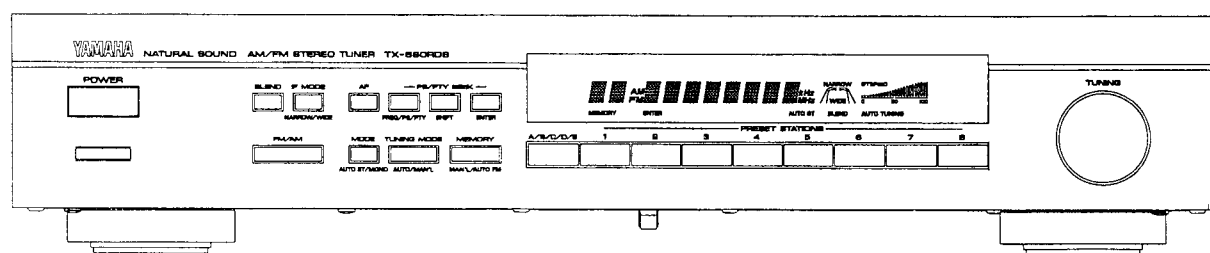


YAMA-01150

AM/FM STEREO TUNER TX-680RDS

SERVICE MANUAL

FRONT PANEL



IMPORTANT NOTICE

This manual has been provided for the use of authorized YAMAHA Retailers and their service personnel. It has been assumed that basic service procedures inherent to the industry, and more specifically YAMAHA Products, are already known and understood by the users, and have therefore not be restated.

WARNING : Failure to follow appropriate service and safety procedures when servicing this product may result in personal injury, destruction of expensive components and failure of the product to perform as specified. For these reasons, we advise all YAMAHA product owners that all service required should be performed by an authorized YAMAHA Retailer or the appointed service representative.

IMPORTANT : The presentation or sale of this manual to any individual of firm does not constitute authorization, certification or recognition of any applicable technical capabilities, or establish a principle agent relationship of any form.

The data provided is believed to be accurate and applicable to the unit(s) indicated on the cover. The research, engineering, and service department of YAMAHA are continually striving to improve YAMAHA products. Modifications are, therefore, inevitable and specifications are subject to change without notice or obligation to retrofit. Should any discrepancy appear to exist, please contact the distributor's Service Division.

WARNING : Static discharges can destroy expensive components. Discharge any static electricity your body may have accumulated by grounding yourself to the ground buss in the unit (heavy gauge black wires connect to this buss.)

IMPORTANT : Turn the unit OFF during disassembly and parts replacement. Recheck all work before you apply power to the unit.

CONTENTS

TO SERVICE PERSONNEL	1	ADJUSTMENTS	3~7
INTERNAL VIEW	1	BLOCK DIAGRAM	8
REAR PANELS.....	1	PRINTED CIRCUIT BOARD.....	9
SPECIFICATIONS	2	SCHEMATIC DIAGRAM.....	10
DIMENSIONS.....	2	PARTS LIST	11~17
DISASSEMBLY PROCEDURE	2		

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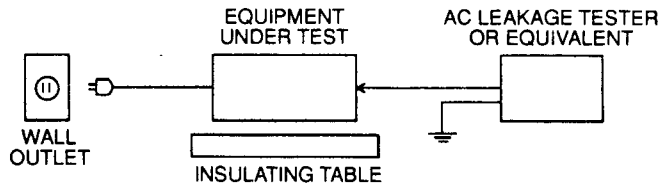
YAMAHA
YAMAHA CORPORATION
HAMAMATSU, JAPAN

TX-680RDS

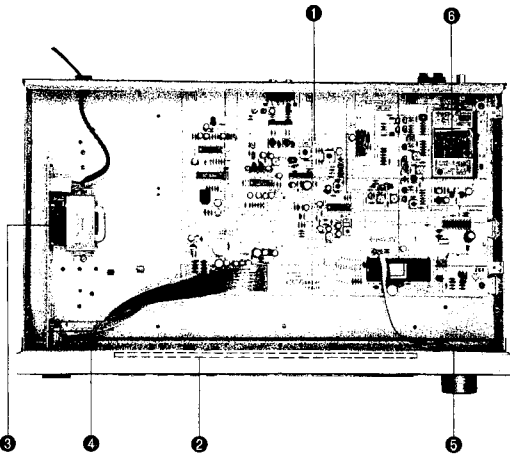
TO SERVICE PERSONNEL

Critical Component Information

Components having special characteristics are marked and must be replaced with parts having specifications equal to those originally installed.



INTERNAL VIEW

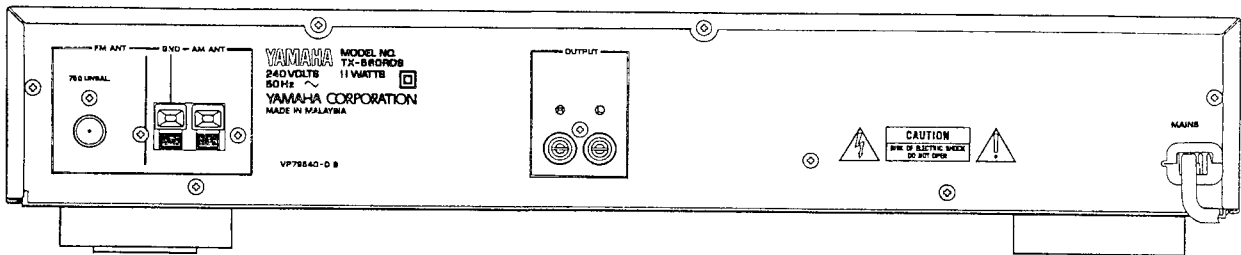


- ① Tuner Circuit Board (1)
- ② Tuner Circuit Board (2)
- ③ Tuner Circuit Board (3)
- ④ Tuner Circuit Board (4)
- ⑤ Tuner Circuit Board (5)
- ⑥ FM Front-end pack

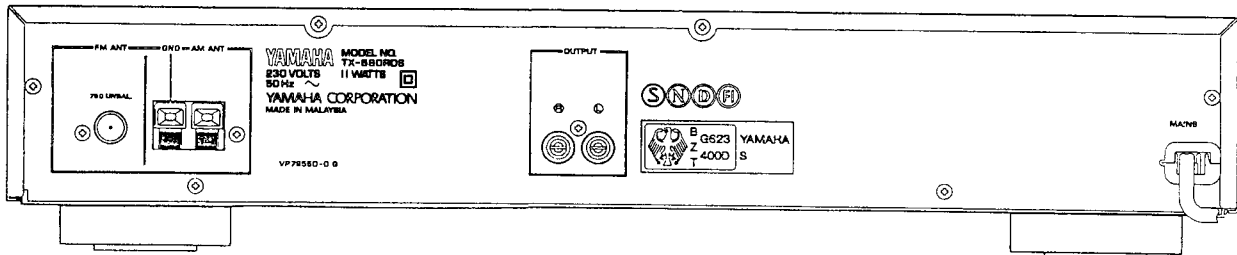
TX-680RDS

REAR PANELS

British model



European model



TX-680RDS

SPECIFICATIONS

FM SECTION

Tuning Range

B and G Models :

..... 87.50 to 108.00 MHz

50 dB Quieting Sensitivity(IHF)

75 Ω (NARROW) mono .. 1.55 μV (15.1 dBf)

75 Ω stereo 21 μV (37.7 dBf)

Usable Sensitivity

B model

75 Ω 1 kHz 100 % Mod 0.8 μV (9.3 dBf)

G model (DIN)

Mono(S/N 26 dB) 0.8 μV

Stereo(S/N 46 dB) 22 μV

Image Response Ratio

B model 40 dB

G model 75 dB

IF Response Ratio

B model 90 dB

G model 75 dB

Spurious Response Ratio 70 dB

AM Suppression Ratio 55 dB

Capture Ratio 1.5 dB

Alternate Channel Selectivity (NARROW)

B model 85 dB

Selectivity 40 kHz Dev. ±300 kHz (NARROW)

G model 70 dB

Stereo Separation (WIDE)

B model 52 dB

G model (40 kHz Dev.) 45 dB

Signal to Noise Ratio (IHF)

B model

Mono 90 dB

Stereo 85 dB

G model (DIN-Weighted 40kHz Dev.)

Mono 83 dB

Stereo 79 dB

Harmonic Distortion (WIDE F:1kHz)

Mono 0.02 %

Stereo 0.03 %

Frequency Response

B model

30 Hz to 13 kHz 0±0.5 dB

20 Hz to 15 kHz 0±1.5 dB

G model

20 Hz to 15 kHz 0±0.5 dB

AM SECTION

Tuning Range 531 to 1611 kHz

Usable Sensitivity 100 μV/m

Selectivity 32 dB

Signal to Noise Ratio 50 dB

Image Response Ratio 40 dB

Spurious Response Ratio 50 dB

Harmonic Distortion (400Hz) 0.3 %

AUDIO SECTION

Output Level/Impedance

B model

FM 100 % Mod. 1 kHz 700 mV/1 kΩ

AM 30 % Mod. 400 Hz 180 mV/1 kΩ

G model

FM 100 % Mod. 1 kHz 600 mV/1 kΩ

AM 30 % Mod. 400 Hz 180 mV/1 kΩ

GENERAL

Power Supply

B model AC 240 V, 50 Hz

G model AC 230 V, 50 Hz

Power Consumption 11 W

Dimensions 435 mm x 86 mm x 291 mm

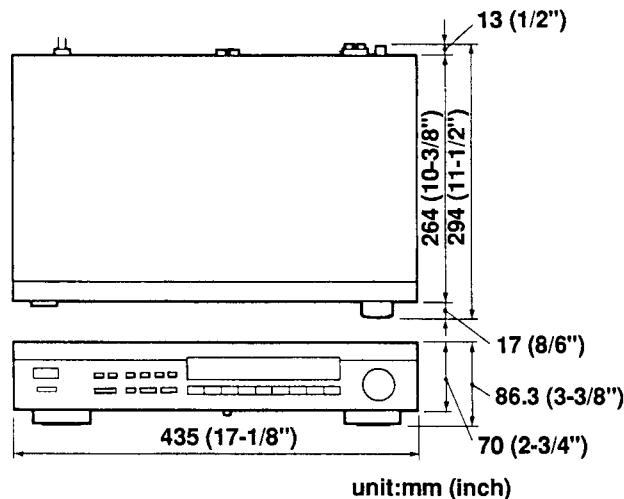
Weight 3.5 kg

The specifications are subject to change without notice.

B British model

G European model

DIMENSIONS



DISASSEMBLY PROCEDURE

(Remove parts in disassembly order as numbered.)

1. Removal of Top Cover

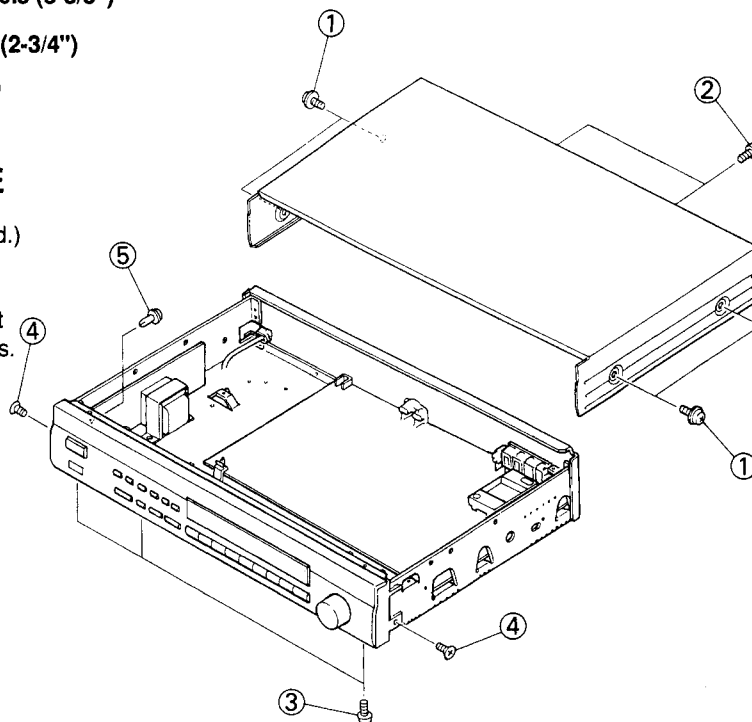
Remove 4 screws ① and 2 screws ②, and lift the cover up while opening it at the lower edges.

2. Removal of Front Panel

a. Remove 3 screws ③.

b. Remove 2 screws ④ and a plastic rivet ⑤.

c. Pull the front panel forward.



TX-680RDS

TX-680RDS

ADJUSTMENTS

1. Before Adjustment

- 1) After the power switch is pushed on, wait 5 minutes before starting the adjustment to be sure of the most stable operations.
- 2) Adjust the OSC coil and IFT with insulated screw driver.
- 3) Set the switches to the following position.
TUNING MODE : AUTO
- 4) Decibel abbreviations
dBμ : Decibels above or below 1 μV

2. Measuring instrument abbreviations

- FM SG : FM signal generator
- SSG : Stereo signal generator
- AM SG : AM signal generator
- DIST.M : Distortion meter
- FC : Frequency counter
- ACVM : AC voltage meter
- DCVM : DC voltage meter
- RDS SG : RDS signal generator

Example :

- 0 dBμ = 1 μV, 60 dBμ = 1 mV
- X dBμ = (X + 11.2) dBf
- When substituting 60 for X,
60 dBμ = 72.2 dBf

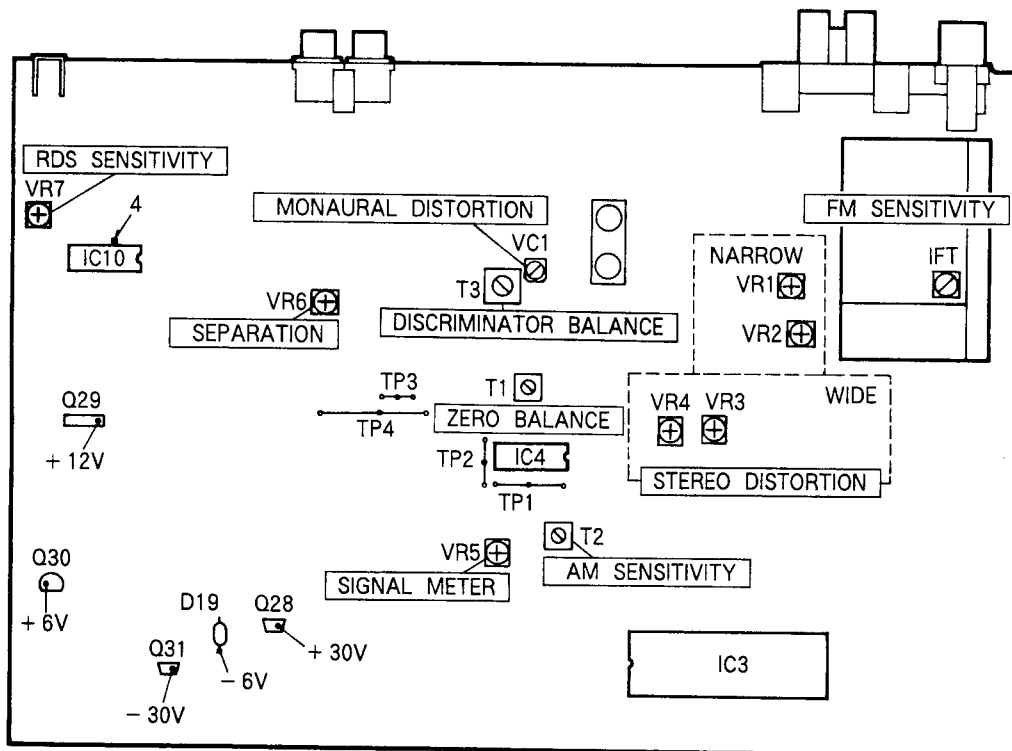
<POWER SUPPLY CHECK>

Check that the following voltages are obtained respectively across each test point and ground on the tuner circuit.

Test Points	Rating or Standard	Remark
+12 V terminal Emitter of Q29	+11.5 ±0.5 V	Make sure AC line voltage is within the specification. B models : 240 V ±10 % G models : 230 V ±10 %
+6 V terminal Emitter of Q30	+6 ±0.5 V	
+30 V terminal Emitter of Q28	+28 ±1.0 V	
-6 V terminal Anode of D19	-6 ±0.5 V	
-30 V terminal Emitter of Q31	-29 ±1.0 V	

TX-680RDS

TEST POINTS



TX-680RDS

<Confirmation of preset>

- Turn the POWER switch on and write the preset stations programmed by the user into the following table.

CAUTION :

Setting to the test mode erases the user's preset stations.

Preset keys	P1	P2	P3	P4	P5	P6	P7	P8
A								
B								
C								
D								
E								

Upon completion of the test, use the above table to program the user's preset stations.

- Turn the POWER switch on again while pressing the preset keys "1", "2" and "3" simultaneously to enter the manufacturer's preset.

Confirm that the frequencies are preset to the following values.

(The unit is now in Test mode. Press P8 to clear the test mode.)

<Confirmation of FL-Tube unit>

Confirmation of the display

1. Turn the POWER switch on again while pressing the preset keys "1", "2" and "3" simultaneously to enter the test mode.

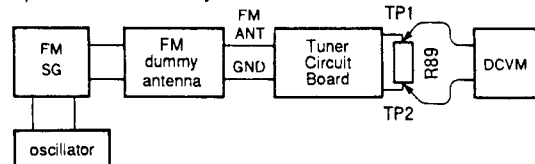
All the segments of the FL-Tube should light. (Goes on after 5 to 6 seconds.)

2. After 1., the display mode is changed by pressing the following keys.

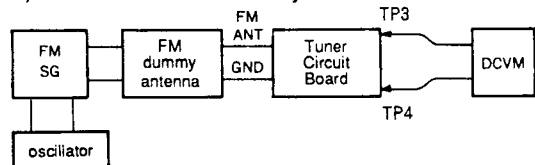
- 1 P1 : All lit mode (All segments are lit.)
- 2 P2 : All turned off mode (All segments are turned off.)
- 3 P3 : The fifth segment in the dot matrix from the right is lit.
- 4 P8 : The Test mode is switched to normal mode.

• Connection Diagram (Measuring Instruments)

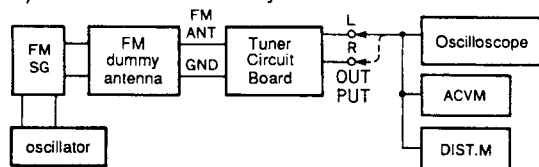
1) Zero balance adjustment



2) Discriminator balance adjustment



3) Monaural distortion adjustment



	P1	P2	P3	P4	P5	P6	P7	P8
A, D	87.5M	95.1	98.1	101.5	108.0	88.1	106.1	108.0
B, E	630K	1080	1440	531	1611	900	1350	1404
C	Frequency	The same as PRESET A						
	Station name	ABCD	IJKL	ORST	YZab	ghij	opqr	wxyz
		EFGH	MNOP	UVWX	cdef	kimn	stuv	-./
								0123
								4567

* Total of 40 stations, P1 to P8 for A to E, can be set to the preset values.

* Set the functions as specified below.

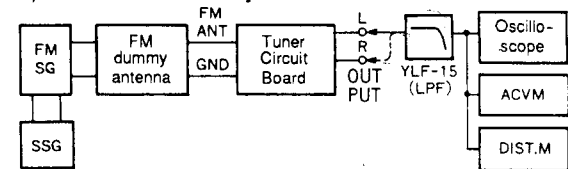
- TUNING MODE key : AUTO TUNING
- MODE key : AUTO ST
- BLEND key : ON
- IF MODE : WIDE

<FM TUNER SECTION>

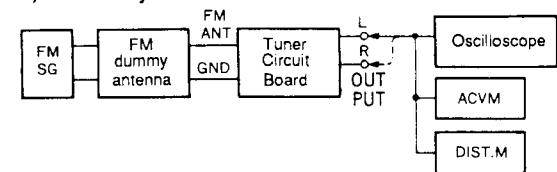
- Use a low pass filter to measure the output.
- Set the following modes.

- TUNING MODE key : AUTO TUNING
- MODE key : AUTO ST
- BLEND key : OFF
- IF MODE : WIDE

4) Stereo distortion adjustment



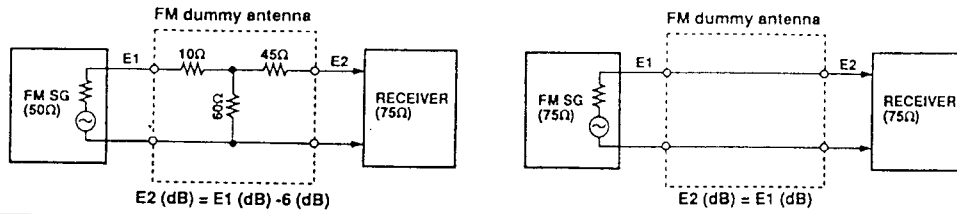
5) Sensitivity verification



TX-680RDS

TX-680RDS

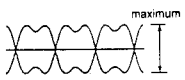
● Dummy antenna



Step	Adjustment item	Signal at ANT IN	Reception Frequency	Adjusted Point	Test points	Rating
1	Adjustment of zero balance	FM SG : 98.1 MHz ANT input : 70 dB μ Modulation : 100 % Monaural : 100 Hz	Preset A-3: 98.1 MHz	T1	TP1, TP2	DCVM DC 0V \pm 50 mV at tuned point
2	Adjustment of discriminator balance	Same as Step 1.	Same as Step 1.	T3	TP3, TP4	DCVM DC 0V \pm 50 mV
3	Adjustment of monaural distortion	Same as Step 1.	Same as Step 1.	VC1	OUT PUT	Minimize distortion.
4	Verification of zero balance	Same as Step 1.	Same as Step 1.		OUT PUT	0V \pm 50 mV
5	Verification of discriminator balance	Same as Step 1.	Same as Step 1.		OUT PUT	0V \pm 50 mV
6	Verification of monaural distortion	FM SG : 98.1 MHz ANT input : 70 dB μ Modulation : 100 % Monaural : 1 kHz	Same as Step 1.		OUT PUT	To be less than -56 dB
7	Adjustment of frontend IFT	FM SG : 98.1MHz ANT input : 30 dB μ Modulation : 100 % Monaural : 1 kHz	Same as Step 1.	Frontend IFT core	Signal meter.	Meter indication to be maximum. CAUTION : Over-adjustment of the IFT core will reduce the sensitivity Maximum \pm 90°
8	Adjustment of stereo distortion (Wide)	FM SG : 98.1 MHz ANT input : 70 dB μ Stereo L or R : 1 kHz Modulation : 100 %	Same as Step 1.	VR3 and 4	OUT PUT	Minimize distortion. Tuning mode : AUTO IF MODE : WIDE
9	Adjustment of stereo Distortion (Narrow)	Same as Step 8.	Same as Step 1.	VR1 and 2	OUT PUT	Minimize distortion. AUTO IF MODE : NARROW
10	Verification stereo Distortion (Wide)	Same as Step 8.	Same as Step 1.		OUT PUT	To be less than -52 dB Tuning mode : AUTO IF MODE : WIDE
11	Verification of stereo Distortion (Narrow)	Same as Step 8.	Same as Step 1.		OUT PUT	To be less than -35 dB AUTO IF MODE : NARROW
12	Verification of sensitivity		Preset A-6 : 88.1 MHz Preset A-3 : 98.1 MHz Preset A-7 : 106.1 MHz	VR6	ANT terminal (75 Ω) OUT PUT	S/N : 30 dB To be 3 dB μ or less
13	Adjustment of separation	Same as Step 8.	Preset A-3 : 98.1 MHz		OUT PUT	Maximize stereo separation. 40 dB or more
14	Verification of BLEND	Same as Step 8.	Same as Step 13.		OUT PUT	BLEND : ON Separation to be spoiled.

5 ※ Execution of Factory PRESET (Refer to TEST MODE on page 4) will facilitate setting reception frequency for adjustment.

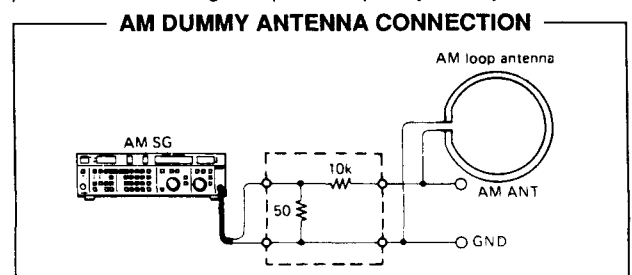
TX-680RDS

Step	Adjustment item	Signal at ANT IN	Reception Frequency	Adjusted Point	Test points	Rating
15	Adjustment of signal meter	FM SG : 98.1 MHz ANT input : 50 dB μ Modulation : 30 % Monaural : 1 kHz ANT input : -10 dB μ	Preset A-3 : 98.1 MHz	VR5	Signal meter	IF NODE : WIDE Maximize meter indication. All segment to be on. Check to ensure that signal meters turn OFF.
16	Verification of autotuning	ANT input : 23 dB μ Stereo L or R Modulation : 30 % Monaural : 1 kHz	Same as Step 15.	Tuning knob		Automatic reception should be available when tuning knob turn to the right or left. Stereo indicator : ON Sound to be muted during tuning
17	Adjustment of RDS sensitivity	RDS-SG Modulation : 0.67 % (0.5 kHz) Data-on FM-SG ANT input : 70 dB μ Modulation : 100 % Monaural : 1 kHz	Same as Step 15.	VR7	Connect digital voltmeter to pin 4 of IC10 and GND	AC mode Maximize voltage indication. 
18	Verification of auto PS (Program Service)	RDS-SG Modulation : 1.6 % Data-on FM-SG ANT. input : 40 dB μ Modulation : 100 % Monaural : 1 kHz	Same as Step 15.		Display	PS mode to be selected automatically within 5 seconds.

※ Execution of Factory PRESET (Refer to TEST MODE on page 4) will facilitate setting reception frequency for adjustment.

<AM TUNER SECTION>

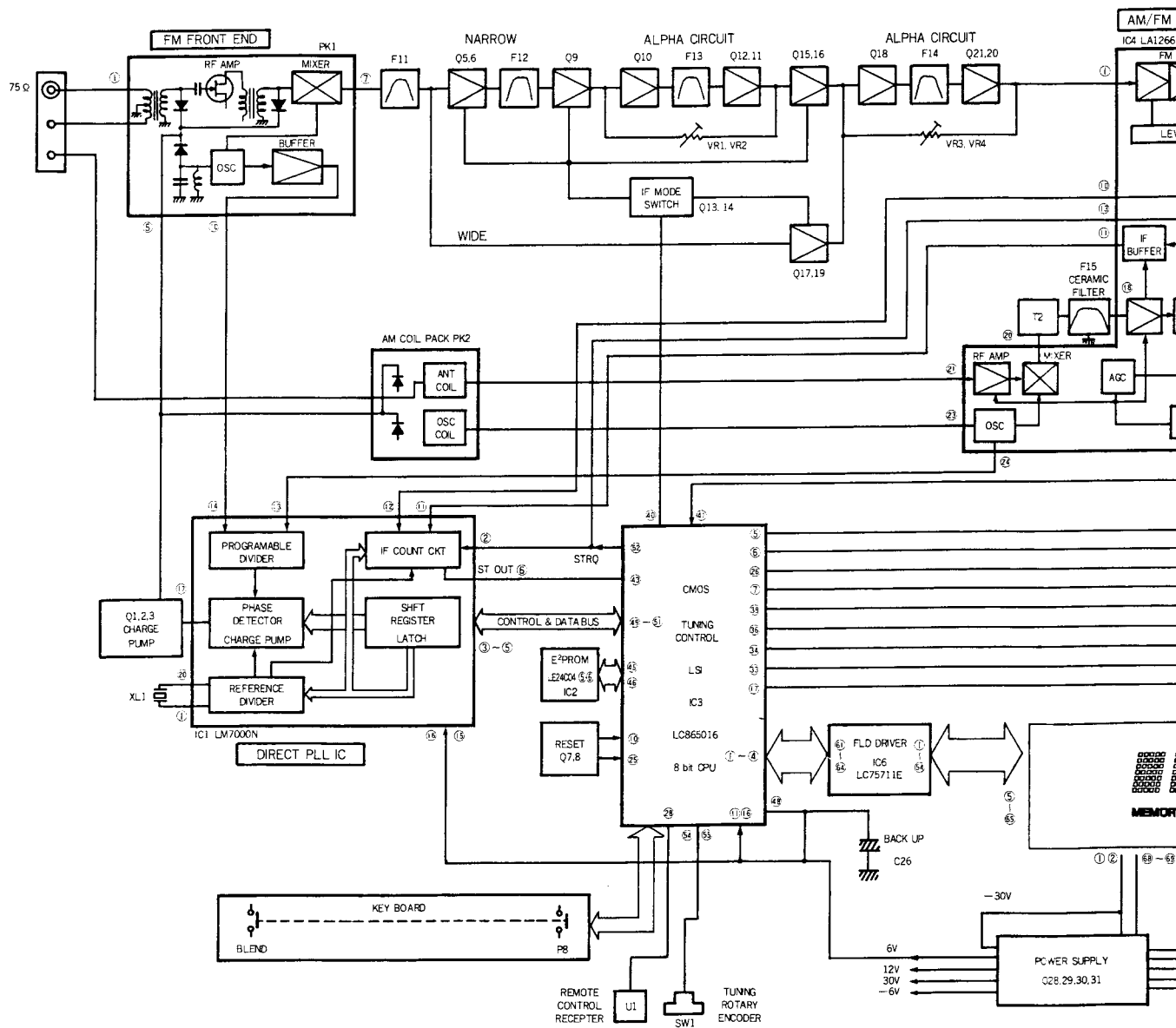
- To be adjusted after FM section adjustment.
- Use the specified dummy antenna for loop antenna.



Step	Adjustment item	Signal at ANT IN	Reception Frequency	Adjusted Point	Test points	Rating
1	Adjustment of sensitivity	AM SG : 400 Hz ANT input : 50 dB μ Modulation : 30 %	Preset B-1 : 630 kHz	T2	OUT PUT	Preset : CH B-1 Non AGC Maximize detection output. Repeat Step 1 and 2.
2	Verification of sensitivity	Modulation : 30 %	Preset B-1 : 630 kHz Preset B-2 : 1080 kHz Preset B-3 : 1440 kHz		ANT terminal	Receive at preset CH B-1, 2 and 3. Sensitivity to be less than 54 dB μ .
3	Verification of auto tuning	AM SG : 400 Hz ANT input : 60 dB μ Modulation : 30 %	Preset B-1 : 630 kHz	Tuning knob		Tuning mode : AUTO Sound to be muted during search. To be tuned automatically.

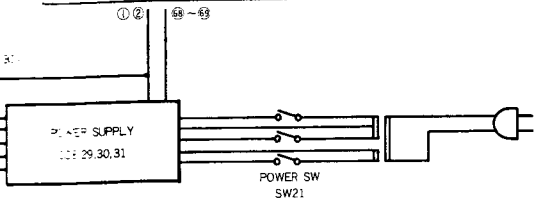
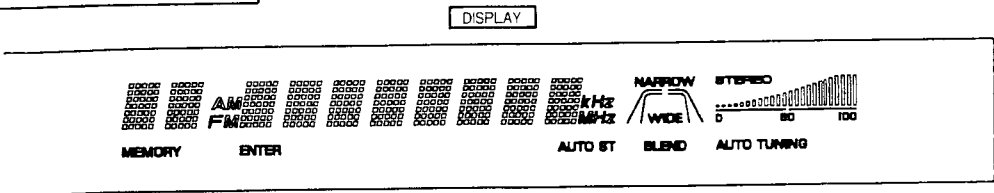
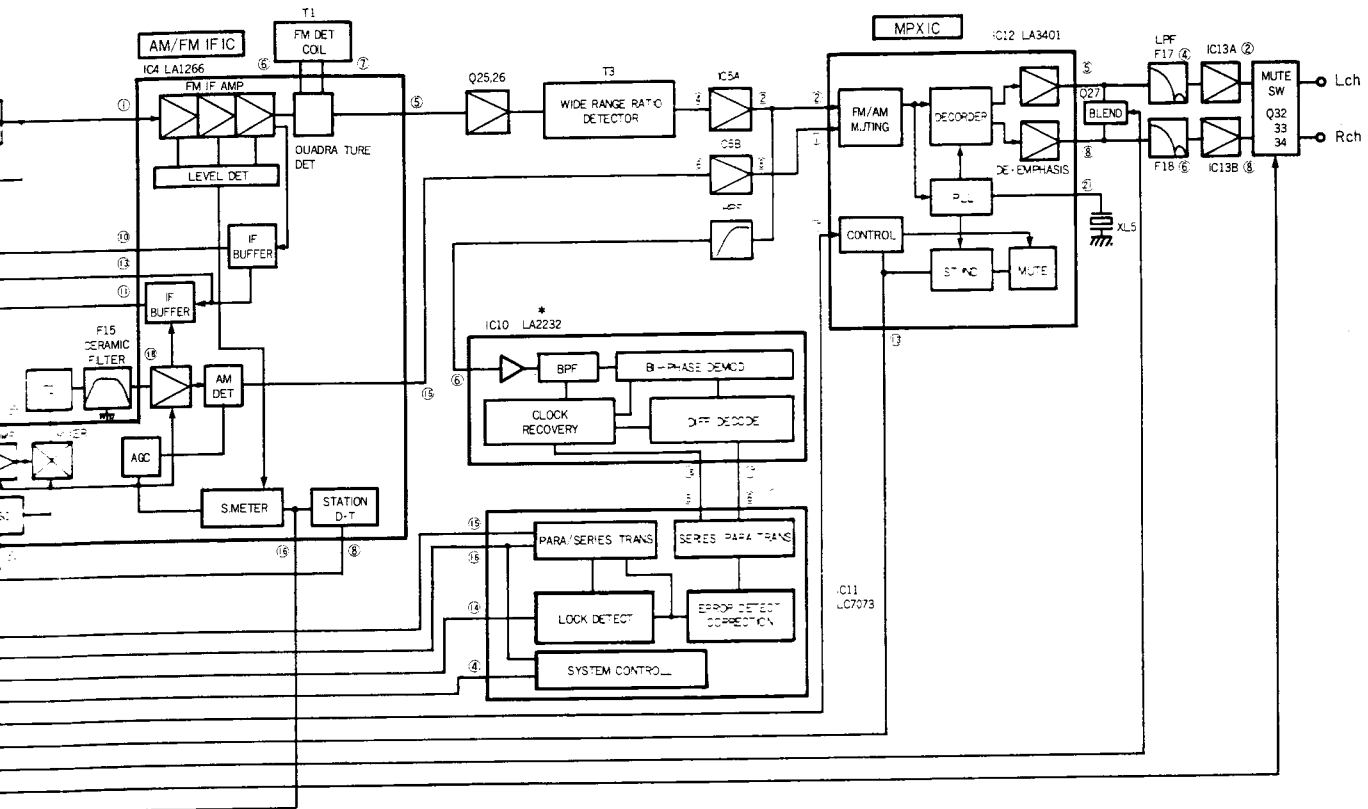
※ Execution of Factory PRESET (Refer to TEST MODE on page 4) will facilitate setting reception frequency for adjustment.

■ BLOCK DIAGRAM

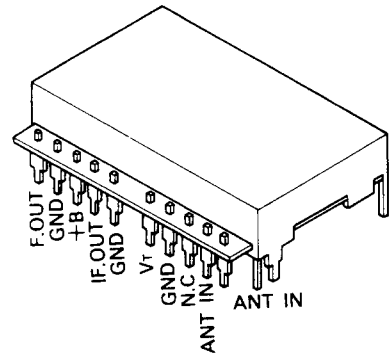


TX-680RDS

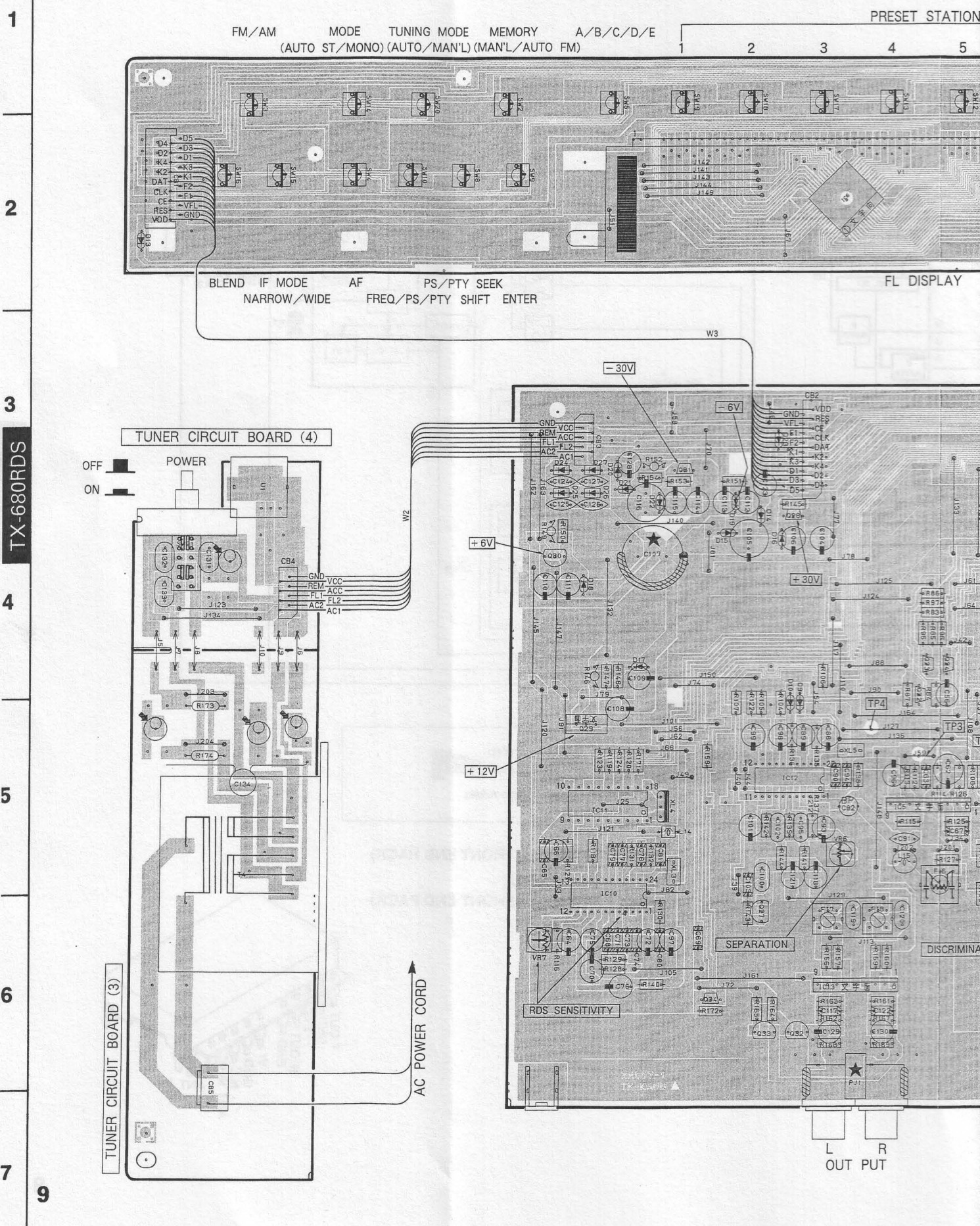
TX-680RDS



- PK1 : Vi122600 (FRONT END PACK) [B models]
- PK2 : Vi122700 (FRONT END PACK) [G model]



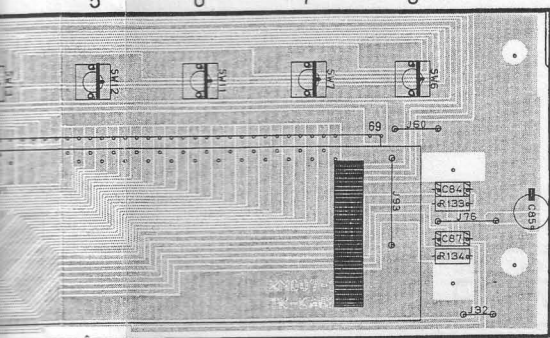
TX-680RDS PRINTED CIRCUIT BOARD



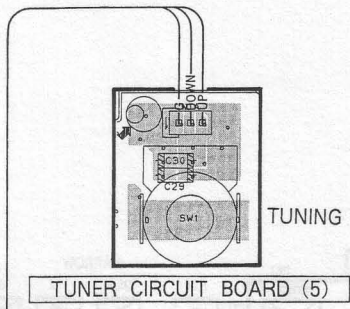
E F G H I J

ET STATIONS

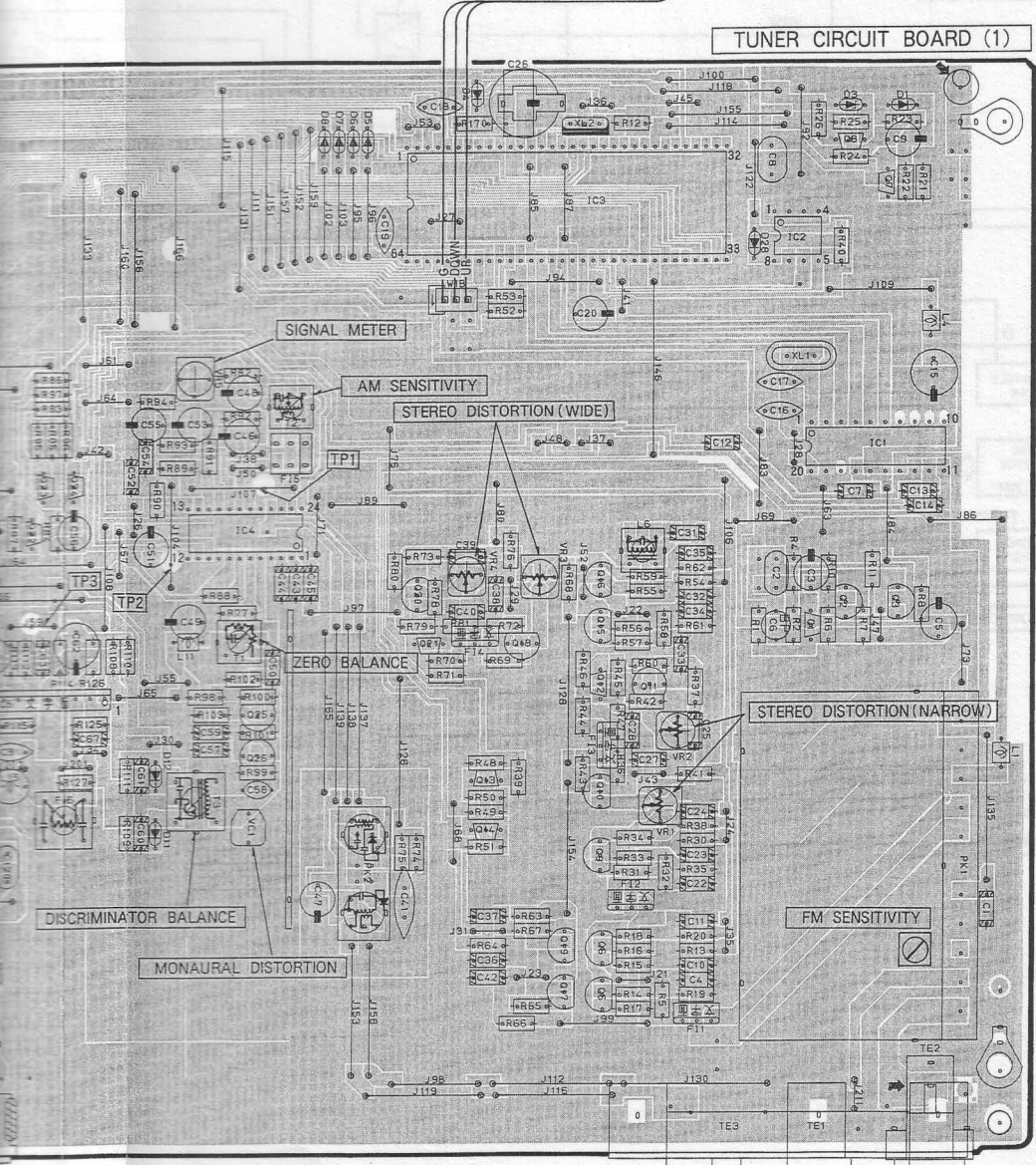
5 6 7 8



DISPLAY TUNER CIRCUIT BOARD (2)



TUNING TUNER CIRCUIT BOARD (5)



GND AM ANT FM ANT 75 Ω UNBAL

● Semiconductor Location

Ref.No.	Location
D 1	H 3
D 3	H 3
D 4	G 3
D 5	F 3
D 6	F 3
D 7	F 3
D 8	F 3
D 9	D 5
D 10	D 5
D 11	E 6
D 12	E 5
D 13	A 2
D 14	D 4
D 15	D 4
D 16	D 4
D 17	D 4
D 18	C 4
D 19	D 4
D 20	C 3
D 22	D 4
D 23	D 3
D 24	C 3
D 25	C 3
D 26	C 3
D 27	C 3
D 28	D 4

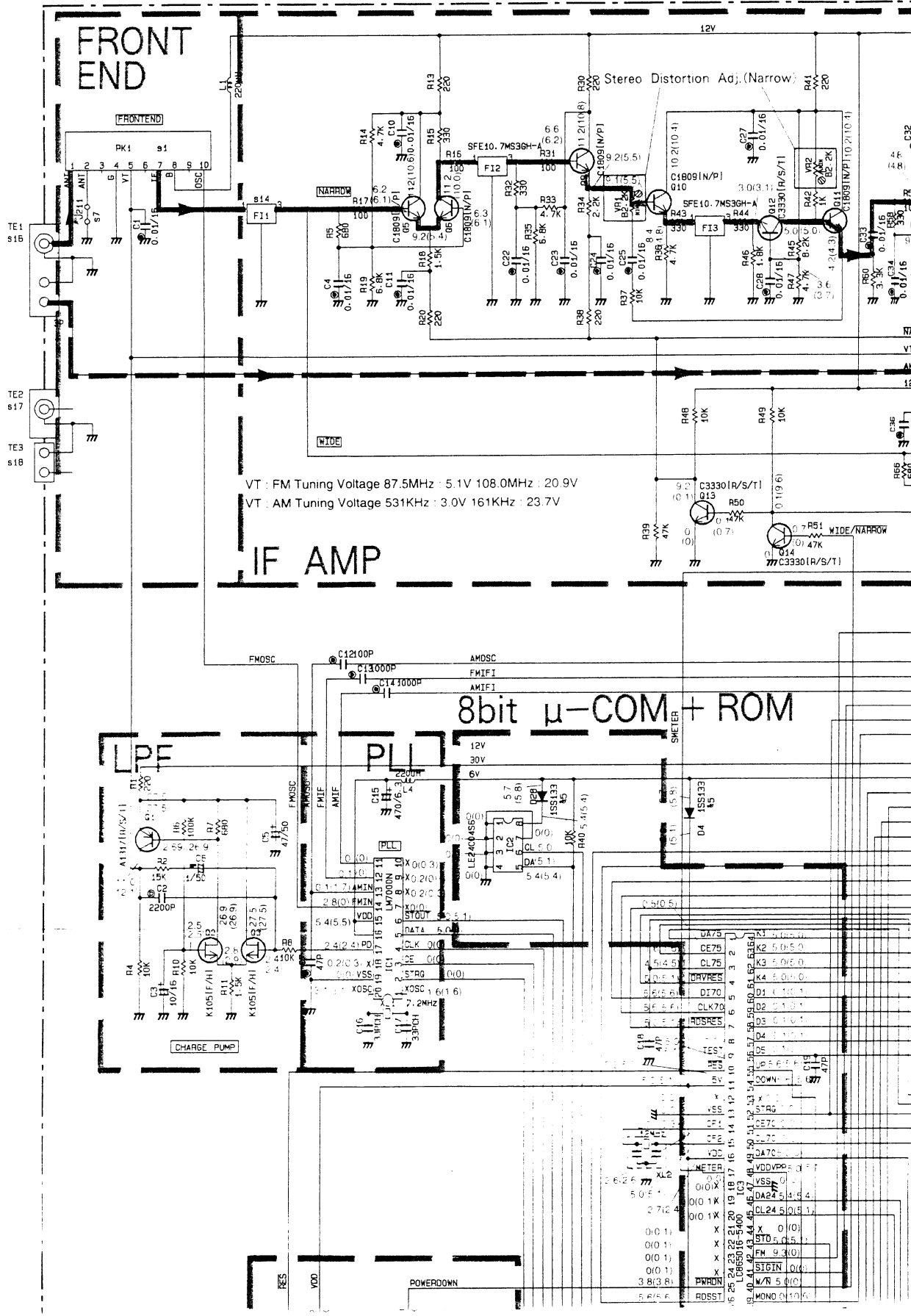
Ref.No.	Location
IC 1	H 4
IC 2	H 4
IC 3	G 3
IC 4	F 5
IC 5	E 5
IC 6	E 2
IC 10	C 6
IC 11	C 5
IC 12	D 5
IC 13	E 6

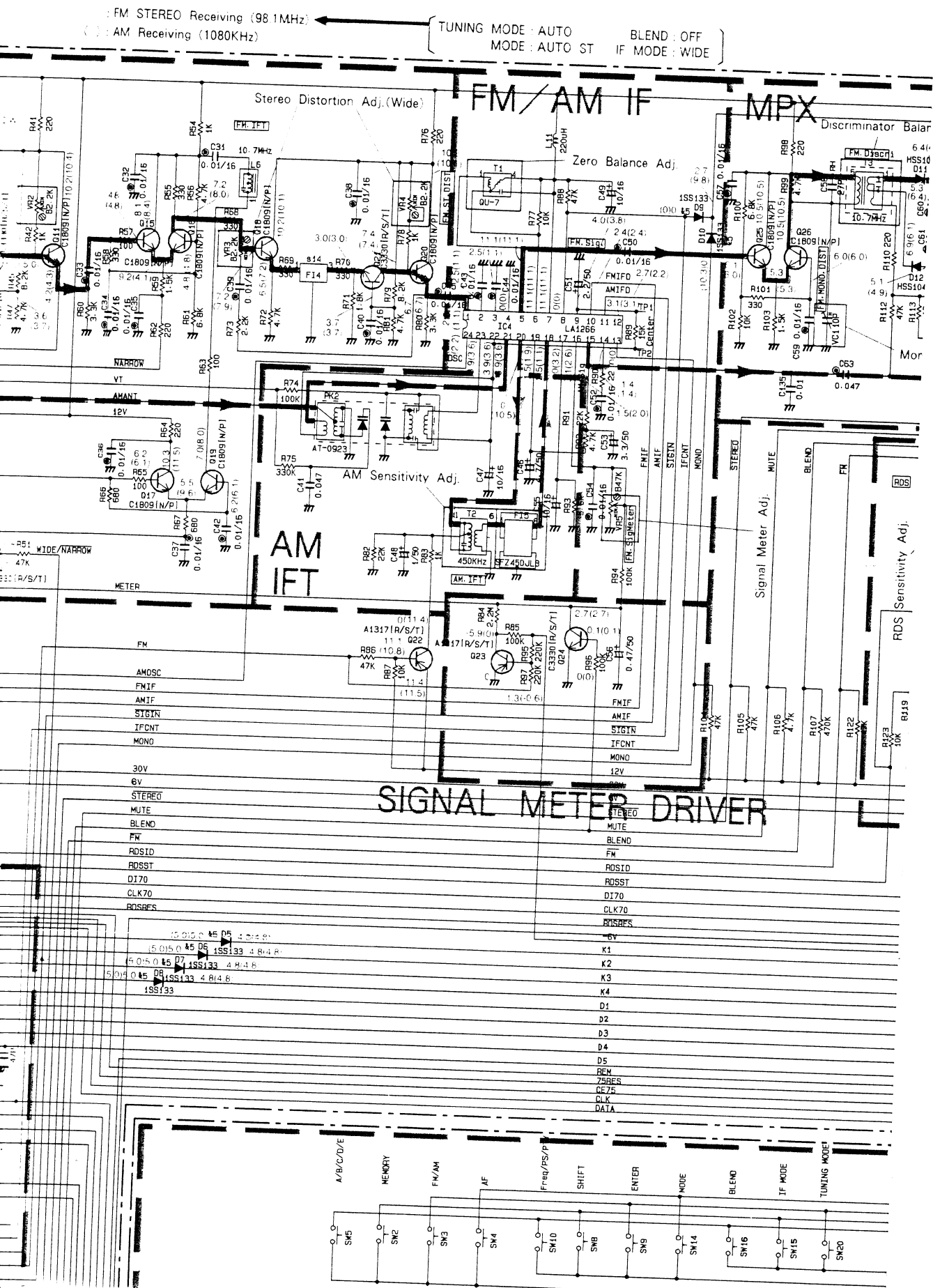
Ref.No.	Location
Q 1	H 5
Q 2	H 5
Q 3	H 5
Q 5	G 6
Q 6	G 6
Q 7	H 3
Q 8	H 3
Q 9	G 6
Q 10	G 5
Q 11	G 5
Q 12	G 5
Q 13	G 5
Q 14	G 6
Q 15	G 5
Q 16	G 5
Q 17	G 16
Q 18	G 5
Q 19	G 16
Q 20	F 5
Q 21	F 5
Q 22	E 5
Q 23	E 4
Q 24	F 4
Q 25	F 5
Q 26	F 5
Q 27	D 6
Q 28	D 4
Q 29	C 5
Q 30	C 4
Q 31	D 3
Q 32	D 6
Q 33	D 6
Q 34	D 6

SCHEMATIC DIAGRAM

FM (at 98.1MHz STEREO) : FM
AM (at 1080KHz) : AM

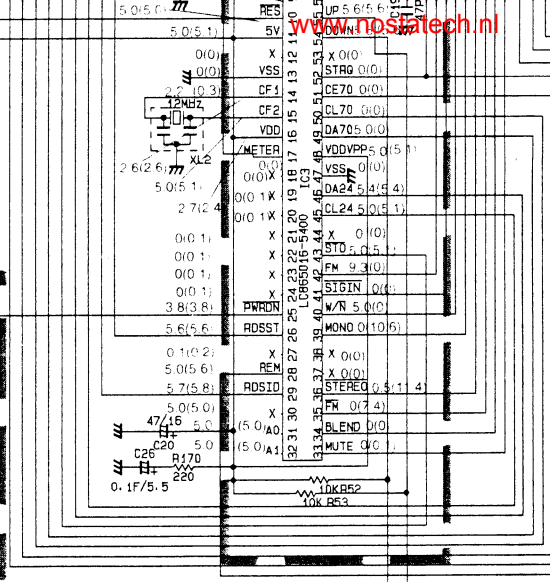
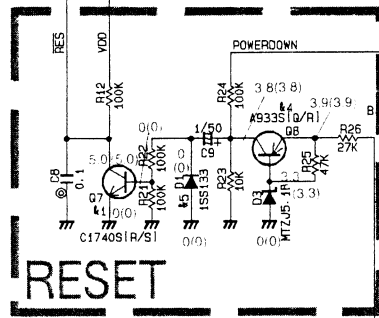
1
2
3
4
5





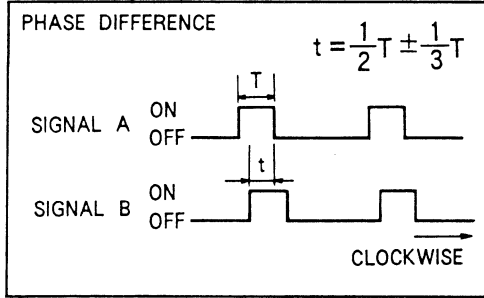
5

6

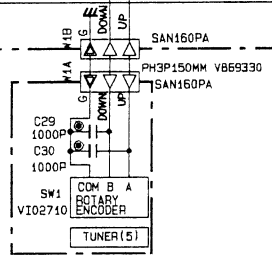


7

ROTARY ENCODER



NOTICE
 (J)..... Japanese model
 (U)..... U.S.A model
 (C)..... Canadian model
 (A)..... Australian model
 (G)..... European model
 (B)..... British model
 (R)..... General model
 (P)..... RP model



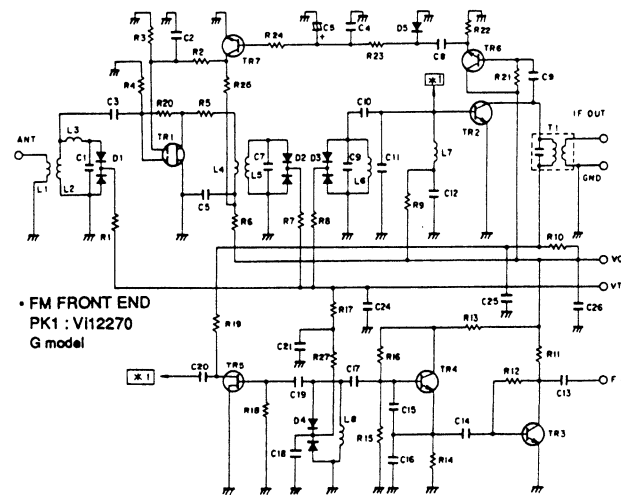
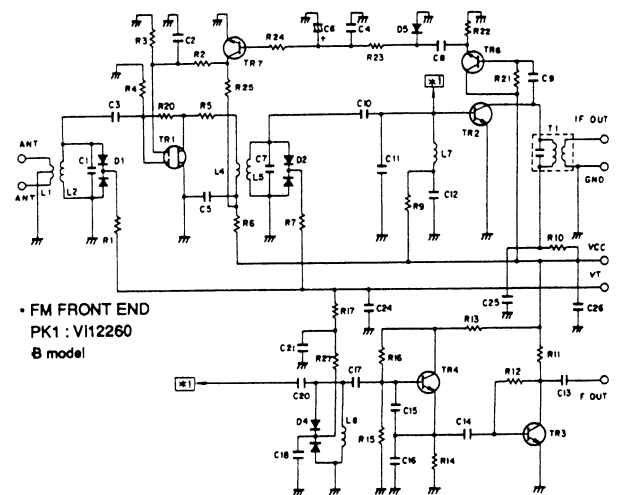
NOTICE
 (J)..... Japanese model
 (U)..... U.S.A model
 (C)..... Canadian model
 (A)..... Australian model
 (G)..... European model
 (B)..... British model
 (R)..... General model
 (P)..... RP model

8

REMOTE CONTROL TRANSMITTER CODE

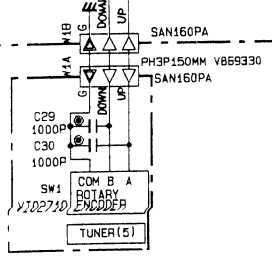
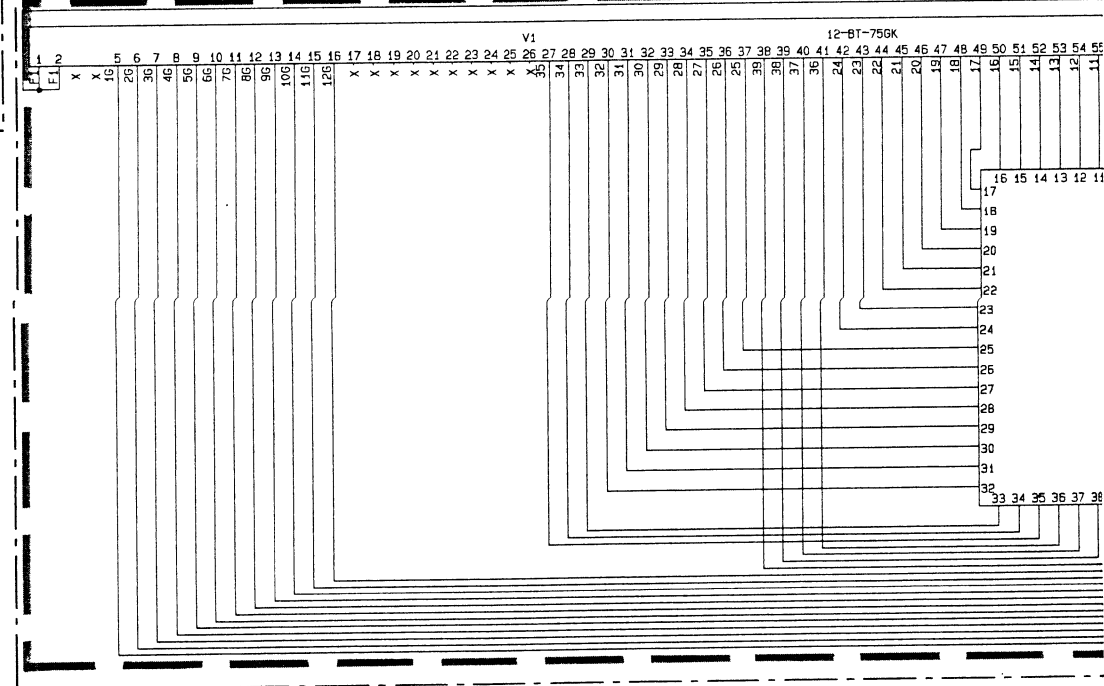
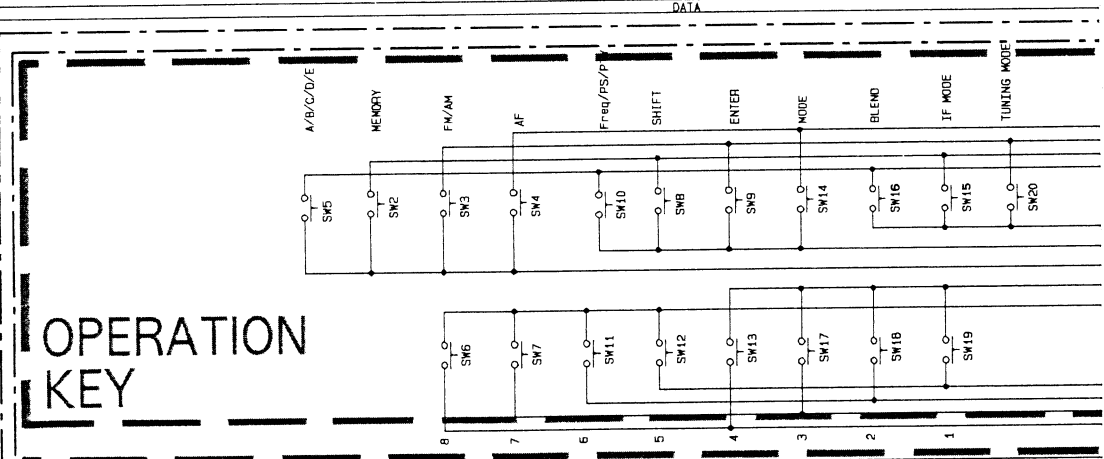
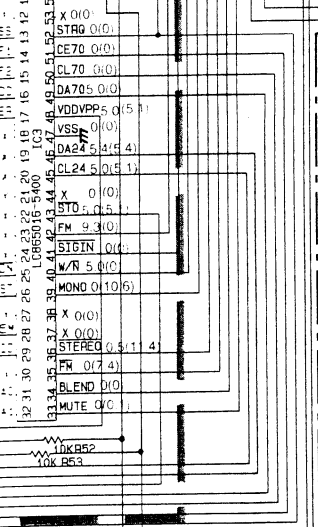
CUSTOM (HEX)	DATA (HEX)	FUN CTION	CUSTOM (HEX)	DATA (HEX)	FUN CTION
7A	10	PRESET + (TUNER)	D1	10	P3
7A	11	PRESET - (TUNER)	D1	11	P4
7A	12	A/B/C/D/E (TUNER)	D1	12	P5
D1	0D	A/B/C/D/E	D1	13	P6
D1	0E	P1	D1	14	P7
D1	0F	P2	D1	15	P8

9

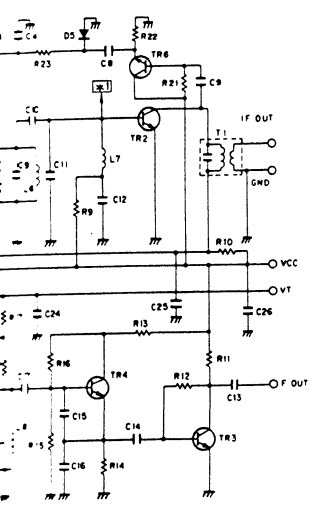


0

<p>2SC4495</p>	<p>2SC1809 2SC2878 2SC2061</p>	<p>2SC3330 2SA1317 2SC1740S 2SA933S</p>	<p>LE24CO4S6</p>	<p>LA3401</p>	<p>LA1 LA2</p>
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NOTICE
 (J)..... Japanese model
 (U)..... U.S.A model
 (C)..... Canadian model
 (A)..... Australian model
 (G)..... European model
 (B)..... British model
 (R)..... General model
 (P)..... RP model



#	B	G
1	PK1	V112260
2	F16	X
3	F127	GE20053
4	J201-204	X
5	L15	X
6	C91	B2P
7	J211-212	X
8	R138	470
9	R137	22K
10	R139-142	39K
11	C95-102	1200P/100
12	R125	2.7K
13	R113	22K
14	F11-4	SFE10.7MM/A
15	C67	X
16	TE1	X
17	TE2	VP68240
18	TE3	VE36560
19		
20	R173-174	X
21	C194	X

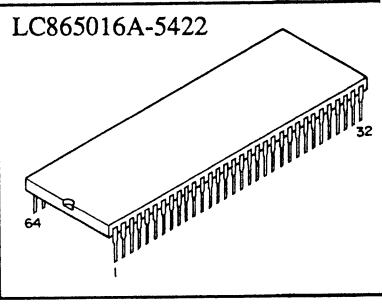
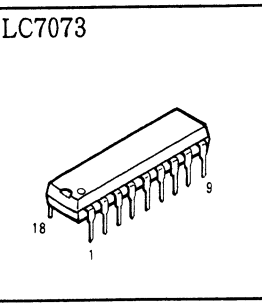
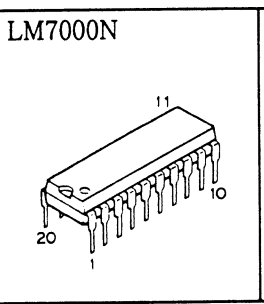
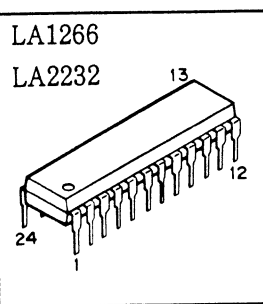
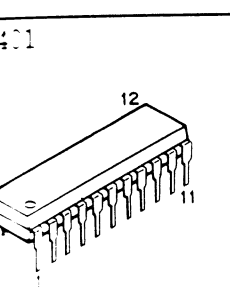
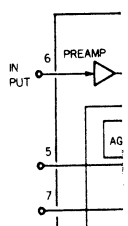
Interchangeable Parts at Manufacture-Stage

Mark	Reference Parts Number	Parts Name
1	07-28	2SC1740S(R/S) 2SC2603(E,F) 2SC3311A(Q/R/S)
2		
3	U1	6P1U521Y 6P1U581Y
4	08-31	2SA9335(Q/R) 2SA1115(E/F) 2SA1309A(Q/R/S)
5	D1-4-10-13-15-20-21-28	1SS133 HSS104TD

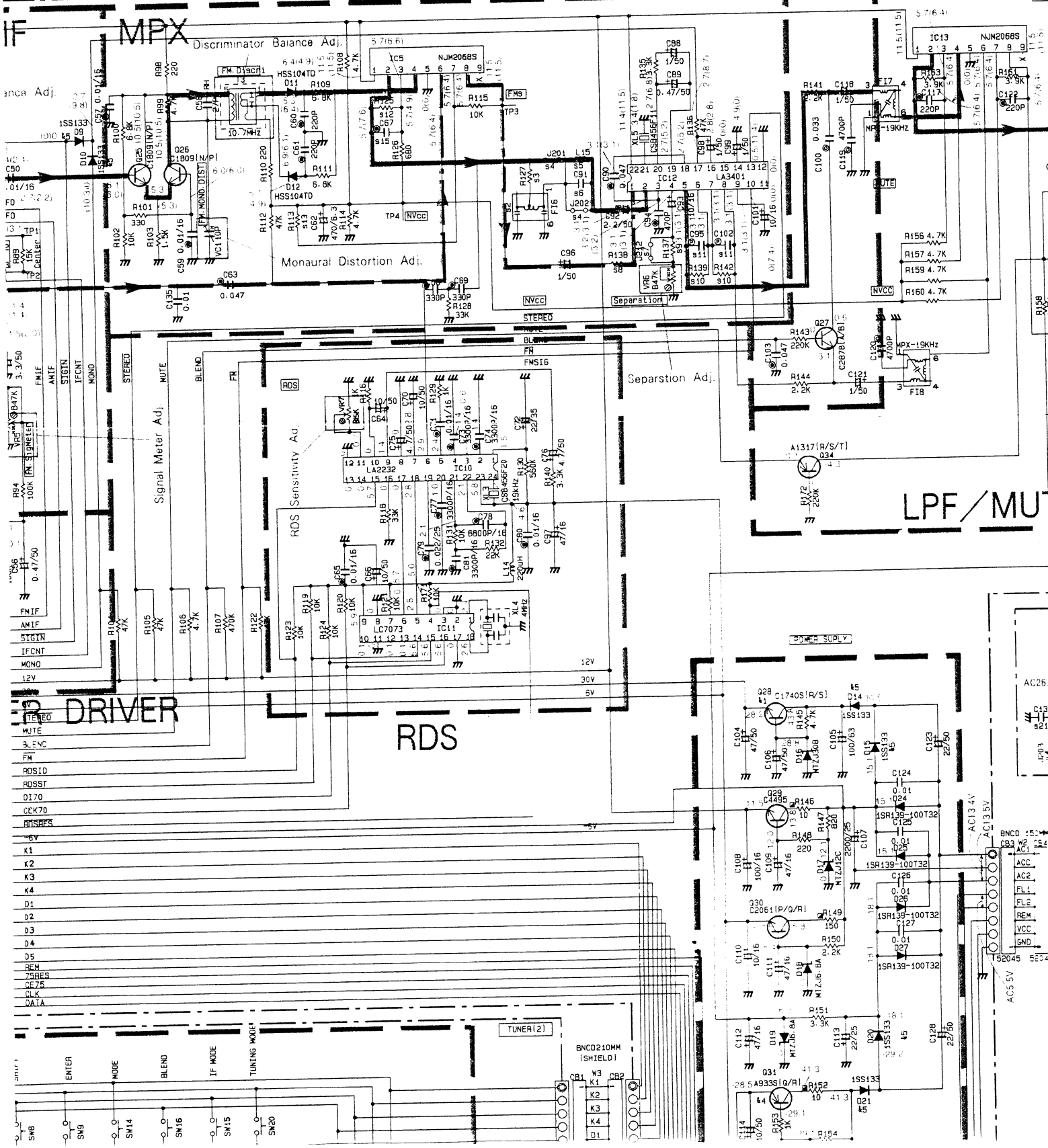
REMARKS	PARTS NAME
NO MARK	CARBON FILM RESISTOR (1/6W)
□	CARBON FILM RESISTOR (1/4W)
△	METAL OXIDE FILM RESISTOR
▲	METAL FILM RESISTOR
⊠	METAL PLATE RESISTOR
■	FIRE PROOF CARBON FILM RESISTOR
□	CEMENT MOLDED RESISTOR
⊙	SEMI VARIABLE RESISTOR
■	CHIP RESISTOR

REMARKS	PARTS NAME
NO MARK	ELECTROLYTIC CAPACITOR
⊗	TANTALUM CAPACITOR
NO MARK	CERAMIC CAPACITOR
⊙	AXIAL LEAD CERAMIC CAPACITOR
⊖	POLYESTER FILM CAPACITOR
⊕	POLYSTYRENE FILM CAPACITOR
⊖	MICA CAPACITOR
⊕	POLYPROPYLENE FILM CAPACITOR
●	SEMICONDUCTIVE CERAMIC CAPACITOR

IC10:



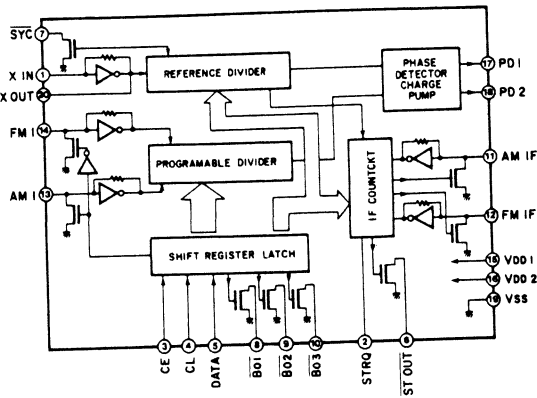
F G H I BLEND SWITCH



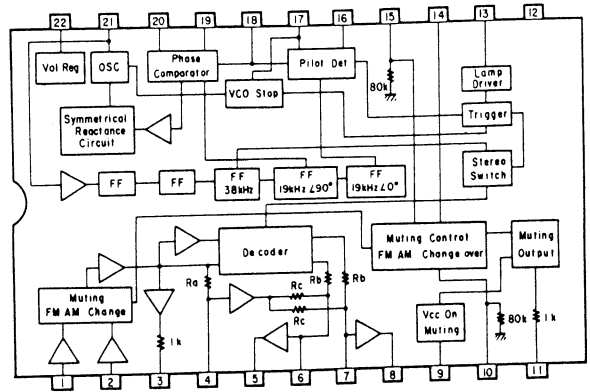
- BLEND OFF MODE WIDE
- IF
- MPX
- Discriminator Balance Adj.
- Monaural Distortion Adj.
- RDS
- RDS Sensitivity Adj.
- DRIVER
- RDS
- LPF/MUT
- ENTER
- MODE
- BLEND
- IF-MODE
- TUNING MODE
- TUNER(2)
- ENTER
- MODE
- BLEND
- IF-MODE
- TUNING MODE
- TUNER(2)

IC BLOCK

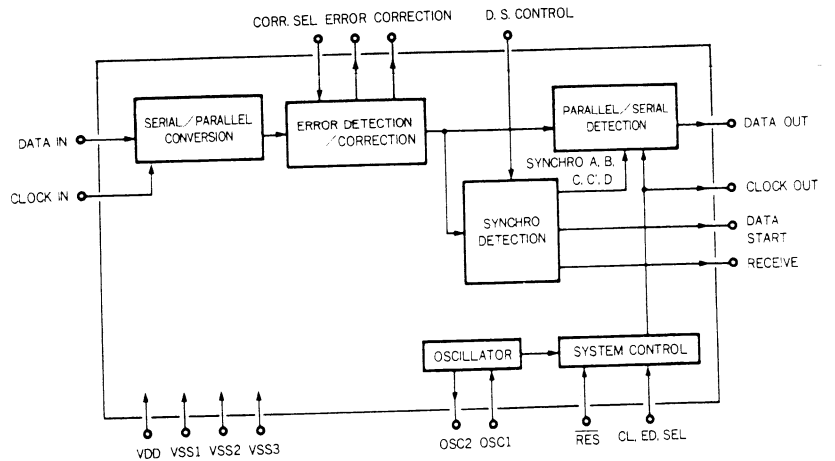
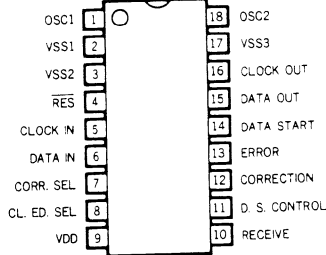
• IC1 : LM7000N (DIRECT PLL)



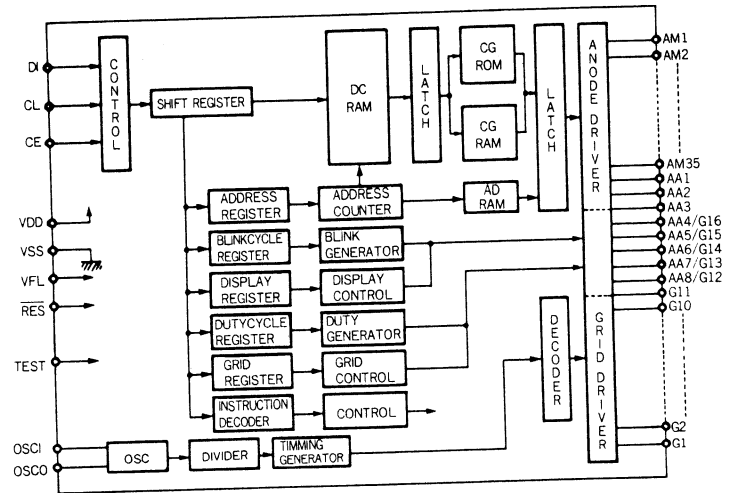
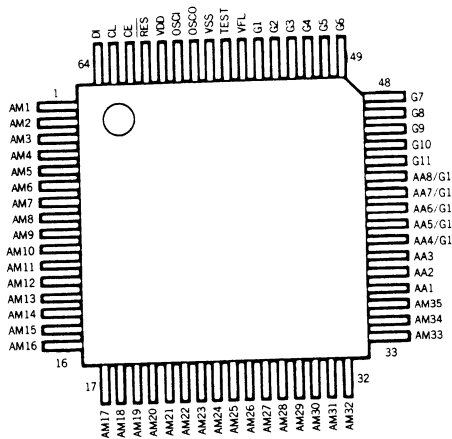
• IC12 : LA3401 (MPX)



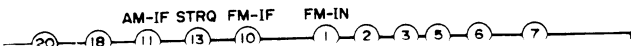
• IC11 : LC7073

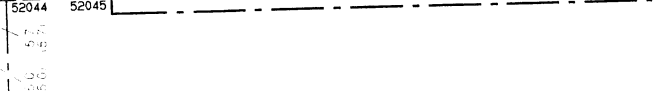
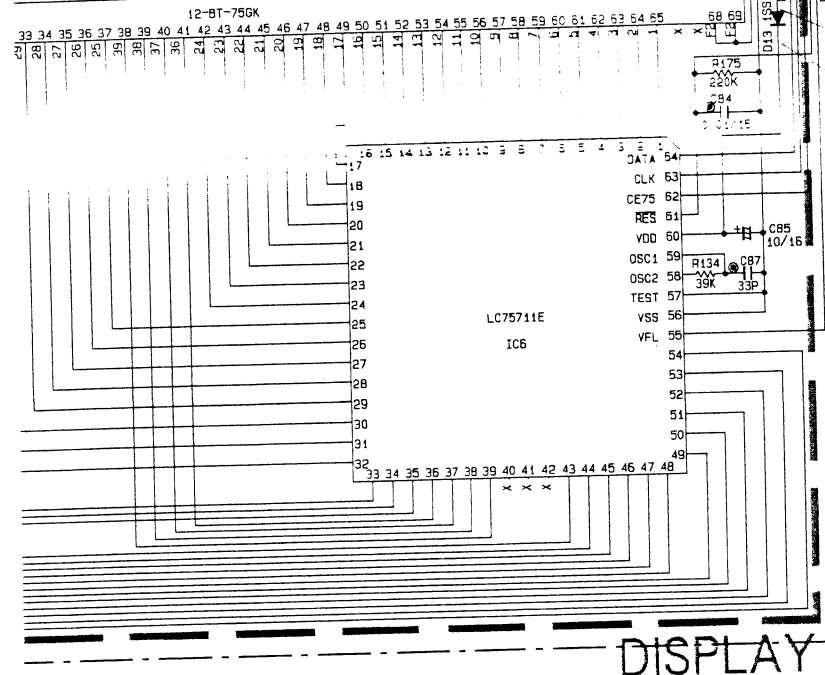
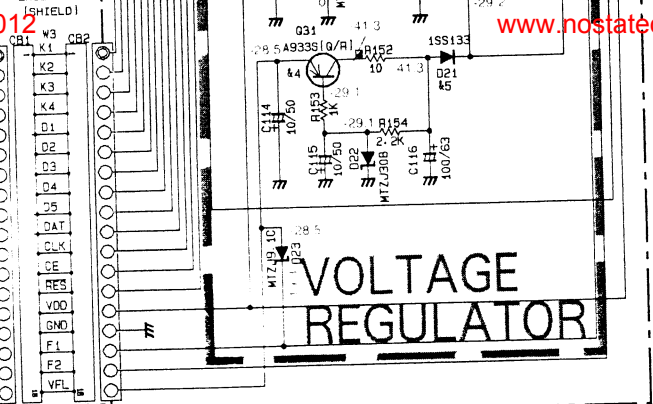
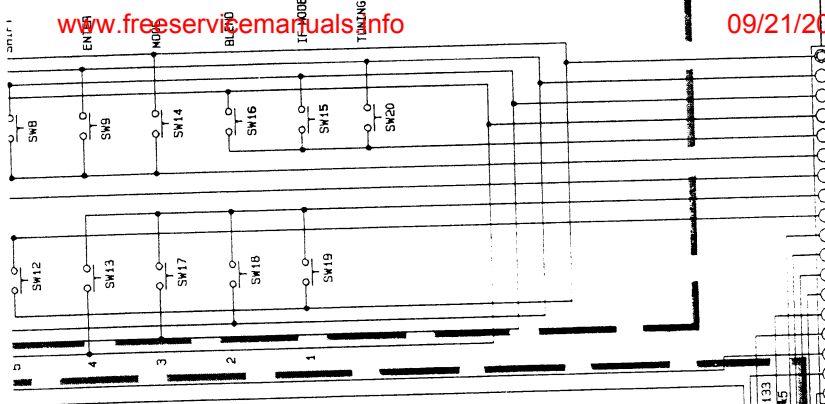


• IC6 : LC75711E (FLD Driver)

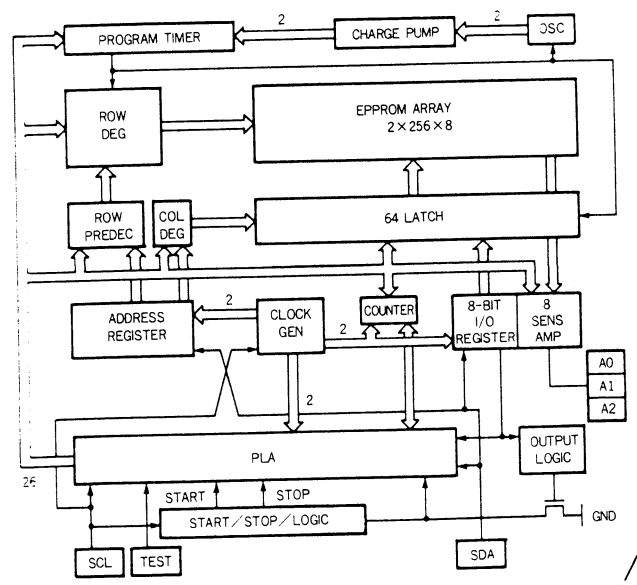


• IC4 : LA1266 (AM/FM IF)

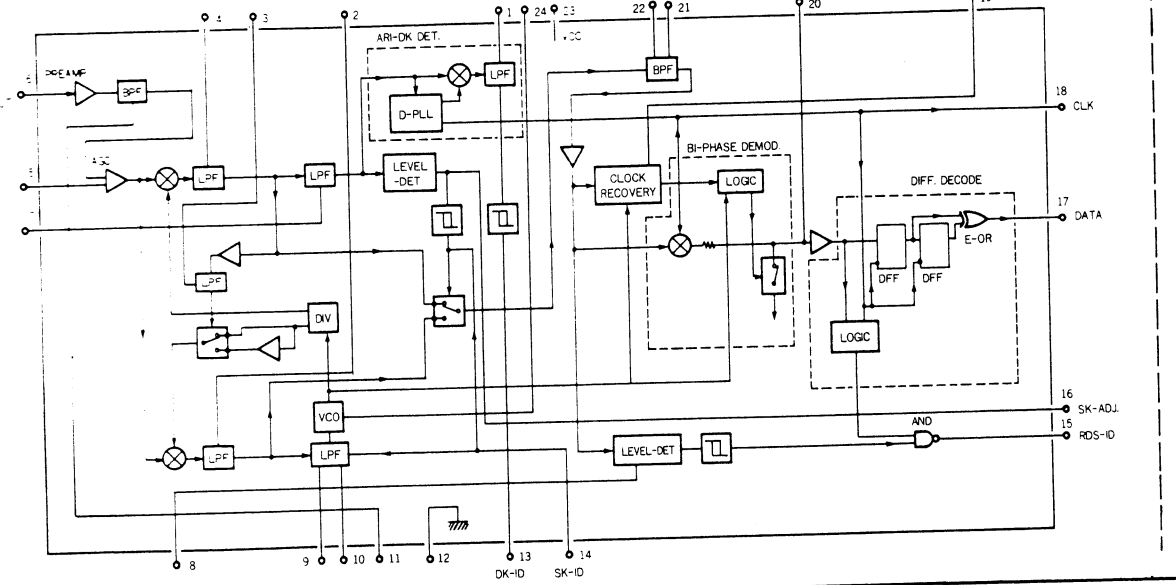




• IC2 : LE24CO4S6

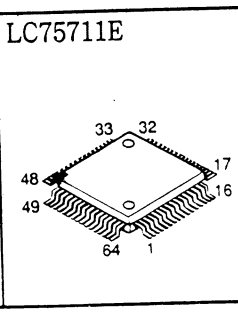
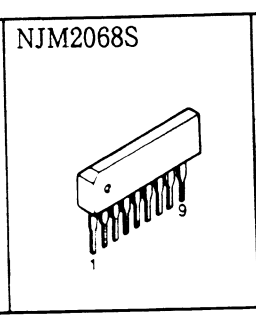
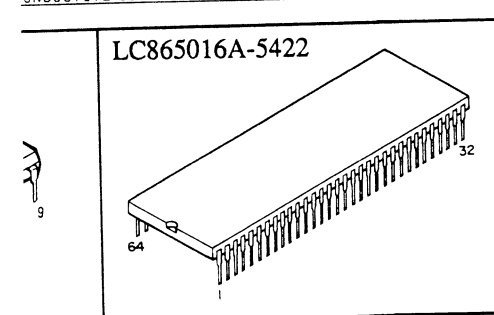


• IC10 : LA2232

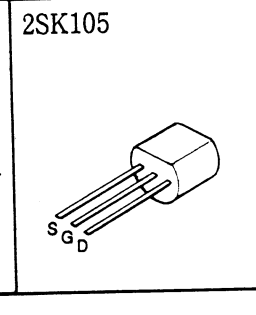


- 1740S (R/S)
- 85031E (F)
- 3311A (Q/R/S)
- U521Y
- U5B1Y
- 93351Q (R)
- V1151E (F)
- V1309A (Q/R/S)
- 3133
- 31C4TD

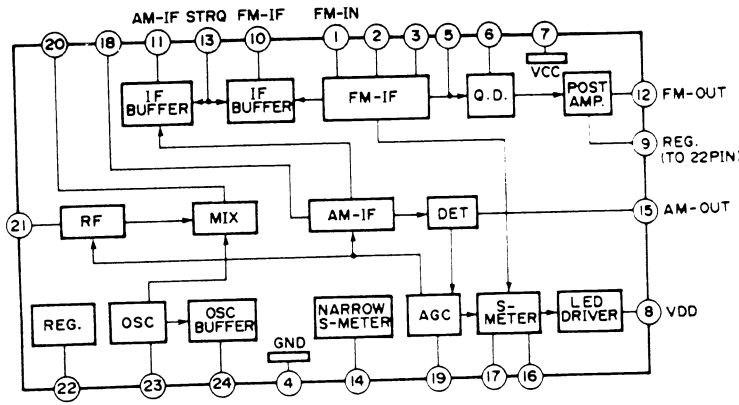
PARTS NAME	SYMBOL
POLYESTER CAPACITOR	⌘
ALUMINUM CAPACITOR	⌘
IC CAPACITOR	⌘
LEAD CERAMIC CAPACITOR	⌘
STEEL FILM CAPACITOR	⌘
MYRENE FILM CAPACITOR	⌘
CAPACITOR	⌘
POLYESTER FILM CAPACITOR	⌘
DUCTIVE CERAMIC CAPACITOR	⌘



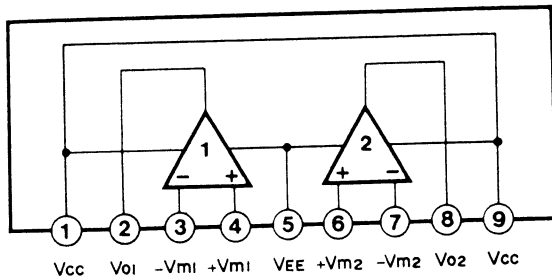
- 1SS133, 1SS176
- 1SR139-100
- MTZJ5.1B
- MTZJ30B
- MTZJ12C
- MTZJ6.8A
- HSS104TD
- HSS104



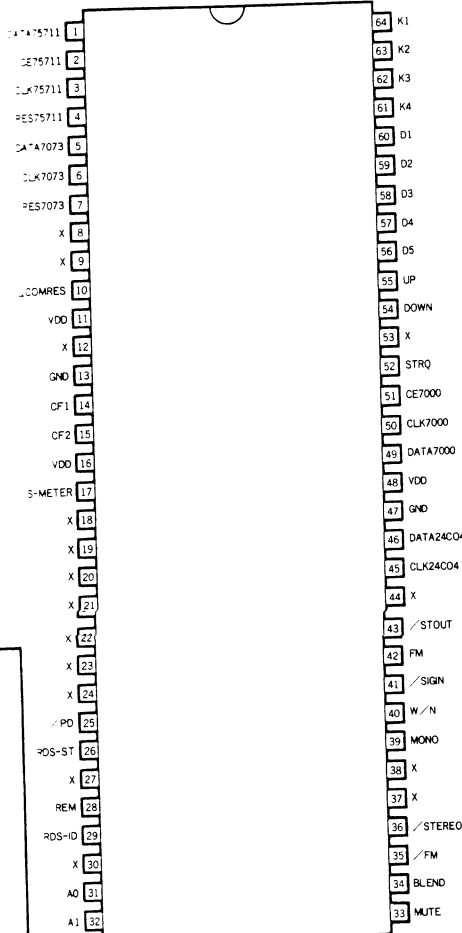
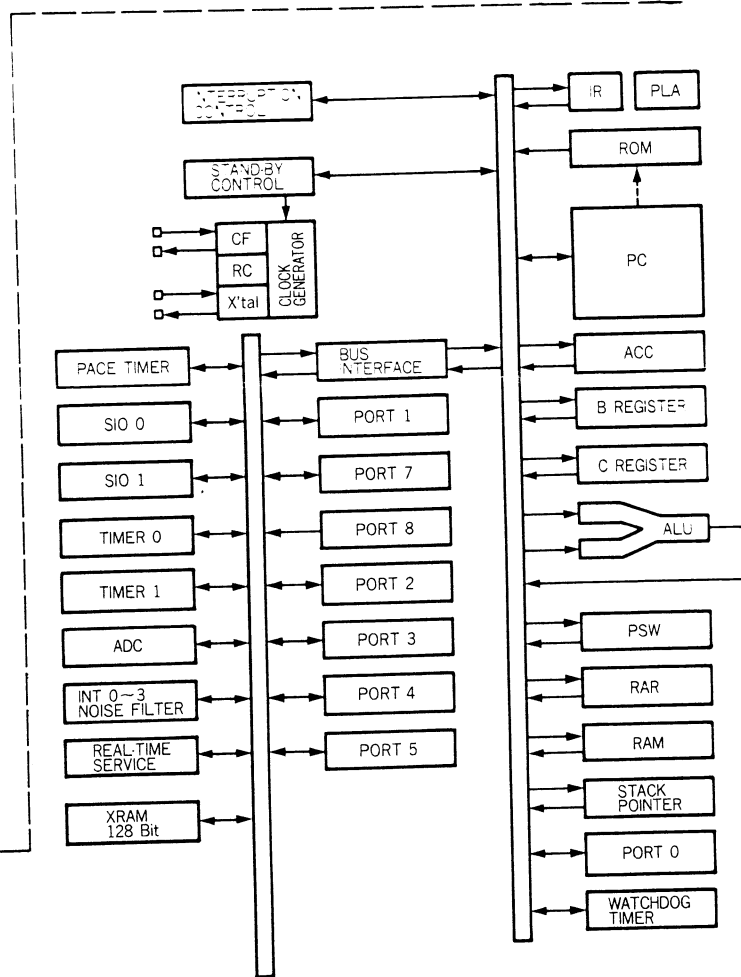
• IC4 : LA1266 (AM/FM IF)



• IC5,IC13 : NJM2068S (DUAL OP-AMP.)



• IC3 : LC8565016A-5422 (8bit-CPU)



PIN NO.	TERMINAL NAME	I/O	FUNCTION	PIN NO.	TERMINAL NAME	I/O	FUNCTION
1	DATA75	I/O	to LC75711 (DATA75711)	33	MUTE	O	MUTE
2	CE75	I/O	to LC75711 (CE75711)	34	BLEND	I/O	BLEND
3	CLK75	I/O	to LC75711 (CLK75711)	35	/FM	O	/FM
4	/DRVRES	I/O	to LC75711 (RE75711)	36	/STEREO	I/O	/STEREO
5	CI70	I/O	to LC7073 (DATA7073)	37	X		-
6	CLK70	I/O	to LC7073 (CLK7073)	38	X		-
7	/RDSRES	I/O	to LC7073 (RES7073)	39	MONO		I/O MONO
8	X		-	40	W/N	O	WIDE/NARROW
9	TEST	I	-	41	/SIGIN	I	/SIGNAL IN
10	/RES	I	/μ COM RESET	42	FM		FM
11	5V		VDD	43	/STO	I	/STOUT
12	X		-	44	X		-
13	VSS		GND	45	CLK24	I/O	to LE24CO4 (CLK24CO4)
14	CF1	I	μ COM CLOCK (CF1)	46	DA24	I/O	to LE24CO4 (DATA24CO4)
15	CF2	O	μ COM CLOCK (CF2)	47	VSS		GND
16	VDD		VDD	48	VDDVPP		VDD
17	METER	O	S-METER	49	DA70	I/O	to LM7000N (DATA7000)
18	X		-	50	CL70	I/O	to LM7000N (CLK7000)
19	X		-	51	CE70	I/O	to LM7000N (CE7000)
20	X		-	52	STRQ	I/O	STOP REQUEST
21	X		-	53	X		-
22	X		-	54	DOWN	I	to Rotary Encoder (DOWN)
23	X		-	55	UP	I	to Rotary Encoder (UP)
24	X		-	56	D5	I/O	Key Input (D5)
25	/PWRDN		/POWER DOWN	57	D4	I/O	Key Input (D4)
26	RDSST	I/O	to LC7073 (RDS-ST)	58	D3	I/O	Key Input (D3)
27	X		-	59	D2	I/O	Key Input (D2)
28	REM		REM	60	D1	I/O	Key Input (D1)
29	RDS-ID	I/O	to LC7073 (RDS-ID)	61	K4	I/O	Key Input (K4)
30	X		-	62	K3	I/O	Key Input (K3)
31	AO	I/O	AO	63	K2	I/O	Key Input (K2)
32	A1	I/O	A1	64	K1	I/O	Key Input (K1)

CAUTION

- Components having special characteristics are marked Δ and must be replaced with parts having specifications equal to those originally installed.
- All voltages are measured with a 10MΩ/V DC electric volt meter.
- Schematic diagram is subject to change without notice.

Yamaha A150

TX-680RDS

■ ELECTRICAL PARTS

■ WARNING

Components having special characteristics are marked \triangle and must be replaced with parts having specifications equal to those originally installed.

- Carbon resistors (1/6W or 1/4W) are not included in the ELECTRICAL PARTS List. For the parts No. of the carbon resistors, refer to last page.

ABBREVIATIONS IN THIS LIST ARE AS FOLLOWS :

C.A.EL.CHP	: CHIP ALUMI. ELECTROLYTIC CAP	L.EMIT	: LIGHT EMITTING MODULE
C.CE	: CERAMIC CAP	LED.DSPLY	: LED DISPLAY
C.CE.ARRAY	: CERAMIC CAP ARRAY	LED.INFRD	: LED, INFRARED
C.CE.CHP	: CHIP CERAMIC CAP	MODUL.RF	: MODULATOR, RF
C.CE.ML	: MULTILAYER CERAMIC CAP	PHOT.CPL	: PHOTO COUPLER
C.CE.M.CHP	: CHIP MULTILAYER CERAMIC CAP	PHOT.INTR	: PHOTO INTERRUPTER
C.CE.SAFTY	: RECOGNIZED CERAMIC CAP	PHOT.RFLCT	: PHOTO REFLECTOR
C.CE.TUBLR	: CERAMIC TUBULAR CAP	PIN.TEST	: PIN, TEST POINT
C.CE.SMI	: SEMI CONDUCTIVE CERAMIC CAP	PLST.RIVET	: PLASTIC RIVET
C.EL	: ELECTROLYTIC CAP	R.ARRAY	: RESISTOR ARRAY
C.MICA	: MICA CAP	R.CAR.CHP	: CHIP RESISTOR
C.ML.FLM	: MULTILAYER FILM CAP	R.CAR.FP	: FLAME PROOF CARBON RESISTOR
C.MP	: METALLIZED PAPER CAP	R.FUS	: FUSABLE RESISTOR
C.MYLAR	: MYLAR FILM CAP	R.MTL.CHP	: CHIP METAL FILM RESISTOR
C.MYLAR.ML	: MULTILAYER MYLAR FILM CAP	R.MTL.FLM	: METAL FILM RESISTOR
C.PAPER	: PAPER CAPACITOR	R.MTL.OXD	: METAL OXIDE FILM RESISTOR
C.PLS	: POLYSTYRENE FILM CAP	R.MTL.PLAT	: METAL PLATE RESISTOR
C.POL	: POLYESTER FILM CAP	RSNR.CE	: CERAMIC RESONATOR
C.POLY	: POLYETHYLENE FILM CAP	RSNR.CRYS	: CRYSTAL RESONATOR
C.PP	: POLYPROPYLENE FILM CAP	R.TW.CEM	: TWIN CEMENT FIXED RESISTOR
C.TNTL	: TANTALUM CAP	R.WW	: WIRE WOUND RESISTOR
C.TNTL.CHP	: CHIP TANTALUM CAP	SCR.BND.HD	: BIND HEAD B-TITE SCREW
C.TRIM	: TRIMMER CAP	SCR.BW.HD	: BW HEAD TAPPING SCREW
CN	: CONNECTOR	SCR.CUP	: CUP TITE SCREW
CN.BS.PIN	: CONNECTOR, BASE PIN	SCR.TERM	: SCREW TERMINAL
CN.CANNON	: CONNECTOR, CANNON	SCR.TR	: SCREW, TRANSISTOR
CN.DIN	: CONNECTOR, DIN	SUPRT.PCB	: SUPPORT, P.C.B.
CN.FLAT	: CONNECTOR, FLAT CABLE	SURG.PRTCT	: SURGE PROTECTOR
CN.POST	: CONNECTOR, BASE POST	SW.TACT	: TACT SWITCH
COIL.MX.AM	: COIL, AM MIX	SW.LEAF	: LEAF SWITCH
COIL.AT.FM	: COIL, FM ANTENNA	SW.LEVER	: LEVER SWITCH
COIL.DT.FM	: COIL, FM DETECT	SW.MICRO	: MICRO SWITCH
COIL.MX.FM	: COIL, FM MIX	SW.PUSH	: PUSH SWITCH
COIL.OUTPT	: OUTPUT COIL	SW.RT.ENC	: ROTARY ENCODER
DIOD.ARRAY	: DIODE ARRAY	SW.RT.MTR	: ROTARY SWITCH WITH MOTOR
DIODE.BRG	: DIODE BRIDGE	SW.RT	: ROTARY SWITCH
DIODE.CHP	: CHIP DIODE	SW.SLIDE	: SLIDE SWITCH
DIODE.VAR	: VARACTOR DIODE	TERM.SP	: SPEAKER TERMINAL
DIOD.Z.CHP	: CHIP ZENER DIODE	TERM.WRAP	: WRAPPING TERMINAL
DIODE.ZENR	: ZENER DIODE	THRMST.CHP	: CHIP THERMISTOR
DSCR.CE	: CERAMIC DISCRIMINATOR	TR.CHP	: CHIP TRANSISTOR
FER.BEAD	: FERRITE BEADS	TR.DGT	: DIGITAL TRANSISTOR
FER.CORE	: FERRITE CORE	TR.DGT.CHP	: CHIP DIGITAL TRANSISTOR
FET.CHP	: CHIP FET	TRANS	: TRANSFORMER
FL.DSPLY	: FLUORESCENT DISPLAY	TRANS.PULS	: PULSE TRANSFORMER
FLTR.CE	: CERAMIC FILTER	TRANS.PWR	: POWER TRANSFORMER ASS'y
FLTR.COMB	: COMB FILTER MODULE	TUNER.AM	: TUNER PACK, AM
FLTR.LC.RF	: LC FILTER, EMI	TUNER.FM	: TUNER PACK, FM
GND.MTL	: GROUND PLATE	TUNER.PK	: FRONT-END TUNER PACK
GND.TERM	: GROUND TERMINAL	VR	: ROTARY POTENTIOMETER
HOLDER.FUS	: FUSE HOLDER	VR.MTR	: POTENTIOMETER WITH MOTOR
IC.PRTCT	: IC PROTECTOR	VR.SW	: POTENTIOMETER WITH ROTARY SW
JUMPER.CN	: JUMPER CONNECTOR	VR.SLIDE	: SLIDE POTENTIOMETER
JUMPER.TST	: JUMPER, TEST POINT	VR.TRIM	: TRIMMER POTENTIOMETER
L.DTCT	: LIGHT DETECTING MODULE		

TX-680RDS

Schm	Ref.	PART NO.	Description		
	*	VR639100	P. C. B.	TUNER(B)	
	*	VR639200	P. C. B.	TUNER(G)	
		CB1	VQ044800	CN. BS. PIN	18P
		CB2	VP573800	CN. BS. PIN	18P
		CB3	VP682200	CN. BS. PIN	8P
		CB4	VP682200	CN. BS. PIN	8P
		CB5	VG879900	CN. BS. PIN	2P
		C1	VF467300	C. CE. TUBLR	0.01uF 16V
		C2	UA653220	C. MYLAR	2200pF 50V
		C3	VJ836900	C. EL	10uF 16V
		C4	VF467300	C. CE. TUBLR	0.01uF 16V
		C5	UJ667470	C. EL	47uF 50V
	*	C6	VG722100	C. EL	1uF 50V
		C7	VF466700	C. CE. TUBLR	47pF 50V
		C8	UA655100	C. MYLAR	0.1uF 50V
		C9	VJ839100	C. EL	1uF 50V
		C10	VF467300	C. CE. TUBLR	0.01uF 16V
		C11	VF467300	C. CE. TUBLR	0.01uF 16V
		C12	VF466800	C. CE. TUBLR	100pF 50V
		C13	VF467000	C. CE. TUBLR	1000pF 50V
		C14	VF467000	C. CE. TUBLR	1000pF 50V
		C15	UJ628470	C. EL	470uF 10V
		C16	VA761200	C. CE	33pF 50V
		C17	VA761200	C. CE	33pF 50V
		C18	VE551500	C. CE	47pF 50V
		C19	VE551500	C. CE	47pF 50V
		C20	VJ837200	C. EL	47uF 16V
		C22	VF467300	C. CE. TUBLR	0.01uF 16V
		C23	VF467300	C. CE. TUBLR	0.01uF 16V
		C24	VF467300	C. CE. TUBLR	0.01uF 16V
		C25	VF467300	C. CE. TUBLR	0.01uF 16V
		C26	VC362100	C. EL	0.1uF 5.5V
		C27	VF467300	C. CE. TUBLR	0.01uF 16V
		C28	VF467300	C. CE. TUBLR	0.01uF 16V
		C29	VF467000	C. CE. TUBLR	1000pF 50V
		C30	VF467000	C. CE. TUBLR	1000pF 50V
		C31	VF467300	C. CE. TUBLR	0.01uF 16V
		C32	VF467300	C. CE. TUBLR	0.01uF 16V
		C33	VF467300	C. CE. TUBLR	0.01uF 16V
		C34	VF467300	C. CE. TUBLR	0.01uF 16V
		C35	VF467300	C. CE. TUBLR	0.01uF 16V
		C36	VF467300	C. CE. TUBLR	0.01uF 16V
		C37	VF467300	C. CE. TUBLR	0.01uF 16V
		C38	VF467300	C. CE. TUBLR	0.01uF 16V
		C39	VF467300	C. CE. TUBLR	0.01uF 16V
		C40	VF467300	C. CE. TUBLR	0.01uF 16V
		C41	Fi554470	C. CE	0.047uF 50V
		C42	VF467300	C. CE. TUBLR	0.01uF 16V
		C43	VF467300	C. CE. TUBLR	0.01uF 16V
		C44	VF467300	C. CE. TUBLR	0.01uF 16V
		C45	VF467300	C. CE. TUBLR	0.01uF 16V
		C46	UM416470	C. EL	4.7uF 50V
		C47	VJ836900	C. EL	10uF 16V
		C48	VJ839100	C. EL	1uF 50V

* New Parts

Schm	Ref.	PART NO.	Description		
		C49	VJ836900	C. EL	10uF 16V
		C50	VF467300	C. CE. TUBLR	0.01uF 16V
		C51	VJ839200	C. EL	2.2uF 50V
		C52	VF467300	C. CE. TUBLR	0.01uF 16V
		C53	UM216330	C. EL	3.3uF 50V
		C54	VF467300	C. CE. TUBLR	0.01uF 16V
		C55	VJ836900	C. EL	10uF 16V
		C56	VJ839000	C. EL	0.47uF 50V
		C57	VF467300	C. CE. TUBLR	0.01uF 16V
		C58	Vi026900	C. CE	27pF 50V
		C59	VF467300	C. CE. TUBLR	0.01uF 16V
		C60	VG278400	C. CE. TUBLR	220pF 50V
		C61	VG278400	C. CE. TUBLR	220pF 50V
		C62	UJ628470	C. EL	470uF 10V
		C63	Vi101300	C. CE. TUBLR	0.047uF 50V
		C64	UM417100	C. EL	10uF 50V
		C65	VF467300	C. CE. TUBLR	0.01uF 16V
		C66	UM417100	C. EL	10uF 50V
		C67	VG277700	C. CE. TUBLR	68pF 50V(G)
		C68	VG278600	C. CE. TUBLR	330pF 50V
		C69	VG278600	C. CE. TUBLR	330pF 50V
		C70	UM417100	C. EL	10uF 50V
		C71	VF467300	C. CE. TUBLR	0.01uF 16V
		C72	Ui367220	C. EL	22uF 50V
		C73	VG279600	C. CE. TUBLR	3300pF 16V
		C74	VG279600	C. CE. TUBLR	3300pF 16V
		C75	UM416470	C. EL	4.7uF 50V
		C76	UM416470	C. EL	4.7uF 50V
		C77	VG279600	C. CE. TUBLR	3300pF 16V
		C78	VG279900	C. CE. TUBLR	6800pF 16V
		C79	VG280100	C. CE. TUBLR	0.022uF 25V
		C80	VF467300	C. CE. TUBLR	0.01uF 16V
		C81	VG279600	C. CE. TUBLR	3300pF 16V
		C84	VF467300	C. CE. TUBLR	0.01uF 16V
		C85	VJ836900	C. EL	10uF 16V
		C87	VG277000	C. CE. TUBLR	33pF 50V
		C88	VJ839100	C. EL	1uF 50V
		C89	VJ839000	C. EL	0.47uF 50V
		C90	Vi101300	C. CE. TUBLR	0.047uF 50V
		C91	FG211820	C. CE	82pF 50V(G)
	*	C92	VD916400	C. EL	2.2uF 50V
		C93	VJ836900	C. EL	10uF 16V
		C94	VF466900	C. CE. TUBLR	470pF 50V
		C95	UT452750	C. PP	750pF 100V(G)
		C95	UT453120	C. PP	1200pF 100V(B)
		C96	VJ839100	C. EL	1uF 50V
		C97	VJ837200	C. EL	47uF 16V
		C98	VJ839100	C. EL	1uF 50V
		C99	VJ839100	C. EL	1uF 50V
		C100	UA654330	C. MYLAR	0.033uF 50V
		C101	VJ836900	C. EL	10uF 16V
		C102	UT452750	C. PP	750pF 100V(G)
		C102	UT453120	C. PP	1200pF 100V(B)
		C103	Vi101300	C. CE. TUBLR	0.047uF 50V

* New Parts

TX-680RDS

TX-680RDS

Schm Ref.	PART NO.	Description		
C104	UJ667470	C. EL	47uF	50V
C105	UH178100	C. EL	100uF	63V
C106	UJ667470	C. EL	47uF	50V
C107	UJ649220	C. EL	2200uF	25V
C108	VF964800	C. EL	100uF	16V
C109	VJ837200	C. EL	47uF	16V
C110	VJ836900	C. EL	10uF	16V
C111	VJ837200	C. EL	47uF	16V
C112	VJ837200	C. EL	47uF	16V
C113	UM407220	C. EL	22uF	25V
C114	UM417100	C. EL	10uF	50V
C115	UM417100	C. EL	10uF	50V
C116	UH178100	C. EL	100uF	63V
C117	VG278700	C. CE. TUBLR	390pF	50V
C118	VJ839100	C. EL	1uF	50V
C119	UA653470	C. MYLAR	4700pF	50V
C120	UA653470	C. MYLAR	4700pF	50V
C121	VJ839100	C. EL	1uF	50V
C122	VG278700	C. CE. TUBLR	390pF	50V
C123	Ui367220	C. EL	22uF	50V
C124	UG444100	C. CE	0.01uF	50V
C125	UG444100	C. CE	0.01uF	50V
C126	UG444100	C. CE	0.01uF	50V
C127	UG444100	C. CE	0.01uF	50V
C128	Ui367220	C. EL	22uF	50V
C129	VJ839100	C. EL	1uF	50V
C130	VJ839100	C. EL	1uF	50V
C131	UA655100	C. MYLAR	0.1uF	50V
C132	UA655100	C. MYLAR	0.1uF	50V
C133	UA655100	C. MYLAR	0.1uF	50V
C134	FG244100	C. CE	0.01uF	50V(G)
C135	UG444100	C. CE	0.01uF	50V
C136	VG278400	C. CE. TUBLR	220pF	50V
D1	VD631600	DIODE	1SS133,176,HSS104	
D3	VG437400	DIODE. ZENR	MTZJ5.1B	5.1V
D4	VD631600	DIODE	1SS133,176,HSS104	
D5	VD631600	DIODE	1SS133,176,HSS104	
D6	VD631600	DIODE	1SS133,176,HSS104	
D7	VD631600	DIODE	1SS133,176,HSS104	
D8	VD631600	DIODE	1SS133,176,HSS104	
D9	VD631600	DIODE	1SS133,176,HSS104	
D10	VD631600	DIODE	1SS133,176,HSS104	
D11	VN158100	DIODE	HSS104TD	
D12	VN158100	DIODE	HSS104TD	
D13	VD631600	DIODE	1SS133,176,HSS104	
D14	VD631600	DIODE	1SS133,176,HSS104	
D15	VD631600	DIODE	1SS133,176,HSS104	
D16	VG443300	DIODE. ZENR	MTZJ30B	30V
D17	VG440300	DIODE. ZENR	MTZJ12C	12V
D18	VG438200	DIODE. ZENR	MTZJ6.8A	6.8V
D19	VG438200	DIODE. ZENR	MTZJ6.8A	6.8V
D20	VD631600	DIODE	1SS133,176,HSS104	
D21	VD631600	DIODE	1SS133,176,HSS104	
D22	VG443300	DIODE. ZENR	MTZJ30B	30V

* New Parts

Schm Ref.	PART NO.	Description		
D23	VG439300	DIODE. ZENR	MTZJ9.1C	9.1V
D24	VH770800	DIODE	1SR139-100	
D25	VH770800	DIODE	1SR139-100	
D26	VH770800	DIODE	1SR139-100	
D27	VH770800	DIODE	1SR139-100	
D28	VD631600	DIODE	1SS133,176,HSS104	
Fi1	GG000670	FLTR. CE	SFE10.7MMH-A(B)	
Fi1	VJ801500	FLTR. CE	SFE10.7MM9 (G)	
Fi2	GG000560	FLTR. CE	SFE10.7MS3GHY-A	
Fi3	GG000560	FLTR. CE	SFE10.7MS3GHY-A	
Fi4	GG000670	FLTR. CE	SFE10.7MMH-A(B)	
Fi4	VJ801500	FLTR. CE	SFE10.7MM9 (G)	
Fi5	VC219000	FLTR. CE	SFZ450JL3	
Fi6	GE200530	FLTR. LC	114KHz (G)	
Fi7	VQ063400	FLTR. LC	19KHz	
Fi8	VQ063400	FLTR. LC	19KHz	
IC1	XB818A00	IC	LM7000N	
IC2	XL800A00	IC	LE24C04S6	
IC3	XM656B00	IC	LC865016-5400	
IC4	XB760A00	IC	LA1266	
IC5	XA956A00	IC	NJM2068S	
IC6	XL799A00	IC	LC75711E	
IC10	XL801A00	IC	LA2232	
IC11	XL802A00	IC	LC7073	
IC12	iG158100	IC	LA3401	
IC13	XA956A00	IC	NJM2068S	
L1	V1546100	COIL	220uH	
L4	V1546100	COIL	220uH	
L6	VB106700	COIL. IF. FM	10.7MHz	
L11	V1546100	COIL	220uH	
L14	V1546100	COIL	220uH	
L15	VB100300	COIL	8.2mH (G)	
PJ1	VE366700	JACK. PIN	2P	
PK1	Vi122600	TUNER. PK	TFFGIU139A(B)	
PK1	Vi122700	TUNER. PK	TFFG3E164A(G)	
PK2	Vi027400	COIL. AM		
Q1	VC218700	TR	2SA1317 R,S,T	
Q2	iE101280	FET	2SK105 F,H	
Q3	iE101280	FET	2SK105 F,H	
Q5	VB433300	TR	2SC1809 M,N,P	
Q6	VB433300	TR	2SC1809 M,N,P	
Q7	iC174020	TR	2SC1740S R,S	
Q8	iA093320	TR	2SA933S Q,R	
Q9	VB433300	TR	2SC1809 M,N,P	
Q10	VB433300	TR	2SC1809 M,N,P	
Q11	VB433300	TR	2SC1809 M,N,P	
Q12	VC218900	TR	2SC3330 R,S,T	
Q13	VC218900	TR	2SC3330 R,S,T	
Q14	VC218900	TR	2SC3330 R,S,T	
Q15	VB433300	TR	2SC1809 M,N,P	
Q16	VB433300	TR	2SC1809 M,N,P	
Q17	VB433300	TR	2SC1809 M,N,P	
Q18	VB433300	TR	2SC1809 M,N,P	
Q19	VB433300	TR	2SC1809 M,N,P	

* New Parts

A

B

C

D

E

TX-680RDS

EXPLODED VIEW

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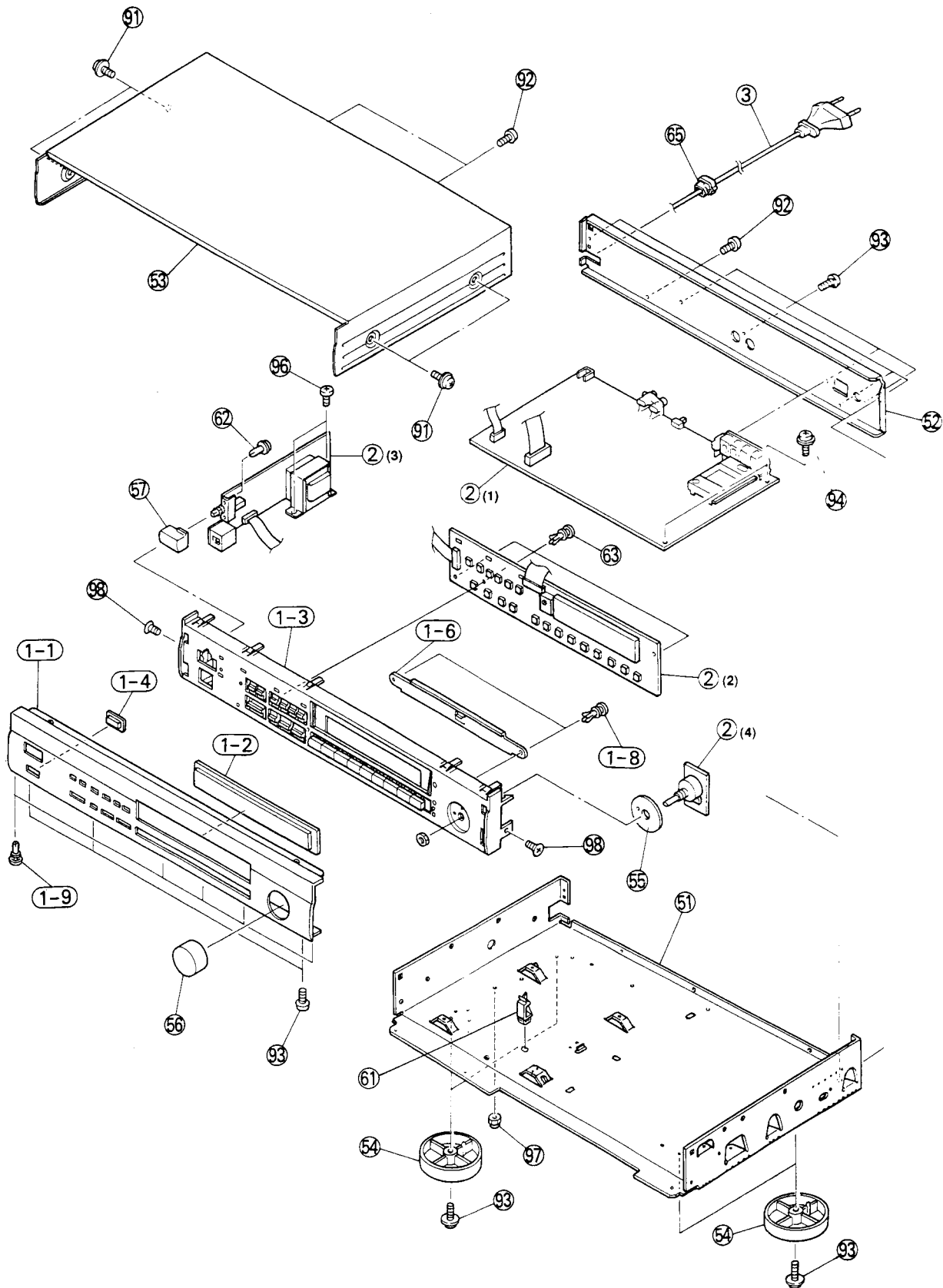
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TX-680RDS



TX-680RDS

MECHANISM PARTS

Ref. No.	PART NO.	Description	Remarks	Markets
* 1-	1 VR215300	FRONT PANEL	BL	
* 1-	1 VR215400	FRONT PANEL	TI	
* 1-	2 VR217500	WINDOW PANEL		
* 1-	3 VR244800	SUB PANEL	BL	
* 1-	3 VR244900	SUB PANEL	TI	
	1- 4	VH897500 LENS		
* 1-	6 VR435800	SUPPORT, FP		
* 1-	8 VR189100	PUSH RIVET	P3055-B	
* 1-	9 VQ368600	PUSH RIVET	P3555-B	
* 2	VR639100	P.C.B. ASS'Y, TUNER	TUNER	(B)
* 2	VR639200	P.C.B. ASS'Y, TUNER	TUNER	(G)
* 3	VL238900	POWER CORD ASS'Y		(G)
* 3	VN804500	POWER CORD ASS'Y		(B)
* 51	VQ709000	CHASSIS		
* 52	VR216500	REAR PANEL		(B)
* 52	VR216600	REAR PANEL		(G)
* 53	VR216700	TOP COVER	BL	
* 53	VR216800	TOP COVER	TI	
* 54	VQ780300	LEG	D60xH16	
* 55	VR435700	PLATE, RE		
* 56	VR217100	KNOB	D32	BL
* 56	VR217200	KNOB	D32	TI
* 57	VQ780000	BUTTON		BL
* 57	VQ780100	BUTTON		TI
61	VA772900	SUPPORT, P.C.B.	No. 2127	
62	CB657750	PLASTIC RIVET	No. 238	
* 63	VQ368600	PUSH RIVET	P3555-B	
65	VN158600	CORD STOPPER	No. 2104	
* 68	VQ166200	DAMPER	1x10x10	
91	EL300470	BW HEAD S-TITE SCREW	4x8	MFZN2-BL BL
91	EX601150	BW HEAD S-TITE SCREW	4x8-10	FNM3-BL TI
92	EN301010	BIND HEAD BONDING TAP. SCREW	3x8	FCRM3-BL
93	Ei330086	BIND HEAD B-TITE SCREW	3x8	FCRM3-BL
94	EX600700	BW HEAD TAPPING SCREW	3x8	FCM3-CU
96	EP630210	BIND HEAD S-TITE SCREW	3x6	ZMC2-BL
97	VQ057700	HEXAGON CAP NUT	3mm	FNM3-3G
98	E0330066	FLAT HEAD B-TITE SCREW	3x6	FCRM3-BL
99	EK930010	BW HEAD TAPPING SCREW	3x8-8	FCRM3-BL
100	VB770500	BIND HEAD B-TITE SCREW	3x12	FNM3-3G
	ACCESSORIES			
	VN159900	PIN-PLUG CORD	2P 1.0m	
	VQ043100	LOOP ANTENNA	3P 1.4m	(B)
* 1-	VQ099100	AM LOOP ANTENNA	1.0m	(G)
* 1-	VQ147100	ANTENNA, FM	1P 1.4m	(G)

* New Parts

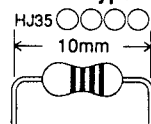
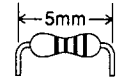
TX-680RDS

Parts List for Carbon Resistors

Value	1/4W Type Part No.	1/6W Type Part No.	Value	1/4W Type Part No.	1/6W Type Part No.
1.0 Ω	HJ35 3100	HF85 3100	10 kΩ	HF45 7100	HF45 7100
1.8 Ω	HJ35 3180	*	11 kΩ	HF45 7110	HF45 7110
2.2 Ω	HJ35 3220	HF85 3220	12 kΩ	HJ35 7120	HF85 7120
3.3 Ω	HJ35 3330	HF85 3330	13 kΩ	HF45 7130	HF45 7130
4.7 Ω	HJ35 3470	HF85 3470	15 kΩ	HF45 7150	HF45 7150
5.6 Ω	HJ35 3560	HF85 3560	18 kΩ	HF45 7180	HF45 7180
10 Ω	HF45 4100	HF45 4100	22 kΩ	HF45 7220	HF45 7220
15 Ω	HJ35 4150	HF85 4150	24 kΩ	HF45 7240	HF45 7240
22 Ω	HF45 4220	HF45 4220	27 kΩ	HJ35 7270	HF85 7270
27 Ω	HJ35 4270	HF85 4270	30 kΩ	HF45 7300	HF45 7300
33 Ω	HF45 4330	HF45 4330	33 kΩ	HF45 7330	HF45 7330
39 Ω	HJ35 4470	HF85 4390	36 kΩ	HF45 7360	HF45 7360
47 Ω	HF45 4470	HF45 4470	39 kΩ	HF45 7390	HF45 7390
56 Ω	HF45 4560	HF45 4560	47 kΩ	HF45 7470	HF45 7470
68 Ω	HF45 4680	HF45 4680	51 kΩ	HF45 7510	HF45 7510
75 Ω	HF45 4750	HF45 4750	56 kΩ	HF45 7560	HF45 7560
82 Ω	HF45 4820	HF45 4820	62 kΩ	HF45 7620	HF45 7620
91 Ω	HF45 4910	HF45 4910	68 kΩ	HF45 7680	HF45 7680
100 Ω	HF45 5100	HF45 5100	82 kΩ	HF45 7820	HF45 7820
110 Ω	HJ35 5110	HF85 5110	91 kΩ	HF45 7910	HF45 7910
120 Ω	HF45 5120	HF45 5120	100 kΩ	HF45 8100	HF45 8100
150 Ω	HF45 5150	HF45 5150	110 kΩ	HF45 8110	HF45 8110
160 Ω	HJ35 5160	*	120 kΩ	HF45 8120	HF45 8120
180 Ω	HF45 5180	HF45 5180	150 kΩ	HF45 8150	HF45 8150
200 Ω	HF45 5200	HF45 5200	180 kΩ	HF45 8180	HF45 8180
220 Ω	HF45 5220	HF45 5220	220 kΩ	HJ35 8220	HF85 8220
270 Ω	HF45 5270	HF45 5270	270 kΩ	HF45 8270	HF45 8270
330 Ω	HF45 5330	HF45 5330	300 kΩ	HF45 8300	HF45 8300
390 Ω	HF45 5390	HF45 5390	330 kΩ	HF45 8330	HF45 8330
430 Ω	HF45 5430	HF45 5430	390 kΩ	HJ35 8390	HF85 8390
470 Ω	HF45 5470	HF45 5470	470 kΩ	HF45 8470	HF45 8470
510 Ω	HF45 5510	HF45 5510	560 kΩ	HJ35 8560	HF85 8560
560 Ω	HF45 5560	HF45 5560	680 kΩ	HJ35 8680	HF85 8680
680 Ω	HF45 5680	HF45 5680	820 kΩ	HJ35 8820	HF85 8820
820 Ω	HF45 5820	HF45 5820	1.0 MΩ	HF45 9100	HF45 9100
910 Ω	HF45 5910	HF45 5910	1.2 MΩ	HJ35 9120	*
1.0 kΩ	HF45 6100	HF45 6100	1.5 MΩ	HJ35 9150	HF85 9150
1.2 kΩ	HF45 6120	HF45 6120	1.8 MΩ	HJ35 9180	HF85 9180
1.5 kΩ	HF45 6150	HF45 6150	2.2 MΩ	HJ35 9220	HF85 9220
1.8 kΩ	HF45 6180	HF45 6180	3.3 MΩ	HJ35 9330	HF85 9330
2.0 kΩ	HJ35 6200	HF85 6200	3.9 MΩ	HJ35 9390	*
2.2 kΩ	HF45 6220	HF45 6220	4.7 MΩ	HJ35 9470	HF85 9470
2.4 kΩ	HJ35 6240	HF85 6240			
2.7 kΩ	HF45 6270	HF45 6270			
3.0 kΩ	HF45 6300	HF45 6300			
3.3 kΩ	HF45 6330	HF45 6330			
3.6 kΩ	HJ35 6360	HF85 6360			
3.9 kΩ	HF45 6390	HF45 6390			
4.7 kΩ	HF45 6470	HF45 6470			
5.1 kΩ	HF45 6510	HF45 6510			
5.6 kΩ	HF45 6560	HF45 6560			
6.8 kΩ	HF45 6680	HF45 6680			
8.2 kΩ	HF45 6820	HF45 6820			
9.1 kΩ	HF45 6910	HF45 6910			

1/4W Type
HF45 ○○○○

1/6W Type
HF85 ○○○○

TX-680RDS