Ref. No. 0M3361

# ONKYO SERVICE MANUAL

## QUARTZ SYNTHESIZED TUNER AMPLIFIER MODEL TX-811

**Black model**

| | |
|---|---|
| BHUD, BHUDN | 120V AC, 60Hz |
| BHUG | 220V AC, 50Hz |
| BHUQA, BHUQB | 240V AC, 50Hz |
| BHUW | 120 or 220V AC, 50/60Hz |

**SAFETY-RELATED COMPONENT WARNING!!**
COMPONENTS IDENTIFIED BY MARK ⚠ ON THE SCHEMATIC DIAGRAM AND IN THE PARTS LIST ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE THESE COMPONENTS WITH ONKYO PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL.

MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

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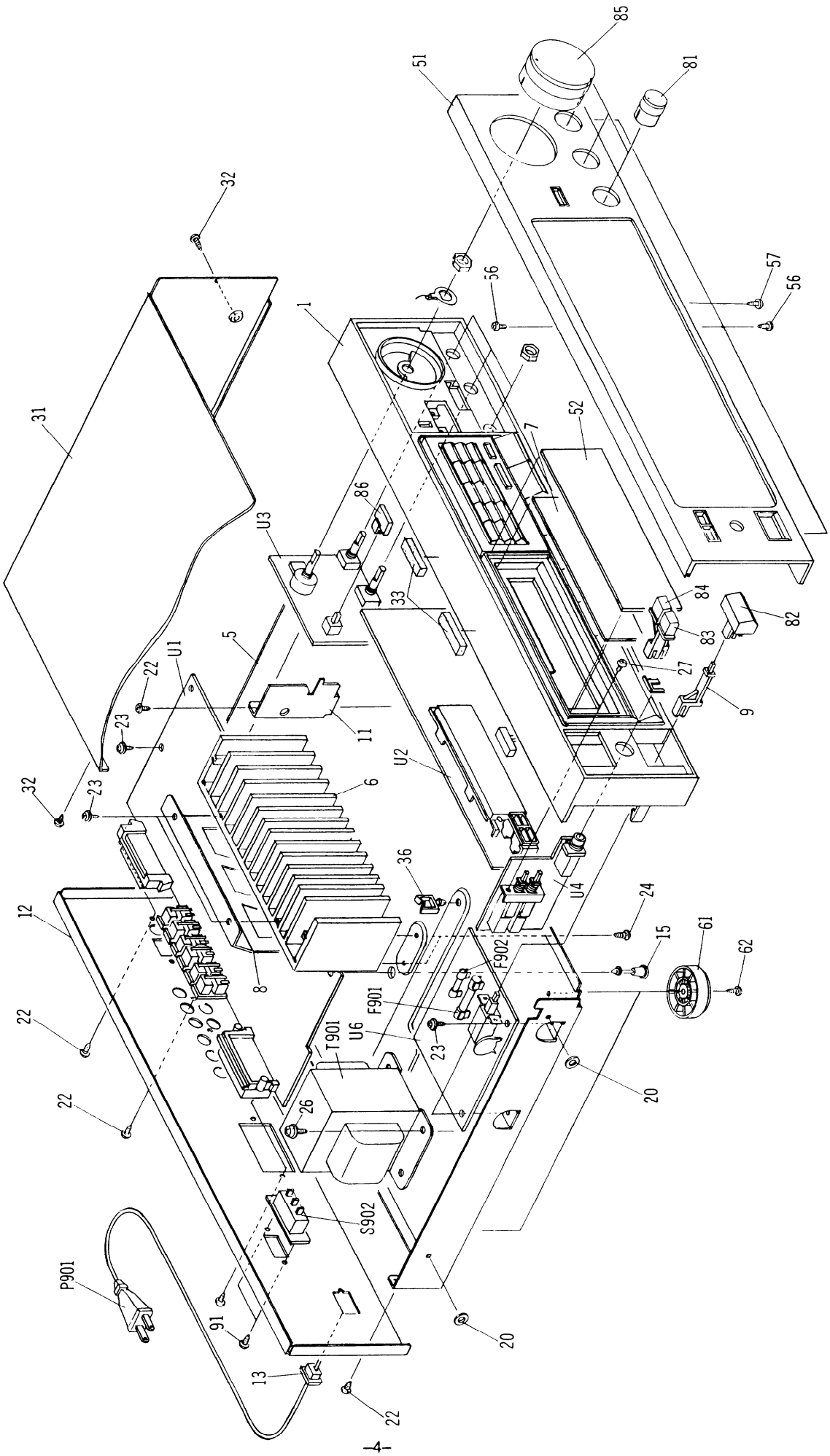
ONKYO AUDIO COMPONENTS

# EXPLODED VIEW



# PARTS LIST

| REF. NO. | PART NO. | DESCRIPTION |
|---|---|---|
| 1 | 27110540Y | Front bracket ass'y |
| 5 | 27100187BY | Chassis |
| 6 | 27160210Y | Radiator |
| 7 | 28133241Y | Back plate |
| 8 | 27130574Y | Bracket, IC |
| 9 | 27273116Y | Joint, POWER |
| 11 | 27130577Y | Bracket, SHIELD |
| 12 | 27121320Y | Back panel <D> |
| | 27121320-1Y | Back panel <G> |
| | 27121320-3Y | Back panel <W> |
| | 27121320-4Y | Back panel <QA/QB> |
| 13 | 27300750 | ⚠ Bushing(Strainrelief) |
| 15 | 27190524 | KGLS-14R, Holder |
| 18 | 28141058Y | 14×50×25, Cushion |
| 20 | 27270212 | Spacer <G/W/QA/QB> |
| 22 | 834430088 | 3TTS+8B(BC), Tapping screw |
| 23 | 831130088 | 3TTW+8B, Tapping screw |
| 26 | 830440089 | 4TTC+8C(BC), Tapping screw |
| 27 | 82143006 | 3P+6FN(BC), Pan head screw |
| 31 | 28184432Y | Top cover |
| 32 | 834430088 | 3TTS+8B(BC), Tapping screw |
| 33 | 28140020Y | Cushion |
| 36 | 27300833 | Clamp |
| 51 | 1A207121 | Front panel ass'y |
| 52 | 28191504Y | Clear plate |
| 56 | 833430080 | 3TTP+8P(BC), Tapping screw |
| 57 | 834430088 | 3TTS+8B(BC), Tapping screw |
| 61 | 27175219CY | Leg |
| 62 | 834430088 | 3TTS+8B(BC), Tapping screw |
| 81 | 28323310AY | Knob, TONE |
| 82 | 28323241-1AY | Knob, POWER |
| 83 | 28323314Y | Knob, SPEAKER A |
| 84 | 28323316Y | Knob, SPEAKER B |
| 85 | 28323689-1 | Knob, VOLUME |
| 86 | 28323638Y | Knob, LOUDNESS |
| 91 | 82143006 | 3P+6F(BC), Pan head screw <W> |
| F901 | 252049 | ⚠ 4A(ST-6), Fuse, primary <D/W> |
| F902 | 252074 | ⚠ 2A-SE-EAK, Fuse, primary <G/W/QA/QB> |
| P901 | 253163 | ⚠ AS-UC-6#18, Power supply cord <D> |
| | 253164Y | ⚠ AS-CEE, Power supply cord <G/W> |
| | 253118 | ⚠ AS-SAA, Power supply cord <QA> |
| | 2300413 | ⚠ Power supply cord <QB> |

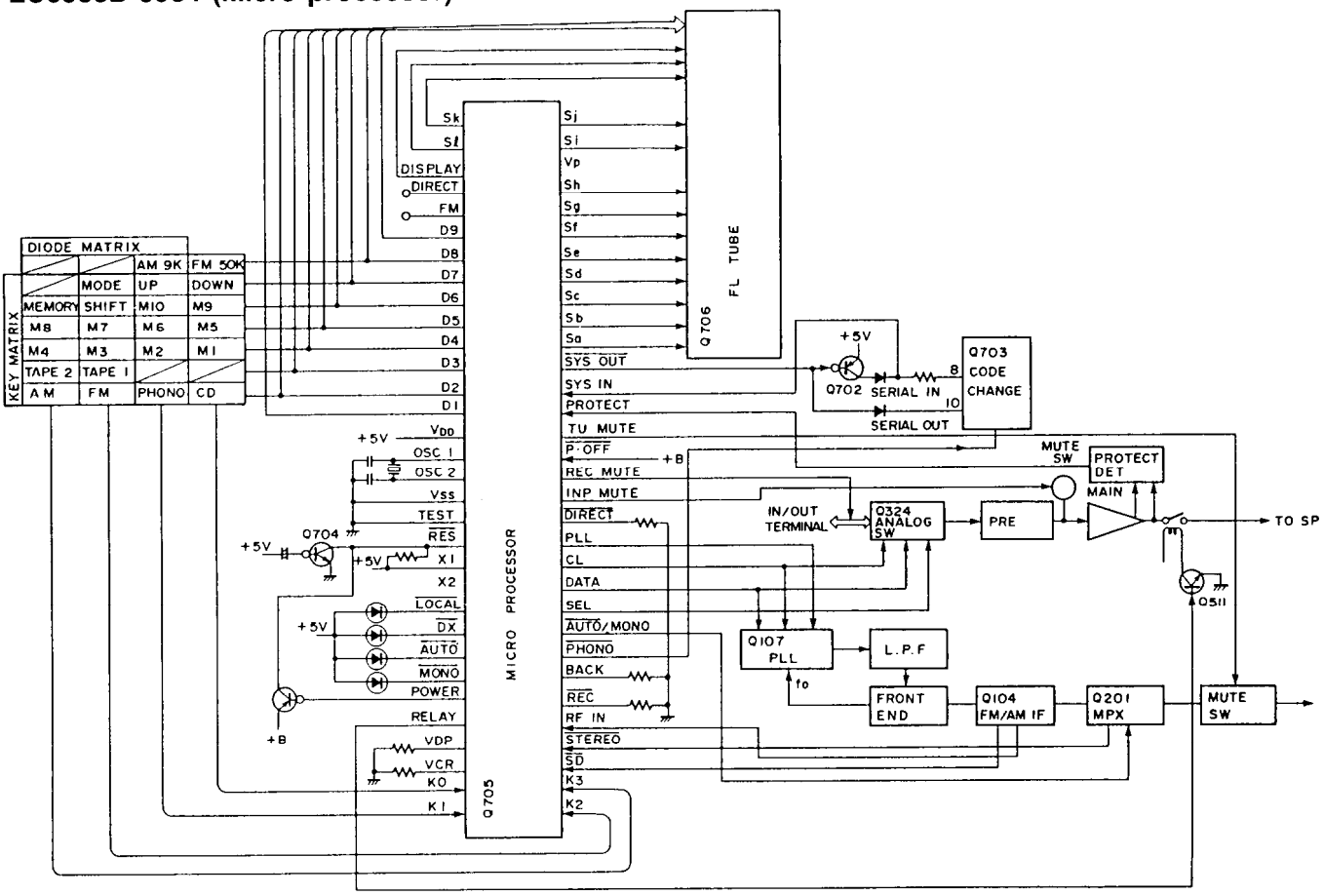
| REF. NO. | PART NO. | DESCRIPTION |
|---|---|---|
| S902 | 25065123 | ⚠ NSS-1258P, Voltage selector switch <W> |
| T901 | 2300506Y | ⚠ NPT-1028DM, Power transformer <D> |
| | 2300507Y | ⚠ NPT-1028GM, Power transformer <G> |
| | 2300508Y | ⚠ NPT-1028DGM, Power transformer <W> |
| | 2300509Y | ⚠ NPT-1028QM, Power transformer <QA/QB> |
| U1 | 1A207558-4 | NAAR-3558-4, Main circuit pc board ass'y <D> |
| | 1A207558-4A | NAAR-3558-4A, Main circuit pc board ass'y <G/QA/QB> |
| | 1A207558-4B | NAAR-3558-4B, Main circuit pc board ass'y <W> |
| U2 | 1A207559-4 | NADIS-3559-4, Display circuit pc board ass'y <D> |
| | 1A207559-4A | NADIS-3559-4A, Display circuit pc board ass'y <G/QA/QB> |
| | 1A207559-4B | NADIS-3559-4B, Display circuit pc board ass'y <W> |
| U3 | 1A207560-4 | NAAF-3560-4, Tone circuit pc board ass'y <D> |
| | 1A207560-4A | NAAF-3560-4A, Tone circuit pc board ass'y <G/W/QA/QB> |
| U4 | 1A207561-4 | NASW-3561-4, Speaker switch pc board ass'y <D> |
| | 1A207561-4A | NASW-3561-4A, Speaker switch pc board ass'y <G/W/QA/QB> |
| U6 | 1A203563-3 | NAPS-3563-3, Power supply circuit pc board ass'y <D> |
| | 1A203563-3A | NAPS-3563-3A, Power supply circuit pc board ass'y <G/QA/QB> |
| | 1A203563-3B | NAPS-3563-3B, Power supply circuit pc board ass'y <W> |

NOTE: <D> : Only 120V model
<G> : Only 220V model
<W> : Only Worldwide model
<QA> : Only Australian model
<QB> : Only U.K. model

NOTE: THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBERS SPECIFIED.

# IC BLOCK DIAGRAM AND DESCRIPTIONS

## Q705
## LC6538D-3984 (Micro processor)




| Pin No. | Terminal | Descriptions |
|---|---|---|
| 1<br>2 | Sk<br>Sl | These are the output terminal for segment signal.<br>"H" when active. |
| 3 | DISPLAY | This is the display control output terminal. "H" during FL tube lights on. |
| 4 | DIRECT | This is the direct indicator output terminal. Not used. |
| 5 | FM | This is FM control output terminal. Not used. |
| 6<br>7<br>8<br>9<br>10<br>11<br>12<br>13<br>14 | D9<br>D8<br>D7<br>D6<br>D5<br>D4<br>D3<br>D2<br>D1 | These are the output terminal for digit and key scan signal.<br>"H" when active. |
| 15 | $V_{DD}$ | This is the device power source terminal. At the time of operation, the supply is 5V.<br>The internal data memory (RAM) is maintained by means of the super capacitor. |
| 16<br>17 | OSC1<br>OSC2 | This is the main system clock connection terminal.<br>Connect to the 4.00MHz ceramic oscillator. |
| 18 | $V_{SS}$ | Ground terminal. |
| 19 | TEST | This is the test terminal for LSI. Connect to the ground terminal. |
| 20 | $\overline{RES}$ | This is the reset terminal. Reset at the low level when the power is turned on. |
| 21<br>22 | X1<br>X2 | These are the sub clock input terminal.<br>Not used. |
| 23<br>24<br>25<br>26 | $\overline{LOCAL}$<br>$\overline{DX}$<br>$\overline{AUTO}$<br>$\overline{MONO}$ | These are the auto reception mode indicator output terminal. "L" when active. |

| Pin No. | Terminal | Descriptions |
|---|---|---|
| 27 | POWER | This is the power control output terminal. "H" when the power is turned on. |
| 28 | RELAY | This is the speaker protection relay control output terminal. "H" when active. |
| 29<br>30 | VDP<br>VCR | These are the video signal control output terminal. Not used. |
| 31<br>32<br>33<br>34 | K0<br>K1<br>K2<br>K3 | These are the key return signal input terminal. "H" when active. |
| 35 | $\overline{SD}$ | This is the auto stop input terminal. Auto tuning stops when this terminal becomes low level. |
| 36 | $\overline{STEREO}$ | This is the input terminal for detection of the stereo broadcast. "L" when stereo broadcast. |
| 37 | RF IN | This is IF signal level input terminal. DX mode when this terminal becomes the high level. |
| 38<br>39 | REC<br>BACK | These are the mode setting input terminals. |
| 40 | $\overline{PHONO}$ | This is PHONO control output terminal. "L" when selector switch is PHONO. |
| 41 | $\overline{AUTO/MONO}$ | This is AUTO/MONO switching output terminal. "L" when AUTO. |
| 42 | SEL | Connect to terminal SEL of analog switch. (Q324 LC7821) |
| 43 | DATA | This is the serial data output terminal.<br>Connect to terminal DATA of PLL IC (Q107 LM7001) and terminal DI of analog switch. |
| 44 | CLOCK | This is the serial clock output terminal.<br>Connect to terminal CI of PLL IC and terminal DI of analog switch. |
| 45 | PLL | Connect to terminal CE of PLL IC. |
| 46 | $\overline{DIRECT}$ | This is the direct control output terminal. "L" when active. |
| 47 | INP MUTE | This is the muting output terminal for audio amplifier. "H" when the selector switch is operated. |
| 48 | REC MUTE | This is the muting output terminal for recording. "H" when the selector switch is operated. |
| 49 | $\overline{P. OFF}$ | This is the input terminal for detection of stoppage of electric current.<br>"L" when the stoppage of electric current. |
| 50 | TU MUTE | This is the muting output terminal of tuner section. "H" when active. |
| 51 | PROTECT | This is the detection terminal for protection circuit. The speaker relay turns off when this terminal becomes the high level. |
| 52 | SYS IN | This is the system code input terminal. "H" when active. |
| 53 | $\overline{SYS OUT}$ | This is the system code output terminal. "L" when active. |
| 54<br>55<br>56<br>57<br>58<br>59<br>60<br>61 | Sa<br>Sb<br>Sc<br>Sd<br>Se<br>Sf<br>Sg<br>Sh | These are the segment output terminal. "H" when active. |
| 62 | VP | This is the power supply terminal for pull-down resistor. |
| 63<br>64 | Si<br>Sj | These are the segment output terminal. "H" when active. |

## Key and diode matrix

| | D1(14) | D2(13) | D3(12) | D4(11) | D5(10) | D6( 9) | D7( 8) | D8( 7) | D9( 6) |
|---|---|---|---|---|---|---|---|---|---|
| K3(34) | | AM | TAPE-2 | M4 | M8 | MEMORY | DIRECT | PSET30 | |
| K2(33) | | FM | TAPE-1 | M3 | M7 | SHIFT | FM MODE | EU1/2 | |
| KI(32) | | PHONO | VCR | M2 | M6 | M10 | UP | AM9K | VKEY |
| K0(31) | POWER | CD | VDP | M1 | M5 | M9 | DOWN | FM50K | PKEY |
| | | | | | | | | DIODE MATRIX | |

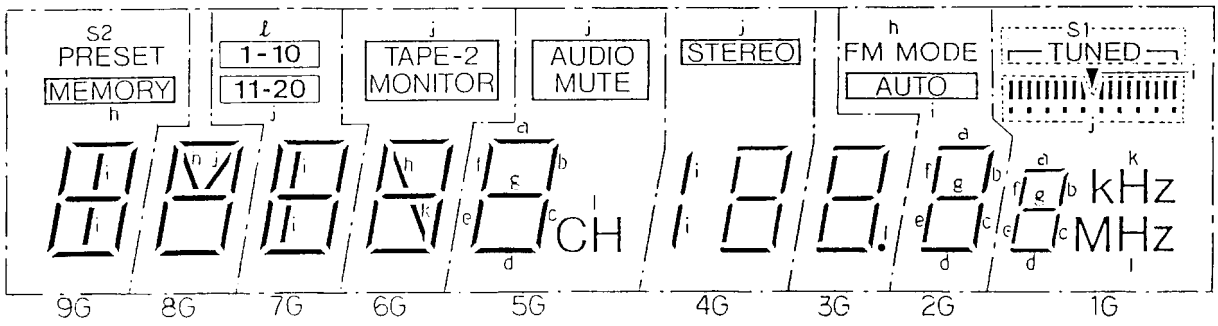
**FM50K (FM band setting)**

| FM50K | Region | Frequency range | Channel space | Reference frequency | IF frequency |
|---|---|---|---|---|---|
| 1 | Europer | 87.50 ~108.00MHz | 50kHz | 25kHz | 10.7MHz |
| 0 | U.S.A. | 87.5 ~108.0MHz | 100kHz | 25kHz | 10.7MHz |

**AM9K (AM band setting)**

| AM9K | Region | Frequency range | Channel space | Reference frequency | IF frequency |
|---|---|---|---|---|---|
| 1 | Europer | 522 ~ 1611 kHz | 9kHz | 9kHz | 450kHz |
| 0 | U.S.A. | 530 ~ 1710 kHz | 10kHz | 10kHz | 450kHz |

## Q706
## FIP9BDM8 (FL tube)




### Terminal connection

| TERMINAL NO. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ELECTRODE | F | F | NP | P (j) | 9G | P (i) | 8G | P (h) | P (g) | 7G | P (f) | NP | 6G | P (e) | P (d) | P (c) | 5G | P (b) | | |
| TERMINAL NO. | | | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 |
| ELECTRODE | | | P (a) | NP | 4G | P (k) | P (l) | NP | 3G | P (s2) | 2G | P (s1) | 1G | NP | NP | NP | 1G | NP | F | F |

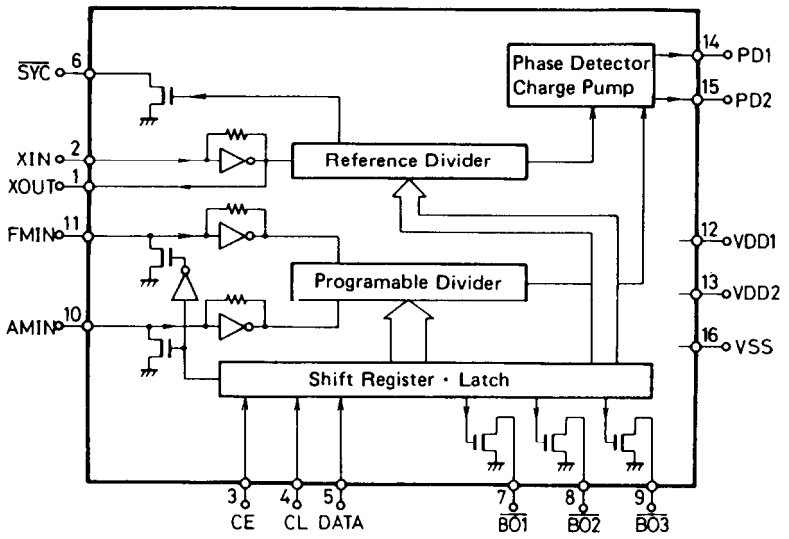
Notes F: Filament NP: No Pin
G: Grid
P: Anode

### Connection of fluorescent tube and microporcessor

| | D9 (6) | D8 (7) | D7 (8) | D6 (9) | D5 (10) | D4 (11) | D3 (12) | D2 (13) | D1 (14) |
|---|---|---|---|---|---|---|---|---|---|
| Sa (54) | a | a | a | a | a | a | a | a | a |
| Sb (55) | b | b | b | b | b | b | b | b | b |
| Sc (56) | c | c | c | c | c | c | c | c | c |
| Sd (57) | d | d | d | d | d | d | d | d | d |
| Se (58) | e | e | e | e | e | e | e | e | e |
| Sf (59) | f | f | f | f | f | f | f | f | f |
| Sg (60) | g | g | g | g | g | g | g | g | g |
| Sh (61) | MEMORY | h | h | h | | | | FM MODE | |
| Si (63) | i | i | i | | | / | | AUTO | ▼ |
| Sj (64) | j | j | 11-20 | TAPE-2 | MUTING | STEREO | | MONO | IIIII |
| Sk (1) | | | k | k | k | | | | kHz |
| Sl (2) | l | | 1-10 | | CH | | | | MHz |

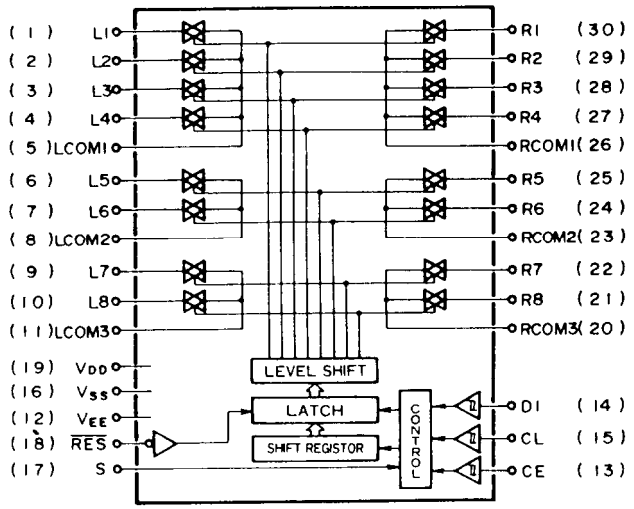
( ): Pin number of micro processor

## Q107
## LM7001 (PLL synthesizer and controller)




| Pin No. | Terminal | Description |
|---|---|---|
| 1 | XOUT | Connect to the 7.2 MHz crystal oscillator. |
| 2 | XIN | |
| 3 | CE | Chip enable terminal. Connect to the PLL terminal of micro processor. |
| 4 | CL | Serial clock input terminal. Connect to the CLOCK terminal of microprocessor. |
| 5 | DATA | Serial data input terminal. Connect to the DATA terminal of microprocessor. |
| 6 | $\overline{SYN}$ | Not used. |
| 7 | $\overline{BO1}$ | Not used. |
| 8 | $\overline{BO2}$ | FM control signal output terminal. "L" when FM. |
| 9 | $\overline{BO3}$ | AM control signal output terminal. "L" when AM. |
| 10 | AMIN | AM local oscillator input terminal. |
| 11 | FMIN | FM local oscillator terminal. |
| 12 | $V_{DD}1$ | Power supply terminal for back-up. |
| 13 | $V_{DD}2$ | Power supply terminal. |
| 14 | PD1 | Charge pump output of the phase detector which constitutes the PLL. High level is output when the divided local oscillator frequency is high than the reference frequency. In the opposite case, low level is output. Floating occurs when the frequencies matched. The output is applied to the variable capacitor diode in the local oscillator through the low pass filters. |
| 15 | PD2 | |
| 16 | Vss | Ground terminal. |

## Q324
## LC7821 (Analog switch)




Serial data composition — Switch

| A0 | A1 | A2 | A3 | SW 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ADDRESS | | | | | | | | | | | |
| 0 | 1 | 0 | 1 | CD | PHPNO | TUNER | VDP | TAPE 1 REC | TAPE 1 PB | SOURCE | TAPE 2 |

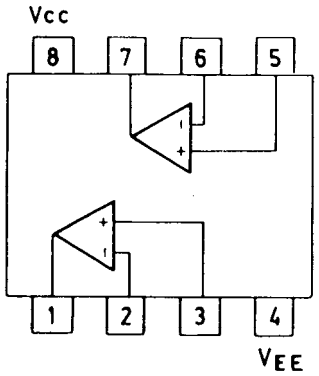
The source becomes ON when the bit of switch becomes the high level.

(Q312)

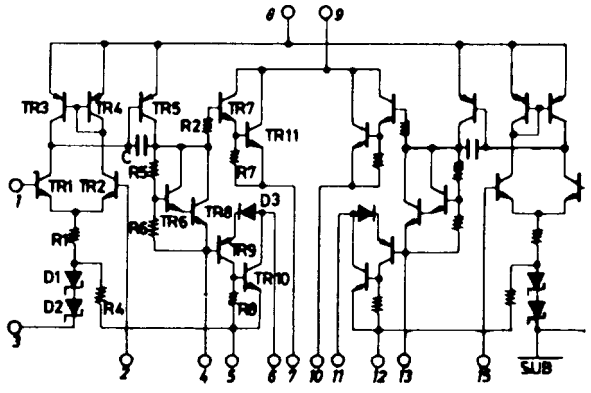
| Pin No. | Terminal | Description |
|---|---|---|
| 1 | CD | Input/output terminals of audio signal of right channel. Control to the inside analog switch at the serial data. |
| 2 | —— | |
| 3 | PHONO | |
| 4 | TUNER | |
| 5 | L COM 1 | |
| 6 | VDP | |
| 7 | VCR PLAY | |
| 8 | L COM 2 | |
| 9 | TAPE 1 PLAY | |
| 10 | —— | |
| 11 | L COM 3 | |
| 12 | $V_{EE}$ | Negative power supply terminal. (−15V) |
| 13 | CE | Chip enable terminal. Connect to SEL terminal of micro processor. |
| 14 | DI | Serial data input terminal. Connect to DATA terminal of micro processor. |
| 15 | CL | Serial clock input terminal. Connect to CLOCK terminal of micro processor. |

| Pin No. | Terminal | Description |
|---|---|---|
| 16 | Vss | Ground terminal. |
| 17 | S | Selector terminal. |
| 18 | RES | Reset terminal. When power is turned ON, the condition of the analog switch is not determined, but when this terminal is "L", all analog switches are OFF. |
| 19 | $V_{DD}$ | Power supply terminal. (+15V) |
| 20 | R COM 3 | Input/output terminals of audio signal of left channel. Control to the inside analog switch at the serial data. |
| 21 | —— | |
| 22 | TAPE 1 PLAY | |
| 23 | R COM 2 | |
| 24 | VCR PLAY | |
| 25 | VDP | |
| 26 | R COM 1 | |
| 27 | TUNER | |
| 28 | PHONO | |
| 29 | —— | |
| 30 | CD | |

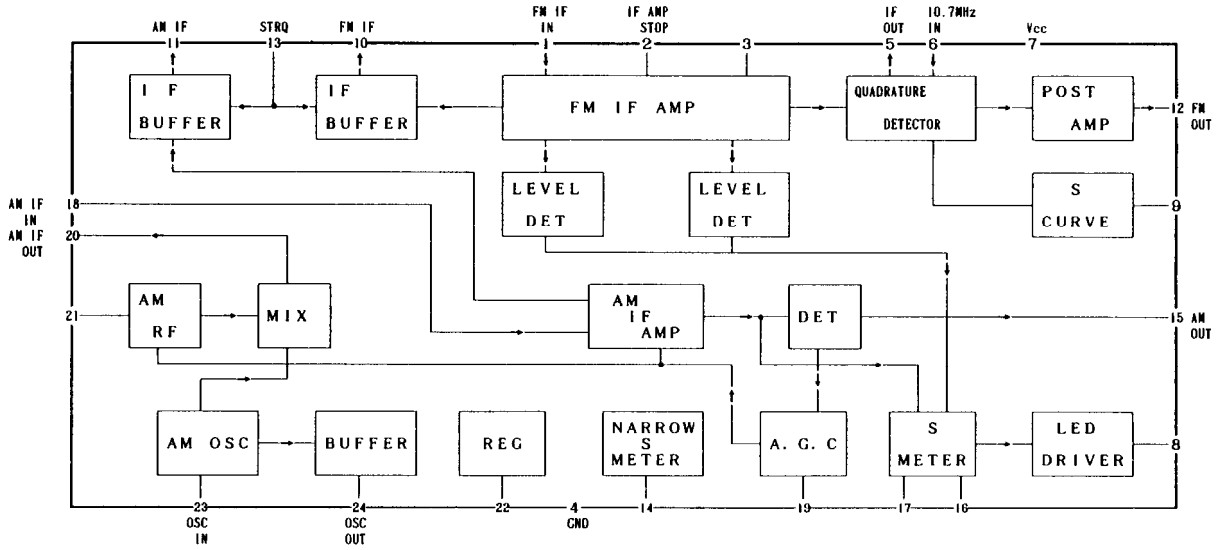
## Q301, Q401, Q402
## NJM4558D-X (Operation amplifier)



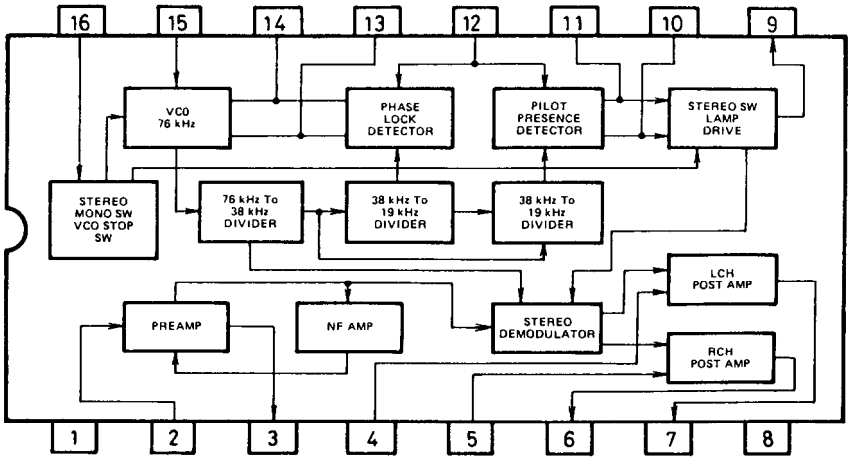

## Q501
## STK4151V (Power amplifier IC)



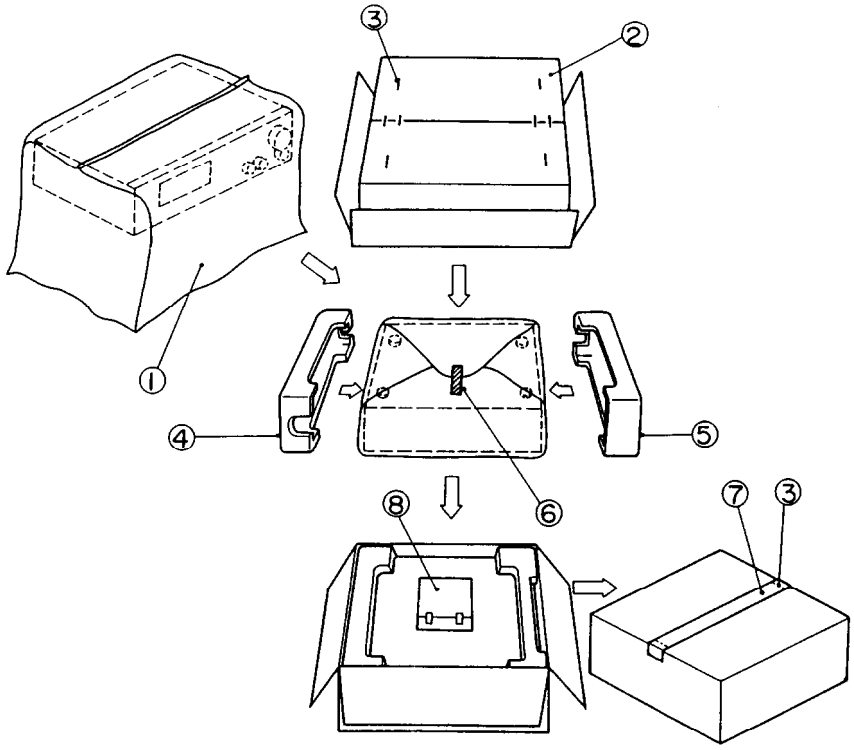
## Q104
## LN1266 (FM IF & AM radio system)




## Q201
## AN7470 (Stereo decoder)



# PACKING VIEW




| REF. NO. | PART NO. | DESCRIPTION |
|---|---|---|
| 1 | 29100034AY | 850 ×650mm, Poly-vinyl bag |
| 2 | 29052022Y | Master carton box |
| 3 | 282301 | Sealing hook |
| 4 | 29091328BY | Pad R |
| 5 | 29091327BY | Pad L |
| 6 | 261504 | Adhesive tape |
| 7 | 260012 | Damplon tape |
| 8 | Accessary bag ass'y | |
| | **–120V model–** | |
| | 29341487Y | Instruction manual |
| | 29341488Y | Instruction manual (Canadian model) |
| | 292064B | FM antenna |
| | 232140 | NMA-3057, AM loop antenna |
| | 29100097Y | 250 ×350mm, Poly-vinyl bag |
| | 29365019Y | Warranty card (U.S.A. model) |
| | 29358002GY | Service station list (U.S.A. model) |
| | **–220V/240V models–** | |
| | 29341488Y | Instruction manual |
| | 292092 | FM antenna |
| | 232140 | NMA-3057, AM loop antenna |
| | 29100097Y | 250 ×350mm, Poly-vinyl bag |
| | 25060123 | FM adaptor (240V model) |
| | **–Worldwide model–** | |
| | 29341488Y | Instruction manual |
| | 292092 | FM antenna |
| | 232140 | NMA-3057, AM loop antenna |
| | 29100097Y | 250 ×350mm, Poly-vinyl bag |
| | 25060123 | FM adaptor |
| | 25055040 | CV-K-2, Conversion plug |

# PRINTED CIRCUIT BOARD PARTS LIST

## MAIN CIRCUIT PC BOARD (NAAR-3558-4/4A/4B)

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | **Front end** | |
| U001 | 240084 | TFFG2U122A <D> |
| | 240085 | TFFG4E122A <G/W> |
| | **ICs** | |
| Q104 | 22240039 | LA1266 |
| Q107 | 22240090 | LM7001 |
| Q201 | 22240242 | AN7470 |
| Q301 | 222502 | NJM4558D-X |
| Q324 | 22240079 | LC7821 |
| Q501 | 222044 | STK4151V |
| Q902 | 222780125 | 78M12HF |
| Q906 | 222780055 | 78M05HF |
| | **Transistors** | |
| Q101 | 2211723 | 2SC1923-O |
| Q102 | 2210746 | 2SC945A-P <G/W> |
| Q103 | 2211255 | 2SC1815-GR |
| Q105 | 2212294 | 2SK108-D |
| Q106 | 2211255 | 2SC1815-GR |
| Q108, Q109 | 2213090 | DTA114YS |
| Q202, Q323 | 2211455 | 2SA1015-GR |
| Q203, Q204 | 2212285 | 2SC2878-A |
| Q321, Q322 | 2212286 | 2SC2878-B |
| Q503, Q504 | 2212285 or | 2SC2878-A or |
| | 2212286 | 2SC2878-B |
| Q505, Q506 | 2211455 | 2SA1015-GR |
| Q507, Q508 | 2211732 or | 2SC1845-F or |
| | 2211733 | 2SC1845-E |
| Q509, Q510 | 2211255 | 2SC1815-GR |
| Q511 | 2210746 | 2SC945A-P |
| Q903 | 2211455 | 2SA1015-GR |
| | **Diodes** | |
| D101, D102 | 223132 | 1K60 |
| D103 | 223150, | US1040, |
| | 223145 or | 1S2076TD or |
| | 223124 | 1S2473 |
| D201, D501 | 223163 | 1SS133 |
| D502 | 224150512 | 05AZ5.1Y |
| D503 | 223163 | 1SS133 |
| D901 | 22380023 | RBV401 |
| D902 | 223862 or | WL01 or |
| | 223890 | W01RL |
| D903, D904 | 224151203 | 05AZ12Z |
| D906 | 223880 or | GP101N4003 or |
| | 223896 | 1N4003F |
| D907 | 223163 | 1SS133 |
| D908 | 224152704 | 05AZ27R |
| D910 | 224150512 | 05AZ5.1Y |
| | **Transformers** | |
| L101 | 233401 | NFIF-4072 |
| L102 | 233402 | NFIF-4073 |
| L152 | 232139 | NMIF-4062 |
| | **Coils** | |
| L103 | 233383 | NMC-6070 <G/W> |
| L201, L202 | 233294 | NMC-5040 <G/W> |
| L501, L502 | 231001 | S-1.3B |
| | **RF block** | |
| L151 | 232152 | NMRF-7052 |

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | **Ceramic filters** | |
| X101, X103 | 3010071 | SFE10.7MA5 <D> |
| X101 | 3010070 | SFE10.7MS3GYA <G/W> |
| X102 | 3010137 | SFE10.7MMK <G/W> |
| X151 | 3010123 | SFZ450JL |
| X152 | 3010076 | BFU450C |
| | **X'tal** | |
| X104 | 3010158Y | XTL-7.2M |
| | **Capacitors** | |
| C001 | 354741009 | 10μF, 16V, Elect. |
| C106 | 354784799 | 0.47μF, 50V, Elect. |
| C107 | 354742209 | 22μF, 16V, Elect. |
| C108 | 354784709 | 47μF, 50V, Elect. |
| C112 | 354780229 | 2.2 μF, 50V, Elect. |
| C113 | 354784799 | 0.47μF, 50V, Elect. |
| C116 | 371122234 | 0.022 μF ±5%, 50V, Mylar |
| C117 | 371123334 | 0.033 μF ±5%, 50V, Mylar |
| C118 | 354780229 | 2.2 μF, 50V, Elect. |
| C119 | 354782299 | 0.22μF, 50V, Elect. |
| C123 | 354721019 | 100 μF, 6.3V, Elect. |
| C154 | 354780479 | 4.7 μF, 50V, Elect. |
| C155 | 354784709 | 47μF, 50V, Elect. |
| C156, C157 | 354741009 | 10μF, 16V, Elect. |
| C159 | 371123334 | 0.033 μF ±5%, 50V, Mylar |
| C160 | 371122234 | 0.022 μF ±5%, 50V, Mylar |
| C201 | 354744719 | 470 μF, 16V, Elect. |
| C202 | 354741009 | 10μF, 16V, Elect. |
| C204, C205 | 371121824 | 1800 pF±5%, 50V, Mylar <D> |
| | 371121224 | 1200pF±5%, 50V, Mylar <G> |
| | 371121524 | 1500pF ±5%, 50V, Mylar <W> |
| C206 | 371124734 | 0.047 μF ±5%, 50V, Mylar |
| C207 | 370134714 | 470pF ±5%, 100V, APS |
| C208 | 354780109 | 1 μF, 50V, Elect. |
| C209 | 354780339 | 3.3 μF, 50V, Elect. |
| C210 | 354782299 | 0.22μF, 50V, Elect. |
| C212, C213 | 354741009 | 10μF, 16V, Elect. |
| C215, C216 | 354780229 | 2.2 μF, 50V, Elect. |
| C217, C218 | 371123924 | 3900pF±5%, 50V, Mylar |
| C219 | 354780229 | 2.2 μF, 50V, Elect. |
| C301, C302 | 354780229 | 2.2 μF, 50V, Elect. |
| C307, C308 | 354721019 | 100 μF, 6.3V, Elect. |
| C309, C310 | 371126224 | 6200pF±5%, 50V, Mylar |
| C311, C312 | 371121824 | 1800pF±5%, 50V, Mylar |
| C313, C314 | 354780229 | 2.2 μF, 50V, Elect. |
| C315, C316 | 354741019 | 100 μF, 16V, Elect. |
| C333 | 354741009 | 10μF, 16V, Elect. |
| C334 | 354780229 | 2.2 μF, 50V, Elect. |
| C501, C502 | 354780229 | 2.2 μF, 50V, Elect. |
| C507, C508 | 354742219 | 220 μF, 16V, Elect. |
| C511, C512 | 354784709 | 47μF, 50V, Elect. |
| C513, C514 | 354781019 | 100 μF, 50V, Elect. |
| C515 | 354781009 | 10μF, 50V, Elect. |
| C521, C522 | 371124734 | 0.047 μF ±5%, 50V, Mylar |
| C523 | 354722219 | 220 μF, 6.3V, Elect. |
| C525 | 354780479 | 4.7 μF, 50V, Elect. |
| C526 | 354780109 | 1 μF, 50V, Elect. |
| C905, C906 | 3504207 | 6800μF, 50V, Elect. |
| C907, C908 | 354742219 | 220 μF, 16V, Elect. |
| C910, C912 | 354784709 | 47μF, 50V, Elect. |
| C911 | 354752229 | 2200μF, 25V, Elect. |
| C915, C919 | 354781009 | 10μF, 50V, Elect. |
| C917, C921 | 354741009 | 10μF, 16V, Elect. |
| | **Resistors** | |
| R101 | 5210070 or | N06HR100KBD |
| | 5210221 | Semi-fixed |

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| R201 | 5210062 or | N06HR4.7KBD or |
| | 5210216 | N06HR5KBD, Semi-fixed |
| R202 | 5210072 or | N06HR220KBD or |
| | 5210222 | N06HR200KBD, Semi-fixed |
| R513-R516 | 442523324 | 3.3kohm, 1/2W, Metal oxide film |
| R517, R518 | 442520914 | 9.1ohm, 1/2W, Metal oxide film |
| R519, R520 | 4500001 | BPR2FK-0.1, Metal plate |
| R527-R530 | 442520824 | 8.2ohm, 1/2W, Metal oxide film |
| R902, R903 | 441729114 | 910ohm, 2W, Metal oxide film |
| R904 | 441726804 | 68ohm, 2W, Metal oxide film |
| R906 | 442521004 | 10ohm, 1/2W, Metal oxide film |
| R913 | 442520104 | 1ohm, 1/2W, Metal oxide film |
| | **Terminals** | |
| P001 | 25060085 | NTM-4PDMN29, Antenna <D> |
| | 25060087 | NTM-2PDMN31, Antenna <G/W> |
| P501 | 25060093 | NTM-8PDML34, Speaker |
| P301 | 25045252 | NPJ-6PDBL124 |
| P302 | 25045213 | NPJ-6PDBL92 |
| | **Relay** | |
| RL501 | 25065339 | NRL-2P5A-DC24-046 |

## DISPLAY CIRCUIT PC BOARD (NADIS-3559-4/4A/4B)

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | **IC** | |
| Q705 | ~~22240244~~, | LC6538D-3984, |
| | ~~22240277 or~~ | LC6538D-4120 or |
| | 22240319 | LC6538D-4297 |
| | **Transistor** | |
| Q707 | 2212600 | DTA124ES |
| Q704 | 221282 | DTC144ES |
| | **FL tube** | |
| Q706 | 212075 | FIP9BDM8 |
| | **Diodes** | |
| D708-D711 | 223150, | US1040, |
| D714-D717 | 223145 or | 1S2076TD or |
| | 223124 | 1S2473 |
| D712 | 223163 | 1SS133 <G> |
| D713 | 223150, | US1040, |
| | 223145 or | 1S2076TD or |
| | 223124 | 1S2473 <G> |
| D718-D720 | 223163 | 1SS133 |
| D721 | 223150, | US1040, |
| | 223145 or | 1S2076TD or |
| | 223124 | 1S2473 |
| D722, D733 | 223163 | 1SS133 |
| D729 | 224150623 | 05AZ6.2C |
| D730, D732 | 223163 | 1SS133 <W> |
| D731 | 223150, | US1040, |
| | 223145 or | 1S2076TD or |
| | 223124 | 1S2473 <W> |
| | **L.E.Ds** | |
| D723, D725 | 225137CG, | SEL2413E-CG, |
| | 225137DG or | SEL2413E-DG or |
| | 225137DY | SEL2413E-DY |
| D724, D726 | 225142 | SEL2913K |

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | **OSC element** | |
| X702 | 3010150 | CST4.00MGW |
| | **Coil** | |
| L701 | 233400K220 or | NCH-2238 or |
| | 233409K220 | NCH-1284 |
| | **Capacitors** | |
| C704 | 3000051 | 0.047F, 5.5V, Super |
| C707 | 353780109 | 1 μF, 50V, Elect. |
| C708 | 375524744 | 0.47μF ±5%, 50V, Plastic (MMT) |
| | **Resistors** | |
| R709 | 49163473406 | 47kohm×6, 1/10W, Network |
| R711 | 49163104404 | 100kohm ×4, 1/10W, Network |
| R717 | 49163473404 | 47kohm×4, 1/10W, Network |
| | **Switches** | |
| S701-S721 | 25035548 | NPS-111-S510 |
| S722 | 25065286 | NSS-22112, Slide, band <W> |
| | **Holder** | |
| | 27190700 | L.E.D |

## TONE CIRCUIT PC BOARD (NAAF-3560-4/4A)

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | **ICs** | |
| Q401, Q402 | 222502 | NJM4558D-X |
| | **Capacitors** | |
| C401, C402 | 354780229 | 2.2 μF, 50V, Elect. |
| C405, C406 | 354780229 | 2.2 μF, 50V, Elect. |
| C407, C408 | 371122234 | 0.022 μF ±5%, 50V, Mylar |
| C409, C410 | 354780339 | 3.3 μF, 50V, Elect. |
| C411, C412 | 371122234 | 0.022 μF ±5%, 50V, Mylar |
| C413, C414 | 353744709 | 47 μF, 16V, Elect. |
| C443, C444 | 371124734 | 0.047 μF ±5%, 50V, Mylar |
| | **Resistors** | |
| R405 | 5104228 | N11RHC250KWT22Z, Variable, Balance |
| R417 | 5104229 | N14RHC100KWT22Z, Variable, Treble |
| R421 | 5104229 | N14RHC100KWT22Z, Variable, Bass |
| R449 | 5142001 | N16RGP100KBTP25, Variable, Volume |
| | **Switch** | |
| S441 | 25035611 | NPS-122-L573 |

## SPEAKER SWITCH PC BOARD (NASW-3561-4/4A)

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| R551, R552 | 441622714 | 270ohm, 1W, Metal oxide film resistors |
| S551 | 25035610 | NPS-122-142-L572, Speaker switch |
| P551 | 25045256 | YKB21-5010, Headphone jack <D> |
| | 25045255 | YKB21-5009, Headphone jack <G/W> |

## POWER SUPPLY PC BOARD

NOTE: THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBERS SPECIFIED.

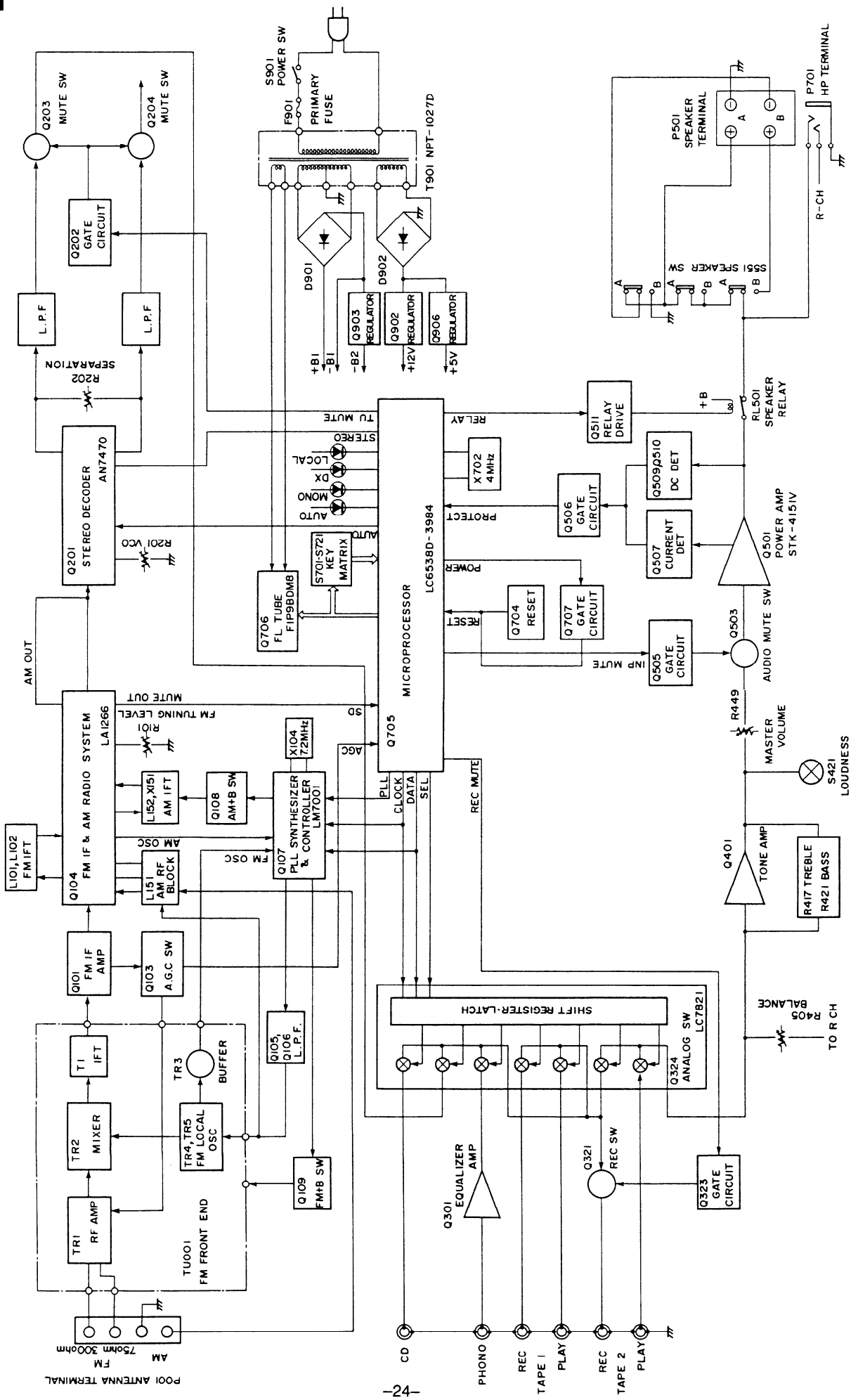
### POWER SUPPLY CIRCUIT PC BOARD (NAPS-3563-3/3A/3B)

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| C901 | 3500065A | ⚠ DE7150FZ103P AC400V/125V, Capacitor IS |
| | 27301216 | ⚠ SB1925, Cover for C901 <G/W> |
| R901 | 431523355 | ⚠ 3.3Mohm, 1/2W, Solid resistor <D> |
| S901 | 25035550 | ⚠ NPS-111-L512P, Power switch |
| F901a | 250113 | ⚠ SN5051, Fuseholder <D/W> |
| F902a | 25050065 | ⚠ YSH4037, Fuseholder <G/W> |
| F901 | 252049 | ⚠ 4A(ST-6), Fuse, primary <D/W> |
| F902 | 252074 | ⚠ 2A-SE-EAK, Fuse, primary <G/W> |

NOTE: <D> : Only 120V model
<G> : Only 220V/240V models
<W> : Only Worldwide model

# BLOCK DIAGRAM

## —120V MODEL—



# ADJUSTMENT PROCEDURES

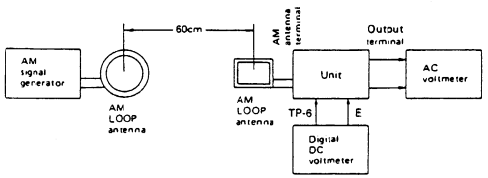
**FM section**

| Item | Step | Connection of instrument | FM SG output | Stereo modulator output | Tuned frequency | Output indicator | Adjustment point | Adjust for | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| I F | 1 | Fig. 1 | 99.1MHz<br>1kHz,75kHz devi.<br>65dBf(60dB) | ——— | 99.1MHz | DC voltmeter | L101 | 0±20mV | Set the FM mode switch to MONO. Repeat the steps 1 and 2 util no further adjustment in necessary. |
| | 2 | | | | | Distortion analyzer | L102 | Minimum | |
| V C O | | Fig. 2 | 99.1MHz<br>1kHz,75kHz devi.<br>65dBf(60dB) | ——— | 99.1MHz | Frequency counter | R201 | 19kHz±10Hz | Set the FM mode switch to AUTO. |
| Stereo distortion | | Fig.3 | 99.1MHz<br>Ext. modulation<br>65dBf(60dB) | L+R 1kHz<br>67.5kHz devi. | 99.1MHz | Distortion analyzer | IF on front end | Minimum | |
| Stereo separation | 1 | Fig.3 | 99.1MHz<br>Ext. modulation<br>65dBf(60dB) | Lch. 1kHz | 99.1MHz | Rch. AC voltmeter | R202 | Minimum | Maximum and same separation |
| | 2 | | | Rch. 1kHz | | Lch. AC voltmeter | | Minimum | |
| Tuned indicator level | 1 | Fig. 3 | 99.1MHz<br>1kHz, 75kHz devi.<br>19.2dBf(14dB)(120V model)<br>12dB (other models) | | 99.1MHz | TUNED indicator | R101 | Light on | |
| | 2 | | 99.1MHz<br>1kHz, 75kHz devi.<br>18.2dBf(13dB)<br>11dB (other models) | | | | | Light off | |

**AM section**

| Step | AM SG output | Tuned Frequency | Output indicator | Adjustment point | Adjust for |
|---|---|---|---|---|---|
| 1 | ——— | 522kHz<br>(530kHz)<br>〈531kHz〉 | Digital DC voltmeter | OSC coil on RF block | 1.5V±0.1V |
| 2 | 603kHz,60dB/m<br>(600kHz)<br>400Hz 30% mod. | 603kHz<br>(600kHz) | A C voltmeter | RF coil on R F block | Maximum |
| 3 | 990kHz, 60dB/m<br>400Hz 30% mod. | 990kHz | A C voltmeter | L152 | Maximum |

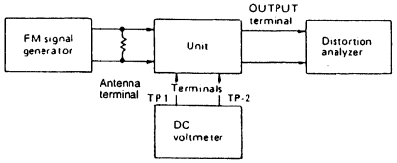
Note: ( ):120V model 〈10kHz step〉
〈 〉: Worldwide model



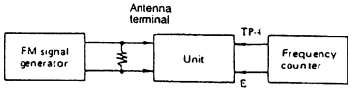

Reference specifications

| | | | |
|---|---|---|---|
| Tuned voltage | AM | 530kHz (U.S.A. model) | 1.5 ±0.4V |
| | | 522kHz (European model) | 1.5 ±0.4V |
| | | 1710kHz (U.S.A. model) | 8.0 ±0.5V |
| | | 1611kHz (Europe in model) | 7.5 ±0.5V |
| | FM | 87.9MHz (U.S.A. model) | 2.0 ±0.5V |
| | | 87.50MHz (European model) | 2.0 ±0.5V |
| | | 108.0MHz (U.S.A. model) | 7.5 ±0.5V |
| | | 108.0MHz (European model) | 7.5 ±0.5V |
| Muting width | (U.S.A. model) | | 65 ± 15kHz |
| | (European model) | | 35 ± 10kHz |
| Muting level | (U.S.A. model) | | FM 14 ± 15dB |
| Auto stop level | (European model) | | AM Less than 72dB/m |
| | | | FM Less than 20dBμ |
| Stereo indicator level | | | 14 ± 4dBμ |



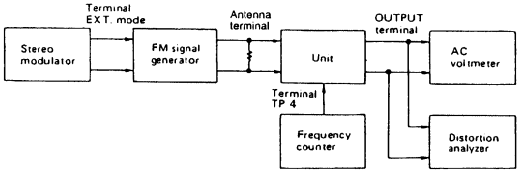



〈Fig. 1〉

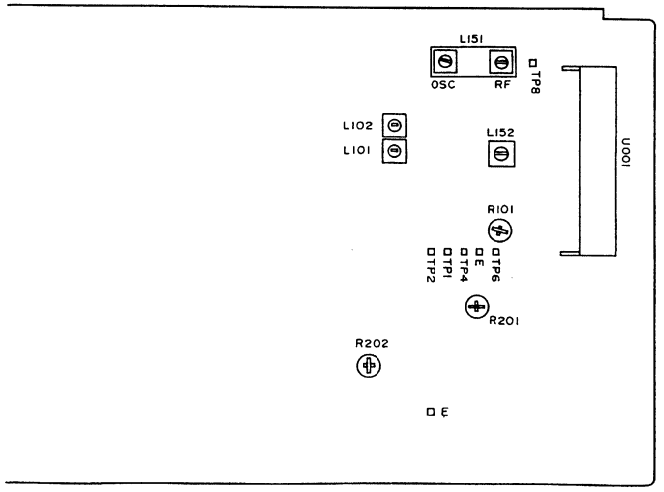



Use the high impedance probe. (10 : 1)

〈Fig. 2〉




〈Fig.3〉




Adjustment point.

# SPECIFICATIONS

**AMPLIFIER SECTION**

| | | |
|---|---|---|
| Power output: | 40 watts per channel, min, RMS, at 8 ohms, both channels driven, from 40Hz to 20kHz, with no more than 0.3% total harmonic distortion. | |
| Musical Power Output: | 2 × 95 watts at 4 ohms, 1kHz (DIN) | |
| | 2 × 68 watts at 8 ohms, 1kHz (DIN) | |
| Continuous Power Output: | 2 × 50 watts at 4 ohms, 1kHz (DIN) | |
| | 2 × 45 watts at 8 ohms, 1kHz (DIN) | |
| Total Harmonic Distortion: | 0.3% at rated power | |
| | 0.1% at 30 watts output | |
| IM Distortion: | 0.3% at rated power | |
| | 0.1% at 30 watts output | |
| Damping Factor: | 35 at 8 ohms | |
| Frequency Response: | 20 – 30,000Hz ±1dB | |
| RIAA Diviation: | 20 – 20,000Hz ±0.8dB | |
| Sensitivity and Impedance: | Phono: | 2.5mV/50 kohms |
| | CD: | 150mV/50 kohms |
| | Tape Play: | 150mV/50 kohms |
| | Tape Rec: | 150mV/3.5 kohms |
| Phono Overload (MM): | 120mV RMS at 1kHz, 0.3% THD. | |
| Signal-to-Noise Ratio: | Phono: | 80dB (at 5 mV input, A weighted) |
| | CD/Tape: | 100dB (IHF-A) |
| Tone controls: | Bass: | ±10dB at 100Hz |
| | Treble: | ±10dB at 10kHz |

**TUNER SECTION**

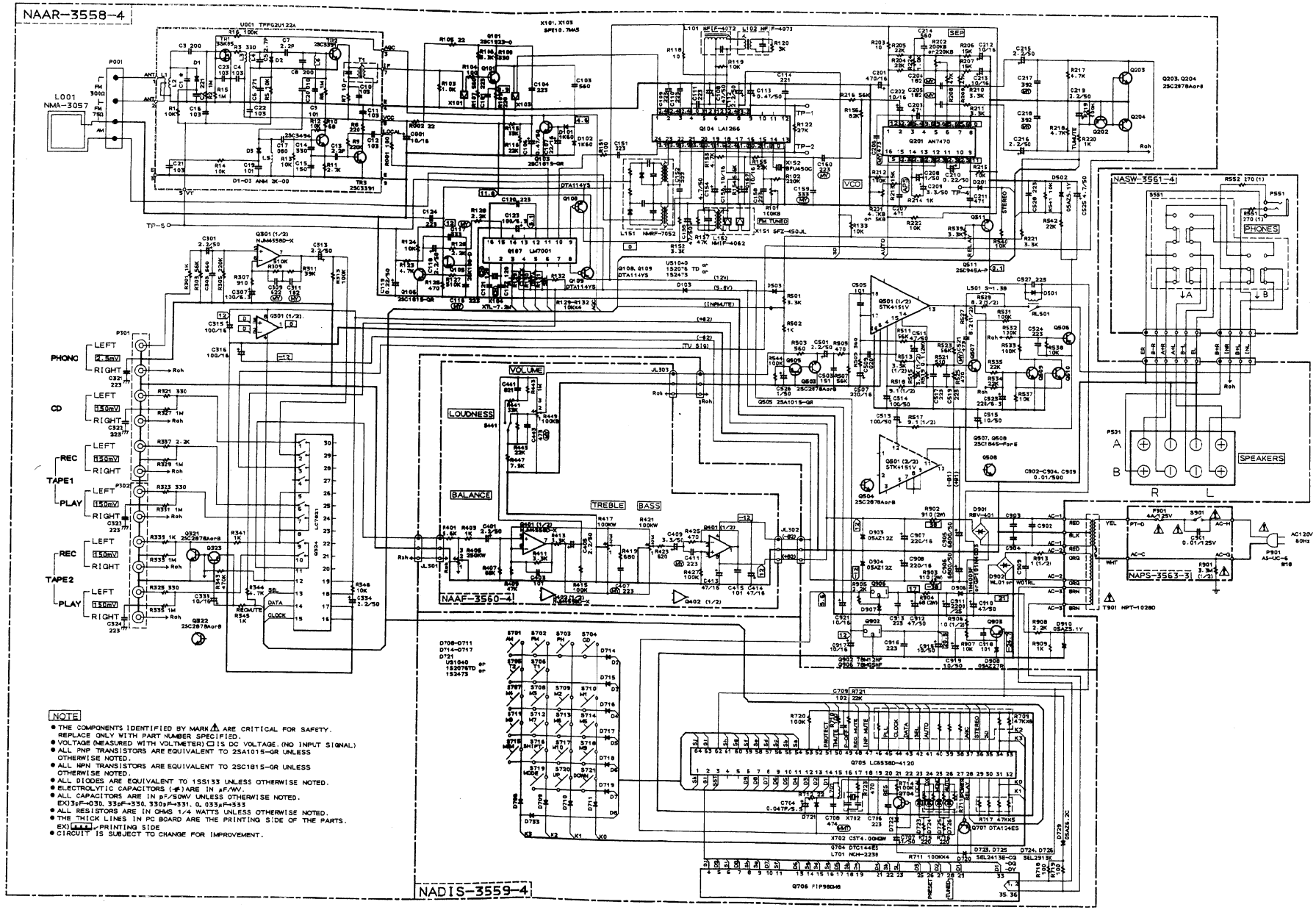
| | | | |
|---|---|---|---|
| **FM:** | **–220V/240V/ Worldwide models–** | | **–120V model–** |
| Tuning Range: | 87.50 – 108.00MHz (50kHz steps) | | 87.5 – 108.0MHz (100kHz steps) |
| | 87.50 – 108.00MHz (50kHz steps) or (100kHz steps) (Worldwide model) | | |
| Usable Sensitivity: | Mono: | 12.4dBf, 1.2μV, 75ohms<br>1.2μV (S/N 26dB, 40kHz Devi.)<br>75ohms DIN | Mono: 12.4dBf, 2.3μV |
| | Stereo: | 19.2dBf, 2.5μV, 75ohms<br>25μV (S/N 46dB, 40kHz Devi.)<br>75ohms DIN | Stereo: 18.2dBf, 4.5μV |
| 50dB Quieting Sensitivity: | Mono: | 18.2dBf, 2.2μV, 75ohms | Mono: 18.2dBf, 4.5μV |
| | Stereo: | 38.2dBf, 22μV, 75ohms | Stereo: 38.2dBf, 45μV |
| Capture Ratio: | 1.5dB | | 1.5dB |
| Image Rejection Ratio: | 85dB | | 40dB |
| IF Rejection Ratio: | 90dB | | 90dB |
| Signal-to-Noise Ratio: | Mono: | 70dB | Mono: 70dB |
| | Stereo: | 65dB | Stereo: 65dB |
| Alternate Channel Attenuation: | | | 55dB |
| Selectivity: | 50dB DIN (±300kHz, 40kHz dev.) | | |
| AM suppression Ratio: | 50dB | | 50dB |
| Harmonic Distortion: | Mono: | 0.15% | Mono: 0.15% |
| | Stereo: | 0.30% | Stereo: 0.30% |
| Frequency Response: | 30 – 15,000Hz ±1.5dB | | 30 – 15,000Hz ±1.5dB |
| Stereo Separation: | 40dB at 1kHz | | 40dB at 1kHz |
| | 30dB at 100 – 10,000Hz | | 30dB at 100 – 10,000Hz |
| Muting Level: | 17.2dBf, 4μV | | 17.2dBf, 4μV |
| **AM:** | | | |
| Tuning Range: | 522 – 1611kHz ( 9kHz steps) | | 530 – 1710kHz (10kHz steps) |
| | 522 – 1611kHz ( 9kHz steps) or 530 – 1710kHz (10kHz steps) (Worldwide model) | | |
| Usable Sensitivity: | 30μV | | 30μV |
| Image Rejection Ratio: | 40dB | | 40dB |
| IF Rejection Ratio: | 40dB | | 40dB |
| Signal-to-Noise Ratio: | 40dB | | 40dB |
| Harmonic Distortion: | 0.8% | | 0.8% |

**GENERAL**

| | |
|---|---|
| Dimensions (W × H × D): | 435 × 115 × 320mm |
| | 17-1/8" × 4-1/2" × 12-9/16" |
| Weight: | 6.8kg., 14.8 lbs. |

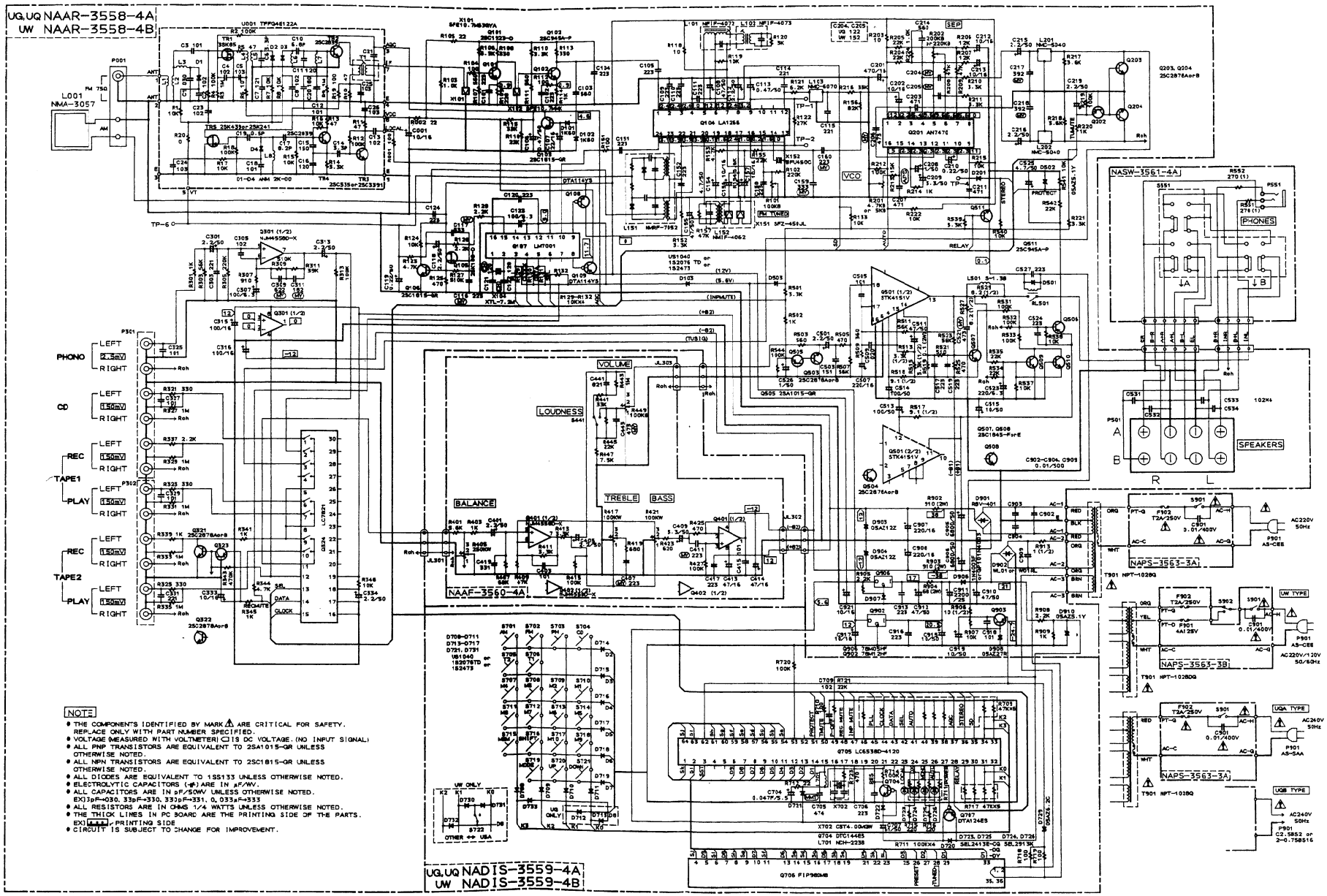
# SCHEMATIC DIAGRAM

— 120V MODEL —



# SCHEMATIC DIAGRAM

## — OTHER MODELS —



# SERVICE PROCEDURES

## 1.Replacing the fuses

For continued protection against fire hazard,replace only with same type and same rating fuse.

D (120V) model

| Circuit no. | Part no. | Description |
|---|---|---|
| F901 | 252049 | 4A(ST-6),Primary |

G (220V) and Q (240V) models

| Circuit no. | Part no. | Description |
|---|---|---|
| F902 | 252074 | 2A-SE-EAK,Primary |

W (Worldwide) model

| Circuit no. | Part no. | Description |
|---|---|---|
| F901 | 252049 | 4A(ST-6),Primary |
| F902 | 252074 | 2A-SE-EAK,Primary |

## 2.Safety-check out

(Only U.S.A. model)

After correcting the original service problem,perform the following safety check before releasing the set to the customer.

Connect the insulating-resistance tester between the plug of power suuply cord and nickel screw on the back panel.

Specifications: 3.3Mohm ±10% at 500V.

## 3.Change of voltage

Worldwide models are equipped with a voltage selector to conform with local power supplies. This switch is located on the back panel. Be sure to set this switch to match the voltage of the power supply in your area before turning the power switch on.

This swith is set to 220V at the factory. Voltage is changed by sliding the groove in the switch with the screwdriver to the right or left. Confirm that the switch has been moved all the way to the right or left before turning the power switch on.

## 4.Step band selector switch

Worldwide models are equipped with a step band selector switch. This switch is located on the back panel. This switch is set to 50kHz (FM) and 9kHz (AM) at the factory, but may have to be reset to 100kHz and 10kHz depending on the area where the unit is used.

| De-emphasis | FM step | AM step |
|---|---|---|
| Europe: 50μsec | 50kHz | 9kHz |
| U.S.A.: 75μsec | 100kHz | 10kHz |

## 5.Changing the band step

With the exception of the models below, a BAND STEP selector switch is not provided.

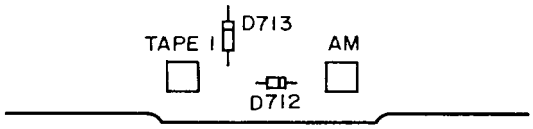
(FM)

| MODEL | BAND STEP | D713 | R122 |
|---|---|---|---|
| UD | 100kHz→50kHz | Additional | 27kΩ→27kΩ |
| UG/UQ | 50kHz→100kHz | Eliminated | 27kΩ→13kΩ |

(AM)

| BAND STEP | D712 |
|---|---|
| 10kHz→9kHz | Additional |
| 9kHz→10kHz | Eliminated |

In D712 ISS133 (Part No. 223163) is used. In D713 US1040 (Part No. 223150) is used. R101, with the muting amplitude determined, is on the back panel side of the tuner circuit printed circuit board assembly test points TP-1 and TP-2. (Refer page 13)




## 6.Memroy preservation

This unit does not require memory preservation batteries. A built-in memory power back-up system preserves contents of the memory during power failures and even when the unit is unplugged. The unit must be plugged in and the power switch turned on and off once in order to charge the back-up system. Note that since this is not a permanent memory,the power switch must be turned on and off a few times each month to keep the back-up system operative.

The period of time during which memory contents are preserved after power has last been turned off varies depending on climate and placement of the unit.

On the average, memory contents are protected over a period of 3 to 4 weeks (a minimum of 2 weeks) after the last time power has been turned off. This period is shorter when the unit is exposed to very high humidity or used in an area with an extremely humid climate.

— OTHER MODELS —