

**YAMAHA Hi-Fi STEREO
SERVICE MANUAL
FM/AM STEREO RECEIVER
MODEL CR-400**



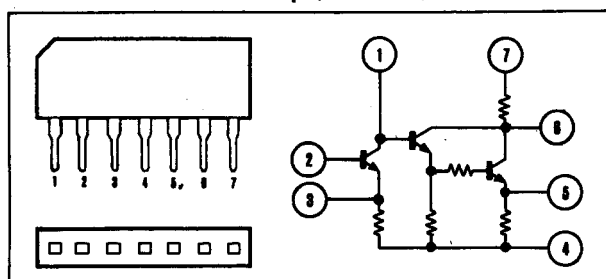
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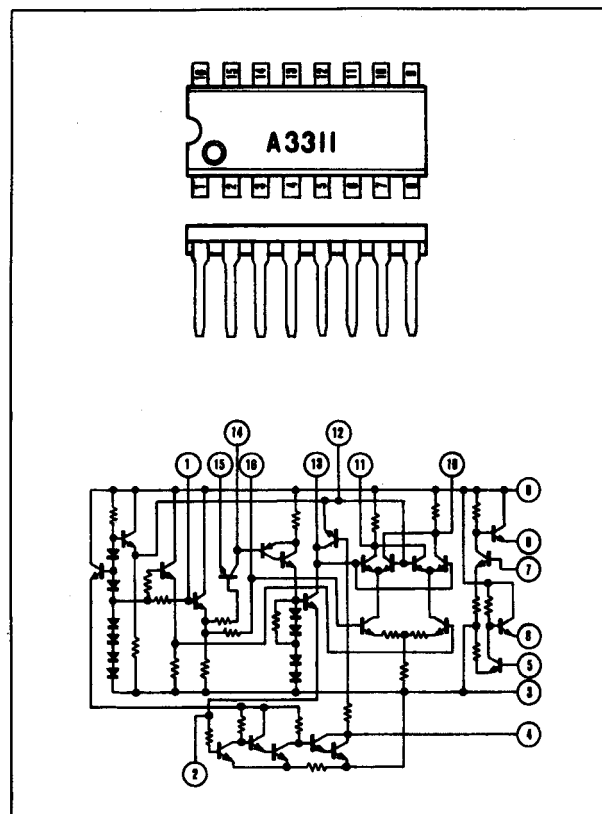
NEW PARTS

1. INTEGRATED CIRCUIT

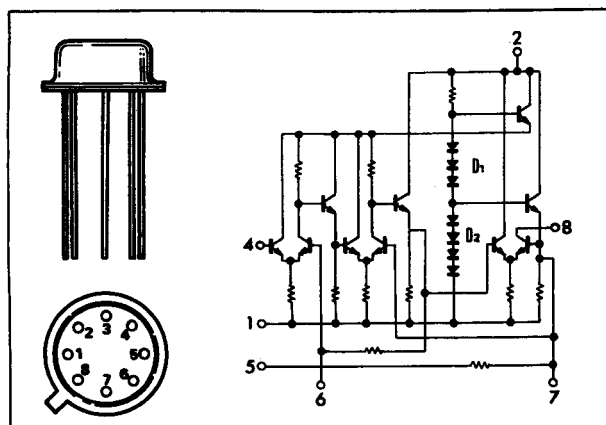
TA-7122p (EQ AMP)



LA-3311 (MPX)



LA-1111 (FM IF)



ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

	Vcc	Icc	Tstg	Topr
TA-7122P	42V	8mA	-30~ +75°C	-55~ +125°C
LA-1111	10V	15.5mA	-30~ +125°C	-20~ +75°C
LA-3311	14V	IL 40mA	-30~ +100°C	-20~ +70°C

Tstg: Upper and lower limit values of the ambient temperature which must not be surpassed when the transistor out of operation is kept in storage.

Topr: Limit value of the ambient temperature at which operation is possible under the prescribed heat radiation conditions.

Vcc: Maximum collector voltage.

Icc: Maximum collector current.

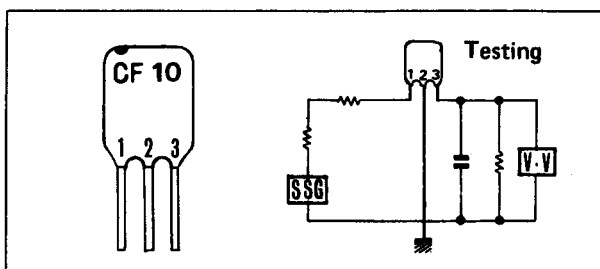
IL: Current to drive the Lamp.

NOTE:

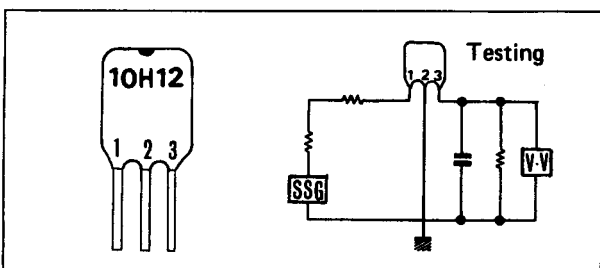
1. Do not wet ICs with water or other conductive liquids.
2. Do not leave ICs in heat or oxidizing atmospheres for long periods.
3. Avoid using testers to check ICs for service ability.
4. When soldering an IC with a regular soldering iron, work as first as possible, try to finish within at most four seconds. For best results, use a special IC soldering iron.

2. CERAMIC FILTER

CF-10M-12



CF-10H-12



Part Name	CF-10H-12	CF-10M-12
Items		
f _o	10.7 MHz	10.7 MHz
Input Output Impedance	470Ω	500Ω
Bandwidth	160 ± 40 kHz (at -3 dB) 400 kHz : or lower (at -20 dB)	290 ± 40 kHz (at -3 dB) 650 kHz : or lower (at -20 dB)

3. LIGHT EMITTING DIODE (L.E.D.)

TLR-102

Remark:

Panel Circuit Indicator

Features:

- Low drive power, High Brightness Visible Red Light Emission
- Red Opaque Lens Provides Excellent Wide Viewing Angle
- Fast Response Time, Capable of Pulse Operation
- Miniature Package
- Miniature Package
- Maximum Ratings

Forward Current (I_F) ; 15 mA

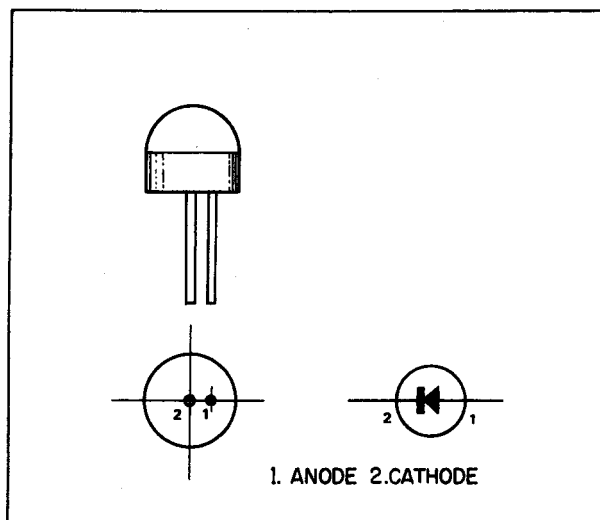
Inverse Voltage (V_R) ; 4V

- Characteristics

Forward Voltage (V_F) ; 2.6 V (at I_F = 20 mA)

Inverse Current (I_R) ; 0.5μA (at V_R = 4V)

Brightness (B) ; 60fL (at I_F = 10mA)



Note:

Soldering temperature : lower than 260°C

Soldering time : less than 3 sec.

How to check the led :

Please use a V.O.M. Rated Forward Resistance: 3kΩ

Rated Inverse Resistance: ∞Ω

SPECIFICATIONS

• AUDIO SECTION

POWER OUTPUT

Continuous RMS Power (both channels driven at 20 to 20,000Hz, 8Ω)	18 + 18 Watts
Continuous RMS Power (both channels driven at 20 to 20,000Hz, 4Ω)	18 + 16 Watts
Continuous RMS Power (both channels driven at 1kHz 8Ω)	18 + 18 Watts
Continuous RMS Power (both channels driven at 1kHz 4Ω)	20 + 20 Watts
Continuous RMS Power (each channel driven at 1kHz 8Ω)	20/20 Watts
Continuous RMS Power (each channel driven at 1kHz 4Ω)	24/24 Watts
Dynamic Power (IHF 8Ω)	56 Watts
Dynamic Power (IHF 4Ω)	76 Watts

TOTAL HARMONIC DISTORTION

Power Amplifier only (at rated power 8Ω) (at 1 Watt)	less than 0.1%
Overall (AUX to Power Amp. at rated Power 8Ω)	less than 0.5%

INTERMODULATION DISTORTION (70Hz:7kHz = 4:1 SMPTE method)

Power Amplifier only (at rated Power 8Ω)	less than 0.1%
Power Amplifier only (at 1 Watt, 8Ω)	less than 0.1%
Overall (AUX to Power output, 8Ω) at rated Power	less than 0.1%

POWER BANDWIDTH (IHF distortion 0.5% const.)

Frequency Response (at 1 Watt)	15 ~ 50,000Hz
Overall (AUX, TAPE PB to Power Output)	20 ~ 50,000Hz +0.5dB, -3dB
Overall (MIC to Power Output)	100 ~ 10,000Hz +0.5dB, -6dB
Deviation of RIAA (30Hz to 15kHz)	+0.7 dB, -0.7dB
Load Impedance	4 ~ 18Ω
Damping Factor (at 1kHz, 8Ω)	40
Channel Separation (at rated power 1kHz)	
Overall (from PHONO)	50dB
Overall (from AUX, TAPE PB)	50dB
Overall (from MIC)	50dB

Hum and Noise (IHF, Closed Circuit A Network)

Overall (from PHONO)	72dB
Overall (from MIC)	65dB
Overall (from AUX, TAPE PB)	85dB
Volume at minimum	85dB
Input Sensitivity and Impedance (at rated power 1kHz)	
PHONO	3mV (50kΩ)
PHONO max. input capability	135mV (T.H.O. 0.5%)
MIC	3mV (50kΩ)
MIC max. input capability	450mV (T.H.O. 0.3%)
TAPE PB, AUX	150mV (100kΩ)
Output Level and Impedance (at 1kHz)	
TAPE REC OUT	150mV (10kΩ)
PRE OUT	200mV (3kΩ)
Tone Controls	
BASS	+10dB, -10dB at 50Hz
TREBLE	+10dB, -10dB at 10kHz
Loudness Control	+8dB at 100Hz, +4dB at 10kHz

• TUNER SECTION

FM:

Tuning Range	88 ~ 108MHz
Usable Sensitivity, (IHF)	2.5μV
Image Frequency Rejection	55dB
IF Rejection	75dB
Spurious Response Rejection	75dB
AM Rejection	50dB
Capture Ratio	2.0dB
Alternate Channel Selectivity (IHF)	65dB
Signal-to-Noise Ratio	68dB
Total Harmonic Distortion	
MONO (at 400 Hz)	0.3%
STEREO (at 400Hz)	0.8%
Stereo Separation (at 400Hz)	40dB
(50Hz to 10kHz)	25dB
Frequency Response	
(50Hz to 10kHz)	+1.0dB, -1.0dB
(20Hz to 15kHz)	+1.5dB, -3dB
Sub-Carrier Suppression	40dB
Muting Overside Signal Level	10μV
Antenna Impedance	300Ω balanced 75Ω unbalanced

AM:

Tuning Range	525 ~ 1,805kHz
Usable Sensitivity (IHF)	52dB/m
Signal-to-Noise Ratio (at 80dB/m)	43dB
Image Frequency Rejection (at 1,000kHz)	45dB
Selectivity (at 1,000kHz)	25dB
IF Rejection (at 1,000kHz)	40dB

• GENERAL

Semiconductors

IC's : 4
FET's: 3,
Transistors: 38
Diodes: 22,
Zener Diode: 1
LEO's : 2

Power Source

AC 110, 117, 130, 220,
240V, 50/60Hz

Power Consumption

Max.
Rated
130 Watts
80 Watts

AC Outlets

Switched
Unswitched
1 (200 Watts)
1 (200 Watts)

Dimensions

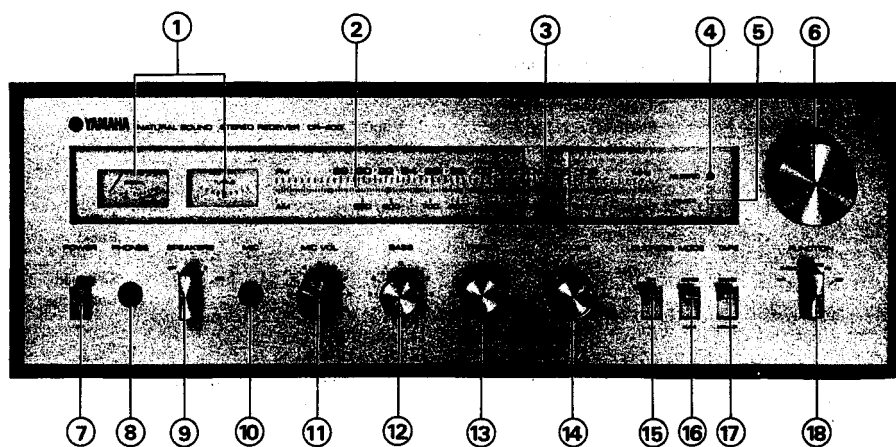
W: 444mm x H: 158mm
x O: 300mm
(17 1/4" x 6 1/4" x 11 3/4")

Weight

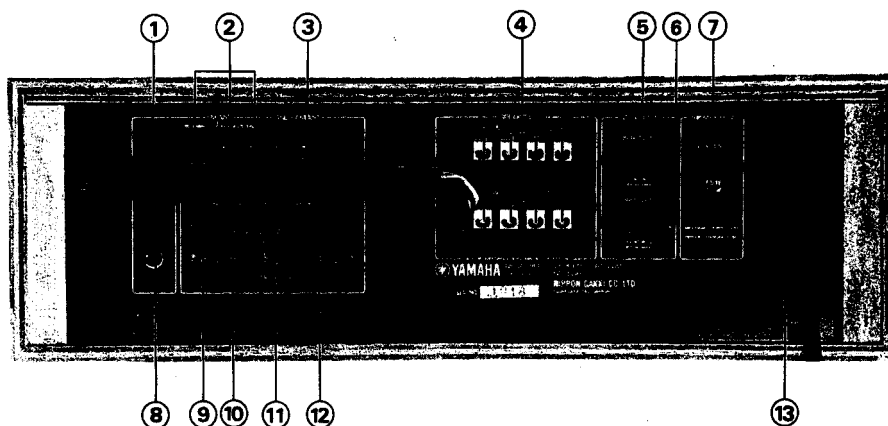
9.5 kg (20.9 lbs.)

EXTERNAL VIEW

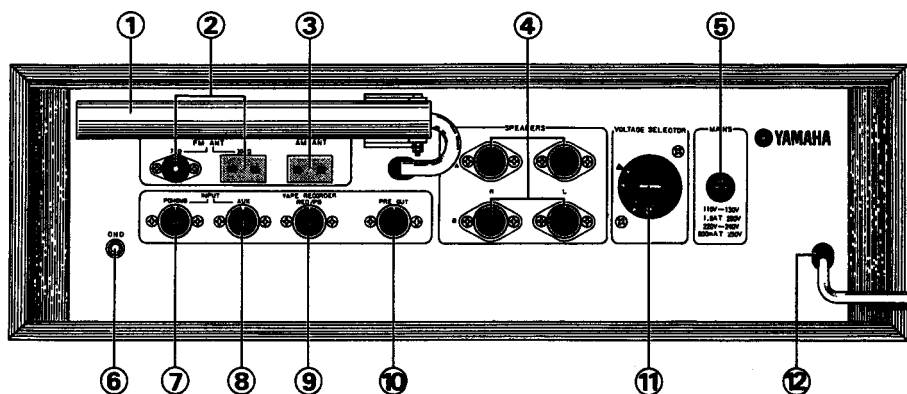
FRONT PANEL



REAR PANEL (U.S. & CANADIAN MODELS)



REAR PANEL (EUROPEAN MODEL)



FRONT PANEL

- ① SIGNAL AND TUNING METERS
- ② DIAL SCALE
- ③ DIAL POINTER
- ④ FM STEREO INDICATOR
- ⑤ POWER INDICATOR
- ⑥ TUNING KNOB
- ⑦ POWER SWITCH
- ⑧ HEADPHONE JACK
- ⑨ SPEAKER SELECTOR SWITCH
- ⑩ MIC JACK
- ⑪ MIC VOLUME CONTROL
- ⑫ BASS CONTROL
- ⑬ TREBLE CONTROL
- ⑭ VOLUME CONTROL
- ⑮ LOUDNESS CONTROL
- ⑯ MODE SWITCH
- ⑰ TAPE MONITOR SWITCH
- ⑱ FUNCTION SWITCH

REAR PANEL (U.S. & CANADIAN MODELS)

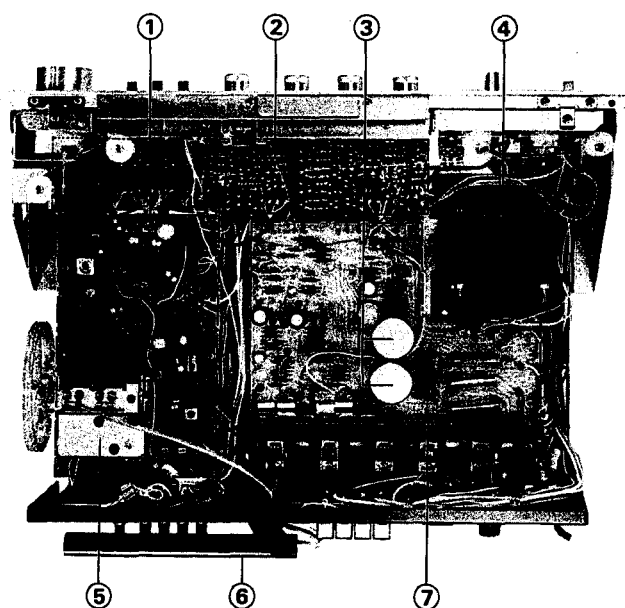
- ① AM FERRITE BAR ANTENNA
- ② FM ANTENNA TERMINALS
- ③ AM ANTENNA TERMINALS
- ④ SPEAKER TERMINALS
- ⑤ AC OUTLET (UNSWITCHED)
- ⑥ AC OUTLET (SWITCHED)
- ⑦ PRIMARY FUSE
- ⑧ GROUND TERMINAL
- ⑨ PHONO INPUT JACKS
- ⑩ AUX INPUT JACKS
- ⑪ TAPE REC OUT/TAPE PB JACKS
- ⑫ PRE OUT JACKS
- ⑬ AC CORD

REAR PANEL (EUROPEAN MODEL)

- ① AM FERRITE BAR ANTENNA
- ② FM ANTENNA CONNECTORS
- ③ AM ANTENNA CONNECTOR
- ④ SPEAKER CONNECTORS
- ⑤ PRIMARY FUSE
- ⑥ GROUND TERMINAL
- ⑦ PHONO INPUT CONNECTOR
- ⑧ AUX INPUT CONNECTOR
- ⑨ TAPE REC OUT/TAPE PB CONNECTOR
- ⑩ PRE OUT CONNECTOR
- ⑪ VOLTAGE SELECTOR
- ⑫ AC CORD

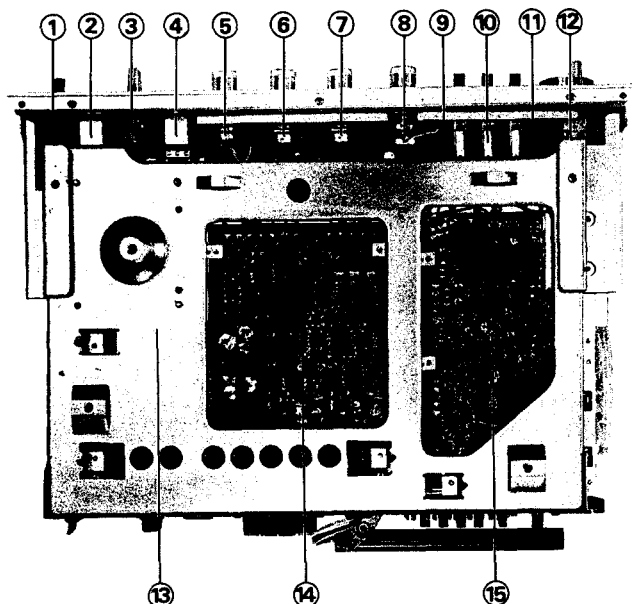
INTERNAL VIEW

TOP VIEW



- ① TUNER CIRCUIT BOARD
NA06386 ; U.S. & CANADIAN MODELS
NA06387 ; EUROPEAN, GENERAL &
AUSTRALIAN MODELS
NA06391 ; SOUTH AFRICAN MODEL
- ② PREAMP CIRCUIT BOARD
NA06380
- ③ ELECTROLYTIC CAPACITOR (3300 μ F/50WV)
- ④ POWER TRANSFORMER
GA60604
- ⑤ RF FRONT END PACK
FB117U ; EXCEPT SOUTH AFRICAN MODEL
FB117S ; SOUTH AFRICAN MODEL ONLY
- ⑥ AM FERRITE BAR ANTENNA
- ⑦ MAIN AMP CIRCUIT BOARD
NA06379 ; GENERAL, SOUTH AFRICAN &
AUSTRALIAN MODELS
NA06384 ; U.S. & CANADIAN MODEL
NA06385 ; EUROPEAN MODEL

BOTTOM VIEW



- ① POWER SWITCH
- ② HEADPHONE JACK
- ③ SPEAKER SELECTOR SWITCH
- ④ MIC JACK
- ⑤ VARIABLE RESISTOR (MIC VOLUME CONTROL:
50k Ω WITH SWITCH)
- ⑥ A VARIABLE RESISTOR (BASS CONTROL: W 30k Ω x2)
- ⑦ VARIABLE RESISTOR (TREBLE CONTROL: W 30k Ω
x2)
- ⑧ B VARIABLE RESISTOR (VOLUME CONTROL:
250k Ω x 2)
- ⑨ LOUDNESS SWITCH
- ⑩ MODE SELECTOR SWITCH
- ⑪ TAPE MONITOR SWITCH
- ⑫ PREAMP CIRCUIT BOARD
- ⑬ TUNER CIRCUIT BOARD
- ⑭ MAIN AMP CIRCUIT BOARD
- ⑮ CHASSIS

PARTIAL DISASSEMBLY

CABINET REMOVAL

- a. Remove screws 1~5 as shown in Photo 1.

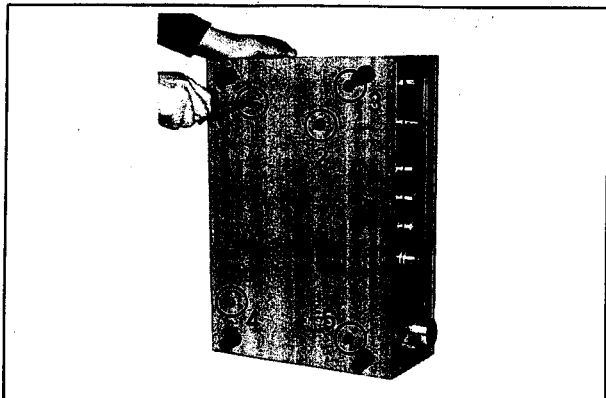


Photo 1

- b. Remove the cabinet as shown in Photo 2.

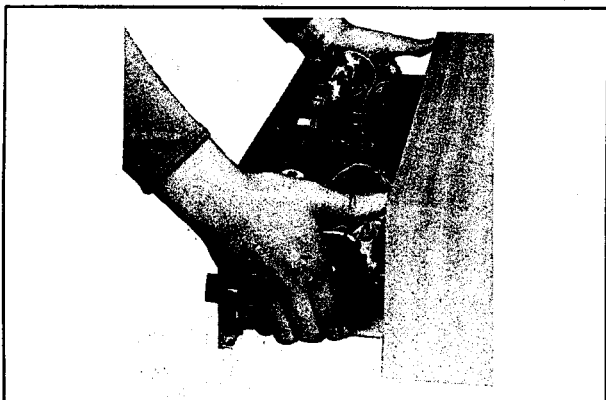


Photo 2

FRONT PANEL REMOVAL

- a. Loosen screws 1 and 2 with a hexagonal wrench. Then remove the tuning knob as shown in Photo 4.

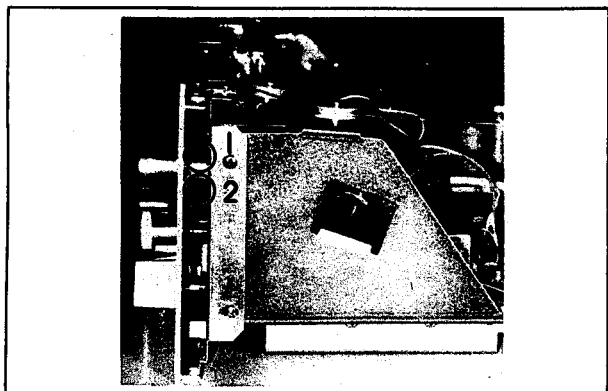


Photo 3

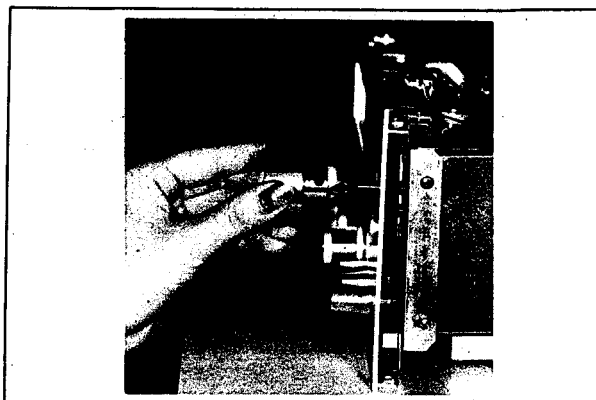


Photo 4

- b. Remove the other knobs (use a hexagonal wrench for the speaker and function switch only).
c. Remove screws 1 through 5 as shown in Photo 5. Then pull the front panel forward to remove it.

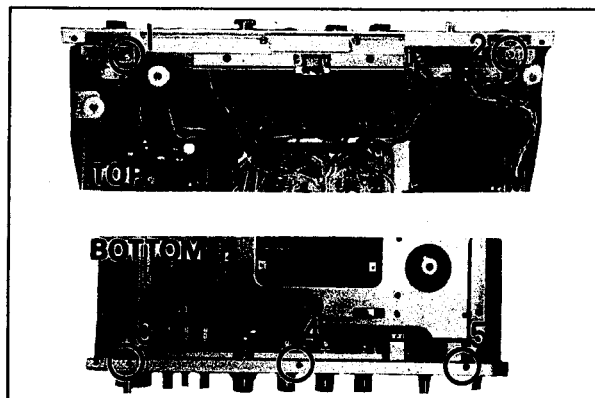


Photo 5

SIGNAL & TUNING METER REMOVAL

- a. Remove the dial pointer cord.
b. Remove screws 1 and 2 holding the meter frame, as shown in Photo 6.
c. Remove three lamps and then take off the meter frame.
d. Remove the meter holder spring and then the meter can be removed.

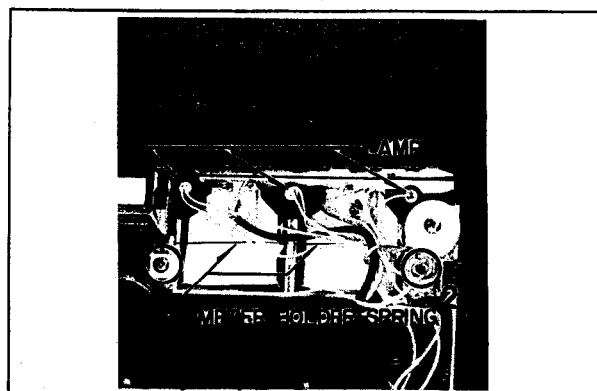


Photo 6

PREAMP CIRCUIT BOARD REMOVAL

- Remove the front panel (refer to photo 3~5).
- Remove screws 1, 2 and 3 as shown in Photo 7.
- Remove the switch levers and apron bushings.
- Remove screw 1 and loosen screw 2 as shown in Photo 8 and then tilt the sub-chassis forward.
- Remove the preamp circuit board by pulling it.

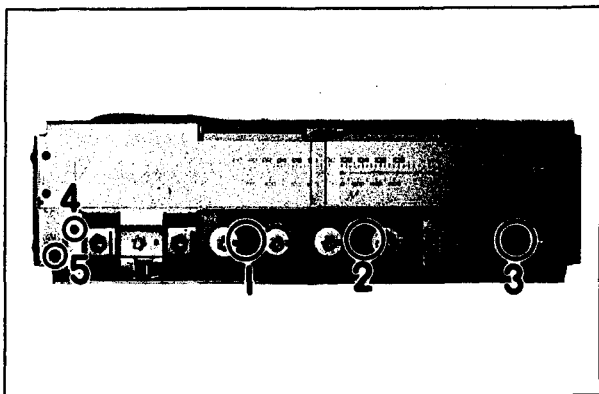
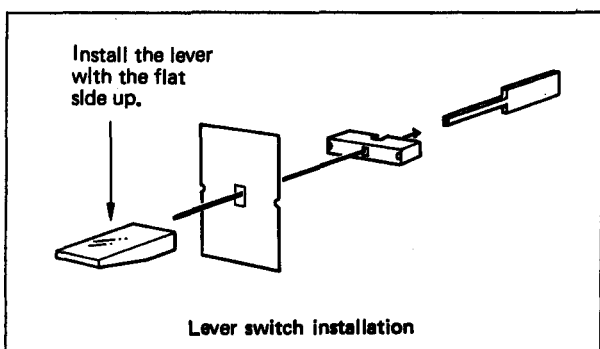
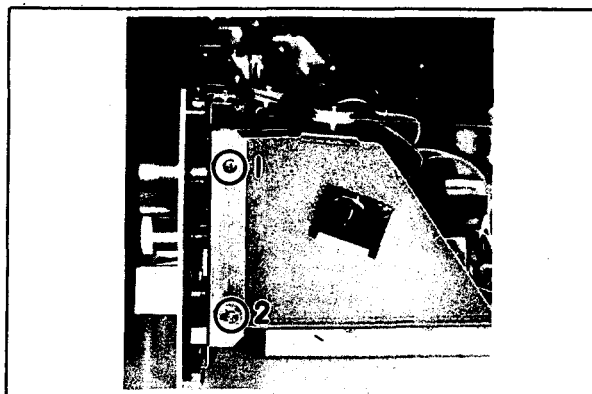
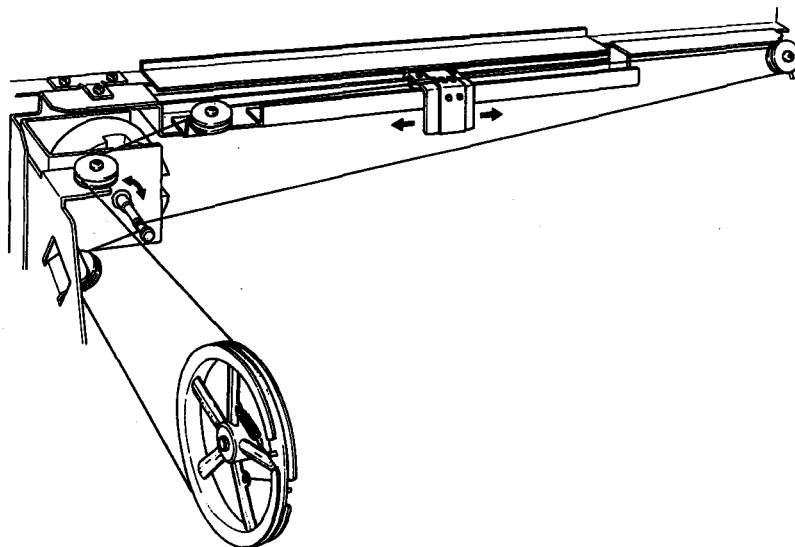


Photo 7



DIAL MECHANISM



POWER SWITCH REMOVAL

Photo 8

- Remove screws 4, 5 as shown in Photo 7 and then pull it.

LIGHT EMITTING DIODE CIRCUIT BOARD REMOVAL

- Tilt the sub-chassis forward.
- Remove screw as shown in Photo 9 and then remove the light emitting diode circuit board.

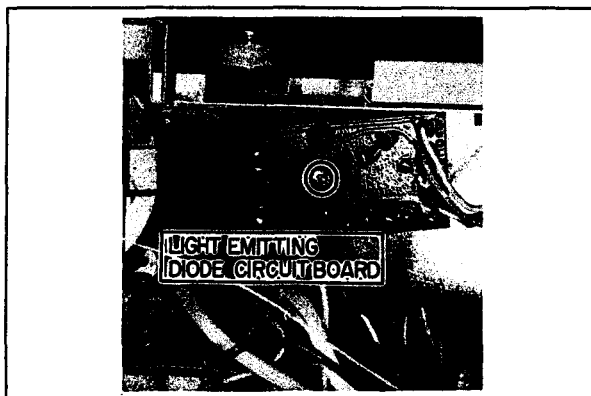


Photo 9

MEASUREMENT AND ADJUSTMENT

FM SECTION

FM IF ADJUSTMENT

STEP	ALIGNMENT ITEM	TERMINALS TO BE CONNECTED	INSTRUMENT REQUIRED	ADJUST	HOW TO ADJUST	RATING OR STANDARD	REMARKS
1	S curve	Connect output terminal of the sweep SG to the front-end No.6 and No.5 (E) terminal of the tuner circuit board. Insert a 10k Ω resistor between TP1 and hot Clip of Sw. SG and connect it to the sweep SG input terminal. Refer to Fig.1	10.7MHz IF sweep SG. Output, 70dB	Upper and lower cores of the discrim. coil GE6025.	Adjust for symmetrical S curve with the secondary-side (upper) core. Adjust for max. height with the primary side (lower core).	40mVp-p for S-curve output voltage E_o . 200kHz or less for deviation between the S curve's center f_o and the 10.7MHz marker.	For a complete amplifier unit, measure in the detuned state. Refer to Fig. 1

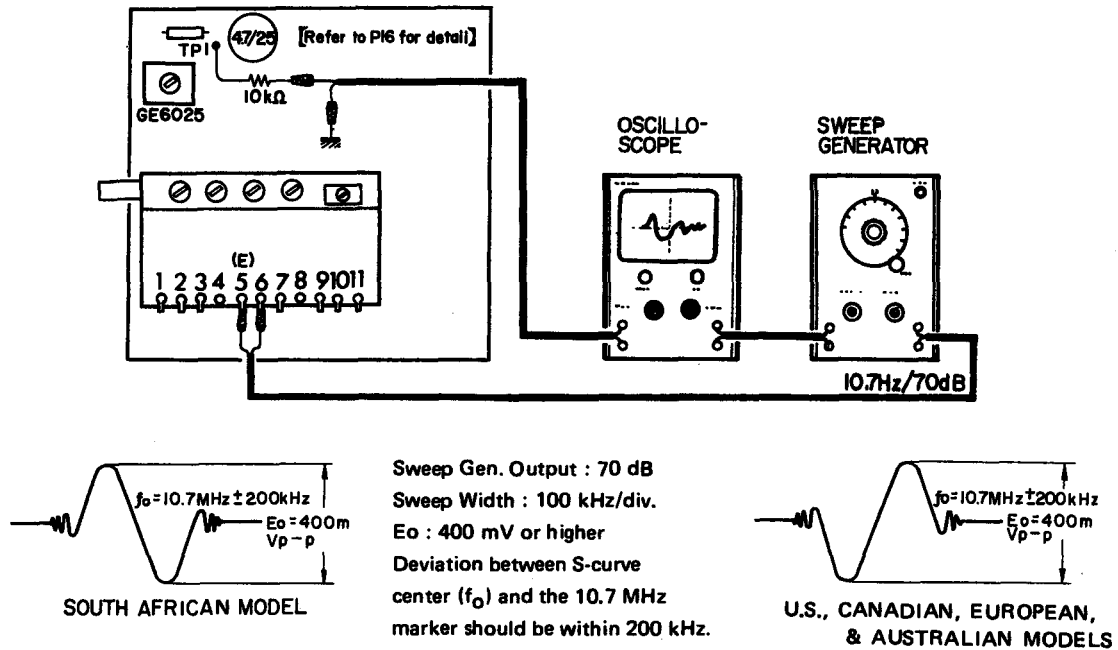


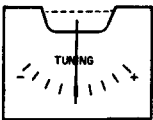
Fig. 1

FM MPX ADJUSTMENT

STEP	ALIGNMENT ITEM	TERMINALS TO BE CONNECTED	INSTRUMENT REQUIRED	ADJUST	HOW TO ADJUST	RATING OR STANDARD	REMARKS
1	Pilot signal	Connect dummy antenna to FM Ant. terminal and feed SG output through the dummy antenna. Connect oscilloscope to No.14 pin of FM MPX IC LA-3311.	Oscilloscope. SG: $f_c = 98\text{MHz}$; Antenna input 400KHz/60dB; 90% Pilot Signal;10%	T301 (GE6056) orange in color.	Adjust for max. output with min. amplitude fluctuation	Approx. 2Vp-p at No.14 pin of FM MPX IC LA3311.	

STEP	ALIGNMENT ITEM	TERMINALS TO BE CONNECTED	INSTRUMENT REQUIRED	ADJUST	HOW TO ADJUST	RATING OR STANDARD	REMARKS
2	Separation I	FR terminal and E (GND)	Same as Step. 1 Left channel modulated.	VR301 (B 10 k Ω) and T302 (GE6069).	Adjust for min. leakage to R channel w/o distortion.		
3	Separation II	FL terminal and E (GND)	Same as Step. 1 Right channel modulated.	Same as Step 2 for fine adjustment.	Adjust for min. leakage to L channel w/o distortion.		
4	Separation balance	FR terminal and E (GND). FL terminal and E (GND).	Same as Step 1. Both L and R channels modulated.	VR301 (B 10 k Ω) and T302 (GE6069).	Make fine adjustment for precise balance between L and R channels.	3dB or less for difference between L and R channels.	

FM TUNER OVERALL ADJUSTMENT

STEP	ALIGNMENT ITEM	TERMINALS TO BE CONNECTED	INSTRUMENT REQUIRED	ADJUST	HOW TO ADJUST	RATING OR STANDARD	REMARKS
1	Tuning meter (Center meter)			Upper core of the discrim. coil (GE6025)	Detune the set completely, and adjust for the tuning meter to defect to the center. (Refer to REMARKS)		
2	Tuning point setting	FM ant. terminal	FM SG: 60dB ant. input 98MHz.	Tuning	Adjust for the tuning meter to deflect to the center.		Set AFC to OFF. (Ground the diamond connector pin of AFC Terminal of the tuner circuit board.)
3	Distortion factor	FM ant. terminal & REC OUT	Distortion meter FM SG: 400Hz 100% modulation (monaural) at the tuning point in Step2.	Lower core of the discrim. coil (GE6025)	Adjust for min. distortion.	Less than -46dB	Set AFC to OFF
4	Front end and IF pre-setting	FM ant. terminal	FM SG: About 30dB antenna input at the tuning point in Step2.	Front End: IF Core	Adjust for max. deflection of the signal meter.		Set AFC to OFF

STEP	ALIGNMENT ITEM	TERMINALS TO BE CONNECTED	INSTRUMENT REQUIRED	ADJUST	HOW TO ADJUST	RATING OR STANDARD	REMARKS
5	Separation	FM ant. terminal, FR terminal and E (GND), FL terminal and E (GND).	60dB antenna input at the tuning point in Step2. Stereo 100% modulation.	VR301 (10k Ω B) and T302 (GE6069)	Adjust with T302 (GE6069) for min. wave height and min. leakage to the other channel w/o distortion. Then, use VR301 for the optimum separation.	26dB or better with both channels simultaneously modulated. 30dB or better with one channel modulated.	

FM TRACKING ADJUSTMENT

STEP	ALIGNMENT ITEM	TERMINALS TO BE CONNECTED	INSTRUMENT REQUIRED	ADJUST	HOW TO ADJUST	RATING ON STANDARD	REMARKS
1	Dial pointer indication.	FM antenna terminals	FM SG: Antenna input, 60dB; Carrier freq., 98MHz.	Dial pointer	Set the pointer to the center of the tuning meter by means of the tuning knob, thereafter aligning it with 98-MHz.		Set AFC to OFF (Ground the diamond connector pin of A.F.C. Terminal of the tuner circuit board.)
2	LF and HF tracking	FM antenna terminals	FM SG: LF, 88MHz; HF, 108MHz.	Dial pointer	Using the tuning knob have the tuning meter point to the center Read deviation between the pointer deflection and the actual value that has to be indicated.	± 2.0 mm or less from the center of the scale mark	

STEP	ALIGNMENT ITEM	TERMINALS TO BE CONNECTED	INSTRUMENT REQUIRED	ADJUST	HOW TO ADJUST	RATING OR STANDARD	REMARKS
3	Tracking I.	FM antenna terminals	Same as Step2.	Dial pointer	When tracking error is still greater than specified after the adjustment in Step2, re-adjust the pointer to meet the specification	$\pm 2.0\text{mm}$	
4	Tracking II.	FM antenna terminals	Same as Step2.	Front-end trimmer capacitor and coil	If not falling within the specification after Step 3, adjust the front-end trimmer coil.	$\pm 2.0\text{mm}$	The adjustment described in this chart is extremely difficult, and should therefore not be attempted unless the balance is very badly out of adjustment.

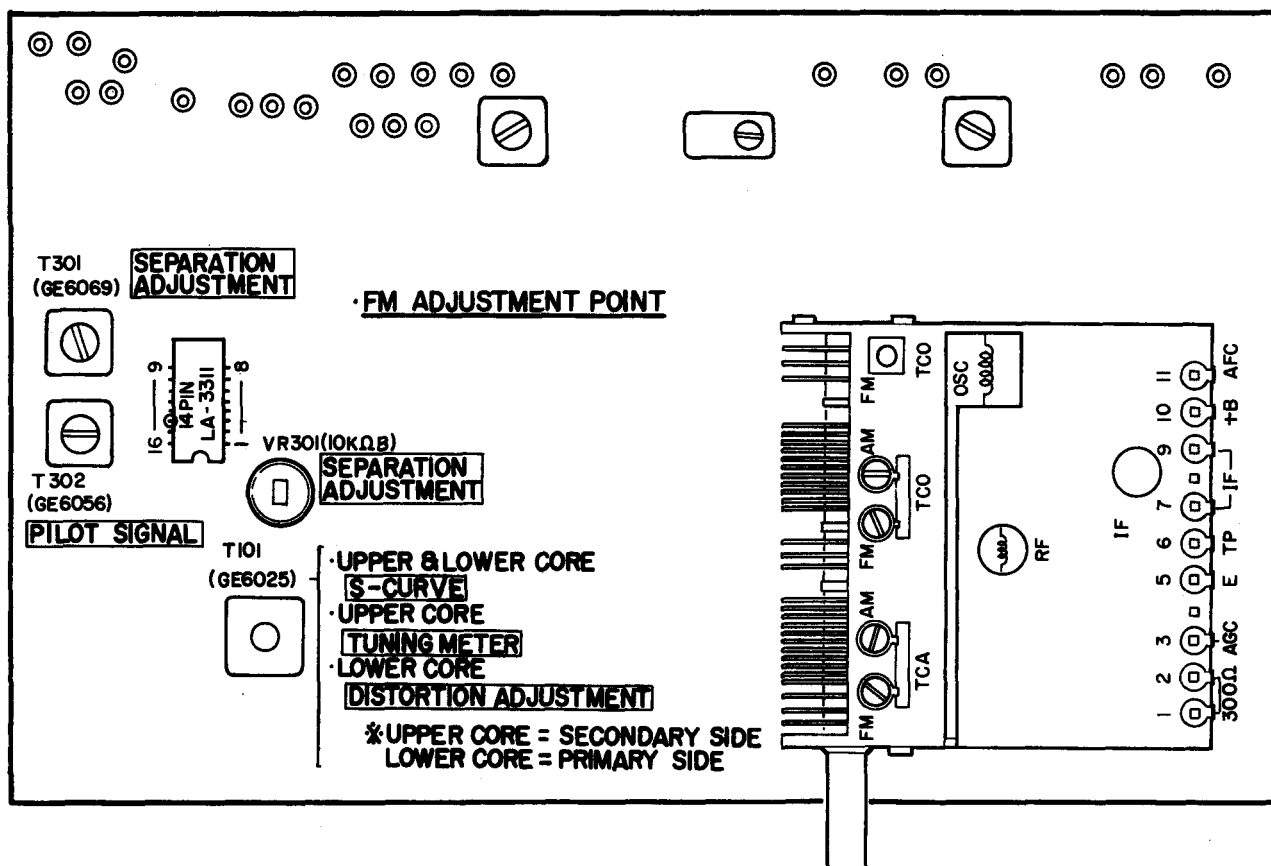


Fig. 2

AM SECTION

AM IF ADJUSTMENT

STEP	ALIGNMENT ITEM	TERMINALS TO BE CONNECTED	INSTRUMENT REQUIRED	ADJUST	HOW TO ADJUST	RATING OR STANDARD	REMARKS
1	V curve	Insert a capacitor between B1 and hot Clip of Sw. SG and connect to output terminal of the sweep SG. Connect input terminal of the sweep SG to TP-2 and E.	455kHz IF sweep SG. Output, 40dB	CF201 (AM ceramic filter) and T202 (GE6030).	See those shown under RE-MARKS.	See those shown under REMARKS.	Center frequency: $f_o = 455\text{kHz} \pm 10\text{kHz}$ South African Model (470 kHz $\pm 10\text{kHz}$) Output voltage: $E_o = 800\text{mV}$ or higher Bandwidth: $B = 5\text{kHz}$ or more Sweep output: 40dB Sweep width: 2kHz/div. Refer to Fig. 3

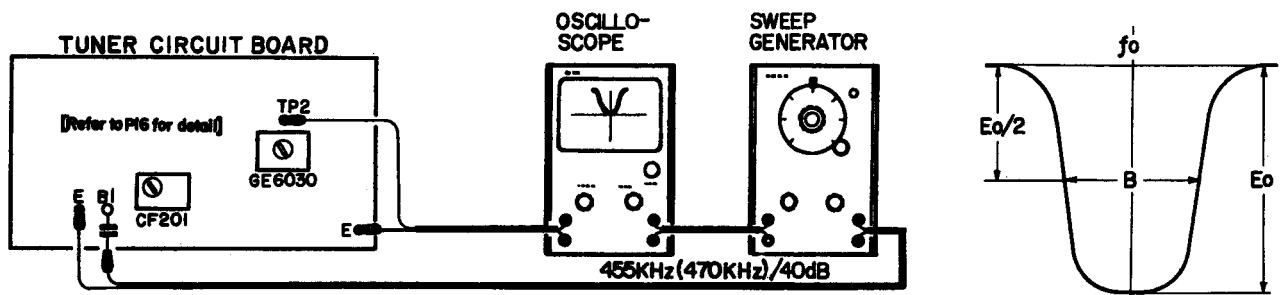
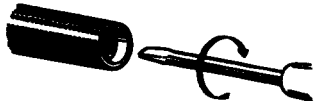


Fig. 3

AM TRACKING ADJUSTMENT Be sure to carry out this adjustment after FM adjustment.

STEP	ALIGNMENT ITEM	TERMINALS TO BE CONNECTED	INSTRUMENT REQUIRED	ADJUST	HOW TO ADJUST	RATING ON STANDARD	REMARKS
1	OSC coil Adjustment	Bar antenna and REC OUT	AM SG, 600kHz. Oscilloscope. V.T.V.M.	Dial Pointer and AM oscillator coil (GE6013)	Set the Dial pointer to 600-kHz. Tune with core of the coil. See the signal meter deflects to max.		Set to "2.1" on the dial scale.
2	Low Frequency range	Same as Step 1	AM SG, 600kHz 54dB	Bar antenna Core	Same as Step 1		

MAIN AMP CIRCUIT BOARD ADJUSTMENT

After the power switch is turned, wait 2 minutes before adjustment, to be sure of the most stable operation.

STEP	ALIGNMENT ITEM	TERMINALS TO BE CONNECTED	INSTRUMENT REQUIRED	ADJUST	HOW TO ADJUST	RATING OR STANDARD	REMARKS
1	Mid-point Voltage	L: TP1 - E R: TP3 - E	DC voltmeter	L: VR601 R: VR602	Adjust for the rating.	$0 \pm 30\text{mV}$	Refer to Fig. 6
2	Idling current	L: TP2 - TP1 R: TP4 - TP3	DC voltmeter	L: VR603 R: VR604	Adjust for the rating.	$25 \pm 5\text{mV}$	Refer to Fig. 6

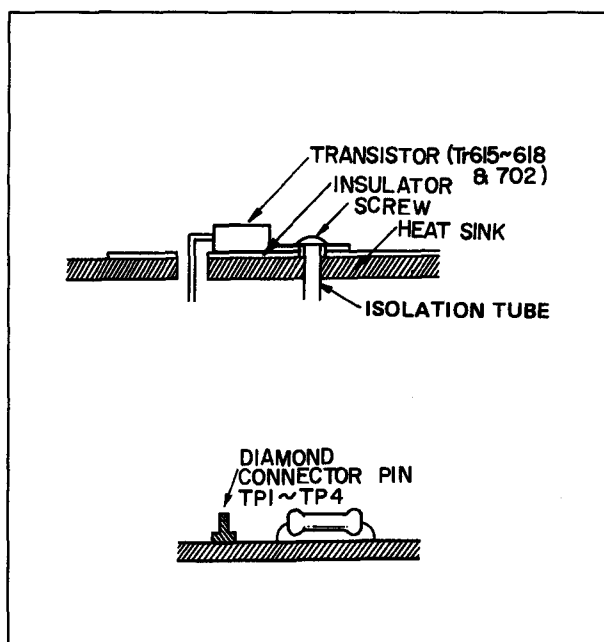


Fig. 5

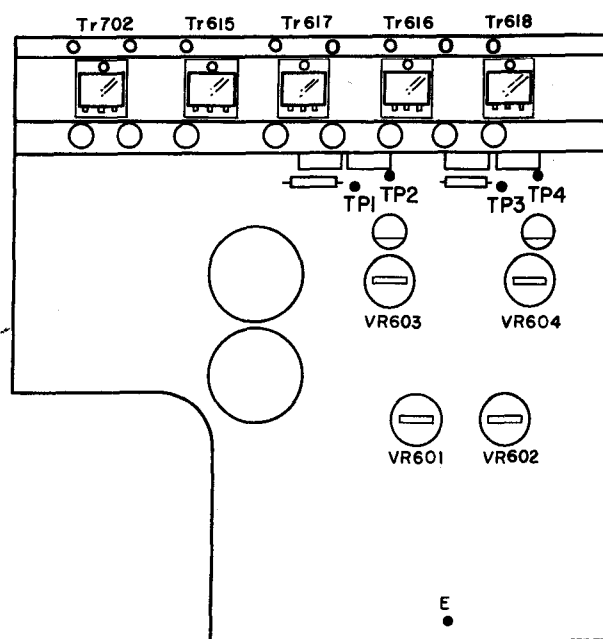


Fig. 6

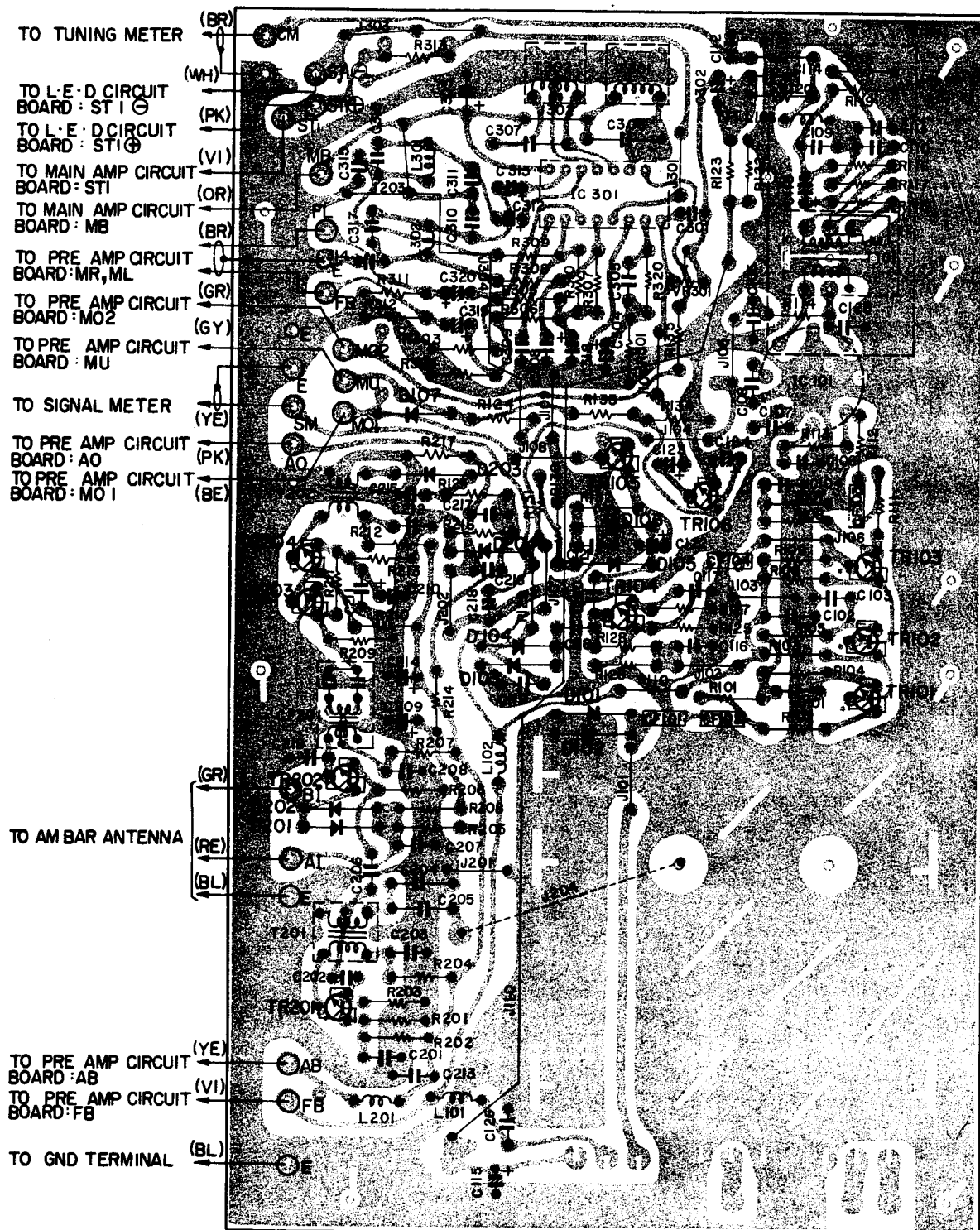
PRINTED CIRCUIT BOARD

TUNER CIRCUIT BOARD

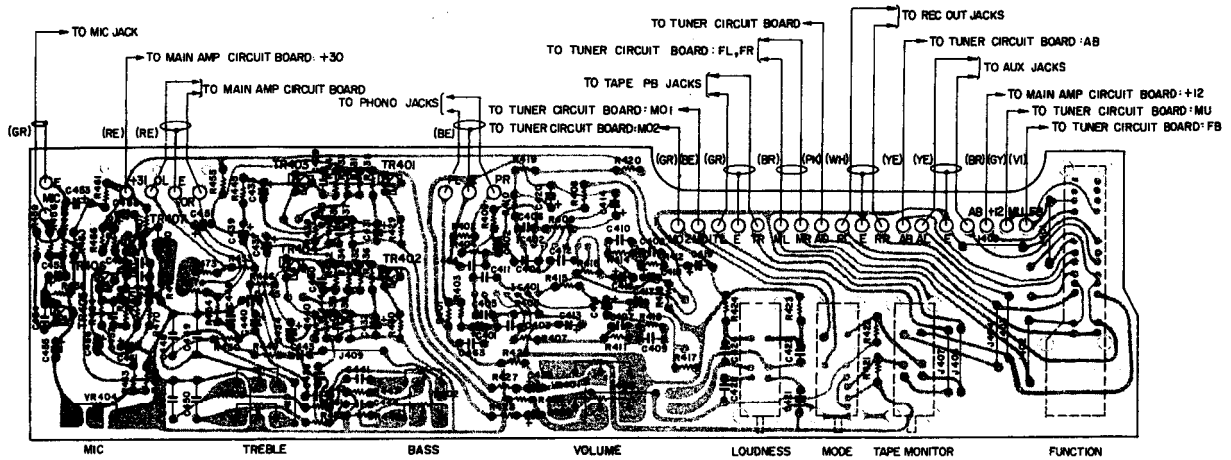
NA06386 : U.S. & CANADIAN MODELS

NA06387 : GENERAL, EUROPEAN & AUSTRALIAN MODELS

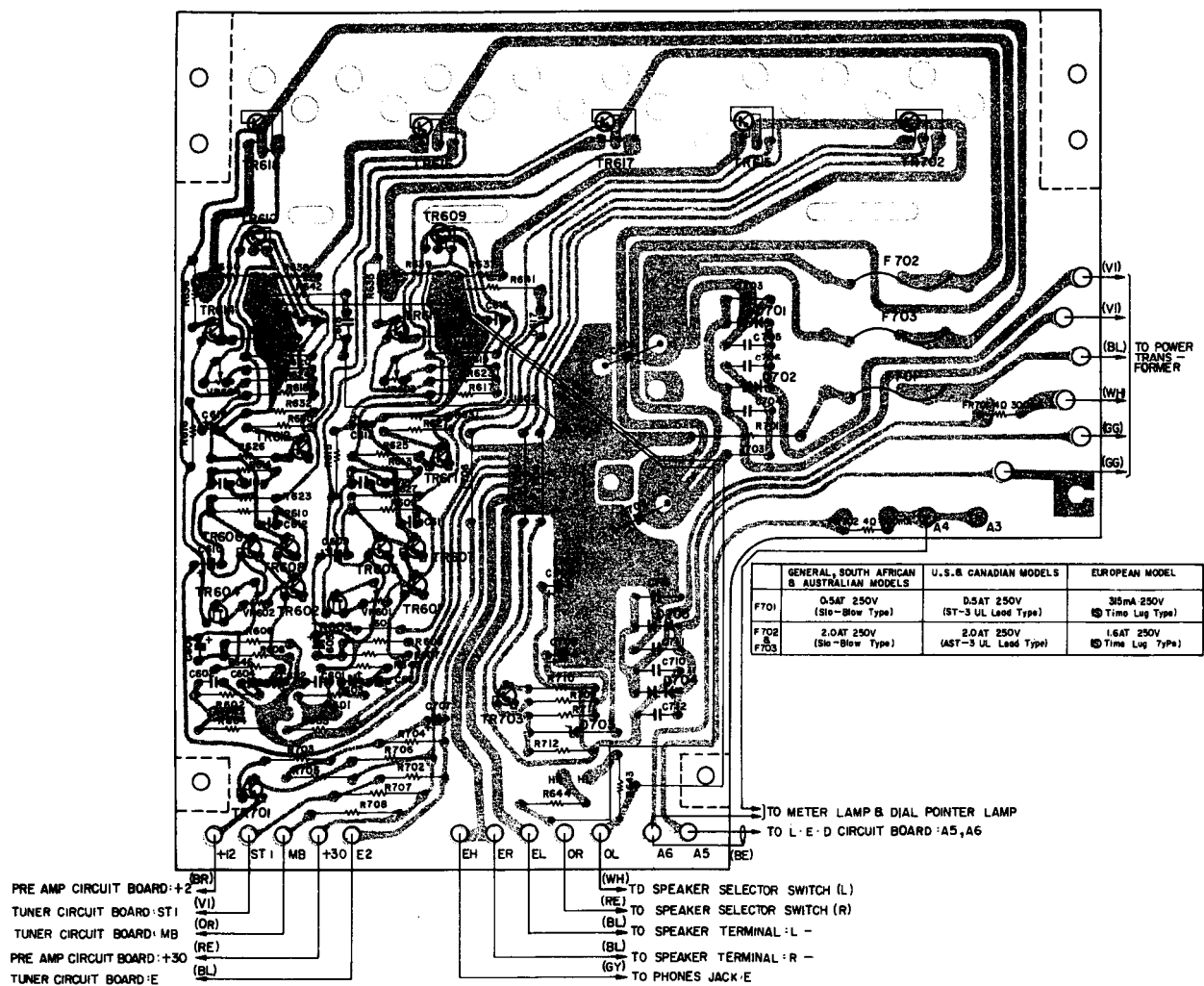
NA06391 : SOUTH AFRICAN MODEL



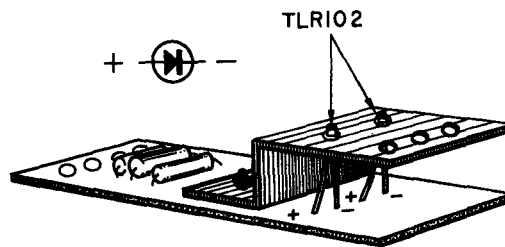
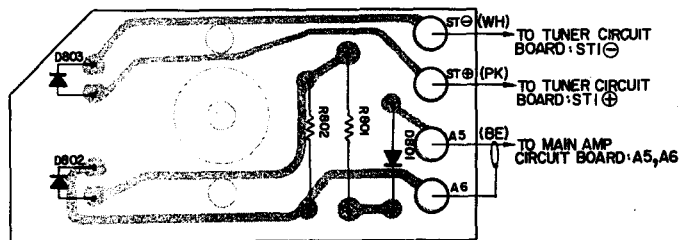
PREAMP CIRCUIT BOARD NA06380



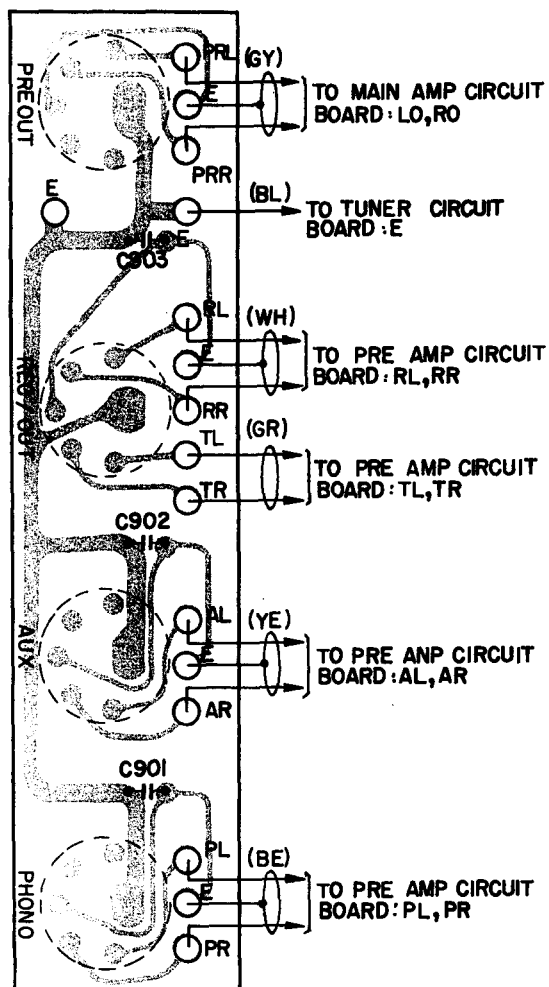
MAIN AMP CIRCUIT BOARD NA06384 : U.S. & CANADIAN MODELS NA06379 : GENERAL, SOUTH AFRICAN & AUSTRALIAN MODELS NA06385 : EUROPEAN MODEL



LIGHT EMITTING DIODE CIRCUIT BOARD NA06382



DIN CONNECTOR CIRCUIT BOARD (EUROPEAN MODEL ONLY) NA06383



WIRE COLORS ABBREVIATIONS

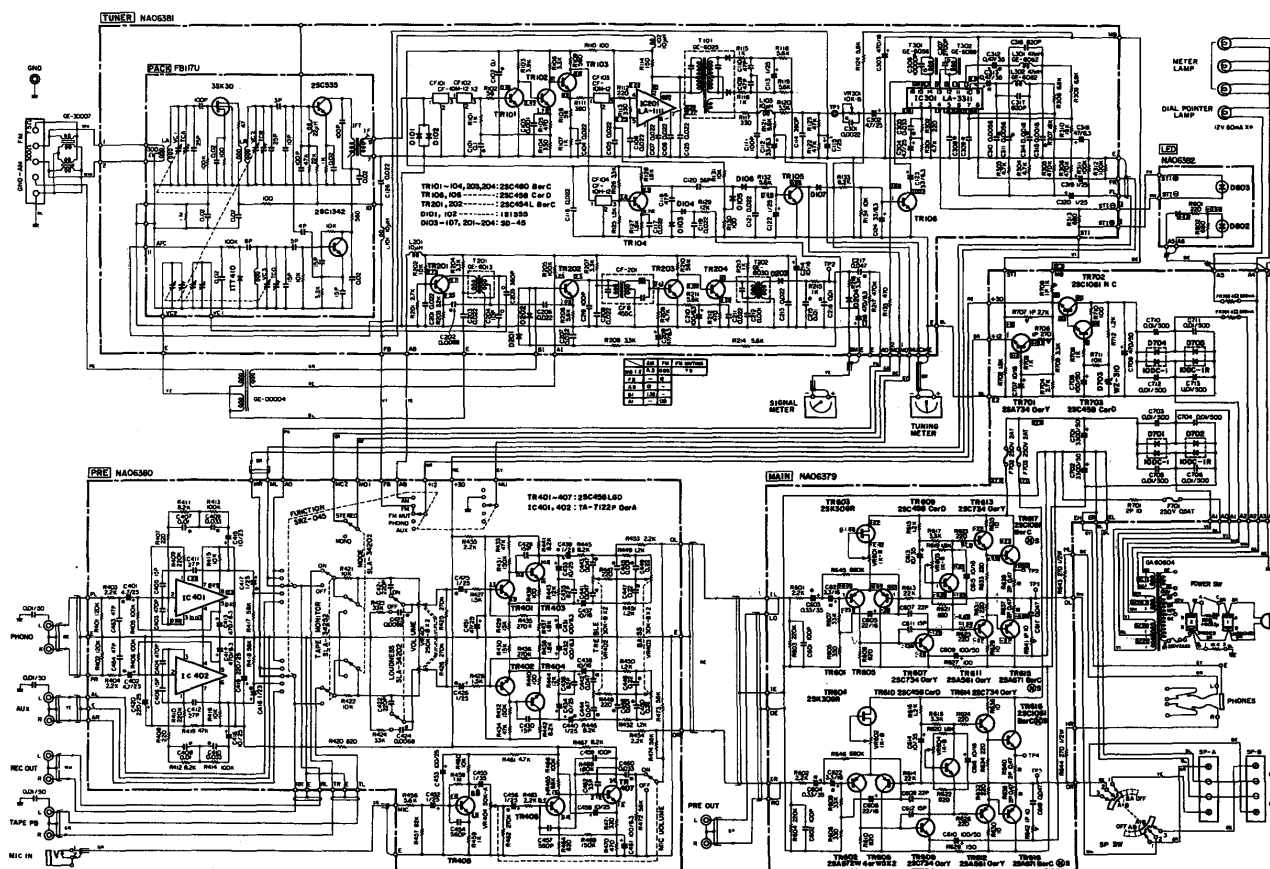
BL ▶ Black	GR ▶ Green	GG ▶ Light Green
BR ▶ Brown	BE ▶ Blue	SB ▶ Light Blue
RE ▶ Red	VI ▶ Violet	PK ▶ Pink
OR ▶ Orange	GY ▶ Gray	
YE ▶ Yellow	WH ▶ White	

• CAPACITOR

SYMBOL	PART NAME	REMARK
⊗	TANTALUM CAPACITOR	—N—
NO MARK	(BI-POLAR) ELECTROLYTIC CAPACITOR	
⊙	MYLAR CAPACITOR	—II—
○	POLYSTYRENE CAPACITOR	
NO MARK	CERAMIC CAPACITOR	

• RESISTOR

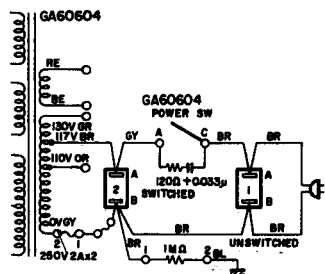
SYMBOL	PART NAME
—W—	FUSE RESISTOR
△	METALIZED OXIDATION RESISTOR
⊠	CEMENT MOLDED RESISTOR
NO MARK	CARBON RESISTOR



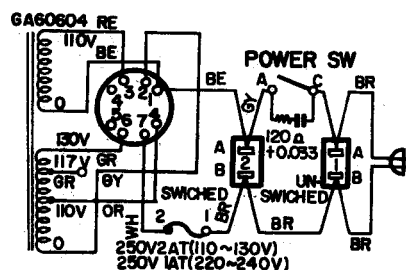
PARTIAL CHANGES MADE ACCORDING TO DESTINATION

▼ POWER

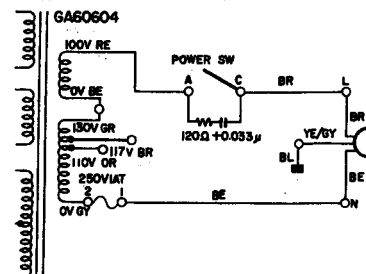
• U.S. & CANADIAN MODELS



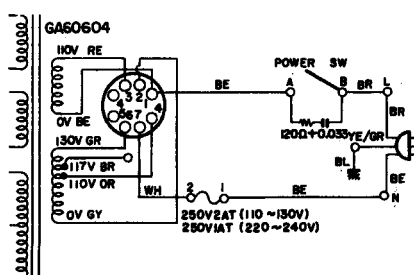
• GENERAL MODEL



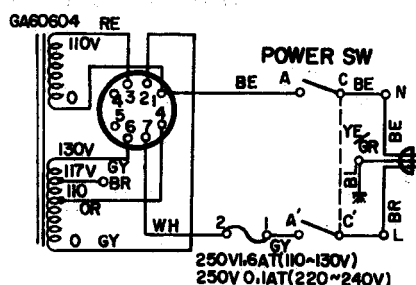
• AUSTRALIAN MODEL



• SOUTH AFRICAN MODEL

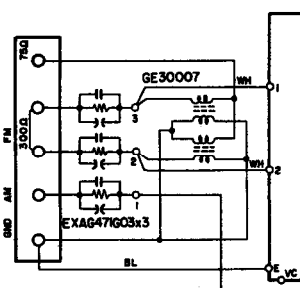


• EUROPEAN MODEL

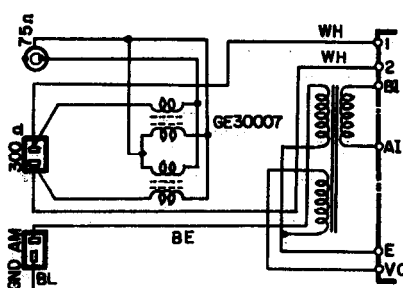


▼ ANTENNA

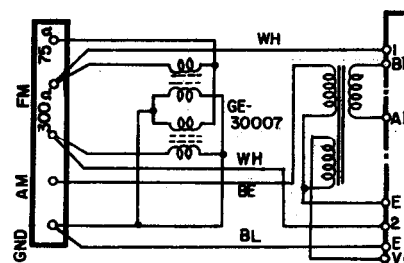
• U.S. & CANADIAN MODELS



• EUROPEAN MODEL

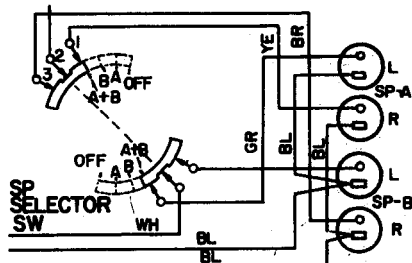


• EXCEPT U.S. & CANADIAN, EUROPEAN MODELS



▼ SPEAKER

• EUROPEAN MODEL



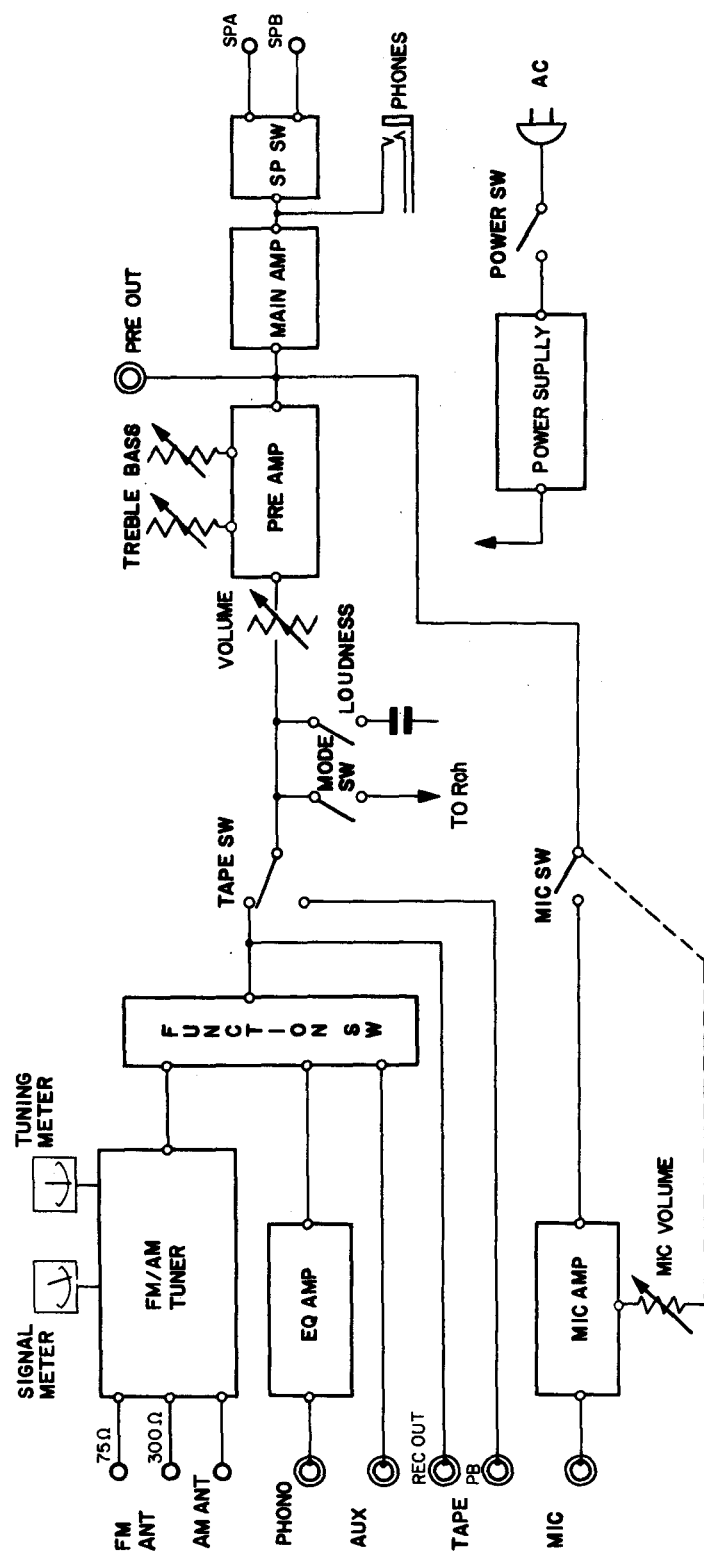
▼ TUNER

DESTINATION	U.S. & CANADIAN MODELS	EUROPEAN, GENERAL & AUSTRALIAN MODELS	SOUTH AFRICAN MODELS
NA. NO	NA06386	NA06387	NA06391
FRONT END	FB117U	FB117U	FB117S
C308 & C309	0.012 μ F	0.0082 μ F	0.0082 μ F
CF201	CF8-455C	CF8-455C	CF7S

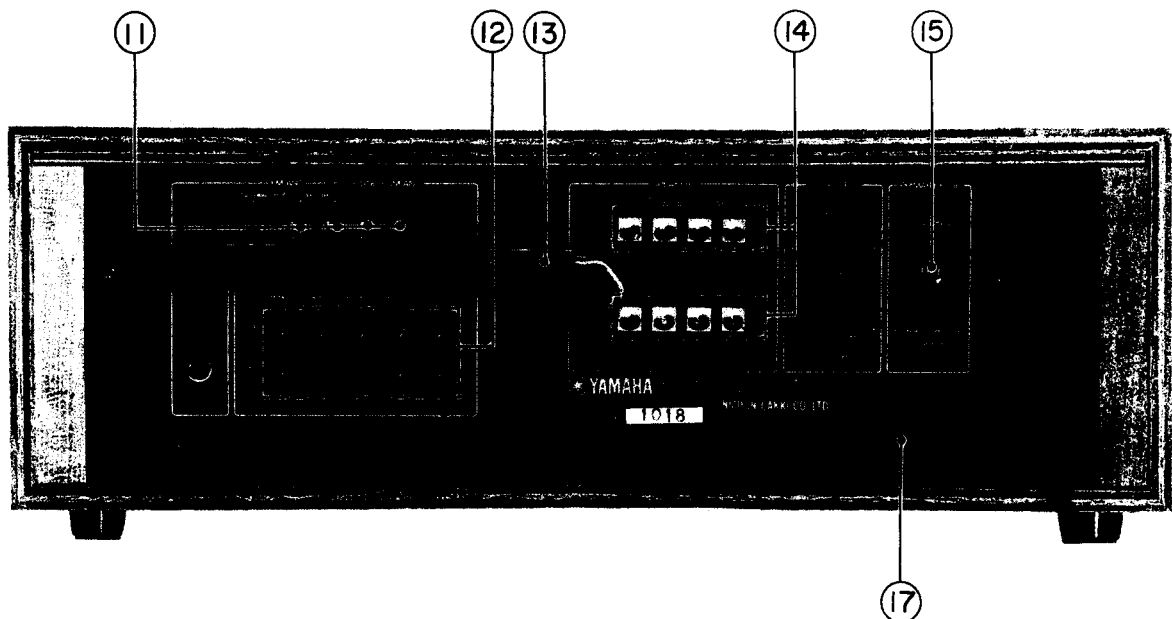
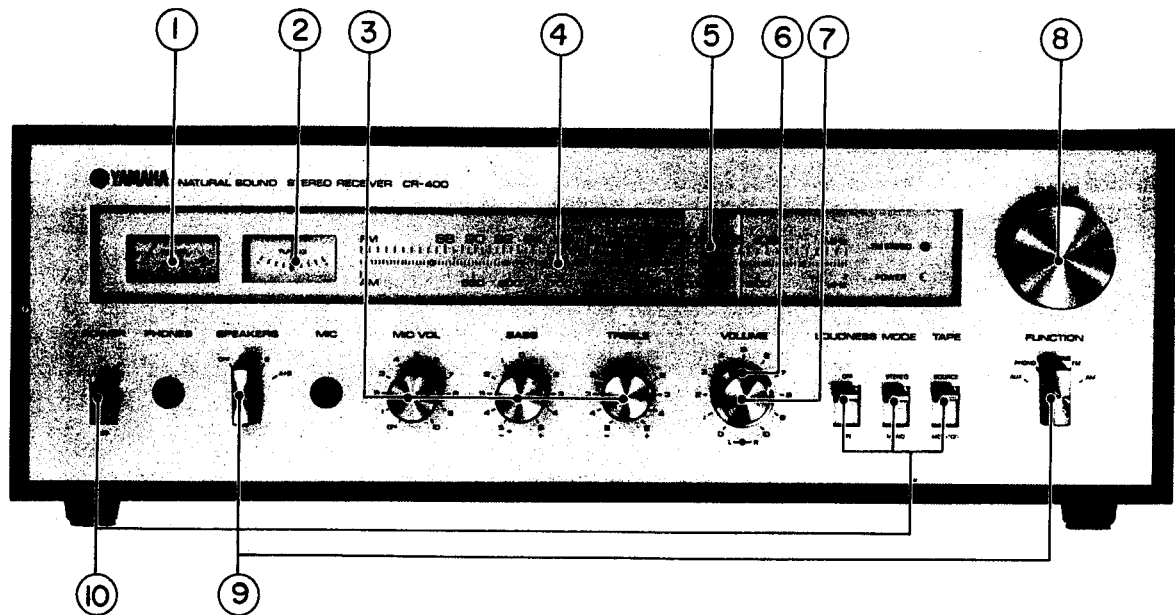
• EXCEPT EUROPEAN MODEL

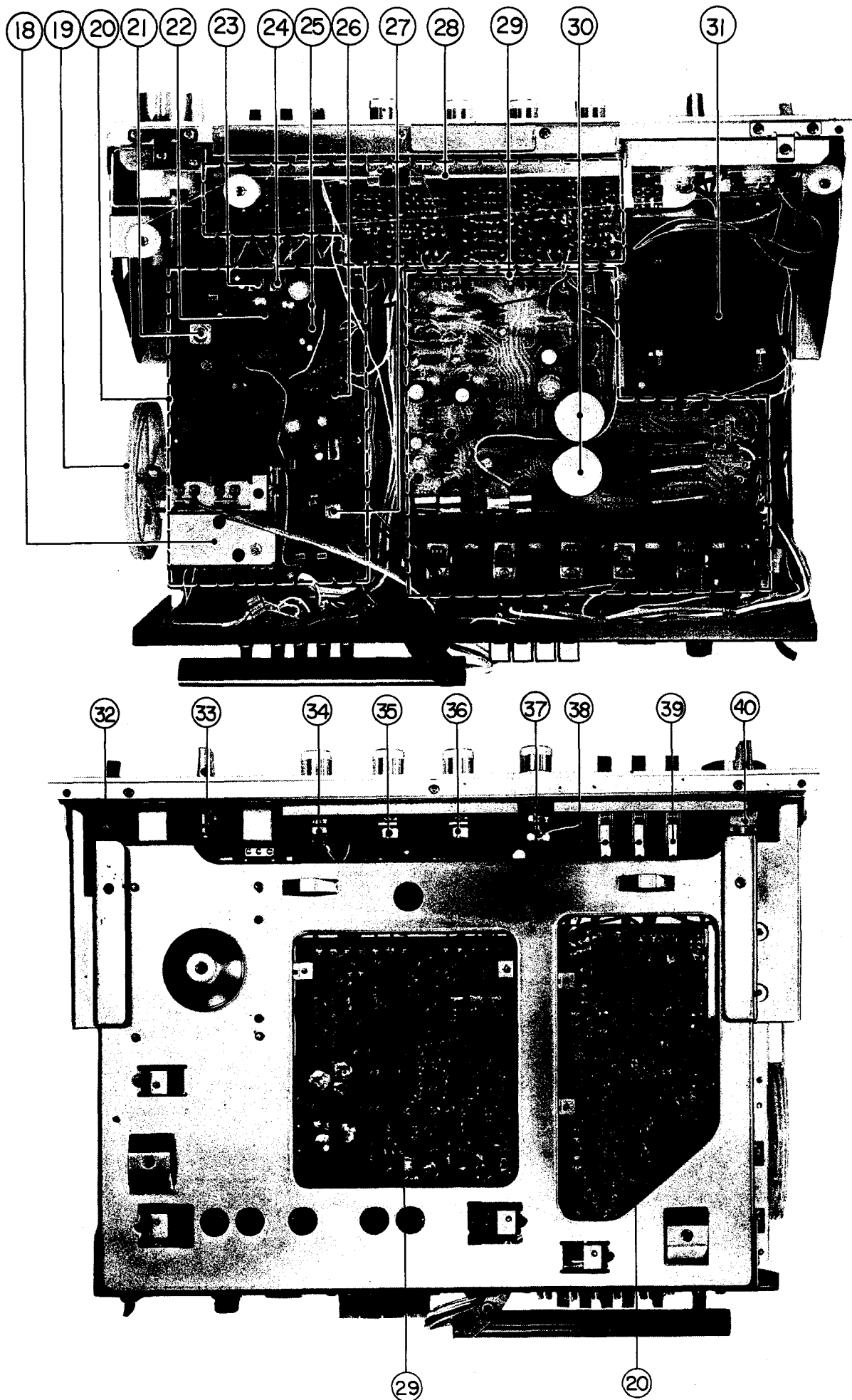
Refer to OVERALL SCHEMATIC DIAGRAM.

BLOCK DIAGRAM



PARTS LIST





Ref. No.	Part No.	Description			Remarks	Common Models
29	320000NA063790	MAIN AMP Circuit Board	#65012	メインアンプシート	General, Australian models (#62801)	
	320000NA066570	-do.-	#65350	"	Canadian model (NA06384 #63481)	
29	320000NA063840	-do.-	#65021	メインアンプシート	U.S. model (#63481)	
29	320000NA063850	-do.-	#65012	メインアンプシート	European model (#62801)	
	420000HL314100	Metal-Oxide Film Resistor	10 Ω 1W	酸化金属被膜抵抗		
	420000HL315270	-do.-	270 Ω 1W	"		
	420000HL416100	-do.-	1K Ω 1W	"		
	420000HL316270	-do.-	2.7K Ω 1W	"		
	420000HL324100	-do.-	10 Ω 2W	"		
	420000HZ000030	Metal Plate Resistor	0.47 Ω 2W	金属板抵抗		
	420000HT410020	Variable Resistor	B 1K Ω SV10KR	可変抵抗器	for adjustment	
	420000HW113390	Fuse Resistor	3.9 Ω 500mA	ヒューズ抵抗	except U.S. model (HZ00010)	
	420000HW213390	-do.-	3.9 Ω 500mA	"	U.S. model (HZ00010)	
30	FL16933	Electrolytic Capacitor	3300 μ F 50WV	電解コンデンサー	Servicing 420000FL269330	
	420000FP155330	Tantalum Capacitor	0.33 μ 35WV	タンタルコンデンサー		
	FP13633	-do.-	3.3 μ 16WV	タンタルコンデンサー	Servicing 420000FP156330	
	320000BA063870	Heat Sink		放熱器		
	420000iL000170	Insulator	X30B-6001	サ - コ ン		
	iH00008	Diode	10DC-1	ダイオード	Servicing 420000iH000140	
	iH00009	-do.-	10DC-1R	ダイオード	-do.- 420000iH000150	
	420000iF000220	Zener Diode	WZ-310	ツェナーダイオード		
	iA05617	Transistor	2SA561 O or Y	トランジスタ	Servicing 420000iA056120	
	420000iA076300	-do.-	2SA763 W4 or 5	"		
	iA06717	-do.-	2SA671 B or C N S	"	Servicing 420000iA048910	
	iC04583	-do.-	2SC458 C	"	-do.- 420000iC045890	
	iC10617	-do.-	2SC1061 B or C N S	"	-do.- 420000iC078910	
	iC10619	-do.-	2SC1061 N S	"	-do.- 420000iC078910	
	iC07343	-do.-	2SC734 O or Y	"	-do.- 420000iC073420	
	iE00002	FET	2SK30A GR	F E T	-do.- 420000iE000010	
	420000KB000310	Fuse	0.5AT 250V	ヒューズ (耐ラッシュ)	General, South African & Australian models	
	420000KB000350	-do.-	2.0AT 250V	ヒューズ (耐ラッシュ)	General, South African & Australian models	
	420000KB000900	Lead Type Fuse (UL Listed) ST-3	0.5AT 250V	ULリード付ヒューズ	U.S. & Canadian models	
	420000KB000840	Lead Type Fuse (UL Listed) ASF-3	2.0AT 250V	" "	U.S. & Canadian models	
	420000KB000650	Time Lag Fuse	315mAT 250V	タイムラグヒューズ	European model	
	420000KB000740	-do.-	1.6AT 250V	"	European model	

Ref. No.	Part No.	Description			Remarks	Common Models	
28	320000NA063800	PRE-AMP Circuit Board	#63082	ブリアンプシート	except U.S. model		
	320000NA066070	-do.-	#64980	"	U.S. model (NA06380 #63081)		
	420000FP156100	Tantalum Capacitor	1 μ F 35WV	タンタルコンデンサー			
	420000FJ546470	Electrolytic Capacitor	4.7 μ F 25V	電解コンデンサー	KU Type		
	420000FJ546100	-do.-	1 μ F 25V	"	KU Type		
37	420000HS120300	Variable Resistor	38M B250K Ω x 2 w/C.T (V24 30KC)	可変抵抗器			
35 36	420000HS410120	Variable Resistor	B 30K Ω x 2	可変抵抗器			
34	420000HS410150	Variable Resistor	A 50K Ω w/SW	可変抵抗器			
38	420000KA200120	Lever Switch	SLA34202	レバースイッチ	Shorting		
39	420000KA200150	-do.-	SLA34252	レバースイッチ	Non shorting		
40	420000KA500290	Rotary Switch	SRZ-045 L = 25	ロータリースイッチ			
	420000iG000110	Integrated Circuit	TA7122P B or A	I C			
	420000iC045890	Transistor	2SC458 LGD	トランジスター			
	320000AA073600	PRE-AMP Circuit Board Bracket		ブリシート金具			
20	320000NA066550	Tuner Circuit Board	#65600	チューナーシート	U.S. & Canadian models (NA06386 #63101)		
	320000NA066560	-do.-	#65360	"	General, Australian & European models (NA06387 #63101)		
	320000NA064690	-do.-	#63102	"	South African model (NA06391 #63413)		
	420000FP155470	Tantalum Capacitor	0.47 μ F 35WV	タンタルコンデンサー			
	420000GE300090	RF Inductor	10 μ F	RFインダクター			
27	420000GE100150	AM OSC Coil	GE6013	AM周波数コイル			
26	420000GE100100	AM IFT	GE6030	AM I F T			
21	420000GE100060	FM IFT	GE6025	F M I F T			
23	420000GE200070	MPX Coil	GE6056	M P X コイル			
25	420000GE200110	-do.-	GE6062 47mH	"			
24	420000GE200120	-do.-	GE6069	"			
	420000GG000080	AM Ceramic Filter	CF-8-455C	AMセラミック フィルター	except South African models		
	420000GG000070	-do.-	CF-7	"	South African model		
	420000GG990030	Ceramic Filter	CF-10M-12	"	(GG00004)		
	420000GG990130	-do.-	CF-10H-12	"	(GG00004)		
	420000HT410070	Variable Resistor	B10K Ω SV19R	可変抵抗器			
	420000iG000050	Integrated Circuit	LA1111	I C			
22	420000iG000060	-do.-	LA3311	I C			
	420000iF000040	Diode	1S1555	ダイオード			
	420000iF000330	-do.-	1S188 FM1	ダイオード			
	420000iC045480	Transistor	2SC454L B or C	トランジスター			
	420000iC046080	-do.-	2SC460 B or C	"			
	iC04583	-do.-	2SC458 C	"	Servicing 420000iC045890		
18	420000PA000140	FM/AM RF Pack	FB117U	F M パック	General, U.S., Canadian & European models		
18	420000PA000150	-do.-	FB117S	"	South African model		

Ref. No.	Part No.	Description		Remarks	Common Models
18	320000NA066320	L.E.D. Circuit Board	#64680	発光ダイオード	U.S. and Canadian models (NA06382 #63411)
	320000NA066380	-do.-	#63413	"	except U.S. & Canadian models (NA06382 #63411)
	420000IF000040	Diode	1S1555	ダイオード	
	420000IF000290	Light-Emitting Diode	TLR-102	発光ダイオード	
	320000C8068640	Indicator Holder		インジケータホルダー	
	420000C8068880	Plastic Rivet	3.5 φ	プラスチックリベット	
	320000NA063830	DIN Connector Circuit Board	#63452	DINコネクタシート	European model
	320000NA066470	-do.-	#63453	"	-do.-
	420000LB500090	DIN 5P Socket		DIN 5Pソケット	
	320000NB066510	Front Panel Unit		パネルユニット	
	420000NB066530	Dial Scale Panel Unit		ダイヤル目盛板ユニット	General, U.S., Canadian, South African, Australian, European models
5	320000NB066680	Dial Pointer Unit		ダイヤル指針ユニット	
2	420000JI000190	Tuning Meter		チューニングメーター	
1	420000JI000200	Signal Meter		シグナルメーター	
	420000C8068630	Cord Stopper (small)		コード押え (小)	General U.S. & Canadian model
	420000C8004410	Cord Stopper (large)		" (大)	South African, Australian, European model
	420000FZ000110	Spark Killer	0.0033 μF + 120Ω	スパークキラー	General, U.S., Canadian, South African, Australian model
	420000JB000230	Pilot Lamp (with lead)	12V 600mA	リード式パイロットランプ	
	320000AA064900	Dial Spring		ダイヤルスプリング	
	320000AA073630	Meter Holder Spring		メーター押えバネ	
8	320000BA064380	Knob, Tuning		チューニングツマミ	
9	320000BA064410	Knob, Switch		スイッチツマミ	
3	320000BA064450	Knob		ツマミ	
6	420000BA064440	-do.-		ダブルツマミ	
7	320000BA064470	-do.-		"	
	320000C8068660	Serrated Bushing		セレーションブッシュ	
10	320000C8068570	Switch Lever Knob		スイッチレバー	
	320000C8068760	Shading Bushing		遮光用ブッシュ	
	320000C8068770	-do.-		遮光用ブッシュ	
19	320000C8060540	Pulley		バリコシプーリー	
	320000AA063730	Washer		スペシャルワッシャー	
	420000CG060220	Dial Panel		ダイヤルパネル	
4	320000BA064550	Dial Scale Plate		ダイヤル目盛板	Australian, European, General South African, U.S., & Canadian models
32	420000KA200100	Power Switch	SJ-1909	パワースイッチ	General, U.S., Canadian, South African, Australian models
32	420000KA200110	-do.-	SJ-1913	"	European model
	420000LB300070	Phone Jack	JH-5020K	ホーンジャック	
	320000BB063190	Tuning Shaft		チューニングシャフト	
	320000C8068290	Meter Frame		メーター枠	
	320000C8068270	Phone Nut		ホーンナット	
	320000C8068280	Phone Jack Stopper		P. J. 通り止メ	

