ST-JX22L/22L

Met dank aan Paul Huneker Ned. Ver. v. Historie v/d Radio

ST-JX22L: SILVER
AEP Mo
UK Mo

ST-JX22LB: BLACK T
AEP Mo

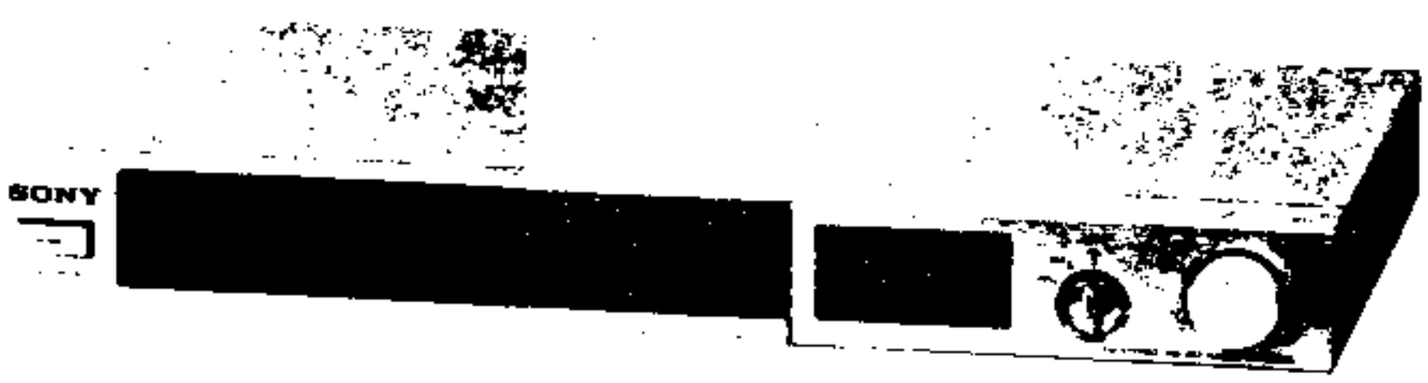


Photo: ST-JX22L

FM STEREO/FM-AM TUNE

SPECIFICATIONS

FM tuner section

Tuning range 87.5 MHz - 108 MHz
Antenna terminals 300 ohms, balanced
75 ohms, unbalanced
Intermediate frequency
10.7 MHz

	(at 40 kHz deviation)
Sensitivity	at 46 dB quieting 17.3 dBf, 4 μV (mono) ; 38.3 dBf, 45 μV (stereo)
Usable sensitivity	10.3 dBf, 1.8 μV (IHF) 1.7 μV (S/N = 26 dB)
Signal-to-noise ratio	76 dB (mono) 71 dB (stereo)
Harmonic distortion (at 1 kHz)	0.15% (mono) 0.3% (stereo)
IM distortion	0.15% (mono) 0.3% (stereo)

Separation (at 1 kHz)	45 dB
Frequency response	40 Hz – 12.5 kHz ±0.5 dB 30 Hz – 15 kHz $^{+0.5}_{-2}$ dB
Selectivity	at 300 kHz 70 dB
Capture ratio	1.0 dB
AM suppression ratio	54 dB
Image response ratio	50 dB
IF response ratio	90 dB

Spurious response ratio	70 dB
RF intermodulation	60 dB (IHF)
Muting threshold	approx. 25.2 dBf, 10
Output level/ impedance	at 75 kHz deviation 750 mV, 2.7 k ohm

– Continued on page 2

SAFETY-RELATED COMPONENT WARNING!!

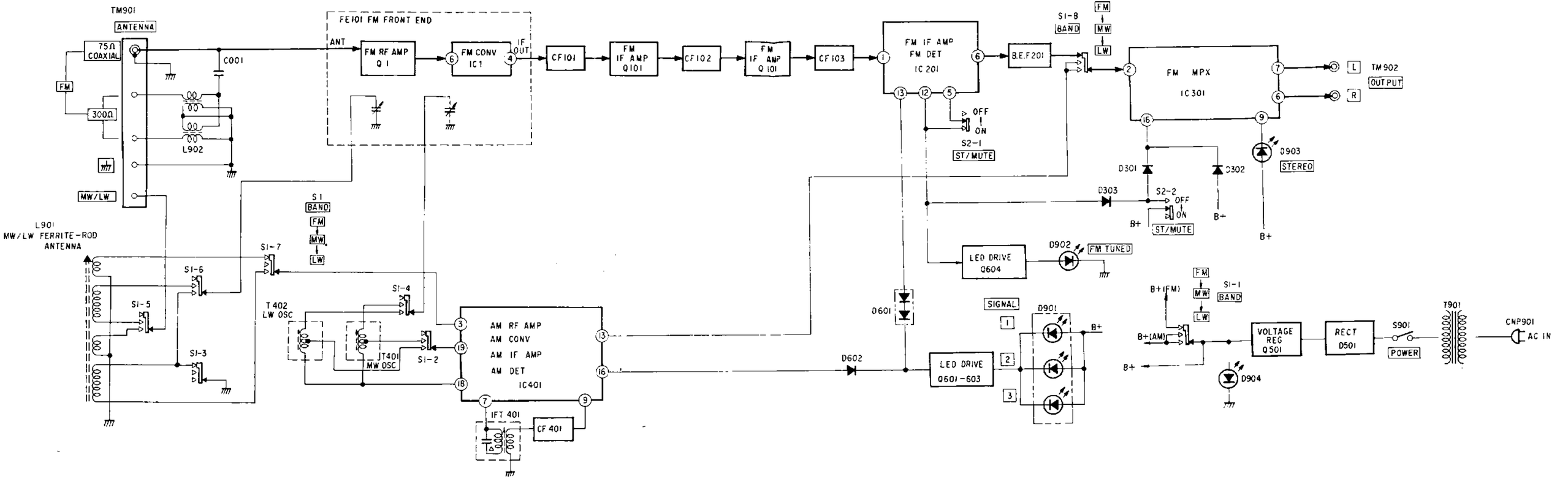
COMPONENTS IDENTIFIED BY SHADING AND MAR. ⚠ ON THE SCHEMATIC DIAGRAMS, EXPLODEI VIEWS AND IN THE PARTS LIST ARE CRITICAL TC SAFE OPERATION. REPLACE THESE COMPONENT: WITH SONY PARTS WHOSE PART NUMBERS APPEAF AS SHOWN IN THIS MANUAL OR IN SUPPLEMENT: PUBLISHED BY SONY.

SONY

SERVICE MANUAL

SECTION 1
OUTLINE

1-1. BLOCK DIAGRAM

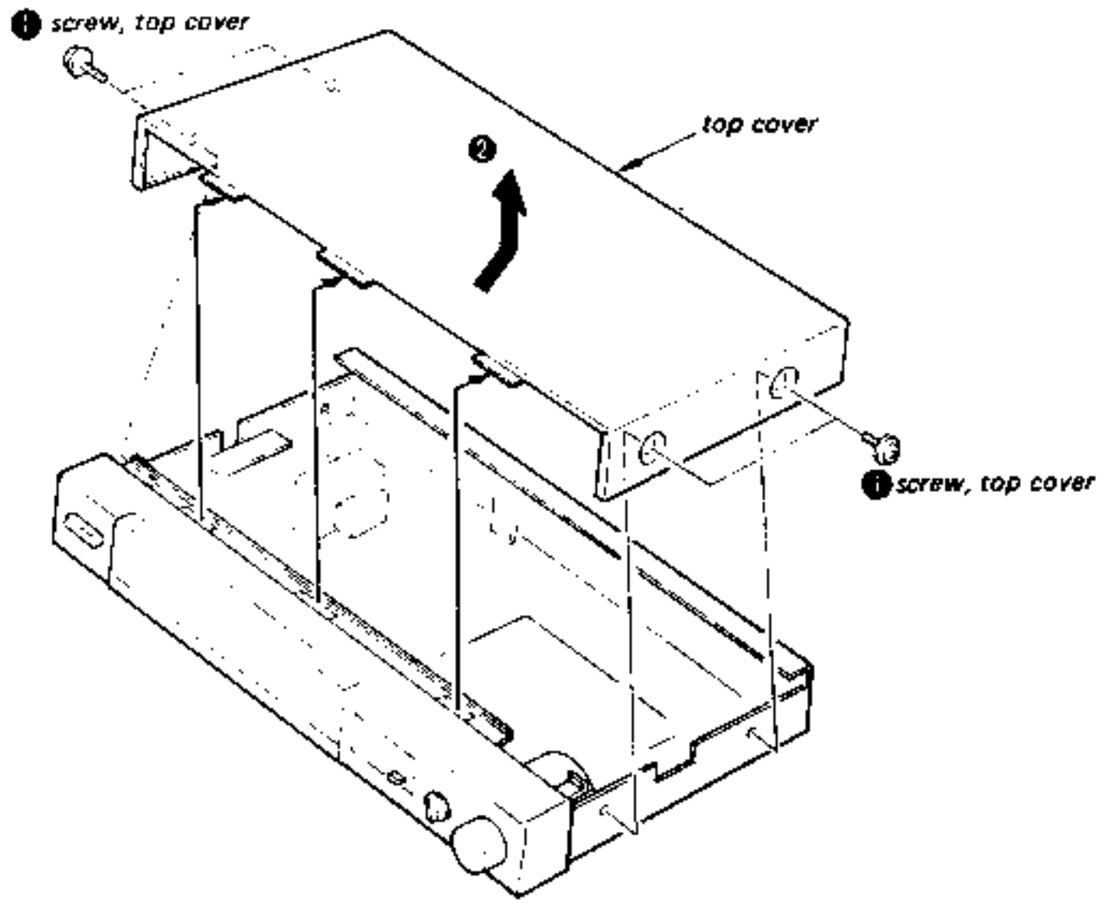


SECTION 2
DISASSEMBLY

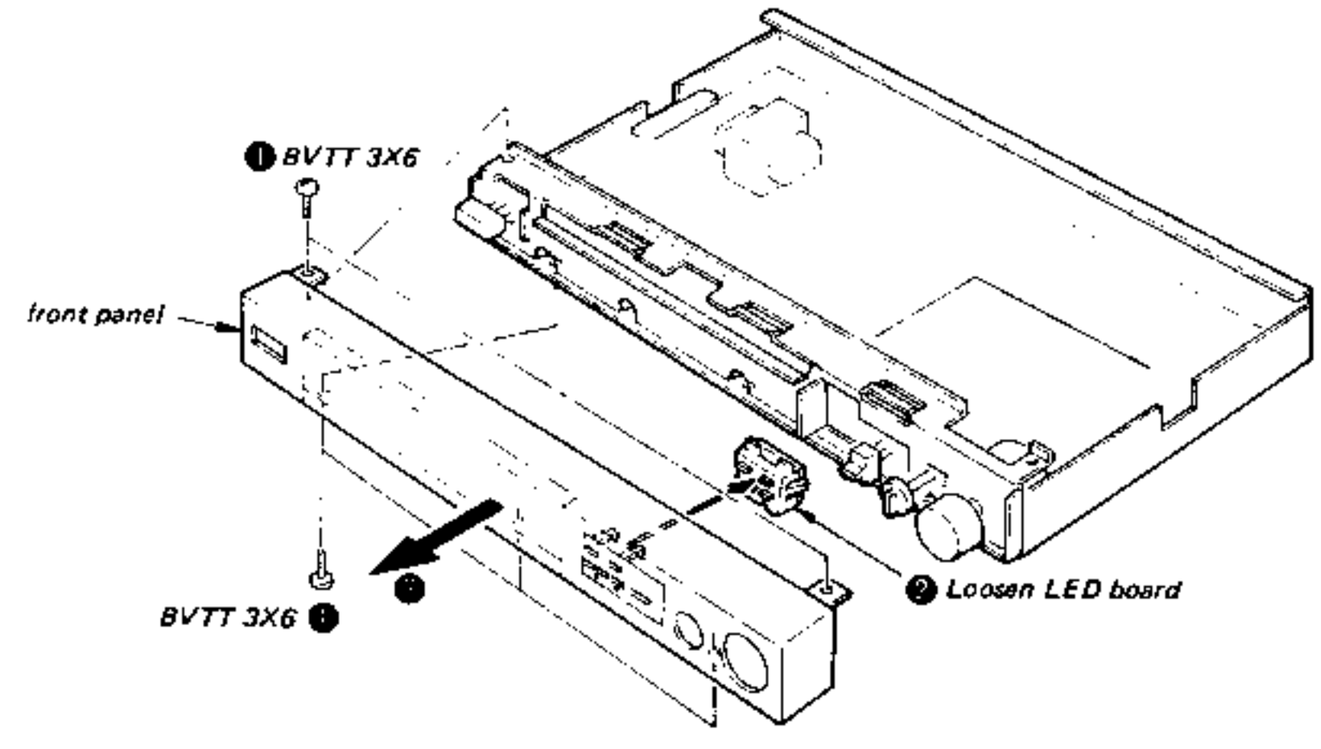
2-1. REMOVAL

Note: Follow the disassembly procedure in the numerical order given.

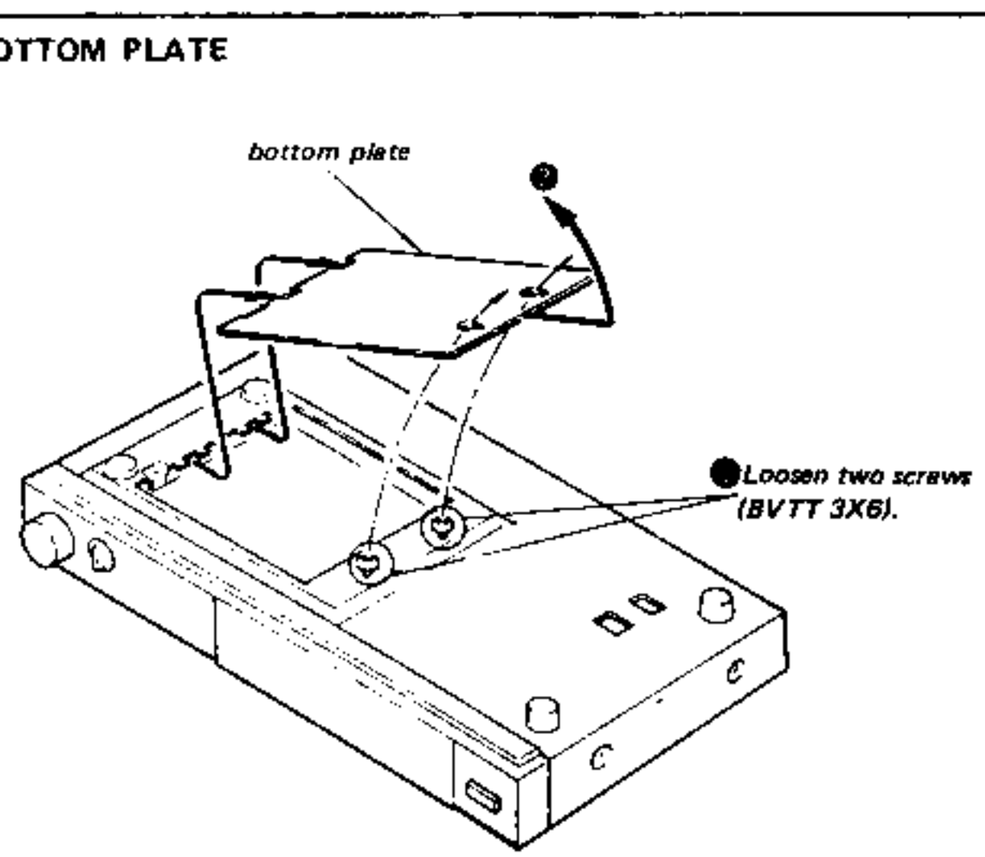
TOP COVER



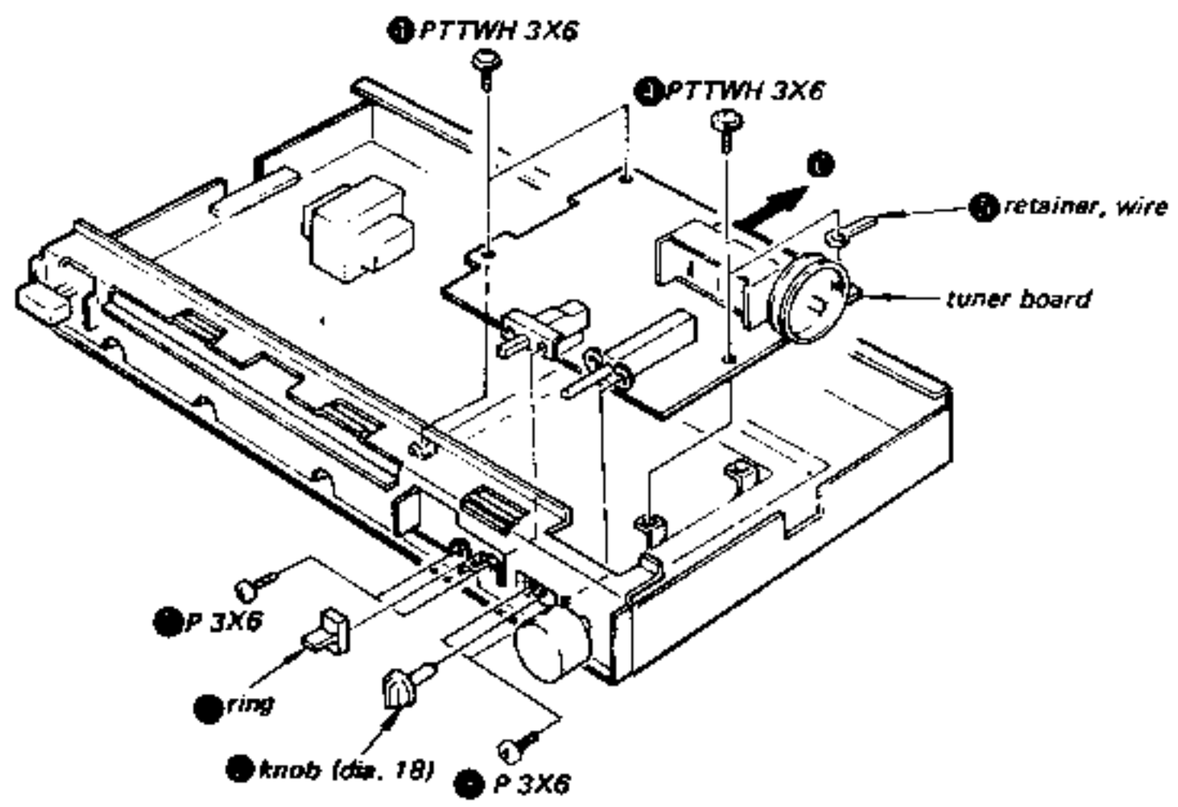
FRONT PANEL



BOTTOM PLATE

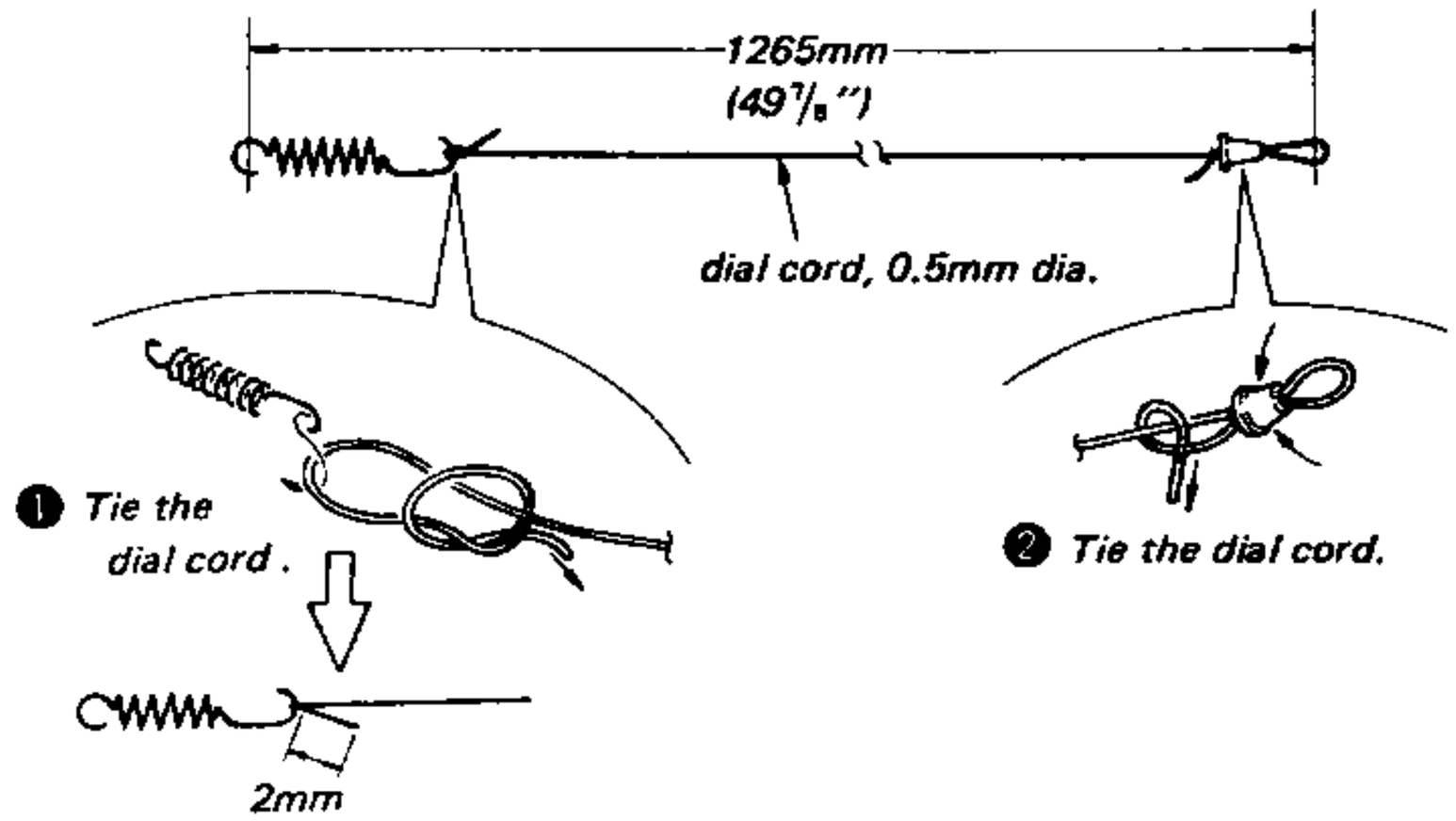


TUNER BOARD

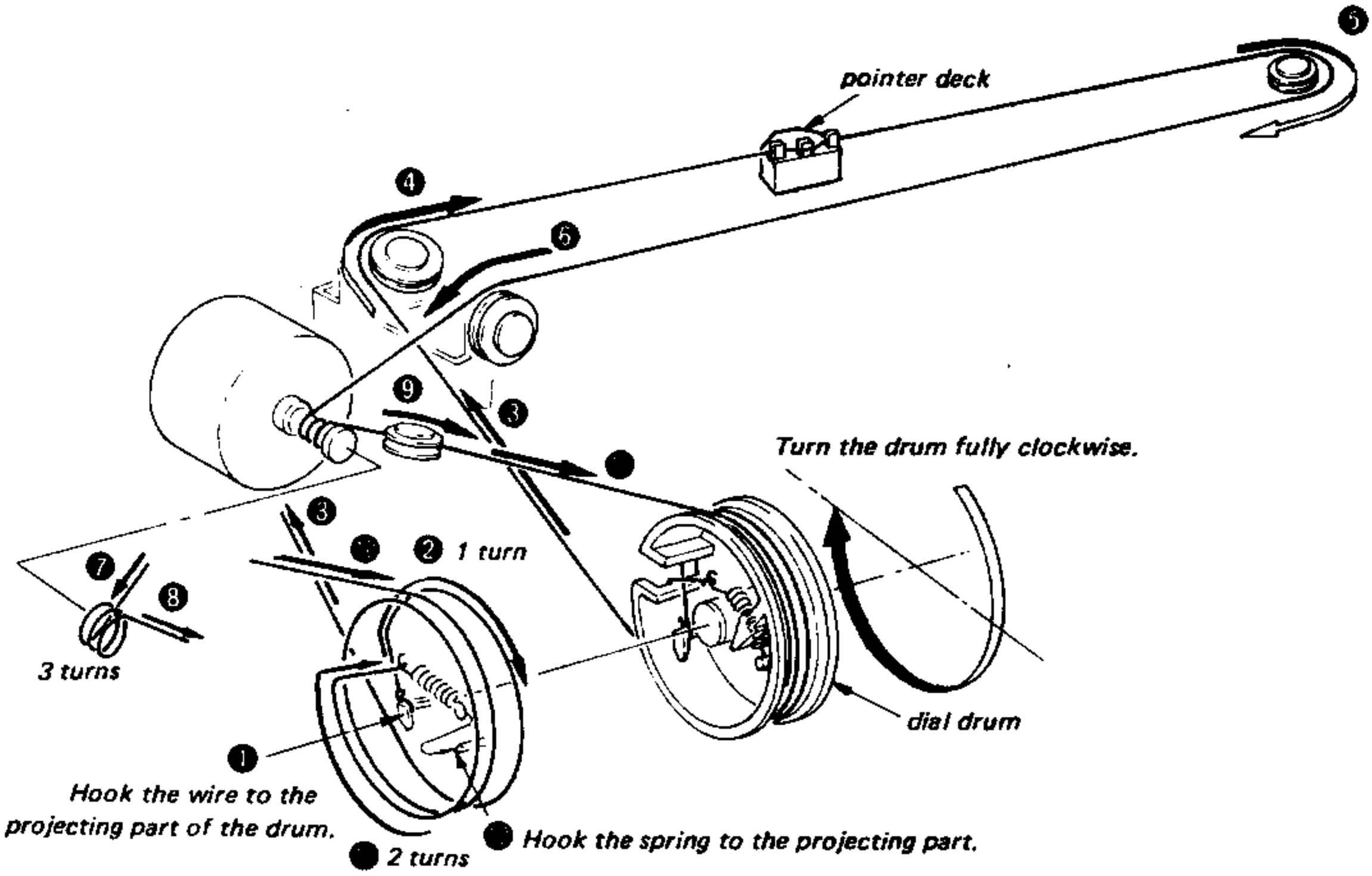


2-2. DIAL CORD STRINGING

1) Preparation



2) Stringing



3) Dial Pointer Installation

1. Receive a broadcasting station signal and set the dial pointer on the dial scale.
2. Apply a drop of contact cement to the dial pointer.

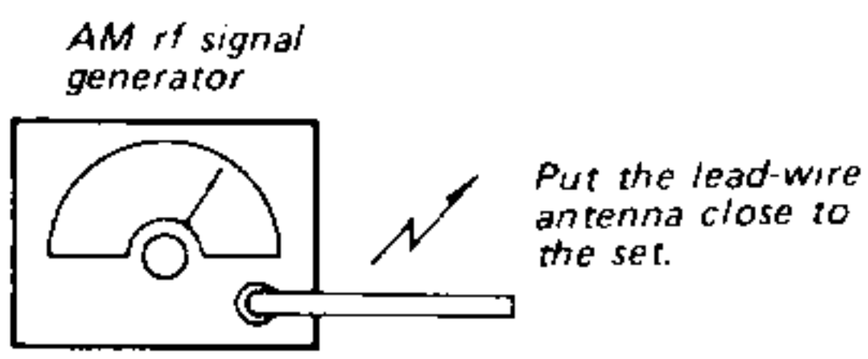
SECTION 3
ADJUSTMENTS

MW/LW SECTION

Setting:

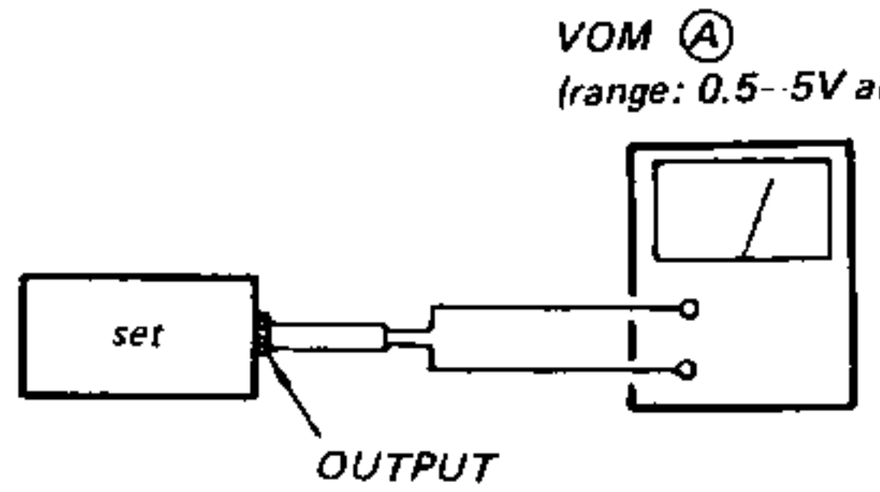
Band Selector: MW
LW

Setup:

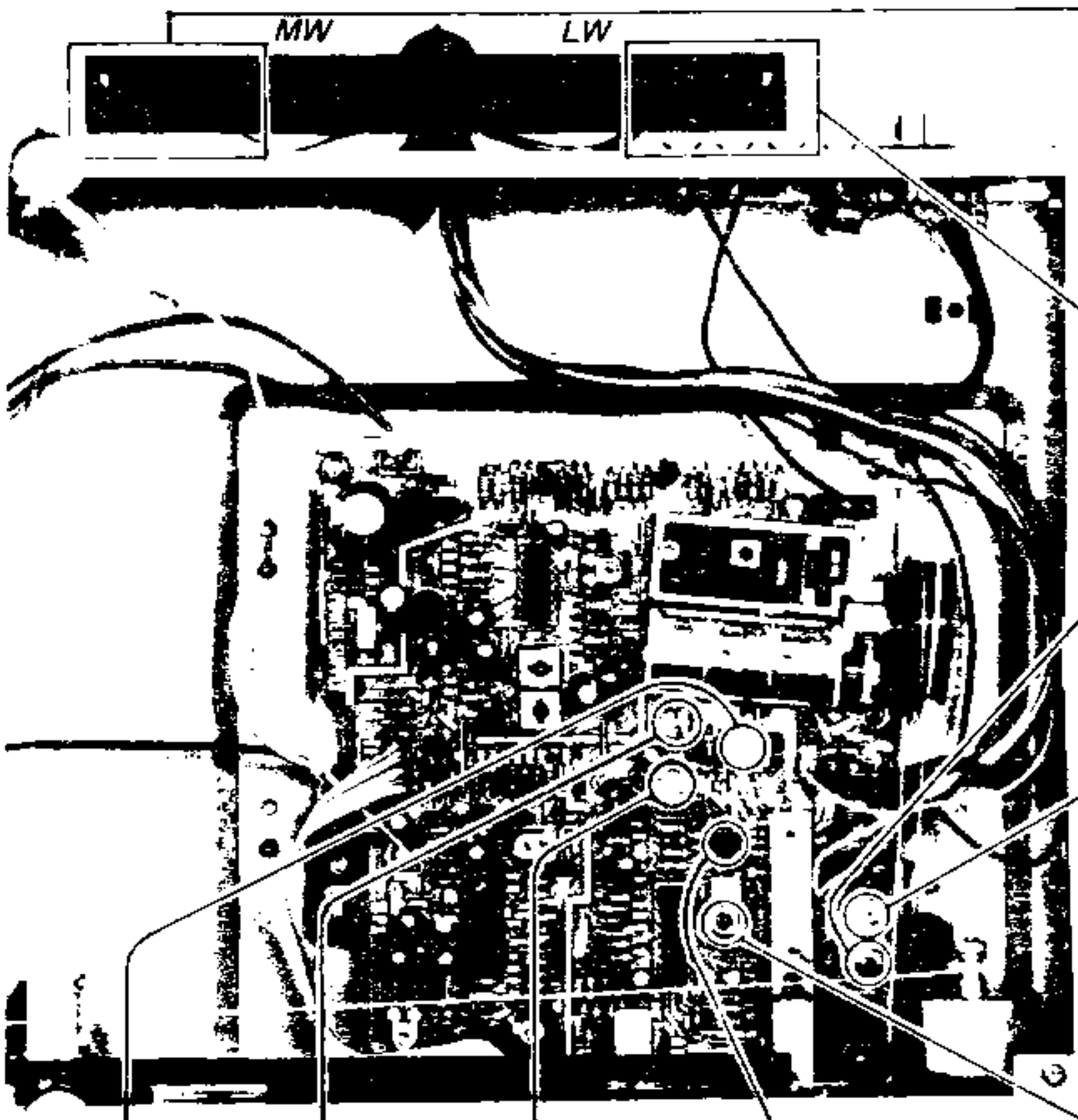


Carrier frequency: *1,000kHz (MW)*
250kHz (LW)

30% amplitude modulation by 400 Hz signal



- Repeat the procedures in each adjustment several times, and the frequency coverage and tracking adjustments should be finally done by the trimmer capacitors.



MW TRACKING ADJUSTMENT	
Adjust for a maximum reading on VOM Ⓐ .	
L501	600kHz
CT404	1,400kHz

LW TRACKING ADJUSTMENT	
Adjust for a maximum reading on VOM Ⓐ	
L501	170kHz
CT403	310kHz

AM 1F ADJUSTMENT	
Adjust for maximum reading on VOM Ⓐ .	
IFT401	455kHz

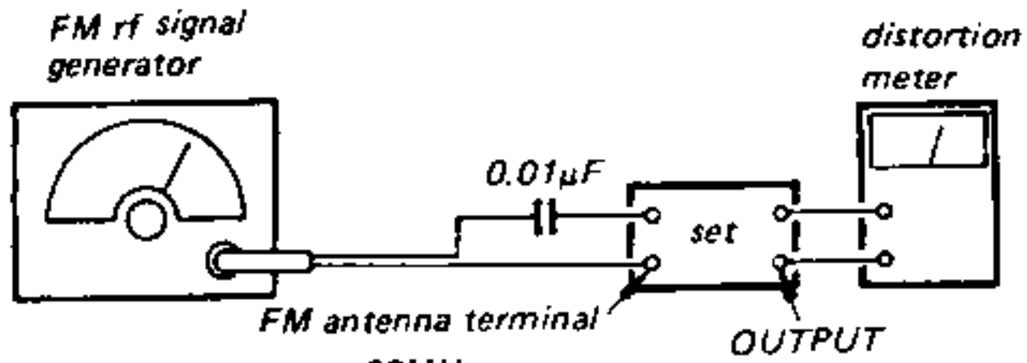
CT404	T402
1,660kHz	515kHz
Adjust for a maximum reading on VOM Ⓐ .	
MW FREQUENCY COVERAGE ADJUSTMENT	

CT401	T402
365kHz	145kHz
Adjust for a maximum reading on VOM Ⓐ .	
LW FREQUENCY COVERAGE ADJUSTMENT	

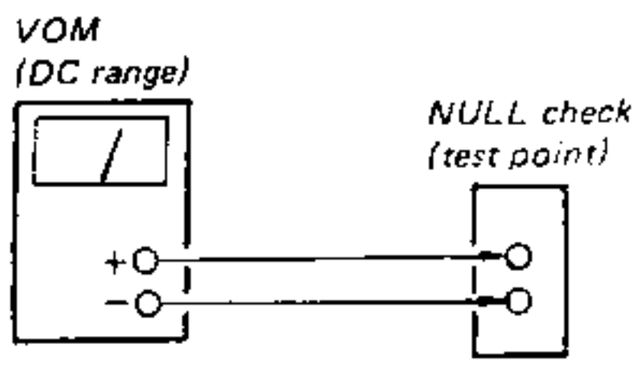
FM SECTION

FM Discriminator Alignment

Procedure:

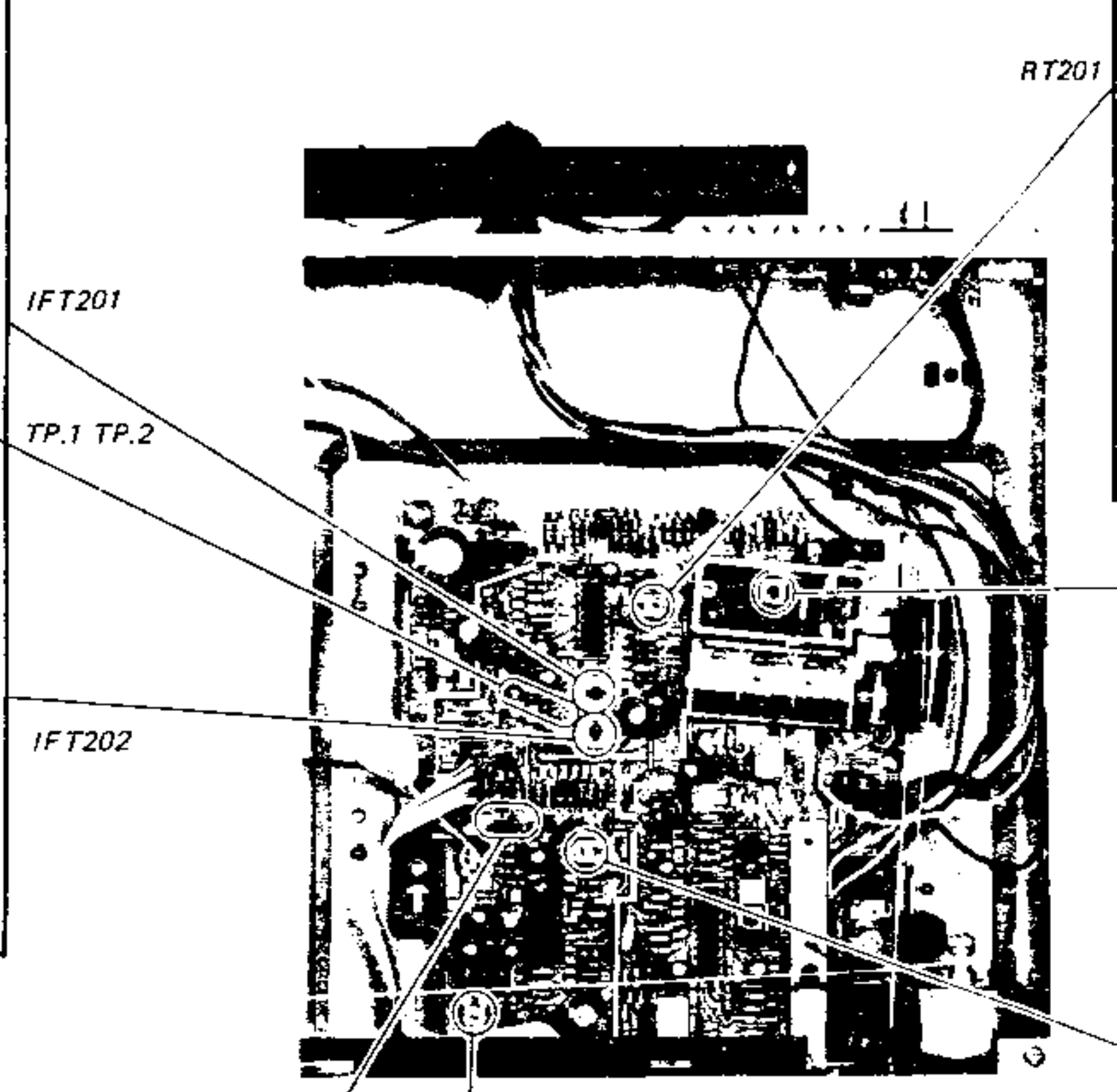


Carrier frequency: 98MHz
Output level: 1mV (60dB)
Modulation: 1kHz, 40kHz deviation (100%)
Mode: mono



1. Tune the set to 98MHz.
2. Connect a VOM to NULL CHECK (test point) and adjust the primary-side core (red) of IFT201 for 0V DC reading on the VOM.
3. Adjust the secondary-side core (black) of IFT202 for a minimum reading on the distortion meter.

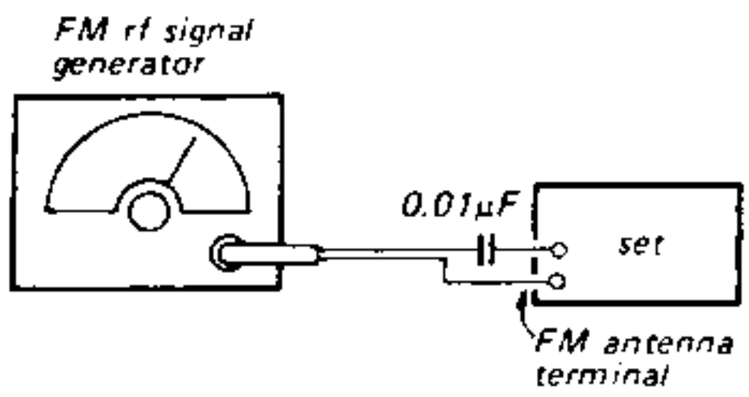
Note: Repeat the secondary-side and primary-side adjustments several times.



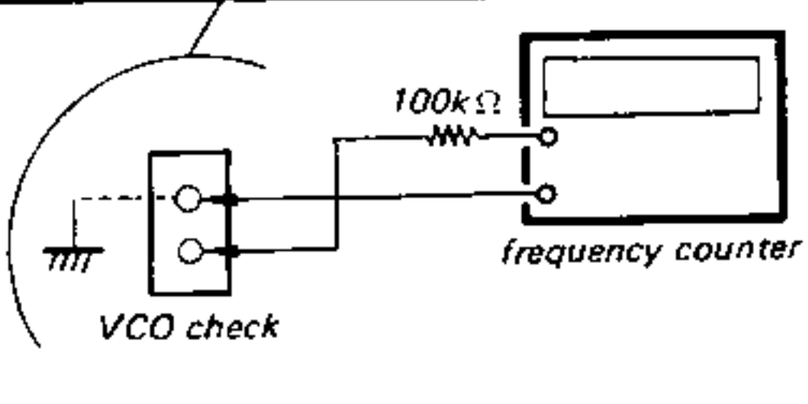
VCO Adjustment

A) Regular Method

Procedure:



Carrier frequency: 98MHz
Modulation: no modulation
Output level: 1mV (60dB)

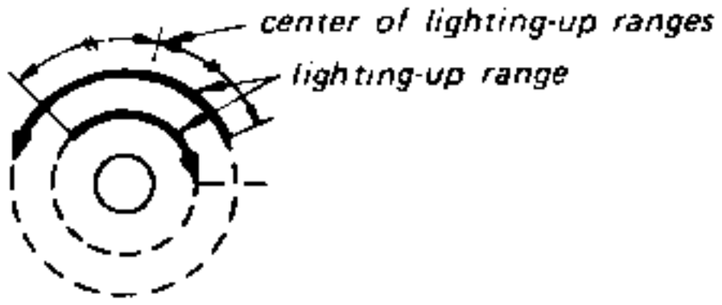


1. Tune the set to 98MHz.
2. Adjust RT301 for 19kHz ± 50Hz on the counter.

B) Simple Method

Procedure:

1. Tune the set to the FM stereo broadcasting signal.
2. Turn RT301 clockwise or counterclockwise and memorize the lighting-up range of the stereo lamp.
3. Secure RT301 at the center of the lighting-up range of both turns as shown below.

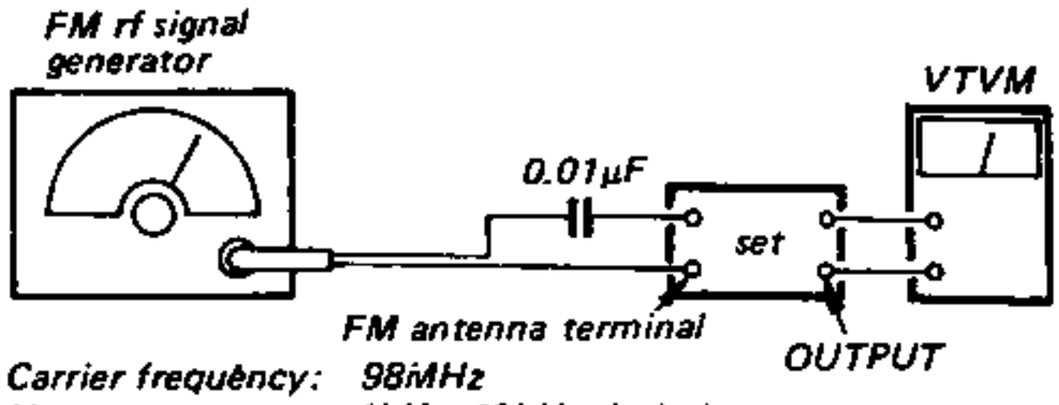


FM Muting Level Adjustment

Setting:

STEREO MUTING switch (S2): ON

Procedure:



Carrier frequency: *98MHz*
Modulation: *1kHz, 40kHz deviation (100%)*
Output level: *10μV (20dB)*

1. Tune the set to 98MHz.
2. Set the output level of the FM rf signal generator to 20dB (10μV).
3. Turn RT201 and stop it just when the VTVM indication suddenly decreases.

IFT1

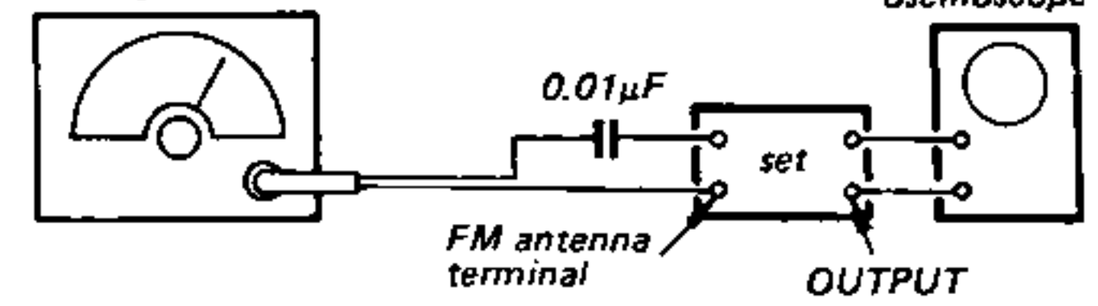
The FM front-end is carefully adjusted at the factory and is supplied as one whole block for replacement. In case of replacement, perform the following adjustments.

1. Front-End IFT Adjustment.

Setting:

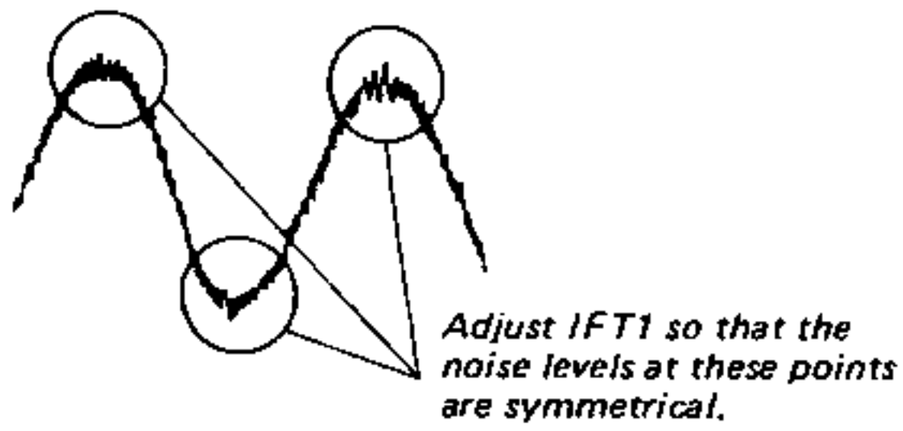
STEREO MUTING switch (S2): OFF

Procedure:



Carrier frequency: *98MHz*
Modulation: *1kHz, 40kHz deviation (100%)*
Output level: *2μV (6dB)*

Adjust IFT1 so that the noise levels at the peak of the waveforms on the oscilloscope are symmetrical and the output level is maximum.



2. Dial Pointer Setting
(Refer to Dial Pointer Setting on page 7.)

3. MW Tuning Adjustment
(Refer to MW Tuning Adjustment on page 8.)

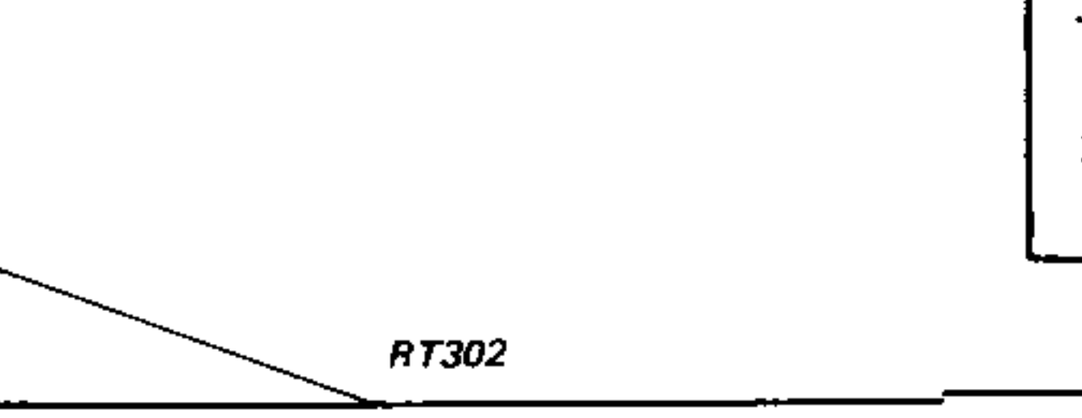
RT302

FM Stereo Separation Adjustment

Setting:

STEREO MUTING switch (S2): ON

Procedure:



Carrier frequency: *98MHz*
Output level: *1mV (60dB)*
Mode: *stereo*
Modulation:
Audio (1kHz): *16.25kHz deviation (40%)*
Pilot (19kHz): *7.5kHz deviation (20%)*
Sub-channel (38kHz): *16.25kHz deviation (40%)*

FM stereo signal generator output channel	VTVM connection	VTVM reading (dB)
L-CH	L-CH	Ⓐ
R-CH	L-CH	Ⓑ Adjust RT302 for minimum reading.
R-CH	R-CH	Ⓒ
L-CH	R-CH	Ⓓ Adjust RT302 for minimum reading.

L-CH Stereo Separation: Ⓐ – Ⓑ
R-CH Stereo Separation: Ⓒ – Ⓓ

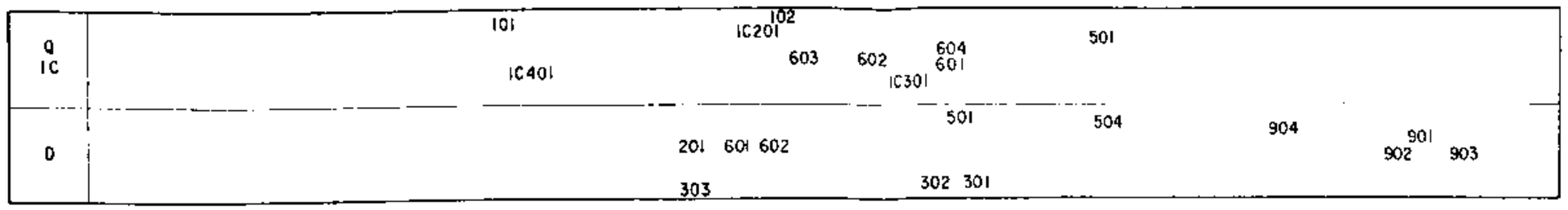
The separations of both channels should be equal.

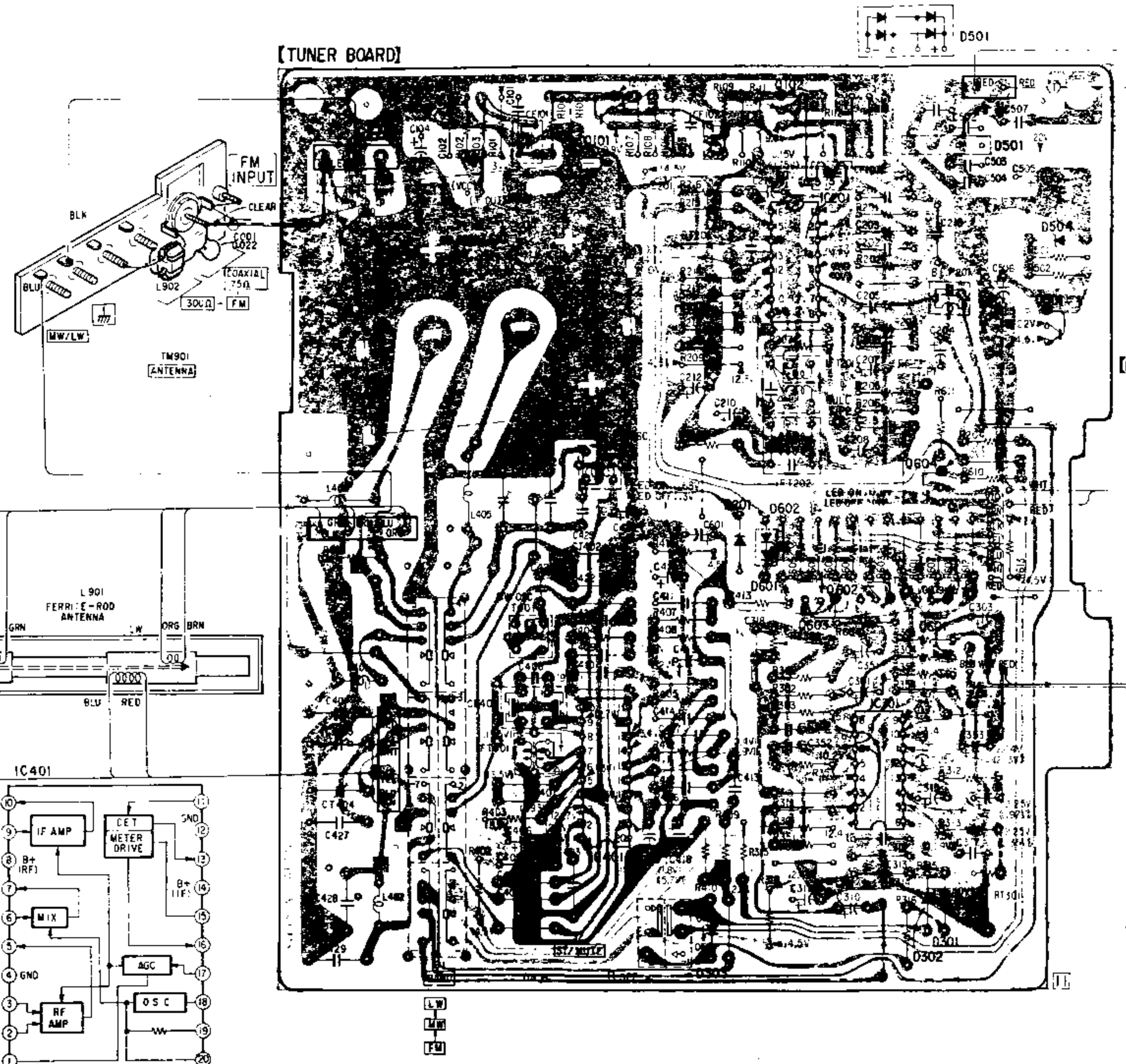
SECTION 4
DIAGRAMS

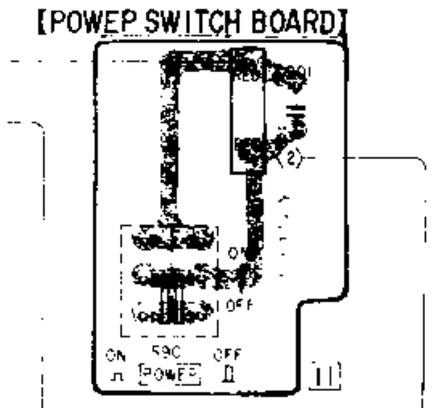
4-1. MOUNTING DIAGRAM
– Conductor Side –

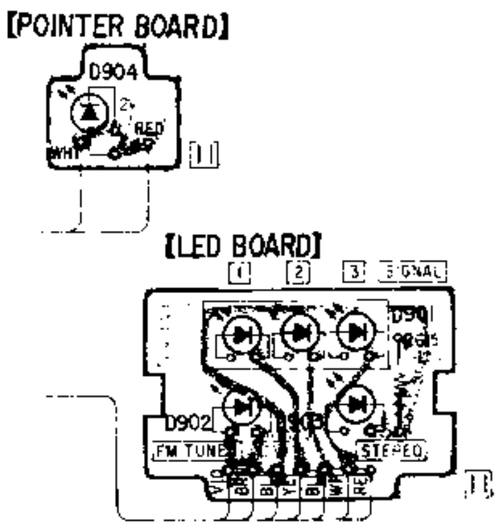
A B C D E F G H

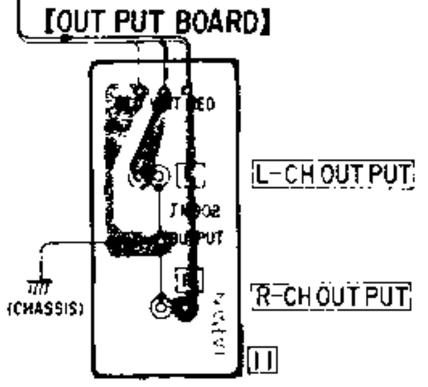
• See page 13 for semiconductor lead layouts.

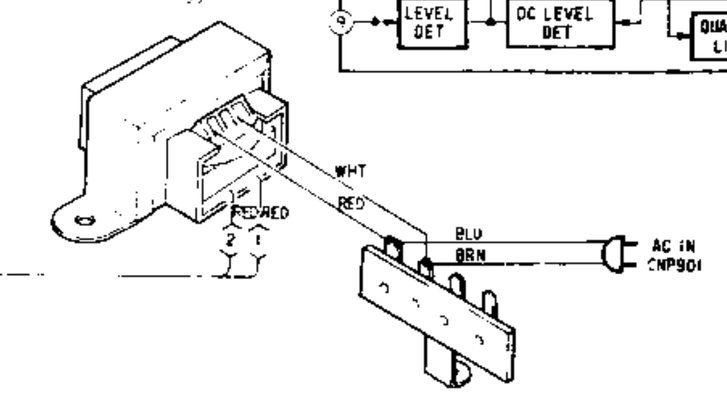


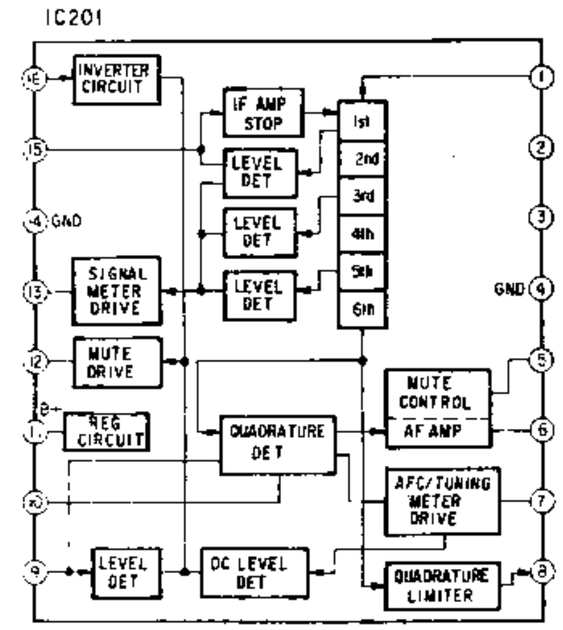


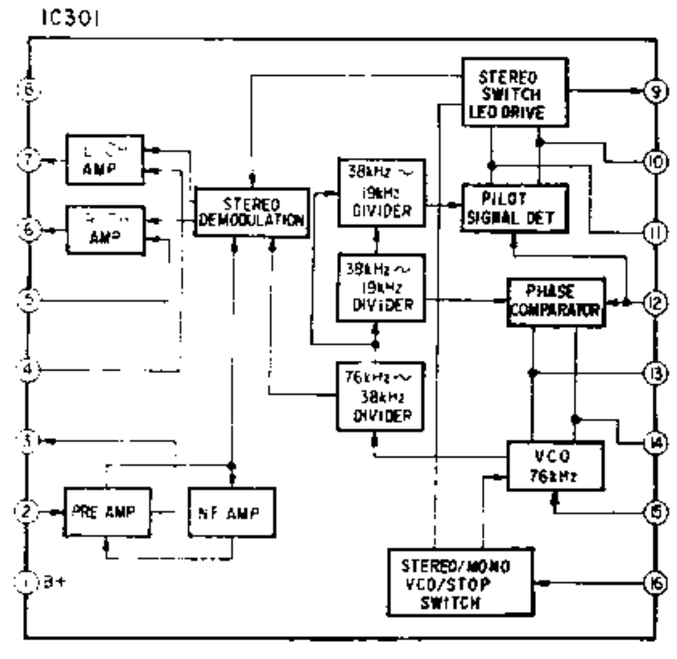




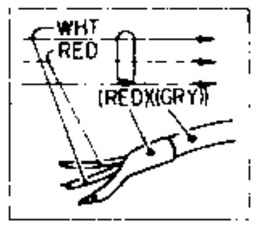




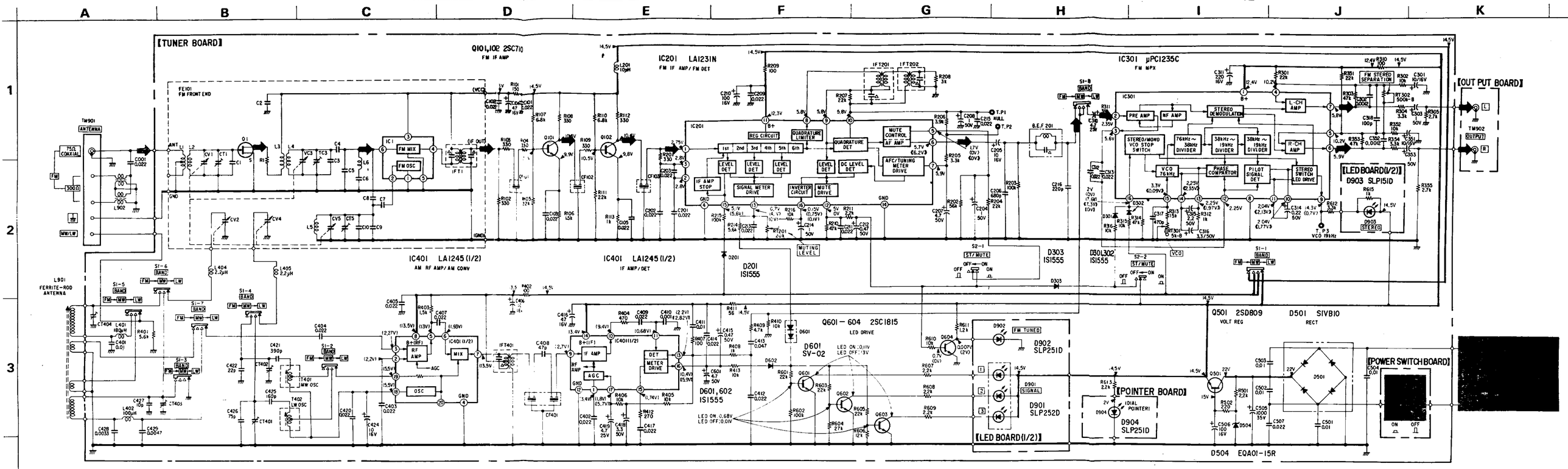




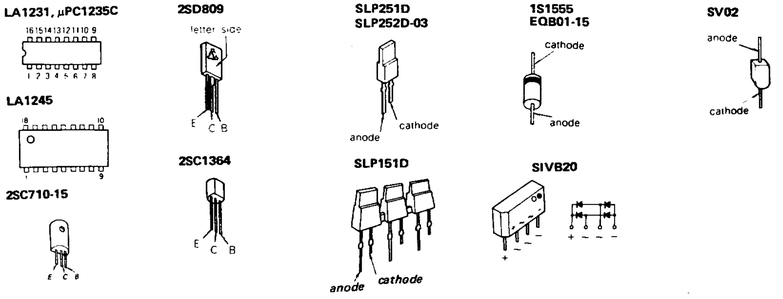
- Color code of sleeving over the end of the jacket.



- ⌒: parts extracted from the component side.
- ⊣⊢: indicates side identified with part number.
- : B+ pattern
- ▬▶▬ : signal path
- ▬▶▬ : L-CH signal path
- ▬▶▬ : R-CH signal path



Semiconductor Lead Layouts



- All capacitors are in μF unless otherwise noted. pF : μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in ohms, ¼W unless otherwise noted. kΩ : 1000 Ω, MΩ : 1000 kΩ
- △ : internal component.
- ▭ : panel designation.
- ▭ : adjustment for repair.
- ——: B+ bus.
- Readings are taken under no-signal (detuned) conditions. with a VOM (20 kΩ/V)

no mark	: FM (Detuned condition)	ST/MUTE switch: ON
< >	: FM (Tuned condition)	
( )	: AM (Detuned condition)	
≪ ≫	: FM (Detuned condition)	ST/MUTE switch: OFF
(( ))	: AM (Tuned condition)	

- ➡ : signal path

Note: Voltage are measured with a VOM (50kΩ/V)

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

SECTION 5
EXPLODED VIEWS AND PARTS LIST

GENERAL SECTION

No.	Part No.	Description
1	3-302-902-00	(SILVER)...KNOB, PUSH
1	3-302-902-41	(BLACK)....KNOB, PUSH
2	3-671-893-00	CLAMP (LOW TYPE)
3	3-703-244-00	BUSHING, CORD
4	3-703-249-01	SCREW, S TIGHT, +PTTWH 3X6
5	3-703-354-01	(BLACK)....SCREW (OS), CASE, CLAW
5	3-703-354-11	(SILVER)...SCREW (OS), CASE, CLAW
6	3-703-473-00	SCREW, TERMINAL
7	3-703-590-01	LABEL (11585S) (SMALL), FTZ
8	4-809-050-00	SPRING, TENSION
9	4-859-586-01	DRUM (165), DIAL
10	4-864-307-00	RING
11	4-864-520-00	SPRING, TENSION
12 ♦	4-866-080-00	HEAT SINK
13	4-881-506-00	(JX22L;AEP)....LABEL, MODEL NUMBER
13	4-881-507-00	(JX22L;UK).....LABEL, MODEL NUMBER
13	4-881-554-00	(JX22LB;AEP)...LABEL, MODEL NUMBER
14 ♦	4-881-512-00	BRACKET (A), PULLEY
15 ♦	4-881-513-00	BRACKET (B), PULLEY
16 ♦	4-881-514-00	BRACKET (C), PULLEY
17 ♦	4-881-515-00	BRACKET, POINTER
18 ♦	4-881-516-02	BRACKET (LEFT), PANEL
19 ♦	4-881-517-02	BRACKET (RIGHT), PANEL
20	4-881-519-00	POINTER
21	4-881-520-01	(SILVER)...KNOB (DIA. 18)
21	4-881-520-11	(BLACK)....KNOB (DIA. 18)
22	4-881-521-00	HOLDER, LED
23 ♦	4-881-522-00	PLATE, BOTTOM
24 ♦	4-881-525-11	(AEP)...PLATE, JACK
24 ♦	4-881-525-21	(UK)....PLATE, JACK
25 ♦	4-881-526-00	PANEL, SUB
26 ♦	4-881-529-00	CHASSIS
27 ♦	4-881-531-00	BRACKET (C), PANEL
28 ♦	4-881-533-00	REINFORCEMENT
29	4-881-534-00	SLIDER
30	4-881-535-00	HOLDER
31	4-881-539-00	RING
32	4-881-528-00	(SILVER)...CASE
32	4-881-528-21	(BLACK)....CASE
33	7-621-759-45	+PSW, 2.6X6
34	7-623-615-01	EYELET, 2X2
35	7-682-147-09	SCREW +P 3X6
36	7-685-134-11	SCREW +P 2.6X8 TYPE2 NON-SLIT
37	7-685-646-11	SCREW +BVTP 3X8 TYPE2 N-S
38	.....	
39	7-685-871-01	SCREW +BVTT 3X6 (S)

GENERAL SECTION

No.	Part No.	Description
40	9-911-825-42	STRING, 0.5MM WHITE
41	9-911-845-XX	CUSHION
42	.....	
43	A-4322-426-A	(SILVER)...PANEL ASSY
43	X-4881-508-1	(BLACK)....PANEL ASSY
44	X-3701-069-0	FOOT ASSY, M.F
45	X-4864-705-0	PULLEY ASSY
46	X-4875-108-0	(SILVER)...KNOB ASSY, POWER
46	X-4881-405-0	(BLACK)....KNOB ASSY, POWER
47	X-4875-123-1	FOOT ASSY, MF
48 ♦	X-4881-501-0	WHEEL ASSY, TUNING
49	X-4881-503-0	(SILVER)...KNOB (DIA.28) ASSY, R
49	X-4881-503-2	(BLACK)....KNOB (DIA.28) ASSY, R

ACCESSORY & PACKING MATERIAL

No.	Part No.	Description
91	1-501-161-00	ANTENNA,FEEDER
92	1-551-734-31	CORD, CONNECTION
93	3-701-630-00	BAG, POLYETHYLENE
94	.....	
95	3-773-266-11	(JX22LB)...MANUAL, INSTRUCTION (ENGLISH)
95	3-773-266-41	(JX22LB)...MANUAL, INSTRUCTION (GERMANY)
95	3-783-846-11	(JX22L;AEP,UK)...MANUAL, INSTRUCTION
95	3-783-846-41	(JX22L;AEP).....MANUAL, INSTRUCTION
96	4-875-040-00	SHEET, PROTECTION
97	4-881-536-00	CUSHION, UPPER
98	4-881-537-00	CUSHION, LOWER
99	4-881-540-00	(JX22L)...INDIVIDUAL CARTON (MADE IN FRANCE)
99	4-881-542-00	(JX22L)...INDIVIDUAL CARTON (MADE IN JAPAN)
99	4-881-556-00	(JX22LB)..INDIVIDUAL CARTON

NOTE:

- Items with no part number and no description are not stocked because they are seldom required for routine service.
- Items marked " ♦ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.

CAPACITORS:

- All capacitors are in μF. Common capacitors are omitted. Refer to the following lists for their part numbers. MF:μF, PF:μμF.

RESISTORS

- All resistors are in ohms. Common 1/4W, 1/8W and 1/16W carbon resistors are omitted. Refer to the following lists for their part numbers.
- F : nonflammable

COILS

- MMH : mH, UH : μH

SEMICONDUCTORS

In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···, UPC···: μPC, UPD···: μPD···

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
501	♦;1-535-115-00	TERMINAL			
502	♦;1-535-116-00	TERMINAL			
503	♦;1-535-117-00	TERMINAL			
504	♦ 1-536-392-XX	L-TYPE TERMINAL STRIP			
505	⚠1-551-427-11	(AEP)...CORD, POWER, EULO PLUG			
505	⚠1-551-962-00	(UK)....CORD, POWER			
505	⚠1-551-967-00	(UK)....CORD, POWER			
506	♦;1-607-339-00	PC BOARD, TUNER			
507	♦;1-607-340-00	PC BOARD, OUTPUT			
508	♦;1-607-341-00	PC BOARD, POINTER			
509	♦;1-607-342-00	PC BOARD, LED			
510	♦;1-607-343-00	PC BOARD, POWER SWITCH			
511	♦;A-4351-305-A	MOUNTED PCB, TUNER			
C216	1-161-315-00	CERAMIC	220PF	10%	50V
C410	1-161-323-00	CERAMIC	0.001MF	10%	50V
C426	1-161-373-51	CERAMIC	75PF	5%	50V
C901	⚠1-101-004-61	CERAMIC	0.01MF		50V
CF101	1-527-968-81	FILTER, CERAMIC			
CF102	1-527-968-81	FILTER, CERAMIC			
CF103	1-527-968-81	FILTER, CERAMIC			
CF401	1-527-937-00	FILTER, CERAMIC			
CT401	1-141-180-00	CAP, TRIMMER			
CT402	1-141-180-00	CAP, TRIMMER			
CT403	1-141-180-00	CAP, TRIMMER			
CT404	1-141-180-00	CAP, TRIMMER			
D201	8-719-815-55	DIODE 1S1555			
D301	8-719-815-55	DIODE 1S1555			
D302	8-719-815-55	DIODE 1S1555			
D303	8-719-815-55	DIODE 1S1555			
D501	8-719-511-20	DIODE S1VB20			
D504	8-719-931-15	DIODE EQB01-15			
D601	8-719-300-02	DIODE SV02			
D602	8-719-815-55	DIODE 1S1555			
D901	8-719-901-78	DIODE SLP252D-03			
D902	8-719-902-52	DIODE SLP251D			
D903	8-719-901-53	DIODE SLP151D			
D904	8-719-902-52	DIODE SLP251D			

ELECTRICAL PARTS

Ref.No.	Part No.	Description
F201	1-235-126-00	ENCAPSULATED COMPONENT
FE101	1-463-405-00	FRONT END
IC201	8-759-812-31	IC LA1231
IC301	8-759-112-35	IC UPC1235C
IC401	8-759-812-45	IC LA1245
IFT201	1-404-400-00	TRANSFORMER, DISCRIMINATOR
IFT202	1-404-401-00	TRANSFORMER, DISCRIMINATOR
IFT401	1-404-383-00	TRANSFORMER, IF
L201	1-407-157-XX	MICRO INDUCTOR 10UH
L401	1-407-708-00	MICRO INDUCTOR 180UH
L402	1-407-750-00	MICRO INDUCTOR 100UH
L404	1-408-109-00	MICRO INDUCTOR 2.2UH
L405	1-408-109-00	MICRO INDUCTOR 2.2UH
L901	1-401-978-00	ANTENNA, FERRITE-ROD (LW/MW)
PT901	⚠1-447-314-00	TRANSFORMER, POWER
Q101	8-729-671-15	TRANSISTOR 2SC710-15
Q102	8-729-671-15	TRANSISTOR 2SC710-15
Q501	8-729-180-93	TRANSISTOR 2SD809-F
Q601	8-729-663-47	TRANSISTOR 2SC1364
Q602	8-729-663-47	TRANSISTOR 2SC1364
Q603	8-729-663-47	TRANSISTOR 2SC1364
Q604	8-729-663-47	TRANSISTOR 2SC1364
RT201	1-226-237-00	RES, ADJ, CARBON 20K
RT301	1-226-235-00	RES, ADJ, CARBON 5K
RT302	1-226-241-00	RES, ADJ, CARBON 500K
S1	1-554-131-00	SWITCH, ROTARY SLIDE
S2	1-554-128-00	SWITCH, PUSH (1 KEY)
S901	⚠1-553-072-21	SWITCH, PUSH
T401	1-405-953-00	COIL (OSC)
T402	1-405-954-00	COIL (OSC)
TM901	1-536-666-21	TERMINAL BOARD (ANTENNA) (INCLUDING L902,C001)
TM902	1-507-731-00	JACK, PIN 2P

NOTE:

- Items with no part number and no description are not stocked because they are seldom required for routine service.
- Items marked " ♦ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.

CAPACITORS:

- All capacitors are in μF. Common capacitors are omitted. Refer to the following lists for their part numbers. MF:μF, PF:μμF.

RESISTORS

- All resistors are in ohms. Common 1/4W, 1/8W and 1/16W carbon resistors are omitted. Refer to the following lists for their part numbers.
- F : nonflammable

COILS

- MMH : mH, UH : μH

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

SEMICONDUCTORS

In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···, UPC···:
UPD···: μPD···

ELECTROLYTIC CAPACITORS

CAP. (μF)	RATING → : Use the high voltage rated one.					
	6.3 VOLT.	10 VOLT.	16 VOLT.	25 VOLT.	35 VOLT.	50 VOLT.
	PART No.	PART No.	PART No.	PART No.	PART No.	PART No.
0.47					→	1-121-726-00
1.0					→	1-121-391-00
2.2					→	1-121-450-00
3.3	→	→	→	1-121-392-00	→	1-121-393-00
4.7	→	→	→	1-121-395-00	→	1-121-396-00
10	→	→	1-121-651-00	1-121-398-00	→	1-121-738-00
22	→	→	1-121-479-00	1-121-480-00	1-121-662-00	1-121-152-00
33	→	→	1-121-403-00	1-121-404-00	1-121-652-00	1-121-405-00
47	→	1-121-352-00	1-121-409-00	1-121-410-00	1-121-653-00	1-121-411-00
100	→	1-121-414-00	1-121-415-00	1-121-416-00	1-121-357-00	1-121-417-00
220	1-121-419-00	1-121-420-00	1-121-421-00	1-121-422-00	1-121-261-00	1-121-423-00
330	1-121-751-00	1-121-805-00	1-121-521-00	1-121-654-00	1-121-655-00	1-121-656-00
470	1-121-424-00	1-121-425-00	1-121-426-00	1-121-733-00	1-121-361-00	1-121-810-00
1000	–	1-121-736-00	1-121-245-00	1-121-657-00	1-121-388-00	1-123-061-00
2200	1-121-658-00	1-121-659-00	1-121-660-00	1-123-067-00	1-121-984-00	–
3300	1-121-661-00	1-123-075-00	1-123-071-00	–	–	–

CAP. (μF)	100 VOLT.	160 VOLT.	250 VOLT.	350 VOLT.
	PART No.	PART No.	PART No.	PART No.
0.47		–	–	–
1.0	1-123-249-00	1-123-252-00	1-123-003-00	1-121-168-00
2.2	1-123-250-00	1-123-026-00	–	1-123-028-00
3.3	1-121-995-00	–	1-123-004-00	1-123-006-00
4.7	1-123-255-00	1-121-246-00	1-121-759-00	1-123-007-00
10	1-121-126-00	1-121-999-00	1-123-254-00	1-123-008-00
22	1-121-996-00	1-123-253-00	1-123-005-00	1-123-022-00
33	1-121-997-00	1-121-757-00	–	–
47	1-123-251-00	1-121-919-00	–	–
100	1-123-084-00	–	–	

CERAMIC CAPACITORS

CAP. (pF)	RATING							
	50 VOLT.	CAP. (pF)	50 VOLT.	CAP. (pF)	50 VOLT.	CAP. (μF)	50 VOLT.
	PART No.		PART No.		PART No.		PART No.
0.5	1-101-837-00	22	1-102-959-00	150	1-101-361-00	0.001	1-102-074-00
0.75	1-101-586-00	24	1-102-960-00	160	1-101-367-00	0.0012	1-102-118-00
1.0	1-102-934-00	27	1-102-961-00	180	1-102-976-00	0.0015	1-102-119-00
1.5	1-101-576-00	30	1-102-962-00	200	1-102-977-00	0.0018	1-102-120-00
2.0	1-102-935-00	33	1-102-963-00	220	1-102-978-00	0.0022	1-102-121-00
3	1-102-936-00	36	1-102-964-00	240	1-102-979-00	0.0027	1-102-122-00
4	1-102-937-00	39	1-102-965-00	270	1-102-980-00	0.0033	1-102-123-00
5	1-102-942-00	43	1-102-966-00	300	1-102-981-00	0.0039	1-102-124-00
6	1-102-943-00	47	1-101-880-00	330	1-102-820-00	0.0047	1-102-125-00
7	1-102-944-00	51	1-101-882-00	360	1-102-821-00	0.0056	1-102-126-00
8	1-102-945-00	56	1-101-884-00	390	1-102-822-00	0.0068	1-102-127-00
9	1-102-946-00	62	1-101-886-00	430	1-102-823-00	0.0082	1-102-128-00
10	1-102-947-00	68	1-101-888-00	470	1-102-824-00	0.01	1-102-129-00
11	1-102-948-00	75	1-101-890-00	510	1-101-059-00	0.022	1-101-005-00
12	1-102-949-00	82	1-102-971-00	560	1-102-115-00	0.047	1-101-006-00
13	1-102-950-00	91	1-102-972-00	680	1-102-116-00		
15	1-102-951-00	100	1-102-973-00	820	1-102-117-00		
16	1-102-952-00	110	1-102-815-00				
18	1-102-953-00	120	1-102-816-00				
20	1-102-958-00	130	1-101-081-00				

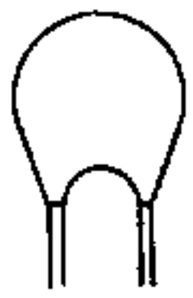
0.001μF = 1,000pF

CERAMIC (SEMICONDUCTOR) CAPACITORS

CAP. (μF)	RATING → : Use the high voltage rated one.				
	25 VOLT.	50 VOLT.	CAP. (μF)	25 VOLT.	50 VOLT.
	PART No.	PART No.		PART No.	PART No.
0.001	→	1-161-039-00	0.018	1-161-016-00	1-161-054-00
0.0012	→	1-161-040-00	0.022	1-161-017-00	1-161-055-00
0.0015		1-161-041-00	0.027	1-161-018-00	1-161-056-00
0.0018		1-161-042-00	0.033	1-161-019-00	1-161-057-00
0.0022		1-161-043-00	0.039	1-161-010-00	1-161-058-00
0.0027	→	1-161-044-00	0.047	1-161-021-00	1-161-059-00
0.0033	→	1-161-045-00	0.056	→	1-161-060-00
0.0039	→	1-161-046-00	0.068	→	1-161-061-00
0.0047	→	1-161-047-00	0.082	1-161-024-00	1-161-062-00
0.0056	→	1-161-048-00	0.1	1-161-025-00	1-161-063-00
0.0068	→	1-161-049-00			
0.0082	1-161-012-00	1-161-050-00			
0.01	1-161-013-00	1-161-051-00			
0.012	→	1-161-052-00			
0.015	1-161-015-00	1-161-053-00			

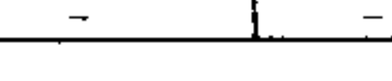
MYLAR CAPACITORS

CAP. (μF)	RATING											
	50 VOLT.	100 VOLT.	200 VOLT.		50 VOLT.	100 VOLT.	200 VOLT.		50 VOLT.	100 VOLT.	200 VOLT.	
	PART No.	PART No.	PART No.		PART No.	PART No.	PART No.		PART No.	PART No.	PART No.	
0.001	1-108-227-00	1-108-365-00	1-108-409-00	0.01	1-108-239-00	1-108-377-00	1-108-421-00	0.1	1-108-251-00	1-108-389-00	1-108-433-00	
0.0012	1-108-351-00	1-108-366-00	1-108-410-00	0.012	1-108-357-00	1-108-378-00	1-108-422-00	0.12	1-108-363-00	1-108-390-00	1-108-434-00	
0.0015	1-108-228-00	1-108-367-00	1-108-411-00	0.015	1-108-240-00	1-108-379-00	1-108-423-00	0.15	1-108-252-00	1-108-391-00	1-108-435-00	
0.0018	1-108-352-00	1-108-368-00	1-108-412-00	0.018	1-108-358-00	1-108-380-00	1-108-424-00	0.18	1-108-364-00	1-108-392-00	1-108-436-00	
0.0022	1-108-220-00	1-108-369-00	1-108-413-00	0.022	1-108-242-00	1-108-381-00	1-108-425-00	0.22	1-108-254-00	1-108-393-00	1-108-437-00	
0.0027	1-108-353-00	1-108-370-00	1-108-414-00	0.027	1-108-359-00	1-108-382-00	1-108-426-00	0.27	1-108-854-00	–	–	
0.0033	1-108-232-00	1-108-371-00	1-108-415-00	0.033	1-108-244-00	1-108-383-00	1-108-427-00	0.33	1-108-855-00	–	–	
0.0039	1-108-354-00	1-108-372-00	1-108-416-00	0.039	1-108-360-00	1-108-384-00	1-108-428-00	0.39	1-108-856-00	–	–	
0.0047	1-108-234-00	1-108-373-00	1-108-417-00	0.047	1-108-246-00	1-108-385-00	1-108-429-00	0.47	1-108-857-00	–	–	
0.0056	1-108-355-00	1-108-374-00	1-108-418-00	0.056	1-108-361-00	1-108-386-00	1-108-430-00					
0.0068	1-108-237-00	1-108-375-00	1-108-419-00	0.068	1-108-249-00	1-108-387-00	1-108-431-00					
0.0082	1-108-356-00	1-108-376-00	1-108-420-00	0.082	1-108-362-00	1-108-388-00	1-108-432-00					



TANTALUM CAPACITORS

CAP. (μF)	RATING → : Use the high voltage rated one.						
	3.15 VOLT.	6.3 VOLT.	10 VOLT.	16 VOLT.	20 VOLT.	25 VOLT.	35 VOLT.
	PART No.	PART No.	PART No.	PART No.	PART No.	PART No.	PART No.
0.01					→	→	1-131-396-00
0.015						→	1-131-397-00
0.022						→	1-131-398-00
0.033						→	1-131-399-00
0.047						→	1-131-400-00
0.068					→	→	1-131-401-00
0.1					→	→	1-131-402-00
0.15					→	→	1-131-403-00
0.22					→	→	1-131-404-00
0.33					→	1-131-409-00	1-131-405-00
0.47	–	–	–	–	1-131-412-00	→	1-131-406-00
0.68	–	–	–	1-131-415-00	→	1-131-410-00	1-131-407-00
1.0	–	–	1-131-418-00	–	1-131-413-00	→	1-131-408-00
1.5	–	1-131-421-00	–	1-131-416-00	→	1-131-411-00	1-131-348-00
2.2	1-131-424-00	–	1-131-419-00	–	1-131-414-00	1-131-355-00	1-131-349-00
3.3	–	1-131-422-00	–	1-131-417-00	1-131-362-00	1-131-356-00	1-131-350-00
4.7	1-131-425-00	–	1-131-420-00	1-131-369-00	1-131-363-00	1-131-357-00	1-131-351-00
6.8	–	1-131-423-00	1-131-376-00	1-131-370-00	1-131-364-00	1-131-358-00	1-131-352-00
10	1-131-426-00	1-131-383-00	1-131-377-00	1-131-371-00	1-131-365-00	1-131-359-00	1-131-353-00
15	1-131-390-00	1-131-384-00	1-131-378-00	1-131-372-00	1-131-366-00	1-131-360-00	–
22	1-131-391-00	1-131-385-00	1-131-379-00	1-131-373-00	1-131-367-00		
33	1-131-392-00	1-131-386-00	1-131-380-00	1-131-374-00			
47	1-131-393-00	1-131-387-00	1-131-381-00	–			
68	1-131-394-00	1-131-388-00	–	–			
100	1-131-395-00	–	–	–			



TANTALUM CAPACITORS

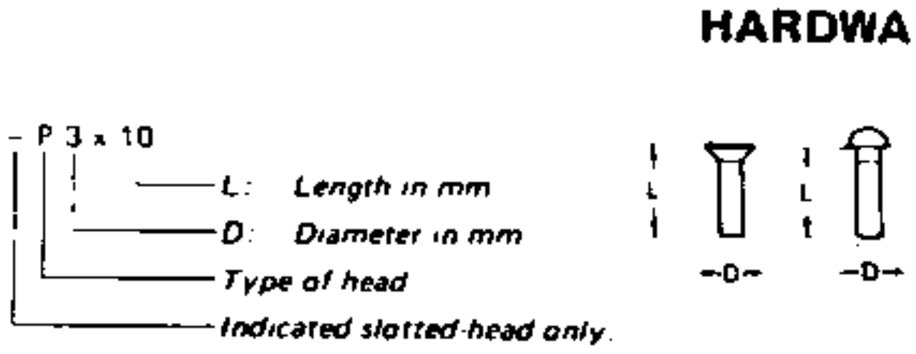
CAP. (μF)	RATING					
	3 VOLT.	6.3 VOLT.	10 VOLT.	16 VOLT.	20 VOLT.	35 VOLT.
	PART No.	PART No.	PART No.	PART No.	PART No.	PART No.
0.033						1-131-273-00
0.047						1-131-274-00
0.068						1-131-275-00
0.1						1-131-276-00
0.15						1-131-277-00
0.22			–	–	1-131-262-00	1-131-278-00
0.33			–	–	1-131-263-00	1-131-279-00
0.47			1-131-169-00	–	1-131-264-00	1-131-280-00
0.68			–	1-131-258-00	1-131-265-00	1-131-281-00
1.0			1-131-254-00	–	1-131-266-00	1-131-282-00
1.5		1-131-250-00	–	–	1-131-267-00	1-131-283-00
2.2		–	–	1-131-259-00	1-131-268-00	1-131-284-00
3.3		–	1-131-255-00	–	1-131-269-00	–
4.7		1-131-251-00	1-131-171-00	–	1-131-270-00	–
6.8		–	–	1-131-260-00	1-131-271-00	–
10	–	–	1-131-256-00	–	1-131-272-00	–
15	–	1-131-252-00	–	1-131-261-00		
22	–	–	1-131-257-00	–		
33	1-131-176-00	1-131-253-00	1-131-173-00	–		
47	1-131-288-00	1-131-174-00	–	–		
100	1-131-177-00					

1/4 WATT CARBON RESISTORS

Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.
1.0	1-246-401-00	10	1-246-425-00	100	1-246-449-00	1.0k	1-246-473-00	10k	1-246-497-00	100k	1-246-521-00	1.0M	1-246-545-00
1.1	1-246-402-00	11	1-246-426-00	110	1-246-450-00	1.1k	1-246-474-00	11k	1-246-498-00	110k	1-246-522-00	1.1M	1-210-814-00
1.2	1-246-403-00	12	1-246-427-00	120	1-246-451-00	1.2k	1-246-475-00	12k	1-246-499-00	120k	1-246-523-00	1.2M	1-210-815-00
1.3	1-246-404-00	13	1-246-428-00	130	1-246-452-00	1.3k	1-246-476-00	13k	1-246-500-00	130k	1-246-524-00	1.3M	1-210-816-00
1.5	1-246-405-00	15	1-246-429-00	150	1-246-453-00	1.5k	1-246-477-00	15k	1-246-501-00	150k	1-246-525-00	1.5M	1-210-817-00
1.6	1-246-406-00	16	1-246-430-00	160	1-246-454-00	1.6k	1-246-478-00	16k	1-246-502-00	160k	1-246 526-00	1.6M	1-210-818-00
1.8	1-246-407-00	18	1-246-431-00	180	1-246-455-00	1.8k	1-246-479-00	18k	1-246-503-00	180k	1-246-527-00	1.8M	1-210-819-00
2.0	1-246-408-00	20	1-246-432-00	200	1-246-456-00	2.0k	1-246-480-00	20k	1-246-504-00	200k	1-246-528-00	2.0M	1-210-820-00
2.2	1-246-409-00	22	1-246-433-00	220	1-246-457-00	2.2k	1-246-481-00	22k	1-246-505-00	220k	1-246-529-00	2.2M	1-210-821-00
2.4	1-246-410-00	24	1-246-434-00	240	1-246-458-00	2.4k	1-246-482-00	24k	1-246-506-00	240k	1-246-530-00	2.4M	1-244-754-00
2.7	1-246-411-00	27	1-246-435-00	270	1-246-459-00	2.7k	1-246-483-00	27k	1-246-507-00	270k	1-246-531-00	2.7M	1-244-755-00
3.0	1-246-412-00	30	1-246-436-00	300	1-246-460-00	3.0k	1-246-484-00	30k	1-246-508-00	300k	1-246-532-00	3.0M	1-244-756-00
3.3	1-246-413-00	33	1-246-437-00	330	1-246-461-00	3.3k	1-246-485-00	33k	1-246-509-00	330k	1-246-533-00	3.3M	1-244-757-00
3.6	1-246-414-00	36	1-246-438-00	360	1-246-462-00	3.6k	1-246-486-00	36k	1-246-510-00	360k	1-246-534-00	3.6M	1-244-758-00
3.9	1-246-415-00	39	1-246-439-00	390	1-246-463-00	3.9k	1-246-487-00	39k	1-246-511-00	390k	1-246-535-00	3.9M	1-244-759-00
4.3	1-246-416-00	43	1-246-440-00	430	1-246-464-00	4.3k	1-246-488-00	43k	1-246-512-00	430k	1-246-536-00	4.3M	1-244-760-00
4.7	1-246-417-00	47	1-246-441-00	470	1-246-465-00	4.7k	1-246-489-00	47k	1-246-513-00	470k	1-246-537-00	4.7M	1-244-761-00
5.1	1-246-418-00	51	1-246-442-00	510	1-246-466-00	5.1k	1-246-490-00	51k	1-246-514-00	510k	1-246-538-00	5.1M	1-244-762-00
5.6	1-246-419-00	56	1-246-443-00	560	1-246-467-00	5.6k	1-246-491-00	56k	1-246-515-00	560k	1-246-539-00		
6.2	1-246-420-00	62	1-246-444-00	620	1-246-468-00	6.2k	1-246-492-00	62k	1-246-516-00	620k	1-246-540-00		
6.8	1-246-421-00	68	1-246-445-00	680	1-246-469-00	6.8k	1-246-493-00	68k	1-246-517-00	680k	1-246-541-00		
7.5	1-246-422-00	75	1-246-446-00	750	1-246-470-00	7.5k	1-246-494-00	75k	1-246-518-00	750k	1-246-542-00		
8.2	1-246-423-00	82	1-246-447-00	820	1-246-471-00	8.2k	1-246-495-00	82k	1-246-519-00	820k	1-246-543-00		
9.1	1-246-424-00	91	1-246-448-00	910	1-246-472-00	9.1k	1-246-496-00	91k	1-246-520-00	910k	1-246-544-00		

HARDWARE NOMENCLATURE

Screw:



Nut, Washer, Retaining ring:

Reference Designation	Shape	Description	Remarks
SCREWS			
P		pan-head screw	binding-head (B) screw for replacement
PWH		pan-head screw with washer face	binding-head (B) screw and flat washer for replacement
PS PSP		pan-head screw with spring washer	binding-head (B) screw and spring washer for replacement
PSW PSPW		pan-head screw with spring and flat washers	binding-head (B) screw and spring and flat washers for replacement
R		round-head screw	binding-head (B) screw for replacement
K		flat-countersunk-head screw	
RK		oval-countersunk-head screw	
B		binding-head screw	
T		truss-head screw	binding-head (B) screw for replacement
F		flat-fillister-head screw	
RF		fillister-head screw	
BV		brazier-head screw	

Reference Designation	Shape	Description	Remarks
SELF-TAPPING SCREWS			
TA		self-tapping screw	ex TA P 3 x 10
PTP		pan-head self-tapping screw	binding-head self-tapping (TA, B) screw for replacement
PTPWH		pan-head self-tapping screw with washer face	binding-head self tapping (TA, B) screw and flat washer for replacement
PTTWH		pan-head thread-rolling screw with washer face	binding-head (B) screw and flat washer for replacement
SET SCREWS			
SC		set screw	
SC		hexagon-socket set screw	ex SC 2 6 x 4, hexagon socket
NUT			
N		nut	
WASHERS			
W		flat washer	
SW		spring washer	
LW		internal-tooth lock washer	ex LW3, internal
LW		external-tooth lock washer	ex LW3, external
RETAINING RINGS			
E		retaining ring	
G		grip-type retaining ring	

ST-JX22L/22LB

MW/LW tuner section

		MW	LW
Tuning range		522 kHz - 1,602 kHz	153 kHz – 344 kHz
Antenna	ferrite-bar antenna	provided	provided
	external antenna terminal	provided	provided
Intermediate frequency		450 kHz	450 kHz
Usable sensitivity	ferrite-bar antenna	200 μV/m (at 1,000 kHz)	400 μV/m (at 230 kHz)
	external antenna	100 μV (at 1,000 kHz)	50 μV (at 230 kHz)
Signal-to-noise ratio		54 dB	54 dB
Harmonic distortion		0.3%	0.3%
Selectivity		35 dB (9 kHz)	35 dB (9 kHz)

General

System FM stereo, FM/AM superheterodyne tuner

Power requirements (AEP) : 220 V ac
(UK) : 240 V ac
adjustable
50/60 Hz

Power consumption 8 watts

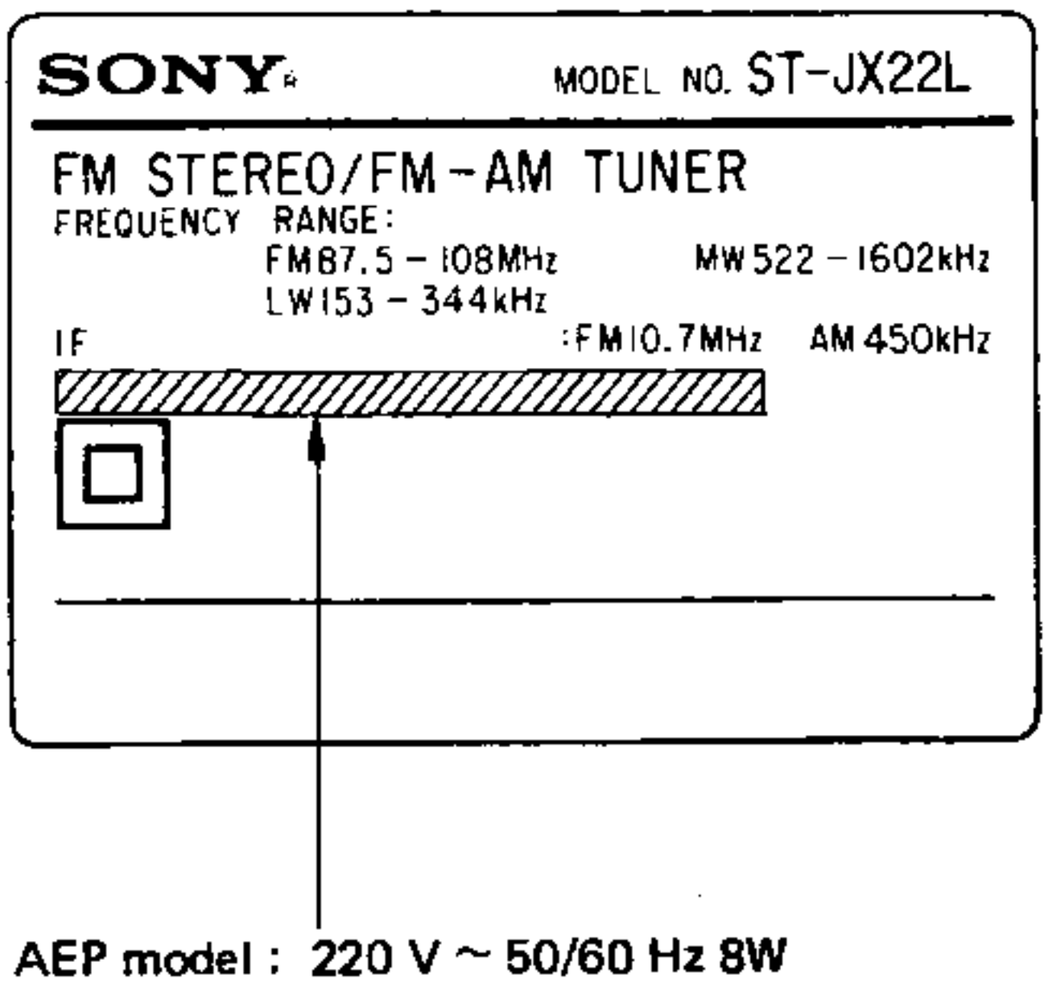
Dimensions Approx. 430 × 55 × 310 mm (w/h/d)
(17 × 2¼ × 12¼ inches)
including projecting parts and controls

Weight Approx. 2.6 kg (5 lbs 12 oz) net
Approx. 3.1 kg (6 lbs 14 oz) in shipping carton

MODEL IDENTIFICATION

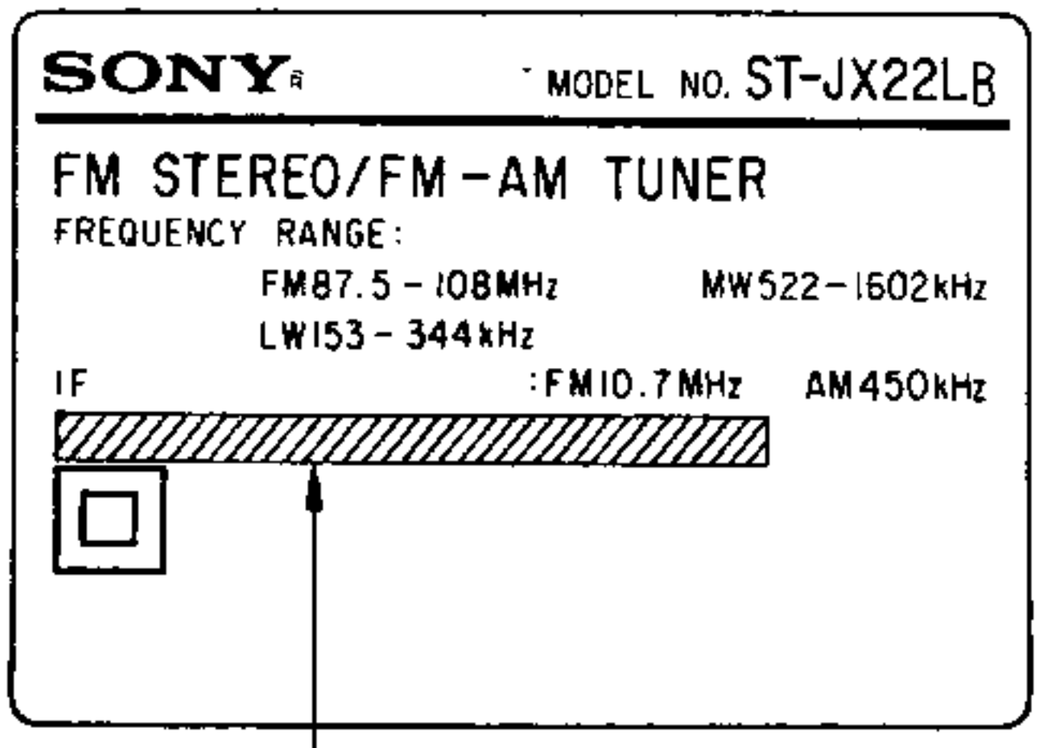
– Specification Label –

- **ST-JX22L**



AEP model : 220 V ~ 50/60 Hz 8W
UK model : 240 V ~ 50/60 Hz 8W

- **ST-JX22LB**



AEP model : 220 V ~ 50/60 Hz 8W

Sony Corporation
Audio & Video Group

9-951-035-11

English
82J0288-1
Printed in Japan

SONY

TROUBLESHOOTING GUIDE

AEP Model
UK Model

ST-JX22L

Met dank aan **Paul Huneker**

FM STEREO/FM-AM TUNER

Sony Corporation/Audio & Video Group

Table of Contents

This Guide is to facilitate repair.
Please use in conjunction with the Service Manual.

[How to use the ST-JX22L Troubleshooting Guide]

- Check in numerical order, starting with ①. When the voltages and waveforms differ from the ones in the table, check for the defective part given in the table. If it is normal, proceed to the next number.

- How to use the table

Example:

Voltage	Defective Parts
 3 Vp-p	Q103, Q104 R302 ~ R305 C101, C105

Possible defective parts

Normal voltages and waveforms
For a sinusoidal wave:

 low frequency

 high frequency

- The voltages, etc. may differ from those given in the Service Manual. Also, the signal level applied to check for the defective parts has no relation whatsoever to the standard input level and input level for alignments given in the Service Manual.

- Cold solders and pattern cuts are not included under "Defective Parts", so please check for these, also.

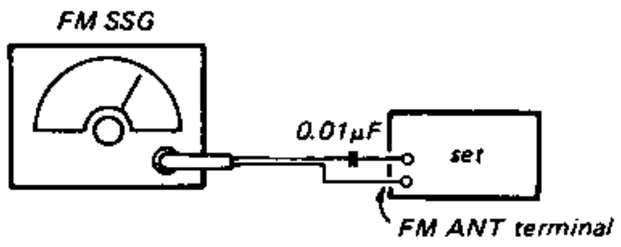
(MEMO)

ST-JX22L ST-JX22L

- No FM Sound
- Poor FM Sensitivity
- FM Sound Too Small

Input 98 MHz FM signal from FM ANT plug with FM SSG (60 dB, 1 KHz, deviation (30%) monoral)

Receive FM SSG signal (MUTING: OFF)



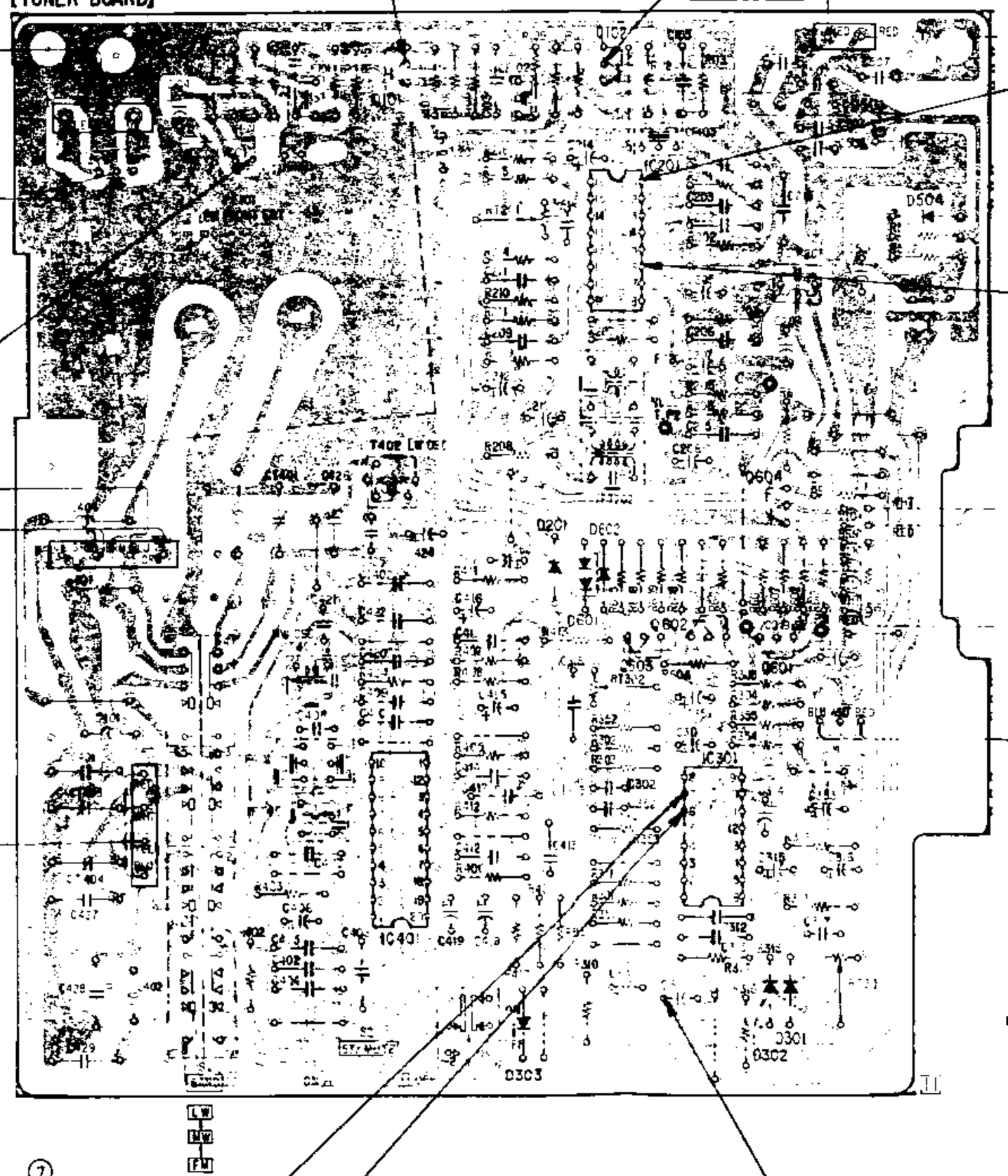
Note: Easy check for FM reception sensitivity.

- Input a 98 MHz FM signal from FM ANT terminal using FM SSG.
- Receive FM SSG singal.

IC201 pin ① IF voltage

Output	Voltage
50 dB	60 m Vp-p
55 dB	100 m Vp-p

[TUNER BOARD]



① 30 m Vp-p

Voltage	Defective Part
	Front end C001, L902

10.7 MHz
Front end output waveform

② 60mVp-p

Voltage	Defective Part
	Q101, CF101, C103 R101~R108

10.7MHz IF waveform

③ 300 m Vp-p

Voltage	Defective Part
	Q102 CF102, C105 R109~R113

10.7 MHz IF Waveform

④ 200 m Vp-p

Voltage	Defective Part
	CF103 R201 C201 ~C203

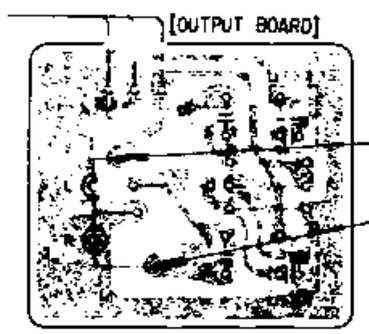
10.7 MHz, IF waveform

⑤ 300 m Vp-p

Voltage	Defective Part
	IC201, IFT201, IFT202 RT201, R202, R204 ~R211 C204, C207 ~C214

1 KHz. Detected signal waveform

[OUTPUT BOARD]



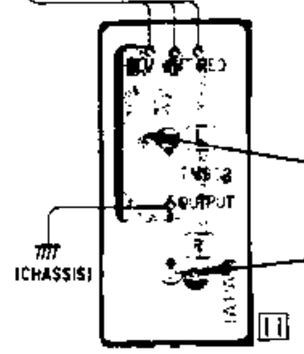
AEP only
Sirial No 503001~
No 206031~

⑧ 700mVp-p

Voltage		Defective Part
	L	R304, R901, R902, C303, C902 L901
	R	R354, R903, R904, C353, C903, L902

1KHz Signal waveform

[OUT PUT BOARD]



⑧ 700 m Vp-p

Voltage		Defective Part
	L	R304, R305 C303
	R	R354, R355 C353

1 KHz Signal waveform

⑦ 1.6 Vp-p

Voltage		Defective Part
	L	IC301, D301, R316, S2 RT302, R301 ~R303 C318, C301, C302
	R	IC301, D301, R316, S2 RT302, R351 ~R353 C318, C351, C352

1 KHz Signal waveform

⑥ 300 m Vp-p

Voltage	Defective Part
	B.E.F.201 C205, C206 C310, R203

1 KHz MPX Input waveform

[- IC 201 (FM IF amp, FM detection) Troubleshooting.]

ST-JX22L ST-JX22L

Voltage values and waveforms are for reception of the following FM signal input from FM ANT terminal.

RF frequency	98 MHz
RF output level	60 dB
AF frequency	1 KHz
Modulation rate	30%

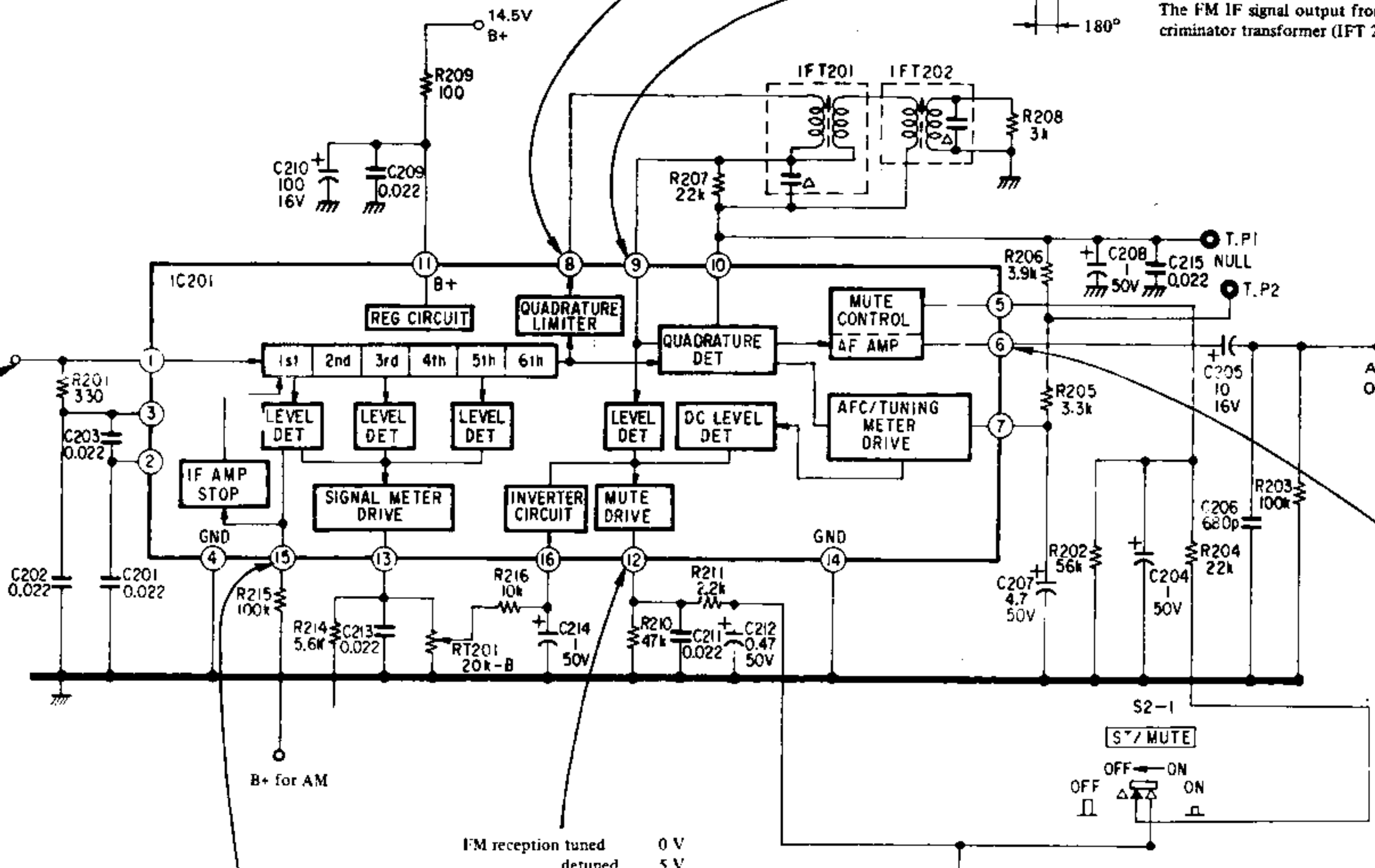
R + L STEREO
(STEREO/MUTING Switch ON)

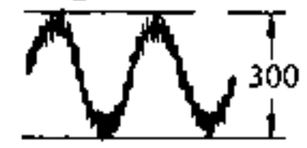
FM IF waveform

330 m Vp-p
10.7 MHz FM IF waveform

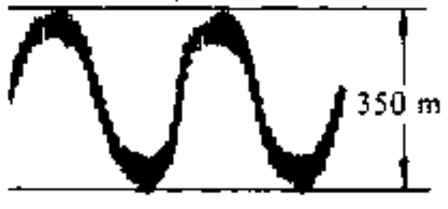
180 m Vp-p
10.7 MHz FM IF waveform

The FM IF signal output from pin ⑧ is phase shifted at the discriminator transformer (IFT 201, IFT 202) and input to Pin ⑨.





19 KHz pilot signal is superimposed on 1 KHz signal waveform.



Detected 1 KHz Singal waveform.
19 KHz pilot signal is superimposed

Main IC201 Functions

FM IF amp.
Quadrature detection
Muting
Signal Meter drive
Tuning meter drive.

5.6V for AM reception
When pin ⑮ goes H, the IF AMP operation stop.

FM reception tuned	0 V
detuned	5 V
For FM reception tuned	
Pin ⑫	0 V
Q604	OFF
D902	ON

FM tuned LED lights up

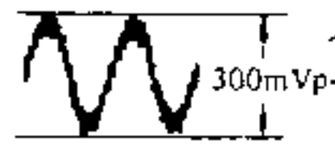
[· IC 301 (Stereo demodulation) troubleshooting]

ST-JX22L ST-JX22L

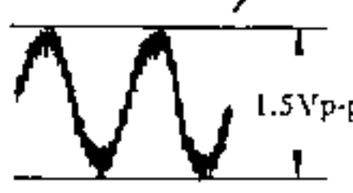
Voltage values and waveforms are for reception of the following FM signal input from FM ANT terminal.

RF frequency	98 MHz
RF output	60 dB
AF frequency	1 KHz
Modulation rate	30%

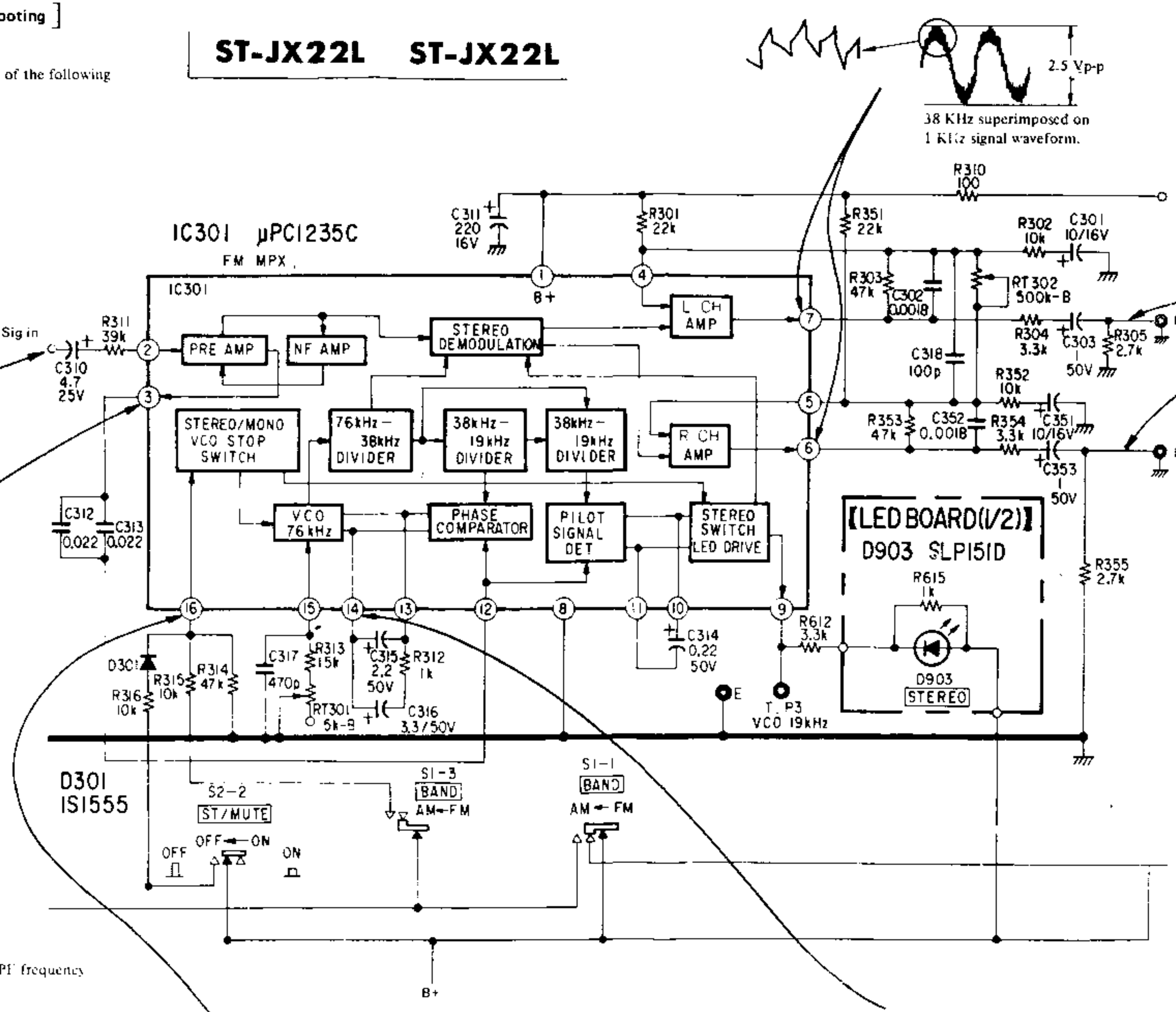
R + L STEREO
(STEREO/MUTING Switch ON)



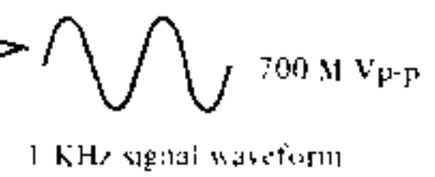
19 KHz pilot signal is superimposed on 1 KHz signal waveform.



19 KHz pilot signal is superimposed on 1 KHz signal waveform.



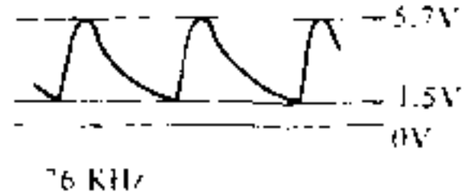
38 KHz superimposed on 1 KHz signal waveform.



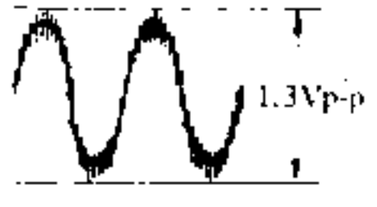
700 M Vp-p

1 KHz signal waveform

VCO stops when pin (16) is high
(Stereo muting switch off, or AM mode).
(VCO Stops when DC voltage is more than 7 V.)



76 KHz
VCO Oscilation Waveform

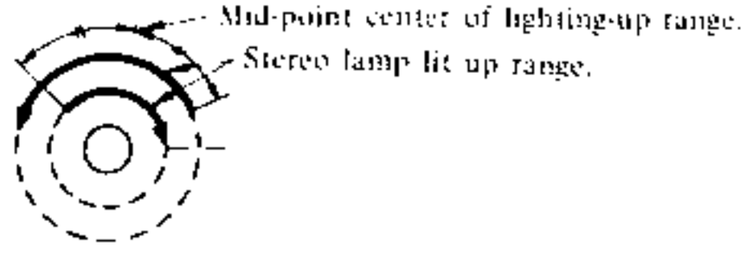


19 KHz pilot signal is superimposed on the 1 KHz signal waveform. This pilot signal is phase compared to the VCO signal inside the IC.

Main IC 301 Functions
Input pre-amp
PLL section (76 KHz VCO, phase comparator, LPF frequency divider, DC-AMP)
Stereo demodulation
Output amp.
Stereo lamp drive
VCO Stop switch

· Easy VCO adjustment method

1. Receive FM stereo signal.
2. Turn RT301 right and left, and set at the mid-point of the areas where the stereo lamp is lit up overlap.



- No AM (MW, LW) Sound
- Poor AM (") Sensitivity
- AM (") Sound Too Small

With AM SSG, input an AM signal from AM ANT. terminal.

Mode	Frequency	Output
MW	650KHz	60dB
LW	250KHz	60dB

Receive AM SSG signal. (MUTING: OFF)

NOTE: Easy check for AM reception sensitivity

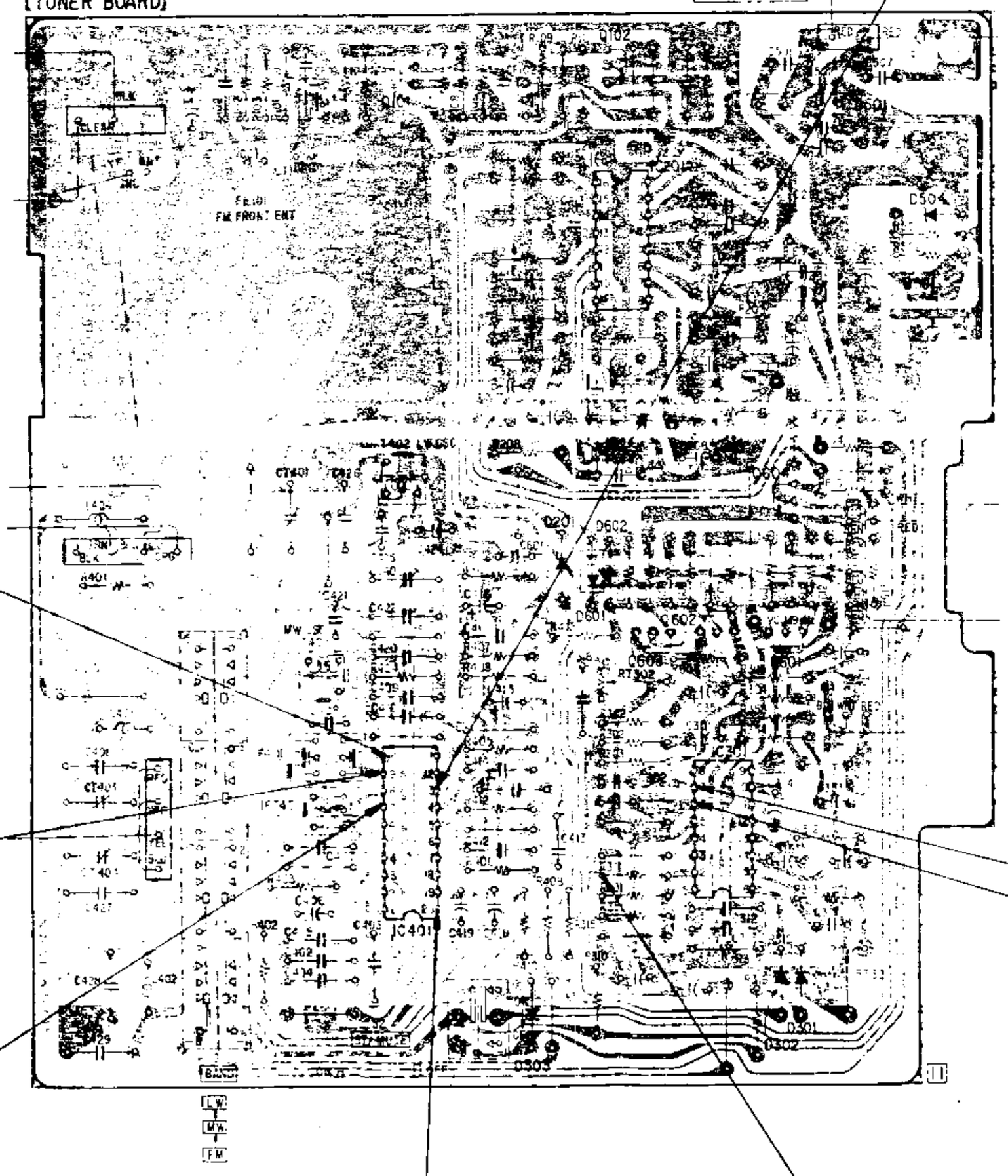
- INPUT a 650 KHz AM Signal from AM ANT terminal using AM SSG.
- Receive AM SSG Signal.
- IC 401 PIN ⑦ IF Voltage.

Output	Voltage
50dB	120mVp-p
55dB	200mVp-p

Voltage, Waveform	Defective Part
MW: 800mVp-p LW: 800mVp-p	IC 401, C402 C409 ~ C411 C417 ~ C419 R404 ~ R407 R412

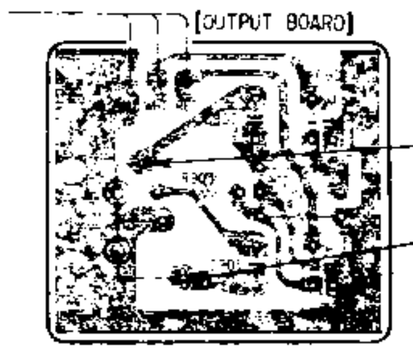
Detected Signal waveform.
1 KHz Signal has IF wave superimposed.

【TUNER BOARD】



AEP only
Sirial No 503001~
No 206031~

⑧

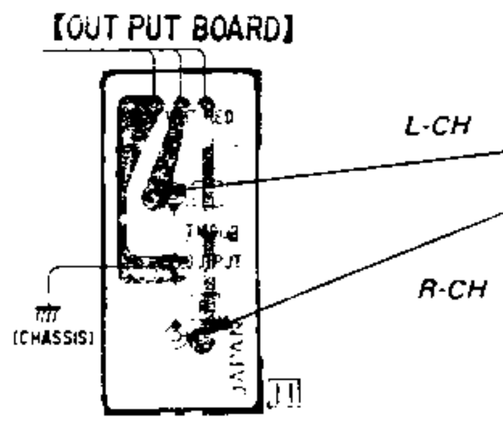


Voltage		Defective Part
MW: 650mVp-p LW: 650mVp-p	L	R304, R901, R902 C303, C902 L901
	R	R354, R903, R904 C353, C903 L902

1KHz Signal waveform

⑧

【OUT PUT BOARD】



Voltage, Waveform		Defective Part
MW: 650mVp-p LW: 650mVp-p	L	R304, R305 C303
	R	R354, R355 C353,

1 KHz Singal Waveform.

①

Voltage, Waveform	Defective Part
MW: 75mVp-p LW: 75mVp-p	IC 401

IF Waveform

③

Voltage, Waveform	Defective Part
MW: 55mVp-p LW: 55mVp-p	IFT 401 CT 401 C 408

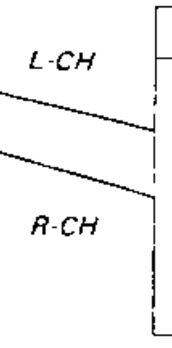
IF Waveform

②

Voltage, Waveform		Defective Part
MW: 350mVp-p LW: 350mVp-p	MW	IC401, CT404, L901 S1, CV2, C407
	LW	IC401, CT403, L901 S1, CV2, C407

IF Waveform

⑦



Voltage, Waveform		Defective Part
MW: 1.2Vp-p LW: 1.2Vp-p	L	IC301, D302, R314, S1 RT302, R301~R303 C318, C301, C302
	R	IC301, D302, R314, S1 RT302, R351~R353 C318, C351, C352

1 KHz Signal Waveform

①

Voltage, Waveform		Defective Part
MW: 1Vp-p LW: 1Vp-p	MW	IC401, T401, CT402 CV4, S1
	LW	IC401, T402, CT401 CV4, S1

Local oscillation waveform

⑥

Voltage, Waveform	Defective Part
MW: 220mVp-p LW: 220mVp-p	R408 ~ R410 C412, C413, C310 S1.

1 KHz Signal Waveform.