2684

US Model
Canadian Model

FM/AM STEREO CASSETTE CORDER

SPECIFICATIONS

Radio section

Frequency range	FM 87.5–108 MHz AM 530–1,605 kHz (566–187 m)
Antennas	FM: Telescopic antenna External antenna terminal AM: Built-in ferrite bar antenna

Tape recorder section and general

Recording system	4-track 2-channel stereo or monaural
Fast winding time	Approx. 1 min. 30 sec. with Sony cassette C-60
Frequency response	30–15,000 Hz (with Sony METALLIC cassette, with the TAPE SELECT switch set to TYPE IV) 30–14,000 Hz (with chromium dioxide cassette, with the TAPE SELECT switch set to TYPE II) 30–13,000 Hz (with standard cassette, with the TAPE SELECT switch set to TYPE I)
S/N ratio	46 dB
Total harmonic distortion	2%
Wow and flutter	0.075% (WRMS)
Speakers	Two-way; Approx. 20 cm (8 inches) dia. woofers Approx. 5 cm (2 inches) dia. tweeters

– Continued on page 2 –

MICROFILM

SERVICE MANUAL

2684

Inputs	Two microphone input jacks (minijack) sensitivity 0.3 mV (−68 dB) for low impedance microphone Two line input/phono input jacks (phono jack) with the LINE IN/PHONO selector set to LINE IN: sensitivity 200 mV (−12 dB) input impedance 47 kilohms with the LINE IN/PHONO selector set to PHONO: sensitivity 3 mV (−48 dB) input impedance 27 kilohms Two mixing microphone input jacks (minijack) sensitivity 1.2 mV (−56 dB) for low impedance microphone
Outputs	Two line output jacks (phono jack) load impedance 10 kilohms or higher rated output 0.44 V (−5 dB) at load impedance 47 kilohms Two external speaker jacks (minijack) for 4-ohm or 8-ohm impedance speaker Headphones jack (stereo binaural jack) for 8-ohm impedance headphones
Power requirements	120 V ac, 60 Hz 15 V dc, 10 batteries, size D (IEC designation R20) 12 V car battery with optional Sony DCC-16AW car battery cord
Power consumption	18 W ac (US)/24W ac (Canadian)
Battery life	Approx. 12 hours of continuous recording with the built-in microphones using Eveready No. 1250 Heavy Duty batteries
Dimensions	Approx. 594 × 347 × 169 mm (w/h/d) ($23^1/_2 \times 13^3/_4 \times 6^3/_4$ inches) incl. projecting parts and controls
Weight	Approx. 10.9 kg (24 lb) incl. batteries
Power output and total harmonic distortion	With 4-ohm loads, both channels driven, from 150–15,000 Hz; rated 4.5 W per channel minimum RMS power, with no more than 10% total harmonic distortion. (US model)
Power output	5.8 W x 2 at 10 % harmonic distortion (Canadian)

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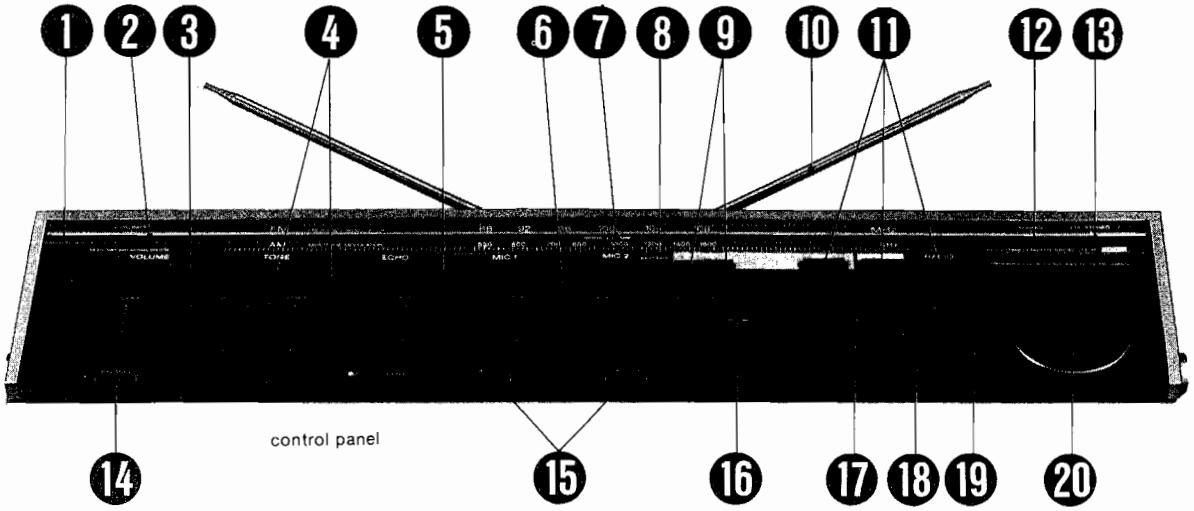
SECTION 1
OUTLINE

1-1. GENERAL DESCRIPTION

LOCATION AND FUNCTION OF CONTROLS



❶ **POWER switch:** Depress to turn on the cassette-corder (⏏ ON). To turn the cassette-corder off, depress the switch again (⏏ OFF). It is possible to record or playback a tape even when the switch is released (⏏ OFF). With the switch in this position, the cassette-corder will be automatically turned off at the end of the tape.

● Be sure to release the switch (⏏ OFF) when the cassette-corder is not in use.

❷ **OPR/BATT (operation/battery) indicator:** Lights up to show operation. This indicator also shows the battery condition.

❸ **VOLUME control:** Slide upwards for more volume.

❹ **BASS and TREBLE TONE controls:** Adjust the tone quality of the reproduced sound to your preference. Slide the control towards +5 for more bass or treble, and towards −5 for less bass or treble.

❺ **ECHO LEVEL control:** Adjusts the echo level of the microphones connected to the MIX MIC jacks.

❻ **MIC LEVEL controls:** Adjusts the level of the microphones connected to the MIX MIC jacks.

❼ **Dial scale and pointer:** The pointer moves as the tuning knob is turned, indicating the tuned frequency on the dial scale.

❽ **MIC MIX button:** Press this button to mix the microphone inputs with other inputs.

❾ **REC MODE (record mode) selector:** Choose the desired recording system.

AUTO: For automatic level adjustment recording (SONY-MATIC).

MANUAL: For manual level adjustment recording.

❿ **Telescopic antennas:** Used for FM reception.

⓫ **Function select buttons**

TAPE: For playing back the tape or for recording from the built-in microphones or the EXT MIC jacks.

LINE IN/PHONO: For listening to or recording the sound from the LINE IN/PHONO jacks.

RADIO: For listening to or recording radio programs.

⓬ **TUNING indicator:** Lights at correct tuning of radio programs. The indicator might flicker or not light up at all on a very weak signal.

⓭ **FM STEREO indicator:** Lights when an FM stereo program of sufficient signal strength is tuned in.

⓮ **BALANCE control:** Slide to adjust the left and right speaker (or headphones) volume for optimum stereo effect.

⓯ **PAN POT controls:** Slide the controls to position the input of the microphones connected to the MIX MIC jacks between the speakers.

⓰ **REC LEVEL/SOURCE LEVEL (record level/source level) controls:** Adjust the recording level when the MANUAL button is pressed and adjust the level of the sound source when the MIC MIX button is pressed.

⓱ **TAPE SELECT switch:** Set to the proper position for the type of tape to be used in recording.

⓲ **AFC/ISS (automatic frequency control/interference suppress switch):** Used as the automatic frequency control for FM reception or as the interference suppress switch for recording of AM program.

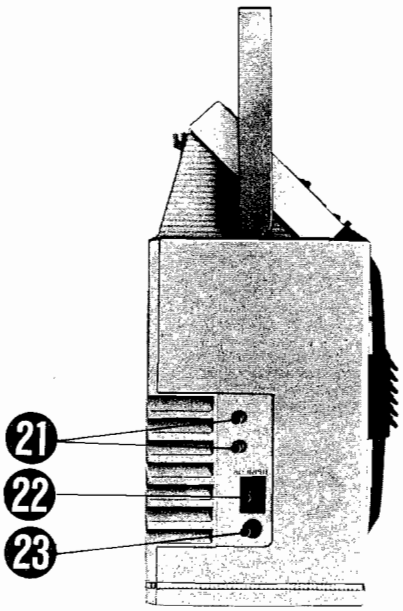
⓳ **BAND SELECT switch:** Choose the desired band.

FM STEREO: For normal FM program reception. The cassette-corder operates in stereo mode for FM stereo programs and will be automatically switched to mono mode for non-stereo FM programs.

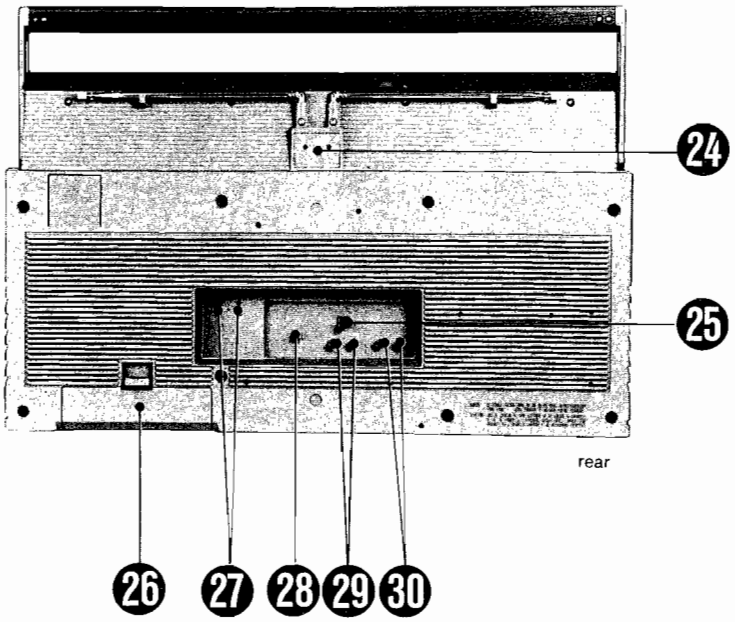
FM: When an FM stereo program is too noisy, use this position. The set will operate in monaural mode regardless of the transmitted FM stereo program.

AM: For AM program reception.

⓴ **TUNING knob:** Turn to select the frequency of the desired station, as marked on the dial scale.

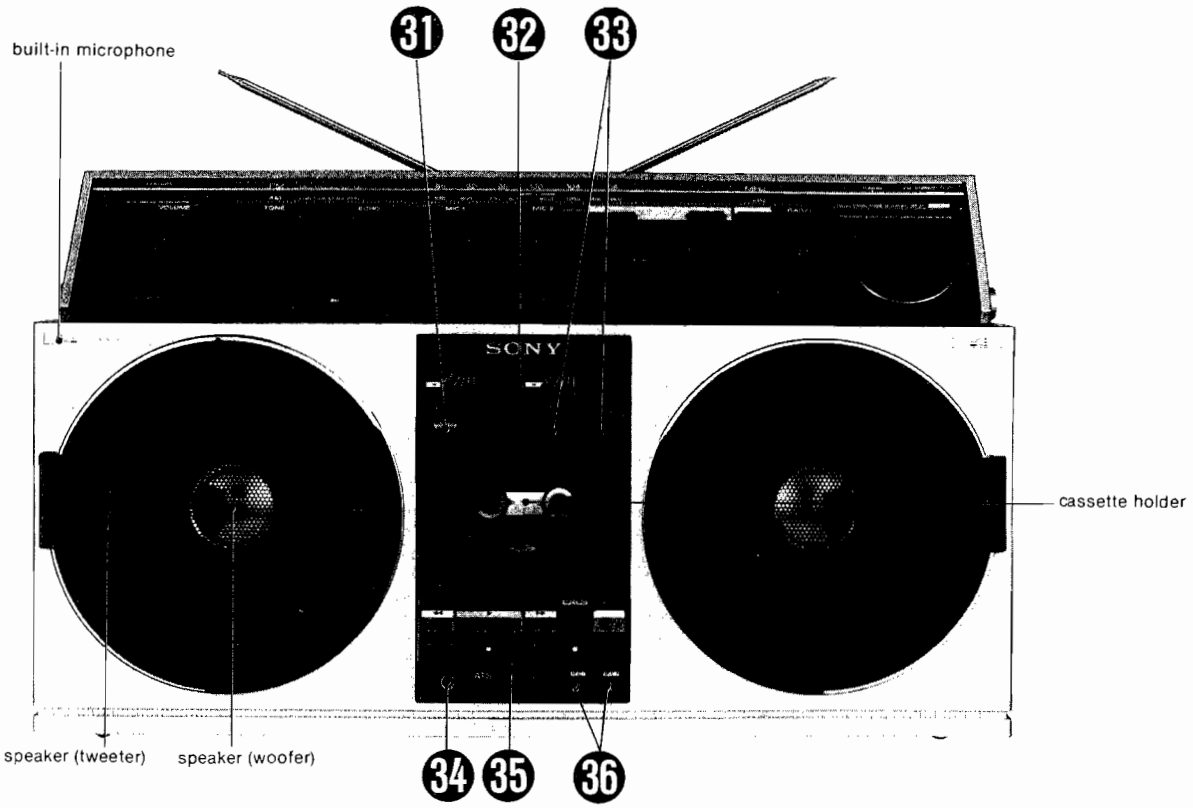


left side



rear

㉑ **EXT SP (external speaker) jacks:** Minijacks for connecting external speakers.
㉒ **AC INPUT socket:** For operation on house current.
㉓ **DC IN 12 V (external input) jack:** For operation on a car battery.
㉔ **EXT ANT (external antenna) jacks:** Connect an FM external antenna using the supplied antenna connector.
㉕ ⏚ **(ground) terminal:** For connecting the ground wire of the record player.
㉖ **Battery compartment**
㉗ **EXT MIC (external microphone) jacks:** Minijacks for recording with microphones. For connecting a two-pin plug microphone, use the pin receptacle. The remote control function of the microphone does not operate with this set.
㉘ **LINE IN/PHONO (line input/phono input) selector:** Selects the input from the LINE IN/PHONO jacks. When connecting a record player, set the selector to PHONO. When connecting other equipment, set the selector to LINE IN.
㉙ **LINE IN/PHONO (line input/phono input) jacks:** Phono jacks for listening to or recording from a stereo amplifier, another tape recorder or TV (with the LINE IN/PHONO selector set to LINE IN), or a record player (with the LINE IN/PHONO selector set to PHONO).
㉚ **LINE OUT (line output) jacks:** Phono jacks for playing back a tape or listening to a radio program through a stereo amplifier, or for duplicating a tape onto another tape recorder.

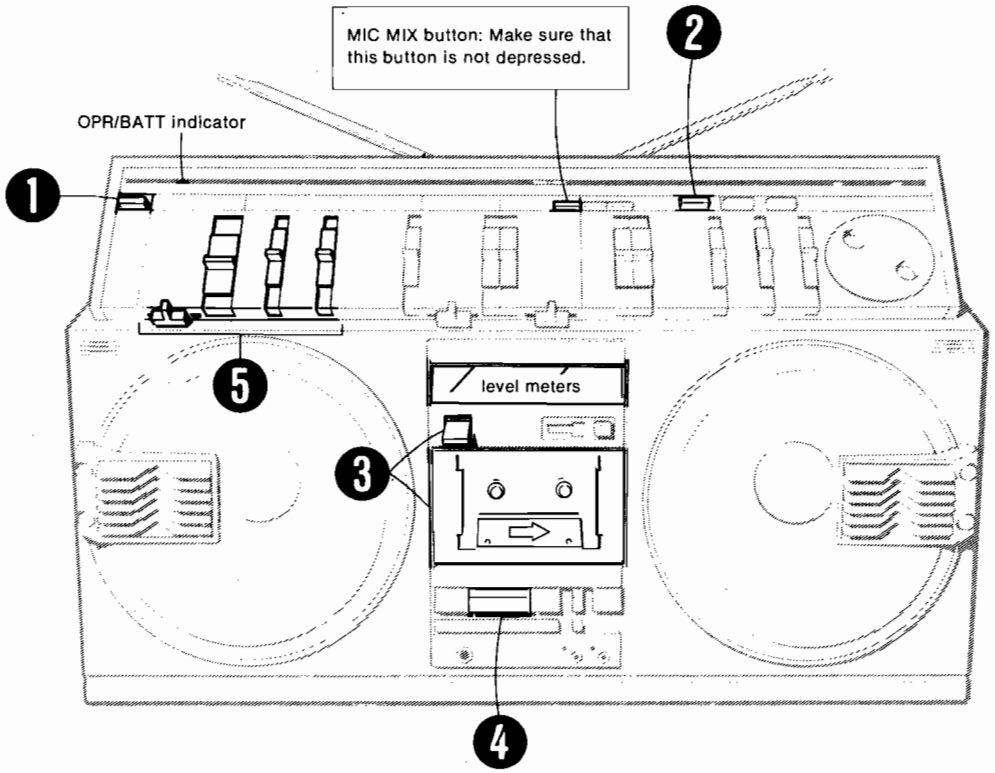


㉛ **EJECT button:** Press to open the cassette holder.
㉜ **Level meters:** The pointers of the meters show the signal level in recording or playback mode, and the input sound level in radio program reception. The LEFT meter shows the level of the left channel and the RIGHT meter, the level of the right channel.
㉝ **Tape counter and reset button:** Use the counter for indexing the tape contents. Before recording, set the counter to 000 by pushing the reset button. The figures of the counter change as the tape passes. Make a note of the figures and the program being recorded. Later on, the desired program can be rapidly located by using the ◀◀ REW or ▶▶ FF button.
㉞ **HEADPHONES jack:** Stereo binaural jack for listening with 8-ohm stereo headphones.

㉟ **Tape operation mode select buttons**
◀◀ **REW (rewind):** Press to rewind the tape.
▶ **FWD (forward):** Press for playback.
▶▶ **FF (fast forward):** Press to advance the tape rapidly.
■ **(stop):** Press to stop the tape and to release the locked buttons.
RECORD: For recording, keep this button pressed and press the ▶ FWD button.
PAUSE: Depress to stop the tape for a moment during recording or playback. To restart, press the button again to release it.
To stop the tape for a long time, use the ■ button.
REC MUTE (record muting): Hold this button pressed to eliminate unwanted programs and provide an interspacing during recording. While this button is pressed, the pointers of the level meters do not swing.
㊱ **MIX MIC (mixing microphone input) jacks:** Minijacks for connecting mixing microphones. For connecting a two-pin plug microphone, use the pin receptacle. The remote control function of the microphone does not operate with this set.

PLAYBACK

● The numbers in the illustration refer to the sequence of operations.

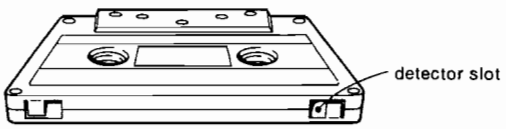


❶ Depress the POWER switch (ON).
The OPR/BATT indicator will light up.
❷ Press the TAPE button.
● The TAPE SELECT switch has no effect upon playback (Playback Automatic Tape Selector System).
❸ Insert a cassette. See "CASSETTE INSERTION".
❹ Press the ▶ FWD button. Playback will begin.
● If you press and release the POWER switch at this step, the cassette-corder will be automatically turned off at the end of the tape.
❺ Adjust the volume and tone to your preference.
Adjust the balance of the left and right channels for optimum stereo effect.
● During playback, the pointers of the level meters swing according to the recorded level.

To stop the tape, press the ■ button.
● At the end of the tape, the tape motion stops and the locked button is released automatically.

After you have finished, be sure to press and release the POWER switch to turn off the set.

Playback Automatic Tape Selector (ATS)
When recording, set the TAPE SELECT switch to the position which corresponds to the type of tape being used, since the switch sets the optimum equalization for the tape being used.
When playing back, however, there is no need to set the TAPE SELECT switch, because the Playback Automatic Tape Selector automatically sets the appropriate equalization.
The cassettes of most chromium dioxide and metallic tapes have detector slots next to their safety tabs. The ATS operates by detecting this slot.



● When a chromium dioxide or metallic tape cassette without this detector slot is played back, the ATS does not operate. In this case, adjust the BASS and TREBLE controls as necessary.

All-mode shut-off mechanism
At the end of the tape, the tape motion stops in any operating mode and the locked buttons will be released automatically.
This protects the tapes and prevents undue battery wear. The mechanism activates after about 5 seconds at the end of the tape.

MICROPHONE MIXING

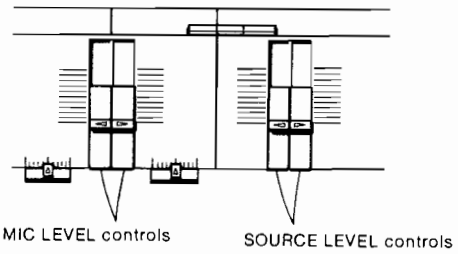
The CFS-99 allows you to mix the sound of external microphones and other sound sources.

NOTES

- Make sure that the VOLUME control is not slid fully to "0". In this position, the mixed sound cannot be heard from the speakers, even if you slide the MIC LEVEL controls and SOURCE LEVEL controls fully to "10".
- A howling sound may occur when the microphone is too near the speakers. If this happens, move the microphone away from the speakers or slide the MIC LEVEL controls or VOLUME control slightly towards "0".

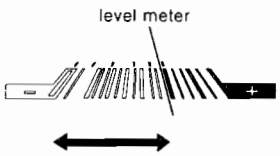
HOW TO FINELY-ADJUST THE MIXING LEVEL

❶ Observing the pointers of the level meters, set the microphone level with the MIC LEVEL controls.
If you slide the SOURCE LEVEL controls fully to "0", the pointers only indicate the microphone inputs.
❷ Observing the pointers of the level meters, set the level of the sound source (tape, radio or connected equipment) with the SOURCE LEVEL controls.
❸ Adjust these controls together to get good mixing balance results.
❹ Adjust the overall sound with the VOLUME control.



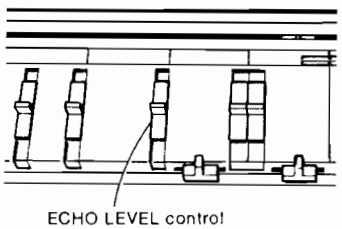
Proper mixing level

Generally, mixing level should be adjusted so that the pointers of the level meters deflect as close as possible to "0" at the highest signal-level passage. The pointers may go over "0" for an instant at the sudden high level bursts, but this is not a problem.



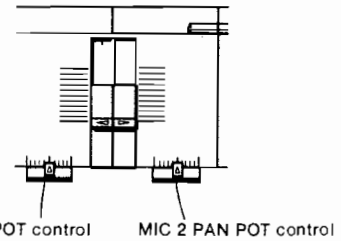
ECHO EFFECT

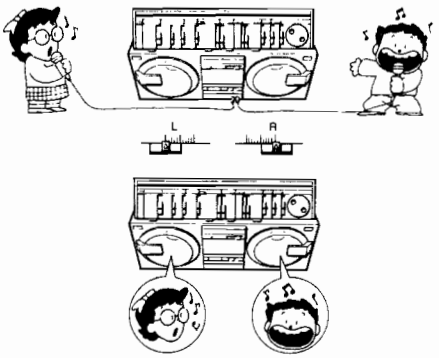
You can add an echo effect to the microphones connected to the MIX MIC jacks. Slide the ECHO LEVEL control upwards for a greater echo effect.
When you are using two microphones, the same amount of echo effect will be added to both microphones.



HOW TO POSITION THE MICROPHONE INPUTS BETWEEN THE RIGHT AND LEFT SPEAKERS — PAN POT

When the PAN POT controls are set to the center position, both microphone inputs are mixed and output at the same level at both speakers. This is the appropriate position for public address. When the MIC 1 PAN POT control is set to "L" and the MIC 2 PAN POT controls is set to "R", the microphone input to the MIC 1 MIX MIC jack is output only by the left speaker and the input to the MIC 2 MIX MIC jack only by the right speaker. This is the position to use for stereo pickup.





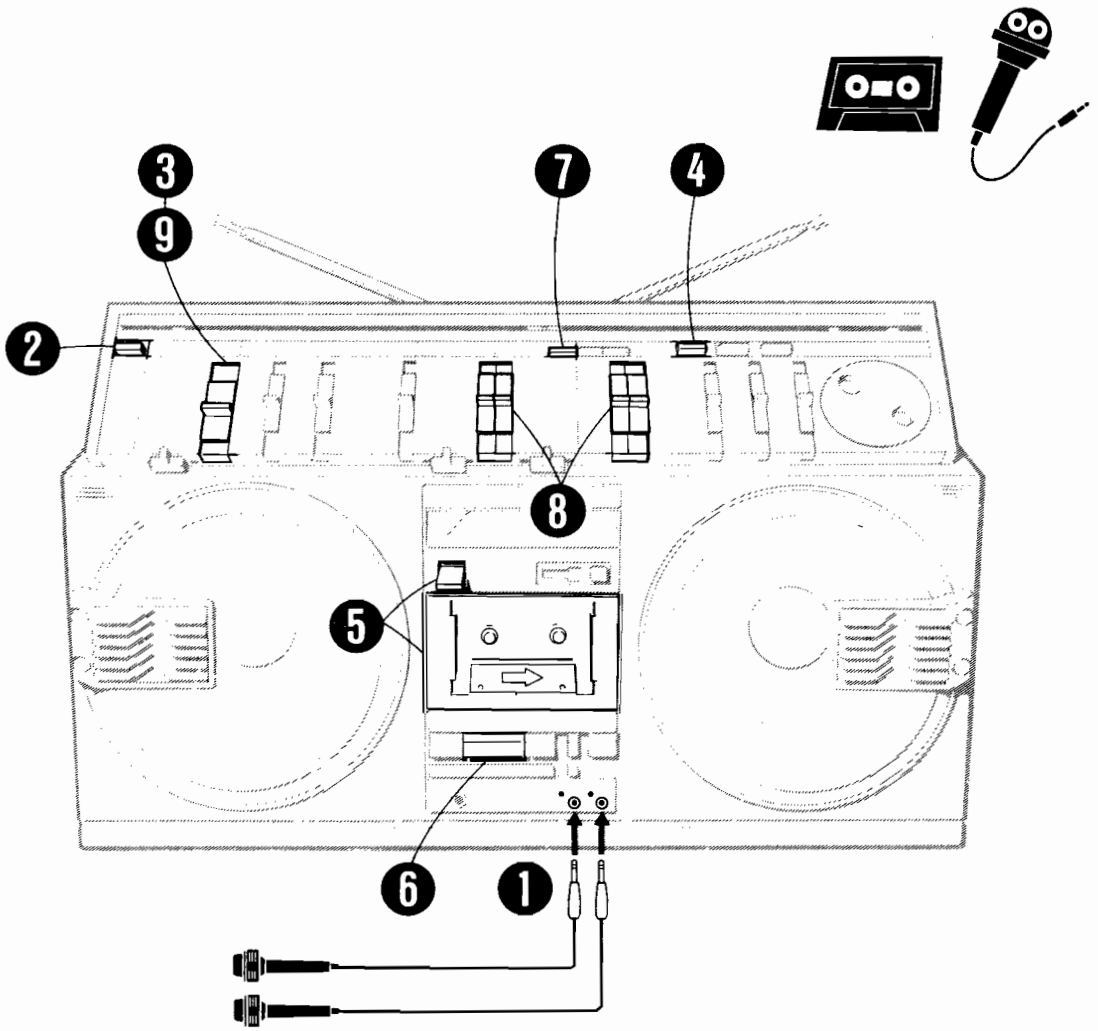
Use these controls to shift the input of the microphones so that the desired portion is output from each speaker.

FADE-IN AND FADE-OUT

You can fade-in and fade-out using the MIC LEVEL and SOURCE LEVEL controls.

RECORDED TAPE PLUS MICROPHONE MIXING ("SING-ALONG")

● The numbers in the illustration refer to the sequence of operations.



❶ Connect the microphone(s) to the MIX MIC jack(s).
❷ Depress the POWER switch (ON).
❸ Set the VOLUME control at "2".
❹ Press the TAPE button.
❺ Insert a cassette. See "CASSETTE INSERTION".
❻ Press the ▶ FWD button. Playback will begin.
❼ Press the MIC MIX button.
❽ Adjust the microphone level with the MIC LEVEL controls.

The MIC 1 LEVEL control adjusts the level of the microphone connected to the MIC 1 MIX MIC jack. The MIC 2 LEVEL control adjusts the level of the microphone connected to the MIC 2 MIX MIC jack.

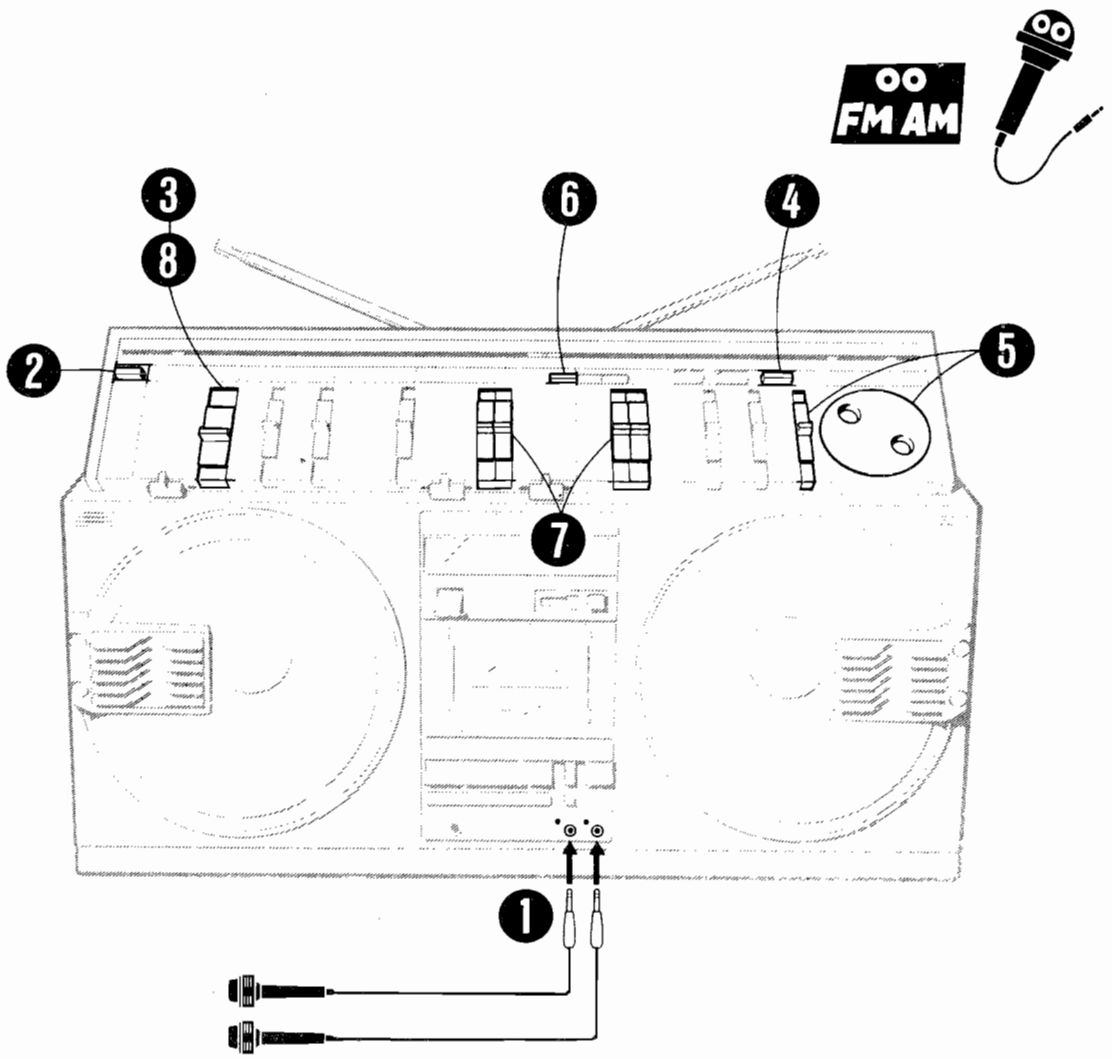
Adjust the tape level with the SOURCE LEVEL controls.

The L control is for the left channel and the R for the right channel.

❾ Adjust the overall sound with the VOLUME control.
● For recording, connect another recorder to the CFS-99 LINE OUT jacks and set the recorder into the record mode.

RADIO PLUS MICROPHONE MIXING

● The numbers in the illustration refer to the sequence of operations.



❶ Connect the microphone(s) to the MIX MIC jack(s).
❷ Depress the POWER switch (ON).
❸ Set the VOLUME control at "2".
❹ Press the RADIO button.
❺ Tune in the desired station.
❻ Press the MIC MIX button.

❼ Adjust the microphone level with the MIC LEVEL controls.

The MIC 1 LEVEL control adjusts the level of the microphone connected to the MIC 1 MIX MIC jack. The MIC 2 LEVEL control adjusts the level of the microphone connected to the MIC 2 MIX MIC jack.

Adjust the radio level with the SOURCE LEVEL controls.

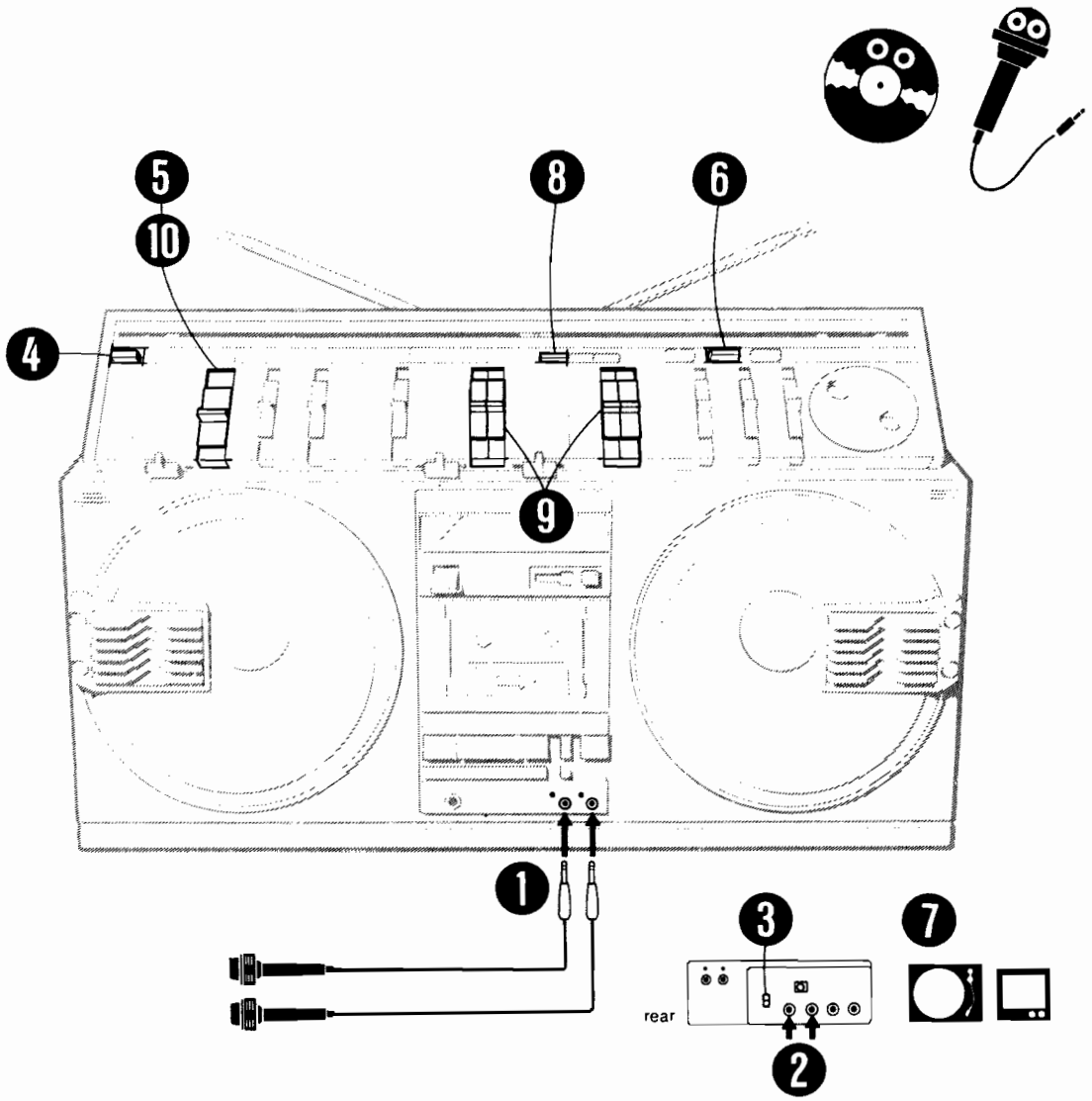
The L control is for the left channel and the R for the right channel.

❽ Adjust the overall sound with the VOLUME control.

● For recording, insert a cassette and press the ▶ FWD button while pressing the RECORD button.

)ISC OR TV PLUS MICROPHONE MIXING

◗ The numbers in the illustration refer to the sequence of operations.



◗ Connect the microphone(s) to the MIX MIC jack(s).
◗ Connect a record player or a TV to the LINE IN/PHONO jacks t the rear.
◗ Set the LINE IN/PHONO selector to PHONO when a record layer is connected, and set the selector to LINE IN when a TV, tc. is connected.
◗ Depress the POWER switch (ON).
◗ Set the VOLUME control at "2".
◗ Press the LINE IN/PHONO button.
◗ Play the record or select the desired TV program.

❺ Press the MIC MIX button.
❻ Adjust the microphone level with the MIC LEVEL controls.

The MIC 1 LEVEL control adjusts the level of the microphone connected to the MIC 1 MIX MIC jack. The MIC 2 LEVEL control adjusts the level of the microphone connected to the MIC 2 MIX MIC jack.

Adjust the disc or TV level with the SOURCE LEVEL controls.

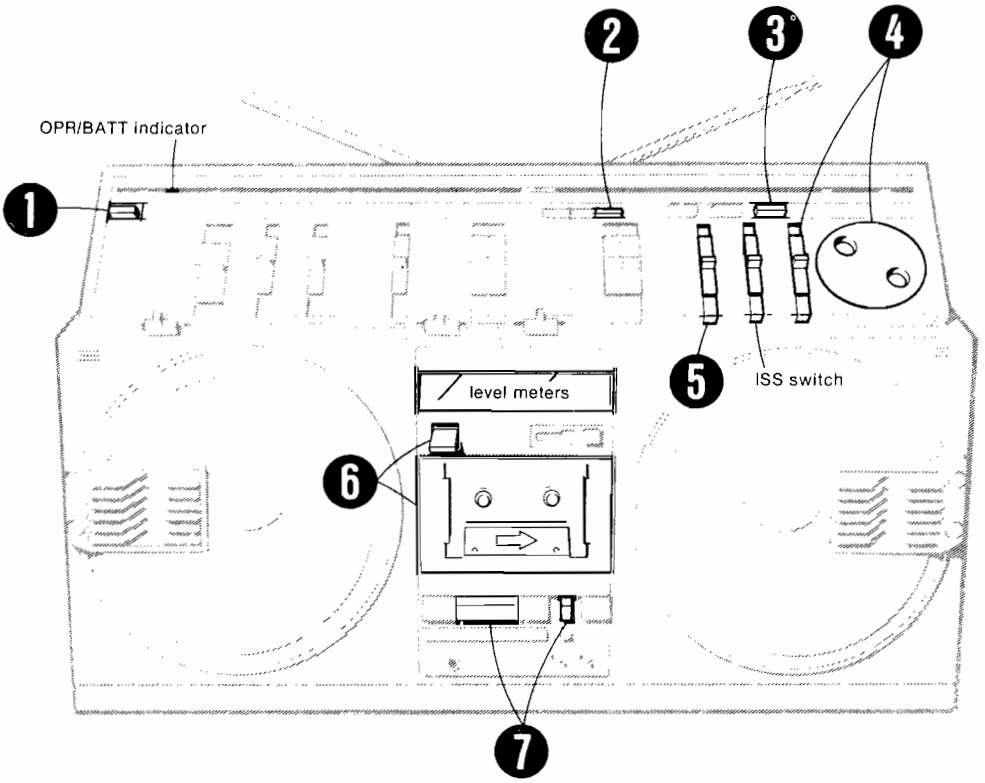
The L control is for the left channel and the R for the right channel.

❿ Adjust the overall sound with the VOLUME control.
● For recording, insert a cassette and press the ▶ FWD button while pressing the RECORD button.

RECORDING FROM THE BUILT-IN RADIO

SONY-MATIC RECORDING
When the AUTO button is depressed, the recording level is automatically adjusted and a proper recording level is maintained.

● The numbers in the illustration refer to the sequence of operations.



❶ Depress the POWER switch (ON).
The OPR/BATT indicator will light up.
❷ Press the AUTO button.
❸ Press the RADIO button.
❹ Tune in the desired station.
❺ Set the TAPE SELECT switch to the proper position according to the type of tape to be used.

❻ Insert a cassette.
❼ While pressing the RECORD button, press the ▶ FWD button. Recording will begin.
● If you press and release the POWER switch at this step, the cassette-corder will be automatically turned off at the end of the tape.
● The pointers of the level meters will swing according to the input level.
● The radio sound is heard through the speakers or headphones at any desired volume and tone control settings without affecting the recording level (Variable-Monitor System).

To stop the tape, press the ■ button.
● At the end of the tape, the tape motion stops and the locked buttons are released automatically.

When the recording is completed, press and release the POWER switch to turn off the set.

Note: Make sure that the BAND SELECT switch is set to FM STEREO for recording FM stereo programs. Otherwise, the programs will be recorded in mono mode.

To hear the program just recorded
1. Press the TAPE button.
2. Press the ◀◀ REW button to rewind the tape.
3. Press the ▶ FWD button. Playback will begin.

RECORDING FROM VARIOUS SOUND SOURCES

Various sound sources can be connected to the proper cassette-corder jacks by using an appropriate optional connecting cord.

Notes on connection

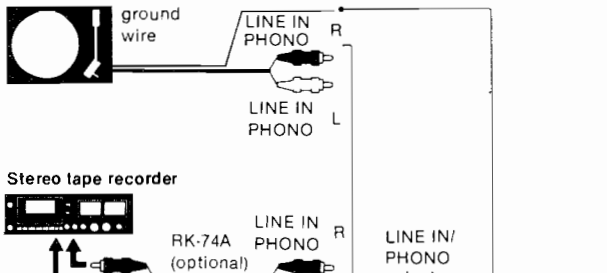
- When interconnecting electronic equipment with the CFS-99, there are certain conditions that should be observed. In general, the output impedance of a signal source should be much lower than the input impedance of the device to be connected to the signal source. The output level of a signal source should be equal to or slightly higher than the rated sensitivity of the other device. These specifications, both for Sony and other makes of equipment may be found in the instruction manual of the particular piece of equipment.
- Turn off the CFS-99, amplifier, and other connected devices before making connections.
- Insert the cable connectors fully into the jacks.

Loose connections may cause hum and noise.

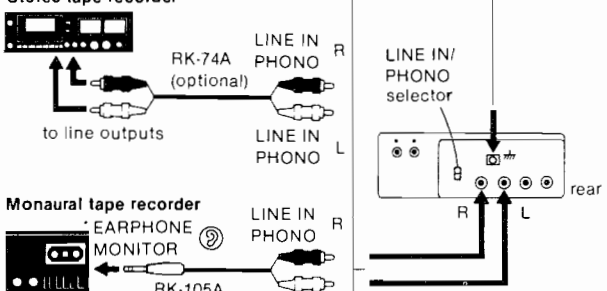
- The red plug of the connecting cord should be connected to the right channel and the other plug to the left channel.
- If your radio, TV, etc., is not a Sony product, refer to the instruction manual of that set.

LISTENING AND/OR RECORDING OF THE SOUND FROM OTHER EQUIPMENT

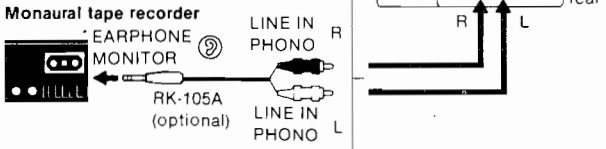
Record player equipped with a magnetic cartridge with a 3 to 5 mV output



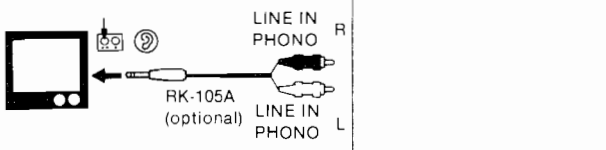
Stereo tape recorder



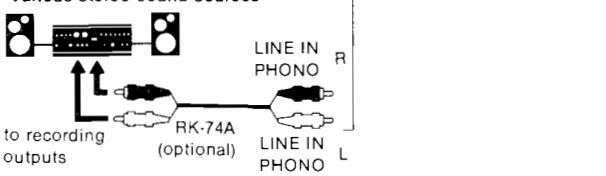
Monaural tape recorder



TV equipped with an earphone jack



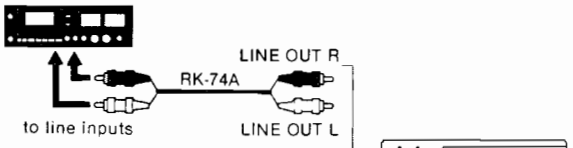
Various stereo sound sources



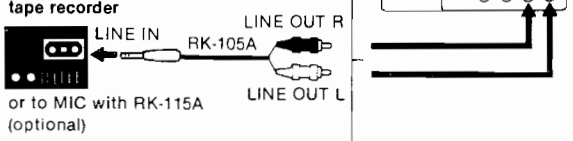
❶ Connect equipment as illustrated above.
❷ Set the LINE IN/PHONO selector to PHONO for a record player, or to LINE IN for the other equipment.
❸ Press the POWER switch (ON) and the LINE IN/PHONO button on the control panel.
❹ Turn on the connected equipment. Its volume and tone control settings have no effect on the recording.
The sound from the connected equipment can be heard through the speakers or headphones.
❺ To record, insert a cassette and press the ▶ FWD button while pressing the RECORD button.
For automatic recording, press the AUTO button.
For manual recording, press the MANUAL button.

LISTENING THROUGH OR RECORDING ONTO OTHER EQUIPMENT

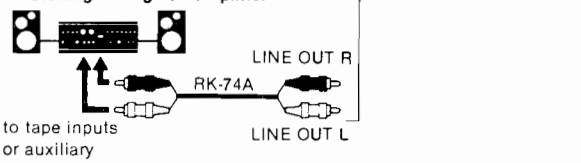
Recording onto a stereo tape recorder



Recording onto a monaural tape recorder

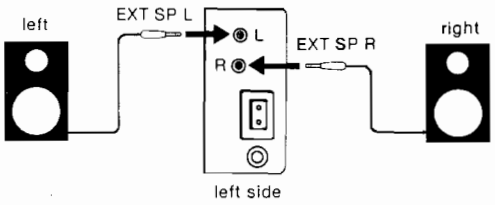


Listening through an amplifier



❶ Connect equipment to the LINE OUT jacks.
❷ Play back a tape or tune in the desired station on the CFS-99.
❸ Turn on the connected equipment and set it to the record mode or listening mode, as required.

Listening through external speakers

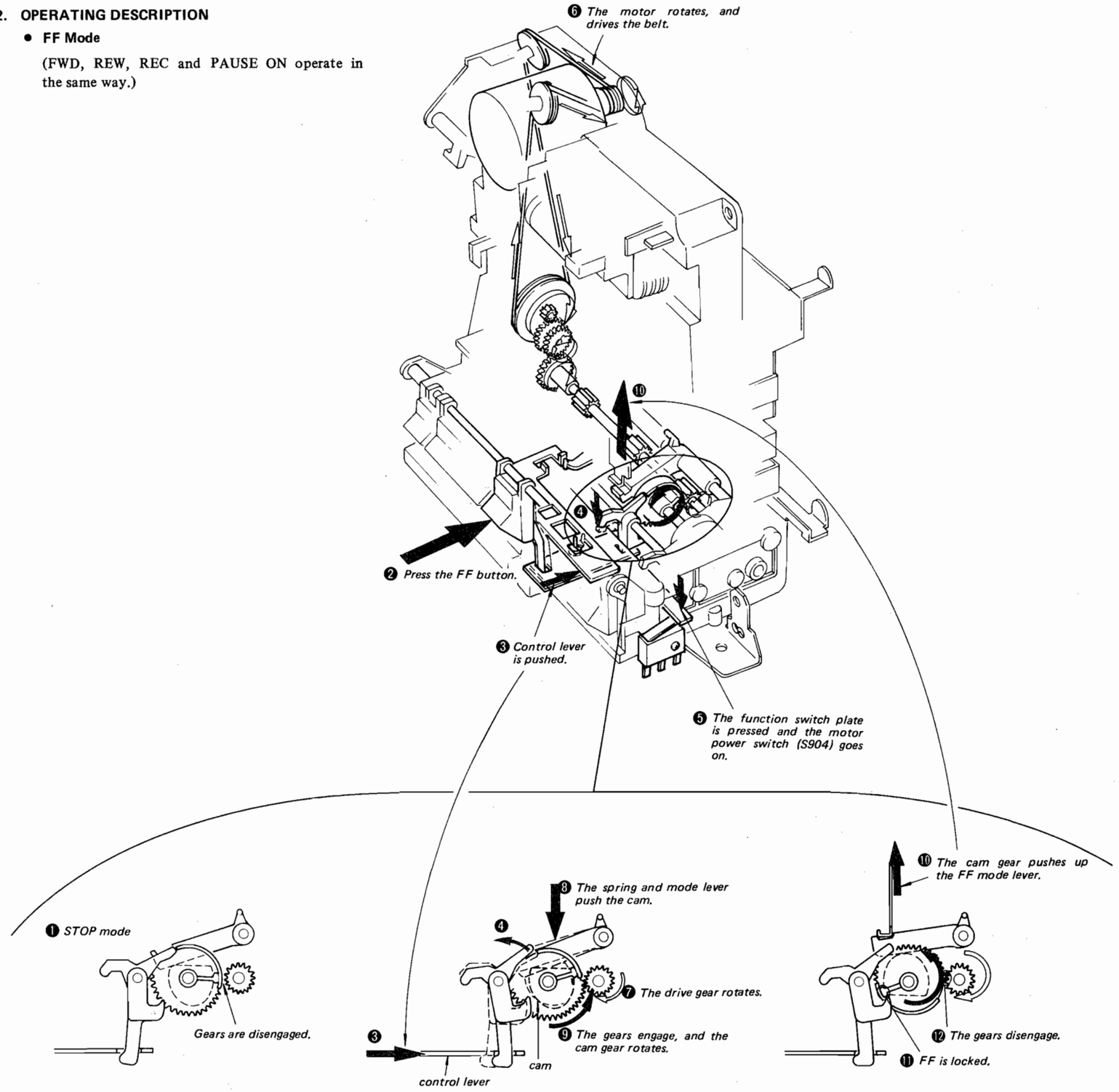


- When external speakers are connected, the built-in speakers are automatically disconnected.
- Make sure that headphones are disconnected from the cassette-corder.

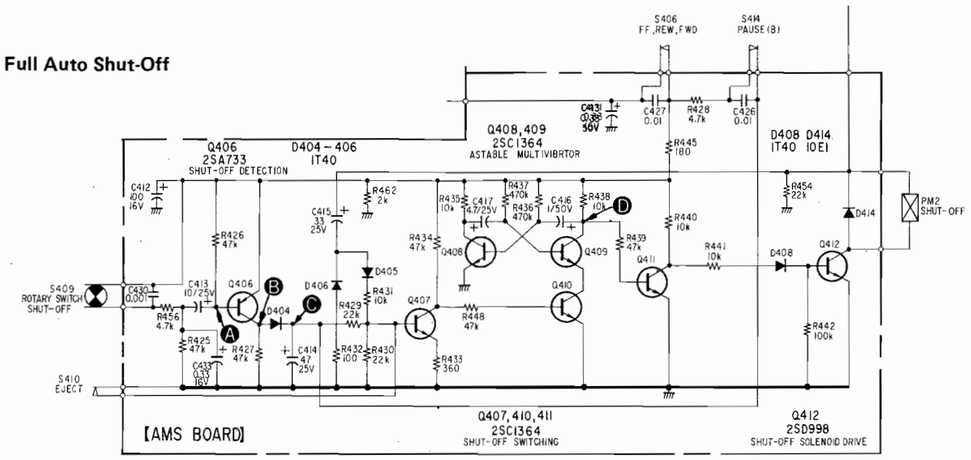
1-2. OPERATING DESCRIPTION

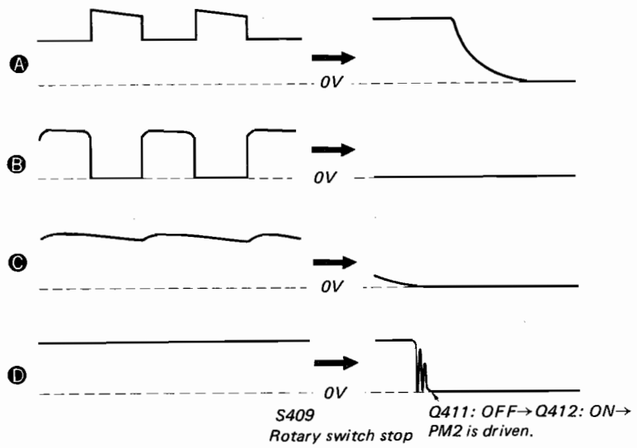
- **FF Mode**

(FWD, REW, REC and PAUSE ON operate in the same way.)



- **Full Auto Shut-Off**



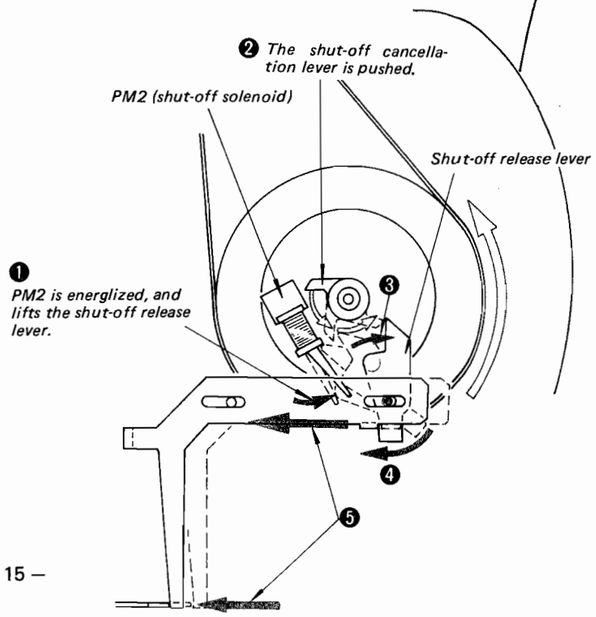


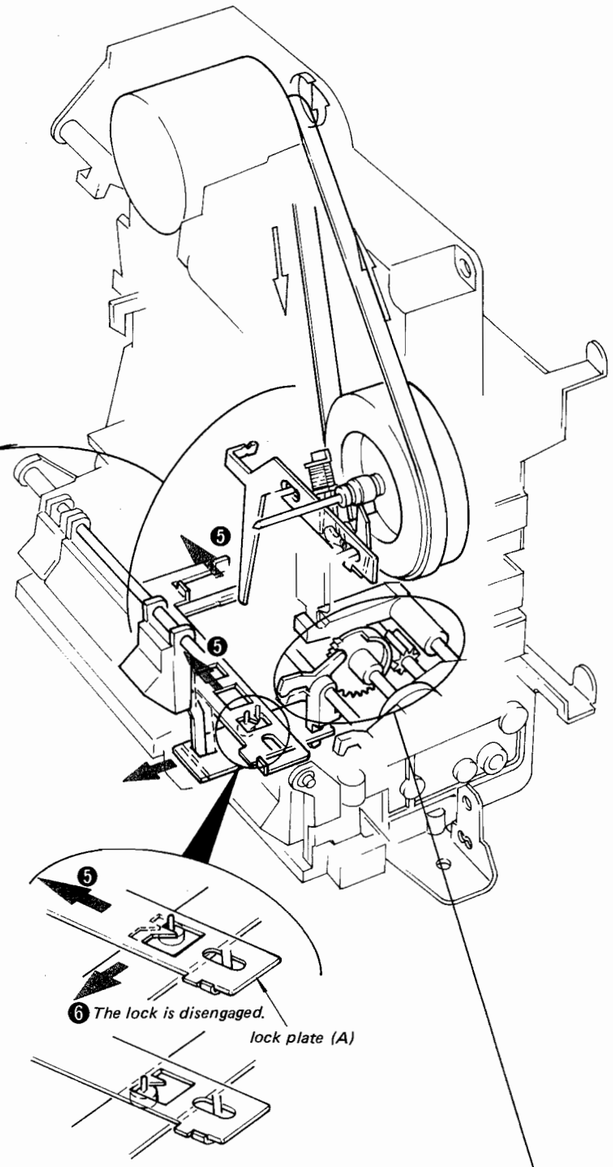
During FWD, REC, FF or REW, the rotary switch is turned on and off by the rotation of the tape counter pulley. Because of this, Q406 goes on and off simultaneously and voltage is generated at points Ⓐ – Ⓓ. When the reel table stops rotating at tape end, the tape counter also stops, and the rotary switch remains at either ON or OFF. In either case, the base potential of Q406 rises and Q406 goes off.

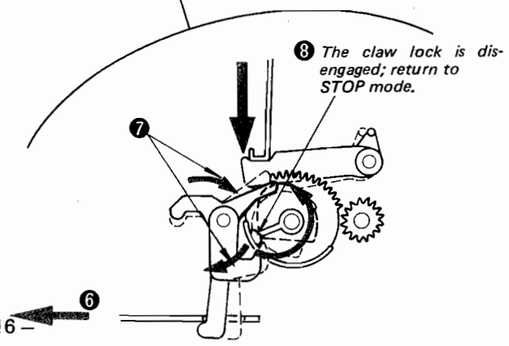
When the voltage at Ⓒ drops below a certain point, Q407 goes off, Q410 goes on, and the astable multivibrator begins to oscillate. This signal turns on Q412 and drives PM2.

At this point, Q407 is forced ON by S414 (PAUSE B) to prevent shut-off during pause operation. S410 (EJECT) goes on when the EJECT button is pushed, and causes shut-off.

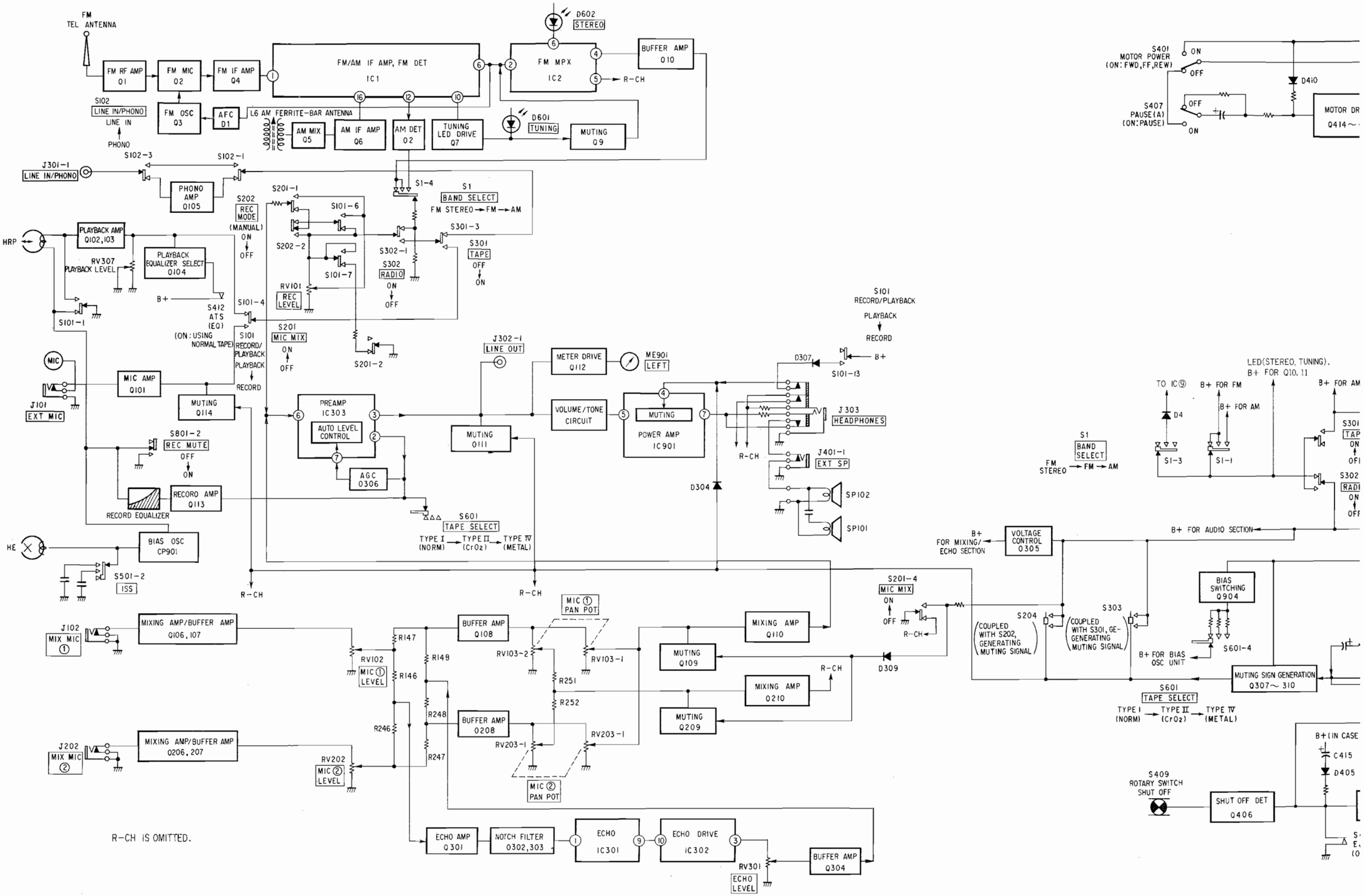
When S401 (motor power supply) is on, the B+ signal passes through D405 and is applied to the base of Q407 to prevent shut-off. After PM2 (shut-off solenoid) is driven, the operations ending in shut-off occur in the following order.

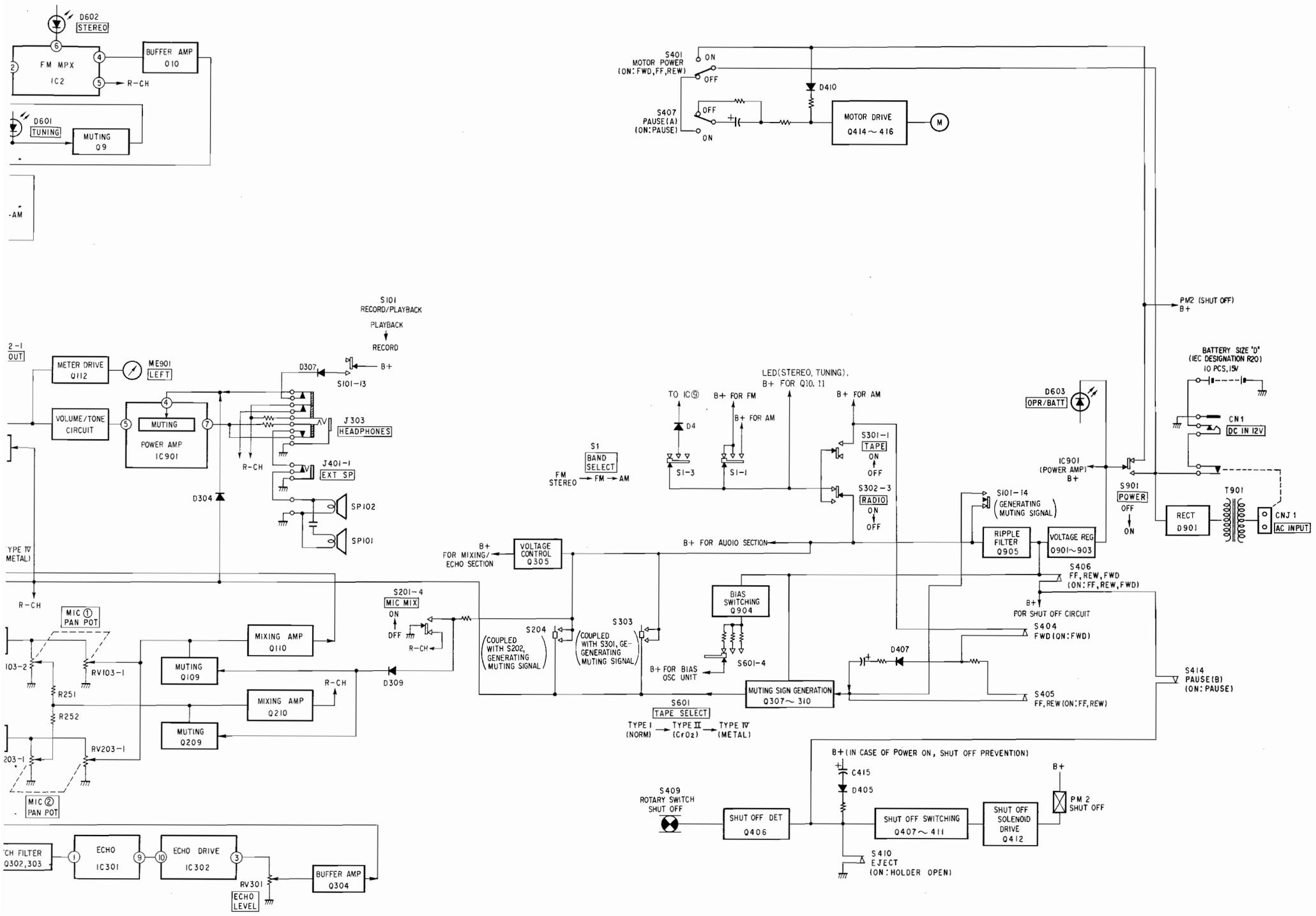






1-3. BLOCK DIAGRAM




D602
STEREO
FM MPX
IC2
BUFFER AMP
Q10
R-CH
D601
TUNING
MUTING
Q9
S401
MOTOR POWER
(ON:FWD,FF,REW)
ON
OFF
S407
PAUSE(A)
(ON:PAUSE)
D410
MOTOR DRIVE
Q414~416
M
S101
RECORD/PLAYBACK
PLAYBACK
RECORD
METER DRIVE
Q112
ME901
LEFT
D307
B+
S101-13
VOLUME/TONE
CIRCUIT
MUTING
POWER AMP
IC901
J303
HEADPHONES
R-CH
J401-1
EXT SP
D304
SP102
SP101
LED(STEREO, TUNING),
B+ FOR Q10, 11
TO IC⑤
B+ FOR FM
B+ FOR AM
D4
S1-3
S1-1
S1
BAND
SELECT
FM
STEREO
FM → AM
S301-1
TAPE
ON
OFF
S302-3
RADIO
ON
OFF
PM2 (SHUT OFF)
B+
BATTERY SIZE "D"
(IEC DESIGNATION R20)
10 PCS, 15V
D603
OPR/BATT
CN1
DC IN 12V
IC901
(POWER AMP)
B+
S901
POWER
OFF
ON
T901
RECT
D901
CNJ 1
AC INPUT
S101-14
(GENERATING
MUTING SIGNAL)
RIPPLE
FILTER
Q905
VOLTAGE REG
Q901~903
B+ FOR AUDIO SECTION
B+
FOR MIXING/
ECHO SECTION
VOLTAGE
CONTROL
Q305
S406
FF, REW, FWD
(ON:FF, REW, FWD)
B+
FOR SHUT OFF CIRCUIT
S404
FWD(ON:FWD)
D407
S405
FF, REW(ON:FF, REW)
S414
PAUSE(B)
(ON:PAUSE)
BIAS
SWITCHING
Q904
S601-4
B+ FOR BIAS
OSC UNIT
S204
(COUPLED
WITH S202,
GENERATING
MUTING SIGNAL)
S303
(COUPLED
WITH S301, GE-
GENERATING
MUTING SIGNAL)
MUTING SIGN GENERATION
Q307~310
S601
TAPE SELECT
TYPE I (NORM) → TYPE II (CrO2) → TYPE IV (METAL)
S201-4
MIC MIX
ON
OFF
R-CH
MIC ① PAN POT
MIXING AMP
Q110
MUTING
Q109
RV103-1
R251
R252
MIXING AMP
Q210
MUTING
Q209
RV203-1
MIC ② PAN POT
D309
B+(IN CASE OF POWER ON, SHUT OFF PREVENTION)
C415
D405
S409
ROTARY SWITCH
SHUT OFF
SHUT OFF DET
Q406
SHUT OFF SWITCHING
Q407~411
SHUT OFF
SOLENOID
DRIVE
Q412
B+
PM 2
SHUT OFF
S410
EJECT
(ON:HOLDER OPEN)
ECHO
IC301
ECHO DRIVE
IC302
RV301
ECHO
LEVEL
BUFFER AMP
Q304

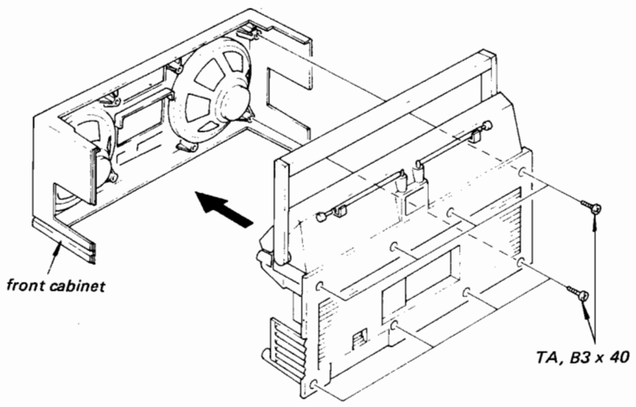
SECTION 2
DISASSEMBLY

2-1. REMOVAL

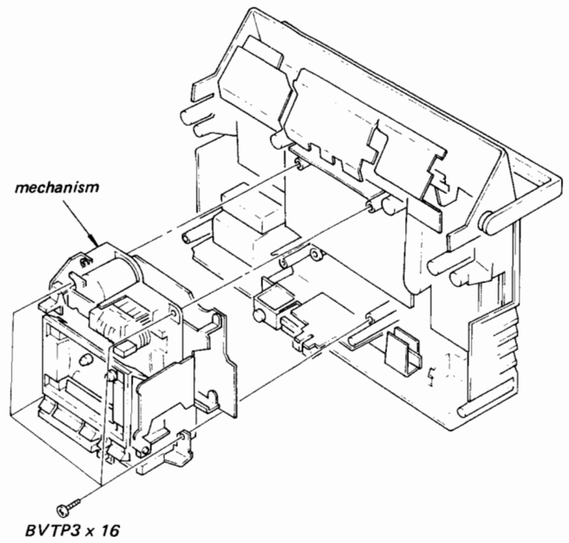
Note: Follow the disassembly procedure in the numerical order given.

CASSETTE WINDOW
Press the EJECT button and remove the cassette window.

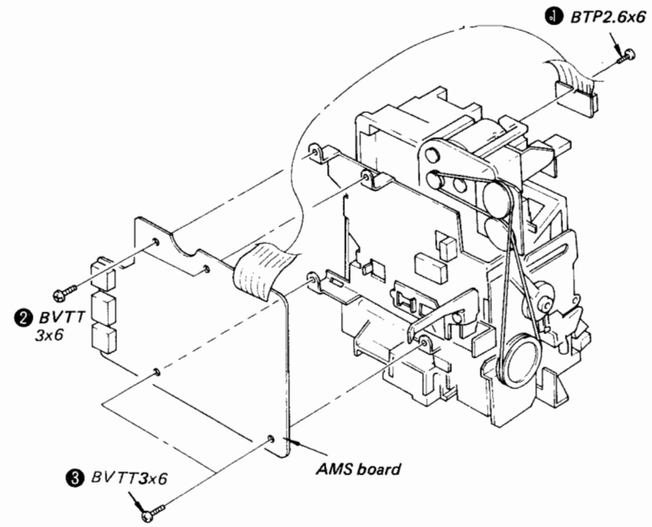
FRONT CABINET



MECHANISM



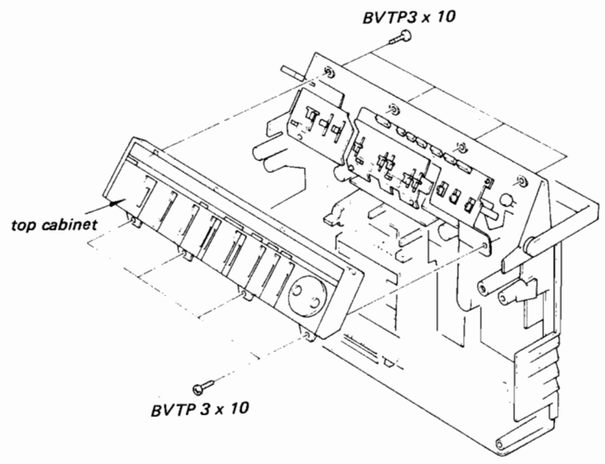
AMS BOARD



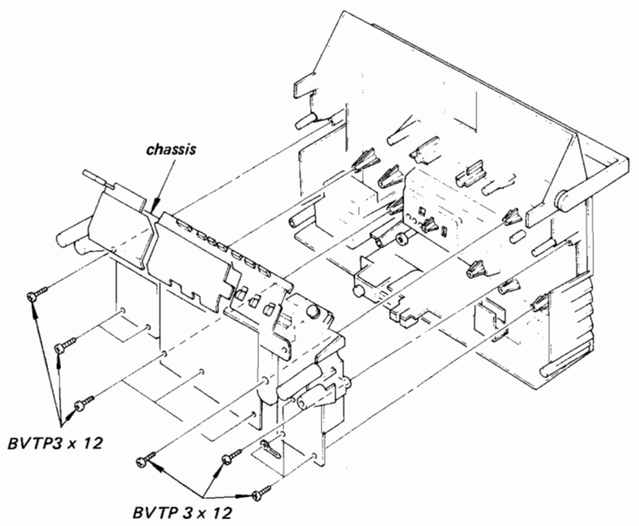
THRUS

❷ PT
2.(

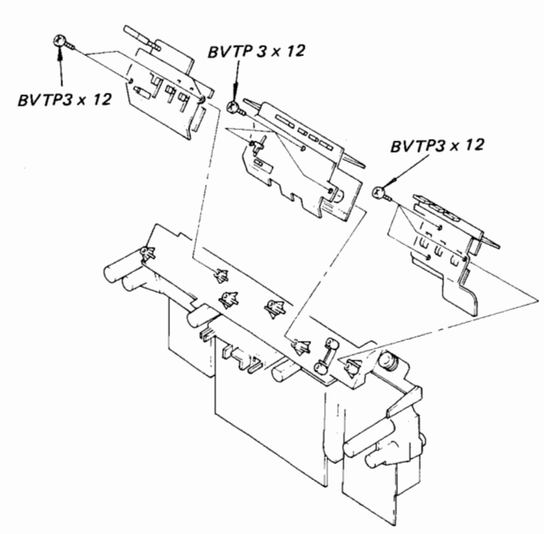
TOP CABINET

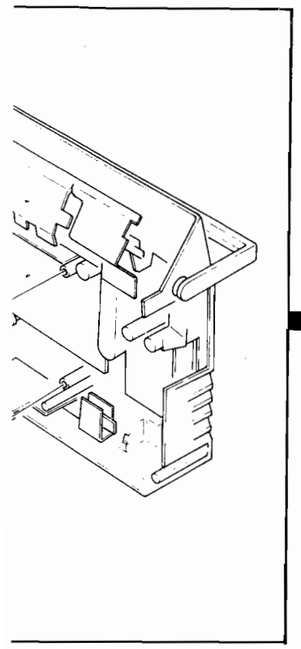


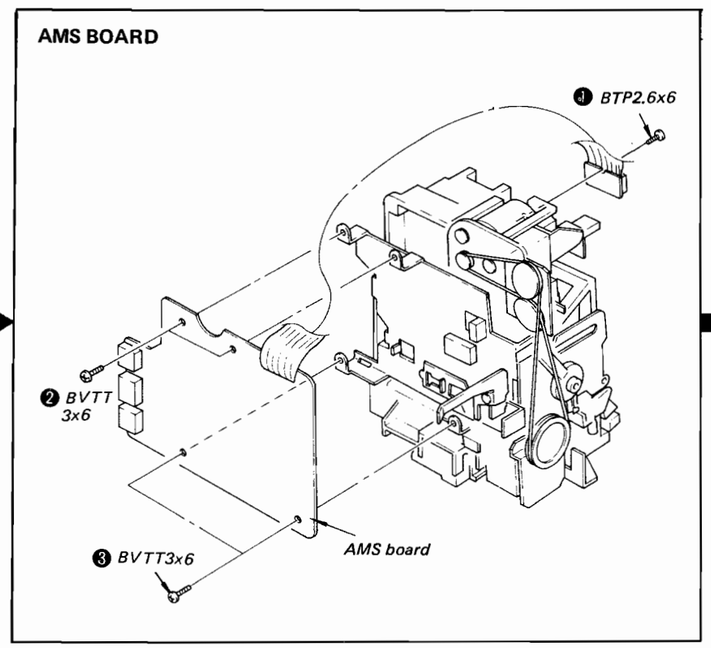
CHASSIS

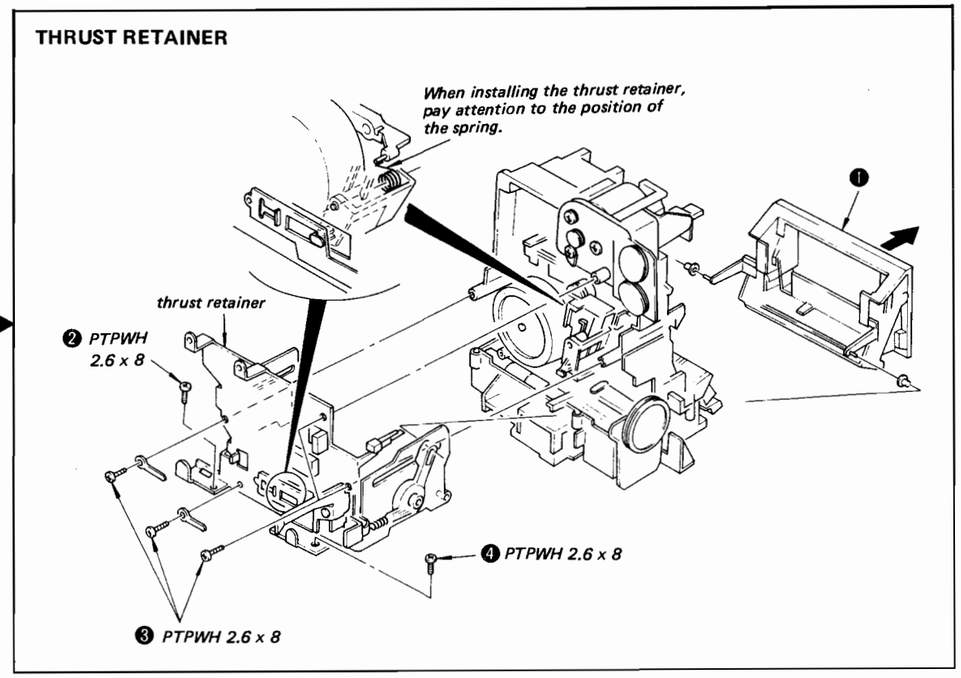


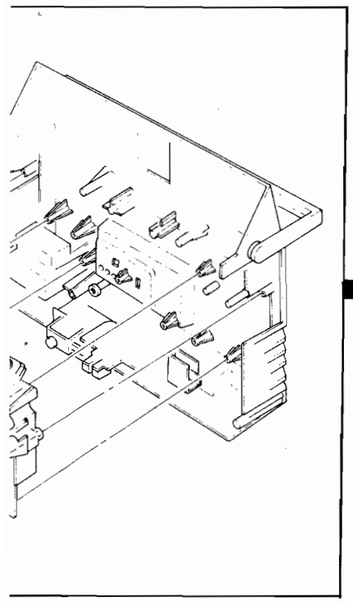
PC BOARDS ON CHASSIS

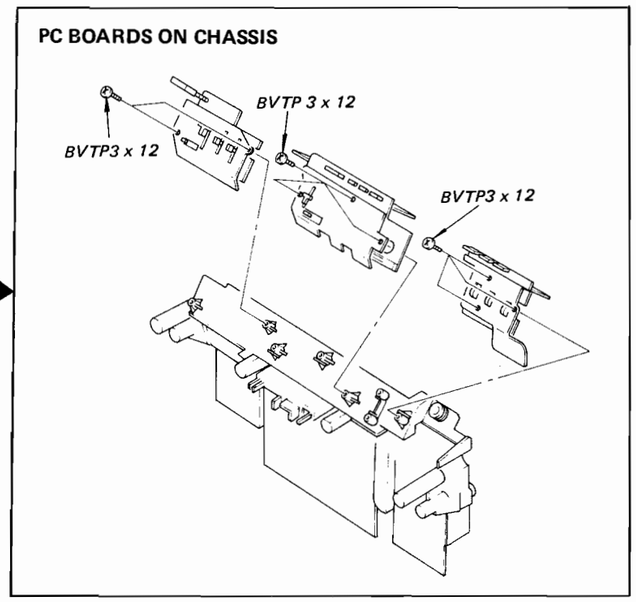





AMS BOARD
❹ BTP2.6x6
❷ BVTT 3x6
❸ BVTT3x6
AMS board

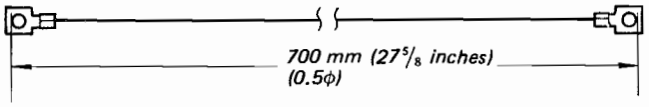

THRUST RETAINER
When installing the thrust retainer, pay attention to the position of the spring.
❶
thrust retainer
❷ PTPWH 2.6 x 8
❹ PTPWH 2.6 x 8
❸ PTPWH 2.6 x 8



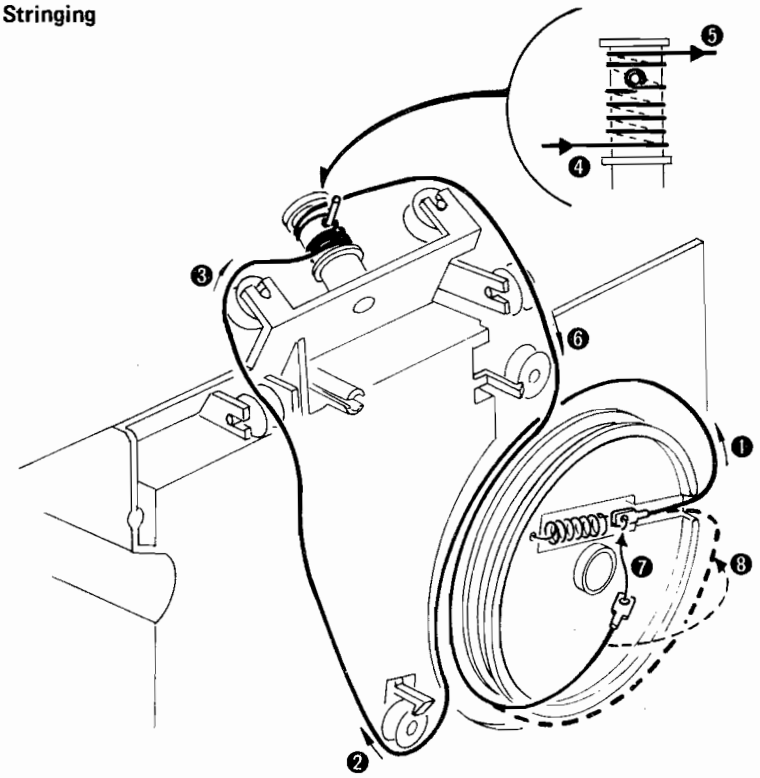

PC BOARDS ON CHASSIS
BVTP3 x 12
BVTP 3 x 12
BVTP3 x 12

2-2. DIAL CORD STRINGING

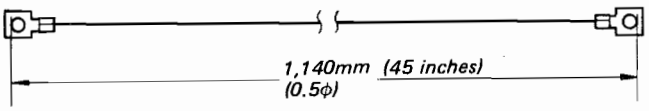
(1) Drum Cord Preparation



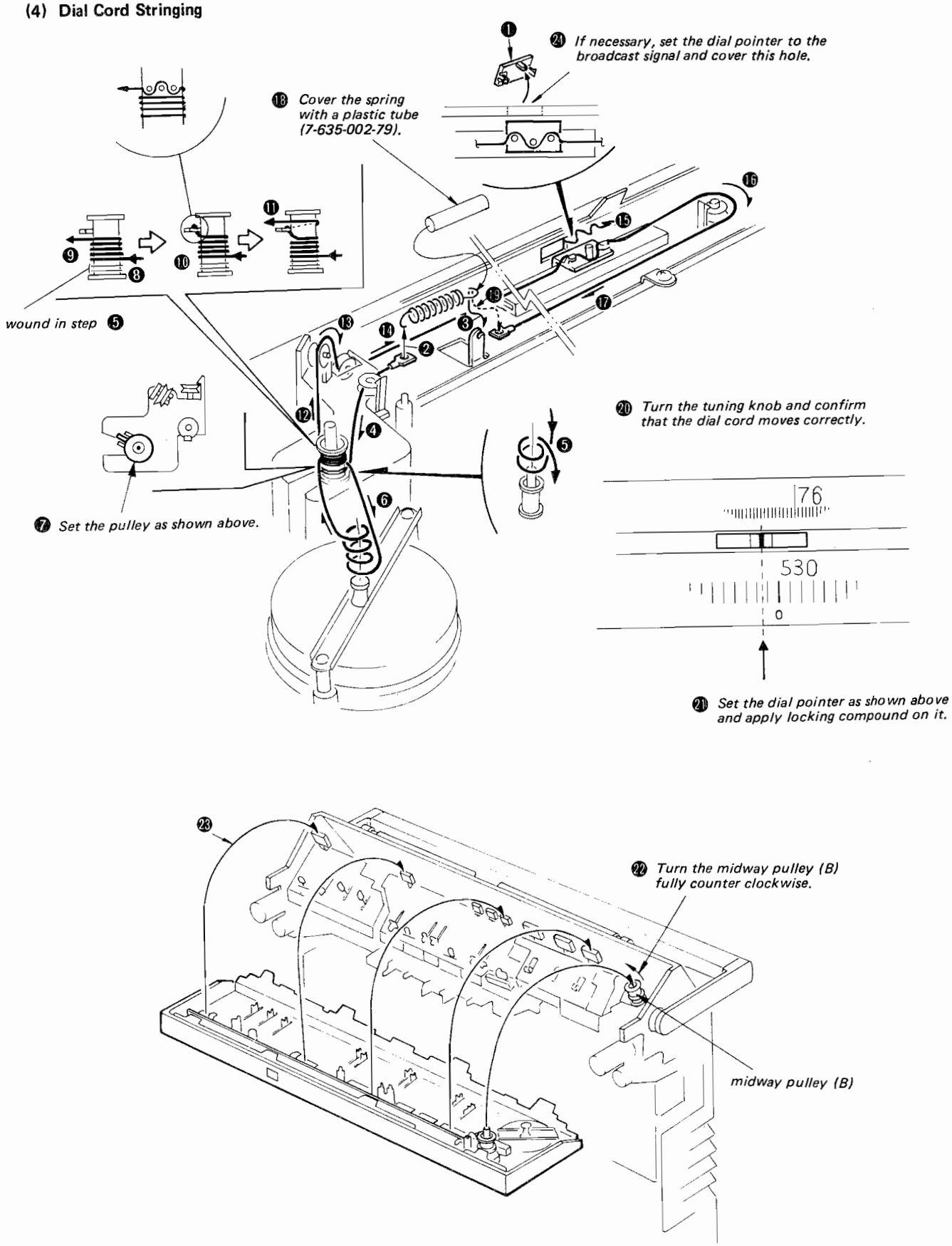
(2) Drum Cord Stringing



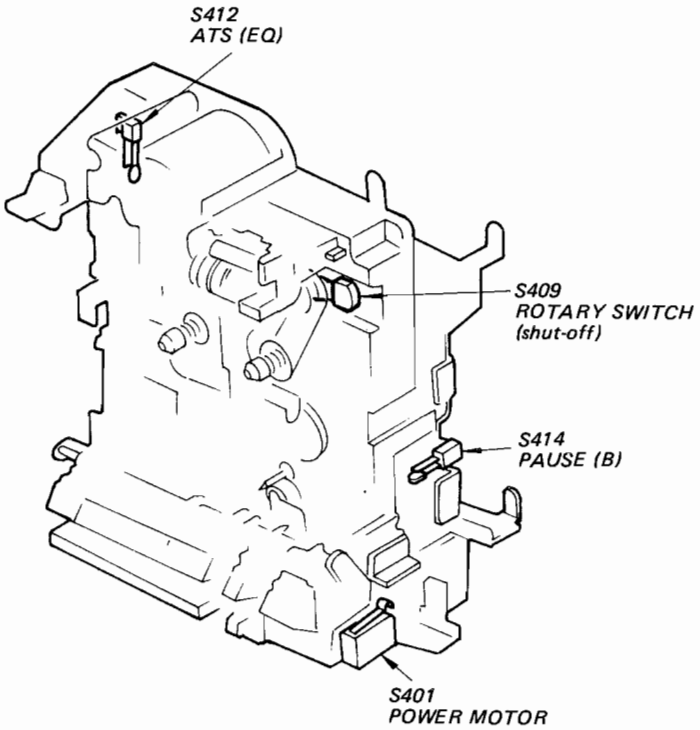
(3) Dial Cord Preparation

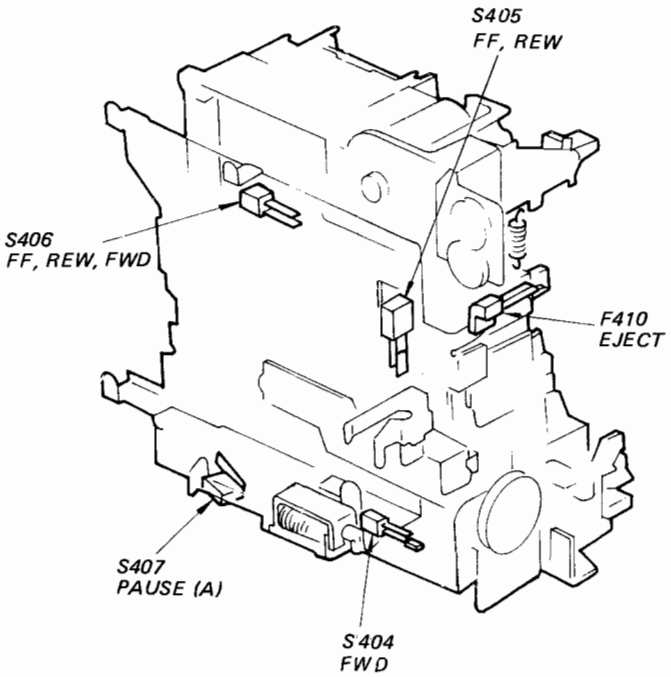


(4) Dial Cord Stringing



2-3. SWITCH LOCATION FOR MECHANISM





SECTION 3
ADJUSTMENTS

3-1. MECHANICAL ADJUSTMENT

PRECAUTION

1. Clean the following parts with a denatured-alcohol-moistened swab:

record/playback head	pinch roller
erase head	rubber belts
capstan	idlers

2. Demagnetize the record/playback head with a head demagnetizer.
3. Do not use a magnetized screwdriver for the adjustments.
4. After the adjustments, apply suitable locking compound to the parts adjusted.
5. The adjustments should be performed with the rated power supply voltage unless otherwise noted.

Torque Measurement

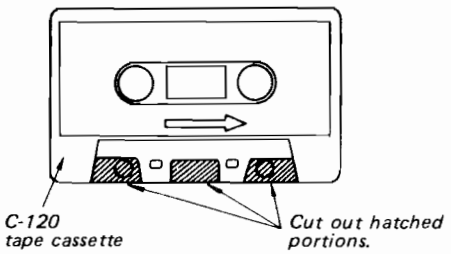
Torque	Torque meter	Meter reading
Forward	CQ-102C	22 ~ 55 g•cm (0.30 ~ 0.76 oz•inch)
Fast Forward and Rewind	CQ-201B	Less than 130 g•cm (1.79 oz•inch)
Back Tension	CQ-102C	2 ~ 5 g•cm (0.03 ~ 0.07 oz•inch)

Tape Pulling Strength Measurement

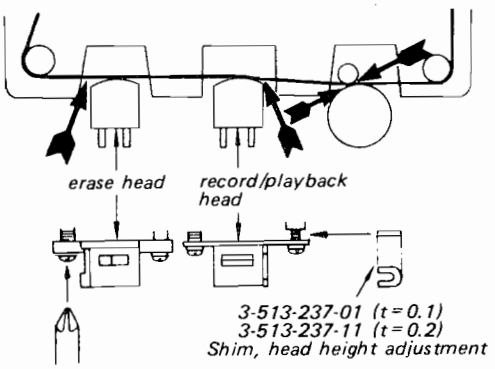
Meter	Meter reading
CQ-403	More than 160 g (5.65 oz)

Head Height Adjustment

1. Prepare an adjustment cassette as shown below.



2. In record mode and viewing from the front, adjust the head heights to eliminate tape curl and tape twist at arrowed portions.



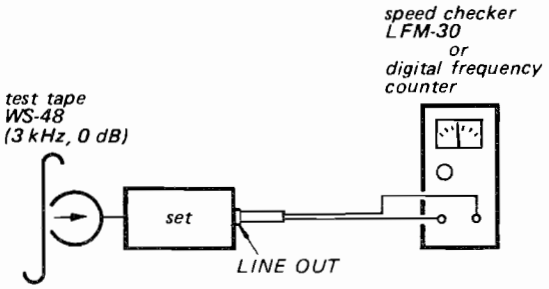
Tape Speed Adjustment

Setting:

VOLUME control: mechanical mid

Procedure:

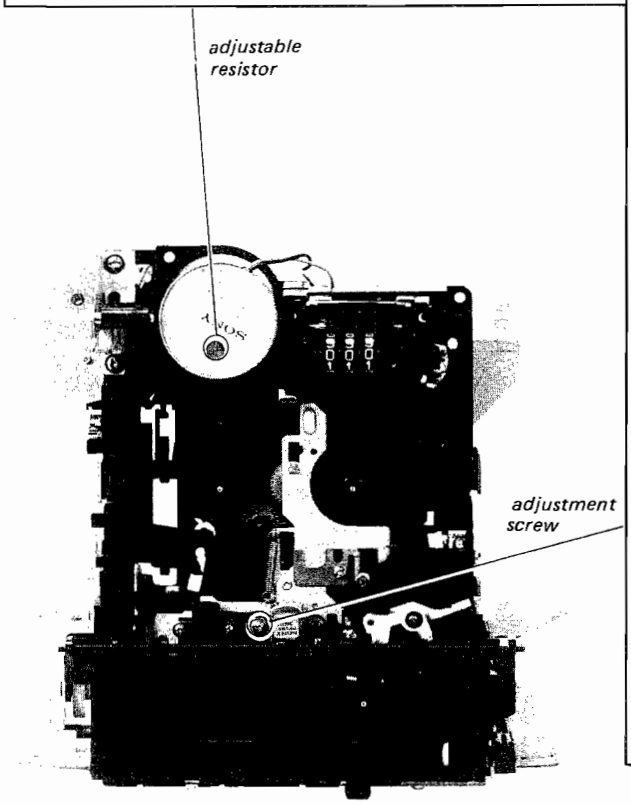
Mode: playback



Specification:

Speed checker	Digited frequency counter
±1%	2.970 ~ 3.030 Hz

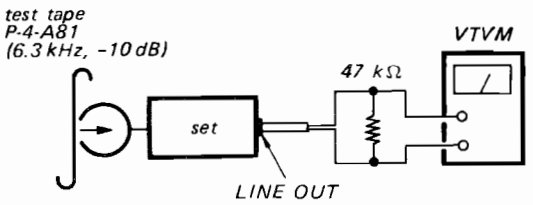
Frequency difference between the beginning and the end of the tape should be within 1% (30 Hz)



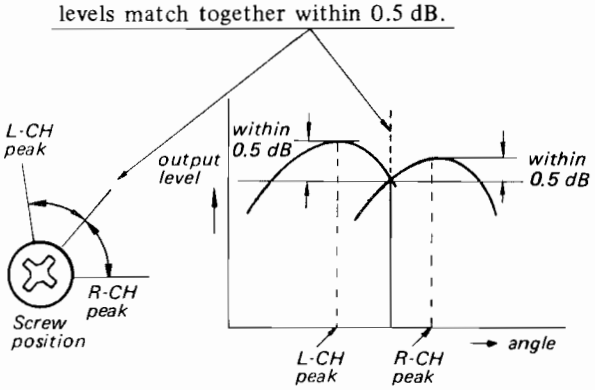
Record/playback Head Azimuth Adjustment

Procedure:

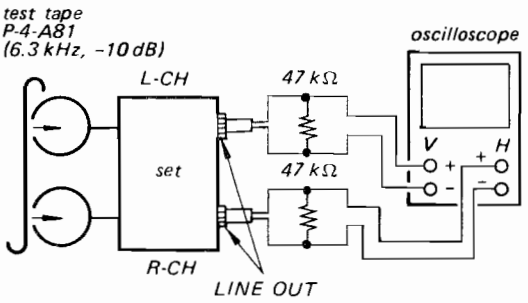
1. Mode: playback

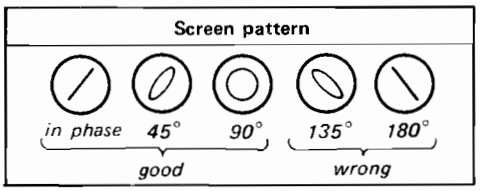


2. Turn the adjustment screw for the maximum output levels. If these levels do not match, turn the adjustment screw where both of output levels match together within 0.5 dB.



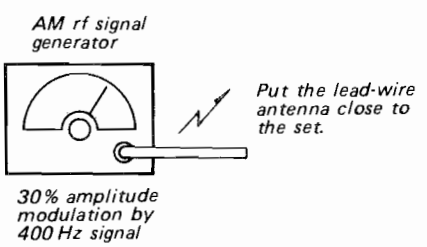
3. Phase Check
Mode: playback

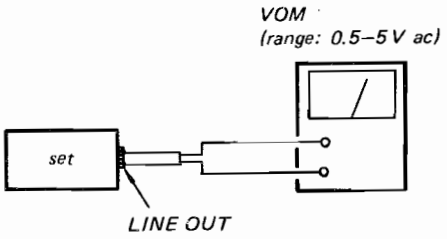




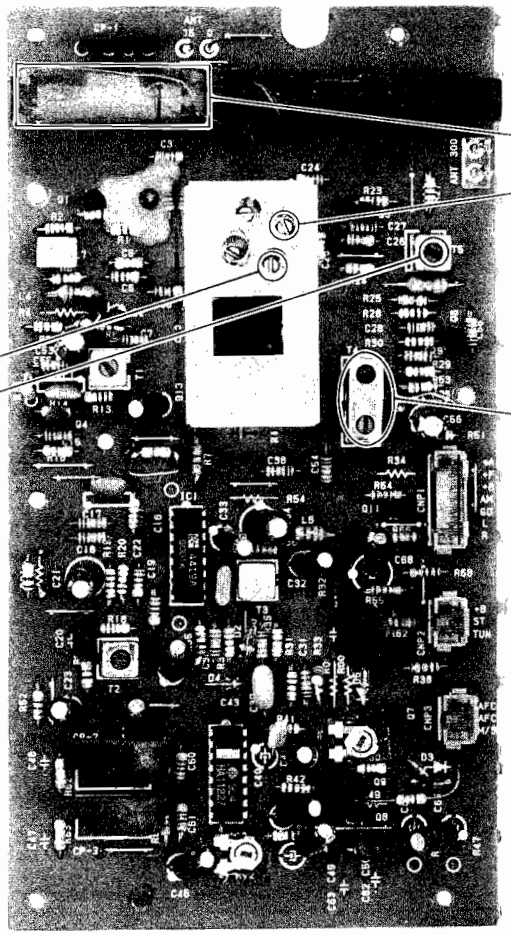
3-2. ELECTRICAL ADJUSTMENTS

MW SECTION





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

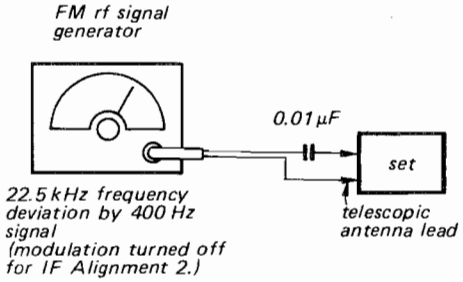


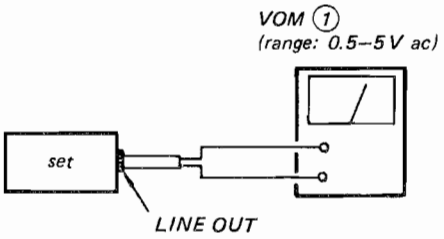
MW FREQUENCY COVERAGE ADJUSTMENT	
Adjust for a maximum reading on VOM.	
1,680 kHz	CT3
520 kHz	T5

MW TRACKING ADJUSTMENT	
Adjust for a maximum reading on VOM.	
L6	520 kHz
CT4	1,680 kHz

MW IF ALIGNMENT	
Adjust for a maximum reading on VOM.	
T4	455 kHz

FM SECTION





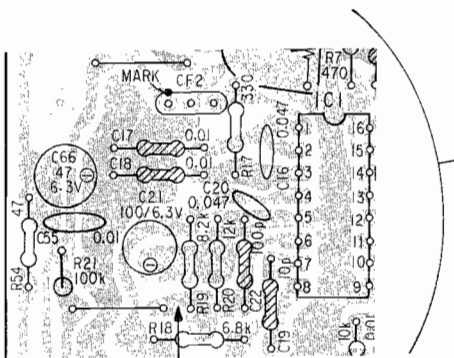
- Repeat the procedures in each adjustment several times, and the frequency coverage and tracking adjustments should be finally done by the trimmer capacitors.

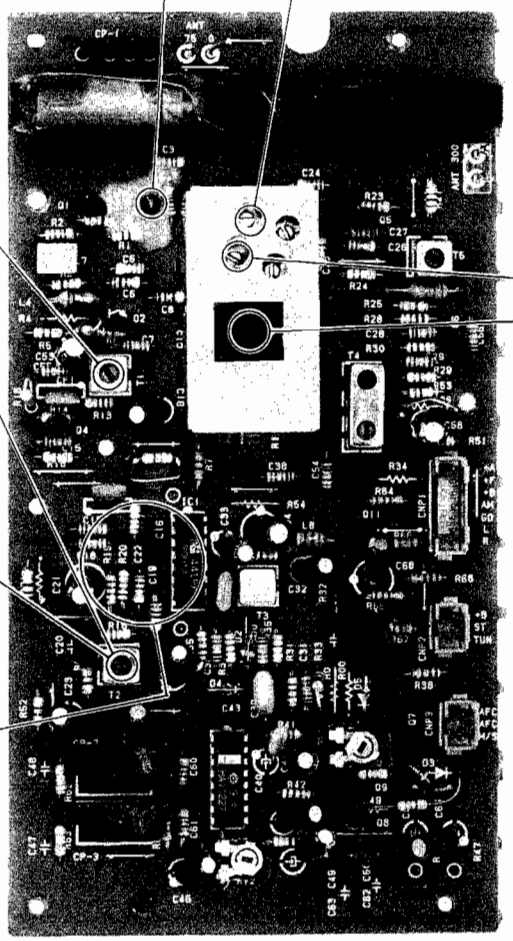
FM TRACKING ADJUSTMENT	
Adjust for a maximum reading on VOM (1).	
87.1 MHz	108.5 MHz
L3	CT1

FM IF ALIGNMENT 1 (10.7 MHz with modulation)
Adjust for a maximum reading on VOM (1).
T1
T2

FM IF ALIGNMENT 2 (10.7 MHz with no modulation)
Adjust for 0V reading on VOM (2).
T2

FM FREQUENCY COVERAG ADJUSTMENT	
Adjust for a maximum readin on VOM (1).	
CT2	108.5 MH
L5	87.1 MH

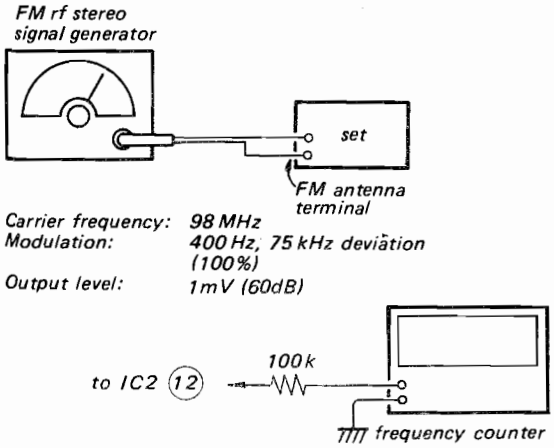




19kHz Adjustment

A) Regular Method

Procedure:

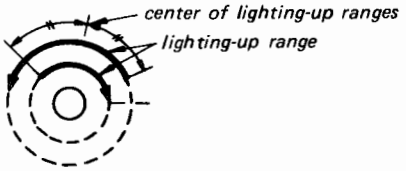


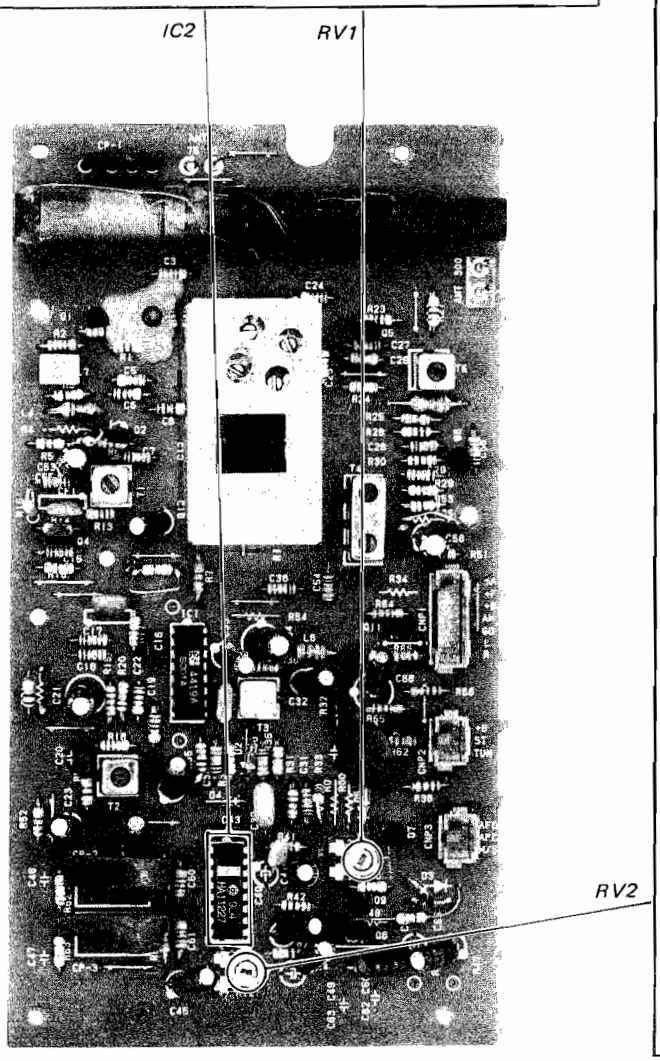
1. Tune the set to 98 MHz.
2. Adjust RV1 for 19 kHz ±30 Hz on the counter.

B) Simple Method

Procedure:

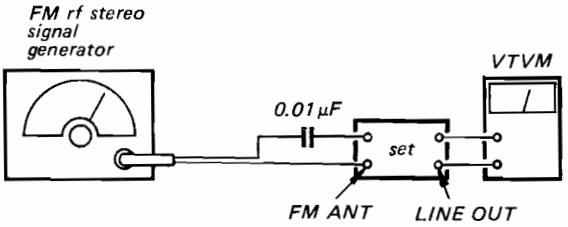
1. Tune the set to the FM stereo broadcasting signal.
2. Turn RV1 clockwise or counterclockwise and memorize the lighting-up range of the stereo lamp.
3. Secure RV1 at the center of the lighting-up range of both turns as shown below.





FM Stereo Separation Adjustment

Procedure:



Carrier frequency: 98 MHz
Output level: 1 mV (60 dB)
Mode: Stereo
Modulation:
Audio (400 Hz): 67.5 kHz deviation (90%)
Pilot (19 kHz): 7.5 kHz deviation (10%)

FM stereo signal generator output channel	VTVM connection	VTVM reading (dB)
L-CH	L-CH	Ⓐ
R-CH	L-CH	Ⓑ Adjust RV2 for minimum reading.
R-CH	R-CH	Ⓒ
L-CH	R-CH	Ⓓ Adjust RV2 for minimum reading.

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

The separations of both channels should be equal.

TAPE RECORDER SECTION

Note: The adjustment should be performed in the order given in this service manual. The adjustments should be performed for both L-CH and R-CH.

- Set the TAPE SELECT switch according to the tape as follows.

TAPE	TAPE SELECT switch
CS-15	TYPE I (NORM)
CS-25	TYPE II (CrO_2)
CS-40	TYPE IV (METAL)

Standard Record:

Deliver the standard input signal level to the input jack and set the REC LEVEL control to obtain the standard output signal level.

Standard Input Level

	source imp.	input level
MIC	300 Ω	0.77mV (−60dB)
LINE IN	10 kΩ	0.44V (−5dB)
MIX MIC	300 Ω	2.5mV (−50dB)
PHONO	2.2 kΩ	7.7mV (−40dB)

Standard Output Level

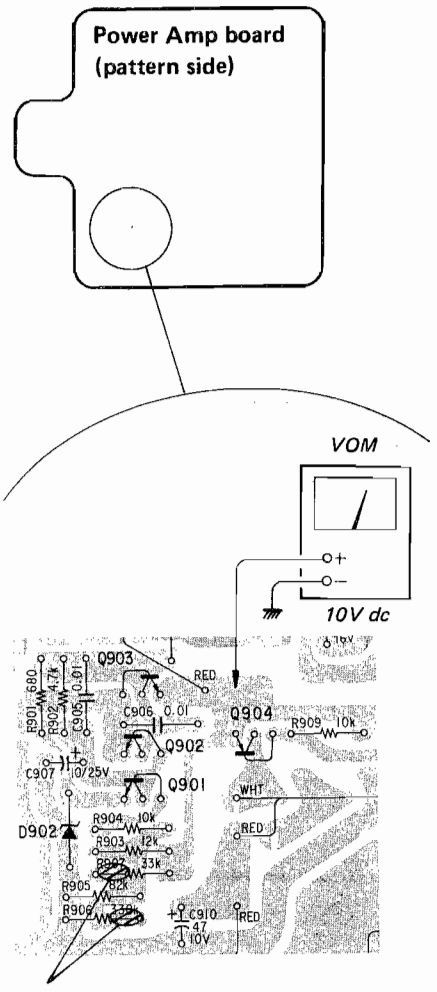
	load imp.	input level
EXT SP	4 Ω	0.775V (0dB)
LINE OUT	47 kΩ	0.44V (−5dB)
HEADPHONES	8 Ω	39mV (−26dB)

B+ Voltage Adjustment

Setting:

Power supply voltage: 15V dc
Power switch: ON

Adjustment Location and Specification:



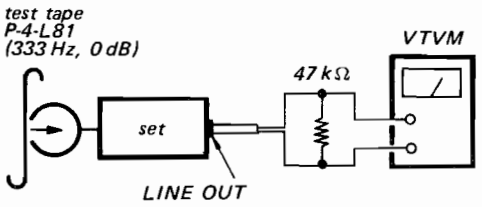
Change the pattern connection for 10V dc VOM reading.

Playback Level Adjustment

Setting:

TAPE SELECT switch: TYPE I

Procedure:



Specification:

LINE OUT level: 0.55±0.1V
(−3±1.5 dB)

Level difference between channels:
less than 0.5 dB

Check that the LINE OUT level does not change in playback mode while changing the mode from playback to stop several times.

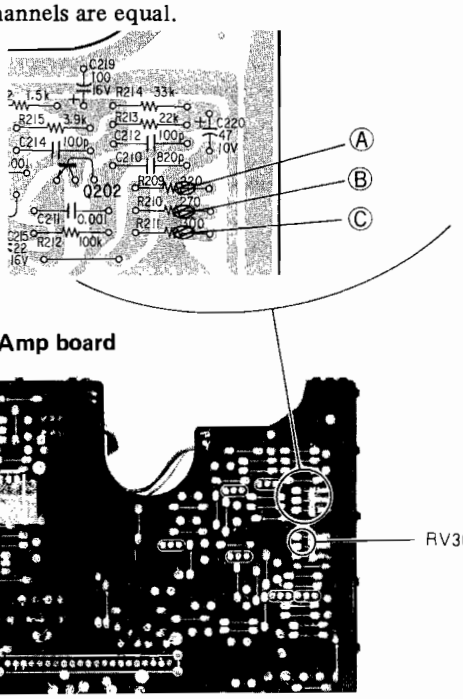
Adjustment Location:

(R-CH)

Pattern connection	LINE OUT level
Ⓐ	Low ↕
Ⓑ	
Ⓒ	High

(L-CH)

Adjust RV307 so that the separations of both channels are equal.



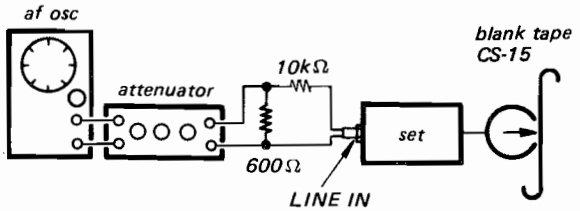
Record Bias Adjustment

Setting:

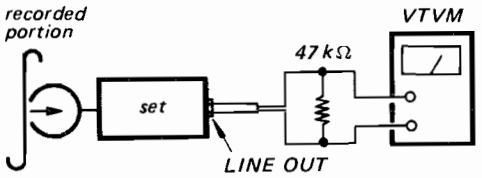
REC LEVEL control: MID
LINE IN switch: ON

Procedure:

1. Mode: record



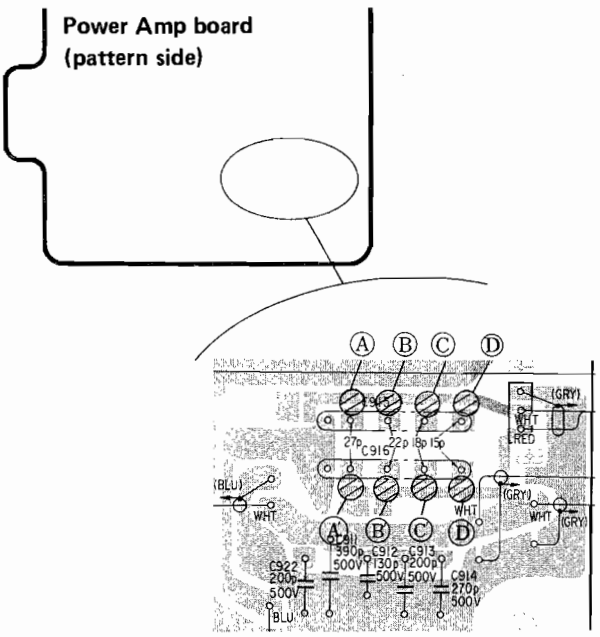
2. Mode: playback



Change the pattern connection so that 6.3 kHz signal level is 0^{+2}_{-1} dB relative to 333 Hz signal level.

Adjustment Location:

Pattern connection		6.3 kHz VTVM reading
L-CH	R-CH	
Ⓐ	Ⓐ'	down ↕
Ⓑ	Ⓑ'	
Ⓒ	Ⓒ'	
Ⓓ	Ⓓ'	up



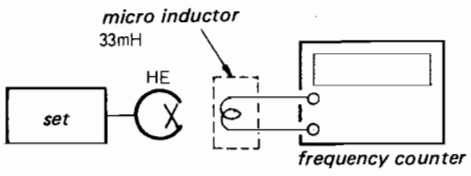
Bias OSC Frequency Adjustment

Setting:

TAPE SELECT switch: TYPE IV (METAL)

Procedure:

Mode: record (without signal)

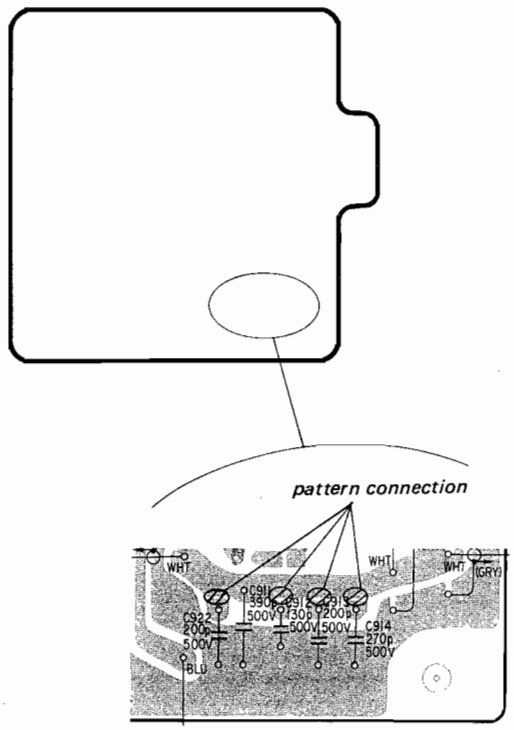


Put the micro inductor close to the erase head core. Change the pattern connection for specified frequency.

Specification:

AFC/ISS switch	counter reading
1	86±1.5 kHz
2	83±2.5 kHz
3	80±2.5 kHz

Adjustment Location:



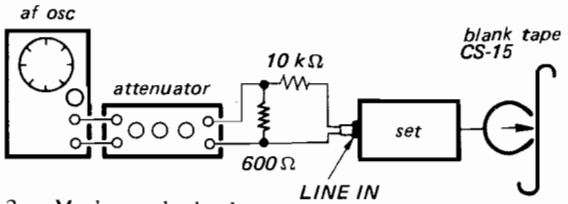
Record Level Adjustment

Setting:

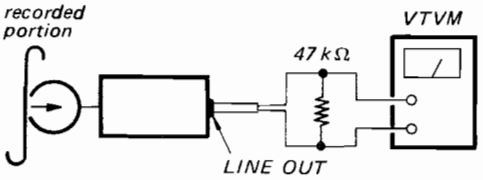
TAPE SELECT switch: TYPE I (NORM)
REC LEVEL control: standard record

Procedure: (See page 31.)

1. Mode: record



2. Mode: playback

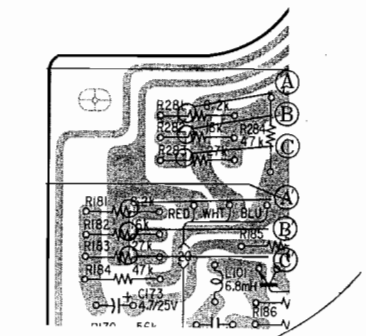


Specification:

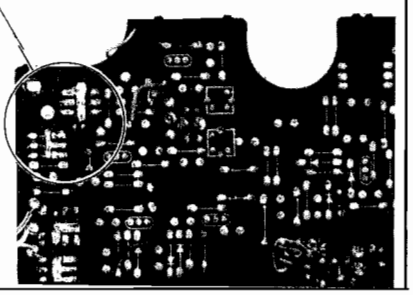
LINE OUT level: 0.44±0.08V (–5±1.5 dB)

Adjustment Location:

Pattern connection		LINE OUT level
R-CH	L-CH	
Ⓐ	Ⓐ'	High
Ⓑ	Ⓑ'	↕
Ⓒ	Ⓒ'	Low



Pre Amp board



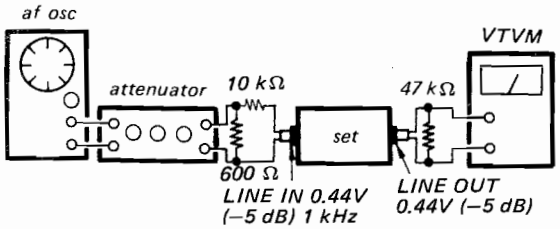
Meter Calibration

Setting:

Power Supply Voltage: 15V dc
LINE IN switch : ON
MIC MIX switch : ON

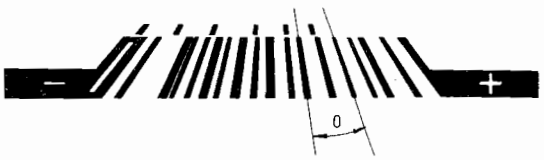
Procedure:

1. Mode: playback



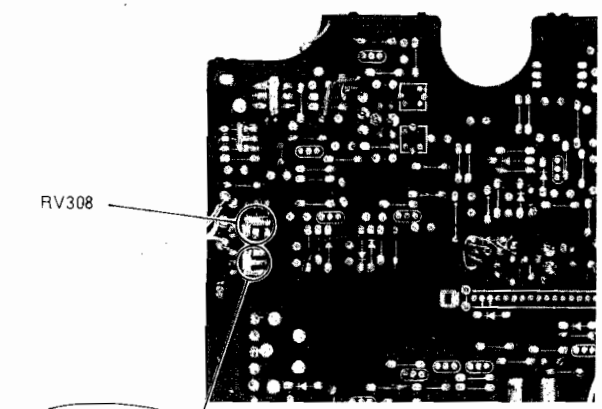
Slide the REC LEVEL control for 0.44V (–5 dB) LINE OUT level.

2. Change the pattern connection for the R-CH meter indication as shown below.

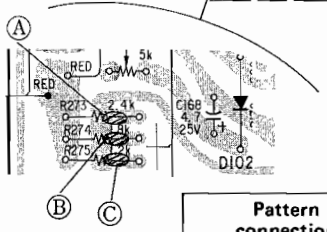


Specification : 0±1

3. Adjust RV308 so that the L-CH meter indicates the same level as R-CH.



Pre Amp board



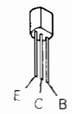
Pattern connection	Level meter indication
Ⓐ	⊖
Ⓑ	↕
Ⓒ	⊕

SECTION 4
DIAGRAMS

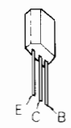
- **Semiconductor Lead Layouts**

2SD773

2SA733
2SA772
2SA772-23
2SC945
2SC1345
2SC1361
2SC1362
2SC1363
2SC1364
2SC1474
2SC1674



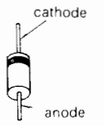
2SA1027R



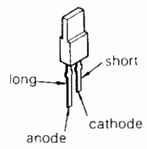
2SC710
2SC710-13
2SC710-14

2SK120

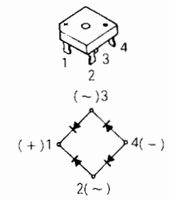
10E-1
10E-2
RD6.2E
RD8.2E
RD13E
1S1555
1S2076
1S2687S-1
1T22
1T22AM
1T23
1T40
EQB01-12Z
SD113



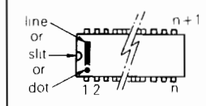
SLP141B
SLP241B



S4VB10

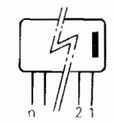


KB4419A
HA11227
HA12024
CX766



(Top view)

BX372

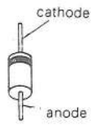


(Marking side view)

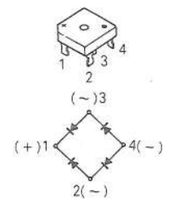
SECTION 4
DIAGRAMS

0
0-13
0-14

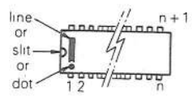
10E-1
10E-2
RD6.2E
RD8.2E
RD13E
1S1555
1S2076
1S2687S-1
1T22
1T22AM
1T23
1T40
EQB01-12Z
SD113



S4VB10

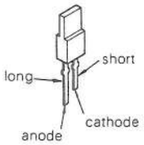


KB4419A
HA11227
HA12024
CX766



(Top view)

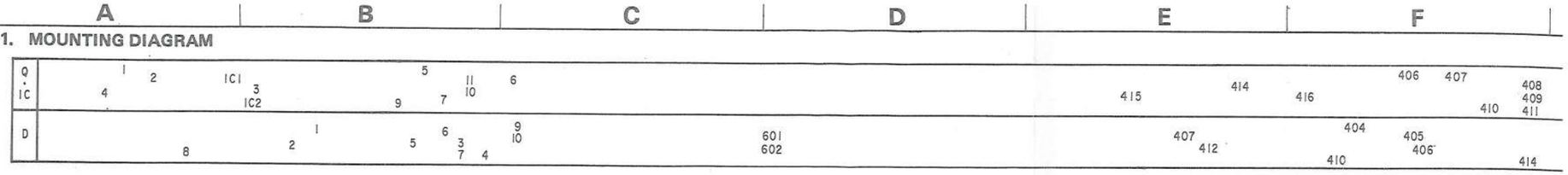
SLP141B
SLP241B



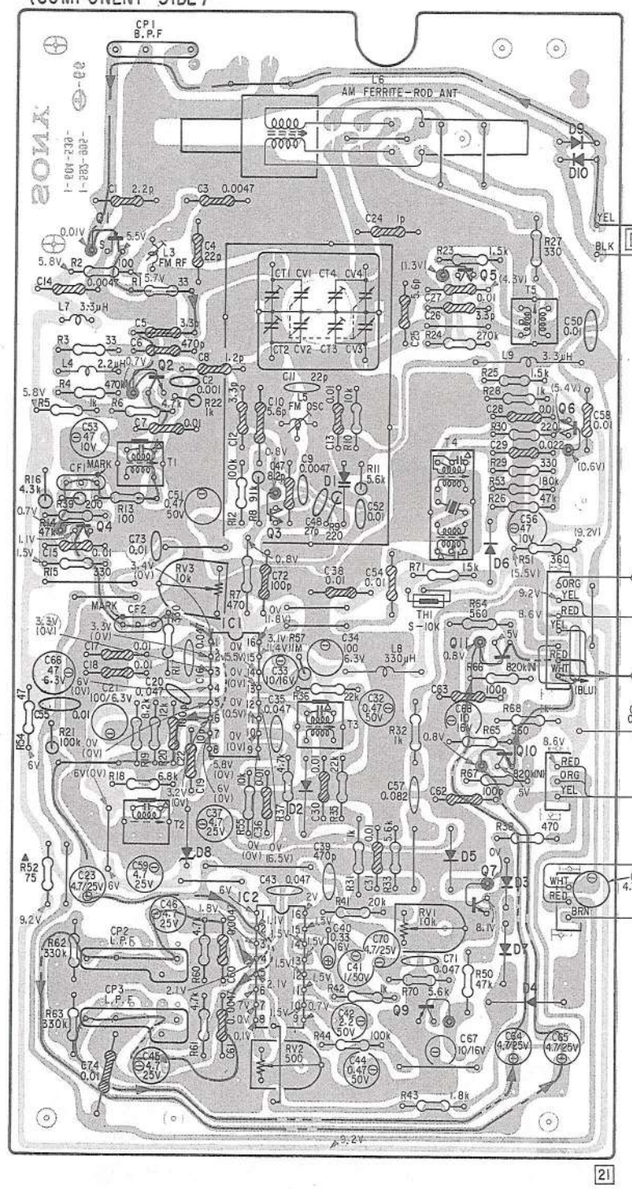
BX372

(Marking side view)

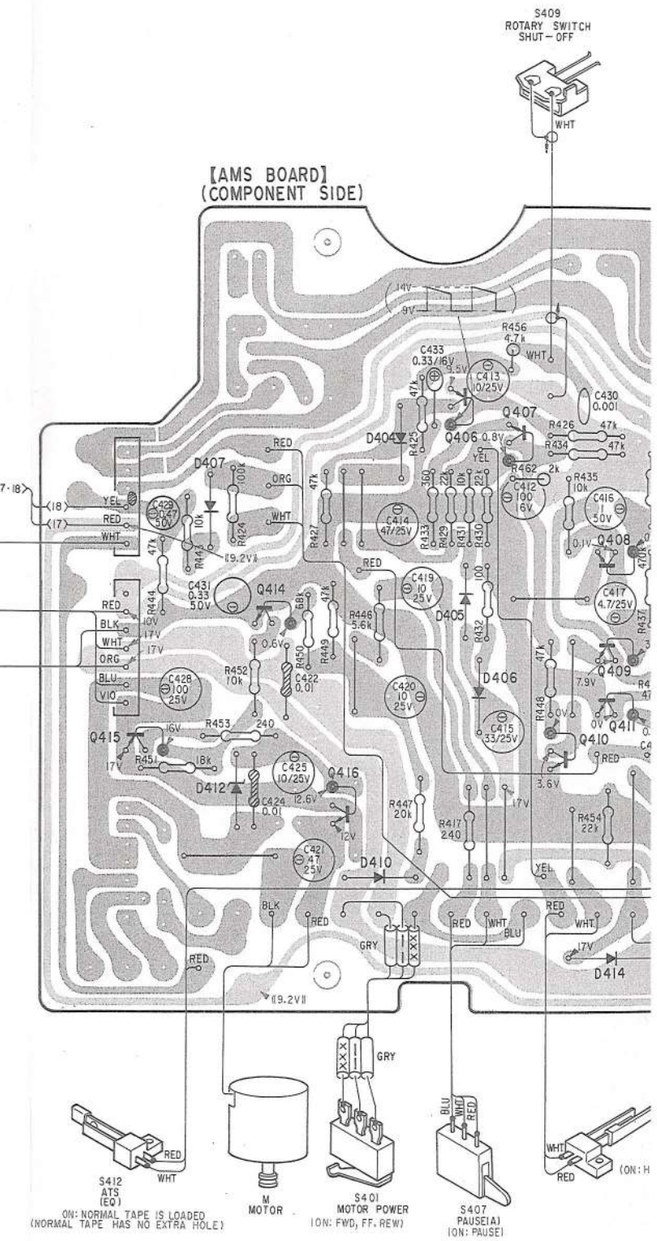
4-1. MOUNTING DIAGRAM



【RADIO BOARD】
(COMPONENT SIDE)



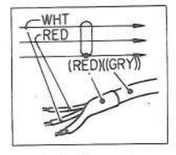
【AMS BOARD】
(COMPONENT SIDE)



5 9 7 11 10 6 415 414 416 406 407 408 409 411 410 412	Q · IC
5 6 3 7 4 9 10 601 602 407 412 404 410 405 406 414 408	D

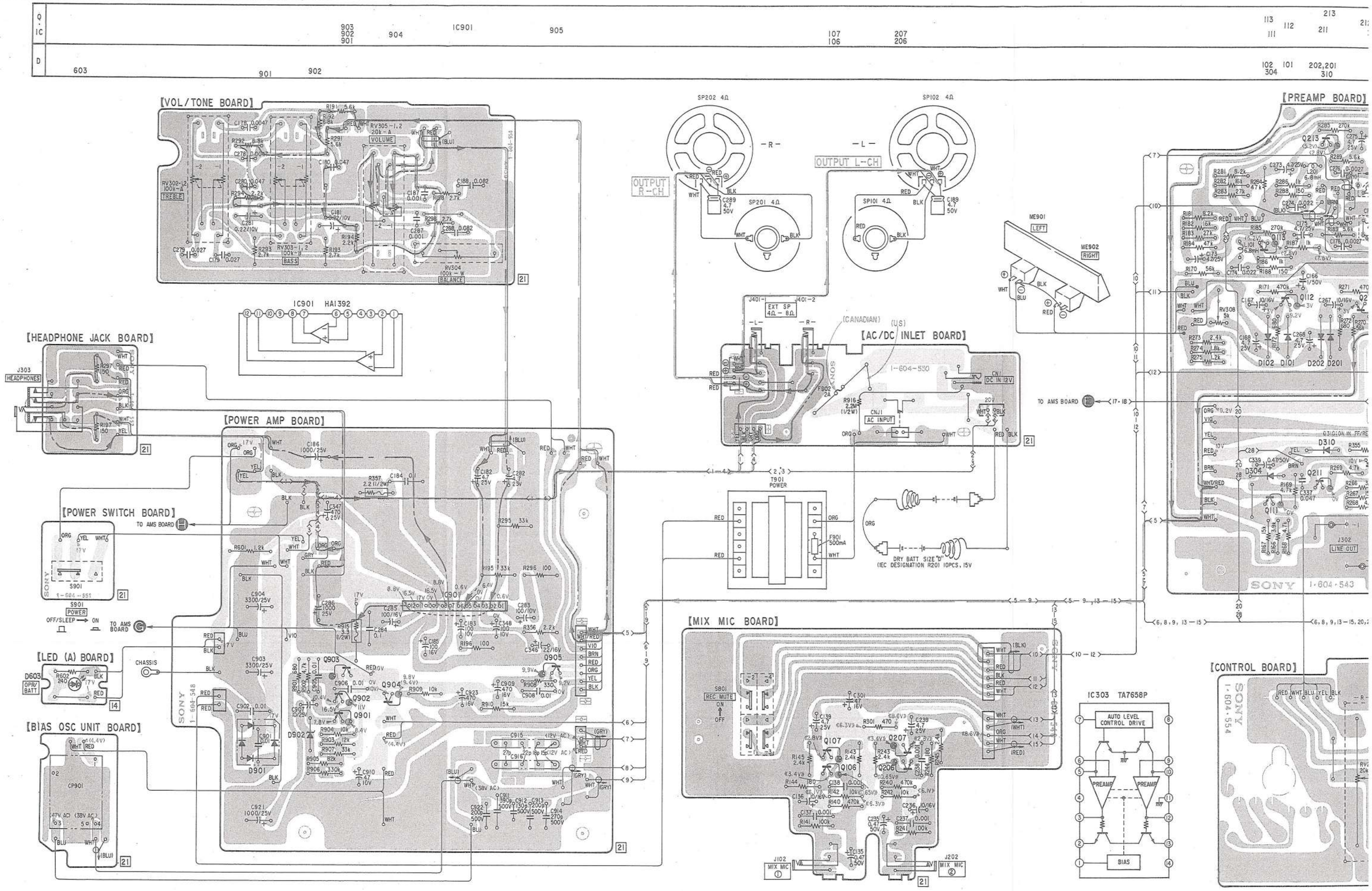
FM TEL ANT
EXT ANT
R34 1k
FM INPUT
YEL
BLK
FERRITE-ROD ANT
D9
D10
IC1 KB4419A
FM IF AMP
FM QUADRATURE DET
FM VOLTAGE CONTROL
AGC AMP
AM IF AMP
FM LED DRIVE
AM LED DRIVE
TO BAND SWITCH BOARD
TO PREAMP BOARD
TO POWER AMP BOARD
【LED (B) BOARD】
(CONDUCTOR SIDE)
D601
TUNING
D602
STEREO
SONY 1-604-541
14
IC2 HA11227
POWER SUPPLY
PREAMP
DECORDER
STEREO/ MONORAL SWITCH
LED DRIVE
STEREO MUTING
VCO 76kHz
F.F 38kHz
F.F 19kHz
DC AMP
PHASE COMPARATOR
VOLTAGE COMP.
OR
21
【AMS BOARD】
(COMPONENT SIDE)
S409
ROTARY SWITCH
SHUT-OFF
S406
FF, REW, FWD
(ON: FF, REW, FWD)
S414
PAUSE(B)
(ON: PAUSE)
S404
FWD
(ON: FWD)
S405
FF, REW
(ON: FF, REW)
S412
ATS
(EQ)
ON: NORMAL TAPE IS LOADED
(NORMAL TAPE HAS NO EXTRA HOLE)
M
MOTOR
S401
MOTOR POWER
(ON: FWD, FF, REW)
S407
PAUSE(A)
(ON: PAUSE)
S410
EJECT
(ON: HOLDER OPEN)
PM2
SHUT-OFF

- [ ]← : indicates side identified with part number.
- Color code of sleeving over the end of the jacket.



- ▒ : B+ pattern
- ▬▶ : signal path
- ▬▶ : L-CH signal path
- ▬▶ : R-CH signal path

4-2. MOUNTING DIAGRAM See page 36 for semiconductor lead layouts.



【PREAMP BOARD】

【ECHO BOARD】

【CONNECTION BOARD】

【CONTROL BOARD】

【BAND SWITCH BOARD】

IC303 TA7658P

K L M N O P

114 214 205 204 108 203 104 101 304 202 103 201 102 305 IC302 IC301 303 302 301 Q・IC

311 309 D

1 2 3 4 5

【ECHO BOARD】

【CONNECTION BOARD】

【FUNCTION BOARD】

【BAND SWITCH BOARD】

TO AMS BOARD

MICROPHONE -L-

MICROPHONE -R-

PLAYBACK INPUT R-CH

PLAYBACK INPUT L-CH

REC MODE

S203 (AUTO) ON OFF

S202 (MANUAL) ON OFF

MIC MIX ON OFF

S1 BAND SELECT FM STEREO ↓ FM ↓ AM

S601 TAPE SELECT TYPE I (NORM) ↓ TYPE II (CrO2) ↓ TYPE IV (METAL)

S301 TAPE ON OFF

S302 RADIO ON OFF

TO RADIO BOARD

IC302 BX372

LOW-PASS FILTER / EMITTER FOLLOWER / SAMPLE HOLD / PULSE-WIDTH CHANGE / CLOCK OSC

IC301 CX766

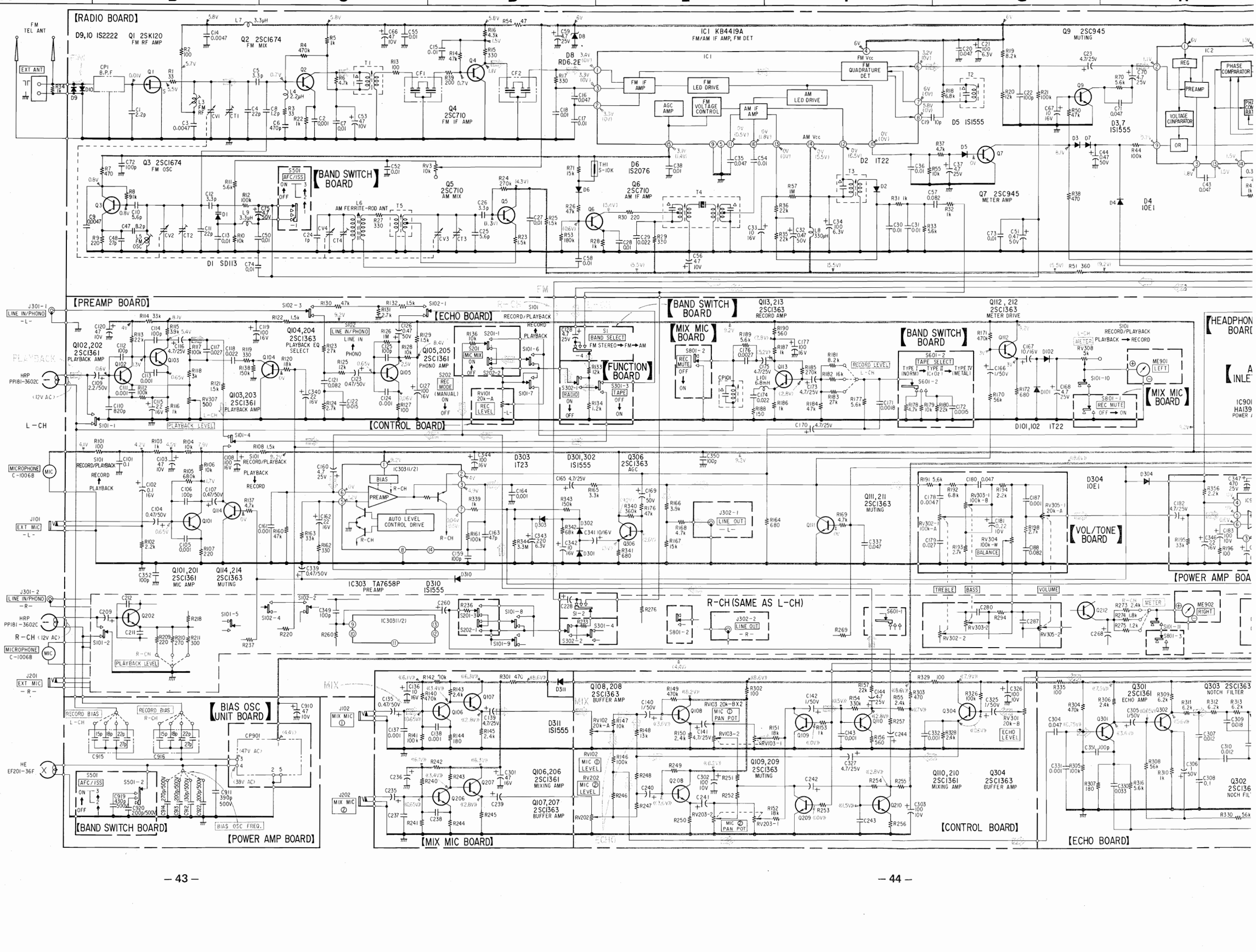
B.B.D

- : indicates side identified with part number.
- Color code of sleeving over the end of the jacket.

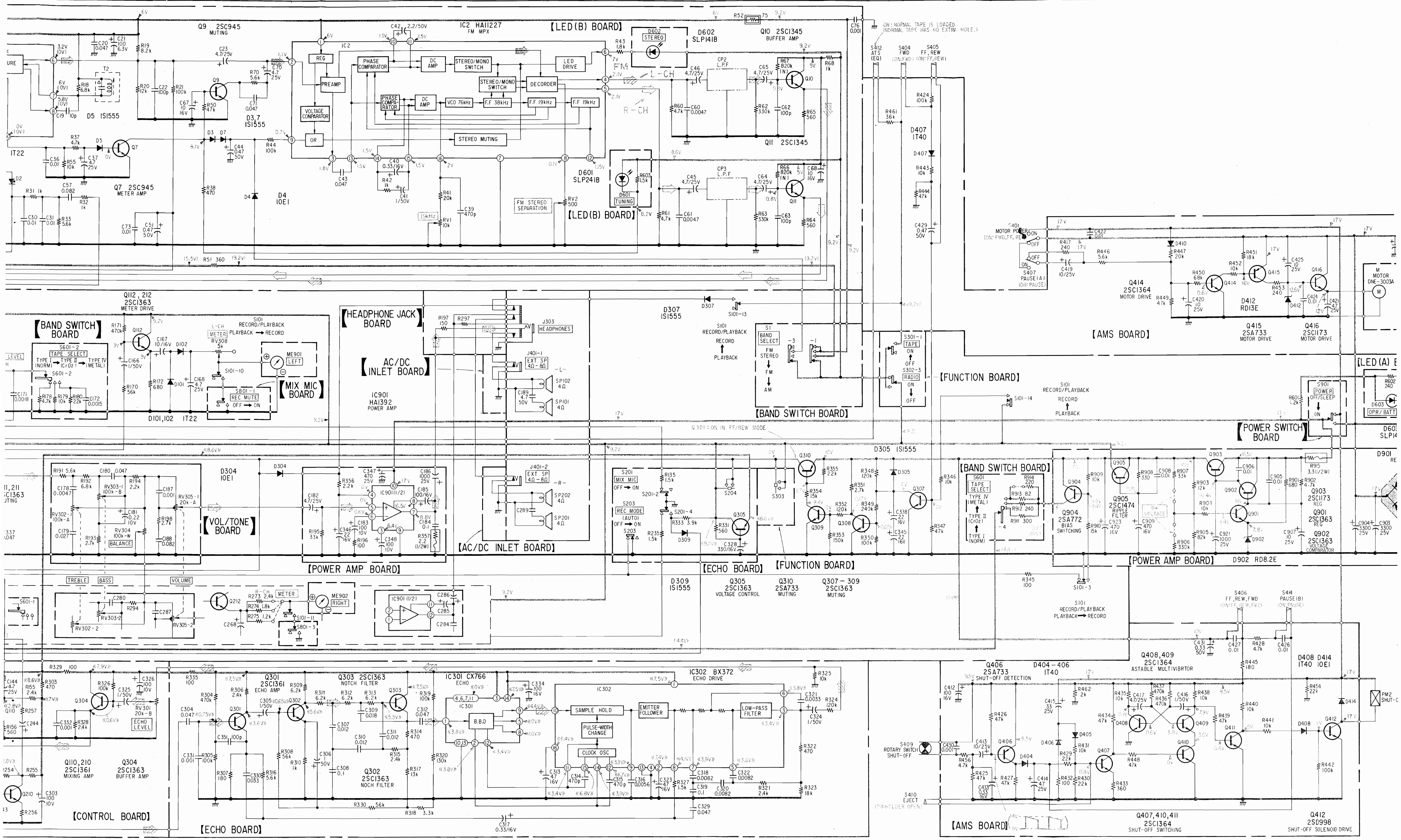
WHT RED (RED)(GRY)

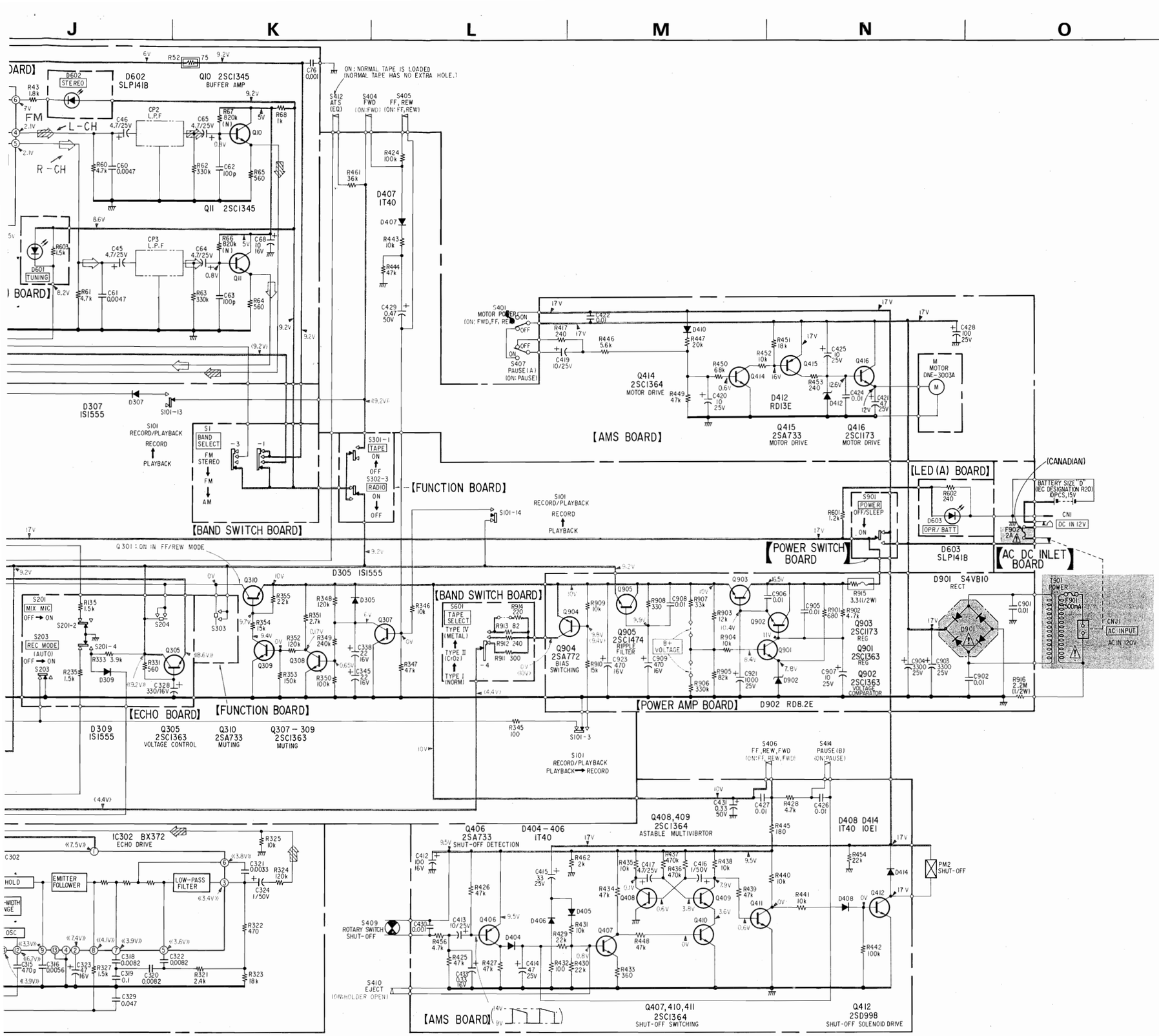
- : B+ pattern
- : signal path
- : L-CH signal path
- : R-CH signal path

4-3. SCHEMATIC DIAGRAM



G	H	I	J	K	L	M	N


[LED(B) BOARD]
[BAND SWITCH BOARD]
[HEADPHONE JACK BOARD]
[AC/DC INLET BOARD]
[MIX MIC BOARD]
[VOL/TONE BOARD]
[POWER AMP BOARD]
[ECHO BOARD]
[FUNCTION BOARD]
[AMS BOARD]
[POWER SWITCH BOARD]
[CONTROL BOARD]
IC2 HA11227 FM MPX
IC901 HA1392 POWER AMP
IC301 CX766 ECHO
IC302 BX372 ECHO DRIVE



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

Note: Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

- Components for right channel have same values as for left channel. Reference numbers are coded from 200.
- All capacitors are in μF unless otherwise noted. pF : μμF 50 WV or less are not indicated except for electrolytics.
- △ : internal component.
- ▭ : panel designation.
- ▭ : adjustment for repair.
- Readings are taken under no-signal (detuned) conditions.

≪ ≫ : MIC MIX (RADIO)
MIC 1, 2 LEVEL: MINIMUM
SOURCE LEVEL: MINIMUM
( ) : AM
< > : RECORD (REC MODE-AUTO)

• Switch

Rif. No.	Switch	Position
S1	BAND SELECT	FM STEREO
S101	REC/PLAYBACK	PLAYBACK
S102	LINE IN/PHONO	PHONO
S201	MIC MIX	OFF
S202	REC MODE (MANUAL)	ON
S203	REC MODE (AUTO)	OFF
S204	MUTING	OFF
S301	TAPE	ON
S302	RADIO	OFF
S303	MUTING	OFF
S401	POWER MOTOR	OFF
S404	FWD	OFF
S405	FF, REW	OFF
S406	FF·REW·FWD	OFF
S407	PAUSE (A)	OFF
S409	SHUT OFF	OFF
S410	EJECT	OFF
S412	ATS (EQ)	OFF
S414	PAUSE (B)	OFF
S501	AFC/ISS	OFF
S601	TAPE SELECT	TYPE I (NORM)
S801	REC MUTE	OFF
S901	POWER	OFF/SLEEP

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

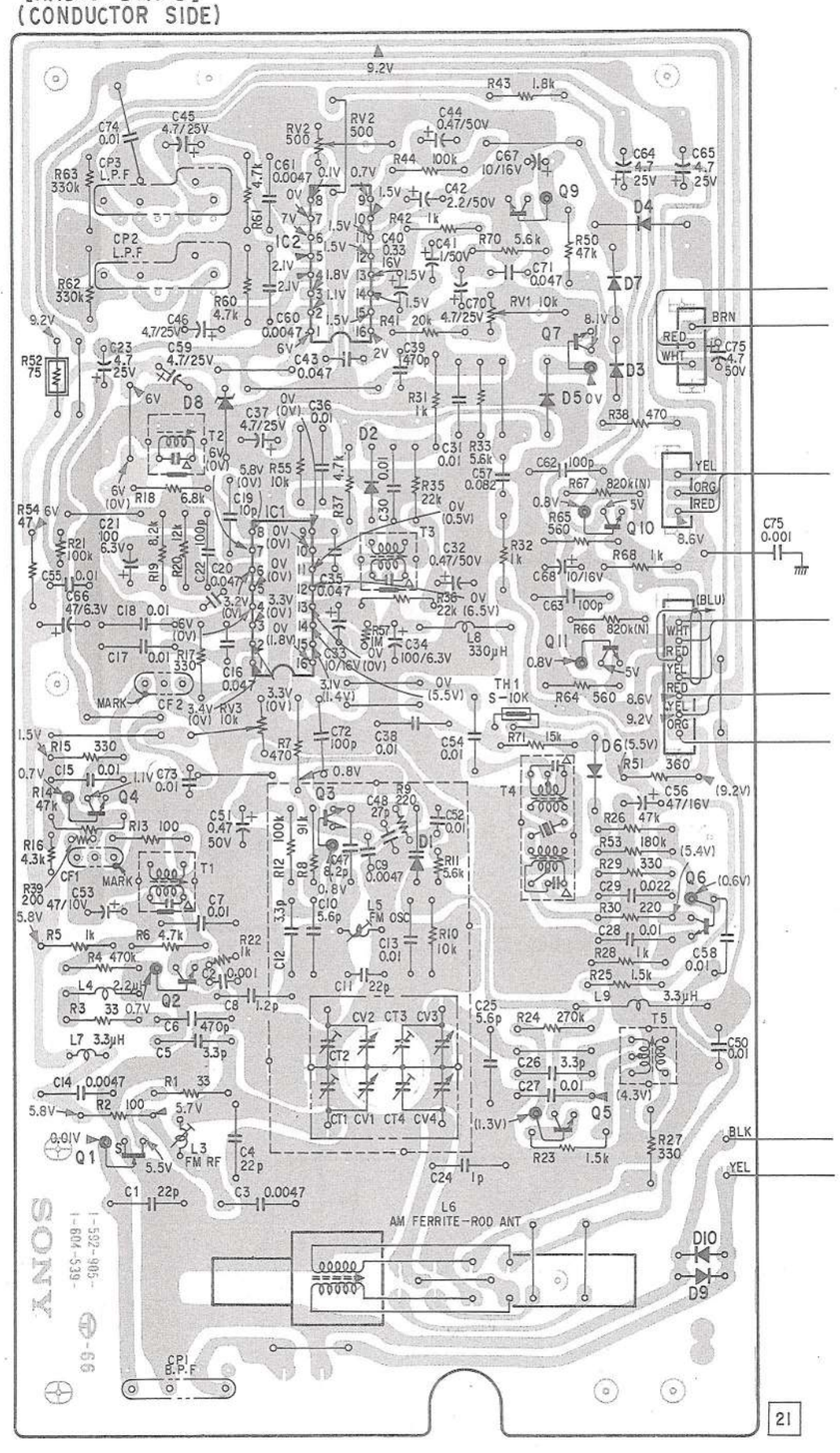
CFS-99 CFS-99

4-4. MOUNTING DIAGRAM

See page 36 for semiconductor lead layouts.

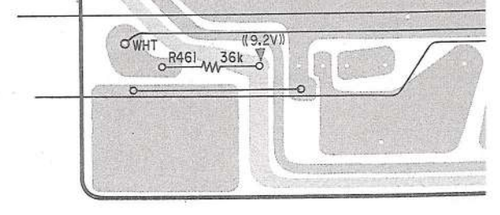
【RADIO BOARD】
(CONDUCTOR SIDE)

Q, IC	D
9	
	4
IC2	
	7
	3
7	
	8 5
	2
10	
IC1	
11	
	6
4 3	1
6	
2	
	10 9



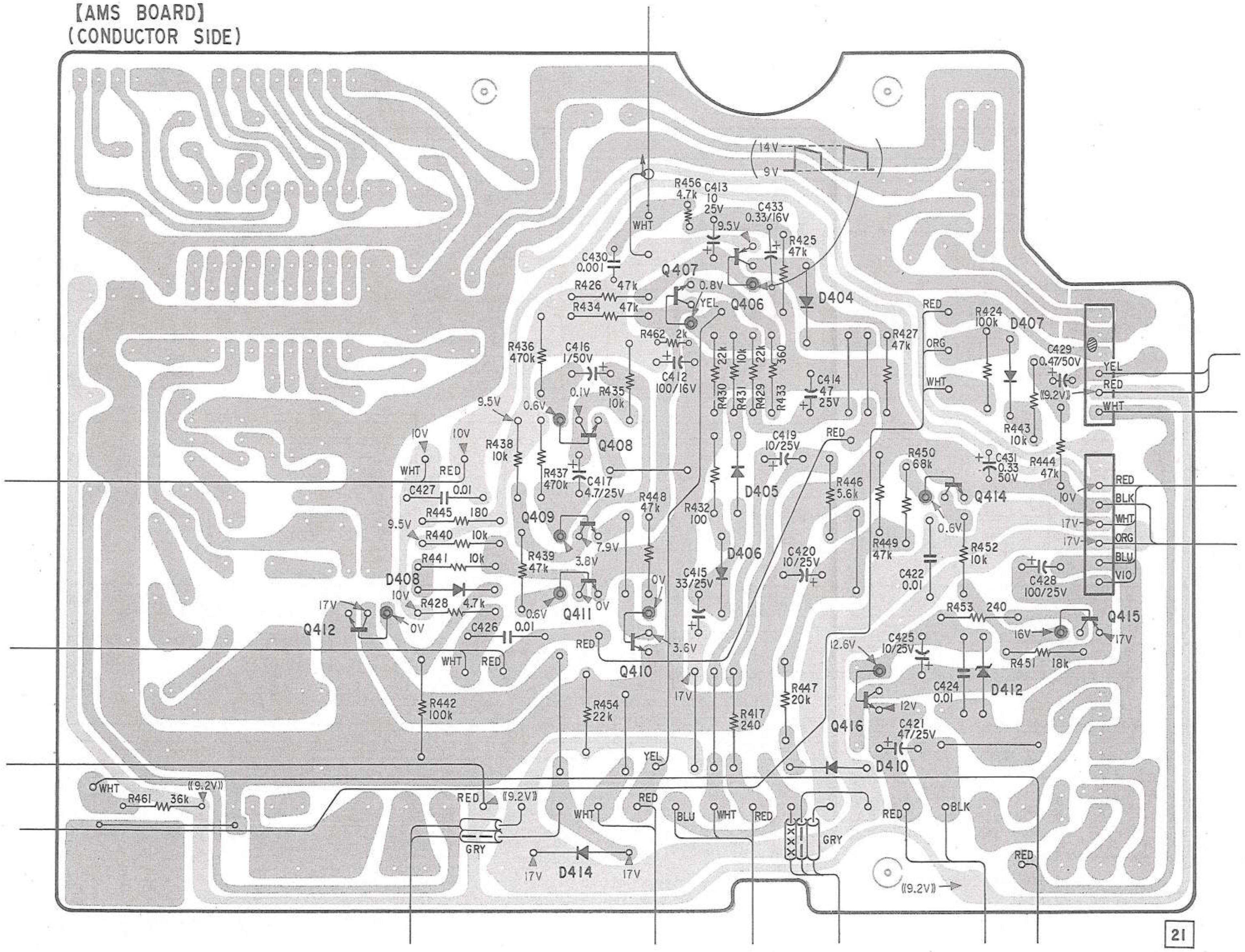
Q · IC	412
D	

【AMS BOARD】
(CONDUCTOR SIDE)

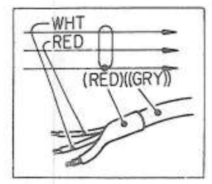


	A	B	C	D	E	F	G
Q · IC			412, 408, 409, 411	410, 407, 406	416, 414, 415		
D			408, 414	405, 406, 404, 410	407, 412		

【AMS BOARD】
(CONDUCTOR SIDE)

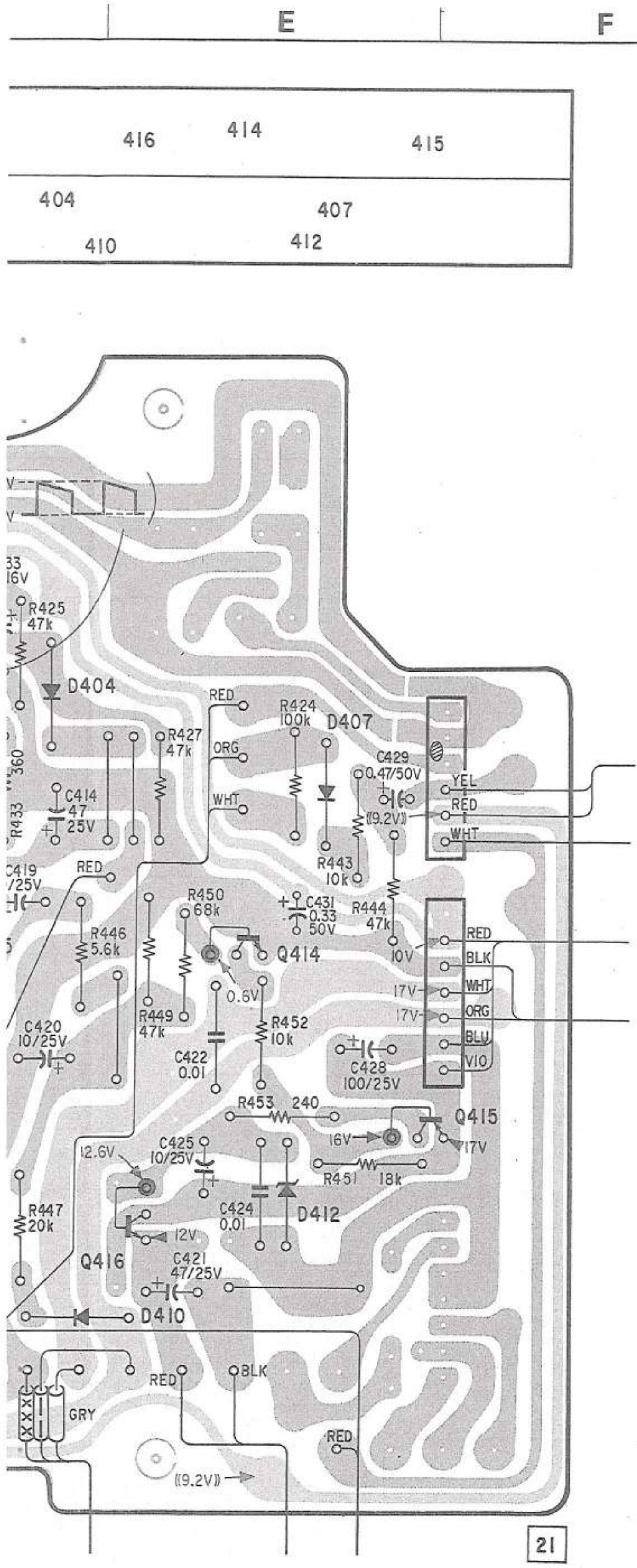


- Color code of sleeving over the end of the jacket.

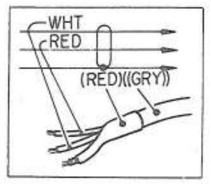


- [ ]← : indicates side identified with part number.
- ▒▒: B + pattern

 CFS-99

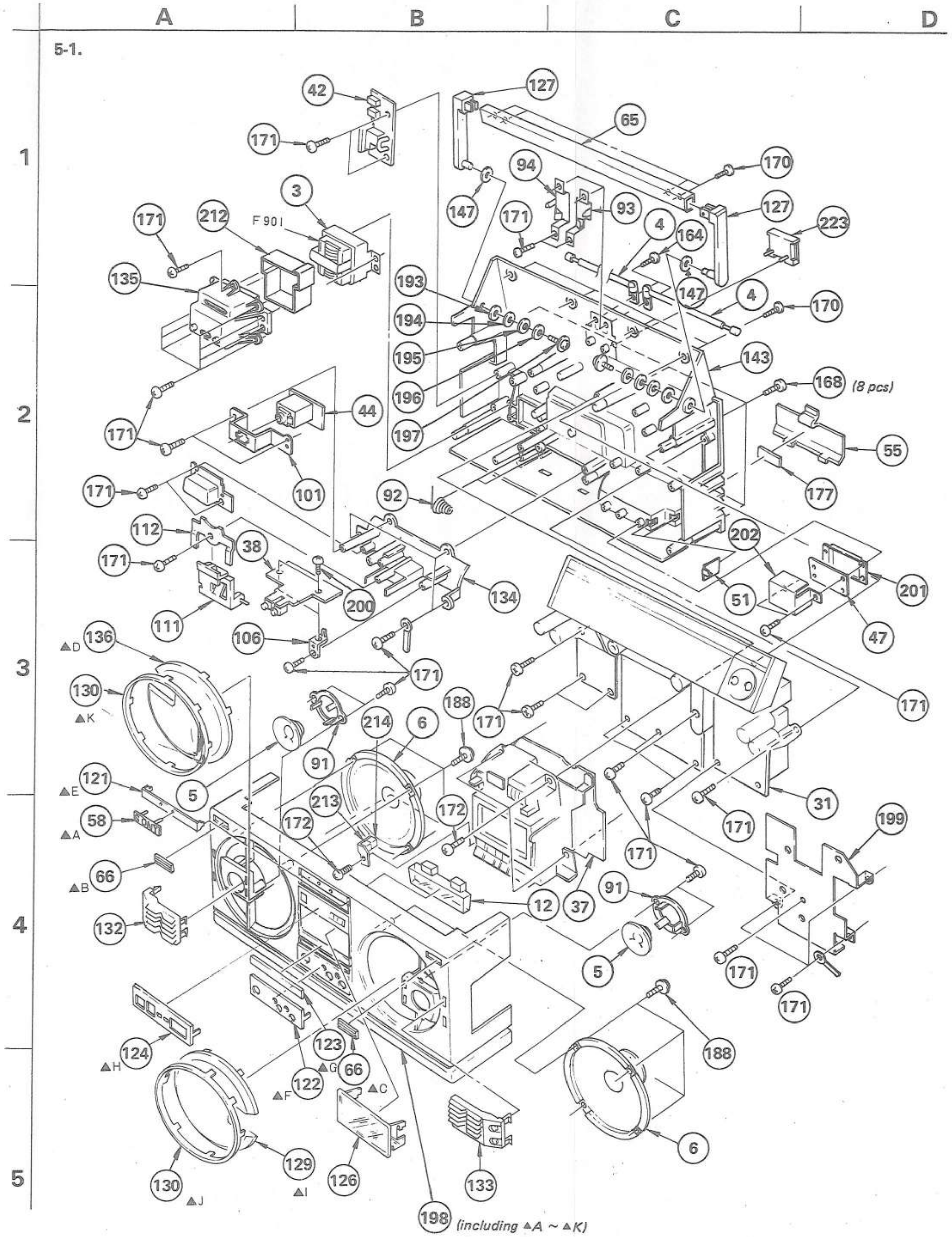


- Color code of sleeving over the end of the jacket.

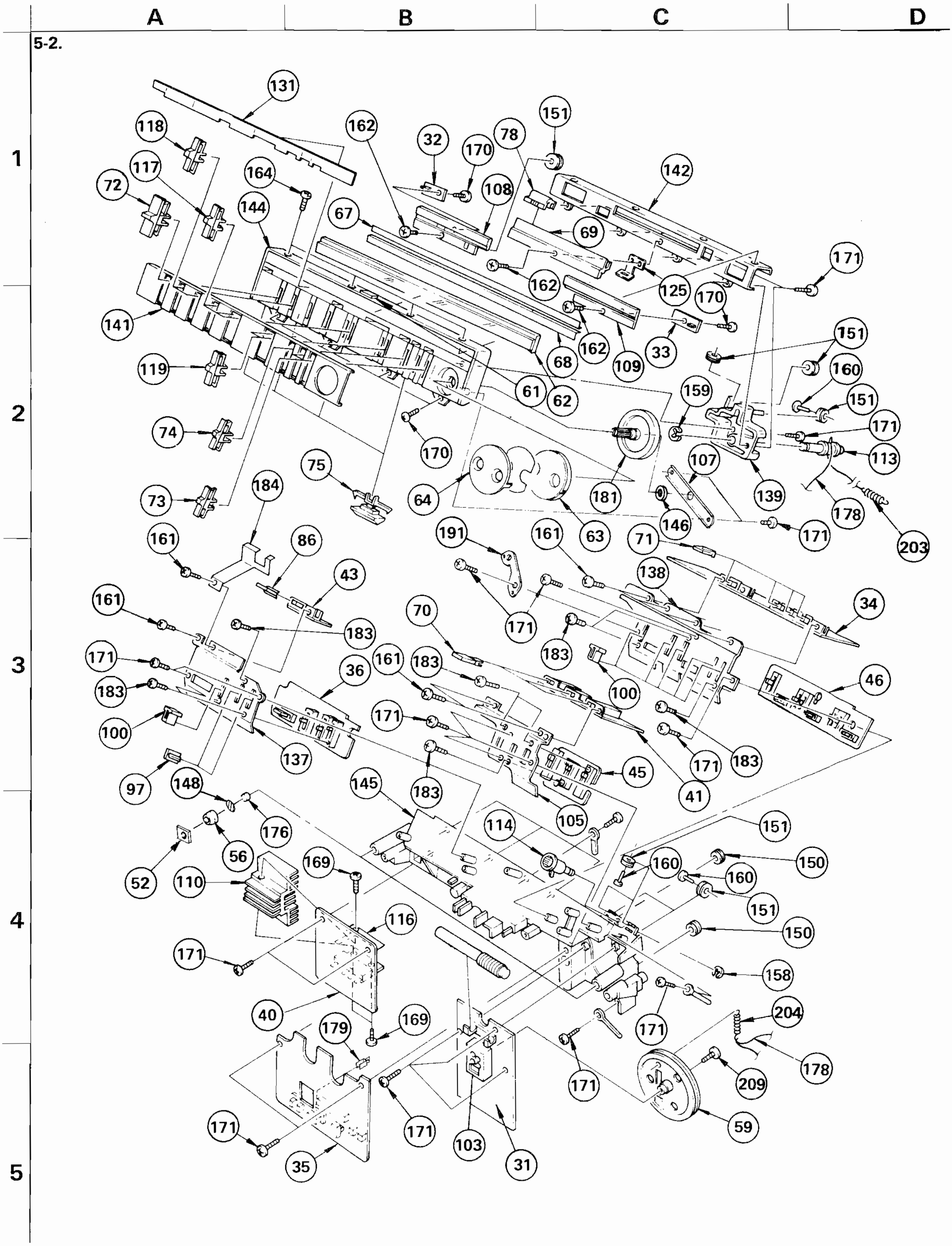


- [ ]← : indicates side identified with part number.
- ░: B + pattern

SECTION 5
EXPLODED VIEWS AND PARTS LIST



5-2.


A
B
C
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131
118
117
72
164
144
162
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78
151
108
142
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171
141
162
125
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137
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148
145
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110
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150
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179
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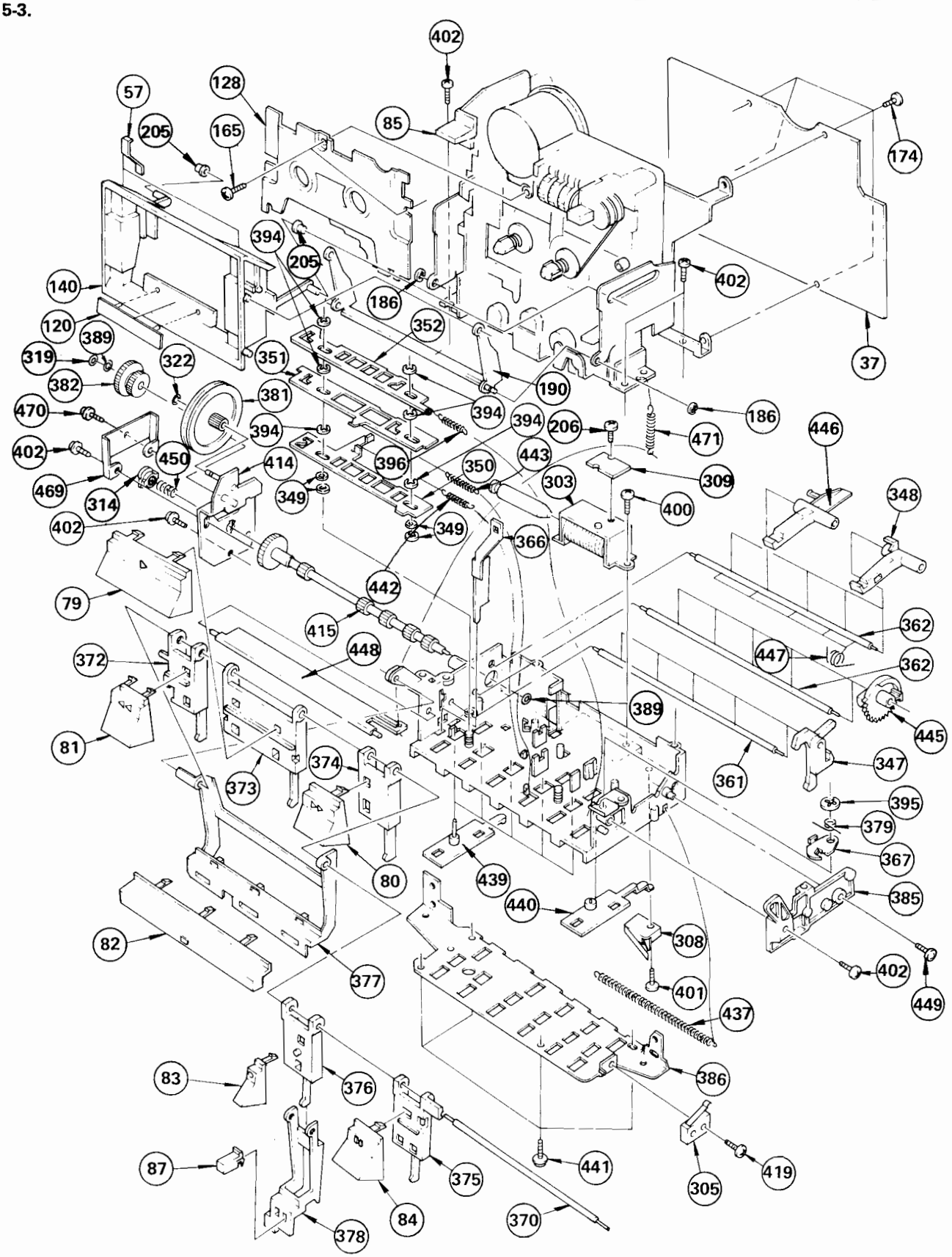
103
59
35
31

5-3.


A
B
C
D
1
2
3
4
5
402
57
128
85
205
165
174
394
205
140
186
402
120
389
352
37
319
322
351
382
381
190
470
394
394
206
186
471
446
402
450
414
396
350
443
309
469
314
349
303
400
348
402
349
366
79
442
362
415
448
447
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372
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81
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308
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401
449
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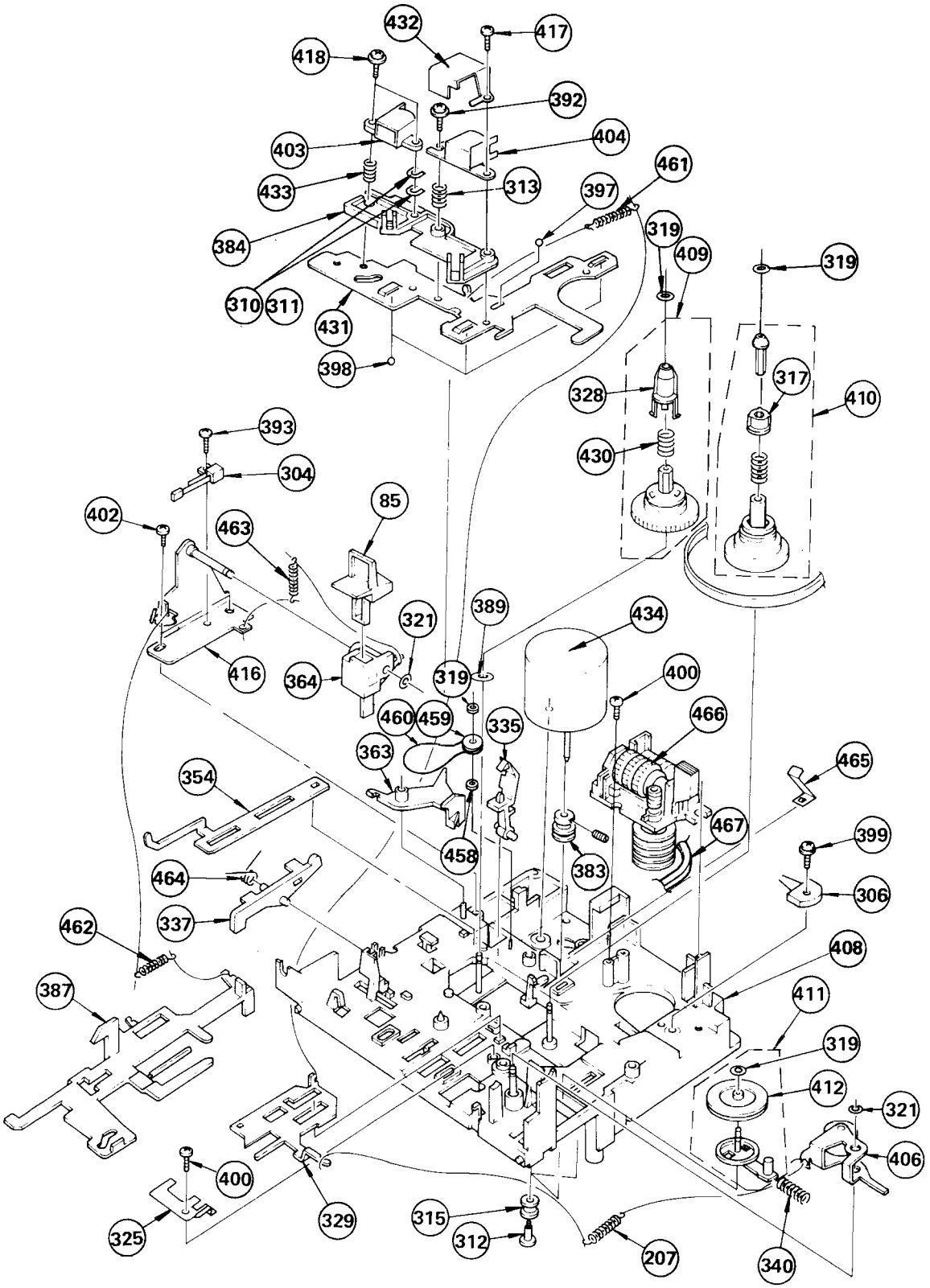
378

5-4.


A
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C
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432
417
418
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403
404
461
433
313
397
384
319
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431
398
328
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410
393
430
304
85
402
463
321
389
434
416
364
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400
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458
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464
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337
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387
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412
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315
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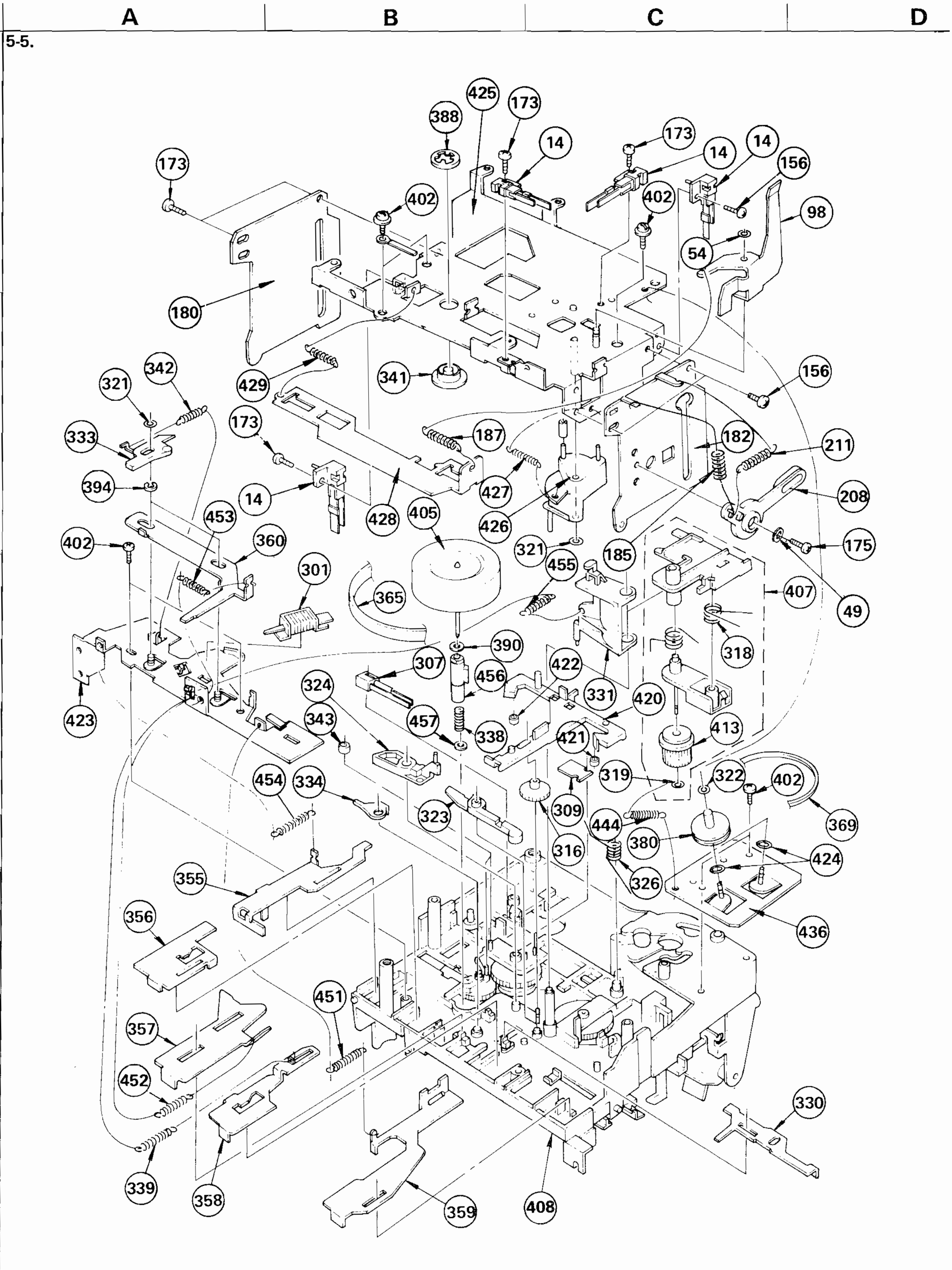
312
207
340

5-5.


A
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173
388
425
173
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173
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14
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402
402
98
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180
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429
321
342
173
187
182
211
333
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360
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359
408

GENERAL SECTION

No.	Part No.	Description
3 ⚠	1-447-094-00	TRANSFORMER, POWER (119D1)
4	1-501-226-00	ANTENNA, TELESCOPIC
5	1-503-019-00	SPEAKER
6	1-503-020-00	SPEAKER
7	.....	
8 ♦	1-508-819-00	17MM BASE POST
9 ♦	1-508-822-00	17MM BASE POST
10 ♦	1-508-825-00	17MM BASE POST
11	.....	
12	1-520-437-00	METER (ME)
13 ♦	1-535-115-00	TERMINAL
14	1-552-804-00	SWITCH, LEAF (S404,405,410,414)
15	.....	
21	.....	
22	.....	
23 ♦	1-560-094-00	PIN, CONNECTOR (7P)
24 ♦	1-561-237-00	CONNECTOR HOUSING (2P)
25	.....	
30 ⚠	1-561-322-00	INLET, AC DC
31 ♦	A-3266-139-A	MOUNTED PCB, RADIO
32 ♦	1-604-540-00	PC BOARD, LED (OP)
33 ♦	1-604-541-00	PC BOARD, LED (ST.TU)
34 ♦	A-3281-147-A	MOUNTED PCB, ECHO
35 ♦	A-3270-086-A	MOUNTED PCB, PRE AMPLIFIER
36 ♦	1-604-544-21	PC BOARD, VOL TONE
37 ♦	A-3279-251-A	MOUNTED PCB, AMS
38 ♦	1-604-546-21	PC BOARD, MIX MIC
39	.....	
40 ♦	A-3260-123-A	MOUNTED PCB, AMPLIFIER, POWER
41 ♦	1-604-549-21	PC BOARD, FUNCTION
42 ♦	1-604-550-21	PC BOARD, AC DC INLET
43 ♦	1-604-551-21	PC BOARD, POWER SW
44 ♦	1-604-552-21	PC BOARD, HEADPHONE JACK
45 ♦	1-604-553-21	PC BOARD, BAND SW
46 ♦	A-3273-039-A	MOUNTED PCB, CONTROL
47 ♦	1-604-567-00	PC BOARD, EXTENSION
48	.....	
49	3-464-123-00	SPACER (DIA. 2.7XO.5)
50	.....	
51	3-538-133-00	PLATE, BATTERY CONTACT
52	3-548-352-00	CUSHION, MICROPHONE
53	.....	
54	3-558-708-21	WASHER, STOPPER
55	3-560-438-11	LID, BATTERY CASE

GENERAL SECTION

No.	Part No.	Description
56	3-565-331-11	CUSHION, MICROPHONE
57	3-571-315-00	SPRING
58	3-572-504-00	EMBLEM, SONY
59	3-573-012-00	DRUM, DIAL
60	.....	
61	3-577-704-00	CAP
62	3-577-705-00	WINDOW, DIAL
63	3-577-706-00	KNOB, TUNING
64	3-577-707-00	ORNAMENT, TUNING KNOB
65	3-577-708-00	HANDLE
66	3-577-709-00	ORNAMENT, MICROPHONE
67 ♦	3-577-710-21	PLATE, BACK
68 ♦	3-577-710-11	PLATE, BACK
69 ♦	3-577-712-00	PLATE (C), BACK
70	3-577-713-00	KNOB, FUNCTION
71	3-577-714-00	KNOB, MODE
72	3-577-715-00	KNOB, CONTROL
73	3-577-718-01	KNOB, SWITCH
74	3-577-718-11	KNOB, SWITCH
75	3-577-719-01	KNOB, BALANCE
76	.....	
77	.....	
78	3-577-720-00	POINTER
79	3-577-721-00	BUTTON, FWD
80	3-577-722-00	BUTTON, FF
81	3-577-723-00	BUTTON, REW
82	3-577-724-00	BUTTON, STOP
83	3-577-725-00	BUTTON, REC
84	3-577-726-00	BUTTON, PAUSE
85	3-577-727-00	BUTTON, EJECT
86	3-577-728-00	KNOB, POWER
87	3-577-729-00	BUTTON, REC MUTE
88	.....	
89	.....	
90	.....	
91 ♦	3-577-732-00	RETAINER, TWEETER
92	3-577-733-00	SPRING
93 ♦	3-577-734-00	BOARD (A), TERMINAL, ANTENNA
94 ♦	3-577-735-00	BOARD (B), TERMINAL, ANTENNA
95	.....	
96	.....	
97	3-577-741-00	ADAPTER, TONE
98 ♦	3-577-742-00	LEVER, REC
99	.....	
100	3-577-746-00	ADAPTER, CONTROL

GENERAL SECTION

No.	Part No.	Description
101 ♦	3-577-747-00	BRACKET, H.P
102	.....	
103 ♦	3-577-802-00	PLATE (A), SHIELD
104	.....	
105 ♦	3-577-753-00	HOLDER (C), PC BOARD
106 ♦	3-577-754-00	BRACKET, MIX PC BOARD
107 ♦	3-577-756-00	RETAINER, FLY
108	3-577-757-00	BASE (L), LED
109	3-577-758-00	BASE (R), LED
110 ♦	3-577-759-00	HEAT SINK
111	3-577-760-00	LEVER, REC MUTE
112	3-577-761-00	RETAINER, LEVER, MUTE
113	3-577-762-00	PULLEY (A), MIDWAY
114	3-577-763-00	PULLEY (B), MIDWAY
115	.....	
116 ♦	3-577-765-00	RETAINER, HEAT SINK
117	3-577-766-01	KNOB, TONE
118	3-577-766-11	KNOB, TONE
119	3-577-766-21	KNOB, TONE
120	3-577-767-00	ORNAMENT, CASSETTE HOLDER
121	3-577-768-00	PANEL (A), FRONT
122	3-577-769-11	PANEL (B), FRONT
123	3-577-770-11	PANEL (C), FRONT
124	3-577-771-11	PANEL (D), FRONT
125 ♦	3-577-772-00	BRACKET, RELAY
126	3-577-773-00	WINDOW, CASSETTE
127	3-577-774-00	PLATE, SIDE, HANDLE
128 ♦	3-577-775-00	COVER, MD
129	3-577-776-00	NET (R), SPEAKER
130	3-577-777-00	ESCUTCHEON, SPEAKER
131	3-577-778-11	PLATE, ORNAMENTAL, 8 COLOR
132	3-577-779-00	DIFFUSER (L)
133	3-577-780-00	DIFFUSER (R)
134	3-577-781-00	COVER, BATTERY CASE
135 ♦	3-577-782-11	COVER, TRANSFORMER
136	3-577-783-00	NET (L), SPEAKER
137 ♦	3-577-784-00	HOLDER (A), PC BOARD
138 ♦	3-577-785-00	HOLDER (B), PC BOARD
139	3-577-786-00	BASE, PULLEY
140	3-577-787-00	HOLDER, CASSETTE
141	3-577-788-11	PANEL, CONTROL
142 ♦	3-577-789-00	RETAINER, DIAL WINDOW
143	3-577-791-11	CABINET (REAR)
144	3-577-792-11	CABINET (TOP)
145	3-577-793-00	CHASSIS

GENERAL SECTION

No.	Part No.	Description
146 ♦	3-577-798-00	COLLAR
147	3-701-445-11	WASHER, 7
148 ♦	3-577-825-00	CLOTH, DUST PROTECTION
149	.....	
150	3-811-140-00	PULLEY
151	3-817-114-00	PULLEY P8
156	7-621-773-95	SCREW +B 2.6X6
157	7-623-508-01	LUG, 3
158	7-624-108-04	STOP RING 4.0, TYPE -E
159	7-624-109-04	STOP RING 5.0, TYPE -E
160	7-625-723-90	RIVET 3X8
161	7-682-146-01	SCREW +P 3X5
162	7-682-248-04	SCREW +K 3X8
163	.....	
164	7-682-548-04	SCREW +B 3X8
165	7-685-133-29	SCREW +P 2.6X6 TYPE2 SLIT
166	.....	
167	.....	
168	7-685-555-19	SCREW +BTP 3X40 TYPE2 N-S
169	7-685-645-71	SCREW +BVTP 3X6 TYPE2 SLIT
170	7-685-647-84	SCREW +BV 3X10 TYPE 2
171	7-685-648-21	SCREW +BVTP 3X12 TYPE2 SLIT
172	7-685-650-21	SCREW +BVTP 3X16 TYPE2 SLIT
173	7-685-862-01	SCREW +BVTT 2.6X6 (S)
174	7-685-871-01	SCREW +BVTT 3X6 (S)
175	7-687-504-31	SCREW,TOTSU PTTWH 2.6X12
176	8-814-194-10	MICRIPHONE C-1006B
177	9-911-815-02	CUSHION
178	9-911-825-42	STRING, DIAL
179	X-3571-402-0	BOARD ASSY, TERMINAL, GROUND
180 ♦	3-577-738-00	PLATE (B), FULCRUM, HOLDER
181	X-3577-704-0	FLYWHEEL ASSY
182 ♦	3-577-736-00	PLATE (A), FULCRUM, HOLDER
183	7-621-775-20	SCREW +B 2.6X5
184 ♦	3-577-800-00	PLATE, CONTACT
185	3-601-380-01	SPRING
186	7-624-105-04	STOP RING 2.3, TYPE -E
187	3-530-249-XX	SPRING, TENSION
188	3-703-136-00	SCREW, TAPPING
189	.....	
190	X-3577-706-0	LEVER ASSY, HOLDER FULCRUM
191 ♦	3-577-807-00	PLATE, GROUND
192	.....	
193	3-493-850-00	WASHER
194	3-577-814-00	WASHER
195	3-577-815-00	WASHER, PLATE SPRING

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.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

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.

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- 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.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

GENERAL SECTION

No.	Part No.	Description
196	3-577-810-00	WASHER
197	3-577-828-00	SCREW, LOCK
198	X-3577-709-1	CABI FRONT ASSY
199 ♦	3-577-808-00	PLATE (C), SHIELD
200	7-682-544-04	SCREW +B 3X3
201 ♦	3-577-803-00	PLATE (F), SHIELD
202 ♦	3-577-805-00	PLATE (G), SHIELD
203	3-701-788-XX	SPRING, TENSION
204	3-571-495-00	SPRING (2), TENSION
205	3-577-799-00	ROLLER, THREADING GUIDE
206	7-685-780-00	SCREW PTT 2X3
207	3-579-026-00	SPRING, TENSION
208	X-3577-707-1	SOFT EJECT ASSY
209	7-621-759-75	+PSW, 2.6X10
210	.....	
211	3-531-541-00	SPRING, TENSION
212 ♦	3-577-806-00	PLATE, SHIELD, TRANSFORMER
213 ♦	3-577-824-11	RETAINER, CUSHION
214 ♦	3-561-428-00	CUSHION (20X20X20)
215	3-701-439-11	WASHER 0.25
216 ♦	1-605-053-21	PC BOARD, OSCILLATION PACK
217 ♦	1-535-249-00	TERMINAL, CONNECTOR

ACCESSORY & PACKING MATERIAL

No.	Part No.	Description
251	1-551-504-00	CORD, POWER
252	1-561-235-00	ANTENNA CONNECTOR, 2P
253	3-577-796-00	CUSHION (R)
254	3-577-797-00	CUSHION (L)
255	3-577-823-00	BAG, PROTECTION
256 ♦	3-577-830-00	STICKER, POP
257	3-577-831-00	INDIVIDUAL CARTON
258	3-701-632-00	BAG, POLYETHYLENE
259	.....	
260	3-703-133-00	(US)...TAG, CAUTION, ANTENNA
261	3-703-157-01	LABEL, DESTINATION
262	3-703-390-01	(US)...INSTRUCTION
263	3-783-497-21	MANUAL, INSTRUCTION
264	3-783-497-31	(Canadian)...MANUAL, INSTRUCTION
265	3-793-828-11	QUESTIONNAIRE
266	8-893-528-10	(Canadian)···TAPE

MECHANISM SECTION

No.	Part No.	Description
301	1-454-255-00	SOLENOID, PLUNGER
302	.....	
303	.....	
304	1-514-346-00	SWITCH, LEAF (S412)
305	1-552-665-00	SWITCH, MICRO (S401)
306	1-552-913-31	SWITCH, ROTARY (S409)
307	1-553-490-00	SWITCH, LEAF (S406)
308	1-553-727-00	SWITCH, SLIDE (S407)
309 ♦	1-602-735-00	PC BOARD, S.OFF
310	3-513-237-01	PLATE
311	3-513-237-11	PLATE
312	3-533-254-11	SCREW, MOTOR
313	3-539-237-00	SPRING (3), COMPRESSION
314	3-545-403-00	BEARING
315	3-548-886-00	CUSHION (B), MOTOR
316	3-558-620-00	GEAR, REWIND
317	3-558-621-00	CLAW, REEL TABLE
318	3-558-652-00	SPRING
319	3-558-708-01	WASHER, STOPPER
320	3-558-708-11	WASHER, STOPPER
321	3-558-708-21	WASHER, STOPPER
322	3-559-408-00	POLY-WASHER, 1.2 DIA
323	3-561-818-00	LEVER, REVIEW
324	3-561-839-00	LEVER, FF
325	3-561-852-00	SPRING
326	3-564-327-00	SPRING
327	.....	
328	3-564-335-00	TABLE (B), REEL, S SIDE
329 ♦	3-573-401-00	LEVER, RP (SS)
330 ♦	3-573-413-00	LEVER, REC (BSS)
331 ♦	3-579-028-00	LEVER (C), REC
332	.....	
333	3-573-426-00	LEVER (SS), RELEASE, SHUT-OFF
334 ♦	3-573-427-00	LEVER, REC (ASS)
335	3-573-438-00	CLAW, RECORDING SAFETY
336	.....	
337	3-573-451-00	LEVER (SS), EJECT LOCK
338	3-573-461-00	SPRING, COMPRESSION
339	3-573-462-00	SPRING, TENSION
340	3-573-464-00	SPRING, COMPRESSION
341	3-573-467-00	RETAINER (D), THRUST
342	3-573-468-00	SPRING, TENSION
343	3-573-469-00	RETAINER, LEAD, SD
344	.....	
345	.....	

MECHANISM SECTION

No.	Part No.	Description
346	.....	
347	3-578-303-00	ARM, SELECTION
348	3-578-304-00	ARM, DRIVING
349	3-579-049-00	SPACER (S11)
350 ♦	3-579-030-00	PLATE, LOCK
351 ♦	3-578-308-00	PLATE, PREVENTION, REC
352 ♦	3-578-309-00	PLATE, PREVENTION, FR
353	.....	
354 ♦	3-578-311-00	LEVER (S1), RECORD PREVENTION
355 ♦	3-578-312-00	LEVER, PAUSE
356 ♦	3-578-313-00	LEVER, REC
357 ♦	3-578-314-00	LEVER (S1), FF
358 ♦	3-578-315-00	LEVER, FWD
359 ♦	3-578-316-00	LEVER, REW
360 ♦	3-578-317-00	LEVER, SHUT-OFF
361 ♦	3-578-319-00	SHAFT, ARM, SELECTION
362 ♦	3-578-320-00	SHAFT, GEAR, CAM
363	3-578-324-00	LEVER, DETECTION
364	3-578-327-00	LEVER (B), EJECT
365	3-578-328-00	BELT, CAPSTAN
366 ♦	3-578-329-00	LEVER (C), RECORD PREVENTION
367	3-578-331-00	PLATE, LOCK, PAUSE
368	.....	
369	3-578-335-00	BELT
370 ♦	3-578-336-00	SHAFT, BUTTON, CONTROL
371	.....	
372	3-578-338-00	BUTTON, REW
373	3-578-339-00	BUTTON, FWD
374	3-578-340-00	BUTTON, FF
375	3-578-341-00	BUTTON, PAUSE
376	3-578-342-00	BUTTON, REC
377	3-578-343-00	BUTTON, STOP
378	3-578-344-00	BUTTON, REC MUTE
379	3-578-345-00	SPRING
380	3-578-346-00	PULLEY (A)
381	3-578-347-00	PULLEY (B)
382	3-578-348-00	GEAR (A)
383	X-3578-317-1	MOTOR PULLEY ASSY
384 ♦	3-578-360-00	BRACKET (S1), HEAD
385	3-578-361-00	RETAINER, CHASSIS
386 ♦	3-578-362-00	RETAINER, CONTROL LEVER
387	3-578-363-00	LEVER (A), EJECT
388 ♦	3-638-192-00	RING, RETAINING (TYPE CS)
389	3-701-437-01	WASHER
390	3-701-438-11	WASHER, 2.5

MECHANISM SECTION

No.	Part No.	Description
391	.....	
392	3-701-465-00	SCREW, LOCK
393	7-621-772-18	SCREW +B 2X4
394	7-624-118-01	RING, RETAINING E-2.5
395	7-624-190-11	STOP RING 3, TYPE-CS
396	.....	
397	7-671-112-01	STEEL, BALL
398	7-671-113-01	STEAL, BALL 3
399	7-687-106-21	SCREW, TOTSU PTP 2X10 TYPE2 SLIT
400	7-687-134-21	SCREW, TOTSU PTP 2.6X8 TYPE2
401	7-687-207-21	PTPWH 2X12, TYPE 2, SLIT
402	7-687-234-21	SCREW, TOTSU PTPWH 2.6X8, TYPE2
403	8-825-724-60	HEAD, ERASE (EF-201-36F)
404	8-829-373-30	HEAD, REC/PB (PP181-3602C)
405	A-2109-005-A	FLYWHEEL ASSY (SS)
406	A-2110-005-A	PINCH ROLLER ASSY
407	A-2136-012-A	IDLER COMPLETE ASSY (SS), FR
408	A-3102-034-A	CHASSIS SUB ASSY (S1), MECH
409	A-3130-024-A	TABLE ASSY, REEL, S SIDE
410	A-3130-020-A	TABLE ASSY, REEL, T SIDE
411	A-3136-014-A	IDLER COMPLETE ASSY, FWD
412	X-3561-801-0	IDLER ASSY, FWD
413	X-3563-902-0	IDLER ASSY, FR
414 ♦	X-3578-302-0	BRACKET ASSY, GEAR
415	X-3578-303-0	SHAET ASSY, GEAR
416 ♦	X-3578-322-0	BRACKET, SWITCH
417	7-621-772-98	+B 2X7
418	7-685-855-01	SCREW, +BVTT 2X10
419	7-621-257-55	SCREW +P 2.3X8
420 ♦	3-579-001-00	BRAKE (R)
421	3-538-051-00	RUBBER, BRAKE
422	3-579-008-00	RUBBER (S1), BRAKE
423 ♦	X-3578-311-0	RETAINER (S1) ASSY, LEVER
424	3-547-734-00	WASHER
425 ♦	X-3578-316-0	RETAINER (S1) ASSY, THRUST
426	3-579-020-00	LEVER, F.R SWITCH
427	3-578-399-00	SPRING, TENSION
428 ♦	3-577-743-00	SLIDER, REC
429	3-578-394-00	SPRING, TENSION
430	3-489-043-00	SPRING, COMPRESSION
431 ♦	X-3578-315-0	BASE ASSY, HEAD
432 ♦	3-579-011-00	PLATE, SHIELD, HEAD
433	3-574-470-00	SPRING, COMPRESSION
434	8-835-033-01	MOTOR, DC (DNE-3001A)
435	.....	

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RESISTORS
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- F : nonflammable

COILS
- MMH : mH, UH : μH

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MECHANISM SECTION

No.	Part No.	Description
436 ♦	X-3578-310-0	BRACKET ASSY, PULLEY
437	3-554-710-00	SPRING, TENSION
438	.....	
439	X-3578-313-0	LEVER (R) ASSY, CONTROL
440	X-3578-312-0	LEVER (P) ASSY, CONTROL
441	7-687-233-21	SCREW, TOTSU PTPWH 2.6X6, TYPE2
442	3-578-391-00	SPRING, TENSION
443	3-578-392-00	SPRING, TENSION
444	3-578-396-00	SPRING, TENSION
445	3-579-015-00	GEAR, CAM
446	3-579-002-00	ARM (F), DRIVING
447	3-579-005-00	SPRING
448 ♦	X-3578-309-0	PLATE (P) ASSY, FUNCTION, SWITCH
449	7-687-234-11	SCREW, TOTSU PTPWH 2.6X8, TYPE2
450	3-561-843-00	SPRING, COMPRESSION
451	3-578-397-00	SPRING, TENSION
452	3-578-388-00	SPRING, TENSION
453	3-578-393-00	SPRING, TENSION
454	3-578-389-00	SPRING, TENSION
455	3-578-390-00	SPRING, TENSION
456	3-579-016-00	PULLEY, DRIVING
457	3-579-003-00	WASHER (S)
458	3-701-437-21	WASHER
459	X-3570-020-6	PULLEY, MOTOR (2400)
460	3-570-910-00	BELT, DRIVING
461	3-578-387-00	SPRING, TENSION
462	3-578-395-00	SPRING, TENSION
463	3-578-398-00	SPRING, TENSION
464	3-558-606-00	SPRING
465	3-579-019-00	SPRING
466	1-548-545-31	COUNTER, TAPE (WITH ROTARY SW)
467	3-527-153-XX	BELT (C)
468	.....	
469 ♦	3-579-004-00	ARM, GEAR
470	7-621-959-35	SCREW,TOTSU PWH 2.6X5
471	3-579-048-00	SPRING, TENSION

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
C39	1-130-014-00	FILM	470PF	5%	50V
C314	1-130-014-00	FILM	470PF	5%	50V
C315	1-130-014-00	FILM	470PF	5%	50V
C915	1-107-253-00	MICA	15+18+22+27PF	10%	500V
C916	1-107-253-00	MICA	15+18+22+27PF	10%	500V
CF1	1-527-795-71	FILTER, CERAMIC			
CF2	1-527-795-71	FILTER, CERAMIC			
♦CNJ201	1-560-093-00	PIN, CONNECTOR (6P)			
♦CNJ202	1-560-096-00	PIN, CONNECTOR (9P)			
♦CNP1	1-560-560-00	PIN, CONNECTOR 7P			
♦CNP2	1-560-556-00	PIN, CONNECTOR 3P			
♦CNP101	1-560-089-00	PIN, CONNECTOR (2P)			
♦CNP101	1-560-092-00	PIN, CONNECTOR (5P)			
♦CNP102	1-560-093-00	PIN, CONNECTOR (6P)			
♦CNP102	1-560-556-00	PIN, CONNECTOR 3P			
♦CNP103	1-560-556-00	PIN, CONNECTOR 3P			
♦CNP109	1-560-561-00	PIN, CONNECTOR 8P			
♦CNP401	1-560-080-00	PIN, CONNECTOR (2P)			
♦CNP402	1-560-084-00	PIN, CONNECTOR (6P)			
♦CNP801	1-560-557-00	PIN, CONNECTOR 4P			
♦CNP802	1-560-089-00	PIN, CONNECTOR (2P)			
♦CNP901	1-560-555-00	PIN, CONNECTOR 2P			
♦CNP902	1-560-557-00	PIN, CONNECTOR 4P			
♦CNP904	1-560-555-00	PIN, CONNECTOR 2P			
CP1	1-231-392-00	FILTER, BANDPASS			
CP2	1-231-303-00	LOW-PASS FILTER			
CP3	1-231-303-00	LOW-PASS FILTER			
CP101	1-409-334-00	COIL, TRAP			
CP201	1-409-334-00	COIL, TRAP			
CP901	1-464-153-00	UNIT, BIAS OSCILLATOR			
CT1-4 CV1-4	1-151-382-00	CAP, TUNING, POLYETHYLENE			
D1	8-719-768-71	DIODE 1S2687S-1			
D2	8-719-422-21	DIODE 1T22AM			
D3	8-719-815-55	DIODE 1S1555			
D4	8-719-200-02	DIODE 10E2			
D5	8-719-815-55	DIODE 1S1555			
D6	8-719-815-55	DIODE 1S1555			
D7	8-719-815-55	DIODE 1S1555			
D8	8-719-162-07	DIODE RD6.2E			
D9	8-719-815-55	DIODE 1S1555			
D10	8-719-815-55	DIODE 1S1555			
D101	8-719-422-21	DIODE 1T22AM			
D102	8-719-422-21	DIODE 1T22AM			
D201	8-719-422-21	DIODE 1T22AM			
D202	8-719-422-21	DIODE 1T22AM			
D301	8-719-815-55	DIODE 1S1555			

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ELECTRICAL PARTS

Ref.No.	Part No.	Description
D302	8-719-815-55	DIODE 1S1555
D303	8-719-422-21	DIODE 1T22AM
D304	8-719-200-02	DIODE 10E2
D305	8-719-815-55	DIODE 1S1555
D307	8-719-815-55	DIODE 1S1555
D309	8-719-815-55	DIODE 1S1555
D310	8-719-815-55	DIODE 1S1555
D311	8-719-815-55	DIODE 1S1555
D404	8-719-815-55	DIODE 1S1555
D405	8-719-815-55	DIODE 1S1555
D406	8-719-815-55	DIODE 1S1555
D407	8-719-815-55	DIODE 1S1555
D408	8-719-815-55	DIODE 1S1555
D410	8-719-815-55	DIODE 1S1555
D412	8-719-113-07	DIODE RD13E
D414	8-719-200-02	DIODE 10E2
D601	8-719-922-41	DIODE SLP241B
D602	8-719-900-41	DIODE SLP141B
D603	8-719-900-41	DIODE SLP141B
D901 ⚠	8-719-504-10	DIODE S4VB1D
D902	8-719-182-07	DIODE RD8.2E
F901 ⚠	1-532-262-XX	(US), FUSE, GLASS TUBE
F901 ⚠	1-532-268-XX	(Canadian), FUSE, GLASS TUBE
F902 ⚠	1-532-268-99	(Canadian), FUSE, GLASS TUBE
IC1	8-759-944-20	IC KB4419A
IC2	8-759-312-27	IC HA11227
IC301	8-757-660-00	IC CX-766
IC302	8-749-937-20	IC BX-372
IC303	8-759-276-58	IC TA7658P
IC901	8-759-313-92	IC HA1392
J101	1-507-450-00	JACK
J102	1-507-678-00	JACK
J201	1-507-450-00	JACK
J202	1-507-678-00	JACK
J301	1-507-671-00	PIN JACK 2P
J302	1-507-671-00	PIN JACK 2P
J303	1-507-609-00	JACK (LARGE TYPE)
J401-1,-2	1-507-678-00	JACK
L3	1-459-157-00	COIL
L4	1-408-109-00	MICRO INDUCTOR 2.2UH
L5	1-459-157-00	COIL
L6	1-401-724-00	ANTENNA, FERRITE-ROD MW
L7	1-408-177-00	MICRO INDUCTOR 3.3UH
L8	1-408-135-00	MICRO INDUCTOR 330UH
L9	1-408-111-00	MICRO INDUCTOR 3.3UH
L101	1-408-217-00	MICRO INDUCTOR 6.8MMH
L201	1-408-217-00	MICRO INDUCTOR 6.8MMH
Q1	8-769-111-00	TRANSISTOR 2SK120
Q2	8-729-167-42	TRANSISTOR 2SC1674
Q3	8-729-167-42	TRANSISTOR 2SC1674
Q4	8-729-671-13	TRANSISTOR 2SC710-13
Q5	8-729-671-13	TRANSISTOR 2SC710-13

ELECTRICAL PARTS

Ref.No.	Part No.	Description
Q6	8-729-671-14	TRANSISTOR 2SC710-14
Q7	8-729-663-47	TRANSISTOR 2SC1364
Q9	8-729-663-47	TRANSISTOR 2SC1364
Q10	8-729-663-47	TRANSISTOR 2SC1364
Q11	8-729-663-47	TRANSISTOR 2SC1364
Q101	8-729-665-47	TRANSISTOR 2SC1362
Q102	8-729-665-47	TRANSISTOR 2SC1362
Q103	8-729-665-47	TRANSISTOR 2SC1362
Q104	8-729-663-47	TRANSISTOR 2SC1364
Q105	8-729-665-47	TRANSISTOR 2SC1362
Q106	8-729-665-47	TRANSISTOR 2SC1362
Q107	8-729-663-47	TRANSISTOR 2SC1364
Q108	8-729-663-47	TRANSISTOR 2SC1364
Q109	8-729-663-47	TRANSISTOR 2SC1364
Q110	8-729-663-47	TRANSISTOR 2SC1364
Q111	8-729-663-47	TRANSISTOR 2SC1364
Q112	8-729-663-47	TRANSISTOR 2SC1364
Q113	8-729-663-47	TRANSISTOR 2SC1364
Q114	8-729-663-47	TRANSISTOR 2SC1364
Q201	8-729-665-47	TRANSISTOR 2SC1362
Q202	8-729-665-47	TRANSISTOR 2SC1362
Q203	8-729-665-47	TRANSISTOR 2SC1362
Q204	8-729-663-47	TRANSISTOR 2SC1364
Q205	8-729-665-47	TRANSISTOR 2SC1362
Q206	8-729-665-47	TRANSISTOR 2SC1362
Q207	8-729-663-47	TRANSISTOR 2SC1364
Q208	8-729-663-47	TRANSISTOR 2SC1364
Q209	8-729-663-47	TRANSISTOR 2SC1364
Q210	8-729-663-47	TRANSISTOR 2SC1364
Q211	8-729-663-47	TRANSISTOR 2SC1364
Q212	8-729-663-47	TRANSISTOR 2SC1364
Q213	8-729-663-47	TRANSISTOR 2SC1364
Q214	8-729-663-47	TRANSISTOR 2SC1364
Q301	8-729-665-47	TRANSISTOR 2SC1362
Q302	8-729-663-47	TRANSISTOR 2SC1364
Q303	8-729-663-47	TRANSISTOR 2SC1364
Q304	8-729-663-47	TRANSISTOR 2SC1364
Q305	8-729-663-47	TRANSISTOR 2SC1364
Q306	8-729-663-47	TRANSISTOR 2SC1364
Q307	8-729-663-47	TRANSISTOR 2SC1364
Q308	8-729-663-47	TRANSISTOR 2SC1364
Q309	8-729-663-47	TRANSISTOR 2SC1364
Q310	8-729-612-77	TRANSISTOR 2SA1027R
Q406	8-729-612-77	TRANSISTOR 2SA1027R
Q407	8-729-663-47	TRANSISTOR 2SC1364
Q408	8-729-663-47	TRANSISTOR 2SC1364
Q409	8-729-663-47	TRANSISTOR 2SC1364
Q410	8-729-663-47	TRANSISTOR 2SC1364
Q411	8-729-663-47	TRANSISTOR 2SC1364
Q412	8-729-199-80	TRANSISTOR 2SD998

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Q414	8-729-663-47	TRANSISTOR 2SC1364
Q415	8-729-612-77	TRANSISTOR 2SA1027R
Q416	8-729-217-33	TRANSISTOR 2SC1173
Q901	8-729-663-47	TRANSISTOR 2SC1364
Q902	8-729-663-47	TRANSISTOR 2SC1364
Q903	8-729-217-33	TRANSISTOR 2SC1173
Q904	8-760-523-10	TRANSISTOR 2SA772-23
Q905	8-760-335-10	TRANSISTOR 2SC1474
R357	1-212-942-00	FUSIBLE 2.2 5% 1/2W F
R915	1-212-946-00	FUSIBLE 3.3 5% 1/2W F
R916	1-202-723-00	COMPOSITION 2.2M 10% 1/2W
RV1	1-226-236-00	RES, ADJ, CARBON 10K
RV2	1-226-232-00	RES, ADJ, CARBON 500
RV3	1-226-236-00	RES, ADJ, CARBON 10K
RV101	1-228-148-00	RES, VAR, SLIDE 20K
RV102	1-228-148-00	RES, VAR, SLIDE 20K
RV103	1-228-149-00	RES, VAR, SLIDE 20K/20K
RV201	1-228-148-00	RES, VAR, SLIDE 20K
RV202	1-228-148-00	RES, VAR, SLIDE 20K
RV203	1-228-149-00	RES, VAR, SLIDE 20K/20K
RV301	1-228-147-00	RES, VAR, SLIDE 20K
RV302	1-228-152-00	RES, VAR, SLIDE 100K/100K
RV303	1-228-150-00	RES, VAR, SLIDE 100K/100K
RV304	1-228-145-00	RES, VAR, SLIDE 100K
RV305	1-228-151-00	RES, VAR, SLIDE 20K/20K
RV307	1-226-232-00	RES, ADJ, CARBON 500
RV308	1-226-235-00	RES, ADJ, CARBON 5K
S1	1-553-663-00	SWITCH, SLIDE
S101	1-553-662-00	SWITCH, SLIDE
S102	1-553-267-00	SWITCH, SLIDE
S201		
S202	1-553-665-00	SWITCH, PUSH (3 KEY)
S203		
S204		
S301		
S302	1-553-664-00	SWITCH, PUSH
S303		
S501	1-552-819-00	SWITCH, SLIDE
S601	1-553-663-00	SWITCH, SLIDE
S801	1-552-645-00	SWITCH, PUSH
S901	1-552-530-00	SWITCH, PUSH
T1	1-403-872-00	1.F.T
T2	1-404-249-00	COIL, FM DETECTOR
T3	1-403-137-00	I.F.T DETECTION
T4	1-403-144-00	I.F.T(TRIPLE TUNE)
T5	1-405-655-00	COIL, MW OSC
TH1	1-800-202-XX	THERMISTOR S-10K

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.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

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. PART No.	CAP. (pF)	50 VOLT. PART No.	CAP. (pF)	50 VOLT. PART No.	CAP. (μF)	50 VOLT. 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				

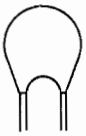
0.001μF = 1,000pF

CERAMIC (SEMICONDUCTOR) CAPACITORS

CAP. (μF)	RATING → : Use the high voltage rated one. 25 VOLT. PART No.	50 VOLT. PART No.	CAP. (μF)	25 VOLT. PART No.	50 VOLT. 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

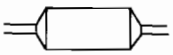
CAP. (μF)	RATING			CAP. (μF)	RATING			CAP. (μF)	RATING		
	50 VOLT.	100 VOLT.	200 VOLT.		50 VOLT.	100 VOLT.	200 VOLT.		50 VOLT.	100 VOLT.	200 VOLT.
	PART No.	PART No.	PART No.		PART No.	PART No.	PART No.		PART No.	PART No.	PART No.
0.001	1-108-227-00	1-108-365-00	1-108-409-00	0.01	1-108-239-00	1-108-377-00	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	1-108-230-00	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

→ : Use the high voltage rated one.

CAP. (μF)	RATING						
	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

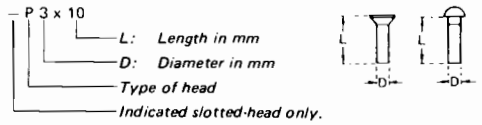
CAP. (μF)	RATING					
	3 VOLT.	6.3 VOLT.	10 VOLT.	16 VOLT.	20 VOLT.	35 VOLT.
	PART No.	PART No.	PART No.	PART No.	PART No.	PART No.
0.033						1-131-273-00
0.047						1-131-274-00
0.068						1-131-275-00
0.1						1-131-276-00
0.15						1-131-277-00
0.22			–	–	1-131-262-00	1-131-278-00
0.33			–	–	1-131-263-00	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

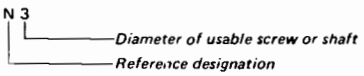
Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.
1.0	1-246-401-00	10	1-246-425-00	100	1-246-449-00	1.0k	1-246-473-00	10k	1-246-497-00	100k	1-246-521-00	1.0M	1-246-545-00
1.1	1-246-402-00	11	1-246-426-00	110	1-246-450-00	1.1k	1-246-474-00	11k	1-246-498-00	110k	1-246-522-00	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		braizer-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	

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