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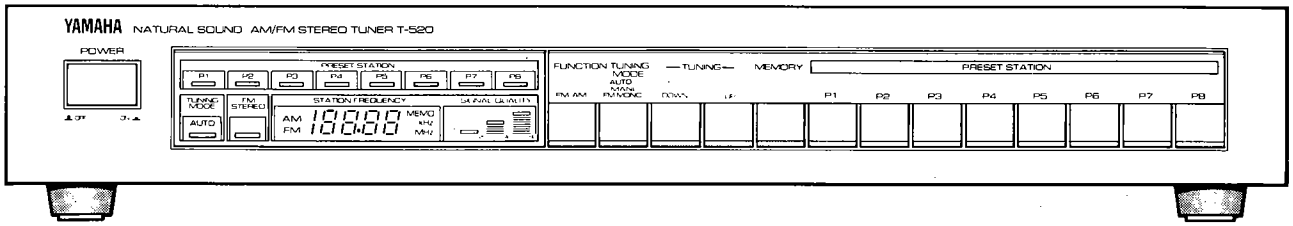
T-520/17

AM/FM STEREO TUNER

T-520/17

SERVICE MANUAL

T-520



U, C, R, A models

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 inherant to the industry, and more specifically Yamaha Products, are already known and understood by the users, and have therefore not been 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 or firm does not constitute authorization, certification, recognition of any applicable technical capabilitites, 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 departments of Yamaha are continually striving to improve Yamaha products. Modifications are, therefore, inevitable and changes in specification 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

004581

SINCE 1887 YAMAHA
NIPPON GAKKI CO., LTD. HAMAMATSU, JAPAN
2.6k-103 Prinred in Japan. '84.12

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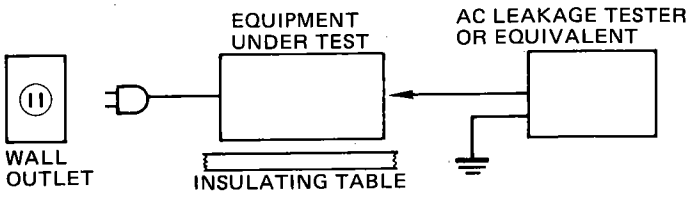
■ TO SERVICE PERSONNEL

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

2. Leakage Current Measurement (For 120 V Model Only).
   When service has been completed, it is imperative that you verify that all exposed conductive surfaces are properly insulated from supply circuits.

- Meter impedance should be equivalent to 1500 ohm shunted by 0.15μF.
- Leakage current must not exceed 0.5mA.
- Be sure to test for leakage with the AC plug in both polarities.



■ SPECIFICATIONS

■FM SECTION

Tuning Range	87.5 to 108.1MHz (U)(C)(R) 87.5 to 108.0MHz (G)(A)(B)
50dB Quieting Sensitivity	
Mono, 75Ω	1.55μV (15.1dBf)
Stereo, 75Ω	21μV (37.7dBf)
Usable Sensitivity	
Mono	0.8μV (75Ω) 9.3dBf
(30dB Quieting)	
DIN Mono (S/N 26dB), 75Ω	1.4μV (G)
DIN Stereo (S/N 46dB), 75Ω	30μV (G)
Image Response Ratio	
(98MHz)	40dB/75dB (G)
IF Response Ratio	
(98MHz)	100dB/75dB (G)
Spurious Response Ratio	
(98MHz)	80dB/70dB (G)
AM Suppression Ratio	
(IHF)	55dB
Capture Ratio	
(IHF)	1.5dB
Alternate Channel	85dB
Selectivity (two signals)	70dB (G)
Signal to Noise Ratio	
(at 85dBf)	
Mono	81dB
Stereo	76dB
Harmonic Distortion	
Mono 1kHz	0.1%
Stereo 1kHz	0.2%
Stereo Separation	
1kHz	40dB
Frequency Response	
30Hz to 13kHz	0 ± 0.5dB
Meter Saturation Level	100μV (45.2dBf)

■AM SECTION

Tuning Range	520 to 1610kHz (U)(C) 522 to 1611kHz (G)(A)(B) 520 to 1620kHz or 522 to 1611kHz (R)
Usable Sensitivity (IHF)	250μV/m
Selectivity	24dB
Signal to Noise Ratio	50dB
Image Response Ratio	40dB
Spurious Response Ratio	Better than 50dB
Distortion	0.5%

■LW SECTION (G)(B) models only

Tuning Range	153 to 360kHz
Usable Sensitivity (IHF)	250μV/m
Selectivity	32dB
Signal to Noise Ratio	50dB
Image Response Ratio	30dB
Spurious Response Ratio	Better than 45dB
Distortion (400Hz)	0.5%

■AUDIO SECTION

Output Level/Impedance	
FM 100% MOD 1kHz	500mV/3.3kΩ
FM 40kHz DEV. 1kHz	400mV/3.3kΩ (G)
AM 30% MOD 400Hz	150mV/3.3kΩ
LW 30% MOD 400Hz	150mV/3.3kΩ

■GENERAL

Power Supply	
U.S. & Canadian Models	120V, 60Hz
General Model	110–130V/220–240V 50/60Hz
European Models	220V, 50Hz
British & Australian Models	240V, 50Hz
Power Consumption	10W (U) (C) (R) 14W (A) (G) (B)
Dimensions (W x H x D)	435 x 72 x 281 mm (17-1/8x2-7/8x11")
Weight	3.0 kg (6 lbs. 10 oz)

(U) ..... U.S.A. model
(C) ..... Canadian model
(A) ..... Australian model
(G) ..... European model
(B) ..... British model
(R) ..... General model

Specifications subject to change without notice.

■FRONT PANELS

▼U, C, R, A models

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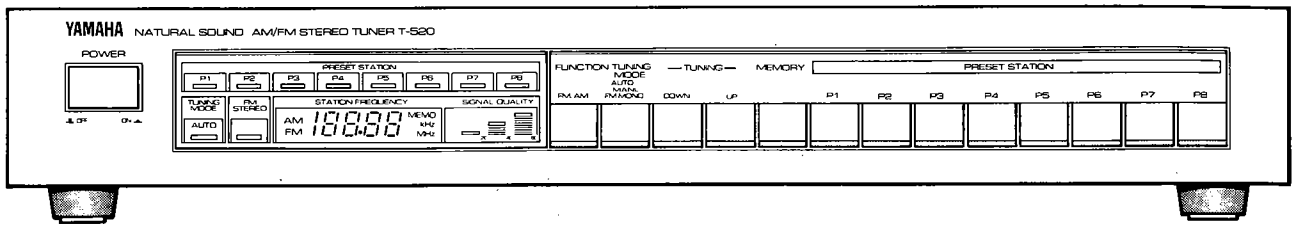
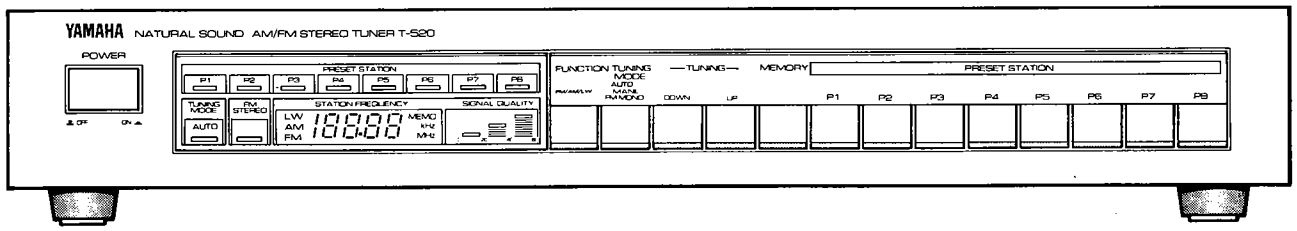


▼G, B models



▼U, C, R, A models

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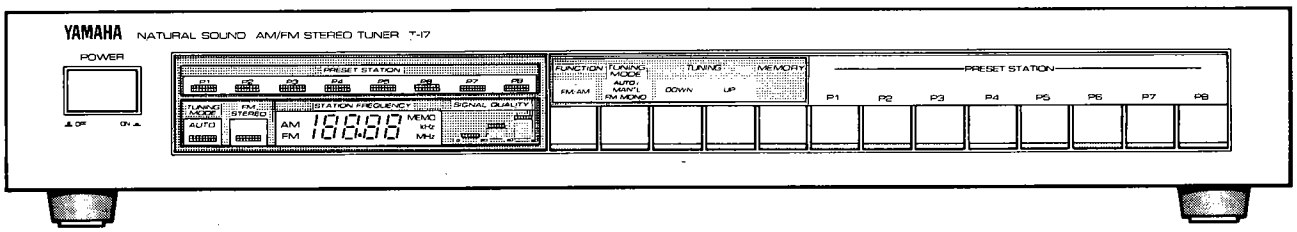
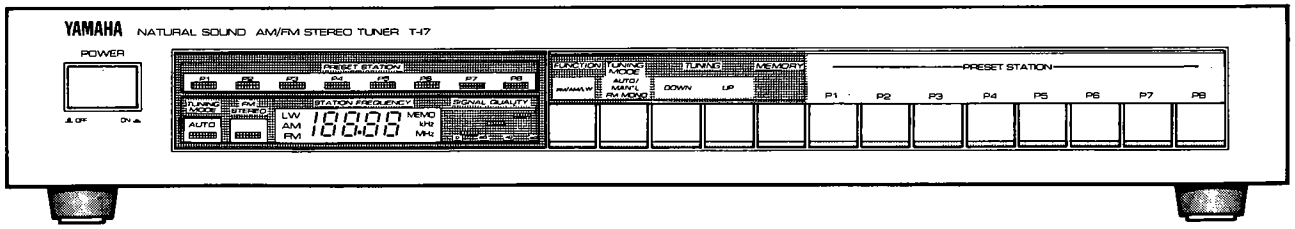


▼G, B models



■ REAR PANELS

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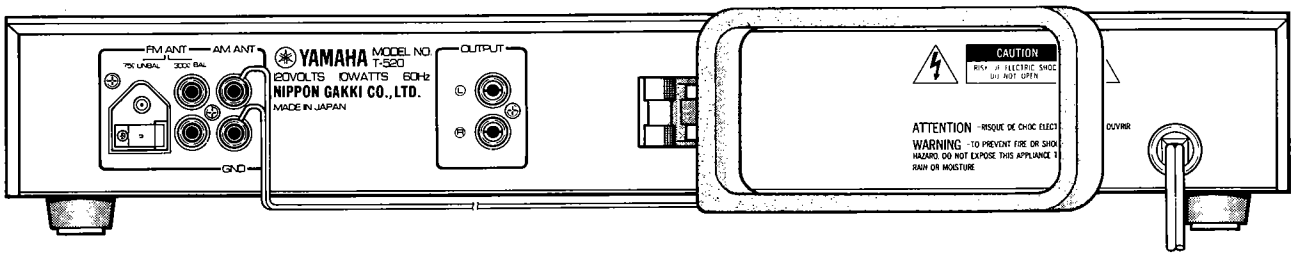
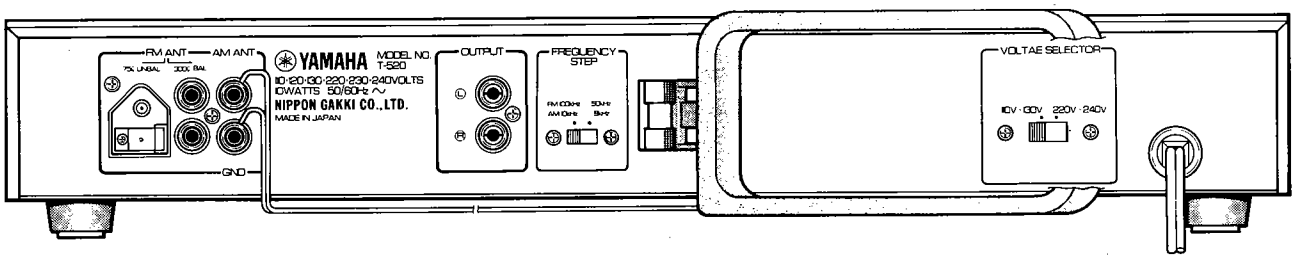
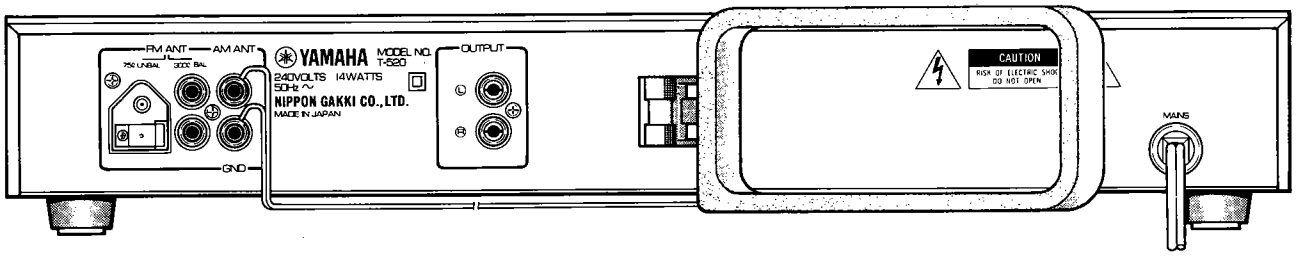
▼U.S.A. & Canadian models



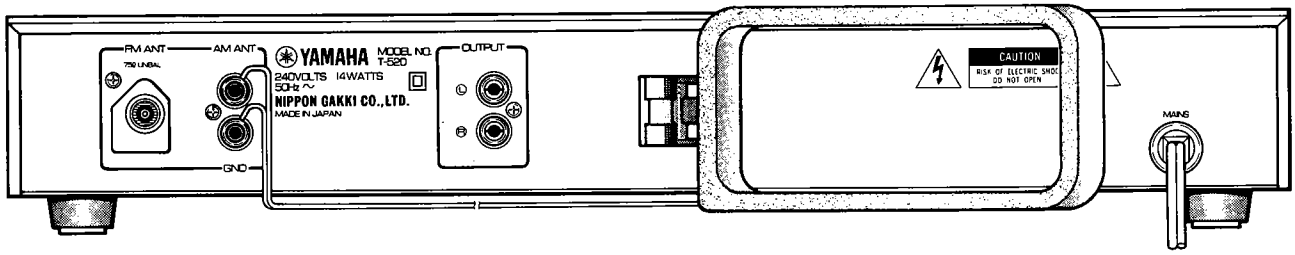
▼General model



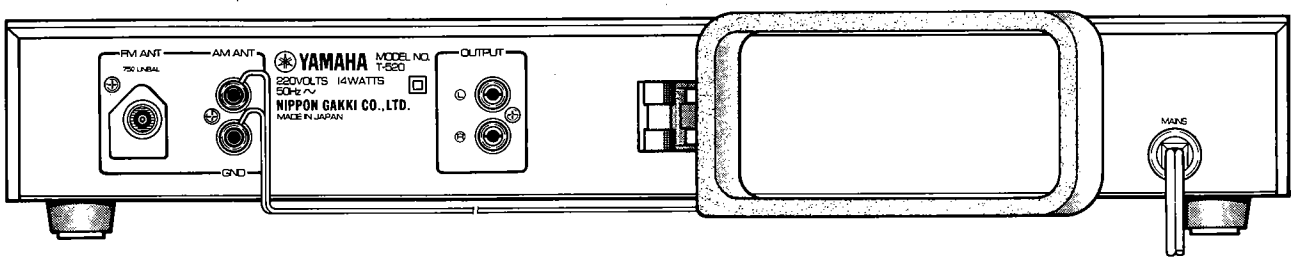
▼Australian model



▼British model



▼Eruopean model



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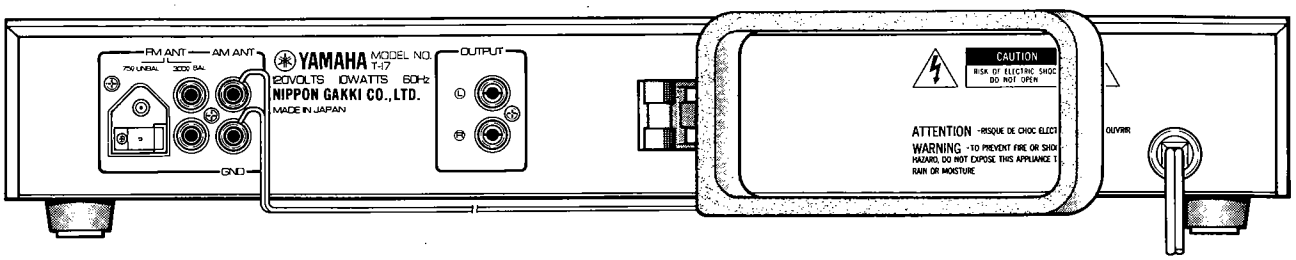
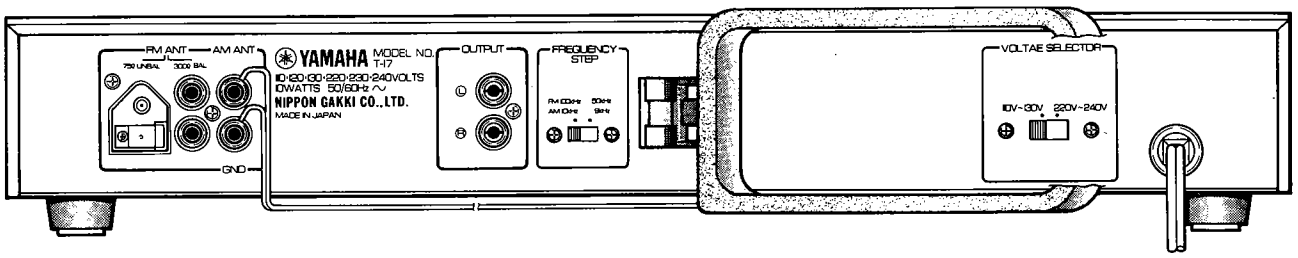
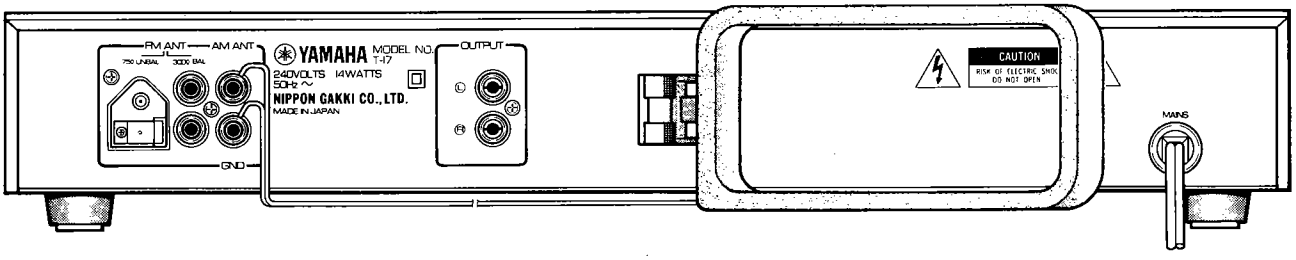
▼U.S.A. & Canadian models



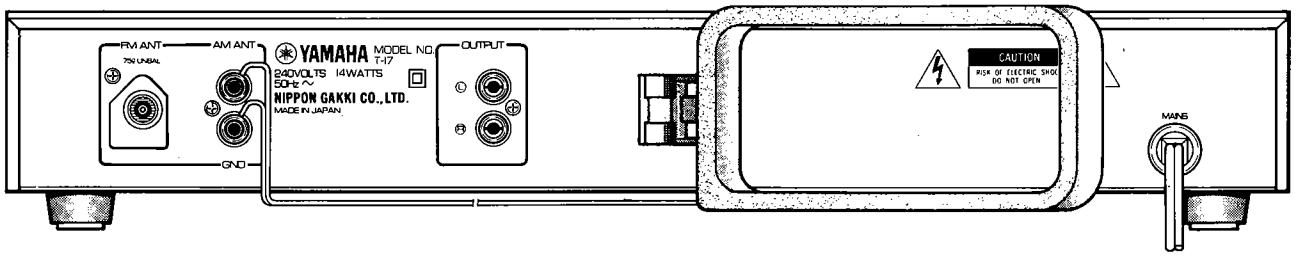
▼General model



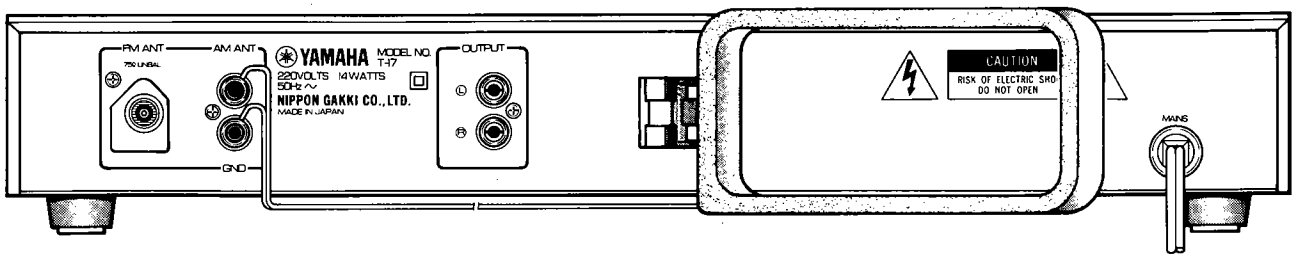
▼Australian model



▼British models



▼European models



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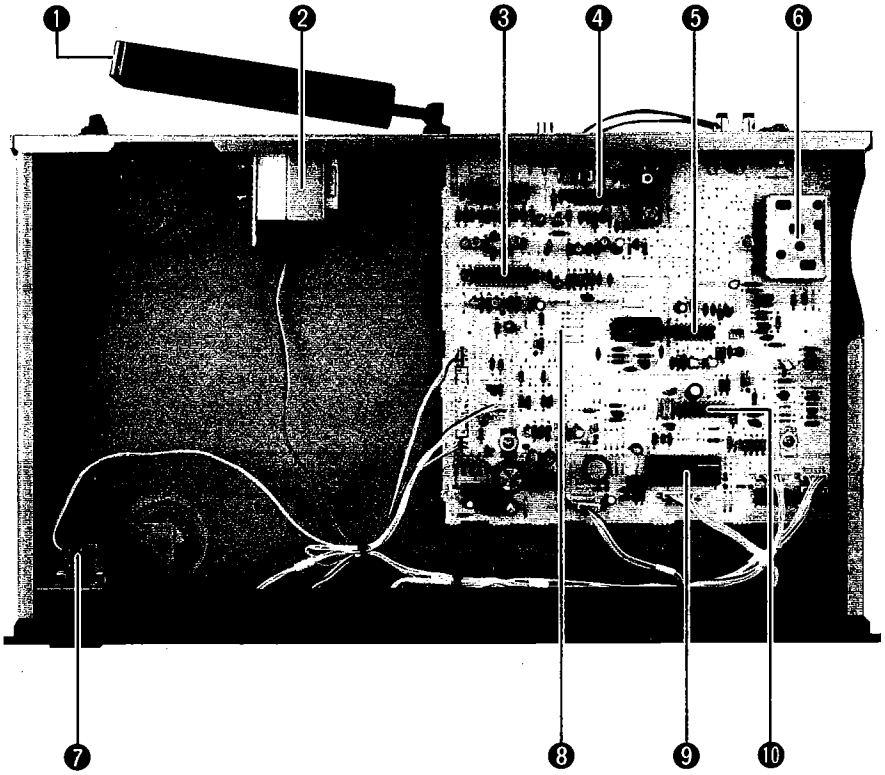
■ INTERNAL VIEW

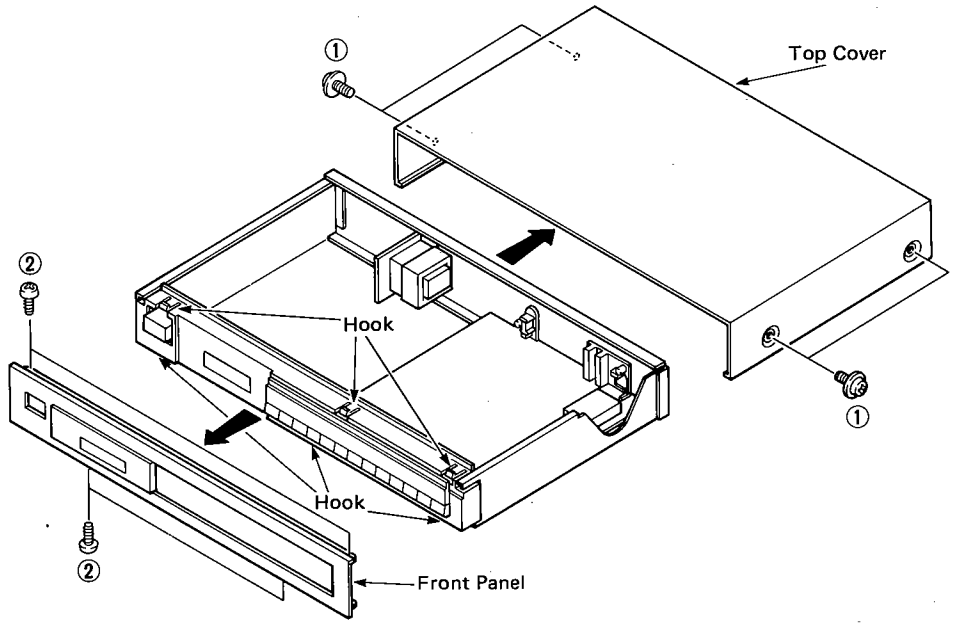


❶ AM LOOP ANTENNA
❷ POWER TRANSFORMER
U, C models: GA68490
R, A, G, B models: GA68480
❸ MPX IC: LA3400
❹ AM IC: LA1245
❺ FM IF IC: LA1235
❻ FRONT END PACK
❼ POWER SWITCH
❽ TUNER CIRCUIT BOARD (1)
❾ 4 BIT CPU: LC7030
❿ PLL IC: LM7000

■ DISASSEMBLY PROCEDURES

1. Removal of Top Cover
Remove 4 screws (①) in Fig. 1, and slide the Top Cover back.

2. Removal of Front Panel
Remove 4 screws (②) and 6 hooks in Fig. 1, and pull the Front Panel forward.



■ ADJUSTMENTS

1. Before adjustment

Note 1) After the Power switch is pushed on, wait for 5 minutes before measuring, to be sure of the most stable operation.

Note 2) Adjust the OSC coil and IFT with a nonferrous screw driver.

Note 3) Proceed with the AM section adjustments after having finished the FM section adjustment.

Note 4) 0dBμ = 1μV Ex: 60dBμ = 1mV

2. Measuring instruments abbreviation

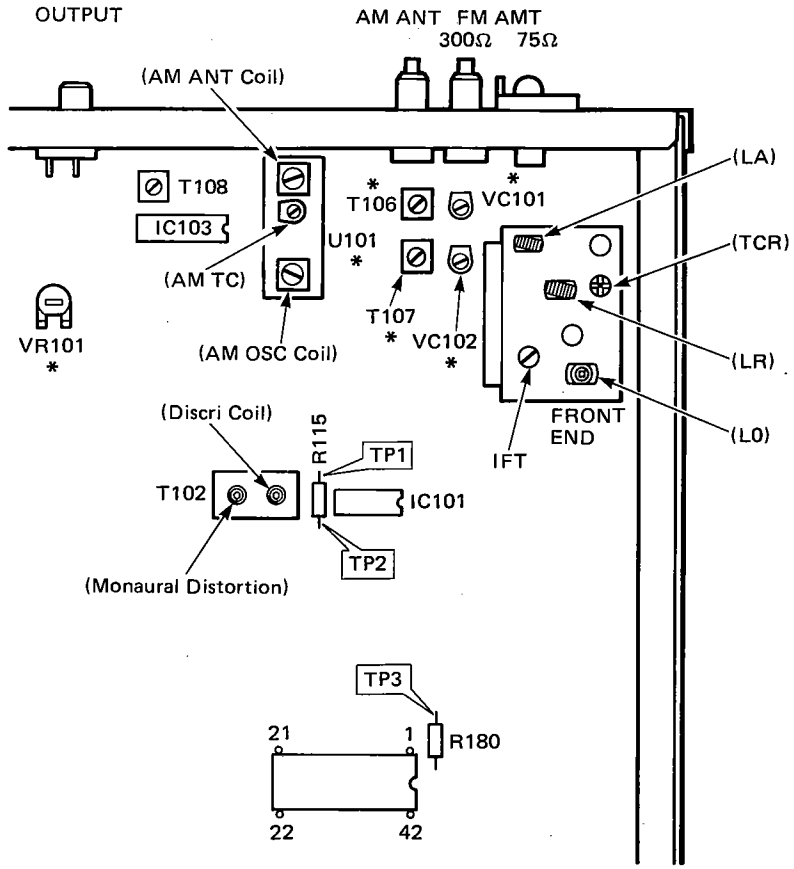
FM SG : FM signal generator
SSG : Stereo signal generator
AM SG : AM signal generator
DIST. M : Distortion meter
FC : Frequency counter
A.C.V.M. : AC voltagemeter
D.C.V.M. : DC voltagemeter

<POWER SUPPLY CHECK>

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

Test point	Rating or standard	Remark
+12	+12.5V ± 1V DC	Make sure that AC line voltage comes within: Models / AC line voltage — U, C: 120V ± 10%; G: 220V ± 10%; A, B: 240V ± 10%
+5.5	+5.5V ± 0.5V DC	
FB	At FM reception mode +12.5V ± 1V DC	
	At AM reception mode less than +1V DC	
AB	At AM reception mode +12.5V ± 1V DC	
	At FM reception mode less than +1V DC	
$\overline{\text{LW}}$ (G, B models only)	At LW reception mode +12.5V ± 0.5V DC	
	At FM or AM reception mode less than +1V DC	

- **TEST POINT**



Note: * marked

U101 : R.U.C.A models only
VR101 : G. B models only
VC101 : G. B models only (AM High)
VC102 : G. B modes only (LW High)
T106 : G. B models only (AM Low)
T107 : G. B models only (LW Low)

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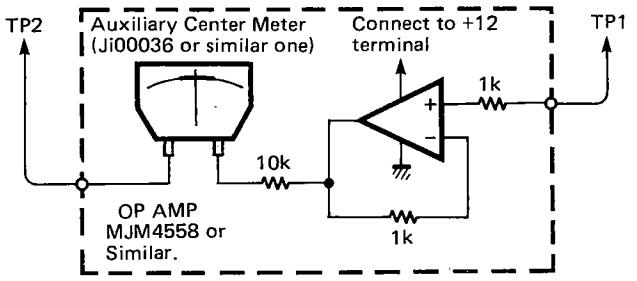
<FM TUNER SECTION>

- Use 19kHz L.P.F. to measure the output.
- On step 1 and 2 connect the auxiliary center meter (ji00036 or similar) to confirm the best tuned point.
- 100% modulation means that the Frequency Deviation is 75kHz.
- For the G, B model, install the Matching Transformer and connect FM SG.



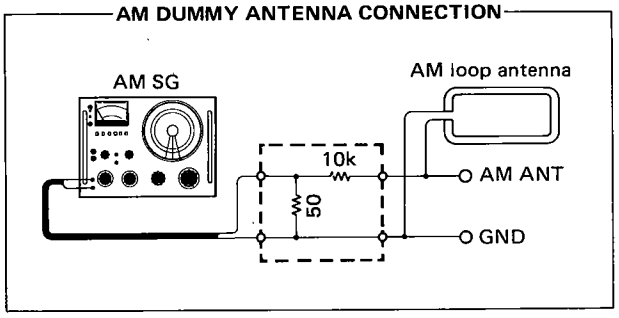
Step	Adjustment item	Connection terminal	Instrument required	Adjustment locations	Adjustment method	Rating or standard	Remarks
1	Discriminator balance	TP1 ~ TP2	Auxiliary center meter	T102 (Discri Coil)	Adjust so that the pointer of the auxiliary center meter points to 0 at detuned point.		After the adjustment of step 1 to 5, confirm it again.
2	Confirmation of station center set	300Ω FM ANT TP1 ~ TP2	FM SG [98MHz ± 1kHz, 70dBμ (75.2dBf), MONO 1kHz, 100% MOD] Auxiliary center meter	TUNING Key → UP or DOWN	Confirm that the auxiliary center meter deflects to 0 when tuned to signal of FM SG.		
3	Monaural distortion	300Ω FM ANT OUTPUT L,R	FM SG [98MHz ± 1kHz, 70dBμ (75.2dBf), MONO 100Hz, 100% MOD] DIST. M L.P.F.	T102 (Monaural Distortion) SIGNAL QUALITY indicator	Reduce distortion to minimum.	Less than −43dB	Confirm that all signal quality indicators lights
4	Stereo distortion	300Ω FM ANT OUTPUT L, R	FM SG, SSG [98MHz ± 1kHz, 70dBμ (75.2dBf), STEREO L, R 1kHz, 100% MOD] DIST. M L.P.F.	Front end IFT STEREO indicator	Same as step 3	Less than −33dB	Confirm that stereo indicator lights up.
5	Separation	300Ω FM ANT OUTPUT L, R	FM SG, SSG [98MHz ± 1kHz, 70dBμ (75.2dBf), STEREO L, R 1kHz, 100% MOD] L.P.F. A.C.V.M.	VR101 (G model only)	Reduce output level to minimum.	Separation more than 28dB	
6	Confirmation of auto seach reception	300Ω FM ANT	FM SG [98MHz ± 1kHz, 20dBμ (25.2dBf), MONO 1kHz, 100% MOD]	TUNING Key → Up or DOWN		Confirm that auto search reception is possible with the tuning key.	Confirm that muting is performed at auto reception.

Note: X dBμ = x + 5.2dBμf

<AM TUNER SECTION> . . . . . R, U, C, A models only

- Connect the AM loop antenna to the AM ANT terminals.
- Connect the AM dummy antenna for adjustment.

AM DUMMY ANTENNA CONNECTION



- Shorting TP3 (P SET) and ground (between chassis) while set at FM will result in automatic memory of each preset from P1 to P3 as given in the right table. This is convenient when making an adjustment.
<Addition> P SET : 4 Pin of IC105 (LC7030)

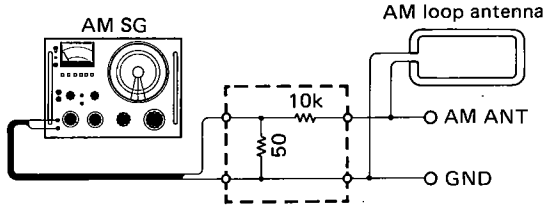
	P1	P2	P3
FM	98.0MHz		
AM	630kHz	1080kHz	1440kHz

Step	Adjustment item	Connection terminal	Instrument required	Adjustment locations	Adjustment method	Rating or standard
1	AM IFT	AM ANT OUTPUT	AM SG AM dummy antenna [630kHz ± 0.1kHz 50dBμ 400Hz, 30% MOD] A.C.V.M.	T108	Adjust so that the detector output is at maximum.	
2	Confirmation of sensitivity	AM ANT OUTPUT	AM SG AM dummy antenna [630kHz ± 0.1kHz 1080kHz ± 0.1kHz 1440kHz ± 0.1kHz 400Hz, 30% MOD] A.C.V.M. DIST. M		Obtain AM SG output level where distortion become 10%.	Less than 58dBμ
3	Confirmation of auto search reception	AM ANT	AM SG AM dummy antenna [1080kHz ± 0.1kHz 60dBμ 400Hz, 30% MOD]	TUNING key UP or DOWN		Confirm the auto search reception with the tuning key

<AM & LW TUNER SECTION> . . . . G, B models only

- Connect the AM loop antenna to the AM ANT terminals.
- Connect the AM dummy antenna for adjustment.

AM DUMMY ANTENNA CONNECTION



- Shorting TP3 (P SET) and ground (between chassis) while set at FM will result in automatic memory of each preset from P1 to P4 as given in the right table. This is convenient when making an adjustment.
  <Addition> P SET : 4 Pin of IC105 (LC7030)

	P1	P2	P3	P4
FM	98.0MHz			
AM	630kHz	1080kHz	1440kHz	245kHz

Step	Adjustment item	Connection terminal	Instrument required	Adjustment locations	Adjustment method	Rating or standard
1	AM IFT	AM ANT OUTPUT	AM SG. AM dummy antenna [630kHz ± 0.1kHz 50dBμ 400Hz, 30% MOD] A.C.V.M.	T108	Adjust so that the detector output is at maximum.	
2	AM sensitivity	AM ANT OUTPUT	AM SG AM dummy antenna [630kHz ± 0.1kHz 1080kHz ± 0.1kHz 1440kHz ± 0.1kHz 400Hz, 30% MOD] A.C.V.M. DIST. M	T106 (Low frequency range) VC101 (High frequency range)	Obtain AM SG output level where distortion become 10%	Less than 58dBμ
3	LW sensitivity	AM ANT OUTPUT	AM SG AM dummy antenna [173kHz ± 0.1kHz 245kHz ± 0.1kHz 326kHz ± 0.1kHz 400Hz, 30% MOD] A.C.V.M. DIST. M	T107 (Low frequency range) VC102 (High frequency range)	Obtain AM SG. output level where distortion become 10%	Less than 63dBμ
4	Confirmation of auto search reception	AM ANT	AM SG AM dummy antenna [1080kHz ± 0.1kHz 60dBμ 400Hz, 30% MOD]	TUNING key UP or DOWN		Confirm the auto search reception with the tuning key

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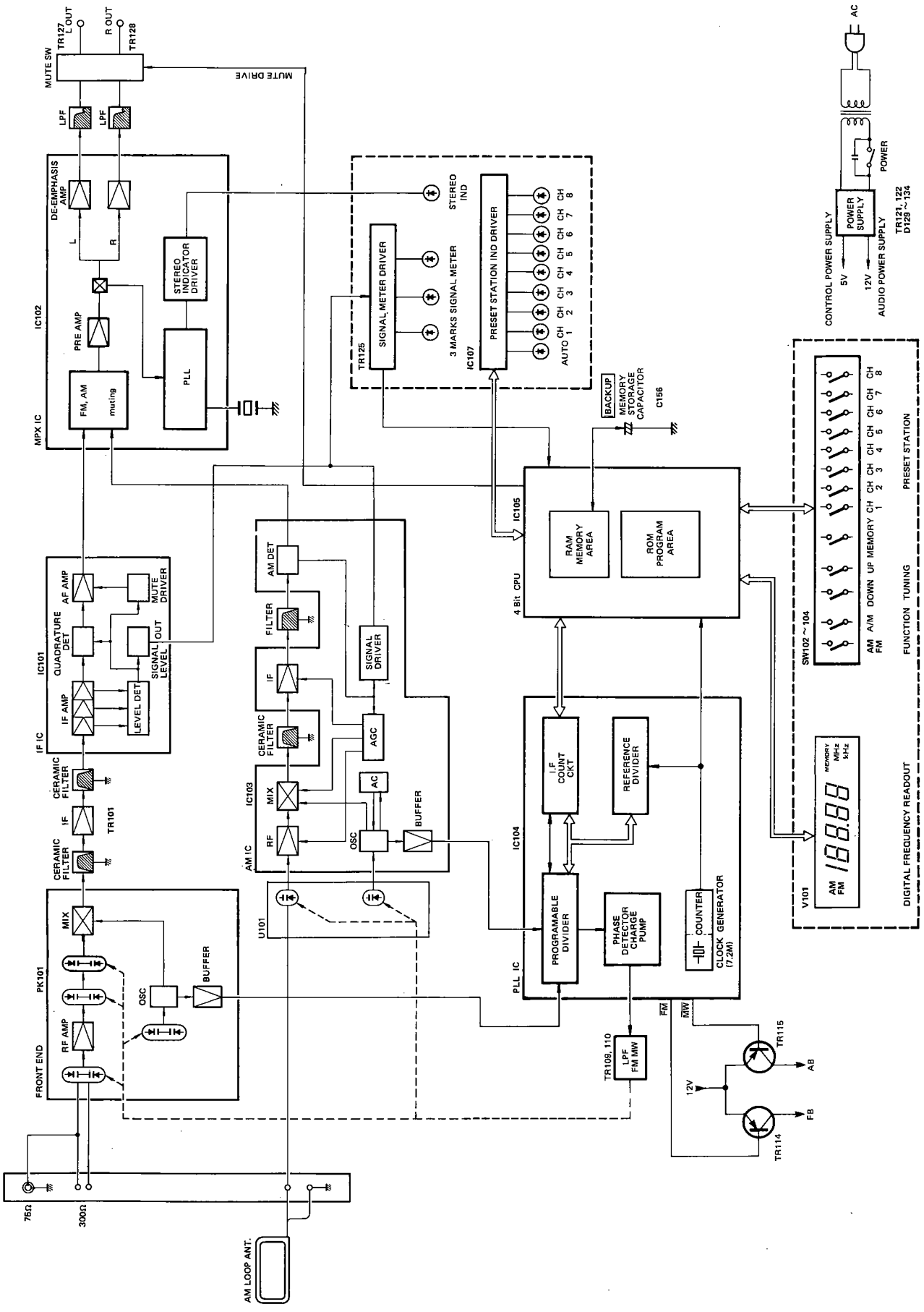
<DIGITAL CONTROL SECTION>

Step	Confirmation item	Connection terminal	Instrument required	Operation key	Confirmation method
1	Preset memory	300Ω FM ANT	FM SG. SSG [98MHz ± 1kHz 70dBμ (75.2 dBf) STEREO L, R 1kHz, 100% MOD]	FUNCTION TUNING MODE TUNING (UP or DOWN) MEMORY PRESET STATION	①Receive FM 98MHz by means of auto search. ②Press MEMORY key → MEMORY indicator flashes about 5 seconds. ③Press P1 → MEMORY indicator goes OFF P1 of PRESET STATION indicator lights.
		AM ANT	AM SG AM dummy antenna [1080kHz ± 0.1kHz 80dBμ 400Hz, 30% MOD]		④Receive AM 1080kHz ⑤Press MEMORY key → MEMORY indicator flashes about 5 seconds. ⑥Press P2 → MEMORY indicator goes OFF P2 of PRESET STATION indicator lights.
		300Ω FM ANT AM ANT	FM SG. SSG AM SG AM dummy antenna		⑦Press P1 and P2 and check that content is read out. → P1 and P2 of PRESET STATION indicator lights.
2	Tuning mod	Same as step 1	Same as step 1	FUNCTION TUNING MODE TUNING (UP or DOWN)	Tune to FM 98MHz and AM 1080kHz, and chech that when receiving MAN'L/MONO, FM reception become forced mono TUNING MODE indicator → Goes out FM STEREO indicator → Goes out
					Check that tuning operation stops when tuned while AUTO searching. TUNING MODE indicator → lights up FM STEREO indicator → lights up
3	Last channel memory			POWER	①Read out P2. ②Turn OFF POWER Switch. ③Turn ON POWER Switch after 5 seconds. ④P2 content should come out. P2 of PRESET STATION indicator lights.

■ BLOCK DIAGRAM

- U, C, R, A models



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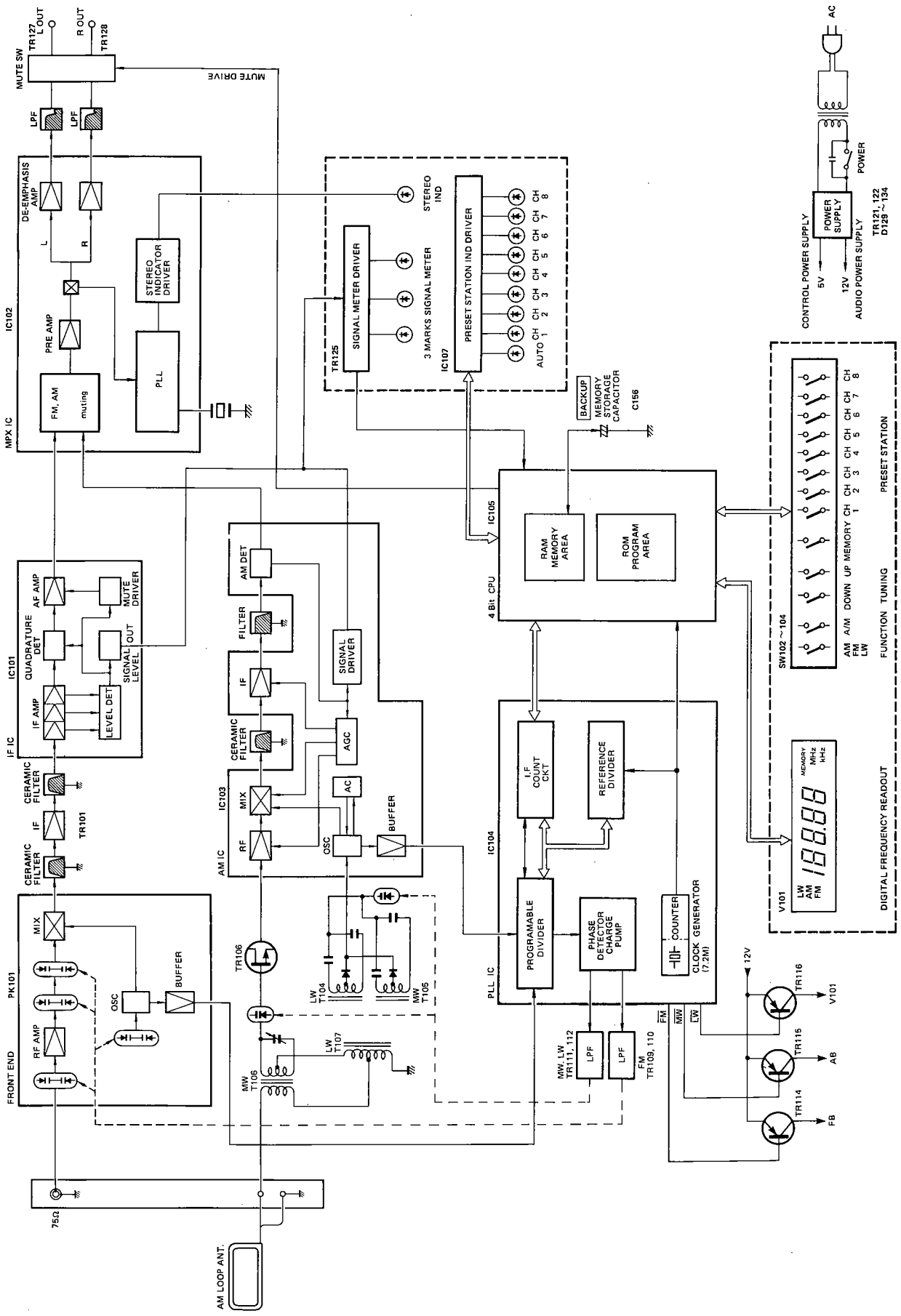
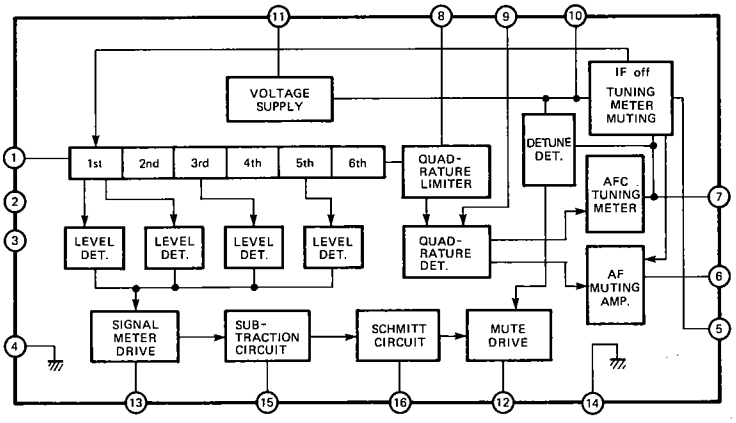
- G, B models



■IC BLOCK

IC101 : LA1235



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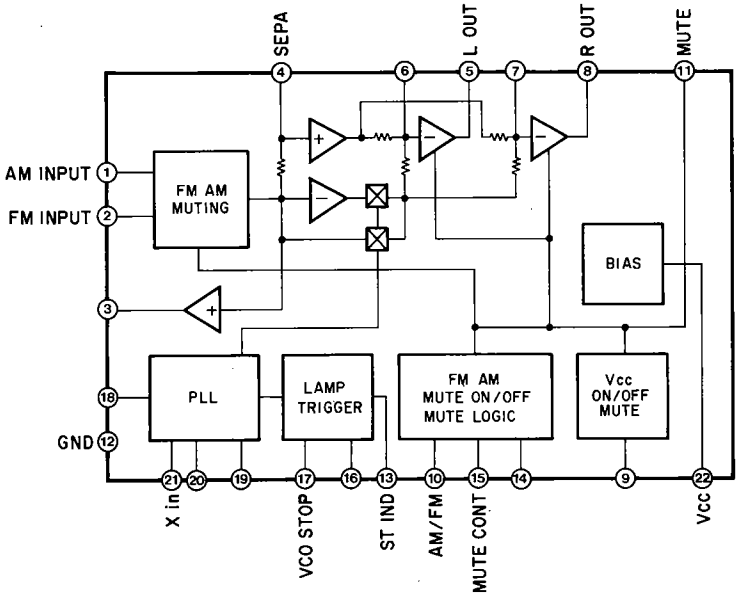

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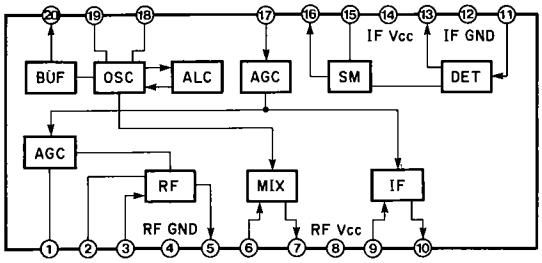

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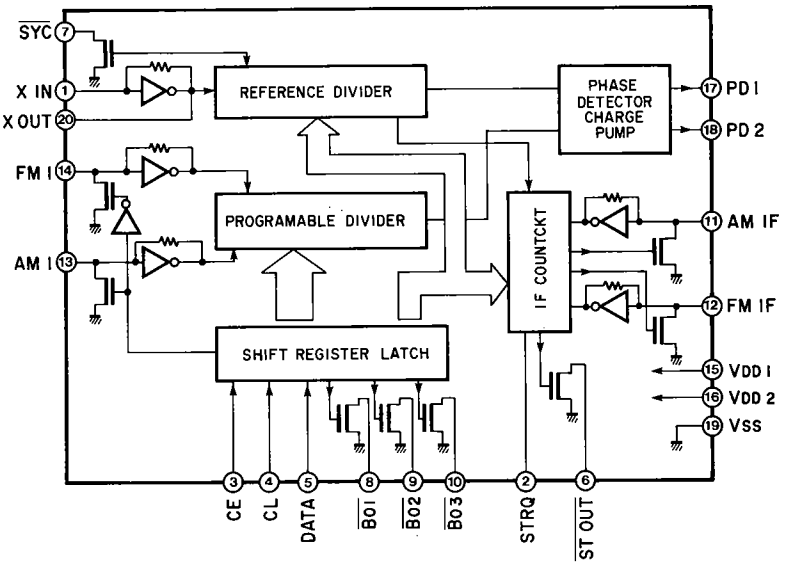
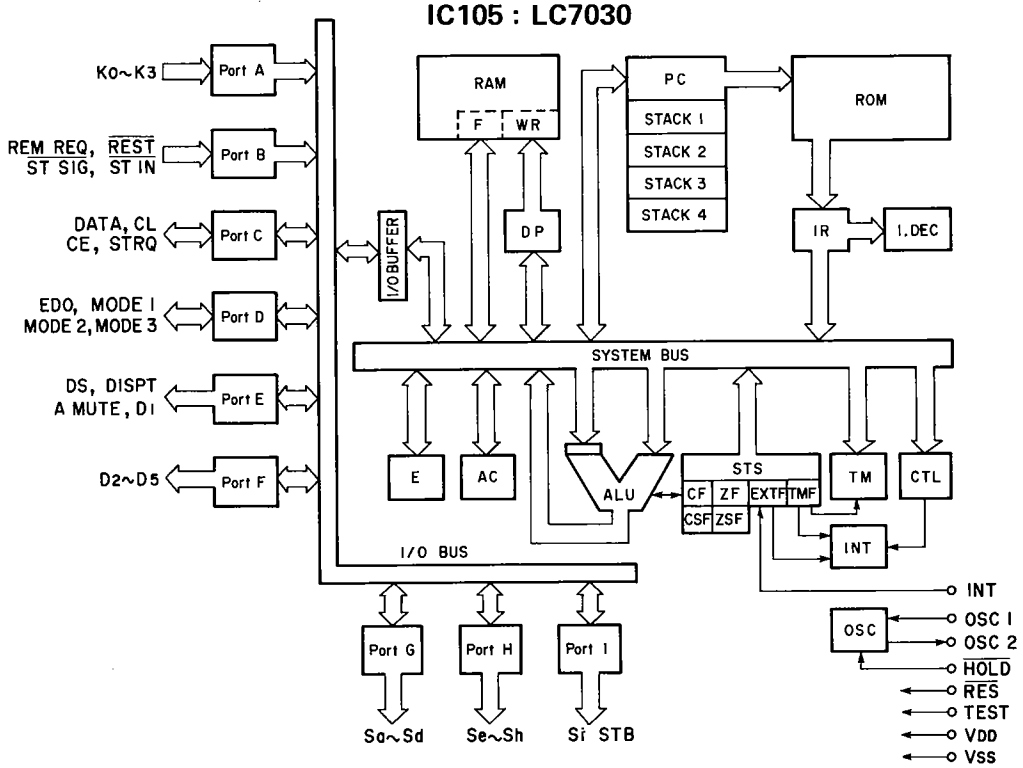
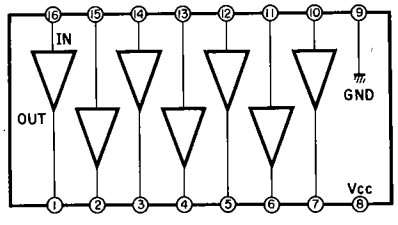
IC104 : LM7000



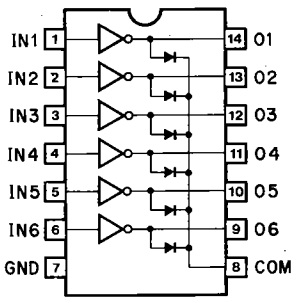
IC105 : LC7030



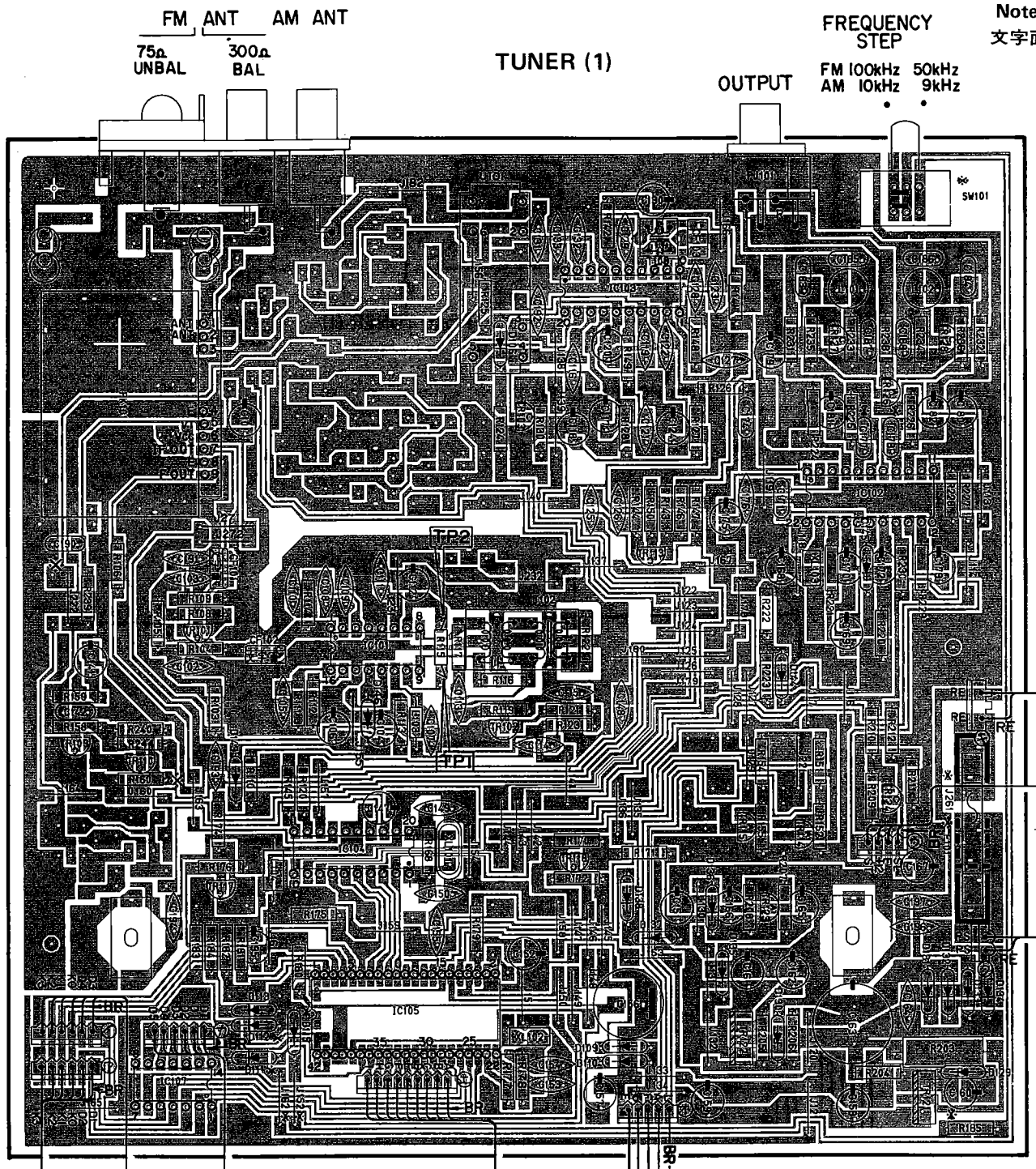
IC106 : BA618



IC107 : LB1274

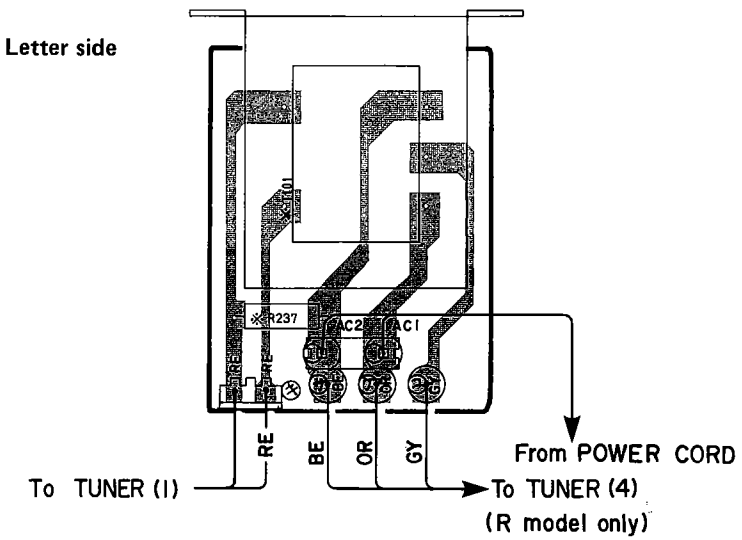


■ PRINTED CIRCUIT BOARD ..... R, U, C, A models



Note)
文字面 : Letter side

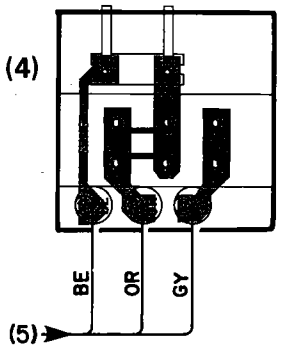
TUNER (5)



Note: * marked

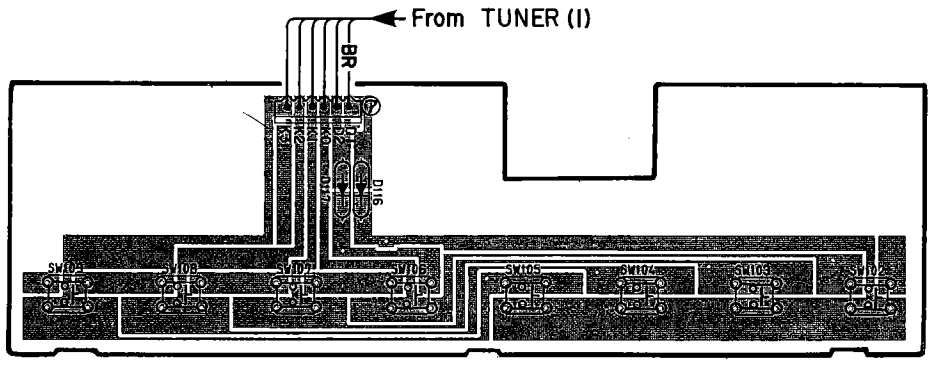
	R	U, C	A
C177, 178	1500P/100	1500P/100	1000P/100
C190	0.033	0.01	0.033
R160	4.7K	22K	4.7K
R185	10K	OPEN	OPEN
R237	OPEN	1/2P 2.2M	OPEN
J151, 162	SHORT	OPEN	OPEN
J261	SHORT	OPEN	SHORT
D112	OPEN	OPEN	Set
D111, 115	Set	OPEN	OPEN
SW101	Set	OPEN	OPEN
SW116	Set	OPEN	OPEN
F101	OPEN	0.5A 250V	OPEN
T101	GA68480	GA68490	GA68480
TUNER (4)	Set	Non Set	Non Set

TUNER (4)

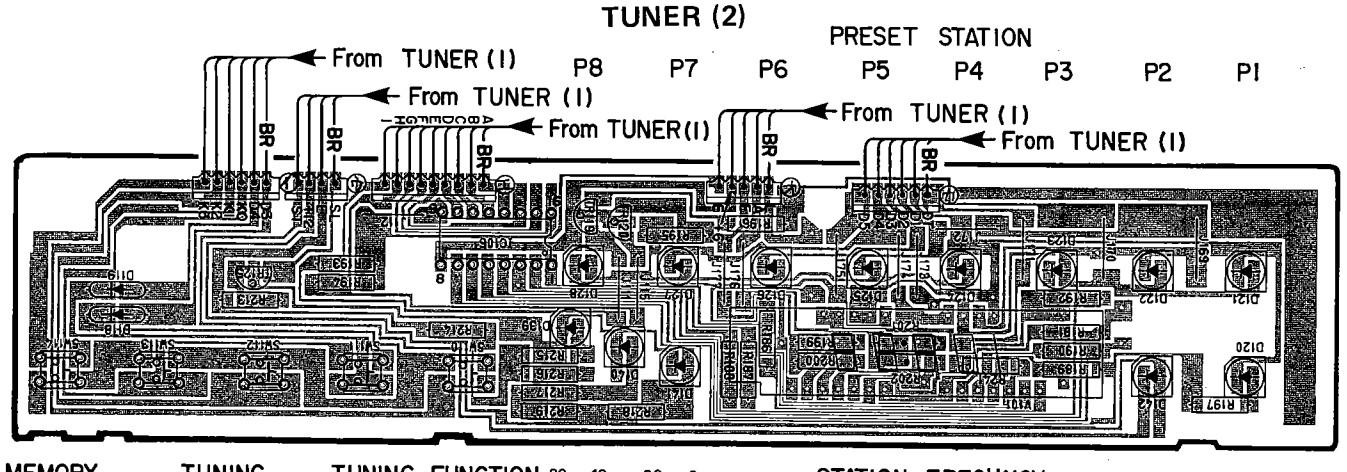


110V~130V 220V~240V
VOLTAE SELECTOR
(R model only)

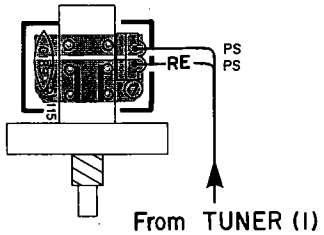
TUNER (3)



TUNER (2)

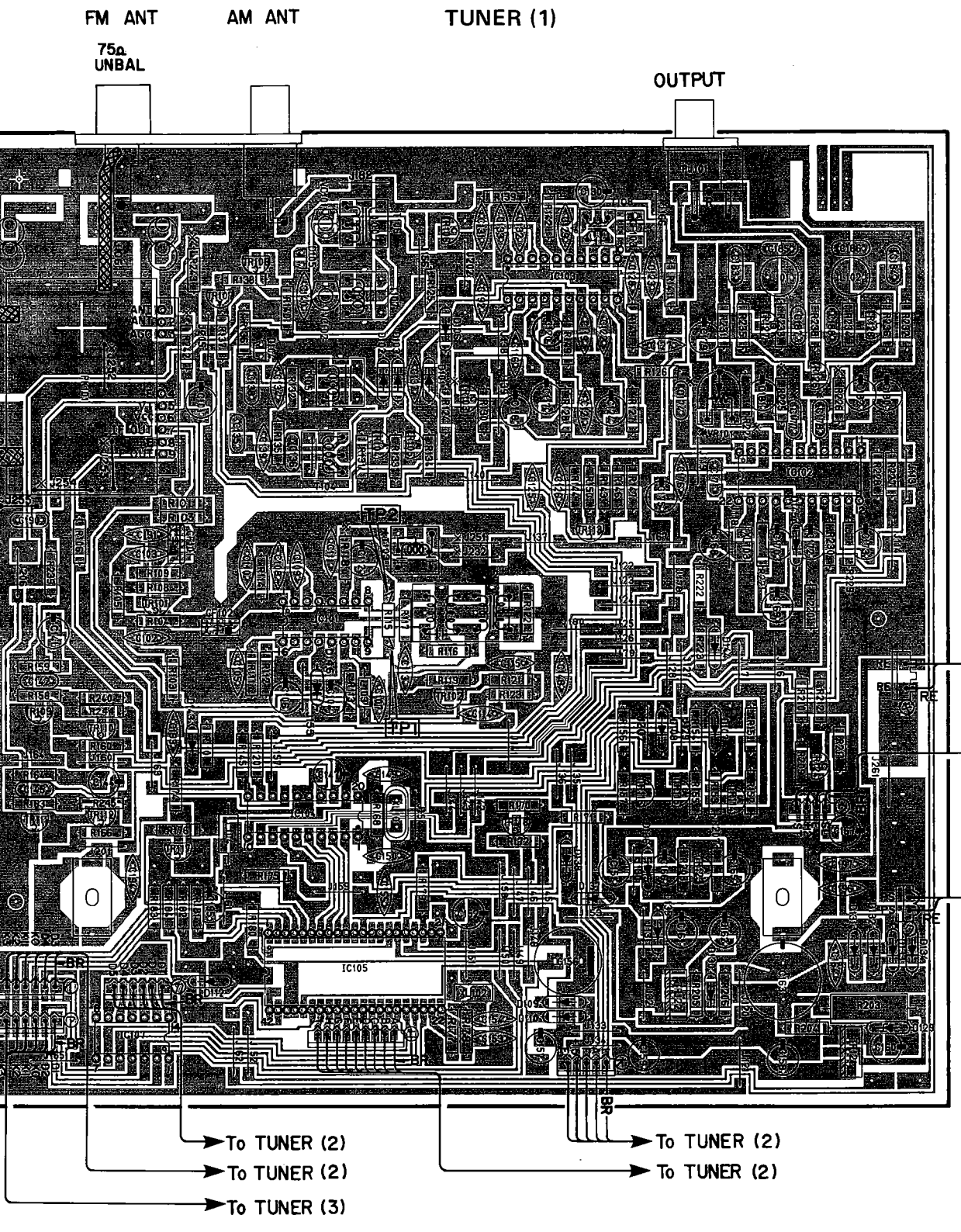


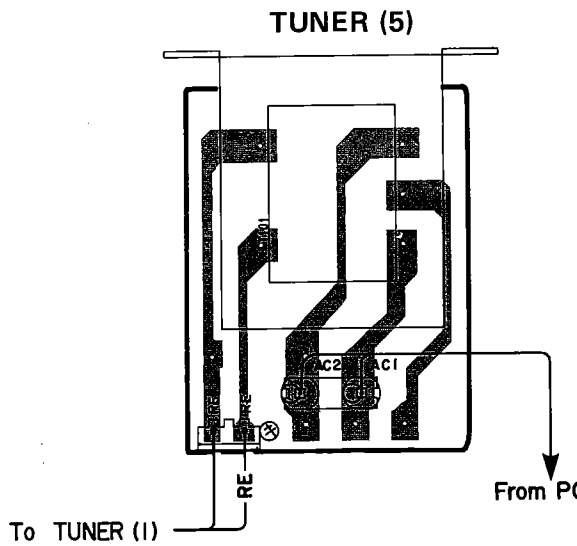
TUNER (6)

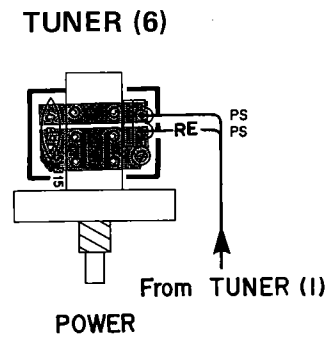


PRINTED CIRCUIT BOARD ..... G, B models

Note)
文字面 : Letter side

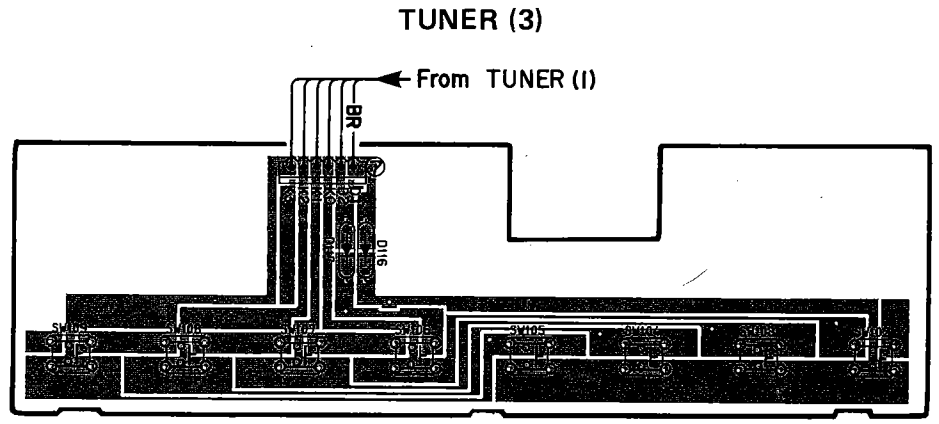


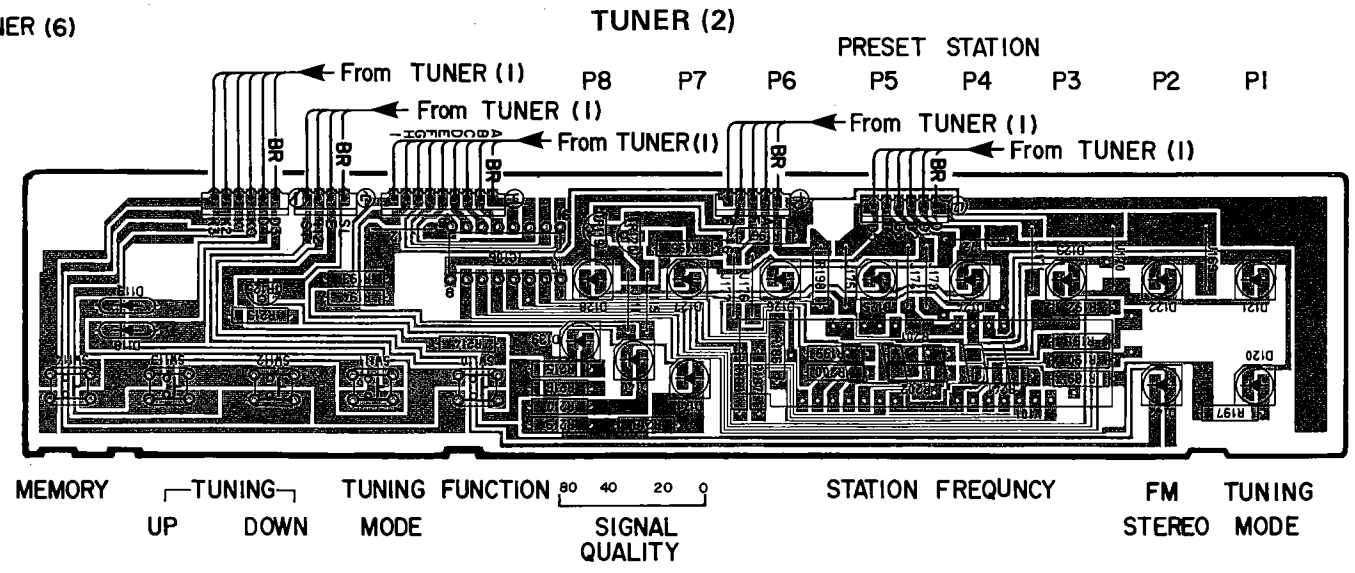




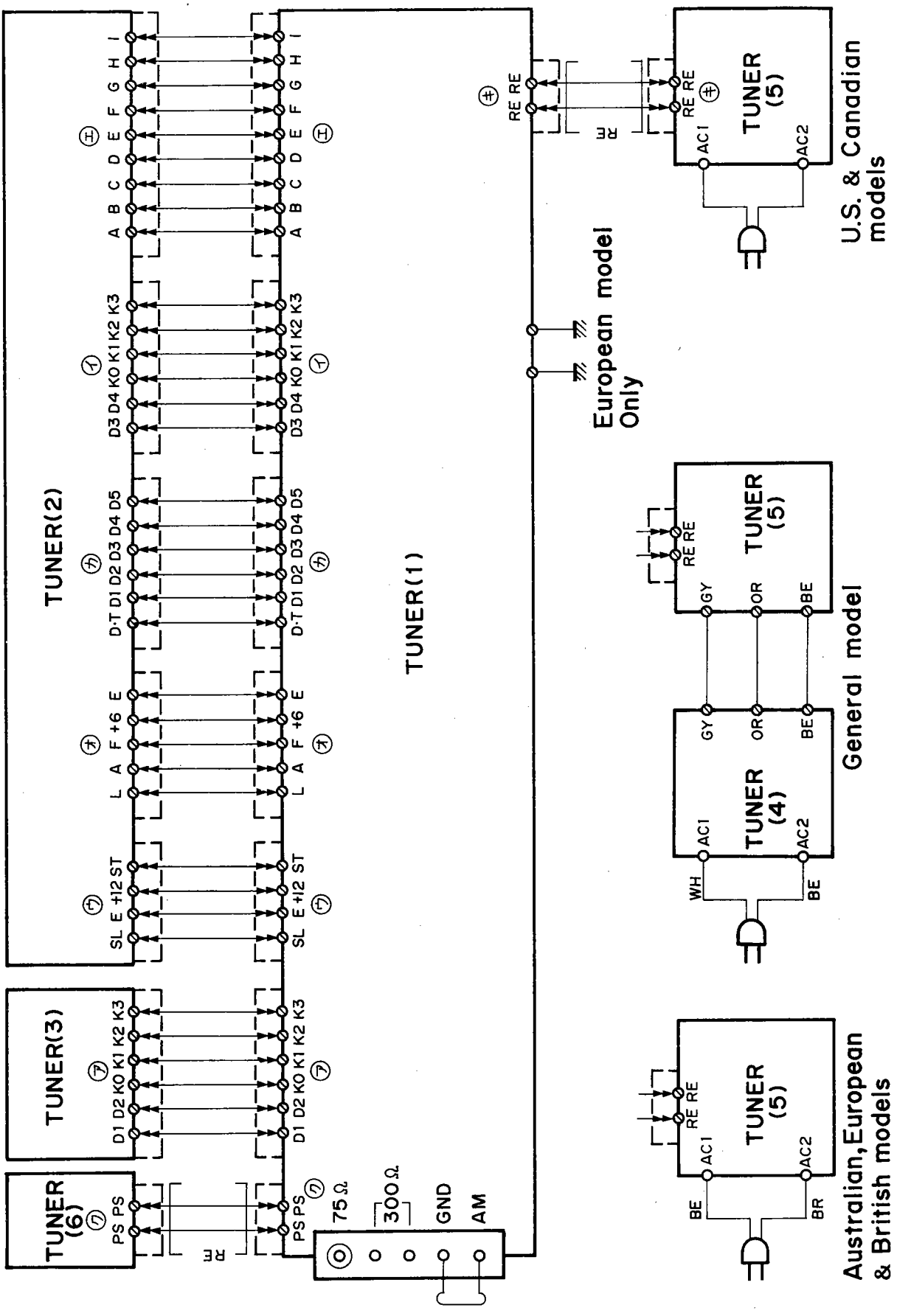
Note: * marked

	G	B
C177, 178	470P/100	1000P/100
C174	0.022	0.047
R110	1K	3.3K
R225, 226	100K	47K
R224	OPEN	47K
R118	10K	SHORT
R126	47K	10K
R124	1K	470
R243	100K	OPEN
R242	1M	OPEN
VR101	B100K	OPEN
T103	GE20040	OPEN
PK101	PA00085	PA00081
J232	OPEN	SHORT
J251 ~ 255	SHORT	OPEN





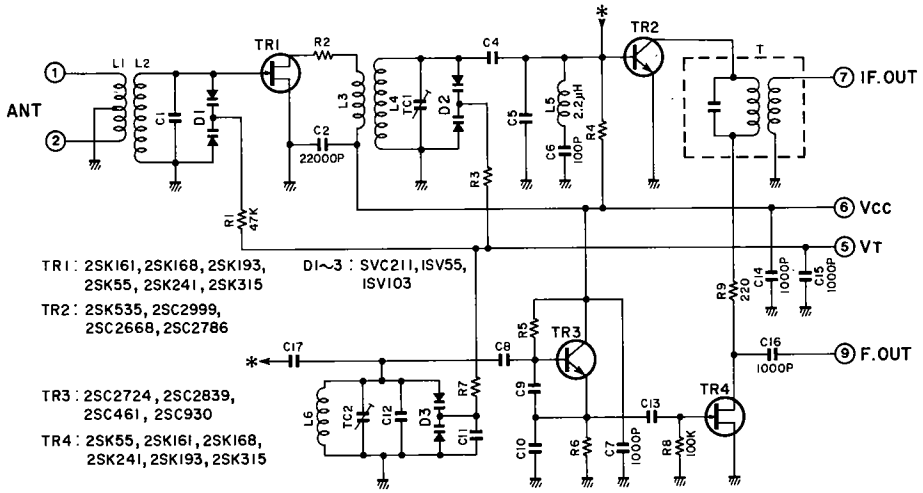
■WIRING


TUNER(2)
TUNER(3)
TUNER(6)
TUNER(1)
SL E +12 ST L A F +6 E D-T D1 D2 D3 D4 D5 D3 D4 KO K1 K2 K3 A B C D E F G H I
D1 D2 KO K1 K2 K3
PS PS
RE
75Ω
300Ω
GND
AM
RE RE
R
European model Only
TUNER (5)
AC1
AC2
U.S. & Canadian models
GY OR BE
TUNER (4)
WH
BE
General model
BR
Australian, European & British models

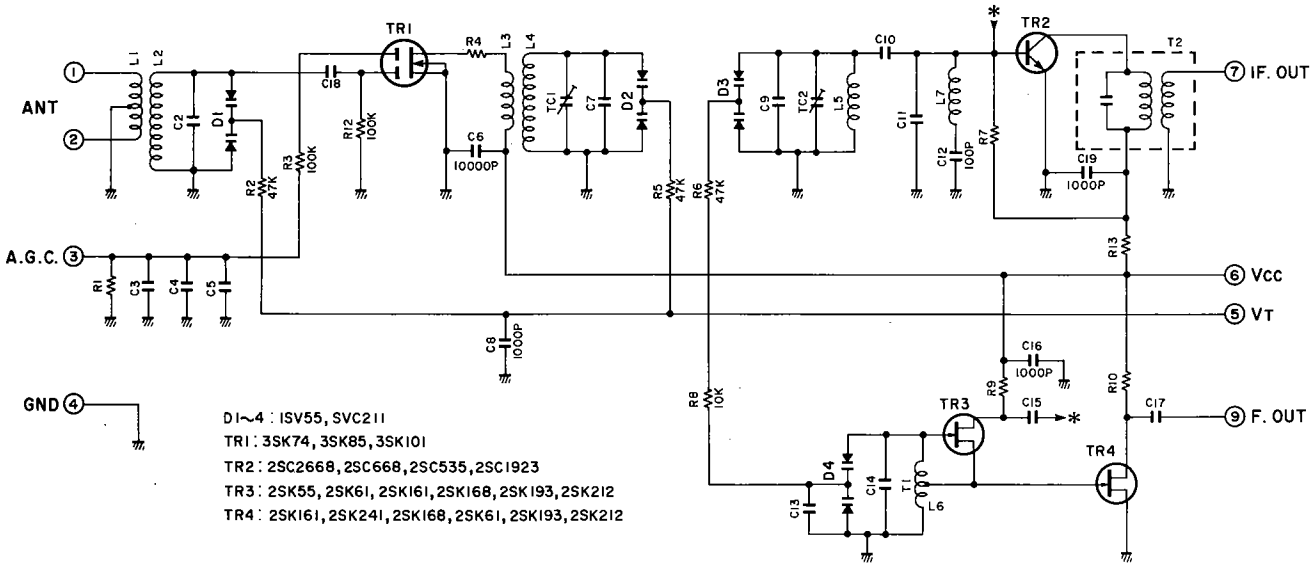
■SCHEMATIC DIAGRAM

- FRONT END PACK (PK101)

R.U.C.A models



G.B models



PARTS LIST

■WARNING
Components having special characteristics are marked ⚠ and must be replaced with parts having specifications equal to those originally installed.
- Carbon resistors of this stereo tuner are 1/4W. There is no discription about them in this parts list. Use the "Part No." HJ35○○○○ or equivalent.

■ELECTRICAL PARTS

	Ref. No.	Part No.	Description		部品名	Remarks	Common Model	Markets	ランク
※		NA 08 58 40	Tuner Circuit Board		チューナーシート			R	
※		NA 08 58 50	〃		〃			U, C	
※		NA 08 58 60	〃		〃			A	
※		NA 08 58 70	〃		〃			G	
※		NA 08 58 80	〃		〃			B	
		FG 21 05 00	Ceramic Cap	5pF 50V	セラコン	C134, 139		G, B	
		FG 21 13 30	〃	33pF 50V	〃	C111, 113, 192			
		FG 21 21 00	〃	100pF 50V	〃	C114			
		FG 21 22 20	〃	220pF 50V	〃	C154			
		FG 21 24 70	〃	470pF 50V	〃	C153, 176			
		FG 21 31 00	〃	1000pF 50V	〃	C125, 127, 133, 148			
		FG 24 41 00	〃	0.01μF 50V	〃	C102,103,105,107~110,115 116,119,121~123,126,129 131,132,155,164,189,191			
		FG 24 41 00	〃	0.01μF 50V	〃	C137, 140		G, B	
		FG 24 42 20	〃	0.022μF 50V	〃	C126,193,194,196,197			
※		Fi 19 13 30	〃	33pF 50V	〃	C149, 150			
		FU 35 17 50	Mica Cap	75pF 500V	マイカコン	C136		G, B	
		FZ 00 35 80	Electrolytic Cap	47000μF 5.5V	ケミコン	C156			
		UA 25 32 70	Mylar Cap	2700pF 50V	マイラーコン	C183, 184			
		UA 25 31 00	〃	1000pF 50V	〃	C185, 186			
		UA 25 33 90	〃	3900pF 50V	〃	C187, 188			
		UA 25 41 00	〃	0.01μF 50V	〃	C190		U, C	
		UA 25 43 30	〃	0.033μF 50V	〃	C190		R,A,G,B	
		UA 25 42 20	〃	0.022μF 50V	〃	C174		G	
		UA 25 44 70	〃	0.047μF 50V	〃	〃		R,U,C,A,B	
		UA 25 44 70	〃	0.047μF 50V	〃	C142, 171			
		UA 25 44 70	〃	0.047μF 50V	〃	C145		G, B	
		UL 46 61 00	Electrolytic Cap	1μF 50V	ケミコン	C141			
		UL 46 61 00	〃	1μF 50V	〃	C144		G, B	
		UT 45 22 20	Polypropylene Film Cap	220pF 100V	ポリプロコン	C135		G, B	
		UT 45 24 30	〃	430pF 100V	〃	C138		G, B	
		UT 45 24 70	〃	470pF 100V	〃	C177, 178		G	
		FT 15 31 00	〃	1000pF 100V	〃	〃		A, B	
		FT 15 31 50	〃	1500pF 100V	〃	〃		R, U, C	
		Ui 91 84 70	Electrolytic Cap	470μF 6.3V	ケミコン	C147			
		UW 93 71 00	〃	10μF 16V	〃	C124,130,157,159 161,168,179,180,117			
		UW 93 73 30	〃	33μF 16V	〃	C165			
		UW 93 81 00	〃	100μF 16V	〃	C101, 160, 162			
		UW 93 82 20	〃	220μF 16V	〃	C158, 166			
		UW 94 92 20	〃	2200μF 25V	〃	C163			
		UW 96 54 70	〃	0.47μF 50V	〃	C120, 152, 170			
		UJ 16 61 00	〃	1μF 50V	〃	C104,106,151,167 169,172,173,181,182			
		UJ 16 62 20	〃	2.2μF 50V	〃	C112			
		UW 96 63 30	〃	3.3μF 50V	〃	C175			
		UW 96 64 70	〃	4.7μF 50V	〃	C118, 195			
		FY 00 01 50	Trimmer Cap	20pF	トリマーコン	VC102		G, B	
		FY 00 02 50	〃	11pF	〃	VC101		G, B	
		GE 10 06 40	AM ANT Coil		AM ANT コイル	T106		G, B	
		GE 10 06 00	AM IFT Coil	450kHz	AM IFT コイル	T108			
※		GE 10 07 40	Quadrature Detection Coil		クオドラチャー検波コイル	T102			
		GE 20 04 00	Anti-birdie Filter	114kHz	アンチバーディーフィルター	T103		G, B	
		GE 90 09 20	LW OSC Coil		LW OSC コイル	T104		G, B	

※New Parts（新規部品）

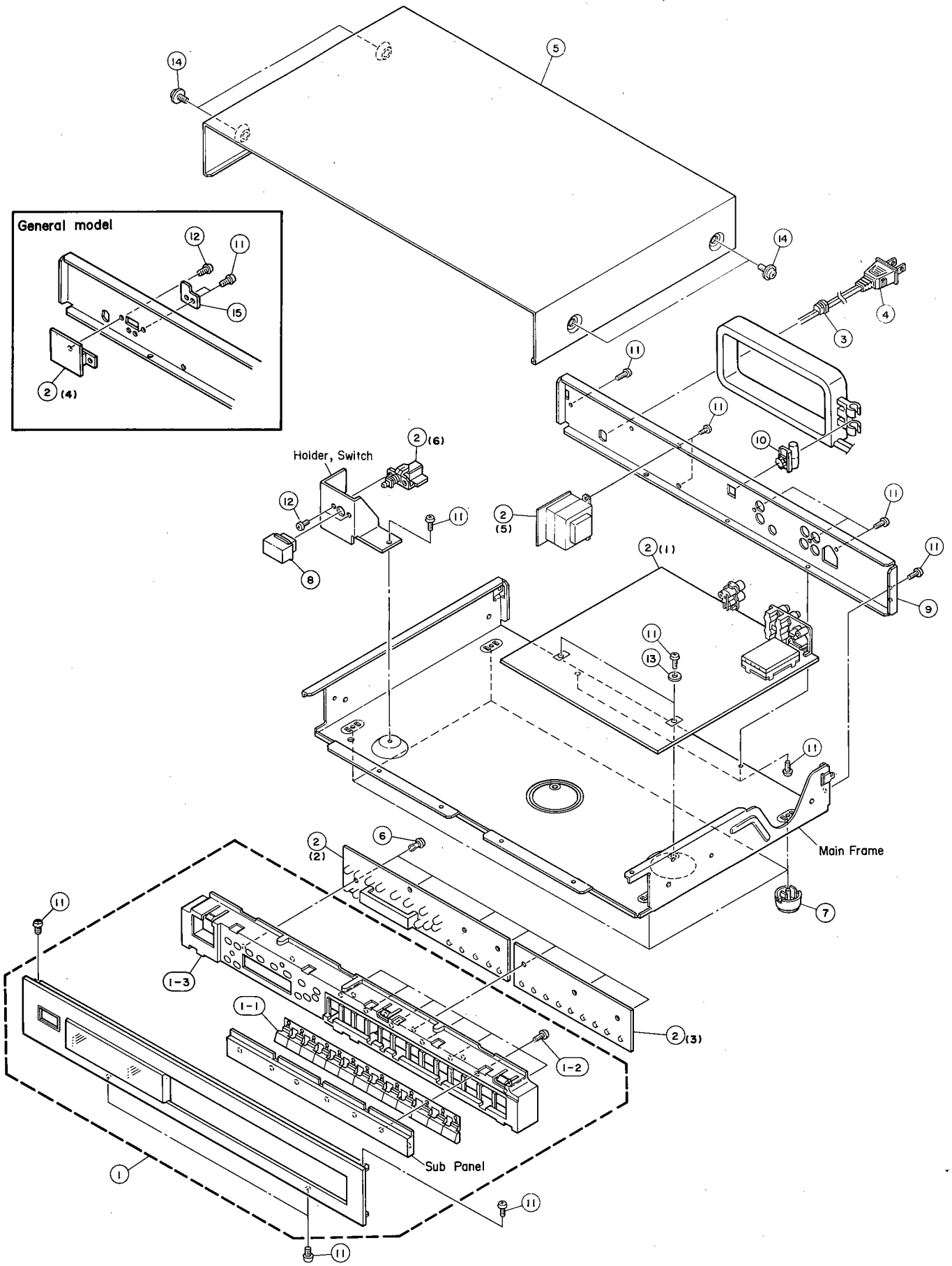
Ref. No.	Part No.	Description		部品名	Remarks	Common Model	Markets	ランク
	GE 90 09 10	LW ANT Coil		LW ANTコイル	T107 } Inter-changeable		G, B	
	GE 90 09 30	〃		〃	〃 } Inter-changeable		G, B	
	GE 90 09 40	AM OSC Coil		AM OSCコイル	T105		G, B	
※	GA 68 48 00	Power Transformer		電源トランス	T101		R, A, G, B	
※	GA 68 49 00	〃		〃	〃		U, C	
	GE 30 05 00	Inductor	12μH	インダクター	L103			
	GE 30 04 50	〃	1mH	〃	L104			
※	GE 90 18 50	〃	39mH	〃	L101, 102			
	GG 00 05 60	FM Ceramic Filter	SFE10.7MS3GHY-A	FMセラミックフィルター	CF101, 102			
	GG 00 06 60	AM Ceramic Filter	SFU450B9	AMセラミックフィルター	CF103			
	GG 00 07 00	Ceramic Resonator	FCR400K	セラミック振動子	XL102			
※	GG 00 07 40	〃	CSB456F10	〃	XL103			
	QU 00 38 00	Quartz Crystal Unit	7.2MHz	水晶振動子	XL101			
	HG 30 92 20	Carbon Resistor	2.2MΩ 1/2W	カーボン抵抗	R237		U, C	
	HL 42 43 90	Metal Oxide Film Resistor	39Ω 2W	酸金抵抗	R203			
	HV 45 68 20	Flame Proof Carbon Resistor	8.2kΩ RDF25SL	不燃化カーボン抵抗	R115			
	HT 37 04 20	Pre-Set Potentiometer	B100kΩ	半固定抵抗	VR101		G	
	iA 11 15 10	Transistor	2SA1115 (E, F)	トランジスタ	TR114,115,123,126	Inter-changeable		
	iA 09 33 00	〃	2SA933 (Q, R)	〃	〃	Inter-changeable		
	iA 11 15 10	〃	2SA1115 (E, F)	〃	TR104,105,107,116	Inter-changeable	G, B	
	iA 09 33 00	〃	2SA933 (Q, R)	〃	〃	Inter-changeable	G, B	
	iC 17 40 00	〃	2SC1740 (S, R)	〃	TR101,109,110,113,117 ～120,124,125,127,128	Inter-changeable		
	iC 26 03 10	〃	2SC2603 (E, F)	〃	〃	Inter-changeable		
	iC 17 40 00	〃	2SC1740 (S, R)	〃	TR108, 111, 112 } Inter-changeable		G, B	
	iC 26 03 10	〃	2SC2603 (E, F)	〃	〃 } Inter-changeable		G, B	
	iD 08 80 20	〃	2SD880 (O, Y)	〃	TR121, 122			
	iE 10 12 30	FET	2SK105 (E, F)	FET	TR102 } Inter-changeable			
	iE 10 26 00	〃	2SK246 (Y)	〃	〃 } Inter-changeable			
	iE 10 32 00	〃	2SK192A(Y,GR,BL)	〃	TR106		G, B	
	iF 00 06 70	Diode	IS2473	ダイオード	D106,109,110,116～ 119,135～138,143～146	Inter-changeable		
	iF 00 00 40	〃	IS1555	〃	〃	Inter-changeable		
	iF 00 06 70	〃	IS2473	〃	D101～103,107,108	Inter-changeable	G, B	
	iF 00 00 40	〃	IS1555	〃	〃	Inter-changeable	G, B	
	iF 00 06 70	〃	IS2473	〃	D111, 115 } Inter-changeable		R	
	iF 00 00 40	〃	IS1555	〃	〃 } Inter-changeable		R	
	iF 00 06 70	〃	IS2473	〃	D113 } Interchangeable		R, U, A, C	
	iF 00 00 40	〃	IS1555	〃	〃 } Interchangeable		R, U, A, C	
	iF 00 06 70	〃	IS2473	〃	D112 } Interchangeable		A, G, B	
	iF 00 00 40	〃	IS1555	〃	〃 } Interchangeable		A, G, B	
	iF 00 16 70	Zener Diode	RD6.8EB2	ツェナーダイオード	D129			
	iF 00 35 50	〃	HZ12B-2	〃	D130			
	iF 00 22 00	Varactor Diode	SVC321 A,B,C,D	バラクタダイオード	D104, 105 } Interchangeable		G, B	
	iF 00 41 70	〃	ISV100	〃	〃 } Interchangeable		G, B	
	iF 00 42 70	LED (Red)	SLR-55URC3H	LED (アカ)	D120～128, 142			
	iF 00 42 80	〃 (Green)	SLR-55MC3H	〃 (ミド)	D139～141			
	iH 00 14 30	Diode	ISR35-100A	ダイオード	D131～134			

※New Parts（新規部品）

	Ref. No.	Part No.	Description	部品名	Remarks	Common Model	Markets	ランク
※		iF 00 82 80	Frequency Display	ＬＥＤ周波数表示器	VC101		G, B	
※		iF 00 83 00	〃	〃	〃		R, U, A, C	
		iG 04 78 00	IC LA1245	ＩＣ	IC103			
		iG 04 94 10	〃 LB1274	〃	IC107			
		iG 13 20 00	〃 BA618	〃	IC106			
		iG 13 95 00	〃 LA1235	〃	IC101			
※		iG 14 25 00	〃 LA3400	〃	IC102			
※		iG 14 26 00	〃 LM7000	〃	IC104			
※		iG 14 27 00	〃 LC7030	〃	IC105			
		KA 40 12 80	Slide Switch SSP322 2-2	スライドスイッチ	SW101		R	
		KA 40 16 80	〃 J-S5084 2-2	〃	SW116		R	
		KA 80 24 10	Push Switch SUF 2-2	プッシュスイッチ	SW115			
		KA 90 63 80	Switch EVQ-QRB-04M	ライトタッチスイッチ	SW102～114			
		KB 00 11 50	Fuse 0.5A 250V	ヒューズ	F101		U, C	
		LB 20 22 60	Pin Jack 2P	ピンジャック	PJ101			
※		NA 08 58 20	AM Coil Pack	ＡＭコイルパック	U101		R, U, A, C	
※		PA 00 08 10	FM Front End Pack FE343U	ＦＭフロントエンドパック	PK101		R,U,A,C,B	
		PA 00 08 50	〃 BPE446U16	〃	〃		G	
		LA 00 24 80	Lapping Terminal P=10 2P U-Type	Ｕ型ラッピング端子板			R	
		LA 00 39 90	Antenna Terminal 5P	アンテナ端子板			R, U, A, C	
		LA 00 55 80	〃 3P	〃			G,B	
		LB 20 18 80	Fuse Holder Pin	ヒューズホルダーピン			U, C	
		LA 00 38 70	Lapping Terminal P=10 2P WTM-Type	ＷＴＭ型ラッピング端子			U,A,C,G,B	
		BB 06 83 70	Ground Angle	アース金具				

※New Parts（新規部品）

■ EXPLODED VIEW



■ MECHANISM PARTS

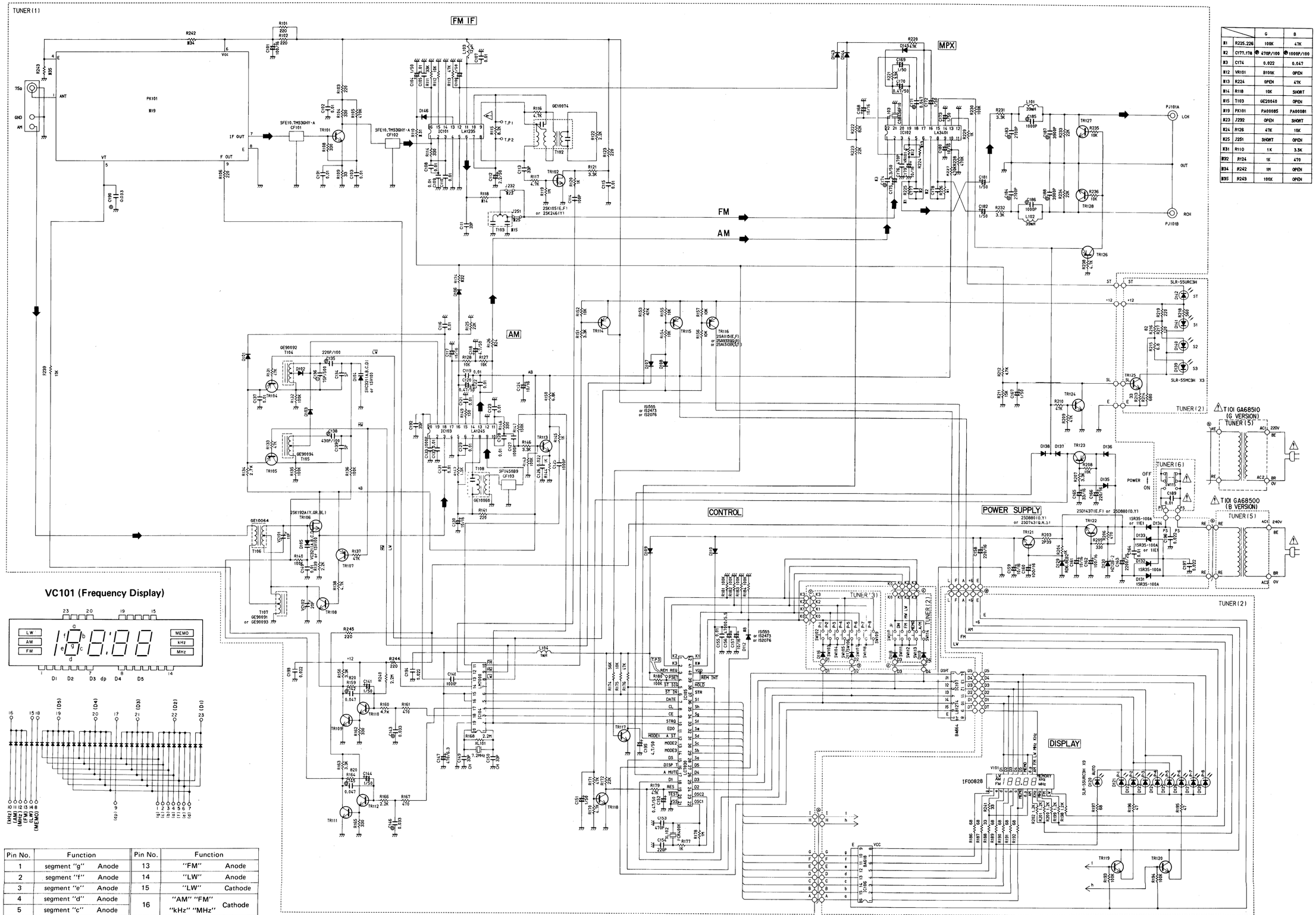
	Ref. No.	Part No.	Description		部品名	Remarks	Common Model	Markets	ランク	
※	1	NB 62 34 10	Panel Unit		パネルユニット	T-520 Silver		R, U, A, C		
※	〃	NB 62 34 20	〃		〃	〃 Black		R, U, A, C		
※	〃	NB 62 34 30	〃		〃	〃 Silver		G, B		
※	〃	NB 62 34 40	〃		〃	〃 Black		G, B		
※	〃	NB 62 35 20	〃		〃	T-17 Silver		R, U, A, C		
※	〃	NB 62 35 30	〃		〃	〃 Black		R, U, A, C		
※	〃	NB 62 35 40	〃		〃	〃 Silver		G, B		
※	〃	NB 62 35 50	〃		〃	〃 Black		G, B		
※	1-1	NB 62 31 40	Button Ass'y		ボタンAss'y	Silver				
※	〃	NB 62 31 50	〃		〃	Black				
	1-2	Ei 32 60 86	Binding Head Tapping Screw	2.6X8 FCRM3-BI	バインドタッピングネジ	PACK				
※	1-3	CB 63 44 40	Sub Chassis		サブシャーシ					
※	2	NA 08 58 40	Tuner Circuit Board		チューナーシート			R		
※	〃	NA 08 58 50	〃		〃			U, C		
※	〃	NA 08 58 60	〃		〃			A		
※	〃	NA 08 58 70	〃		〃			G		
※	〃	NA 08 58 80	〃		〃			B		
	3	CB 61 68 10	Cord Stopper	CM-22A	コードストッパー			U, C		
	〃	CB 62 01 90	〃	CM-22B	〃			R, A, G, B		
	4	MG 00 16 30	Power Cord	6A 250V 2m	電源コード			R		⚠
	〃	MG 00 08 40	〃	10A 125V 2m	〃	Interchangeable		U, C		⚠
	〃	MG 00 12 40	〃	10A 125V 2m	〃			U, C		⚠
	〃	MG 00 09 20	〃	7.5A 250V 2.5m	〃	Interchangeable		A		⚠
	〃	MG 00 14 90	〃	7.5A 250V 2.5m	〃			A		⚠
	〃	MG 00 09 60	〃	2.5A 250V 2m	〃	Interchangeable		G		⚠
	〃	MG 00 16 20	〃	2.5A 250V 2m	〃			G		⚠
	〃	MG 00 18 60	〃	2.5A 250V 2m	〃			B		⚠
	5	AA 61 37 60	Top Cover		トップカバー	Silver	T-500			
	〃	AA 61 38 60	〃		〃	Black	T-500			
	6	CB 60 56 20	Plastic Rivet		プラスチックリベット					
	7	CB 61 03 90	Leg		脚					
※	8	NB 62 33 70	Button Ass'y		ボタンAss'y	Silver				
※	〃	NB 62 33 80	〃		〃	Black				
※	9	AA 62 33 90	Rear Panel		リアパネル	T-520		R		
※	〃	AA 62 34 00	〃		〃	〃		U, C		
※	〃	AA 62 34 10	〃		〃	〃		A		
※	〃	AA 62 34 20	〃		〃	〃		G		
※	〃	AA 62 41 30	〃		〃	〃		B		
※	〃	AA 62 34 40	〃		〃	T-17		R		
※	〃	AA 62 34 50	〃		〃	〃		U, C		
※	〃	AA 62 34 60	〃		〃	〃		A		
※	〃	AA 62 34 70	〃		〃	〃		G		
※	〃	AA 62 41 40	〃		〃	〃		B		
	10	CB 60 74 70	Holder, Antenna		アンテナホルダー					
	11	Ei 33 00 86	Binding Head Tapping Screw	3X8 FCRM3-BI	バインドタッピングネジ	PACK				
	12	ED 33 00 66	Binding Head Screw	3X6 FCRM3-BI	バインド小ネジ	PACK				
	13	EV 43 00 36	Toothed Lock Washer	φ3 ZMC2-Y	歯付座金	PACK				
	14	EK 13 50 20	B. W Head Tapping Screw	4X8 FNM3-3g	ブレザータッピングネジ	Silver				
	〃	EK 36 50 40	〃	4X8 FCRM3-BI	〃	Black				
	15	CB 60 14 40	Votage Selector Stopper		VSストッパー			R		
		CB 06 92 50	Binding Tie	BK-1	インシュロックタイ					

※New Parts（新規部品）

Ref. No.	Part No.	Description		部品名	Remarks	Common Model	Markets	ランク
		Accessories		付属品				
	Mi 08 28 50	FM Q-matching Antenna	FM	FM Qマッチアンテナ			R, U, A, C	
	Mi 06 44 00	〃	FM	〃			G, B	
※	Mi 08 87 90	Pin Plug Cord	1m	出力コード				
	Mi 08 29 10	Loop Antenna	AM	ループアンテナ				
	LB 60 59 30	Matching Transformer	FM (300Ω→75Ω)	整合器			G, B	

※New Parts（新規部品）

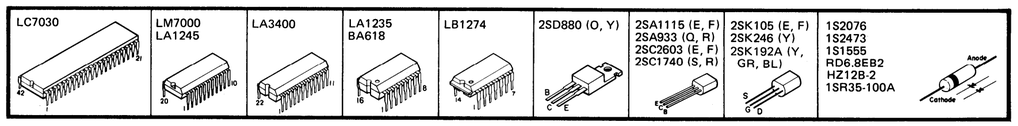
■ SCHEMATIC DIAGRAM ..... G, B models



VC101 (Frequency Display)

Pin No.	Function		Pin No.	Function	
1	segment "g"	Anode	13	"FM"	Anode
2	segment "f"	Anode	14	"LW"	Anode
3	segment "e"	Anode	15	"LW"	Cathode
4	segment "d"	Anode	16	"AM" "FM" "kHz" "MHz"	Cathode
5	segment "c"	Anode			
6	segment "b"	Anode	17	decimal point	Cathode
7	segment "a"	Anode	18	"MEMO"	Cathode
8	"MEMO"	Anode	19	digit "5"	Anode
9	decimal point	Anode	20	digit "4"	Anode
10	"kHz"	Anode	21	digit "3"	Anode
11	"AM"	Anode	22	digit "2"	Anode
12	"MHz"	Anode	23	digit "1"	Anode

		G	B
R1	R225,226	100K	47K
R2	C177,178	⊕ 470P/100	⊕ 1000P/100
R3	C174	0.022	0.047
R12	VR101	B100K	OPEN
R13	R224	OPEN	47K
R14	R118	10K	SHORT
R15	T103	GE20040	OPEN
R19	PK101	PA00085	PA00081
R23	J232	OPEN	SHORT
R24	R126	47K	10K
R25	J251	SHORT	OPEN
R31	R110	1K	3.3K
R32	R124	1K	470
R34	R242	1M	OPEN
R35	R243	100K	OPEN



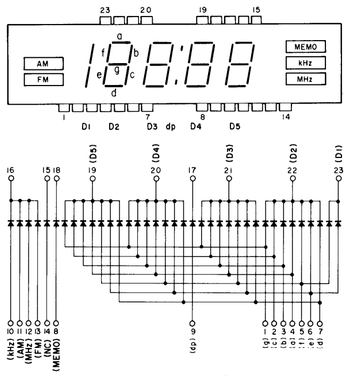
- *Components having special characteristics are marked ⚠ and must be replaced with parts having specifications equal to those originally installed.*
- *Schematic Diagram is subject to change without notice.*

■ SCHEMATIC DIAGRAM ..... R, U, C, A models

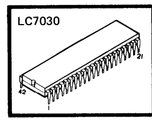
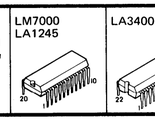
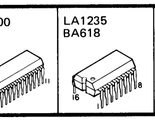
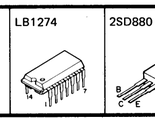
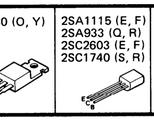
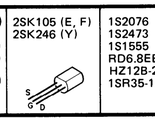
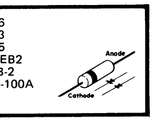
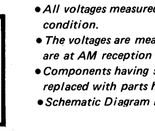
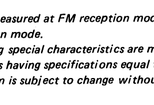
※ MARK ----- SEE BELOW TABLE

		R	U, C	A
※2	C177, 178	@1500P/100	@1500P/100	@1000P/100
※8	D112	OPEN	OPEN	1S1555 or 1S2076
※10	D111, 115	OPEN	OPEN	1S1555 or 1S2473 or 1S2076
※11	R185	10K	OPEN	OPEN
※20	SW101	KA 40128	OPEN	OPEN
※21	F101	OPEN	0.5A 250V	OPEN
※26	J261	SHORT	OPEN	SHORT
※27	R237	OPEN	1/2P2.2M	OPEN
※28	T101	GA68480	GA68490	GA68500
※29	C190	0.033	0.01	0.033
※30	R160	4.7K	22K	4.7K

VC101 (Frequency Display)



Pin No.	Function	Pin No.	Function
1	segment "g" Anode	13	"FM" Anode
2	segment "f" Anode	14	NOT USED
3	segment "e" Anode	15	NOT USED
4	segment "d" Anode	16	"AM" "FM" "kHz" "MHz" Cathode
5	segment "c" Anode		
6	segment "b" Anode	17	decimal point Cathode
7	segment "a" Anode	18	"MEMO" Cathode
8	"MEMO" Anode	19	digit "5" Anode
9	decimal point Anode	20	digit "4" Anode
10	"kHz" Anode	21	digit "3" Anode
11	"AM" Anode	22	digit "2" Anode
12	"MHz" Anode	23	digit "1" Anode

LC7030	LM7000 LA1245	LA3400	LA1235 BA618	LB1274	2SD880 (O, Y)	2SA1115 (E, F) 2SA933 (Q, R) 2SC2603 (E, F) 2SC1740 (S, R)	2SK105 (E, F) 2SK246 (Y)	1S2076 1S2473 1S1555 RD6.8EB2 HZ12B-2 1SR35-100A
								

- *All voltages measured with a 10MΩ/VDC electric volt meter, under no-signal condition.*
- *The voltages are measured at FM reception mode. Only the voltages at IC103 are at AM reception mode.*
- *Components having special characteristics are marked ⚠ and must be replaced with parts having specifications equal to those originally installed.*
- *Schematic Diagram is subject to change without notice.*