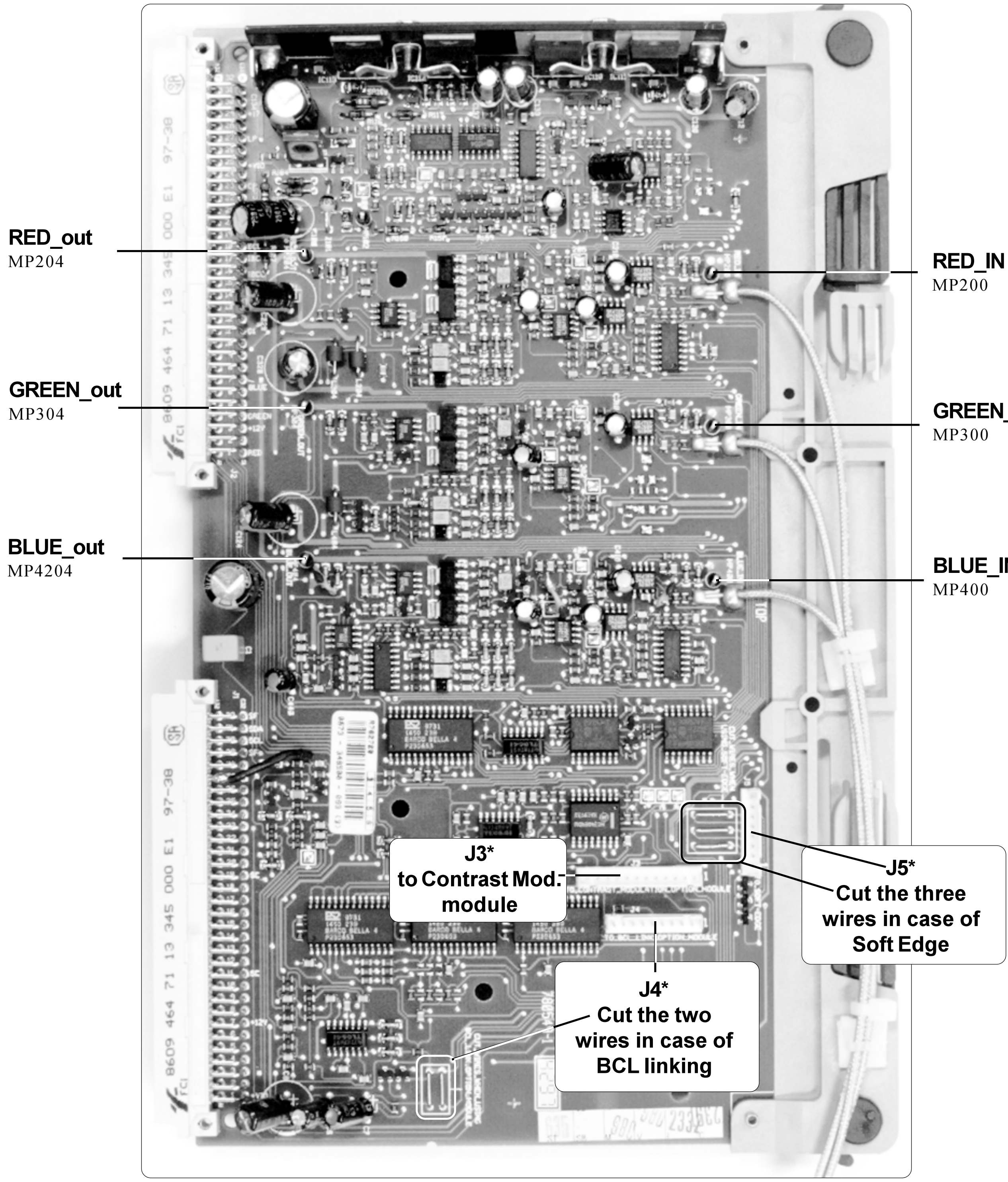
R331	H5	4
R332	F6	4
R333	G5	4
R334	F6	4
R335	G5	4
R336	F5	4
R337	G2	4
R338	H2	4
R339	H6	4
R340	H2	4
R341	H1	4
R342	H1	4
R343	H1	4
R344	H4	4
R345	G4	4
R346	G4	4
R347	G5	4
R358	B3	4
R359	B3	4
R400	B2	5
R401	C2	5
R402	B4	5
R403	C3	5
R404	C3	5
R405	C3	5
R406	C3	5
R407	C3	5
R408	C4	5
R409	C4	5
R410	C4	5
R411	C4	5
R412	C3	5
R413	D4	5
R414	C3	5
R415	E2	5
R416	E3	5
R417	E2	5
R418	E3	5
R419	E1	5
R420	E3	5
R421	E3	5
R422	E4	5
R423	E2	5
R424	F2	5
R425	F1	5
R426	F1	5
R427	F1	5
R428	G1	5
R429	G2	5
R430	F6	5
R431	H5	5
R432	F6	5
R433	G5	5
R434	F6	5
R435	G5	5
R436	F5	5
R437	G2	5
R438	H2	5
R439	H6	5
R440	H2	5
R441	H1	5
R442	H1	5
R443	H1	5
R444	H4	5
R445	G4	5
R446	G4	5
R447	G5	5
R448	G3	5
R449	G2	5
R450	H3	5
R451	H3	5
R452	G3	5
R453	G3	5
R454	E6	5
R455	E5	5
R456	E5	5
R457	D6	5
R458	B3	5
R459	B3	5
SR100	G6	2
SR101	E6	2
W1	H5	1
W2	H5	1
W3	H3	1
W4	H3	1
W5	H3	1
Z1	B3	1
Z2	B3	1
Z3	A5	1
Z100	B6	2
Z101	C6	2

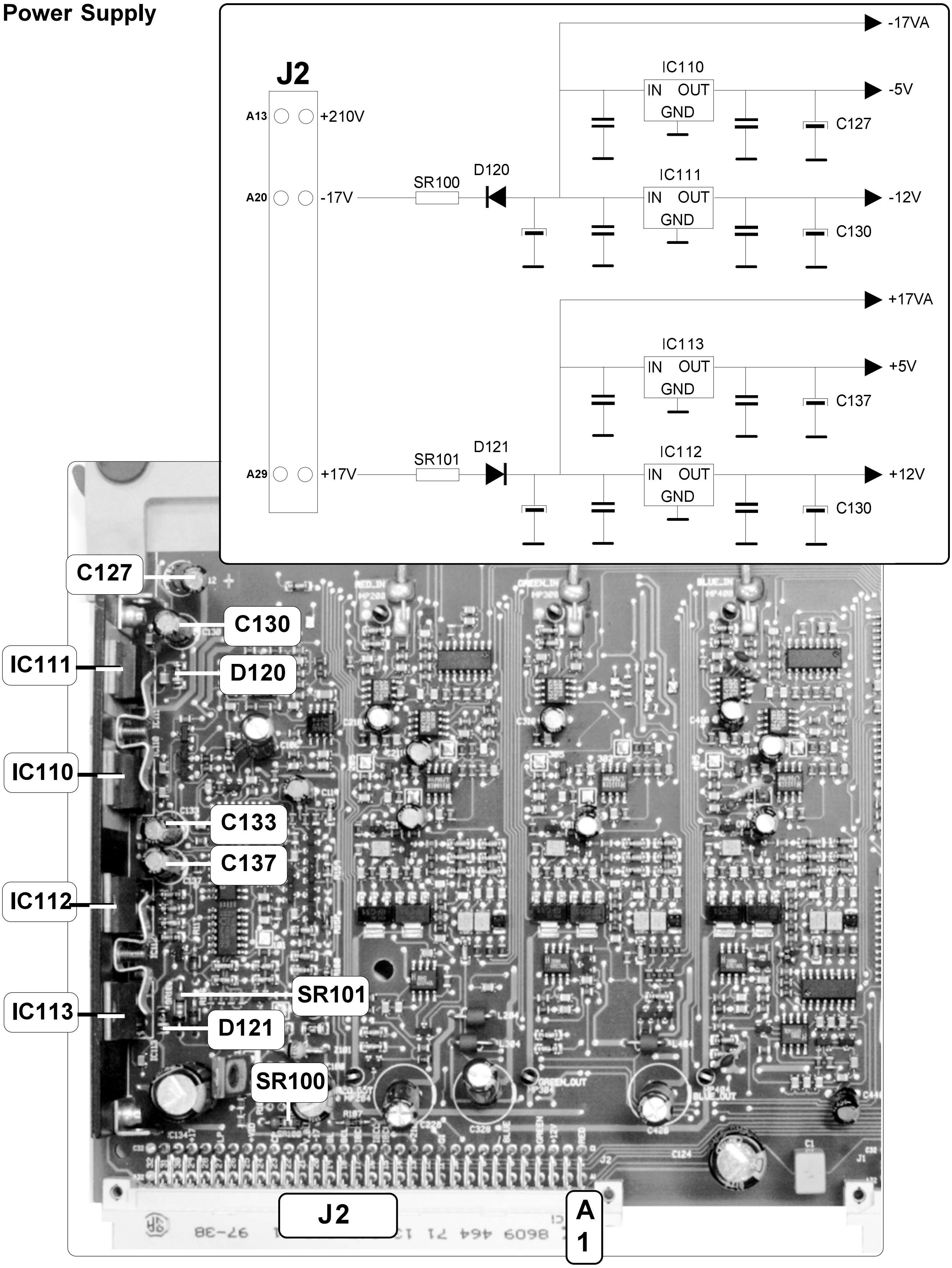
Name: RGB DRIVER			Sheet: 6/6
Module No: R762720 –	Index: 2	PCB No: R780549 –	Rev: 1
Date: 17-12-1997	Drawn: JVDY	Checked: PDGY	
BARCO NV		Division: BPS	

Measurement contacts and Connector location



J3*: interconnection with the optional Contrast modulation module
J4*: interconnection with the optional BCL Linking module
J5*: interconnection with the optional Soft Edge module

Power Supply



Technical description of the R-G-B driver R762720

Introduction

The RGB Driver module contains the following parts:
- Red Video driver channel
- Green Video driver channel
- Blue Video driver channel
- Generation of support signals

General.

The black level of the Red, Green and Blue signals have been clamped at zero volt and the amplitude adjusted to 0.7V on the Input board. The signal is now ready to undergone the Brightness and Contrast controls before reaching the video power amplifiers. The optional contrast modulation can also be added to the contrast voltages if implemented.
Furthermore, as a colour temperature adjustment is also possible, the gain and black levels are controllable per colour and tracked is some way to maintain the colour temperature over the full range.
The red, green and blue colours are passing through identical circuits, but, as a gamma correction is implemented, the red and blue channels are a bit different from the green (master) channel. We'll discuss first the green channel and limit the discussion of the red and blue to the differences with the green.

Green video channel.

a) Contrast / Green Gain / Contrast Modulation.

The videosignal is terminated at 50 Ohm with R300 (coax cable is 50 Ohm) , clamped at 0V and has an amplitude of 0.7V on the input board. IC301 is an analog multiplier and its output $W = (X1-X2) \times (Y1-Y2) + Z$.

The videosignal at pin Y1 is thus multiplied with the voltage at pin X1, since X2 and Y2 are both at zero level.
The Z input is at this moment connected to ground level, consequently, the black level at the output is also 0V.
The *GAIN_GREEN* voltage changes from 0.05V ---> 1.2V. This voltage is the result of the general contrast, the individual gain adjustment of the green channel and the contrast modulation board. IC304 (HF A100) amplifies this signal 5.7 times.

b) Brightness / Black level offset controls.

The positive bias voltage obtained by R319/R317 installs a negative black level output in order to use the full output swing if this amplifier. This black level is then again pulled up with R324 and the current generator Q300. C317 means a bypass for the video frequencies.
Via Q301 and R329 the green video is applied to the base of Q302. The latter is, together with Q303/Q304, an non-inverting amplifier with a low impedance drive output, necessary to match the 75 Ohm cable impedance realising the connection with the video output amplifier.
The required biasing current is obtained with R337, which determines together with R340 the gain of this amplifier.
The output signal *G_OUT* and the current from the *DC_GREEN* voltage (= black level offset voltage) is compared with the reference of +2V in IC305(2,3,6) during the *CP* pulse time window.
If, for example, the output voltage is too high, the output of the comparator increases and the current generator Q300 draws less current through R324. The voltage drop across this resistor decreases and compensates the too high DC output level.

c) Peaking adjustment.

By adding an overshoot and undershoot to the video transitions, the picture looks sharper. If these over/undershoots are adjustable in amplitude and width, we can adjust an overshoot matching the bandwidth and the scanning frequency of the signal.
If for example the *PEAKING_1* line is high, there is a current flowing in R330/D303/R331 towards the emitter of Q302. The RLC circuit L33/C319/R331 is then in parallel across the emitter resistor. A critically damped sinus peak is seen at the output.
PEAKING_1 gives the smallest peak and must be selected for the highest scanning frequencies.
Three selections are possible related to the scanning frequencies : low / mid and high range.
If no peaking is wanted, R336 means a compensation, in order not to change the gain of this stage.

d) Spot killer.

During operation, the gate of Q301 is at +12V and the latter is fully conducting (5 Ohm resistance). At switching off the projector, the *SPOT_KILL* line is dropped very quickly to 0V and Q301 is immediately blocked. This avoids any undesired voltage peaks that could cause a spot on the CRT.

Red video channel.

The in- and output circuits are identical to the green channel. In between the contrast adjustment and the x 5.7 amplifier, a gamma correction network is incorporated. This gamma correction is based on the red CRT characteristic which is different from the green one.

The relation light output / drive voltage for the red CRT is more linear for the red CRT phosphor than for the green phosphor.
With IC202/IC203 a non-linear correction in the mid-grey zones is now possible.

The (original) video signal is applied to the X1 (pin 8) input of the multiplier IC203
Pin 7 (X2) is fixed at 0.7V with R212/R214.

The same videosignal is, on the other hand, sent through a step attenuator. By switching on one of the switchers of IC202 the video signal is divided with R204, R206, R208, R210 and the common R213. With the *MIDLIGHTS_1, 2, 3 , 4* lines one can select between 15 possible steps. The attenuated signal is then applied to the Y2 input whereas the Y1 is at 0V.
The output W, pin 5, is (X1-X2) x (Y1-Y2).

Assume the input is a linear ramp from 0 -100% or from 0 - 0.7V. The output of the multiplier is then a positive parabola with a maximum at 50% of the ramp and zero at 0 and 100% of the ramp. The amplitude of this parabola is determined by the step attenuator. This parabola is sent to the inverting input of IC204 via R217 and subtracted from the original ramp.
As a result, we obtain a new non-linear ramp where the 50% zone has a decreased amplitude and the 0 and 100% zones are not affected. With this step attenuator, the light output / drive voltage of the red CRT tube can be adjusted to match the green one.

Blue video channel.

a) Gamma correction.

The light output / drive voltage of the blue CRT is less linear than the green one. We can obtain a matching when the polarity of the parabola is inverted compared to the red

one. This is got by swapping the Y1 and Y2 inputs of the multiplier IC403.
If we assume again a linear ramp input, the parabola of the output W of IC403 is negative. The final result at output pin 6 of IC404 is a non-linear ramp with an increased amplitude in the grey zones.

b) Blue correction circuit.

The blue phosphor saturates from some drive voltage onwards. This saturation point depends on the CRT phosphor, the spot size, frequency of scanning, temperature, etc...
To resolve this problem, the blue signal undergoes an increased gain from some level onwards (the breakpoint level) .

This level can be adjusted by software and is the *BLUE_BRKPNT* voltage. As soon the emitter voltage of Q402 exceeds the *BLUE_BRKPNT* level with 0.3V diode voltage drop), the diode D412 gets forward biased and R456 is added to the emitter load. The slope of the correction is further adjusted by means of the *BLUE_CORR 1,2,3* voltages. This will add to the emitter load one of the feedback resistor(s) R454, R455, R456 or a combination of these.

c) DC stabilisation, additional clamping.

Without further measures, the DC level of the emitter voltage would not be very stable. It is very much temperature dependent and it varies with the bias current through the stage. An additional clamping is required.
This clamper compares the output voltage with the emitter voltage during the *CP* timing window. The output voltage drives Q407 which is part of the biasing resistor (drain connected to -12V).
Q408 provides a lower impedance for the source of Q407, as the current flow through R437 and Q407 depends also on the video signal.

Blanking.

The composite blanking pulses are the result of the sum of different individual blanking informations added together in the NAND IC104 after modelling to the correct TTL amplitude.
If there is no blanking necessary, the output pin 8 of the NAND is low level and this forward biases Q107 and Q109. The current flowing through the latter installs around +11V at the *BL* output.

In case of blanking, the TTL high level output of IC104 forward biases Q108 now and through Q110 the BL output is at around -16V.

D114 - D117 avoid saturation of the transistors and hence improve the switching.
Following blanking informations are an input to the NAND gate IC104 :

- *LP* (line pulses) :
  are dropped in amplitude with R116/R117/R140 limited with D102/D103, inverted by IC103 (5,6) and input to pin 1.
  (note : the same negative line pulses are inverted again with IC103(1,2) and then referred to as *HFB* to be used in the optional Contrast modulation board.
- *V BL* (Vertical Blanking) :
  these pulses are also dropped to TTL level, inverted and applied to pin 2.
- *SPOT_KILL* (pin 5) :
  The line SPOT_KILL is +12V during operation and drops to zero level at switching off the projector to blank the picture.

- *SCAN FAIL* (pin 6):
  This line is high when there is no scan fail and drops to zero when scan fail has been detected.
  (note : The scan fail condition also drops the SPOT_KILL line to an active low level and hence switches off the video output stages of the UN DRIVE board.
- Supply voltages controls (pin 3,4) :
  The +/- 12V and +/-5V supply voltages are checked with the window detector IC105. If one voltage fails or is not within the desired window, the output switches low and the same pins 3, 4 are pulled low level. Note that this will mean a scan fail condition and the SPOT_KILL line will be active as well.
- *LEFT/RIGHT* blanking :
  The blanking pulses for the beginning of the scan (left blanking) are generated by IC108 (output 4) by triggering the monoflop on the positive transition of the *LP* pulses. The output pulse train of pin 13 is integrated with R138/C108 and compared with the *LEFT_BLANKING* voltage. The output of the Miller integrator drives the current source Q104 which determines the pulse width of the blanking pulses.

  The pulses for the end of the scan are generated by the other monoflop in IC108. Here, the monoflop is triggered by the negative transition and the positive pulses at pin 5 output are used. Consequently, the low level of these pulses is the blanking time. It is obvious that, in this case, the negative pulses at pin 12 are integrated and the obtained voltage is used to adapt the pulse width in conjunction with the *RIGHT_BLANKING* voltage.

  The integration of the pulses (average voltage) means a tracking of the range with the line frequency. The absolute value of the required blanking is much smaller for the higher scanning than for the lower scanning signals.
  Another tracking is also got by a correction current via D122 and D124 by switching on Q111 with *HFB* pulses.

I²C Interfacing.

IC100 : the *MIDLIGHTS_RED* and *_BLUE* switching on/off voltages.

IC101 : 3 outputs are the *PEAKING* adjustments.

If no peaking is needed, the three outputs are at approx. -11V and hence Q112 and Q113 are both conducting. The output *NO_PEAKING* is then at about +12V.
As soon one output of a comparator switches to a positive high, due to the resistive dividers R171/R172/R173, the emitter of Q112 jumps at -3.5V and the latter gets blocked. The *NO_PEAKING* line is then at about -5V and D123 is forward biased to keep the impedance of the *NO_PEAKING* line low and avoid distortions in the RGB DRIVE stages.

IC100 uses the same address of IC601 on the INPUT board. The data line *SDA* of either one of these I²C interfaces can be disconnected via a switching Mosfet. To select this IC100, output port P7 of IC101 must be low level, blocking Q103 and via R113, Q102 is forward biased.

IC109 :
two outputs are used for the Left/Right blankings and VO3 is the Blue breakpoint output. The DC range is corrected with IC102 (8, 9, 10).

7. Spot suppression

There are two actions at switching off the projector :

- via the **G1 grid** :

The G1 grid voltage is at approximately 0V via D101. During normal operation and on condition the +17V is correct (sufficiently high) Q100 is saturated and Q101 is off as its base is lower than 0.6V. The collector of Q101 is then at 150V or the voltage drop across Z101. C100 is consequently charged up to 150V.
At switching off, the +17V drops very quickly to zero and the +210V rather decays slowly. The moment Q100 shuts off and Q101 gets forward biased, the collector of the latter drops to zero and the - of the capacitor C100 drops also instantly with the same amplitude to -150V. The G1's are dropped to -150V and the CRT's are blanked.

- via the **cathodes** (drive voltage) :

The *SPOT_KILL* line is in normal operation at +12V via R106. When the projector is switched off, the line is dropped to 0V via D100. This zero level cuts the output via the mosfets Q201, Q301, Q401.

Contrast, brightness and gain adjustments

Contrast / Gain.

The general (common) contrast and the individual gain controls are first combined with the (optional) contrast modulation waveforms and as such used in a multiplier (a variable gain amplifier) to adjust the amplitudes.

The contrast voltage is generated by the IC3 *VO0* output and ranges from +1V (minimum) to +3V (maximum). The multiplier requires just the opposite, hence, the contrast voltage is inverted by IC5 (8,9,10). R54 and D8 avoid this contrast voltage from exceeding the +3V as this would mean that the multiplier inverts the polarity of the videosignal.
This contrast voltage is now three time multiplied with the gain control of each colour.
This is relised by using the contrast voltage as the *VRP3, VRP2* and *VRP1* supply for the potentiometers *1, 2* and *3* of the Bella IC3 and the other end of the potentiometers *(VRN*)* is connected to the +3V, or the minimum contrast.
The outputs *VO1,2,3* are thus the result of the general contrast and the individual gain controls.
The output range of the Bella's in not what is needed by the multipliers. Therefor the OPAMP's / inverters in IC4 adapt the range to 0.05V <---> 1.19V which is the needed range of the multipliers.

BCL / IBCL / Drive modes.

The contrast voltage can be reduced by the *BCL* and *IBCL* informations. The negative *BCL* voltage from the EHT board drives Q2 on from the -0.6V level onwards and this will turn on Q1. The *INT*ernal *CONTRAST* voltage or the *BCL_LINK* voltage cannot further increase in this case.
The *IBCL* voltages are slightly smoothed and compared to an adjustable voltage *(IBCL_VALUE)* from the potentiometer *"0"* of IC2. This value depends on the Eco / Normal / Boost mode drive, set by software.
As soon an *IBCL_** voltage reaches the *IBCL_VALUE* the corresponding comparator drops the contrast through one or more of the conducting diodes D4, D5, D6.

ABL trigger generator.

The ABL circuits of the RGB video amplifiers are triggered by a pulse of 20 µS and an

amplitude of 12V. This pulse is added to the *IBCL* lines as these lines are not carrying any valid information during this time. The *ABL* pulse is here ac coupled to the lines through C19, C20 and C21.
As the ABL trigger pulse is generated on the *UN SYNC+ VERT DEFL* board and superposed on the *V BL* (has an amplitude from 17V - 34V), the *V BL* is dropped by 20V with Z3 and Q3 will conduct during this *V BL* pulse time.
The differentiator C18/R70 drives Q4 into conduction for 20µS and via R73/C19, C20, C21 they are AC coupled into the IBCL lines.

Brightness / Black Level.

Introduction.

The brightness control is about identical to the contrast. The general brightness is combined with the individual *BLACK_LEVEL_** and the resulting *OUTPUT_DC_** voltage is an offset of the reference black level of +2V.
At 50% brightness setting, the black level of the output signal of the *RGB DRIVE* board must be clamped at +2V. This condition is translated into a 2V output for the potentiometers *VO1, VO2, VO3* of IC1 **and** IC2. Only then, there is no current flow in R7, R8, R9, R10, R11 and R12. The +2V *OUTPUT_DC* is now the same as the reference voltage of the inverters/sommators (=comparators) IC205, IC305, IC405.

Circuit Implementation.

As *VRN0* = +3V and *VRP0* = +1V the brightness voltage at *VO0* of IC1 changes from +3V (min. brightness) to +1V(max. brightness). This brightness voltage is applied again to the *VRP1,2,3* of three potentiometers in IC1. The other end *VRN1,2,3* of these potentiometers is the reference voltage **+2V.**
These three potentiometers in IC1 obtain the same settings of the gain controls in IC3. If now the brightness voltage is +2V (50%) the outputs *VO1,2,3* of IC1 are ALWAYS at +2V, irrelevant the gain setting.
Any change of the brightness and gain settings change the output voltage(s). With above **“gain scaled brightness voltages”** the black level is tracked with the gain adjustment in order not to deteriorate the colour temperature with contrast.

We can however add to these “gain scaled brightness voltages” an extra offset via R10, R11, R12 to adjust the low lights.

Parts listing RGB Driver R762720

SIT.	ITEM NO.	DESCRIPTION	QUANTITY
150	A556392	SPR PCB L12,6D3,8D3,8DUAL	2
80	R133085	HTSN@A GEN I_SHT CRA 30	0,00014
160	R34698902	SLVU SHR D 1,2/0,6 BK 20	1
60	R3631059	SCR Z933 M 3 X 8 SS	2
50	R3674391	RVT BLND_R3,2C 3,2WSTAL	2
10	R367699	RVT AVTRON2,5L 8,1 AL	4
110	R367699	RVT AVTRON2,5L 8,1 AL	2
100	R722276	LOCK49 PCB UN CPL	1
30	R802629	HTSN G800 RGB PR-AMP	1
40	R802692	HTSN G800 FIX HTSN	
70	V1330681	HTSN@A TO220 SPG DUAL	2
151	Z3495427	CBLU COA RG178 BU 50E 400	3
C 1	V1140426	C POMERA 100N K250E2 85	
C 2	P210227	C# Z5U MU 100N Z 50 0805	1
C 3	P210227	C# Z5U MU 100N Z 50 0805	1
C 4	P210227	C# Z5U MU 100N Z 50 0805	1
C 5	P210227	C# Z5U MU 100N Z 50 0805	1
C 6	R111476	C EL RA 47M M 25E2 85	
C 7	R111546	C EL RA 1M M 50E2 85	
C 8	R111477	C EL RA 100M M 25E2 85	
C 9	P210227	C# Z5U MU 100N Z 50 0805	1
C 10	P210227	C# Z5U MU 100N Z 50 0805	1
C 11	P210227	C# Z5U MU 100N Z 50 0805	1
C 12	P210227	C# Z5U MU 100N Z 50 0805	1
C 13	P210227	C# Z5U MU 100N Z 50 0805	1
C 14	P210227	C# Z5U MU 100N Z 50 0805	1
C 15	P210227	C# Z5U MU 100N Z 50 0805	1
C 16	P210227	C# Z5U MU 100N Z 50 0805	1
C 17	P210035	C# X7R MU 1N K 50 0805	1
C 18	P210106	C# X7R MU 3N9J 50 1206	1
C 19	P210227	C# Z5U MU 100N Z 50 0805	1
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C 26	P210227	C# Z5U MU 100N Z 50 0805	1
C 27	P210227	C# Z5U MU 100N Z 50 0805	1
C 28	P210227	C# Z5U MU 100N Z 50 0805	1
C100	R111568	C EL RA 2M2M250E2 85	1
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C102	P210227	C# Z5U MU 100N Z 50 0805	1
C103	P210227	C# Z5U MU 100N Z 50 0805	1
C104	P210227	C# Z5U MU 100N Z 50 0805	1
C105	P210178	C# Y5V MU 1M Z 16 1206	1
C106	R111466	C EL RA 100M M 16E2 85	
C107	P210178	C# Y5V MU 1M Z 16 1206	1
C108	P210227	C# Z5U MU 100N Z 50 0805	1
C109	P210025	C# COG MU 470P J 63 0805	1
C110	R1115935	C EL5 RA 10M M 35E2 85	
C111	P210041	C# X7R MU 10N K 50 0805	1
C112	P210227	C# Z5U MU 100N Z 50 0805	1
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C136	P210227	C# Z5U MU 100N Z 50 0805	1
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C200	P210227	C# Z5U MU 100N Z 50 0805	1
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C202	P210227	C# Z5U MU 100N Z 50 0805	1
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C204	P210130	C# COG MU 2P2D 50 0805	1
C205	P210134	C# COG MU 5P6D 50 0805	1
C206	P210182	C# COG MU 12P J 50 0805	1
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C241	P210227	C# Z5U MU 100N Z 50 0805	1
C242	P210227	C# Z5U MU 100N Z 50 0805	1
C245	P201354	R# CE H 0E J 0W12 0805	1
C247	P210227	C# Z5U MU 100N Z 50 0805	1
C247	P210227	C# Z5U MU 100N Z 50 0805	1

SIT.	ITEM NO.	DESCRIPTION	QUANTITY
C300	P210227	C# Z5U MU 100N Z 50 0805	1
C301	P210227	C# Z5U MU 100N Z 50 0805	1
C302	P210227	C# Z5U MU 100N Z 50 0805	1
C310	R1115935	C EL5 RA 10M M 35E2 85	
C312	P210061	C# COG MU 4P7D 50 0805	1
C314	P210133	C# COG MU 3P9D 50 0805	1
C315	P210227	C# Z5U MU 100N Z 50 0805	1
C316	P210227	C# Z5U MU 100N Z 50 0805	1
C317	R1115935	C EL5 RA 10M M 35E2 85	
C318	P210227	C# Z5U MU 100N Z 50 0805	1
C319	P210130	C# COG MU 2P2D 50 0805	1
C320	P210135	C# COG MU 8P2D 50 0805	1
C321	P210182	C# COG MU 12P J 50 0805	1
C322	P210134	C# COG MU 5P6D 50 0805	1
C323	P210061	C# COG MU 4P7D 50 0805	1
C324	P210227	C# Z5U MU 100N Z 50 0805	1
C325	P210227	C# Z5U MU 100N Z 50 0805	1
C326	P210227	C# Z5U MU 100N Z 50 0805	1
C327	P210227	C# Z5U MU 100N Z 50 0805	1
C328	R111466	C EL RA 100M M 16E2 85	
C329	P210019	C# COG MU 47P J 50 0805	1
C330	P210227	C# Z5U MU 100N Z 50 0805	1
C331	P210227	C# Z5U MU 100N Z 50 0805	1
C332	P210227	C# Z5U MU 100N Z 50 0805	1
C333	P210021	C# COG MU 100P J 50 0805	1
C334	P210227	C# Z5U MU 100N Z 50 0805	1
C345	P201354	R# CE H 0E J 0W12 0805	1
C400	P210227	C# Z5U MU 100N Z 50 0805	1
C401	P210227	C# Z5U MU 100N Z 50 0805	1
C402	P210227	C# Z5U MU 100N Z 50 0805	1
C403	P210091	C# COG MU 1P D 50 0805	1
C404	P210130	C# COG MU 2P2D 50 0805	1
C405	P210134	C# COG MU 5P6D 50 0805	1
C406	P210182	C# COG MU 12P J 50 0805	1
C407	P210227	C# Z5U MU 100N Z 50 0805	1
C408	P210227	C# Z5U MU 100N Z 50 0805	1
C409	P210227	C# Z5U MU 100N Z 50 0805	1
C410	R1115935	C EL5 RA 10M M 35E2 85	
C411	R1115935	C EL5 RA 10M M 35E2 85	
C412	P210061	C# COG MU 4P7D 50 0805	1
C414	P210133	C# COG MU 3P9D 50 0805	1
C415	P210227	C# Z5U MU 100N Z 50 0805	1
C416	P210227	C# Z5U MU 100N Z 50 0805	1
C417	R1115935	C EL5 RA 10M M 35E2 85	
C418	P210227	C# Z5U MU 100N Z 50 0805	1
C419	P210130	C# COG MU 2P2D 50 0805	1
C420	P210135	C# COG MU 8P2D 50 0805	1
C421	P210182	C# COG MU 12P J 50 0805	1
C422	P210134	C# COG MU 5P6D 50 0805	1
C423	P210061	C# COG MU 4P7D 50 0805	1
C424	P210227	C# Z5U MU 100N Z 50 0805	1
C425	P210227	C# Z5U MU 100N Z 50 0805	1
C426	P210227	C# Z5U MU 100N Z 50 0805	1
C427	P210227	C# Z5U MU 100N Z 50 0805	1
C428	R111466	C EL RA 100M M 16E2 85	
C429	P210019	C# COG MU 47P J 50 0805	1
C430	P210227	C# Z5U MU 100N Z 50 0805	1
C431	P210227	C# Z5U MU 100N Z 50 0805	1
C432	P210227	C# Z5U MU 100N Z 50 0805	1
C433	P210021	C# COG MU 100P J 50 0805	1
C434	P210227	C# Z5U MU 100N Z 50 0805	1
C435	P210227	C# Z5U MU 100N Z 50 0805	1
C436	P210227	C# Z5U MU 100N Z 50 0805	1
C437	P210227	C# Z5U MU 100N Z 50 0805	1
C438	P210227	C# Z5U MU 100N Z 50 0805	1
C439	P210227	C# Z5U MU 100N Z 50 0805	1
C440	R1115935	C EL5 RA 10M M 35E2 85	

SIT.	ITEM NO.	DESCRIPTION	QUANTITY
C441	P210227	C# Z5U MU 100N Z 50 0805	1
C442	P210227	C# Z5U MU 100N Z 50 0805	1
C443	P210227	C# Z5U MU 100N Z 50 0805	1
C444	P210227	C# Z5U MU 100N Z 50 0805	1
C445	P201354	R# CE H 0E J 0W12 0805	1
C446	R112238	C NP0 MI 47P G100E2	1
C447	P210227	C# Z5U MU 100N Z 50 0805	1
C447	P210227	C# Z5U MU 100N Z 50 0805	1
C448	R112230	C NP0 MI 10P G100E2	1
C448	R112230	C NP0 MI 10P G100E2	1
C449	R112238	C NP0 MI 47P G100E2	1
D 1	P234099	D#4148 R DMMELF	1
D 2	P234099	D#4148 R DMMELF	1
D 3	P234099	D#4148 R DMMELF	1
D 4	P234099	D#4148 R DMMELF	1
D 5	P234099	D#4148 R DMMELF	1
D 6	P234099	D#4148 R DMMELF	1
D 7	P234099	D#4148 R DMMELF	1
D 8	P234099	D#4148 R DMMELF	1
D 9	P234055	D#BAT54 SCH SOT23	1
D 10	P234047	D#BAV99 SER SOT23	1
D 11	P234047	D#BAV99 SER SOT23	1
D 12	P234047	D#BAV99 SER SOT23	1
D100	P234196	D#BYD37J AVA SOD87	1
D101	P234196	D#BYD37J AVA SOD87	1
D102	P234099	D#4148 R DMMELF	1
D103	P234099	D#4148 R DMMELF	1
D104	P234099	D#4148 R DMMELF	1
D105	P234099	D#4148 R DMMELF	1
D106	P234099	D#4148 R DMMELF	1
D107	P234099	D#4148 R DMMELF	1
D108	P234055	D#BAT54 SCH SOT23	1
D109	P234099	D#4148 R DMMELF	1
D111	P234099	D#4148 R DMMELF	1
D112	P234099	D#4148 R DMMELF	1
D113	P234099	D#4148 R DMMELF	1
D114	P234099	D#4148 R DMMELF	1
D115	P234055	D#BAT54 SCH SOT23	1
D116	P234055	D#BAT54 SCH SOT23	1
D117	P234099	D#4148 R DMMELF	1
D118	P234099	D#4148 R DMMELF	1
D119	P234099	D#4148 R DMMELF	1
D120	P234196	D#BYD37J AVA SOD87	1
D121	P234196	D#BYD37J AVA SOD87	1
D122	P234004	D#BAV70 C-C SOT23	1
D123	P234099	D#4148 R DMMELF	1
D124	P234004	D#BAV70 C-C SOT23	1
D200	P234099	D#4148 R DMMELF	1
D201	P234099	D#4148 R DMMELF	1
D203	P234259	D#BA682 S035A1 DMMELF	1
D204	P234259	D#BA682 S035A1 DMMELF	1
D205	P234259	D#BA682 S035A1 DMMELF	1
D206	P234259	D#BA682 S035A1 DMMELF	1
D207	P234259	D#BA682 S035A1 DMMELF	1
D208	P234259	D#BA682 S035A1 DMMELF	1
D209	P234259	D#BA682 S035A1 DMMELF	1
D210	P234099	D#4148 R DMMELF	1
D211	P234099	D#4148 R DMMELF	1
D300	P234099	D#4148 R DMMELF	1
D301	P234099	D#4148 R DMMELF	1
D303	P234259	D#BA682 S035A1 DMMELF	1
D304	P234259	D#BA682 S035A1 DMMELF	1
D305	P234259	D#BA682 S035A1 DMMELF	1
D306	P234259	D#BA682 S035A1 DMMELF	1
D307	P234259	D#BA682 S035A1 DMMELF	1
D308	P234259	D#BA682 S035A1 DMMELF	1

SIT.	ITEM NO.	DESCRIPTION	QUANTITY
D309	P234259	D#BA682 S035A1 DMMELF	1
D310	P234099	D#4148 R DMMELF	1
D311	P234099	D#4148 R DMMELF	1
D400	P234099	D#4148 R DMMELF	1
D401	P234099	D#4148 R DMMELF	1
D403	P234259	D#BA682 S035A1 DMMELF	1
D404	P234259	D#BA682 S035A1 DMMELF	1
D405	P234259	D#BA682 S035A1 DMMELF	1
D406	P234259	D#BA682 S035A1 DMMELF	1
D407	P234259	D#BA682 S035A1 DMMELF	1
D408	P234259	D#BA682 S035A1 DMMELF	1
D409	P234259	D#BA682 S035A1 DMMELF	1
D410	P234099	D#4148 R DMMELF	1
D411	P234099	D#4148 R DMMELF	1
D412	P234289	D#HSMS2814 SCH SOT23	1
I 1	P230653	U#BELLA 4 SOL28 P	1
I 2	P230653	U#BELLA 4 SOL28 P	1
I 3	P230653	U#BELLA 4 SOL28 P	1
I 4	P230705	U#34084 MC SOL16 P	1
I 5	P230328	U#064 TL SO14 I	1
I 6	P230328	U#064 TL SO14 I	1
I100	P230543	U#8574 PCF SOL16 P	1
I101	P230543	U#8574 PCF SOL16 P	1
I102	P230328	U#064 TL SO14 I	1
I103	P230021	U#74HC04 SO14 I	1
I104	P230206	U#74HC30 SO14 I	1
I105	P230028	U#393 LM SO8 P	1
I106	P230006	U#062 TL SO8 P	1
I108	P230073	U#74HCT123 SO16 I	1
I109	P230653	U#BELLA 4 SOL28 P	1
I110	R134011	U 7905C TO220 P	1
I111	R134016	U 7912 TO220 P	1
I112	R134002	U 7812 TO220 P	1
I113	R134001	U 7805 TO220 P	1
I201	P231489	U#835 AD SO8 I	1
I202	P231526	U#541 DG SO16 I	1
I203	P231489	U#835 AD SO8 I	1
I204	P231233	U#1100 HFA SO8 I	1
I205	P230100	U#3080 CA SO8 P	1
I301	P231489	U#835 AD SO8 I	1
I304	P231233	U#1100 HFA SO8 I	1
I305	P230100	U#3080 CA SO8 P	1
I401	P231489	U#835 AD SO8 I	1
I402	P231526	U#541 DG SO16 I	1
I403	P231489	U#835 AD SO8 I	1
I404	P231233	U#1100 HFA SO8 I	1
I405	P230100	U#3080 CA SO8 P	1
I406	P230100	U#3080 CA SO8 P	1
I407	P231526	U#541 DG SO16 I	1
J 1	R313531	J EUR2C MBS P64 E1C3S 1,6	1
J 2	R313531	J EUR2C MBS P64 E1C3S 1,6	1
J 3	R313932	J CT H MBT P12 M2SN WH	1
J 4	R313929	J CT H MBT P 9 M2SN WH	1
J 5	R313928	J CT H MBT P 8 M2SN WH	1
J250	V3136372	J MD1 C FBT P 2 E1SN 8,5	1
J350	V3136372	J MD1 C FBT P 2 E1SN 8,5	1
J450	V3136372	J MD1 C FBT P 2 E1SN 8,5	1
L200	P250005	L# FFECH 0,47M M160	1
L201	P250509	CH# 1.5 UH L1210	1
L202	P250516	CH# 3.3 UH L1210	1
L203	P250005	L# FFECH 0,47M M160	1
L204	R302108	CORE TUBE 3,5 /1,3 X 3	1
L204	Z34501104	WU CUSN 0,60 MM 40	1
L300	P250005	L# FFECH 0,47M M160	1

SIT.	ITEM NO.	DESCRIPTION	QUANTITY
L301	P250509	CH# 1.5 UH L1210	1
L302	P250516	CH# 3.3 UH L1210	1
L303	P250005	L# FFECH 0,47M M160	1
L304	R302108	CORE TUBE 3,5 /1,3 X 3	1
L304	Z34501104	WU CUSN 0,60 MM 40	1
L400	P250005	L# FFECH 0,47M M160	1
L401	P250509	CH# 1.5 UH L1210	1
L402	P250516	CH# 3.3 UH L1210	1
L403	P250005	L# FFECH 0,47M M160	1
L404	R302108	CORE TUBE 3,5 /1,3 X 3	1
L404	Z34501104	WU CUSN 0,60 MM 40	1
M102	R313729	J TESTEYE D2.1 H3.1 SN BK	1
M200	R313729	J TESTEYE D2.1 H3.1 SN BK	1
M204	R313729	J TESTEYE D2.1 H3.1 SN BK	1
M300	R313729	J TESTEYE D2.1 H3.1 SN BK	1
M304	R313729	J TESTEYE D2.1 H3.1 SN BK	1
M400	R313729	J TESTEYE D2.1 H3.1 SN BK	1
M404	R313729	J TESTEYE D2.1 H3.1 SN BK	1
PC	R780549	PCB G808S RGB DVR	1
Q 1	P232044	Q#BC859B P SS SOT23	1
Q 2	P232043	Q#BC849B N SS SOT23	1
Q 3	P232043	Q#BC849B N SS SOT23	1
Q 4	P232044	Q#BC859B P SS SOT23	1
Q100	P232043	Q#BC849B N SS SOT23	1
Q101	R131471	Q BF458 N P TO126	1
Q102	P232046	Q#BSS123 F SS SOT23	1
Q103	P232043	Q#BC849B N SS SOT23	1
Q104	P232044	Q#BC859B P SS SOT23	1
Q105	P232044	Q#BC859B P SS SOT23	1
Q106	P232043	Q#BC849B N SS SOT23	1
Q107	P232043	Q#BC849B N SS SOT23	1
Q108	P232044	Q#BC859B P SS SOT23	1
Q109	P232044	Q#BC859B P SS SOT23	1
Q110	P232043	Q#BC849B N SS SOT23	1
Q111	P232079	Q#BSS84 F SS SOT23	1
Q112	P232043	Q#BC849B N SS SOT23	1
Q113	P232044	Q#BC859B P SS SOT23	1
Q200	P232079	Q#BSS84 F SS SOT23	1
Q201	P232046	Q#BSS123 F SS SOT23	1
Q202	P232090	Q#BFR92A N SS SOT23	1
Q203	P232109	Q#BFG31 P SS SOT223	1
Q204	P232109	Q#BFG31 P SS SOT223	1
Q205	P232044	Q#BC859B P SS SOT23	1
Q300	P232079	Q#BSS84 F SS SOT23	1
Q301	P232046	Q#BSS123 F SS SOT23	1
Q302	P232090	Q#BFR92A N SS SOT23	1
Q303	P232109	Q#BFG31 P SS SOT223	1
Q304	P232109	Q#BFG31 P SS SOT223	1
Q305	P232044	Q#BC859B P SS SOT23	1
Q400	P232079	Q#BSS84 F SS SOT23	1
Q401	P232046	Q#BSS123 F SS SOT23	1
Q402	P232090	Q#BFR92A N SS SOT23	1
Q403	P232109	Q#BFG31 P SS SOT223	1
Q404	P232109	Q#BFG31 P SS SOT223	1
Q405	P232044	Q#BC859B P SS SOT23	1
Q406	P232044	Q#BC859B P SS SOT23	1
Q407	P232079	Q#BSS84 F SS SOT23	1
Q408	P232043	Q#BC849B N SS SOT23	1
R 1	P201057	R# CE H 56E F 0W12 0805	1
R 2	P201057	R# CE H 56E F 0W12 0805	1
R 3	P201079	R# CE H470E F 0W12 0805	1
R 4	P201055	R# CE H 47E F 0W12 0805	1
R 5	P201079	R# CE H470E F 0W12 0805	1

SIT.	ITEM NO.	DESCRIPTION	QUANTITY
R 6	P201055	R# CE H 47E F 0W12 0805	1
R 7	P201087	R# CE H 1K F 0W12 0805	1
R 8	P201087	R# CE H 1K F 0W12 0805	1
R 9	P201087	R# CE H 1K F 0W12 0805	1
R 10	P201107	R# CE H 6K8 F 0W12 0805	1
R 11	P201107	R# CE H 6K8 F 0W12 0805	1
R 12	P201107	R# CE H 6K8 F 0W12 0805	1
R 16	P201084	R# CE H750E F 0W12 0805	1
R 18	P201084	R# CE H750E F 0W12 0805	1
R 20	P201084	R# CE H750E F 0W12 0805	1
R 22	P201135	R# CE H100K F 0W12 0805	1
R 23	P201118	R# CE H 20K F 0W12 0805	1
R 24	P201079	R# CE H470E F 0W12 0805	1
R 25	P201055	R# CE H 47E F 0W12 0805	1
R 26	P201113	R# CE H 12K F 0W12 0805	1
R 27	P201139	R# CE H150K F 0W12 0805	1
R 28	P201105	R# CE H 5K6 F 0W12 0805	1
R 29	P201129	R# CE H 56K F 0W12 0805	1
R 30	P201113	R# CE H 12K F 0W12 0805	1
R 31	P201105	R# CE H 5K6 F 0W12 0805	1
R 32	P201129	R# CE H 56K F 0W12 0805	1
R 34	P201113	R# CE H 12K F 0W12 0805	1
R 35	P201105	R# CE H 5K6 F 0W12 0805	1
R 36	P201129	R# CE H 56K F 0W12 0805	1
R 38	P201119	R# CE H 22K F 0W12 0805	1
R 39	P201099	R# CE H 3K3 F 0W12 0805	1
R 40	P201099	R# CE H 3K3 F 0W12 0805	1
R 41	P201099	R# CE H 3K3 F 0W12 0805	1
R 42	P201089	R# CE H 1K2 F 0W12 0805	1
R 43	P201072	R# CE H240E F 0W12 0805	1
R 44	P201105	R# CE H 5K6 F 0W12 0805	1
R 45	P201103	R# CE H 4K7 F 0W12 0805	1
R 46	P201063	R# CE H100E F 0W12 0805	1
R 47	P201135	R# CE H100K F 0W12 0805	1
R 48	P201119	R# CE H 22K F 0W12 0805	1
R 49	P201112	R# CE H 11K F 0W12 0805	1
R 50	P201135	R# CE H100K F 0W12 0805	1
R 51	P201146	R# CE H300K F 0W12 0805	1
R 52	P201135	R# CE H100K F 0W12 0805	1
R 53	P201146	R# CE H300K F 0W12 0805	1
R 54	P201087	R# CE H 1K F 0W12 0805	1
R 55	P201146	R# CE H300K F 0W12 0805	1
R 56	P201063	R# CE H100E F 0W12 0805	1
R 57	P201151	R# CE H470K F 0W12 0805	1
R 58	P201151	R# CE H470K F 0W12 0805	1
R 59	P201151	R# CE H470K F 0W12 0805	1
R 60	P201127	R# CE H 47K F 0W12 0805	1
R 61	P201127	R# CE H 47K F 0W12 0805	1
R 62	P201127	R# CE H 47K F 0W12 0805	1
R 63	P201138	R# CE H130K F 0W12 0805	1
R 64	P201138	R# CE H130K F 0W12 0805	1
R 65	P201138	R# CE H130K F 0W12 0805	1
R 66	P201103	R# CE H 4K7 F 0W12 0805	1
R 67	P201087	R# CE H 1K F 0W12 0805	1
R 68	P201111	R# CE H 10K F 0W12 0805	1
R 69	P201095	R# CE H 2K2 F 0W12 0805	1
R 70	P201087	R# CE H 1K F 0W12 0805	1
R 71	P201111	R# CE H 10K F 0W12 0805	1
R 72	P201095	R# CE H 2K2 F 0W12 0805	1
R 73	P201063	R# CE H100E F 0W12 0805	1
R 74	P201091	R# CE H 1K5 F 0W12 0805	1
R 75	P201088	R# CE H 1K1 F 0W12 0805	1
R 76	P201111	R# CE H 10K F 0W12 0805	1
R 77	P201079	R# CE H470E F 0W12 0805	1
R 78	R101544	R MF H 4K7 F 0W4 E3	1
R100	P201099	R# CE H 3K3 F 0W12 0805	1
R101	P201095	R# CE H 2K2 F 0W12 0805	1

SIT.	ITEM NO.	DESCRIPTION	QUANTITY
R102	P201139	R# CE H150K F 0W12 0805	1
R103	P201139	R# CE H150K F 0W12 0805	1
R104	R101557	R MF H 56K F 0W4 E3	1
R105	R101557	R MF H 56K F 0W4 E3	1
R106	P201111	R# CE H 10K F 0W12 0805	1
R107	R101524	R MF H100E F 0W4 E3	1
R108	P201079	R# CE H470E F 0W12 0805	1
R109	P201055	R# CE H 47E F 0W12 0805	1
R110	P201079	R# CE H470E F 0W12 0805	1
R111	P201135	R# CE H100K F 0W12 0805	1
R112	P201118	R# CE H 20K F 0W12 0805	1
R113	P201111	R# CE H 10K F 0W12 0805	1
R114	P201055	R# CE H 47E F 0W12 0805	1
R115	P201079	R# CE H470E F 0W12 0805	1
R116	R101548	R MF H 10K F 0W4 E3	1
R117	R101548	R MF H 10K F 0W4 E3	1
R118	P201095	R# CE H 2K2 F 0W12 0805	1
R120	P201135	R# CE H100K F 0W12 0805	1
R121	P201127	R# CE H 47K F 0W12 0805	1
R122	P201135	R# CE H100K F 0W12 0805	1
R123	P201127	R# CE H 47K F 0W12 0805	1
R124	P201157	R# CE H820K F 0W12 0805	1
R125	P201131	R# CE H 68K F 0W12 0805	1
R126	P201112	R# CE H 11K F 0W12 0805	1
R127	P201114	R# CE H 13K F 0W12 0805	1
R128	P201116	R# CE H 16K F 0W12 0805	1
R129	P201120	R# CE H 24K F 0W12 0805	1
R130	P201118	R# CE H 20K F 0W12 0805	1
R131	P201111	R# CE H 10K F 0W12 0805	1
R132	P201087	R# CE H 1K F 0W12 0805	1
R133	P201124	R# CE H 36K F 0W12 0805	1
R134	P201143	R# CE H220K F 0W12 0805	1
R135	P201119	R# CE H 22K F 0W12 0805	1
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R144	P201129	R# CE H 56K F 0W12 0805	1
R145	P201133	R# CE H 82K F 0W12 0805	1
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R152	P201075	R# CE H330E F 0W12 0805	1
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R156	P201071	R# CE H220E F 0W12 0805	1
R157	P201071	R# CE H220E F 0W12 0805	1
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R159	R101520	R MF H 47E F 0W4 E3	1
R160	R101520	R MF H 47E F 0W4 E3	1
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R162	P201055	R# CE H 47E F 0W12 0805	1
R164	P201157	R# CE H820K F 0W12 0805	1
R165	P201111	R# CE H 10K F 0W12 0805	1
R166	P201111	R# CE H 10K F 0W12 0805	1
R167	P201103	R# CE H 4K7 F 0W12 0805	1
R168	P201129	R# CE H 56K F 0W12 0805	1
R169	P201124	R# CE H 36K F 0W12 0805	1
R170	P201111	R# CE H 10K F 0W12 0805	1
R171	P201111	R# CE H 10K F 0W12 0805	1

SIT.	ITEM NO.	DESCRIPTION	QUANTITY
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R173	P201111	R# CE H 10K F 0W12 0805	1
R174	P201127	R# CE H 47K F 0W12 0805	1
R200	P201056	R# CE H 51E F 0W12 0805	1
R201	P200693	R# CE H 4E7 J 0W12 0805	1
R202	P201063	R# CE H100E F 0W12 0805	1
R203	P200693	R# CE H 4E7 J 0W12 0805	1
R204	P201099	R# CE H 3K3 F 0W12 0805	1
R205	P201031	R# CE H 4E7 F 0W12 0805	1
R206	P201089	R# CE H 1K2 F 0W12 0805	1
R207	P201031	R# CE H 4E7 F 0W12 0805	1
R208	P201083	R# CE H680E F 0W12 0805	1
R209	P201031	R# CE H 4E7 F 0W12 0805	1
R210	P201073	R# CE H270E F 0W12 0805	1
R211	P201031	R# CE H 4E7 F 0W12 0805	1
R212	P201088	R# CE H 1K1 F 0W12 0805	1
R213	P201071	R# CE H220E F 0W12 0805	1
R214	P201107	R# CE H 6K8 F 0W12 0805	1
R215	P200693	R# CE H 4E7 J 0W12 0805	1
R216	P200693	R# CE H 4E7 J 0W12 0805	1
R217	P201066	R# CE H130E F 0W12 0805	1
R218	P201135	R# CE H100K F 0W12 0805	1
R219	P201086	R# CE H910E F 0W12 0805	1
R220	P201057	R# CE H 56E F 0W12 0805	1
R221	P200693	R# CE H 4E7 J 0W12 0805	1
R222	P200693	R# CE H 4E7 J 0W12 0805	1
R223	P201079	R# CE H470E F 0W12 0805	1
R224	P201095	R# CE H 2K2 F 0W12 0805	1
R225	P201079	R# CE H470E F 0W12 0805	1
R226	P201079	R# CE H470E F 0W12 0805	1
R227	P201139	R# CE H150K F 0W12 0805	1
R228	P201111	R# CE H 10K F 0W12 0805	1
R229	P201063	R# CE H100E F 0W12 0805	1
R230	P201111	R# CE H 10K F 0W12 0805	1
R231	P201078	R# CE H430E F 0W12 0805	1
R232	P201111	R# CE H 10K F 0W12 0805	1
R233	P201080	R# CE H510E F 0W12 0805	1
R234	P201111	R# CE H 10K F 0W12 0805	1
R235	P201083	R# CE H680E F 0W12 0805	1
R236	P201111	R# CE H 10K F 0W12 0805	1
R237	P201087	R# CE H 1K F 0W12 0805	1
R238	P201075	R# CE H330E F 0W12 0805	1
R239	P201135	R# CE H100K F 0W12 0805	1
R240	P201079	R# CE H470E F 0W12 0805	1
R241	P201061	R# CE H 82E F 0W12 0805	1
R242	P201039	R# CE H 10E F 0W12 0805	1
R243	P201039	R# CE H 10E F 0W12 0805	1
R244	P201087	R# CE H 1K F 0W12 0805	1
R245	P201063	R# CE H100E F 0W12 0805	1
R246	P201103	R# CE H 4K7 F 0W12 0805	1
R247	P201103	R# CE H 4K7 F 0W12 0805	1
R300	P201056	R# CE H 51E F 0W12 0805	1
R301	P200693	R# CE H 4E7 J 0W12 0805	1
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R318	P201135	R# CE H100K F 0W12 0805	1
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R320	P201057	R# CE H 56E F 0W12 0805	1
R321	P200693	R# CE H 4E7 J 0W12 0805	1
R322	P200693	R# CE H 4E7 J 0W12 0805	1
R323	P201079	R# CE H470E F 0W12 0805	1
R324	P201095	R# CE H 2K2 F 0W12 0805	1
R325	P201079	R# CE H470E F 0W12 0805	1
R326	P201079	R# CE H470E F 0W12 0805	1
R327	P201139	R# CE H150K F 0W12 0805	1
R328	P201111	R# CE H 10K F 0W12 0805	1

SIT.	ITEM NO.	DESCRIPTION	QUANTITY
R329	P201063	R# CE H100E F 0W12 0805	1
R330	P201111	R# CE H 10K F 0W12 0805	1
R331	P201078	R# CE H430E F 0W12 0805	1
R332	P201111	R# CE H 10K F 0W12 0805	1
R333	P201080	R# CE H510E F 0W12 0805	1
R334	P201111	R# CE H 10K F 0W12 0805	1
R335	P201083	R# CE H680E F 0W12 0805	1
R336	P201111	R# CE H 10K F 0W12 0805	1
R337	P201087	R# CE H 1K F 0W12 0805	1
R338	P201075	R# CE H330E F 0W12 0805	1
R339	P201135	R# CE H100K F 0W12 0805	1
R340	P201079	R# CE H470E F 0W12 0805	1
R341	P201061	R# CE H 82E F 0W12 0805	1
R342	P201039	R# CE H 10E F 0W12 0805	1
R343	P201039	R# CE H 10E F 0W12 0805	1
R344	P201087	R# CE H 1K F 0W12 0805	1
R345	P201063	R# CE H100E F 0W12 0805	1
R346	P201103	R# CE H 4K7 F 0W12 0805	1
R347	P201103	R# CE H 4K7 F 0W12 0805	1
R400	P201056	R# CE H 51E F 0W12 0805	1
R401	P200693	R# CE H 4E7 J 0W12 0805	1
R402	P201063	R# CE H100E F 0W12 0805	1
R403	P200693	R# CE H 4E7 J 0W12 0805	1
R404	P201099	R# CE H 3K3 F 0W12 0805	1
R405	P201031	R# CE H 4E7 F 0W12 0805	1
R406	P201089	R# CE H 1K2 F 0W12 0805	1
R407	P201031	R# CE H 4E7 F 0W12 0805	1
R408	P201083	R# CE H680E F 0W12 0805	1
R409	P201031	R# CE H 4E7 F 0W12 0805	1
R410	P201073	R# CE H270E F 0W12 0805	1
R411	P201031	R# CE H 4E7 F 0W12 0805	1
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R414	P201107	R# CE H 6K8 F 0W12 0805	1
R415	P200693	R# CE H 4E7 J 0W12 0805	1
R416	P200693	R# CE H 4E7 J 0W12 0805	1
R417	P201066	R# CE H130E F 0W12 0805	1
R418	P201135	R# CE H100K F 0W12 0805	1
R419	P201086	R# CE H910E F 0W12 0805	1
R420	P201057	R# CE H 56E F 0W12 0805	1
R421	P200693	R# CE H 4E7 J 0W12 0805	1
R422	P200693	R# CE H 4E7 J 0W12 0805	1
R423	P201079	R# CE H470E F 0W12 0805	1
R424	P201095	R# CE H 2K2 F 0W12 0805	1
R425	P201079	R# CE H470E F 0W12 0805	1
R426	P201079	R# CE H470E F 0W12 0805	1
R427	P201139	R# CE H150K F 0W12 0805	1
R428	P201111	R# CE H 10K F 0W12 0805	1
R429	P201063	R# CE H100E F 0W12 0805	1
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R431	P201078	R# CE H430E F 0W12 0805	1
R432	P201111	R# CE H 10K F 0W12 0805	1
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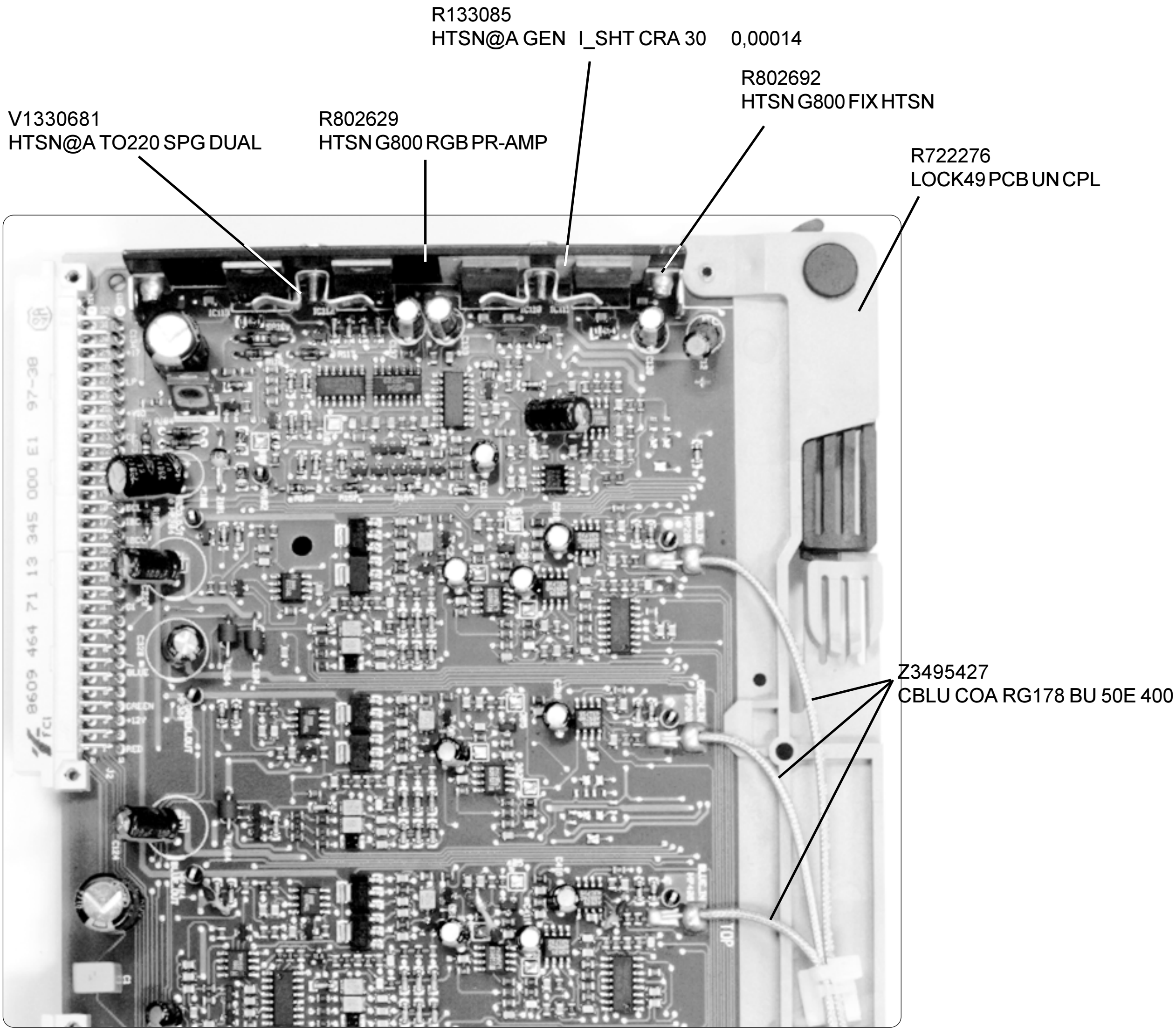
R434	P201111	R# CE H 10K F 0W12 0805	1
R435	P201083	R# CE H680E F 0W12 0805	1
R436	P201111	R# CE H 10K F 0W12 0805	1
R437	P201087	R# CE H 1K F 0W12 0805	1
R438	P201075	R# CE H330E F 0W12 0805	1
R439	P201135	R# CE H100K F 0W12 0805	1
R440	P201079	R# CE H470E F 0W12 0805	1
R441	P201061	R# CE H 82E F 0W12 0805	1
R442	P201039	R# CE H 10E F 0W12 0805	1
R443	P201039	R# CE H 10E F 0W12 0805	1
R444	P201087	R# CE H 1K F 0W12 0805	1
R445	P201063	R# CE H100E F 0W12 0805	1
R446	P201103	R# CE H 4K7 F 0W12 0805	1
R447	P201103	R# CE H 4K7 F 0W12 0805	1

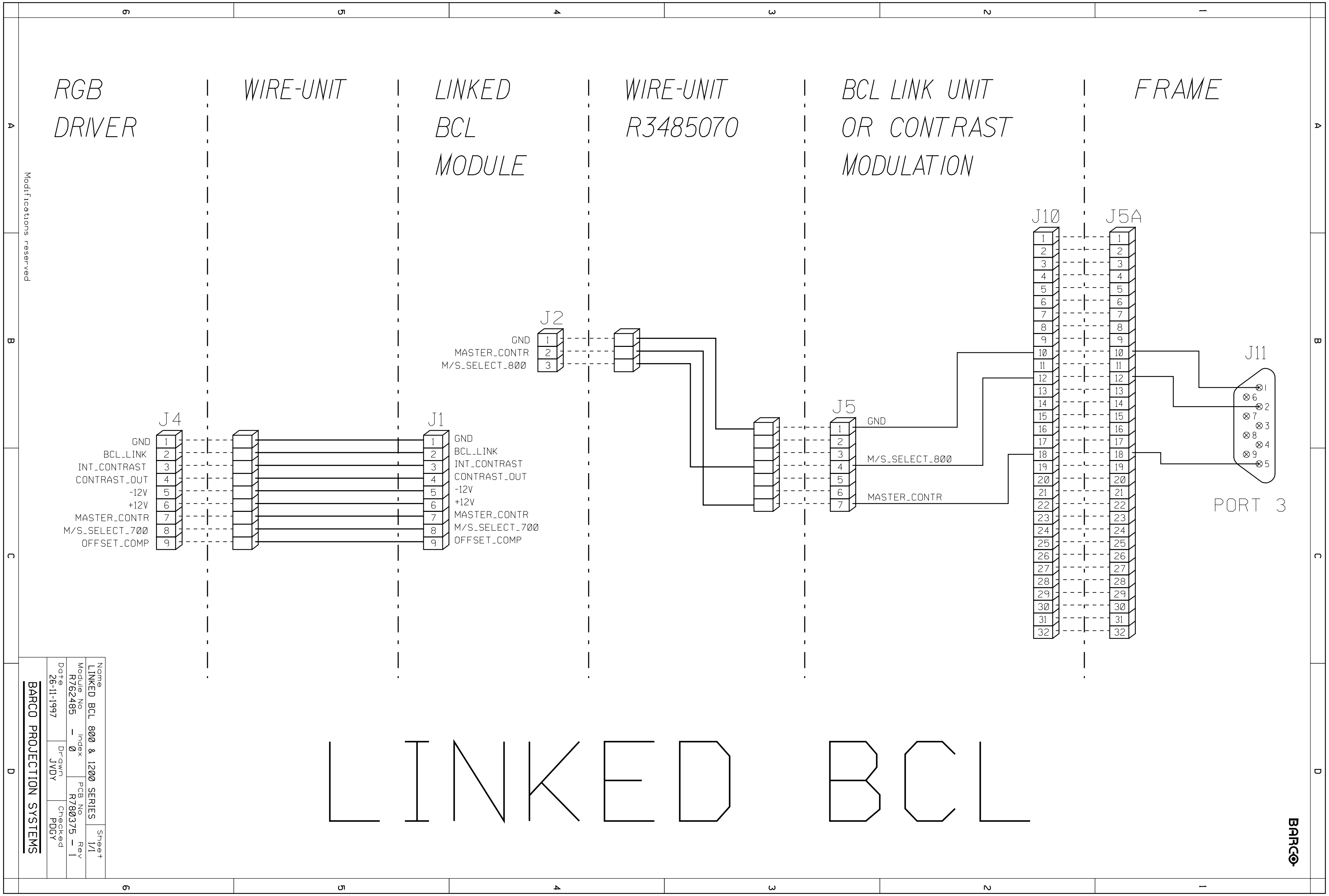
SIT.	ITEM NO.	DESCRIPTION	QUANTITY
R448	P201103	R# CE H 4K7 F 0W12 0805	1
R449	P201103	R# CE H 4K7 F 0W12 0805	1
R450	P201105	R# CE H 5K6 F 0W12 0805	1
R451	P201105	R# CE H 5K6 F 0W12 0805	1
R452	P201103	R# CE H 4K7 F 0W12 0805	1
R453	P201039	R# CE H 10E F 0W12 0805	1
R454	P201088	R# CE H 1K1 F 0W12 0805	1
R455	P201093	R# CE H 1K8 F 0W12 0805	1
R456	P201101	R# CE H 3K9 F 0W12 0805	1
R457	P200693	R# CE H 4E7 J 0W12 0805	1
R458	R101519	R MF H 39E F 0W4 E3	1
R458	R101519	R MF H 39E F 0W4 E3	1

SIT.	ITEM NO.	DESCRIPTION	QUANTITY
SR10	R1011907	R CFFH E1 K 0W35	⚠ 1
SR11	R1011907	R CFFH E1 K 0W35	⚠ 1
Z 1	P234164	D#ZEN 5V6 0W5 C DMMELF	1
Z 2	P234164	D#ZEN 5V6 0W5 C DMMELF	1
Z 3	P234179	D#ZEN 20V 0W5 C DMMELF	1
Z100	P234089	D#ZEN 13V 0W5 C DMMELF	1
Z101	R131771	D ZEN 150V 3W25 C SOD57	1

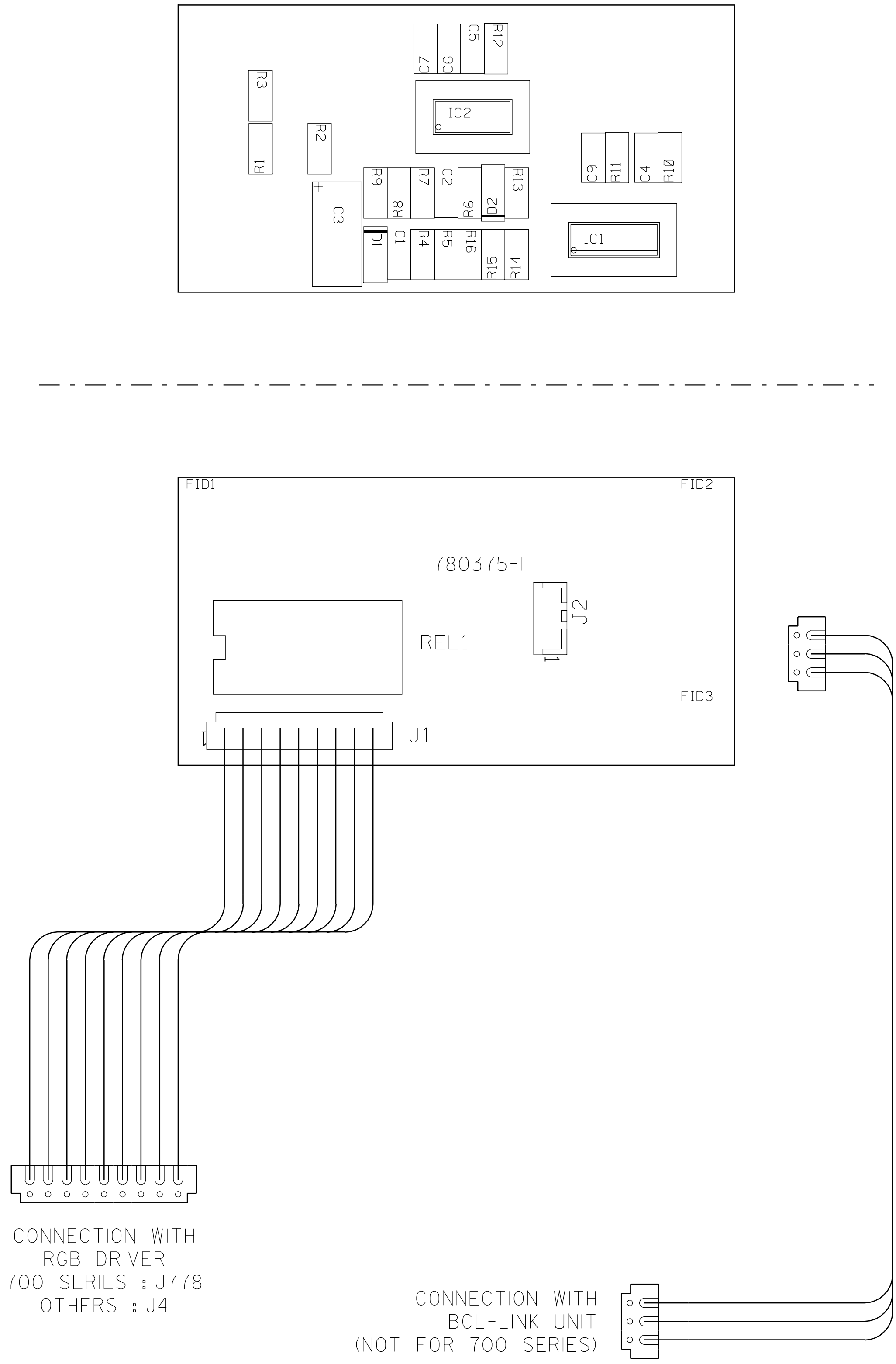
PRODUCT SAFETY NOTICE

Components identified by ⚠ have SPECIAL CHARACTERISTICS IMPORTANT TO SAFETY. Before replacing any of these components, read carefully the ser-vice safety precautions.





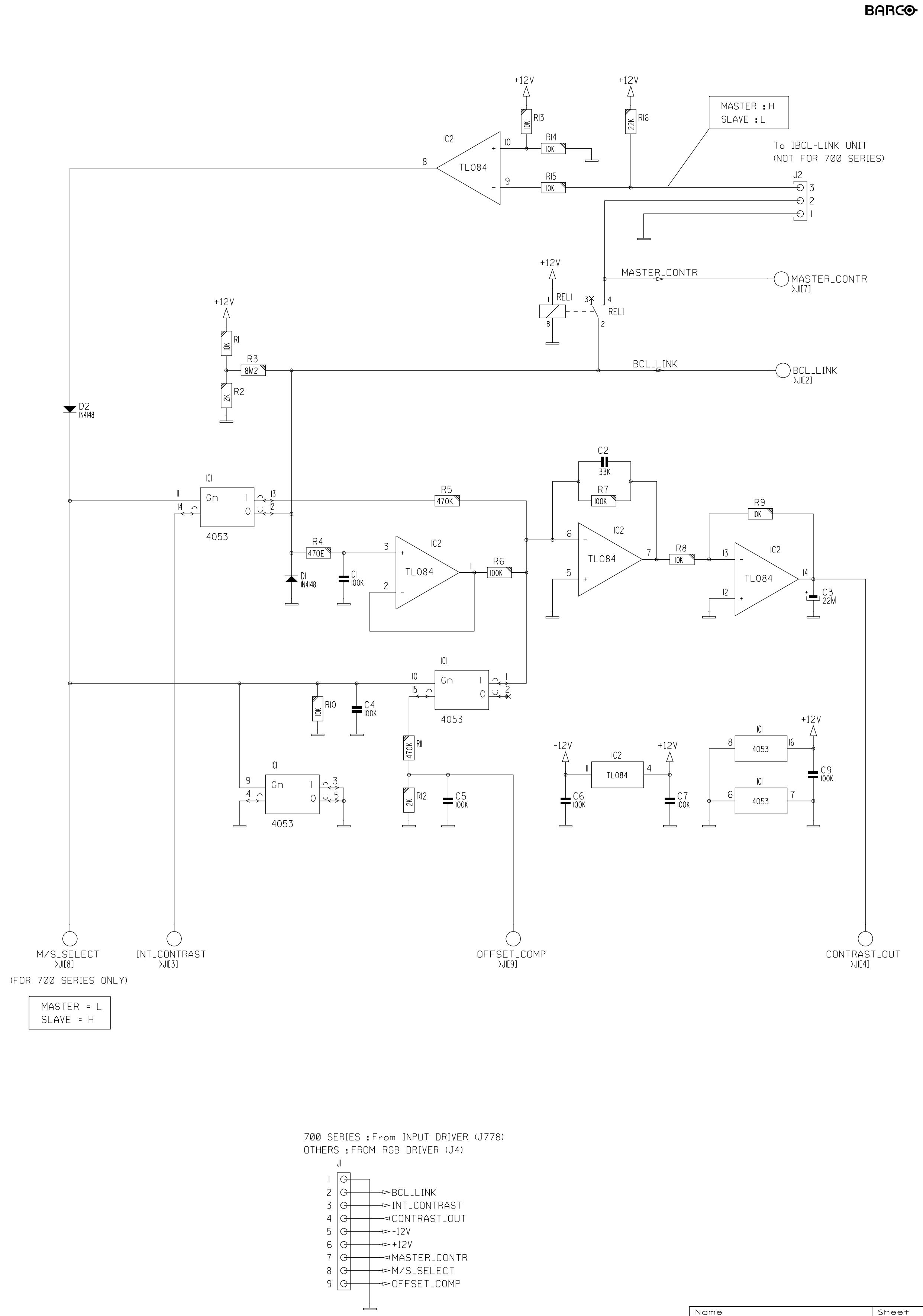
RGB DRIVER
WIRE-UNIT
LINKED BCL MODULE
WIRE-UNIT R3485070
BCL LINK UNIT OR CONTRAST MODULATION
FRAME
J4
GND
BCL_LINK
INT_CONTRAST
CONTRAST_OUT
-12V
+12V
MASTER_CONTR
M/S_SELECT_700
OFFSET_COMP
J1
J2
GND
MASTER_CONTR
M/S_SELECT_800
J5
GND
M/S_SELECT_800
MASTER_CONTR
J10
J5A
J11
PORT 3
LINKED BCL
BARCO
Modifications reserved
Name
LINKED BCL 800 & 1200 SERIES
Sheet
1/1
Module No
R762485
Index
0
PCB No
R780375
Rev
1
Date
26-11-1997
Drawn
JVDY
Checked
PDGY
BARCO PROJECTION SYSTEMS



Name			Sheet
LINKED BCL UNIT			1 / 1
Module No R762485	Index — Ø	PCB No R780375	Rev — 1
Date 26-11-1997	Drawn JVDY	Checked PDGY	

BARCO PROJECTION SYSTEMS

Modifications reserved



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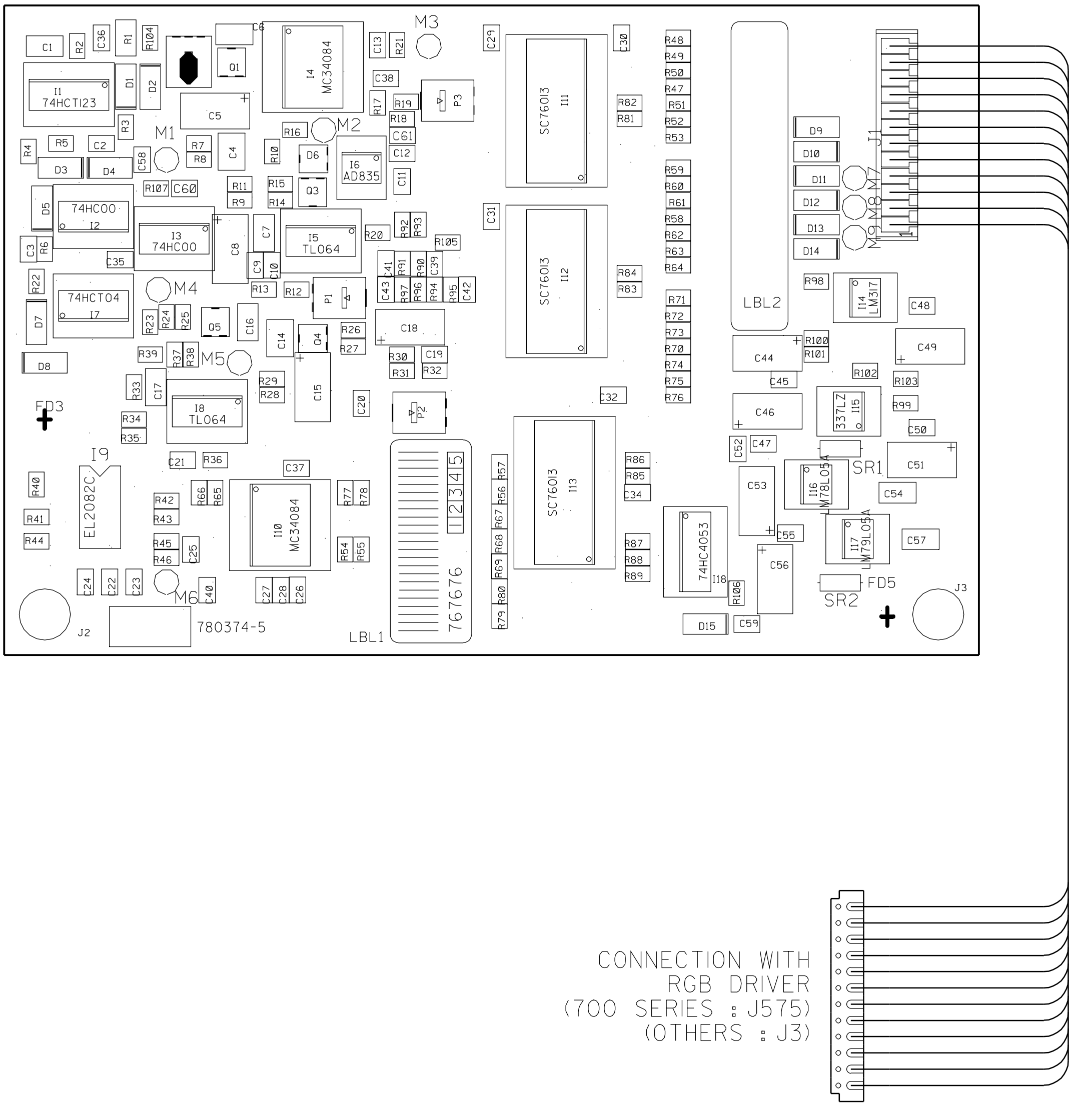
Module No R762485	Index 0	PCB No R780375 Rev 1
Date 26-11-1997	Drawn JVDY	Checked PDGY

BARCO PROJECTION SYSTEMS

Modifications reserved

BARCO

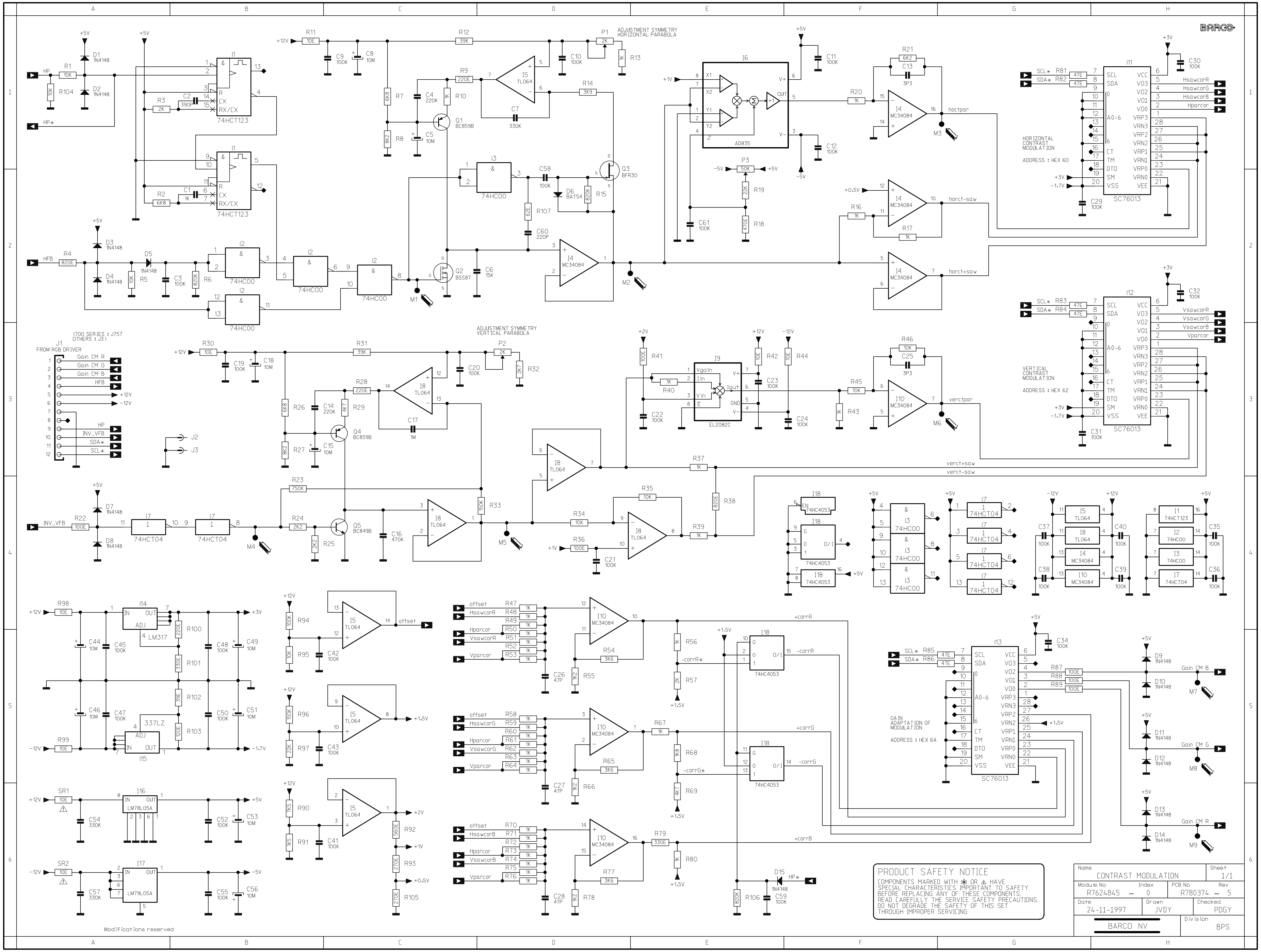


CONNECTION WITH
RGB DRIVER
(700 SERIES : J575)
(OTHERS : J3)

Name			Sheet
CONTRAST MODULATION			1 / 1
Module No	Index	PCB No	Rev
R7624845 —	0	R780374	— 5
Date	Drawn	Checked	
24-11-1997	JVDY	PDGY	

BARCO PROJECTION SYSTEMS

Modifications reserved



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.

Name		Sheet
CONTRAST MODULATION		1/1
Module No	Index	PCB No / Rev
R7624845 -	0	R780374 - 5
Date	Drawn	Checked
24-11-1997	JVDY	PDGY
BARCO NV		Division: BPS

COMP.	LOC.
C1	B2
C2	B1
C3	B2
C4	C1
C5	C1
C6	D2
C7	D1
C8	C1
C9	C1
C10	D1
C11	F1
C12	F1
C13	F1
C14	C3
C15	C3
C16	C4
C17	C3
C18	B3
C19	B3
C20	C3
C21	D4
C22	E3
C23	E3
C24	F3
C25	F3
C26	D5
C27	D6
C28	D6
C29	H2
C30	H1
C31	H3
C32	H2
C34	G5
C35	H4
C36	H4
C37	G4
C38	G4
C39	H4
C40	H4
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C43	C5
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C56	B6
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D5	A2
D6	D2
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D10	H5
D11	H5
D12	H5
D13	H6
D14	H6
D15	E6
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I1	B1
I1	H4
I2	B2
I2	B2
I2	C2
I2	B2
I2	H4
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I3	H4
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M5	D4
M6	G3
M7	H5
M8	H5
M9	H6
P1	D1
P2	D3
P3	E1

COMP.	LOC.
Q1	C1
Q2	C2
Q3	D2
Q4	C3
Q5	C4
R1	A1
R2	A2
R3	A1
R4	A2
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R85	F5
R86	F5
R87	G5
R88	G5
R89	G5
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R91	B6
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R93	C6
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R101	B5
R102	B5
R103	B5
R104	A1
R105	C6
R106	E6
R107	D2
SR1	A6
SR2	A6