Service Manual

ORDER NO.
ARP3067

DIGITAL SATELLITE RECEIVER

DBR-S200NL

THIS MANUAL IS APPLICABLE TO THE FOLLOWING MODEL(S) AND TYPE(S).

Type	Model	Power Requirement	Remarks
	DBR-S200NL		
NYXK/NL	○	AC230V	

● This service manual should be used together with the following manual(s):

Model	Order No.	Remarks
TS4/NYXK/FR	ARP3039	

CONTENTS

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T – ZZV MAR. 2000 Printed in Japan

1. CONTRAST OF MISCELLANEOUS PARTS

NOTES:
- *Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Screws adjacent to ▼ mark on product are used for disassembly.*
- *Reference Nos. indicate the pages and Nos. in the service manual for the base model.*
- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*

Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%).

560 → 56 x 10^1 → 561 ..... RD1/4PU 5 6 1 J
47k → 47 x 10^3 → 473 ..... RD1/4PU 4 7 3 J
0.5 → R50 ..... RN2H R 5 0 K
1 → 1R0 ..... RS1P 1 R 0 K

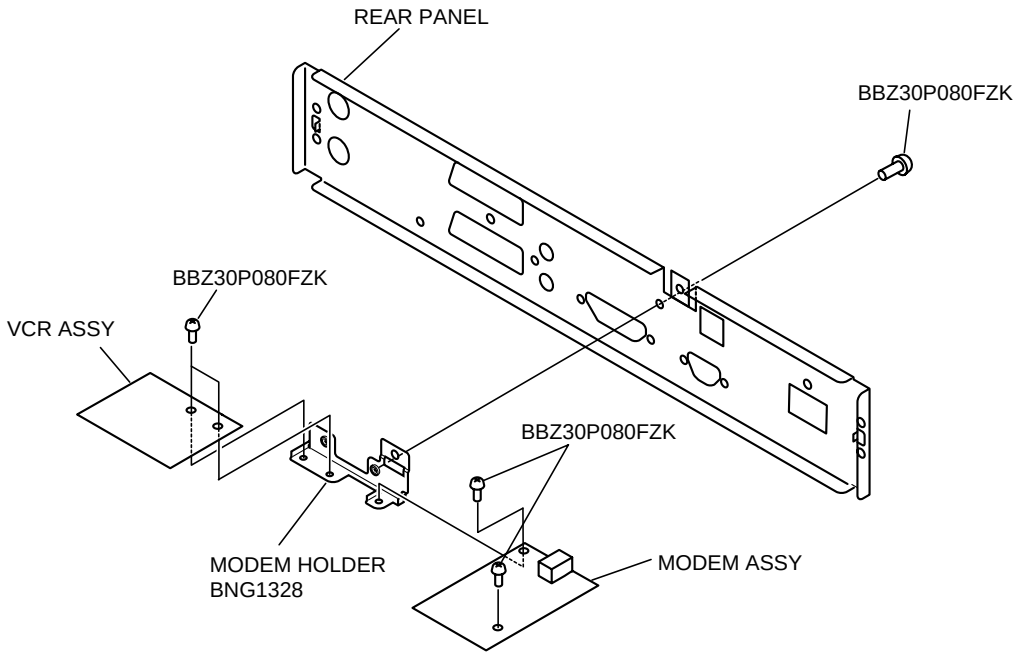
Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62k → 562 x 10^1 → 5621 ..... RN1/4PC 5 6 2 1 F

● CONTRAST TABLE

DBR-S200NL/NYXK/NL and TS4/NYXK/FR are constructed the same except for the following:

Ref. No.	Mark	Symbol and Description	Part No.		Remarks
			TS4/NYXK/FR	DBR-S200NL/NYXK/NL	
		PCB SECTION			
P4-6		MAIN ASSY	BWE1055	BWE1095 *1	*1 Refer to page3,4, 8-20,26-29.
		├IC3001 16M FLASH ROM (I)	BGC1002-A-AV	BGC1050-A-AV	
	NSP	├ANALOG AV BLOCK	B4E1055	B4E1061	
	NSP	├IO/MODEM BLOCK	B5E1055	B5E1056	
	NSP	├SRS AUDIO BLOCK	Not used	B7E1061	
		├R6026	Not used	RS1/16S0R0J *2	*2 Refer to page18.
		├SERIAL No. (PAP)	BAX1145	BAX1258	*3 MAIN ASSY ↔ MODEM ASSY
		└3P HOUSING ASSY	Not used	BDX1550 *3	
P4-2		FRONT ASSY	BWE1079	BWE1082 *4	*4 Refer to page5,21,23.
		VCR ASSY	Not Used	BWE1088 *5	*5 Refer to page5,22,24.
		MODEM ASSY	Not Used	BXF1133 *6	*6 BXF1133 have no service part.
		PACKING SECTION			
P3-7		INSTRUCTION MANUAL	BRC1003 (French)	BRC1023 (Dutch)	
	NSP	BROCHURE	Not used	BRY1025	
P3-3		REMOTE CONTROL UNIT	BXD1010	BXD1047	
		REMOTE CONTROL CABLE	Not used	BDH1019	
P3-14		MODEM CABLE	BDH1014	BDH1015	
	NSP	MODEM ADAPTER	Not used	BKP1140	
P3-11	NSP	MODEM APPROVAL CARD	BRM1022	Not used	
	NSP	REGISTRATION FORM	Not used	BRY1026	
	NSP	SECA SMART CARD KIT	Not used	BPK1020	
	NSP	WARRANTY CARD	Not used	BRY1033	
P3-10	NSP	STICKER(PAP)	BAX1271	Not used	
	NSP	SERIAL PAPER	Not used	RRW-168	
P3-6	NSP	BATTERY 2P (R03,AAA)	VEM1018	Not used	
	NSP	BATTERY 2P (R6P,AA)	Not used	VEM1017	
P3-1		PACKING CASE(PAP)	BHD1369	BHD1472	
		EXTERIOR SECTION			
P4-1		FRONT PANEL ASSY	BWX1144	BWX1153	
P4-9		REAR PANEL (MET)	BNC1137	BNC1154	
P4-18		BONNET CASE (MET)	BNE1090	BNE1096	
P4-4		CHASSIS (MET)	BNA1149	BNA1151	
P4-17		BARRIER (PLS)	BEC1173	Not used	
		PIONEER BADGE (AL)	Not used	BAM1004	
		MODEM HOLDER (MET)	Not used	BNG1328 *7	*7 Refer to page3.
P4-10	NSP	NAME LABEL	BAL1366	BAL1385	
	NSP	BARCODE LABEL	Not used	BAL1310	*8 MAIN ASSY ↔ FRONT ASSY
P4-8		20P FLEXIBLE FLAT CABLE	BDD1032	BDD1037 *8	
P4-15		12P FLEXIBLE FLAT CABLE	Not used	BDD1022 *9	*9 MAIN ASSY ↔ MODEM ASSY
P4-19		SCREW (For Bonnet ×5)	BBZ30P080FZK	BBZ30P080FNI	
		SCREW (For Modem Assy, Modem Holder,VCR Assy ×5)	Not used	BBZ30P080FZK *10	*10 Refer to page3



■ PCB PARTS LIST

Mark	No.	Description	Part No.
AF		**MAIN ASSY**	
		SEMICONDUCTORS	
	IC4002		AK4319A-VM
	IC1001		BA05SFP
	IC3001		BGC1050-A-AV
	IC6005		CAT24WC16JI
	IC2002		HD74HCT125FP
	IC5006		HIN211CB
	IC3003		HYB3118165BST-60
	IC3005		HYB39S16160AT-10
	IC3002		MBM29LV400TC-90PFTN
	IC7101		NJM2179M
	IC1002		NJM317DL1
	IC4003		NJM3404AM
	IC5007		PACS1284-04Q
	IC6001		PE5128A
	IC6002		PST9124N
	IC2003		SN74LVU04ANS
	IC2001		STI5510
	IC4001		STV6411A
	IC2004		TC74ACT04F
	Q2001,Q2002		2SA1036K
	Q1006,Q2003,Q2004,Q6033,Q6036		2SA1037K
	Q1012		2SB1132
	Q1007,Q2011,Q4015,Q4018-Q4023		2SC4081
	Q4025-Q4027,Q6031,Q6035		2SC4081
	Q1011		2SD1664
	Q6017		2SK2103
	Q6018		2SK2503
	Q1014		DTA124EK
	Q6001-Q6004		DTB113ZK
	Q4008-Q4013,Q4028,Q4029		DTC123TKA
	Q1004,Q1008-Q1010,Q1013,Q6032		DTC124EUA
	Q6034		DTC124EUA
	Q4030		DTC124TKA
	Q2005-Q2010,Q2012,Q6005-Q6012		DTC143EK
	Q1005		IRFR9024N
	Q4014,Q4016,Q4017		UMD2N
	D1001,D1007,D1009,D1010,D5004		1SS355
	D6002,D6003,D6011,D6013		1SS355
	D1008,D6017		DA204U
	D4012,D4013		DAN202K
	D2001		HVU356
	D4011		PDZ4.7B
	D1005,D1011		RB160L-40
	D4016		UDZ11B
	D4017-D4036		UDZ12B
	D6016		UDZS5.1B
		COILS AND FILTERS	
	F1001		BTF1072
	L4005		BTH1065
	L2002,L2004		DTL1038
		CAPACITORS	
	C6013 (0.047F/5.5V)		ACH1246
	C4050,C4051		CCSRCH100D50
	C2009		CCSRCH180J50
	C2012-C2014		CCSRCH101J50
	C4021,C4022,C6015,C6016		CCSRCH220J50
	C2005-C2008,C2010,C2011		CCSRCH221J50
	C2019		CCSRCH330J50
	C2003,C2004		CCSRCH331J50
	C4070		CEAT100M50
	C1009,C2056		CEAT101M10
	C1006		CEAT101M16
	C1007		CEAT101M50
	C4023,C4030-C4035,C4037		CEAT220M50

Mark	No.	Description	Part No.
	C4061		CEAT221M16
	C2001,C2002,C4038-C4041		CEAT2R2M50
	C4045,C4046,C4074,C4075		CEAT2R2M50
	C7201,C7202		CEAT2R2M50
	C6022		CEAT330M35
	C4065		CEAT470M10
	C1010,C1012		CEAT470M16
	C6019		CEAT470M25
	C4060,C6025,C6026		CEAT471M10
	C2034,C2058,C4047,C4048		CKSRYB102K50
	C4052-C4059		CKSRYB102K50
	C1001-C1005,C1011,C1016,C2031		CKSRYB103K50
	C2037		CKSRYB103K50
	C1015		CKSRYB332K50
	C2062,C4071,C6036,C6037		CKSRYB471K50
	C7108		CKSRYB472K50
	C6056,C6063		CKSRYB473K16
	C1017,C1020,C2016,C2033,C2035		CKSRYF103Z50
	C4009,C4066,C4068,C6031,C6035		CKSRYF103Z50
	C2015,C2017,C2026,C2028,C2032		CKSRYF104Z16
	C2038-C2043,C2045,C2046		CKSRYF104Z16
	C2048-C2050,C2052,C2053,C2055		CKSRYF104Z16
	C2063,C3001-C3004,C3007-C3009		CKSRYF104Z16
	C4001-C4008,C4010-C4015		CKSRYF104Z16
	C4017-C4020,C4062,C4069		CKSRYF104Z16
	C4072,C4073,C5031-C5035,C6014		CKSRYF104Z16
	C6033,C6052,C6053,C6057-C6059		CKSRYF104Z16
	C6062,C7102,C7104,C7203,C7204		CKSRYF104Z16
	C1018		CKSRYF105Z10
	C1019,C7107,C7109		CKSRYF474Z10

RESISTORS

	R6001,R6002	RAB4C102J
	R2054,R2069,R6019	RAB4C103J
	R2107-R2115	RAB4C180J
	R2030-R2032,R2056,R2059	RAB4C220J
	R2089-R2093	RAB4C220J
	R6003	RAB4C333J
	R2001,R2002	RD1/2VM3R3J
	R1014	RS1/10S1200F
	R1016	RS1/10S1202F
	R1015	RS1/10S1801F
	R1017	RS1/10S3601F
	R2137	RS1/10S331J
	R4142,R6026	RS1/16S0R0J
	R2038,R4140,R4141	RS1/16S100J
	R4001,R4004,R4007,R4010,R4013	RS1/16S101J
	R4016,R4019,R4047,R4048,R6022	RS1/16S101J
	R6027,R6028,R6052,R6053	RS1/16S101J
	R1020,R2006,R2012,R2131,R4090	RS1/16S102J
	R6055,R7111	RS1/16S102J
	R1011,R1024,R2004,R2009	RS1/16S103J
	R2024-R2027,R2041,R2044	RS1/16S103J
	R2050,R2051,R2053,R2086,R2098	RS1/16S103J
	R2100-R2102,R2125-R2128,R3004	RS1/16S103J
	R3023,R4057,R4059,R4083,R4089	RS1/16S103J
	R6063-R6065	RS1/16S103J
	R1012,R2036,R2040,R4030-R4035	RS1/16S104J
	R4084,R6004,R6023,R6024	RS1/16S104J
	R2039	RS1/16S105J
	R4064,R4065,R4068	RS1/16S111J
	R2078-R2081	RS1/16S113J
	R7110	RS1/16S114J

Mark	No.	Description	Part No.
	R2003,R2008,R6007-R6013		RS1/16S121J
	R2019,R2020		RS1/16S131J
	R1021,R7106,R7112		RS1/16S152J
	R4050,R4051,R4118,R4119		RS1/16S154J
	R4136		RS1/16S183J
	R4063,R4066,R4067		RS1/16S201J
	R2116-R2123,R2130,R3005		RS1/16S220J
	R5040-R5046		RS1/16S221J
	R1009,R1013,R2013,R2014,R2021		RS1/16S222J
	R2042		RS1/16S222J
	R1026,R1027,R2022,R2023,R4133		RS1/16S223J
	R4082		RS1/16S224J
	R4058,R4060		RS1/16S242J
	R6005		RS1/16S330J
	R4069-R4080,R4147		RS1/16S331J
	R6057,R6058,R6071		RS1/16S332J
	R4135,R6059,R7109		RS1/16S333J
	R7107		RS1/16S392J
	R2028,R7105		RS1/16S432J
	R2070,R6037		RS1/16S470J
	R2005,R2011,R4014,R4015		RS1/16S471J
	R4017,R4018,R4020,R4021,R4029		RS1/16S471J
	R4086		RS1/16S471J
	R1010,R1025,R2132,R3001-R3003		RS1/16S472J
	R3006,R4049,R4085,R4091,R6049		RS1/16S472J
	R6061,R6062		RS1/16S472J
	R3007-R3009,R4038,R4039		RS1/16S473J
	R4044,R4045,R6039,R6089,R6091		RS1/16S473J
	R7108		RS1/16S473J
	R7114,R7115		RS1/16S512J
	R2129		RS1/16S560J
	R2135,R4097-R4100,R4103-R4106		RS1/16S562J
	R6088		RS1/16S563J
	R2017		RS1/16S5R1J
	R4023,R4027,R4028		RS1/16S620J
	R7104		RS1/16S623J
	R1019		RS1/16S680J
	R2007		RS1/16S681J
	R4087		RS1/16S682J
	R1018,R2015,R2016,R2018,R4022		RS1/16S750J
	R4024-R4026,R4040,R4042,R6060		RS1/16S750J
	R4055,R4056,R4120,R4121		RS1/16S753J
	R7113		RS1/16S822J
	R4143-R4145		RS1/16S910J
	R1023		RS1/2S1R0J
	R1022		RS1/2S1R2J
	Other Resistors		RS1/10S□□□J

OTHERS

Mark			
⚠	M1001	DIGITAL TUNER MODULE	BXF1108
	CN2003	12P FFC CONNECTOR	9604S-12C
	CN5001	12P FFC CONNECTOR	9604S-12C
	CN6001	20P FFC CONNECTOR	9604S-20C
		S/N LABEL(PAP)	BAX1258
		3P HOUSING ASSY	BDX1550
	JA4002	2P PIN JACK	BKB1017
	CN4001	SCART CONNECTOR	BKN1019
	CN6002	19P PLUG	BKP1120
	CN5004	DSUB 9P CONNECTOR	BKP1122
	CN5005	DSUB 25P CONNECTOR	BKP1123
	X6002	(32.768KHz)	BSS1027
	X2002	(27MHz)	BSS1061
	X6001	(10.0MHz)	BSS1076

Mark	No.	Description	Part No.

BF FRONT ASSY

SEMICONDUCTORS

	D8409	BEL1037
	D8410	SLR-343VC(NPQ)

SWITCHES AND RELAYS

	S8401,S8402,S8404-S8407	ASG7013

RESISTORS

	Other Resistors	RD1/4PU□□□J

OTHERS

	M8401 REMOTE SENSOR UNIT	BXX1034
	CN8401 20P CONNECTOR	9604S-20F

EF VCR ASSY

SEMICONDUCTORS

	IC7303	KS88C01008SM-BH
	IC7301	PE5169B
	IC7302	PST9124N
	Q7301	DTA143EK
	Q7302-Q7314	DTC114TUA
	Q7315	DTC143EK
	D7301	UDZ12B

CAPACITORS

	C7303,C7304	CEAT470M16
	C7301,C7302,C7309	CKSRYF104Z16

RESISTORS

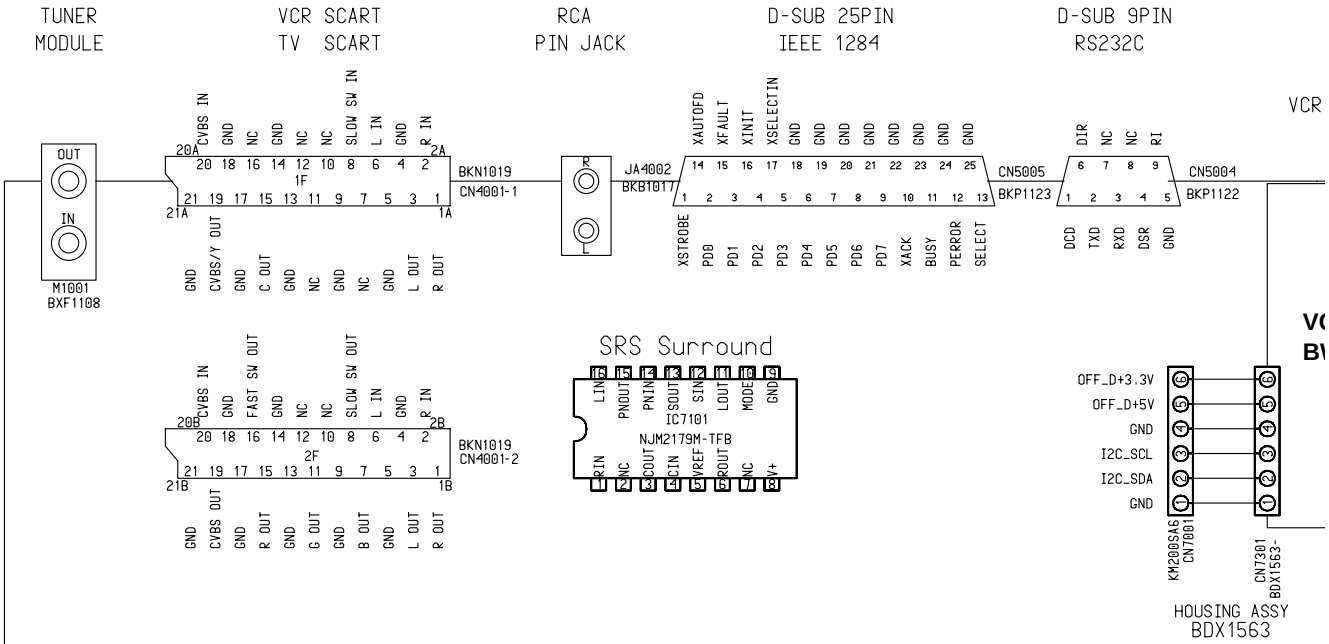
	R7308-R7311	RAB4C103J
	R7305,R7306	RS1/16S101J
	R7307,R7312	RS1/16S103J
	R7304	RS1/16S104J
	R7302	RS1/16S331J

OTHERS

	X7302 (8.00MHz)	ASS1015
	7301 6P HOUSING ASSY	BDX1563
	X7301 (10.0MHz)	BSS1076
	JA7301 JACK	RKN1004

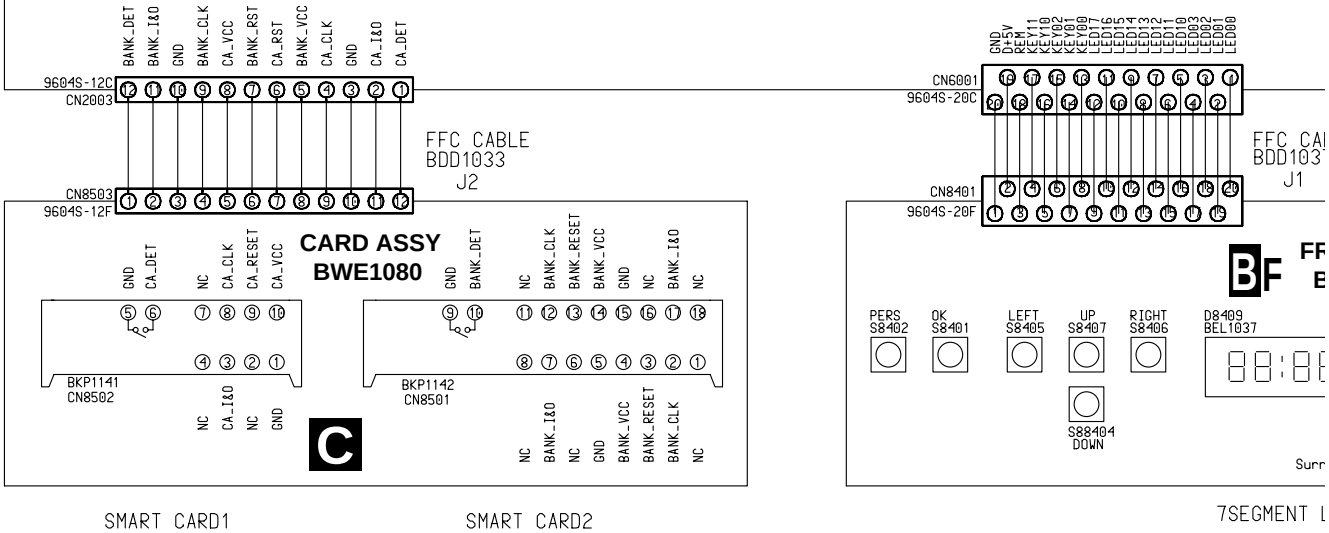
2. SCHEMATIC DIAGRAM

2.1 OVERALL CONNECTION DIAGRAM

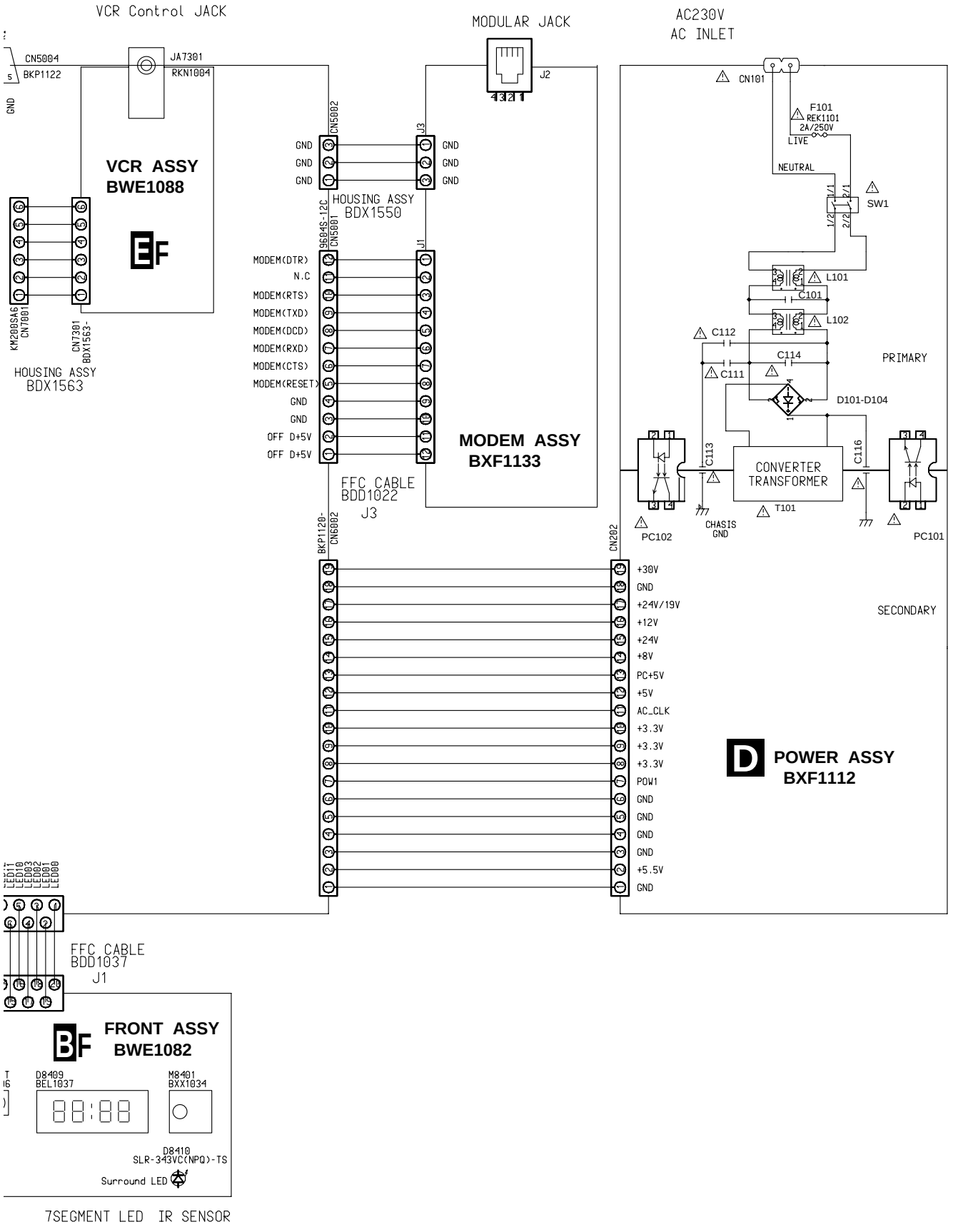


A (A1/7F- A7/7F) MAIN ASSY(BWE1095)

CHDEC BLOCK	:	B1E1055
DMXCPU BLOCK	:	B2E1055
MEMORY BLOCK	:	B3E1055
ANALOG AV BLOCK	**:**	**B4E1061**
IO/MODEM BLOCK	**:**	**B5E1056**
SUBPWR/CPU BLOCK	:	B6E1055
SRS AUDIO BLOCK	**:**	**B7E1061**



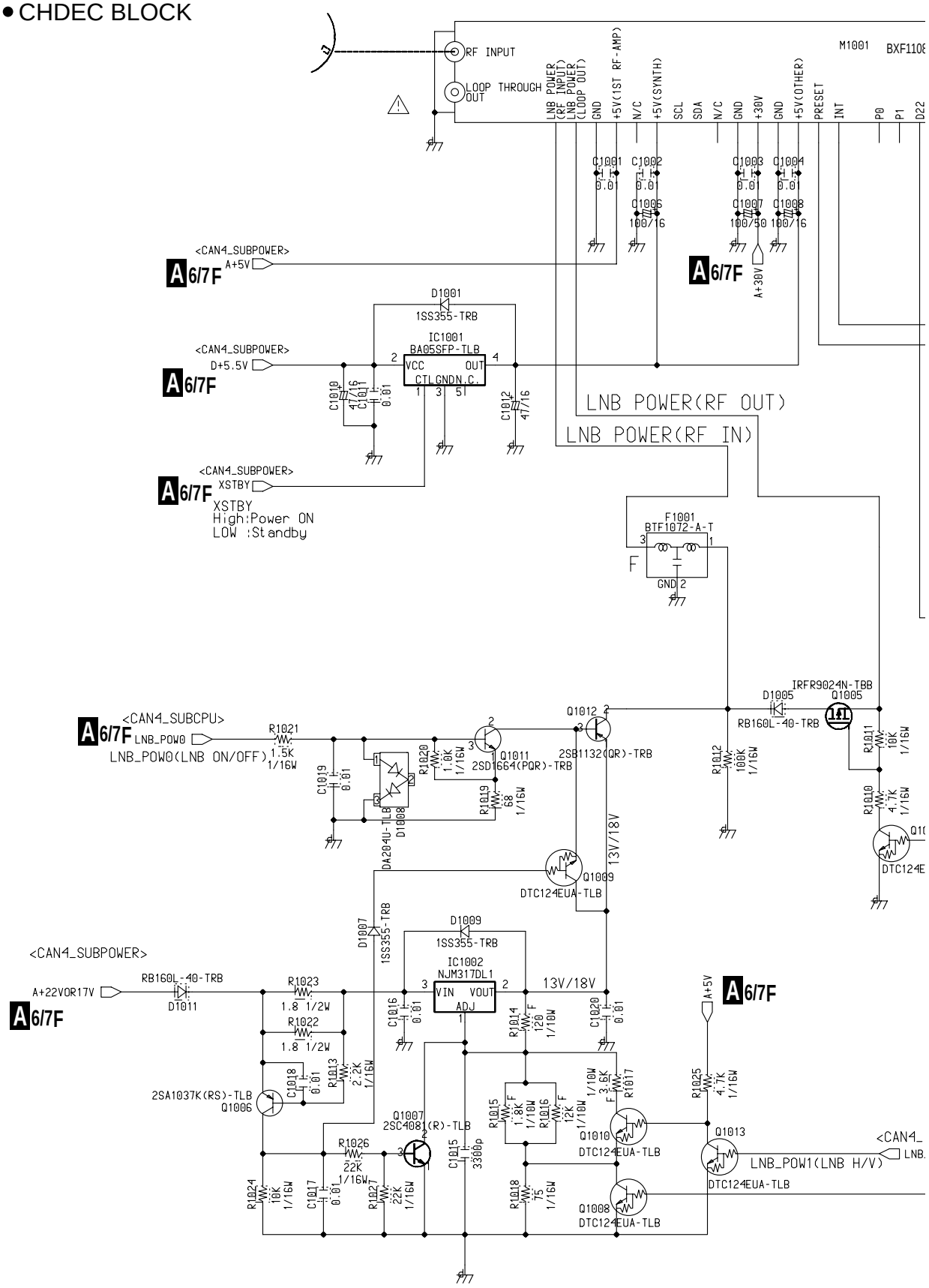
Note : When ordering service parts, be sure to refer to "EXPLODED VIEWS and PARTS LIST" or "PCB PARTS LIST".

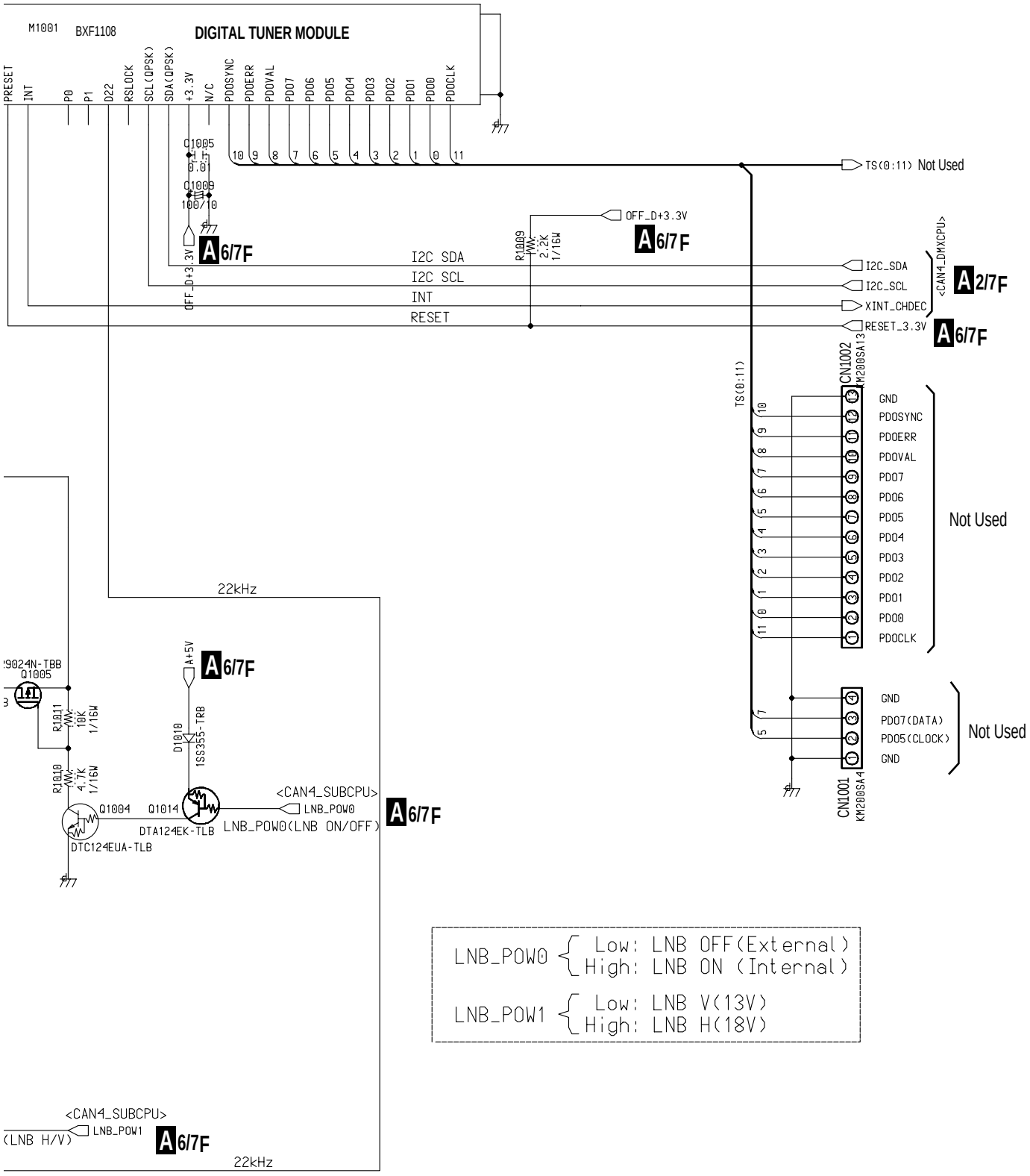


2.2 MAIN ASSY (1/7)

A 1/7F MAIN ASSY (1/7) (BWE1095)

- CHDEC BLOCK

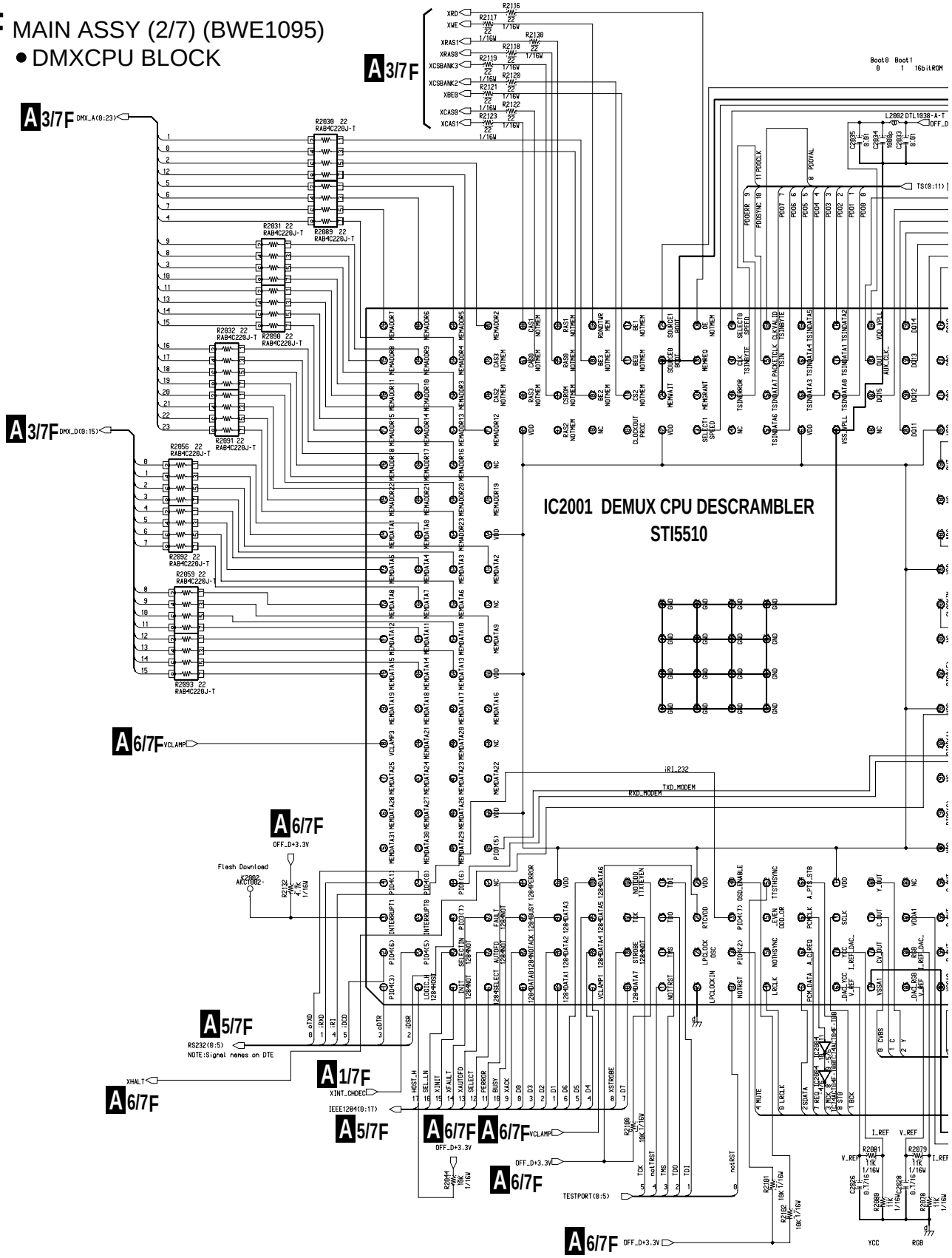


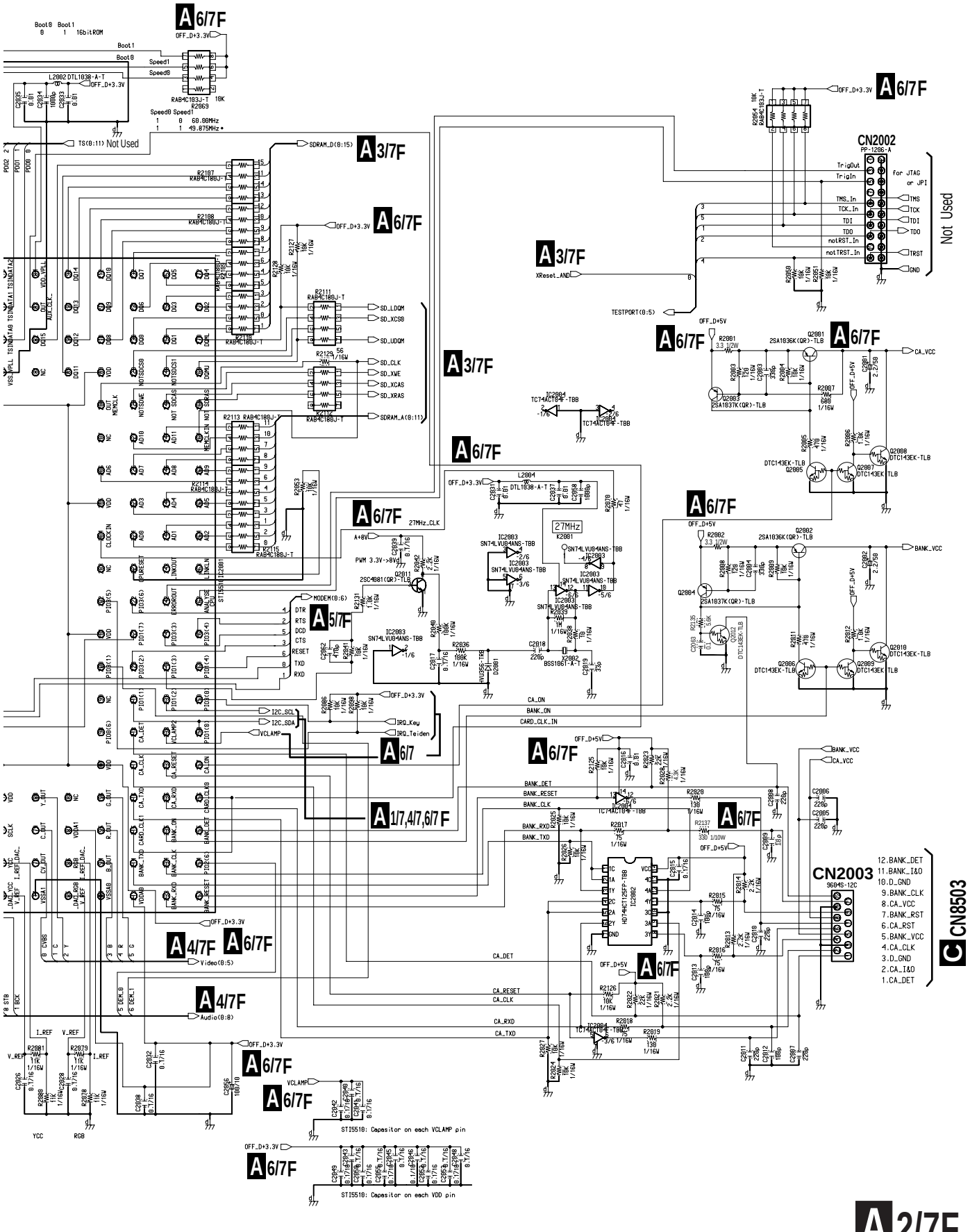

M1001 BXF1108
DIGITAL TUNER MODULE
PRESET
INT
P0
P1
D22
RSLOCK
SCL(QPSK)
SDA(QPSK)
+3.3V
N/C
PDOSYNC
PDOERR
PDOVAL
PDO7
PDO6
PDO5
PDO4
PDO3
PDO2
PDO1
PDO0
PDOCLK
C1005
0.01
C1009
100/10
OFF_D+3.3V
A6/7F
R1009
2.2K
1/16W
I2C SDA
I2C SCL
INT
RESET
TS(0:11) Not Used
I2C_SDA
I2C_SCL
XINT_CHDEC
RESET_3.3V
<CAN4_DMYCPU>
A2/7F
CN1002
KM200SA13
GND
PDOSYNC
PDOERR
PDOVAL
PDO7
PDO6
PDO5
PDO4
PDO3
PDO2
PDO1
PDO0
PDOCLK
Not Used
CN1001
KM200SA4
GND
PDO7(DATA)
PDO5(CLOCK)
GND
Not Used
22kHz
A+5V
A6/7F
Q1005
R1011
10K
1/16W
D1010
1SS355-TRB
R1010
4.7K
1/16W
Q1004
DTC124EUA-TLB
Q1014
DTA124EK-TLB
<CAN4_SUBCPU>
LNB_POW0
LNB_POW0(LNB ON/OFF)
A6/7F
<CAN4_SUBCPU>
LNB_POW1
(LNB H/V)
A6/7F
22kHz
LNB_POW0 { Low: LNB OFF(External) / High: LNB ON (Internal)
LNB_POW1 { Low: LNB V(13V) / High: LNB H(18V)

2.3 MAIN ASSY (2/7)

A 2/7F MAIN ASSY (2/7) (BWE1095)

- DMXCPU BLOCK

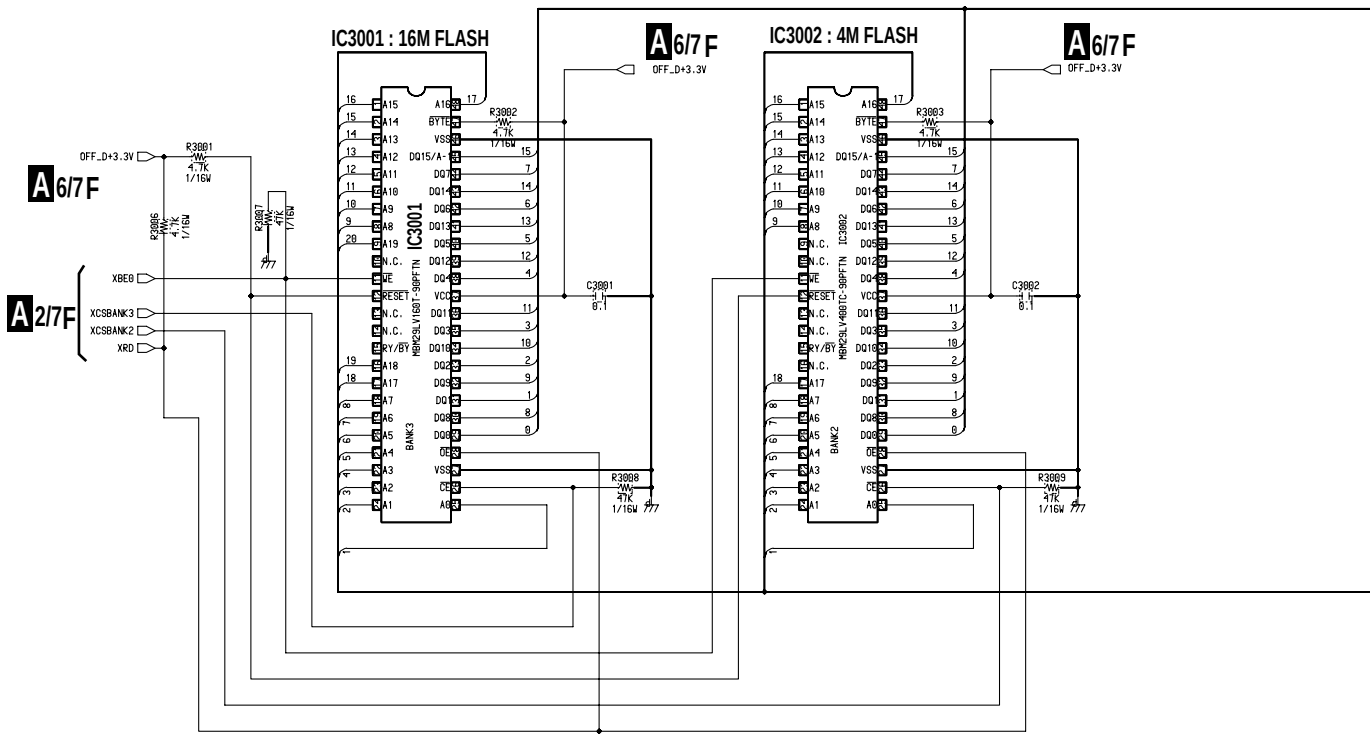


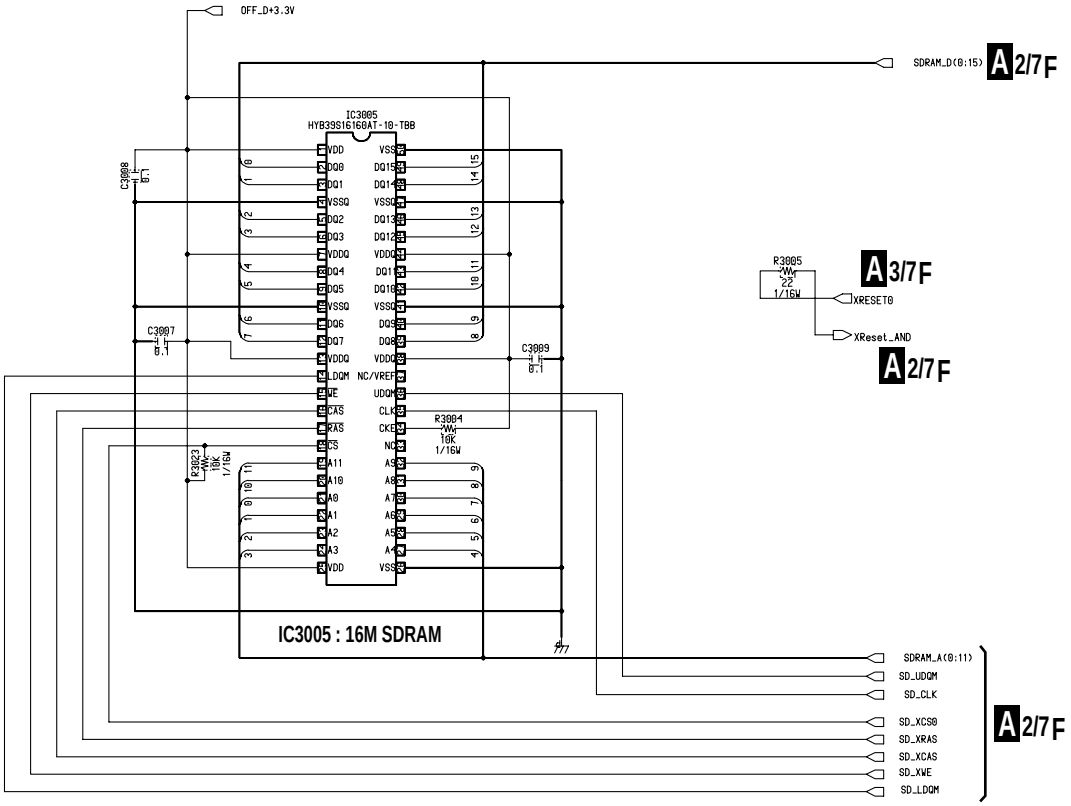

A 6/7F
A 3/7F
A 5/7F
A 6/7
A 1/7,4/7,6/7F
A 4/7F
A 2/7F
CN2002
CN2003
CN8503
Not Used
SDRAM_D(0:15)
SDRAM_A(0:11)
MODEM(0:6)
Video(0:5)
Audio(0:8)
TS(0:11)
TESTPORT(0:5)
CA_VCC
BANK_VCC
27MHz
STI5510: Capasitor on each VCLAMP pin
STI5510: Capasitor on each VDD pin

2.4 MAIN ASSY (3/7)

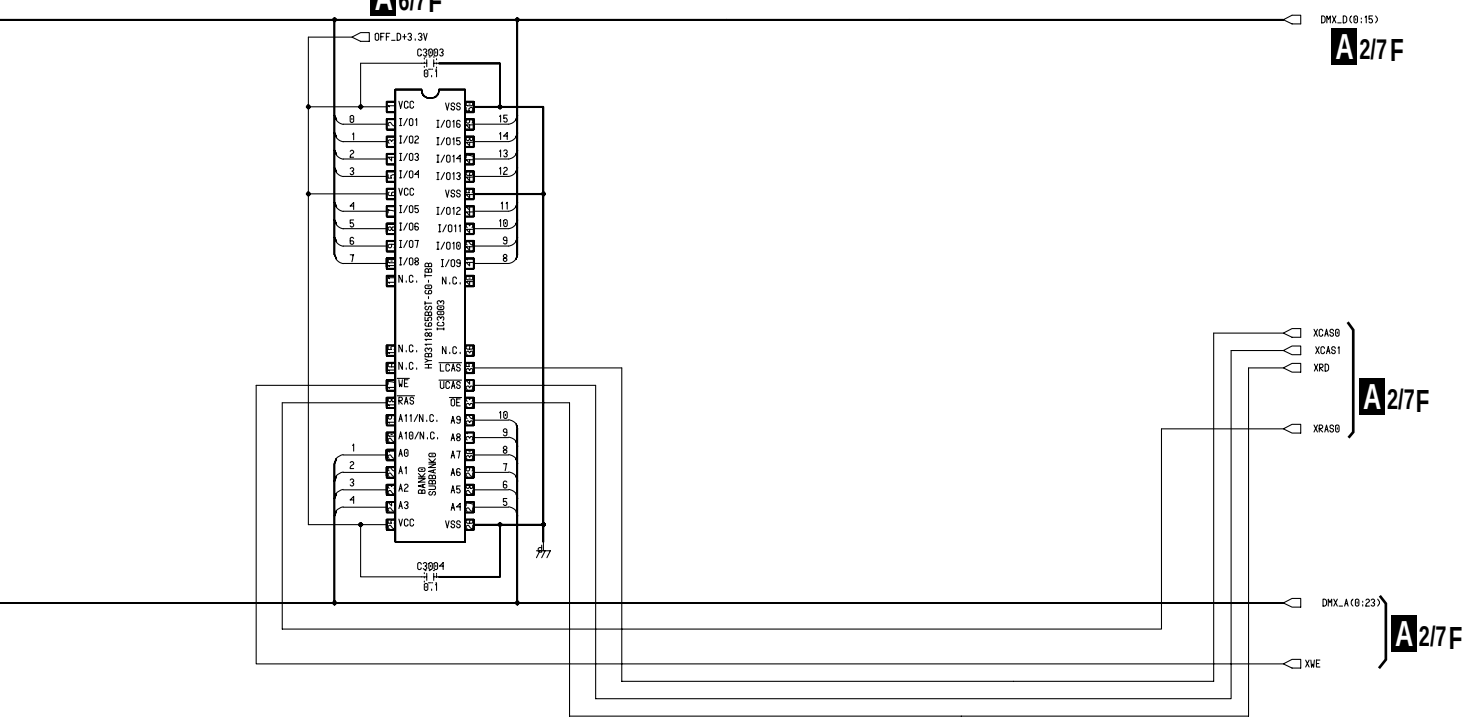
A 3/7F MAIN ASSY (3/7) (BWE1095)

- MEMORY BLOCK





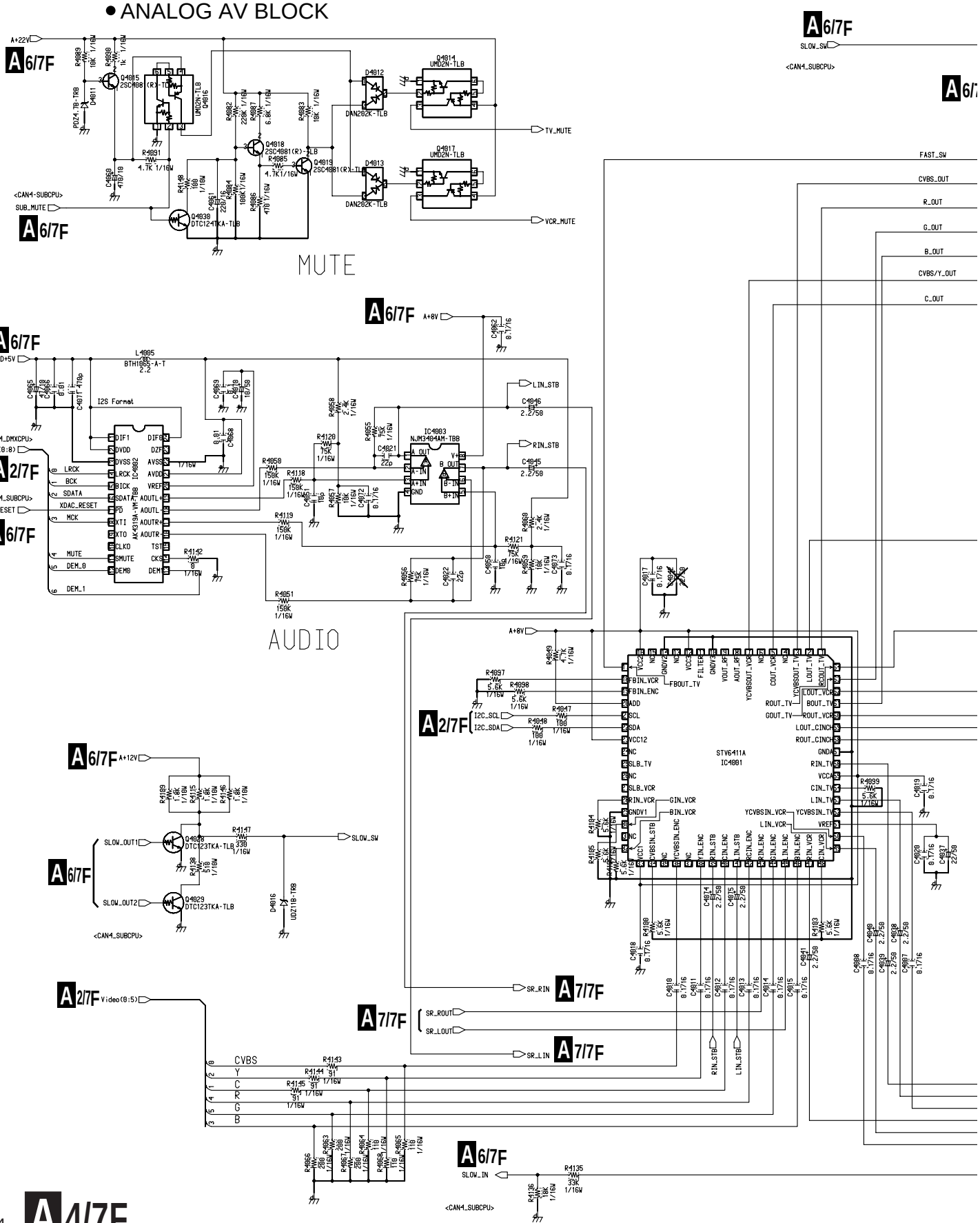
IC3003 : 16M DRAM

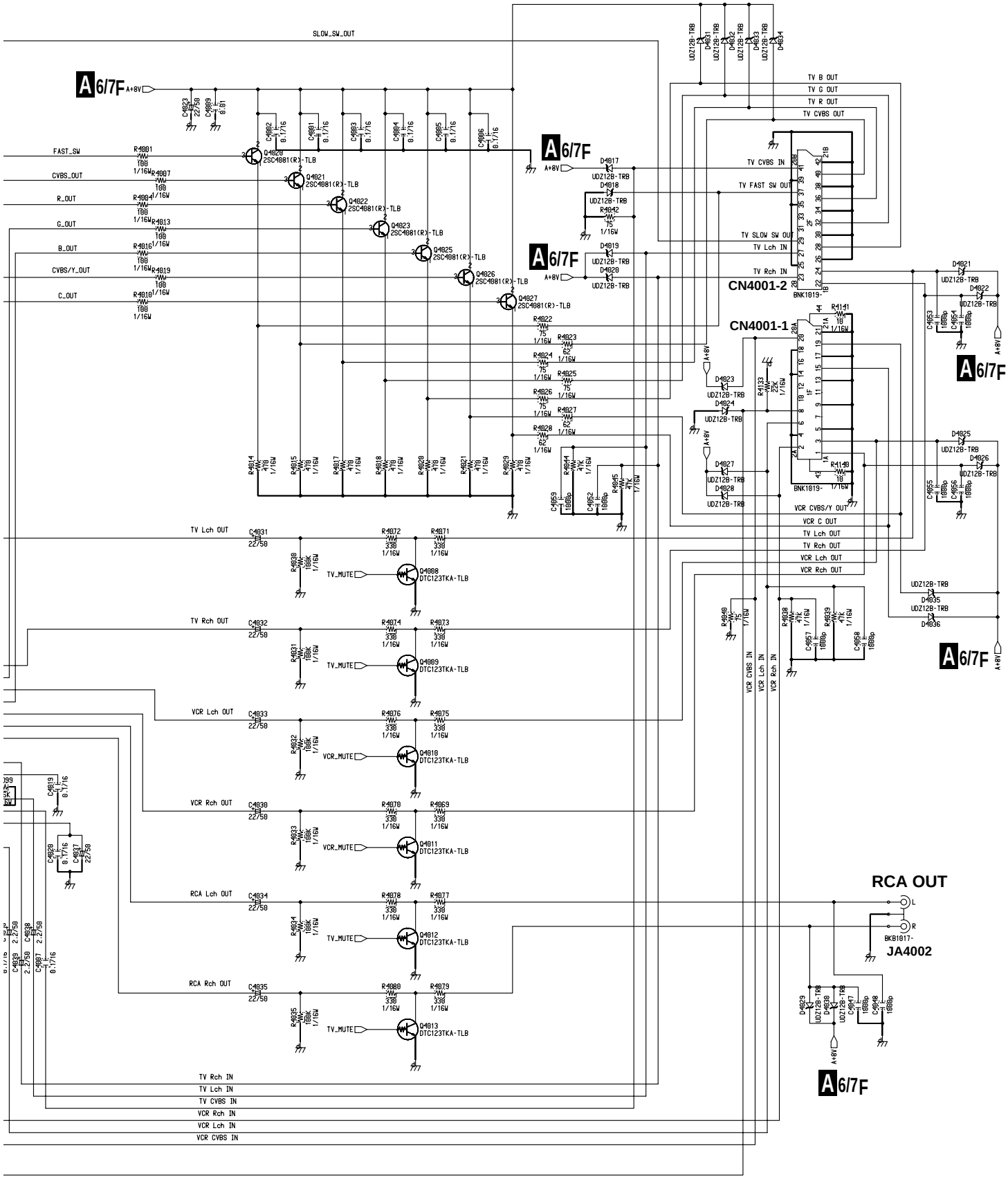


2.5 MAIN ASSY (4/7)

A 4/7F MAIN ASSY (4/7) (BWE1095)

- ANALOG AV BLOCK

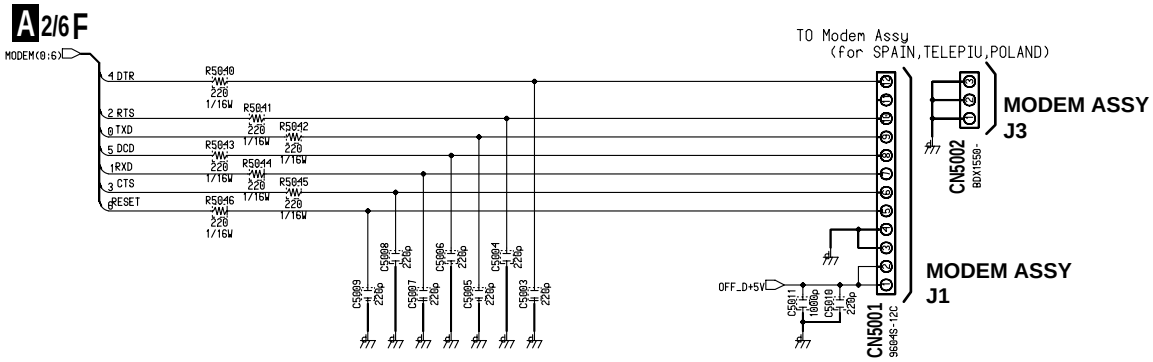


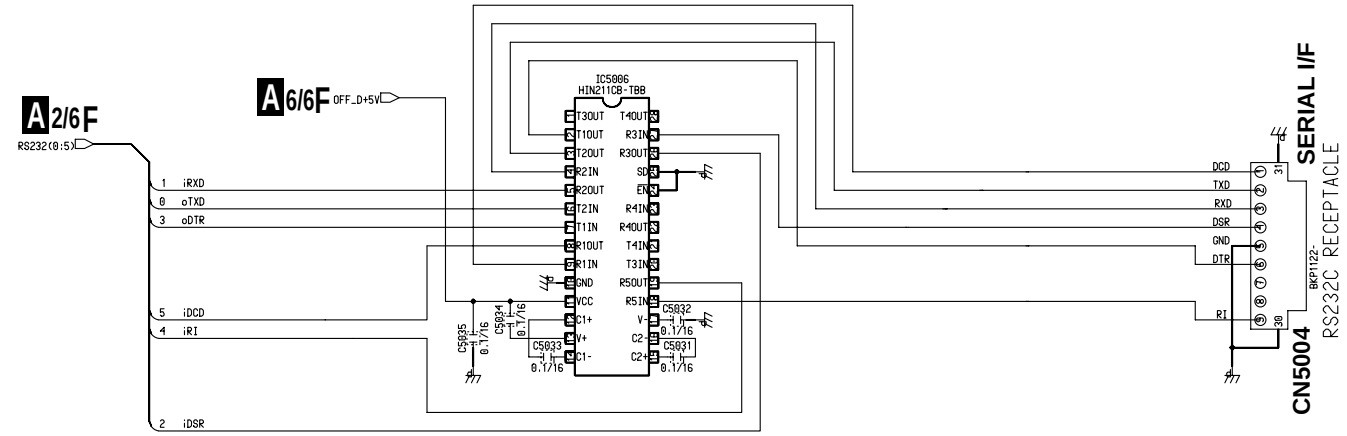

SLOW_SW_OUT
A6/7F
A+8V
FAST_SW
CVBS_OUT
R_OUT
G_OUT
B_OUT
CVBS/Y_OUT
C_OUT
Q4020 2SC4081(R)-TLB
Q4021 2SC4081(R)-TLB
Q4022 2SC4081(R)-TLB
Q4023 2SC4081(R)-TLB
Q4025 2SC4081(R)-TLB
Q4026 2SC4081(R)-TLB
Q4027 2SC4081(R)-TLB
TV B OUT
TV G OUT
TV R OUT
TV CVBS OUT
TV CVBS IN
TV FAST SW OUT
TV SLOW SW OUT
TV Lch IN
TV Rch IN
CN4001-2
CN4001-1
BNK1019-
VCR CVBS/Y OUT
VCR C OUT
TV Lch OUT
TV Rch OUT
VCR Lch OUT
VCR Rch OUT
TV_MUTE
VCR_MUTE
RCA OUT
BKB1017-
JA4002
VCR CVBS IN
VCR Lch IN
VCR Rch IN

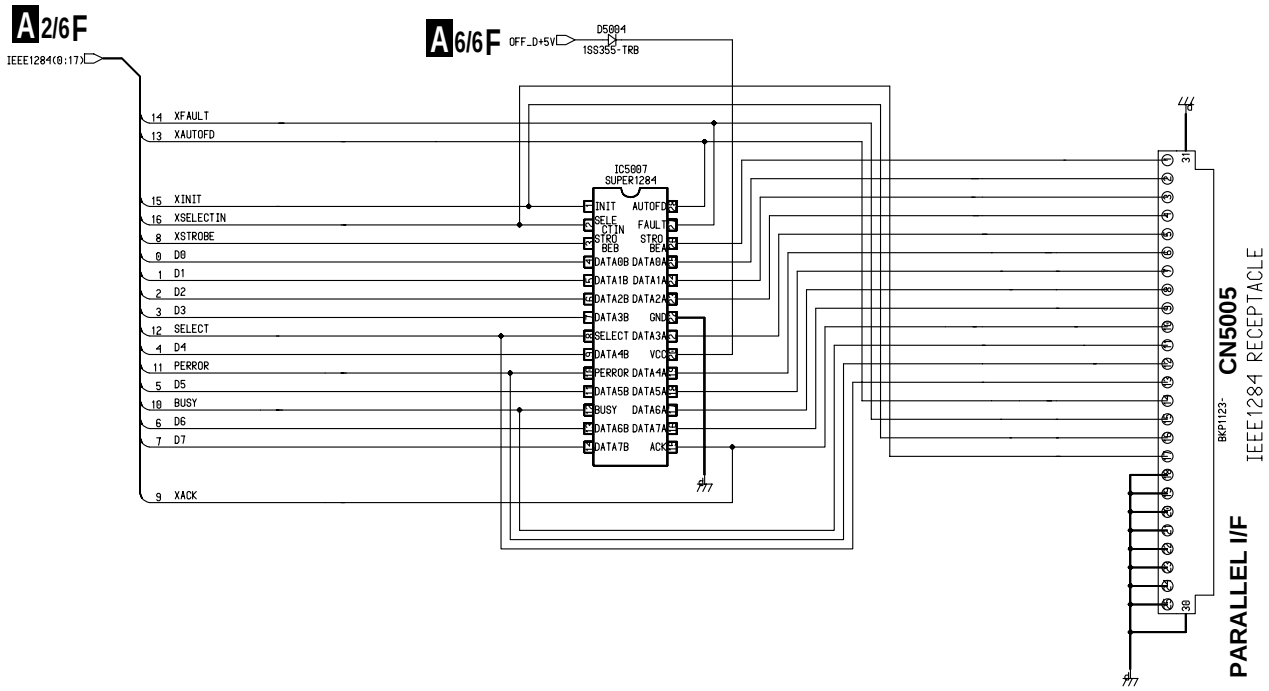
2.6 MAIN ASSY (5/7)

A 5/7F MAIN ASSY (5/7) (BWE1095)

- I/O MODEM BLOCK



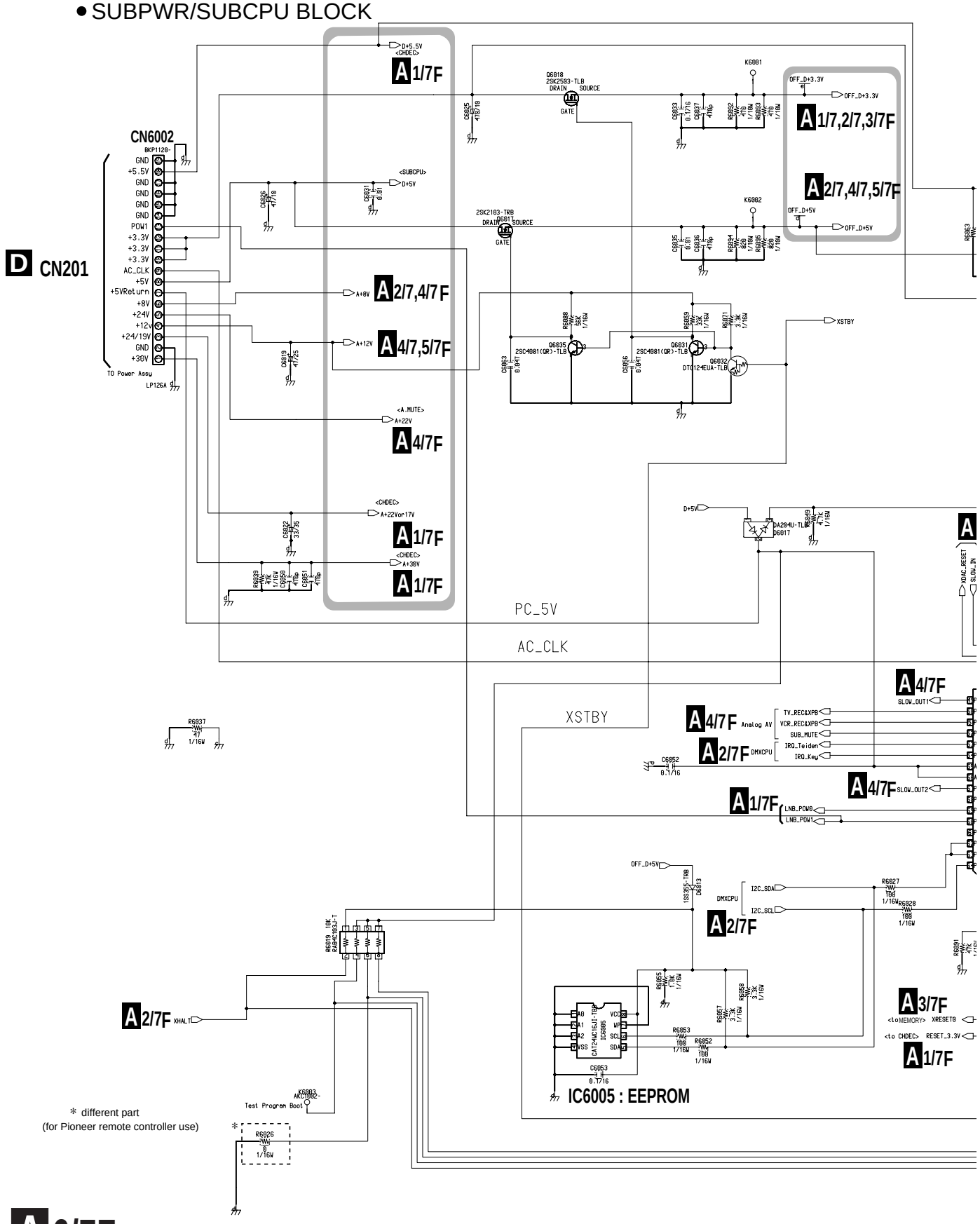

A2/6F
RS232(0:5)
A6/6F OFF_D+5V
IC5006
HIN211CB-TBB
1 iRXD
0 oTXD
3 oDTR
5 iDCD
4 iRI
2 iDSR
C5035 0.1/16
C5034 0.1/16
C5033 0.1/16
C5032 0.1/16
C5031 0.1/16
DCD
TXD
RXD
DSR
GND
DTR
RI
SERIAL I/F
CN5004
RS232C RECEPTACLE
BKP1122-


A2/6F
IEEE1284(0:17)
A6/6F OFF_D+5V
D5004
1SS355-TRB
IC5007
SUPER1284
14 XFAULT
13 XAUTOFD
15 XINIT
16 XSELECTIN
8 XSTROBE
0 D0
1 D1
2 D2
3 D3
12 SELECT
4 D4
11 PERROR
5 D5
10 BUSY
6 D6
7 D7
9 XACK
CN5005
IEEE1284 RECEPTACLE
PARALLEL I/F
BKP1123-

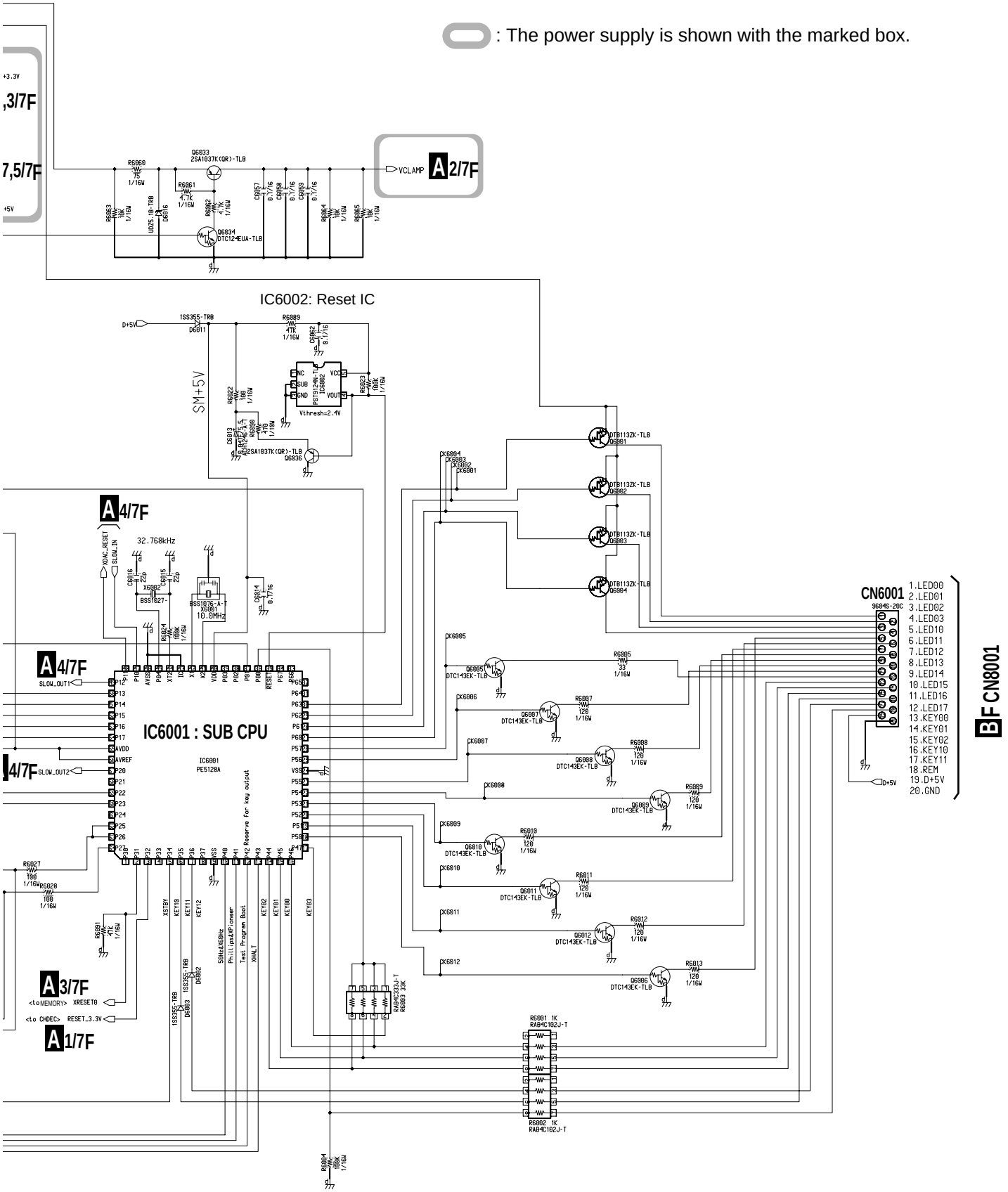
2.7 MAIN ASSY (6/7)

A 6/7F MAIN ASSY (6/7) (BWE1095)

- SUBPWR/SUBCPU BLOCK



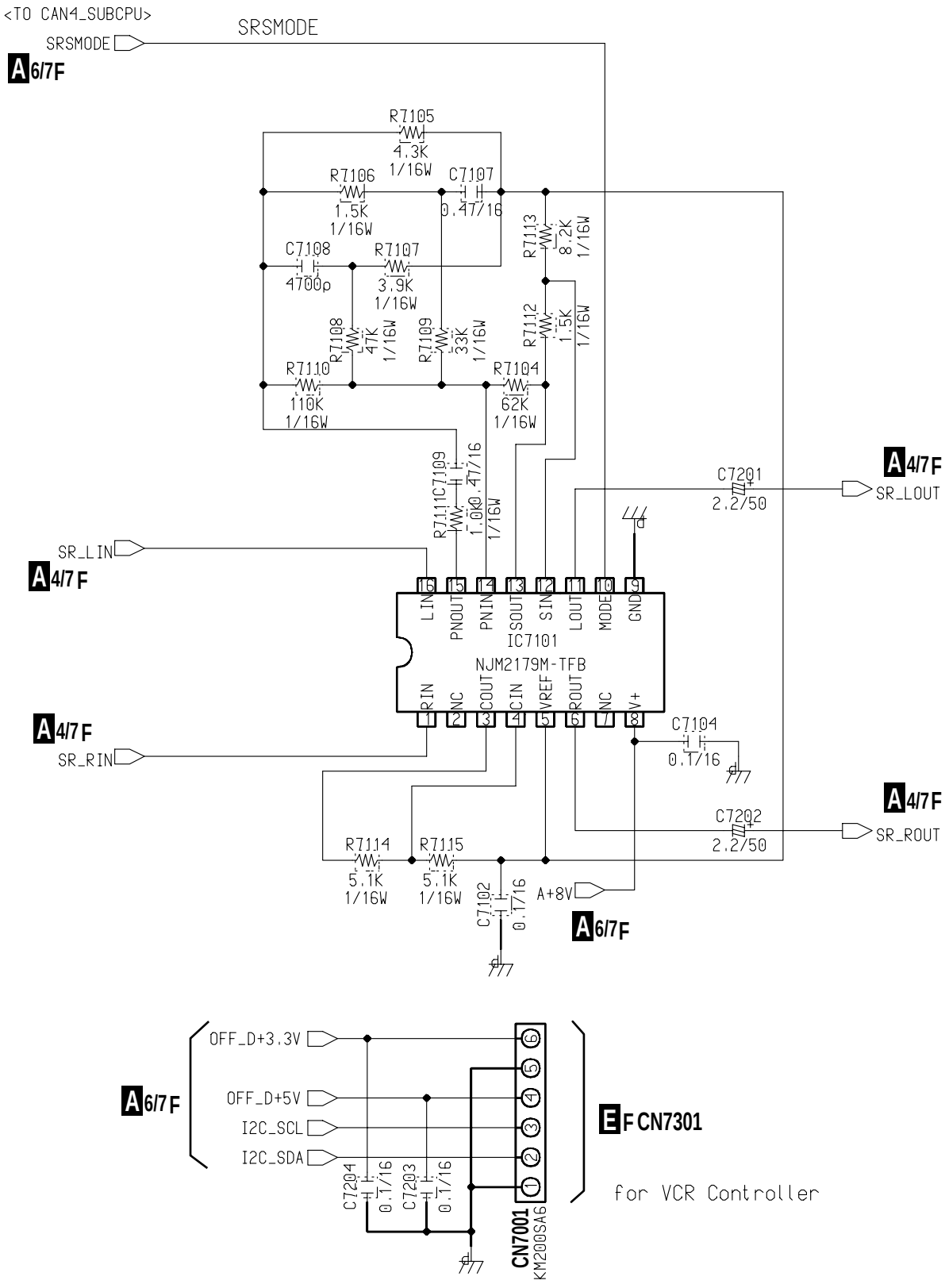
: The power supply is shown with the marked box.



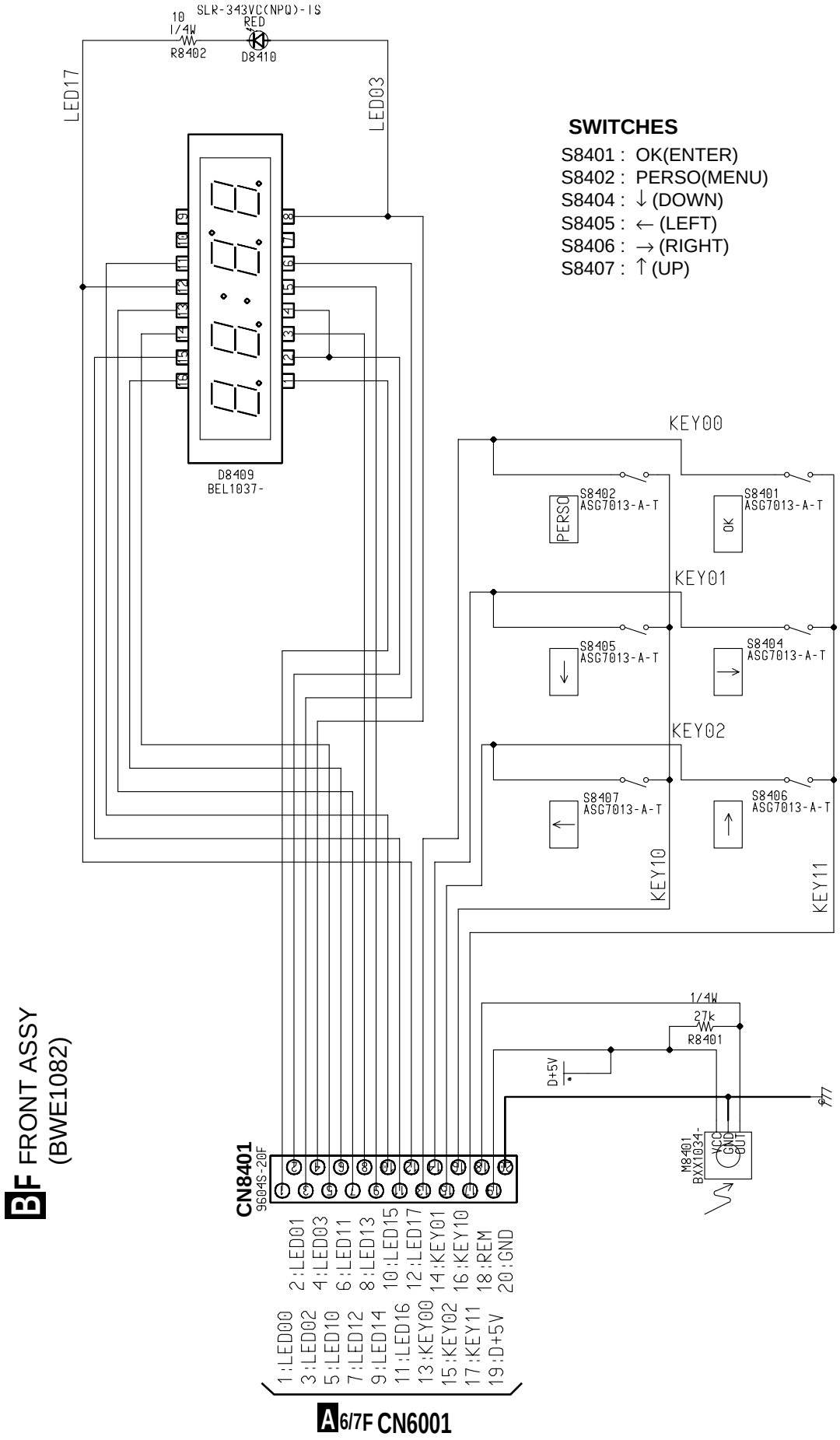
2.8 MAIN ASSY (7/7)

A 7/7F MAIN ASSY (7/7) (BWE1095)

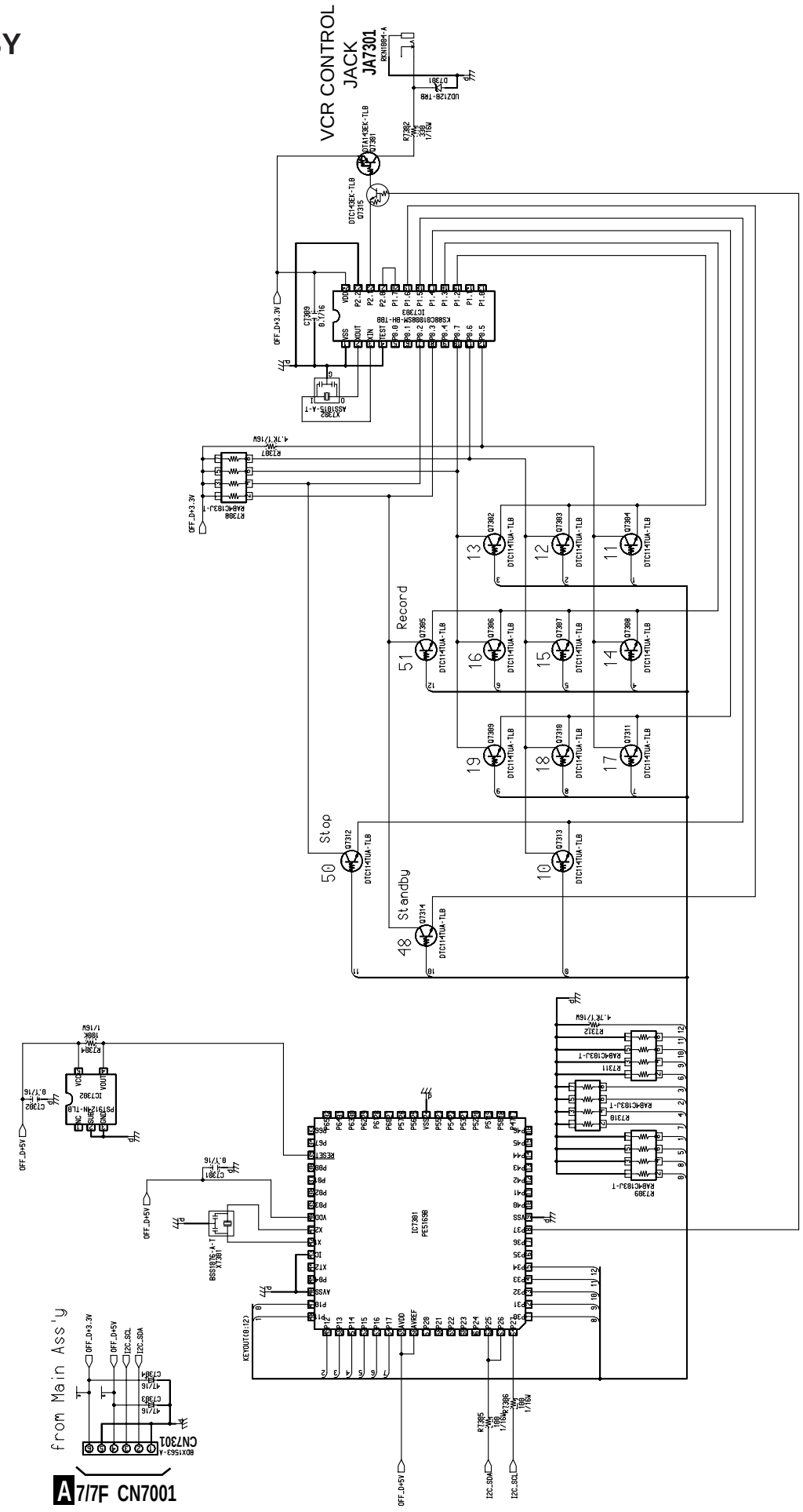
- SRS AUDIO BLOCK



2.9 FRONT ASSY



2.10 VCR ASSY



VCR ASSY (BWE1088)

3. PCB CONNECTION DIAGRAM

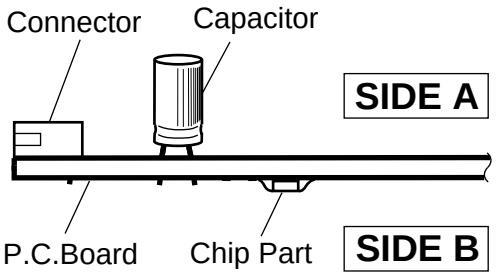
3.1 FRONT ASSY

NOTE FOR PCB DIAGRAMS :

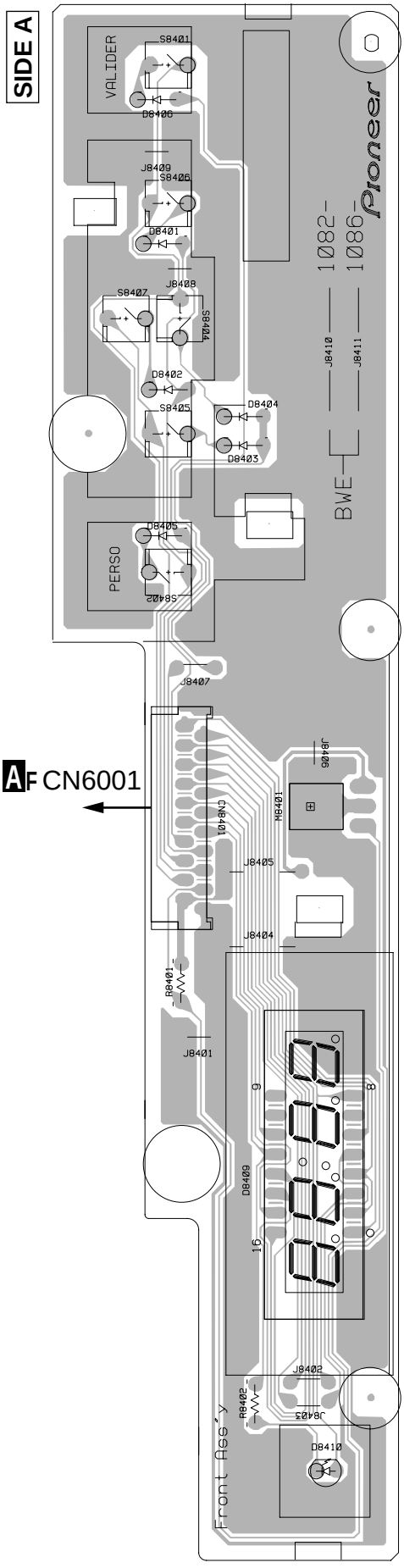
1. Part numbers in PCB diagrams match those in the schematic diagrams.
2. A comparison between the main parts of PCB and schematic diagrams is shown below.

Symbol In PCB Diagrams	Symbol In Schematic Diagrams	Part Name
B C E	B C E B C E	Transistor
B C E	B C E B C E	Transistor with resistor
D G S	D G S D G S	Field effect transistor
		Resistor array
		3-terminal regulator

3. The parts mounted on this PCB include all necessary parts for several destinations.
   For further information for respective destinations, be sure to check with the schematic diagram.
4. View point of PCB diagrams.



BF FRONT ASSY



AF CN6001

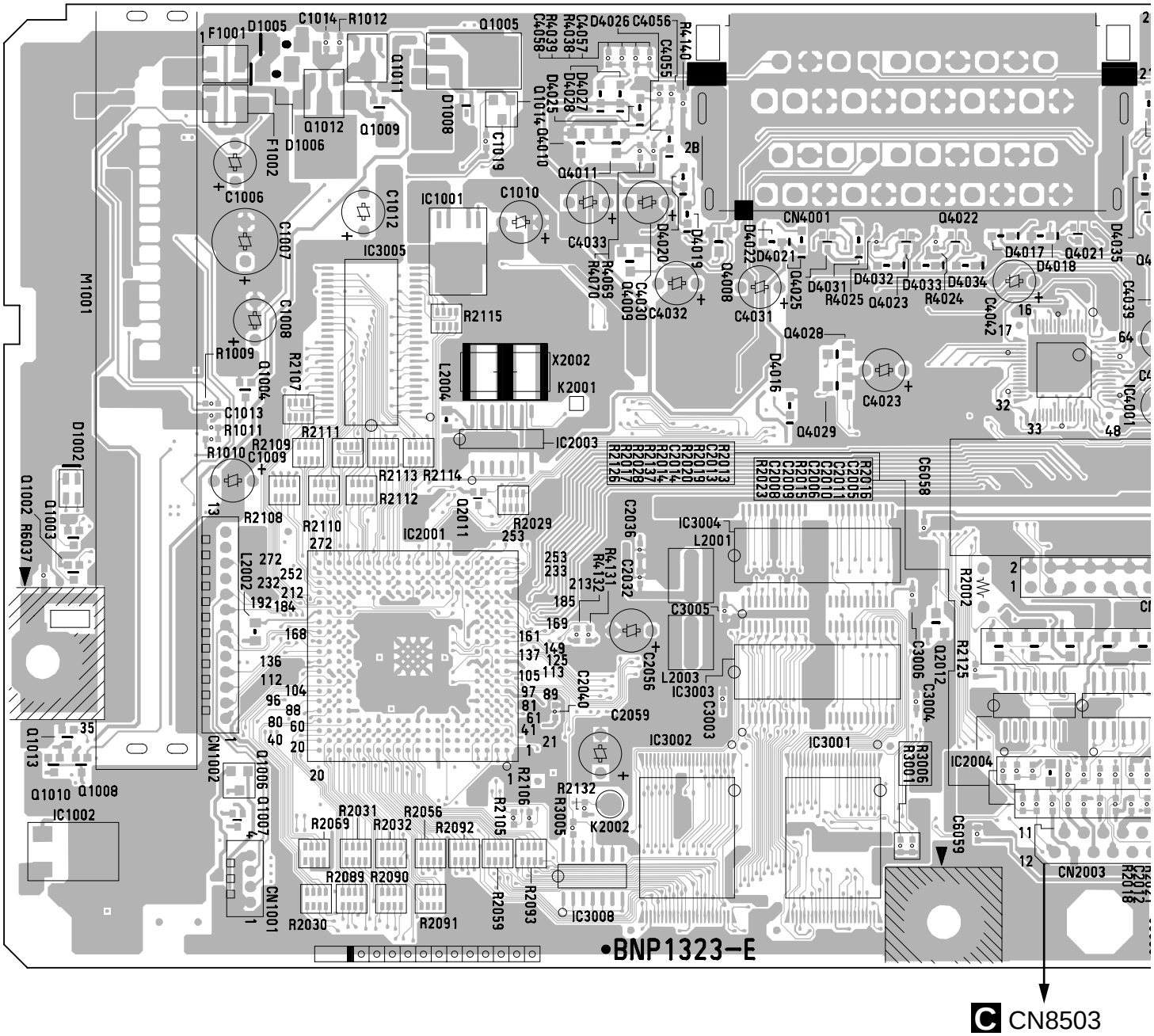
BNP1336-D

3.2 MAIN ASSY

AF MAIN ASSY

TUNER MODULE

VCR SCART
TV SCART



Q1012 Q1011 Q1009 Q1005 Q1014 Q4010 Q4011
IC3005 IC1011 Q4009 Q4008 Q4025 Q4022 Q4021 Q40
Q1003 Q1002 Q1004 Q2011 IC2003 IC3004 Q4028 Q4029 IC4001

Q2006 Q2009 Q2004 Q2002 Q2
Q1010 Q1013 Q1008 Q1006 Q1007 IC2001 IC3002 IC3003 IC3001 IC2004 IC2002
IC1002 IC3008

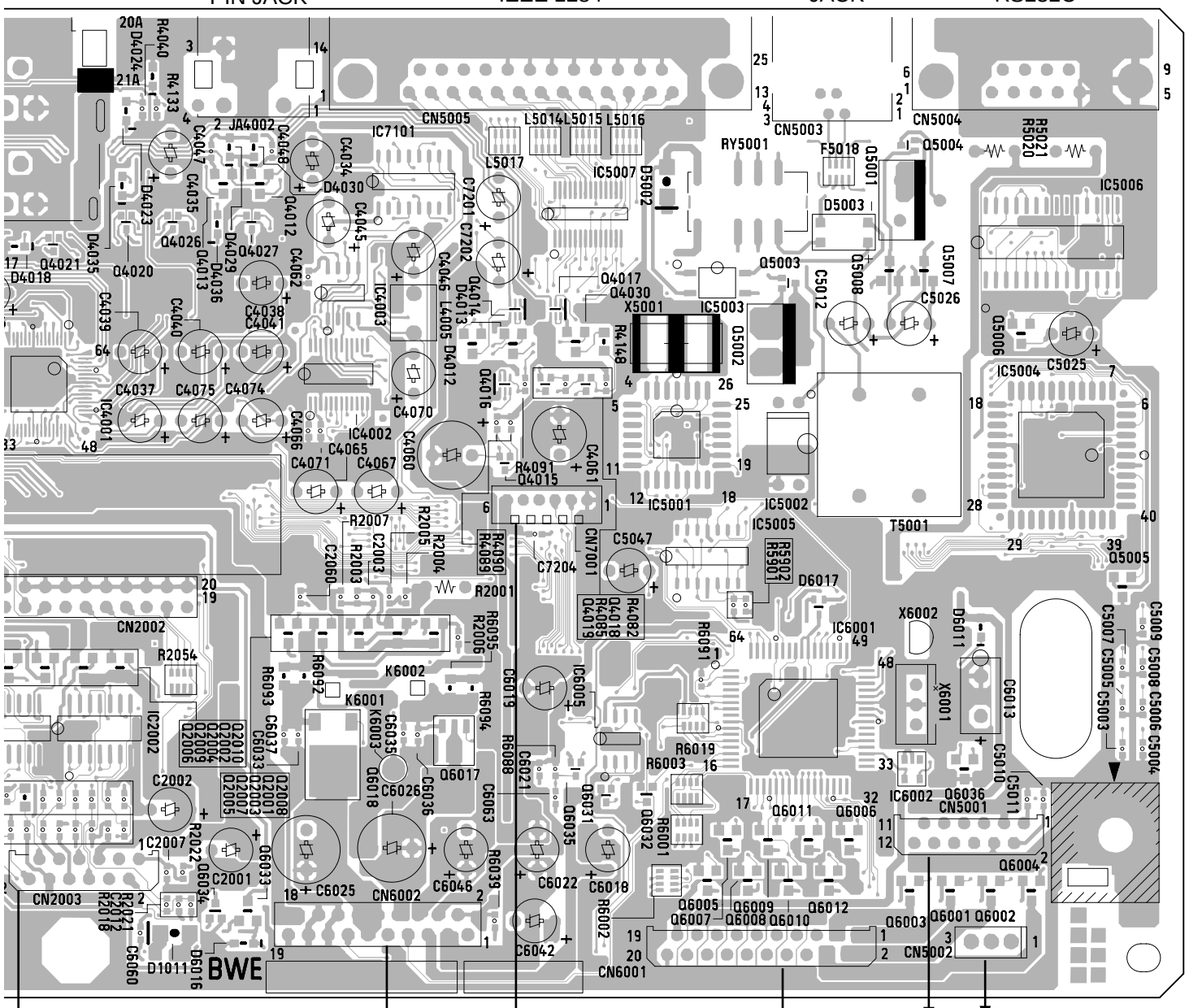
SIDE A

RCA PIN JACK

D-SUB 25PIN IEEE 1284

MODULAR JACK

D-SUB 9PIN RS232C



N8503

D CN201

EF CN7301

BF CN8001

J1 J3

MODEM ASSY

Q4013 Q4012 IC7101 IC5007 Q5001 Q5004

Q4021 Q4020 Q4026 Q4027 IC4003 Q4014 Q4017 IC5003 Q5002 Q5003 Q5008 Q5007 Q5006 IC5006

IC4001 IC4002 Q4016 Q4015 Q4019 Q4018 IC5001 IC5005 IC5002 IC5004 Q5005

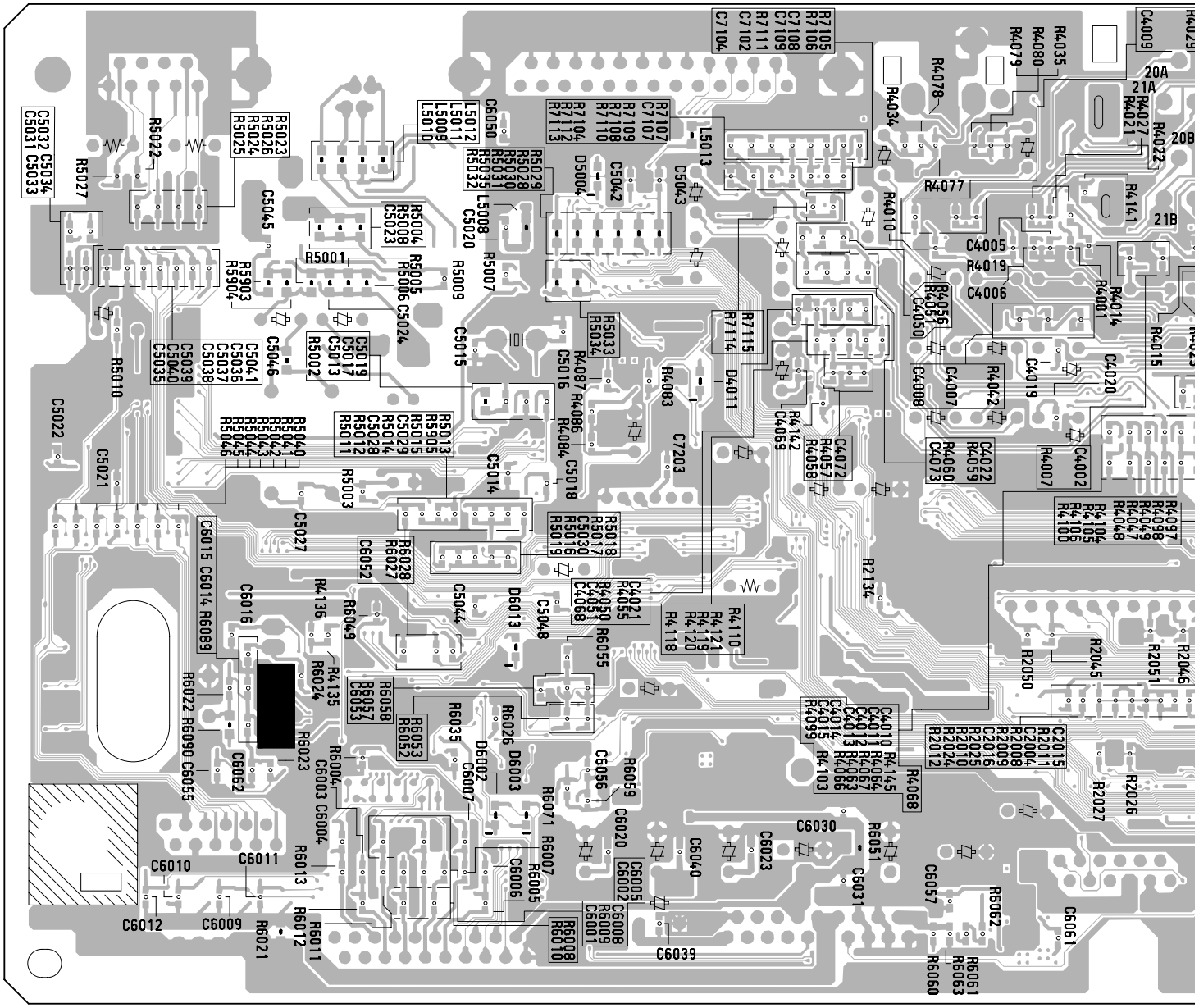
Q2005 Q2007 Q2003 Q2001 Q2008

2004 Q2002 Q2010

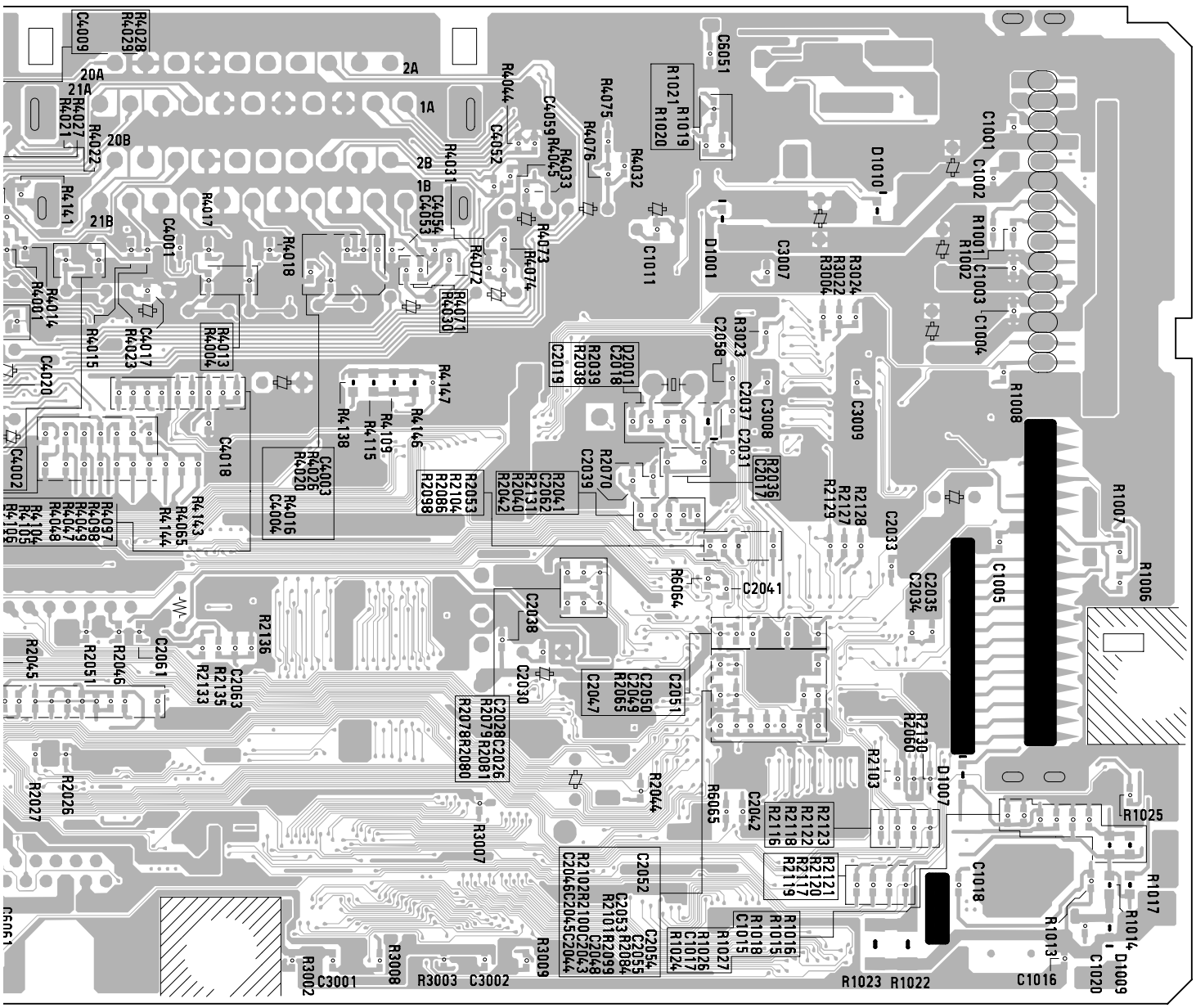
IC2002 Q6018 Q6017 IC6005 Q6007 Q6009 IC6001 Q6011 Q6006 IC6002 Q6036

Q6034 Q6033 Q6010 Q6012 Q6003 Q6001 Q6002 Q6004

AF MAIN ASSY


C5032 C5034 C5031 C5033
R5027
R5022
R5023 R5026 R5024 R5025
C5045
R5001
R5004 R5008 C5023
R5903 R5904
R5005 R5006 C5024
C5039 C5040 C5035
C5041 C5036 C5037 C5038
C5046
R5010
C5022
C5021
R5002
C5019 C5017 C5013
R5040 R5041 R5042 R5043 R5044 R5045 R5046
R5011
R5013 R5905 R5015 C5029 R5014 C5028 R5012
R5003
C5027
C6015 C6014 R6089
C6016
R4136
R6049
R6022 R6090 C6055
C6062
R6023
R6024
R4135
R6058 R6057 C6053
R6053 R6052
R6004
C6003 C6004
C6010
C6011
R6013
C6012
C6009
R6021
R6012
R6011
L5012 L5011 L5009 L5010
C6050
R5029 R5028 R5031 R5030 R5035 R5032
L5008
C5020
R5009
R5007
C5015
C5014
C5016
R4087 R4086 R4084
C5018
R5033 R5034
R5018 R5017 C5030 R5016 R5019
R6028 R6027
C6052
C5044
D6013
C5048
C4021 R4033 C4031 C4068 R4050
R6055
R6035
R6026 D6003
D6002
C6007
R6071
R6007
R6005
C6006
C6056
R6059
C6020
C6005 C6002 C6008 C6009 C6001
R6008 R6010
C6039
C6040
C6030
C6023
R6051
C6031
C6057
R6062
C6061
R6061 R6063 R6060
R2134
R4110 R4121 R4119 R4120 R4118
R7107 C7107 R7109 R7108 R7110
R7104 R7112 R7113
L5013
C5042
C5043
D5004
R7105 R7106 R7111 C7102 C7108 C7109 C7104
R4078
R4034
R4077
R4010
R4035 R4080 R4079
C4009
20A
21A
R4027 R4021
R4022
20B
R4141
21B
C4005
R4019
C4006
R4056 C4050
C4008
C4007
R4042
C4019
R4001
R4014
R4015
C4020
R4142 C4069
R7115 R7114 D4011
C7203
R4083
C4072 R4057 R4058
C4022 R4059
R4060 C4073
R4007
C4002
R4097 R4098 R4049 R4047 R4048 R4104 R4105 R4106 R4100
R2045
R2050
R2051
R2046
R2027
R2026
C4010 R4145 C4011 R4054 C4012 R4057 C4013 R4083 C4014 C4015 R4099 R4103
R4068
R4086
C2015 R2011 C2004 R2008 R2009 C2016 R2025 R2010 R2024 R2012

SIDE B

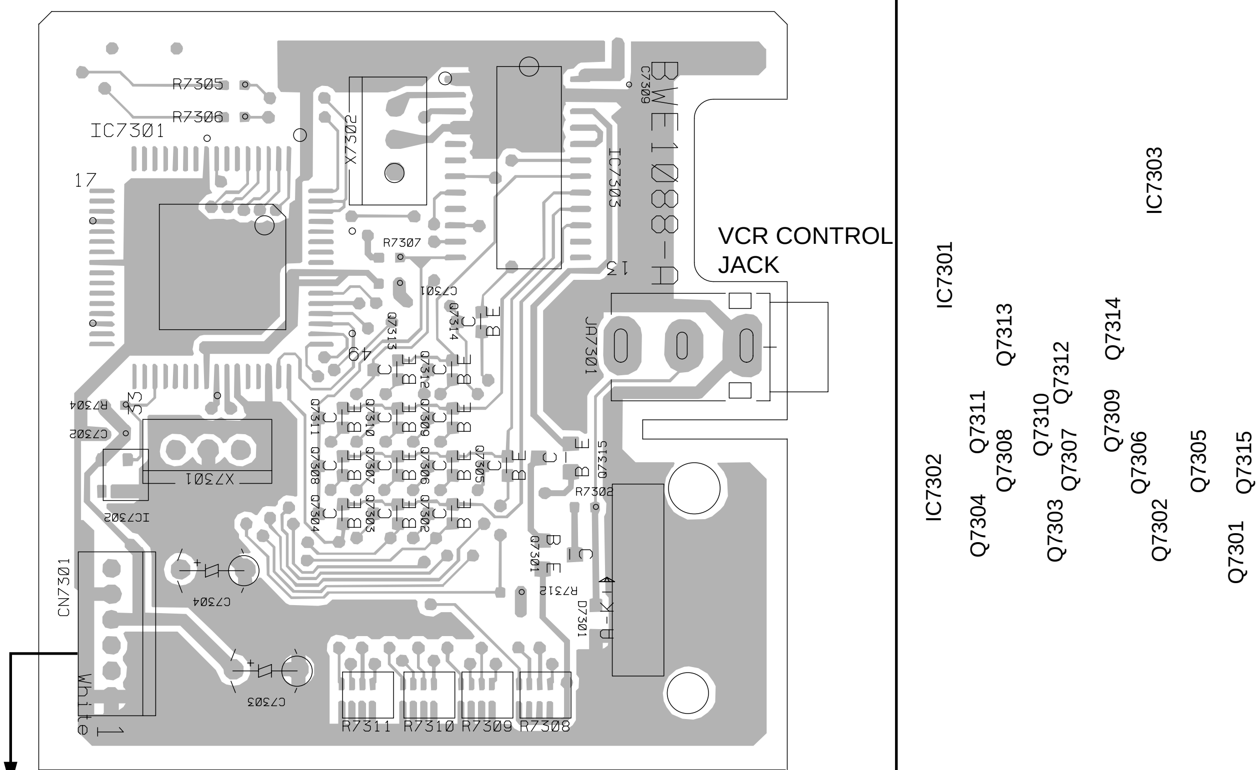


BNP1323-E

3.3 VCR ASSY

E F VCR ASSY

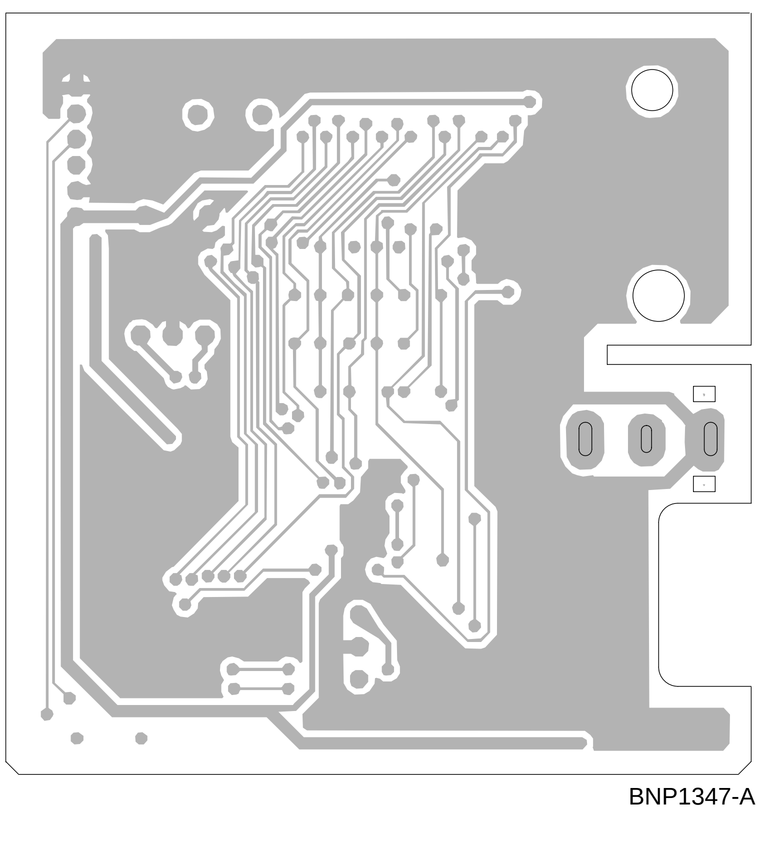
SIDE A



A F CN7001

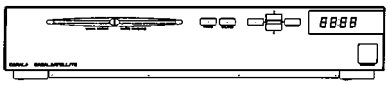
BNP1347-A

SIDE B



BNP1347-A

Service Manual



ORDER NO.
ARP3039

CANAL PLUS TUNER

TS4

THIS MANUAL IS APPLICABLE TO THE FOLLOWING MODEL(S) AND TYPE(S).

Type	Model	Power Requirement	Remarks
	TS4		
NYXK/FR	◯	AC230V	

CONTENTS

PIONEER CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153-8654, Japan
PIONEER ELECTRONICS SERVICE, INC. P.O. Box 1760, Long Beach, CA 90801-1760, U.S.A.
PIONEER ELECTRONIC (EUROPE) N.V. Haven 1087, Keetberglaan 1, 9120 Melsele, Belgium
PIONEER ELECTRONICS ASIACENTRE PTE. LTD. 253 Alexandra Road, #04-01, Singapore 159936

O- SZS AUG. 1999 Printed in Japan

1. SAFETY INFORMATION

This service manual is intended for qualified service technicians ; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.
Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.

WARNING
This product contains lead in solder and certain electrical parts contain chemicals which are known to the state of California to cause cancer, birth defects or other reproductive harm.

Health & Safety Code Section 25249.6 – Proposition 65

NOTICE
(FOR CANADIAN MODEL ONLY)
Fuse symbols (fast operating fuse) and/or (slow operating fuse) on PCB indicate that replacement parts must be of identical designation.

REMARQUE
(POUR MODÈLE CANADIEN SEULEMENT)
Les symboles de fusible (fusible de type rapide) et/ou (fusible de type lent) sur CCI indiquent que les pièces de remplacement doivent avoir la même désignation.

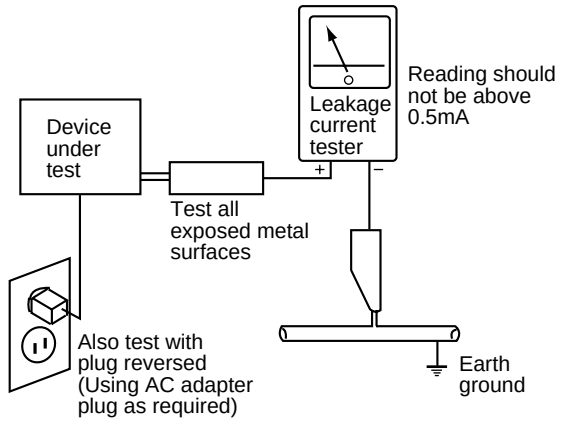
(FOR USA MODEL ONLY)

1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5mA.



AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a ⚠ on the schematics and on the parts list in this Service Manual.

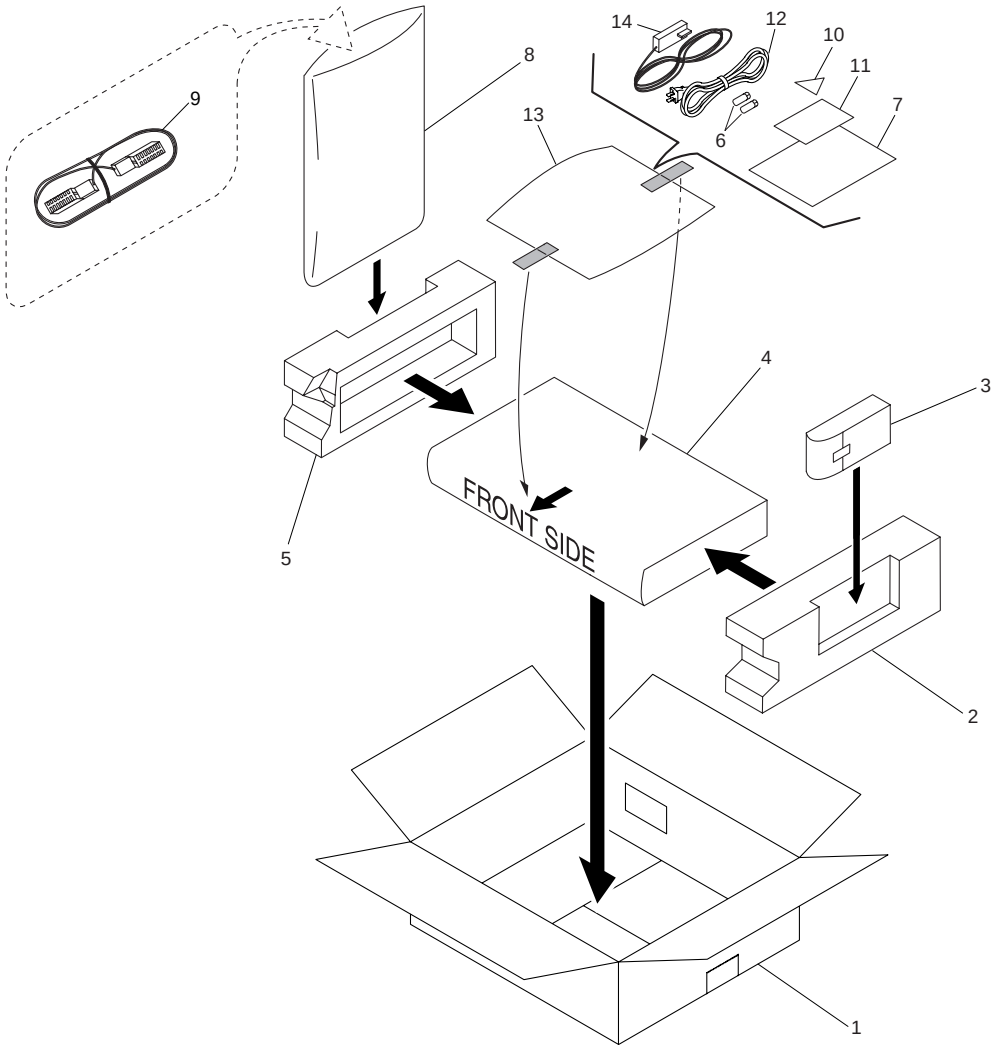
The use of a substitute replacement component which does not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

2. EXPLODED VIEWS AND PARTS LIST

NOTES: ●*Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.*
●*The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
●*Screws adjacent to ▼ mark on the product are used for disassembly.*

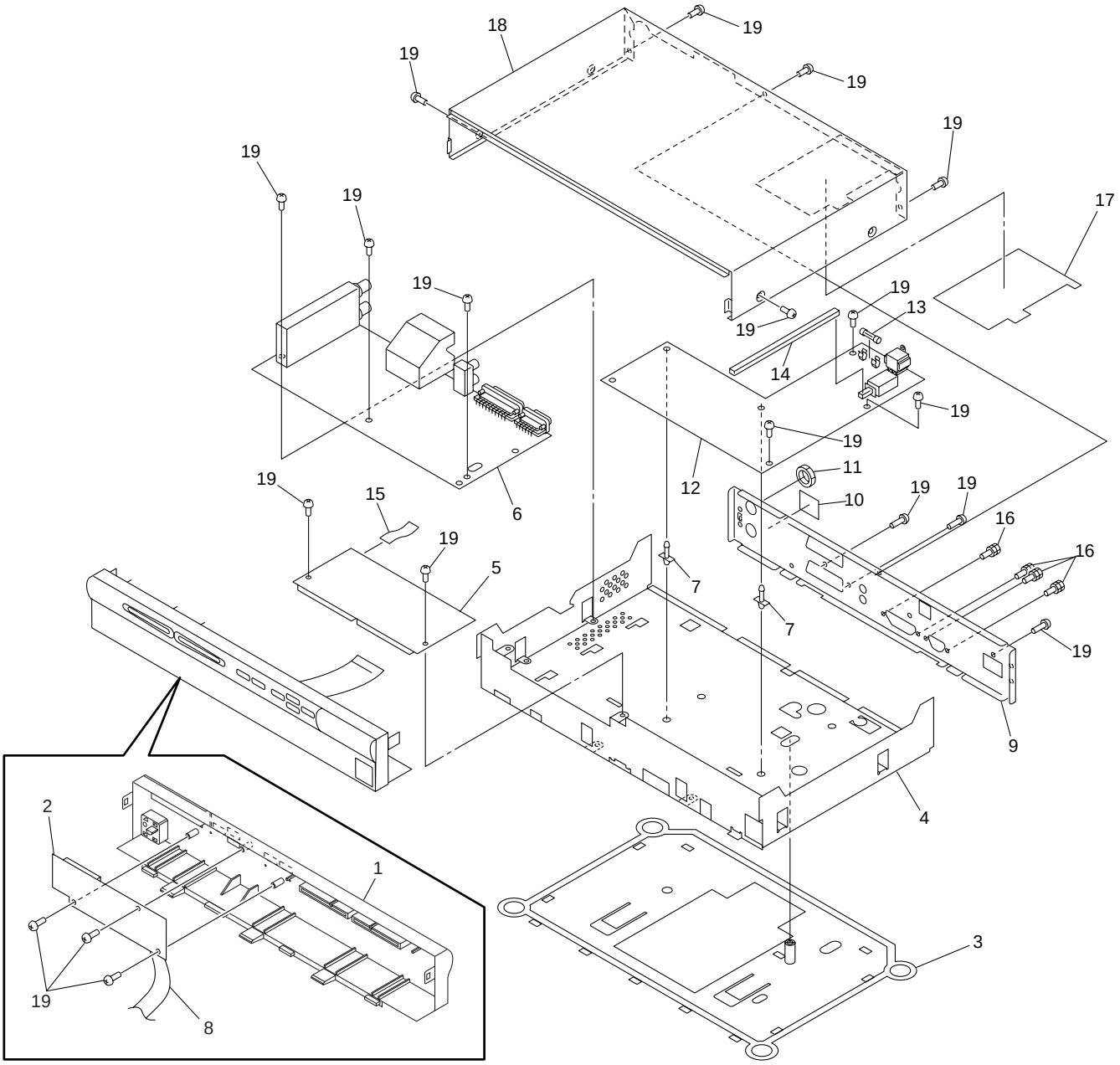
2.1 PACKING



• PACKING PARTS LIST

Mark	No.	Description	Part No.
	1	PACKING CASE(PAP)	BHD1369
	2	SIDE PAD R	BHA1147
	3	REMOTE CONTROL UNIT	BXD1010
	4	SHEET	AHG1153
	5	SIDE PAD L	BHA1146
NSP	6	BATTERY (R03) 2P	VEM1018
	7	INSTRUCTION MANUAL (French)	BRC1003
	8	POLYETHYLENE BAG	Z21-038
	9	SCART CABLE (1m:Black)	BDH1018
NSP	10	STICKER	BAX1271
	11	MODEM APPROVAL CARD	BRM1022
⚠	12	AC POWER CORD(2m:Black)	BDG1035
NSP	13	CATALOGUE BAG	BHG1047
	14	MODEM CABLE (10m:White)	BDH1014

2.2 EXTERIOR SECTION



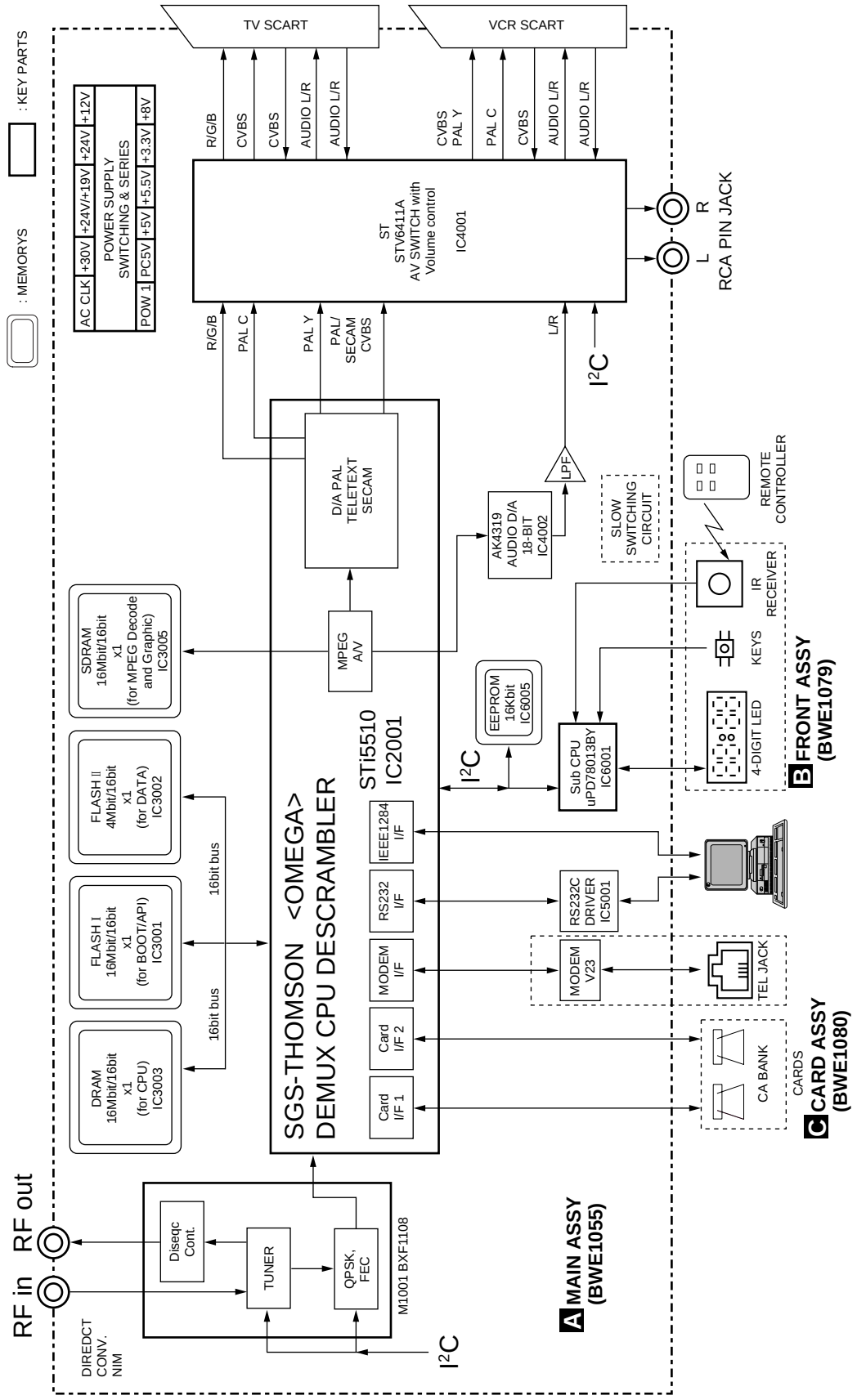
EXTERIOR PARTS LIST

Mark	No.	Description	Part No.
	1	FRONT PANEL ASSY	BMB1071
	2	FRONT ASSY	BWE1079
	3	PLASTIC BASE(PLS)	BMA1001
	4	CHASSIS(MET)	BNA1149
	5	CARD ASSY	BWE1080
	6	MAIN ASSY(FRANCE)	BWE1055
	7	PCB SUPPORT	AEC1215
	8	20P FFC(J1)	BDD1032
	9	REAR PANEL(MET)	BNC1137
	10	NAME LABEL(PAP)	BAL1366
	11	WASHER FACED NUT	BBN1005
	12	POWER ASSY	BXF1112
⚠	13	FUSE (F101: T2AH250V)	REK1101
	14	JOINT	BMR1133
	15	12P FFC(J2)	BDD1033
	16	HEXAGON HEADED SCREW	BBA1059
	17	BARRIER(PLS)	BEC1173
	18	BONNET CASE(MET)	BNE1090
	19	SCREW	BBZ30P080FZK

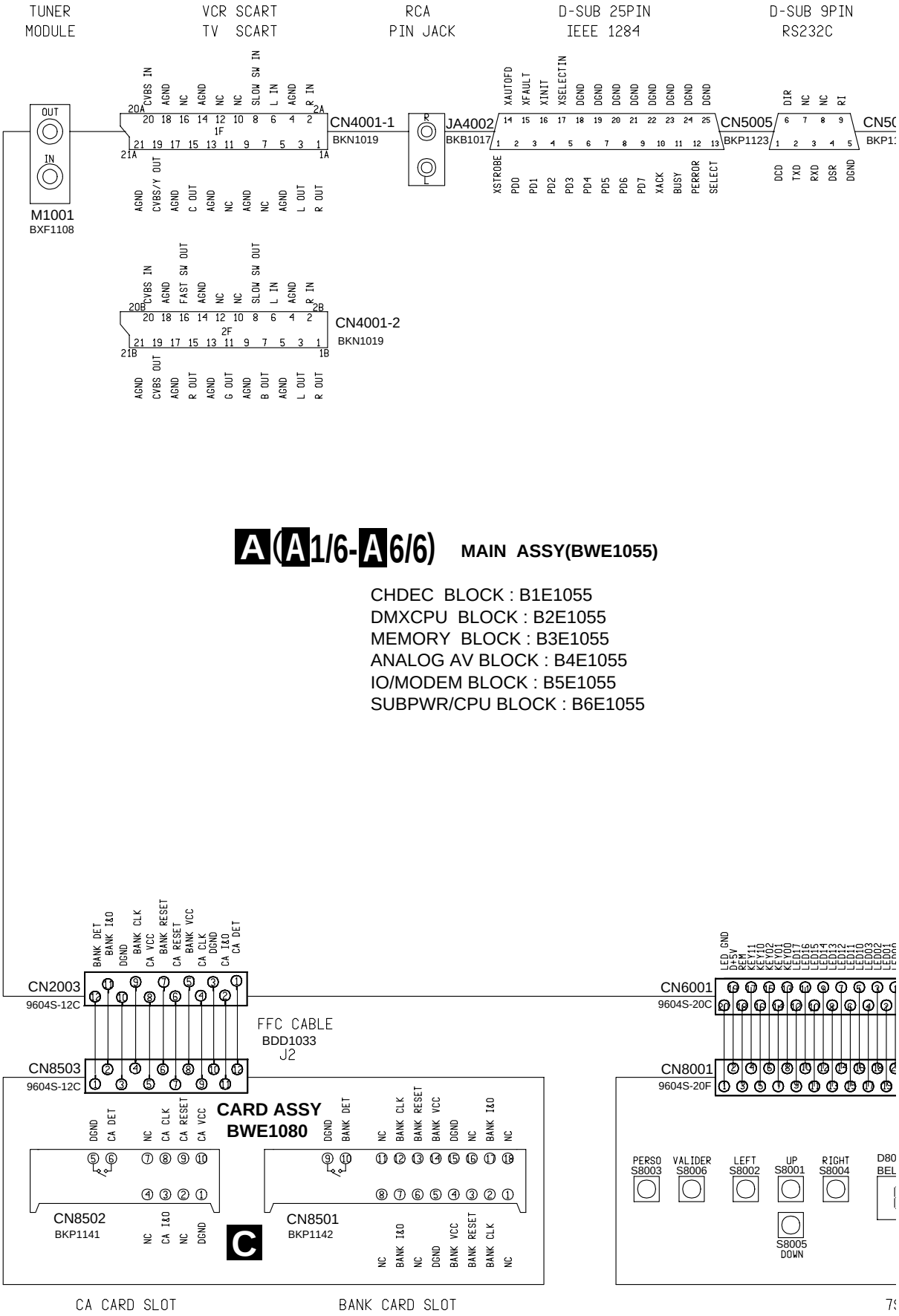
3. BLOCK DIAGRAM AND SCHEMATIC DIAGRAM

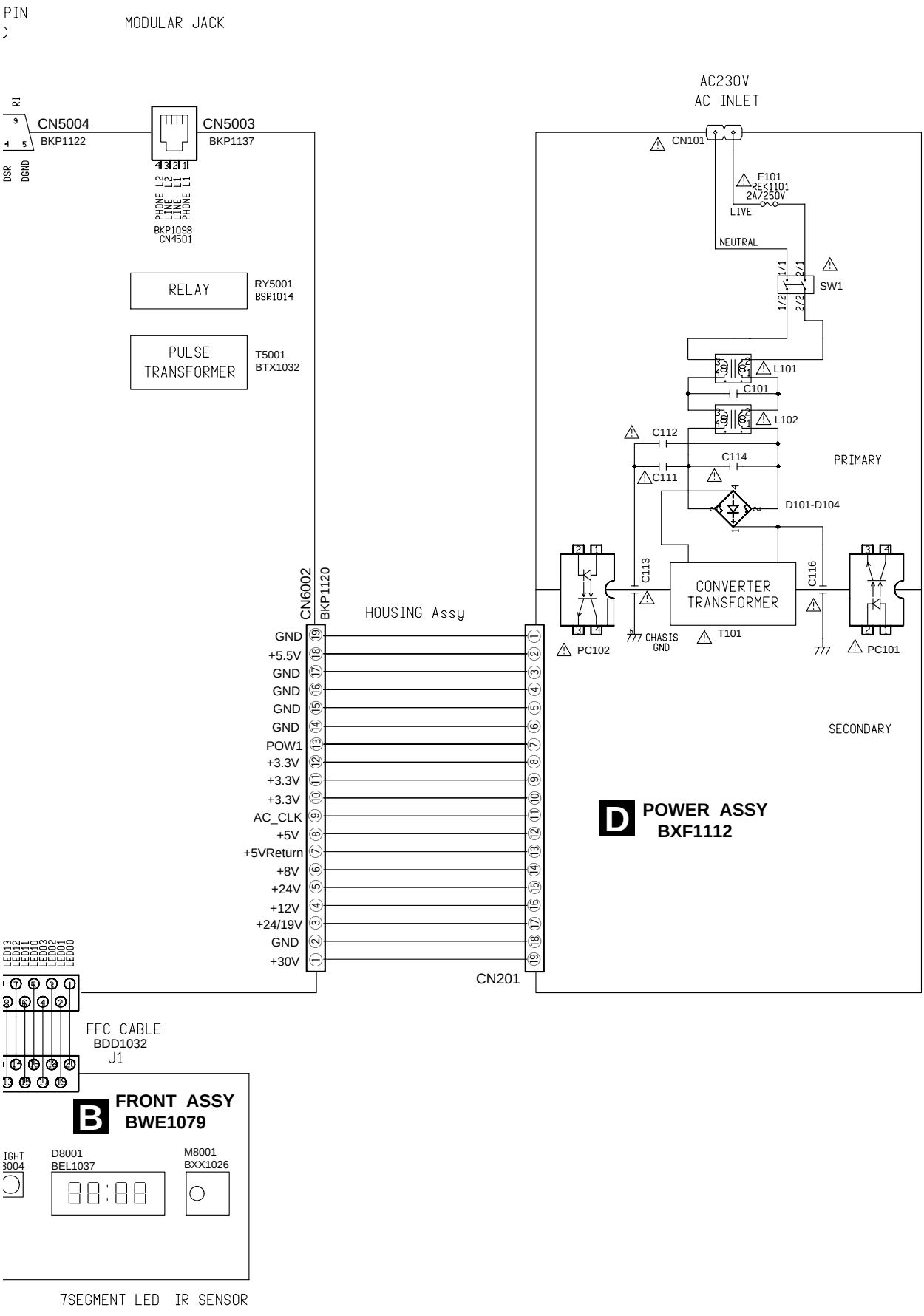
3.1 BLOCK DIAGRAM

Note : When ordering service parts, be sure to refer to "EXPLODED VIEWS and PARTS LIST" or "PCB PARTS LIST".



3.2 OVERALL CONNECTION DIAGRAM

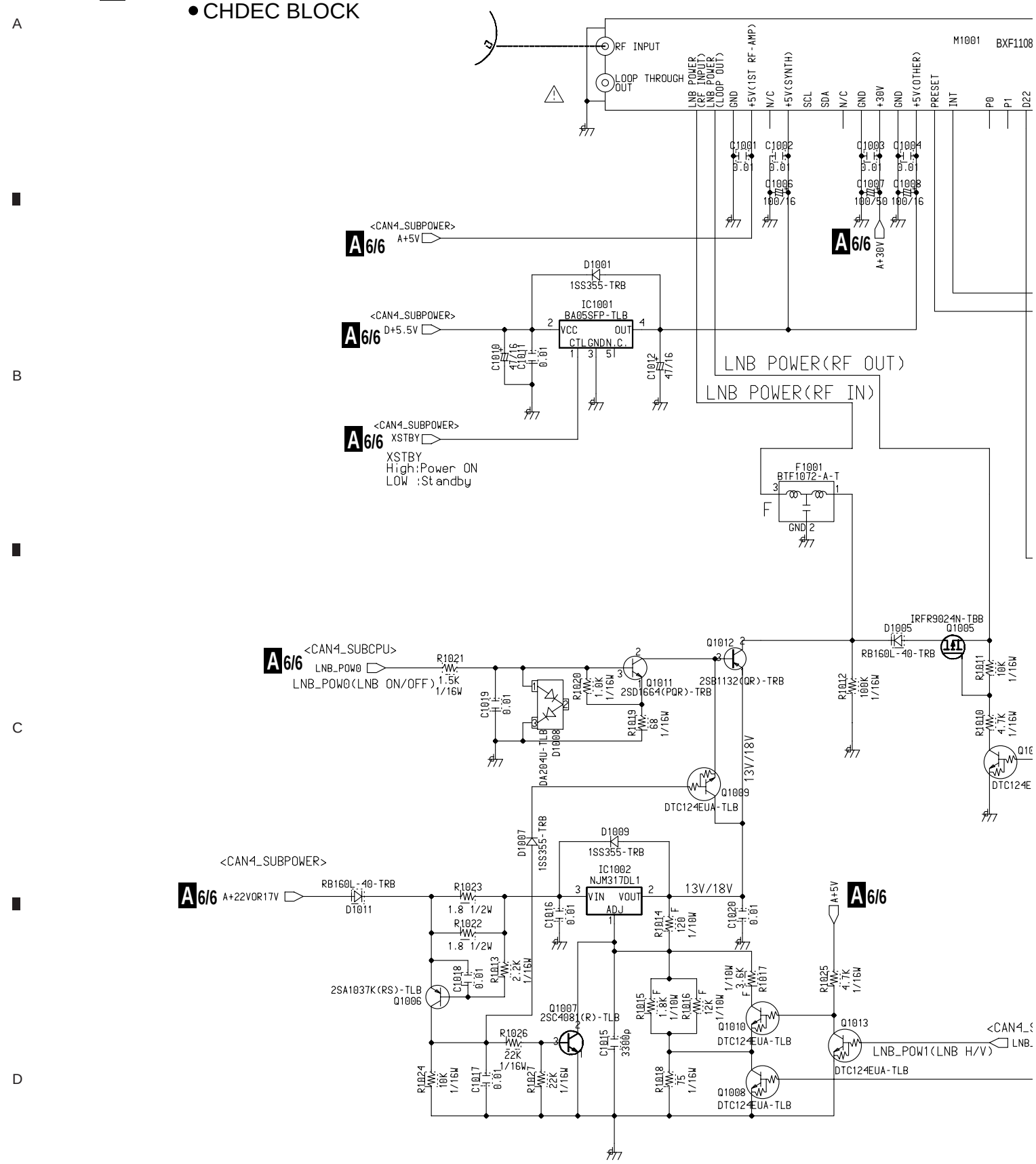


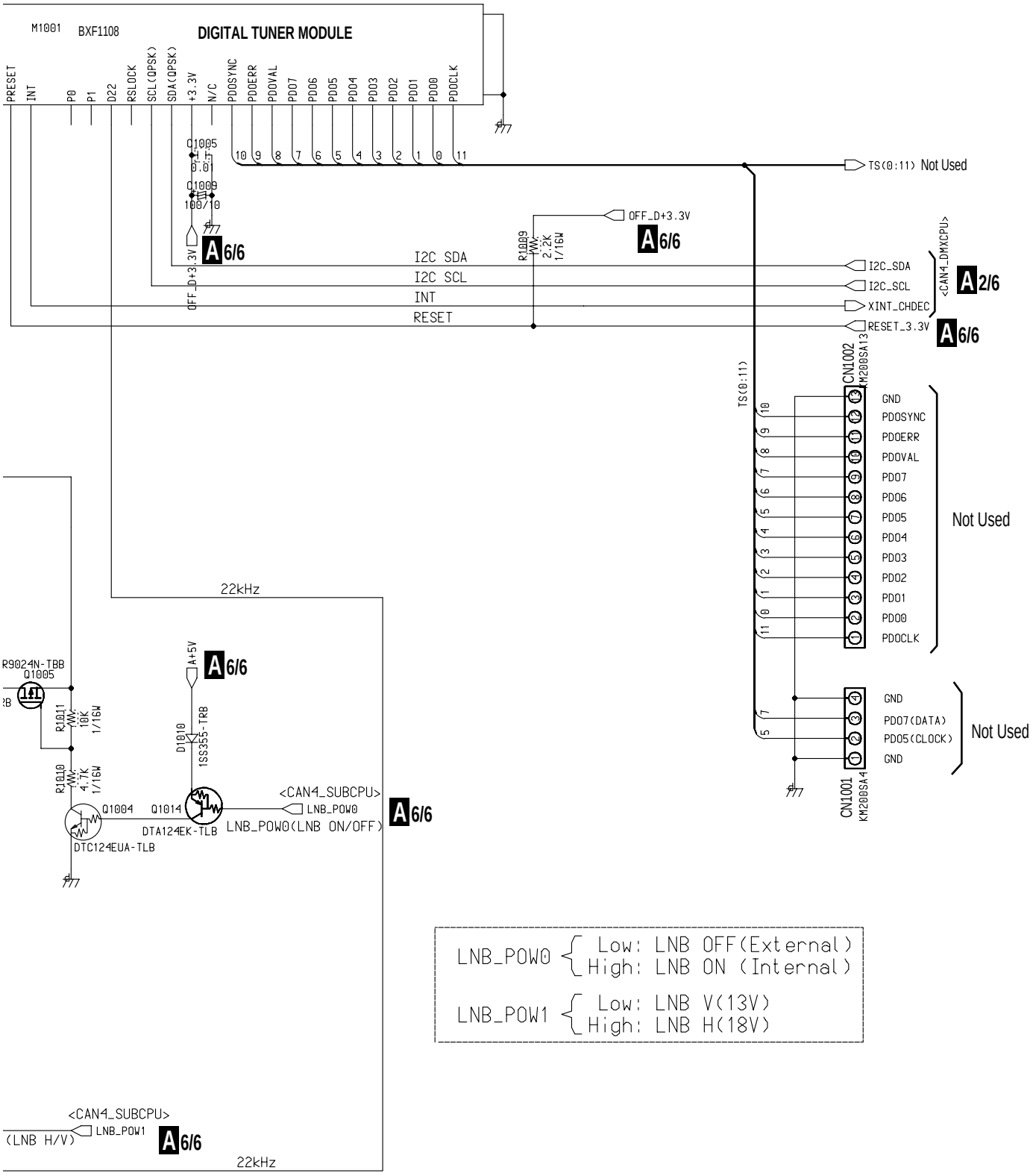

PIN
MODULAR JACK
CN5004
BKP1122
CN5003
BKP1137
RI
DSR
DGND
PHONE L2
LINE L2
LINE L1
PHONE L1
BKP1098
CN4501
RELAY
RY5001
BSR1014
PULSE TRANSFORMER
T5001
BTX1032
AC230V
AC INLET
CN101
F101
REK1101
2A/250V
LIVE
NEUTRAL
SW1
L101
C101
L102
C112
C114
C111
PRIMARY
D101-D104
C113
CONVERTER TRANSFORMER
C116
T101
CHASIS GND
PC102
PC101
SECONDARY
CN6002
BKP1120
HOUSING Assy
GND
+5.5V
GND
GND
GND
GND
POW1
+3.3V
+3.3V
+3.3V
AC_CLK
+5V
+5VReturn
+8V
+24V
+12V
+24/19V
GND
+30V
CN201
D POWER ASSY
BXF1112
LED13
LED12
LED11
LED10
LED03
LED02
LED01
LED00
FFC CABLE
BDD1032
J1
B FRONT ASSY
BWE1079
D8001
BEL1037
M8001
BXX1026
7SEGMENT LED
IR SENSOR

3.3 MAIN ASSY(1/6)

A 1/6 MAIN ASSY (1/6) (BWE1055)

- CHDEC BLOCK

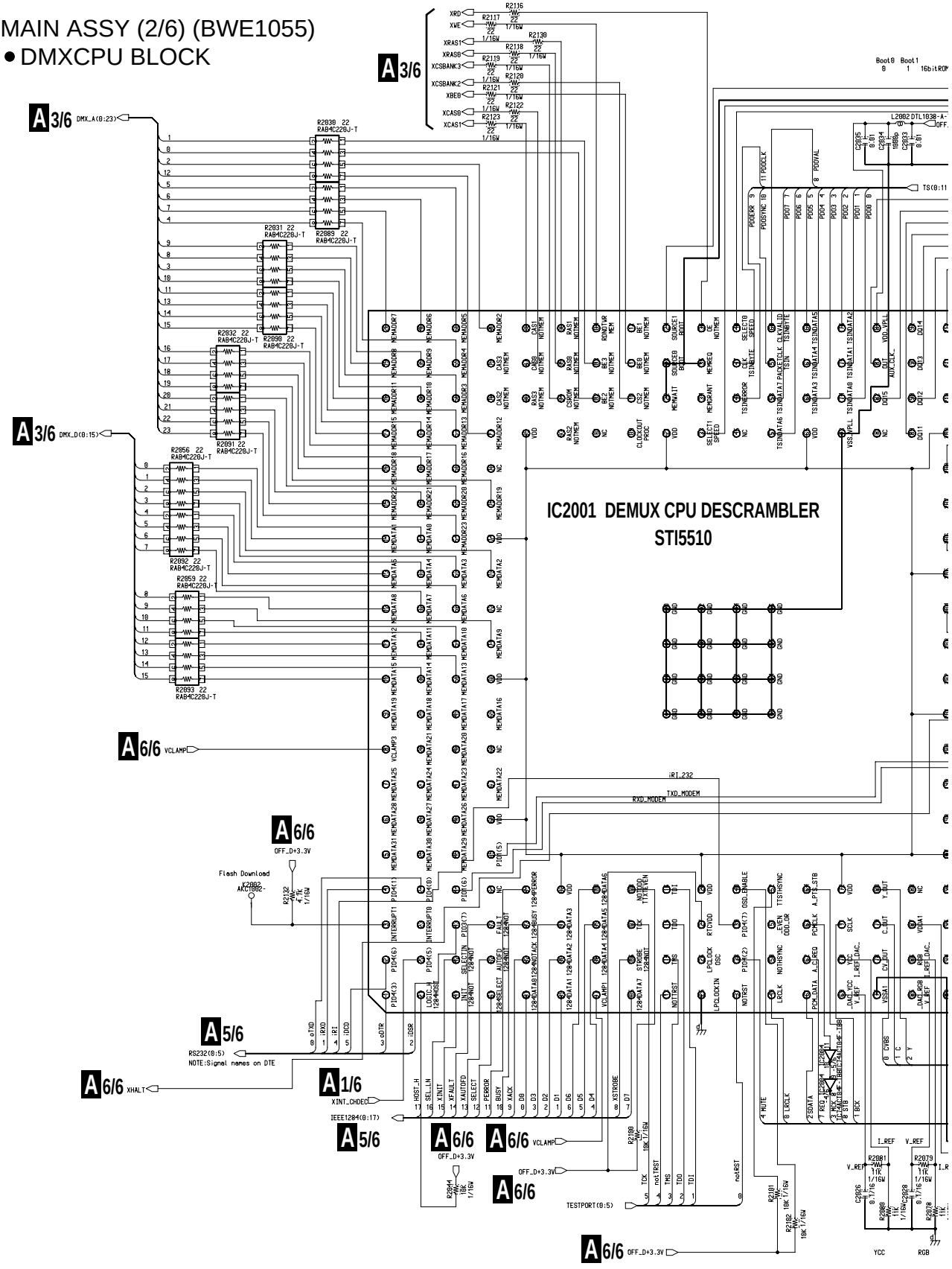


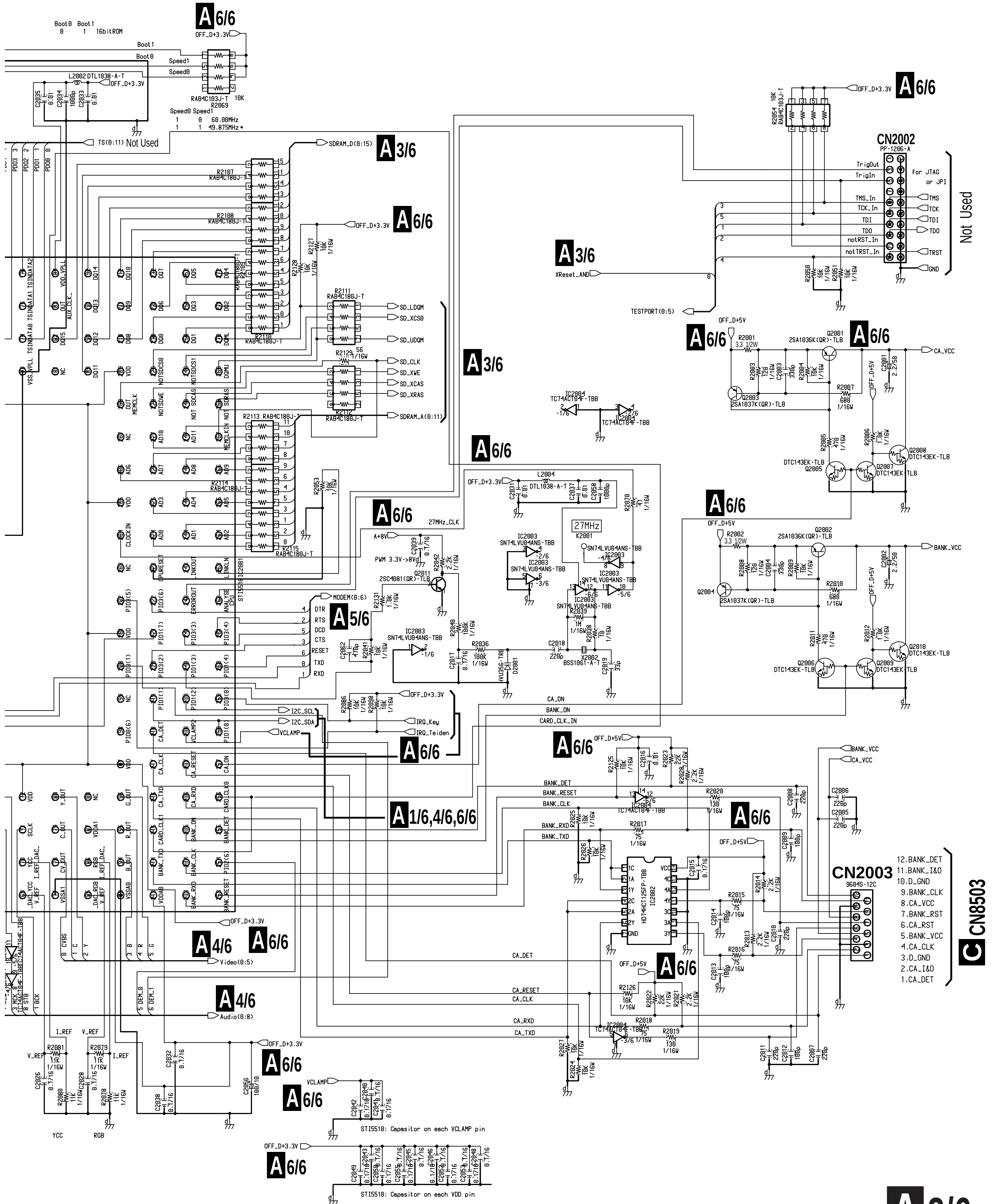

M1001 BXF1108
DIGITAL TUNER MODULE
PRESET
INT
P0
P1
D22
RSLOCK
SCL(QPSK)
SDA(QPSK)
+3.3V
N/C
PDOSYNC
PDOERR
PDOVAL
PDO7
PDO6
PDO5
PDO4
PDO3
PDO2
PDO1
PDO0
PDOCLK
C1005
0.1
C1009
100/10
TS(0:11) Not Used
OFF_D+3.3V
A6/6
R1009
2.2K
1/16W
I2C SDA
I2C SCL
INT
RESET
I2C_SDA
I2C_SCL
XINT_CHDEC
RESET_3.3V
<CAN4_DMXCPU>
A2/6
CN1002
KM200SA13
GND
PDOSYNC
PDOERR
PDOVAL
PDO7
PDO6
PDO5
PDO4
PDO3
PDO2
PDO1
PDO0
PDOCLK
Not Used
CN1001
KM200SA4
GND
PDO7(DATA)
PDO5(CLOCK)
GND
Not Used
22kHz
A+5V
R9024N-TBB
Q1005
R1011
10K
1/16W
R1010
4.7K
1/16W
D1010
1SS355-TRB
Q1004
DTC124EUA-TLB
Q1014
DTA124EK-TLB
<CAN4_SUBCPU>
LNB_POW0
LNB_POW0(LNB ON/OFF)
<CAN4_SUBCPU>
LNB_POW1
(LNB H/V)
22kHz
LNB_POW0 { Low: LNB OFF(External) / High: LNB ON (Internal)
LNB_POW1 { Low: LNB V(13V) / High: LNB H(18V)

3.4 MAIN ASSY(2/6)

A 2/6 MAIN ASSY (2/6) (BWE1055)

- DMXCPU BLOCK

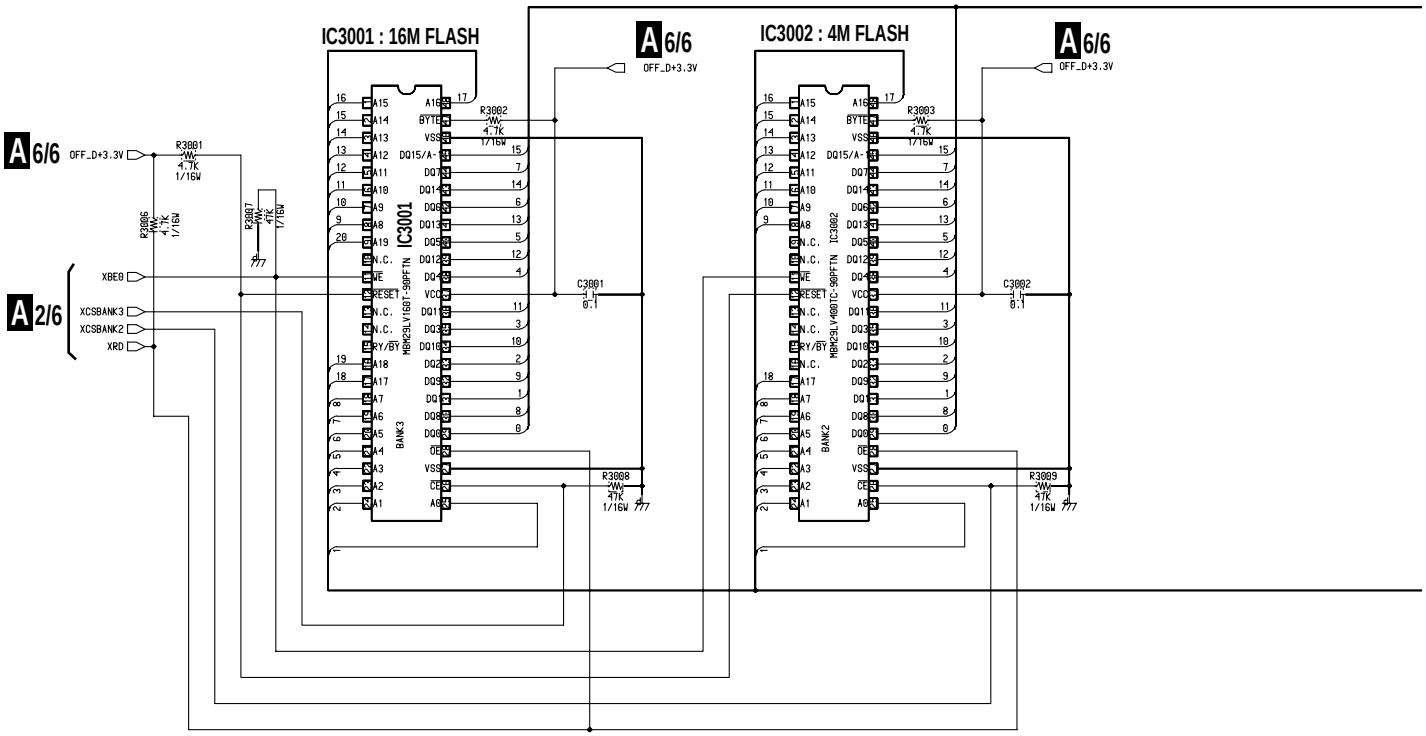


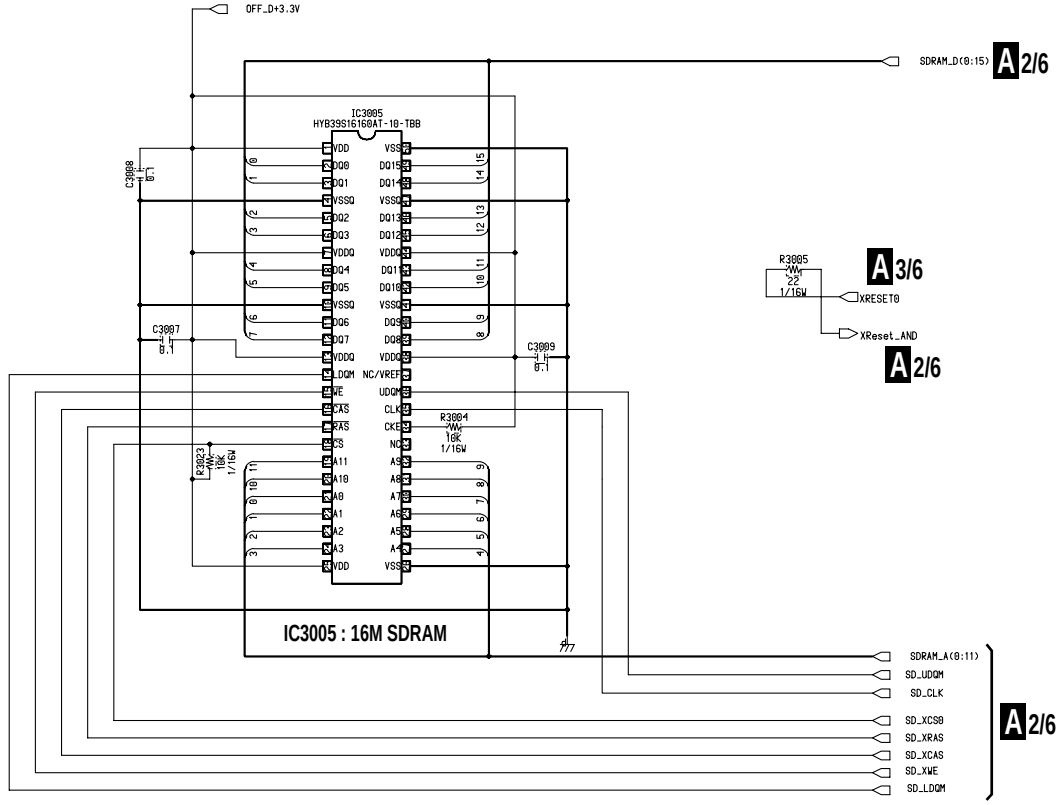

A 6/6
OFF_D+3.3V
Boot0 Boot1
0 1 16bitROM
Boot1
Boot0
Speed1
Speed0
RAB4C103J-T
R2069
10K
L2002 DTL1038-A-T
Speed0 Speed1
1 0 60.00MHz
1 1 49.875MHz
TS(0:11) Not Used
SDRAM_D(0:15)
A 3/6
R2107
RAB4C180J-T
R2108
RAB4C180J-T
R2109
R2110
RAB4C180J-T
R2111
RAB4C180J-T
SD_LDQM
SD_XCS0
SD_UDQM
R2129
56
1/16W
SD_CLK
SD_XWE
SD_XCAS
SD_XRAS
R2112
RAB4C180J-T
SDRAM_A(0:11)
R2113 RAB4C180J-T
R2114
RAB4C180J-T
R2115
RAB4C180J-T
R2127
R2128
R2053
STI5510 IC2001
A 5/6
MODEM(0:6)
DTR
RTS
DCD
CTS
RESET
TXD
RXD
I2C_SCL
I2C_SDA
VCLAMP
IRQ_Key
IRQ_Teiden
A 1/6,4/6,6/6
A 4/6
Video(0:5)
Audio(0:8)
I_REF
V_REF
YCC
RGB
VCLAMP
STI5510: Capasitor on each VCLAMP pin
STI5510: Capasitor on each VDD pin
CN2002
PP-1206-A
TrigOut
TrigIn
TMS_In
TCK_In
TDI
TDO
notRST_In
notTRST_In
TMS
TCK
TDI
TDO
TRST
GND
for JTAG
or JPI
Not Used
R2054 10K
RAB4C103J-T
R2050
R2051
XReset_AND
TESTPORT(0:5)
IC2004
TC74ACT04F-TBB
OFF_D+5V
R2001
3.3 1/2W
Q2001
2SA1036K(QR)-TLB
CA_VCC
Q2003
2SA1037K(QR)-TLB
R2007
680
1/16W
Q2005
DTC143EK-TLB
Q2007
Q2008
L2004
DTL1038-A-T
27MHz
X2001
27MHz_CLK
A+8V
PWM 3.3V->8V
Q2011
2SC4081(QR)-TLB
IC2003
SN74LVU04ANS-TBB
X2002
BSS106T-A-T
D2001
HVU356-TRF
R2002
3.3 1/2W
Q2002
2SA1036K(QR)-TLB
BANK_VCC
Q2004
2SA1037K(QR)-TLB
R2010
680
1/16W
Q2006
Q2009
Q2010
DTC143EK-TLB
CA_ON
BANK_ON
CARD_CLK_IN
BANK_DET
BANK_RESET
BANK_CLK
BANK_RXD
BANK_TXD
CA_DET
CA_RESET
CA_CLK
CA_RXD
CA_TXD
HD74HCT125FP-TBB
IC2002
CN2003
9604S-12C
12.BANK_DET
11.BANK_I&O
10.D_GND
9.BANK_CLK
8.CA_VCC
7.BANK_RST
6.CA_RST
5.BANK_VCC
4.CA_CLK
3.D_GND
2.CA_I&O
1.CA_DET
C CN8503

3.5 MAIN ASSY(3/6)

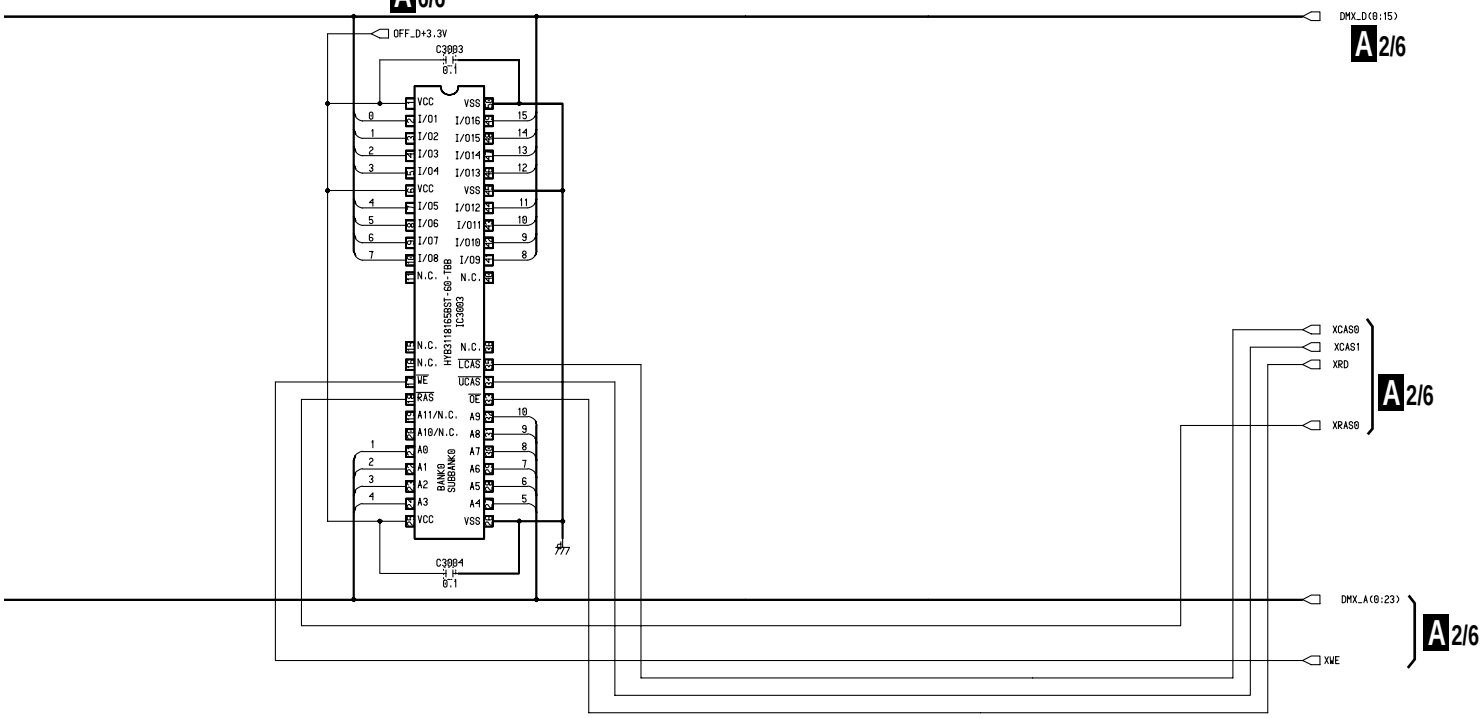
A 3/6 MAIN ASSY (3/6) (BWE1055)

- MEMORY BLOCK





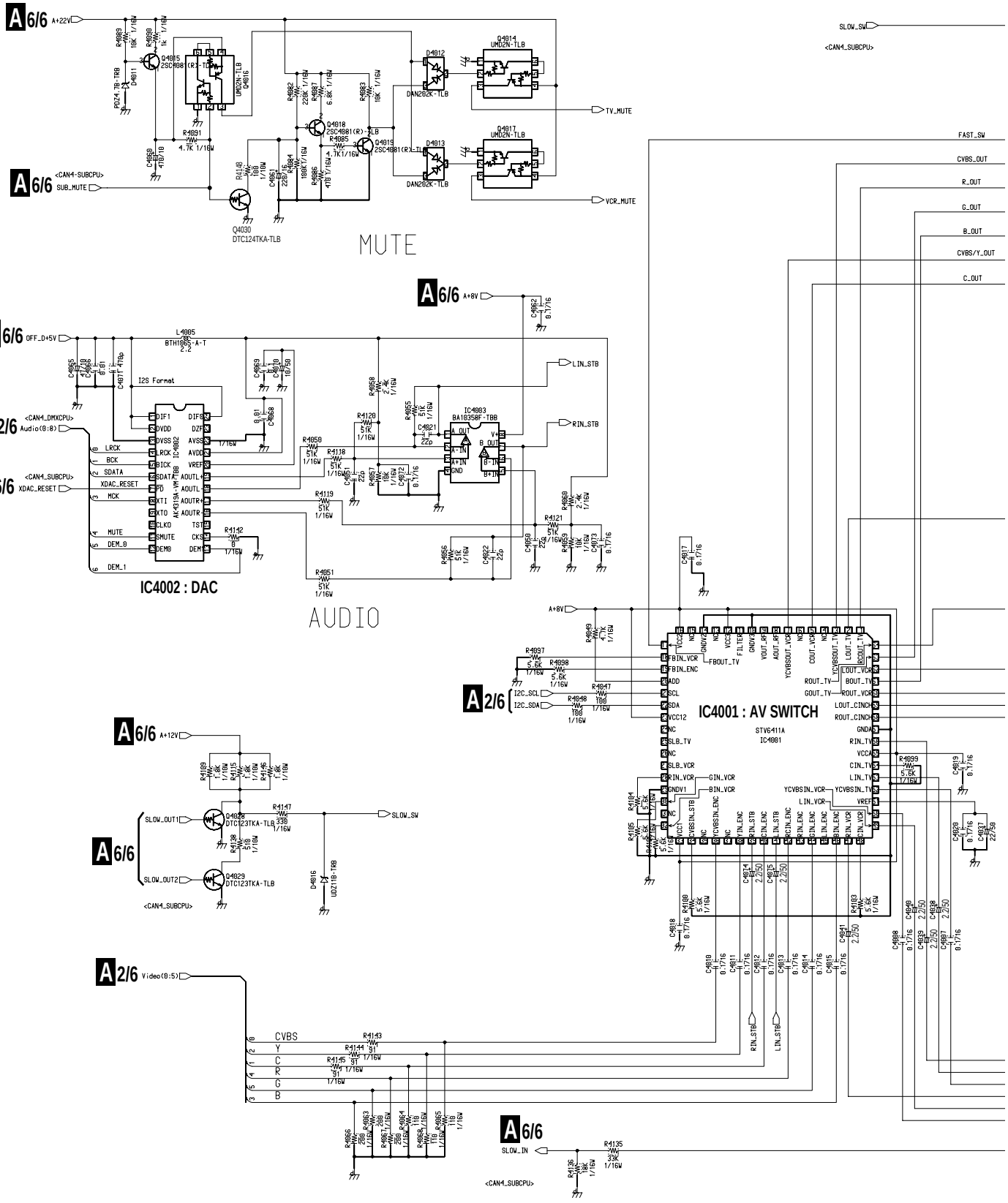
IC3003 : 16M DRAM

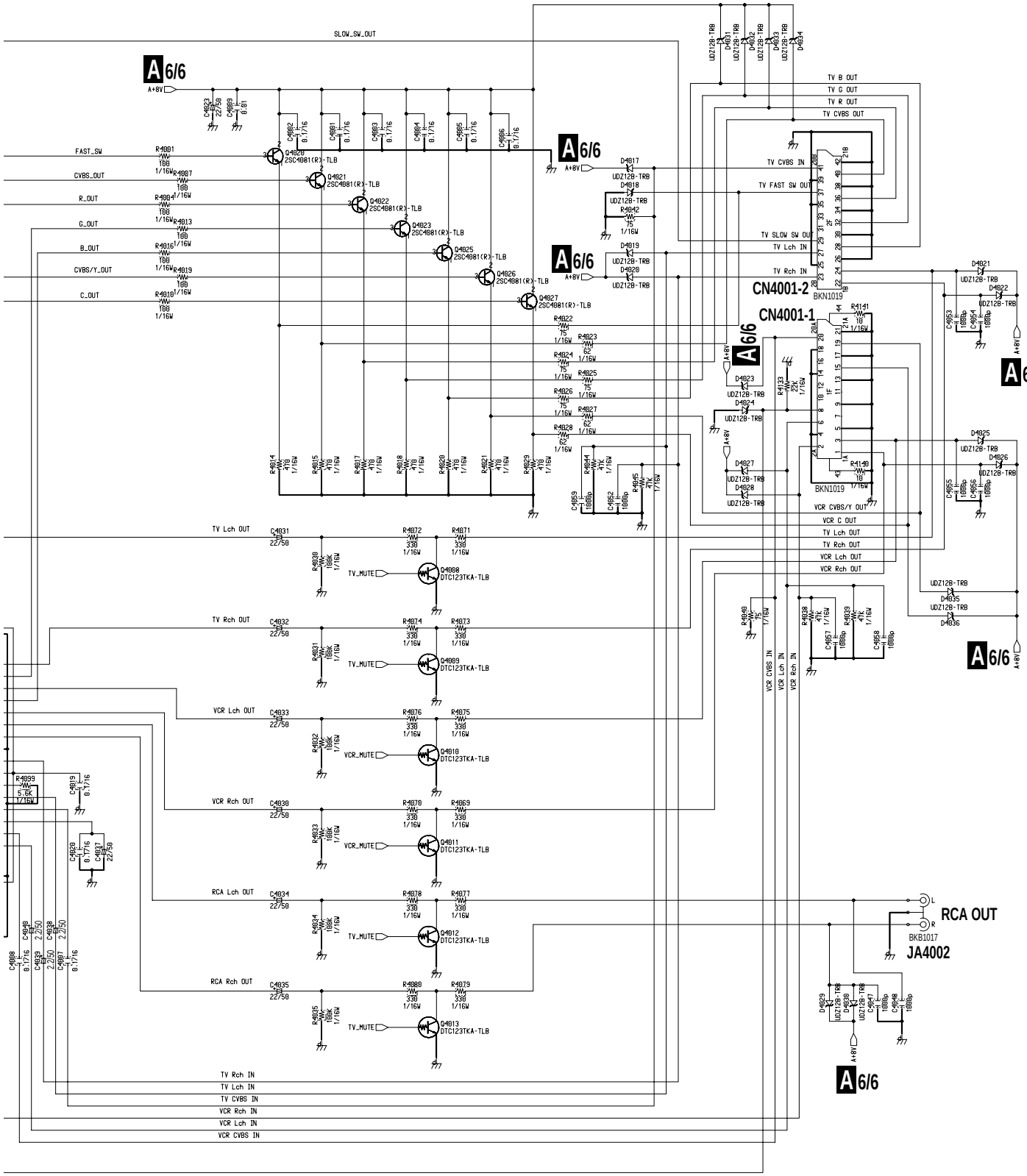


3.6 MAIN ASSY(4/6)

A 4/6 MAIN ASSY (4/6) (BWE1055)

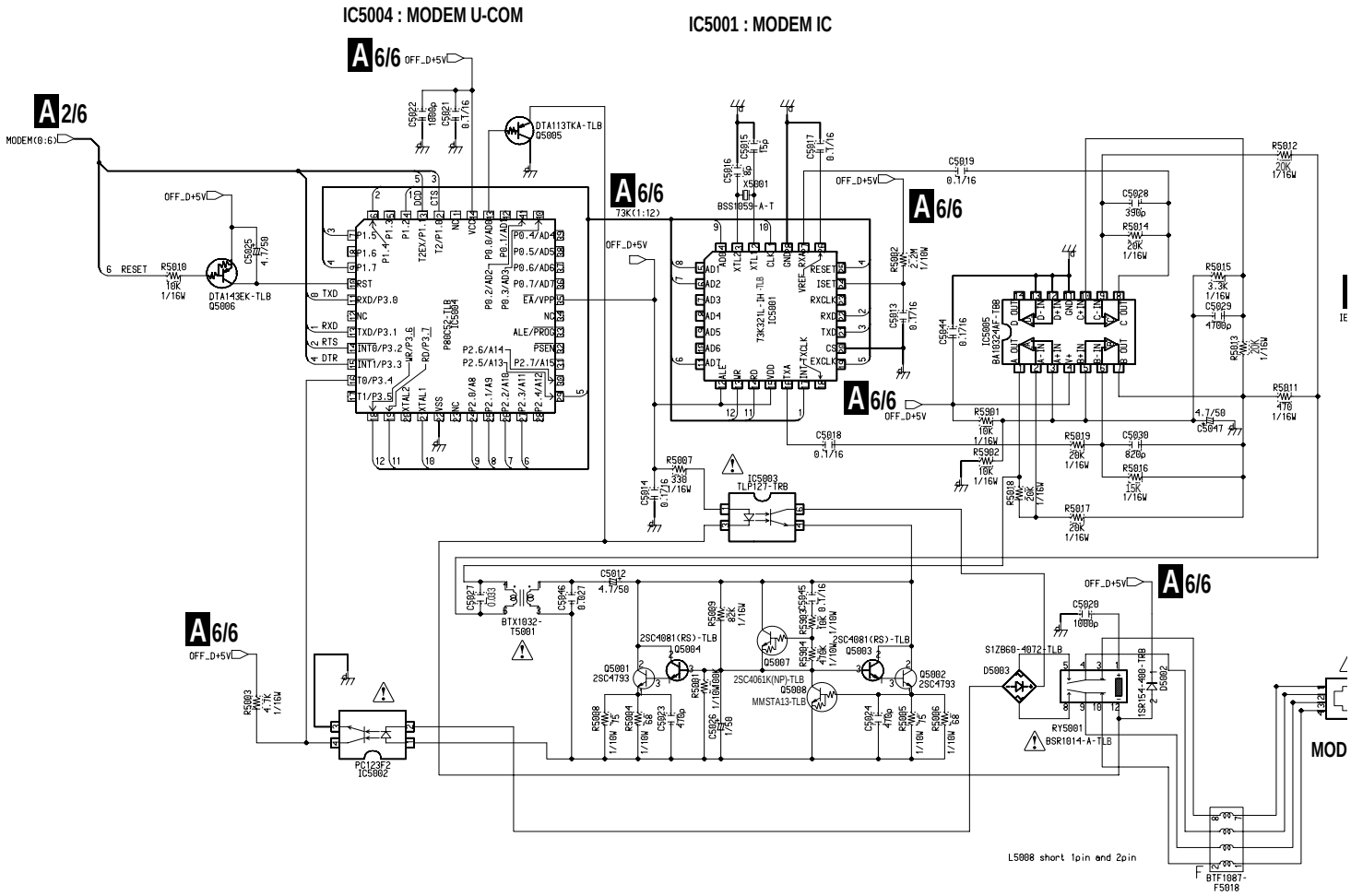
- ANALOG AV BLOCK

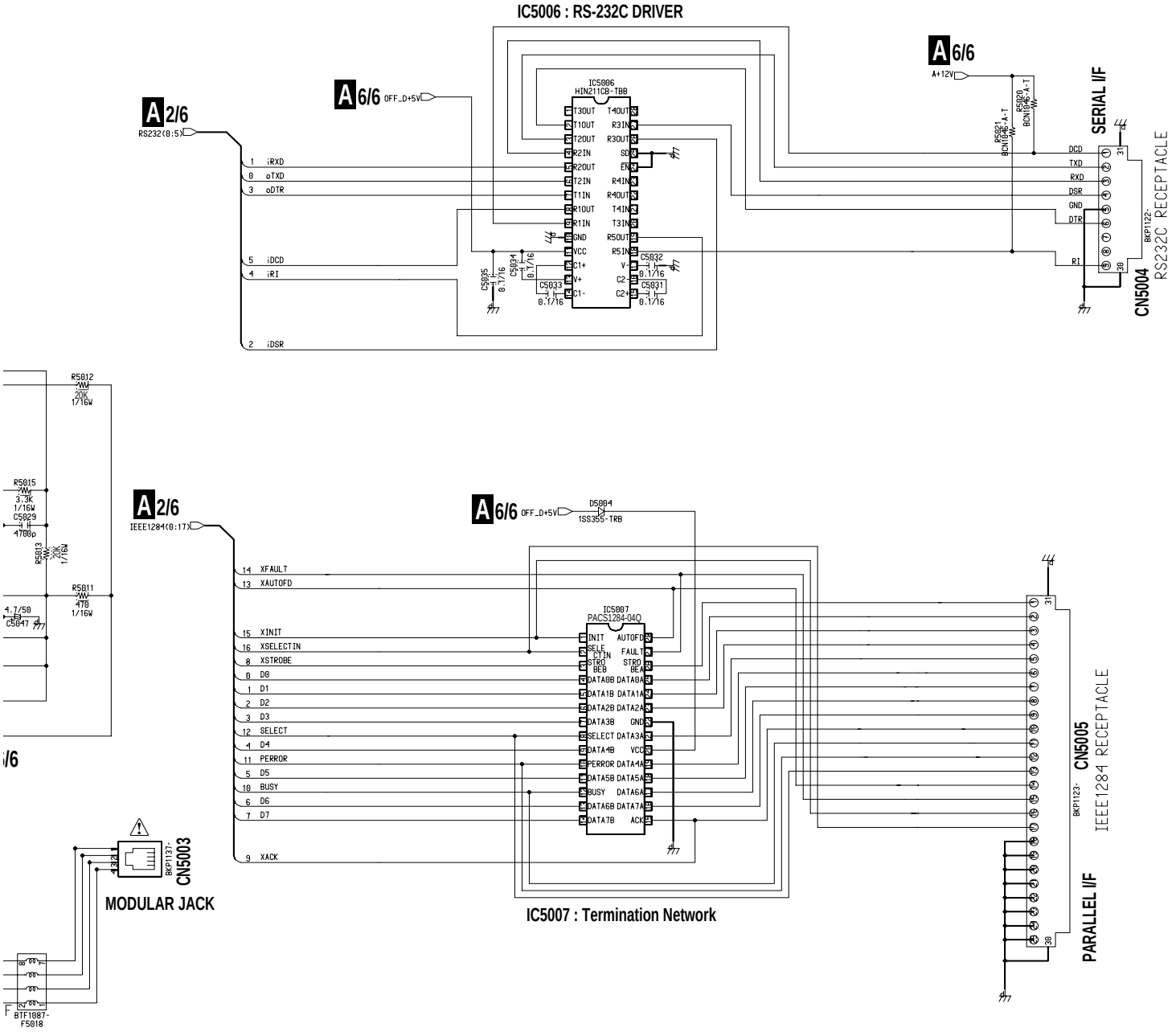



SLOW_SW_OUT
A6/6
A+8V
FAST_SW
CVBS_OUT
R_OUT
G_OUT
B_OUT
CVBS/Y_OUT
C_OUT
Q4020 2SC4081(R)-TLB
Q4021 2SC4081(R)-TLB
Q4022 2SC4081(R)-TLB
Q4023 2SC4081(R)-TLB
Q4025 2SC4081(R)-TLB
Q4026 2SC4081(R)-TLB
Q4027 2SC4081(R)-TLB
TV B OUT
TV G OUT
TV R OUT
TV CVBS OUT
TV CVBS IN
TV FAST SW OUT
TV SLOW SW OUT
TV Lch IN
TV Rch IN
CN4001-2
CN4001-1
BKN1019
VCR CVBS/Y OUT
VCR C OUT
TV Lch OUT
TV Rch OUT
VCR Lch OUT
VCR Rch OUT
TV Lch OUT
TV Rch OUT
VCR Lch OUT
VCR Rch OUT
RCA Lch OUT
RCA Rch OUT
TV_MUTE
VCR_MUTE
Q4008 DTC123TKA-TLB
Q4009 DTC123TKA-TLB
Q4010 DTC123TKA-TLB
Q4011 DTC123TKA-TLB
Q4012 DTC123TKA-TLB
Q4013 DTC123TKA-TLB
RCA OUT
BKB1017
JA4002
TV Rch IN
TV Lch IN
TV CVBS IN
VCR Rch IN
VCR Lch IN
VCR CVBS IN

3.7 MAIN ASSY(5/6)

A 5/6 MAIN ASSY (5/6) (BWE1055)
- I/O MODEM BLOCK

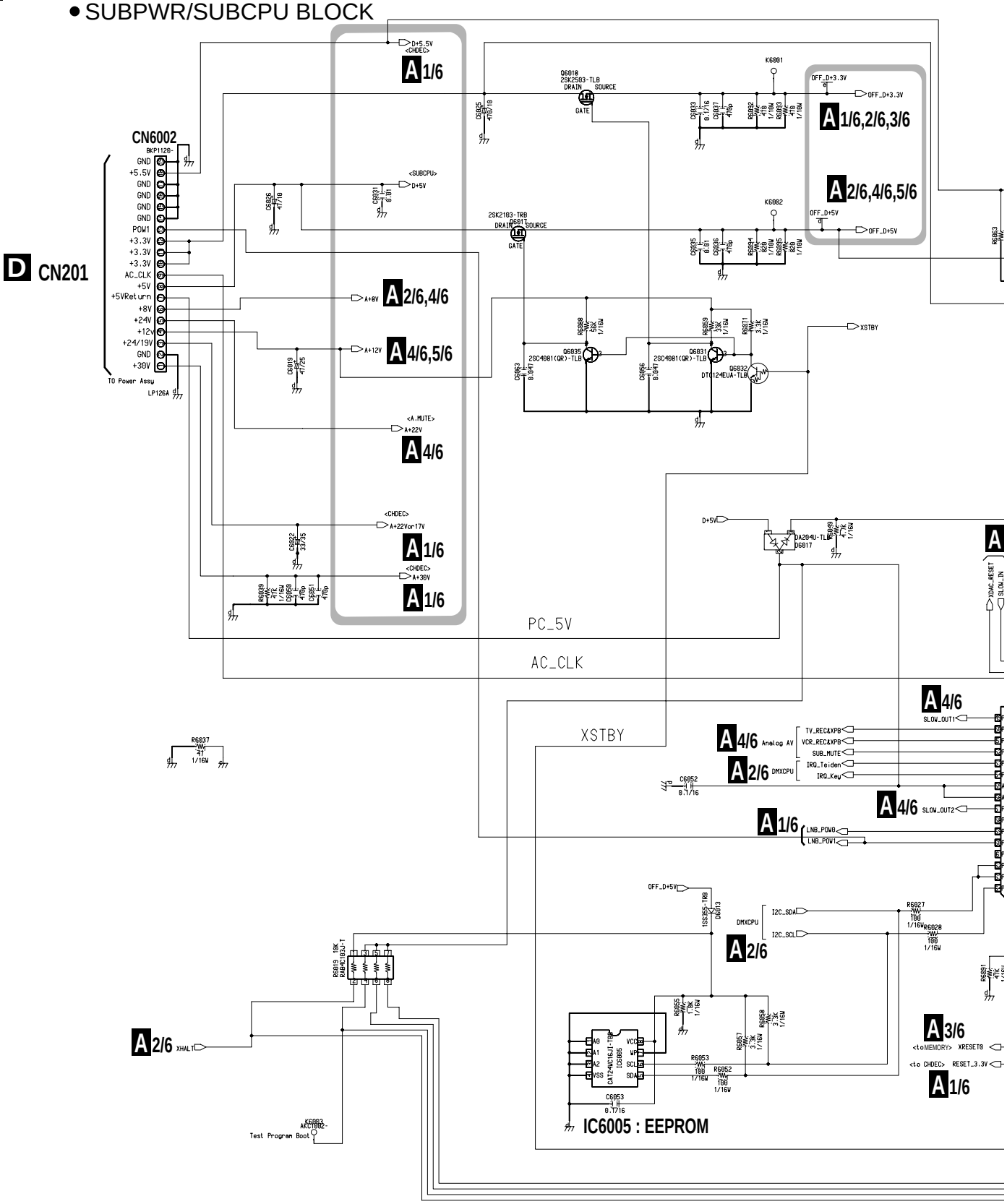



IC5006 : RS-232C DRIVER
A2/6
RS232(0:5)
A6/6 OFF_D+5V
IC5006
HIN211CB-TBB
A6/6
A+12V
SERIAL I/F
DCD
TXD
RXD
DSR
GND
DTR
RI
CN5004
RS232C RECEPTACLE
A2/6
IEEE1284(0:17)
A6/6 OFF_D+5V
D5004
1SS355-TRB
IC5007
PACS1284-04Q
CN5005
IEEE1284 RECEPTACLE
PARALLEL I/F
CN5003
MODULAR JACK
IC5007 : Termination Network

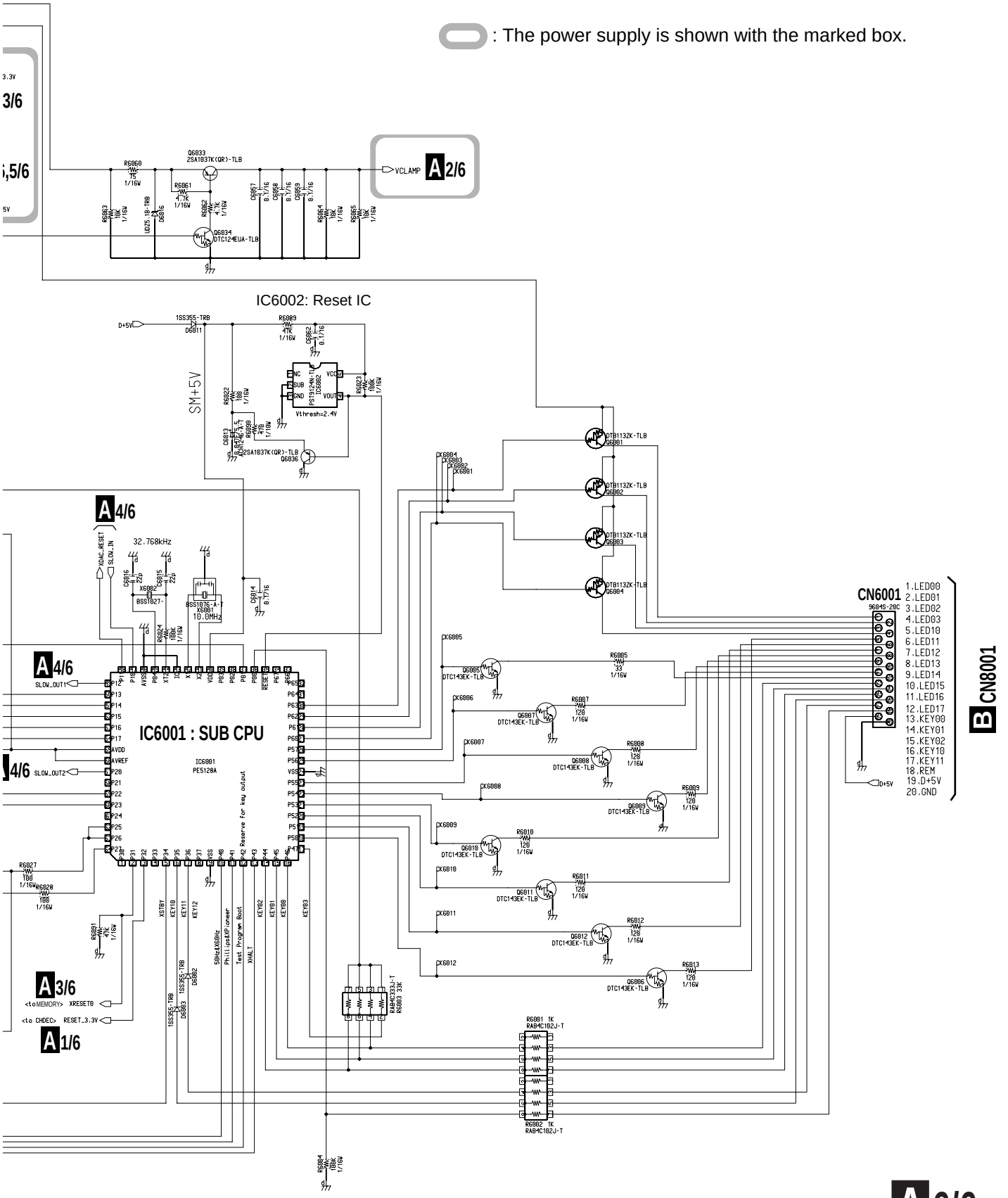
3.8 MAIN ASSY(6/6)

A 6/6 MAIN ASSY (6/6) (BWE1055)

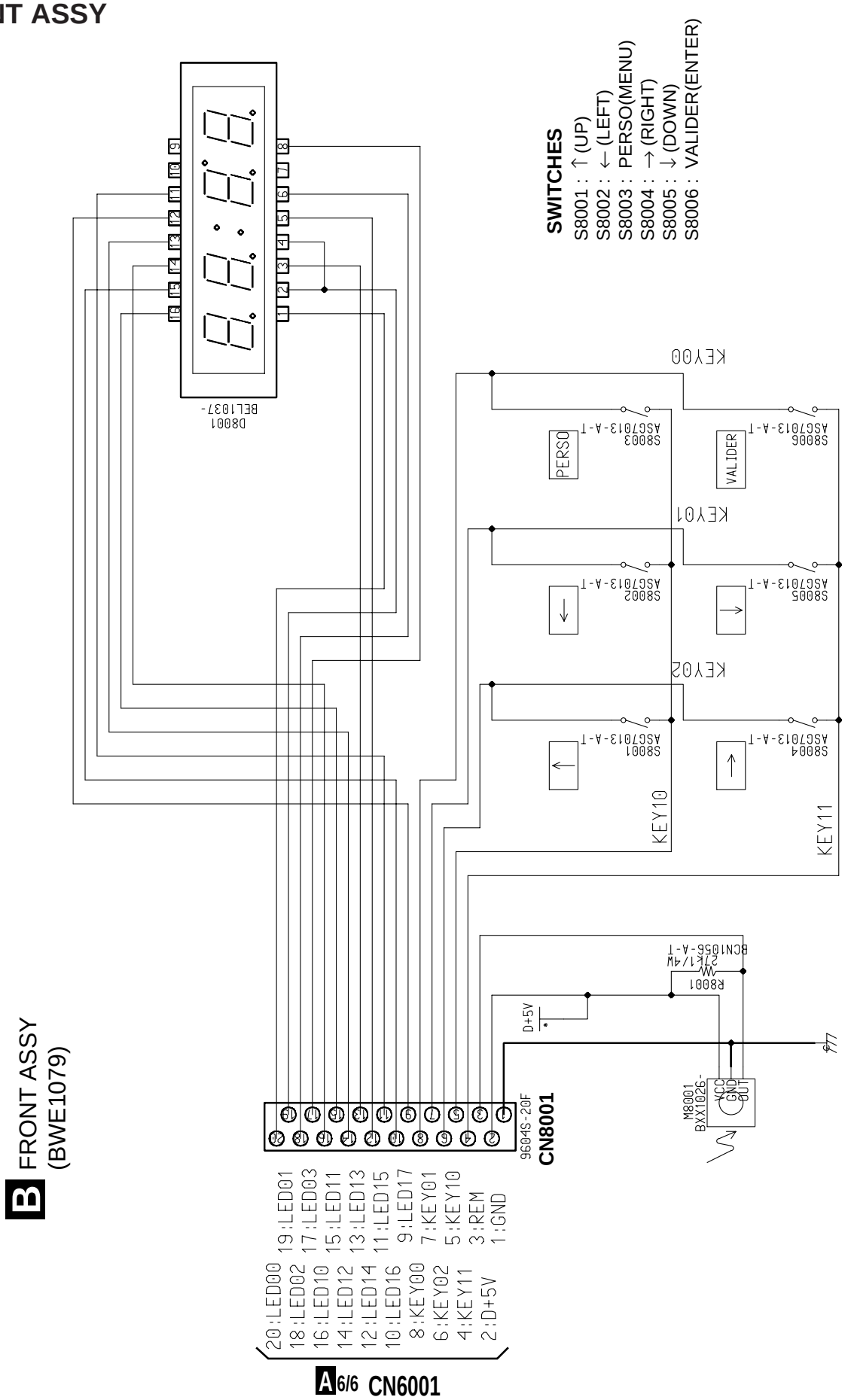
- SUBPWR/SUBCPU BLOCK



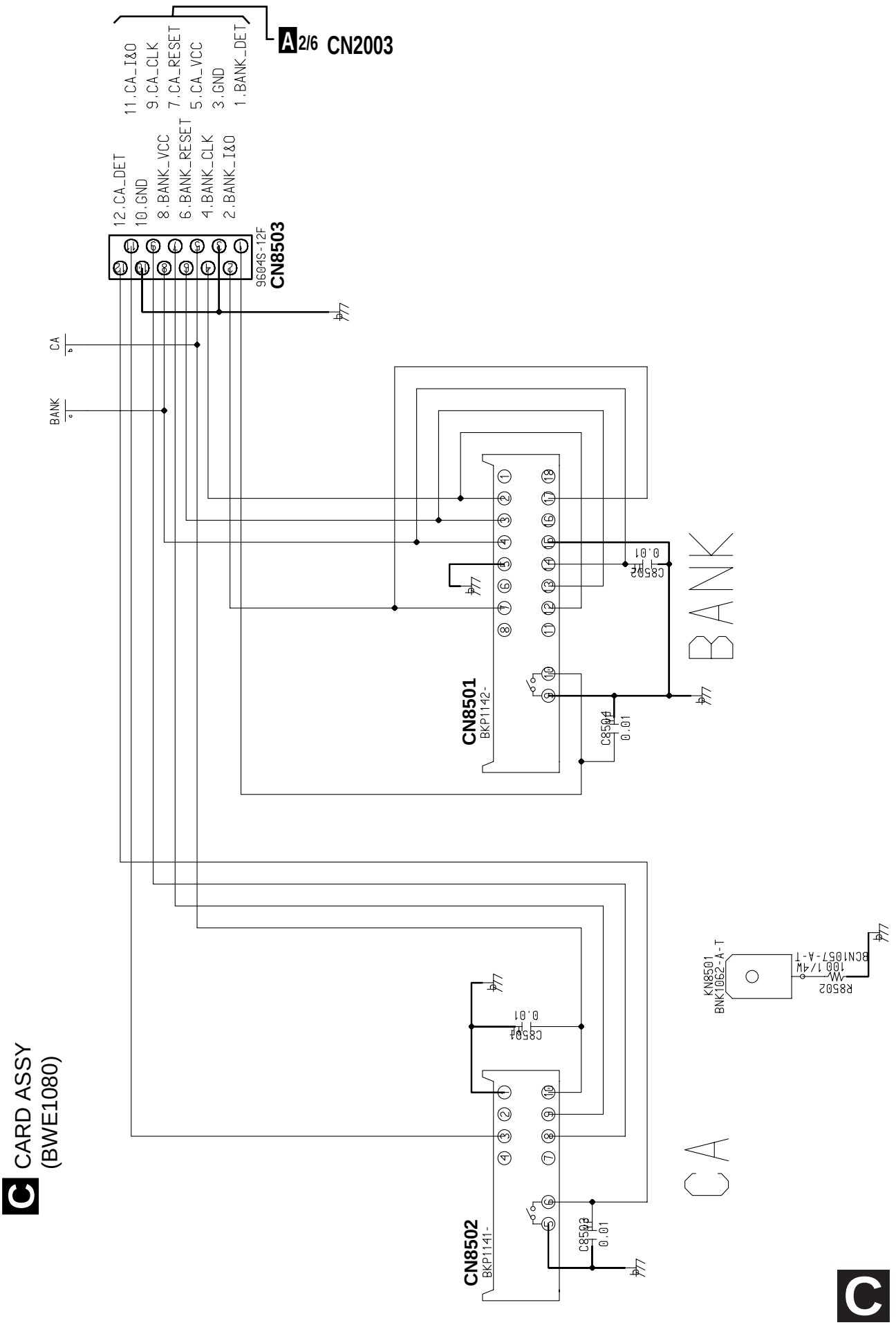
: The power supply is shown with the marked box.



3.9 FRONT ASSY

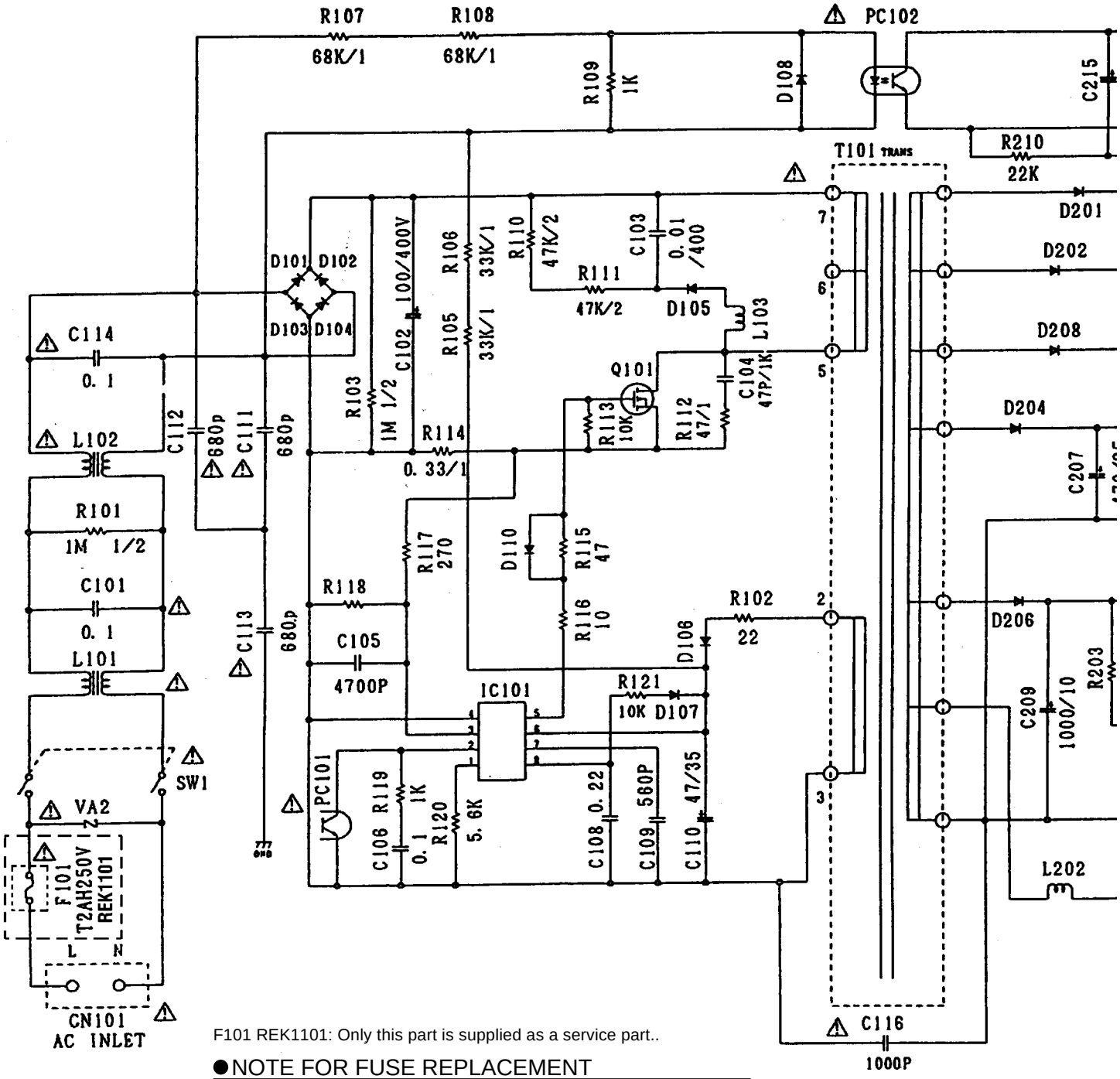


3.10 CARD ASSY



3.11 POWER ASSY

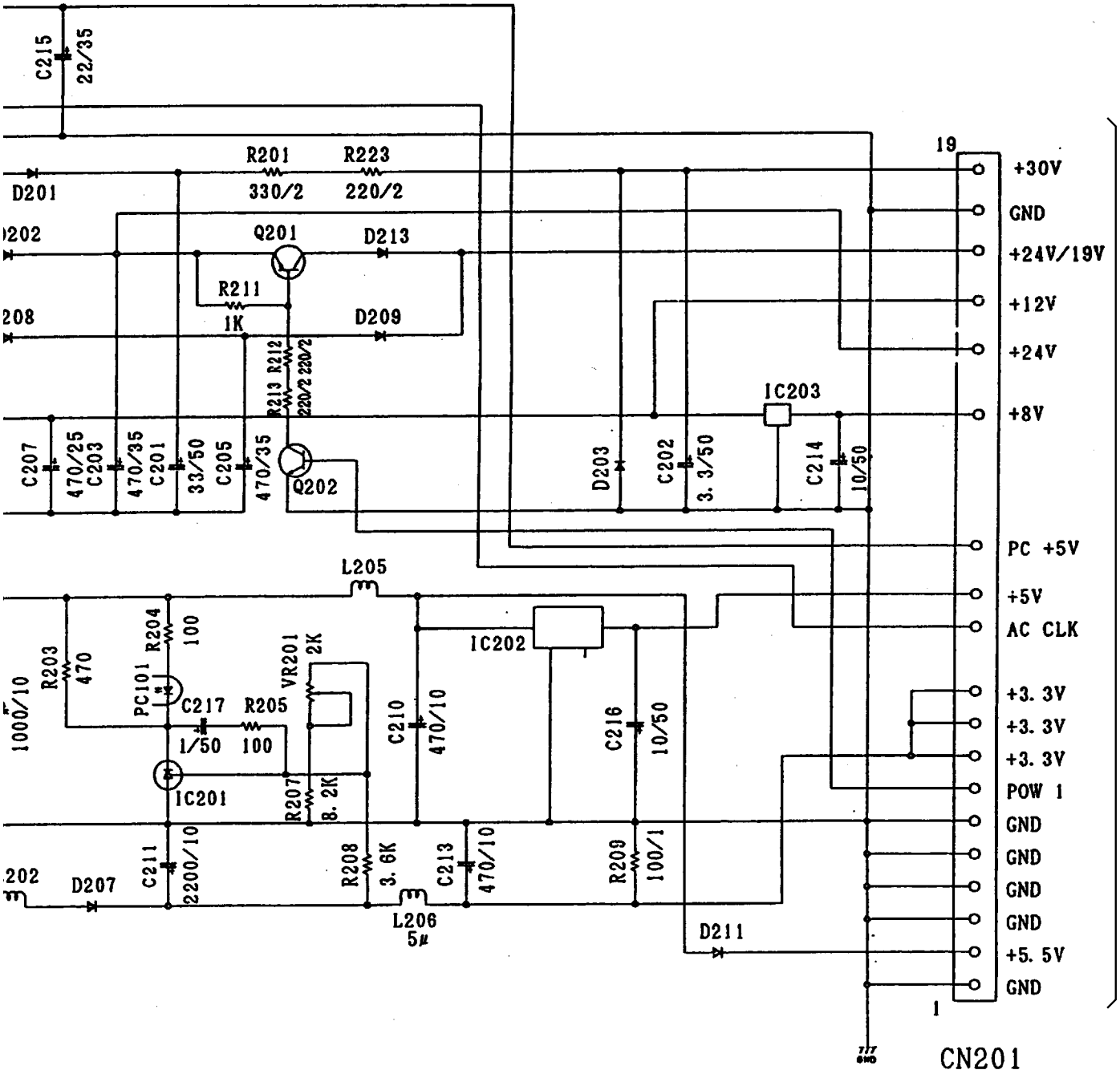
D POWER ASSY (BXF1112)



F101 REK1101: Only this part is supplied as a service part..

● NOTE FOR FUSE REPLACEMENT

CAUTION – FOR CONTINUED PROTECTION AGAINST RISK OF FIRE.
REPLACE ONLY WITH SAME TYPE AND RATINGS ONLY.


C215 22/35
R201 330/2
R223 220/2
D201
Q201
D213
R211 1K
D209
R213 220/2
R212 220/2
C207
C203 470/25
C201 470/35
C205 33/50
470/35
Q202
IC203
D203
C202 3.3/50
C214 10/50
L205
R203 470
R204 100
PC101
C217 1/50
R205 100
VR201 2K
IC201
R207 8.2K
C210 470/10
IC202
C216 10/50
1000/10
C211 2200/10
D207
R208 3.6K
L206 5μ
C213 470/10
R209 100/1
D211
19
+30V
GND
+24V/19V
+12V
+24V
+8V
PC +5V
+5V
AC CLK
+3.3V
+3.3V
+3.3V
POW 1
GND
GND
GND
GND
+5.5V
GND
1
CN201
A6/6 CN6002

4. PCB CONNECTION DIAGRAM

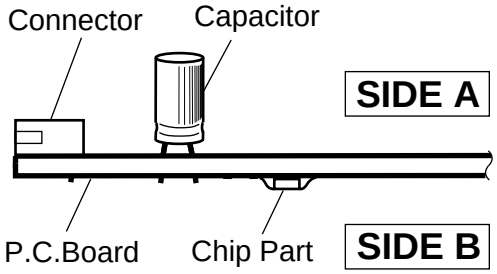
4.1 FRONT ASSY

NOTE FOR PCB DIAGRAMS :

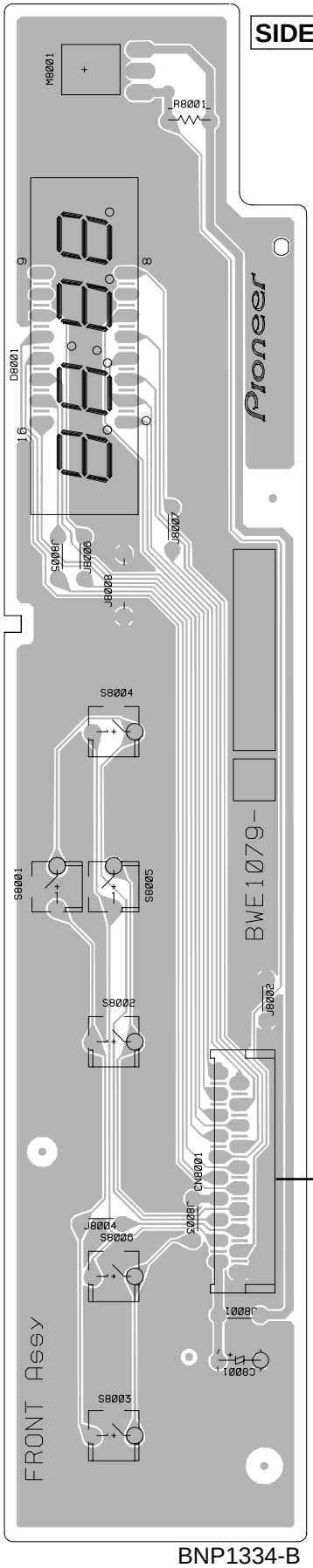
1. Part numbers in PCB diagrams match those in the schematic diagrams.
2. A comparison between the main parts of PCB and schematic diagrams is shown below.

Symbol In PCB Diagrams	Symbol In Schematic Diagrams	Part Name
B C E	B C E B C E	Transistor
B C E	B C E B C E	Transistor with resistor
D G S	D G S D G S	Field effect transistor
		Resistor array
		3-terminal regulator

3. The parts mounted on this PCB include all necessary parts for several destinations.
   For further information for respective destinations, be sure to check with the schematic diagram.
4. View point of PCB diagrams.



B FRONT ASSY



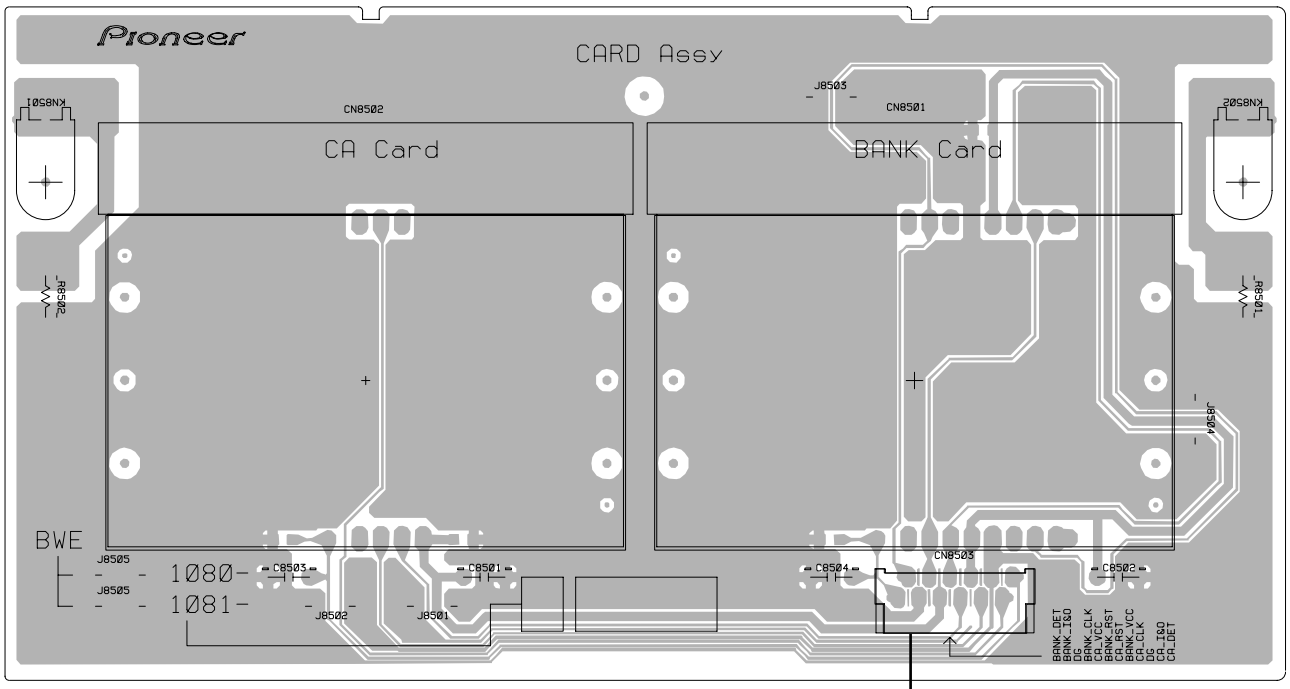
A CN6001

BNP1334-B

4.2 CARD ASSY

C CARD ASSY

SIDE A



BNP1335-B

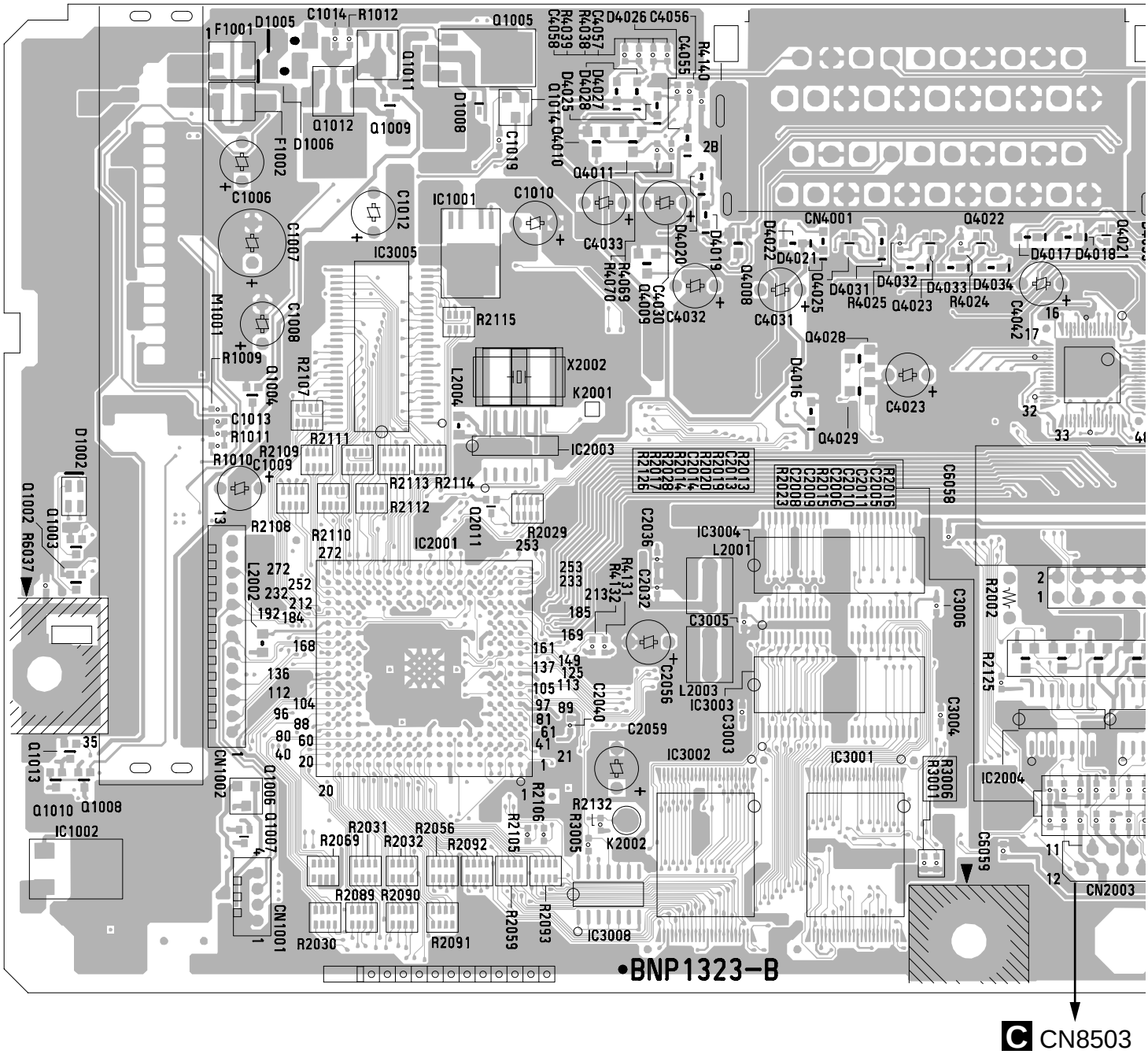
A CN2003

4.3 MAIN ASSY

A MAIN ASSY

TUNER MODULE

VCR SCART
TV SCART



Q1012 Q1011 Q1009 Q1005 Q1014 Q4010 Q4011
IC3005 IC1011 Q4009 Q4008 Q4025 Q4022 Q4021
Q1003 Q1002 Q1004 Q2011 IC2003 IC3004 Q4028 Q4029 IC4001

Q2006 Q2009 Q2004 Q200
Q1010 Q1013 Q1008 Q1006 Q1007 IC2001 IC3002 IC3003 IC3001 IC2004 IC2002
IC1002 IC3008

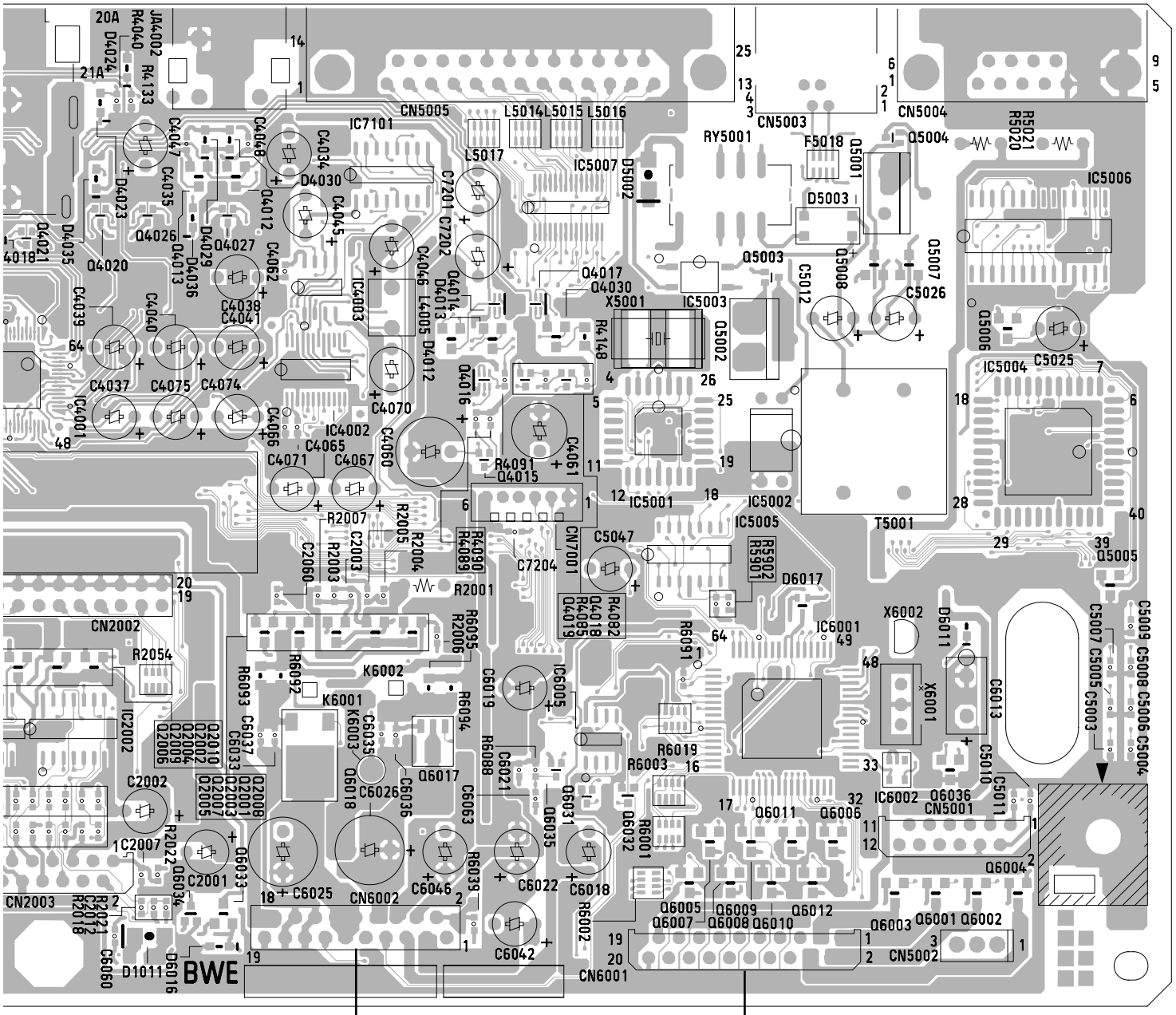
RCA PIN JACK

D-SUB 25PIN IEEE 1284

MODULAR JACK

D-SUB 9PIN RS232C

SIDE A



BNP1323-B

3503 **D** CN201 **B** CN8001

Q4013 Q4012 IC7101 Q5001 Q5004

Q4021 Q4020 Q4026 Q4027 IC4003 Q4014 Q4017 IC5003 Q5002 Q5003 Q5008 Q5007 Q5006 IC5006

IC4001 IC4002 Q4016 Q4015 Q4019 Q4018 IC5001 IC5005 IC5002 IC5004 Q5005

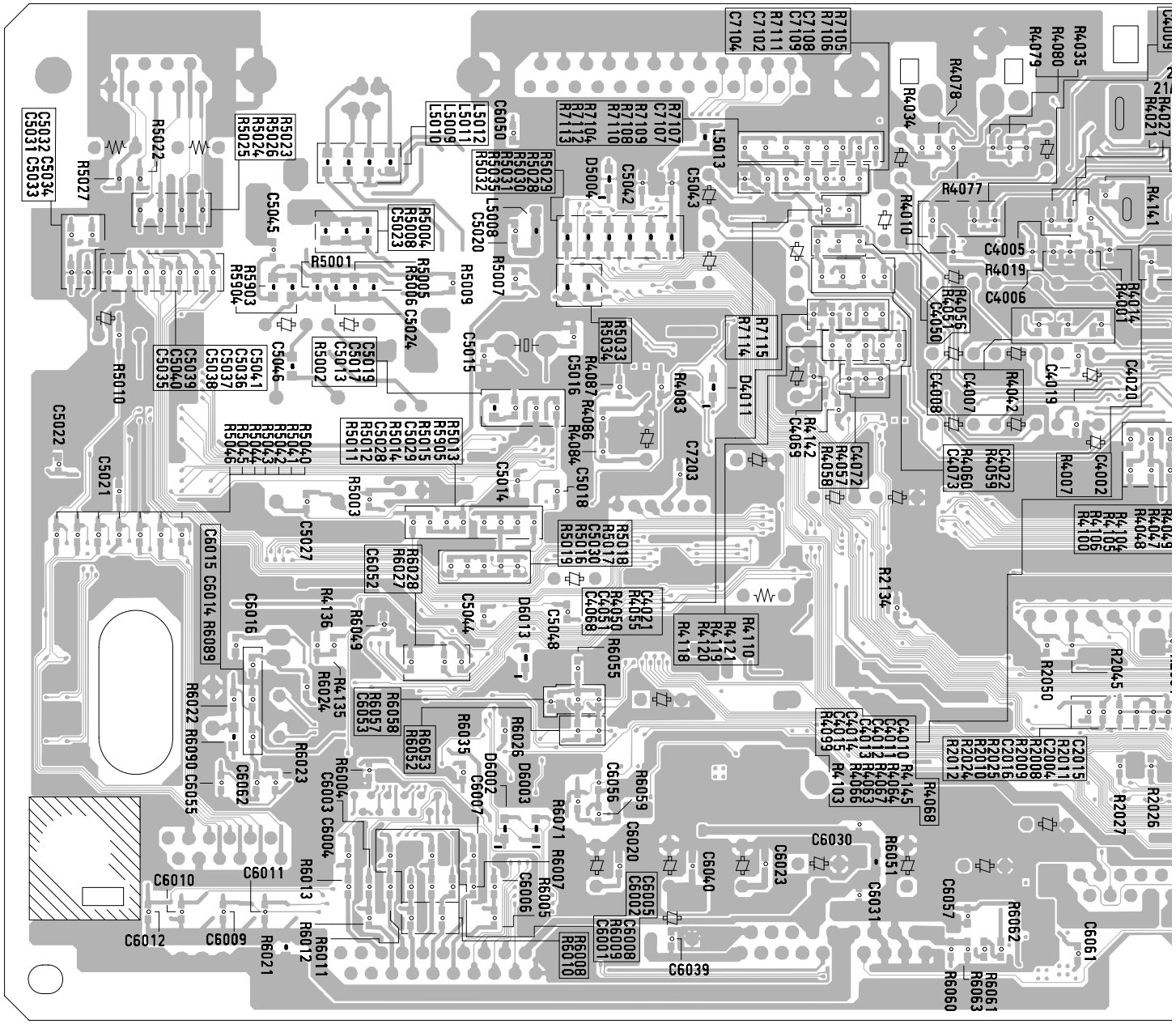
Q2005 Q2007 Q2003 Q2001 Q2008

Q4 Q2002 Q2010

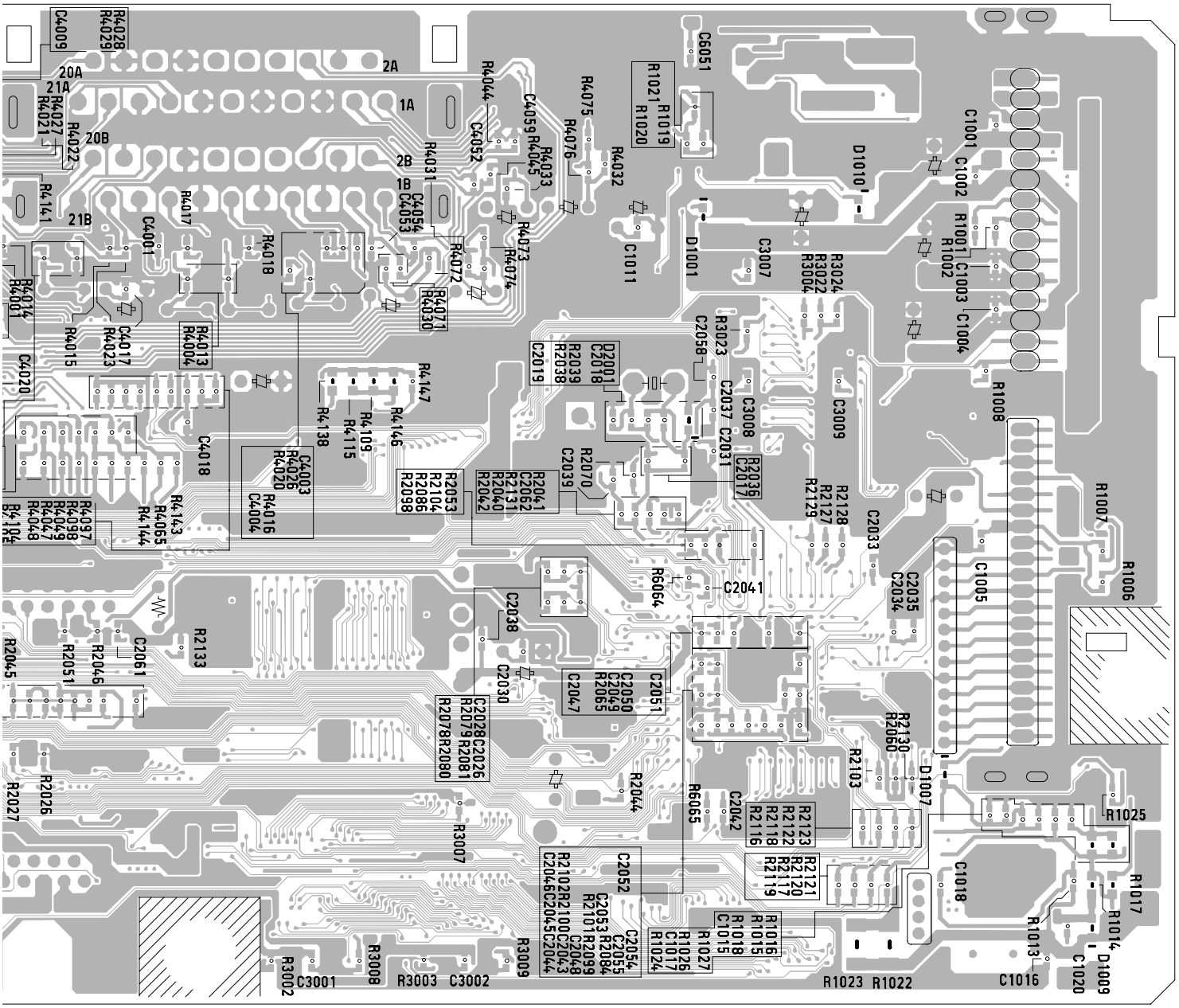
IC2002 Q6018 Q6017 IC6005 Q6007 Q6009 IC6001 Q6011 Q6006 IC6002 Q6036

Q6034 Q6033 Q6010 Q6012 Q6003 Q6001 Q6002 Q6004

A MAIN ASSY



SIDE B



BNP1323-B

5. PCB PARTS LIST

NOTES: ●*Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.*
●*The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
●*When ordering resistors, first convert resistance values into code form as shown in the following examples.*
Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%).
560 Ω → 56 × 10¹ → 561 ..... RD1/4PU 5 6 1 J
47k Ω → 47 × 10³ → 473 ..... RD1/4PU 4 7 3 J
0.5 Ω → R50 ..... RN2H R 5 0 K
1 Ω → 1R0 ..... RS1P 1 R 0 K
Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).
5.62k Ω → 562 × 10¹ → 5621 ..... RN1/4PC 5 6 2 1 F

LIST OF ASSEMBLIES

Mark	No.	Description	Part No.
		MAIN ASSY	BWE1055
		FRONT ASSY	BWE1079
		CARD ASSY	BWE1080
⚠		POWER ASSY	BXF1112

A MAIN ASSY

SEMICONDUCTORS

Mark	No.	Description	Part No.
	IC5001		73K321L-IH
	IC4002		AK4319A-VM
	IC1001		BA05SFP
	IC5005		BA10324AF
	IC6005		CAT24WC16JI
	IC2002		HD74HCT125FP
	IC5006		HIN211CB
	IC3003		HYB3118165BST-60
	IC3005		HYB39S16160AT-10
	IC3001		BGC1002-A-AV
	IC3002		MBM29LV400TC-90PFTN
	IC1002		NJM317DL1
	IC4003		NJM3404AM
	IC5004		P80C52
	IC5007		PACS1284-04Q
⚠	IC5002		PC123F2
	IC6001		PE5128A
	IC6002		PST9124N
	IC2003		SN74LVU04ANS
	IC2001		STI5510
	IC4001		STV6411A
	IC2004		TC74ACT04F
⚠	IC5003		TLP127
	Q2001,Q2002		2SA1036K
	Q1006,Q2003,Q2004,Q6033,Q6036		2SA1037K
	Q1012		2SB1132
	Q5007		2SC4061K
	Q1007,Q2011,Q4015,Q4018-Q4023		2SC4081
	Q4025-Q4027,Q5003,Q5004,Q6031		2SC4081
	Q6035		2SC4081
	Q5001,Q5002		2SC4793
	Q1011		2SD1664
	Q6017		2SK2103
	Q6018		2SK2503
	Q5005		DTA113TKA
	Q1014		DTA124EK
	Q5006		DTA143EK
	Q6001-Q6004		DTB113ZK
	Q4008-Q4013,Q4028,Q4029		DTC123TKA
	Q1004,Q1008-Q1010,Q1013,Q6032		DTC124EUA
	Q6034		DTC124EUA
	Q4030		DTC124TKA
	Q2005-Q2010,Q6005-Q6012		DTC143EK
	Q1005		IRFR9024N
	Q5008		MMSTA13
	Q4014,Q4016,Q4017		UMD2N
	D5002		1SR154-400
	D1001,D1007,D1009,D1010,D5004		1SS355
	D6002,D6003,D6011,D6013		1SS355
	D1008,D6017		DA204U
	D4012,D4013		DAN202K
	D2001		HVU356
	D4011		PDZ4.7B
	D1005,D1011		RB160L-40
	D5003		S1ZB60-4072
	D4016		UDZ11B
	D4017-D4036		UDZ12B
	D6016		UDZS5.1B

COILS AND FILTERS

Mark	No.	Description	Part No.
	F1001		BTF1072
⚠	F5018		BTF1087
	L4005		BTH1065
⚠	T5001		BTX1032
	L2002,L2004		DTL1038

SWITCHES AND RELAYS

Mark	No.	Description	Part No.
⚠	RY5001		BSR1014

CAPACITORS

Mark	No.	Description	Part No.
	C6013 (0.047F/5.5V)		ACH1246
	C2009,C2012-C2014		CCSRCH101J50
	C5015		CCSRCH150J50
	C4021,C4022,C4050,C4051		CCSRCH220J50
	C6015,C6016		CCSRCH220J50
	C2005-C2008,C2010,C2011		CCSRCH221J50
	C2019		CCSRCH330J50
	C2003,C2004		CCSRCH331J50
	C5028		CCSRCH391J50
	C5016		CCSRCH8R0D50
	C4070		CEAT100M50
	C1009,C2056		CEAT101M10
	C1006		CEAT101M16
	C1007		CEAT101M50
	C5026		CEAT1R0M50

Mark	No.	Description	Part No.
	C4023,C4030-C4035,C4037		CEAT220M50
	C4061		CEAT221M16
	C2001,C2002,C4038-C4041		CEAT2R2M50
	C4074,C4075		CEAT2R2M50
	C6022		CEAT330M35
	C4065		CEAT470M10
	C1010,C1012		CEAT470M16
	C6019		CEAT470M25
	C4060,C6025,C6026		CEAT471M10
	C5012,C5025,C5047		CEAT4R7M50
	C5046		CKSQYB273K50
	C5023,C5024		CKSQYB471K50
	C2034,C2058,C4047,C4048		CKSRYB102K50
	C4052-C4059,C5020,C5022		CKSRYB102K50
	C1001-C1005,C1011,C1016,C2031		CKSRYB103K50
	C2037		CKSRYB103K50
	C1015		CKSRYB332K50
	C2062,C4071,C6036,C6037		CKSRYB471K50
	C5029		CKSRYB472K50
	C6056,C6063		CKSRYB473K16
	C5030		CKSRYB821K50
	C1017-C1020,C2016,C2033,C2035		CKSRYF103Z50
	C4009,C4066,C4068,C6031,C6035		CKSRYF103Z50
	C2015,C2017,C2026,C2028,C2032		CKSRYF104Z16
	C2038-C2043,C2045,C2046		CKSRYF104Z16
	C2048-C2050,C2052,C2053,C2055		CKSRYF104Z16
	C3001-C3004,C3007-C3009		CKSRYF104Z16
	C4001-C4008,C4010-C4015		CKSRYF104Z16
	C4017-C4020,C4062,C4069		CKSRYF104Z16
	C4072,C4073,C5013,C5014		CKSRYF104Z16
	C5017-C5019,C5021,C5031-C5035		CKSRYF104Z16
	C5044,C5045,C6014,C6033		CKSRYF104Z16
	C6052,C6053,C6057-C6059,C6062		CKSRYF104Z16
	C5027		CKSRYF333Z50

RESISTORS

R5020,R5021 (680Ω/1/2W)		BCN1046
R2001,R2002		RD1/2VM3R3J
R6001,R6002		RAB4C102J
R2054,R2069,R6019		RAB4C103J
R2107-R2115		RAB4C180J
R2030-R2032,R2056,R2059		RAB4C220J
R2089-R2093		RAB4C220J
R6003		RAB4C333J
R1014		RS1/10S1200F
R1016		RS1/10S1202F
R1015		RS1/10S1801F
R1017		RS1/10S3601F
R4142		RS1/16S0R0J
R2038,R4140,R4141		RS1/16S100J
R4001,R4004,R4007,R4010,R4013		RS1/16S101J
R4016,R4019,R4047,R4048,R6022		RS1/16S101J
R6027,R6028,R6052,R6053		RS1/16S101J
R1020,R2006,R2012,R2131,R4090		RS1/16S102J
R6055		RS1/16S102J
R1011,R1024,R2004,R2009		RS1/16S103J
R2024-R2027,R2041,R2044		RS1/16S103J
R2050,R2051,R2053,R2086,R2098		RS1/16S103J
R2100-R2102,R2125-R2128,R3004		RS1/16S103J
R3023,R4057,R4059,R4083,R4089		RS1/16S103J
R5010,R5901-R5903,R6063-R6065		RS1/16S103J
R1012,R2036,R2040,R4030-R4035		RS1/16S104J
R4084,R6004,R6023,R6024		RS1/16S104J
R2039		RS1/16S105J

Mark	No.	Description	Part No.
	R4064,R4065,R4068		RS1/16S111J
	R2078-R2081		RS1/16S113J
	R2003,R2008,R6007-R6013		RS1/16S121J
	R2019,R2020		RS1/16S131J
	R1021		RS1/16S152J
	R5016		RS1/16S153J
	R5015		RS1/16S182J
	R4136		RS1/16S183J
	R4063,R4066,R4067		RS1/16S201J
	R5012,R5013,R5017-R5019		RS1/16S203J
	R2116-R2123,R2130,R3005		RS1/16S220J
	R1009,R1013,R2013,R2014,R2021		RS1/16S222J
	R2028,R2042		RS1/16S222J
	R1026,R1027,R2022,R2023,R4133		RS1/16S223J
	R4082		RS1/16S224J
	R4058,R4060		RS1/16S242J
	R6005		RS1/16S330J
	R4069-R4080,R4147,R5007		RS1/16S331J
	R6057,R6058,R6071		RS1/16S332J
	R4135,R6059		RS1/16S333J
	R5014		RS1/16S363J
	R2070,R6037		RS1/16S470J
	R2005,R2011,R4014,R4015		RS1/16S471J
	R4017,R4018,R4020,R4021,R4029		RS1/16S471J
	R4086,R5011,R6090		RS1/16S471J
	R1010,R1025,R2132,R3001-R3003		RS1/16S472J
	R3006,R4049,R4085,R4091,R5003		RS1/16S472J
	R6049,R6061,R6062		RS1/16S472J
	R3007-R3009,R4038,R4039		RS1/16S473J
	R4044,R4045,R6039,R6089,R6091		RS1/16S473J
	R5904		RS1/16S474J
	R4050,R4051,R4055,R4056		RS1/16S513J
	R4118-R4121		RS1/16S513J
	R2129		RS1/16S560J
	R4097-R4100,R4103-R4106		RS1/16S562J
	R6088		RS1/16S563J
	R4023,R4027,R4028		RS1/16S620J
	R1019		RS1/16S680J
	R2007,R2010		RS1/16S681J
	R4087		RS1/16S682J
	R1018,R2015-R2018,R4022		RS1/16S750J
	R4024-R4026,R4040,R4042,R6060		RS1/16S750J
	R4143-R4145		RS1/16S910J
	R1022,R1023		RS1/2S1R8J□
	Other Resistors		RS1/10S

OTHERS

⚠	M1001	DIGITAL TUNER MODULE	BXF1108
	CN2003	12P FFC CONNECTOR	9604S-12C
	CN6001	20P FFC CONNECTOR	9604S-20C
		SERIAL NO. LABEL(PAP)	BAX1145
	JA4002	2P PIN JACK	BKB1017
	CN4001	SCART CONNECTOR	BKN1019
	CN6002	19P PLUG	BKP1120
	CN5004	DSUB 9P CONNECTOR	BKP1122
	CN5005	DSUB 25P CONNECTOR	BKP1123
⚠	CN5003	4P MODULAR JACK	BKP1137
	X6002	(32.768KHz)	BSS1027
	X5001	(11.0592MHz)	BSS1059
	X2002	(27MHz)	BSS1061
	X6001	(10.0MHz)	BSS1076

Mark	No.	Description	Part No.

B FRONT ASSY

SEMICONDUCTORS

	D8001	BEL1037

SWITCHES AND RELAYS

	S8001-S8006	ASG7013

RESISTORS

	R8001 (27KΩ/1/4W)	BCN1056

OTHERS

	CN8001 20P CONNECTOR	9604S-20F
	M8001 REMOTE SENSOR UNIT	BXX1026

C CARD ASSY

CAPACITORS

	C8501-C8504	CKCYF103Z50

RESISTORS

	R8502 (100Ω/1/4W)	BCN1057

OTHERS

	CN8503 12P CONNECTOR	9604S-12F
	CN8502 8P CARD CONNECTOR	BKP1141
	CN8501 16P CARD CONNECTOR	BKP1142

D POWER ASSY

This ASSY has no service part as a assy part.
Only the fuse (F101:REK1101) is the service part as a set part.Refer to page 4.

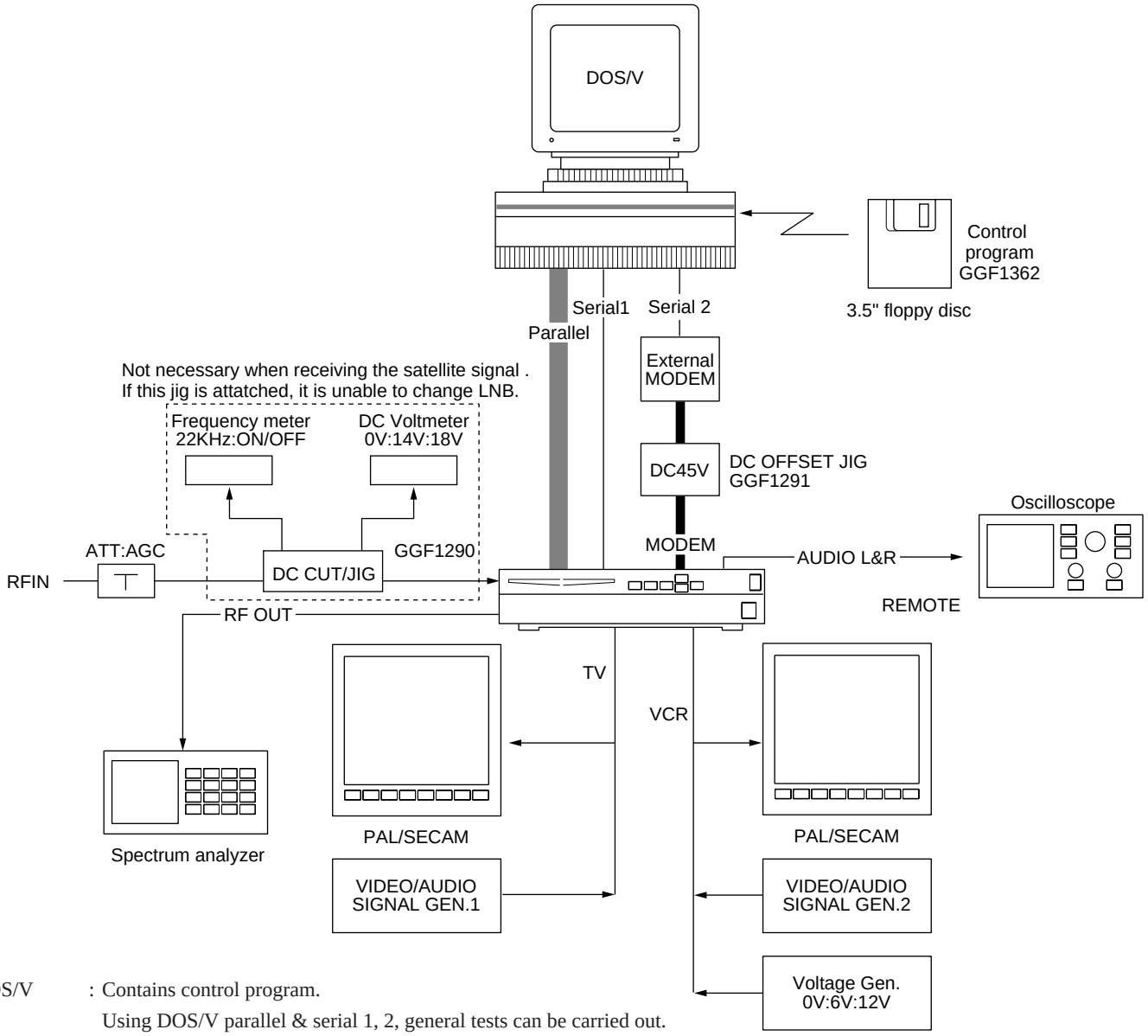
6. GENERAL INFORMATION

6.1 DIAGNOSIS

6.1.1 Test Software

1. Test Software Operating Environment

   The following shows the environment for running the test software using the control program and performing various measurements.



DOS/V : Contains control program.
Using DOS/V parallel & serial 1, 2, general tests can be carried out.

Parallel : For downloading data to Flash ROM (II).
Straight cable.

Serial 1 : For control program control using RS-232C.
Straight cable.

Serial 2 : Controls the External modem using RS-232C.
For performing modem operation check.

External modem
: DOS/V modem. Controlled using RS-232C.
For performing modem operations check.

DC45V JIG : Jig for biasing DC45V to the modem cable.

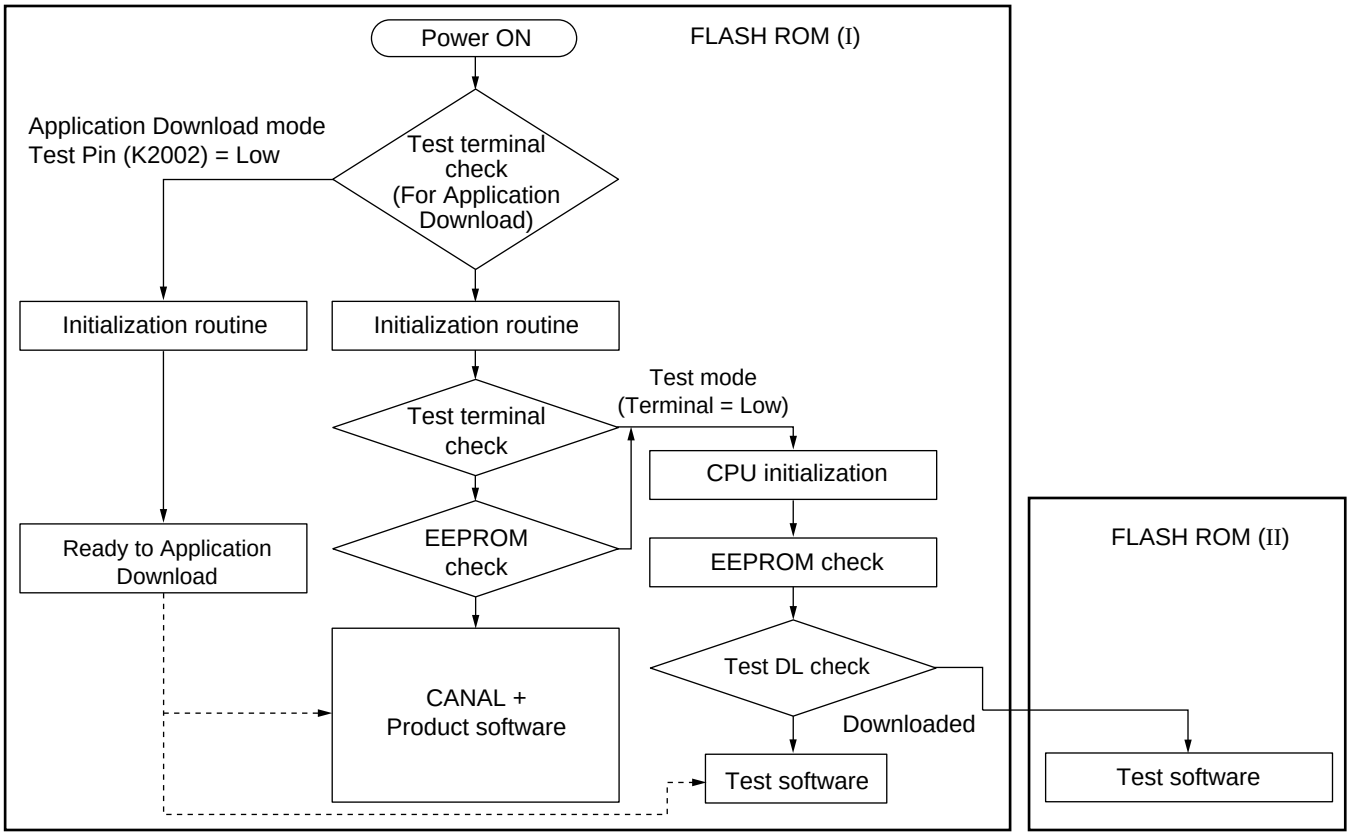
Voltage Gen : Control voltage generator for SLOW SW output selection.

Note: The Communication check softwares are different in each countries as below;

French version : GGF1362
Spanish version : GGF1364
Italian version : GGF1366
Polish version : GGF1367

■Software Configuration

The following shows the test software and Application Download configuration.



The Test software is composed of Boot and Main. Boot exists together with the product software on the FLASH ROM (I). Main exists on the FLASH ROM (II). (FLASH ROM (I) is MBM29LV160T-90PFTN or TC58FVT160FT-85.)

The Test software Boot has only the function of the least required devices (IC) initialization, diagnosis, and downloads the Test software Main into the FLASH ROM (II).

The Test software Main is downloaded into the FLASH ROM (II) and performs the operation checks of all devices, and settings of IC parameters.

Application Download mode is the unusual mode. If the IRD is need to be changed “CANAL +Product software” in FLASH ROM (I), select the Application Download mode.

Application Download mode can download the new “CANAL +Product software”.

■LED DISPLAYS

• Initialization

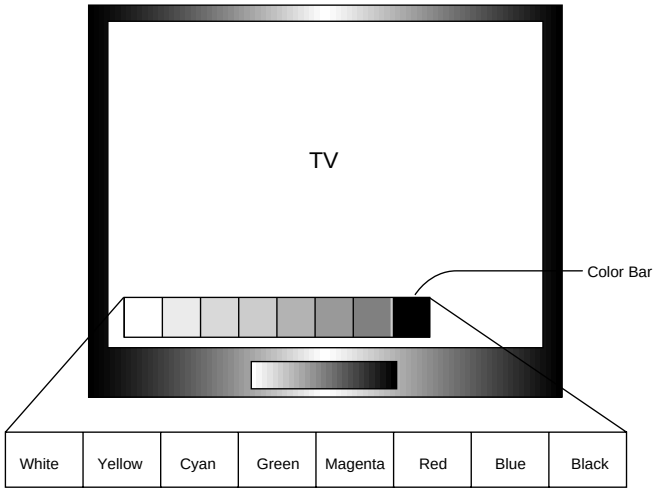
Checks of devices are performed in the following order and results are displayed on the LED.

1) LEDs all lit
2) LED “0” lights Reading the Version (reading each version of the software ,hardware and Patch inside the EEPROM)
3) LED “1” lights Initializing the Tuner section (setting the data to the register by IIC)
4) LED “2” lights Initializing the EEPROM 16K (24LC16B/CAT24WC16J/CAT24WC16JI/BR24C16F) (writing the factory delivery data by IIC) .
5) LED “3” lights Initializing the Video Encoder (inside STi5510) (initializing on the software)
6) LED “4” lights Initializing the demulitiplexer part of the Main CPU STi5510 (inside STi5510 , initializing on the software)
7) LED “5” lights Initiallizing the MPEG VIDEO part (initiallizing on the software)
8) LED “6” lights Initializing the MPEG AUDIO part (initializing on the software)
9) LED “7” lights DAC reset ON

10) LED “8” lights Initializing the FLASH ROM (II) 4M(MBM29LV400TC-90PFTN / TC58FVT400FT-85) (reading the electrinic signature ,initializing on the software)
11) LED “9” lights Initializing the Teletext part (inside STi5510 , initializing on the software)
12) LED “10” lights Initializing the Subtitle part (initializing on the software)
13) LED “11” lights Initializing the Mailbox (initializing on the software)
14) LED “12” lights Initializing the Task (initializing on the software)
15) LED “13” lights Initializing the Device_manager (initializing on the software)
16) LED “14” lights Initializing the interrupt of STi5510 (initializing inside STi5510)
17) LED “15” lights Initializing the SHUTDOWN Task (inside STi5510 , initializing on the software)
18) LED “16” lights Initializing the Service part (initializing on the software)
19) LED “17” lights Initializing Sound part (initializing on the software)
20) LED “18” lights Initializing the Section part (inside STi5510 ,initializing on the software)
21) LED “19” lights Initializing the Mload part (initializing on the software)
22) LED “20” lights Initializing the OSD part (initializing on the software)
23) LED “21” lights Initializing the Parallel part (initializing on the software)
24) LED “22” lights Initializing the Parallel TASK (inside STi5510 ,initializing on the software)
25) LED “23” lights Initializing the Backup part (initializing on the software ,reading EEPROM)
26) LED “24” lights Initializing the Card part(inside STi5510, initializing on the software)
27) LED “25” lights Initializing the Emm part (initializing on the software)
28) LED “26” lights Initializing the Ecm part (initializing on the software)
29) LED “27” lights Initializing the MCOM TASK part (initializing on the software)
30) LED “28” lights Initializing the Clock part (reading SubCPU and EEPROM by IIC ,initializing on the software)
31) LED “29” lights Initializing the Serial part (initializing on the software)
32) LED “30” lights Initializing the Serial TASK (inside STi5510 ,initializing on the software)
33) LED “31” lights Initializing the AV Switch(STV6411A) (writing the necessary data to STV6411A by IIC, initializing on the software)
34) LED “32” lights Initializing the Scvcr part (writing the necessary data to AV Switch(STV6411A) , Video encoder (inside STi5510) and SubCPU by IIC , initializing on the software)
35) LED “33” lights Initializing the Sctv part (writing the necessary data to AV Switch(STV6411A) , Video encoder (inside STi5510) and Subcpu by IIC , initializing on the software)
36) LEDs all lit

Note : The right side two digit of the LED indicator of the frontpanel display the selfcheck number during executing each step.

■OSD Display



6.1.2 Self-Diagnosis Mode

Procedure

1) Open the bonnet and short the Test Pin K6003 and GND.
   (The Test Pin terminal is located at the upper side of CN6002 as seen from the front.)
2) Turn ON the power.
   Push any key.
   The self-diagnosis mode is set.
   LED “0 to 33” on the IRD front panel light up one by one and then all lit. If a LED stops between “0 and 33”, the circuit block corresponding to that number should be checked.
3) When all the LEDs are lit, it indicates that the IRD is waiting for downloading of the Test software Main.
   The Test software Main will be downloaded from the PC connected to the IRD.
4) When the downloading completes normally, OK is displayed on the PC display. If OK, it indicates that the parallel port of the IRD is operating normally.
5) After completing the downloading, resetting the power supply, and this time all LEDs “0 to 33” will light up one by one, and finally all lit. If a LED stops, the circuit block corresponding to that number should be checked.

Example
Downloading of Self-Diagnosis Program

1) Move the cursor to “Program Download” at MAKE CHECK_STEP, press the RETURN key and then press the F10 key to end the setting.

2) When the IRD side sets into the downloading standby state, select IRD CHECK from the main menu, and press the RETURN key. Press the RETURN key once more to download the program.

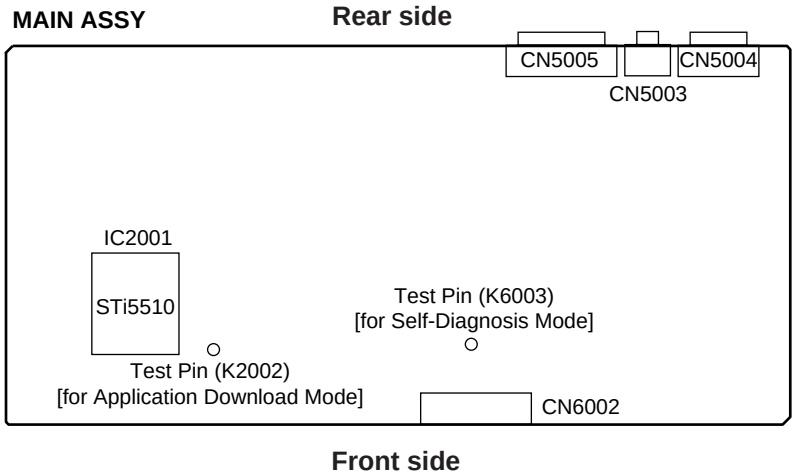


Fig.1 Test Pin LOCATION

■Starting and Operating the Communication Check Software GGF1362

PC Operation Environment
DOS/V machine OS : MS-DOS

Execution program : MAIN. EXE

When the MAIN.EXE is started, the following initial screen is displayed.

MAIN MENU

– – – IRD CHECK – – –

– – – MAKE CHECK_STEP – – –
– – – RETURN to DOS – – –
Ver. * * *

Select MAKE CHECK_STEP with the cursor, and press the RETURN key.
The following will be displayed.

1: Self check error list
2: Program Download
3: Set Parameter 1
4: Set Parameter 2
5: Set Parameter 3
6: Set Parameter 4
7: Tuner Check
8: Check DSCR/BANK/Card Detect
9: DSCR/BANK Card R/W Check
10: DSCR Card R/W Check
11: BANK Card R/W Check
12: Check Audio Volume
13: Check Video Contrast (RGB)
14: Check Video Mute (RGB)
15: Check Video Mute (VIDEO)
16: Check Audio Mute
17: Check SECAM Mode
18:Check S_VHS Mode
19: Check Slow_SW OFF (0V)
20: Check Slow_SW 16:9 (6V)
21: Check Fast_SW
22: Check MONO/STEREO (VCR_SCART)
23: Check MONO/STEREO (TV_SCART)
24: Check Input Voltage
25: Check High BAND (22kHz)
26: Check LNB DC (18V)
27: Check LNB DC (14V)
28: Check MODEM (SET)
29: Check DSCR Card Detect
30: Check BANK Card Detect
31: Application DownLoad
32: Check Parallell Port
33: Check MODEM Sensitivity
34: Check MODEM Carrier Frequency
35: Check VCXO
36: Check Slow_SW 4:3 (12V)
37: Flash Soft clear
38: Set data for V42
STEP:

Push Enter key after choose by Arrow key
f10: END

Press the “F10” key after inputting the command number to be transmitted to IRD.
After returning to the initial screen, select “IRD CHECK” with the cursor key and press the RETURN key. The screen for executing the command will be displayed. Pressing the RETURN key will execute the command selected at “MAKE CHECK_STEP”.
The following shows a list of commands and their functions.

No.	Command	Function
1	Self Check error list	Not used.
2	Program Download	Used for downloading the Test program to IRD.
3	Set parameter 1	Transmits the command used for setting the parameters required for IRD tuning signals. (To set parameters, press the function key F1 at the IRD Check Mode Screen.)
4	Set Parameter 2	Same as above except the use of function key F2.
5	Set Parameter 3	Same as above except the use of function key F3.
6	Set Parameter 4	Same as above except the use of function key F4.
7	Tuner Check	Used to check if the Tuner Bit Error Rate is OK or not at limited MPEG stream signal. OK :Bit Error rate OK, NG : Bit Error rate NG
8	Check DSCR/BANK Card Detect	Checks the DETECT terminal of DSCR Card and BANK Card.
9	DSCR/BANK Card Check	Checks both the No. 10 and No. 11 command function.
10	DSCR Card Check	Used to check if the DSCR Card is present and to check the communication with the main microprocessor. OK : Communication check OK NG : Communication check NG
11	BANK Card Check	Used to check if the Bank Card is present and to check the communication with the main microprocessor. OK : Communication check OK NG : Communication check NG
12	Check Audio Volume	Varies the audio output level (Recovers after two seconds)
13	Check Video Contrast (RGB)	Varies the RGB output contrast level (4 step: 0.7V, 0.8V, 0.9V, 1.0V)
14	Check Video Mute (RGB)	Mutes RGB output (Recovers after 2 seconds)
15	Check Video Mute (Video)	Mutes composite video output (Recovers after 2 seconds)
16	Check Audio Mute	Mutes all audio outputs (TV_SCART, RCA) (Recovers after 2 seconds)
17	Check SECAM Mode	Switches the video output to SECAM
18	Check S_VHS Mode	Switches the video output to Y/C separation output Also switches the video output to PAL
19	Check Slow_SW OFF (0V)	Sets the SLOW_SW (16:9/4:3 discrimination signal) to OFF (Low Level)
20	Check Slow_SW 16:9 (6V)	Sets the SLOW_SW to 16:9
21	Check Fast_SW ON	Sets the FAST_SW (RGB/Video switching signal) to ON (High Level)
22	Check Mono/Stereo (VCR_SCART)	Switches the VCR_SCART audio output to monaural
23	Check Mono/Stereo (TV_SCART)	Switches the SCART mode 5, 2, 4 and 1. (Refer to the next page Fig 2)

No.	Command	Function
24	Check Input Voltage	Checks the tuner AGC voltage, external Slow_SW input voltage OK : Both check are OK, NG : Both check are NG * The IRD has to be set to the initial state, and 6V or 12V has to be applied from outside.
25	Check High Band (22kHz)	Checks the oscillation circuit in the IRD 22kHz pulse is carried from the antenna input
26	Check LNB DC (18V)	DC18V is carried from the antenna input
27	Check LNB DC (14V)	DC14V is carried from the antenna input
28	Check MODEM(SET)	Checks the communication between the MODEM in the IRD and External MODEM. (Refer to the Appendix Page 71.) OK : Communication check is OK, NG:Communication check is NG (Use DC OFFSET JIG)
29	Check DSCR Card Detect	Checks the DETECT terminal of the DSCR Card
30	Check BANK Card Detect	Checks the DETECT terminal of the BANK Card
31	Application Download	Used for downloading the Application to IRD
32	Check pararell Port	Performs parallel port loop back test
33	Check MODEM Sensitivity	Check sensitivity between IRD's modem and external modem.
34	Check MODEM Carrier Frequency	Check carrier frequency at 390 Hz, 450 Hz, 1300 Hz and 2100 Hz.
35	Check VCXO	Check VCXO frequency at upper and lower side.
36	Check Slow_SW4:3(12V)	Sets the Slow_SW to 4:3
37	Flash Soft clear	Erase the Test Program
38	Set data for V42	Sets V42 packet communication timing.

Fig.2 TV VCR SCART TEST

	TV SCART output	RCA audio output	VCR SCART output
Mode 1	VCR output	VCR output	TV output
Mode 2	VCR output	VCR output	MPEG A/V output
Mode 3	MPEG A/V output	MPEG Audio output	TV output
Mode 4	MPEG A/V output	MPEG Audio output	Mute
Mode 5	VCR output	VCR output	Mute
Mode 6	MPEG A/V output	MPEG Audio output	MPEG A/V output

■Outline of the IRD Check on the Main Menu

Select IRD CHECK on the MAIN MENU, and press the RETURN key.
The following screen will be displayed.

```
STEP : * * *                                    NEXT : * * *

— — — — — — — — — — — — — — — — — — — — — — — — — — — — — — — — — — — —

F1 : Set Tuning parameter1          F2 : Set   Tuning parameter2
F3 : Set Tuning parameter3          F4 : Set   Tuning parameter4
F5 : Set the state of IRD           F6 :
F7 : Set eeprom data                F8 :
F9 : Set AV level data              ESC : Return
```

The command selected at “MAKE CHECK_STEP” on the MAIN MENU will be displayed onto ＊＊＊.

F7 --- Refer to the Precautions after repairs (P.42)

Pressing the RETURN key at this screen will transmit the selected command to the IRD.

If the IRD operates normally for the transmitted command, “OK” will be displayed.
If a problem exists, NG will be displayed.

■ Function keys

Set Parameter : Sets the parameters of the received signal.

Example

```
                        – –  Set Parameter 1  – –

Tuner freq   :  0950000KHz (Min: 950000 Max: 2150000)
Code rate    :  1/2     2/3     3/4     5/6     7/8
Symbol rate  :  27500k  (Min : 18000, Max : 30000)
IQ mode      :  I,Q             I,-Q
RF switch    :  LNB-A           LNB-B
Video PID    :  0200    (0000 - 1FFF)
Audio PID    :  0280    (0000 - 1FFF)
Pcr PID      :  1FFE    (0000 - 1FFF)
Error rate   :  Normal          Viterbi
APR          :  1       2       3       4       5       R
AQ Time      :  Known           Unknown
AQ freq      :  2150000KHZ (Min : 950000, Max : 2150000)
AQ C rate    :  1/2     2/3     3/4     5/6     7/8
AQ S rate    :  25000k (Min :18000, Max : 30000)
IQ mode      :  I,Q             I,-Q
RF switch    :  LNB-A           LNB-B
AQ V PID     :  0200    (0000 - 1FFF)
AQ A PID     :  0280    (0000 - 1FFF)
AQ P PID     :  1FFC    (0000 - 1FFF)

                        f1 : sweep     f2 : up     f3 : down     f9 : send     Esc : return
```

After the completion of data setting of each function, using the F9 key, data can be transmitted to control the IRD.

Set the state of IRD

Example

```
                        – –  Set Sub CPU_port  – –

HI_BAND          :          ON          OFF
LNB_POWER        :          OFF         14V     18V
TV/NOT           :          NOT         TV
16:9/4:3         :          4 : 3       16 : 9
RGB ON/OFF       :          OFF         ON
VCR OUT          :          SVHS        CVBS
PAL/SECAM        :          SECAM       PAL
REC/PB (TV)      :          PB          REC
TV AUDIO         :          Stereo      Mono
VCR AUDIO        :          Stereo      Mono
Mute TV a        :          off         on
Mute VCR a/v     :          on          off (REC)       off (PB)


                                                       F9 : send     Esc : return
```

Set AV level data: Used to control the Audio volume and RGB level.

```
                        – –  Set Audio & RGB level  – –

Audio volume        :  0        (Min: 9 Max: 0)
RGB level           :  0.7      0.8      0.9      1.0




                                  f2 : up      f3 : down      F9 : send      Esc : return
```

After the completion of data setting of each function, using the F9 key, data can be transmitted to control the IRD.

Precautions after repairs

When the test software operates, in the EEPROM data, the effective data is written to the address from 0x7F0 to 0x7FF which is related with the test software. when the power is turned ON again, the test software instead of the CANAL + product software will operate and problems will result. After completing repairs, break the above data so that the test software will not operate.
The following describes the procedure.

There are 2 ways to break the test software data. (But use method 1 as much as possible)

Method 1 (Recommended)

1
1) Operate the test software (do not short the test pin).
2) Select MAKE CHECK_STEP with the cursor, and press the RETURN key.
3) In the menu, select the command “37: Flash soft clear” and press the RETURN key.
   And then press the F10 key to end the setting.
4) Select IRD CHECK from the main menu, and press the RETURN key.
   Press the RETURN key once more to clear the Flash data.

Method 2

2
1) Operate the test software (do not short the test pin).
2) Press [F7] and set the EEPROM DATA SET mode.
3) Press [ALT] and [F10] .
4) Press [PAGE UP] so that the address at the most bottom on the display becomes 0x7F0.
5) Press the [↓] key to move the cursor to the 0x7F0 position, and change the address 0x7F0 to 0x7FF data to all FF.
6) Press [F9] .

Here, turn ON the power again, and check that the normal software operates.

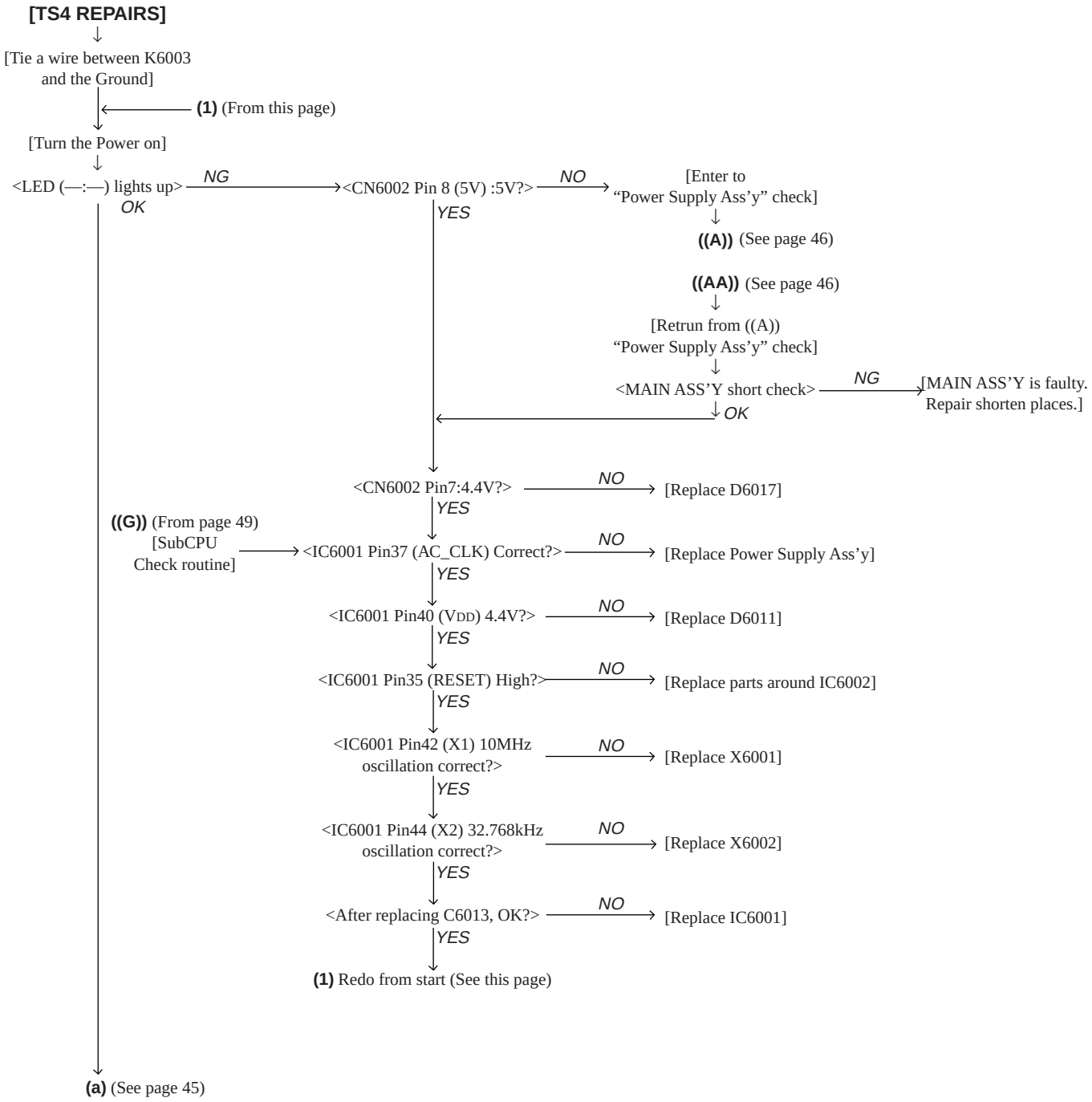
6.1.3 TROUBLESHOOTING

Prologue

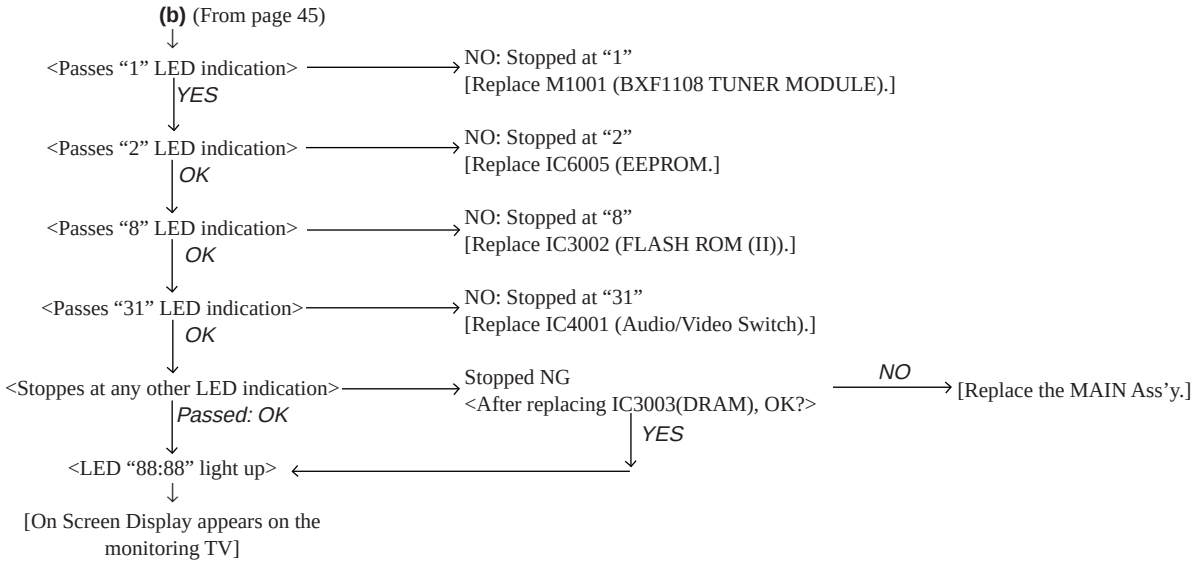
Before entering into repairing stages, we recommend you to make confirmations as following;

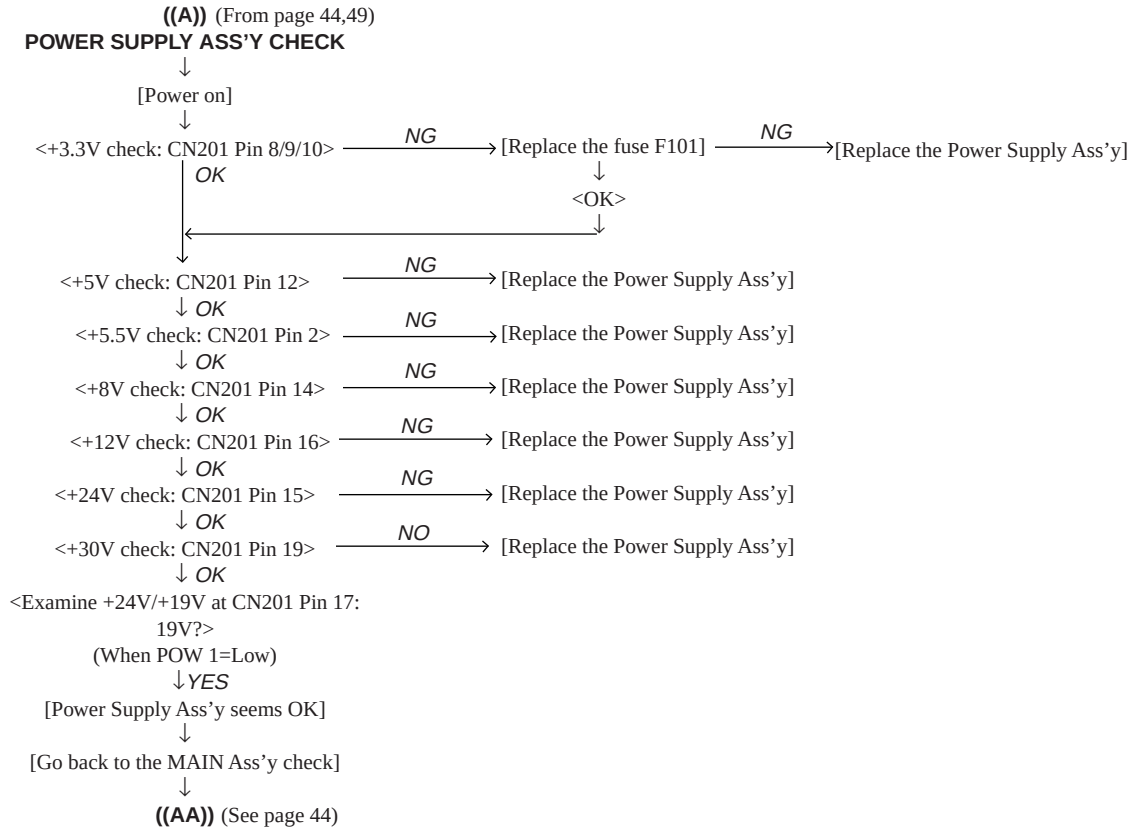
1) This flow chart doesn't describe simple defections like below.
   So check them before your starting;
   * Whether push-switche(s) is(are) broken.
   * Whether connector plug(s) or socket(s) get(s) out of place(s).
   * Whether there are poor contacts of the wire(s).

2) Generally, the IRD may have;
   * Soldering defections made by the mechanical stresses.
   * Devices failures which show an evident chage of their colour.


[TS4 REPAIRS]
[Tie a wire between K6003 and the Ground]
(1) (From this page)
[Turn the Power on]
<LED (—:—) lights up>
NG
OK
<CN6002 Pin 8 (5V) :5V?>
NO
YES
[Enter to "Power Supply Ass'y" check]
((A)) (See page 46)
((AA)) (See page 46)
[Retrun from ((A)) "Power Supply Ass'y" check]
<MAIN ASS'Y short check>
NG
[MAIN ASS'Y is faulty. Repair shorten places.]
OK
<CN6002 Pin7:4.4V?>
NO
[Replace D6017]
YES
((G)) (From page 49) [SubCPU Check routine]
<IC6001 Pin37 (AC_CLK) Correct?>
NO
[Replace Power Supply Ass'y]
YES
<IC6001 Pin40 (VDD) 4.4V?>
NO
[Replace D6011]
YES
<IC6001 Pin35 (RESET) High?>
NO
[Replace parts around IC6002]
YES
<IC6001 Pin42 (X1) 10MHz oscillation correct?>
NO
[Replace X6001]
YES
<IC6001 Pin44 (X2) 32.768kHz oscillation correct?>
NO
[Replace X6002]
YES
<After replacing C6013, OK?>
NO
[Replace IC6001]
YES
(1) Redo from start (See this page)
(a) (See page 45)


(a) (From page 44)
[Push all the keys, one by one.]
<LED (88:88) lights up>
NO
<K6001:3.3V/K6002:5V Both correct?>
NO
<IC6001 Pin5 (XSTBY) High?>
NO
<Replace the FRONT Ass'y>
YES
[Replace parts around Q6017/Q6018]
YES
<IC6001 Pin53 (IRQ_Teiden) High?>
NO
[Replace R2098]
(See the bottom side of IC2001)
YES
<IC6001 Pin54 (IRQ_key) Low?>
NO
[Replace IC6001]
YES
<K2001 27MHz oscillation correct?>
NO
[Replace parts around VCXO]
(For example: crystal resonator, IC2003...)
YES
<R3005 (XRESETO High)>
NO
[Replace R3005]
YES
<IC6001 Pin63(SDA)/Pin64 (SCL) both High?>
NO
<After replacing C6013, OK?>
NO
[Enter I2C (IIC) check]
((B)) (See page 47)
YES
YES
[Enter checking around IC2001 (OMEGA) or Memory devices]
[Add solder to Resistor-Arrays around IC2001]
[Add solder to IC3001]: FLASH ROM (I)
[Add solder to IC3003]: DRAM
[Add solder to IC3002]: FLASH ROM (II)
[Replace IC3001]: FLASH ROM (I)
[Replace IC3003]: DRAM
[Replace IC3002]: FLASH ROM (II)
[Replace the MAIN Ass'y]
(b) (See page 46)


(b) (From page 45)
<Passes “1” LED indication>
NO: Stopped at “1”
[Replace M1001 (BXF1108 TUNER MODULE).]
YES
<Passes “2” LED indication>
NO: Stopped at “2”
[Replace IC6005 (EEPROM.]
OK
<Passes “8” LED indication>
NO: Stopped at “8”
[Replace IC3002 (FLASH ROM (II)).]
OK
<Passes “31” LED indication>
NO: Stopped at “31”
[Replace IC4001 (Audio/Video Switch).]
OK
<Stoppes at any other LED indication>
Stopped NG
<After replacing IC3003(DRAM), OK?>
NO
[Replace the MAIN Ass’y.]
Passed: OK
YES
<LED “88:88” light up>
[On Screen Display appears on the monitoring TV]


((A)) (From page 44,49)
POWER SUPPLY ASS’Y CHECK
[Power on]
<+3.3V check: CN201 Pin 8/9/10>
NG
[Replace the fuse F101]
NG
[Replace the Power Supply Ass’y]
OK
<OK>
<+5V check: CN201 Pin 12>
NG
[Replace the Power Supply Ass’y]
OK
<+5.5V check: CN201 Pin 2>
NG
[Replace the Power Supply Ass’y]
OK
<+8V check: CN201 Pin 14>
NG
[Replace the Power Supply Ass’y]
OK
<+12V check: CN201 Pin 16>
NG
[Replace the Power Supply Ass’y]
OK
<+24V check: CN201 Pin 15>
NG
[Replace the Power Supply Ass’y]
OK
<+30V check: CN201 Pin 19>
NO
[Replace the Power Supply Ass’y]
OK
<Examine +24V/+19V at CN201 Pin 17: 19V?>
(When POW 1=Low)
YES
[Power Supply Ass’y seems OK]
[Go back to the MAIN Ass’y check]
((AA)) (See page 44)

((B)) (From page 45,49)

[IIC_BUS check]

↓

[Add solder to the contacts: R6057/R6058.]
(See bottom side of IC6005) (EEPROM)

↓

[Add solder to the contacts: R6027/R6028.]
(See bottom side of IC6001) (SUB CPU)

↓

[Add solder to IC6001(PE5128A SubCPU.) Pin 62/63/64.]

↓

[Add solder to the contacts: R6052/R6053.]
(See bottom side of IC6005) (EEPROM)

↓

[Add solder to IC6005(EEPROM) Pin5/6.]

↓

[Add solder to the contacts: R4047/R4048.]
(See bottom side of IC4002) (DAC)

↓

[Add solder to IC4001(STV6411A Audio/Video Switch) Pin21/22]

↓

[Replace IC6005(EEPROM).]

↓

[Replace IC6001(PE5128A SubCPU.).]

↓

[Replace IC4001(STV6411A Audio/Video Switch) .]

↓

[Replace M1001(BXF1108 TUNER MODULE).]

↓

[Replace the MAIN Ass'y.]

[Communication block repairs]

↓

[Connect the PC and setup "main.exe"environment.]

Serial communication check:

[Execute any "Set parameter" operation.]
(In the "main.exe" Window, push F1 key then F9 key.)

↓

<Finished correctly?> —*NO*→ [Replace IC5006(HIN211CB RS232 drivers).]

YES ↓

[Replace IC5006(HIN211CB RS232 drivers).] ↓ <Serial communication check> —*NG*→ [Trace the Serial communication line.]

<Serial communication check> ↓ *OK*

Parallel communication check:

[Execute "No.2:Download" operation.]
(Download the GGF1362-program from the PC to FLASH ROM(II))

↓

<Finished correctly?> —*NO*→ [After checking the controls and data lines, Replace the MAIN Ass'y.]

YES ↓

MODEM check:

[Execute "No.28:Check MODEM(SET)" operation.]

↓

<Finished correctly?> —*NO*→ **((C))** for TS4 (See page 48) for the other models, [replace the MODEM Ass'y.]

YES ↓

Card check:

[Execute "No.11 Bank Card R/W CHECK" operation.]
or[Execute "No.10 DSCR Card R/W CHECK" operation.]

↓

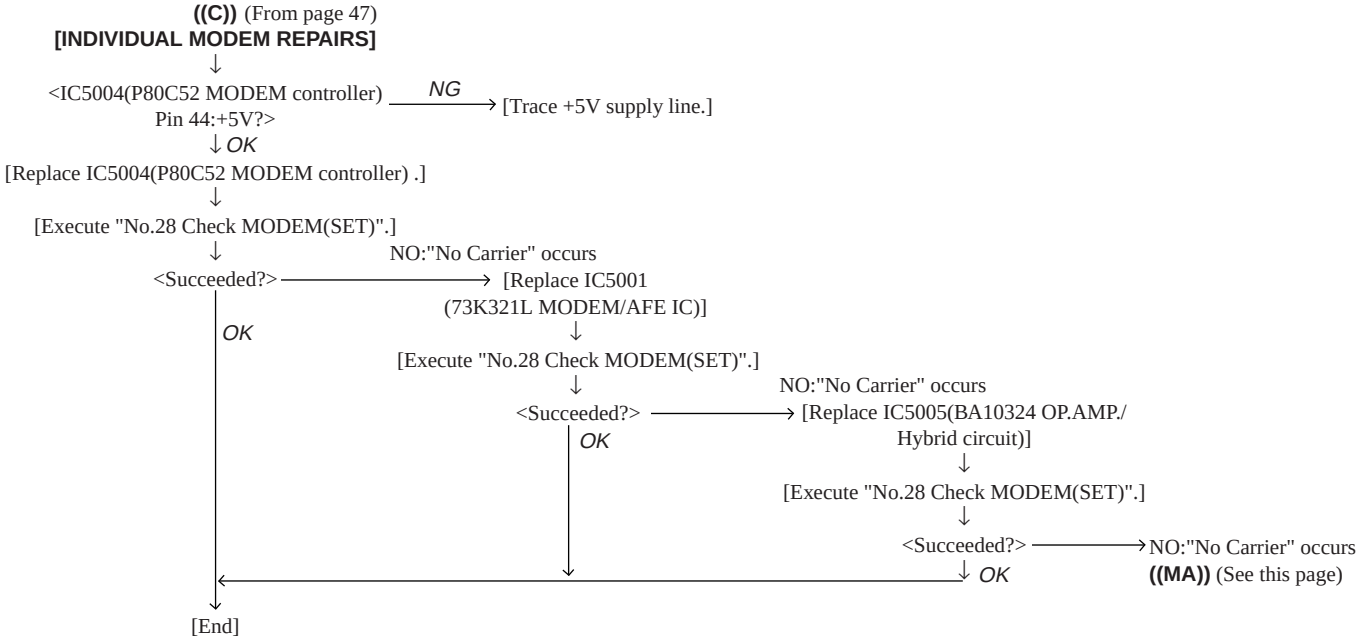
<Finished correctly?> —*NO*→ [Replace the Card Ass'y.]

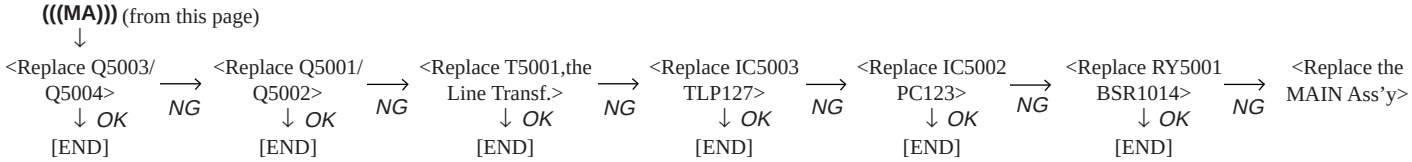
YES ↓

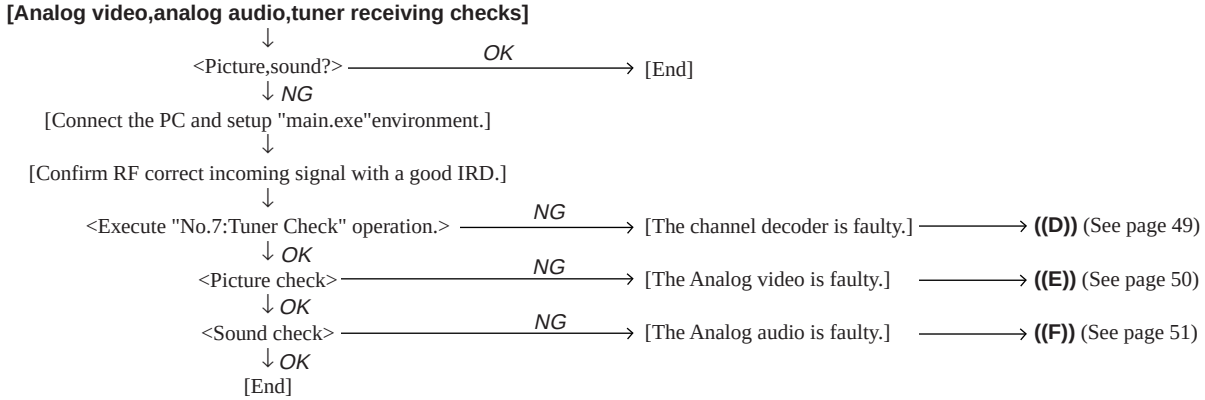
[Replace the Card Ass'y.] ↓ [Card check] —*NG*→ [Around 14.2848MHz CARD_CLK .] ↓ [After checking the line, Replace the Main Ass'y.]

[Card check] ↓ *OK*

[End]


((C)) (From page 47)
[INDIVIDUAL MODEM REPAIRS]
<IC5004(P80C52 MODEM controller) Pin 44:+5V?>
NG
[Trace +5V supply line.]
OK
[Replace IC5004(P80C52 MODEM controller) .]
[Execute "No.28 Check MODEM(SET)".]
<Succeeded?>
NO:"No Carrier" occurs
[Replace IC5001 (73K321L MODEM/AFE IC)]
OK
[Execute "No.28 Check MODEM(SET)".]
<Succeeded?>
NO:"No Carrier" occurs
[Replace IC5005(BA10324 OP.AMP./ Hybrid circuit)]
OK
[Execute "No.28 Check MODEM(SET)".]
<Succeeded?>
NO:"No Carrier" occurs
((MA)) (See this page)
OK
[End]


(((MA))) (from this page)
<Replace Q5003/ Q5004>
OK
[END]
NG
<Replace Q5001/ Q5002>
OK
[END]
NG
<Replace T5001,the Line Transf.>
OK
[END]
NG
<Replace IC5003 TLP127>
OK
[END]
NG
<Replace IC5002 PC123>
OK
[END]
NG
<Replace RY5001 BSR1014>
OK
[END]
NG
<Replace the MAIN Ass'y>


[Analog video,analog audio,tuner receiving checks]
<Picture,sound?>
OK
[End]
NG
[Connect the PC and setup "main.exe"environment.]
[Confirm RF correct incoming signal with a good IRD.]
<Execute "No.7:Tuner Check" operation.>
NG
[The channel decoder is faulty.]
((D)) (See page 49)
OK
<Picture check>
NG
[The Analog video is faulty.]
((E)) (See page 50)
OK
<Sound check>
NG
[The Analog audio is faulty.]
((F)) (See page 51)
OK
[End]

[Channel Decoder section]

((D)) (From page 48)

<M1001(TUNER MODULE) "+5V(1st_RF AMP)":5V?> NO → [Trace "A+5V" line.]

YES ↓

<M1001(TUNER MODULE) "+5V(SYNTH)"/"+5V(OTHER)":5V?> NO → [Trace "D+5.5V" line.]

YES ↓

<M1001(TUNER MODULE) "+3.3V":3.3V?> NO → [Trace "D+3.3V" line.]

YES ↓

<M1001(TUNER MODULE) "+30V":30V?> NO → [Trace "A+30V" line.]

YES ↓

<M1001(TUNER MODULE) "SCL(QPSK)":correct?> NO → [Enter IIC check] → **((B))** (See page 47)

YES ↓

<M1001(TUNER MODULE) "SDA(QPSK)":correct?> NO → [Enter IIC check] → **((B))** (See page 47)

YES ↓

[Connect the PC and setup "main.exe"environment.]

↓

[LNB Power check routine]

↓

[In the "main.exe" Window, push F5 key.]

↓

[Examine M1001(LNB POWER(RF INPUT)).]

↓

<13V(12.5V~14V) or 18V(17V~19V) ?> NO → <LNB_POW0 at Q1011 Base: High?> NO → **((G))** (See Page 44)

YES ↓

<IC1002(NJM317DL1 Voltage Regulator) output :13V or 18V?> NO → <IC1002(NJM317DL1 Voltage Regulator) Pin 3(VIN) :available?> NO → **((A))** (See Page 46)

YES ↓

[Replace Q1012 or Q1009]

YES ↓

[IC1002(NJM317DL1 Voltage Regulator) Pin 2(VOUT) and Pin 1 (ADJ)]

<IC1002: Voltage difference(Vout-Vadj): 1.25V?> NO → <Over-current sensing: OK?> (Around Q1006/Q1007)

YES ↓

[Replace IC1002]

NO ↑

[RF incoming signal is faulty.] (Antenna line seems to has a short path to the ground.)

YES ↓

[Add solder to R1014/R1015/R1016/R1017/R1018.]

<13V and 18V are switched correctly ?> NO → <A+22V or 17V input available?> NO → [Replace the Power Supply Ass'y]

YES ↓

<LNB_POW1 at Q1013 Base : High?> NO → **((G))** (See page 44)

YES ↓

[Replace Q1010 or Q1013]

YES ↓

[Examine 22kHz(HighBand/LowBand switching signal.]

↓

<Correctly overlayed onto 13V or 18V?> NO → <22kHz vailable at M1001(D22)?> NO → [Replace M1001]

YES ↓

[Replace Q1008]

YES ↓

[Execute any "Set parameter" operation.]

(In the "main.exe" Window, push F1 key then F9 key.)

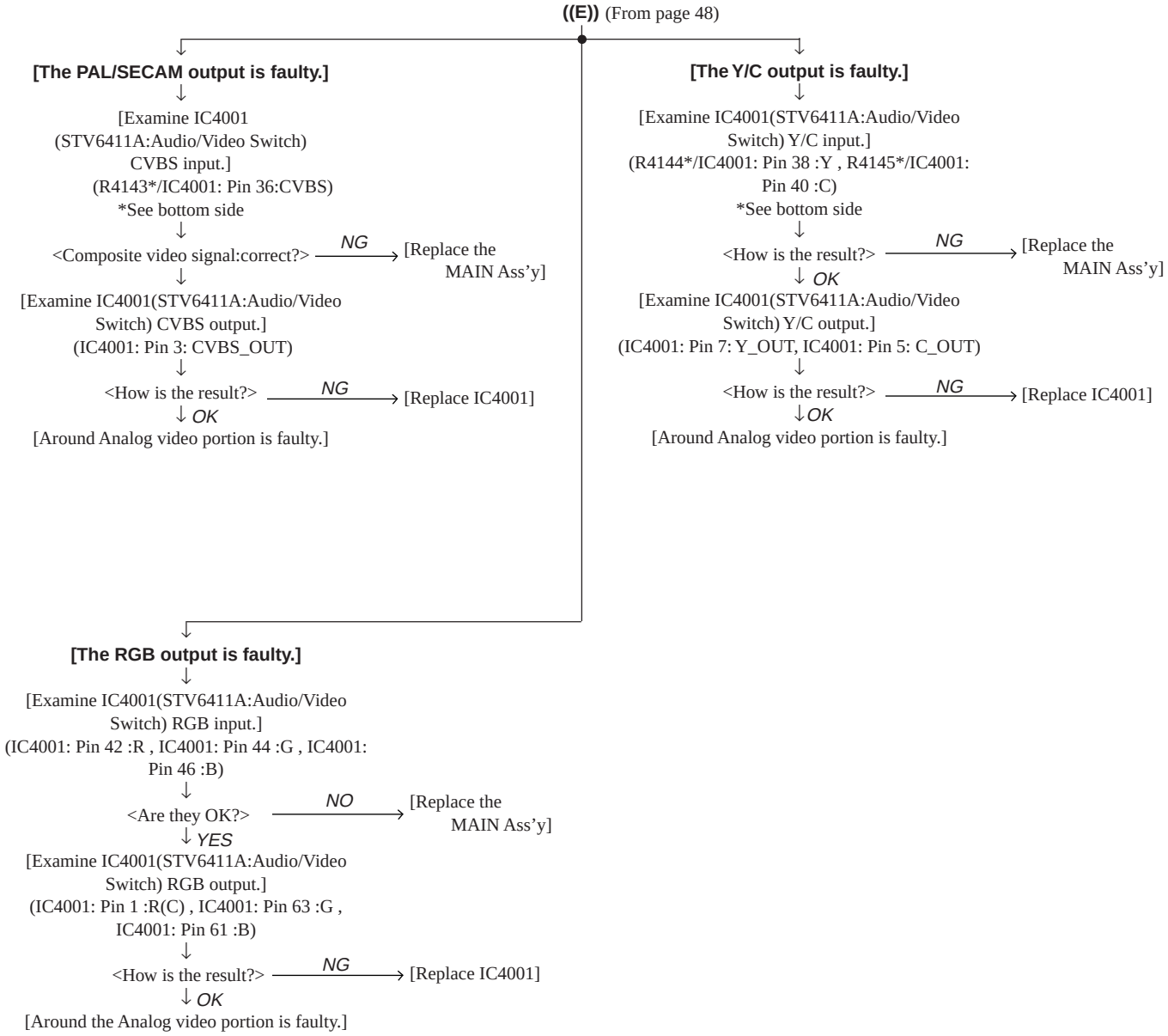
↓

<Execute "No.7 Tuner Check" operation.> NG → [REPLACE M1001 (BXF1108 TUNER MODULE)]

OK ↓

[Examine around the IC2001(OMEGA:STi5510A).]

[Analog Video section]



[Analog Audio section]

((F)) (From page 48)

↓

[Check the Power supplied properly.]

↓

[Examine IC4002(AK4319A-VM D/A converter) input]
(IC4002:Pin 6: SDATA)

↓

<How was the result?> —NO→ [Trace the line going up to IC2001 OMEGA:STi5510A.]

↓ OK

[Examine IC4002(AK4319A-VM D/A converter) output.]
(IC4002:Pin 18/19: L, IC4002:Pin 16/17: R)

↓ YES

<Are they OK?> —NO→ [Replace IC4002]

↓

[Examine IC4003(NJM3404AM OP. Amplifier) output]
(IC4003:Pin 1: L, IC4003:Pin 7: R)

↓

<How is the result?> —NO→ [Replace IC4003]

↓ OK

[Examine IC4001(STV6411A:Audio/Video Switch) Audio outputs.]

↓

[Select where to go from below.]

↓

Audio output terminals which are NG		Examine: IC4001 Pin 2: TV_L	Pin 64: TV_R	Pin 62: VCR_L	Pin 60: VCR_R	Pin 59: RCA_L	Pin 58: RCA_R
TV-SCART & VCR-SCART & CINCI	→	○	○	○	○	○	○
TV-SCART & VCR-SCART	→	○	○	○	○		
TV-SCART & CINCI	→	○	○			○	○
TV-SCART	→	○	○				
VCR-SCART	→			○	○		
CINCI	→					○	○
Others	→	○	○	○	○	○	○

↓

<How is the result?> —NG→ [Replace IC4001]

↓ OK

<Q4014/Q4017(UMD2N)Pin 3: High?> —NO→ [Add solder to the CN4001]
(TV_MUTE/VCR_MUTE)

↓YES

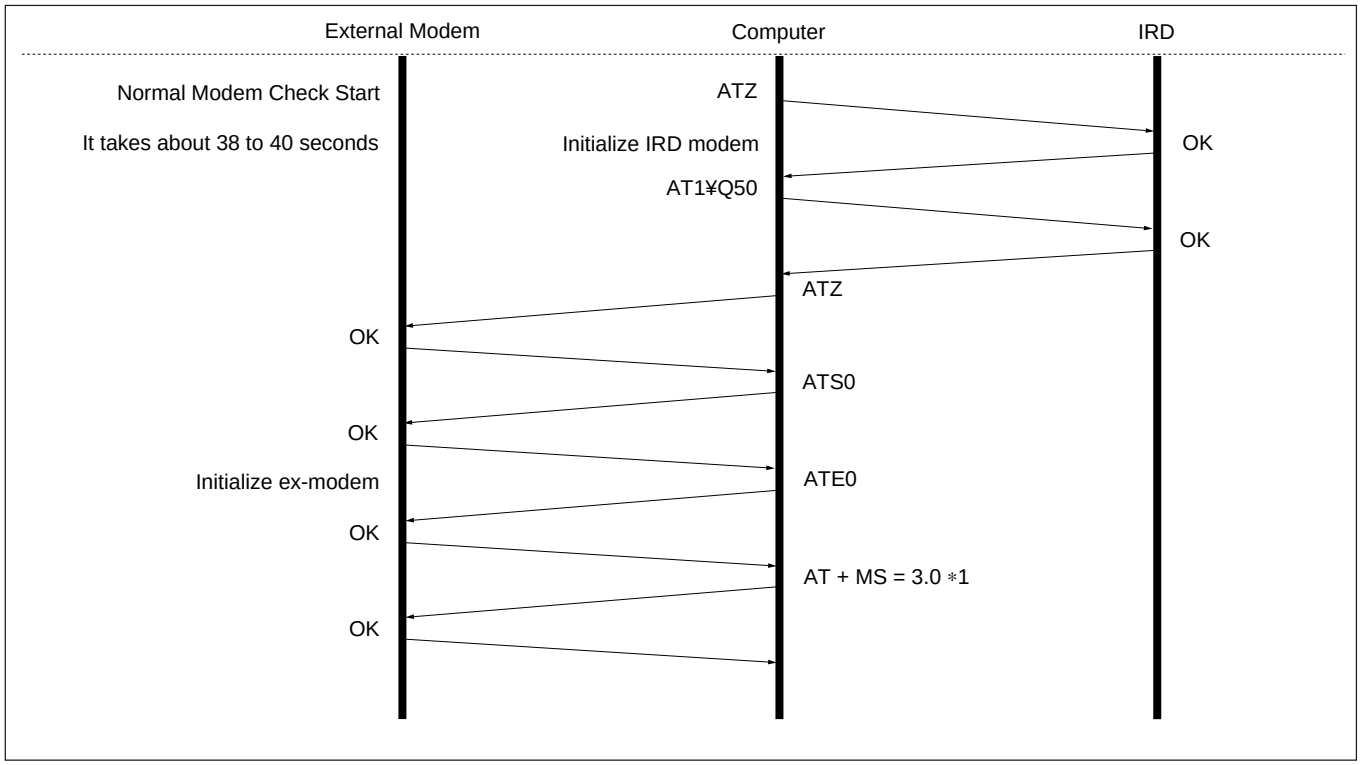
[Examine around the Muting circuitry]
(Q4015/Q4016/Q4018/Q4019/Q4030/D4012/D4013/Q4014/Q4017)

■Appendix.

MODEM Check Sequence

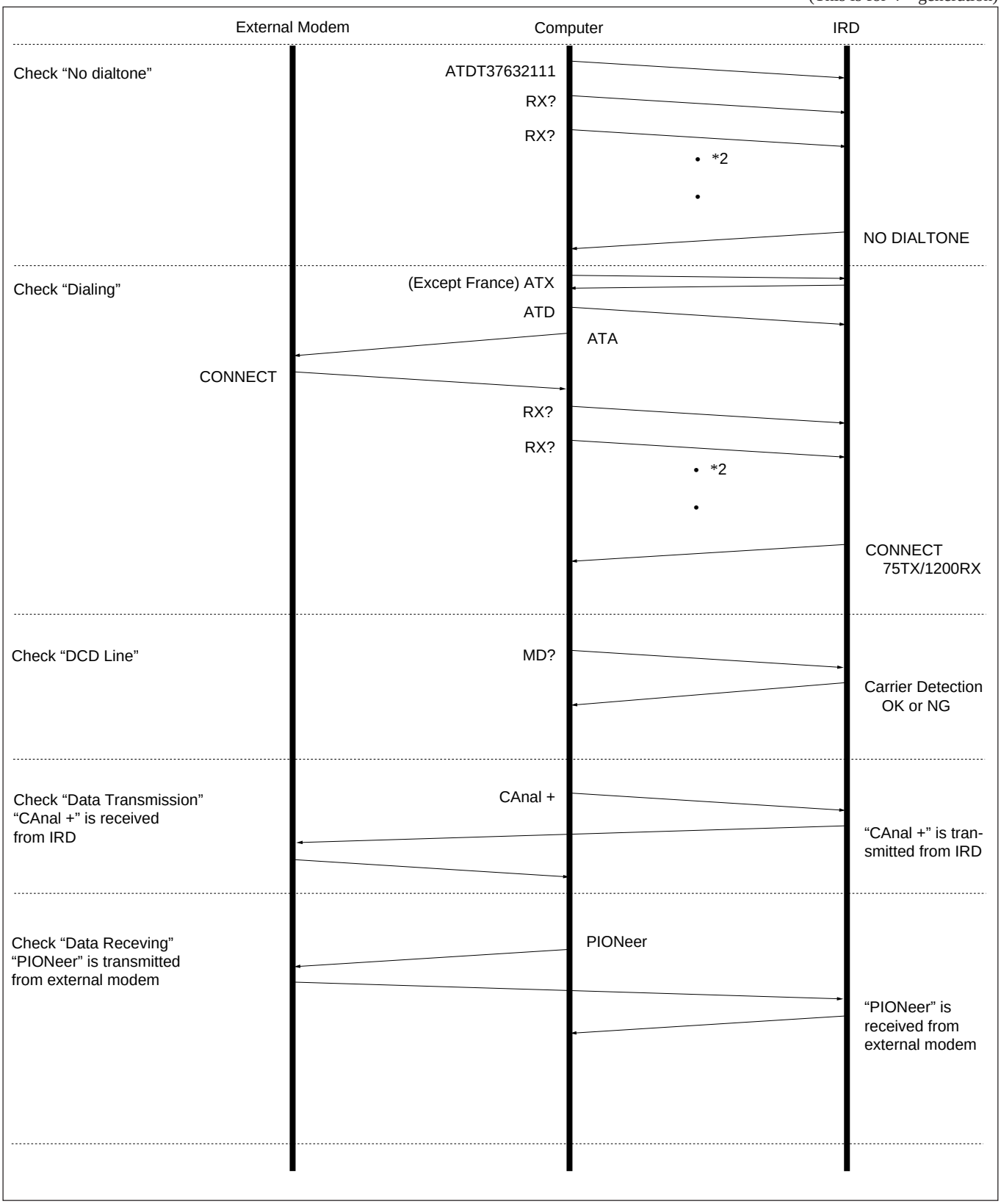
1. Initialization

(This is for 4TH generation)



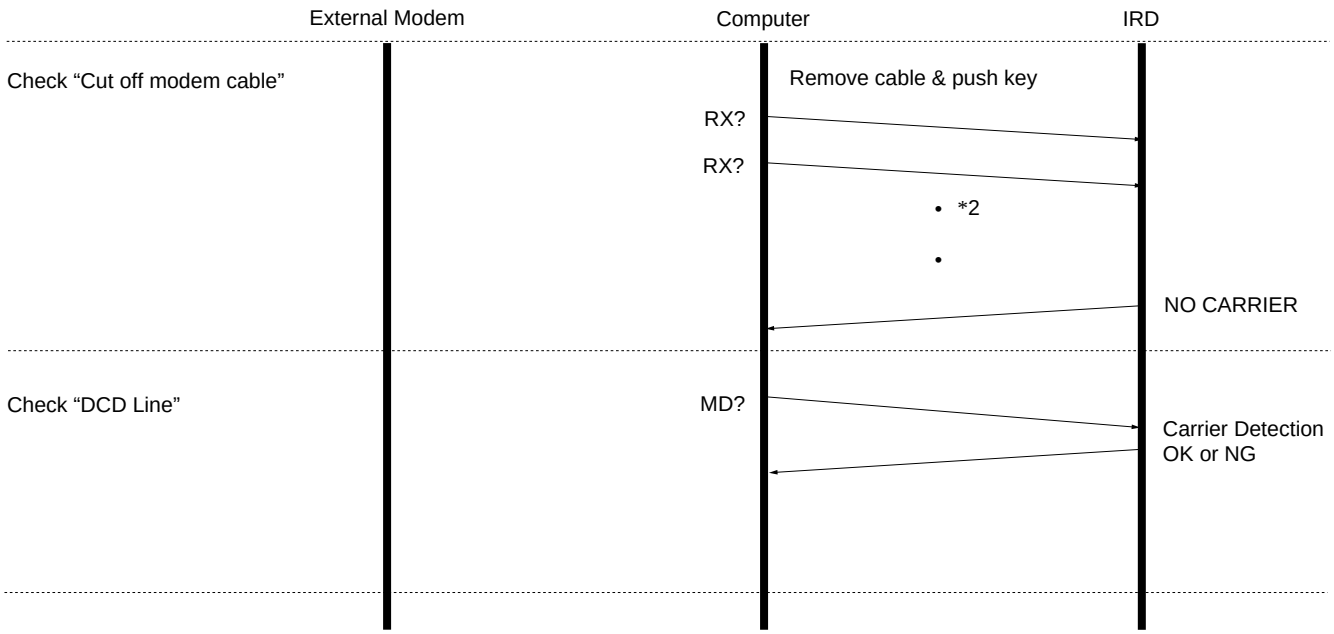
2. Dialing, Transmission & Receiving

(This is for 4TH generation)



3. Cut off detect confirmation

(This is for 4TH generation)



* 1 : France model : “AT + MS = 3.0 is sent to external modem.
Except France : “AT + MS = 2,0,2400,2400” is sent to external modem.

* 2 : Computer continues sending “RX?” to IRD for 10 seconds until result code come back to computer.
result code : This is the code that return from IRD’s modem.
Ex) “NO DIALTONE”, “CONNECT 75TX/1200RX”, “NO CARRIER”, etc.

6.2 IC

• The information shown in the list is basic information and may not correspond exactly to that shown in the schematic diagrams.

CAUTION : Use handling procedures necessary for a static sensitive component.

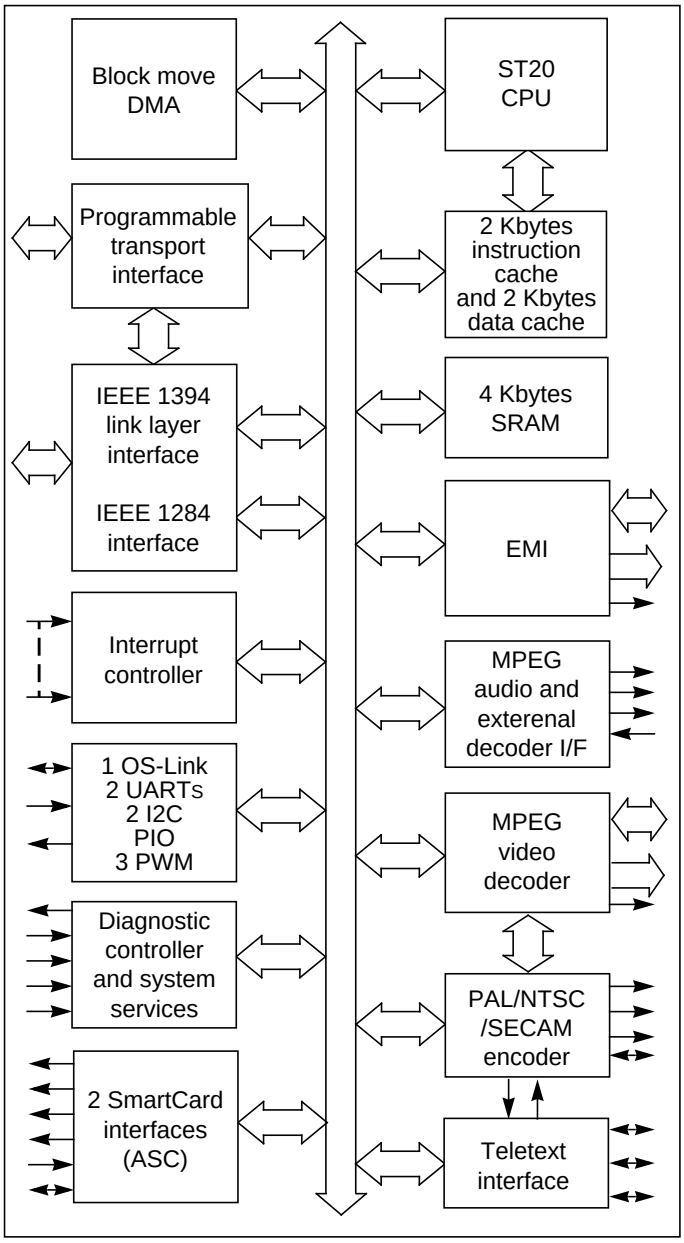
● List of IC

STI5510	BGC1002-A-AV	HYB3118165BST-60	STV6411A	AK4319A-VM
73K321L-IH	HIN211CB	PST9124N	CAT24WC16JI	

■ STI5510 (MAIN ASSY (2/6): IC2001)

PROGRAMMABLE TRANSPORT IC

● Block Diagram



● Pin Function

Signal names are prefixed by **not** if they are active low; otherwise they are active high.

Power supplies

Pin	Number	Function
VDD	13	Power supply.
GND	16	Ground.
VClamp1-3	3	Power supply for clamp diodes.
VDDA0-1	2	Analog power supply for PAL/NTSC/SECAM encoder.
VSSA0-1	2	Analog ground for PAL/NTSC/SECAM encoder.
RTCVDD	1	Real time clock supply.
VDD_VPLL	1	Analog power supply for video PLL.
VSS_VPLL	1	Analog ground for video PLL.

Video output interface

Pin	In/Out	Function
R_OUT	out	Red output.
G_OUT	out	Green output.
B_OUT	out	Blue output.
C_OUT	out	Chroma output.
CV_OUT	out	Composite video output.
Y_OUT	out	Luma output.
I_REF_DAC_RGB	in	DAC current reference.
I_REF_DAC_YCC	in	DAC current reference.
V_REF_DAC_RGB	in	DAC voltage reference.
V_REF_DAC_YCC	in	DAC voltage reference.
OSD_ENABLE	in/out	OSD enable.
notHSYNC	in/out	Horizontal sync.
ODD_OR_EVEN	in/out	Vertical sync.

Audio output interface

Pin	In/Out	Function
SCLK/A_C_STB	out	Serial clock or AC-3 data strobe.
PCM_DATA/A_C_DATA	out	PCM data out or AC-3 data out.
PCMCLK	in/out	PCM clock.
LRCLK/A-WORD_CLK	out	Left/right clock or AC-3 word clock.
A_C_REQ	in	AC-3 data request.
A_PTS_STB	in	AC-3 audio PTS strobe.

External interrupts

Pin	In/Out	Function
Interrupt0-1	in	Interrupt.

System services

Pin	In/Out	Function
ClockIn	in	System input clock - PLL or TimesOneMode.
SpeedSelect0-1	in	PLL speed selector.
notRST	in	System reset.
CPUAnalyse / TrigIn	in	Error analysis / External trigger input to DCU.
CPUReset	in	Soft reset for analyzing from OS-Link.
ErrorOut / TrigOut[1]	in/out, out	Error indicator / Signal to trigger external debug circuitry (e.g. LSA).

1 This pin is tri-stated during reset and then sampled at the end of the reset to determine whether the OS-Link is active and to determine the function of the shared **CPUAnalyse / TrigIn** and the **ErrorOut / TrigOut**. If the **ErrorOut** pin is sampled high (i.e at VDD) then the DCU signals (**TrigIn** and **TrigOut**) are selected and a low value indicates OS-Link signals (i.e. **CPUAnalyse**, **ErrorOut**) are to be used.

External memory interface

Pin	In/Out	Function
MemAddr2-23	out	Address bus.
MemData0-31	in/out	Data bus. MemData0 is the least significant bit (LSB) and MemData31 is the most significant bit (MSB).
MemRdnotWr	out	ReadnotWrite strobe.
MemReq	in	Direct memory access request.
MemGrant	out	Direct memory access granted.
MemWait	in	Memory cycle extender.
notMemCAS0-3	out	CAS strobes - bytes 0-3 or banks 0,1.
notMemRAS0-3	out	RAS strobes - banks 0,1.
notMemCSROM	out	Chip select strobe for ROM in bank3.
notMemOE	out	Output enable strobe - banks 0-3.
notMemBE0-3	out	Byte enable strobes - banks 0-3.
notMemCS2	out	Chip select strobe for memory in bank 2.
BootSource0-1	in	Boot from ROM or from link.
ProcClockOut	out	Processor clock.

SDRAM interface

Pin	In/Out	Function
AD0-11	out	SDRAM address bus.
DQ0-15	in/out	SDRAM data bus (lower byte).
notSDCS0-1	out	SDRAM chip select.
notSDCAS	out	SDRAM CAS.
notSDRAS	out	SDRAM RAS.
notSDWE	out	SDRAM write enable.
MEMCLKIN	in	SDRAM memory clock input.
MEMCLKOUT	out	SDRAM memory clock output.
DQML	out	DQ mask enable (lower).
DQMU	out	DQ mask enable (upper).

Clocks

Pin	In/Out	Function
LPClockIn	in	Low power input clock.
LPClockOsc	in/out	Low power clock oscillator.
AUX_CLK_OUT	out	Auxiliary clock for general use.

Parallel input/output

Pin	In/Out	Function
PIO0[0-7]	in/out	Parallel input/output pin or alternative function (see Table 4.15).
PIO1[0-7]	in/out	Parallel input/output pin or alternative function (see Table 4.15).
PIO2[0-7]	in/out	Parallel input/output pin or alternative function (see Table 4.15).
PIO3[0-7]	in/out	Parallel input/output pin or alternative function (see Table 4.15).
PIO4[0-7]	in/out	Parallel input/output pin or alternative function (see Table 4.15).

OS-Link

Pin	In/Out	Function
LinkIn	in	Serial data input channel.
LinkOut	out	Serial data output channel.

Transport stream input

Pin	In/Out	Function
TSInByteClk	in	Transport stream input byte clock.
TSInByteClkValid	in	Transport stream input byte clock valid edge.
TSInData0-7	in	Transport stream input data.
TSInError	in	Transport stream input packet error.
TSInPacketClk	in	Transport stream input packet strobe.

Teletext interface

Pin	In/Out	Function
TtxtEvennotOdd	in	Teletext even not odd vertical sync signal.
TtxtHsync	in	The HSYNC signal input when the teletext interface is operating in the input mode.

The teletext clock and data inputs are shared PIO pins, as shown in Table 1.

High speed data port

These pins have a dual function, and can be used either to interface to an external IEEE 1394 link layer controller or provide an IEEE 1284 parallel port interface.

Pin	In/Out	Function
1284Data0-7 / AVData7-0	in/out	IEEE 1284 por data or AV data.
1284notSelectIn	in	IEEE 1284 port control signals or AV signals.
1284notInit / AVPacketTag3	in	
1284notFault / AVPacketTag2	out	
1284notAutoFd / AVPacketTag1	in	
1284Select / AVPacketTag0	out	
1284PError / AVByteClkValid	out, in/out	
1284Busy / AVPacketClk	out, in/out	
1284notAck / AVByteClk	out	
1284notStrobe / AVPacketError	in	

Test access port (TAP)

Pin	In/Out	Function
TDI	in	Test data input.
TDO	out	Test data output.
TMS	in	Test mode select.
TCK	in	Test clock.
notTRST	in	Test logic reset.

PIO pins and alternative functions

Table 1 shows the assignment of the alternative functions to the PIO bits. Parentheses ( ) in the table indicate suggested or possible pin usages as a PIO, not an alternative function connection.

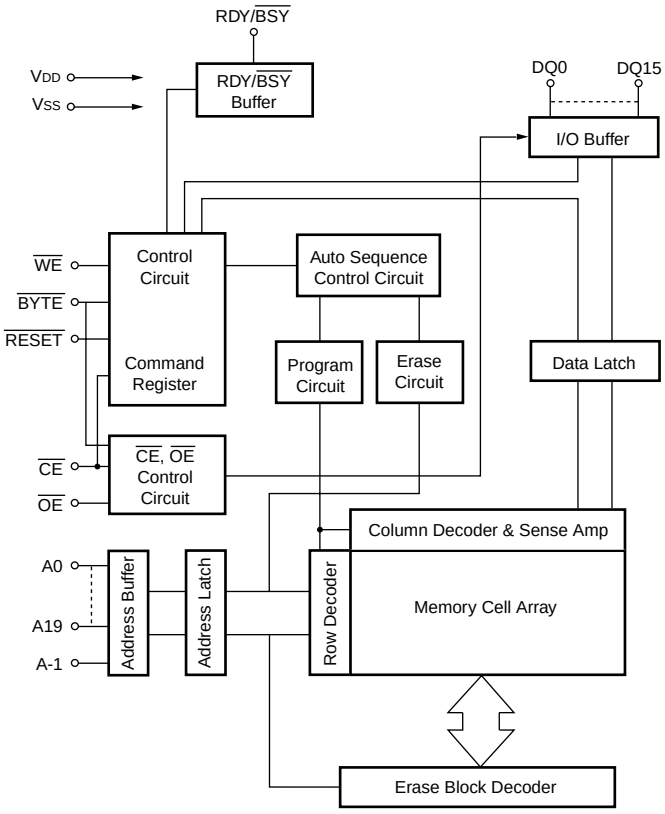
Port bit	Alternative function of PIO pins				
	PIO port 0	PIO port 1	PIO port 2	PIO port 3	PIO port 4
0	ASC0TxD or Sc1DataOut	SSC0 MTSR	ASC2TxD or Sc0DataOut	SSC1 MTSR	ASC3TxD
1	ASC0TRxD or Sc1DataIn	SSC0 MRST	ASC2RxD or Sc0DataIn	SSC1 MRST	ASC3RxD
2	Sc1ClkGenExtClk	SSC0 SClk	Sc0ClkGenExtClk	SSC1 SClk	TtxtClockIn
3	Sc1Clk	PWMOut0	Sc0Clk	CaptureIn0	1284PeriphLogicH
4	(Sc1RST)	PWMOut1	(Sc0RST)	CaptureIn1	1284HostLogicH
5	(Sc1CmdVcc)	ASC1TxD	(Sc0CmdVcc)	CaptureIn2	Interrupt2
6	(Sc1CmdVpp) Sc1Dir	ASC1RxD	(Sc0CmdVpp) Sc2Dir	CompareOut2	Interrupt3
7	(Sc1Detect)	PWMOut2	(Sc0Detect)	1284InnotOut	TtxtData

Table 1 Alternative functions of PIO pins

■ BGC1002-A-AV (MAIN ASSY (3/6): IC3001)

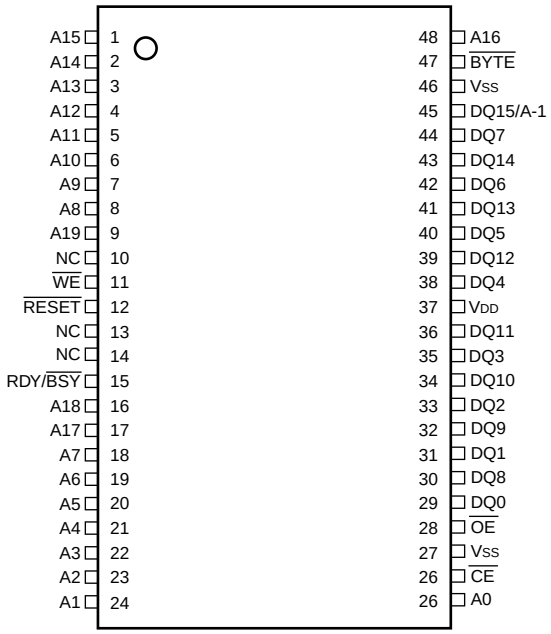
16MB FLASH MEMORY

● Block Diagram



● Pin Assignment

(TOP VIEW)



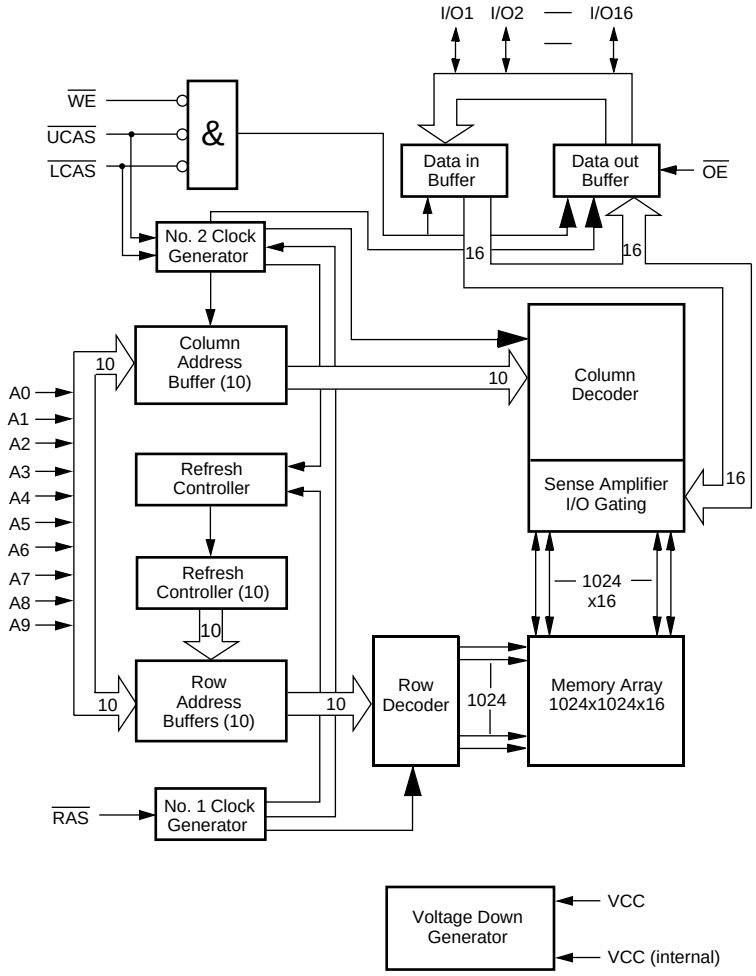
● Pin Function

A0 to A19	Address Input
DQ0 to DQ14	Data Input / Output
DQ15/A-1	Output (Input) / Address Input
$\overline{CE}$	Chip Enable Input
$\overline{OE}$	Output Enable Input
$\overline{BYTE}$	Word / Byte Select Input
$\overline{WE}$	Write Enable Input
RDY / $\overline{BSY}$	Ready / Busy Output
$\overline{RESET}$	Heardware Reset Input
NC	No Connection
V_{DD}	Power Supply
V_{SS}	Ground

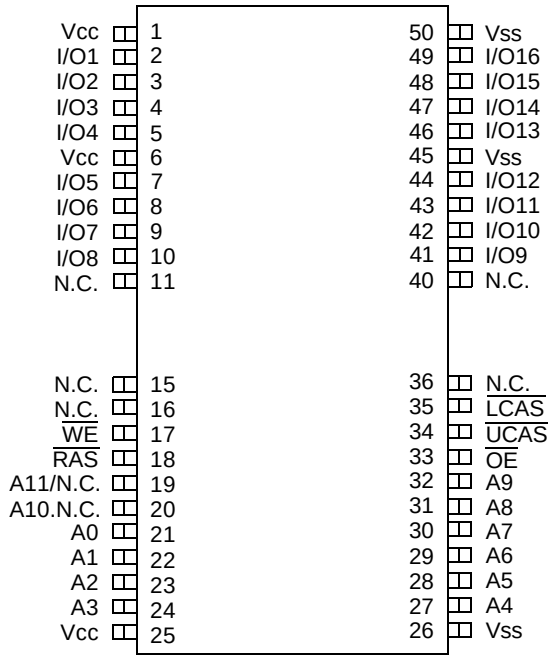
■ HYB3118165BST-60 (MAIN ASSY (3/6): IC3003)

EDO-DRAM

● Block Diagram



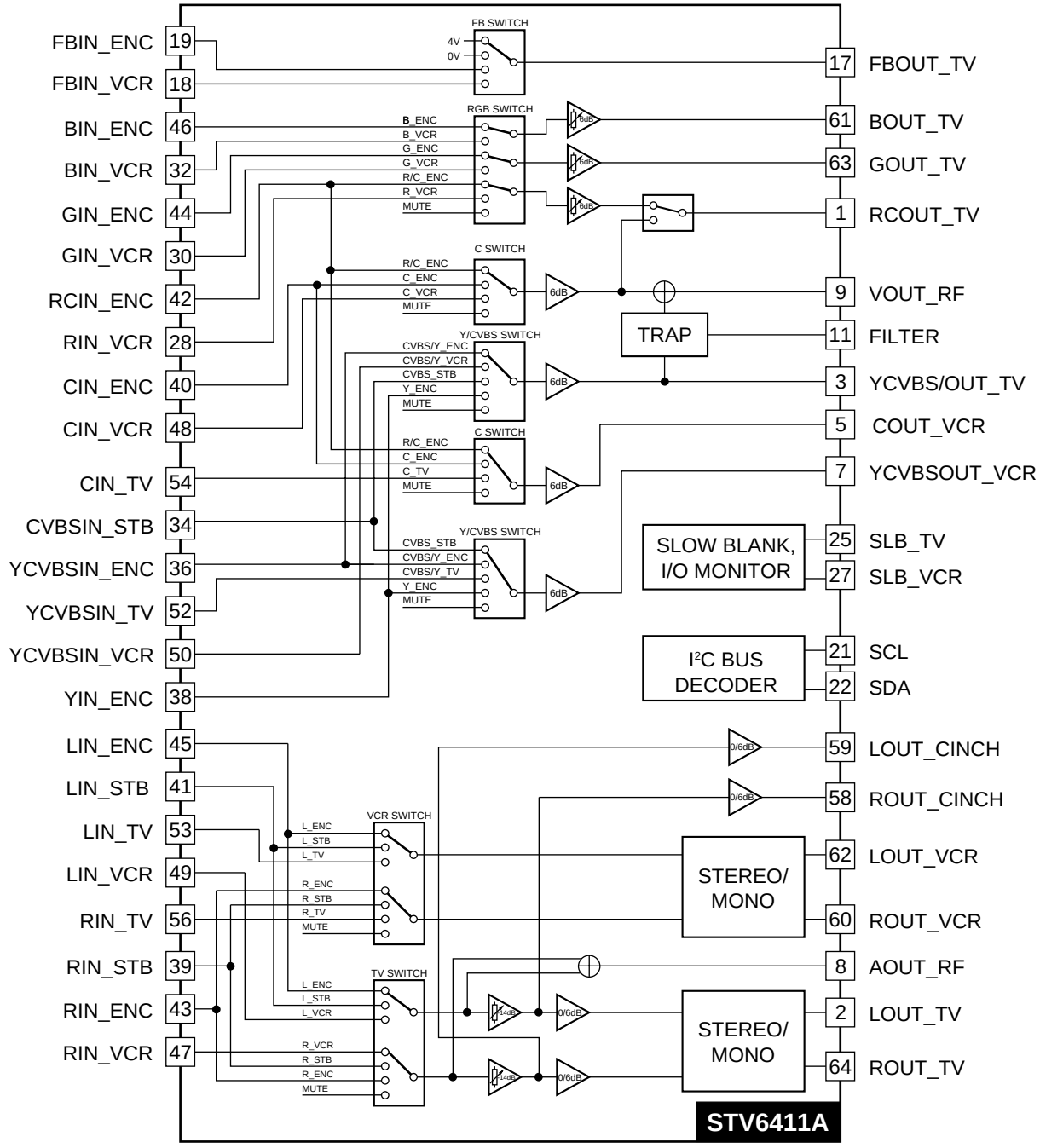
● Pin Assignment



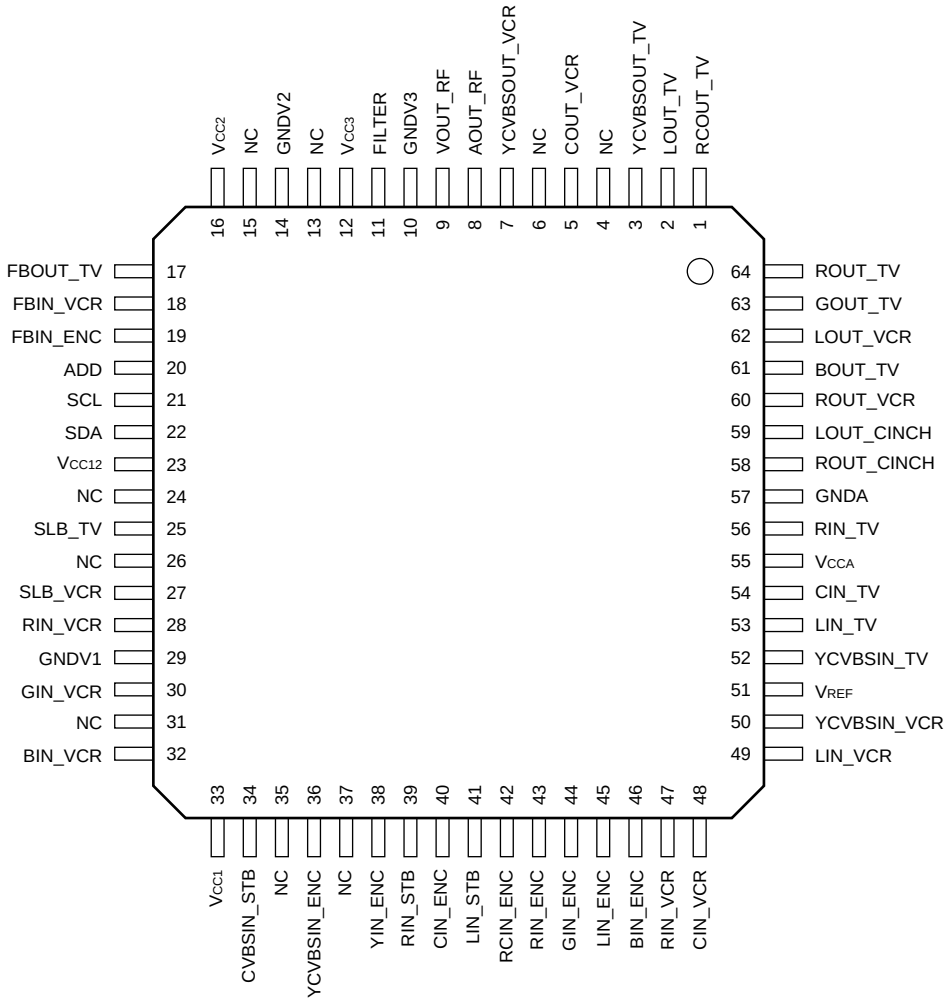
■ STV6411A (MAIN ASSY (4/6): IC4001)

AV SWITCH IC

● Block Diagram



● Pin Assignment



● Pin Function

Pin Number	Symbol	Description
1	RCOUT_TV	Red/chroma Output, to TV Scart
2	LOUT_TV	Audio Left Output, to TV Scart
3	YCVBSOUT_TV	Y/CVBS Output, to TV scart
4	NC	Not Connected
5	COUT_VCR	Chroma Output, to VCR Scart
6	NC	Not Connected
7	YCVBSOUT_VCR	Y/CVBS Output, to VCR Scart
8	AOUT_RF	Audio (L+R) Output to RF Modulator
9	VOUT_RF	Video (CVBS) Output to RF Modulator
10	GNDV3	Video Switches Ground 3
11	FILTER	Chroma Trap Filter
12	V_{CCV3}	Video Switches Supply 3 (8V)
13	NC	Not Connected
14	GNDV2	Video Switches Ground 2
15	NC	Not Connected
16	V_{CCV2}	Video Switches Supply 2 (8V)

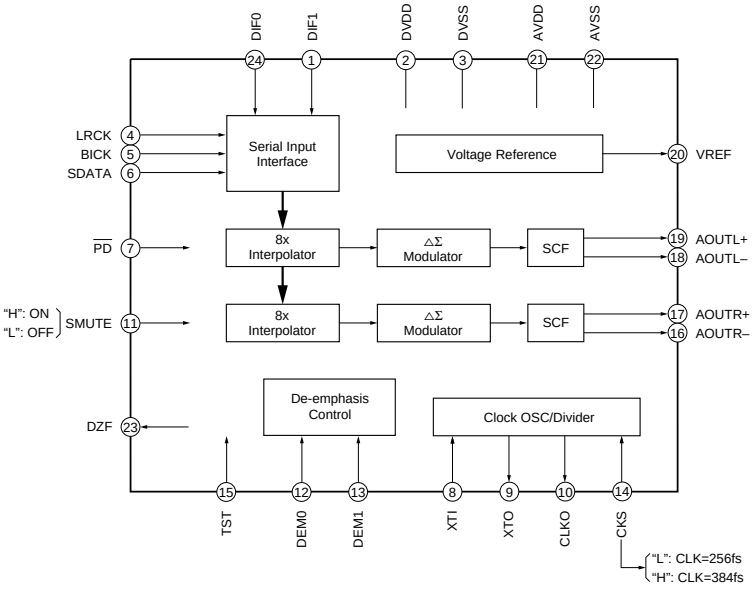
Pin Number	Symbol	Description
17	FBOUT_TV	Fast Blanking Output, to TV Scart
18	FBIN_VCR	Fast Blanking Input, from VCR Scart
19	FBIN_ENC	Fast Blanking Input, from Encoder
20	ADD	I^2C Bus IC Address Programmation
21	SCL	I^2C Bus Clock
22	SDA	I^2C Bus Data
23	V_{CC12}	Slow Blanking Power Supply (12V)
24	NC	Not Connected
25	SLB_TV	Slow Blanking Input/Output from TV
26	NC	Not Connected
27	SLB_VCR	Slow Blanking Input/Output from VCR
28	RIN_VCR	Red Input, from VCR Scart
29	GNDV1	Video Switches Ground 1
30	GIN_VCR	Green Input, from VCR Scart
31	NC	Not Connected
32	BIN_VCR	Blue Input, from VCR Scart
33	V_{CCV1}	Video Switches Supply 1 (8V)
34	CVBSIN_STB	CVBS Input from STB
35	NC	Not Connected
36	YCVBSIN_ENC	Y/CVBS Input from Encoder
37	NC	Not Connected
38	YIN_ENC	Y Input, from Encoder
39	RIN_STB	Audio Right Input, from STB
40	CIN_ENC	Chroma Input, from Encoder
41	LIN_STB	Audio Left Input, from STB
42	RCIN_ENC	Red/Chroma Input, from Encoder
43	RIN_ENC	Audio Right Input, from Encoder
44	GIN_ENC	Green Input, from Encoder
45	LIN_ENC	Audio Left Input, from Encoder
46	BIN_ENC	Blue Input, from Encoder
47	RIN_VCR	Audio Right Input, from VCR Scart
48	CIN_VCR	Chroma Input, from VCR Scart
49	LIN_VCR	Audio Left Input, from VCR
50	YCVBSIN_VCR	Y/CVBS Input from VCR Scart
51	V_{REF}	Voltage Reference Decoupling
52	YCVBSIN_TV	Y/CVBS Input, from TV Scart
53	LIN_TV	Audio Left Input, from TV Scart
54	CIN_TV	Chroma Input, from TV Scart
55	V_{CCA}	Audio Switches Supply (8V)
56	RIN_TV	Audio right input, from TV Scart
57	GNDA	Audio Switches Ground
58	ROUT_CINCH	Audio Right Output, to CINCH
59	LOUT_CINCH	Audio Left Output, to CINCH
60	ROUT_VCR	Audio Right Output, to VCR Scart
61	BOUT_TV	Blue Output, to TV Scart
62	LOUT_VCR	Audio Left Output, to VCR Scart
63	GOUT_TV	Green Output, to TV Scart
64	ROUT_TV	Audio Right Output, to TV Scart

Notes : 1. In application, all unused pins should be left open or high frequency bypassed to ground.

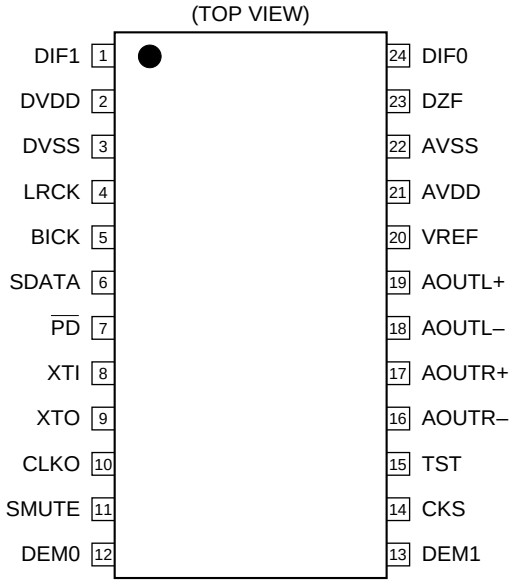
■ AK4319A-VM (MAIN ASSY (4/6): IC4002)

18 bit 2ch D/A

● Block Diagram



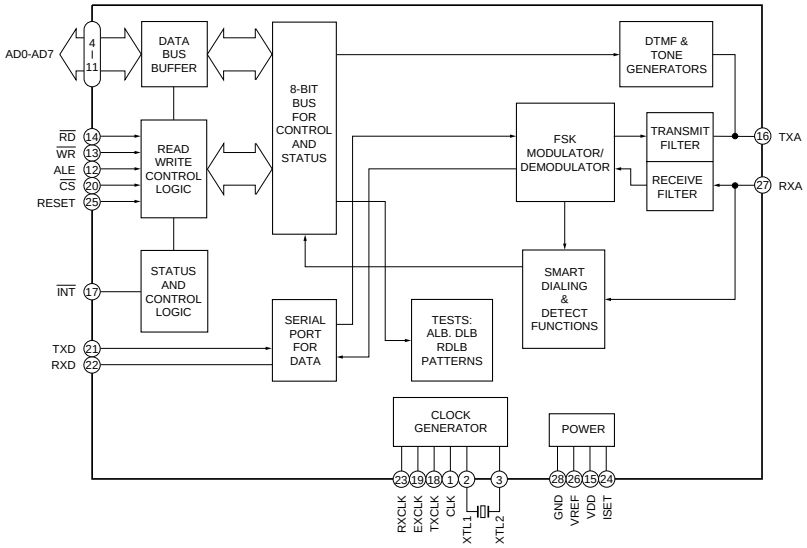
● Pin Assignment



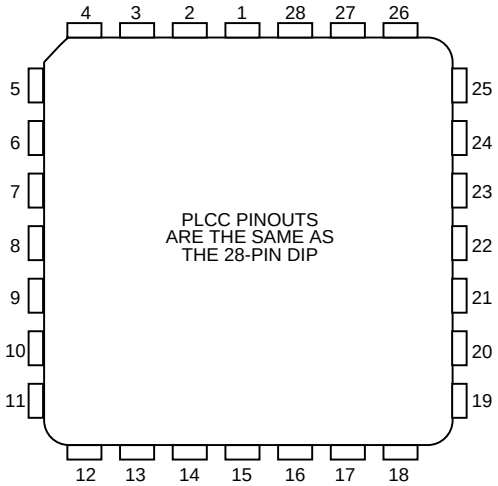
■ 73K321L-IH (MAIN ASSY (5/6): IC5001)

MODEM IC

● Block Diagram



● Pin Assignment



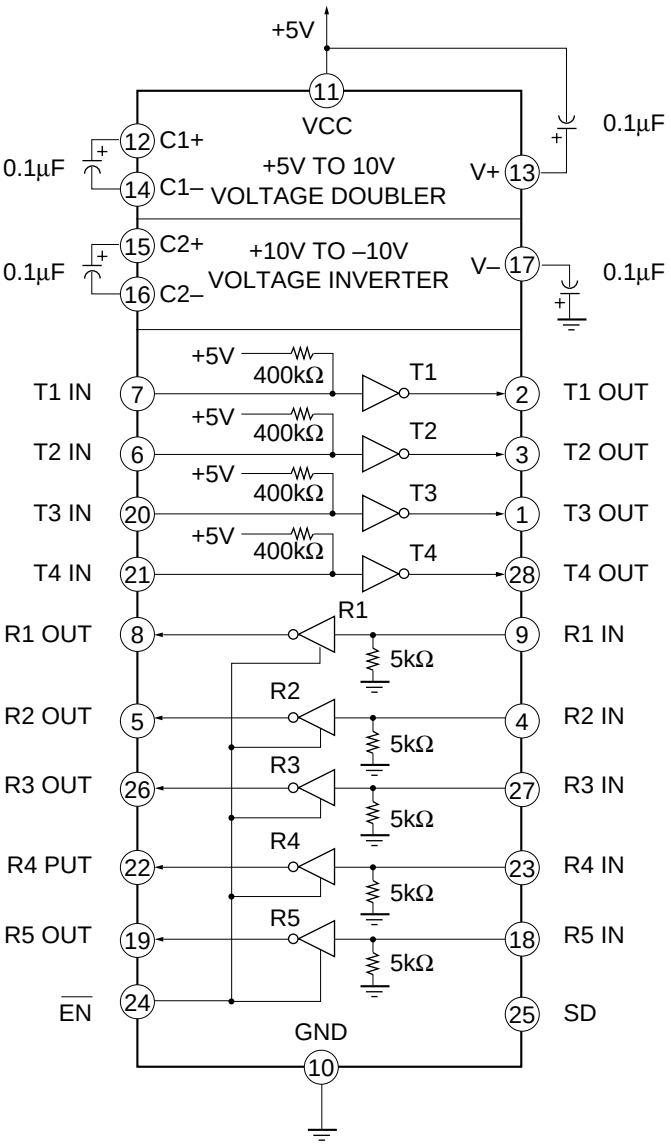
● Pin Function

Pin No.	Pin Name	I/O	Function
1	CLK	O	Output clock. This pin is the output of the crystal oscillator frequency only in the TSC 73K321.
2	XTL1	I	This pin is for the internal crystal oscillator.
3	XTL2	I	This pin is for the internal crystal oscillator. XTL2 can also be driven from an external clock.
4	AD0	I/O	Bidirectional tri-state address/data bus.
5	AD1	I/O	Bidirectional tri-state address/data bus.
6	AD2	I/O	Bidirectional tri-state address/data bus.
7	AD3	I/O	Bidirectional tri-state address/data bus.
8	AD4	I/O	Bidirectional tri-state address/data bus.
9	AD5	I/O	Bidirectional tri-state address/data bus.
10	AD6	I/O	Bidirectional tri-state address/data bus.
11	AD7	I/O	Bidirectional tri-state address/data bus.
12	ALE	I	Address latch enable. The falling edge of ALE latches the address on AD0–AD2 and the chip select on $\overline{CS}$.
13	$\overline{WR}$	I	Write. A low on this informs the TSC 73K321L that data is available on AD0–AD7 for writing into an internal register. Data is altched on the rising edge of $\overline{WR}$.
14	$\overline{RD}$	I	Read. A low request a read of the TSC 73K321L internal registers. Data cannot be output unless both $\overline{RD}$ and the latched $\overline{CS}$ are active or low.
15	VDD	I	Power supply input.
16	TXA	O	Transmit analog output to the phone line.
17	$\overline{INT}$	O	Interrupt. This open drain output signal is used to inform the processor that a detect flag has occurred. $\overline{INT}$ will stay low until the processor reads the detect register or does a full reset.
18	TXCLK	O	Transmit Clock. TXCLK is always active.
19	EXCLK	I	External Clock. Used for serial control interface to clock control data in or out of the TSC 73K321L.
20	$\overline{CS}$	I	Chip select. A low during the falling edge of ALE on this pin allows a read cycle or a write cycle to occur. The state of $\overline{CS}$ is latched on the falling edge of ALE.
21	TXD	I	Transmit Digital Data Input. Serial data for transmission is input on this pin. In Asynchronous modes (1200 or 300 baud) no clocking is necessary.
22	RXD	O/ Weak pull-up	Received Digital Data Output. Serial receive data is available on this pin. The data is always valid on the rising edge of RXCLK when in Synchronous mode. RXD will output constant marks if no carrier is detected.
23	RXCLK	O	Receive Clock. A clock which is 16 x 1200, or 16 x 75 in V.23 mode, or 16 x 300 baud data rate is output in V.21.
24	ISET	I	Chip current reference. Sets bias current for op-amps.
25	RESET	I	Reset. An active high signal high on this pin will put the chip into an inactive state. The output of the CLK pin will be set to the crystal frequency.
26	VREF	O	An internally generated reference voltage.
27	RXA	I	Received modulated analog signal input from the phone line.
28	GND	I	System Ground.

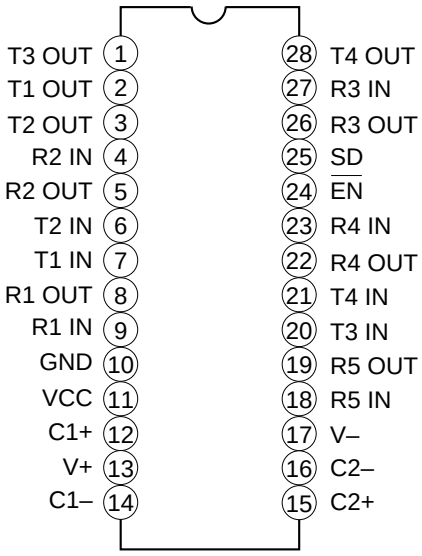
■ HIN211CB (MAIN ASSY (5/6): IC5006)

RS232C IC

● **Block Diagram**



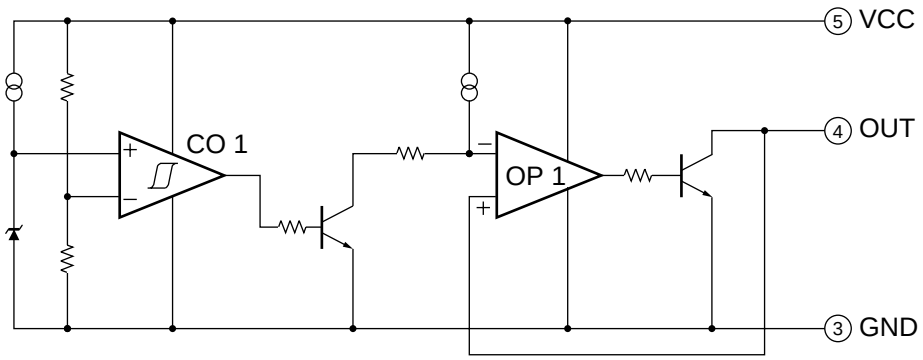
● **Pin Assignment**



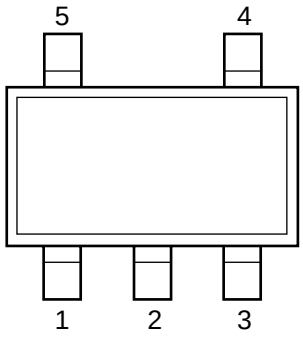
■ PST9124N (MAIN ASSY (6/6): IC6002)

RESET IC

● **Block Diagram**



● **Pin Assignment**

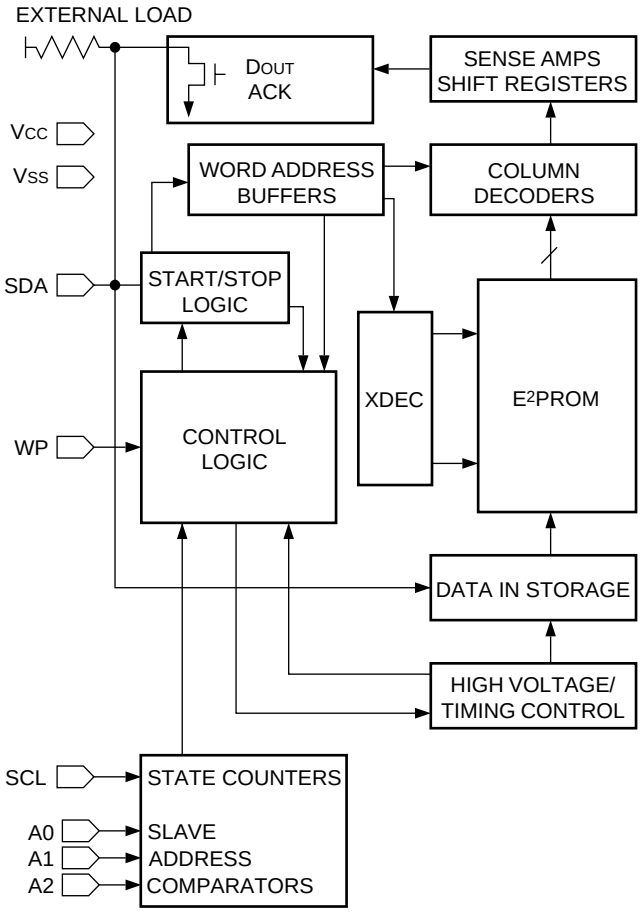


* The Pin 2 this product is SUB, so connect the pin to Ground.

■ CAT24WC16JI (MAIN ASSY (6/6): IC6005)

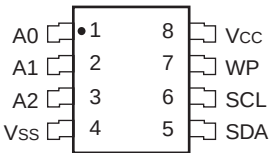
16K-EEPROM

● **Block Diagram**



● **Pin Assignment**

SOIC Package (J)

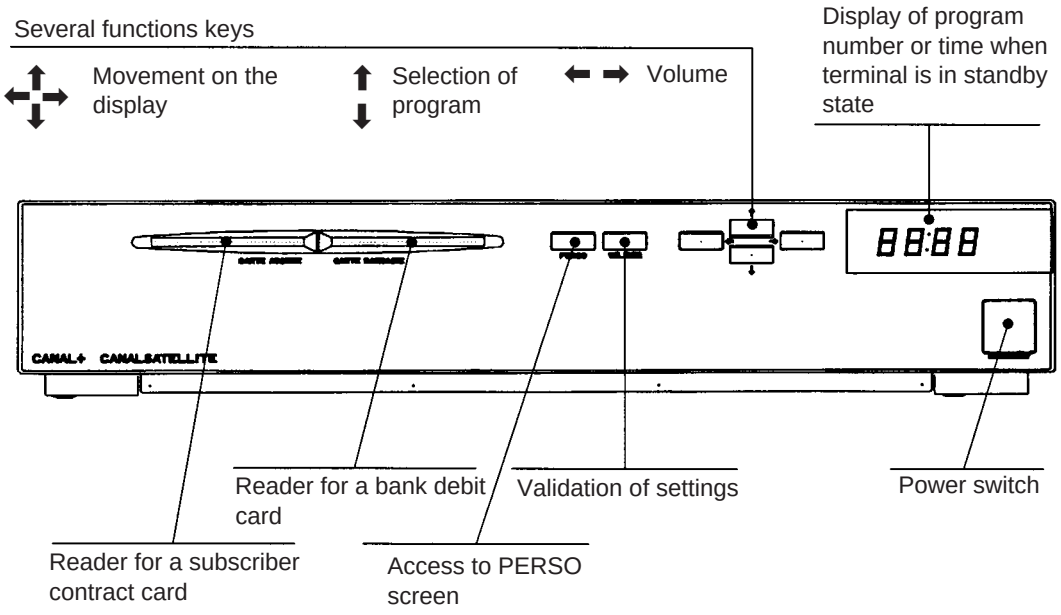


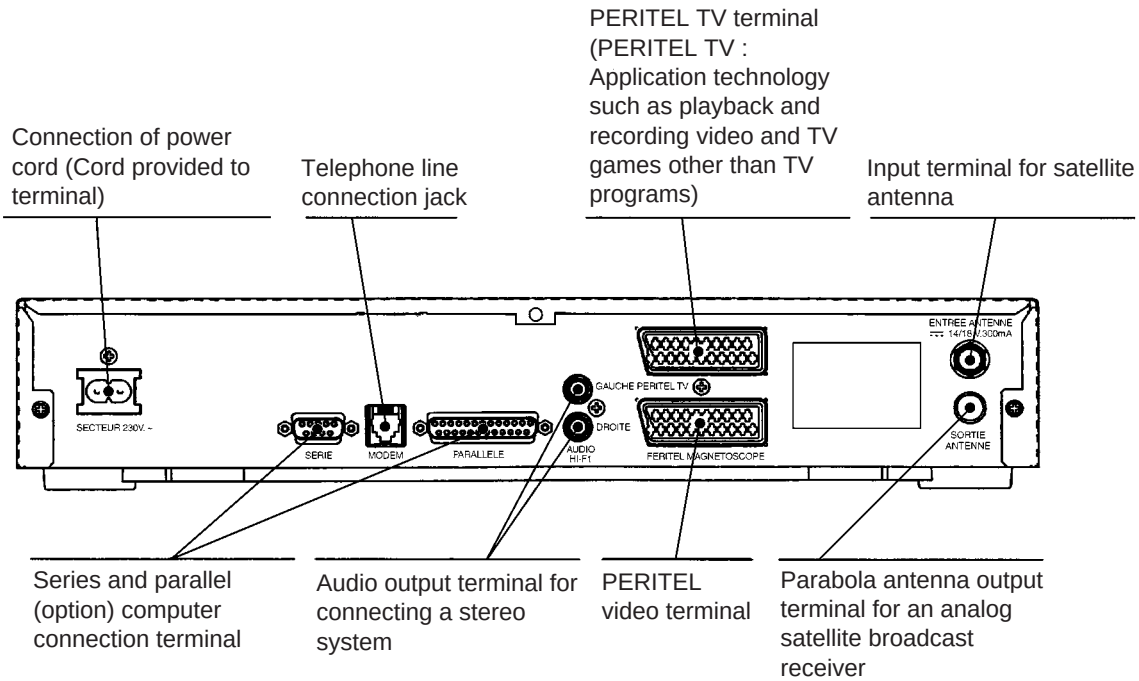
● **Pin Function**

Pin Name	Function
A0, A1, A2	Device Address Inputs
SDA	Serial Data/Address
SCL	Serial Clock
WP	Write Protect
VCC	+1.8V to +6.0V Power Supply
VSS	Ground

7. PANEL FACILITIES AND SPECIFICATIONS

7.1 PANEL FACILITIES





7.2 SPECIFICATIONS

RF

Moduration Method ..... QPSK
Symbol Rate 22, 27, 27.5Mbaud
Inner Code Rate 1/2, 2/3, 3/4, 5/6
Error Correction ..... Viterbi+Reed–solomon
Frequency Range ..... 950 to 2150MHz
Input Level ..... –65 to –25dBm
Max. Input Level 0dBm
Return Loss ..... 8.0dB min.
Spurious Signal and
Local Oscillator Level ..... –63dBm max.
LNB Power Supply ..... Ver. : 12.5V to 14V
Hor. : 17V to 19V

VIDEO

S/N ..... 55dB min.
Responce Flatness ..... –2 ± 2.5dB at 4.7MHz
Differential Gain ..... 10% max.
Differential Phase ..... 5deg max.
Chroma Delay ..... ±40nsec max.
Non Linearity ..... 5% max.

AUDIO

S/N ..... 72dB min.
Responce flatness ..... ±0.5dB at 20 to 20kHz
Channel Separation ..... 50dB min.

DATA COMMUNICATION

Serial Interface RS-232C
Parallel Interface IEEE1284
Modem V23
IC Card ISO-7816

GENERAL

Power Requirement AC230V/50Hz
Power Consumption ..... 18W typ.
Dimensions ..... 380 (W) X 253 (D) X 71 (H)
Net Weight 2.3kg