

## SPECIFICATIONS

### Receiver unit (A-722/722L)

#### Amplifier section

#### Rated power output

35 watts per channel minimum RMS, both channels driven, at 6 Ω from 40 Hz to 20,000 Hz with no more than 0.09% total harmonic distortion (FTC).

(IEC/NF) From 63 to 12,500 Hz, 0.7% T.H.D.	
at 6 Ω	35 W + 35 W
(DIN) 1 kHz, at 6 Ω	40 W + 40 W
(IHF'66) From 40 to 20 kHz, 0.09% T.H.D.	
at 6 Ω	35 W + 35 W
<b>Total harmonic distortion</b>	0.09% at rated power
	0.06% at 1 kHz, 1/2 rated power

<b>Frequency response</b>	
CD, TUNER, AUX, TAPE	40 Hz ~ 70 kHz, 0 dB, -3 dB
<b>Signal to noise ratio (IHF'66)</b>	
DAT INPUT	100 dB
<b>Input sensitivity/Impedance</b>	
DAT INPUT	150 mV/47 kΩ
N.B. circuit (-30 dB VOLUME level)	+16 dB (at 60 Hz)
<b>Output level/Impedance</b>	
SUPER WOOFER OUT	1.5 V/3.6 kΩ
<b>Power consumption</b>	180 W (IEC)
	1.5 A (for U.S.A. and Canada)

<b>Dimensions</b>	W: 270 mm (10-5/8")
	H: 120 mm (4-3/4")
	D: 300 mm (11-4/5")
<b>Weight (Net)</b>	6.5 kg (14.32 lb)

#### A-722L FM tuner section

<b>Tuning frequency range</b>	87.5 MHz ~ 108 MHz
<b>Usable sensitivity (DIN at 75 Ω)</b>	
MONO	0.7 μV
STEREO	22 μV
<b>Total harmonic distortion (DIN at 1 kHz)</b>	
MONO	0.6% (65.2 dBf input)
STEREO	0.8% (65.2 dBf input)
<b>Signal to noise ratio (DIN weighted at 1 kHz)</b>	
MONO	70 dB (65.2 dBf input)
STEREO	64 dB (65.2 dBf input)

#### Note:

KENWOOD follows a policy of continuous advancements in development. For this reason specifications may be without notice.

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Kenwood poursuit une politique de progrès constants en ce qui concerne le développement. Pour cette raison, les spécifications sont sujettes à modifications sans préavis.

Kenwood strebt ständige, Verbesserungen in der Entwicklung an. Daher bleiben Änderungen der technischen Daten jederzeit vorbehalten.

<b>Stereo separation (DIN)</b>	
1 kHz	45 dB
<b>Frequency response</b>	30 Hz ~ 15 kHz, +0.5 dB, -3.0 dB

#### MW tuner section

<b>Tuning frequency range</b>	531 kHz ~ 1,602 kHz
<b>Usable sensitivity</b>	20 μV/(500 μV/m)
<b>Signal to noise ratio</b>	
(at 30% mod, 1 mV input)	48 dB

#### LW tuner section

<b>Tuning frequency range</b>	153 kHz ~ 281 kHz
<b>Usable sensitivity</b>	22 μV
<b>Signal to noise ratio</b>	
(at 30% mod. 1 mV input)	45 dB

#### A-722 FM tuner section

<b>Tuning frequency range</b>	87.5 MHz ~ 108 MHz
<b>Usable sensitivity (MONO at 75 Ω)</b>	1.2 μV/12.8 dBf
<b>Total harmonic distortion (at 1 kHz)</b>	
MONO	0.5% (65 dBf input)
STEREO	0.6% (65 dBf input)
<b>Signal to noise ratio (at 1 kHz)</b>	
MONO	80 dB (65 dBf input)
STEREO	74 dB (65 dBf input)
<b>Stereo separation 1 kHz</b>	38 dB
<b>Frequency response</b>	30 Hz ~ 15 kHz, +0.5 dB, -3.0 dB

#### AM tuner section

<b>Tuning frequency range</b>	531 kHz ~ 1,602 kHz
9 kHz step	530 kHz ~ 1,610 kHz
10 kHz step	530 kHz ~ 1,610 kHz
<b>Usable sensitivity</b>	20 μV/500 μV/m
<b>Signal to noise ratio</b>	
(at 30% mod. 1 mV input)	48 dB

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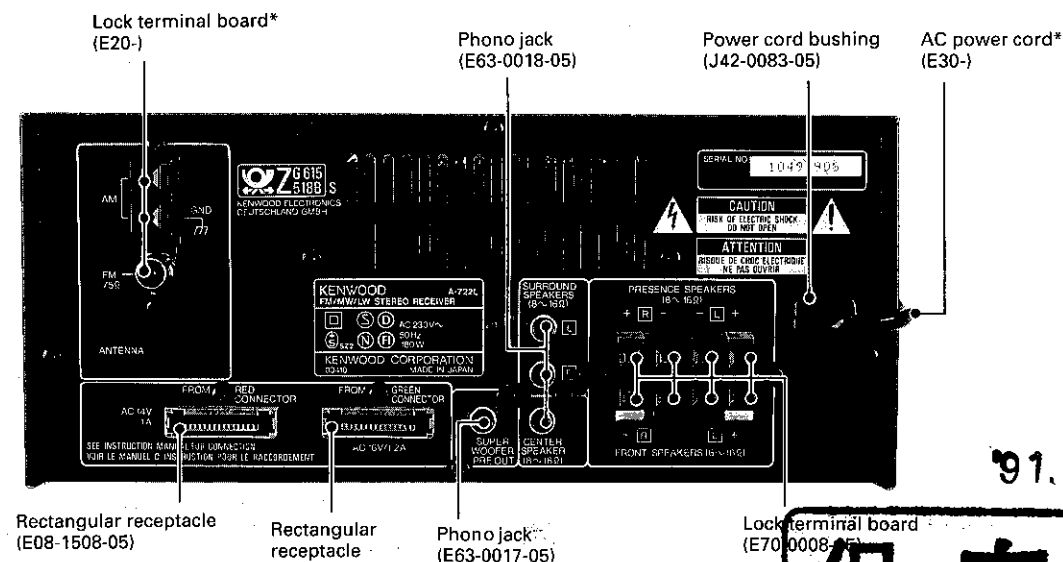
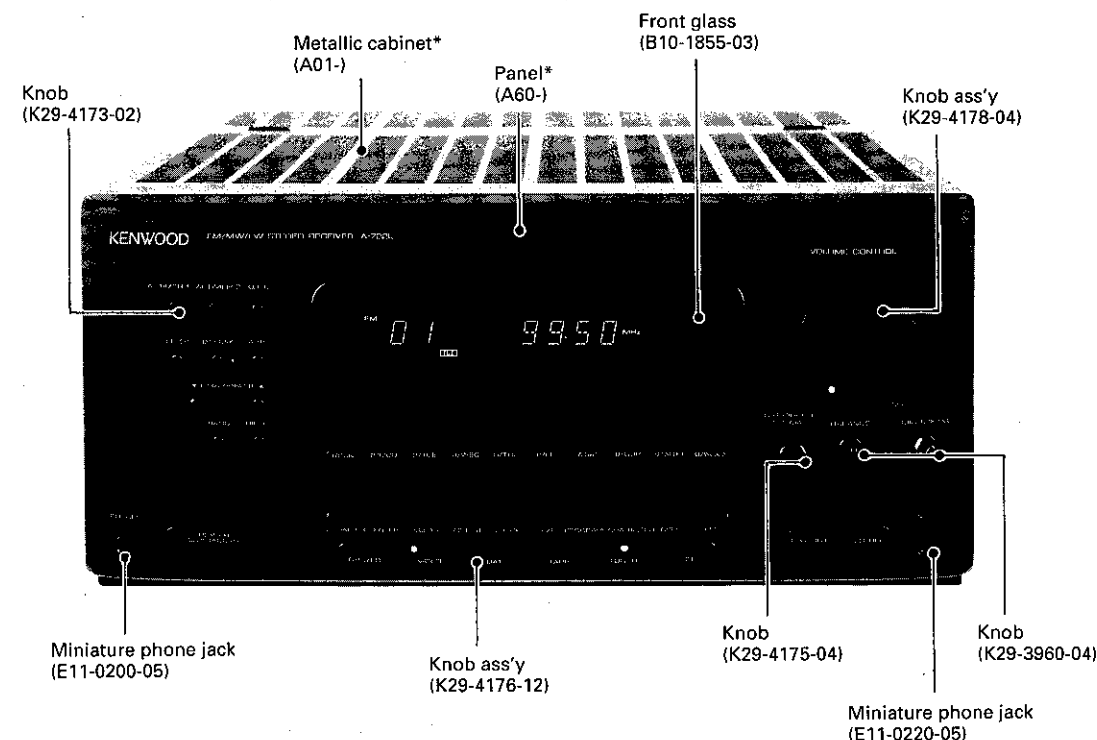
# A-722/722L

## SERVICE MANUAL

(COMPACT HI-FI SYSTEM  
UD COMPONENT SYSTEM

UD-90)

©1991-5 PRINTED IN JAPAN  
B51-4374-00(J)3615



A-722 : K, P, Y, M, X type  
A-722L : T, E type

Refer to the SERVICING NOTES on page 2 before repair.

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保存用  
禁帯出

\* Refer to parts list on page 35  
Photo 2L.

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## SERVICING NOTES

① This unit does not contain a selector IC. Since each speaker relay of this unit is operated according to the data that is serially transmitted from the graphic equalizer (GE-722), the receiver cannot output sound alone. To output a signal to each speaker terminal, follow the following procedures.

### Procedure 1)

Direct the tuner output to the main amplifier input. Connect the test pin on the right (lower right of the tuner board) of the main amplifier board (X09, A/8). (Fig. 1)

Front amplifier	Pins 12 and 10 (Left channel)
	Pins 13 and 11 (Right channel)
Presence amplifier	Pins 12 and R145 lead (Presence left channel)
	Pins 13 and R146 lead (Presence right channel)

### Procedure 2)

Enter the test mode. (Hold down the CHARACTER key, and insert the AC plug into the outlet.)

- 1) Press the DAT key. (Only the front speaker outputs sound.)
- 2) Press the VIDEO key. (The DSP surround four-channel mode is entered, and the front, rear, and center speakers output sound.)
- 3) Press the DBS/LD key. (The DSP front four-channel mode is entered, and the front and presence speakers outputs sound.)

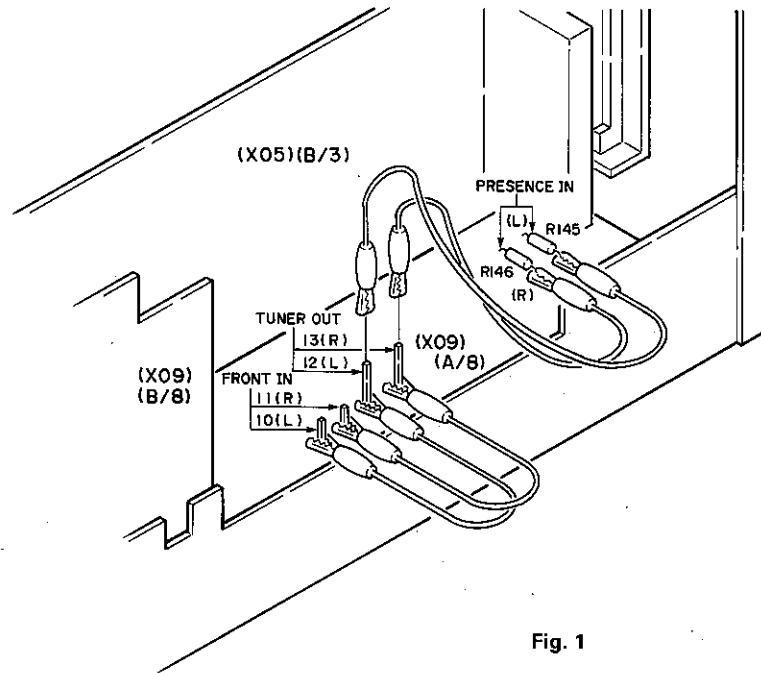
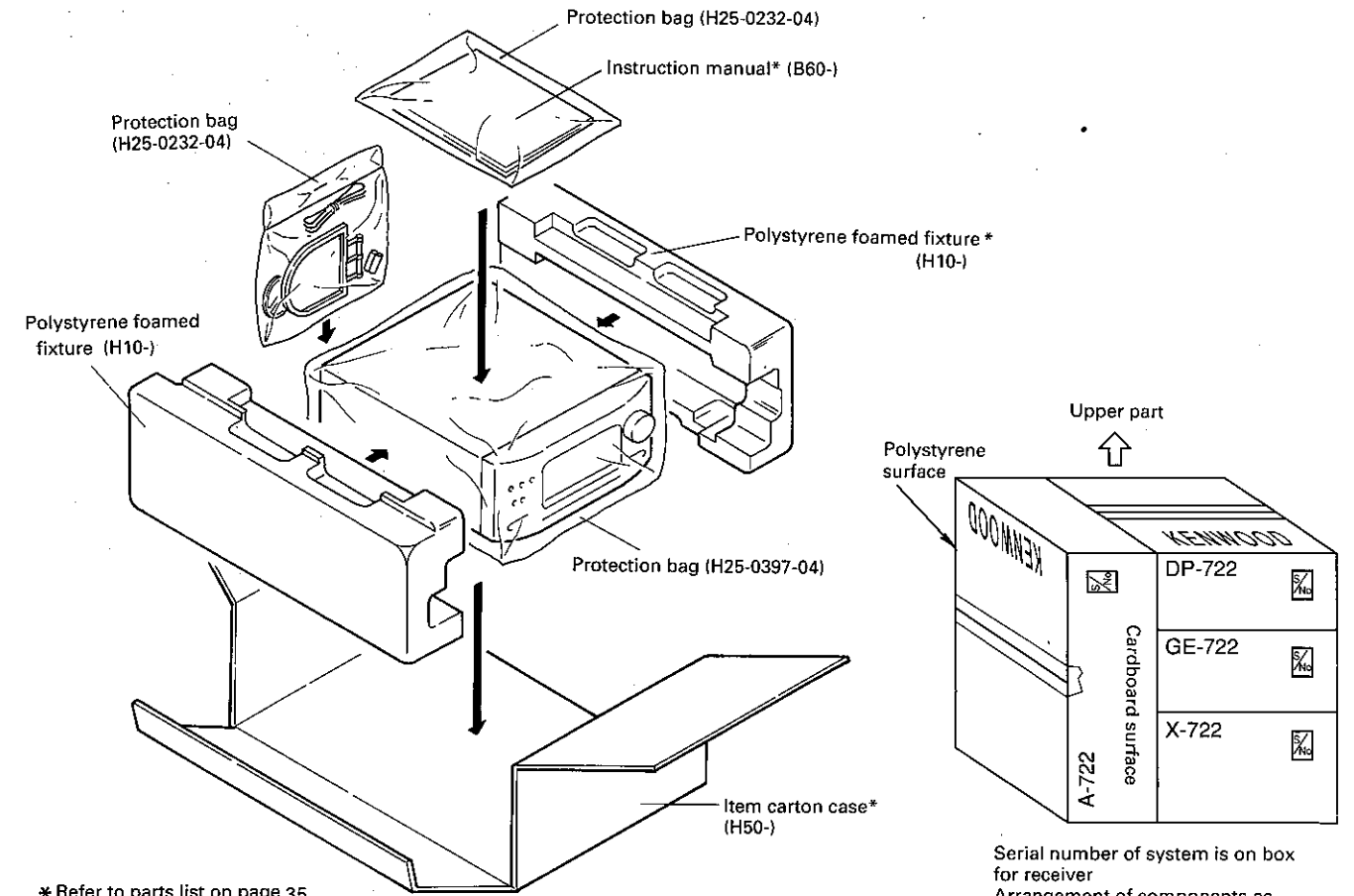


Fig. 1

## PACKING

The A-722 is supplied with all the accessories, except the remote controller (A70-0535-05) for the GE-722.

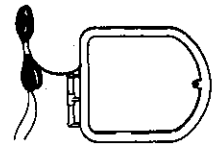

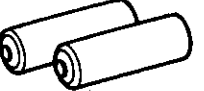

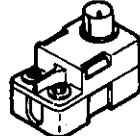
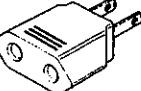


\* Refer to parts list on page 35

Serial number of system is on box for receiver  
Arrangement of components as viewed from window in other box

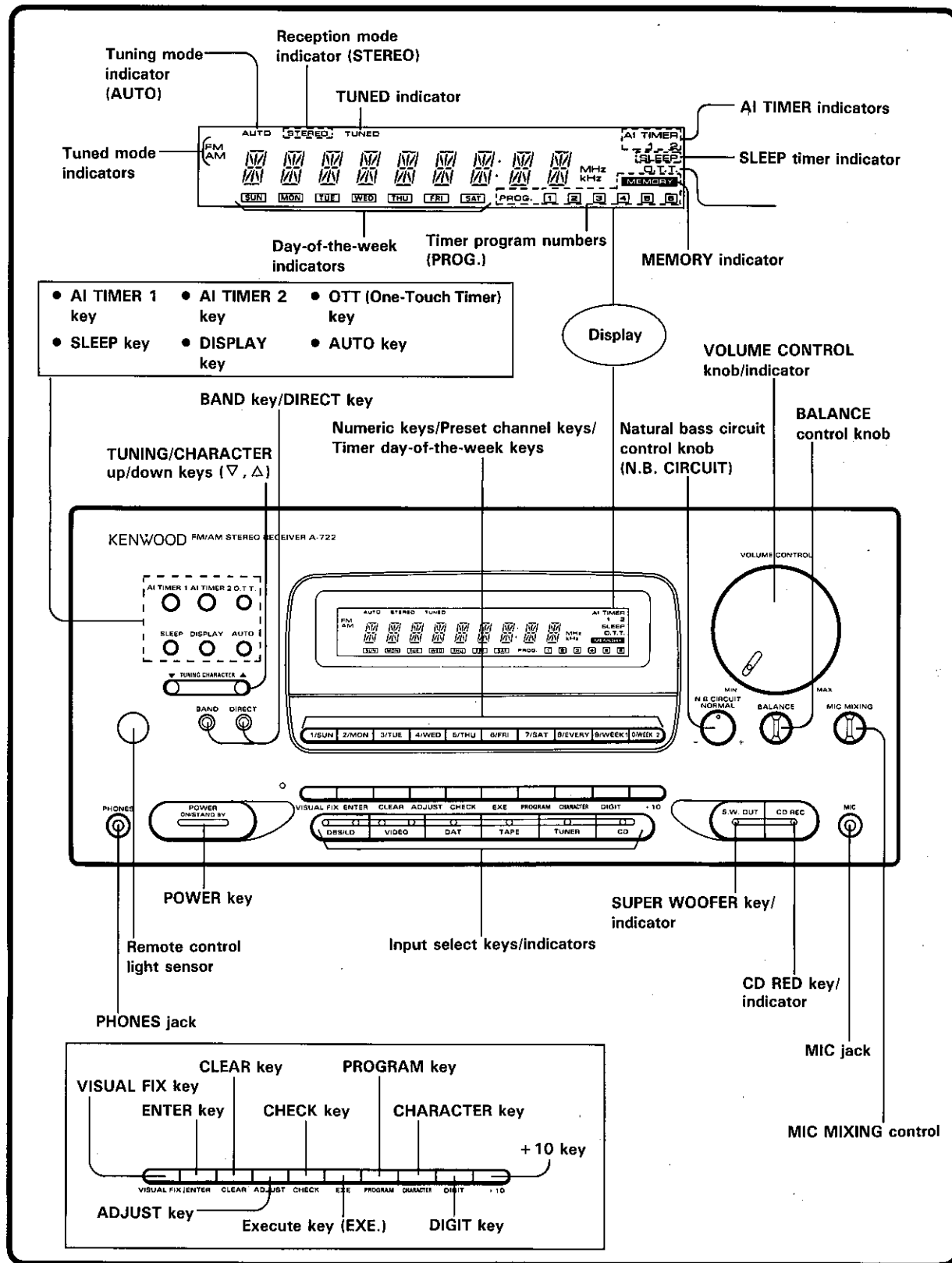
The sleeve method is K, Y, M types, and E, X, T types are corrugated fiberboard boxes.

### Accessories

- |  |   |   |
|--|---|---|
| <ul style="list-style-type: none"> <li>• AM (MW, LW) loop antenna ..... 1<br/>(T90-0173-05): Japan made<br/>(T90-0174-05): Singapore made</li> </ul>  | <ul style="list-style-type: none"> <li>• FM indoor antenna ..... 1<br/>(T90-0176-05): Japan made<br/>(T90-0175-05): Singapore made</li> </ul>  | <ul style="list-style-type: none"> <li>• Batteries (R06/AA) ..... 2</li> </ul>                               |
| <ul style="list-style-type: none"> <li>• Loop antenna stand ..... 1<br/>(J19-2815-04)</li> </ul>    | <ul style="list-style-type: none"> <li>• Antenna adaptor (75 Ω/300 Ω) .. 1<br/>(A-722L only) (T90-0136-05)</li> </ul>                          | <ul style="list-style-type: none"> <li>• AC plug adaptor ..... 1<br/>(M type only) (E03-0115-05)</li> </ul>  |

Controls and indicators

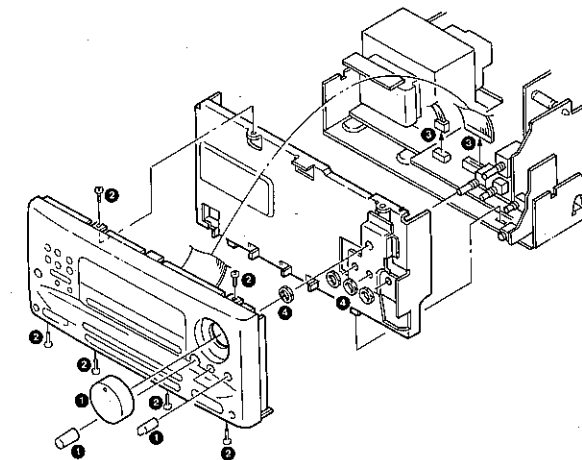
Receiver



DISASSEMBLY FOR REPAIR

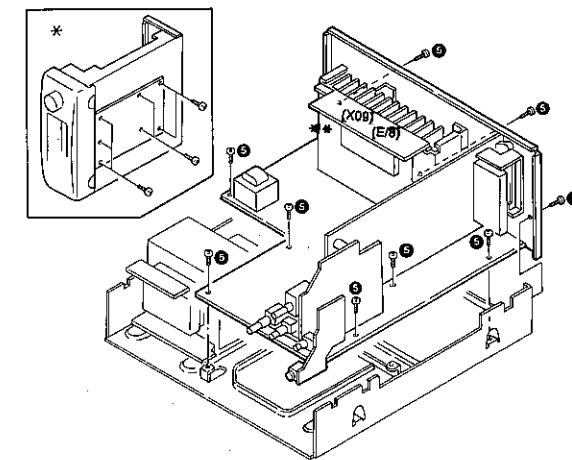
Removing the front panel and sub panel

1. Remove the four knobs ①.
2. Remove the six screws ②.  
Disconnect the two connector ③, then remove the front panel.
3. Remove the four nuts ④, then remove the sub panel.



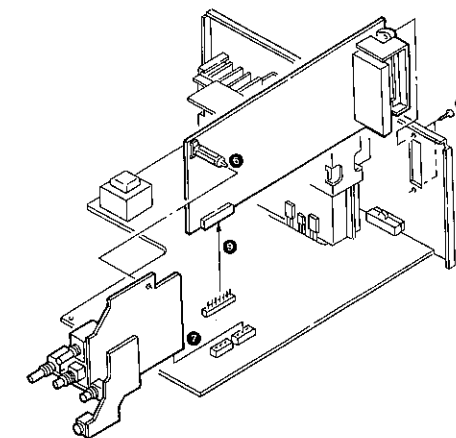
Removing the main PC board (X09: A/8)

4. Remove the nine screws ⑤, then remove the main PC board (X09: A/8).  
\* To adjust the main PC board, cover, as shown in the figure.  
\*\* To remove the final transistors for the front amplifier, remove the presence amplifier—PC board [(X09) (E/8)] first.



Removing the tuner PC board (X05: B/3) and the volume PC boards (X09: B/8, C, D/8)

5. Remove the unit holder ⑥.
6. Disconnect the volume PC boards (X09: B/8, C/8, D/8) from connector ⑦.
7. Remove the two screws ⑧.
8. Disconnect the tuner PC board (X05: B/3) from connector ⑨.



A-722/722L

BLOCK DIAGRAM

A-722/722L

CIRCUIT DESCRIPTION

Microprocessor and back-up condenser of this unit (16-bit serial transmission is supported unlike the UD-7/9 series (8 bits).)

Microcomputer initialization (reset) and test mode

	A-722 RECEIVER microcomputer (X05) IC201 CXP50116-341Q	GE-722 GE microcomputer (X11) IC1 M38063M6-151FP	X-722 DECK microcomputer (X28) IC10 UPD75112CW-133	DP-722 CD microcomputer (X32) IC8 UPD75216ACW-C26
<b>Backup condenser</b>	(X05) C82 2200 μF 6.3 V	(X11) C100 0.047 F 5 V	(X28) C128 2200 μF 6.3 V	None
<b>Initialization (reset)</b>	Hold down the ENTER key, and insert the AC plug into the outlet.	Hold down the MEMORY key, and turn AC on.	Turn AC off in the CRLS test mode (see below).	Turn AC off again
<b>Test mode</b>	<b>Operation</b>	Hold down the CHARACTER key, and insert the AC plug into the outlet.	Short test pin ⑤-⑥, and turn AC on.	See the DP-711 service manual.
	<b>Release</b>	Remove the AC plug from the outlet.	Release — AC off.	Press the PAUSE key.
	<b>Contents</b>	① All fluorescent displays light. For details, see the service manual for each model.		No fluorescent display.

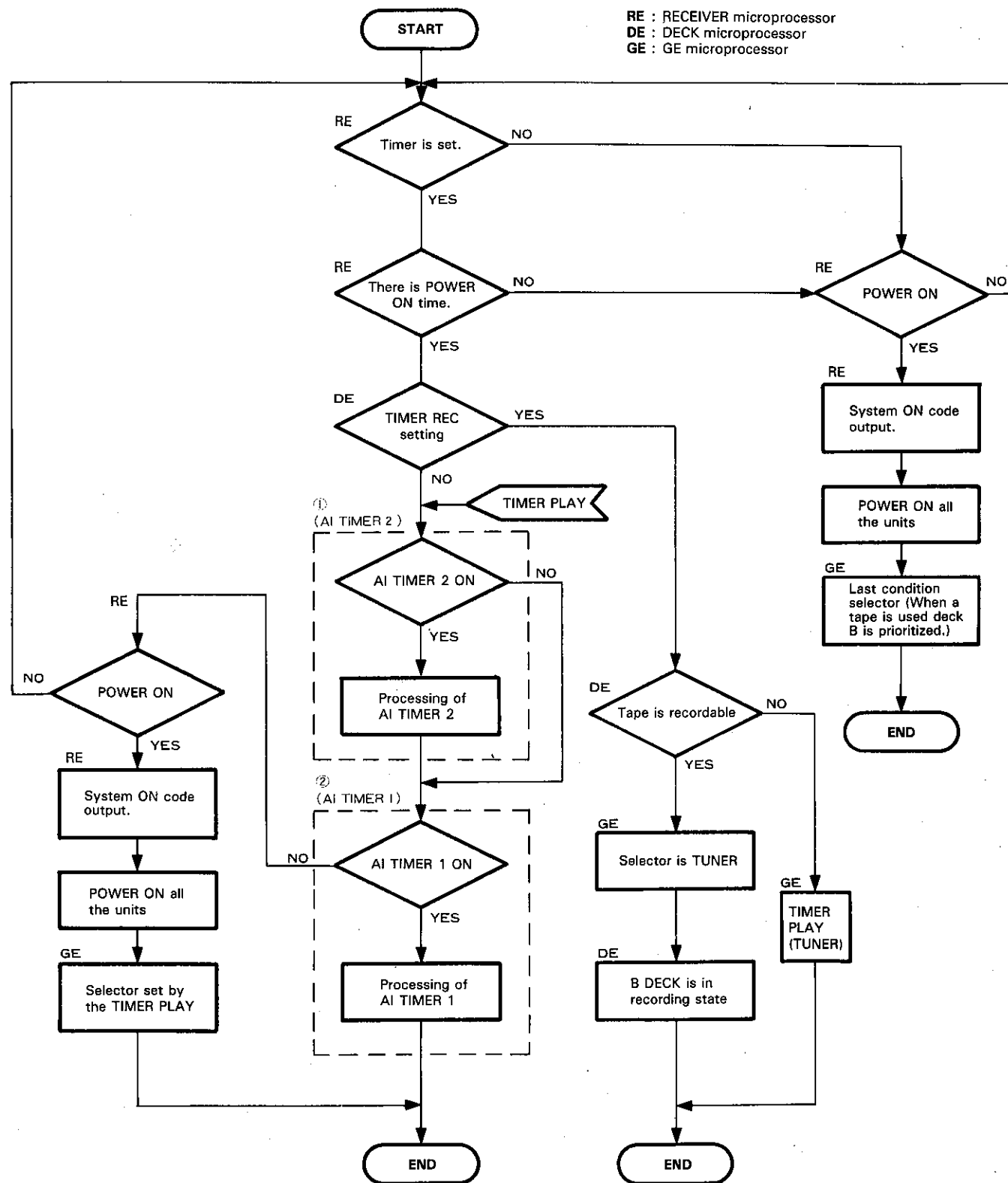
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CIRCUIT DESCRIPTION

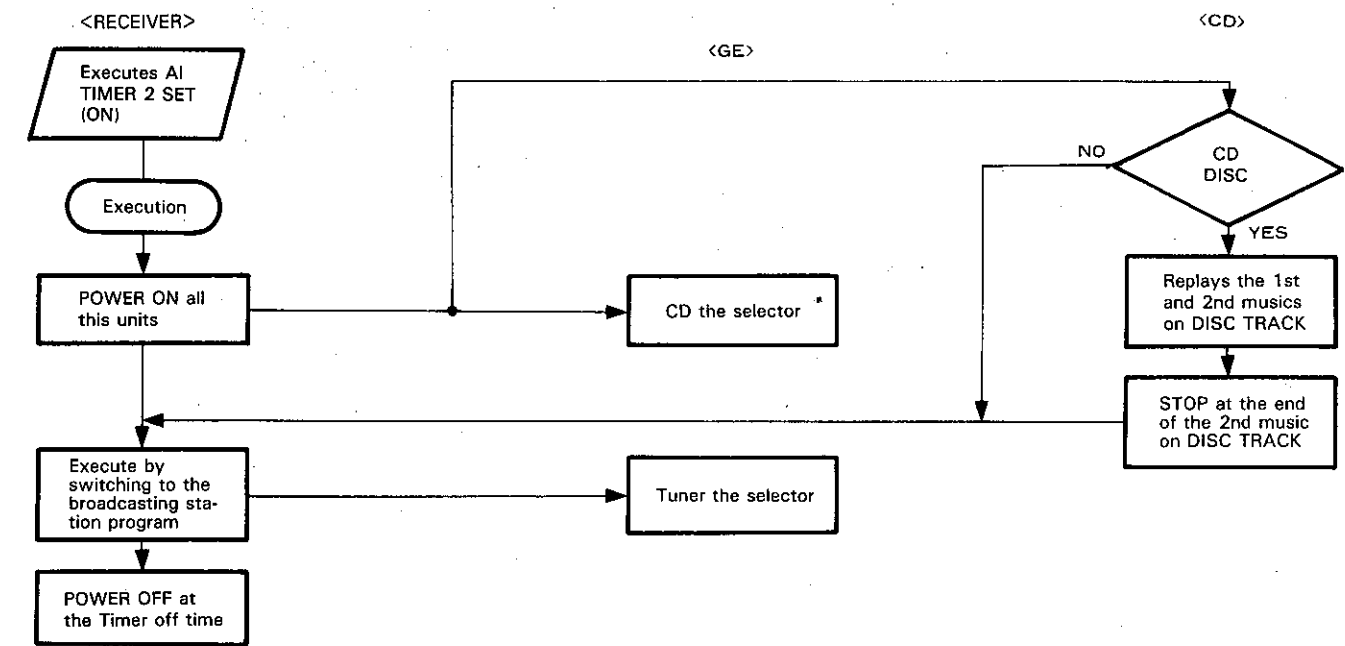
Operation of UD-90 system

The flow chart from power on through sound generation

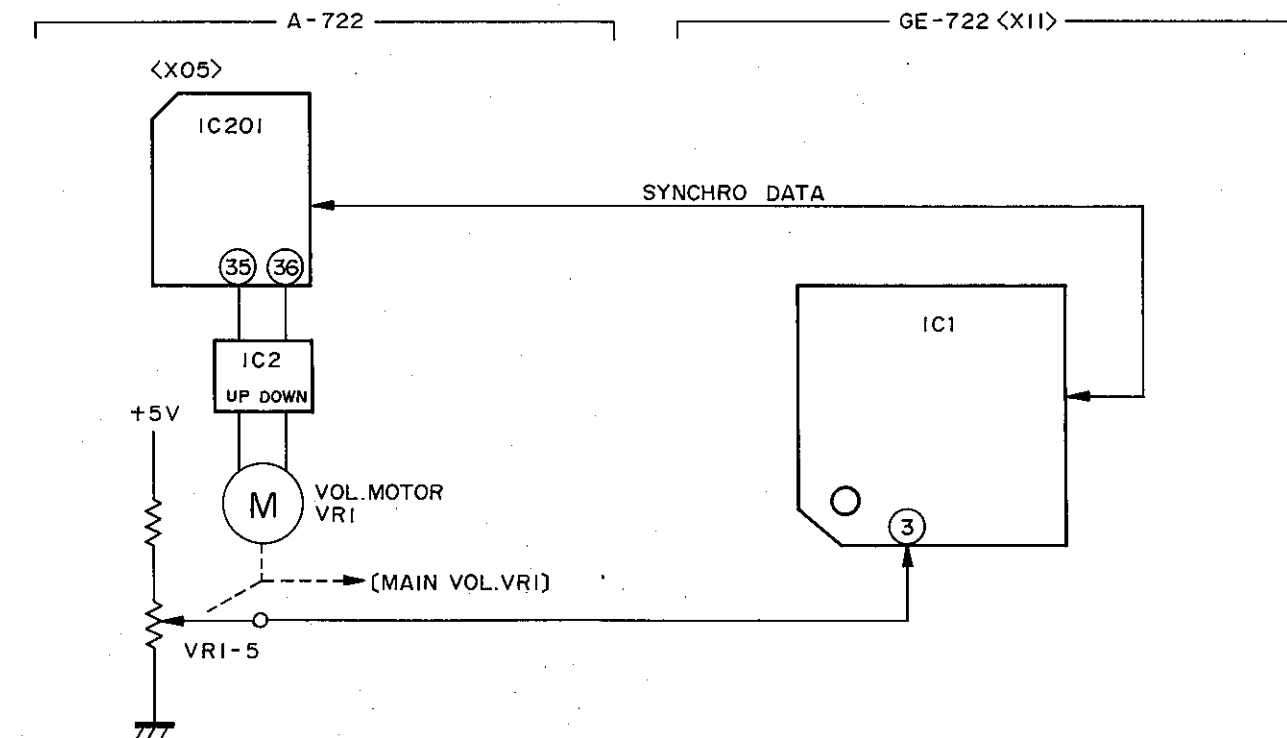


CIRCUIT DESCRIPTION

① Flow chart of AI TIMER 2

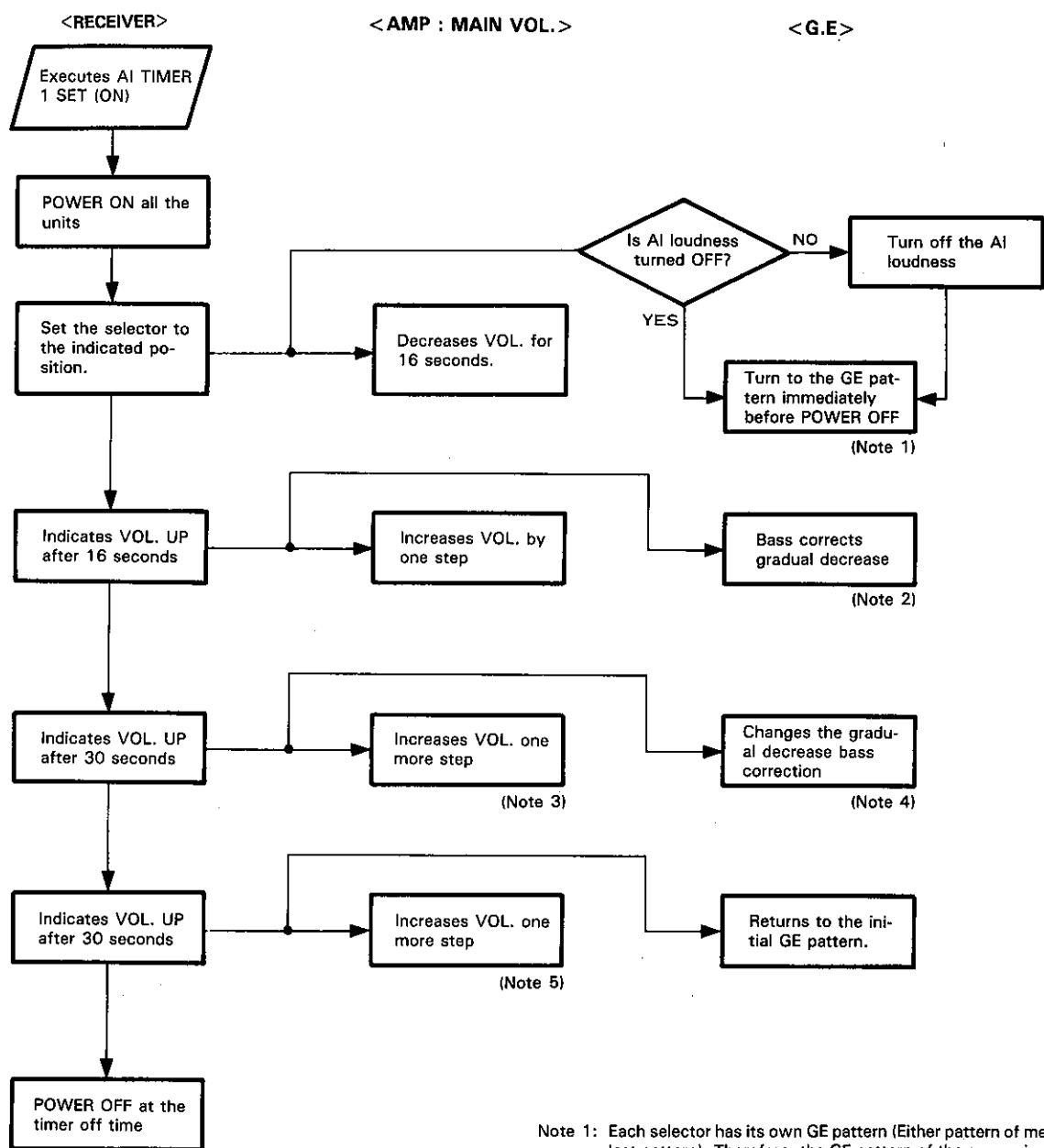


Operation of AI TIMER 2



CIRCUIT DESCRIPTION

② Indication flow of AI TIMER 1



- Note 1: Each selector has its own GE pattern (Either pattern of memory and last pattern). Therefore, the GE pattern of the source indicated by the timer appears.
- Note 2: Shifts to the pattern which has the loudness effect (There are two patterns of the gradual decrease bass correction of AI TIMER 1).
- Note 3: The three steps of increase volume can be selected.
- Note 4: Decrease correction volume is lowered in accordance with VR UP.
- Note 5: Same as Note 3. However, the VR position is limited at the position of 12.

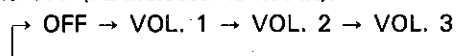
CIRCUIT DESCRIPTION

Function description

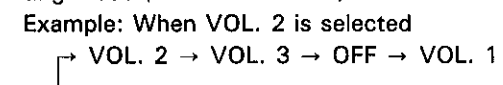
a) AI TIMER 1

- With the program timer mode set to PLAY, when the timer is turned ON, the setting contents for the AI TIMER 1 is activated if the AI TIMER 1 is set to ON (the FL indicator is lit).
- When the AI TIMER 1 is turned ON, first playback starts with the minimum volume level, then the volume level is increased in three steps.
- The third-step volume level (the maximum volume level) can be selected among the three types of the volume levels (VOL. 1-3). Each time the AI TIMER 1 key is pressed, the maximum volume level is changed in order from VOL. 1 to VOL. 3 and TIMER OFF setting cyclically.

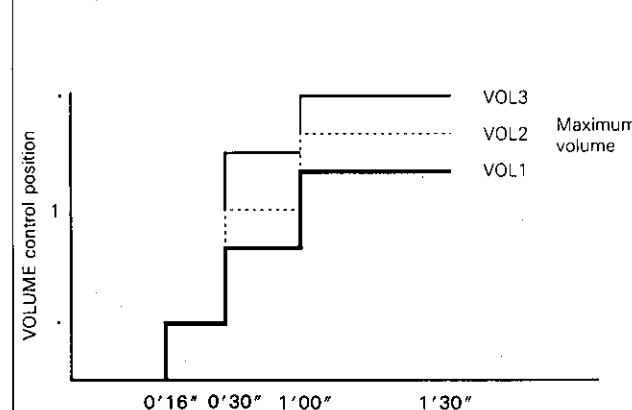
① When the key is pressed with the AI TIMER 1 is OFF (FL indicator is not lit):



② When the key is pressed in the volume setting mode (FL indicator is lit):



Reference for volume selection



- The VOLUME control rotates as the volume changes.
- The graphic equalizer curve also varies accordingly.

b) AI TIMER 2

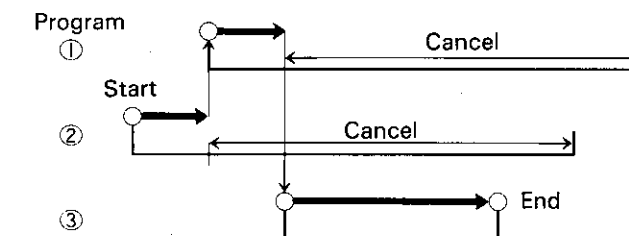
- With the program timer mode set to PLAY, when the timer is turned ON, the setting contents for the AI TIMER 2 is activated if the AI TIMER 2 is set to ON (FL indicator is lit).
- When the AI TIMER 2 is turned ON, if the disc is loaded in the CD player, the two tracks on the disc is played regardless whether the other source is set for play. Then, the playback source is changed to tuner automatically.
- Each time the AI TIMER 2 key is pressed, the timer setting is changed alternately.

Timer program operation

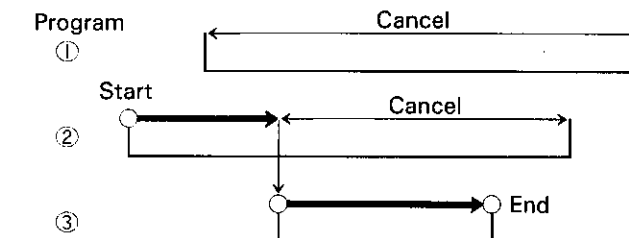
< When the program settings are registered within the same period >

- When the two or more program settings are to be started at the same time: The program having the least number is activated and others will be cancelled.
- When the setting time for two or more programs differ: First, the program with the earliest setting time is activated. Then, if the same mode (REC mode or PLAY mode) has been designated for the other program, the operation is changed to the program in which the same mode as the first one is designated and the end time for the above program will be cancelled. If another mode is set for of other programs, the contents will be cancelled.

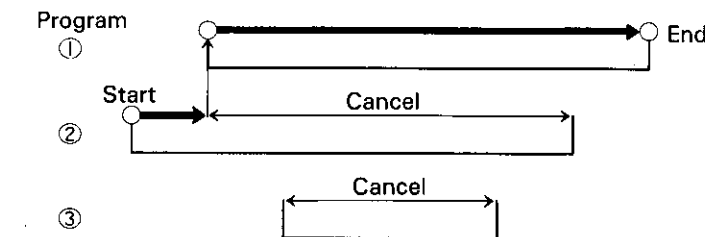
Example 1: When the operation modes for all three programs are set to PLAY:



Example 2: When the operation modes for programs ②, ③ are set to PLAY and that for the program ① is set to REC:



Example 3: When the operation mode for programs ①, ② are set to REC and that for program ③ is set to PLAY:



The program end is determined by the OFF time of the program which is activated at the last.

CIRCUIT DESCRIPTION

Function initial setting

- (1) Tuner section  
 POWER ..... OFF  
 BAND ..... FM  
 Last frequency ..... Lower most limit of each band  
 Last preset ..... "-" display  
 Preset memory ..... Test frequency of each memory  
 AUTO/MONO ..... AUTO  
 BILINGUAL ..... BOTH MODE  
 Display mode ..... POWER ON ... Frequency display  
 POWER OFF ... Clock display

(2) Clock, calendar, and timer section

- Calendar ..... January 1, 1991  
 Clock ..... 0:00 Power failure mode  
 Programmable timer ..... Day of week : TUE  
 ON : 0:00  
 OFF : 0:00  
 MODE : PLAY  
 SOURCE : TUNER  
 SET ch : 01 ch  
 Execution mode : OFF

- Sleep timer ..... OFF  
 One touch timer ..... OFF

(3) Amplifier section

- Selector ..... Audio system : TUNER  
 Video system : LD  
 V-FIX ..... OFF  
 CDREC ..... OFF  
 SUPER WOOFER ..... OFF

Setting of initial conditions (reset)

- (1) Method  
 While pressing ENTER key, turn the AC ON.

- (2) Contents  
 Clears all the memory and returns to the initial conditions. However, the test frequency is newly memorized in the pre-set memory at this time. (The same as when the back-up data is NG.

Conditions by destination

Destination type	Destination switches (DSW)				Band	Receiving frequency range	Inter-channel space	Intermediate frequency	PLL reference frequency				
	B3	B2	B1	B0									
A-722	M, Y	1	1 or 0	0	FM	87.5 ~ 108.0 MHz	100 kHz /50 kHz	+10.7 MHz	50 kHz (25 kHz)				
									AM	531 ~ 1602 kHz /530 ~ 1610 kHz	9 kHz /10 kHz	+450 kHz	10 kHz
	K, P	1	0	0	FM	87.5 ~ 108.0 MHz	100 kHz	+10.7 MHz	50 kHz (25 kHz)				
									AM	530 ~ 1610 kHz	10 kHz	+450 kHz	10 kHz
X	1	1	0	FM	87.5 ~ 108.0 MHz	50 kHz	+10.7 MHz	50 kHz (25 kHz)					
								AM	531 ~ 1602 kHz	9 kHz	+450 kHz	9 kHz	
A-722L	T, E	1	1	0	FM	87.5 ~ 108.0 MHz	50 kHz	+10.7 MHz	50 kHz (25 kHz)				
									MW	531 ~ 1602 kHz	9 kHz	+450 kHz	9 kHz
									LM	153 ~ 281 kHz	1 kHz	+450 kHz	1 kHz

Test mode

- (1) Setting method  
 While pressing CHARACTER key, turn the AC on.  
 (2) Clearing method  
 AC off.  
 (3) Contents  
 • All fluorescent lamps and LEDs light.  
 • S 4-channel mode (the front, center, and rear speakers output sound).  
 • Receive the minimum FM value.  
 The test is performed with the following keys.

- 1) Preset channel calling  
 Normally, the +10 key changes the high-order digits 1-, 2-, and 0- alternately, but it changes the high-order digits 1- and 0- alternately in the test mode. The 0 key does not call any channel, but in the test mode, if the high-order digit is 0, 10 ch is called, and if it is 1, 20 ch is called. Table 1 lists the channels to be called.

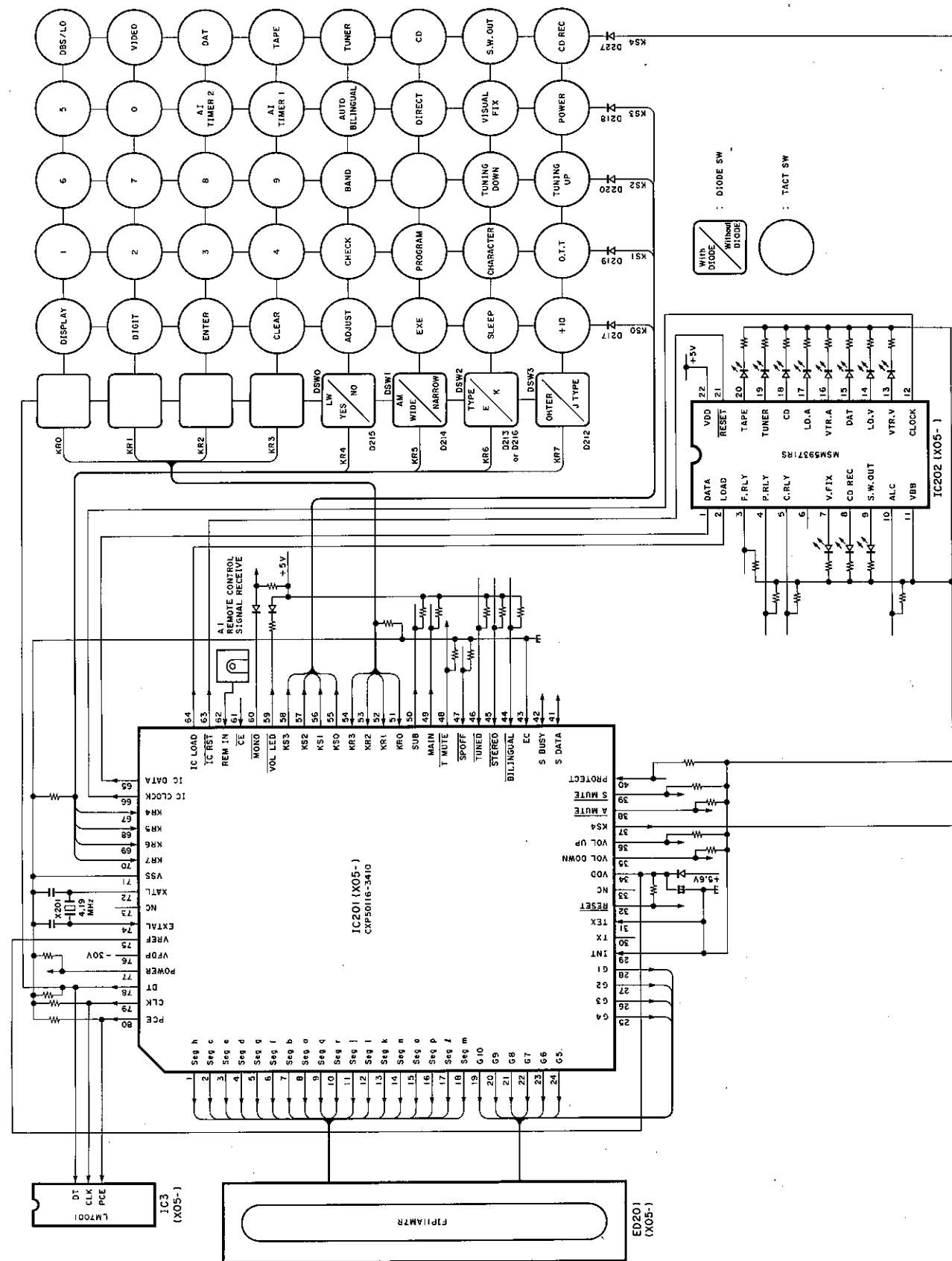
Table 1

High order	Low order	TEN KEY									
		1	2	3	4	5	6	7	8	9	0
0	1	2	3	4	5	6	7	8	9	10	
1	11	12	13	14	15	16	17	18	19	20	

- 2) Motor volume test  
 If the DIGIT key is pressed, the volume keeps increasing for 16 seconds, and then keeps decreasing for 16 seconds. To stop the test in the middle, switch the power off.  
 3) O.T.T key test (one-touch-timer)  
 Normally, the O.T.T key is not accepted if the clock is not functioning. Only in the test mode, it is indicated that the key is accepted, but it does not cause any operation. When the key is pressed the first time, ON 0:30 O.T.T appears on the fluorescent display, and after five seconds, only O.T.T is displayed. When the key is pressed the second time, O.T.T disappears, and the original state before the key is pressed returns.

CIRCUIT DESCRIPTION

Block diagram of surrounding microprocessor



## CIRCUIT DESCRIPTION

Microprocessor: CXP50116-341Q (X05: IC201)

## Pin functions

Pin No.	Pin name	I/O	Name	Description
1 ~ 18	S4 ~ S21/PG0 ~ PG3 PK0 ~ PK3, PJ0 ~ PJ3 TI5 ~ TI10	O	Segment	Segment (h, c, e, d, g, f, b, a, q, r, j, i, k, n, o, p, l, m)
19 ~ 28	S22, S23/T9, T8, T7 ~ T0	O	G10 ~ G1	Grid 10 ~ 1
29 ~ 31	INT, TX, TEX		INT, TX, TEX	No used.
32	RST	I	RESET	Reset pin Low: RESET High: NORMAL
33	NC		NC	No used.
34	Vdd		Vdd	+5 V power supply
35	PI0	O	VOLD	Motor volume down Low: STOP High: ACTIVE
36	PI1	O	VOLU	Motor volume up Low: STOP High: ACTIVE
37	PI2	O	KS4	Key scan signal output (KS4)
38	PI3	O	AMUTE	Amplifier mute Low: ON High: OFF
39	PB0	O	SMUTE	Super woofer mute Low: ON High: OFF
40	PB1	I	PROTECT	Protection detection Low: OFF High: ON
41	PB2	I/O	SDATA	Serial communication DATA
42	PB3	I/O	SBUSY	Serial communication BUSY
43	EC		EC	No used.
44	PX0	I	BILINGUAL	TV bilingual signal detection Low: BILINGUAL High: NORMAL
45	PX1	I	STEREO	Stereo signal detection Low: STEREO High: MONAURAL
46	PX2	I	TUNED	SD signal detection Low: TUNED High: OFF
47	PA0	I	SPOFF	Head phone use detection Low: Use High: No use
48	PA1	O	TMUTE	Tuner mute Low: OFF High: ON
49	PA2	O	MAIN	TV main selection signal output
50	PA3	O	SUB	TV sub selection signal output
51 ~ 54	PF0 ~ PF3	I	KR0 ~ KR3	Key return signal input (KR0 ~ KR3)
55 ~ 58	PE0 ~ PE3	O	KS0 ~ KS3	Key scan signal output (KS0 ~ KS3)
59	PY0	O	VOLLED	Volume LED drive Low: ON High: OFF
60	PY1	O	MONO	Forced monaural output Low: ON High: OFF
61	PY2	I	CE	Chip enable signal input Low: OFF High: ON
62	PY3	I	REMIN	Remote control signal input
63	PD0	O	ICRST	Expansion port IC (MSM59371RS) RESET
64	PD1	O	ICLOAD	Expansion port IC (MSM59371RS) STROBE
65	PD2	O	ICDATA	Expansion port IC (MSM59371RS) DATA
66	PD3	O	ICCLOCK	Expansion port IC (MSM59371RS) CLOCK
67 ~ 70	PC0 ~ PC3	I	KR4 ~ KR7	Key return signal input (KR4 ~ KR7)
71	Vss		Vss	GND
72	XTAL		XTAL	Crystal oscillator input (4.19 MHz)
73	NC		NC	No used.
74	EXTAL		EXTAL	Crystal oscillator input (4.19 MHz)
75	Vref		Vref	No used.
76	Vfdp		Vfdp	-30 V power supply.
77	S0/PH0	O	POWER	Power ON/OFF signal output Low: OFF High: ON
78	S1/PH1	O	DT	PLL IC (LM7001) DATA
79	S2/PH2	O	CLK	PLL IC (LM7001) CLOCK
80	S3/PH3	O	PCE	PLL IC (LM7001) STROBE

## CIRCUIT DESCRIPTION

Expansion port IC: MSM59371(X05: IC202)

## Pin functions

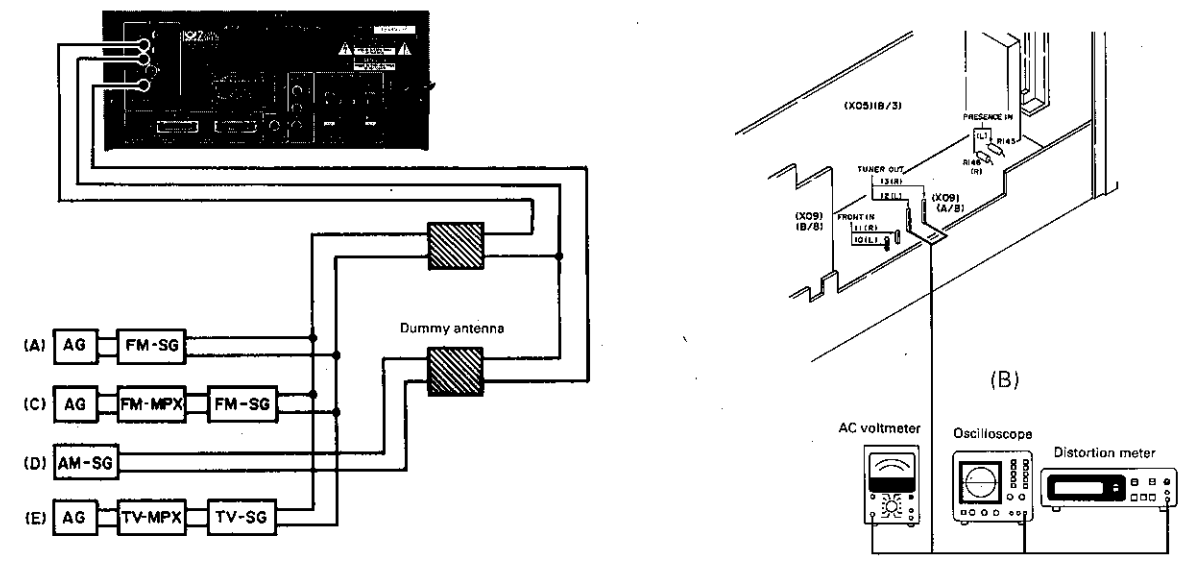
Pin No.	Pin name	I/O	Name	Description
1	DATA	I	ICDATA	DATA input
2	LOAD	I	ICLOAD	Strobe input
3	016	O	F.RLY	Front speaker relay Low: OFF High: ON
4	015	O	P.RLY	Presence speaker relay Low: OFF High: ON
5	014	O	C.RLY	Center and surround speaker relay Low: OFF High: ON
6	013	O		No used.
7	012	O	VFIX	V-FIX LED drive Low: OFF High: ON
8	011	O	CDREC	CD REC LED drive Low: OFF High: ON
9	010	O	S.W.OUT	SUPER WOOFER LED drive Low: OFF High: ON
10	09	O	ALC	ALC signal output Low: OFF High: ON
11	Vbb		Vbb	GND
12	CLOCK	I	ICCLOCK	Clock input
13	08	O	VTR.V	Selector VIDEO (V) LED drive Low: OFF High: ON
14	07	O	LD.V	Selector LD (V) LED drive Low: OFF High: ON
15	06	O	DAT	Selector DAT LED drive Low: OFF High: ON
16	05	O	VTR.A	Selector VIDEO (A) LED drive Low: OFF High: ON
17	04	O	LD.A	Selector LD (A) LED drive Low: OFF High: ON
18	03	O	CD	Selector CD LED drive Low: OFF High: ON
19	02	O	TUNER	Selector TUNER LED drive Low: OFF High: ON
20	01	O	TAPE	Selector TAPE LED drive Low: OFF High: ON
21	RESET	I	ICRST	Reset signal input
22	Vdd		Vdd	+5 V power supply



ADJUSTMENT

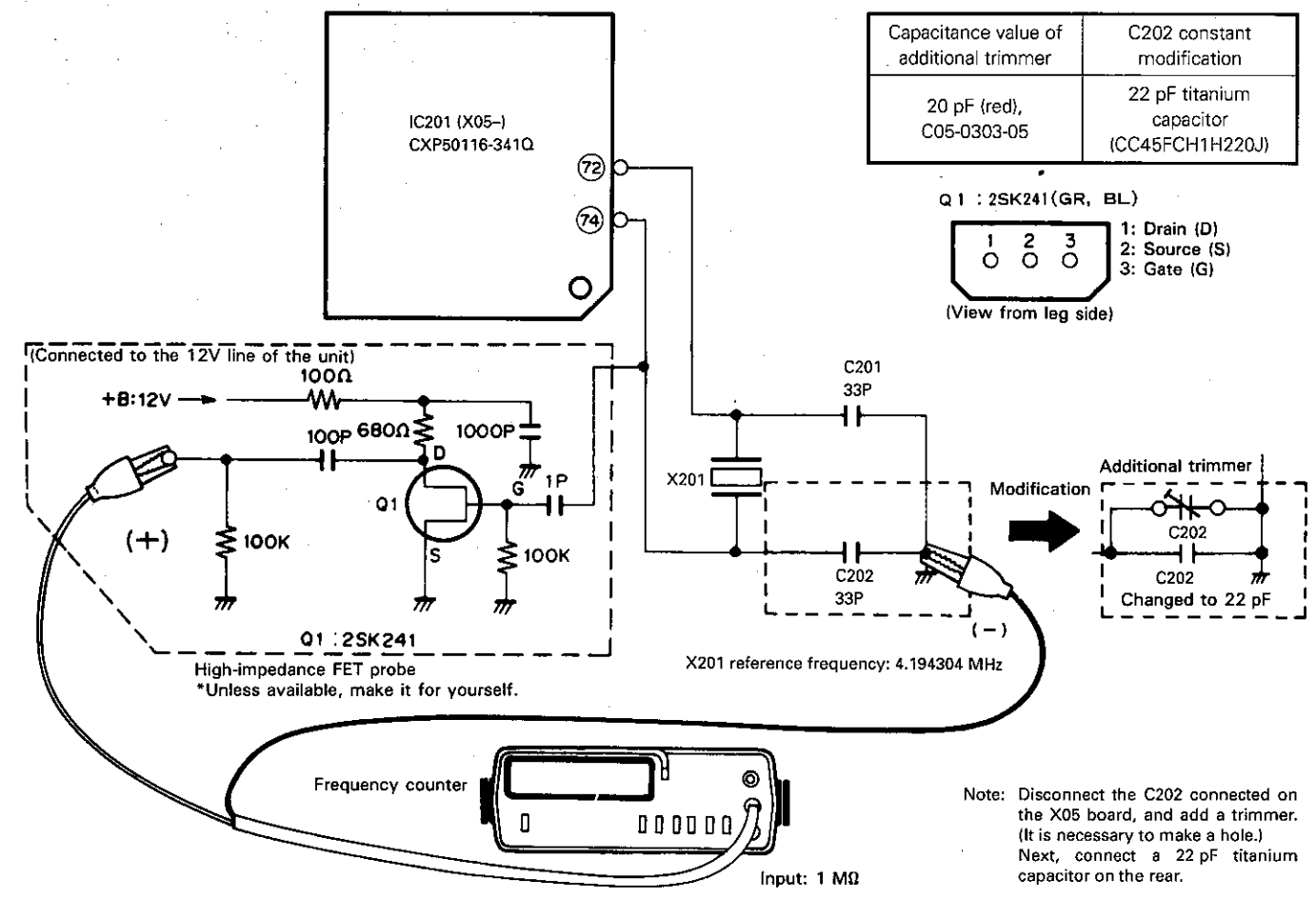
Tuner unit

No.	ITEM	INPUT SETTINGS	OUTPUT SETTINGS	TUNER SETTINGS	ALIGNMENT POINTS	ALIGN FOR	FIG.
FM SECTION		SELECTOR: FM					
1	DISCRIMINATOR	(A) 98.0MHz 1kHz, ±75kHz dev (K,P,M,Y,X type) 1kHz, ±40kHz dev (E,T,M,Y type) 60dBμ (ANT input)	Connect a DC voltmeter between TP3 and TP4. (X05-)	AUTO or MONO 98.0MHz	L2 (X05-)	0V	(a)
2	VCO	(A) 98.0MHz 0 dev 60dBμ (ANT input)	Connect a frequency counter to TP5 and TP6 (GND). (X05-)	AUTO 98.0MHz	VR2 (X05-)	19.00kHz	(b)
3	DISTORTION (STEREO)	(C) 98.0MHz 1kHz, ±68.25kHz dev Pilot: ±7.5kHz dev (K,P,M,Y,X type) 1kHz, ±40kHz dev Pilot: ±6kHz dev (E,T,M,Y type) 60dBμ (ANT input)	(B)	MONO 98.0MHz	IPT (W02-)	Minimum distortion	
4	SEPARATION (E,T type only)	(C) 98.0MHz 1kHz, ±40kHz dev Pilot ±6kHz dev Selector: L or R 60dBμ (ANT input)	(B)	AUTO 98.0MHz	VR4 (X05-)	Minimum crosstalk	
5	TUNING LEVEL	(A) 98.0MHz 1kHz, ±75kHz dev (K,P,M,Y,X type) 1kHz, ±45kHz dev (E,T,M,Y type) 14dBμ (ANT input) 750 18dBμ (ANT input) 3000	(B)	AUTO or MONO 98.0MHz	VR1 (X05-)	Adjust VR1 and stop at the point where ED201 (TUNED) goes on.	
AM (MW) SELECTION		SELECTOR: AM (MW)					
(1)	TUNING LEVEL	(D) 1008kHz 400Hz, 30% mod 26dBμ (ANT input)	(B)	1008kHz	VR3 (X05-)	Adjust VR3 and stop at the point where ED201 (TUNED) goes on.	



ADJUSTMENT

Timer accuracy improvement method



The timer accuracy is within ±40 seconds for one month as a standard. For improved timer accuracy, perform the following procedure:

- (1) If the timer accuracy is without the standard, replace X201 (L77-1176-05) near the microprocessor IC on a printed board (X05-).
- (2) Even if within the standard, for further improved accuracy, change the constant of C202 in the crystal oscillation circuit of microprocessor IC201 and add a trimmer.

**Adjustment method** (Use a high-impedance buffer to avoid frequency deviation.)  
Connect a high-accuracy frequency counter to pin 74 by way of the FET probe shown above, and adjust the frequency fully up to the first digit of the X201 reference frequency 4,194,304 Hz. (Connect the negative (-) side of the frequency counter to the GND side of C202.)

Note (a) As regards the positive (+) side of the frequency counter, arrange as short a distance as possible between pin 74 of IC201 and 1P of the input stage of the FET probe.

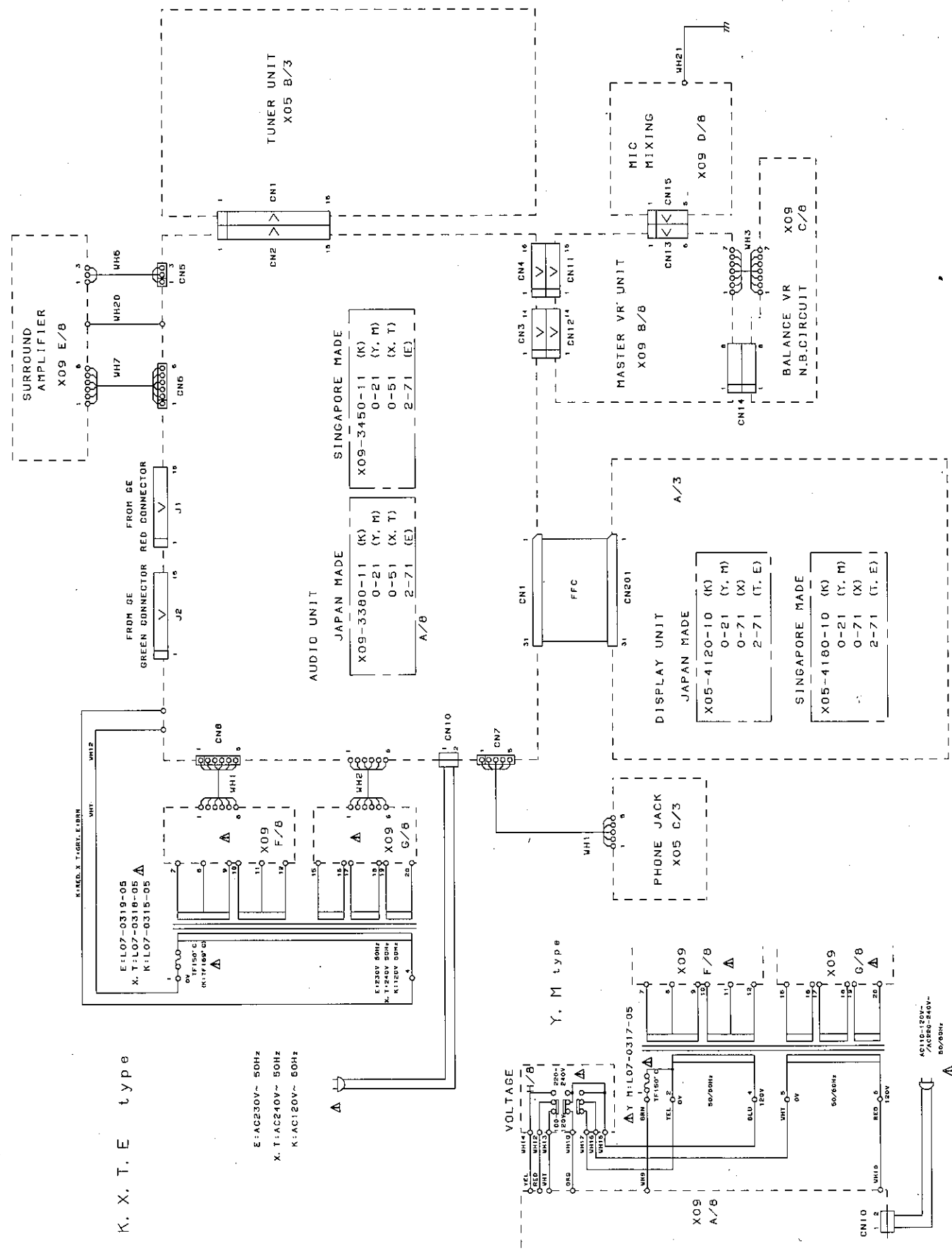
Note (b) Perform the trimmer adjustment after energization of around 10 minutes at normal temperature.

- (3) Monthly error calculation method  
For example, when the result of measurement at pin 74 by the frequency counter is  $f_x = 4,194,275$  Hz... (Reference frequency  $f_0 = 4,194,304$  [Hz])

$$\text{Monthly error [sec]} = \frac{f_x - f_0}{f_0} \times \text{the number of seconds}$$

$$\begin{aligned} \text{taken for one month} &= \frac{4,194,275 - 4,194,304}{4,194,304} \\ &\quad \times (60 \times 60 \times 24 \times 30) \\ &= -17.9 \text{ [sec]} \end{aligned}$$

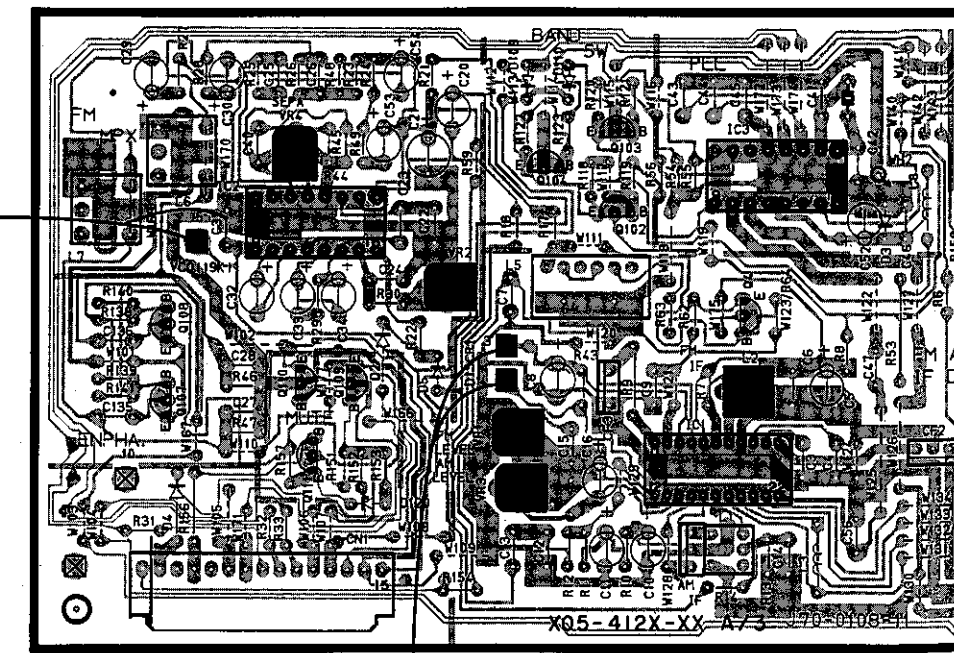
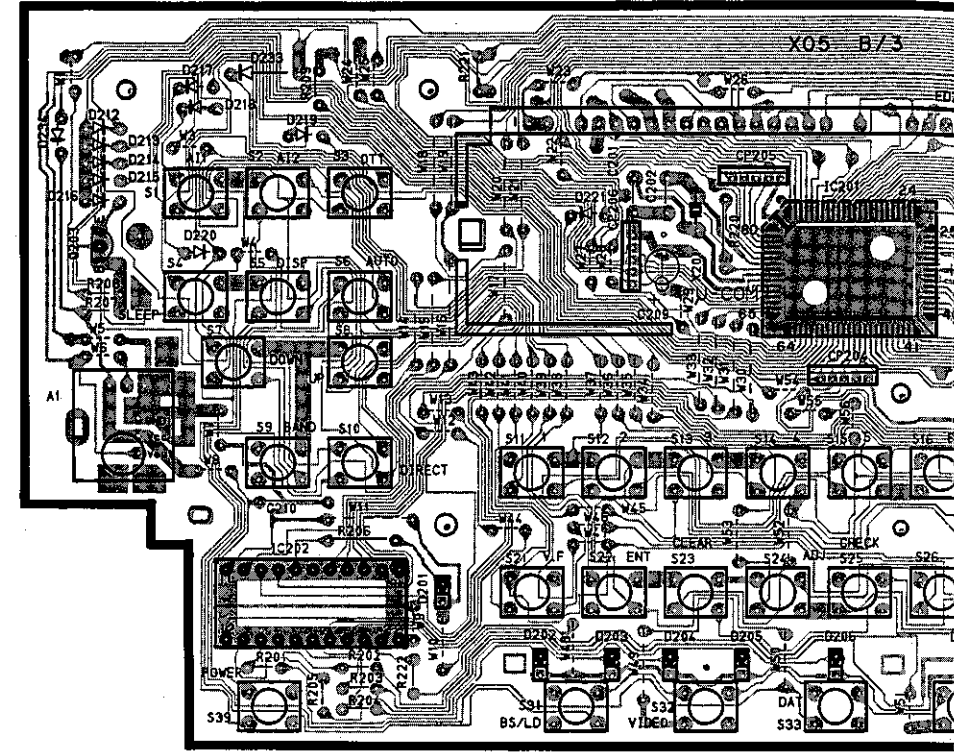
\* A minus value as the monthly error means a loss.



K, X, T, E type

E: AC230V~ 50HZ  
X, T: AC240V~ 50HZ  
K: AC120V~ 50HZ

PC BOARD (Component side view)



(b) VCO : 19.00kHz

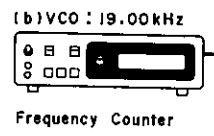
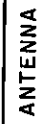
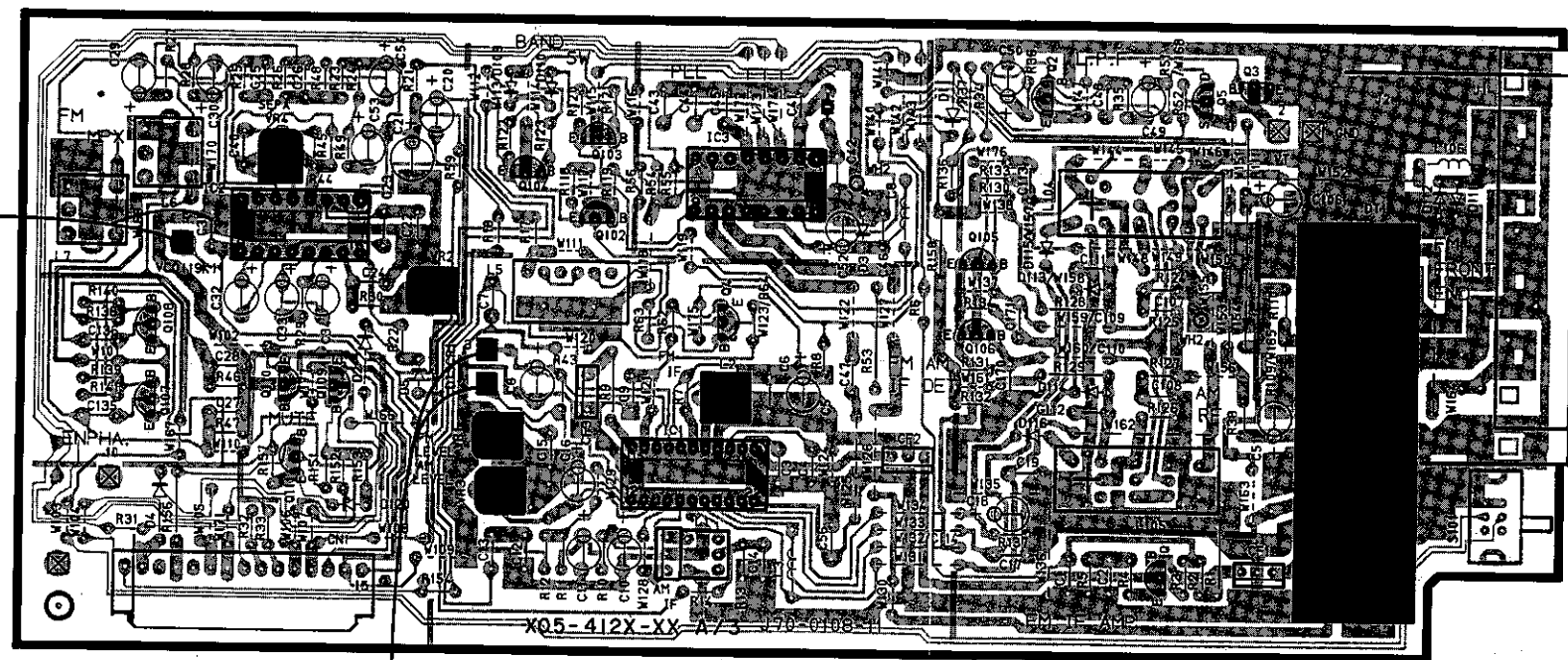
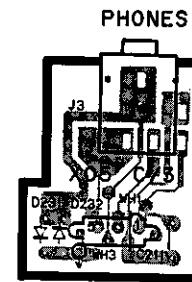
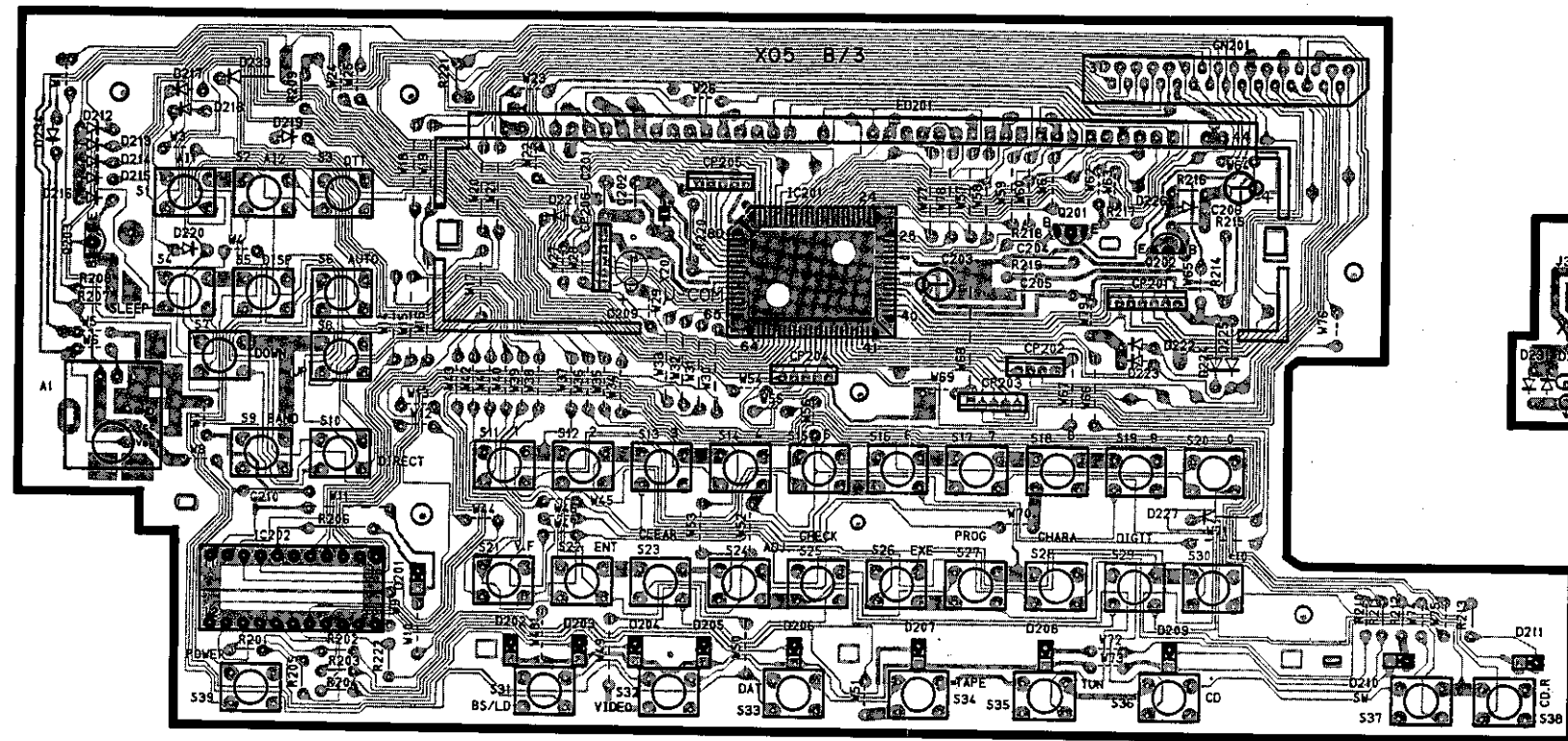
Frequency Counter

(a) Discriminator : CV

DC Voltmeter

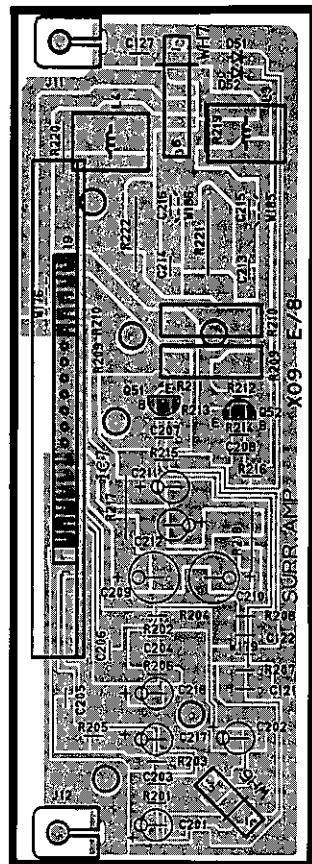
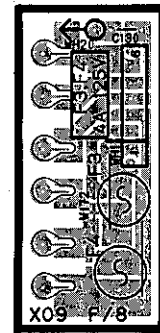
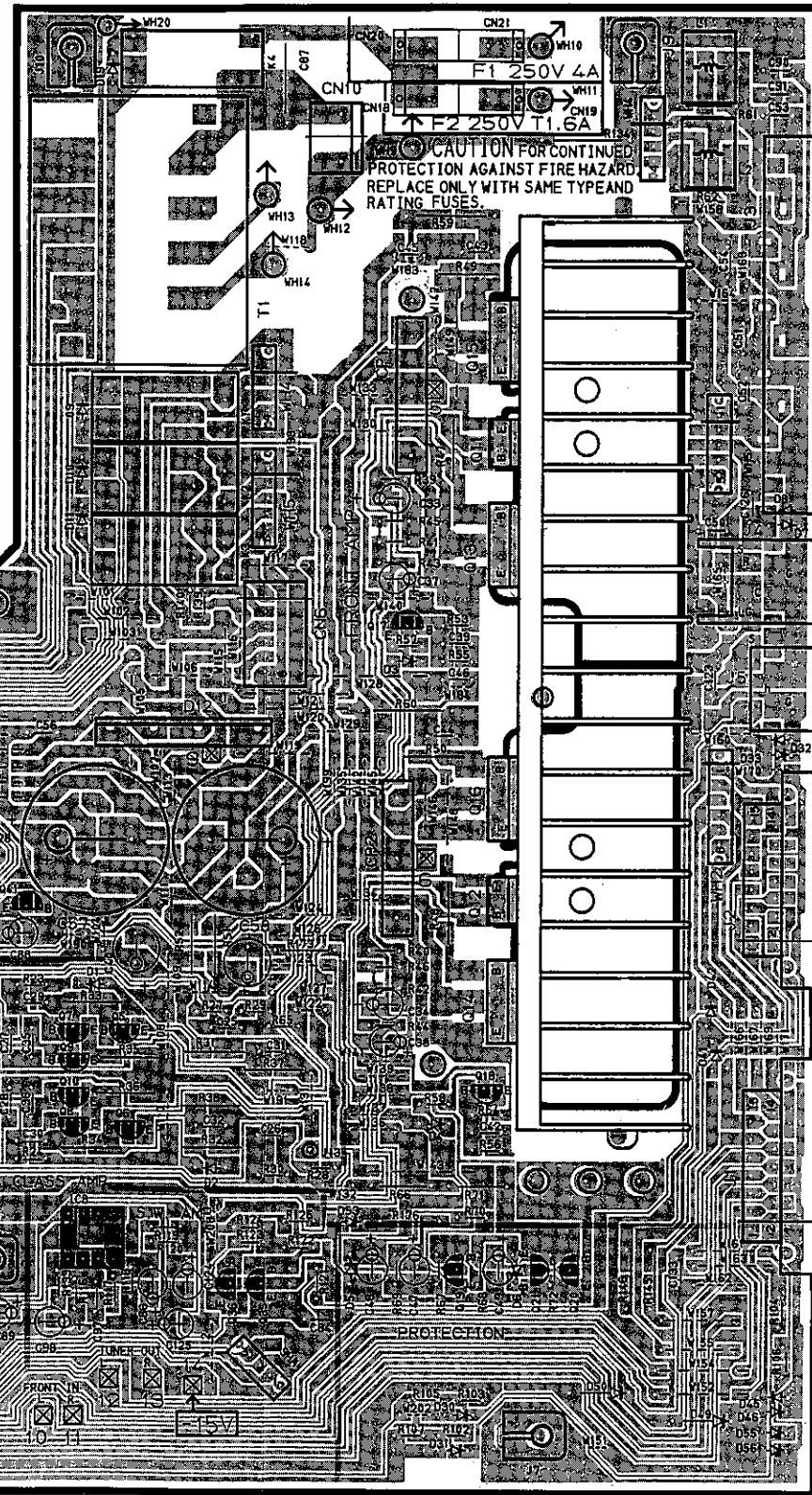
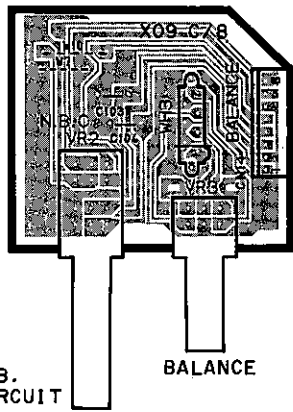
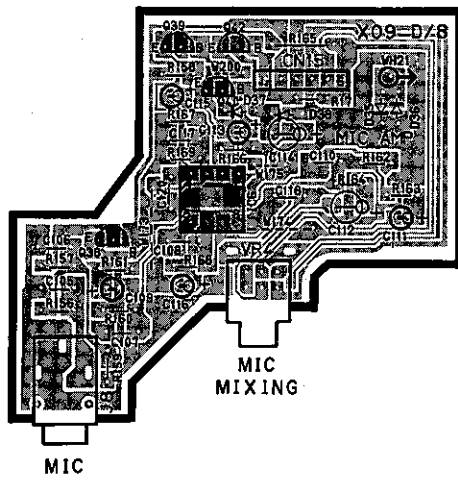
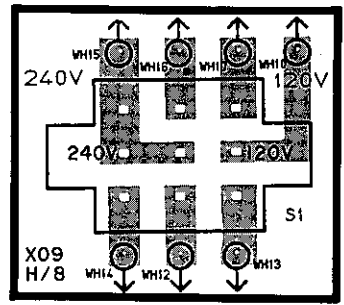
2  
3  
4  
5  
6  
7

PC BOARD (Component side view)



Refer to the schematic diagram for the values of registers and capacitors.

# PC BOARD (Component side view)



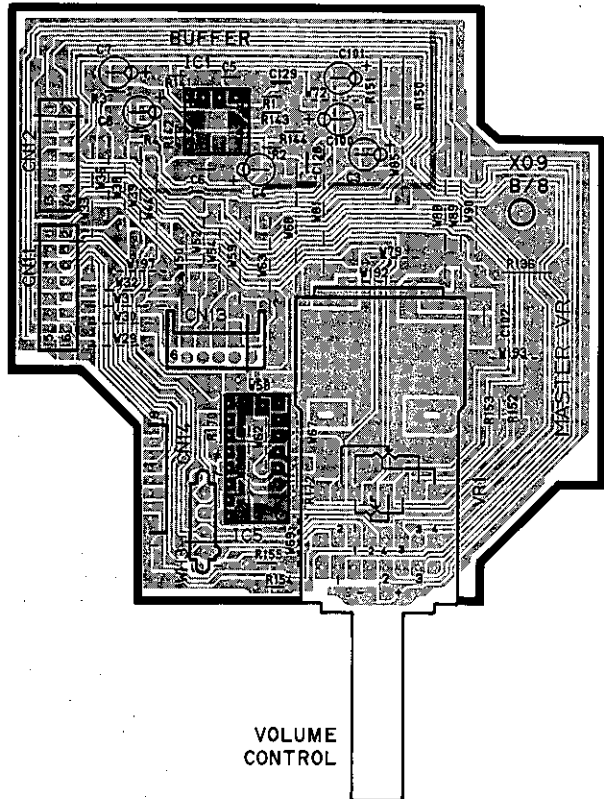
L ch  
R ch  
F 4 ch SPEAKERS  
FRONT SPEAKERS

REAR SPEAKERS  
CENTER SPEAKER

SUB WOOFER

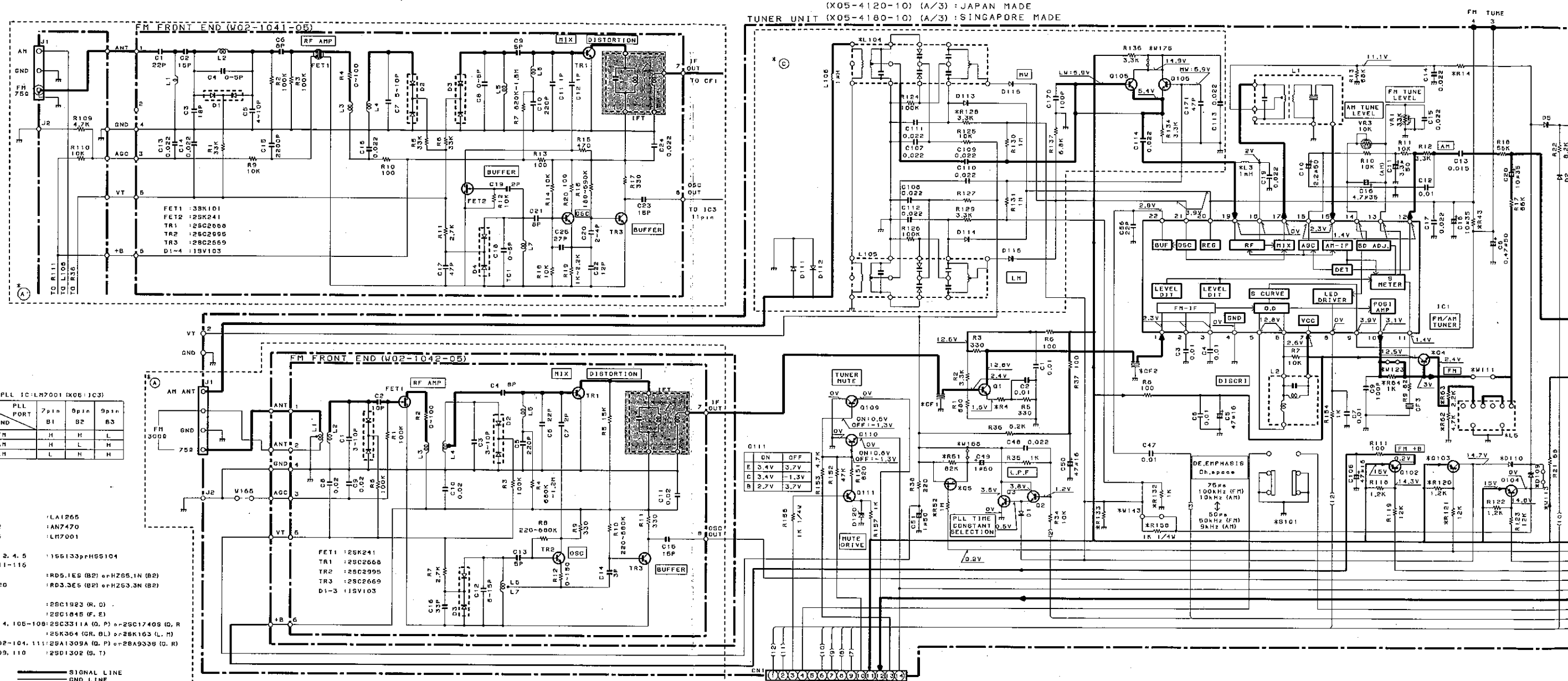
To GE  
AC16V  
1.2A

To GE  
AC14V  
1A



Refer to the schematic diagram for the values of registers and capacitors.

- 2SK163 D G
- 2SK364 D G
- PST529C G D
- 2SA1123 E C B
- 2SA954 E C B
- 2SA992 E C B
- 2SB764 E C B
- 2SC1845 E C B
- 2SC1923 E C B
- 2SC2003 E C B
- 2SC2878 E C B
- 2SD1302 E C B
- TA7815HF INPUT (Case)
- UPC7815HF INPUT (Case)
- 2SD1266 E C B
- 2SB1531 E C B
- 2SD2340 E C B
- DTC124ES E C B
- 2SA933S E C B
- 2SC1740S E C B



PLL IC: LM7001 (X0611C3)

BAND	PLL PORT	7pin	8pin	9pin
FM	B1	H	H	L
	B2	L	L	H
AM	B1	H	L	L
	B2	L	H	H

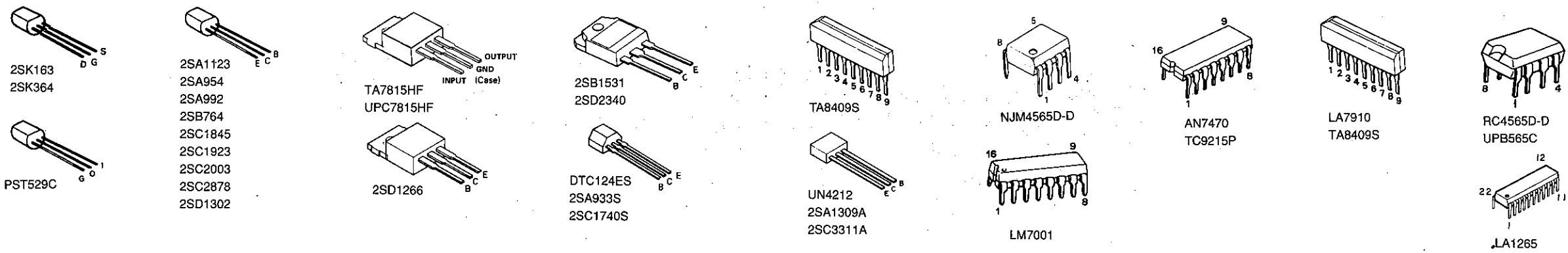
- IC1 : LA1265
- IC2 : AN7470
- IC3 : LM7001
- D1, 2, 4, 5 : 1S6133PH55104
- D101-110 : 1S6133PH55104
- D3 : RD5.1E9 (B2) @H265.1N (B2)
- D120 : RD3.3E5 (B2) @H263.3N (B2)
- D1 : 2SC1923 (R, D)
- D2 : 2SC1845 (F, E)
- D3, 4, 105-109 : 2SC3311 (A, O, P) @-2SC1740S (O, R)
- O5 : 2SK364 (GR, BL) @-2SK163 (L, T)
- O102-104, 111 : 2SA1309A (O, P) @-2SA933S (O, R)
- O109, 110 : 2SD1302 (S, T)

— SIGNAL LINE  
 = GND LINE  
 (±) LINE

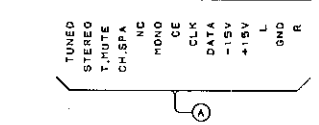
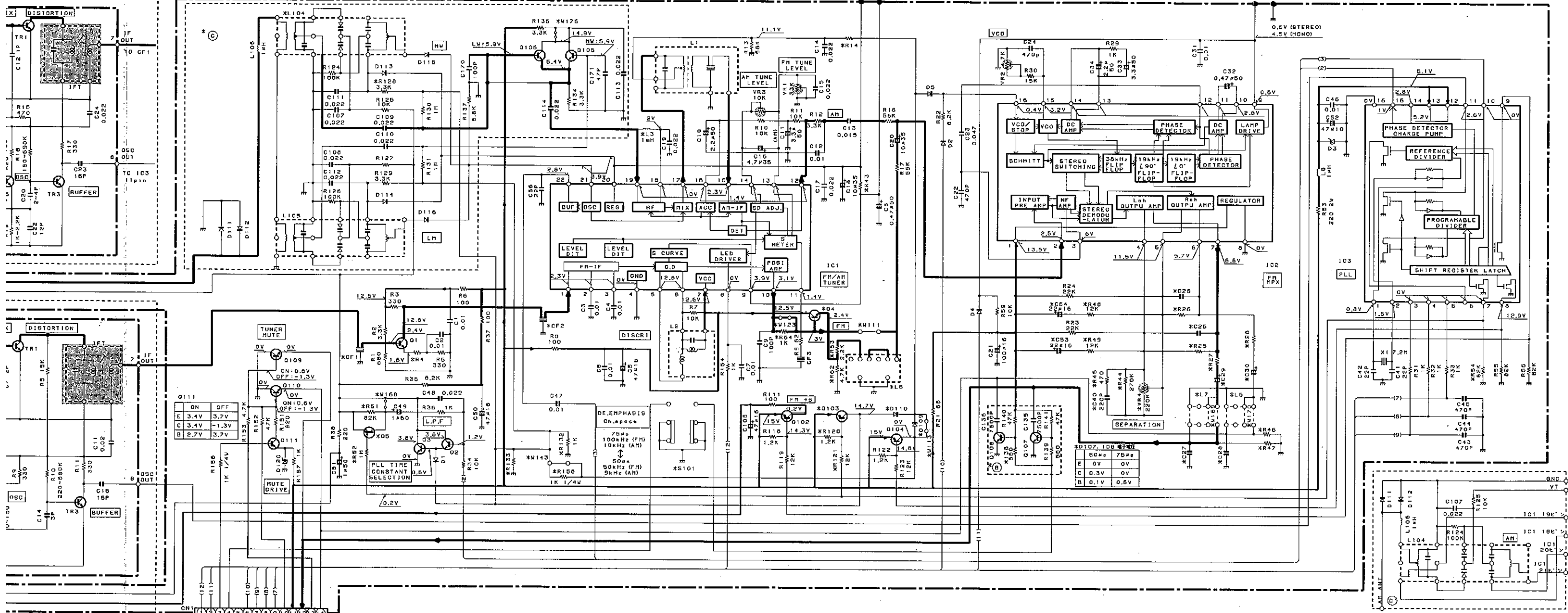
FUNCTION	TUNED	D1E8C	T-MUTE	CH-SPA	NC	RDND	CE	CLK	DATA	-15V	+15V	L	GND	R
1	(12)													
2	(11)													
3	(10)													
4	(9)													
5	(8)													
6	(7)													
7	(6)													
8	(5)													
9	(4)													
10	(3)													

JAPAN MADE	SINGAPORE MADE	R16	R14	R25	R27	R43	R44	R45, 46, 49	R47	R51	R54	R133	R156	L3	L5	L7	Q4, 5	D101	D103	D109	CF1
X05-412	X05-418	0-10	0	0	55 4.7K	56K 3.6K	15K	0	0	39K	V165 W123	220	1K	V170 V169				W113	L72-05		
		0-21	0	0	55 4.7K	56K 3.6K	39K	0	0	39K	V166 W123	220	1K	V170 V169				W113	L72-05		
		0-71	0	0	55 4.7K	56K 3.6K	39K	0	0	39K	V168 W123	220	1K	V170 V169				W113	L72-05		
		2-71	0	0	22 2.7K	47K 3.3K	39K	0	0	3.3K	02K	0	470	W143	0	0	0				L72-05

**CAUTION:** For continued safety, replace safety critical components only with manufacturer's recommended parts (refer to parts list).  $\Delta$  indicates safety critical components. To reduce the risk of electric shock, leakage-current or resistance measurements shall be carried out (exposed parts are acceptably insulated from the supply circuit) before the appliance is returned to the customer.



(X05-4120-10) (A/3) : JAPAN MADE  
 TUNER UNIT (X05-4180-10) (A/3) : SINGAPORE MADE

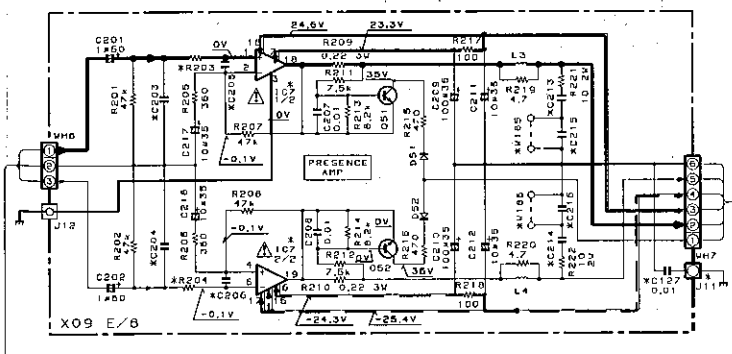
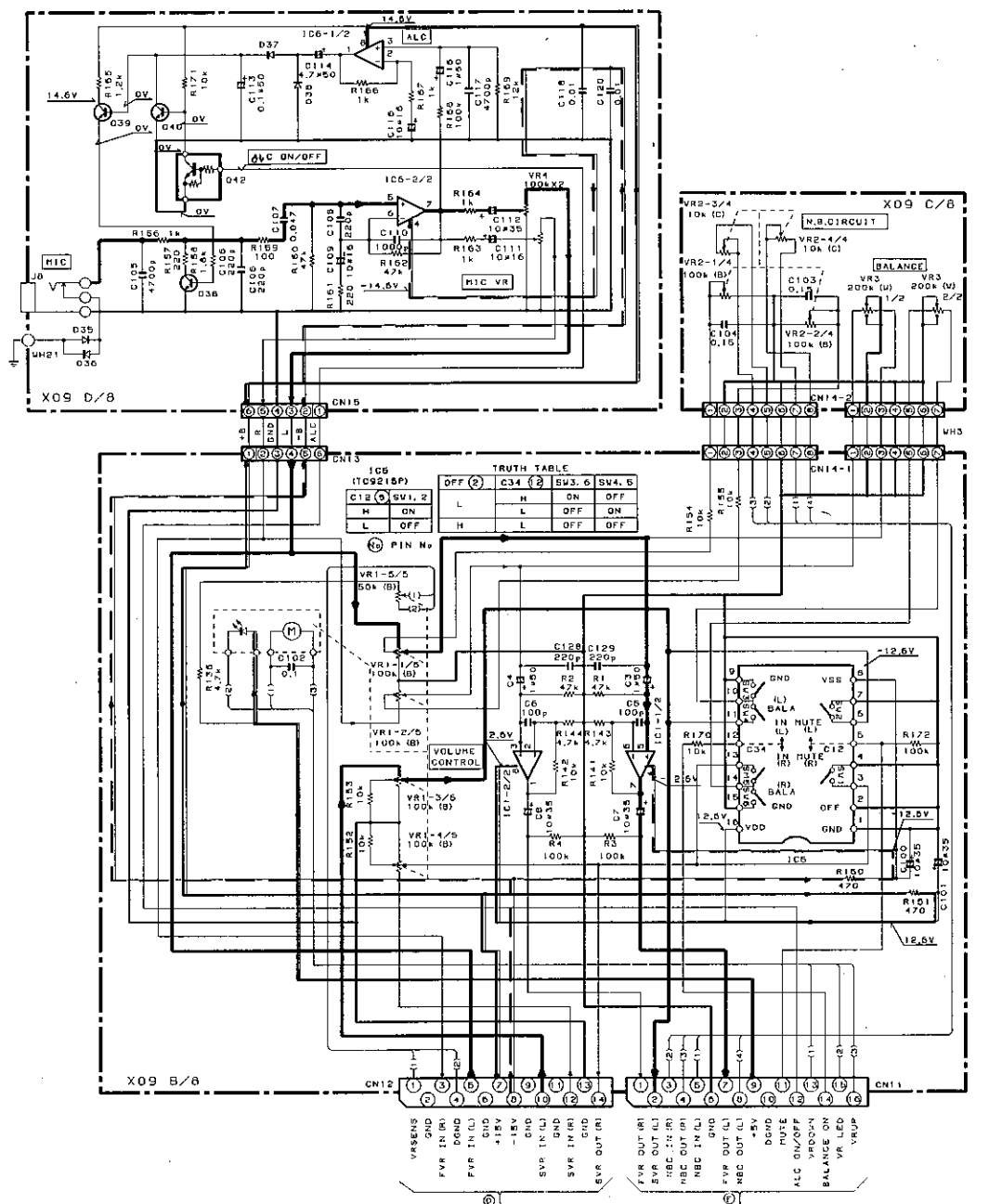


JAPAN MADE	SINGAPORE MADE	REF.	R4	R14	R25	R26	R27	R28	R43	R44	R45, 46, 49	R46	R61	R64	R133	R150	L3	L6	L7	Q4, 5	D101	D103	D110	D109	CF1, 2	VR1	8101	C26	C27	C28	C29	C40	C43	C54	W111
X05-412	X05-416	0-10	0	0	56	4.7K	56K	3.0K	15K	0	52, 54, 55	39K	M158	W123	220	1K	—	W170	W159	—	—	—	—	—	W113	L72-0831	—	X	150P	0.022	1#50	—	—	0	
		0-21	0	0	56	4.7K	56K	3.0K	39K	0	63, 120, 132	39K	M166	W123	220	1K	—	W170	W159	—	—	—	—	—	W113	L72-0831	—	0	150P	0.012	1#50	—	—	0	
		0-71	0	0	56	4.7K	56K	3.0K	39K	0	—	39K	M166	W123	220	1K	—	W170	W159	—	—	—	—	—	W113	L72-0831	—	X	150P	0.012	1#50	—	—	0	
		2-71	0	0	22	2.7K	47K	3.3K	39K	—	—	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	X	1000P	4.70P	2.2#50	0	—	0	

DC voltages are as measured with a high impedance voltmeter with no signal input. Values may vary slightly due to variations between individual instruments or/and units.

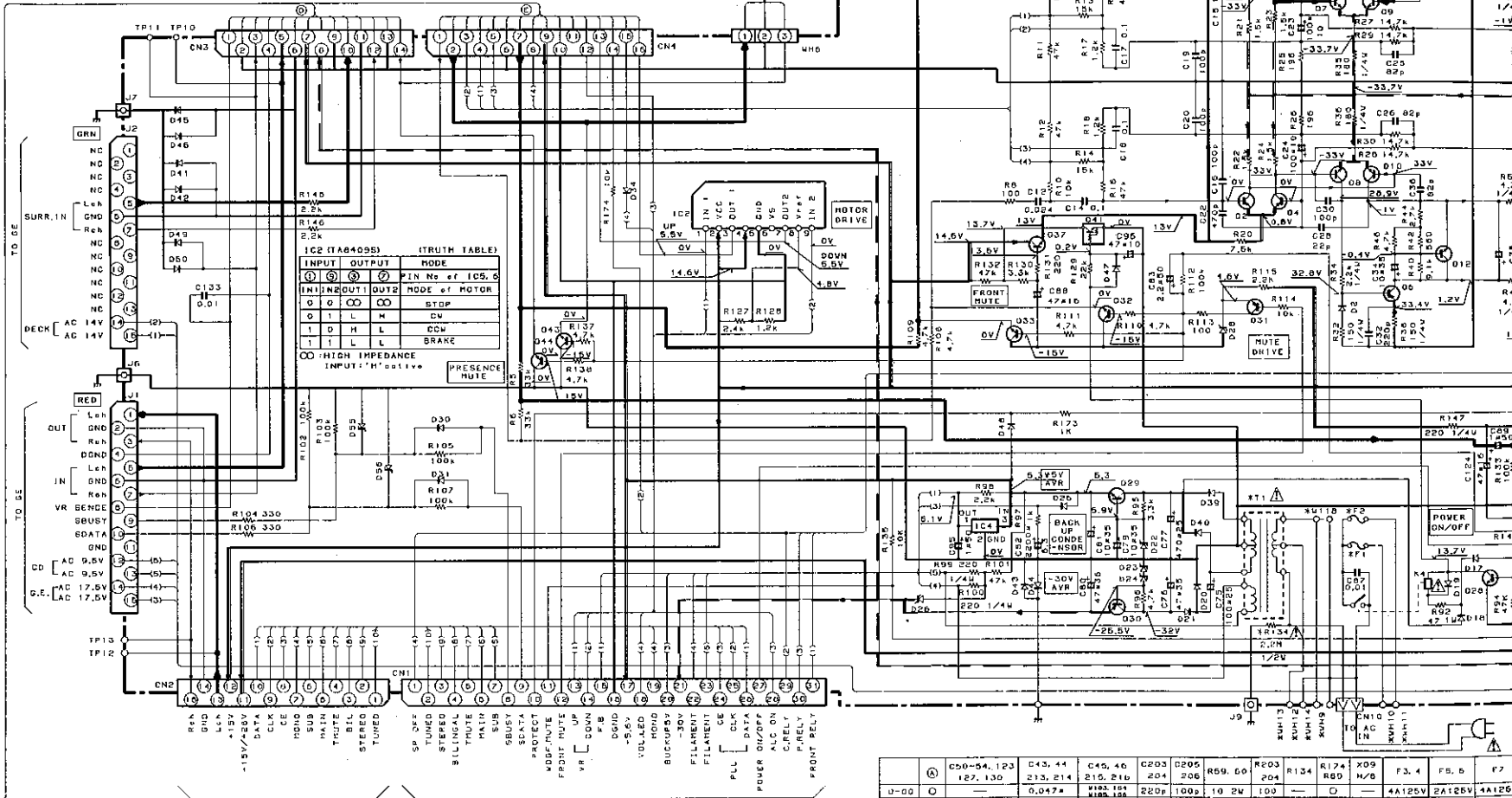
**A-722/722L**  
**KENWOOD**

Y05-2560-11



MODE	SPEAKERS OUTPUT			
	FRONT(MAIN)	PRESENCE	CENTER	SURROUND(REAR)
USED HEAD PHONE	X	X	X	X
DSP OFF	X	X	X	X
DSP FRONT 4ch	X	X	X	X
DSP SURROUND 4ch	X	X	X	X
MOVIE LOGIC	X	X	X	X
DOLBY PRO-LOGIC (NORMAL)	X	X	X	X
DOLBY PRO-LOGIC (PHANTOM)	X	X	X	X
DOLBY 3 STEREO	X	X	X	X

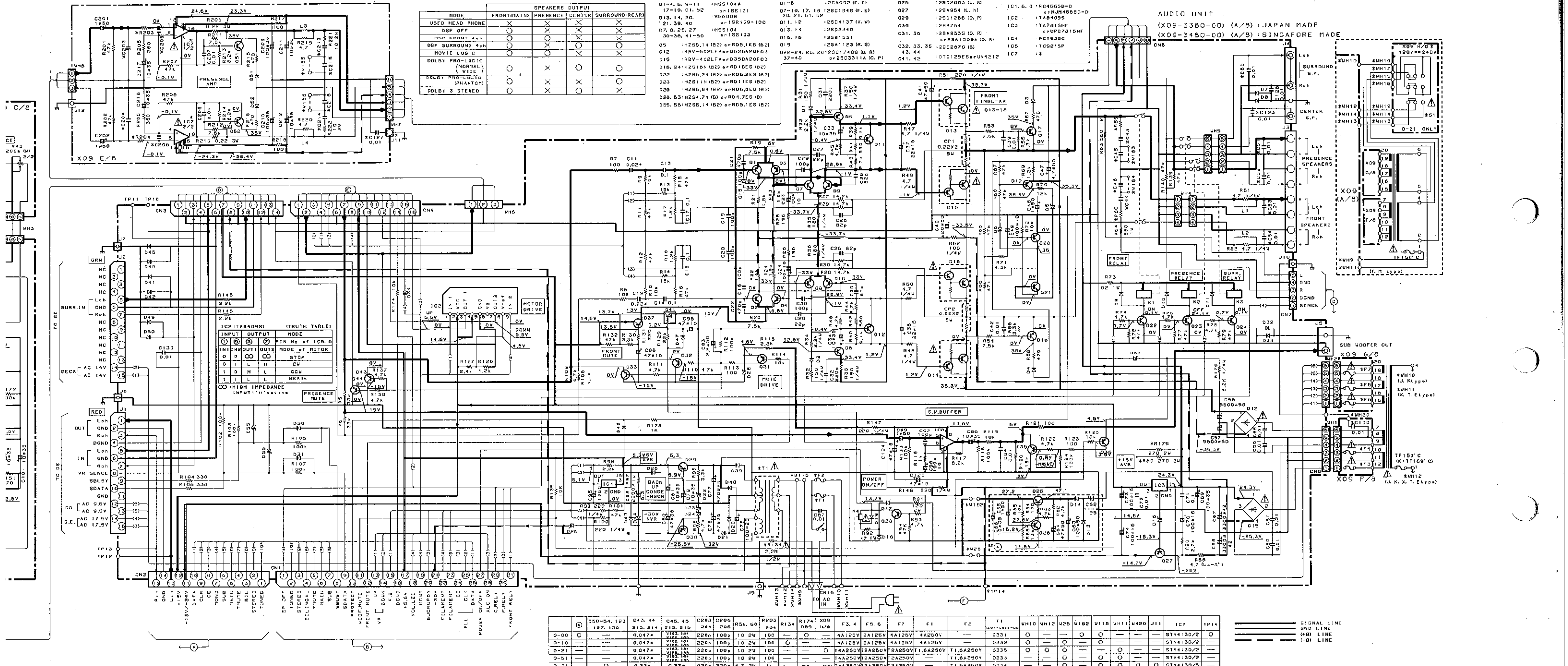
Q1-4, 5, 9-11	1MS1044	Q1-6	2SA92 U. E1
17-19, 21, 22 <td>155688</td> <td>07-10, 17, 18</td> <td>2SC1049 U. E1</td>	155688	07-10, 17, 18	2SC1049 U. E1
21, 39, 40	15R139-100	01.1, 12	2SC1137 U. W
27, 8, 25, 27	15S104	01.3, 14	2SD2340
30-38, 41-50	15S133	015, 16	2SD6031
D5	1N250, 1N (B2) + RD5, 1ES (B2)	019	2SA1123 (R. B)
D12	1R6V-602FA + D5GDA2DF03	022-24, 25, 28	2BC17405 (R. B)
D15	1R6V-602FA + D5GDA2DF03	37-40	2SC3311 A (R. P)
D16	1N250, 2N (B2) + RD6, 2ES (B2)		
D15, 24N250, 1N (B2) + RD11ES (B2)			
D22	1N250, 2N (B2) + RD6, 2ES (B2)		
D23	1N250, 1N (B2) + RD11ES (B2)		
D26	1N250, 2N (B2) + RD6, 2ES (B2)		
D28, D31	1N250, 7N (B2) + RD4, 7ES (B)		
D55, D56	1N250, 1N (B2) + RD5, 1ES (B2)		



Q	C50-54, 123	C43, 44	C45, 46	C203	D205	R59, 60	R203	R134	R174	X09	F3, 4	FR, 5	F7
U-00	127, 130	213, 214	215, 216	204	206	10 2W	100	—	—	—	—	—	—
0-10	—	0.047*	10K	220P	100P	10 2W	100	—	—	—	—	—	—
0-21	—	0.047*	10K	220P	100P	10 2W	100	—	—	—	—	—	—
0-51	—	0.047*	10K	220P	100P	10 2W	100	—	—	—	—	—	—
2-71	—	0.22*	0.22*	0.20P	250P	4.7 2W	1A	—	—	—	—	—	—

**CAUTION:** For continued safety, replace safety critical components only with manufacturer's recommended parts (refer to parts list).  $\Delta$  Indicates safety critical components. To reduce the risk of electric shock, leakage-current or resistance measurements shall be carried out (exposed parts are acceptably insulated from the supply circuit) before the appliance is returned to the customer.

DC voltages are a voltmeter with r slightly due to va ments or/and unit



MODE	FRONT(MAIN)	PRESENCE	CENTER	SURROUND(REAR)
USED HEAD PHONE	X	X	X	X
DSP OFF	X	X	X	X
DSP FRONT 4ch	X	X	X	X
DSP SURROUND 4ch	X	X	X	X
MOVIE LOGIC	X	X	X	X
DOLBY PRO-LOGIC	X	X	X	X
(NORMAL)	X	X	X	X
(WIDE)	X	X	X	X
DOLBY PRO-LOGIC (PHANTOM)	X	X	X	X
DOLBY 3 STEREO	X	X	X	X

- D1-4, 6, 9-11 HSS104
- 17-19, 51, 52 HSS131
- D13, 14, 20, 26600B
- 21, 29, 40 HSS104
- D7, 8, 26, 27 HSS104
- 30-38, 41-50 HSS133
- D9 HZS5,1N (B2) RDS,1E5 (B2)
- D12 HZV,602FA+DRSBA2P0F3
- D15 HZV,602FA+DRSBA2P0F3
- D16, 24 HZS15N (B2) RDS,1E5 (B2)
- D22 HZS5,2N (B2) RDS,2E5 (B2)
- D23 HZS1,1N (B2) RDS,1E5 (B2)
- D25 HZS5,5N (B2) RDS,5E5 (B2)
- D26, 53 HZS4,7N (B2) RDS,4,7E5 (B2)
- D55, 55 HZS5,1N (B2) RDS,1E5 (B2)
- D1-6 S8A592 (F, E)
- 07-10, 17, 18 28C1046 (F, E)
- 20, 21, 51, 52 28C1046 (F, E)
- D11, 12 28C1137 (V, W)
- D13, 14 28D2340
- 015, 16 28B1531
- 019 28A1123 (K, S)
- 022-24, 26, 28 28C17428 (Q, R)
- 37-40 28C3311A (Q, P)
- D25 28E2003 (L, A)
- 027 28A854 (L, N)
- 029 28D1266 (O, P)
- 030 28B754
- 031, 36 28A8335 (O, R)
- 032, 33, 35 28A1309A (O, R)
- 43, 44 28C2070 (B)
- 041, 42 DTC1295E (UN4212)
- IC1, 6, 8 RC45650-D
- IC2 74UM45500-D
- IC2 74AB495
- IC3 TA7615HF
- IC4 UPC7615HF
- IC4 PS1529C
- IC6 TC9215P
- IC7 74

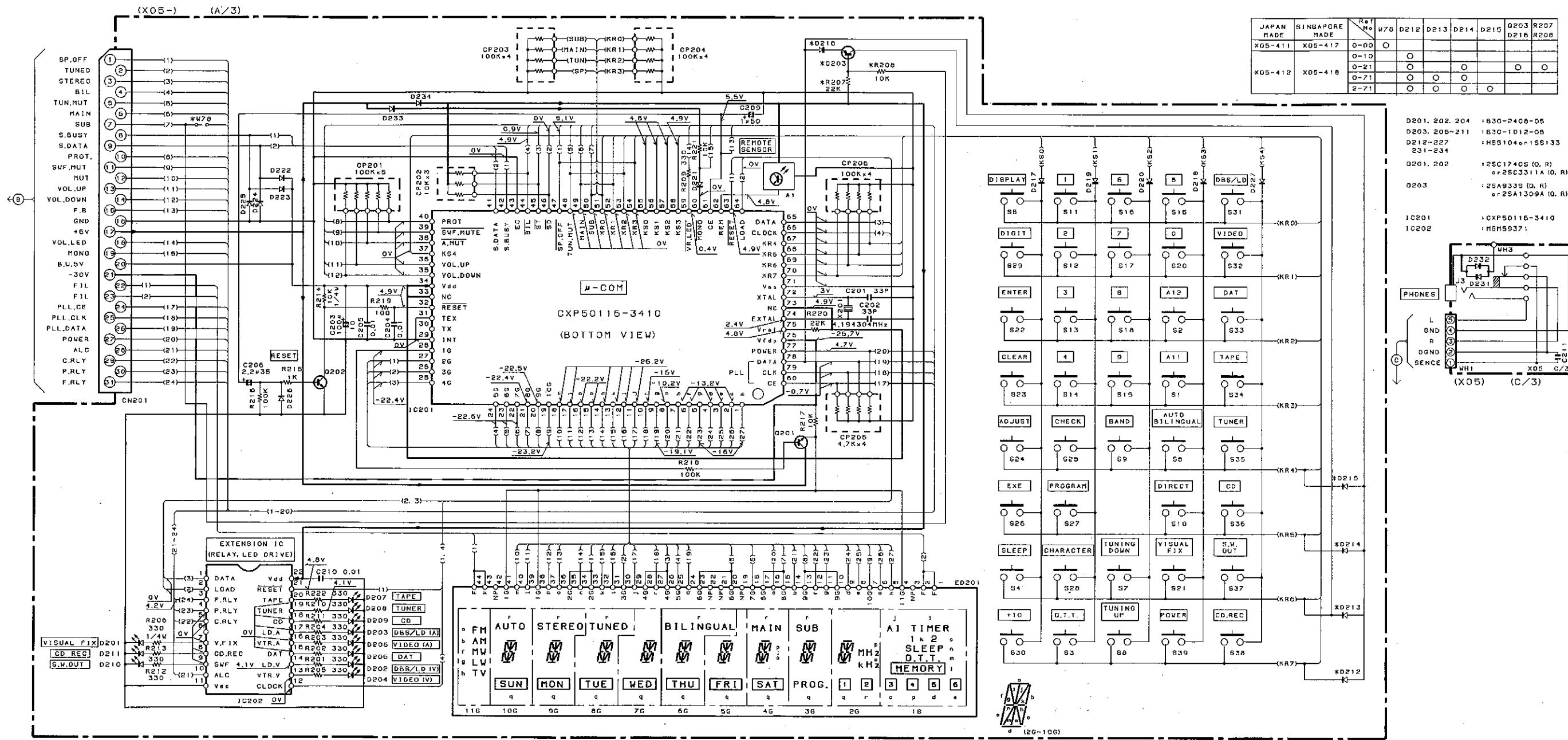
AUDIO UNIT  
 (X09-3360-00) (A/B) : JAPAN MADE  
 (X09-3450-00) (A/B) : SINGAPORE MADE

DC voltages are as measured with a high impedance voltmeter with no signal input. Values may vary slightly due to variations between individual instruments or/and units.

Y05-2560-11





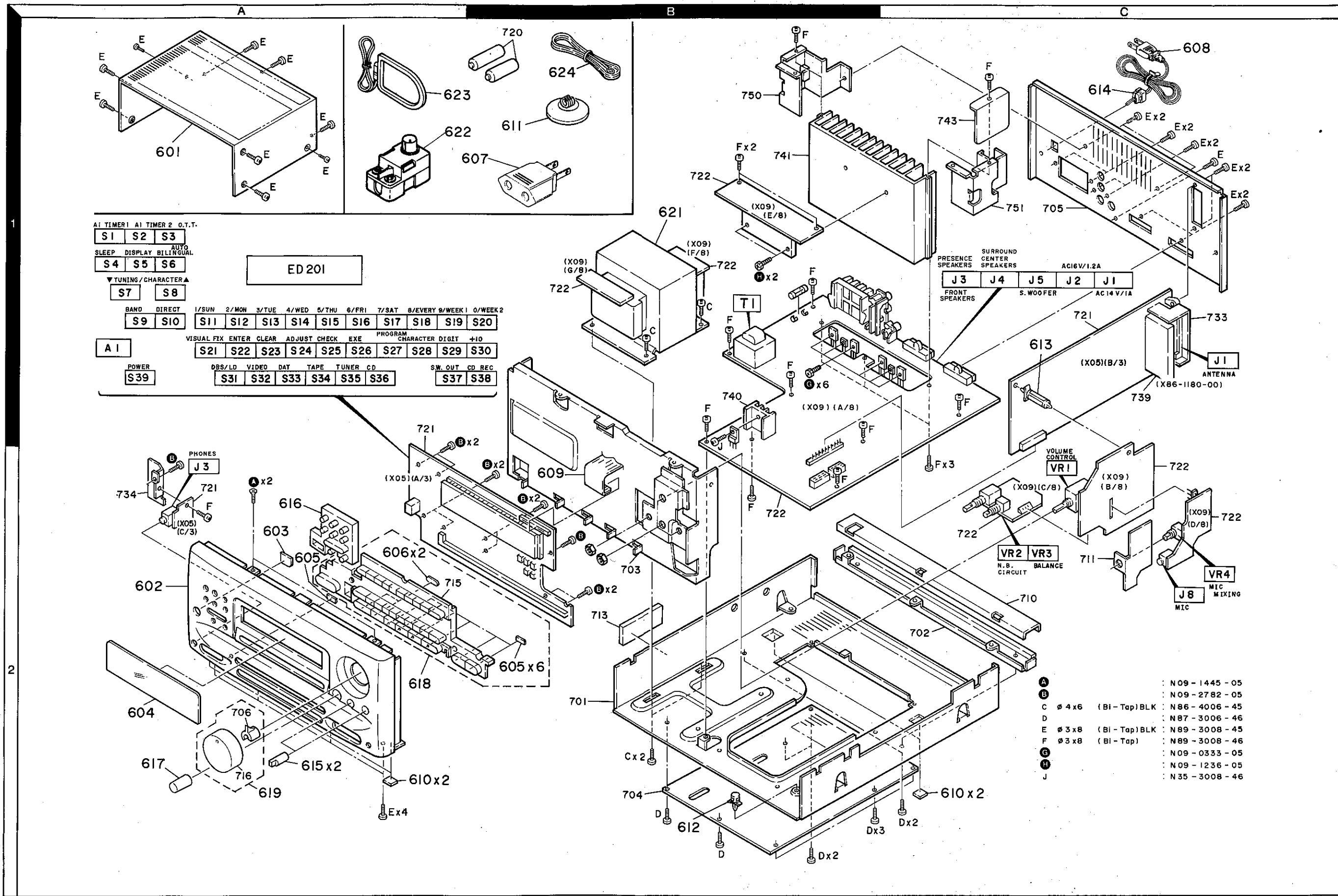


**CAUTION:** For continued safety, replace safety critical components only with manufacturer's recommended parts (refer to parts list).  $\Delta$  Indicates safety critical components. To reduce the risk of electric shock, leakage-current or resistance measurements shall be carried out (exposed parts are acceptably insulated from the supply circuit) before the appliance is returned to the customer.

DC voltages are as measured with a high impedance voltmeter with no signal input. Values may vary slightly due to variations between individual instruments or/and units.

**A-722/722L**  
**KENWOOD**

EXPLODED VIEW



AI	TIMER 1	AI	TIMER 2	O.T.T.							
S1	S2	S3	AUTO								
SLEEP		DISPLAY	BILINGUAL								
S4	S5	S6	ED 201								
▼ TUNING / CHARACTER ▲											
S7	S8										
BAND	DIRECT	1/SUN	2/MON	3/TUE	4/WED	5/THU	6/FRI	7/SAT	8/EVERY 9/WEEK 1	0/WEEK 2	
S9	S10	S11	S12	S13	S14	S15	S16	S17	S18	S19	S20
VISUAL FIX ENTER CLEAR ADJUST CHECK EXE PROGRAM CHARACTER DIGIT +10											
AI	S21	S22	S23	S24	S25	S26	S27	S28	S29	S30	
POWER	OBS/LD	VIDEO	DAY	TAPE	TUNER	CD	SW. OUT		CD	REC	
S39	S31	S32	S33	S34	S35	S36	S37	S38			

- A : N09 - 1445 - 05
- B : N09 - 2782 - 05
- C : Ø 4 x 6 (Bi - Tap) BLK : N86 - 4006 - 45
- D : N87 - 3006 - 46
- E : Ø 3 x 8 (Bi - Tap) BLK : N89 - 3008 - 45
- F : Ø 3 x 8 (Bi - Tap) : N89 - 3008 - 46
- G : N09 - 0333 - 05
- H : N09 - 1236 - 05
- J : N35 - 3008 - 46

PARTS LIST

No.2

\* New Parts
Parts without Parts No. are not supplied.
Les articles non mentionnés dans le Parts No. ne sont pas fournis.
Teile ohne Parts No. werden nicht geliefert.

Table with columns: Ref. No., Address, New Parts, Parts No., Description, Destination. Includes items like POWER TRANSFORMER, METALLIC CABINET, and various manuals.

E: Scandinavia & Europe K: USA P: Canada
Y: FX (Far East, Hawaii) T: England M: Other Areas
Y: APSES (Europe) X: Australia
A-722: K, Y, M, X type
A-722L: L, E type
A indicates safety critical components.

PARTS LIST

No.4

\* New Parts
Parts without Parts No. are not supplied.
Les articles non mentionnés dans le Parts No. ne sont pas fournis.
Teile ohne Parts No. werden nicht geliefert.

Table with columns: Ref. No., Address, New Parts, Parts No., Description, Destination. Includes items like ELECTRO, CERAMIC, and various capacitors.

E: Scandinavia & Europe K: USA P: Canada
Y: FX (Far East, Hawaii) T: England M: Other Areas
Y: APSES (Europe) X: Australia
A-722: K, Y, M, X type
A-722L: L, E type
A indicates safety critical components.

No.1

\* New Parts
Parts without Parts No. are not supplied.
Les articles non mentionnés dans le Parts No. ne sont pas fournis.
Teile ohne Parts No. werden nicht geliefert.

Table with columns: Ref. No., Address, New Parts, Parts No., Description, Destination. Includes items like METALLIC CABINET, FRONT GLASS, and various manuals.

E: Scandinavia & Europe K: USA P: Canada
Y: FX (Far East, Hawaii) T: England M: Other Areas
Y: APSES (Europe) X: Australia
A-722: K, Y, M, X type
A-722L: L, E type
A indicates safety critical components.

No.3

\* New Parts
Parts without Parts No. are not supplied.
Les articles non mentionnés dans le Parts No. ne sont pas fournis.
Teile ohne Parts No. werden nicht geliefert.

Table with columns: Ref. No., Address, New Parts, Parts No., Description, Destination. Includes items like ANTENNA HOLDER, UNIT HOLDER, and various capacitors.

E: Scandinavia & Europe K: USA P: Canada
Y: FX (Far East, Hawaii) T: England M: Other Areas
Y: APSES (Europe) X: Australia
A-722: K, Y, M, X type
A-722L: L, E type
A indicates safety critical components.



\* New Parts  
Parts without Parts No. are not supplied.  
Les articles non mentionnés dans le Parts No. ne sont pas fournis.  
Telle que Parts No. werden nicht geliefert.

No.7

Table with 5 columns: Ref. No., Address, Parts No., Description, Destination. Lists various electronic components like capacitors, relays, and diodes.

E: Scandinavia & Europe K: USA P: Canada  
Y: PX (Far East, Hawaii) T: England M: Other Areas  
Y: AMES (Europe) X: Australia  
A indicates safety critical components.

\* New Parts  
Parts without Parts No. are not supplied.  
Les articles non mentionnés dans le Parts No. ne sont pas fournis.  
Telle que Parts No. werden nicht geliefert.

No.8

Table with 5 columns: Ref. No., Address, Parts No., Description, Destination. Lists various electronic components like connectors, fuses, and transformers.

E: Scandinavia & Europe K: USA P: Canada  
Y: PX (Far East, Hawaii) T: England M: Other Areas  
Y: AMES (Europe) X: Australia  
A indicates safety critical components.

A-722/722L

PARTS LIST

\* New Parts  
Parts without Parts No. are not supplied.  
Les articles non mentionnés dans le Parts No. ne sont pas fournis.  
Telle que Parts No. werden nicht geliefert.

No.9

Table with 5 columns: Ref. No., Address, Parts No., Description, Destination. Lists various electronic components like relays, diodes, and transistors.

E: Scandinavia & Europe K: USA P: Canada  
Y: PX (Far East, Hawaii) T: England M: Other Areas  
Y: AMES (Europe) X: Australia  
A indicates safety critical components.

\* New Parts  
Parts without Parts No. are not supplied.  
Les articles non mentionnés dans le Parts No. ne sont pas fournis.  
Telle que Parts No. werden nicht geliefert.

No.10

Table with 5 columns: Ref. No., Address, Parts No., Description, Destination. Lists various electronic components like switches, relays, and transistors.

E: Scandinavia & Europe K: USA P: Canada  
Y: PX (Far East, Hawaii) T: England M: Other Areas  
Y: AMES (Europe) X: Australia  
A indicates safety critical components.

A-722/722L

PARTS LIST