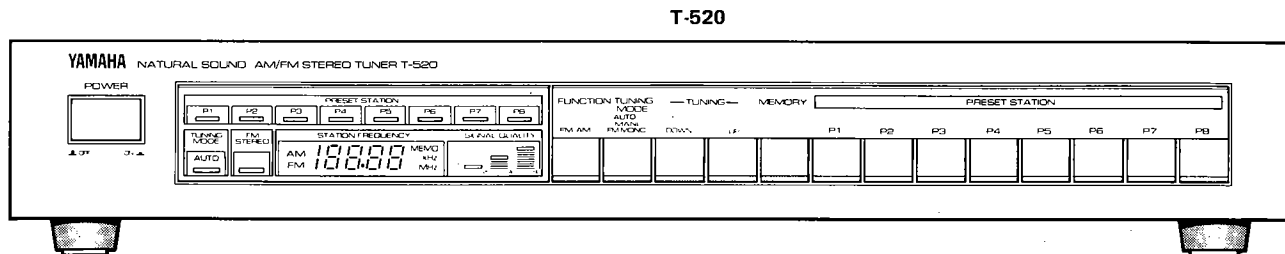


444

# AM/FM STEREO TUNER T-520/17

## SERVICE MANUAL



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 inherent 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 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 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.

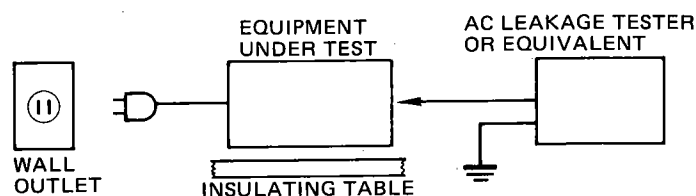
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## ■ TO SERVICE PERSONNEL

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 0.15 $\mu$ F.
  - 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)<br>(R)<br>87.5 to 108.0MHz (G)(A)<br>(B) |
| 50dB Quieting Sensitivity          |                                                                  |
| Mono, 75 $\Omega$                  | 1.55 $\mu$ V (15.1dBf)                                           |
| Stereo, 75 $\Omega$                | 21 $\mu$ V (37.7dBf)                                             |
| Usable Sensitivity                 |                                                                  |
| Mono                               | 0.8 $\mu$ V (75 $\Omega$ ) 9.3dBf                                |
| (30dB Quieting)                    |                                                                  |
| DIN Mono (S/N 26dB), 75 $\Omega$   | 1.4 $\mu$ V (G)                                                  |
| DIN Stereo (S/N 46dB), 75 $\Omega$ | 30 $\mu$ V (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 $\pm$ 0.5dB                                                    |
| Meter Saturation Level             | 100 $\mu$ V (45.2dBf)                                            |

### ■ AM SECTION

|                          |                                                                                              |
|--------------------------|----------------------------------------------------------------------------------------------|
| Tuning Range             | 520 to 1610kHz (U)(C)<br>522 to 1611kHz (G)(A)(B)<br>520 to 1620kHz or<br>522 to 1611kHz (R) |
| Usable Sensitivity (IHF) | 250 $\mu$ V/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) | 250 $\mu$ V/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/3.3k $\Omega$     |
| FM 40kHz DEV. 1kHz     | 400mV/3.3k $\Omega$ (G) |
| AM 30% MOD 400Hz       | 150mV/3.3k $\Omega$     |
| LW 30% MOD 400Hz       | 150mV/3.3k $\Omega$     |

### ■ GENERAL

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

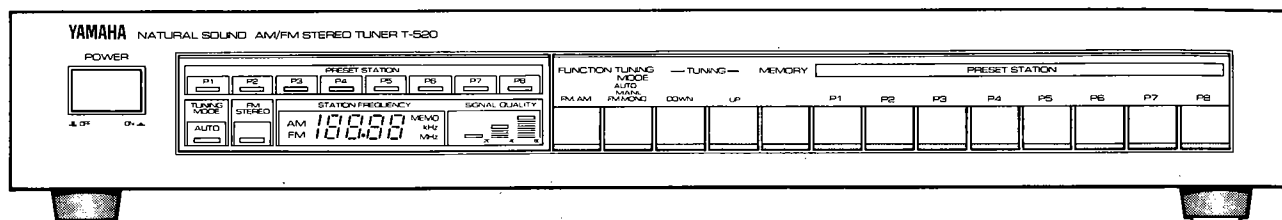
(U) ..... U.S.A. model                      (G) ..... European model  
(C) ..... Canadian model                    (B) ..... British model  
(A) ..... Australian model                   (R) ..... General model

*Specifications subject to change without notice.*

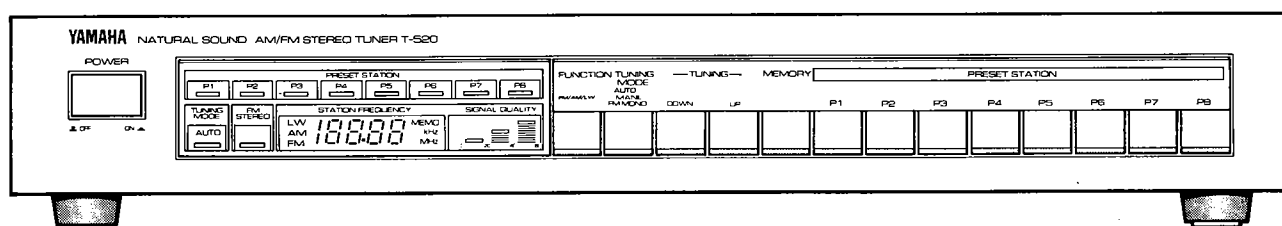
## FRONT PANELS

### ▼ U, C, R, A models

#### T-520

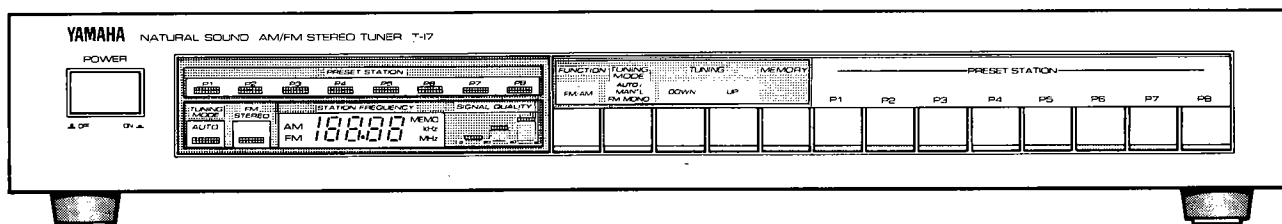


### ▼ G, B models

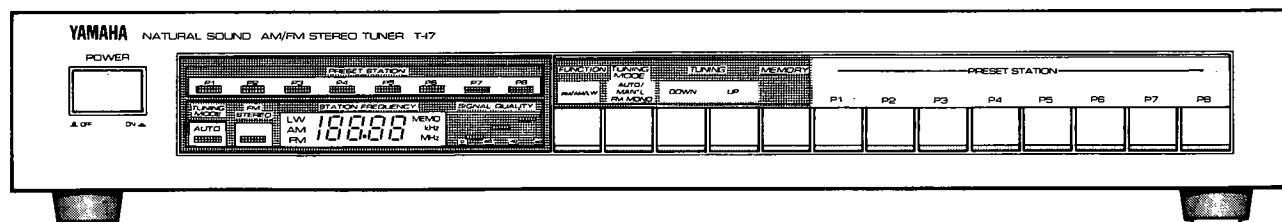


### ▼ U, C, R, A models

#### T-17



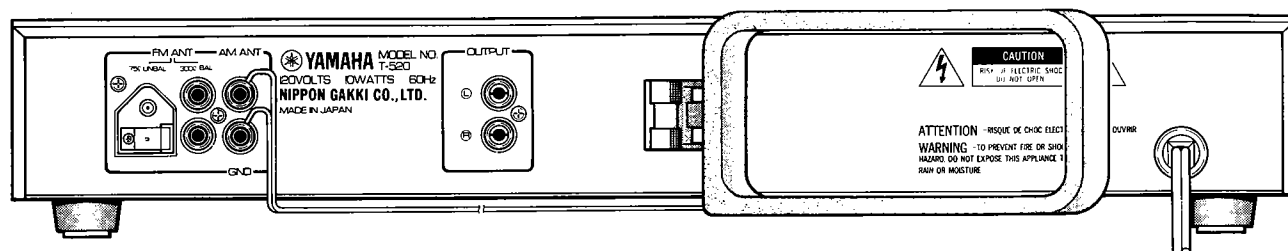
### ▼ G, B models



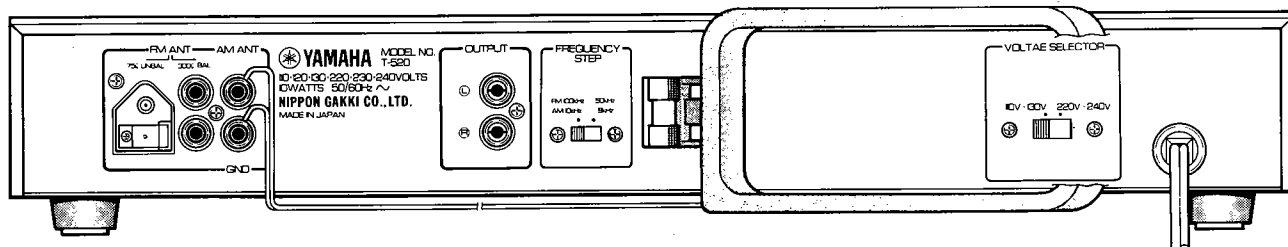
## REAR PANELS

### T-520

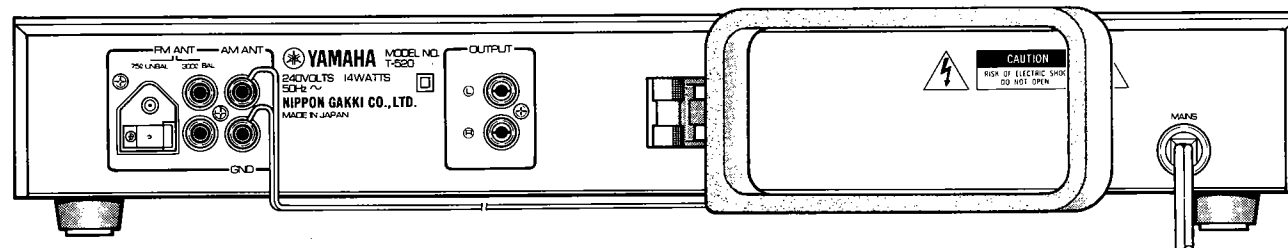
#### ▼ U.S.A. & Canadian models



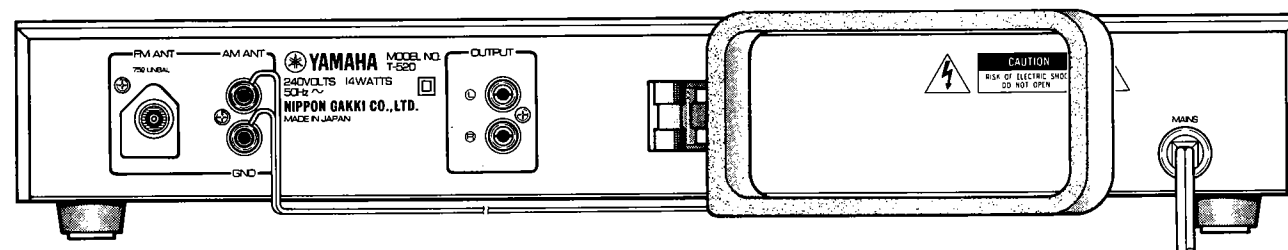
#### ▼ General model



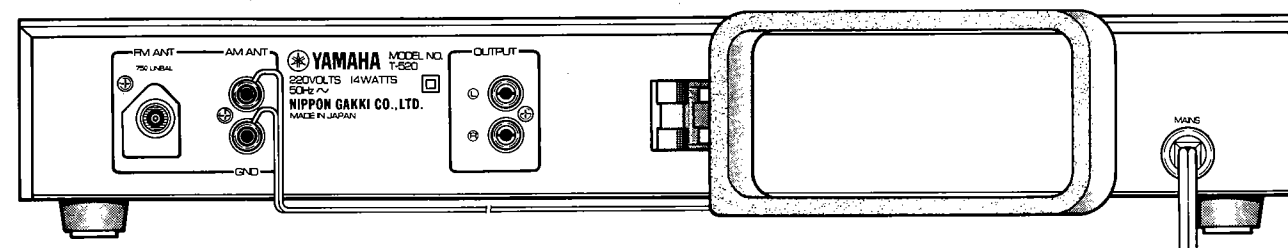
#### ▼ Australian model



#### ▼ British model

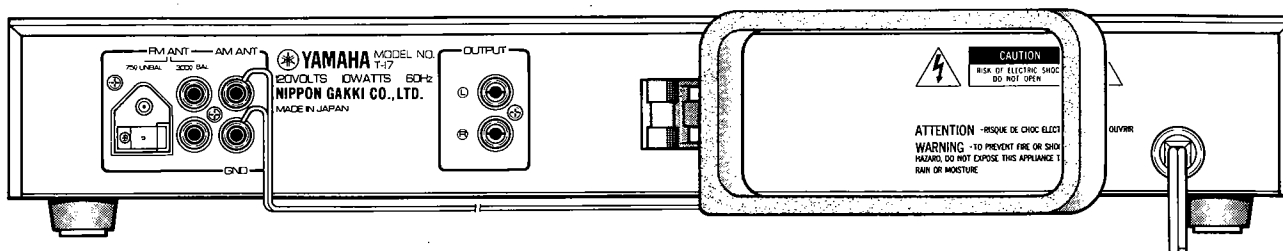


#### ▼ European model

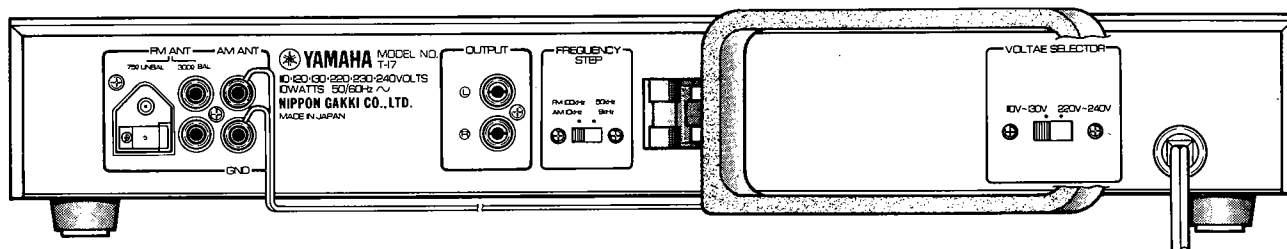


## T-17

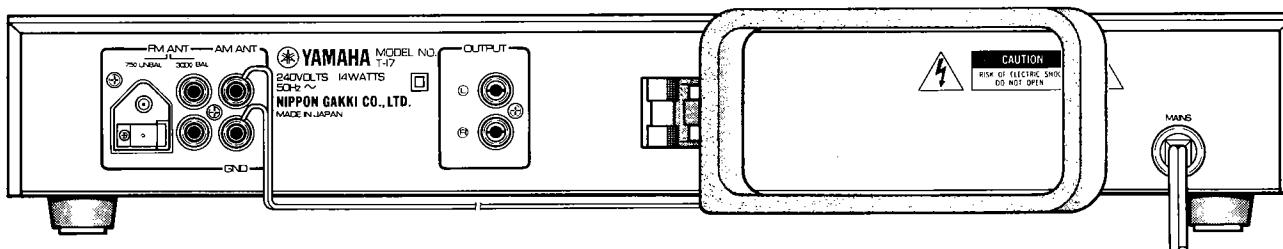
## ▼ U.S.A. &amp; Canadian models



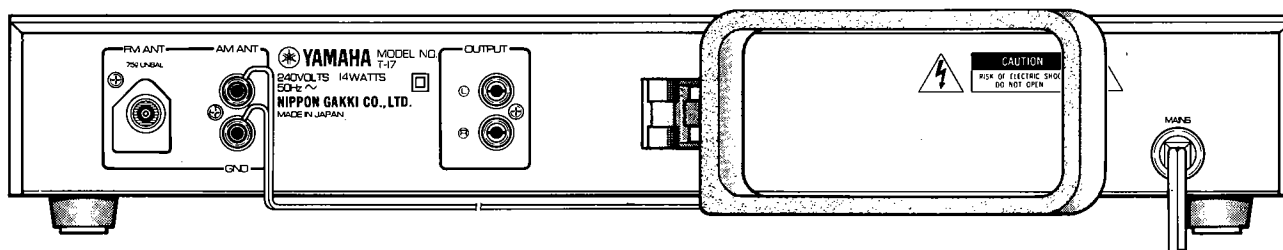
## ▼ General model



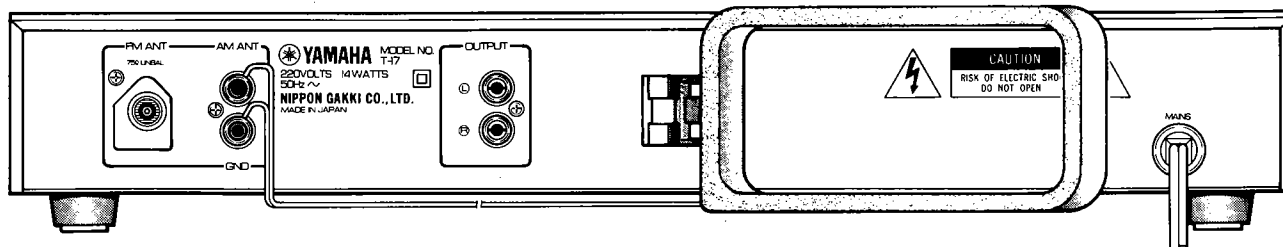
## ▼ Australian model



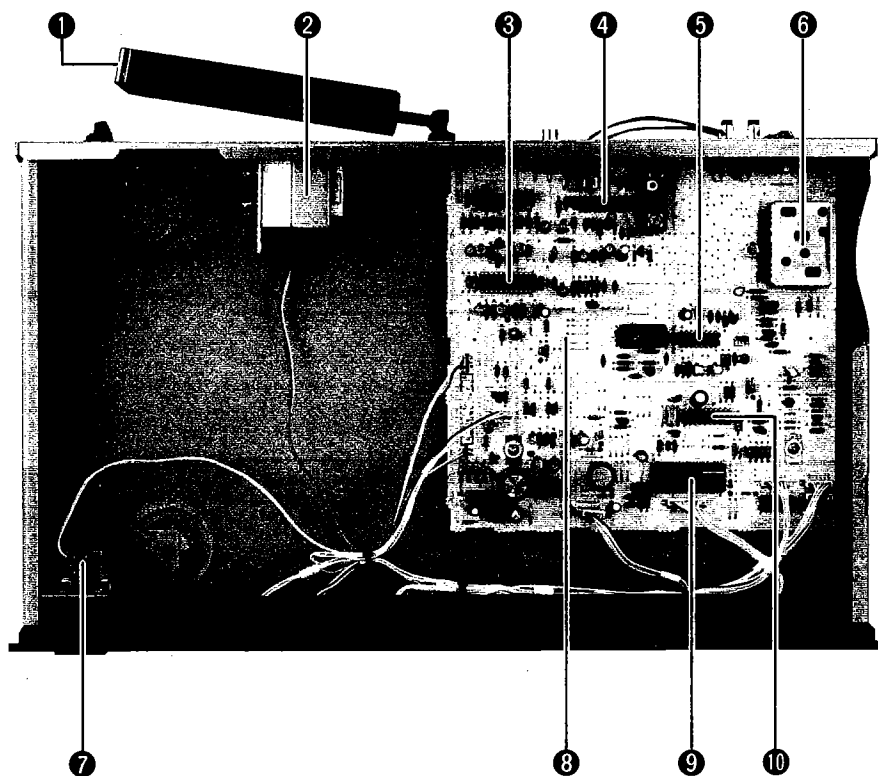
## ▼ British models



## ▼ European models



## INTERNAL VIEW



- ① AM LOOP ANTENNA
- ② POWER TRANSFORMER  
U, C models: GA68490  
R, A, G, B models: GA68480
- ③ MPX IC: LA3400
- ④ AM IC: LA1245
- ⑤ FM IF IC: LA1235
- ⑥ FRONT END PACK
- ⑦ POWER SWITCH
- ⑧ TUNER CIRCUIT BOARD (1)
- ⑨ 4 BIT CPU: LC7030
- ⑩ PLL IC: LM7000

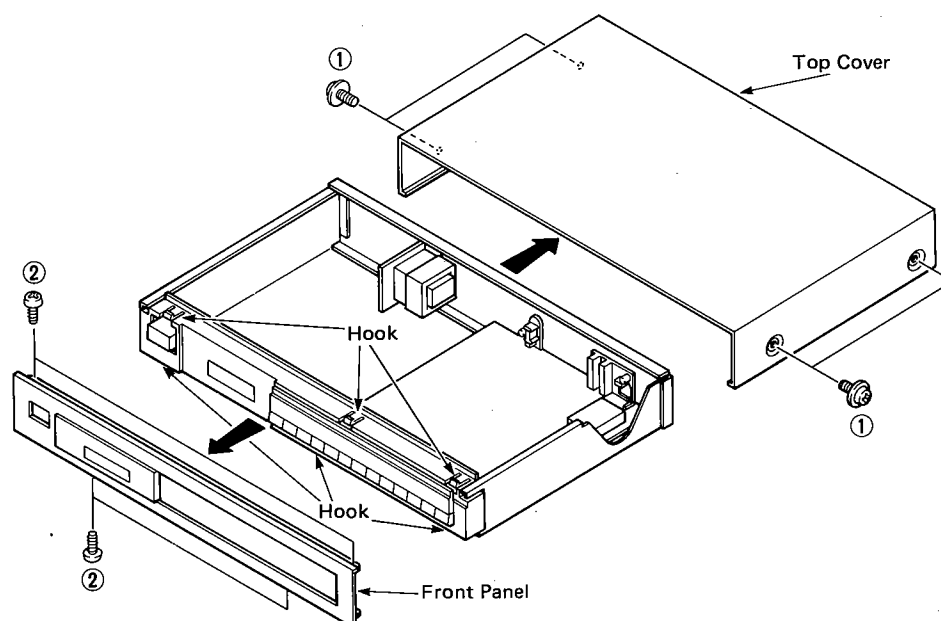
## DISASSEMBLY PROCEDURES

### 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)  $0\text{dB}\mu = 1\mu\text{V}$     Ex:  $60\text{dB}\mu = 1\text{mV}$

### 2. Measuring instruments abbreviation

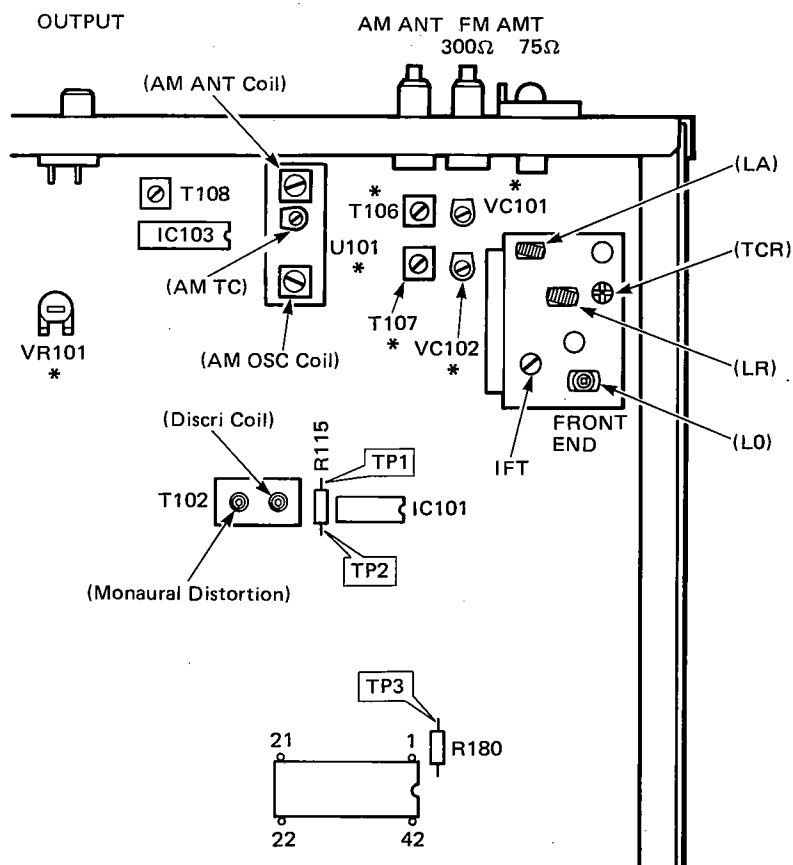
- FM SG : FM signal generator  
 SSG : Stereo signal generator  
 AM SG : AM signal generator  
 DIST. M : Distortion meter  
 FC : Frequency counter  
 A.C.V.M. : AC voltagemeter  
 D.C.V.M. : DC voltagemeter

### <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                                 | <div>Make sure that AC line voltage comes within</div> <table><tr><th>Models</th><th>AC line voltage</th></tr><tr><td>U, C</td><td>120V ± 10%</td></tr><tr><td>G</td><td>220V ± 10%</td></tr><tr><td>A, B</td><td>240V ± 10%</td></tr></table> | Models | AC line voltage | U, C | 120V ± 10% | G | 220V ± 10% | A, B | 240V ± 10% |
| 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<br>+12.5V ± 1V DC         |                                                                                                                                                                                                                                                |        |                 |      |            |   |            |      |            |
|                                             | At AM reception mode<br>less than +1V DC       |                                                                                                                                                                                                                                                |        |                 |      |            |   |            |      |            |
| AB                                          | At AM reception mode<br>+12.5V ± 1V DC         |                                                                                                                                                                                                                                                |        |                 |      |            |   |            |      |            |
|                                             | At FM reception mode<br>less than +1V DC       |                                                                                                                                                                                                                                                |        |                 |      |            |   |            |      |            |
| <div>LW</div> <div>(G, B models only)</div> | At LW reception mode<br>+12.5V ± 0.5V DC       |                                                                                                                                                                                                                                                |        |                 |      |            |   |            |      |            |
|                                             | At FM or AM reception mode<br>less than +1V DC |                                                                                                                                                                                                                                                |        |                 |      |            |   |            |      |            |

### • TEST POINT

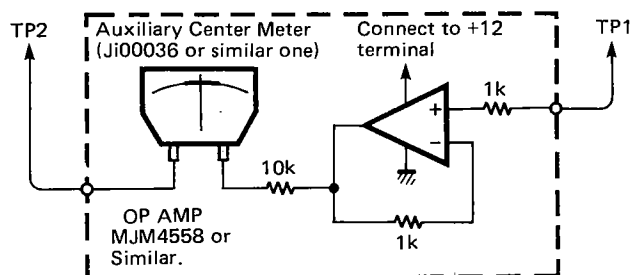


Note: \* marked

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

## &lt;FM TUNER SECTION&gt;

- 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.

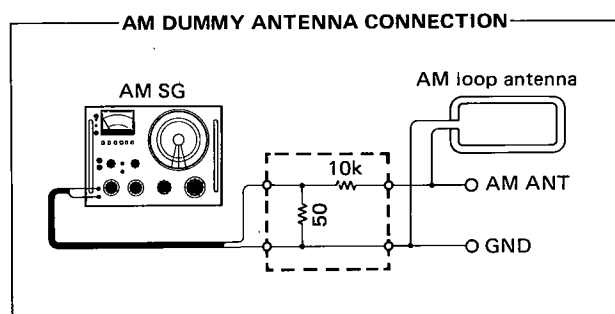


| Step | Adjustment item                       | Connection terminal        | Instrument required                                                                                 | Adjustment locations                                   | Adjustment method                                                                      | Rating or standard                                                  | Remarks                                                |
|------|---------------------------------------|----------------------------|-----------------------------------------------------------------------------------------------------|--------------------------------------------------------|----------------------------------------------------------------------------------------|---------------------------------------------------------------------|--------------------------------------------------------|
| 1    | Discriminator balance                 | TP1 ~ TP2                  | Auxiliary center meter                                                                              | T102 (Discr 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<br>TP1 ~ TP2   | FM SG<br>98MHz ± 1kHz<br>70dBμ (75.2dBf)<br>MONO 1kHz<br>100% MOD<br>Auxiliary center meter         | TUNING Key<br>→ 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<br>OUTPUT L,R  | FM SG<br>98MHz ± 1kHz<br>70dBμ (75.2dBf)<br>MONO 100Hz<br>100% MOD<br>DIST. M<br>L.P.F.             | T102 (Monaural Distortion)<br>SIGNAL QUALITY indicator | Reduce distortion to minimum.                                                          | Less than -43dB                                                     | Confirm that all signal quality indicators lights      |
| 4    | Stereo distortion                     | 300Ω FM ANT<br>OUTPUT L, R | FM SG, SSG<br>98MHz ± 1kHz<br>70dBμ (75.2dBf)<br>STEREO L, R<br>1kHz, 100% MOD<br>DIST. M<br>L.P.F. | Front end IFT<br>STEREO indicator                      | Same as step 3                                                                         | Less than -33dB                                                     | Confirm that stereo indicator lights up.               |
| 5    | Separation                            | 300Ω FM ANT<br>OUTPUT L, R | FM SG, SSG<br>98MHz ± 1kHz<br>70dBμ (75.2dBf)<br>STEREO L, R<br>1kHz, 100% MOD<br>L.P.F. A.C.V.M.   | VR101 (G model only)                                   | Reduce output level to minimum.                                                        | Separation more than 28dB                                           |                                                        |
| 6    | Confirmation of auto search reception | 300Ω FM ANT                | FM SG<br>98MHz ± 1kHz<br>20dBμ (25.2dBf)<br>MONO 1kHz<br>100% MOD                                   | TUNING Key<br>→ 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

## &lt;AM TUNER SECTION&gt; . . . . R, U, C, A models only

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



- 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)

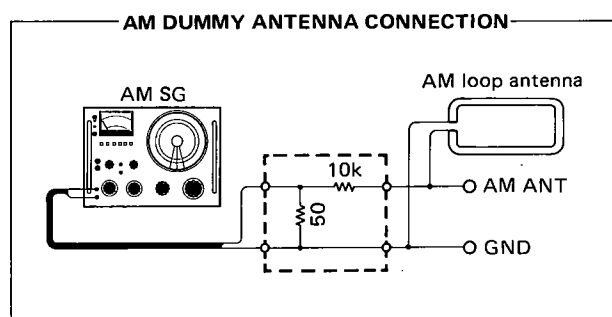
|    | P1      | P2      | P3      |
|----|---------|---------|---------|
| FM | 98.0MHz |         |         |
| AM | 630kHz  | 1080kHz | 1440kHz |



| Step | Adjustment item                       | Connection terminal  | Instrument required                                                                                                                         | Adjustment locations     | Adjustment method                                      | Rating or standard                                    |
|------|---------------------------------------|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------------------------------------------|-------------------------------------------------------|
| 1    | AM IFT                                | AM ANT<br><br>OUTPUT | AM SG<br>AM dummy antenna<br>[ 630kHz $\pm$ 0.1kHz<br>50dB $\mu$<br>400Hz, 30% MOD<br>A.C.V.M.                                              | T108                     | Adjust so that the detector output is at maximum.      |                                                       |
| 2    | Confirmation of sensitivity           | AM ANT<br><br>OUTPUT | AM SG<br>AM dummy antenna<br>[ 630kHz $\pm$ 0.1kHz<br>1080kHz $\pm$ 0.1kHz<br>1440kHz $\pm$ 0.1kHz<br>400Hz, 30% MOD<br>A.C.V.M.<br>DIST. M |                          | Obtain AM SG output level where distortion become 10%. | Less than 58dB $\mu$                                  |
| 3    | Confirmation of auto search reception | AM ANT               | AM SG<br>AM dummy antenna<br>[ 1080kHz $\pm$ 0.1kHz<br>60dB $\mu$<br>400Hz, 30% MOD                                                         | TUNING key<br>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.



- 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<br><br>OUTPUT | AM SG.<br>AM dummy antenna<br>[ 630kHz $\pm$ 0.1kHz<br>50dB $\mu$<br>400Hz, 30% MOD<br>A.C.V.M.                                             | T108                                                                 | Adjust so that the detector output is at maximum.      |                                                       |
| 2    | AM sensitivity                        | AM ANT<br><br>OUTPUT | AM SG<br>AM dummy antenna<br>[ 630kHz $\pm$ 0.1kHz<br>1080kHz $\pm$ 0.1kHz<br>1440kHz $\pm$ 0.1kHz<br>400Hz, 30% MOD<br>A.C.V.M.<br>DIST. M | T106<br>(Low frequency range)<br><br>VC101<br>(High frequency range) | Obtain AM SG output level where distortion become 10%  | Less than 58dB $\mu$                                  |
| 3    | LW sensitivity                        | AM ANT<br><br>OUTPUT | AM SG<br>AM dummy antenna<br>[ 173kHz $\pm$ 0.1kHz<br>245kHz $\pm$ 0.1kHz<br>326kHz $\pm$ 0.1kHz<br>400Hz, 30% MOD<br>A.C.V.M. DIST. M      | T107<br>(Low frequency range)<br><br>VC102<br>(High frequency range) | Obtain AM SG. output level where distortion become 10% | Less than 63dB $\mu$                                  |
| 4    | Confirmation of auto search reception | AM ANT               | AM SG<br>AM dummy antenna<br>[ 1080kHz $\pm$ 0.1kHz<br>60dB $\mu$<br>400Hz, 30% MOD                                                         | TUNING key<br>UP or DOWN                                             |                                                        | Confirm the auto search reception with the tuning key |

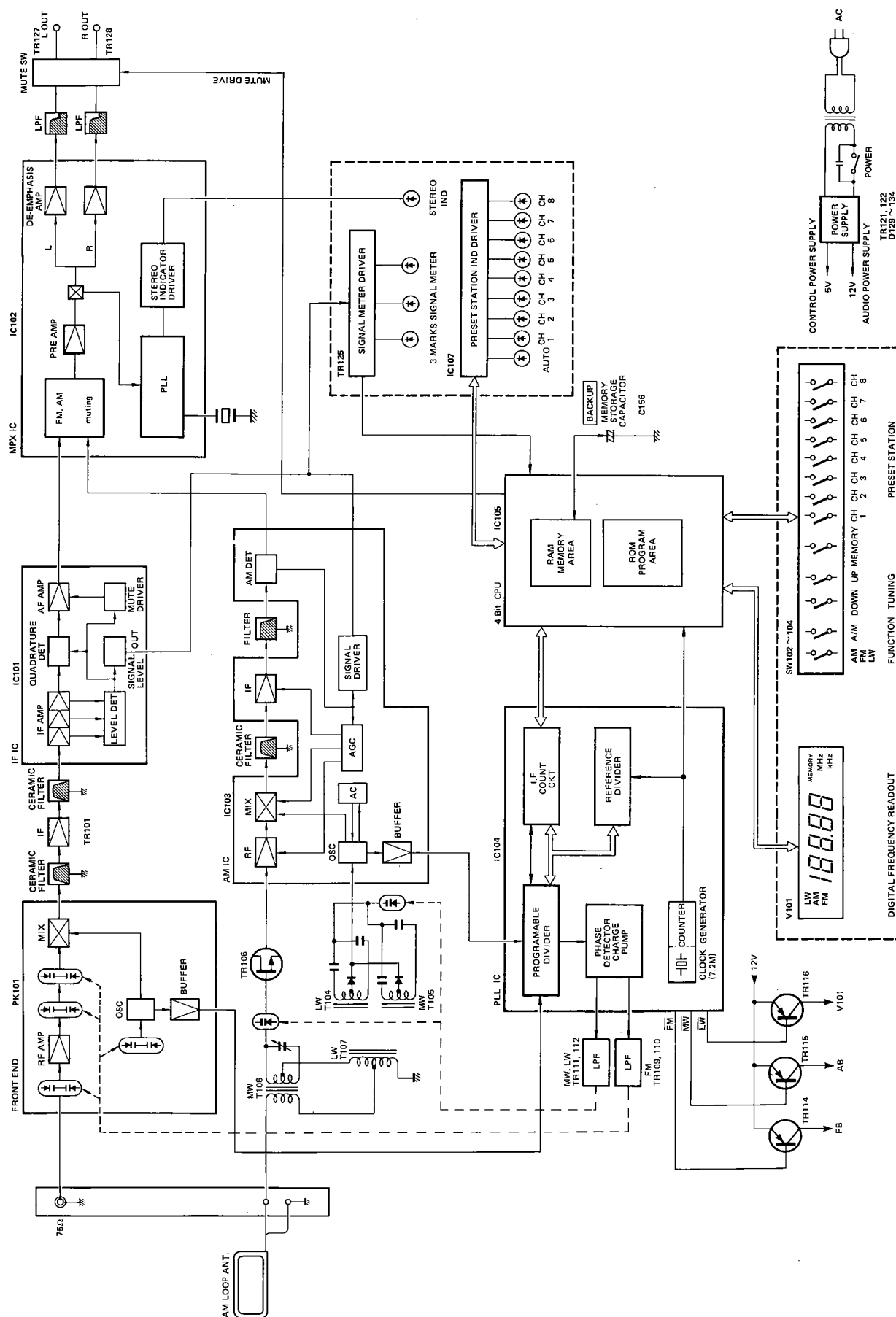
## &lt;DIGITAL CONTROL SECTION&gt;

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

- U, C, R, A models

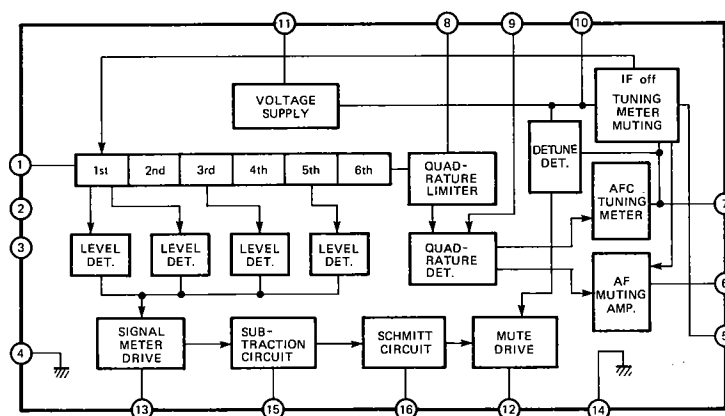


- **G, B models**

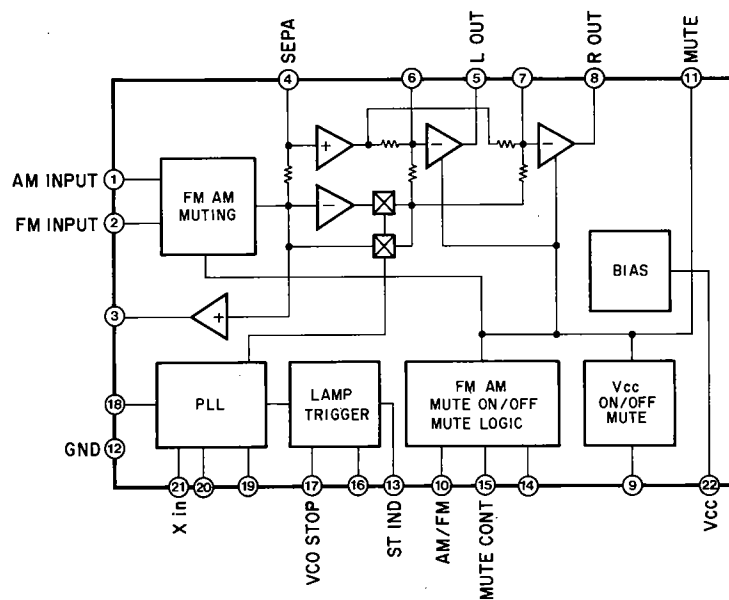


# IC BLOCK

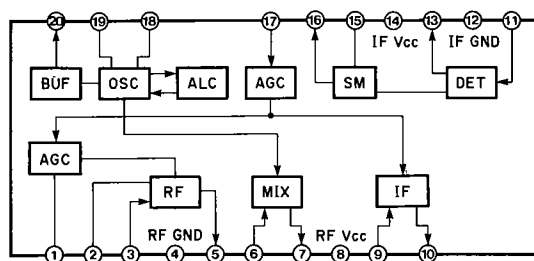
IC101 : LA1235



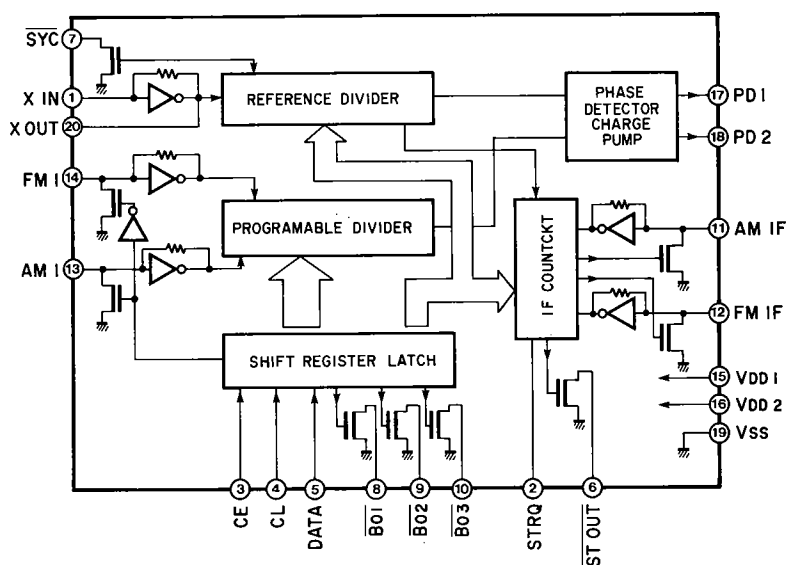
IC102 : LA3400



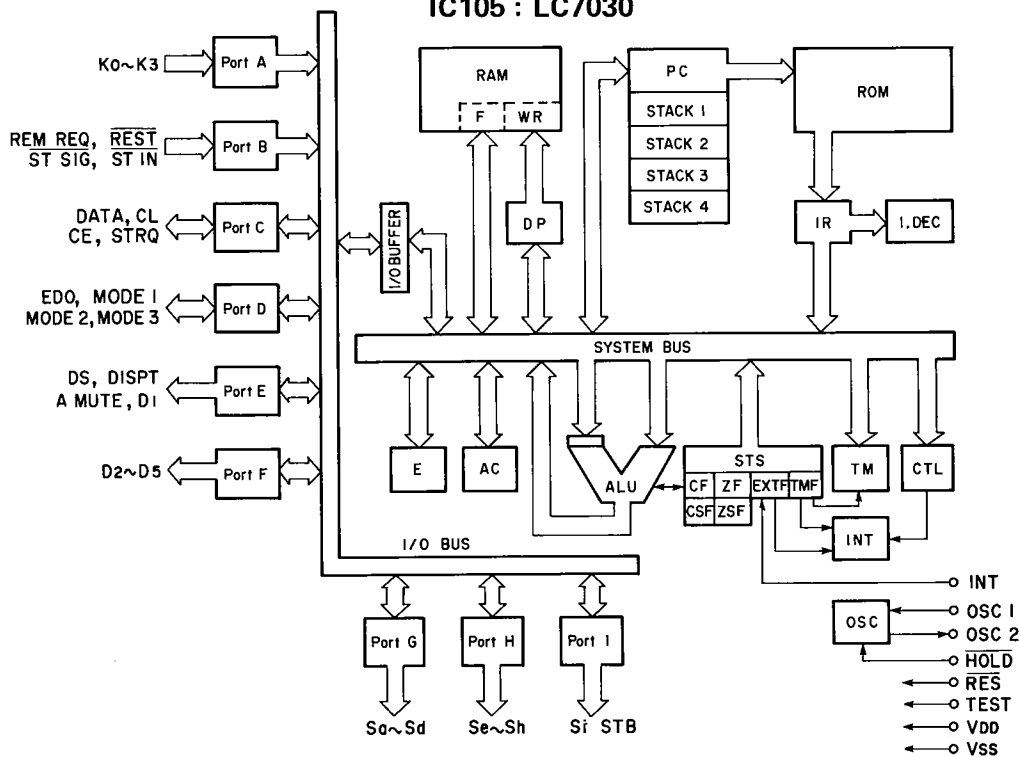
IC103 : LA1245



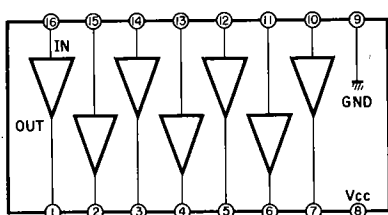
IC104 : LM7000



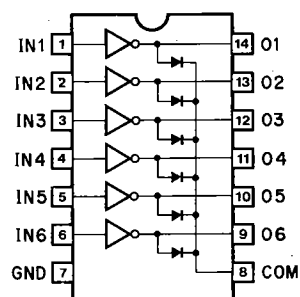
IC105 : LC7030



IC106 : BA618



IC107 : LB1274



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

FM ANT    AM ANT  
75a    300a  
UNBAL    BAL

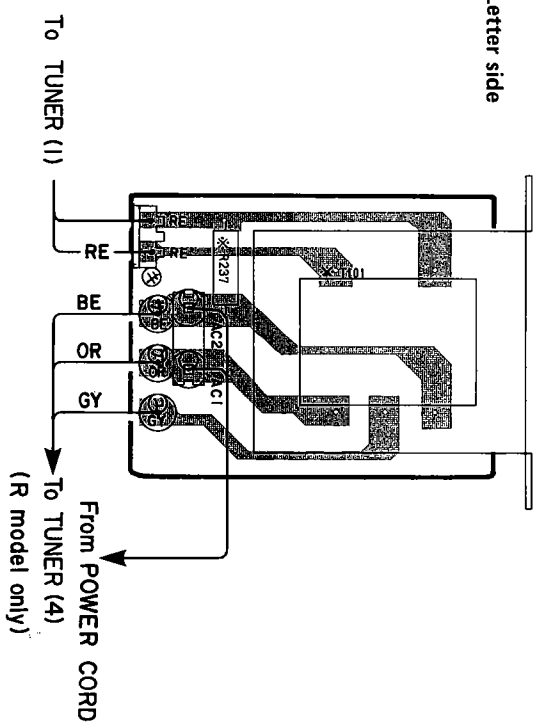
TUNER (1)

OUTPUT

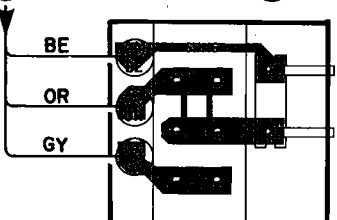
FREQUENCY  
STEP  
FM 100kHz 50kHz  
AM 10kHz 9kHz

Note)  
文字面 : Letter side

TUNER (5)

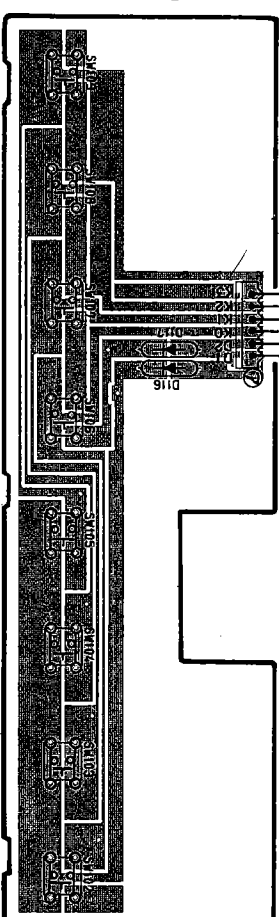


TUNER (4)



TUNER (3)

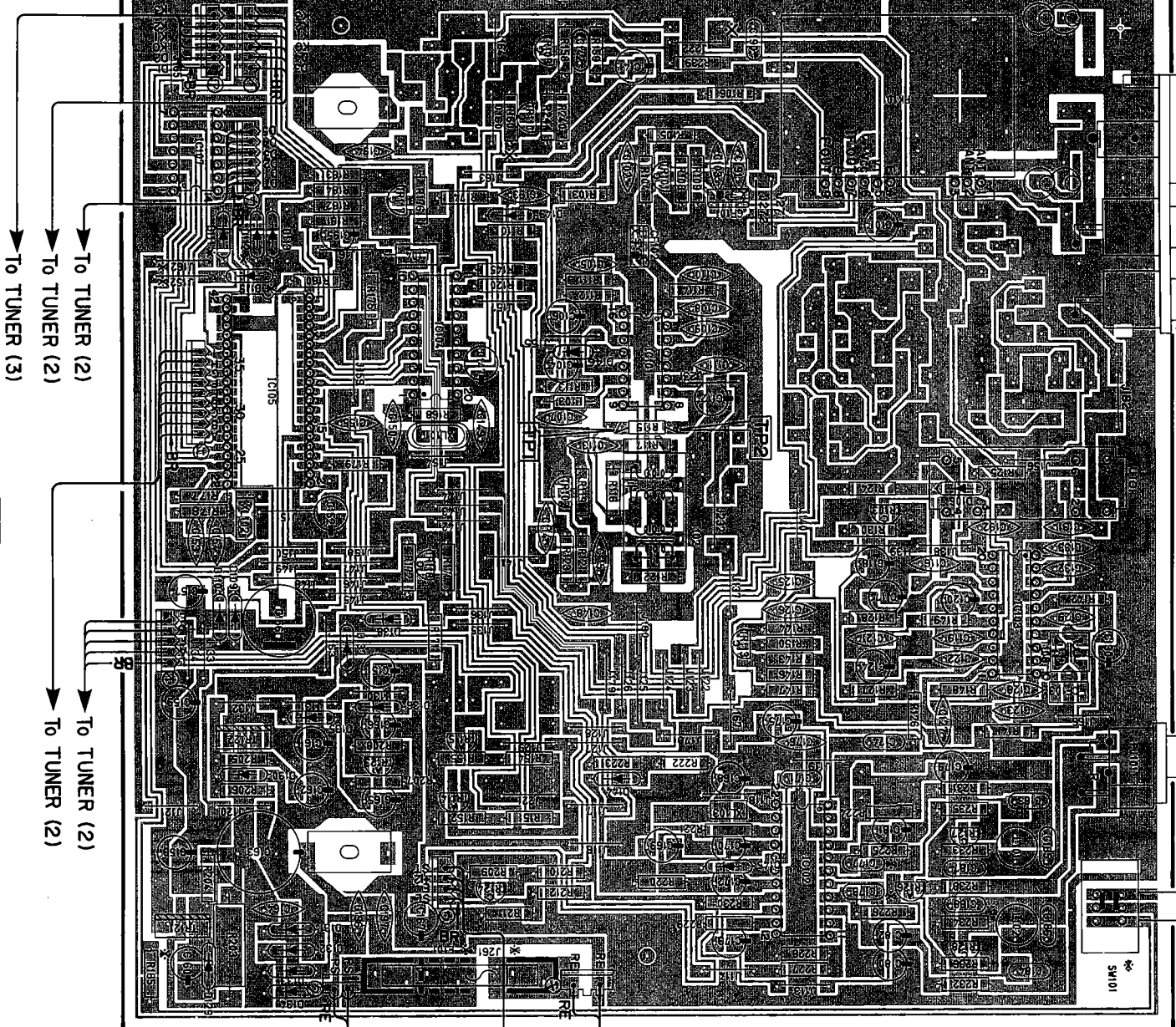
From TUNER (5)  
110V~130V 220V~240V  
VOLTAGE SELECTOR  
(R model only)



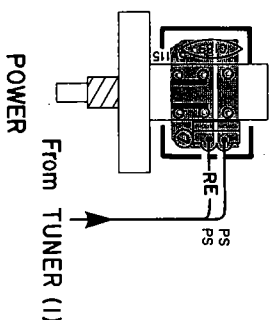
P8    P7    P6    P5    P4    P3    P2    P1  
PRESET STATION

TUNER (2)

PRESET STATION  
P8    P7    P6    P5    P4    P3    P2    P1



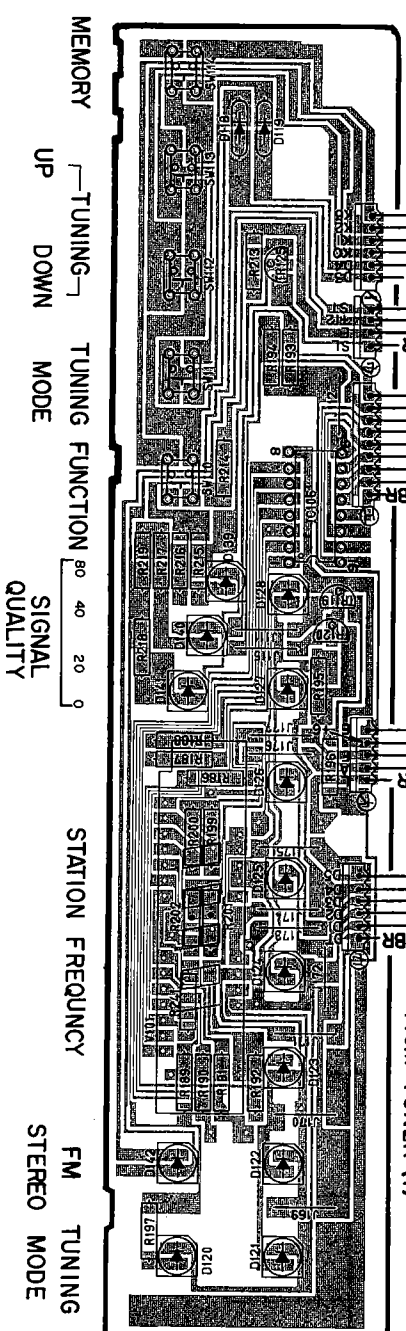
TUNER (6)



POWER

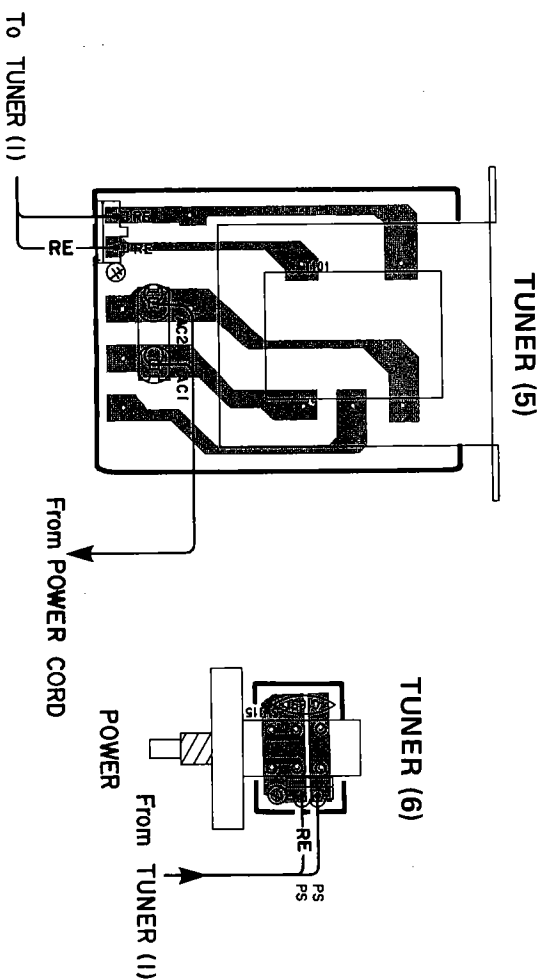
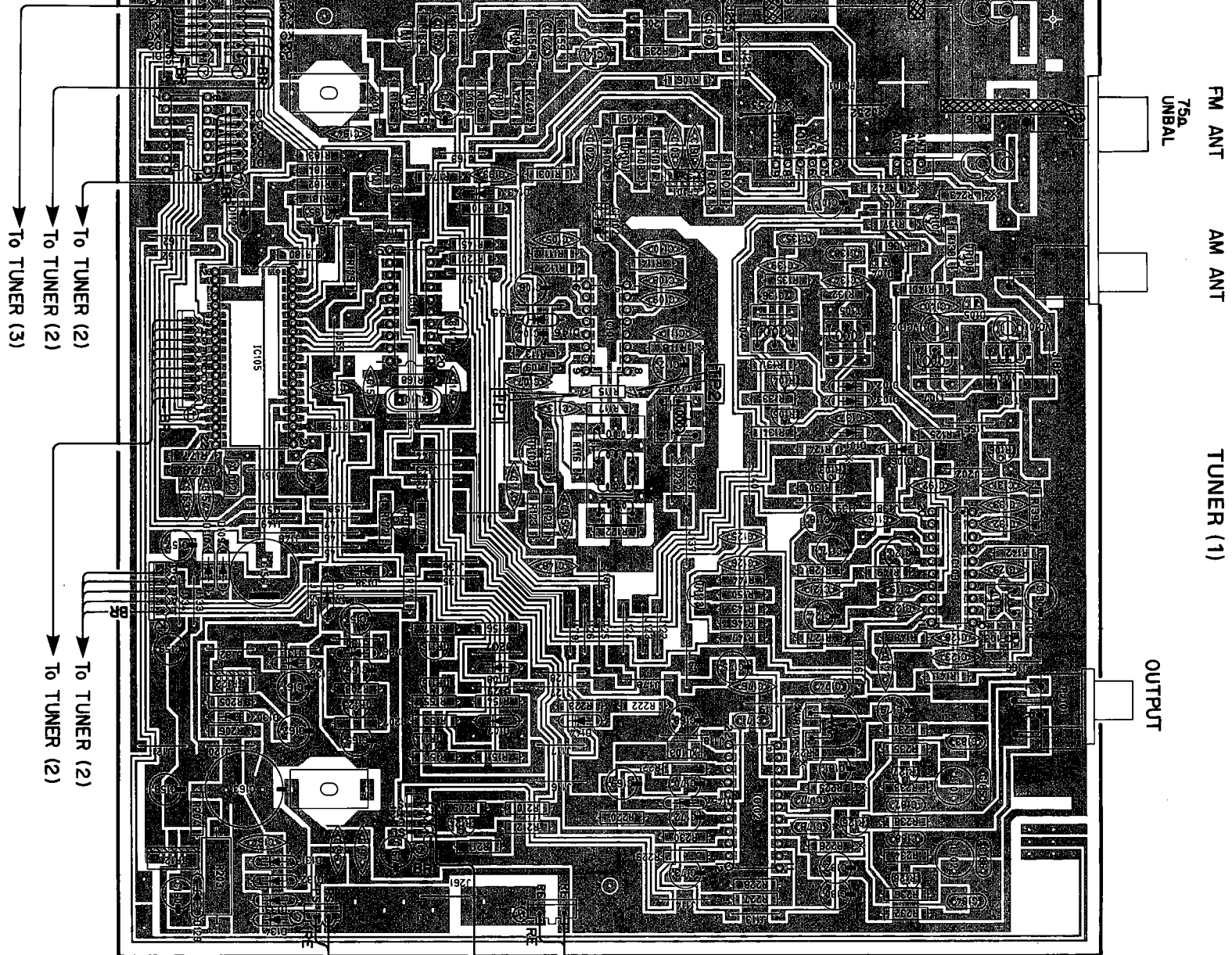
Note: \* marked

|           | 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   |

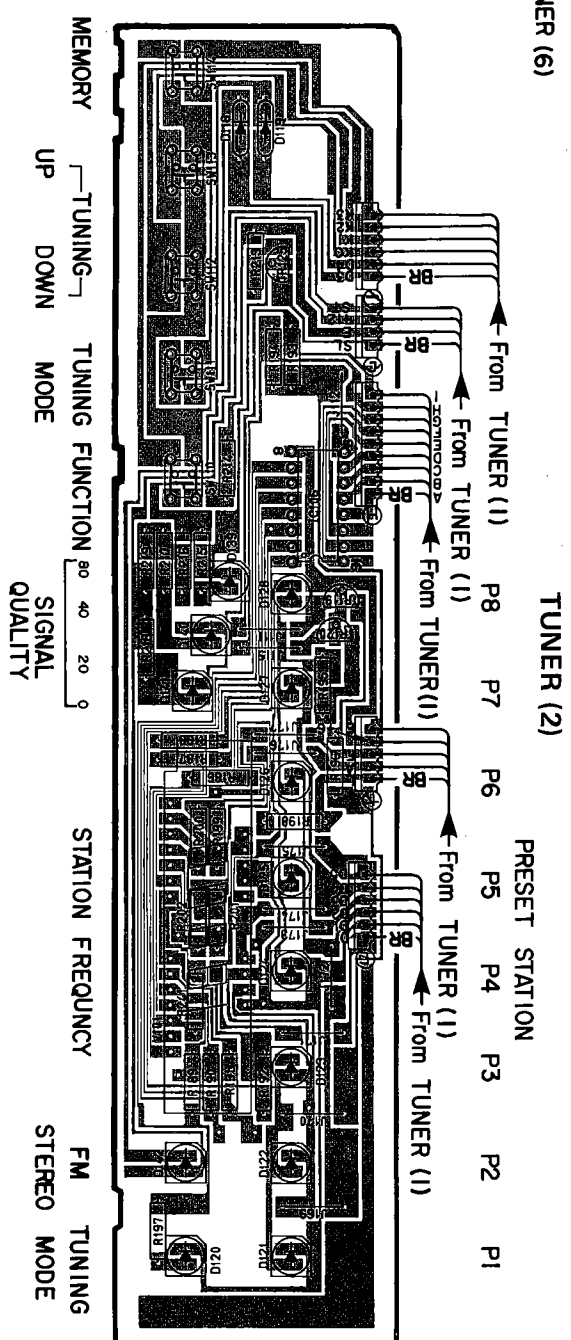
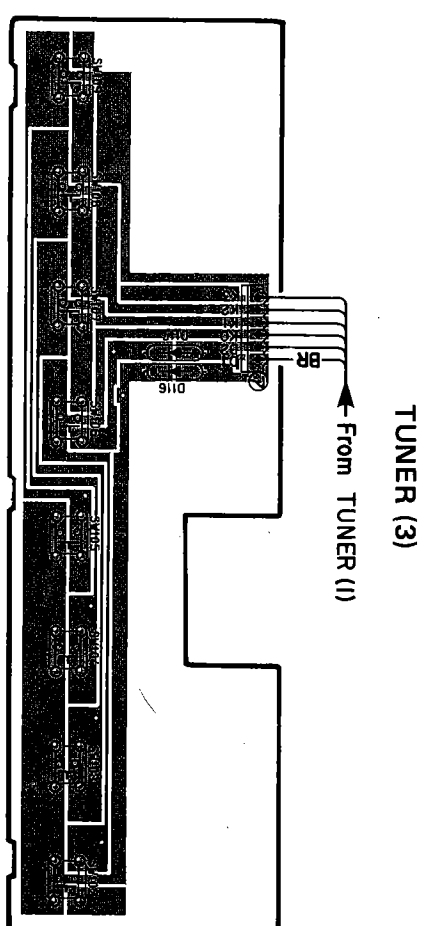


**PRINTED CIRCUIT BOARD . . . . . G, B models**

**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      |



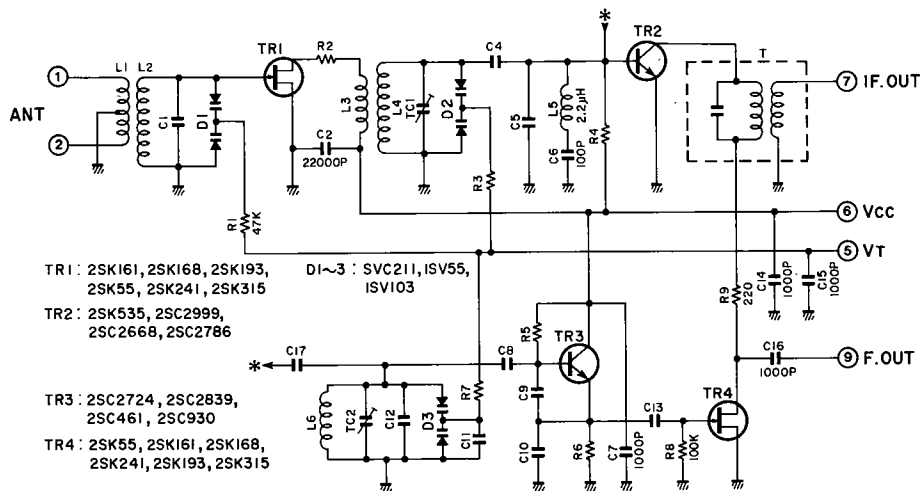


**■ WIRING**

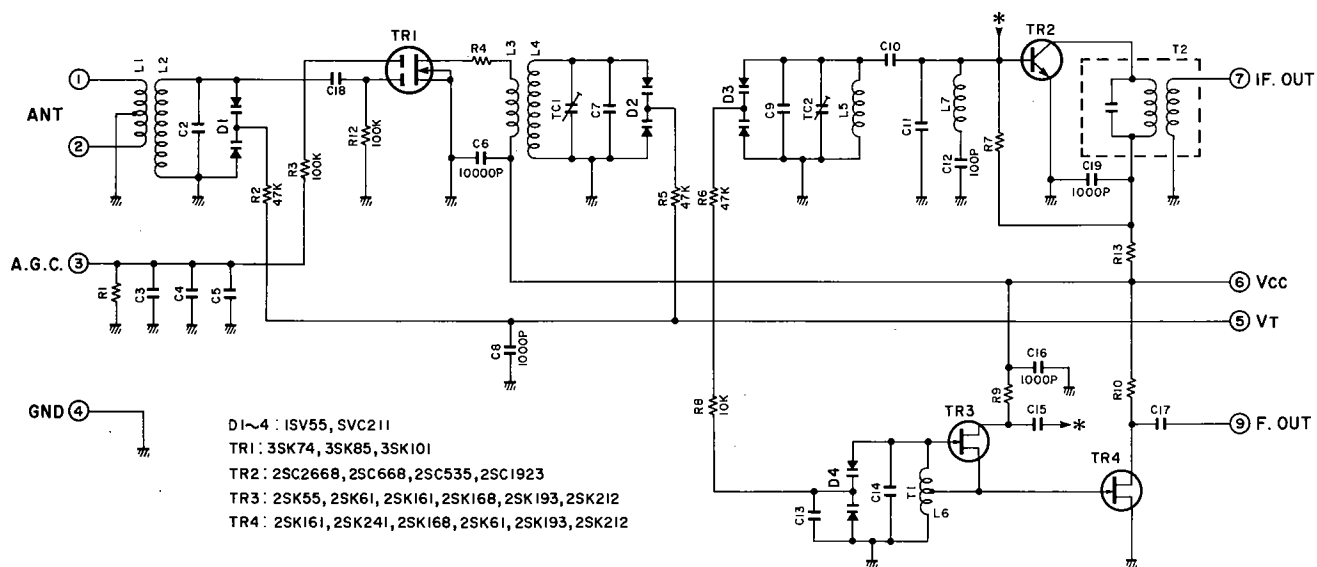
**SCHEMATIC DIAGRAM**

## • FRONT END PACK (PK101)

## R.U.C.A models



## G.B models



# PARTS LIST

## ■WARNING

Components having special characteristics are marked  $\Delta$  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." HJ350000 or equivalent.

T-520/17

T-520/17

## ■ 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 | " 0.01 $\mu$ F 50V                  | "             | C102,103,105,107~110,115<br>116,119,121~123,126,129<br>131,132,155,164,169,181 |              |           |     |
|          | FG 24:41:00 | " 0.01 $\mu$ F 50V                  | "             | C137, 140                                                                      |              | G, B      |     |
|          | FG 24:42:20 | " 0.022 $\mu$ F 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 47000 $\mu$ F 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 | " 0.01 $\mu$ F 50V                  | "             | C190                                                                           |              | U, C      |     |
|          | UA 25:43:30 | " 0.033 $\mu$ F 50V                 | "             | C190                                                                           |              | R,A,G,B   |     |
|          | UA 25:42:20 | " 0.022 $\mu$ F 50V                 | "             | C174                                                                           |              | G         |     |
|          | UA 25:44:70 | " 0.047 $\mu$ F 50V                 | "             | "                                                                              |              | R,U,C,A,B |     |
|          | UA 25:44:70 | " 0.047 $\mu$ F 50V                 | "             | C142, 171                                                                      |              |           |     |
|          | UA 25:44:70 | " 0.047 $\mu$ F 50V                 | "             | C145                                                                           |              | G, B      |     |
|          | UL 46:61:00 | Electrolytic Cap 1 $\mu$ F 50V      | ケミコン          | C141                                                                           |              |           |     |
|          | UL 46:61:00 | " 1 $\mu$ F 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 470 $\mu$ F 6.3V   | ケミコン          | C147                                                                           |              |           |     |
|          | UW 93:71:00 | " 10 $\mu$ F 16V                    | "             | C124,130,157,159<br>161,163,179,180,117                                        |              |           |     |
|          | UW 93:73:30 | " 33 $\mu$ F 16V                    | "             | C165                                                                           |              |           |     |
|          | UW 93:81:00 | " 100 $\mu$ F 16V                   | "             | C101, 160, 162                                                                 |              |           |     |
|          | UW 93:82:20 | " 220 $\mu$ F 16V                   | "             | C158, 166                                                                      |              |           |     |
|          | UW 94:92:20 | " 2200 $\mu$ F 25V                  | "             | C163                                                                           |              |           |     |
|          | UW 96:54:70 | " 0.47 $\mu$ F 50V                  | "             | C120, 152, 170                                                                 |              |           |     |
|          | UJ 16:61:00 | " 1 $\mu$ F 50V                     | "             | C104,106,151,167<br>169,172,173,181,182                                        |              |           |     |
|          | UJ 16:62:20 | " 2.2 $\mu$ F 50V                   | "             | C112                                                                           |              |           |     |
|          | UW 96:63:30 | " 3.3 $\mu$ F 50V                   | "             | C175                                                                           |              |           |     |
|          | UW 96:64:70 | " 4.7 $\mu$ F 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                         | A M A N T コイル | T106                                                                           |              | G, B      |     |
|          | GE 10:06:00 | AM IFT Coil 450kHz                  | A M I F T 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                         | L W O S C コイル | T104                                                                           |              | G, B      |     |

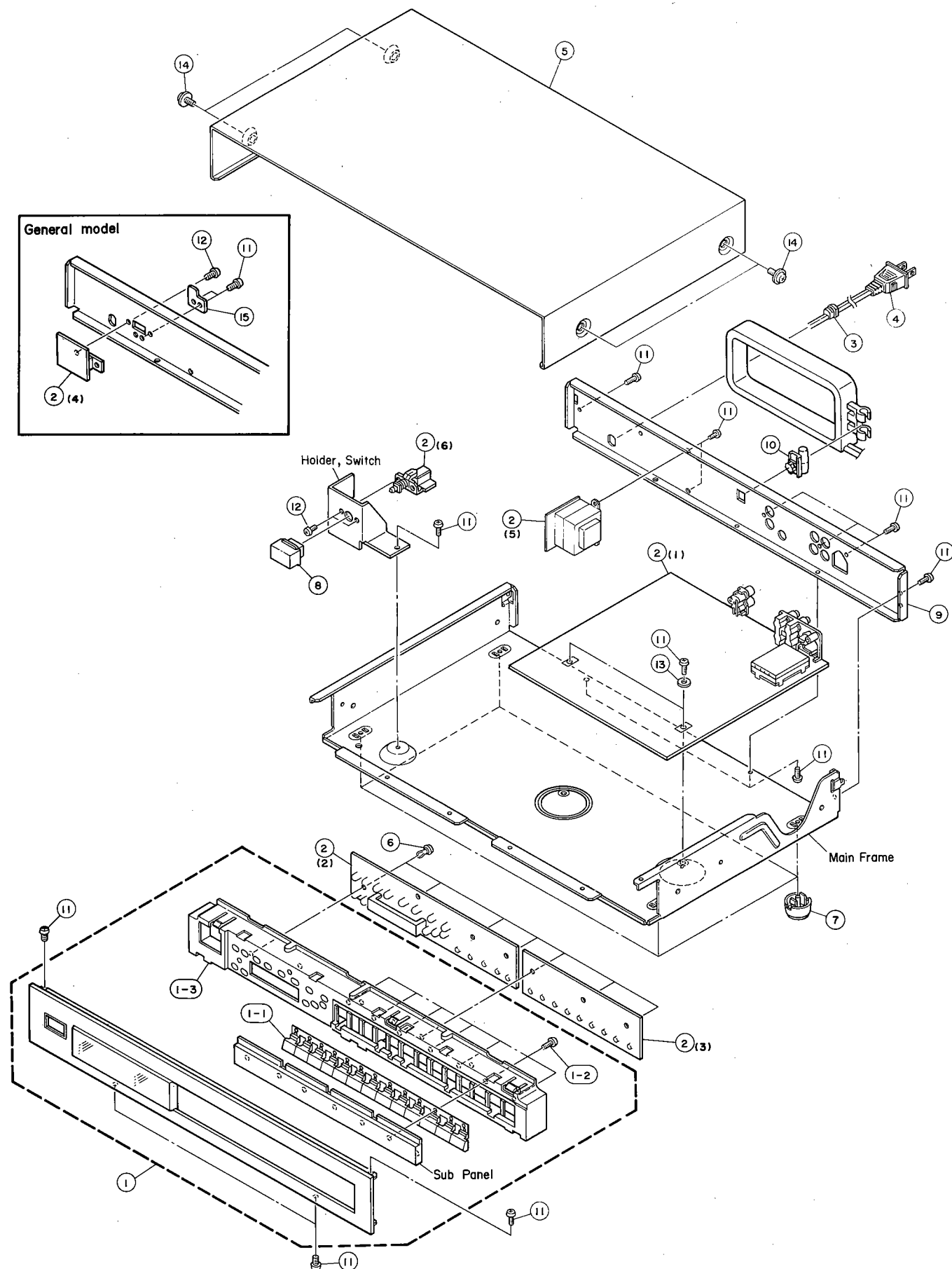
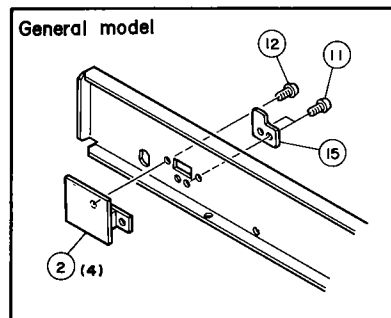
※New Parts (新規部品)

| Ref. No. | Part No.    | Description                 | 部 品 名                 | Remarks       | Common Model                                  | Markets          | ランク        |
|----------|-------------|-----------------------------|-----------------------|---------------|-----------------------------------------------|------------------|------------|
| ※        | GE 90:09:10 | LW ANT Coil                 | L W A N T コイル         | T107          | Inter-changeable                              | G, B             |            |
|          | GE 90:09:30 | "                           | "                     | "             |                                               | G, B             |            |
|          | GE 90:09:40 | AM OSC Coil                 | A M O S C 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                    | 12 $\mu$ H            | 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       | F M セラミックフィルタ | CF101, 102                                    |                  |            |
|          | GG 00:06:60 | AM Ceramic Filter           | SFU450B9              | A M セラミックフィルタ | 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             | 2.2M $\Omega$ 1/2W    | カーボン抵抗        | R237                                          | U, C             |            |
|          | HL 42:43:90 | Metal Oxide Film Resistor   | 39 $\Omega$ 2W        | 酸化金抵抗         | R203                                          |                  |            |
|          | HV 45:68:20 | Flame Proof Carbon Resistor | 8.2k $\Omega$ RDF25SL | 不燃化カーボン抵抗     | R115                                          |                  |            |
|          | HT 37:04:20 | Pre-Set Potentiometer       | B100k $\Omega$        | 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)         | "             | "                                             |                  |            |
|          | iA 11:15:10 | "                           | 2SA1115 (E, F)        | "             | TR104,105,107,116                             | Inter-changeable | G, B       |
|          | iA 09:33:00 | "                           | 2SA933 (Q, R)         | "             | "                                             |                  | G, B       |
|          | iC 17:40:00 | "                           | 2SC1740 (S, R)        | "             | TR101,109,110,113,117<br>~120,124,125,127,128 | Inter-changeable |            |
|          | iC 26:03:10 | "                           | 2SC2603 (E, F)        | "             | "                                             |                  |            |
|          | iC 17:40:00 | "                           | 2SC1740 (S, R)        | "             | TR108, 111, 112                               | Inter-changeable | G, B       |
|          | iC 26:03:10 | "                           | 2SC2603 (E, F)        | "             | "                                             |                  | G, B       |
|          | iD 08:80:20 | "                           | 2SD880 (O, Y)         | "             | TR121, 122                                    |                  |            |
|          | iE 10:12:30 | FET                         | 2SK105 (E, F)         | F E T         | TR102                                         | Inter-changeable |            |
|          | iE 10:26:00 | "                           | 2SK246 (Y)            | "             | "                                             |                  |            |
|          | 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~<br>119,135~138,143~146      | Inter-changeable |            |
|          | iF 00:00:40 | "                           | IS1555                | "             | "                                             |                  |            |
|          | iF 00:06:70 | "                           | IS2473                | "             | D101~103,107,108                              | Inter-changeable | G, B       |
|          | iF 00:00:40 | "                           | IS1555                | "             | "                                             |                  | G, B       |
|          | iF 00:06:70 | "                           | IS2473                | "             | D111, 115                                     | Inter-changeable | R          |
|          | iF 00:00:40 | "                           | IS1555                | "             | "                                             |                  | R          |
|          | iF 00:06:70 | "                           | IS2473                | "             | D113                                          | Interchangeable  | R, U, A, C |
|          | iF 00:00:40 | "                           | IS1555                | "             | "                                             |                  | R, U, A, C |
|          | iF 00:06:70 | "                           | IS2473                | "             | D112                                          | Interchangeable  | A, G, B    |
|          | iF 00:00:40 | "                           | IS1555                | "             | "                                             |                  | 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                | "             | "                                             |                  | G, B       |
|          | iF 00:42:70 | LED (Red)                   | SLR-55URC3H           | L E D (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)

※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 A s s '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 A s s '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    | V S ス ト ッ パ ー       |                  |                 | R          |     |
|          | CB 06 92 50 | Binding Tie                | BK-1                | イ ン シ ュ ロ ッ ク タイ |                 |            |     |

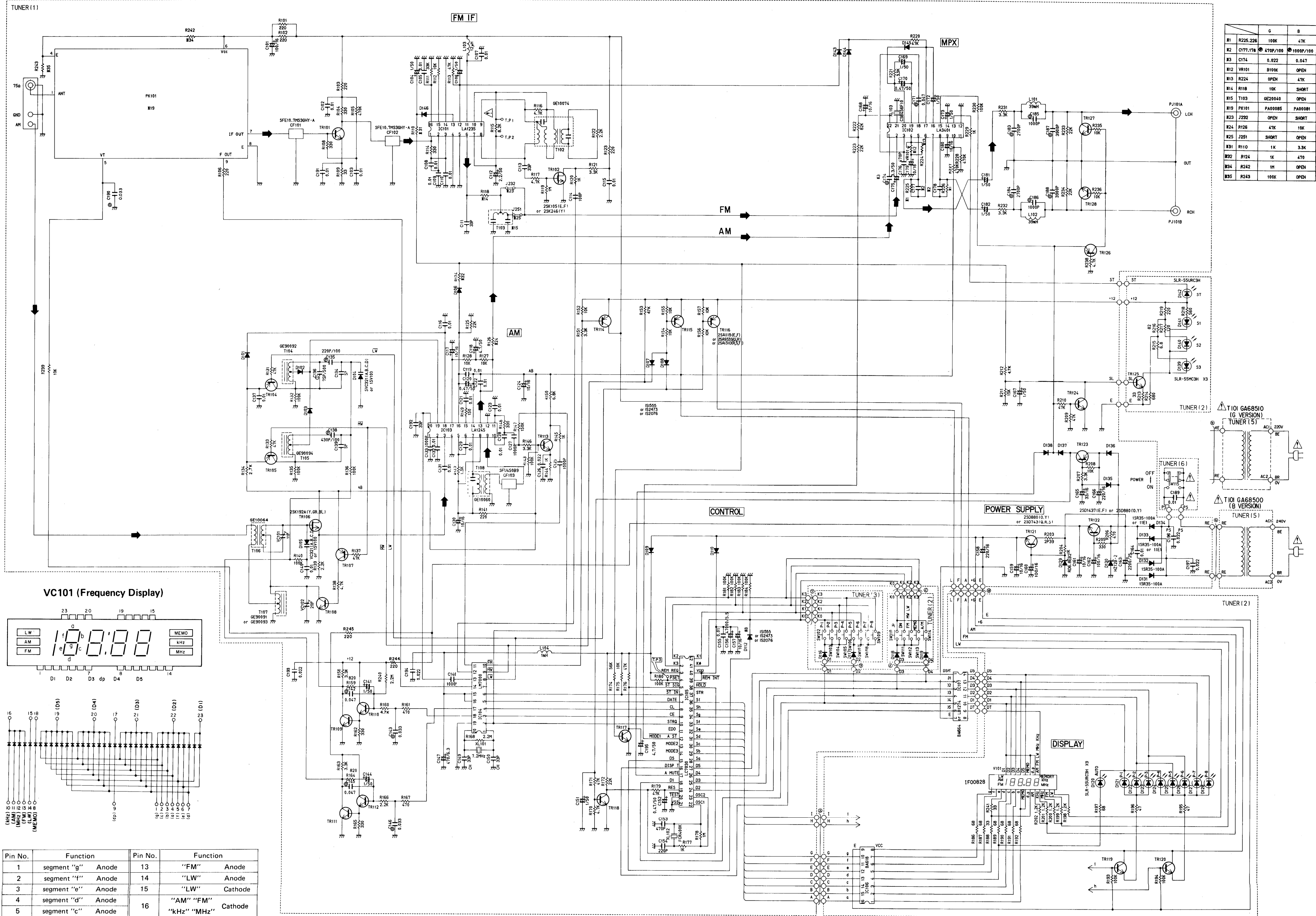
※New Parts (新規部品)

[illegible]

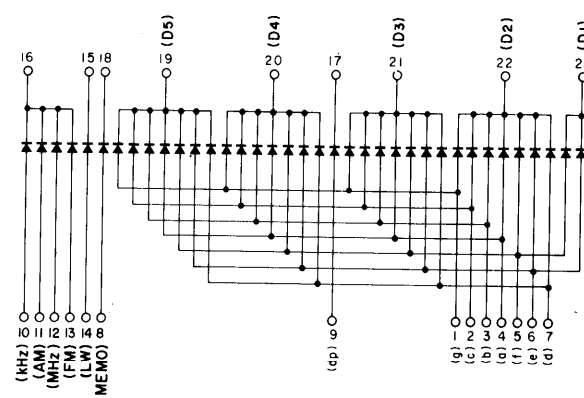
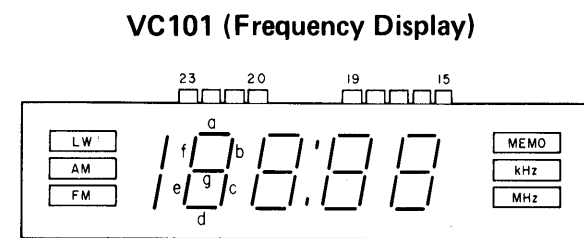
※New Parts (新規部品)



SCHEMATIC DIAGRAM . . . . G, B models



|     | 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 | J292      | 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          |



| 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" Cathode   |
| 5       | segment "c" Anode   | 17      | "kHz" "MHz" Cathode |
| 6       | segment "b" Anode   | 18      | "MEMO" Cathode      |
| 7       | segment "a" Anode   | 19      | digit "5" Anode     |
| 8       | "MEMO" Anode        | 20      | digit "4" Anode     |
| 9       | decimal point Anode | 21      | digit "3" Anode     |
| 10      | "kHz" Anode         | 22      | digit "2" Anode     |
| 11      | "AM" Anode          | 23      | digit "1" Anode     |
| 12      | "MHz" Anode         |         |                     |

LC7030

LM7000  
LA1245

LA3400

LA1235  
BA618

LB1274

2SD880 (O, Y)

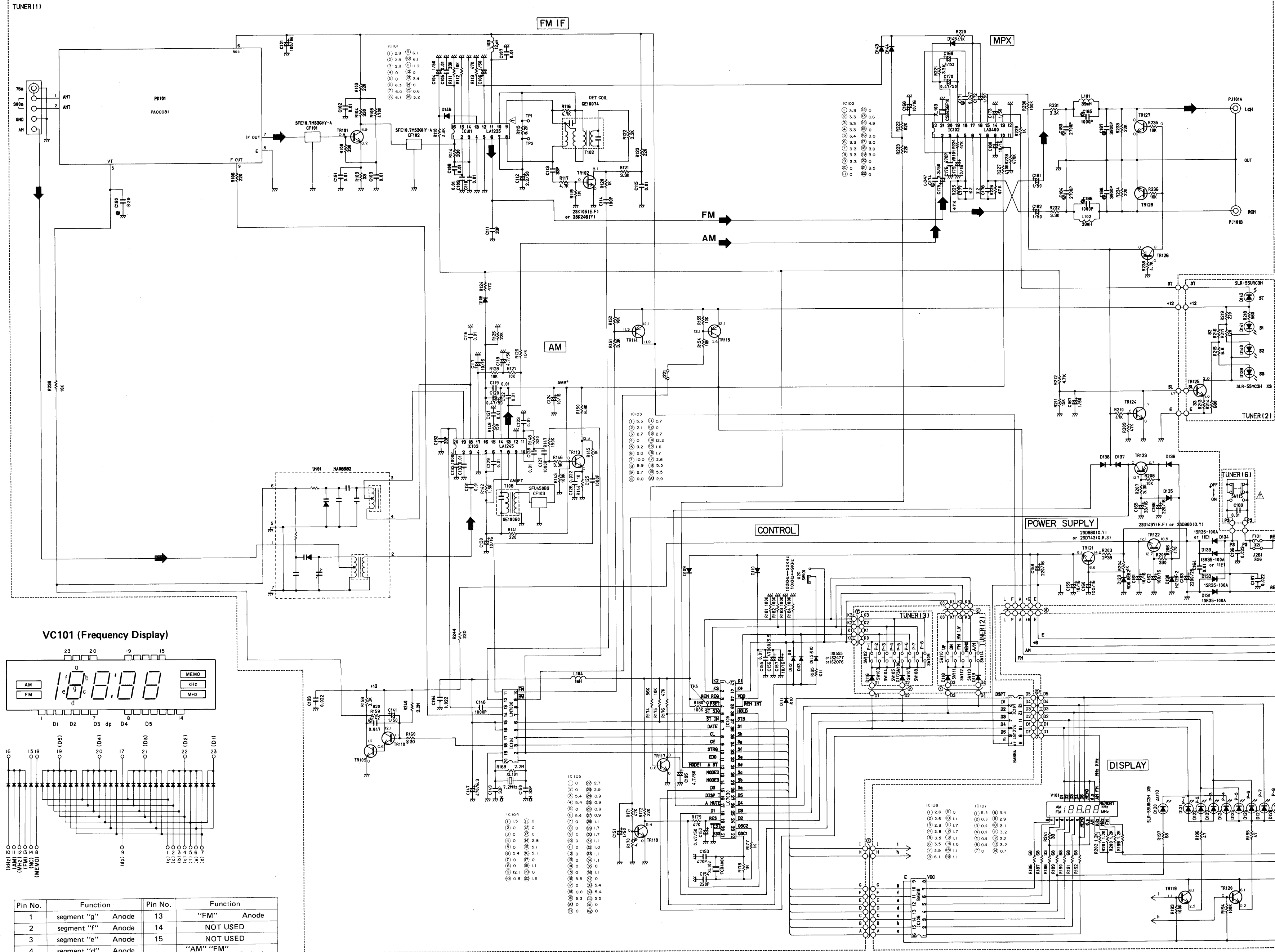
2SA1115 (E, F)  
2SA933 (Q, R)  
2SC2603 (E, F)  
2SC1740 (S, R)

2SK105 (E, F)  
2SK246 (Y)  
2SK192A (Y, GR, BL)

1S2076  
1S2473  
1S1555  
RD6.8E2  
HZ12B-2  
1SR35-100A

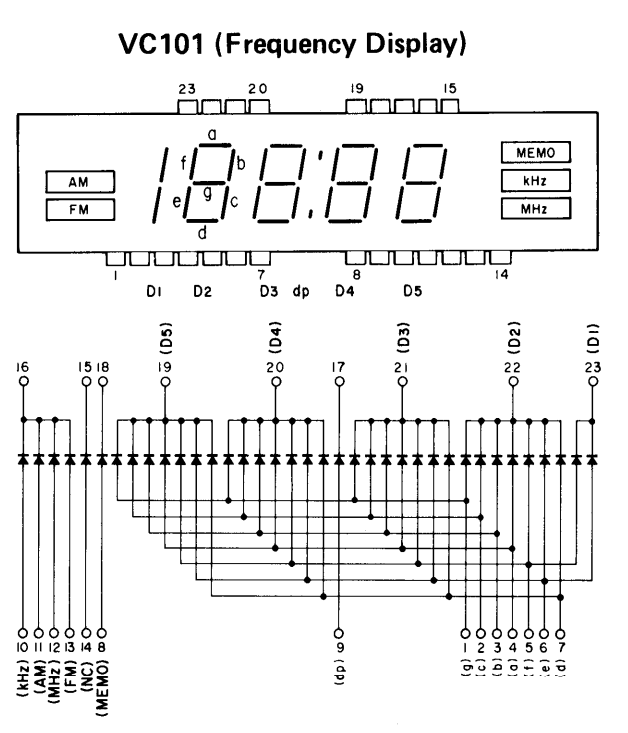
• Components having special characteristics are marked  $\Delta$  and must be replaced with parts having specifications equal to those originally installed.  
• Schematic Diagram is subject to change without notice.

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

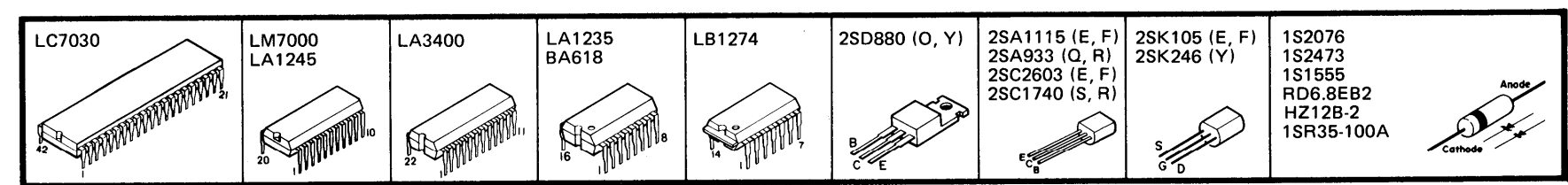


\* MARK — SEE BELOW TABLE

|     | R        | U, C                   | A         |
|-----|----------|------------------------|-----------|
| R2  | C17, 17B | 1500P/100              | 1000P/100 |
| R8  | D12      | OPEN                   | OPEN      |
| R10 | D11, 11S | 15K5 of 15K73 or 15K76 | OPEN      |
| R11 | R185     | 10K                    | OPEN      |
| R20 | SW 101   | KA 4012B               | OPEN      |
| R21 | F101     | OPEN                   | 5SA 250V  |
| R25 | J261     | SHORT                  | OPEN      |
| R27 | R237     | OPEN                   | 1/2P22M   |
| R28 | T 101    | GA68480                | GA68490   |
| R29 | C190     | 0.033                  | 0.01      |
| R30 | R160     | 4.7K                   | 22K       |



| 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" Cathode   |
| 5       | segment "c" Anode   | 17      | "kHz" "MHz" Cathode |
| 6       | segment "b" Anode   | 18      | "MEMO" Cathode      |
| 7       | segment "a" Anode   | 19      | digit "5" Anode     |
| 8       | "MEMO" Anode        | 20      | digit "4" Anode     |
| 9       | decimal point Anode | 21      | digit "3" Anode     |
| 10      | "kHz" Anode         | 22      | digit "2" Anode     |
| 11      | "AM" Anode          | 23      | digit "1" Anode     |
| 12      | "MHz" Anode         |         |                     |



• All voltages measured with a 10MS1/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  $\Delta$  and must be replaced with parts having specifications equal to those originally installed.  
• Schematic Diagram is subject to change without notice.