SERVICE MANUAL ST320/ST320L

marantz®

model ST320/ST320L

Stereophonic Tuner

MARANTZ DESIGN AND SERVICE

Using superior design and selected high grade components, MARANTZ Company has created the ultimate in stereo sound. Only original MARANTZ parts can insure that your MARANTZ product will continue to perform to the specifications for which it is famous.

Parts for your MARANTZ stereo are generally available within 72 hours throughout the nation via a toll-free line to our National Parts Depot in California. The sales professionals who take your call immediately refer to their own desk top computer terminal and can quickly determine the availability and price information you require. If, for some reason, your order should exceed our available stock, we usually can instantly provide an alternate replacement part or current delivery information. When the order is placed and confirmed, the computer simultaneously generates "hard copy" orders at the distribution center. As hard copies come directly from the computer to the national parts depot, your requested stock is assembled and prepared for shipment and placed on the first available carrier for delivery to you.

ORDERING PARTS

Phone orders will eliminate mail delays, and we encourage the use of this method. If you order by mail, use MARANTZ parts order froms which are available from our National Parts Depot located at the following address:

SUPERSCOPE NATIONAL PARTS DEPARTMENT
20525 Nordhoff Street
Chatsworth, California 91311
Phone: 1-800-423-5108
1-213-998-9333

The following information must be supplied to eliminate delays in processing your order:

1. Complete address.
2. Complete part numbers.
3. Complete description of parts.
4. Model number for which part is required (indicate MARANTZ).
5. Account number (for account customers only).

Direct consumers will be provided with the current retail price quotation on available parts in order to advise them of the cost of the parts and shipping.

OVERSEAS PARTS ORDERING

Parts may also be ordered from the following overseas addresses:

U.S.A.

MARANTZ COMPANY, INC.
National Service Dept.
P.O. Box 577
Chatsworth, CA 91311
U.S.A.

CANADA

SUPERSCOPE CANADA, LTD.
3710 Nashua Drive
Mississauga
Ontario, Canada L4V1M5

AUSTRALIA

MARANTZ AUSTRALIA
32 Cross Street
Brookvale, NSW 2100
Australia

JAPAN

MARANTZ JAPAN, INC.
3622 Kamitsuruma
Sagamihara-shi
Kanagawa, Japan

EUROPE

MARANTZ S.A.
326 Avenue Louise Bte 32
1050 Brussels
Belgium

MARANTZ AUDIO U.K. LTD.
Unit 15/16
Saxon Way Industrial Estate
Motor Lane
Harmondsworth UB7 OLW
Great Britain

MARANTZ BELGIUM
45 Rue Auguste Van Zande
1080 Brussels
Belgium

MARANTZ SVENSKA A.B.
Svartviksvangen 56
Traneberg
Box 12016
161 12 BROMMA
SWEDEN

MARANTZ GERMANY GMBH
Max-Planckstrasse 22
6072 Dreieich 1
West Germany

MARANTZ FRANCE
4 Rue Bernard Palissy
92600 Asnieres
France

MARANTZ AUSTRALIA PTY., LTD.
32 Cross Street
Brookvale, N.S.W. 2100
Australia

MARANTZ NORSKE A.S.
Refstadalleen 13
Oslo 5
Norway

MARANTZ DENMARK
Bregnerødvej 132b
3460 BIRKERØD
DENMARK

MARANTZ GMBH AUSTRIA
Wiedner Hauptstrasse 98
1050 WIEN
AUSTRIA

All of the above locations are fully equipped to take care of your total service needs. Because various countries have differing configuration requirements, it is necessary that you contact the service facility in your particular country. In the event that there is no service location listed for your country, please contact the nearest facility for the necessary assistance.

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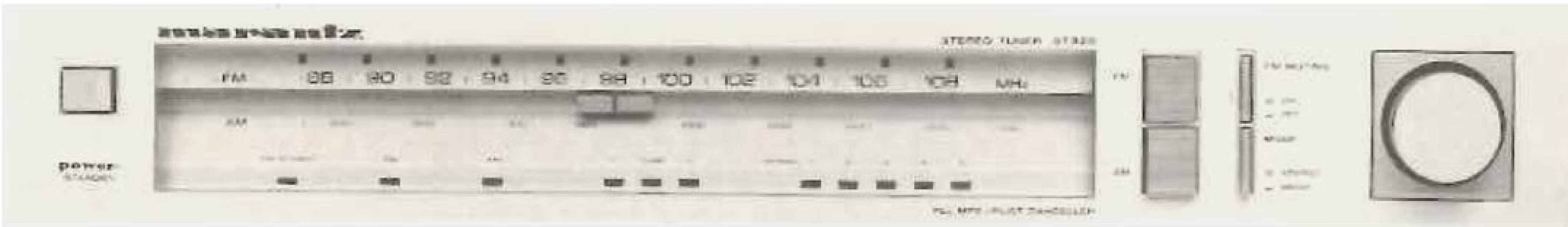
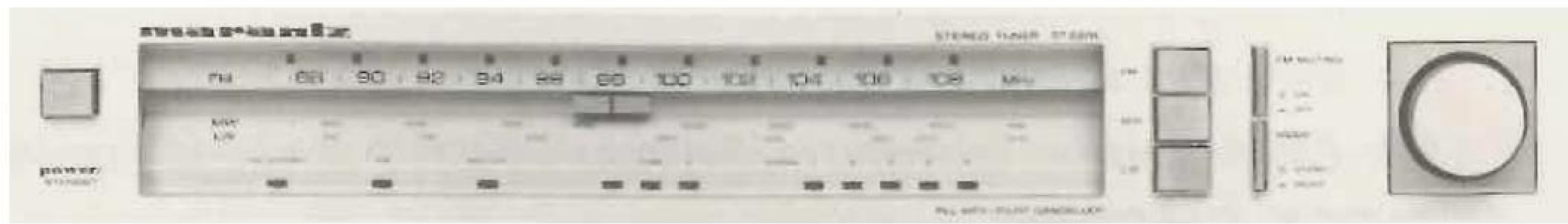


ST320



ST320L

INTRODUCTION

This service manual was prepared for use by Authorized Warranty Stations and contains service information for Marantz Model ST320/ST320L Stereophonic Tuner. Servicing information and voltage data included in this manual are intended for use by the knowledgeable and experienced technician only. All instructions should be read carefully. No attempt should be made to proceed without a good understanding of the operations in the Tuner.
The parts list furnishes information by which replacement parts may be ordered from the Marantz Company. A simple description is included for parts which can usually be obtained through local suppliers.

1. SHOCK FIRE HAZARD SERVICE TEST:

CAUTION: After servicing this appliance and prior to returning to customer, either primary AC cord connector pins (with unit NOT connected to AC mains and its power switch ON), and the face or front panel of product and controls, and chassis bottom.

Any resistance measurement less than 1 Megohms should cause unit to be repaired or corrected before AC power is applied, and verfied before return to user/customer.
Ref. UL standard No. 1270. Para. 66.3.D (Mandatory Test after servicing Electrical Appliances, effective 7-1-83).

2. P.W. BOARDS

As can be seen from the circuit diagram, the chassis of Model ST320/ST320L consists of the following units. Each unit mounted on a printed circuit board is described within the square enclosed by a bold dotted line on the circuit diagram.

1. **Tuner . . . . .mounted on P.W. Board P100**
2. **Signal Strength and Function LED. . . .mounted on P.W. Board PX00**
3. **Function SW . . . . . . .mounted on P.W. Board PS00**
4. **Muting and Mono SW. . . . . .mounted on P.W. Board PT00**
5. **Power SW . . . . .mounted on P.W. Board PU00**
6. **DE-EMP . . . . .mounted on P.W. Board PC50**

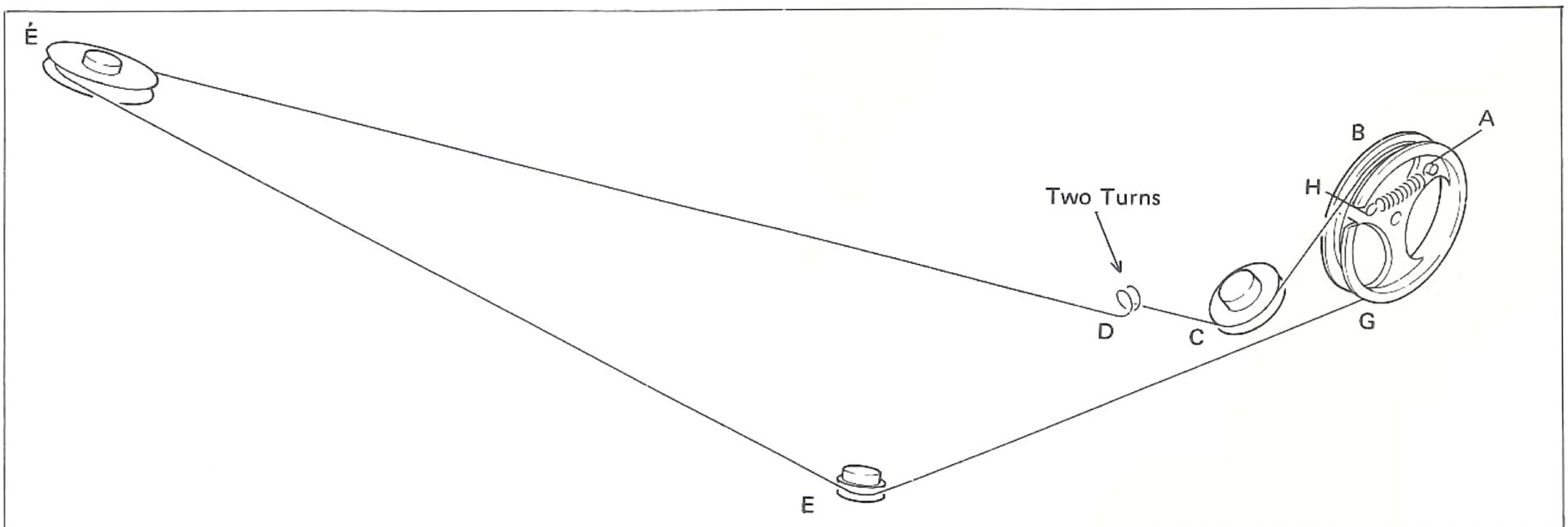


Figure 1. Dial Stringing

3. TEST EQUIPMENT REQUIRED FOR SERVICING

This table lists the test equipment required for servicing the Model ST320/ST320L Tuner.

Item	Manufacturer and Model No.	Use
AM Signal Generator		Signal source for AM alignment
Test Loop		Use with AM Signal Generator
FM Signal Generator MPX Signal Generator	Sound Technology Model 1000A	Signal source for FM alignment Stereo separation alignment and trouble shooting
Distortion Analyzer Audio Oscillator AC VTVM	Sound Technology Model 1700A	Distortion measurements Sinewave and squarewave signal source Voltage measurements (AC)
Oscilloscope	Tektronix Model T932 Philips Model 3232	Waveform analysis and trouble shooting
Frequency Counter	Fluke Model 1900A	MPX Oscillator adjustment (VCO)
Circuit Tester		Trouble shooting
DC VTVM	Fluke Model 8000 "Digital" Simpson Model 313, Triplet Model 801	Voltage measurements (DC)
AC Wattmeter	Simpson Model 1379	Monitors primary power to tuner
Line Voltmeter	Simpson Model 1359	Monitors potential of primary power to tuner
Variable Autotransformer	Superior Electronic Co., Powerstat Model 116B-10A	Adjusts level of primary power to tuner

4. ALIGNMENT PROCEDURES

A dummy resistor of 47 kohms must be connected across the tuner output terminals before alignment.

4.1 FM Alignment Procedures (Selector switch in the "FM" position)

1. FM IF Alignment

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Set Dial Pointer to:	Adjust:
1	Sweep generator to point Ⓑ through 5pF capacitor	10.7 MHz marker at 10.6, 10.7 and 10.8 MHz	Oscilloscope to point Ⓒ	Quiet point on band.	L105 for maximum and symmetric responce.
2			Oscilloscope to point Ⓓ (J201)		L201 for straigth and symmetric "S" surve responce.
3	Repeat steps 1 and 2.				

2. FM RF Alignment

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Set Dial Pointer to:	Adjust:
1	RF generator to FM antenna terminals Ⓐ through matching network (300 ohms, balanced) (Maintain RF level below limt.)	87.4 MHz	VTVM to L or R channel output (J301)	87.4 MHz with tuning gang closed.	L103 for maximum output.
2		108.2 MHz		108.2 MHz with tuning gnag open.	C119 for maximum output.
3		90 MHz		90 MHz	L101, L102 for maximum output.
4		106 MHz		106 MHz	ANT. RF. TRIM. CAP. for maximum output.
5	Repeat steps 1 to 4.				
6	Check overall response curve and repeat above steps as necessary to obtain maximum sensitivity.				
7	No connection	No signal	Center Meter between J201-J202		L201 center tuning meter pointer indicates its center.
8	RF generator 1 m V output to FM antenna terminals Ⓐ through matching network (300 ohms, balanced)	98 MHz	Distortion meter to output (J301)	98 MHz	L202 for minimum distortion.

4.2 Muting Circuit Alignment

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Set Dial Pointer to:	Adjust:
1	RF generator 12.5μV output to FM antenna terminals Ⓐ through matching network (300 ohms, balanced)	98 MHz	VTVM to R or L channel output (J301)	98 MHz	R231 for 12.5μV threshold level. (During this adjustment turn the muting push-switch "ON".)

4.3 Multiplex Alignment Procedures (Selector switch in the "FM" position)

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Set Dial Pointer to:	Adjust:
1	RF generator to FM antenna terminals Ⓐ through matching network (300 ohms, balanced), with 1mV FM stereo signal modulation level DIN 40 kHz +8% pilot IHF 67.5 kMz +9% pilot.	No Modulation	Frequency counter to point Ⓔ (J304)	98 MHz	R302 so that Frequency counter may precisely read 76 kHz
2		Stereo, left (1,000 Hz)	VTVM to right channel output (J301-L)		R329 for same separation in both channels.
3		Stereo, right (1,000 Hz)	VTVM to left channel output (J301-R)		
4		Repeat steps 2 and 3.			
5		Pilot only	VTVM to R or L channel output (J301)	98MHz	R310 so that minimum output should be the same in both channels.

4.4 AM Alignment Procedures

1. MW IF Alignment (Selector switch in the "MW" position)

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Set Dial Pointer to:	Adjust:
1	Sweep generator to point Ⓕ	450 kHz marker	Oscilloscope to point Ⓖ (JA03)	Quiet point on band	LA05 for maximum and symmetric responce.

2. MW RF Alignment (Selector switch in the "MW" position)

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Set Dial Pointer to:	Adjust:
1	Apply the signal to the AM loop antenna from the RF generator using the test loop.	525 kHz	VTVM to L or R channel output (J301)	525 kHz with tuning gang closed.	LA03 for maximum output.
2		1,630 kHz		1,630 kHz with tuning gang open	CA02-1 for maximum output.
3		600 kHz		600 kHz	LA01 for maximum output.
4		1,400 kHz		1,400 kHz	CA07-1 for maximum output.
5	Repeat steps 1 to 4 as necessary to obtain maximum sensitivity.				

3. LW RF Alignment (Selector switch in the "LW" position) (ST320L ONLY)

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Set Dial Pointer to:	Adjust:
1	Apply the signal to the AM loop antenna from the RF generator using the test loop.	145 kHz	VTVM to L or R channel output (J301)	145 kHz with tuning gang closed.	LA04 for maximum output.
2		380 kHz		380 kHzwith tuning gang open	CA02-2 for maximum output.
3		170 kHz		170 kHz	LA02 for maximum output.
4		350 kHz		350kHz	CA07-2 for maximum output.
5	Repeat steps 1 to 4 as necessary to obtain maximum sensitivity.				

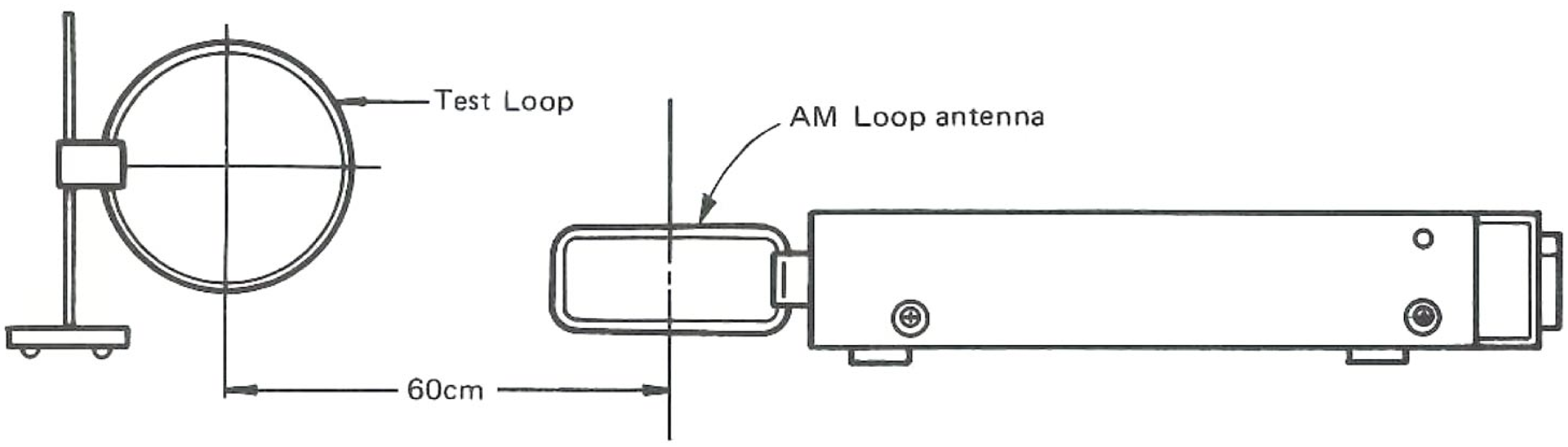
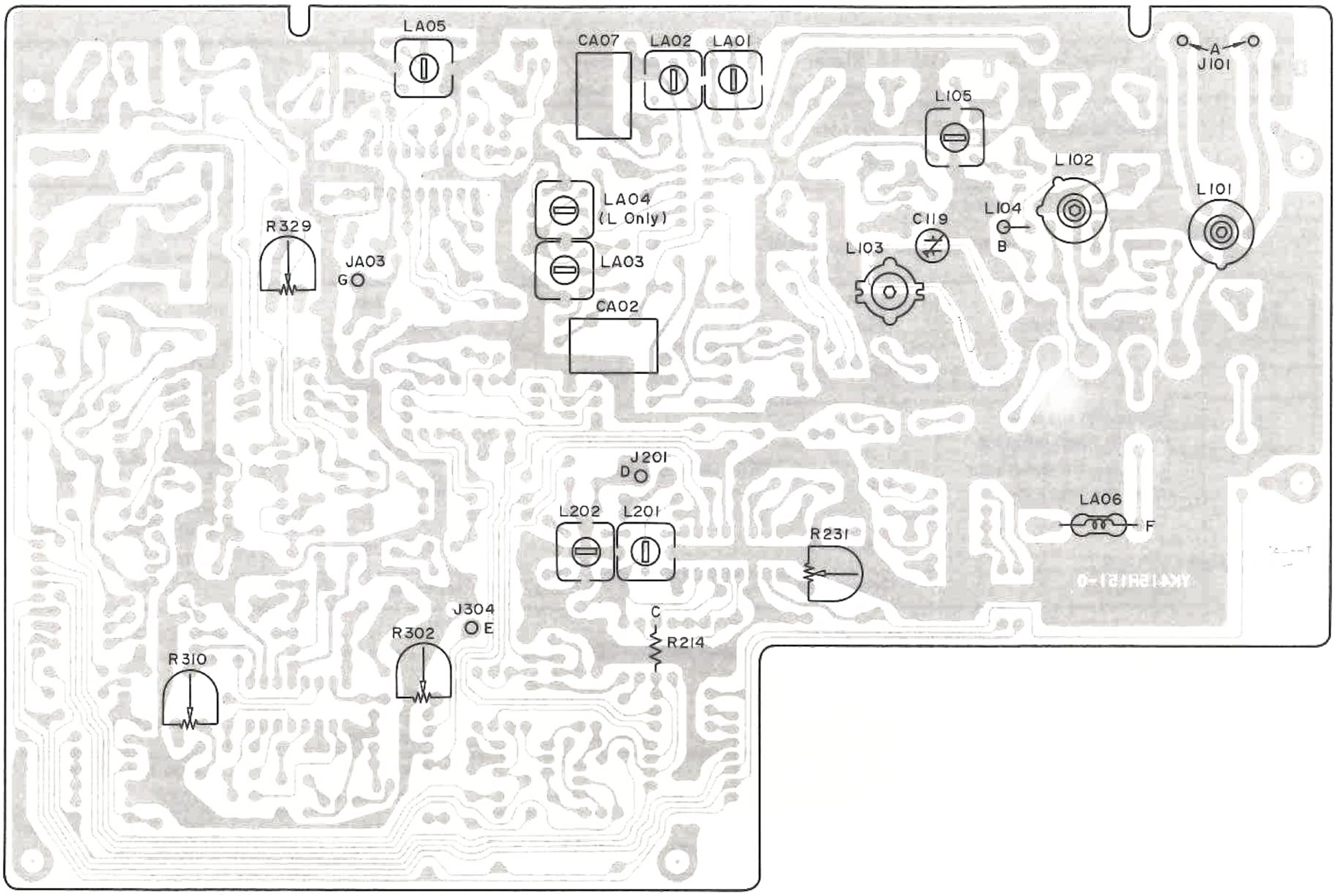
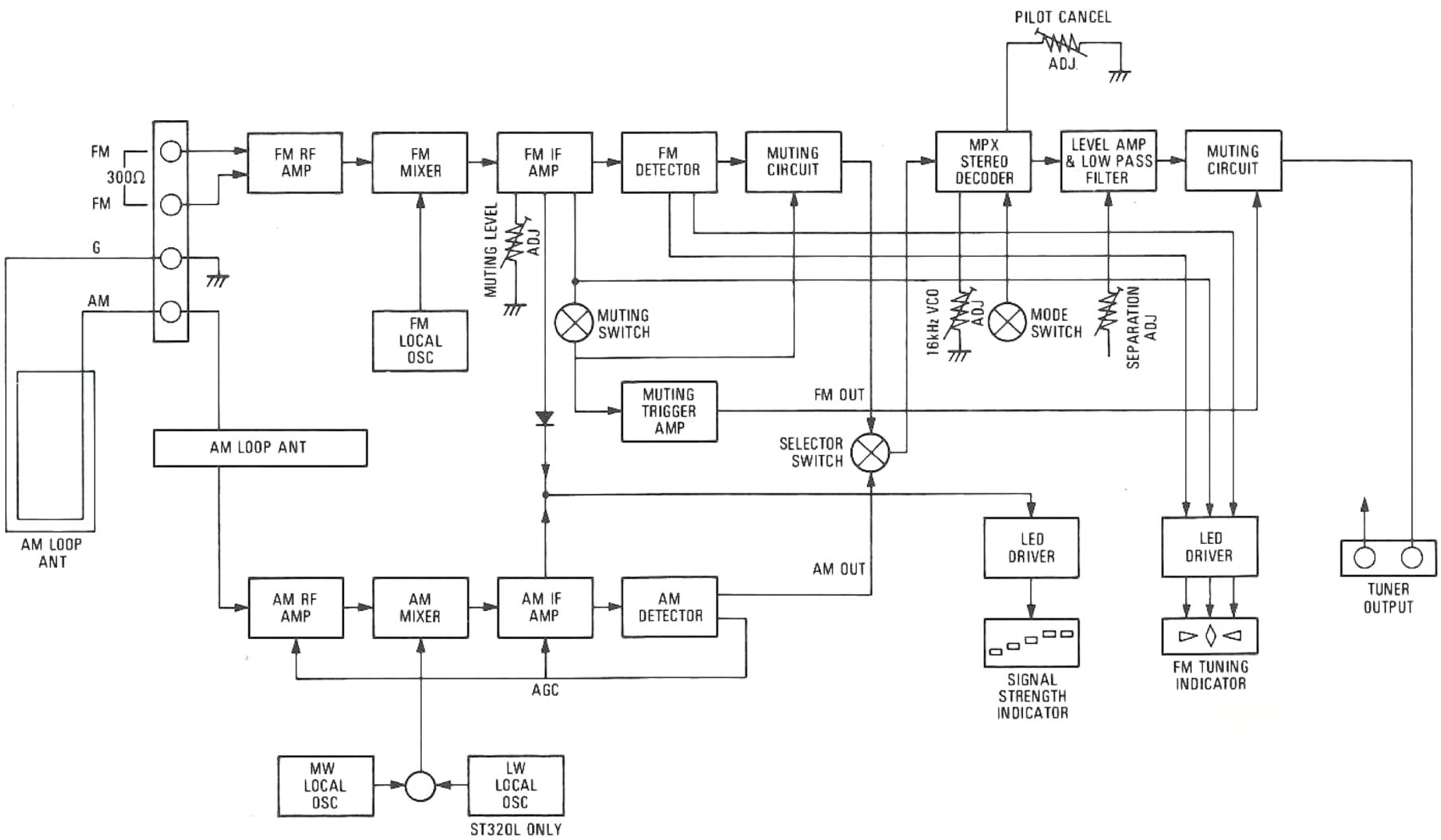


Figure 2. Application of AM Signal

- **Alignment Point**



5 BLOCK DIAGRAM

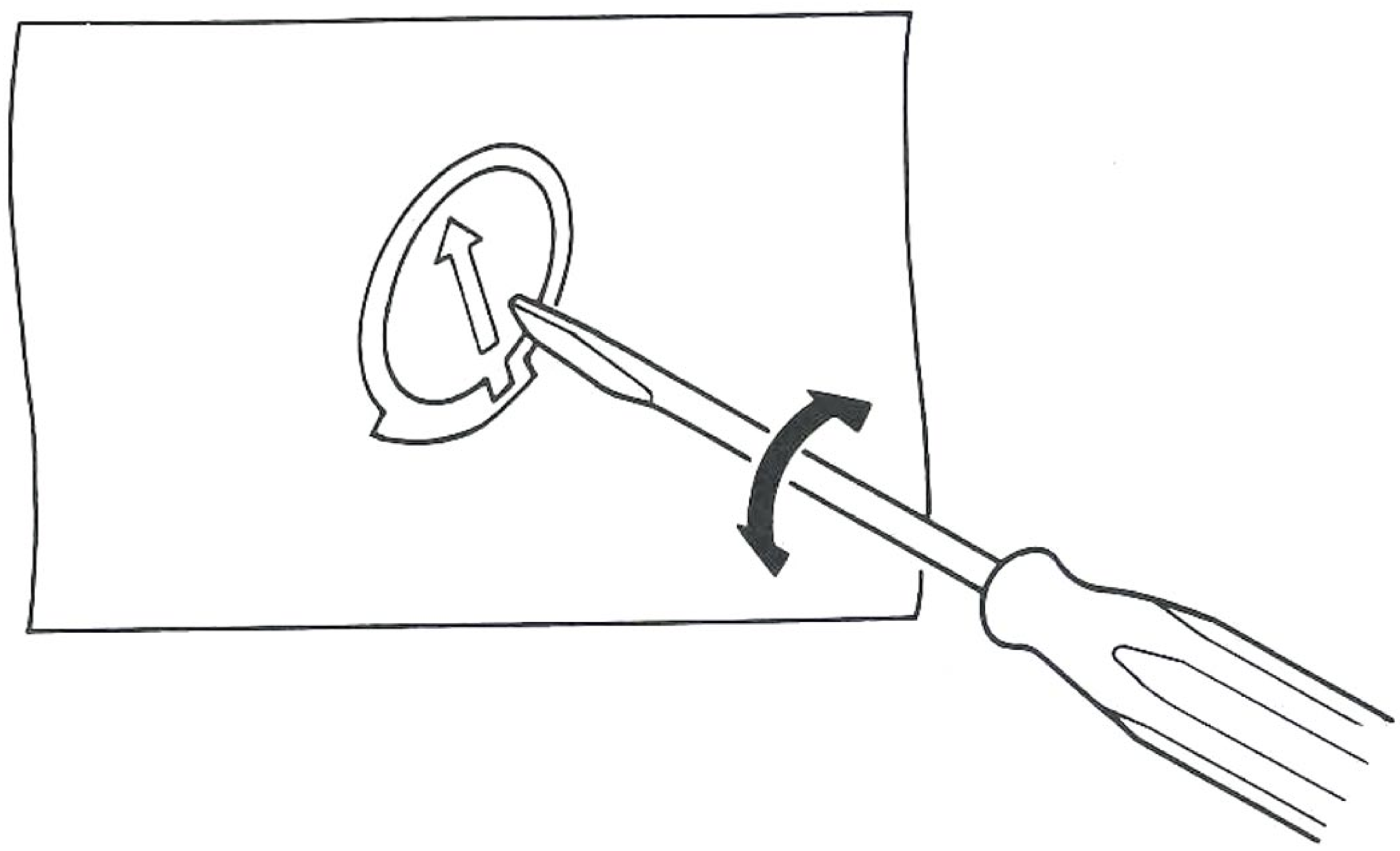


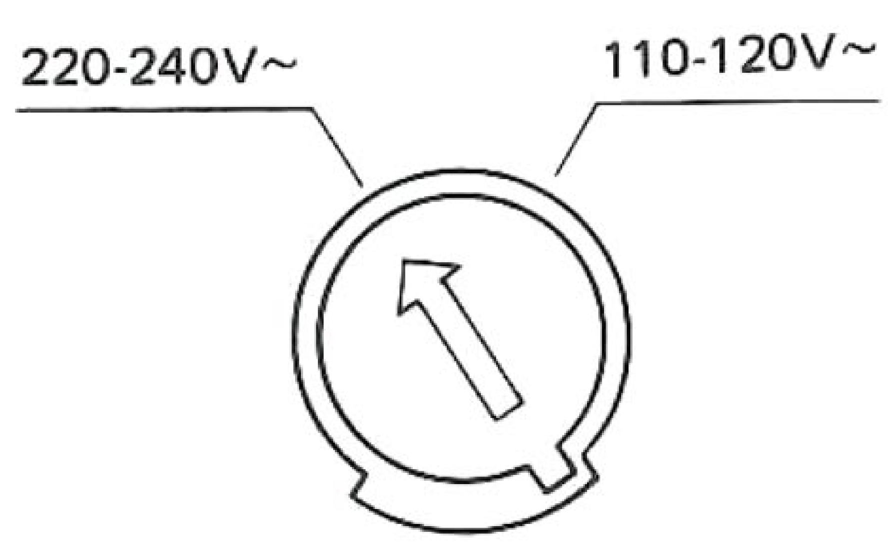
To convert the unit to a different power source voltage, change the position as illustrated in the drawing below.

CAUTION

DISCONNECT POWER SUPPLY CORD FROM AC OUTLET BEFORE CONVERTING VOLTAGE.

Voltage Conversion Chart





(E) Version

NOTE ON SAFETY:

Symbol ⚠ Fire or electrical shock hazard. Only original parts should be used to replace any part marked with symbol ⚠ . Any other component substitution (other than original type), may increase risk of fire or electrical shock hazard.

FTZ REGULATION

Instruction for the use in the range other than specified in FTZ codes.

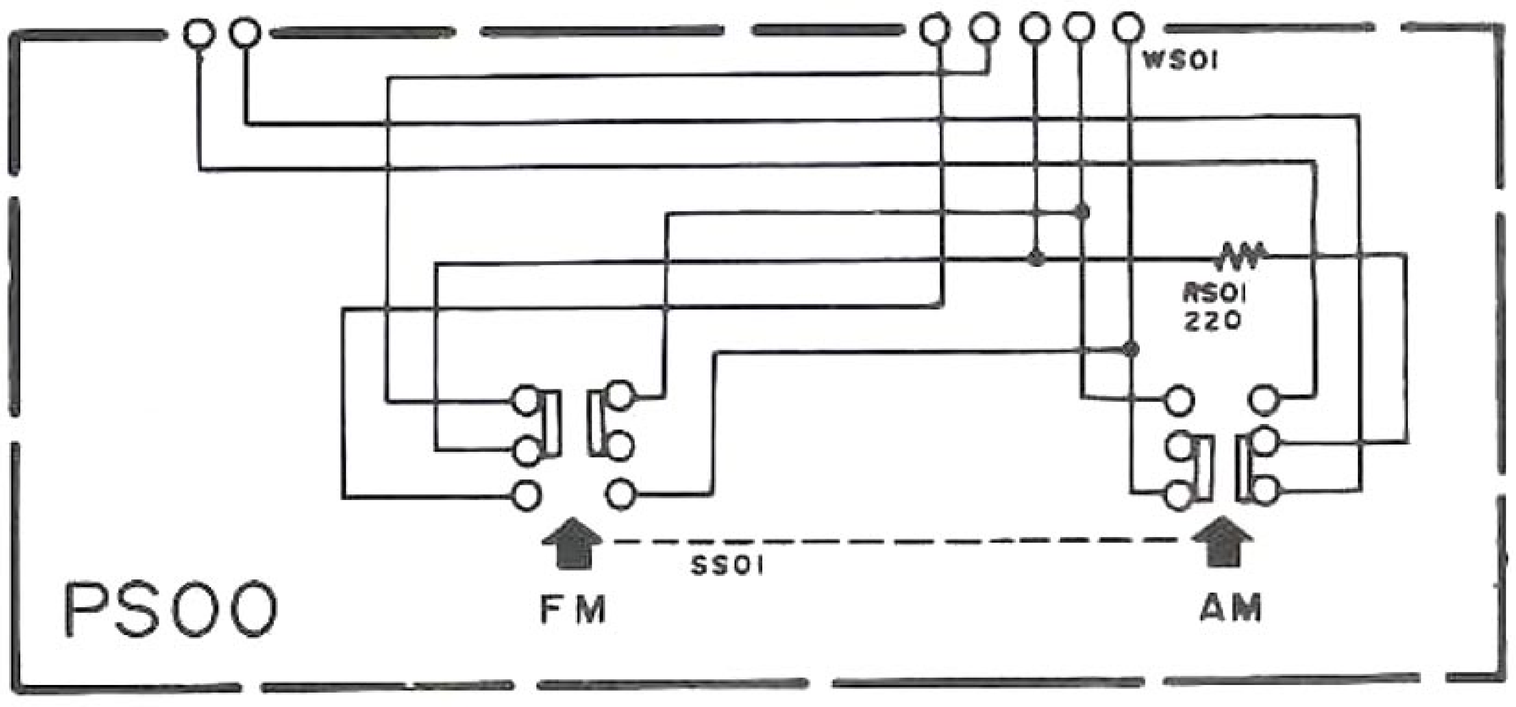
Achtung für die Leute, die in dem Gebiet wohnen, wo die FTZ-Bestimmungen vorherrschend sind.

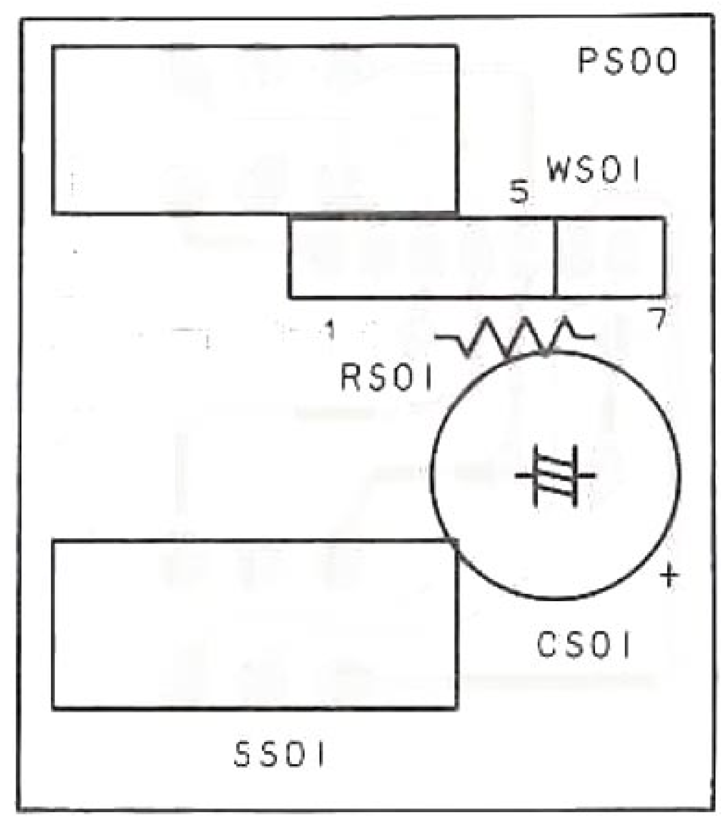
Sollte des Gerät auch für Frequenzen auszerhalb des in den FTZ-Bestimmungen angegebenen Bereiches empfangebereit sein, bitten wir, den Bereich durch Nachstellen des Kernes in der Oszillatorspule (in der Abbildung mit "FTZ" gekennzeichnet) so zu korrigieren, dass er den Bestimmungen entspricht.

7. DIAGRAM AND COMPONT

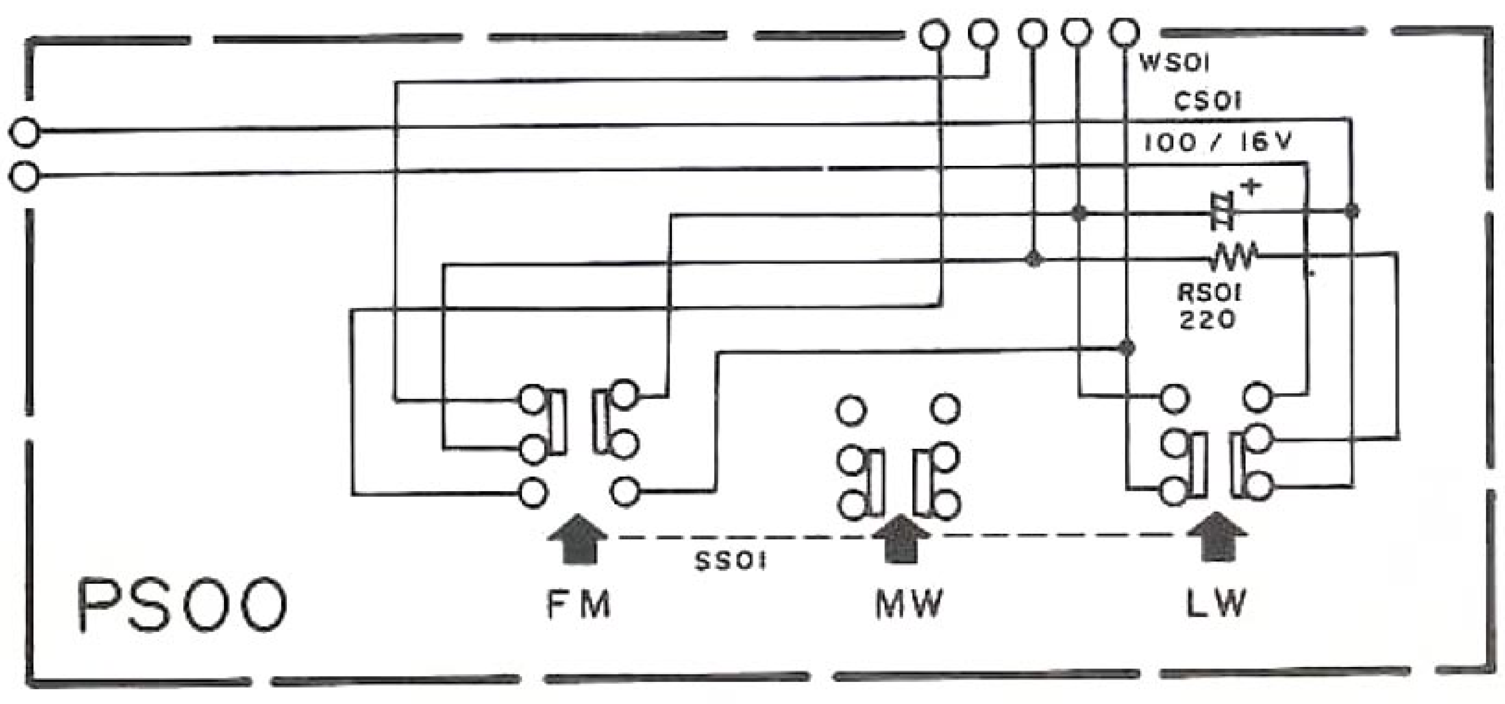
7.1 Selector SW (PS00) Schematic Diagram and Component Locations

ST320

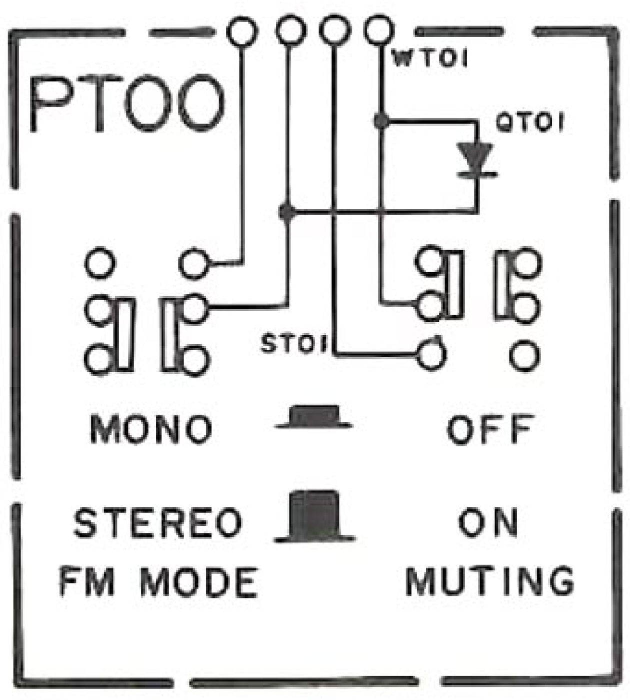


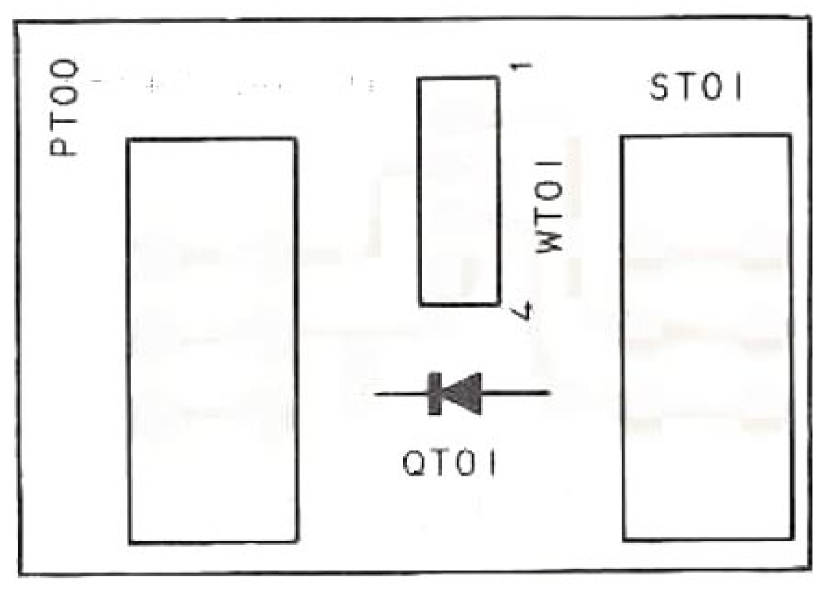


ST320L

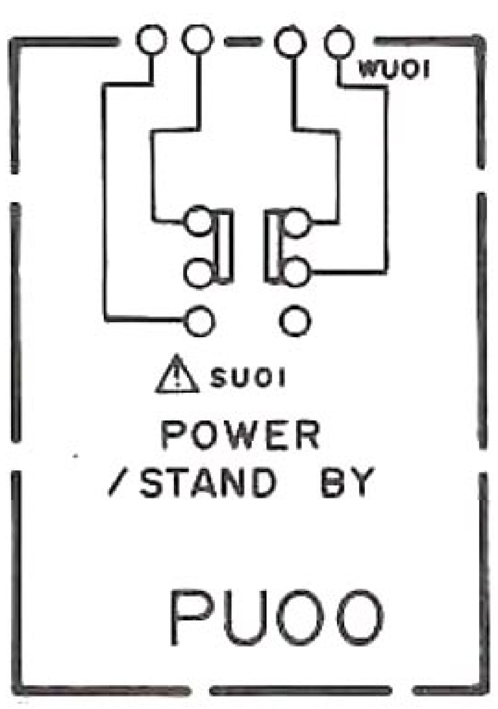


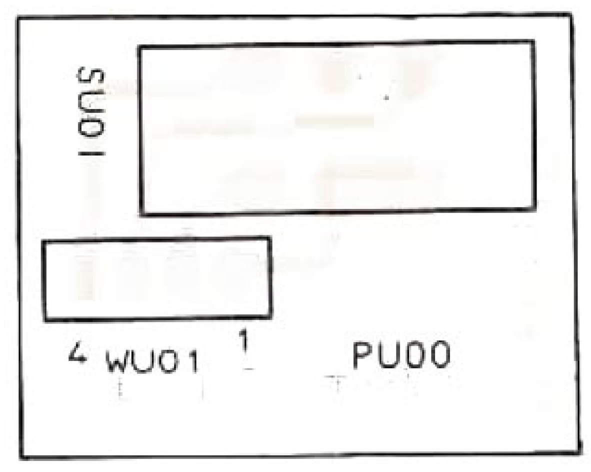
7.2 Muting/Mode SW (PT00) Schematic Diagram and Component Locations





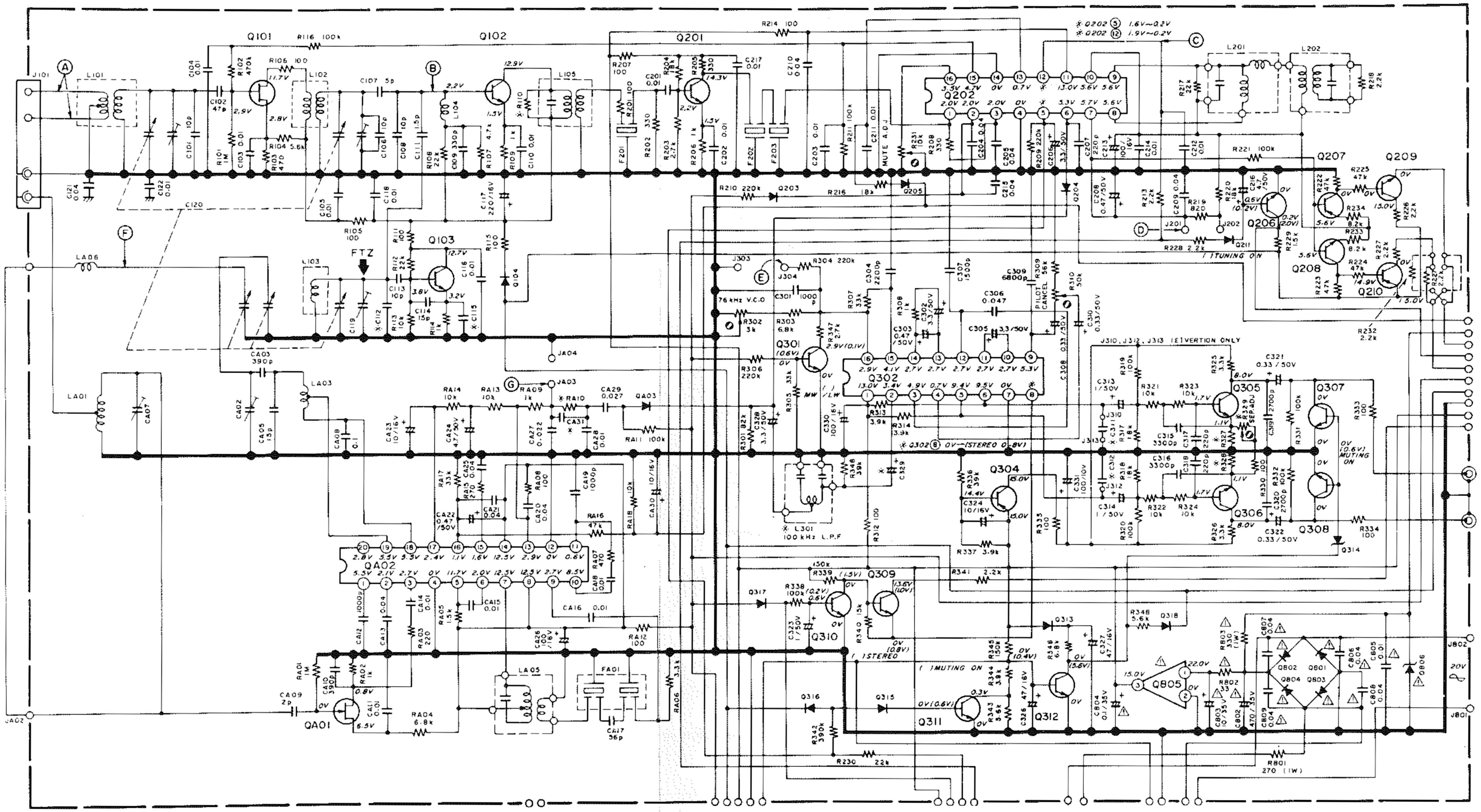
7.3 Power Switch (PU00) Schematic Diagram and Component Locations



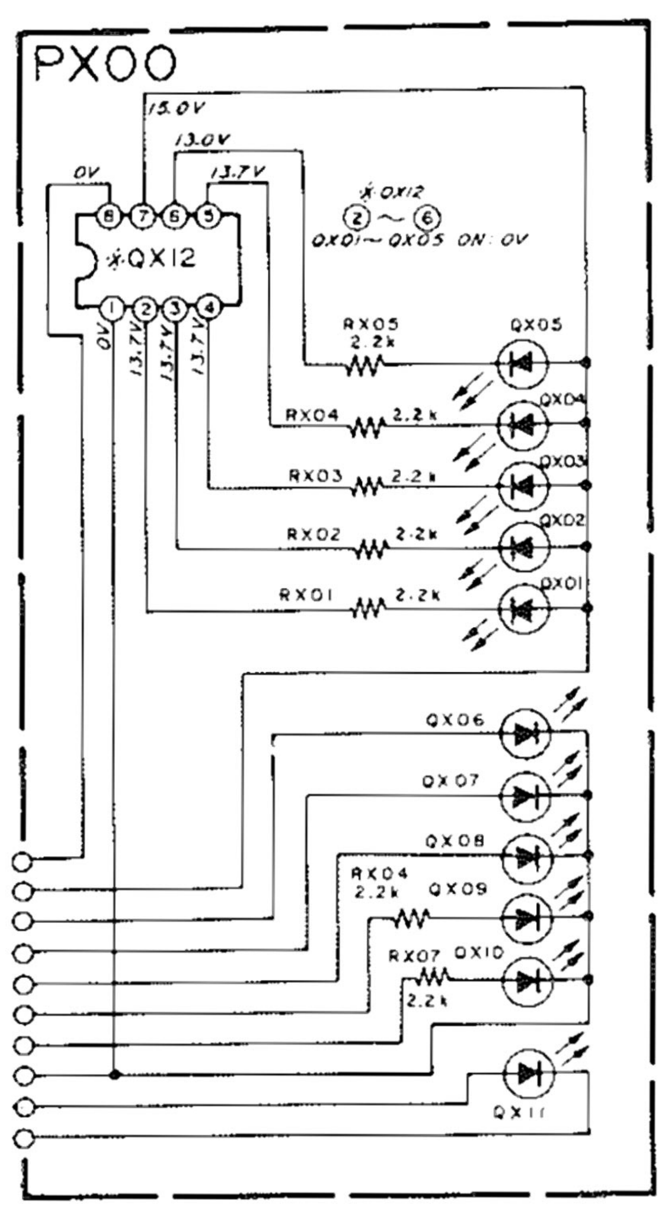


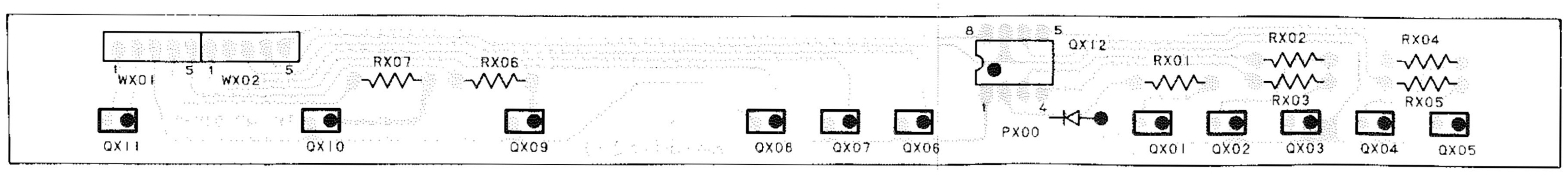
7.4 Tuner Main (P100) Schematic Diagram and Component Locations

ST320



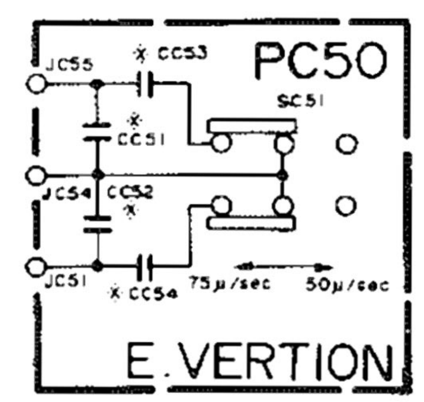
7.5 LED (PX00) Schematic Diagram and Component Locations

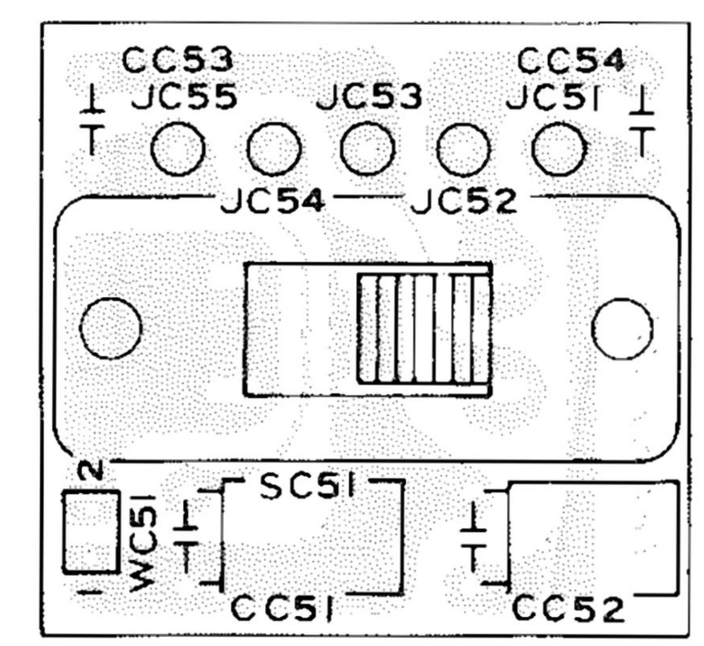




7.6 DE-EMP (PC50) Schematic Diagram and Component Locations

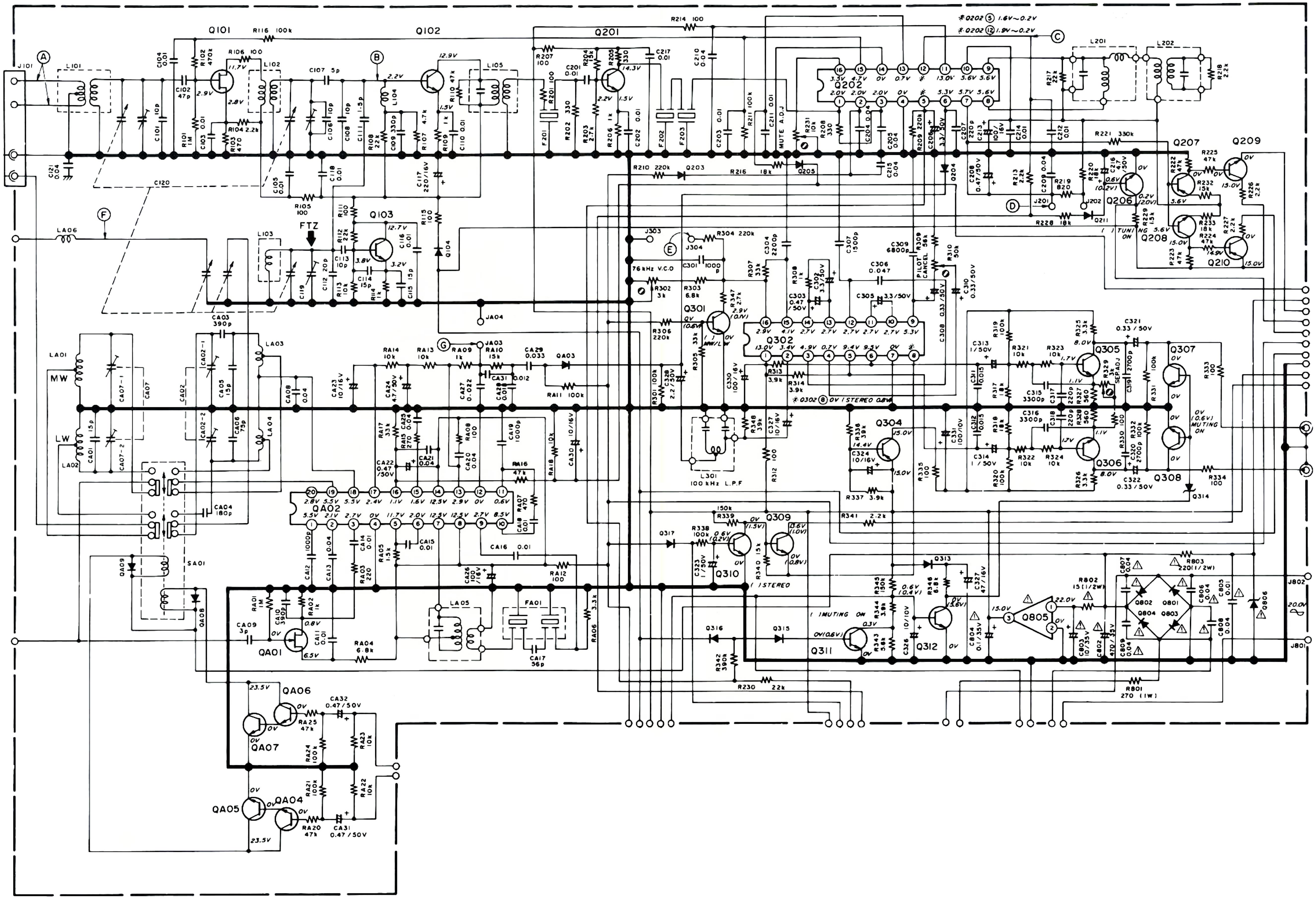
ST320 Only





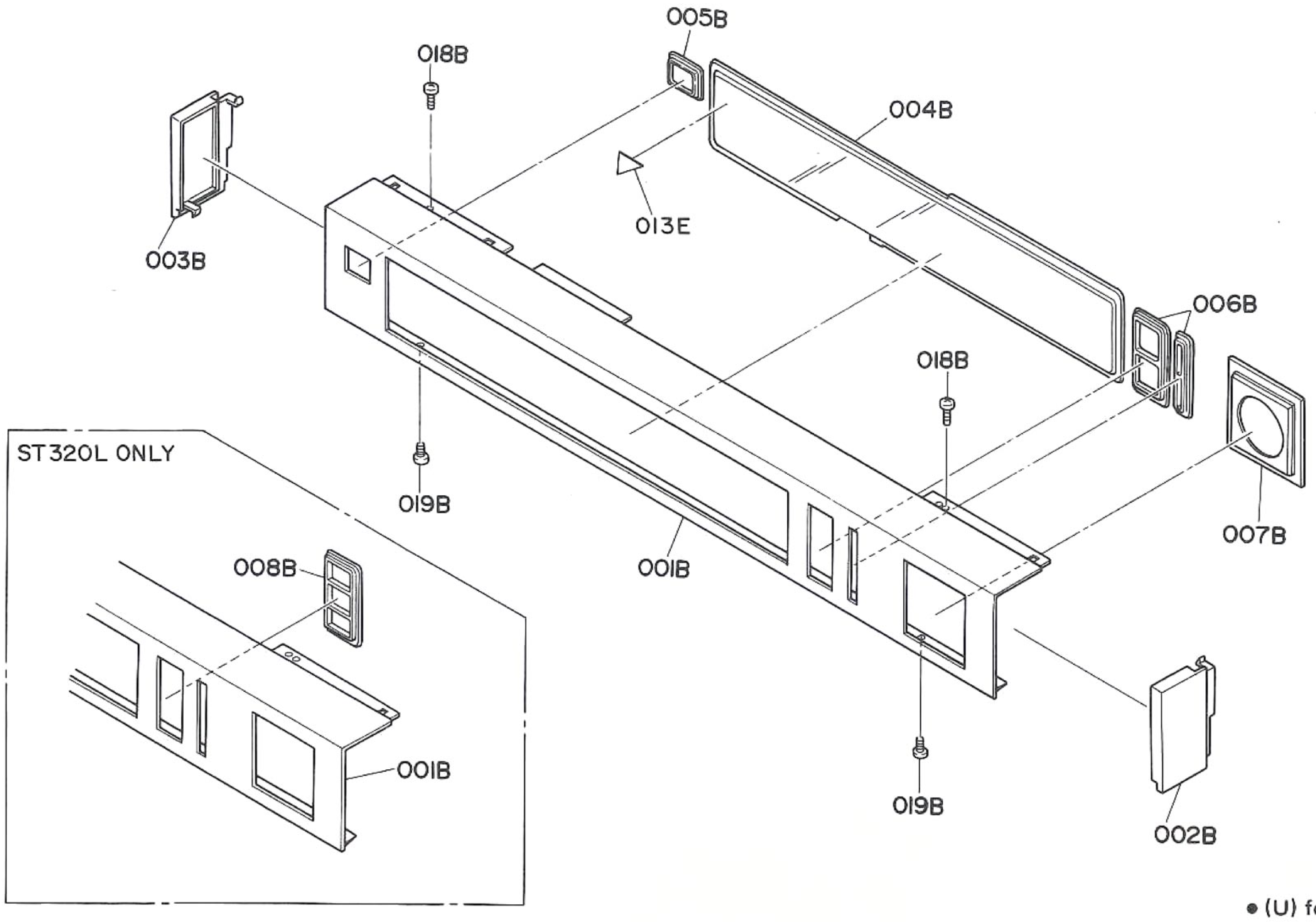
Tuner Main (P100)

ST320L



8. EXPLODED VIEW AND PARTS LIST

● [C01-99]Front Panel

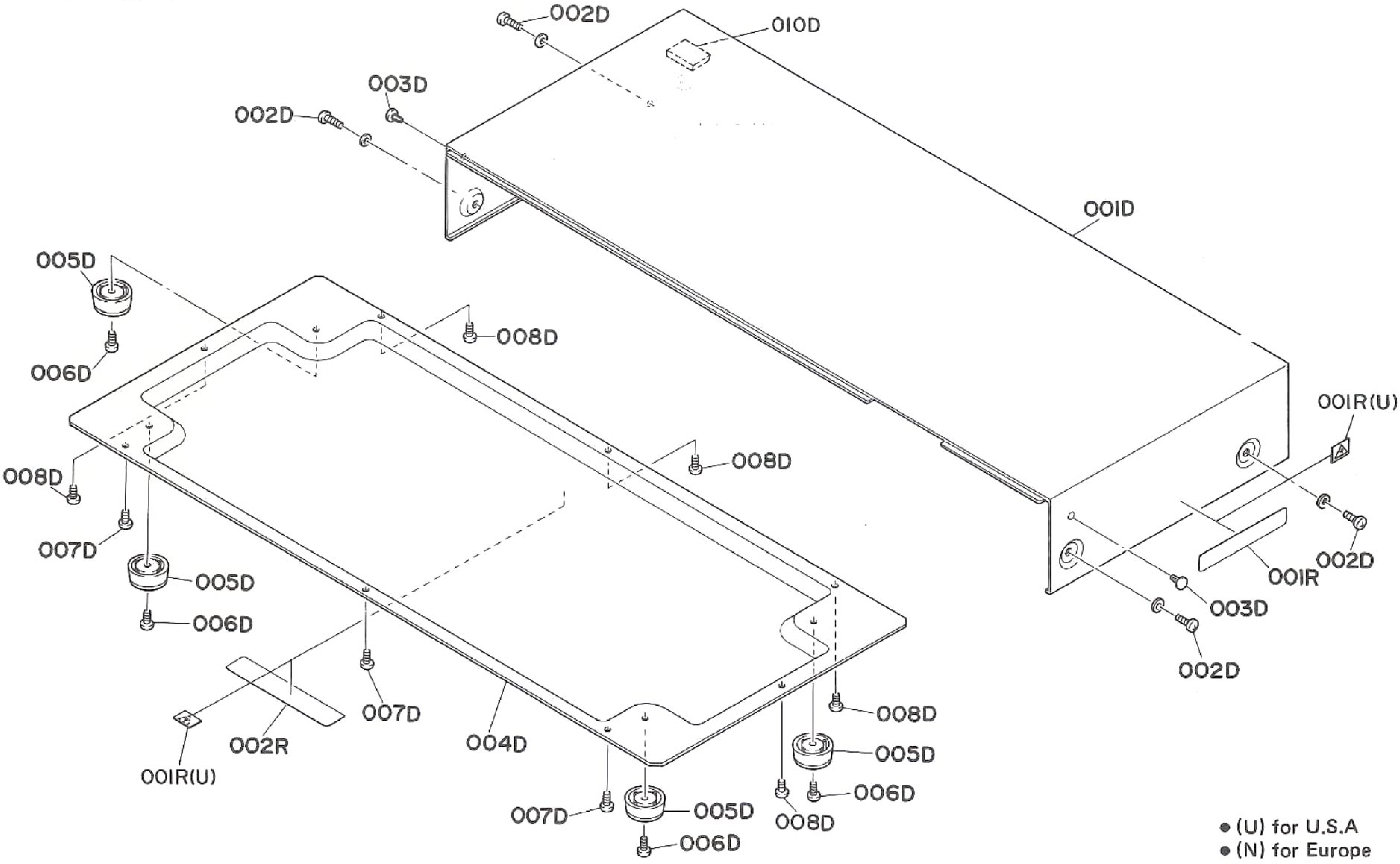


● (U) for U.S.A
● (N) for Europe
● (E) for Europe
● (A) for Australia
● (F) for Japan

REF. DESIG.	Q'TY U	N	E	A	F	PART NO.	DESCRIPTION
							(ST320 ONLY)
A	1	1	1	1	1	415H063400	Front Panel Assembly
001B	1	1	1	1	1	415H063010	Escutcheon, Front Panel
002B	1	1	1	1	1	415H067010	Cap, Right
003B	1	1	1	1	1	415H067020	Cap, Left
004B	1	1	1	1	1	415H158010	Window
005B	1	1	1	1	1	415H259010	Bushing, Power SW
006B	1	1	1	1	1	415H259020	Bushing, FM, AM, Mode, Muting
007B	1	1	1	1	1	415H259030	Bushing, Tuning
013E	1					105H861010	Label

REF. DESIG.	Q'TY U	N	E	A	F	PART NO.	DESCRIPTION
							(ST320L ONLY)
A		1				419H063400	Front Panel Assembly
001B		1				419H063010	Escutcheon, Front Panel
002B		1				415H067010	Cap, Right
003B		1				415H067020	Cap, Left
004B		1				415H158010	Window
005B		1				415H259010	Bushing, Power SW
006B		1				415H259020	Bushing, Mode, Muting
007B		1				415H259030	Bushing, Tuning
008B		1				419H259010	Bushing, FM, MW, LW
							(ST320/ST320L)
018B	2	2	2	2	2	51300306B0	P.H. Tapped Screw P3x6
019B	2	2	2	2	2	51300306B0	P.H. Tapped Screw P3x6

- **[C02-99]Top & Bottom Cover**

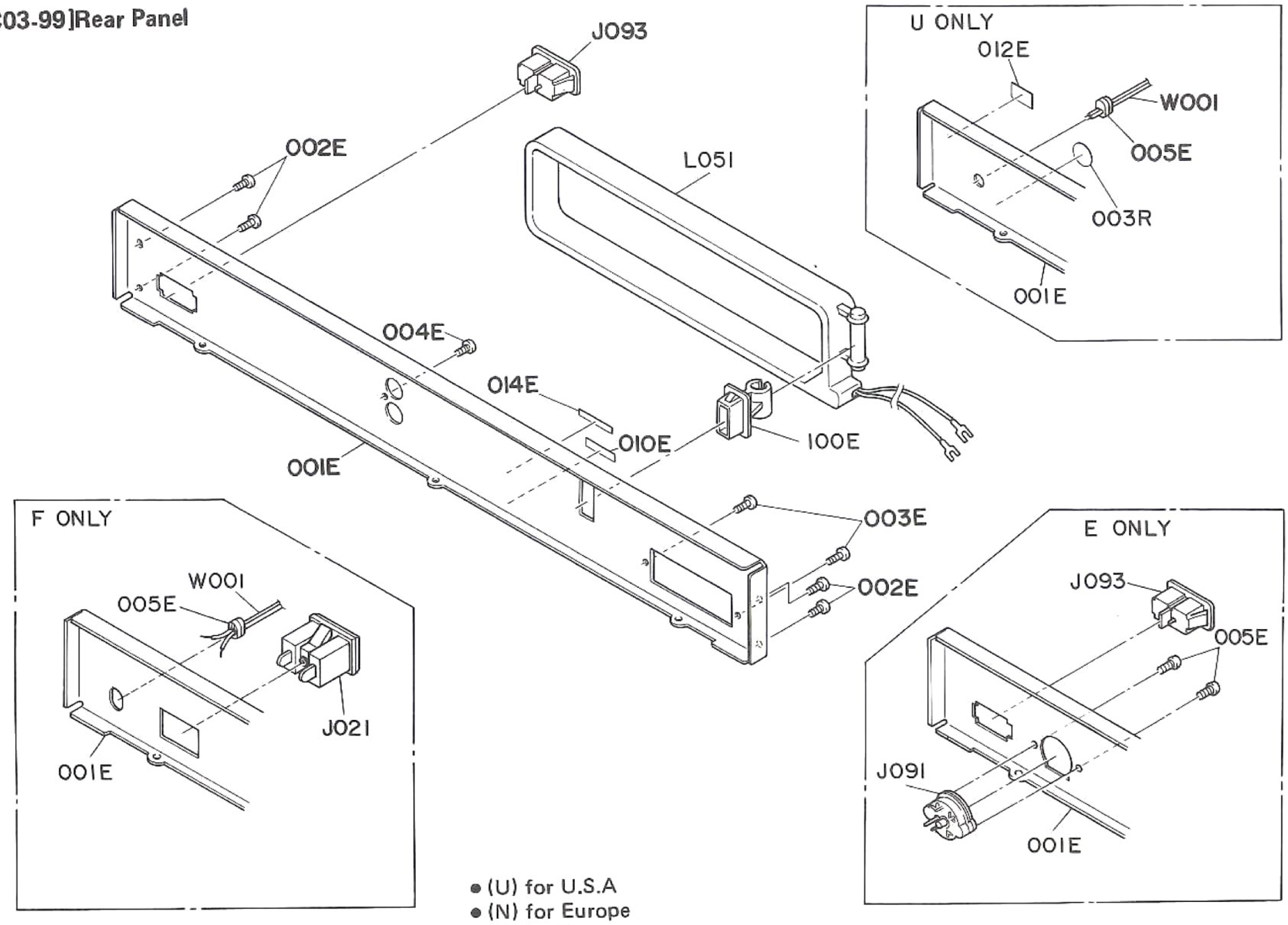


- (U) for U.S.A
- (N) for Europe
- (E) for Europe
- (A) for Australia
- (F) for Japan

REF. DESIG.	Q'TY					PART NO.	DESCRIPTION
	U	N	E	A	F		
001D	1	1	1	1	1	415H257010	Lid, Top Cover
002D	4	4	4	4	4	51260408U0	B.T. Screw (W/W) B4x8
003D	2	2	2	2	2	2991259110	Bushing
004D	1	1	1	1	1	415H257020	Lid, Bottom Cover
005D	4	4	4	4	4	415H057010	Leg
006D	4	4	4	4	4	51570406B0	P. Tapped Screw P4x6
007D	3	3	3	3	3	51280308B0	B.H. Tapped Screw B3x8
008D	5	5	5	5	5	51280308B0	B.H. Tapped Screw B3x8
010D	1	1	1	1	1	2979056020	Buffer

REF. DESIG.	Q'TY					PART NO.	DESCRIPTION
	U	N	E	A	F		
001R		1	1	1		2932861110	Label
001R	2					117H861010	Label
002R		1	1	1		2578861010	Label

[C03-99]Rear Panel



- (U) for U.S.A
- (N) for Europe
- (E) for Europe
- (A) for Australia
- (F) for Japan

REF. DESIG.	Q'TY U	N	E	A	F	PART NO.	DESCRIPTION
001E	1					415H160210	Bracket
001E		1		1		415H160240	Bracket
001E			1			415H160250	Bracket
001E					1	415H160230	Bracket
001E		1				419H160210	Bracket (ST320L, ONLY)
002E	4	4	4	4	4	51280308B0	B.H. Tapped Screw B3x8
003E	2	2	2	2	2	51280308B0	B.H. Tapped Screw B3x8
004E	1	1	1	1	1	51280308B0	B.H. Tapped Screw B3x8
005E	1				1	1455259030	Bushing
005E			2			51280308B0	B.H. Tapped Screw B3x8
010E	1	1	1	1	1	2112265010	Indicator
012E	1					2457861040	Label
014E		1	1	1		4581861010	Label
100E	1	1	1	1	1	417H271020	Holder, Loop ANT.
003R	1					9511101070	Label, UL

REF. DESIG.	Q'TY U	N	E	A	F	PART NO.	DESCRIPTION
⚠W001	1					YC01900070	A.C. Power Cord
⚠W001					1	YC01500130	A.C. Power Cord
J021					1	YJ04000910	Jack, AC Outlet
J091			1			BY05060040	Voltage Selector
⚠J093		1	1	1		YP04000580	Plug, AC Inlet
L051	1	1	1	1	1	LA00035010	ANT. Coil, Loop ANT.

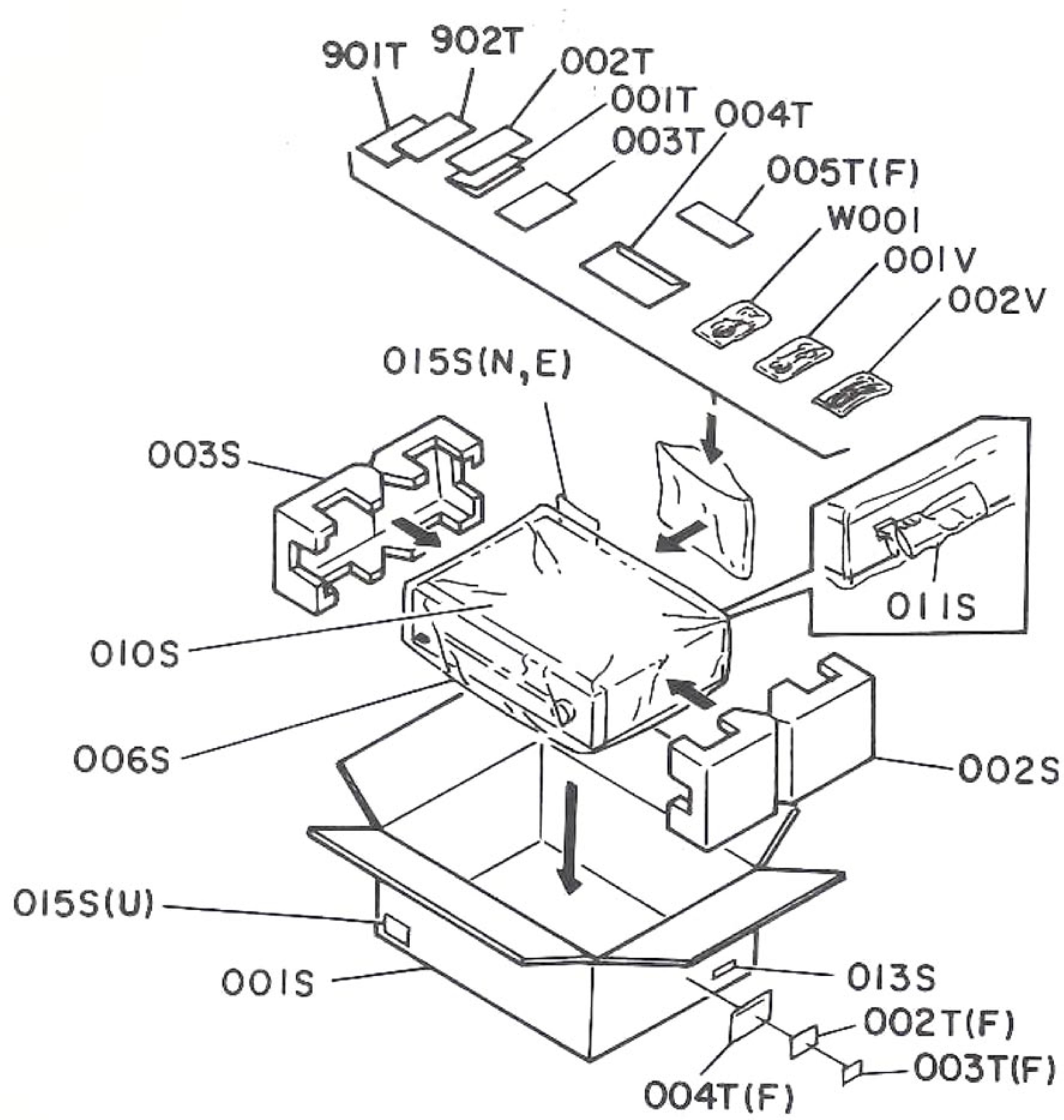

014F
013F
201G
202G
008F
007F
008F
001F
006F
005F
015F
018F
017F
P100
008F
009G
PT00
010G
902F
R001
011F
901F
L001
008F
PS00
001G
003F
004G
003G
013B
019G
020G
002F
PU00
004G
023G
011B
012B
016G
024G
022G
011G
023G
PX00
018G
017G
018G
002G
002G
003F
003F
010B
024G
014G
013G
ST320L ONLY
011B
015G
017G
018G

● (U) for U.S.A
● (N) for Europe
● (E) for Europe
● (A) for Australia
● (F) for Japan

● [P01-99]Front Chassis & General Parts

REF. DESIG.	Q'TY U	N	E	A	F	PART NO.	DESCRIPTION
010B	1	1	1	1	1	415H154010	Knob, Power SW
011B	2	2	2	2	2	415H154030	Knob, Band SW
011B		3				415H154030	Knob, Band(ST320L ONLY)
012B	2	2	2	2	2	415H154020	Knob, Mode, Muting
013B	1					415H154140	Knob, Tuning
013B		1	1	1	1	415H154040	Knob, Tuning
001F	1	1	1	1	1	415H126010	Stay, Right
002F	1	1	1	1	1	415H126020	Stay, Left
003F	4	4	4	4	4	51280308B0	B.H. Tapped Screw B3x8
005F	1	1	1	1	1	2259262500	Pulley
006F	1	1	1	1	1	415H160030	Bracket
007F	2	2	2	2	2	51280308B0	B.H. Tapped Screw B3x8
008F	4	4	4	4	4	51260308B0	B.T. Screw (W/W) B3x8
011F	2	2	2	2	2	51280406B0	B.H. Tapped Screw B4x6
013F	1	1	1	1	1	403H159010	Drum
014F	1	1	1	1	1	2112115020	Spring
015F	1	1	1	1	1	72040805A0	String
017F	1	1	1	1	1	2871005010	Clamper
018F	1	1	1	1	1	2912259020	Bushing
001G	1	1	1	1	1	415H160010	Bracket
002G	2	2	2	2	2	51100306A9	B.H.M. Screw B3x6
003G	2	2	2	2	2	51100306A9	B.H.M. Screw B3x6
004G	2	2	2	2	2	51100306A9	B.H.M. Screw B3x6
901F	1					51280306B0	B.H. Tapped Screw B3x6
902F	1					62030039W0	Lug
009G	1	1	1	1	1	415H273010	Flywheel
010G	1	1	1	1	1	2276262500	Pulley
011G	1	1	1	1	1	2259262510	Pulley
013G	1	1	1	1	1	415H302010	Dial
014G	1	1	1	1		415H302030	Dial
014G					1	415H302020	Dial
015G	1	1	1	1	1	415H053030	Cover
016G	1	1	1	1	1	415H053040	Cover
017G	2	2	2	2	2	51280308B0	B.H. Tapped Screw B3x8
018G	4	4	4	4	4	2276005050	Clamper
019G	1	1	1	1	1	415H103010	Pointer
020G	1	1	1	1	1	51280306B0	B.H. Tapped Screw B3x6
022G	1	1	1	1	1	415H118010	Spacer
023G	3	3	3	3	3	51280308B0	B.H. Tapped Screw B3x8
024G	2	2	2	2	2	2276005050	Clamper
201G	1	1	1	1	1	2259109040	Shield
202G	1	1	1	1	1	2259109053	Shield
⚠L001	1					TS14133020	Power Transformer
⚠L001		1		1		TS14133010	Power Transformer
⚠L001			1			TS14133040	Power Transformer
⚠L001					1	TS14133030	Power Transformer
⚠R001	1					RC10225120	2.2MΩ

● [H01-99] Packing Materials



● (U) for U.S.A
● (N) for Europe
● (E) for Europe
● (A) for Australia
● (F) for Japan

REF. DESIG.	Q'TY U	N	E	A	F	PART NO.	DESCRIPTION
001S	1					415H801010	Packing Case
001S		1				415H801010	Packing Case(ST320L,ONLY)
001S		1	1	1		415H801020	Packing Case
001S					1	415H801030	Packing Case
002S	1	1	1	1	1	415H809010	Cushion, Right
003S	1	1	1	1	1	415H809020	Cushion, Left
006S	1	1	1	1	1	9090909030	Polyethlene Sheet, Set
010S	1	1	1	1	1	2918107360	Sheet, Top Cover
011S	1				1	2918107390	Sheet, Rear Cover
013S	2					9526019010	Serial No. Card
013S		4	4			9526019060	Serial No. Card
013S				4		9526019030	Serial No. Card
013S					4	9526019040	Serial No. Card
015S	2					9510901020	Label

REF. DESIG.	Q'TY U	N	E	A	F	PART NO.	DESCRIPTION
001T	1					415H841210	Instructions
001T		1	1	1		415H851310	Instructions
001T					1	415H851110	Instructions
002T	1					415H851220	Instructions, Spec.
002T		1	1	1		415H851320	Instructions, Spec.
002T					1	9631000110	Guarantee Card
003T	1					103H854010	Guarantee Card
003T		1	1			415H856010	Circuit Diagram
003T				1		9631000090	Guarantee Card
003T					1	2976851040	Instructions, Flysheet
004T	1					2225813010	Envelope
004T					1	2976813020	Envelope
005T	1					9560000100	Hang Tag
005T					1	9560000030	S. Station Card
001V	1	1	1	1	1	ZA02000070	EXT. Antenna
002V	1	1	1	1	1	ZD01000170	Connective Cord
⚠W001		1	1			ZC01805010	A.C. Power Cord
⚠W001				1		ZC02006020	A.C. Power Cord
901T	1					2818854040	Guarantee Card
902T	1					9650000050	S. Station Card

- (U) for U.S.A
- (N) for Europe
- (E) for Europe
- (A) for Australia
- (F) for Japan

9. ELECTRICAL PARTS LIST

REF. DESIG.	Q'TY U	N	E	A	F	PART NO.	DESCRIPTION
							P100-TUNER MAIN CIRCUIT BOARD
							(ST320 ONLY)
P100	1	1	1	1	1	YK415H1510	P.W. Board, Tuner Main
	1					ZZ415H1510	P.W. Board Assembly
		1	1			ZZ415H8510	P.W. Board Assembly
				1		ZZ415H7510	P.W. Board Assembly
							(ST320L ONLY)
P100		1				YK415H1510	P.W. Board, Tuner Main
		1				ZZ419H8510	P.W. Board Assembly
							P100-CAPACITORS
C101	1	1	1	1	1	DD11100370	Ceramic 10pF ±0.5pF
C102	1	1	1	1	1	DD15470370	Ceramic 47pF ±5%
C103	1	1	1	1	1	DK18103320	Ceramic 0.01μF
C104	1	1	1	1	1	DK18103320	Ceramic 0.01μF
C105	1	1	1	1	1	DK18103320	Ceramic 0.01μF
C106	1	1	1	1	1	DD15150370	Ceramic 15pF ±5%
C107	1	1	1	1	1	DD10050370	Ceramic 5pF ±0.25pF
C108	1	1	1	1	1	DD11100370	Ceramic 10pF ±0.5pF
C109	1	1	1	1	1	DK16331300	Ceramic 330pF ±10%
C110	1	1	1	1	1	DK18103320	Ceramic 0.01μF
C111	1	1	1	1	1	DD10015370	Ceramic 1.5pF ±0.25pF
C112		1	1	1	1	DD15200340	Ceramic 20pF ±5%
C112	1					DD15120340	Ceramic 12pF ±5%
C113	1	1	1	1	1	DD11100300	Ceramic 10pF ±0.5pF
C114	1	1	1	1	1	DD15150300	Ceramic 15pF ±5%
C115	1	1	1	1		DD15150300	Ceramic 15pF ±5%
C115					1	DD15330300	Ceramic 33pF ±5%
C116	1	1	1	1	1	DK18103320	Ceramic 0.01μF
C117	1	1	1	1	1	EA22701630	Elect 220μF 16V
C118	1	1	1	1	1	DK18103320	Ceramic 0.01μF
C119	1	1	1	1	1	CT11000150	Trimming 10pF
C120	1	1	1	1	1	CA32400120	Variable
C120		1				CA32200080	Variable (ST320L, ONLY)
C121	1	1	1	1	1	DK18403320	Ceramic 0.04μF
C122	1	1	1	1	1	DK18103320	Ceramic 0.01μF
C201	1	1	1	1	1	DK18103320	Ceramic 0.01μF
C202	1	1	1	1	1	DK18103320	Ceramic 0.01μF
C203	1	1	1	1	1	DK18103320	Ceramic 0.01μF
C204	1	1	1	1	1	DK18403320	Ceramic 0.04μF
C205	1	1	1	1	1	DK18403320	Ceramic 0.04μF
C206	1	1	1	1	1	EA33505030	Elect 3.3μF 50V
C207	1	1	1	1	1	DK16221300	Ceramic 220pF ±10%
C208	1	1	1	1	1	EA47405030	Elect 0.47μF 50V
C209	1	1	1	1	1	DK18403320	Ceramic 0.04μF
C210	1	1	1	1	1	DK18403320	Ceramic 0.04μF
C211	1	1	1	1	1	DK18103320	Ceramic 0.01μF
C212	1	1	1	1	1	DK18103320	Ceramic 0.01μF
C213	1	1	1	1	1	EA10701630	Elect 100μF 16V
C214	1	1	1	1	1	DK18103320	Ceramic 0.01μF
C215	1	1	1	1	1	DK18403320	Ceramic 0.04μF
C217	1	1	1	1	1	DK18103320	Ceramic 0.01μF
C301	1	1	1	1	1	DF55102090	Film 1000pF ±5%
C302	1	1	1	1	1	EA33505030	Elect 3.3μF 50V
C303	1	1	1	1	1	EA47405030	Elect 0.47μF 50V
C304	1	1	1	1	1	DF16222350	Film 2200pF ±10%
C305	1	1	1	1	1	EA33505030	Elect 3.3μF 50V
C306	1	1	1	1	1	DF16473350	Film 0.047μF ±10%
C307	1	1	1	1	1	DF16152350	Film 1500pF ±10%
C308	1	1	1	1	1	EA33405030	Elect 0.33μF 50V
C309	1	1	1	1	1	DK16682300	Ceramic 6800pF
C310	1	1	1	1	1	EA33405030	Elect 0.33μF 50V
C311	1					DF15223300	Film 0.022μF ±5%
C311		1	1	1	1	DF15143300	Film 0.015μF ±5%
C312	1					DF15223300	Film 0.022μF ±5%
C312		1	1	1	1	DF15153300	Film 0.015μF ±5%
C313	1	1	1	1	1	EA10505030	Elect 1μF 50V
C314	1	1	1	1	1	EA10505030	Elect 1μF 50V
C315	1	1	1	1	1	DF15332300	Film 3300pF ±5%
C316	1	1	1	1	1	DF15332300	Film 3300pF ±5%
C317	1	1	1	1	1	DD15221370	Ceramic 220pF ±5%
C318	1	1	1	1	1	DD15221370	Ceramic 220pF ±5%
C319	1	1	1	1	1	DF15272300	Film 2700pF ±5%
C320	1	1	1	1	1	DF15272300	Film 2700pF ±5%
C321	1	1	1	1	1	EA33405030	Elect 0.33μF 50V
C322	1	1	1	1	1	EA33405030	Elect 0.33μF 50V
C323	1	1	1	1	1	EA10505030	Elect 1μF 50V
C324	1	1	1	1	1	EA10601630	Elect 10μF 16V
C326	1	1	1	1	1	EA10603530	Elect 10μF 35V
C327	1	1	1	1	1	EA47601630	Elect 47μF 16V
C328	1	1	1	1	1	EA22505030	Elect 22μF 50V
C329		1	1			EA10601630	Elect 10μF 16V
C330	1	1	1	1	1	EA10701630	Elect 100μF 16V
C331	1	1	1	1	1	EA10701630	Elect 100μF 16V
C801	1	1	1	1	1	DK18103560	Ceramic 0.01μF
⚠C802	1	1	1	1	1	EA47703530	Elect 470μF 35V
⚠C803	1	1	1	1	1	EA10603530	Elect 10μF 35V
⚠C804	1	1	1	1	1	EA10405030	Elect 0.1μF 50V
⚠C805	1	1	1	1	1	DK18103320	Ceramic 0.01μF
⚠C806	1	1	1	1	1	DK18103560	Ceramic 0.01μF
⚠C807	1	1	1	1	1	DK18103560	Ceramic 0.01μF
⚠C808	1	1	1	1	1	DK18103560	Ceramic 0.01μF
⚠C809	1	1	1	1	1	DK18103560	Ceramic 0.01μF
CA03	1	1	1	1	1	DF55391090	Film 390pF ±5%
CA05	1	1	1	1	1	DD15150370	Ceramic 15pF ±5%
CA08	1	1	1	1	1	DK18104020	Ceramic 0.1μF
CA09	1	1	1	1	1	DD10020370	Ceramic 2pF ±0.25pF
CA10	1	1	1	1	1	DD15391370	Ceramic 390pF ±5%
CA11	1	1	1	1	1	DK18103320	Ceramic 0.01μF
CA12	1	1	1	1	1	DK18102300	Ceramic 1000pF
CA13	1	1	1	1	1	DK18403320	Ceramic 0.04μF
CA14	1	1	1	1	1	DK18103320	Ceramic 0.01μF
CA15	1	1	1	1	1	DK18103320	Ceramic 0.01μF
CA16	1	1	1	1	1	DK18103320	Ceramic 0.01μF
CA17	1	1	1	1	1	DD15560370	Ceramic 56pF ±5%
CA18	1	1	1	1	1	DK18103320	Ceramic 0.01μF
CA19	1	1	1	1	1	DK18102300	Ceramic 1000pF
CA20	1	1	1	1	1	DK18403320	Ceramic 0.04μF
CA21	1	1	1	1	1	DK18403320	Ceramic 0.04μF
CA22	1	1	1	1	1	EA47405030	Elect 0.47μF 50V
CA23	1	1	1	1	1	EA10601630	Elect 4.7μF 16V

- (U) for U.S.A
- (N) for Europe
- (E) for Europe
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REF. DESIG.	Q'TY U	N	E	A	F	PART NO.	DESCRIPTION
CA24	1	1	1	1	1	EA47505030	Elect 4.7μF 50V
CA25	1	1	1	1	1	DK18103320	Ceramic 0.01μF
CA26	1	1	1	1	1	EA10701630	Elect 100μF 16V
CA27	1	1	1	1	1	DF15223300	Film 0.022μF ±5%
CA28	1	1	1	1	1	DF15123300	Film 0.012μF ±5%
CA29	1	1	1	1	1	DF15273300	Film 0.027μF ±5%
CA30	1	1	1	1	1	EA10601630	Elect 10μF 16V
CA33	1	1	1	1	1	DF15223300	Film 0.022μF ±5%
							(ST320L ONLY)
CA01		1				DD15150370	Ceramic 15pF ±5%
CA02		1				CT21600020	Trimming
CA04		1				DF55121090	Film 120pF ±5%
CA06		1				DD15470370	Ceramic 47pF ±5%
CA07		1				CT21600020	Trimming
CA31		1				EA47405030	Elect 0.47μF 50V
CA32		1				EA47405030	Elect 0.47μF 50V
							P100-RESISTORS (All Resistors are ±5% & ¼W)
R101	1	1	1	1	1	GD05105140	1MΩ
R102	1	1	1	1	1	GD05474140	470KΩ
R103	1	1	1	1	1	GD05471140	470Ω
R104	1	1	1	1	1	GD05562140	5.6KΩ
R105	1	1	1	1	1	GD05101140	100Ω
R106	1	1	1	1	1	GD05101140	100Ω
R107	1	1	1	1	1	GD05472140	4.7KΩ
R108	1	1	1	1	1	GD05223140	22KΩ
R109	1	1	1	1	1	GD05102140	1KΩ
R110	1			1	1	GD05273140	27KΩ
R110		1	1			GD05473140	47KΩ
R111	1	1	1	1	1	GD05101140	100Ω
R112	1	1	1	1	1	GD05223140	22KΩ
R113	1	1	1	1	1	GD05103140	10KΩ
R114	1	1	1	1	1	GD05102140	1KΩ
R115	1	1	1	1	1	GG05101140	100Ω
R116	1	1	1	1	1	GD05104140	100KΩ
R117	1	1	1	1	1	GD05222140	2.2KΩ
R201	1	1	1	1	1	GD05101140	100Ω
R202	1	1	1	1	1	GD05331140	330Ω
R203	1	1	1	1	1	GD05272140	2.7KΩ
R204	1	1	1	1	1	GD05183140	18KΩ
R205	1	1	1	1	1	GD05331140	330Ω
R206	1	1	1	1	1	GD05102140	1KΩ
R207	1	1	1	1	1	GD05101140	100Ω
R208	1	1	1	1	1	GD05331140	330Ω
R209	1	1	1	1	1	GD05224140	220KΩ
R210	1	1	1	1	1	GD05224140	220KΩ
R211	1	1	1	1	1	GD05104140	100KΩ
R213	1	1	1	1	1	GD05222140	2.2KΩ
R214	1	1	1	1	1	GD05101140	100Ω

REF. DESIG.	Q'TY U	N	E	A	F	PART NO.	DESCRIPTION
R216	1	1	1	1	1	GD05183140	18KΩ
R217	1	1	1	1	1	GD05223140	22KΩ
R218	1	1	1	1	1	GD05222140	2.2KΩ
R219	1	1	1	1	1	GD05821140	820Ω
R220	1	1	1	1	1	GD05183140	18KΩ
R221	1	1	1	1	1	GD05104140	100KΩ
R222	1	1	1	1	1	GD05473140	47KΩ
R223	1	1	1	1	1	GD05473140	47KΩ
R224	1	1	1	1	1	GD05473140	47KΩ
R225	1	1	1	1	1	GD05473140	47KΩ
R226	1	1	1	1	1	GD05222140	2.2KΩ
R227	1	1	1	1		GD05222140	2.2KΩ
R228	1	1	1	1	1	GD05223140	22KΩ
R229	1	1	1	1	1	GD05152140	1.5KΩ
R230	1	1	1	1	1	GD05223140	22KΩ
R231	1	1	1	1	1	RA01030800	Trimming 10KΩ
R232					1	GD05222140	2.2KΩ
R233	1	1	1	1	1	GD05822140	8.2KΩ
R234	1	1	1	1	1	GD05822140	8.2KΩ
R301	1	1	1	1	1	GD05823140	82KΩ
R302	1	1	1	1	1	RA03020800	Trimming 3KΩ
R303	1	1	1	1	1	GD05682140	6.8KΩ
R304	1	1	1	1	1	GD05224140	220KΩ
R305	1	1	1	1	1	GD05333140	33KΩ
R306	1	1	1	1	1	GD05224140	220KΩ
R307	1	1	1	1	1	GD05333140	33KΩ
R308	1	1	1	1	1	GD05102140	1KΩ
R309	1	1	1	1	1	GD05563140	56KΩ
R310	1	1	1	1	1	RA05030800	Trimming 50KΩ
R312	1	1	1	1	1	GG05101140	100Ω
R313	1	1	1	1	1	GD05392140	3.9KΩ
R314	1	1	1	1	1	GD05392140	3.9KΩ
R317	1	1	1	1	1	GD05183140	18KΩ
R318	1	1	1	1	1	GD05183140	18KΩ
R319	1	1	1	1	1	GD05104140	100KΩ
R320	1	1	1	1	1	GD05104140	100KΩ
R321	1	1	1	1	1	GD05103140	10KΩ
R322	1	1	1	1	1	GD05103140	10KΩ
R323	1	1	1	1	1	GD05103140	10KΩ
R324	1	1	1	1	1	GD05103140	10KΩ
R325	1	1	1	1	1	GD05332140	3.3KΩ
R326	1	1	1	1	1	GD05332140	3.3KΩ
R327		1	1	1		GD05561140	560Ω
R327	1				1	GD05102140	1KΩ
R328		1	1	1		GD05561140	560Ω
R328	1				1	GD05102140	1KΩ
R329		1	1	1		RA03020800	Trimming 30KΩ
R329	1				1	RA02030800	Trimming 20KΩ
R330	1	1	1	1	1	GD05101140	100Ω
R331	1	1	1	1	1	GD05104140	100KΩ
R332	1	1	1	1	1	GD05104140	100KΩ
R333	1	1	1	1	1	GD05101140	100Ω

- (U) for U.S.A
- (N) for Europe
- (E) for Europe
- (A) for Australia
- (F) for Japan

REF. DESIG.	Q'TY U	N	E	A	F	PART NO.	DESCRIPTION
R334	1	1	1	1	1	GD05101140	100Ω
R335	1	1	1	1	1	GD05101140	100Ω
R336	1	1	1	1	1	GD05393140	39KΩ
R337	1	1	1	1	1	GD05392140	3.9KΩ
R338	1	1	1	1	1	GD05104140	100KΩ
R339	1	1	1	1	1	GD05154140	150KΩ
R340	1	1	1	1	1	GD05153140	15KΩ
R341	1	1	1	1	1	GD05222140	2.2KΩ
R342	1	1	1	1	1	GD05394140	390KΩ
R343	1	1	1	1	1	GD05562140	5.6KΩ
R344	1	1	1	1	1	GD05392140	3.9KΩ
R345	1	1	1	1	1	GD05154140	150KΩ
R346	1	1	1	1	1	GD05682140	6.8KΩ
R347	1	1	1	1	1	GD05272140	2.7KΩ
R348	1	1	1	1	1	GD05562140	5.6KΩ
R801	1	1	1	1	1	GA05271010	270Ω 1W
⚠R802	1			1	1	NF02330140	33Ω
⚠R802		1	1			RF05150120	15Ω ½W
⚠R803	1	1	1	1	1	GG05221120	220Ω ½W
RA01	1	1	1	1	1	GD05105140	1MΩ
RA02	1	1	1	1	1	GD05102140	1KΩ
RA03	1	1	1	1	1	GD05221140	220Ω
RA04	1	1	1	1	1	GD05682140	6.8KΩ
RA05	1	1	1	1	1	GD05152140	1.5KΩ
RA06	1	1	1	1	1	GD05332140	3.3KΩ
RA07	1	1	1	1	1	GD05471140	470Ω
RA08	1	1	1	1	1	GD05101140	100Ω
RA09	1	1	1	1	1	GD05102140	1KΩ
RA10	1	1	1	1	1	GD05183140	18KΩ
RA11	1	1	1	1	1	GD05104140	100KΩ
RA12	1	1	1	1	1	GD05101140	100Ω
RA13	1	1	1	1	1	GD05103140	10KΩ
RA14	1	1	1	1	1	GD05103140	10KΩ
RA15	1	1	1	1	1	GD05271140	270Ω
RA16	1	1	1	1	1	GD05473140	47KΩ
RA17	1	1	1	1	1	GD05333140	33KΩ
RA18	1	1	1	1	1	GD05103140	10KΩ
							P100-SEMICONDUCTORS
Q101	1	1	1	1	1	HF200552A0	F.E.T 2SK55 (D or E)
Q102	1	1	1	1	1	HT310471C0	Transistor 2SC1047 (C)
Q103	1	1	1	1	1	HT308291C0	Transistor 2SC829 (C)
Q104	1	1	1	1	1	HD20001000	Diode 1S1555
Q201	1	1	1	1	1	HT310471C0	Transistor 2SC1047 (C)
Q202	1	1	1	1	1	HC10033010	IC HA11225
Q203	1	1	1	1	1	HD20001000	Diode 1S1555
Q204	1	1	1	1	1	HD20001000	Diode 1S1555
Q205	1	1	1	1	1	HD20001000	Diode 1S1555
Q206	1	1	1	1	1	HT309452B0	Transistor 2SC945 (E or F)

REF. DESIG.	Q'TY U	N	E	A	F	PART NO.	DESCRIPTION
Q207	1	1	1	1	1	HT110162A0	Transistor 2SA1016(F or G)
Q208	1	1	1	1	1	HT305362B0	Transistor 2SC536 (E or F)
Q209	1	1	1	1	1	HT305362B0	Transistor 2SC536 (E or F)
Q210	1	1	1	1	1	HT110162A0	Transistor 2SA1016(F or G)
Q211	1	1	1	1	1	HD20001000	Diode 1S1555
Q301	1	1	1	1	1	HT305362B0	Transistor 2SC536 (E or F)
Q302	1	1	1	1	1	HC10029010	IC HA11223W
Q304	1	1	1	1	1	HT107332A0	Transistor 2SA733 (P or Q)
Q305	1	1	1	1	1	HT305362B0	Transistor 2SC536 (E or F)
Q306	1	1	1	1	1	HT305362B0	Transistor 2SC536 (E or F)
Q307	1	1	1	1	1	HT326342B0	Transistor 2SC2634 (E or F)
Q308	1	1	1	1	1	HT326342B0	Transistor 2SC2634 (E or F)
Q309	1	1	1	1	1	HT305362B0	Transistor 2SC536 (E or F)
Q310	1	1	1	1	1	HT305362B0	Transistor 2SC536 (E or F)
Q311	1	1	1	1	1	HT326342B0	Transistor 2SC2634 (E or F)
Q312	1	1	1	1	1	HT326342B0	Transistor 2SC2634 (E or F)
Q313	1	1	1	1	1	HD20001000	Diode 1S1555
Q314	1	1	1	1	1	HD30033090	Zener WZ-052
Q315	1	1	1	1	1	HD20001000	Diode 1S1555
Q316	1	1	1	1	1	HD20001000	Diode 1S1555
Q317	1	1	1	1	1	HD20001000	Diode 1S1555
Q318	1	1	1	1	1	HD20001000	Diode 1S1555
⚠Q801	1	1	1	1	1	HD20015030	Diode DS135 (D)
⚠Q802	1	1	1	1	1	HD20015030	Diode DS135 (D)
⚠Q803	1	1	1	1	1	HD20015030	Diode DS135 (D)
⚠Q804	1	1	1	1	1	HD20015030	Diode DS135 (D)
⚠Q805	1	1	1	1	1	HC10077030	IC L78M15
⚠Q806	1	1	1	1	1	HD30027090	Zener WZ-140
QA01	1	1	1	1	1	HF200552A0	F.E.T 2SK55 (D or E)
QA02	1	1	1	1	1	HC10058030	IC LA1245
QA03	1	1	1	1	1	HD20001000	Diode 1S1555
							(ST320L ONLY)
QA04		1				HT305362B0	Transistor 2SC536 (E or F)
QA05		1				HT408631B0	Transistor 2SD863 (E)
QA06		1				HT305362B0	Transistor 2SC536 (E or F)
QA07		1				HT408631B0	Transistor 2SD863 (E)
QA08		1				HD20015030	Diode DS135 (D)
QA09		1				HD20015030	Diode DS135 (D)
							P100-CERAMIC FILTERS, COIL & TRANSFORMERS
FA01	1	1	1	1	1	FF10045200	Ceramic Filter SFZ-450B
F201	1	1	1	1	1	FF11070050	Ceramic Filter SEF 10.7MHz
F202	1			1	1	FF11070050	Ceramic Filter SEF 10.7MHz
F202		1	1			FF11070130	Ceramic Filter SEF 10.7MHz
F203	1			1	1	FF11070050	Ceramic Filter SEF 10.7MHz
F203		1	1			FF11070130	Ceramic Filter SEF 10.7MHz

- (U) for U.S.A
- (N) for Europe
- (E) for Europe
- (A) for Australia
- (F) for Japan

REF. DESIG.	Q'TY U	N	E	A	F	PART NO.	DESCRIPTION
LA01	1	1	1	1	1	LA10295090	Ant. Coil
LA02		1				LA10295080	Ant. Coil (ST320L ONLY)
LA03	1	1	1	1	1	LO10013170	OSC Coil
LA04		1				LO10013180	OSC Coil (ST320L ONLY)
LA05	1	1	1	1	1	LI10013210	AM IFT
LA06	1	1	1	1	1	LC13320050	Choke Coil
L101	1	1	1	1		LA12026170	Ant. Coil
L101					1	LA12026190	Ant. Coil
L102	1	1	1	1		LA12026300	Ant. Coil
L102					1	LA12026200	Ant. Coil
L103	1	1	1	1		LO12036010	OSC Coil
L103					1	LO12036030	OSC Coil
L104	1	1	1	1	1	LC17510010	Choke Coil
L105	1	1	1	1	1	LI10016010	FM IFT
L201	1	1	1	1	1	LI10159040	FM IFT
L202	1	1	1	1	1	LI10159050	FM IFT
L301		1	1			LS10295020	MPX Coil
L051	1	1	1	1	1	LA00035010	Ant. Coil
							P100-MISCELLANEOUS
J101	1	1	1	1	1	YT01040290	Terminal (4P)
J301	1					YT02020290	Terminal (2P)
J301		1	1	1	1	YT02020280	Terminal (2P)
SA01		1				SZ04240010	Solenoid SW, MW/LW (ST320L ONLY)
							PS00-BAND SELECTOR CIRCUIT BOARD (ST320 ONLY)
PS00	1	1	1	1	1	YK415H1530	P.W. Board, Band Selector
	1	1	1	1		ZZ415H1530	P.W. Board Assembly
							(ST320L ONLY)
PS00		1				YK415H1530	P.W. Board, Band Selector
		1				ZZ419H8530	P.W. Board Assembly
							PS00-MISCELLANEOUS
CS01		1				EA10701630	Elect 100µF 16V (ST320L ONLY)
RS01	1	1	1	1	1	GD05221140	220Ω ±5% ¼W
SS01	1	1	1	1	1	SP02020630	Push SW, Band Selector
SS01		1				SP02030200	Push SW, Band Selector (ST320L ONLY)
WS01	1	1	1	1	1	YU05100260	Jumper Lead
WS01		1				YU07100260	Jumper Lead (ST320L ONLY)
							PC50-DE-EMP CIRCUIT BOARD
PC50			1			YF415H0010	P.W. Board DE-EMP
			1			ZZ415H0010	P.W. Board Assembly
CC51			1			DF15153300	Film 0.015µF ±5%
CC52			1			DF15153300	Film 0.015µF ±5%
CC53			1			DF15103300	Film 0.01µF ±5%
CC54			1			DF15103300	Film 0.01µF ±5%
SC51			1			SS02020380	Slide Switch DE-EMP

NOTE ON SAFETY:
Symbol ⚠ Fire or electrical shock hazard. Only original parts should be used to replace any part marked with symbol ⚠. Any other component substitution (other than original type), may incresse risk of fire or electrical shock hazard.

REF. DESIG.	Q'TY U	N	E	A	F	PART NO.	DESCRIPTION
							ST320/ST320L **PT00-ST/MONO, MUTING SW CIRCUIT BOARD**
PT00	1	1	1	1	1	YK415H1540	P.W. Board, ST/MONO, Muting SW
	1	1	1	1		ZZ415H1540	P.W. Board Assembly
							PT00-MISCELLANEOUS
QT01	1	1	1	1	1	HD20001000	Diode 1S1555
ST01	1	1	1	1	1	SP02020600	Push Switch
WT01	1	1	1	1	1	YU04120260	Jumper Lead
							ST320/ST320L **PU00-POWER SW CIRCUIT BOARD**
PU00	1	1	1	1	1	YK415H1550	P.W. Board, Power SW
	1	1	1	1		ZZ415H1550	P.W. Board Assembly
							PU00-MISCELLANEOUS
⚠SU01	1	1	1	1	1	SP02010890	Push Switch
WU01	1	1	1	1	1	YU04300260	Jumper Lead
							ST320/ST320L **PX00-LED CIRCUIT BOARD**
PX00	1	1	1	1	1	YK415H1520	P.W. Board, LED
	1	1	1	1		ZZ415H1520	P.W. Board Assembly
							PX00-RESISTORS (All Reistors are ±5% & ¼W)
RX01	1	1	1	1	1	GD05222140	2.2KΩ
RX02	1	1	1	1	1	GD05222140	2.2KΩ
RX03	1	1	1	1	1	GD05222140	2.2KΩ
RX04	1	1	1	1	1	GD05222140	2.2KΩ
RX05	1	1	1	1	1	GD05222140	2.2KΩ
RX06	1	1	1	1	1	GD05222140	2.2KΩ
RX07	1	1	1	1	1	GD05222140	2.2KΩ
							PX00-SEMICONDUCTORS
QX01	1	1	1	1	1	HI10030020	LED LN224RP
QX02	1	1	1	1	1	HI10030020	LED LN224RP
QX03	1	1	1	1	1	HI10030020	LED LN224RP
QX04	1	1	1	1	1	HI10030020	LED LN224RP
QX05	1	1	1	1	1	HI10030020	LED LN224RP
QX06	1	1	1	1	1	HI10030020	LED LN224RP
QX07	1	1	1	1	1	HI10031020	LED LN324GP
QX08	1	1	1	1	1	HI10030020	LED LN224RP
QX09	1	1	1	1	1	HI10030020	LED LN224RP
QX10	1	1	1	1	1	HI10030020	LED LN224RP
QX11	1	1	1	1	1	HI10030020	LED LN224RP
QX12	1	1	1	1	1	HC10008370	IC TL489
							PX00-MISCELLANEOUS
WX01	1	1	1	1	1	YU05140260	Jumper Lead
WX02	1	1	1	1	1	YU05140260	Jumper Lead

(W01-99)	Assembly and Wiring
(T01-99)	Adjustment
(X01-00)	Correction

10. TECHNICAL SPECIFICATIONS

FM TUNER SECTION

Frequency Range	87.5 ~ 108 MHz
Usable Sensitivity 40 kHz Deviation, 98 MHz	
Mono S/N 26 dB, 300 ohms	2.0 µV
Stereo S/N 46 dB, 300 ohms	60 µV
Alternate Channel Selectivity 98 MHz	65 dB
Image Response Rejection, 98 MHz	55 dB
IF Rejection, 98 MHz	80 dB
Spurious Response Rejection, 98 MHz	85 dB
AM Suppression, 98 MHz	46 dB
Signal-to-Noise Ratio at 98 MHz	
Un-weighted Mono	70 dB
Un-weighted Stereo	63 dB
Weighted Mono	73 dB
Weighted Stereo	66 dB
Pilot Signal & Subcarrier Rejction	
19 kHz	60 dB
38 kHz	65 dB
Total Harmonic Distortion at 98 MHz	
Mono	0.2%
Stereo	0.35%
Frequency Response	
30 Hz ~ 15 kHz	+0/–1 dB
Separation	
Stereo	43 dB
Channel Balance	0.3 dB
Output Voltage, 1 kHz	410 mV
Output Impedance, 1 kHz	1.8k ohms
Acceptable Load Impedance, 1 kHz	47k ohms
Antenna Terminals	
Balanced	300 ohms

MW TUNER SECTION

Frequency Range	525 ~ 1605 kHz
Usable Sensitivity (20 dB S/N 30% Mod., 1 MHz)	10 µV
Selectivity 1 MHz ± 9 kHz	30 dB
Image Rejection, 1 MHz	45 dB
IF Rejection, 1 MHz	65 dB
Signal-to-Noise Ratio, 1 MHz	52 dB
Total Harmonic Distortion, 1 MHz	0.4%

LW TUNER SECTION

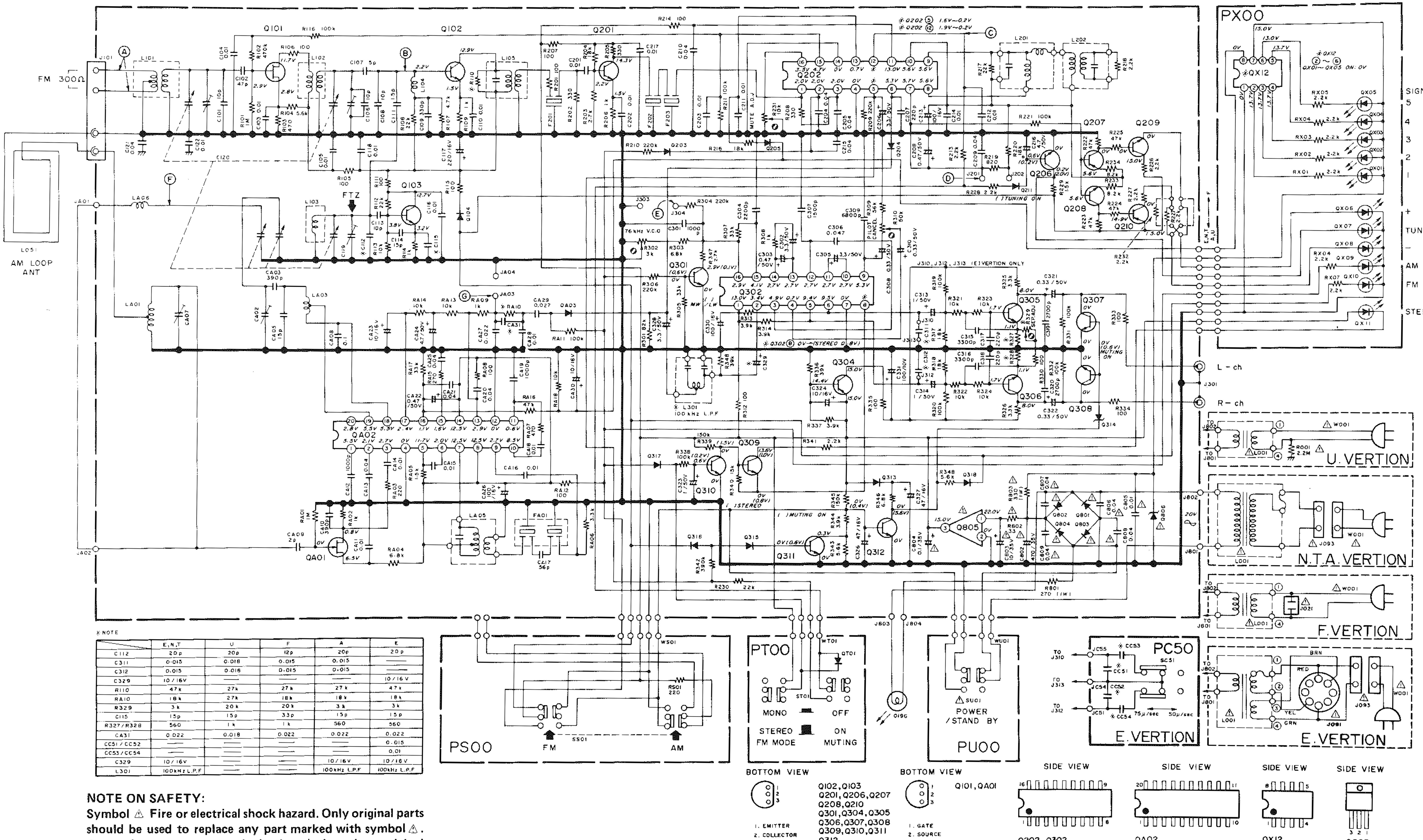
Frequency Range	150 ~ 350 kHz
Usable Sensitivity (20 dB S/N, 30% MOD, 250 kHz)	100 µV
Image Rejection, 250 kHz	30 dB
IF Rejection, 250 kHz	60 dB
Signal-to-Noise Ratio, 250 kHz	48 dB

GENERAL

Power Requirements	220V AC, 50 Hz/60 Hz (E versions are featuring an external voltage selector for use on 110V. Other versions can be converted by a qualified technician to operate on 240V.)
Power Consumption	9W
Semiconductor Coplement	
Integrated Circuits	5
Transistors	22
Diodes	16
Field Effect Transistors	2
Dimensions	
Panel Width	416 mm
Panel Height	55 mm
Depth	192 mm
Weight	
Unit Alone	2.4 kg

Specifications and appearance are subject to change for modification without notice.

Q101, QA01	2SK55 D, E	HF200552A0
Q102, Q201	2SC1047 C	HT31047IC0
Q103	2SC829 C	HT30829IC0
Q202	HA11225	HC10033010
Q208, Q209, Q301, Q305, Q306, Q309, Q310	2SC536 E, F	HT305362B0
Q302	HA11223W	HC10029010
Q304	2SA733	HT107332A0
Q805	L78M15	HC10077030
QA02	LA1245	HC10058030
QX12	TL489	HC10008370
Q314	WZ-052	HD30033090
Q806	WZ-140	HD30027090
Q104, Q203, Q204, Q205, Q313, Q315, Q316, Q317, QA03, QT01, Q211, Q318	1S1555 etc	HD20001000
Q801, Q802, Q803, Q804	DS135D	HD20015030
Q206	2SC945 P, Q	HT309452B0
QX01 ~ QX06, QX08 ~ QX11	LN224RP	HI10030020
QX07	LN324GP	HI10031020
Q307, Q308, Q311, Q312	2SC2634 S, T	HT32634280



※NOTE

	E, N, T	U	F	A	E
C112	20p	20p	12p	20p	20p
C311	0.015	0.018	0.015	0.015	——
C312	0.015	0.018	0.015	0.015	——
C329	10/16V	——	——	——	10/16V
R110	47k	27k	27k	27k	47k
RA10	18k	27k	18k	18k	18k
R329	3k	20k	20k	3k	3k
C115	15p	15p	33p	15p	15p
R327/R328	560	1k	1k	560	560
CA31	0.022	0.018	0.022	0.022	0.022
CC51/CC52	——	——	——	——	0.015
CC53/CC54	——	——	——	——	0.01
C329	10/16V	——	——	10/16V	10/16V
L301	100kHz L.P.F	——	——	100kHz L.P.F	100kHz L.P.F

NOTE ON SAFETY:

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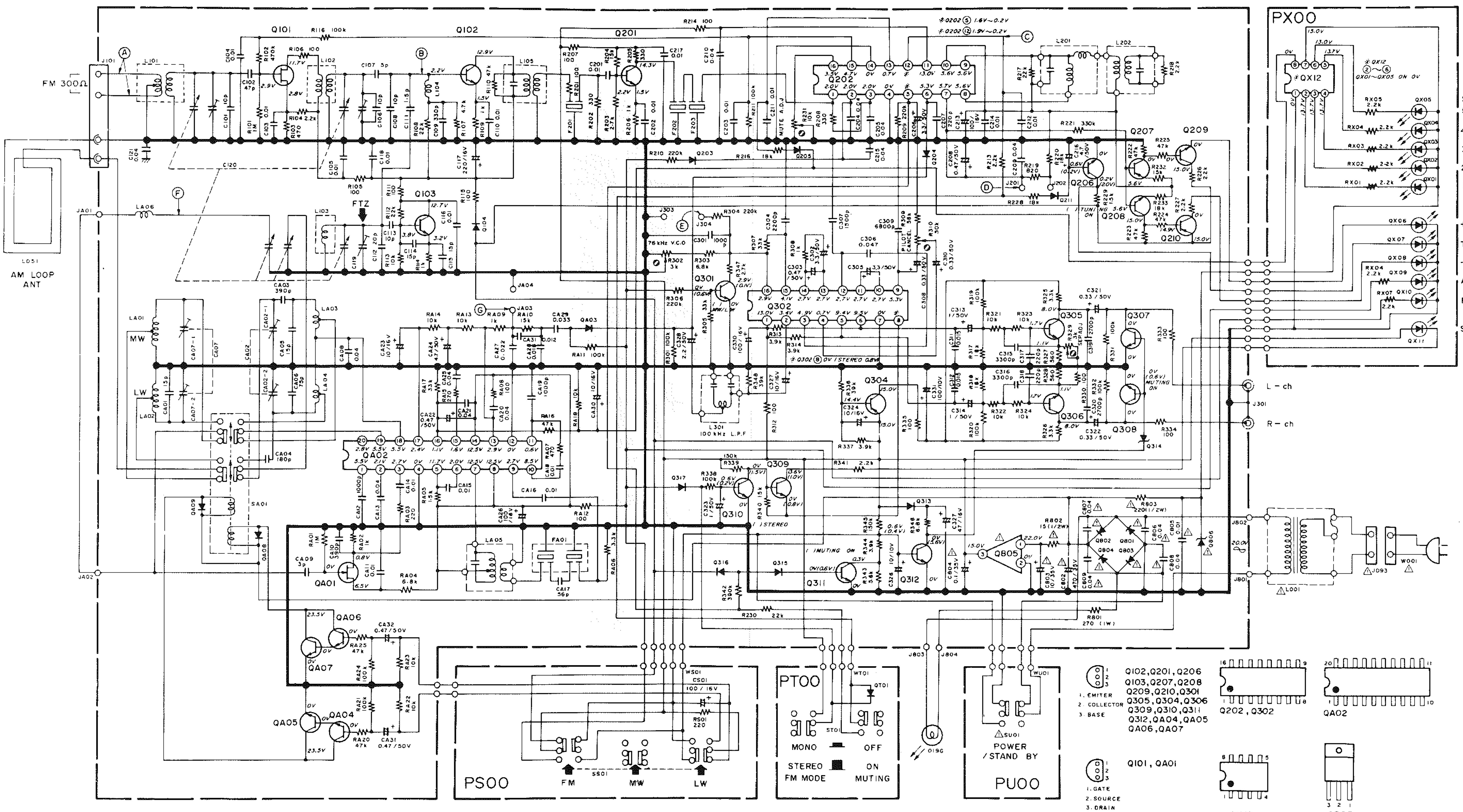
Components and wiring are subject to change for modification without notice.

MODEL ST320L

Q101,QA01 2SK55 D,E HF200552A0	Q102,Q201 2SC1047C HT31047IC0	Q103 2SC829C HT30829IC0	Q202 HA11225 HC10033010	Q208,Q209,Q30! Q305,Q306,Q309 Q310,QA04,QA06 2SC536 E,F HT30536280	Q302 HA11223W HC10029010	Q304 2SA733 HT107332A0	Q805 L78M15 HC10077030	QA02 LA1245 HC10058030	QX12 TL489 HC10008370	Q314 WZ-052 HD30033090	Q806 WZ-140 HD30027090	Q104,Q203,Q204 Q205,Q313,Q315 Q316,Q317,QA03 QT01,Q211 1S1555 etc HD20001000	Q801,Q802,Q803 Q804,QA08,QA09 DS135D HD20015030	QA05,QA07 2SD863E HT40863180	QX01~QX06 QX08~QX11 LN224RP HI10030020	QX07 LN324GP HI10031020	Q307,Q308 Q311,Q312 2SC2634 S,T HT32634280	Q206 2SC945 P,Q HT30945280



NOTE ON SAFETY:
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Components and wiring are subject to change for modification without notice.

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415H855010 CR
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