PIONEER®

AM/FM STEREO TUNER

MODEL TX-900

INSTALLATION, OPERATING AND SERVICE MANUAL

INCLUDING **PARTSLIST, CIRCUIT DIAGRAMS, TROUBLE SHOOTING AND MOUNTING TEMPLATE.**

KC

FEATURES

• HIGH–PERFORMANCE FM FRONT END USING FIELD EFFECT TRANSISTORS

A two-stage RF amplifier using high-performance field effect transistors results in a superb FM front end with nearly perfect performance characteristics; in particular, better selectivity, and higher image rejection.
Separate-heterodyne circuitry assures a high stability in frequency conversion with a large signal -to-noise ratio.

• INTEGRATED CIRCUIT IF AMPLIFIER

Four integrated circuits (IC) and a sharp cut-off characteristic crystal filter are employed in the intermediate frequency amplifier stage of the FM tuner section, greatly contributing to improvement of capture ratio, selectivity in intermediate frequency range, and amplitude limiting capability.

• DELUXE SWITCHING DESIGN

A combination of the switching multiplex circuitry for maximum separation and the automatic mono-stereo switching circuitry permits you to enjoy stereo music of FM with the minimum distortion and best stereo separation.

• EASY–TO–TUNE METERS WITH NEW DIAL POINTER

Tuning-in of FM stations has been made extremely easy with the aid of two meters and a new dial pointer. When a station is properly tuned in, the new dial pointer glows brighter, indicating that you should set the dial there.

• VARIABLE MUTING LEVEL

This feature permits you to set the muting level to a desired value, depending on the field intensity of FM broadcasts in your area. Nuisance noise usually heard when changing FM stations can be completely eliminated with this circuitry.

• AM TUNER SECTION DESIGNED FOR HIGHEST SENSITIVITY

The AM front end is designed with special considerations for high sensitivity. Even in the area where AM signals are extremely weak, you can never miss important news, dynamic music programs, or thrilling plays. A unique amplitude-moderating circuitry employed in the AM tuner section will assure no distortion in output even when excessively large inputs are applied to the tuner.

• SEPARATE LEVEL CONTROLS FOR THE AM TUNER AND THE FM TUNER SECTIONS

Each tuner section is provided with an independent level control, permitting you to maintain the output level of the FM/AM tuner constant irrespectively of the difference in field intensity between AM broadcasts and FM broadcasts. Connecting the tuner outputs to your power amplifier, you need not adjust the output level each time you switch between AM reception and FM reception.

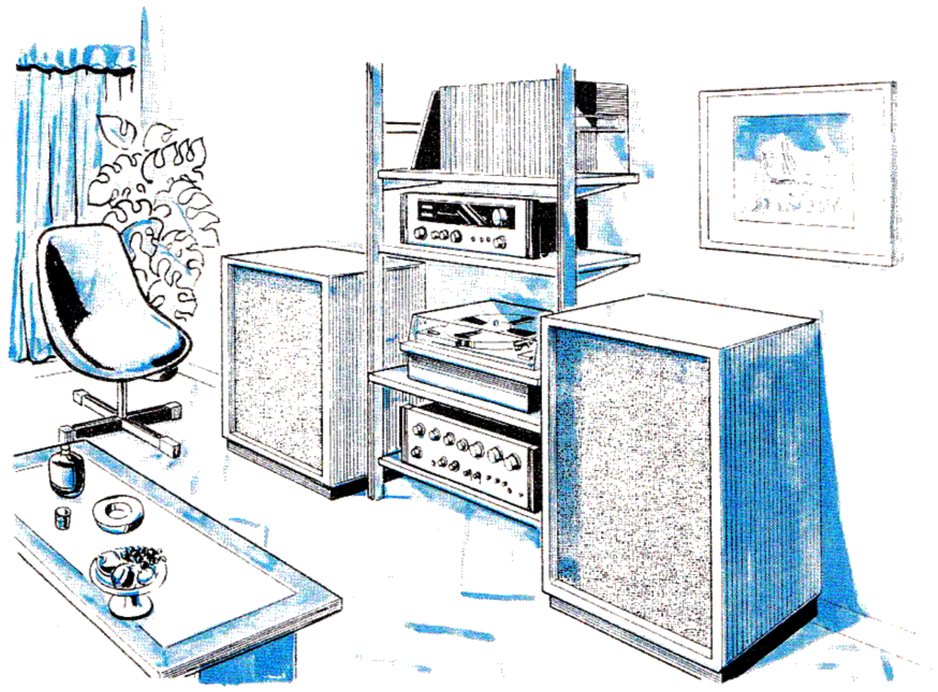
• HIGH–PERFORMANCE EASY–TO–USE DESIGN

This tuner can be directly tied with the PIONEER pre-amplifier unit. When they are tied together, a super-deluxe stereo receiver with many sophisticated but easy-to-use functions can be built.

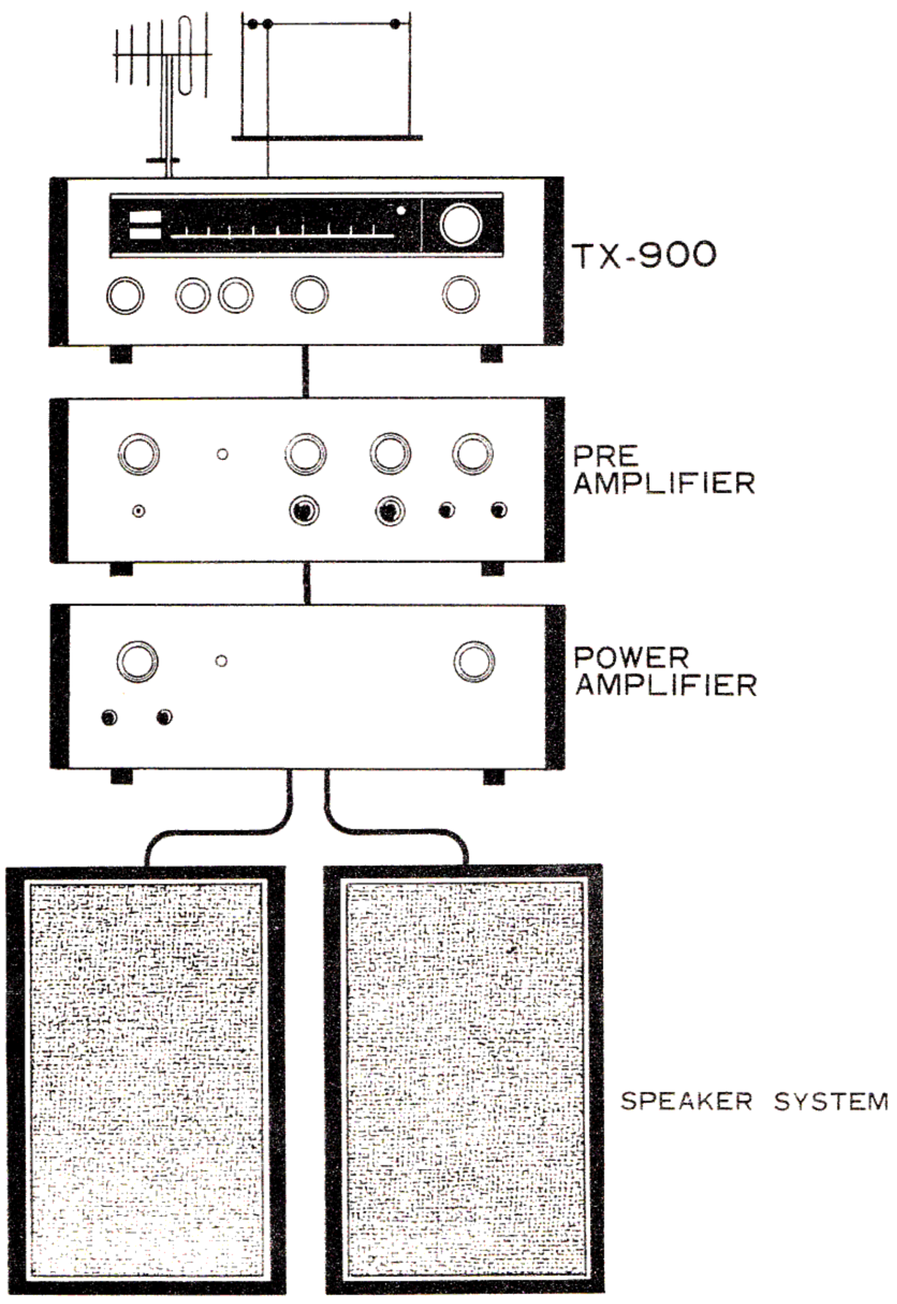
INSTALLATION OF MODEL TX-900

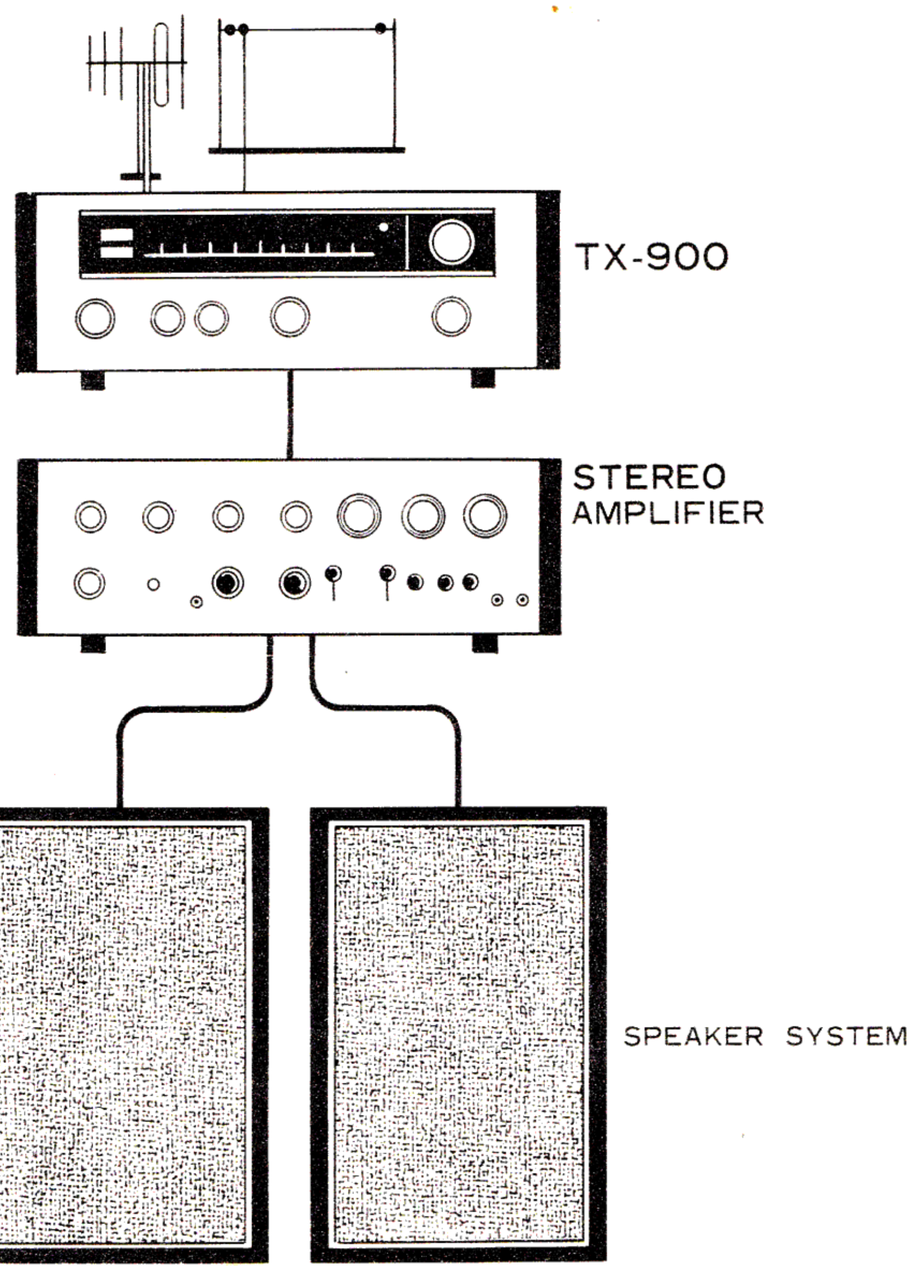
The Model TX-900 is a complete solid-state unit. Install the unit considering the following points:

- Avoid a place where the unit is directly exposed to the sun or where any heating apparatus is near.
- Be sure that the unit is provided with sufficient ventilation, and avoid a place which is damp or dusty.
- Avoid a place where there is much vibration, or the floor is uneven.



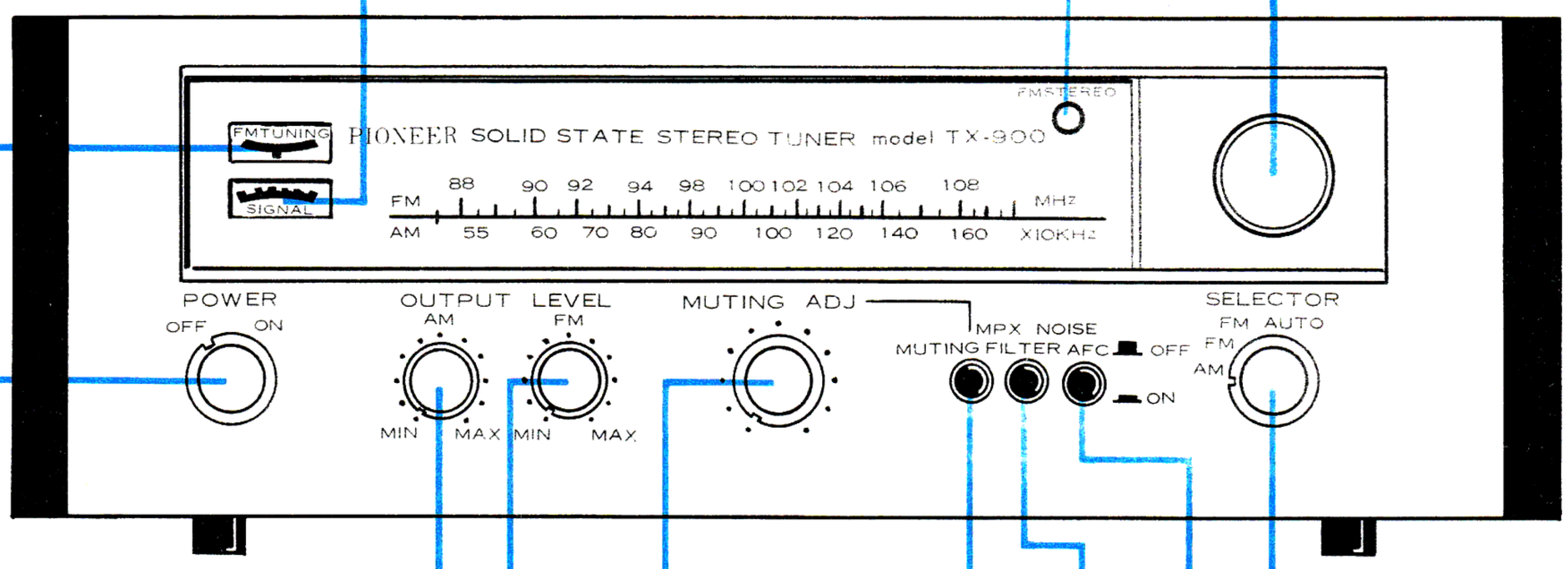
CONSTRUCTION OF STEREO SYSTEM WITH MODEL TX-900





PIONEER

FUNCTIONS OF CONTROLS AND SWITCHES ON FRONT PANEL



(11) FM TUNING METER

When tuning in an FM monaural or an FM stereo station, this meter should be used to make the tuning perfect. After the desired station has been properly tuned in with the SIGNAL METER (10), adjust this meter so that the needle comes to the center of the meter.

(10) SIGNAL METER

This meter indicates the optimum tuning point for AM or FM stations. When the needle is deflected all the way to the right, the desired station has been properly tuned in. For reception of an FM station, the FM TUNING meter should be used for the best tuning.

(9) TUNING CONTROL

This control is used to tune the receiver to the desired AM, FM monaural or FM stereo station.

● FM STEREO INDICATOR

This indicator lamp will flash on when the receiver picks up an FM stereo signal.

(1) POWER SWITCH

This switch controls power to Model TX-900. Turning the switch clockwise will turn power on.

(2) AM OUTPUT LEVEL CONTROL

This control is used to adjust the output level of signals for AM broadcasts. When this control is set to MIN, the output level is reduced by 30 dB (1/30 of the output level at the time when the control is set to MAX).

(3) FM OUTPUT LEVEL CONROL

This control is used to adjust the output level of signals for FM broadcast. When this control is set to MIN, the output level is reduced by 30 dB (about 1/30 of the output level at the time when the control is set to MAX).

(4) MUTING ADJ CONTROL

This control is used to adjust muting level while the MUTING switch is set to the ON position.

(5) MUTING SWITCH

When an FM station is tuned in, setting this switch to MUTING will eliminate interference noises between FM stations.
For reception of a weak-signal station, the switch should be set to OFF. An adjustment of the muting level can be made by means of the MUTING ADJ control (4).

(6) MPX NOISE FILTER SWITCH

This switch is used to eliminate high frequency noise when receiving an FM stereo station.

(7) AFC SWITCH

After the desired FM station has been tuned in, this switch should be set to the ON position.

(8) SELECTOR SWITCH

This switch is used to select the type of broadcast.

AM .....For reception of an AM (medium-wave broadcast band) station.

FM .....For reception of an FM monaural station.

FM AUTO .....For reception of an FM station, with automatic switching between FM monaural and stereo.

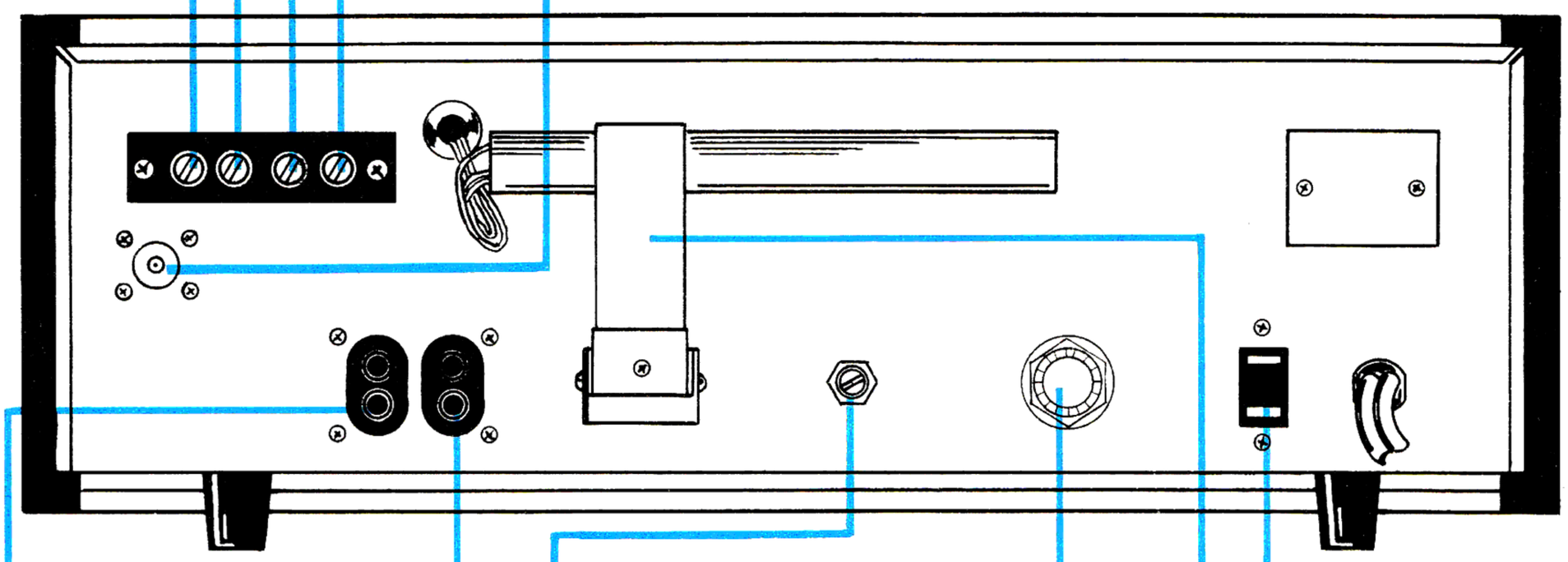
FUNCTIONS OF JACKS AND TERMINALS ON REAR PANEL

(15) FM ANTENNA TERMINALS
These are the terminals for connection with the FM antenna. Either the "T" indoor antenna (furnished) or an outdoor antenna is to be connected to these terminals.

(16) GND TERMINAL
This terminal is used to ground Model TX-900.

• FM 75Ω BNC CONNECTOR
If you use a coaxial cable of 75Ω as an antenna lead wire, make sure to connect the cable to the socket in the tuner with a connector of 75Ω unbalanced (BNC) type.

(17) AM ANTENNA TERMINAL
This is the terminal for connection with the AM antenna.



(12) OUTPUT TERMINALS
These are the output terminal of Model TX-900. They are connected to the input terminal of the amplifier (or to AUX jack).

(14) FUSE HOLDER
If the fuse blows off, be sure that replacement fuse is of proper rating (0.3-ampere rating).

(18) AM FERRITE LOOPSTICK ANTENNA
This is a loopstick antenna for reception of AM stations. In an area relatively close to the AM station(s), this antenna will provide satisfactory reception.

(13) TAPE REC
This terminals is connected to the LINE INPUT terminals of a tape recorder or of a tape deck when recording the program being received by this receiver. Note that the output signal of the receiver is always present on this jack.

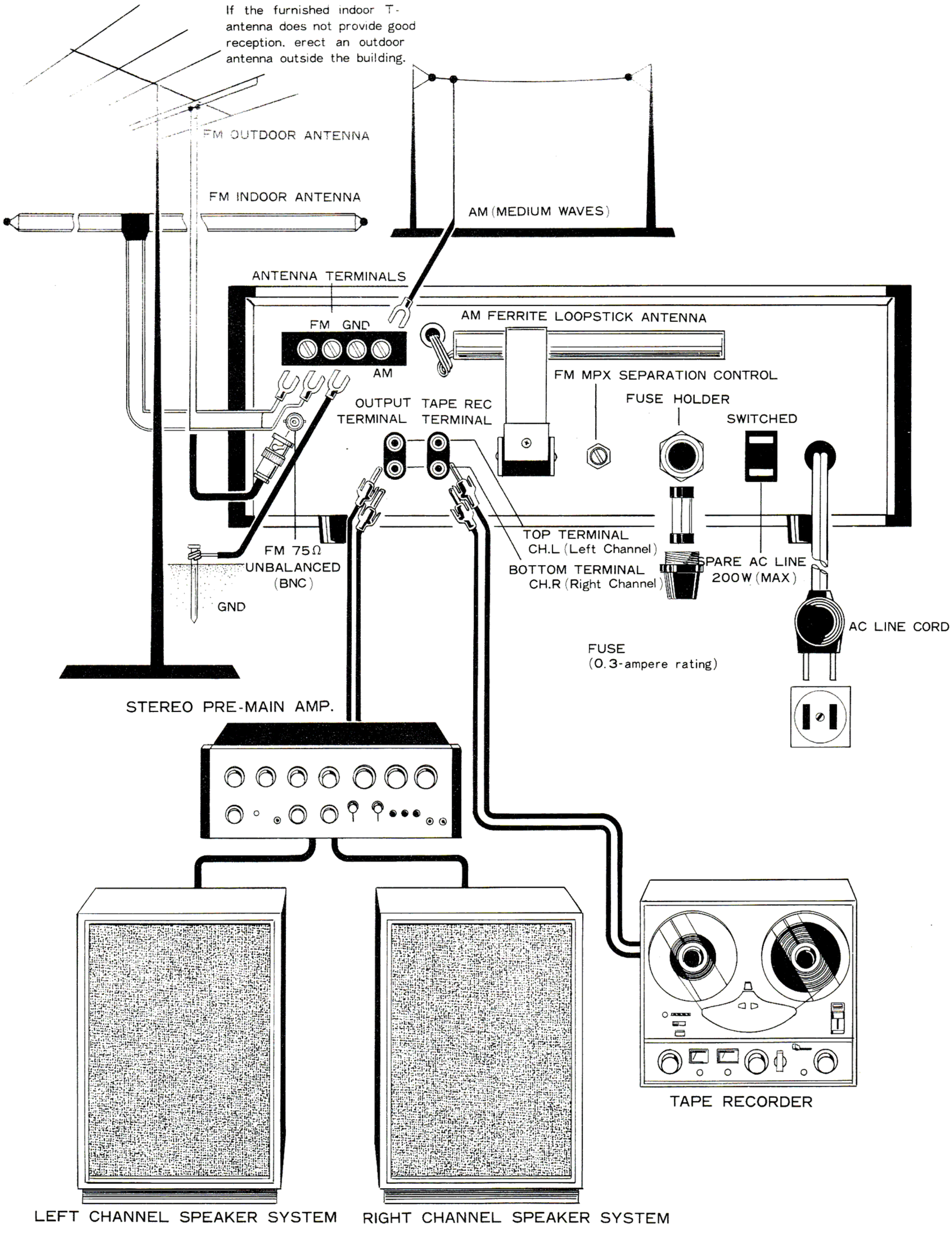
MPX SEPARATION CONTROL
This control adjusts the channel separation of FM multiplex stereo broadcasts. It has already been adjusted at the factory, and normally there should be no need for any further adjustments, which are extremely critical, and cannot be measured by ear.

(19) AC OUTLET
This AC outlet is interconnected with the POWER switch (1), and provides a source of power for any associated equipment such as a tape recorder. It has a maximum capacity of 200 W

Note:

- Tuning of Model TX-900 is made by means of a lamp indication. When the TUNING control is turned, a red lamp moves on the dial. The red lamp glows brighter when the desired station has been tuned in.
- The switches on the front panel are of pushbutton type (5), (6) and (7). If you press the switch, it is set to ON. Pressing it once again will bring it back to OFF.

REAR CONNECTION OF THE TX-900 Ⓚ



CONNECTION WITH AN AMPLIFIER

Connect the output terminal of Model TX-900® with the input terminal of the tuner of the amplifier (or with the AUX jack). Be sure to connect the left channel (L) of Model TX-900® to the left channel of the amplifier; the right channel (R) of Model TX-900® to the right channel of the amplifier. The output level of AM broadcast signals or of FM broadcast signals can be adjusted by means of the output level controls provided on the front panel. Be sure to adjust the output level of a signal source to the input of the amplifier to be connected with this unit so that sound may be reproduced without distortion.

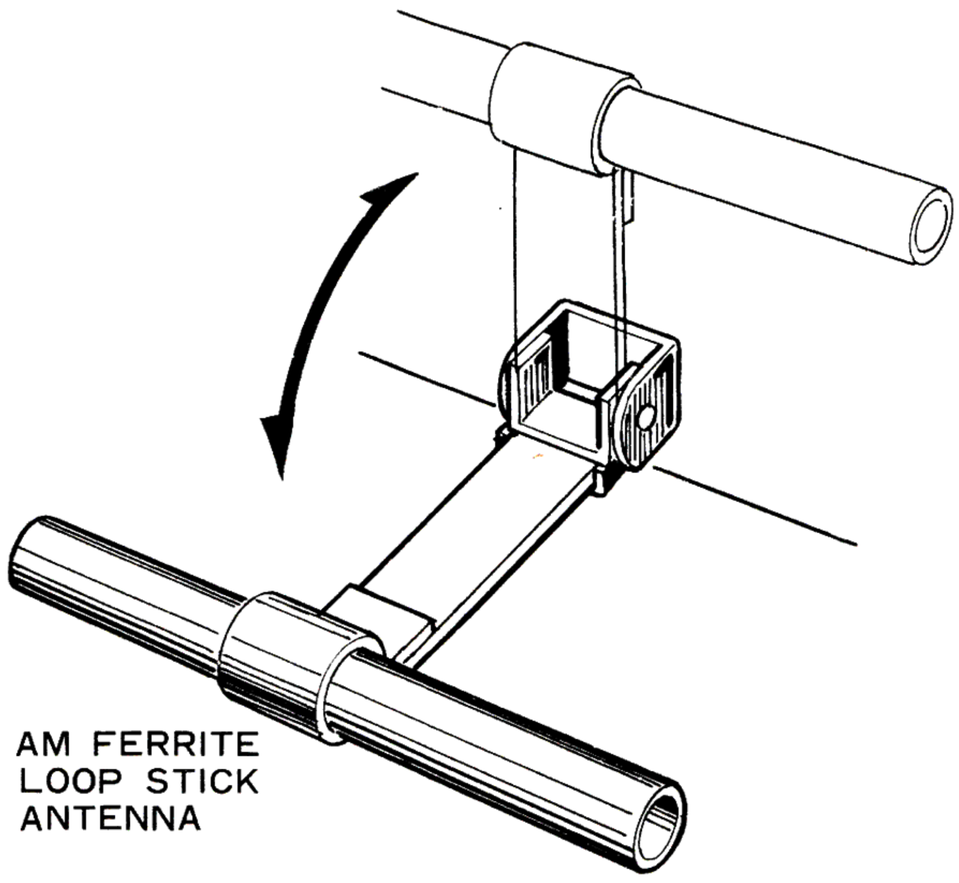
ANTENNA AND GROUND

ANTENNA FOR RECEPTION OF AM PROGRAMS

- If your house is located in an area relatively close to the AM station, the ferrite loopstick antenna provided on the back of Model TX-900® will be sufficient for reception of an AM program. As this antenna is directional, it should be moved about while listening to a station and set at the position which provides the best reception.

- If the loopstick antenna does not provide sufficient sensitivity for reception and hence static noise is significant, put the furnished antenna wire on the wall and connect one end of the wire to the AM antenna terminal (17).

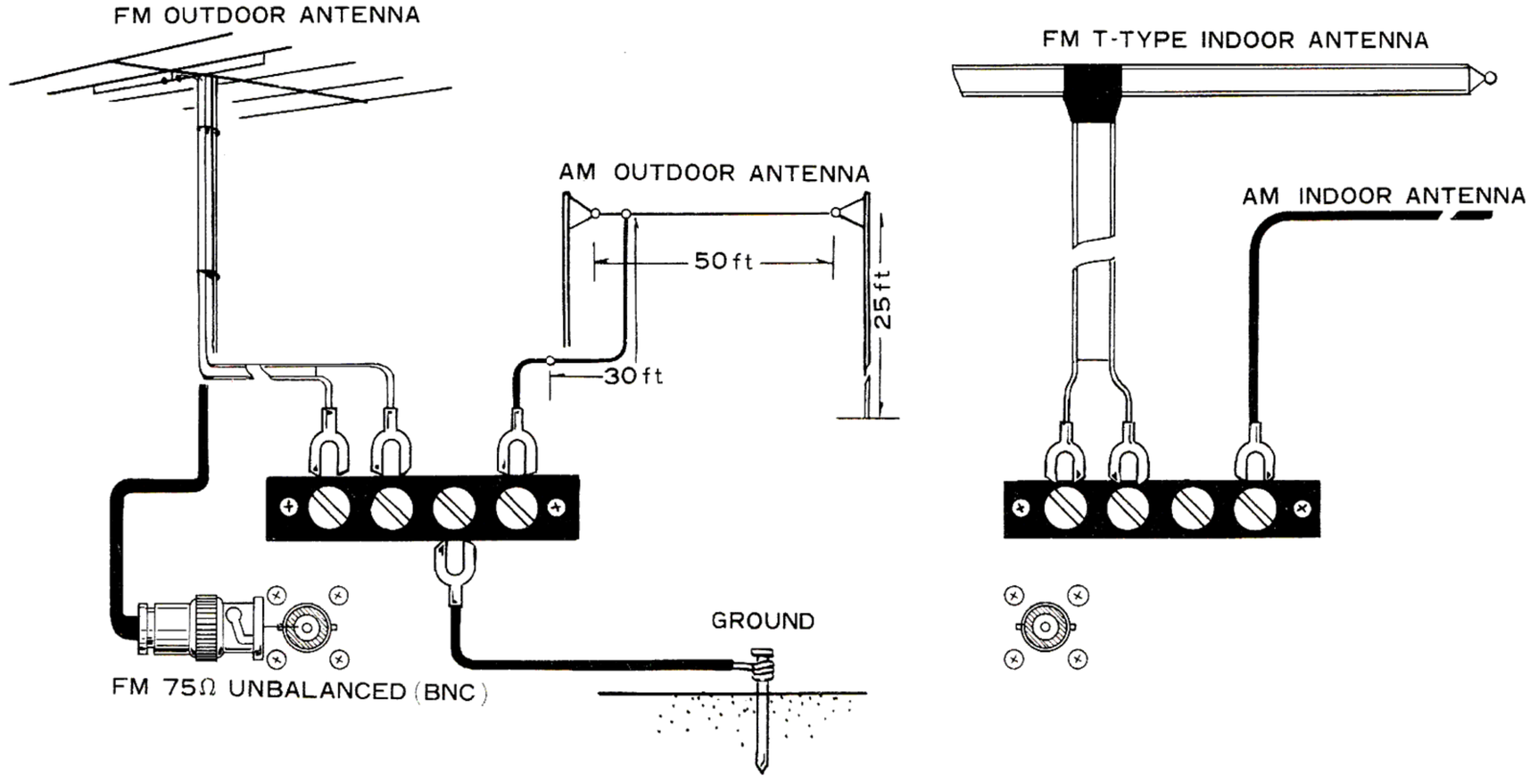
- If your house is far from the AM station and hence incoming signals are very weak, you may need to set up a separate AM antenna outdoors. In this case, connect one end of the lead wire of the AM outdoor antenna to the AM antenna terminal (17).



AM FERRITE
LOOP STICK
ANTENNA

ANTENNA FOR RECEPTION OF FM MONO/FM STEREO PROGRAMS

- If your house is located in an area relatively close to the transmitting station, the furnished FM T- antenna will be sufficient for reception of an FM program. Connect the lead wire of the T- antenna to the FM antenna terminals (15).
- If your house is made of ferro-concrete or is located far from the transmitting station, you may nead to set up a separate FM antenna outdoors. In this case, connect the lead wire of the outdoor antenna to the FM antenna terminals (15).



GROUNDING

- Connect the lead wire coming from a well-grounded electrode to the GND terminal (16).
  It may be sometimes effective for eliminating extraneous noise.

CONNECTION OF TAPE RECORDER WITH MODEL TX-900

Connection of your tape recorder with Model TX-900Ⓚ permits you to record an AM or FM program simultaneously with reception of the program.

(1) If your tape recorder is a monaural recording type, connect either top jack or bottom jack of the TAPE REC jack (13) with the LINE INPUT of the tape recorder, using a shielding wire.
In case the tape recorder is a stereophonic type, the top jack (L) should be connected to left signal and the bottom jack (R) should be connected to right signal.

(2) As signals are always present at the Tape Rec jack (13), set the SELECTOR switch (8) to the program you desire to record.

(3) Monaural tape recorder records only one channel of stereo signals, either left channel or right channel.

RECEPTION OF BROADCASTS

- Tuning in the desired station is indicated by a red lamp. When the desired station has been tuned in, the red lamp glows brighter.

RECEPTION OF AM BROADCAST

(1) Set the SELECTOR switch (8) to AM.
(2) Tune to the desired station by turning the TUNING control (9), observing the deflection of the needle of the SIGNAL meter (10). When the needle is deflected to the extreme right, the desired station has been properly tuned in.

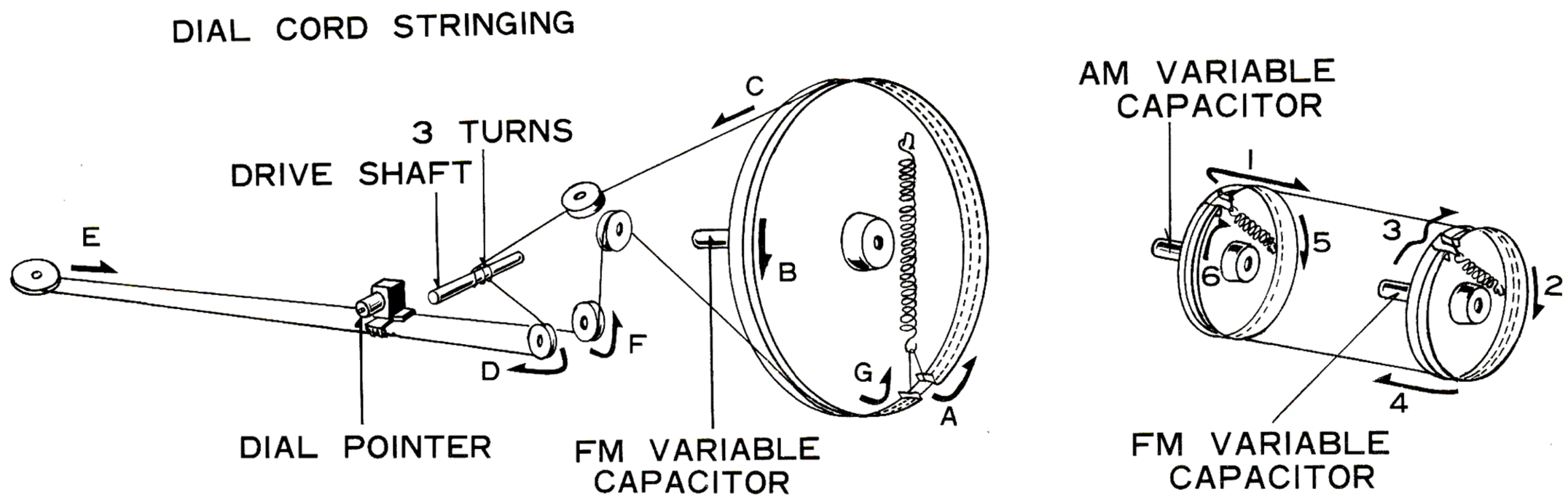
NOTE

- You do not need to worry about the output level adjustment too much. Adjust the output level of the unit to the input of the amplifier so that sounds may not be reproduced without distortion.
- If your house is located far from the transmitting station or between hills, and hence incoming signals are weak for reception of an FM station, set the SELECTOR switch to FM. In this case, an FM stereo broadcast will be received in an FM monaural mose.
- If extraneous noise is still significant when an FM stereo program is received in a monaural mode by setting the SELECTOR switch to FM, setting up of an FM antenna may help to eliminate the noise.

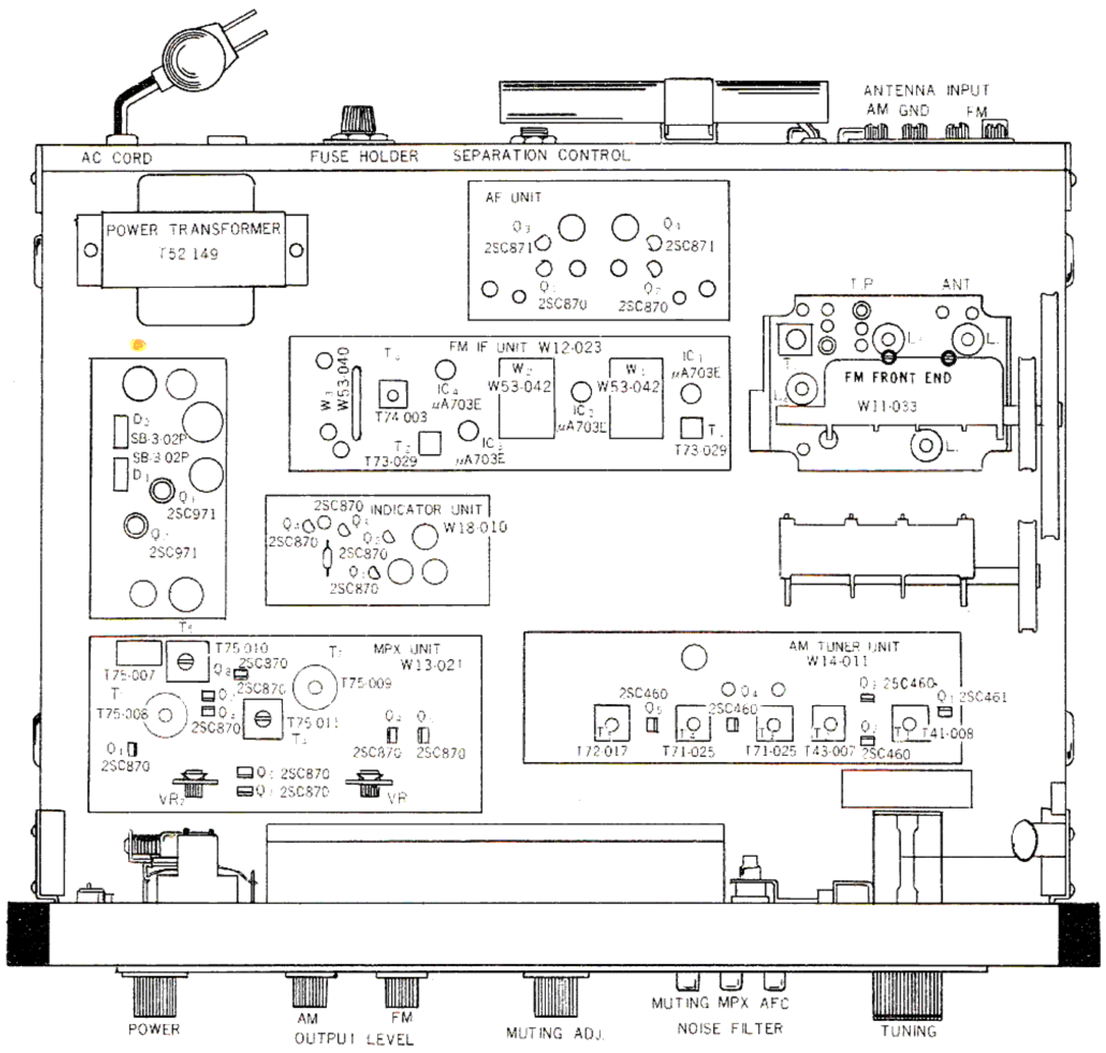
RECEPTION OF FM STEREO BROADCAST

(1) Set the SELECTOR switch (8) to FM AUTO.
(2) Set the AFC switch (7) to OFF.
(3) Tune to the desired station by turning the TUNING control (9), observing the deflection of the needles of both SIGNAL meter (10) and FM TUNING meter (11). When the needle of the SIGNAL meter is deflected to the extreme right, adjust the FM TUNING meter so that the needle comes to the center of the dial (the best listening point).
(4) Set the AFC switch to AFC.
(5) If the desired station is transmitting a stereo program, the stereo indicator lights.
(6) If high frequency noise is significant while receiving an FM station, eliminate the noise by means of the MPX NOISE FILTER (6).

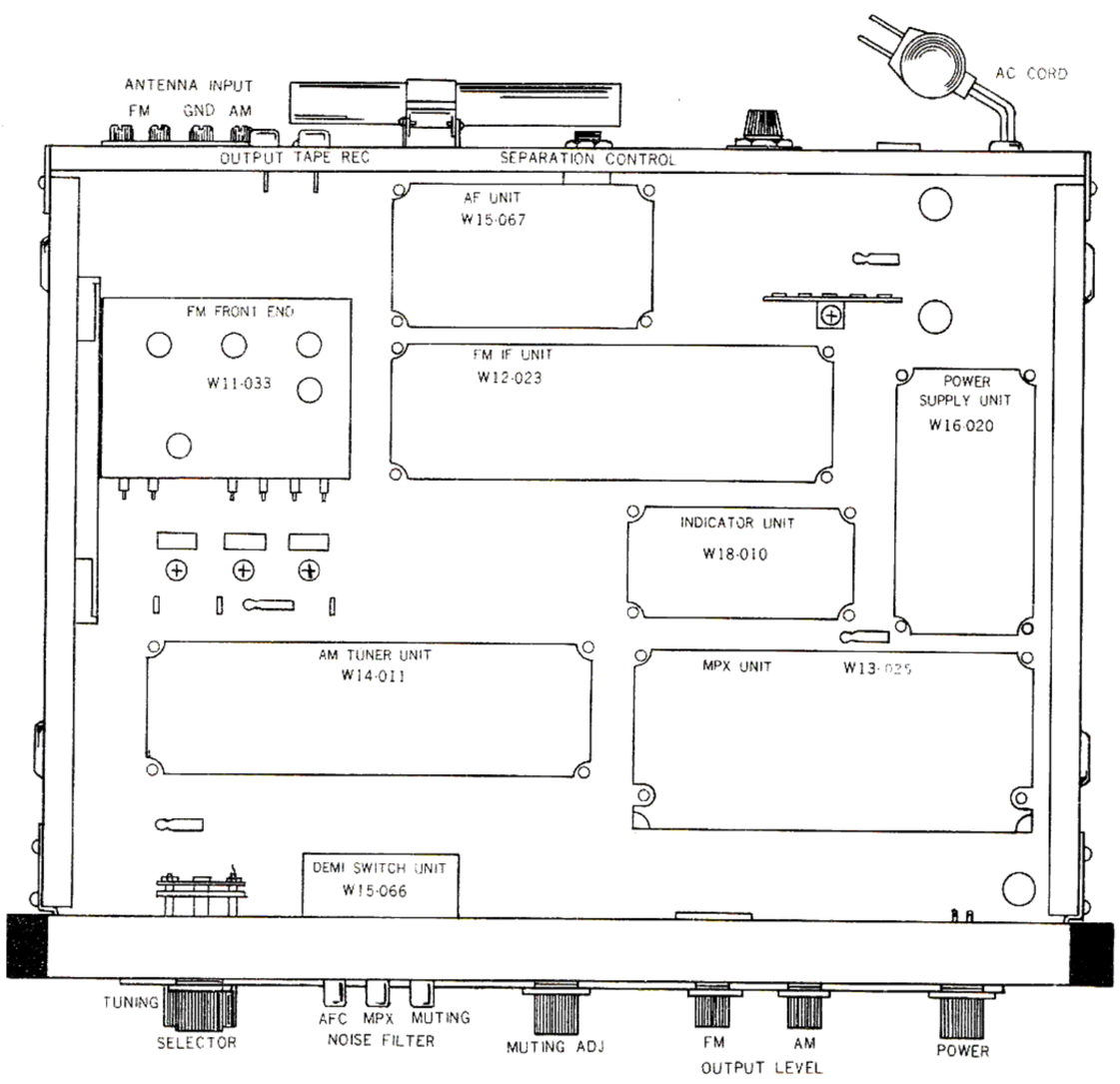
DIAL CORD STRINGING



PARTS LAYOUT (TOP VIEW)



PARTS LAYOUT (BOTTOM VIEW)



TECHNICAL SPECIFICATIONS FOR MODEL TX-900

TRANSISTORS AND DIODES

F.E.T 3
I.C. 4
Transistors 25
Diodes 24

FM SECTION

Circuitry . . . . . Front end using 3 F.E.T.
2 stages RF amplifier.
I.F. stage using 2 crystal filters and 4 I.C
Frequency Range . . . . . 87 ~ 108 MHz
IHF Usable Sensitivity . . 1.7 μv
Image Rejection . . . . . 95 dB (at 98 MHz)
Capture Ratio . . . . . 1.5 dB (IHF rating)
Signal to Noise Ratio . . 60 dB (30% MOD)
70 dB (I.H.F rating)
Antenna Input . . . . . 300 ohms (balanced)
75 ohms (unbalanced)
Output Level . . . . . .1 v (400 Hz, 30% MOD)

MULTIPLEX SECTION

Circuitry . . . . . Time-switching type de-modulator FM Mono/Stereo Automatic selection
Channel Separation . . . . . 38 dB (at 1 kHz)
30 dB (40 Hz – 8 kHz)

AM SECTION

Circuitry . . . . . Superheterodyne
Frequency Range . . . . . 525~ 1605 kHz
IHF Usable Sensitivity . . 10 μv
Image Rejection . . . . . 70 dB (at 1000 kHz)
Output Level . . . . . 1 v (400 Hz, 30% MOD)
Antenna Input . . . . . Built-in Ferrite Loopstick Antenna

POWER SUPPLY, ETC.

Line Requirements . . . . 117Volt 60 Hz.
13VA, 12 watts (Max)
Dimensions . . . . . 15"15/16 405mm
Overall 5" 9/16 140mm
14" 356mm
Weight . . . . . Net Weight 17 3/16 lbs. 7.8 kg
Net Weight with Package 20 1/2 lbs. 9.3kg.

These specification are subject modification for improvement with out notice.

PARTS LIST OF THE TX-900

CAPACITORS
IN μF, 10% TOLERANCE UNLESS OTHERWISE NOTED P: μμF

Symbol	Description				Part No.
C1	Ceramic	0.0015		50V	
C2	〃	〃		〃	
C3	〃	500P		〃	
C4	〃	〃		〃	
C5	Oil Paper	0.01			C15-001-0
C6	Ceramic	〃	+80% −20%	D.C.1.4kV	C43-003-0
C7	〃	〃	〃	〃	〃
C8	〃	820P		50V	
C9	〃	〃		〃	

RESISTORS
IN Ω, ¼W, 10% TOLERANCE UNLESS OTHERWISE NOTED K: KΩ, M: MΩ

Symbol	Description				Part No.
R1	Carbon film	3.3k			
R2	〃	15k			
R3	〃	6.8k			
R4	〃	〃			
R5	〃	1k			
R6	〃	〃			
R7	〃	4.7k			
R8	〃	2.2M			

COIL AND TRANSFORMER

Symbol	Description	Part No.
	MW Ferrite Loopstick Antenna	T42-024-0
	Power Transformer	T52-149-0

SWITCHES

Symbol	Description	Part No.
	Selector	S13-026-0
	Power Switch	S11-014-A

POTENTIOMETERS

Symbol	Description	Part No.
VR1	100k	C81-012-0
VR2	30k dual	C82-043-0
VR3	30k	C81-013-0

COMPOUND PARTS

Symbol	Description	Part No.
LPF1	38 kHz Filter	T75-015-A
LPF2	〃	〃

MISCELLANEOUS

Symbol	Description	Part No.
	FM FRONT END	W11-033-0
	FM IF Unit	W12-023-A
	MPX Unit	W13-025-A
	AM TUNER Unit	W14-011-A
	A.F Unit	W15-067-A
	INDICATOR Unit	W18-010-A
	POWER SUPPLY Unit	W16-020-B
	DEMI-SWITCH Unit	W15-066-A
	Front Panel	M21-283-G
	Metal Cover	M33-113-B
	Foot	M61-017-0
	Dial Pully (for Tunig Capacitor)	M42-027-A
	Dial Pully (Small)	M42-021-B
	Dial Pully	M42-009-A
	Dial Glass	A33-078-B
	Knob, Tuning	A12-146-B
	Knob, Output Level Control, Power	A12-144-B
	Knob, MPX Noise filter	A19-077-0
	Tuning Meter	A91-008-C
	Signal Meter	A91-009-C
	Pilot Lamp (for, Dial Glass)	E22-017-0
	Pilot Lamp (for, Meter)	E22-002-0
	Pilot Lamp Socket	K41-002-B
	Fuse Holder	K96-006-C
	Fuse Holder 1p	K91-005-0
	Pilot Lamp (for FM Stereo)	E22-015-0
	Braket (orange)	A59-036-0
	Fuse 0.3A	E21-017-0
	Spare A.C Outlet	K82-012-0
	Terminal 4p	K21-010-E
	Terminal 4p (Antenna Input)	K11-018-0
	BNC Connector	K73-005-0

FM FRONT END (W11-033)

CAPACITORS

Symbol	Description				Part. No.
C1	Ceramic	5P	±0.5P	50V	
C2	〃	0.001	+100% −0	25V	
C3	〃 (Feed thru)				C47-005-A
C4	〃 (〃)				〃
C5	〃 (〃)				〃
C6	〃	10P	±0.5P	50V	
C7	〃	〃	〃	〃	
C8	〃 (Feed thru)				C47-005-A
C9	〃 (〃)				〃
C10	〃 (〃)				〃
C11	〃	10P	±0.5P	50V	
C12	〃	〃	〃	〃	
C13	〃	0.001	+100% −0	25V	
C14	〃 (Feed thru)				C47-005-A
C15	〃 (〃)				〃
C16	〃	10P	±0.5P	50V	
C17	〃	5P	〃	〃	
C18	〃	22P		〃	
C19	〃 (Feed thru)				C47-005-A

C_{20}	Ceramic	7P	±0.5P	50V	
C_{21}	〃	10P	〃	〃	
C_{22}	〃 (Feed thru)				C47-005-A
C_{23}	〃	0.01	$^{+100\%}_{-0}$	25V	
CT_4	Trimmer				C45-004-B
CT_5	〃				C43-007-0

RESISTORS

Symbol	Description				Part No.
R_1	Carbon film	100k		1/8 W	
R_2	〃	33		〃	
R_3	〃	100k		〃	
R_4	〃	〃		〃	
R_5	〃	56		〃	
R_7	〃	2.2k		〃	
R_8	〃	470		〃	
R_9	〃	220		〃	
R_{10}	〃	3.3k		〃	
R_{11}	〃	8.2k		〃	
R_{12}	〃	1.5k		〃	
R_{13}	〃	22		〃	
R_{14}	〃	〃		〃	
R_{15}	〃	2.2k		〃	
R_{16}	〃	1M		〃	

DIODE AND TRANSISTORS

Symbol	Description	Part No.
D_1	1S85 Variable Capacitance Diode	
Q_1	3SK22-Y F.E.Transistor	
Q_2	2SK19-Y 〃	
Q_3	2SK19-GR 〃	
Q_4	SE3001 Transistor	

COILS

Symbol	Description	Part No.
L_1	Antenna coil	T22-018-0
L_2	R.F. Choke coil	T24-028-0
L_3	R.F. Choke coil	〃
L_4	R.F.1 coil	T21-019-0
L_5	R.F. Choke coil	T24-028-0
L_6	R.F.2 coil	T21-020-0
L_7	O.S.C coil	T23-032-B
L_8	Antenna coil	T22-019-A
L_9	Neutral coil	T21-021-A

FM IF UNIT (W12-023)

CAPACITORS

Symbol	Description				Part No.
C_1	Ceramic	0.01	$^{+100\%}_{-0}$	25V	
C_2	〃	〃	〃	〃	
C_3	〃	〃	〃	〃	
C_4	〃	〃	〃	〃	
C_5	〃	〃	〃	〃	
C_6	〃	15P		50V	
C_7	Mylar	0.1	±20%	〃	
C_8	Ceramic	0.01	$^{+100\%}_{-0}$	25V	
C_9	Ceramic	0.01	$^{+100\%}_{-0}$	25V	
C_{10}	〃	〃	〃	〃	
C_{11}	〃	〃	〃	〃	
C_{12}	〃	〃	〃	〃	
C_{13}	〃	〃	〃	〃	
C_{14}	Mylar	0.1	±20%	50V	
C_{15}	Ceramic	0.01	$^{+100\%}_{-0}$	25V	
C_{16}	〃	5P	±0.5P	50V	
C_{17}	〃	100P		〃	
C_{18}	〃	0.01	$^{+100\%}_{-0}$	25V	
C_{19}	〃	〃	〃	〃	
C_{20}	〃	〃	〃	〃	
C_{21}	〃	〃	〃	〃	
C_{22}	〃	〃	〃	〃	
C_{23}	〃	300P		50V	
C_{24}	Electrolytic	1		25V	
C_{25}	〃	4.7		16V	
C_{26}	〃	〃		〃	

RESISTORS

Symbol	Description				Part No.
R_1	Carbon film	820			
R_2	〃	33k			
R_4	〃	1.2k			
R_5	〃	820			
R_6	〃	〃			
R_7	〃	33			
R_8	〃	4.7k			
R_9	〃	33			
R_{10}	〃	820			
R_{11}	〃	15k			
R_{12}	〃	33k			
R_{13}	〃	100			
R_{14}	〃	220k			
R_{15}	〃	22k			
R_{16}	〃	820			
R_{17}	〃	33k			
R_{18}	〃	〃			
R_{19}	〃	〃			

DIODES AND IC

Symbol	Description	Part No.
D_1	1S188 Diode	
D_2	〃	
D_3	〃	
D_4	〃	
D_5	〃	
D_6	〃	
D_7	〃	
IC_1	LM703L I.C.	
IC_2	〃	
IC_3	〃	
IC_4	〃	

COIL AND TRANSFORMERS

Symbol	Description	Part No.
L	R.F. Choke coil	T24-028-0
T	I.F. Transformer	T73-029-0
T	〃	T74-003-0

COMPOUND PARTS

Symbol	Description	Part No.
W_1	Crystal Filter	W53-042-0
W_2	〃	〃
W_3	F.M. Det Circuit	W53-040-0

AM TUNER UNIT (W14-011)

CAPACITORS

Symbol	Description				Part No.
C_1	Ceramic	0.04	$^{+100\%}_{-0}$	25V	
C_2	〃	〃	〃	〃	
C_3	〃	〃	〃	〃	
C_4	〃	〃	〃	〃	
C_5	〃	〃	〃	〃	
C_6	〃	〃	〃	〃	
C_7	〃	〃	〃	〃	
C_8	〃	〃	〃	〃	
C_9	Mylar	0.01	±20%	50V	
C_{10}	Styrol	410P		〃	
C_{11}	Ceramic	0.04	$^{+100\%}_{-0}$	25V	
C_{12}	Electrolytic	10		10V	
C_{13}	Ceramic	0.04	$^{+100\%}_{-0}$	25V	
C_{14}	〃	〃	〃	〃	
C_{15}	〃	〃	〃	〃	
C_{16}	Electrolytic	10		16V	
C_{17}	Ceramic	0.04	$^{+100\%}_{-0}$	25V	
C_{18}	〃	〃	〃	〃	
C_{19}	〃	47P		50V	
C_{20}	〃	33P		〃	
C_{21}	〃	3P	±0.25P	〃	
C_{22}	〃	0.04	$^{+100\%}_{-0}$	25V	
C_{23}	Electrolytic	2.2		35V	
C_{24}	〃	47		16V	
C_{25}	Ceramic	0.04	$^{+100\%}_{-0}$	25V	
C_{26}	Mylar	0.004	±20%	50V	
C_{27}	〃	0.002	〃	〃	
C_{28}	Electrolytic	1		〃	

RESISTORS

Symbol	Description				Part No.
R_1	Carbon film	4.7k			
R_2	〃	1k			
R_3	〃	〃			
R_4	〃	〃			
R_5	〃	3.3k			
R_6	〃	33k			
R_7	〃	4.7k			
R_8	〃	27k			
R_9	〃	1k			
R_{10}	〃	82			
R_{11}	〃	1k			
R_{12}	〃	470			
R_{13}	〃	1k			
R_{14}	〃	100			
R_{15}	〃	4.7k			
R_{16}	〃	100k			
R_{17}	〃	470			
R_{18}	〃	1k			
R_{19}	〃	220k			
R_{20}	〃	4.7k			
R_{21}	〃	27k			
R_{22}	〃	22k			
R_{23}	Carbon film	470			
R_{24}	〃	1k			
R_{25}	〃	470			
R_{26}	〃	2.2k			
R_{27}	〃	100			
R_{28}	〃	4.7k			

DIODES AND TRANSISTORS

Symbol	Description	Part No.
D_1	1N60 Diode	
D_2	〃	
D_3	〃	
D_4	〃	
D_5	〃	
D_6	〃	
Q_1	2SC461 Transistor	
Q_2	2SC460 Transistor	
Q_3	〃	
Q_4	〃	
Q_5	〃	

COILS AND TRANSFORMERS

Symbol	Description	Part No.
T_1	M.W. R.F. coil	T41-008-0
T_2	M.W. OSC. coil	T43-007-0
T_3	I.F. Transformer	T71-025-A
T_4	〃	〃
T_5	〃	T72-017-0

INDICATOR UNIT (W18-010)

CAPACITOR

Symbol	Description				Part No.
C_1	Electrolytic	0.47		50V	

RESISTORS

Symbol	Description				Part No.
R_1	Carbon film	2.2k			
R_2	〃	33k			
R_3	〃	680			
R_4	〃	47k			
R_5	〃	100			
R_6	〃	10k			
R_7	〃	〃			
R_8	〃	〃			
R_9	〃	〃			
R_{10}	〃	22k			
R_{11}	〃	47			
R_{12}	〃	220			

DIODE AND TRANSISTORS

Symbol	Description	Part No.
D_1	1S188 Diode	
Q_1	2SC870 Transistor	
Q_2	〃	
Q_3	〃	
Q_4	〃	

POTENTIOMETERS

Symbol	Description	Part No.
VR_1	10k, Semi-fixed	C92-049-O
VR_2	100k, Semi-fixed	C92-047-O
VR_3	47k, Semi-fixed	C92-048-O

DEMI-SWITCH UNIT (W15-066)

CAPACITORS

Symbol	Description				Part No.
C_1	Electrolytic	0.47		50V	
C_2	Styrol	0.0022		〃	

RESISTOR

Symbol	Description				Part No.
R_1	Carbon film	220k		$\frac{1}{4}$W	

SWITCH

Symbol	Description	Part No.
S_1	Demi Switch	S31-017-O

A.F UNIT (W15-067)

CAPACITORS

Symbol	Description				Part No.
C_1	Mylar	0.033	±20%	50V	
C_2	〃	〃	〃	〃	
C_3	Ceramic	5P		〃	
C_4	〃	〃		〃	
C_5	〃	10P		〃	
C_6	〃	〃		〃	
C_7	Electrolytic	10		25V	
C_8	〃	〃		〃	
C_9	〃	47		3V	
C_{10}	〃	〃		〃	
C_{11}	Ceramic	220P		50V	
C_{12}	〃	〃		〃	
C_{13}	Electrolytic	10		10V	
C_{14}	〃	〃		〃	
C_{15}	〃	47		35V	
C_{16}	〃	〃		〃	

RESISTORS

Symbol	Description				Part No.
R_1	Carbon film	4.7k			
R_2	〃	〃			
R_3	〃	470k			
R_4	〃	〃			
R_5	〃	150k			
R_6	〃	〃			
R_7	〃	3.9k			
R_8	〃	〃			
R_9	〃	470k			
R_{10}	〃	〃			
R_{11}	〃	6.8k			
R_{12}	〃	〃			
R_{13}	〃	1.2k			
R_{14}	〃	〃			
R_{15}	〃	18k			
R_{16}	〃	〃			
R_{17}	〃	47k			
R_{18}	〃	〃			
R_{19}	〃	1k			
R_{20}	〃	〃			

TRANSISTORS

Symbol	Description	Part No.
Q_1	2SC871 Transistor	
Q_2	〃	
Q_3	2SC870 Transistor	
Q_4	〃	

FM MPX UNIT (W13-025)

CAPACITORS

Symbol	Description				Part No.
C_1	Electrolytic	2.2		10V	C51-022-O
C_2	Mylar	0.02		50V	
C_3	Ceramic	68P		〃	
C_4	Styrol	0.02	±5%	〃	
C_5	Electrolytic	10		10V	
C_6	Styrol	0.005	±5%	50V	
C_7	〃	〃		〃	
C_8	〃	〃		〃	
C_9	Electrolytic	4.7	±20%	15V	
C_{10}	〃	〃		〃	
C_{11}	〃	0.47		25V	
C_{12}	〃	〃		〃	
C_{13}	〃	33		10V	
C_{14}	Styrol	0.005	±5%	50V	
C_{15}	〃	0.0033		〃	
C_{16}	Electrolytic	22		10V	
C_{17}	〃	10		〃	
C_{18}	〃	〃		〃	
C_{19}	Styrol	0.015	±5%	50V	
C_{20}	Electrolytic	1		10V	
C_{21}	〃	22		25V	
C_{22}	Styrol	0.001		〃	
C_{23}	〃	〃		〃	
C_{24}	Ceramic	0.04	$+100\%$ -0	50V	

RESISTORS

Symbol	Description				Part No.
R1	Carbon film	100k		1/8 W	
R2	〃	1k		〃	
R3	〃	47k		〃	
R4	〃	68k		〃	
R5	〃	220		〃	
R6	〃	1k		〃	
R7	〃	4.7k		〃	
R9	〃	100k		〃	
R10	〃	47k		〃	
R11	〃	〃		〃	
R12	〃	12k		〃	
R13	〃	3.3k		〃	
R14	〃	56k		〃	
R15	〃	〃		〃	
R16	〃	100		〃	
R17	〃	10k		〃	
R18	〃	12k		〃	
R19	〃	〃		〃	
R20	〃	10k		〃	
R21	〃	100k		〃	
R22	〃	〃		〃	
R23	〃	330k		〃	
R24	〃	〃		〃	
R25	〃	47k		〃	
R26	〃	〃		〃	
R27	〃	15k		〃	
R28	〃	〃		〃	
R29	〃	1.5k		〃	
R30	〃	〃		〃	
R31	〃	33k		〃	
R33	〃	47k		〃	
R34	〃	33k		〃	
R35	〃	100		〃	
R36	〃	10k		〃	
R37	〃	〃		〃	
R38	〃	3.3k		〃	
R39	〃	680		〃	
R40	〃	4.7k		〃	
R41	〃	15k		〃	
R42	〃	〃		〃	
R43	〃	2.2k		〃	

DIODES AND TRANSISTORS

Symbol	Description	Part No.
D1	OA79 diode	
D2	〃	
D3	〃	
D4	〃	
D5	〃	
D6	1N60 diode	
Q1	2SC870 Transistor	
Q2	〃	
Q3	〃	
Q4	〃	
Q5	〃	
Q6	〃	
Q7	〃	
Q8	〃	
Q9	〃	

TRANSFORMERS

Symbol	Description	Part No.
T1	19kHz Transformer	T75-020-A
T2	38kHz Transformer	T75-021-A
T3	19kHz Transformer	T75-011-A
T4	S.C.A Filter Coil	T75-007-A
T5	19kHz Filter Coil	T75-010-A

POTENTIOMETERS

Symbol	Description	Part No.
VR1	1kΩ Left and Right Level Adjust	C92-022-O
VR2	300Ω Auto Level Adjust	C92-026-O

POWER SUPPLY UNIT (W16-020)

CAPACITORS

Symbol	Description				Part No.
C1	Electrolytic	100		35V	
C2	〃	47		〃	
C3	〃	470		25V	
C4	〃	330		〃	
C5	Ceramic	0.001		50V	
C6	〃	〃		〃	
C7	Electrolytic	100		35V	
C8	〃	47		16V	
C9	Ceramic	0.01		50V	

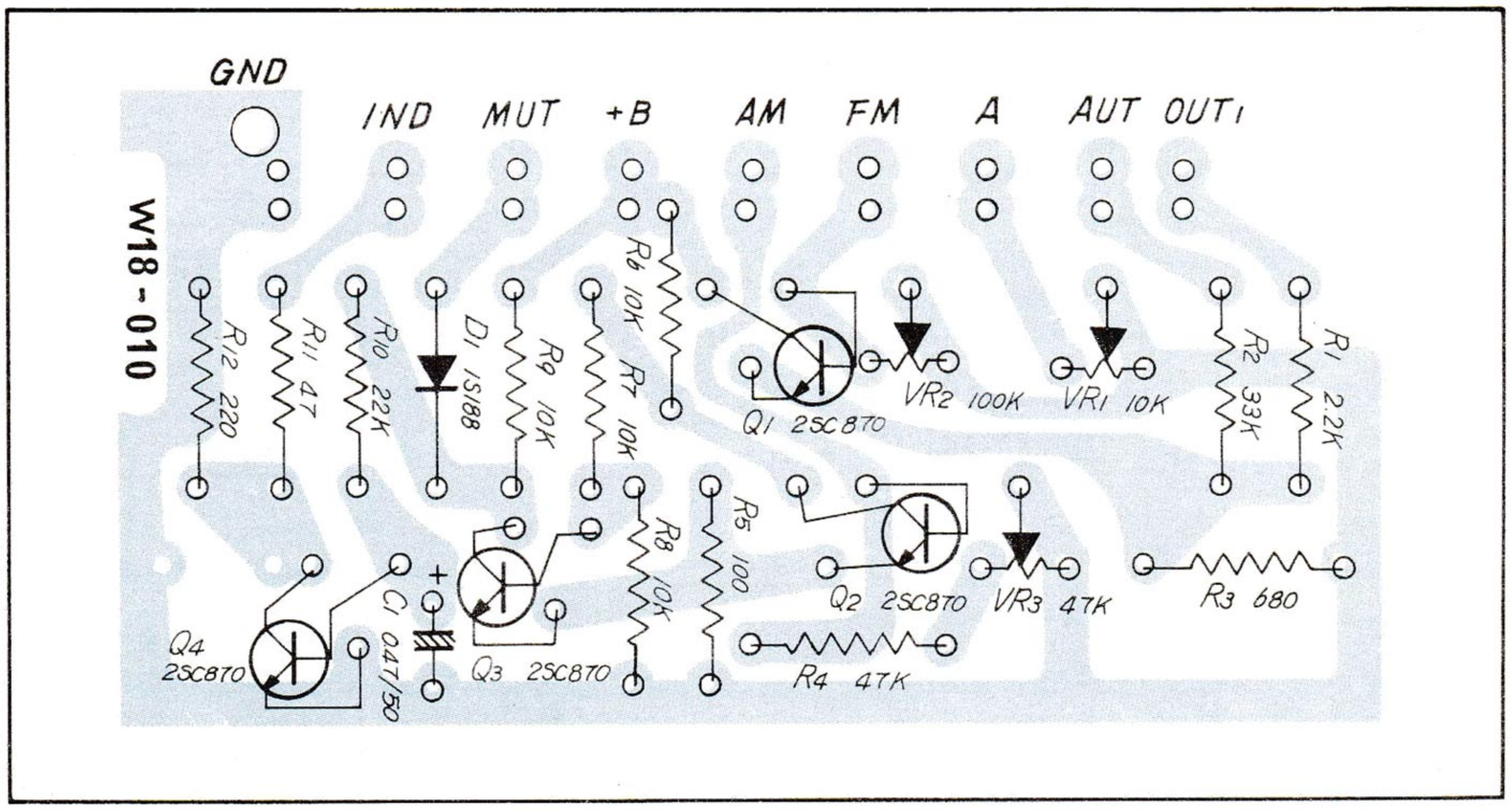
RESISTORS

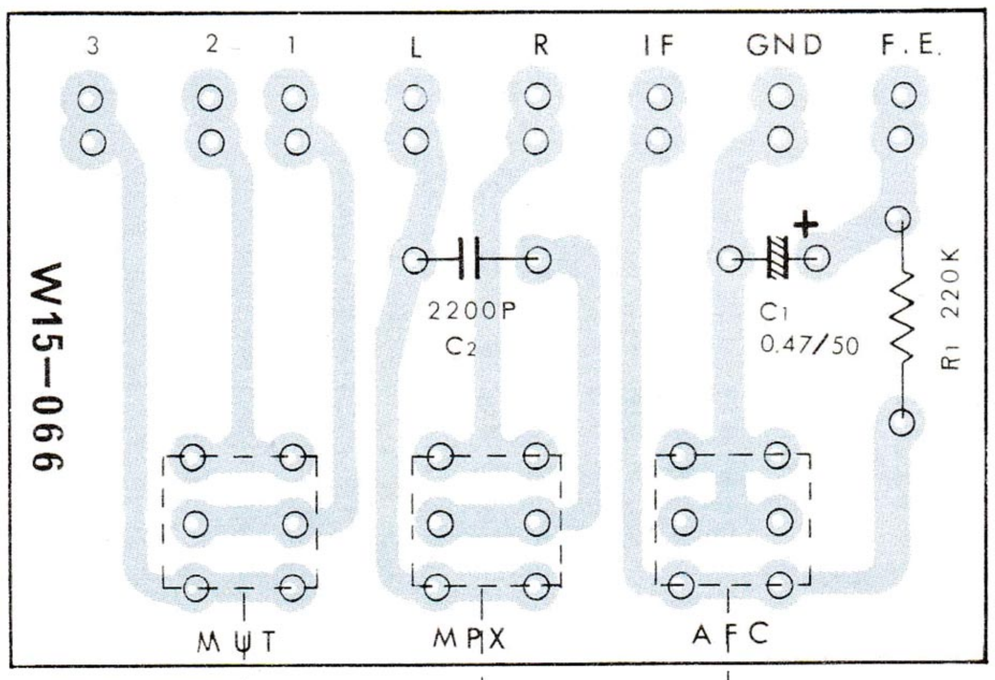
Symbol	Description				Part No.
R1	Carbon film	27			
R2	〃	5.6			
R3	〃	22		1/2 W	
R4	〃	5.6			
R5	〃	15k			
R6	〃	680k			
R7	〃	2.2k			
R8	〃	680		1W	
R9	〃	1k		〃	

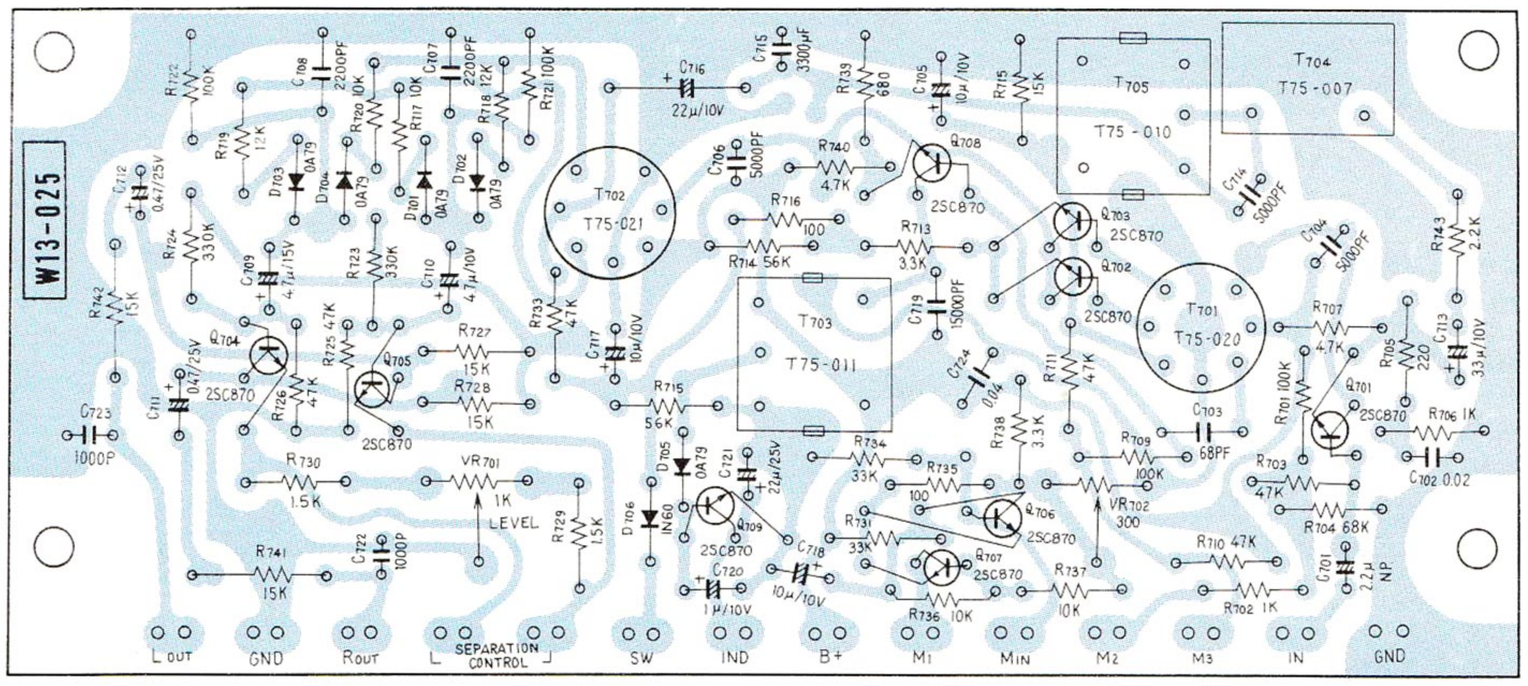
DIODES AND TRANSISTORS

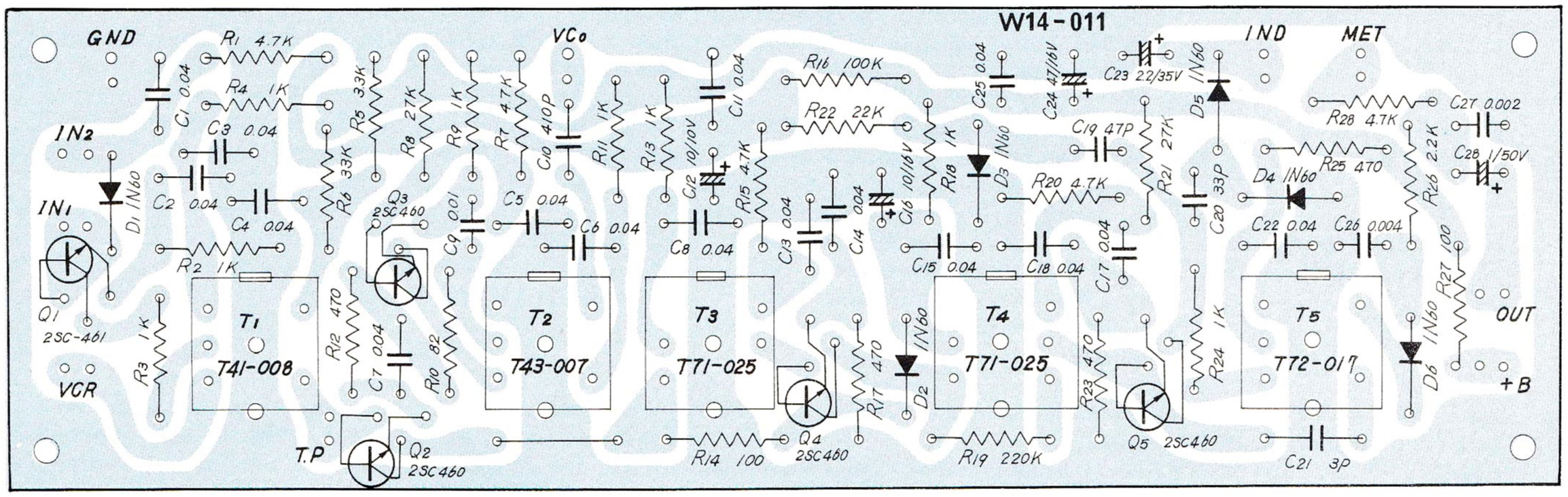
Symbol	Description	Part No.
D1	SB-3-02P diode	
D2	〃	
D3	1S338-Q Zener diode	
Q1	2SC971-2 Transistor	
Q2	〃	

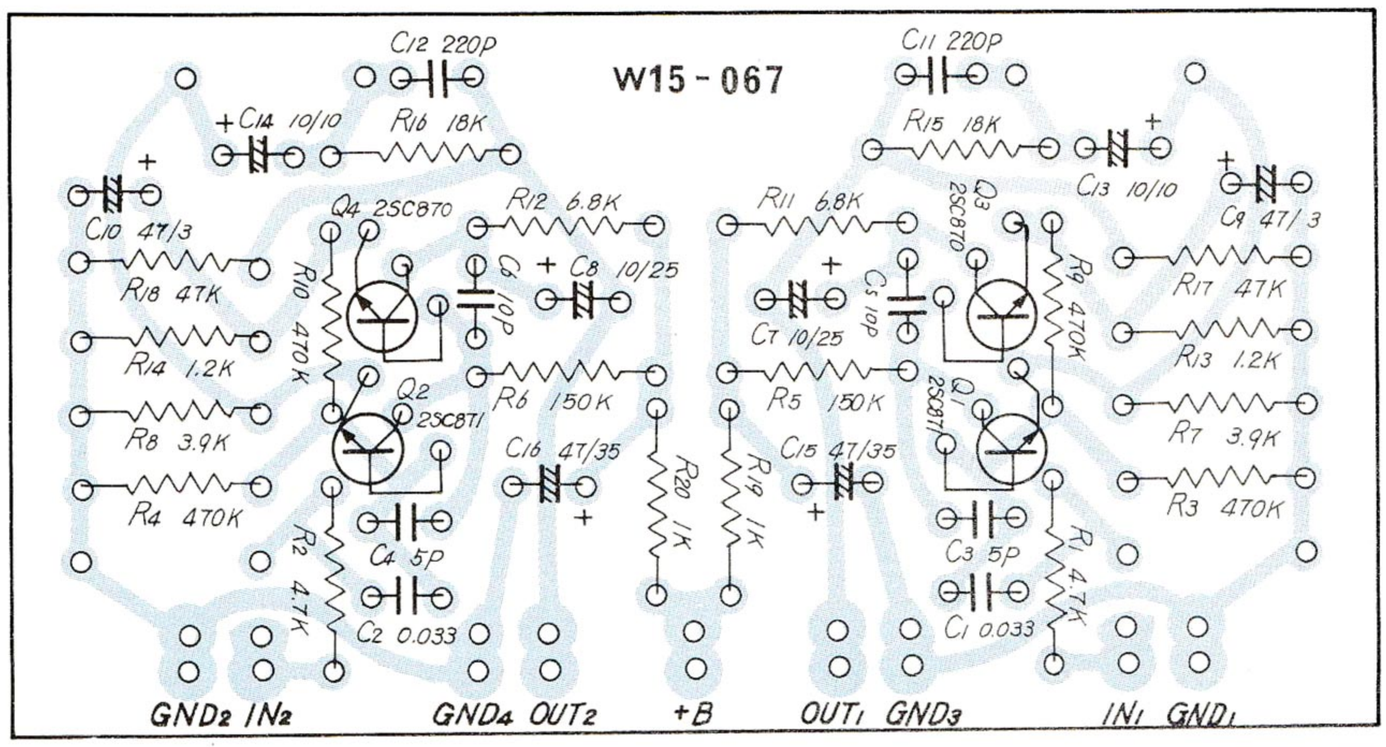
PRINTED CIRCUIT BOARDS

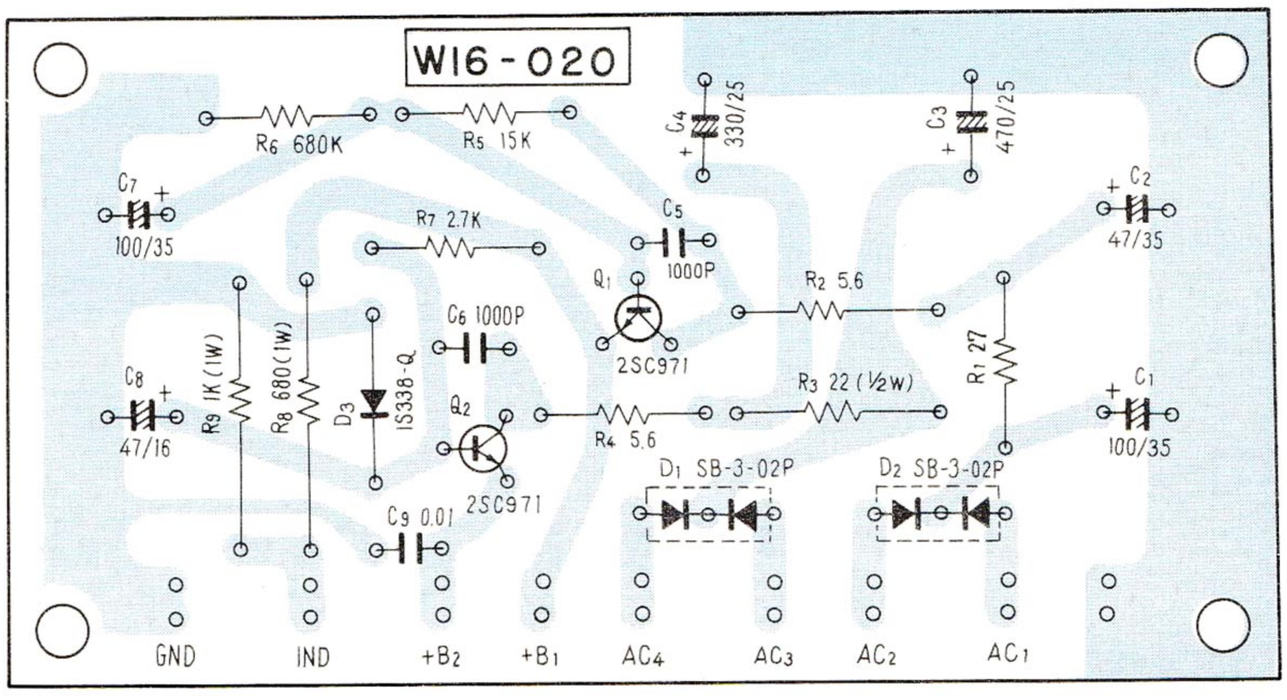












PIONEER

CONDITIONS FREQUENTLY MISTAKEN TO TROUBLES

Noise: There are a variety of noises relating to the operation of a hi-fi unit. Tyese are generally divided into two types; (1) the unit is sick (a transistor or part is deteriorated) and (2) an external source of noise is giving noise to the unit.
When a hi-fi unit produces an unpleasant noise, it is frequently judged that the unit is sick, but a statistical record indicates that the majority of noises produced in a hi-fi acoustic unit is resulted from external sources of noise. Due to the inherent high sensitivity and also the high fidelity in reproduction, the unit amplifiers and reproduces the high extraneous noises, however small. If your receiver produces a noise, check the following table and trace out the source of noise for an appropriate corrective action.
The table includes the conditions that may be mistaken to the troubles of the unit.

	Symptoms	Suspected Source of Noise	Diagonosis and Corrective Action
When Listening to Broadcasts	Continuous or intermittent noise like jjjjjj or zzzzzz.	●Statics or listening. ●Flourescent lamp, motor, or thermostat may be used in house or in the vicinity of the house.	In many cases, it is very difficult to remove the source of noise. In order to increase the radio input larger than the noise level, set up a good outdoor antenna and make a complete grounding.
	When a station is tuned in, hum is mixed in the program.	●Poor fluorescent lamp, motor, or electric heater may be used in house or near the near the house.	Reversing the line plug may occasionally alleviate this noise problem. Usually it is very difficult to eliminate the noise.
	Hissing sound noise in AM (medium wave) reception.	●The frequency of an adjacent station is is interfering that of the station being tuned in (10 kHz beat interference). ●TV set is on in the same house with receiver.	Not possible to remove such interference. If the cause of such noise is in the TV set, increase the distance between the TV set and receiver.
	Static noise in FM reception (in particular, when automobiles run close to the house).	●White noises generated from automobile engines. ●Radio frequency sewing machine or welding machine being used near your house.	In an area surrounded by hills or high buildings, the FM input signals are very weak. Thus the noise limiter in the circuit loses its function. Set up an outdoor FM antenna having many reflector elements.
	Reception of FM stereo program contains more noise than FM mono program.	●Note that the service area covered by an FM stereo broadcast is about 50 of that of a regular mono broadcast.	Increasing FM input signal may alleviate this problem. Use an exclusive FM outdoor antenna instead of the indoor T-antenna.

NOTE

When lead wires dis connected from the Terminals at the time of repairing are to be connected back to the Terminals, make sure to wrab the conducpor pighply around the correct Teminal lug tow or three turns and solder it.

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