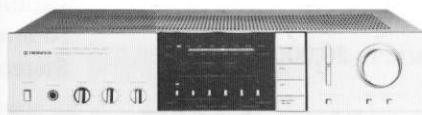


Service Manual

REPAIR & ADJUSTMENTS

**ORDER NO.
ARP-015-0**
**COMPUTER CONTROLLED
STEREO RECEIVER**

SX-4

MODEL SX-4 COMES IN FOUR VERSIONS DISTINGUISHED AS FOLLOWS:

Type	Voltage	Remarks
KU	AC 120V only	U.S.A. model
S	AC 110V, 120V, 220V and 240V (Switchable)	General export model
KC	AC 120V only	Canada model
YP	AC 240V only	Australia model

- This service manual is applicable to the KU type.
- For the circuit description, please refer to the model SX-7 service manual (ARP-047-0).
- Ce manuel d'instruction se réfère au mode de réglage, en français.
- Este manual de servicio trata del método de ajuste escrito en español.

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1. SPECIFICATIONS

Amplifier Section

Continuous Average Power Output is 20 watts* per channel, min., at 8 ohms from 20 Hertz to 20,000 Hertz with no more than 0.04% total harmonic distortion.

Total Harmonic Distortion (20 Hertz to 20,000 Hertz, 8 ohms, from AUX/VIDEO)

continuous rated power output . . . No more than 0.04%
10 watts per channel power output

. No more than 0.04%

Intermodulation Distortion (50 Hertz: 7,000 Hertz = 4 : 1, 8 ohms, from AUX/VIDEO)

continuous rated power output . . . No more than 0.04%

Damping Factor (20 Hertz to 20,000 Hertz, 8 ohms)

. 50

Input (Sensitivity/Impedance)

PHONO 2.5mV/50 kilohms

AUX/VIDEO TAPE PLAY 150mV/50 kilohms

Phono Overload Level (T.H.D. 0.1%, 1,000Hz)

PHONO 130mV

Output (Level/Impedance)

TAPE REC 150mV/2.2 kilohms

Frequency Response

PHONO (RIAA Equalization)

. 30Hz to 15,000Hz±0.5dB

AUX/VIDEO, TAPE PLAY

. 10Hz to 50,000Hz $\begin{smallmatrix} +0.5 \\ -3 \end{smallmatrix}$ dB

Tone Control

BASS ±8dB (100Hz)

TREBLE ±8dB (10kHz)

Loudness Contour (Volume control set at -40dB position)

. +6dB (100Hz)

Hum and Noise (IHF, short circuited A network)

PHONO 70dB

AUX/VIDEO, TAPE PLAY 96dB

FM Tuner Section

Usable Sensitivity . Mono; 11.2dBf (IHF) (1.0μV, 75 ohms)

50dB Quieting Sensitivity

. Mono; 16.3dBf (1.8μV, 75 ohms)

Stereo; 37.2dBf (19.9μV, 75 ohms)

Signal-to-Noise Ratio Mono; 75dB (at 85dBf)

Stereo; 70dB (at 85dBf)

Distortion (at 65dBf)

Mono 100Hz; 0.15%

1kHz; 0.15%

6 kHz; 0.2%

Stereo 100Hz; 0.3%

1kHz; 0.3%

6kHz; 0.4%

Capture Ratio 1.0dB

Alternate Channel Selectivity 400kHz; 60dB

Stereo Separation 1kHz; 40dB

30Hz to 15kHz; 35dB

Frequency Response 20Hz to 15kHz +0.5dB, -1dB

Spurious Response Ratio 65dB

Image Response Ratio 65dB

IF Response Ratio 90dB

AM Suppression Ratio 55dB

Subcarrier Product Ratio 40dB

SCA Rejection ratio 60dB

Muting Threshold 29.3dBf (8μV)

Antenna Input . . 300 ohms balanced, 75 ohms unbalanced

AM Tuner Section

Sensitivity

IHF, ferrite antenna 300μV/m

IHF, external antenna 15μV

Selectivity 27dB

Signal-to-Noise Ratio 50dB

Image Response Ratio 40dB

IF Response Ratio 73dB

Antenna Built-in ferrite loopstick antenna

Miscellaneous

Power Requirements AC 120V, 60Hz

Power Consumption 200W (UL)

Dimensions 420(W) x 98(H) x 311(D) mm

16-9/16(W) x 3-7/8(H) x 12-1/4(D) in

Weight (without package) 5.2 kg (11 lb 7 oz)

Furnished Parts

FM T-type Antenna 1

Dry Battery SUM-3 "AA" 2

Operating Instructions 1

**Measured pursuant to the federal Trade Commission's Trade Regulation rule on Power Output Claims for Amplifier.*

NOTE:

Specifications and design subject to possible modification without notice.

SETTING USE THE AM CHANNEL STEP SWITCH (on the rear panel)

Before the receiver leaves the manufacturing plant, this switch is set to the channel allotment plan of the destination. For the U.S.A., it is set to 10kHz. Check that the switch is set properly before use.

Set it to the 9kHz position when the channel allotment plan is changed and the intervals between the AM broadcasting stations change from 10kHz to 9kHz units.

NOTE:

Contact your dealer and inquire if you are not sure about the channel allotment plan.

LOADING THE BATTERIES

Two size "AA" dry batteries are provided as accessories. They are used to retain the station presetting memory functions.

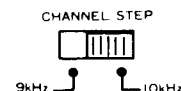
Before using the unit, disconnect the power cord and load the batteries into the compartment on the rear panel as follows:

1. Slide the lid in the direction of the arrow and open the compartment (see Fig. 1).
2. Load the batteries with the polarities properly aligned with the marks on the inside of the compartment (see Fig. 2).
3. Align the tab of the lid with the interlocking hole and depress the lid lightly.

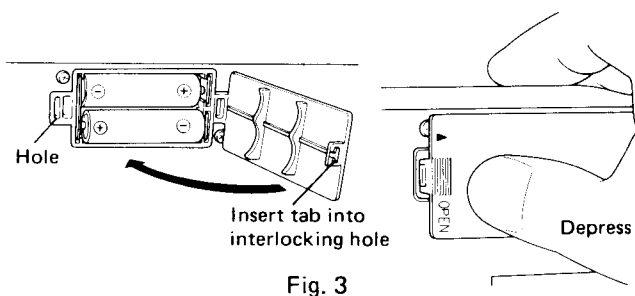
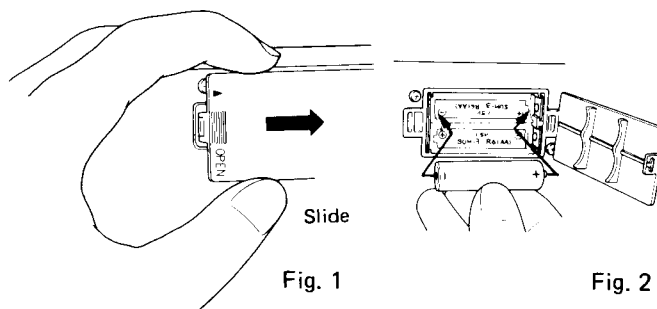
Battery Precautions:

If batteries are incorrectly used, they may leak or even break open inside the battery holder. Observe the following precautions when inserting and replacing the batteries.

1. Always be sure the + and - ends are aligned properly as shown above and as marked on the battery holder.
2. Do not use new batteries and partly used batteries at the same time.
3. Do not use different brands and types of batteries at the same time.

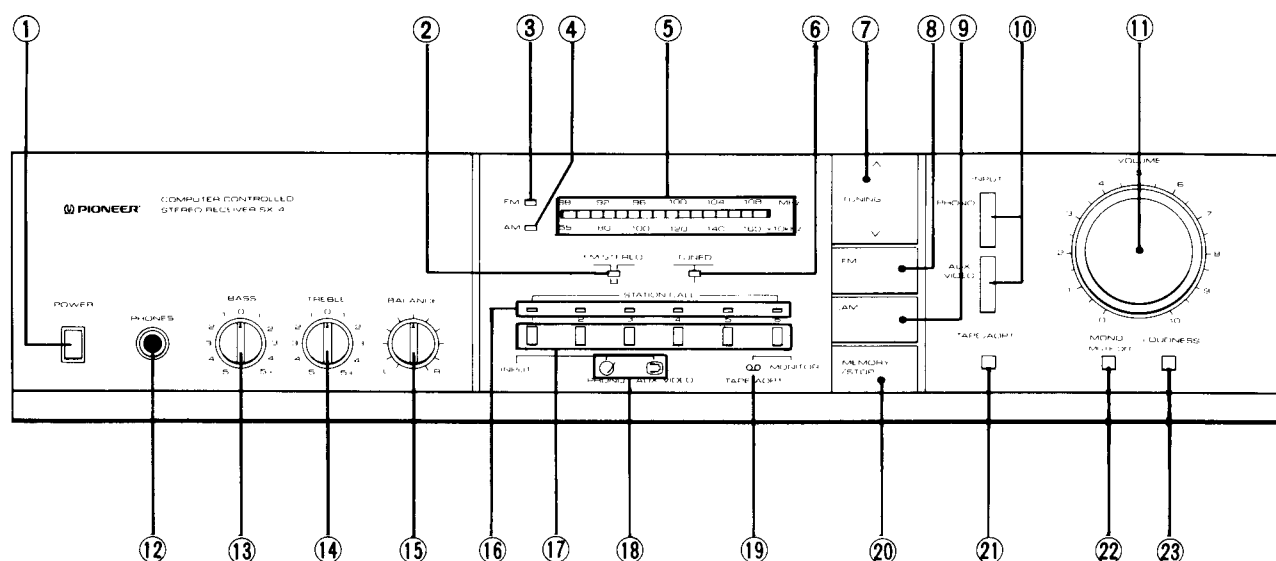


10kHz position



4. There are rechargeable dry cell batteries and non-rechargeable dry cell batteries. Always read the notes on the battery to be sure which kind you have.
5. When replacing the batteries, always use the same type of batteries (carbon zinc) as the ones originally provided with the receiver. Do not use alkaline and nickel cadmium type batteries.

2. FRONT PANEL FACILITIES



① POWER SWITCH

Power is supplied to the unit when this switch is depressed ("in" position).

② FM STEREO INDICATOR

This lights when receiving an FM stereo program.

③ FM INDICATOR

This lights when receiving the FM broadcasts. (This lights when depressed the FM switch).

④ AM INDICATOR

This lights when receiving the AM broadcasts.

⑤ FREQUENCY SCALE

This scale is composed of 16 light-emitting diodes (LEDs). During frequency scanning, the lighting moves from left to right or vice versa, depending on the direction corresponding to the TUNING SWITCH which has been depressed.

⑥ TUNED INDICATOR

This lights when the optimum tuning point has been located during reception. It blinks when stations are being searched.

⑦ TUNING switch

This is used to tune in broadcasting stations. When depressed, the LEDs on the frequency scale light up in the leftward or rightward direction, depending on the direction corresponding to the part of the TUNING switch which has been depressed, and frequency scanning starts. The TUNED indicator now starts to blink.

When a station is located, the LEDs stop moving and the TUNED indicator lights up.

The sound from the station can be heard in about 5 seconds. After that sound has been heard for these few seconds, the frequency scanning operation starts again. In this way, all the broadcasting stations are picked up in succession.

NOTE:

The sound of each station is heard for about 5 seconds but depress the TUNING switch if this is not the required station or if you want to search the next station promptly.

⑧ FM SWITCH

Depress this switch for FM reception.

⑨ AM SWITCH

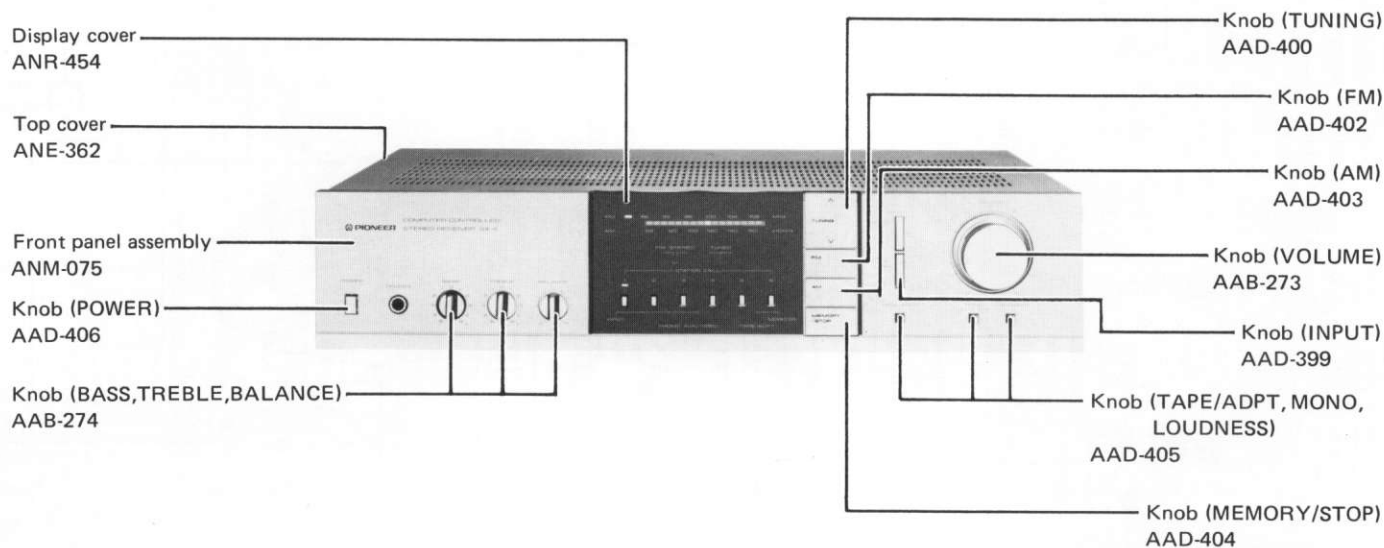
Depress this switch for AM reception.

3. PARTS LOCATION

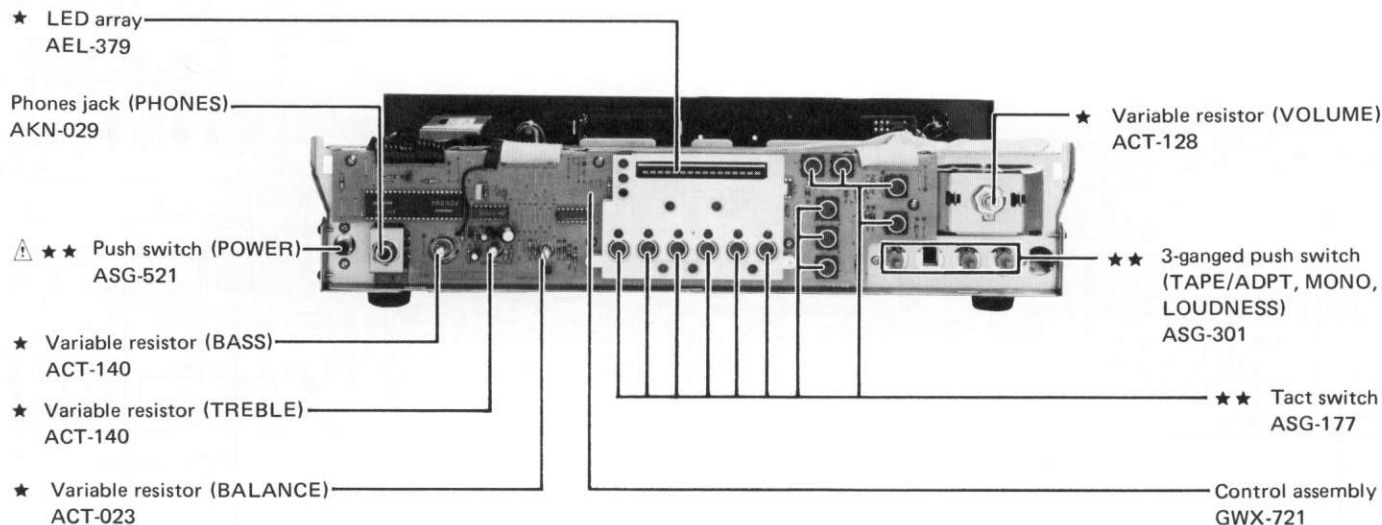
NOTES:

- The  mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- For your Parts Stock Control, the fast moving items are indicated with the marks **★★** and **★**.
★★ GENERALLY MOVES FASTER THAN ★
 This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Front Panel View

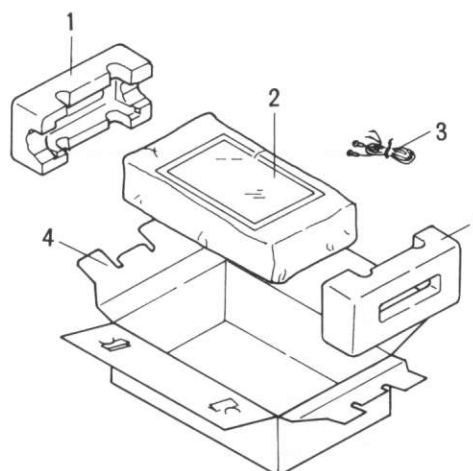


Front View with Panel Removed

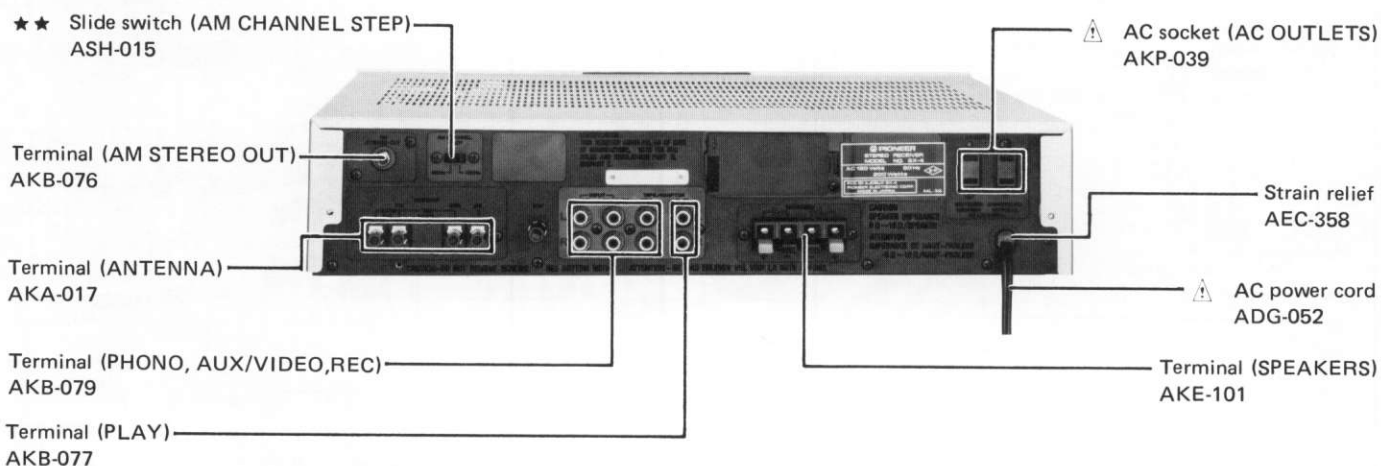


4. PACKING

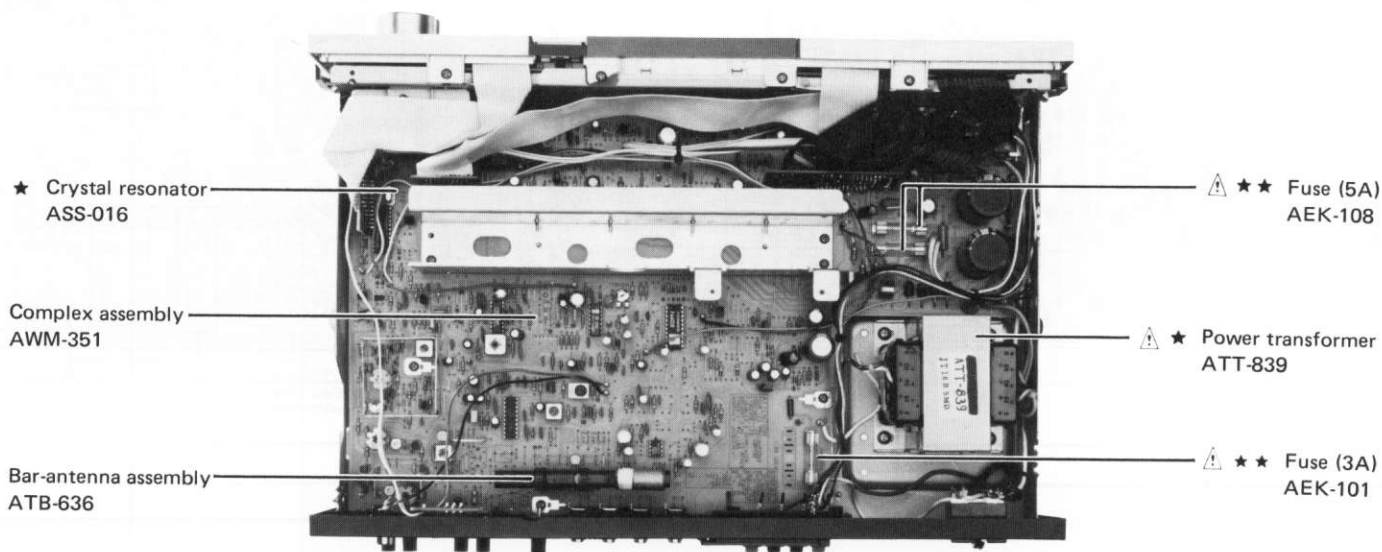
Mark	No.	Part No.	Description
	1.	AHA-294	Side pad
	2.	ARB-439	Operating instructions
	3.	ADH-004	T-type FM antenna
	4.	AHD-961	Packing case

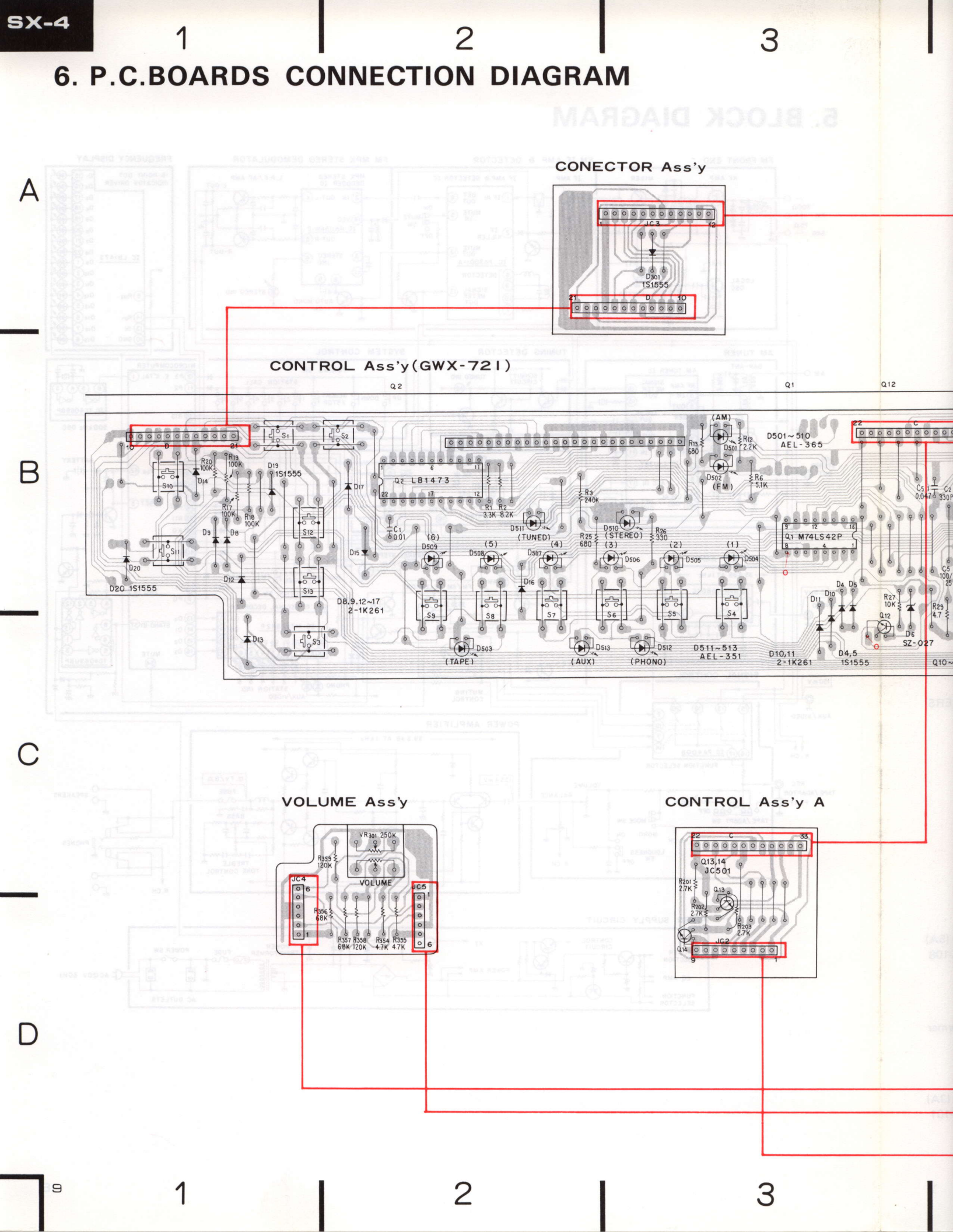


Rear Panel View

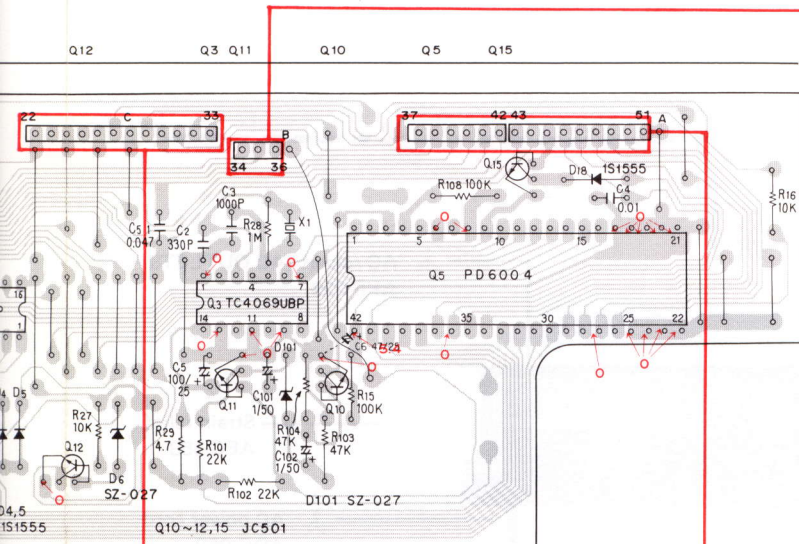


Top View

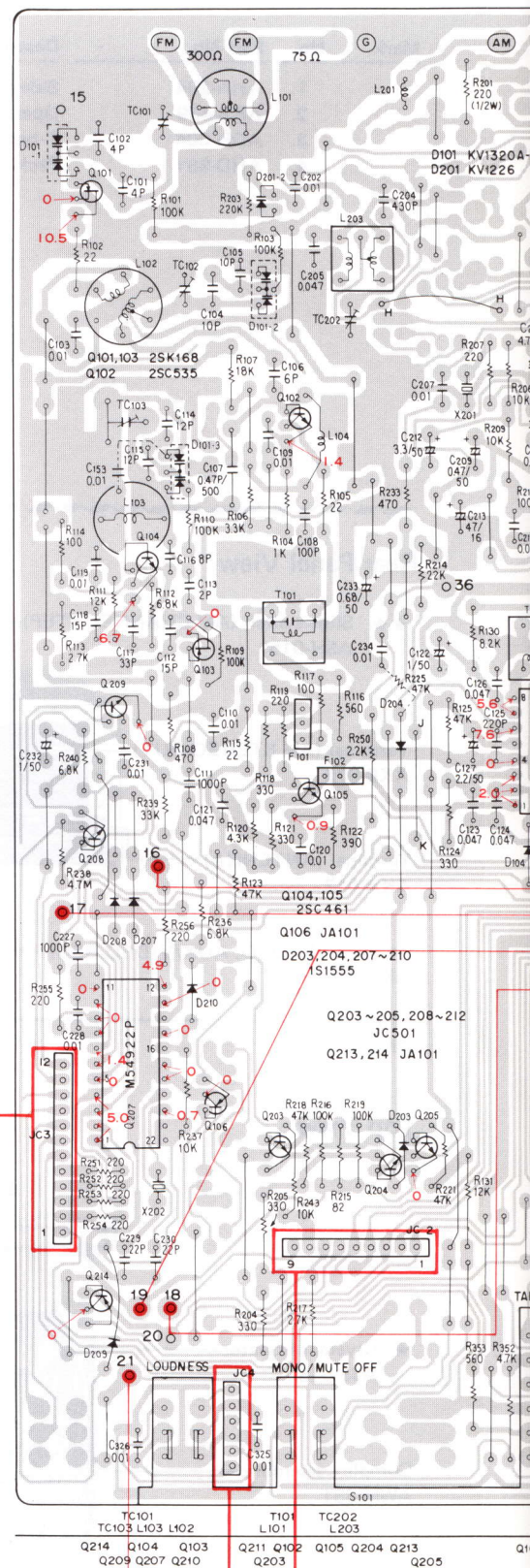
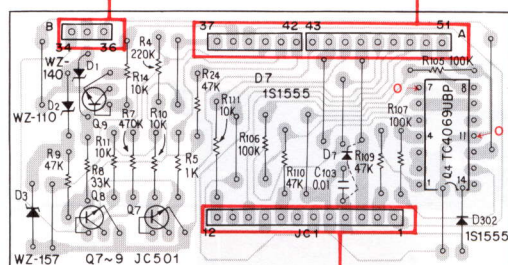




COMPLEX Ass'y



CONTROL Ass'y B
(GWX-717)



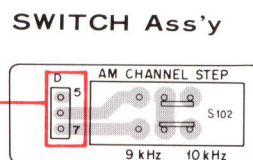
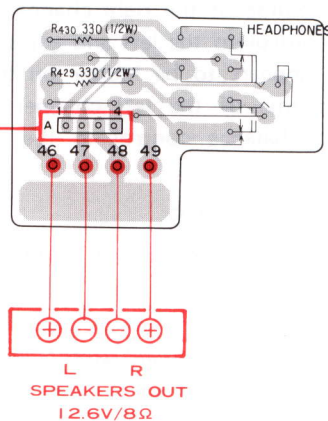
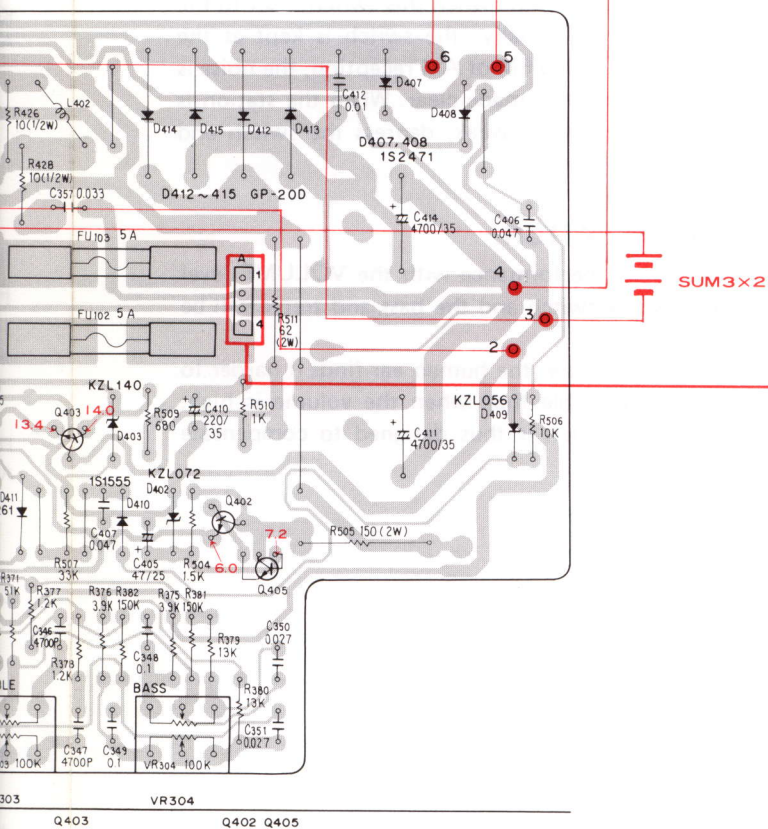


A

B

C

D

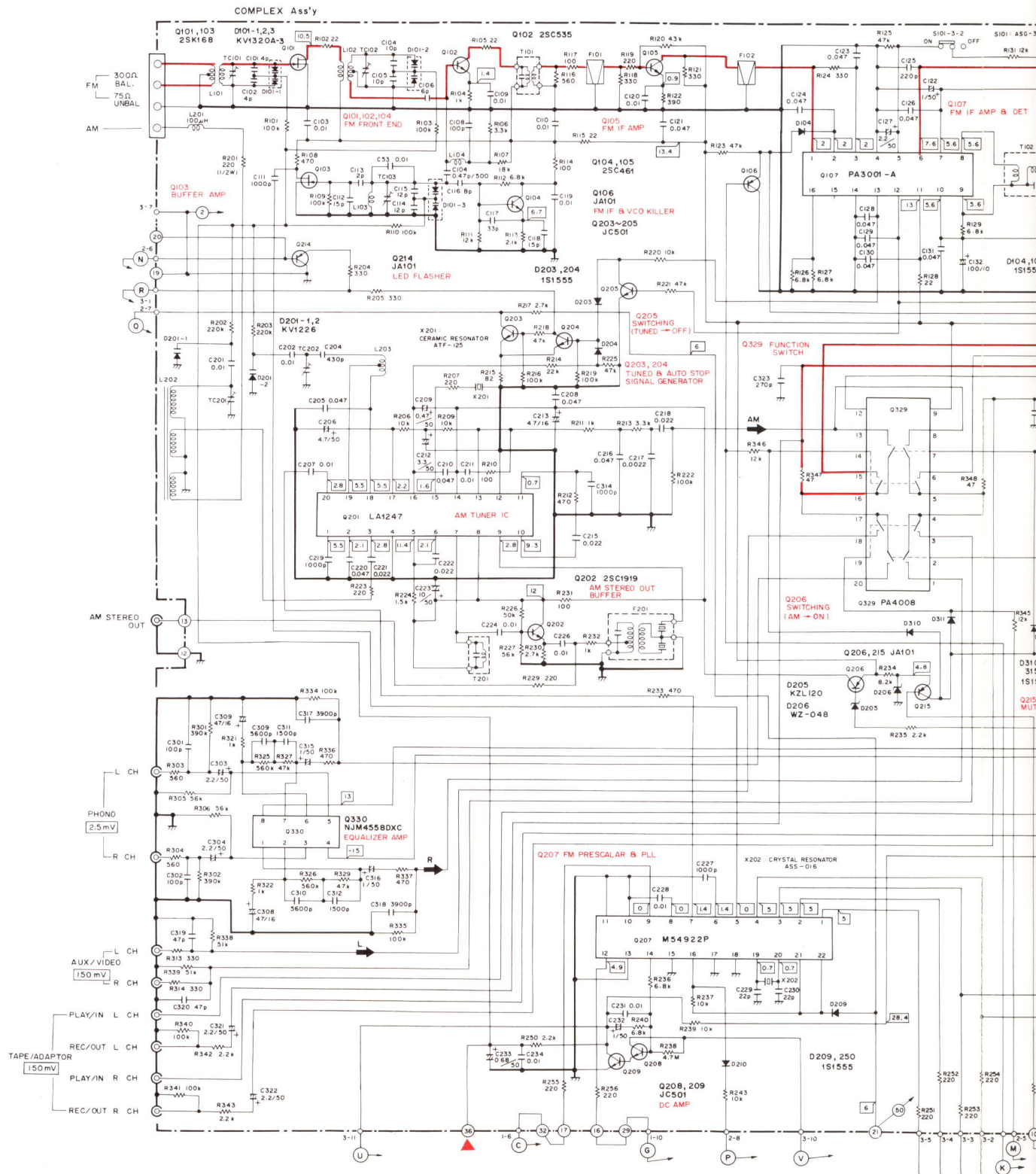
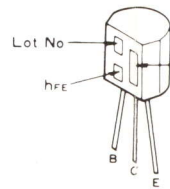


7. SCHEMATIC DIAGRAM

NOTE:

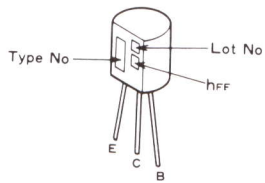
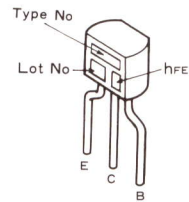
The indicated semiconductors are representative ones only. Other alternative semiconductors may be used and are listed in the parts list.

2SC1919
2SC710
2SA726S

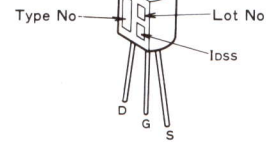


2SC2240

Type No

2SC2603/A/
2SA1115/A/

2SK61



2SA798

SWITCHES:

S1	TUNING (UP)	ON	OFF
S2	TUNING (DOWN)	ON	OFF
S3	MEMORY/STOP	ON	OFF
S4	STATION CALL 1	ON	OFF
S5	STATION CALL 2	ON	OFF
S6	STATION CALL 3	ON	OFF
S7	STATION CALL 4	ON	OFF
S8	STATION CALL 5	ON	OFF
S9	STATION CALL 6	ON	OFF
S10	INPUT (PHONO)	ON	OFF
S11	INPUT (AUX/VIDEO)	ON	OFF
S12	FM	ON	OFF
S13	AM	ON	OFF

S101-1	TAPE/ADAPT	ON	OFF
S101-3	MONO/MUTE OFF	STEREO/ON	MONO/OFF
S101-4	LOUDNESS	ON	OFF
S102	AM CHANNEL STEP	9kHz	10kHz
S103	POWER	ON	OFF

The underlined indicates the switch position.

1. RESISTORS:

Indicated in Ω , $k\Omega$, $M\Omega$, (F) $\pm 1\%$, (G) $\pm 2\%$, (K) $\pm 10\%$, (M) $\pm 20\%$ tolerance

2. CAPACITORS:

Indicated in capacity (μF), voltage (V) unless otherwise noted p, μF

Indication without voltage is 50V except electrolytic capacitor.

3. VOLTAGE, CURRENT:

Signal voltage at 20 Ω W + 20 Ω W 811 output (1kHz)

DC voltage (V) at no input signal

Value in () is DC voltage at rated power.

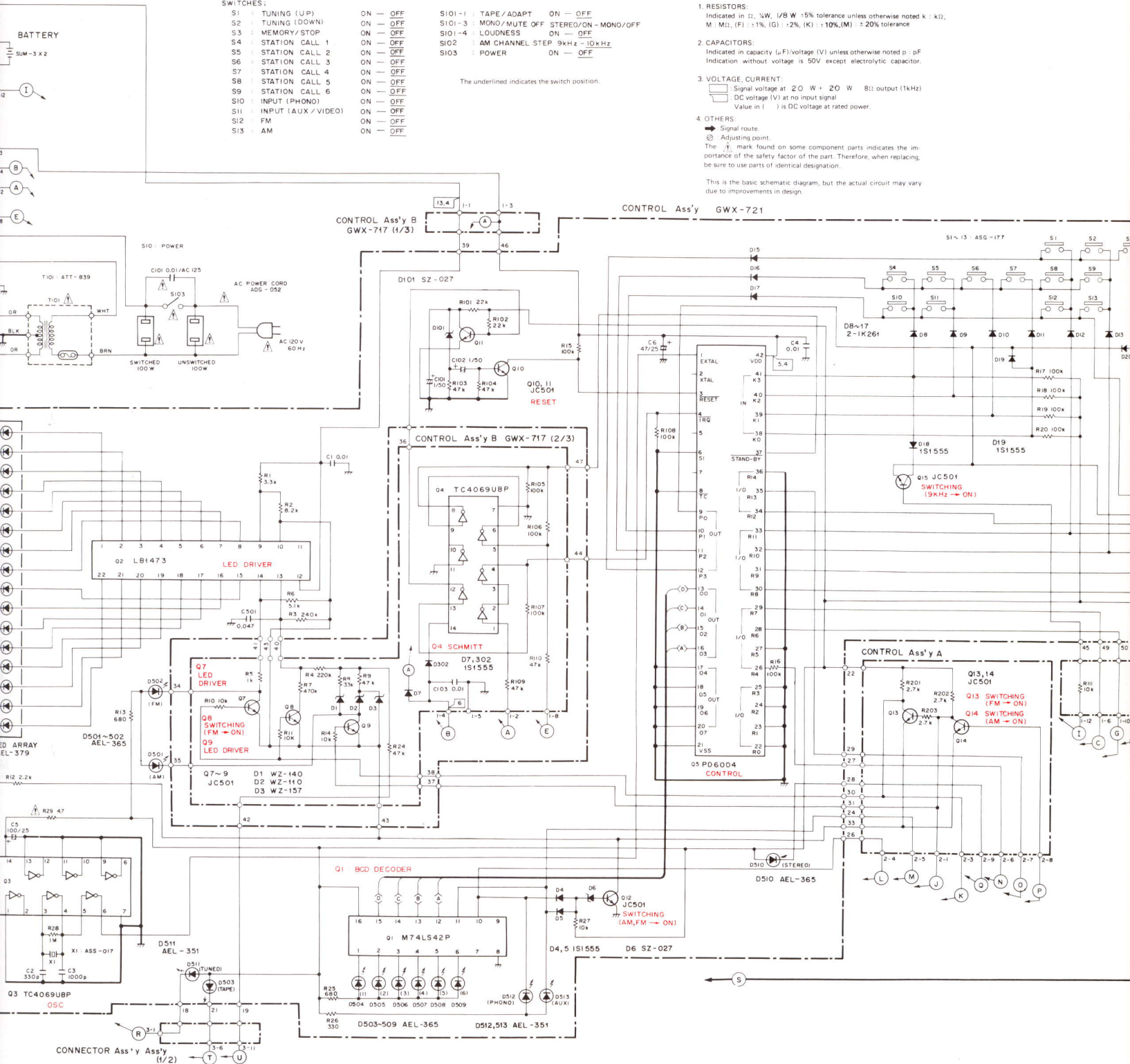
4. OTHERS:

Signal route.

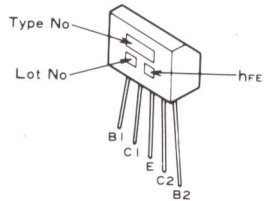
Adjusting point.

The mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

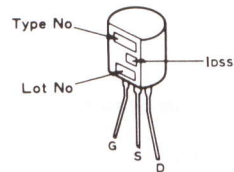
This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.



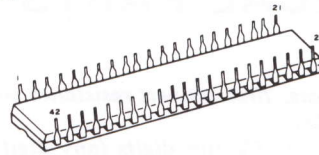
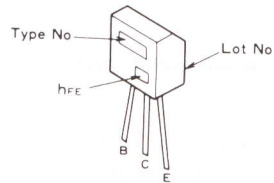
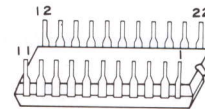
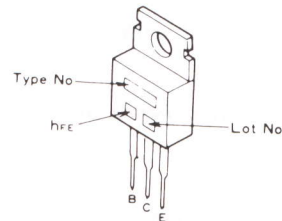
2SA798



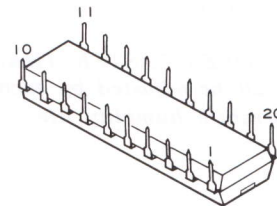
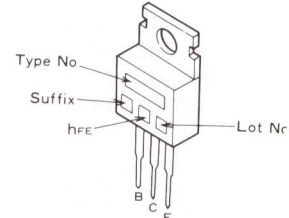
2SK168



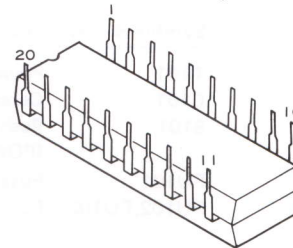
PD6004

2SC535
2SC461LB1473
M54922P2SD313
2SD880

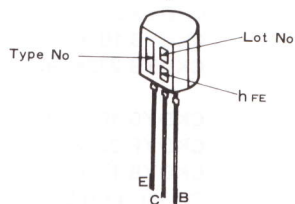
LA1247

2SB595P
2SD525P

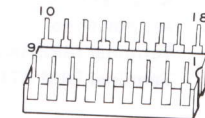
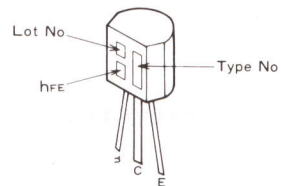
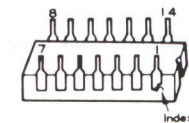
PA4008



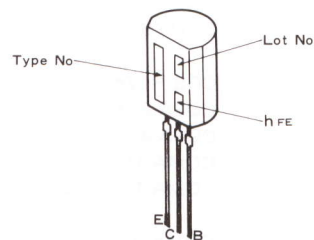
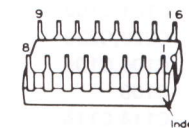
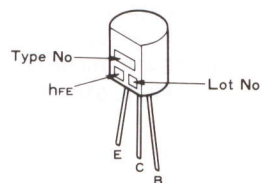
2SC2362



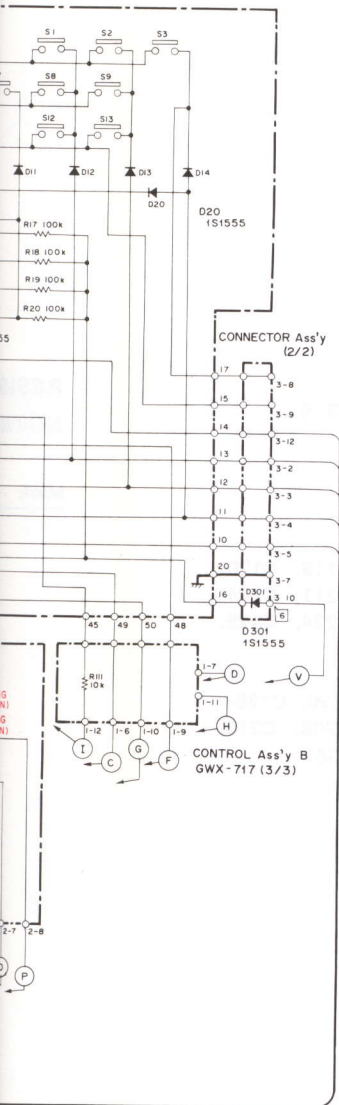
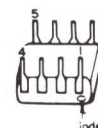
PA0001

2SA850
2SC1735HA1156W-P
TC4069UBP

2SD438

PA3001-A
M74LS42PJA101
JC501

NJM4558DXC



8. ELECTRICAL PARTS LIST

NOTES:

- When ordering resistors, first convert resistance values into code form as shown in the following examples.

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

560Ω 56 × 10¹ 561 RD½PS 561 J
 47kΩ 47 × 10³ 473 RD½PS 473 J
 0.5Ω 0R5 RN2H 0R5 K
 1Ω 010 RS1P 010 K

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

5.62kΩ 562 × 10¹ 5621 RN½SR 5621 F

- The mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★
 ★★ GENERALLY MOVES FASTER THAN ★
 This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Miscellaneous Parts

Mark	Part No.	Symbol & Description	Mark	Part No.	Symbol & Description
				CCDSL 221J 50	C125,C331,C332
	★ ATT-839	T101 Power transformer		CCDSL 100D 50	C342,C343
	ACG-017	C101 Ceramic capacitor		CCDSL 101K 500	C354,C355,C364,C365
	★★ ASG-521	S101 Push switch (POWER)		CCDSL 220K 500	C352,C353
				CKDYB 472K 50	C346,C347
	★★ AEK-101	FU101 Fuse (3A)		CCDSL 271J 50	C323,C324
	★★ AEK-108	FU102,FU103 Fuse (5A)		CKDYX 273M 25	C139,C140
				CKDYB 561K 50	C141,C142
	AEL-379	D101 LED array		CKDYB 182K 50	C145,C146
	AKP-039	AC socket (AC OUTLETS)		CKDYB 222K 50	C143,C144,C217,C334,C335
	ADG-052	AC power cord			
	AKE-101	Terminal (SPEAKERS)		CKDYB 392K 50	C317,C318
	AKB-076	Terminal (AM STEREO OUT)		CKDYF 223Z 50	C215,C218,C221,C222
				CKDYB 102K 50	C111,C214,C219,C227
	GWX-721	Control assembly		CCDSL 470J 50	C319,C320,C336-C339
	GWX-717	Control assembly B		CKDYF 103Z 50	C103, C109, C110, C119, C120, C201, C202, C207, C211, C224, C226, C228, C231, C234, C325, C326, C153
	AWM-351	Complex assembly			

* The complex assembly (AWM-351) is composed of Complex assembly, Volume assembly, Headphones jack assembly and switch assembly.

Complex Assembly

CAPACITORS

Mark	Part No.	Symbol & Description	Mark	Part No.	Symbol & Description
	CCDUJ 040C 50	C101,C102		CQMA 473K 50	C406,C407
	CCDCH 220J 50	C229,C230		CKDYB 152K 50	C311,C312
	CCDTH 100D 50	C104,C105		CKDYB 562K 50	C309,C310
	CCDSL 060D 50	C106			
	CCDTH 120J 50	C114,C115		CGB R47K 500	C107
				CQSA 511J 50	C136
	CCDCH 020C 50	C113		CQSA 431J 50	C204
	CCDCH 080D 50	C116		CQMA 183K 50	C344,C345
	CCDCH 150J 50	C112,C118		CQMA 104K 50	C348,C349
	CCDCH 330J 50	C117			
	CCDSL 101J 50	C108,C310,C302		CQMA 273K 50	C350,C351
				CQMA 333K 50	C356,C357
				CEANL 2R2M 50	C303,C304
				CEANL R47M 50	C150
				CEANL 010M 50	C137,C138,C315,C316

Mark	Part No.	Symbol & Description
	CEANL 2R2M 50	C321,C322,C328,C329
	CEANL 100M 50	C340,C341
	CEANL 470M 16	C307,C308
	CEANL 4R7M 50	C135
	CEA 471M 25L	C418
	CEA R33M 50L	C408
	CEA R68M 50L	C233
	CEA R47M 50L	C147,C148,C209
	CEA 010M 50L	C122,C232
	CEA 2R2M 50L	C127
	CEA 4R7M 50L	C206
	CEA 100M 50L	C149,C223,C401
	CEA 3R3M 50L	C212
	CEA 220M 25L	C360,C361
	CEA 470M 25L	C333,C405,C409,C413,C416,C417
	CEA 470M 50L	C362,C363,C402
	CEA 101M 10L	C132
	CEA 221M 35L	C410
	CEA 221M 16L	C134
	CEA 331M 50L	C330
	CEA 470M 16L	C213
	CEA 221M 100L	C403
	CEA 470M 100L	C404
	ACH-217	C411,C414 Electrolytic (4700/35V)
	ACG-019	C412 Ceramic (0.01/AC150V)
	ACM-014	TC101,TC102 FM ceramic trimmer
	ACM-006	TC103 Ceramic trimmer
	ACM-015	TC201,TC202 AM ceramic trimmer

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
	RD%PM □□□□	R101—R135, R137—R150, R202—R207, R209—R227, R229, R230, R232—R240, R243, R250, R255, R256, R301—R306, R313—R319, R321, R322, R325—R329, R334—R353, R360—R388, R392, R393, R395—R398, R406—R408, R410, R431, R501, R502, R504, R506—R510, R512—R515
	RS2P □□□□	R505,R511
	RN%PQ □□□□F	R136
	RD%PSF □□□□	R389,R415—R418,R421—R424
	RD%PS □□□□	R425—R428,R201
	PD%PMF □□□□	R503,R517
	RD1/8PM □□□□	R251—R254
	ACN-118	R419,R420 Wire wound (0.47/2W X2)
	ACN-029	R516 Carbon composition (2.2M/½W)
★	ACP-079	VR101 Semifixed (2k-B)
★	ACT-023	VR302 Variable (BALANCE)
★	ACT-140	VR303,VR304 Variable (TREBLE, BASS)

TRANSFORMERS, COILS AND FILTERS

Mark	Part No.	Symbol & Description
	ATE-039	T101 FM IF transformer
	ATE-052	T102 FM det. transformer
	ATC-112	L101 FM antenna coil
	ATC-131	L102 FM RF coil
	ATC-115	L103 FM osc. coil
	ATH-049	L104 RF choke coil
	T24-030	L201 Inductor
	ATB-636	L202 Bar-antenna assembly
	ATB-067	L203 AM osc. coil
	ATB-069	T201 AM IF coil
	ATH-028	L401,L402 AF choke coil
	ATF-126	F101,F102 FM ceramic filter
	ATF-121	F201 AM ceramic filter

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★ ★	LA1247	Q201
★ ★	M54922P	Q207
★ ★	PA3001-A	Q107
★ ★	HA1156W-P	Q108
★ ★	PA4008 (PA0001)	Q329
★ ★	NJM4558DXC (NJM4558DX)	Q330
★ ★	2SC1919 (2SC1845)	Q202
★ ★	JC501 (2SC2603/A/)	Q109, Q203—Q205, Q208, Q209, Q313, Q314, Q405
★ ★	2SC1384 (2SD438)	Q401
★ ★	2SC1845 (2SC2240)	Q307,Q308
	2SC535	Q102
★ ★	2SC461 (2SC710)	Q104,Q105
★ ★	2SD880 (2SD313)	Q402,Q403
★ ★	2SC2362 (2SC2240)	Q309,Q310
★ ★	2SA850-D* (2SA850-C*) (2SB560-D*) (2SB560-E*)	Q321,Q322
★ ★	2SC1735-D* (2SC1735-C*) (2SD438-D*) (2SD438-E*)	Q323,Q324

*hfe of Q321-Q324 should have the same value.

Mark	Part No.	Symbol & Description
★ ★	2SB595P-Y** (2SB595P-Q**) (2SB595P-R**)	Q325,Q326
★ ★	2SD525P-Y** (2SD525P-Q**) (2SD525P-R**)	Q327,Q328

** hfe of Q325–Q328 should have the same value.

★ ★	2SA798	Q305,Q306
★ ★	2SA726S (2SA992)	Q110,Q111
★ ★	2SA684A (2SB560)	Q404
★ ★	JA101 (2SA1115/A/)	Q106,Q206,Q214,Q215

★ ★	2SK168 (2SK61-GR)	Q101,Q103
★	WZ-048 (MZ-047)	D206
★	KZL120	D205
★	KZL072	D402
★	KZL140	D301,D403

★	WZ-290	D401
★	MZ-150 (WZ-150)	D416
★	KZL056	D409
★	1S2471	D407,D408

★	1S1555 (1S2473)	D104, D105, D203, D204, D207– D210, D310, D311, D315, D316, D410, D417
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★	GP-20D	D412–D415
★	10E2 (S1B01–02)	D404,D405

★	KV1320A-3	D101
★	KV1226-Y	D201

★	2-1K261	D411
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* KV1320A-3 consists of three twin vari-cap diodes with the identical characteristics.

* KV1226-Y consists of two vari-cap diodes with the identical characteristics.

OTHERS

Mark	Part No.	Symbol & Description
★ ★	ASG-301	S101 Push switch
★	ATF-125	X201 Ceramic resonator
★	ASS-016	X202 Crystal resonator
	AKA-017	Terminal (ANTENNA)
	AKB-077	Terminal (PLAY)
	AKB-079	Terminal (PHONO, AUX/VIDEO, REC)
	AEC-841	Insulator
	PBZ30P060FMC	Screw (3×6)
	VBZ30P060FMC	Screw (3×6)
	ABA-258	Screw
	AKH-005	Spacer

Switch Assembly

Mark	Part No.	Symbol & Description
★ ★	ASH-015	S102 Slide switch (AM CHANNEL STEP)

Volume Assembly

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
★	ACT-128 RD¼PM □□□J	VR301 Variable (VOLUME) R354–R359

Headphones Jack Assembly

Mark	Part No.	Symbol & Description
	AKN-029 RD¼PS 331J	Phones jack (PHONES) R429,R430

Control Assembly A

Mark	Part No.	Symbol & Description
	RD¼PM 272J	R201–R203
★ ★	JC501 (2SC2603/A/)	Q13,Q14

Control Assembly B (GWX-717)

CAPACITORS

Mark	Part No.	Symbol & Description
	CKDYF 103Z 50	C103

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
	RD¼PM □□□J	R4, R5, R7, R8–R11, R14, R24, R105–R107, R109–R111

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★ ★	TC4069UBP	Q4
★ ★	JC501 (2SC2603/A/)	Q7–Q9
★	WZ-140 (MZ-140)	D1
★	WZ-110 (MZ-110)	D2
★	WZ-157 (MZ-157)	D3
★	1S1555 (1S2473)	D7,D302

Connector Assembly

Mark	Part No.	Symbol & Description
	★ 1S1555 (1S2473)	D301

Control Assembly (GWX-721)

CAPACITORS

Mark	Part No.	Symbol & Description
	CKDYF 103Z 50	C1,C4
	CKDYB 331K 50	C2
	CKDYB 102K 50	C3
	CEA 101M 25L	C5
	CEA 010M 50L	C101,C102
	CEA 470M 25L	C6
	CKDYF 473Z 50	C501

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
	RD4PM 0000J	R1—R3, R6, R12, R13, R15—R20, R25—R28, R101—R104, R108
	RD4PMF 0000J	R29

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	M74LS42P	Q1
★★	LB1473	Q2
★★	TC4069UBP	Q3
★★	PD6004	Q5
★★	JC501 (2SC2603/A/)	Q10—Q12,Q15
★	1S1555 (1S2473)	D4,D5,D18—D20
★	2-1K261	D8—D17
★	SZ-027	D6,D101
★	AEL-365	D501—D510 LED (Red)
★	AEL-351	D511—D513 LED (Green)

OTHERS

Mark	Part No.	Symbol & Description
★★	ASG-177	S1—S13 Tact switch
★	ASS-017 PBZ25P100FMC	X1 Ceramic resonator Screw 2.5X10

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Parts List

NOTES:

- Parts without part number cannot be supplied.
 - The . mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
 - For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★ .
- ★★ GENERALLY MOVES FASTER THAN ★
- This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
	1.	BBT30P100FZK	Screw 3X10		36.	AKE-101	Terminal (SPEAKERS)
	2.	ANE-362	Top cover		37.	AKB-076	Terminal (AM STEREO OUT)
	3.				38.	MTZ30P100FZK	Screw 3X10
	4.	AEC-838	Foot assembly		39.	AEC-358	Strain relief
	5.	AAD-406	Knob (POWER)		40.	ADG-052	AC power cord
	6.	AAD-405	Knob		41.	ANR-432	Case cover
	7.	VBZ30P060FMC	Screw 3X6		42.	VBZ30P120FZK	Screw 3X12
	8.	AAB-274	Knob (BASS,TREBLE, BALANCE)	★	43.	WA35F100N080	Washer 3.5φ
	9.	AAB-273	Knob (VOLUME)		44.	AEL-379	LED array
	10.	ANM-075	Front panel assembly		45.		
	11.	ANR-454	Display cover		AWM-351		Complex assembly
	12.	AAD-399	Knob (INPUT)				(Nos.111,114,117 and 118)
	13.	AAD-400	Knob (TUNING)				
	14.	AAD-402	Knob (FM)				
	15.	AAD-403	Knob (AM)				
	16.	AAD-404	Knob (MEMORY/STOP)		101.		Flexible joint
	17.	ABH-088	Coiled spring		102.		Bottom plate
	18.	ABE-072	CS-type washer		103.		Ground plate
	19.				104.		
	20.				105.		
	21.	VTZ40P080FMC	Screw 4X8		106.		
★	22.	ATT-839	Power transformer		107.		Transformer frame
	23.	VMZ30P060FMC	Screw 3X6		108.		Panel stay
	24.	ABN-047	Union nut		109.		Stopper
	25.	NK90FMC	Nut M9		110.		Cushion
	26.	ABN-028	Nut		111.		Headphones jack assembly
	27.	GWX-721	Control assembly		112.		Shield case
★★	28.	ASG-521	Push switch (POWER)		113.		VR holder
	29.	ACG-017	Ceramic capacitor		114.		Volume assembly
★★	30.	AEK-108	Fuse (5A, FU102,FU103)		115.		Side frame R
	31.	VBZ30P080FMC	Screw 3X8		116.		Control assembly A
★★	32.	AEK-101	Fuse (3A,FU101)		117.		Switch assembly
	33.	GWX-717	Control assembly B		118.		Complex assembly
	34.	AKP-039	AC socket (AC OUTPUTS)		119.		Connector assembly
	35.	AXC-013	Battery case		120.		Rear Panel
					121.		Terminal (GND)
					122.		

10. ADJUSTMENTS

Idle Current Adjustment

- Without any load or input signal, turn the VOLUME control to the minimum position.
- Turn the POWER switch ON and let stand for 10 minutes.
- Check that the voltage (DC) between TP-L (TP-R) terminal (-) on the complex assembly and SPEAKERS + terminal (+) on the rear panel lies within 2.35mV—117.5mV range.
- If the voltage is less than 2.35mV, cut jumper JP 1(JP 2). If the voltage exceeds 117.5mV, check for circuit failure.

FM Tuner Adjustment

- Connect the FM signal generator (FM SG) to the FM ANTENNA 300 Ω terminal through a 300 Ω dummy antenna.
 - Set the FM (FUNCTION) switch to the ON position and the MONO/MUTE OFF switch to the MONO/MUTE OFF position.
 - Connect between pin 10 and pin 38 of Q5 on the control assembly (GWX-721) for a short period of time. (The test frequencies are stored in memories. This operation is program controlled of the computer.)
- (*1) Tune the FM SG to the SX-4.
- (*2) Connect the FM multiplex signal generator to the FM SG external modulator terminal. Set the modulation to a Main 1kHz/L+R/ $\pm$ 67.5kHz deviation. Pilot 19kHz/ $\pm$ 7.5kHz deviation.

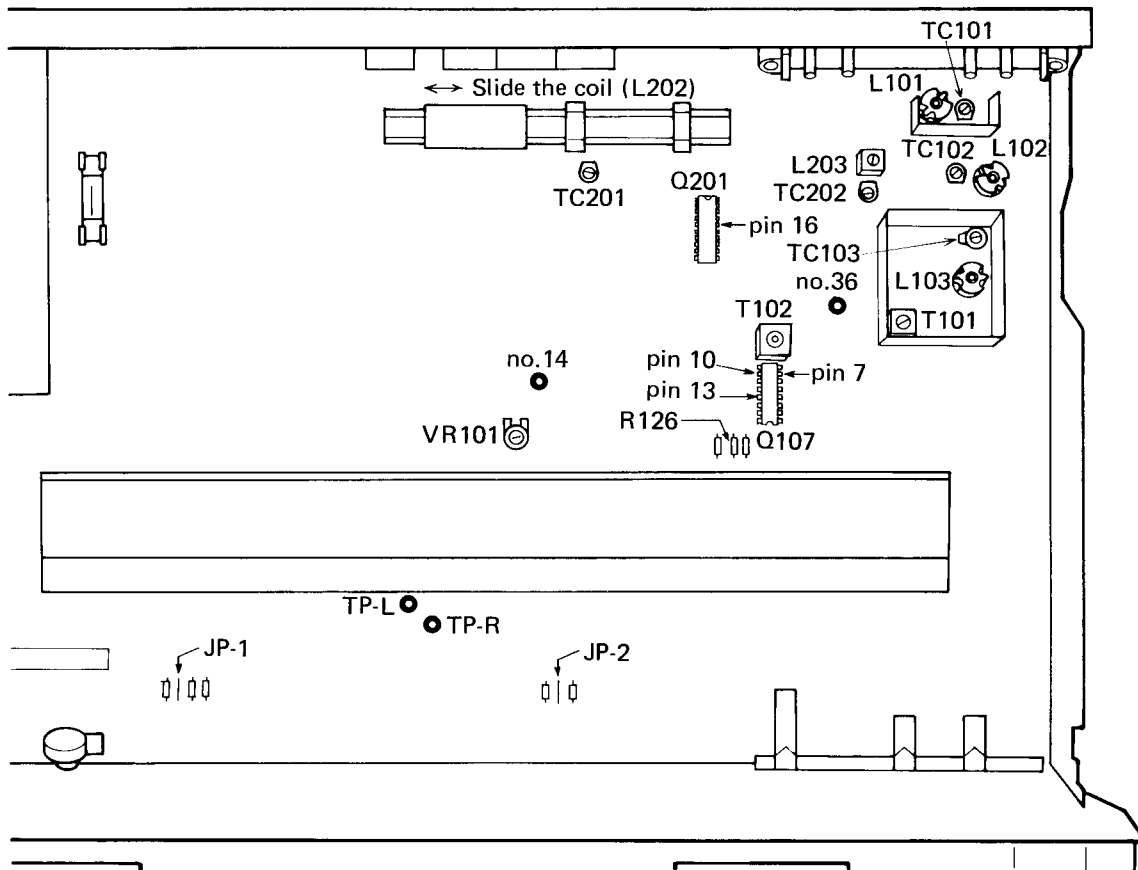
Step	FM SG (400Hz, ±75kHz deviation)		SX-4 STATION CALL switch	Adjustment point	Adjustment procedure
	Frequency	Level			
1	No signal		Push the 1	L103	7.2V DC between terminal no.36 and ground.
2	No signal		Push the 6	TC103	25V DC between terminal no.36 and ground.
3	Repeat steps 1 and 2 until both specifications are correct.				
4	90.0MHz (*1)	40dB	Push the 3	L101, L102	Adjust until DC voltage between pin 13 of Q107 and ground is maximum.
5	106.0MHz (*1)	40dB	Push the 5	TC101,TC102	
6	Repeat steps 4 and 5 until maximum sensitivity is attained.				
7	99.0MHz(*1)	60dB	Push the 4	T101	Adjust until DC voltage between pin 13 of Q107 and ground is maximum.
8	99.0MHz (*1)	60dB	Push the 4	T102	Adjust until distortion at TAPE REC L or R terminal is minimum.
9	Set the MONO/MUTE OFF switch to the STEREO/MUTE ON position.				
10	99.0MHz(*1)	60dB (not modulation)	Push the 4	VR101	Adjust signal at terminal no.14 to 19kHz (±100Hz).
11	99.0MHz (*1) Set to stereo modulation(*2)	60dB	Push the 4	T101 (within ±90°)	Adjust until distortion at TAPE REC L or R terminal is minimum.
12	99.0MHz(*1)	Variable	Push the 4	R126	Confirm that muting operation stops above 36dB - if not, remove R126.

AM Tuner Adjustment

- Connect the AM signal generator (AM SG) to the AM ANTENNA terminal through a 10k Ω resistor.
- Set the AM (FUNCTION) switch to the ON position and the AM CHANNEL STEP switch (on the rear panel) to the 9kHz position.
- Connect between pin 10 and pin 38 of Q5 on the control assembly (GWX-721) for a short period of time. (The test frequencies are stored in memories. This operation is program controlled of the computer.)

(*3) Tune the AM SG to the SX-4.

Step	AM SG (400Hz, 30% modulation)		SX-4 STATION CALL switch	Adjustment point	Adjustment procedure
	Frequency	Level			
1	No signal		Push the 1	L203	2V DC between terminal no.36 and ground.
2	No signal		Push the 4	TC202	25V DC between terminal no.36 and ground.
3	Repeat steps 1 and 2 until both specifications are correct.				
4	603kHz(*3)	40dB	Push the 2	Bar-antenna (L202)	Adjust until DC voltage between pin 16 of Q201 and ground is maximum.
5	1395kHz(*3)	40dB	Push the 3	TC201	
6	Repeat steps 4 and 5 until maximum sensitivity is attained.				
7	Set the AM CHANNEL STEP switch to the 10kHz position.				



10. RÉGLAGE

Réglage du courant déwatté

1. Sans aucune charge ni signal d'entrée, placer de contrôle VOLUME en position minimum.
2. Placer la commutateur de puissance (POWER) sur ON et la maintenir dix minutes.
3. Vérifier que le voltage (CC) entre la borne (-) TP-gauche (TP-droit) de l'assemblage complexe et les SPEAKERS ainsi que la borne (+) du panneau arrière se situe dans une gamme de 2,35mV, 117,5mV.
4. Si le voltage est de moins de 2,35mV, couper le câble d'interconnexion JP 1 (JP 2). Si le voltage est supérieur 117,5mV, toute possibilité de panne de circuit.

Réglage du tuner FM

- Raccorde le générateur de signaux FM (FM SG) sur la borne de l'antenne FM (FM ANTENNA) 300Ω par l'intermédiaire d'une antenne factice 300Ω.
 - Régler le commutateur FM (FUNCTION) en position ON et le commutateur MONO/MUTE OFF en position MONO/MUTE OFF.
 - Raccorder les broche 10 et 38 de Q5 de l'assemblage de contrôle (GWX-721) pendant un court instant. (Les fréquences de contrôle sont gardées en memoire. Le contrôle de cette opération est programmé par l'ordinateur).
- (*1) Accorder le générateur de signaux FM sur SX-4.
- (*2) Raccorder le générateur de signaux FM stéréo multiplex sur la borne du modulateur externe FM SG. Régler la modulation sur déviation principale 1kHz/gauche+droit (L+R)/±67,5kHz, déviation de synchronisation 19kHz/±7,5kHz.

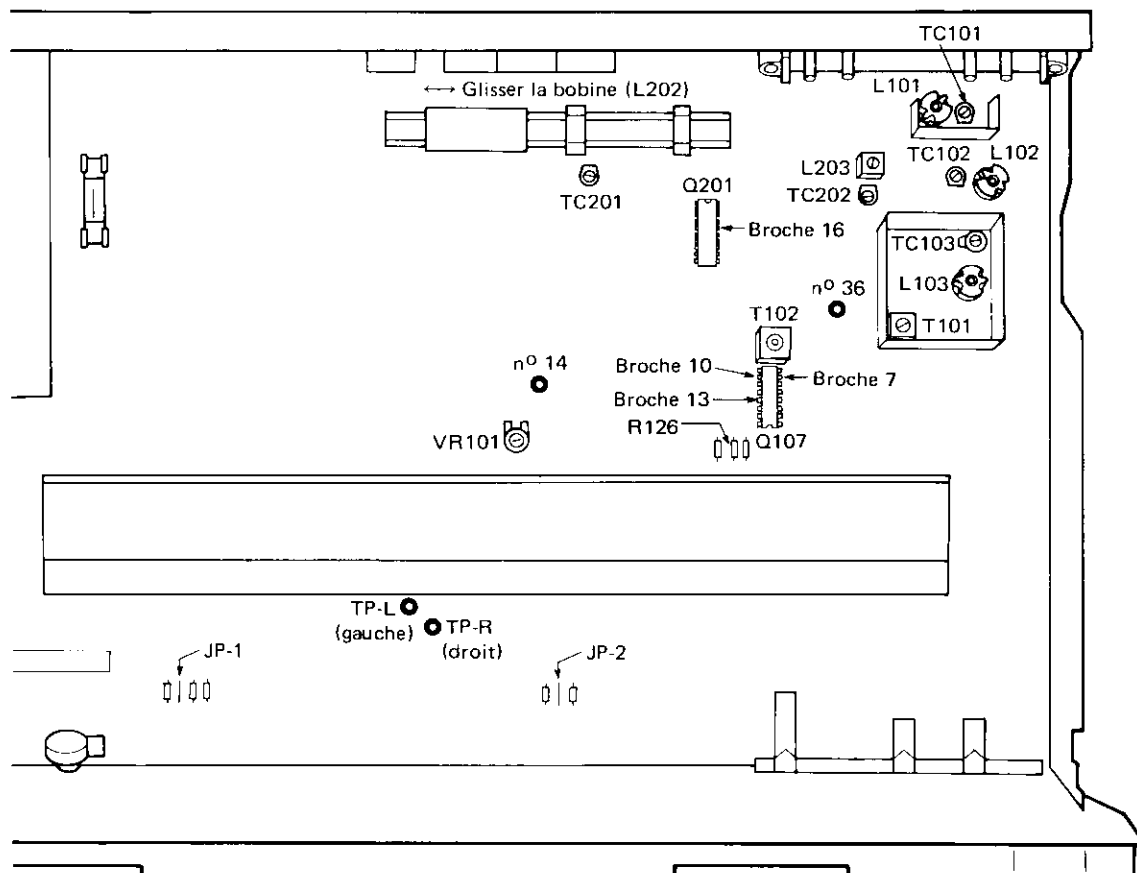
Phase	FM SG (400Hz, ±75kHz, déviation)		Commutateur STATION CALL de SX-4	Point de réglage	Méthode de réglage
	Fréquence	Niveau			
1	Pas de signal		Appuyer la touche n° 1	L103	7,2V CC entre la borne n° 36 et la borne de terre.
2	Pas de signal		Appuyer la touche n° 6	TC103	25V CC entre la borne n° 36 et la borne de terre.
3	Répéter les phases 1 et 2 afin d'obtenir les deux caractéristiques correctes.				
4	90,0MHz (*1)	40dB	Appuyer la touche n° 3	L101,L102	Régler le voltage en CC entre la broche 13 de Q107 et la terre à son maximum.
5	106,0MHz (*1)	40dB	Appuyer la touche n° 5	TC101, TC102	
6	Répéter les phases 4 et 5 afin d'obtenir la sensibilité maximum.				
7	99,0MHz (*1)	60dB	Appuyer la touche n° 4	T101	Régler le voltage en CC entre la broche 13 de Q107 et la terre à son maximum.
8	99,0MHz (*1)	60dB	Appuyer la touche n° 4	T102	Régler afin d'obtenir la distorsion minimum à la borne TAPE REC L ou R.
9	Régler le commutateur MONO/MUTE OF sur la position STEREO/MUTE ON.				
10	99,0MHz (*1)	60dB (pas de modulation)	Appuyer la touche n° 4	VR101	Régler le signal à la borne n° 14 sur 19kHz (±100Hz).
11	99,0MHz (*1) Régler sur modulation stéréo (*2)	60dB	Appuyer la touche n° 4	T101 (entre ±90°)	Régler afin d'obtenir la distorsion minimum à la borne TAPE REC L ou R.
12	99,0MHz (*1)	Variable	Appuyer la touche n° 4	R126	Vérifier que l'opération de blocage casse au-dessus de 36dB, sinon retirer R126.

Réglage du tuner AM

- Raccorder le générateur de signaux AM (AM SG) sur la borne AM d'antenne (AM ANTENNA) par par l'intermédiaire d'un résistor de 10kΩ.
- Régler le commutateur AM (FUNCTION) sur la position ON et le commutateur AM CHANNEL STEP (situé sur le panneau arrière) sur la position 9kHz.
- Raccorder les broche 10 et 38 de Q5 sur l'assemblage de contrôle (GWX-721) pendant un court instant. (Les fréquences de contrôle sont gardées en mémoire. Le contrôle de cette opération est programmé par l'ordinateur.)

(*3) Accorder le générateur de signaux AM SG sur SX-4.

Phase	AM SG (400Hz, 30% modulation)		Commutateur STATION CALL de SX-4	Point de réglage	Méthode de réglage
	Fréquence	Niveau			
1	Pas de signal		Appuyer la touche n° 1	L203	2V CC entre la borne n° 36 et la borne de terre.
2	Pas de signal		Appuyer la touche n° 4	TC202	25V CC entre la borne n° 36 et la borne de terre.
3	Répéter les phases 1 et 2 afin d'obtenir les deux caractéristiques correctes.				
4	603kHz (*3)	40dB	Appuyer la touche n° 2	Antenne tige (L202)	Régler le voltage en CC entre la broche 16 de Q201 et la terre à son maximum.
5	1395kHz (*3)	40dB	Appuyer la touche n° 3	TC201	
6	Répéter les phases 4 et 5 afin d'obtenir la sensibilité maximum.				
7	Placer le commutateur AM CHANNEL STEP en position 10kHz.				



10. AJUSTE

Ajuste de la corriente desvatada

1. Sin carga o señal de entrada alguna, girar el control VOLUME a su posición mínima.
2. Coloque el interruptor POWER en ON y déjelo durante unos 10 minutos.
3. Verificar que la tensión (CC) entre el terminal (-) TP-Izq. (TP-Der.) en el complejo de conjunto y el terminal (+) de los altavoces (SPEAKERS) (+), en el panel posterior oscile entre 2,35mV y 117,5mV.
4. Si la tensión es inferior a los 2,35mV, cortar el puente JP1 (JP2). Si la tensión excede 117,5 mV, verifique la posibilidad de falla del circuito.

Ajuste del Sintonizador de FM

- Conectar el generador de señales de FM (FM SG) al terminal FM ANTENNA 300ohmios a través de una antena ficticia de 300ohmios.
 - Ajustar el interruptor FM (FUNCTION) en la posición ON y el interruptor MONO/MUTE OFF en la posición MONO/MUTE OFF.
 - Conéctelo entre la clavija 10 y la clavija 38 del Q5 en la conjunto de control (GWX-721) por un corto período de tiempo. (Las frecuencias de prueba son acumuladas en la memoria. Esta operación es un programa controlado por la computadora.)
- (*1) Sintonizar el FM SG con el SX-4.
- (*2) Conectar el generador de señales de FM multiplex al terminal modulador exterior del FM SG. Ajustar la modulación a Principal, 1kHz/Izq.+Der. (L+R)/±67,5kHz de desviación; Piloto 19kHz/±7,5kHz de desviación.

Paso	FM SG (400Hz, ±75kHz desviación)		Interruptor STATION CALL SX-4	Punto de ajuste	Procedimientos de ajuste
	Frecuencia	Nivel			
1	Sin señal		Presione 1	L103	7,2V CC entre el terminal no. 36 y masa.
2	Sin señal		Presione 6	TC103	25V CC entre el terminal no. 36 y masa.
3	Repetir los pasos 1 y 2 hasta que ambas especificaciones sean correctas.				
4	90,0MHz (*1)	40dB	Presione 3	L101, L102	Ajustar hasta que la tensión de CC entre la clavija 13 del Q107 y tierra sea la máxima.
5	106,0MHz (*1)	40dB	Presione 5	TC101, TC102	
6	Repetir los pasos 4 y 5 hasta lograrse la máxima sensibilidad.				
7	99,0MHz (*1)	60dB	Presione 4	T101	Ajustar hasta que la tensión de CC entre la clavija 13 del Q107 y tierra sea la máxima.
8	99,0MHz (*1)	60dB	Presione 4	T102	Ajustar hasta que la distorsión en el terminal TAPE REC Izq. (L) Der. (R) sea la mínima.
9	Ajustar el interruptor MONO/MUTE OFF en la posición STEREO/MUTE ON.				
10	99,0MHz (*1)	60dB (son modulación)	Presione 4	VR101	Ajustar la señal en el terminal no. 14 a 19kHz (±100Hz).
11	99,0MHz (*1) Ajustar a modulación estereofónica (*2)	60dB	Presione 4	T101 (dentro de ±90°)	Ajustar hasta que la distorsión en el terminal TAPE REC Izq. (L) Der. (R) sea la mínima.
12	99,0MHz (*1)	Variable	Presione 4	R126	Confirmar que la operación de silenciamiento se detenga por encima de los 36dB. Si no fuera así, remueva el R126.

Ajuste del Sintonizador de AM

- Conectar el generador de señales de AM (FM SG) al terminal AM ANTENA a través de un resistor de 10Kohmio.
 - Ajustar el interruptor de AM (FUNCTION) en la posición ON y el interruptor AM CHANNEL STEP (del panel posterior) en la posición de 9kHz.
 - Conéctelo entre la clavija 10 y la clavija 38 del Q5 en la conjunto de control (GWX-721) por un corto período de tiempo. (Las frecuencias de prueba son almacenadas en la memoria. Esta operación es un programa controlado por la computadora.)
- (*3) Sintonizar el AM SG con el SX-4.

Paso	FM SG (400Hz, 30% modulación)		Interruptor STATION CALL SX-4	Punto de ajuste	Procedimientos de ajuste
	Frecuencia	Nivel			
1	Sin señal		Presione 1	L203	1V CC entre el terminal no. 36 y masa.
2	Sin señal		Presione 4	TC202	25V CC entre el terminal del no. 36 y masa.
3	Repetir los pasos 1 y 2 hasta que ambas especificaciones sean correctas.				
4	603kHz (*3)	40dB	Presione 2	Antena de barra (L202)	Ajustar hasta que la tensión de CC entre la clavija 16 del Q201 y tierra sea la máxima.
5	1395kHz (*3)	40dB	Presione 3	TC201	
6	Repetir los pasos 4 y 5 hasta logarse la máxima sensibilidad.				
7	Ajustar el interruptor AM CHANNEL STEP en la posición 10kHz.				

