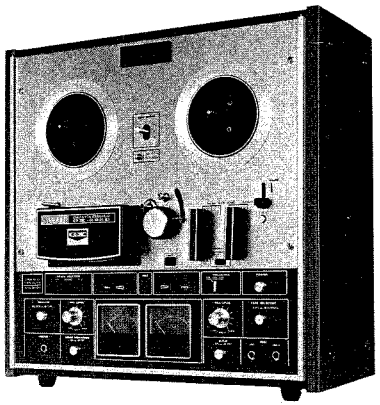
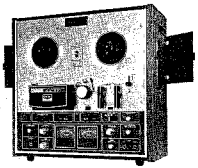
# PARTS LIST



MODEL GX-225D



MODEL GX-221

# STEREO TAPE DECK

## MODEL GX-225D

ALSO APPLICABLE TO MODEL GX-221 STEREO TAPE RECORDER AND GX-221D STEREO TAPE DECK

SECTION 1

# SERVICE MANUAL

TABLE OF CONTENTS

# I. SPECIFICATIONS

An asterisk next to a figure indicates the minimum guaranteed performance.

| | | |
|---|---|---|
| TRACK SYSTEM | | 4 track 2 channel stereo/monaural system |
| REEL CAPACITY | | Up to 7" reel |
| TAPE SPEED | | 7-1/2 ips(19 cm/sec.) ±0.7%(*±0.8%) |
| | | 3-3/4 ips(9.5 cm/sec.) ±0.7%(*±0.8%) |
| | | 1-7/8 ips(4.75 cm/sec.) ±0.7%(*±0.8%) |
| WOW AND FLUTTER | | Less than 0.08%(*0.12%) R.M.S. at 7-1/2 ips |
| | | Less than 0.12%(*0.25%) R.M.S. at 3-3/4 ips |
| | | Less than 0.20%(*0.4%) R.M.S. at 1-7/8 ips |
| FREQUENCY RESPONSE | | |
| | AKAI S.R.T. Tape | 30 to 25,000 Hz ±3 dB at 7-1/2 ips |
| | | 30 to 20,000 Hz ±3 dB at 3-3/4 ips |
| | | 30 to 10,000 Hz ±3 dB at 1-7/8 ips |
| | Regular Tape | 30 to 23,000 Hz(*30 to 22,000 Hz) ±3 dB at 7-1/2 ips |
| | | 30 to 19,000 Hz(*30 to 18,000 Hz) ±3 dB at 3-3/4 ips |
| | | 30 to 9,000 Hz(*40 to 9,000 Hz) ±3 dB at 1-7/8 ips |
| SIGNAL TO NOISE RATIO | | Better than 50 dB(53 dB with N.R. process) |
| | | * Better than 48 dB at 7-1/2 ips |
| | | * Better than 47 dB at 3-3/4 ips |
| | | * Better than 45 dB at 1-7/8 ips |
| | | * Better than 44 dB at Reverse Mode |
| HUM AND NOISE | | 5 mV Tone Control and Main Volume: Min. |
| | | (Model GX-221 only) |
| DISTORTION FACTOR | | Less than 1.5%(*3%) at 1,000 Hz "0" VU Recording |
| TONE CONTROLS | Treble | 12 ±2 dB(Max.) and −14 ±2 dB(Min.) at 10 kHz |
| | Bass | 12 ±2 dB(Max.) and −10 ±2 dB(Min.) at 100 Hz |
| | | (Model GX-221 only) |
| CROSS TALK | | Better than 65 dB(*58 dB) monaural |
| | | Better than 50 dB(*43 dB) stereo |
| ERASE RATIO | | Better than 70 dB |
| BIAS FREQUENCY | | 100 kHz ± 5% |
| BIAS LEAK | | Less than −20 VU |
| HIGH FREQUENCY DEVIATION | | |
| | Between Channels | Within 2 dB, using an 8,000 Hz 3-3/4 ips recorded tape at 7-1/2 ips |
| | Between FWD/REV | Within 3 dB, using an 8,000 Hz 3-3/4 ips recorded tape at 7-1/2 ips |
| REC./P.B. LEVEL | | 4 ± 1.5 dB |
| INPUTS | Mic Input | 0.2 mV(*0.4 mV) Impedance: 10 kΩ |
| | Line Input | 50 mV(*60 mV) Impedance: 150 kΩ |
| | Din Input | 2 mV(low) and 50 mV(*60 mV) (high) |
| OUTPUTS | Line Output | 1.228V (4 x 1 dB) Impedance: 20 kΩ |
| | Din Output | 0.4V |
| | Speaker Output | 30 W total music power at 8Ω (GX-221 only) |
| | | 20 W continuous power at 8Ω (GX-221 only) |
| HEAD PHONE OUTPUT | | 30 to 40 mV at 8Ω |
| REVERSING TIME | | 2 to 6 sec. |
| FAST FORWARD AND REWIND TIME | | 85/65 sec., using a 1,200 ft. tape at 50/60 Hz |
| MOTORS | Main Motor | 3 speed hysteresis synchronous motor |
| | | Type: HC-16X |
| | | Revolutions: 3,000/1,500/750 r.p.m.(50 Hz) |
| | | 3,600/1,800/900 r.p.m.(60 Hz) |
| | Reel Motor | Two 6-pole eddy current outer rotor motors |
| | | Type: 24XO-MR |
| | | Revolutions: 930 r.p.m. (50 Hz) |
| | | 1,120 r.p.m. (60 Hz) |
| HEADS | Erase Head | Type: E4-250 |
| | | Gap: 0.6 mm |
| | | Impedance: 195Ω ± 10% at 100 kHz. |
| | | D.C. Resistance: 3.5Ω |

| | | |
|---|---|---|
| Recording Head | Type: R4-200 | |
| | Gap: 4$\mu$ ± 15% | |
| | Impedance: 1,870Ω at 100 kHz | |
| | D.C. Resistance: 8Ω | |
| Playback Head | Type: P4-200 | |
| | Gap: 1.75$\mu$ ± 15% | |
| | Impedance: 3 ± 1 kΩ at 1 kHz | |
| | D.C. Resistance: 500Ω | |
| I.C. | LD3141 . . . 2 | STK015 . . . 2(GX-221 only) |
| TRANSISTORS | 2SC372(Y) . . . 1 | 2SC971(2)(3) RED . . . 2 |
| | 2SC871(F) . . . 12 | 2SC1211(C)(D) . . . 1 |
| | 2SC945(Q)(R) . . . 6 | 2SD223(G)(Y) . . . 1 |
| | 2SC968(3)(4) . . . 3 | |
| | 2SC458LG(C) . . . 6 | 2SC711(E) . . . 4 |
| | (N.R. Amp.) | (N.R. Amp.) |
| DIODES | 1N34A . . . 7 | 5B2 . . . 1(GX-221 only) |
| | 10D1 . . . 3 | WZ-240 . . . 1 |
| | 10D4 . . . 1 | |
| | WG-599 . . . 4(N.R. Amp.) | |
| POWER SUPPLY | 100 to 240 V A.C. 50/60 Hz | |
| POWER CONSUMPTION | 90W Models GX-225D, GX-221D | |
| | 135W Model GX-221 | |
| INSULATION RESISTANCE | More than 50 MΩ | |
| INSULATION DURABILITY | 500V D.C. for more than 1 min. duration. | |
| DIMENSIONS | 430(W) x 425(H) x 230(D) mm (17.2" x 17" x 9.2") | |
| WEIGHT | 20.5 kg(45.1 lbs.) Models GX-225D, GX-221D | |
| | 22.5 kg(49.5 lbs.) Model GX-221 | |

NOTE: Specifications subject to change without notice.

# II. MEASURING METHOD

## 1. TAPE SPEED DEVIATION

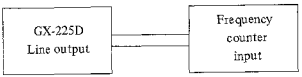



Fig. 1

As shown in Fig. 1, connect a Frequency Counter to the Line output. Playback a 1,000 Hz pre-recorded test tape. Take a frequency counter reading at the beginning, middle, and end of tape winding during playback. The maximum value of these respective readings will represent tape speed deviation.

## 2. WOW AND FLUTTER

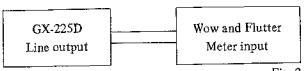



Fig. 2

**Method A**

As shown in Fig. 2, connect the Line output to the Input of a Wow and Flutter Meter. Playback a 3,000 Hz pre-recorded test tape and take a wow and flutter meter reading at the beginning, middle, and end of tape winding. The maximum value of these respective readings will represent the wow and flutter.

**Method B**

Supply a 3,000 Hz sine wave signal from an Audio Frequency Oscillator and make a recording on a blank tape at the beginning, middle, and end of tape winding. Rewind and playback the resultant signal. Measure wow and flutter with a Wow and Flutter Meter. (The wow and flutter value of Method B will be close to twice that of Method A.)

## 3. FREQUENCY RESPONSE

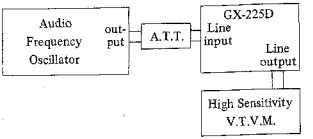



Fig. 3

For measuring frequency response, connect instruments as shown in Fig. 3 and proceed as follows:

1) Supply a 1,000 Hz sine wave to the Line input from an Audio Frequency Oscillator through an Attenuator.
2) Set recorder to recording mode and turn recording level control volume and line output level control volume to maximum. Adjust attenuator to obtain a +4 dB V.T.V.M. reading.
3) Under conditions described in 2) above, re-adjust attenuator so that the Line Output is −16 dB, and record 30 to 22,000 Hz at 7-1/2 ips spot frequencies.
4) Rewind the tape and playback from the beginning. Take V.T.V.M. spot frequency readings and plot values on a graph.

NOTE: When measuring frequency response, new tape should be used.

## 4. SIGNAL TO NOISE RATIO


Fig. 4

As shown in Fig. 4, connect a High Sensitivity V.T.V.M. to the Line output. Playback a 250 Hz "0" VU pre-recorded test tape and measure the output. Then remove the tape and measure the noise level under the same condition. Convert each of the measured values into decibels.

## 5. TOTAL HARMONIC DISTORTION FACTOR

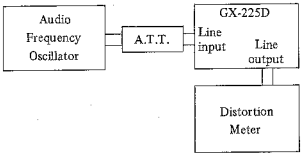



Fig. 5

Connect the measuring instruments as shown in Fig. 5 and record a 1,000 Hz sine wave signal at "0" VU. Playback the resultant signal and measure the overall distortion factor. Measure the noise level of the tape recorder without the tape. Connect the audio frequency oscillator directly to the distortion meter for measurement of the distortion factor of the oscillator. The required distortion factor can be obtained from the results of the above measurement by the following formula:

$$d_0 = d - d_1 - d_2$$

where, $d_0$ = Required distortion factor
$d$ = Overall distortion factor
$d_1$ = Noise level
$d_2$ = Distortion factor of the oscillator

NOTE: When measuring the distortion factor, new tape should be used.

## 6. CROSS TALK
**(Cross talk between the channels)**

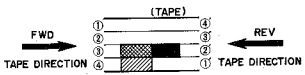



Fig. 6

As shown in Fig. 6, first record a 1,000 Hz sine wave signal on Track No. 3 at +3 VU level. Next, record under a non-input condition. Then, playback the tape on Tracks No. 3 and 4 (reversed condition of tape) through the B.P.F. (band pass filter sensitivity ... 1:1) and obtain a ratio between the two from the following formula:

$$C = 20 \log \frac{E_0}{E_2 - E_1} \text{ (dB)}$$

where, C = Desired cross talk ratio (dB)
$E_0$ = 1,000 Hz signal output level
$E_2$ = 1,000 Hz cross talk level
$E_1$ = Non-input signal recorded level

Fig. 7

## 7. ERASE RATIO

As shown in Fig. 4, connect a High Sensitivity V.T.V.M. to the Line ouput. Playback a virgin tape and take a V.T.V.M. reading of the output level. Next, record a 1,000 Hz sine wave signal at +3 VU, then playback this recorded signal and take a V.T.V.M. reading of the output level. Next, using this pre-recorded tape, record under a non-input condition and take a reading of the noise level output of the erased signal and obtain a ratio between the two from the following formula:

$$Er = 20 \log \frac{E_0}{E_2 - E_1} \text{ (dB)}$$

where, Er = Desired erase ratio (dB)
$E_0$ = 1,000 Hz signal output level
$E_2$ = Non-input signal recorded level
$E_1$ = Virgin tape noise output level

## 8. POWER OUTPUT (GX-221 only)

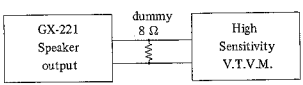



Fig. 8

As shown in Fig. 7, connect an 8Ω dummy load resistor to the speaker output and connect this terminal to a High Sensitivity V.T.V.M. Playback a 250 Hz "0" VU pre-recorded test tape and take a V.T.V.M. reading of the output level. The resultant output can be obtained from the above measurement by using the following formula:

$$P = \frac{E^2}{R} \text{ (W)}$$

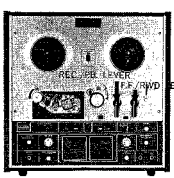
where, P = Desired power output (watts)
E = Measured voltage (R.M.S.)
R = 8Ω

# III. DISMANTLING OF UNIT

In case of trouble, etc. necessitating disassembly, please disassemble in the order shown in photographs. Reassemble in reverse order.

1

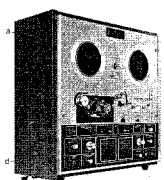

2




3


4


5

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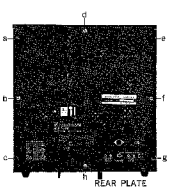


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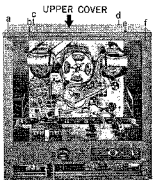

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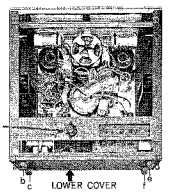


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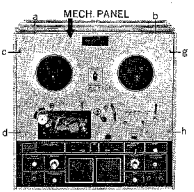


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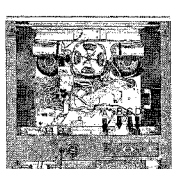


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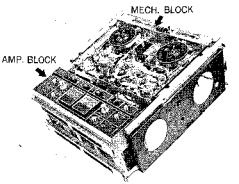


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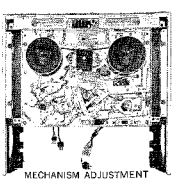


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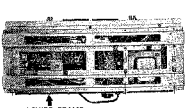


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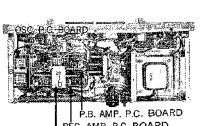


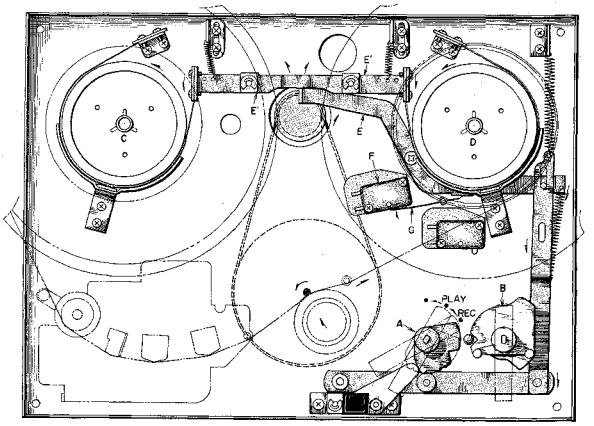



Fig. 9 FWD P.B./RECORDING REVERSE MODE

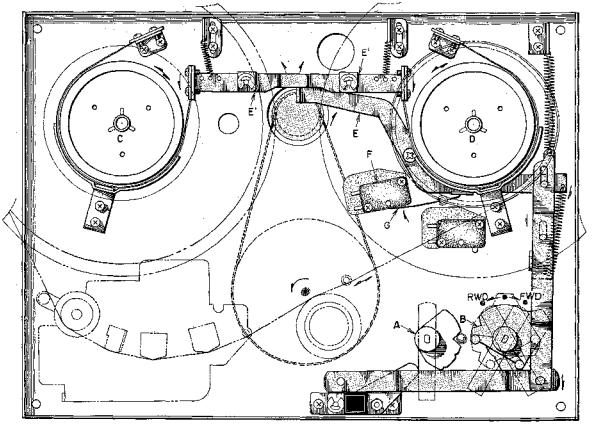



Fig. 10 F.FWD/RWD MODE

## 1. FORWARD PLAYBACK RECORDING MODE (Refer to Fig. 9)

Setting Recording/Playback lever (A) to playback position causes brake lever (E') to move in the direction of the arrow and release the brake of both torque motors, and at the same time, operation micro switch (SW-006) is turned ON by lever (G), and the torque motors begin to rotate in the direction of the arrows. Also the capstan contacts the pinch roller and the tape is transported at constant speed.

## 2. FAST FORWARD/REWIND MODE (Refer to Fig. 10)

1) Setting Fast Forward/Rewind lever (B) to Fast Forward or Rewind position causes brake lever (E') to move in the direction of the arrow, and release the brake of both torque motors, and at the same time, operation micro switch (SW-006) is turned ON by lever (G) and the torque motors begin to rotate in the direction of the arrows.
2) For fast forward or rewind, the mechanical operation is the same, but the voltage supply is different at each mode. (Refer to Chart 2)

## 3. BLOCK DIAGRAM OF VOLTAGE SUPPLY CIRCUIT TO MOTOR AT EACH MODE

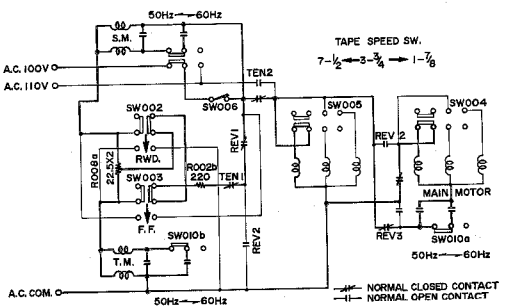



Fig. 11 NORMAL PLAYBACK MODE

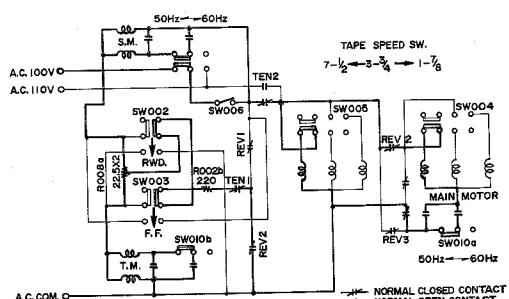



Fig. 12 REVERSE PLAYBACK MODE

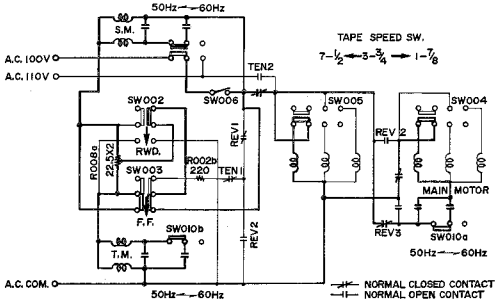



Fig. 13 F.FWD MODE

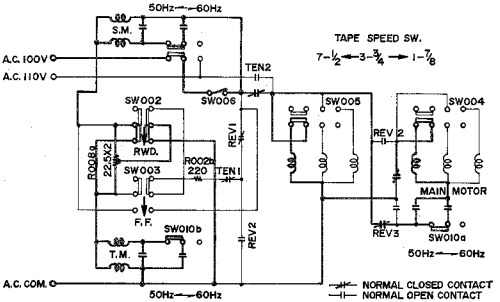
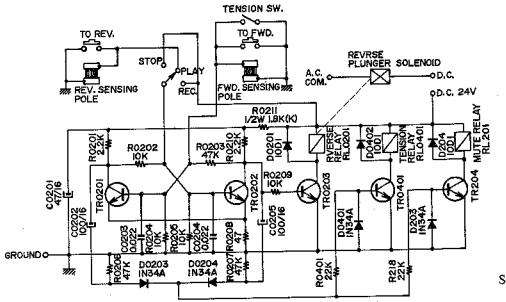



Fig. 14 RWD MODE




Schematic 1

| Transistor / Mode | TR0201 | TR0202 | TR0203 | TR0401 | TR204 |
|---|---|---|---|---|---|
| Normal P.B. | OFF | ON | OFF | OFF | OFF |
| Reverse P.B. | ON | OFF | ON | ON | ON |

Chart 1

## 4. SYSTEM CONTROL CIRCUIT OPERATION

1) Tension Relay Operation

The tension relay functions to switch the supply voltage only when the main motor is first started or at reverse time when the starting torque changes until stability is obtained. The tension relay also prevents strong tension from being applied to the tape when tape direction is changed by supplying uniform voltage to both torque motors.

2) Mute Relay Operation

Because tape travel is slow when the machine is first switched to or from Forward and Reverse, the mute relay mutes the line output signal until proper main motor revolutions are reached.

3) System Control Operation

In Schematic 1, at Forward Playback time, because transistor TR0202 base bias is high when compared with transistor TR0201, TR0202 is held at ON condition. Consequently, the collector voltage of TR0202 is low, and transistor TR0203 is OFF. Also because the condenser C0202 is charged by the collector voltage of transistor TR0201, the base bias of transistor TR0401 as well as TR204 is low and is held at OFF condition. When the Reverse Button is depressed, or the sensing tape passes the reverse sensing pole, the base of transistor TR0202 is grounded, the collector voltage of TR0202 increases and TR0203 is turned ON, and because Rev. Relay RL0201 operates, main motor reverse revolutions begin.

Also because of the TR0202 collector voltage increase, the charge current which has passed diode D0204 as well as resistors R0401 and R218 and also the internal impedance of transistors TR0401 and TR204 flows to condenser C0205, and while this current is flowing, TR0401 and TR204 is maintained at ON condition, and Tension Relay RL0401 as well as Mute Relay RL201 operates.

When the main motor begins reverse revolutions and proper tape speed is reached, the charge of condenser C0205 will be stopped, TR0401 and TR204 base bias will disappear and these two transistors are turned off, the tension relay as well as the Mute Relay is turned off, and proper reverse mode operation begins. During reverse playback when the FWD Button is depressed or the sensing tape passes the FWD sensing pole, the base of transistor TR0201 is grounded, TR0201 is turned off and the collector voltage increases.

Accordingly, transistor TR0202 base bias becomes high, TR0202 is turned ON and the collector voltage decreases. At this time, TR0203 is turned OFF, and Rev. Relay RL0201 is also turned OFF. Thus, main motor revolutions are switched to normal playback direction. Also because of the TR0201 collector voltage increase, as at reverse time, charge current flows to condenser C0202, and transistor TR0401 and TR204 are turned ON. Consequently, Tension Relay RL0401 as well as Mute Relay RL201 operates. The main motor begins forward revolutions and when proper tape speed is reached, condenser C0202 charge will be stopped, the Tension Relay as well as Mute Relay is turned OFF, and proper forward mode operation begins.

At Stop or Recording mode, voltage is supplied to TR0202 base, and because Reverse Button and sensing tape is irrelevant, main motor revolutions are always in forward playback direction.

# V. MECHANISM ADJUSTMENTS

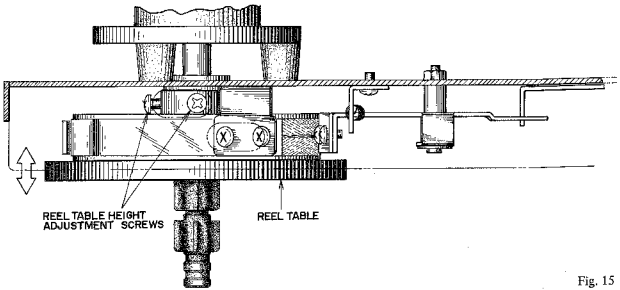



Fig. 15

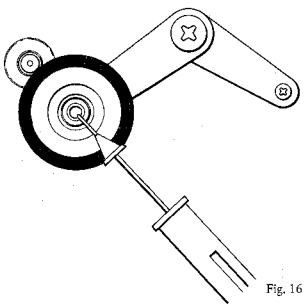


Fig. 16

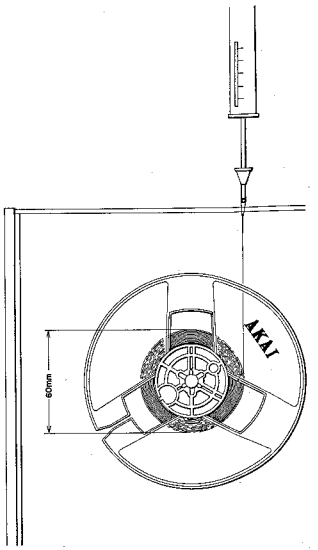



Fig. 17

## 1. REEL TABLE HEIGHT ADJUSTMENT

As shown in Fig. 15, loosen reel table height adjustment screws, and adjust reel table height by moving table in direction of arrow and positioning so that the tape winds in the center of the reel.

## 2. PINCH WHEEL PRESSURE MEASURING METHOD

Measure pinch wheel pressure with a tension gauge as shown in Fig. 16. Read the value on the tension gauge as soon as the pinch wheel separates from the tape and tape travel stops. Ideal pinch wheel pressure is 1.8 kg.

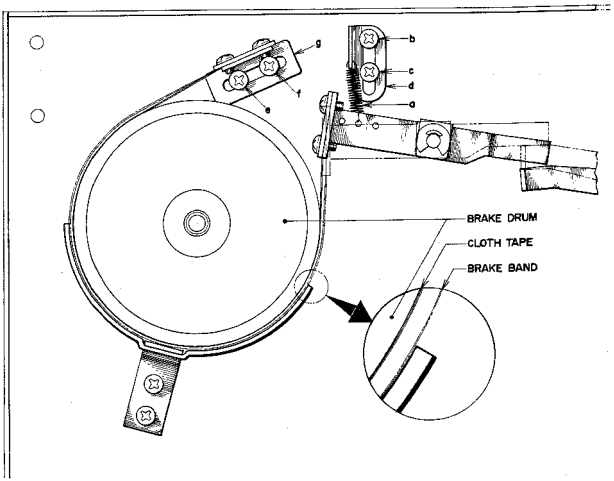



Fig. 18

## 3. BRAKE TENSION ADJUSTMENT

1) As shown in Fig. 17, use a 60 mm diameter tape wound on a 5" reel and measure the brake tension with a tension gauge. Ideal brake tension is from 300 to 370 grams.
2) Brake tension adjustment can be made as follows: (Refer to Fig. 18)
   a) Change position of suspended spring (a).
   b) Loosen screws (b) and (c) and adjust the vertical position of spring suspension metal (d).
   c) Loosen screws (e) and (f) and adjust the horizontal position of brake band suspension metal (g).
   d) Only the left side is shown in Fig. 18, but the right side must be adjusted in the same way.

NOTE: In making brake tension adjustment, at all modes except stop mode, confirm that the brake band completely separates from the cloth tape on the brake drum. (Refer to Fig. 18)

## 4. SUPPLY VOLTAGE AND TENSION AT VARIOUS OPERATING MODES

| Torque Motor / Mode | Left Side | Right Side |
|---|---|---|
| Normal P.B. | 30 V (34 V)<br>60 g | 60 V (68 V)<br>200 g |
| Reverse P.B. | 60 V (68 V)<br>200 g | 30 V (34 V)<br>60 g |
| F.FWD | 5.8 V (6 V)<br>15 g | 94.2 V (103 V)<br>460 to 480 g |
| RWD | 94.2 V (103 V)<br>460 to 480 g | 5.8 V (6 V)<br>15 g |
| Tension Relay at Operating Time | 45 V (51 V)<br>100 g | 45 V (51 V)<br>100 g |

The voltage shown in parentheses are at 60 Hz.

Chart 2

# VI. HEAD ADJUSTMENTS

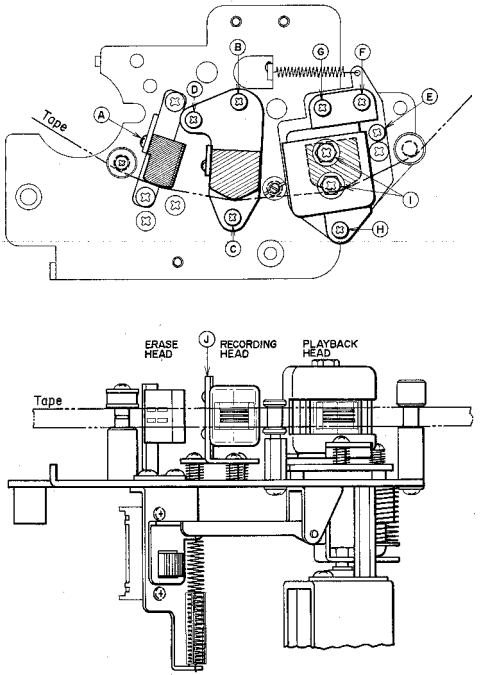



Fig. 19

## 1. HEAD HEIGHT ADJUSTMENT

1) Erase Head
At Playback mode, loosen screws (A) shown in Fig. 19 and adjust head height so that the upper edge of the tape is about 0.1 mm lower than the upper edge of the left channel erase head core.

2) Recording Head
At Playback mode adjust recording head height by turning screws (B) (C) and (D) shown in Fig. 19 to left and right until the upper edge of the tape is the same height as the upper edge of the left channel recording head core.

3) Playback Head
a) At Forward Playback mode, adjust playback head height by turning screws (F) (G) and (H) shown in Fig. 19 to left and right until the upper edge of the tape is the same height as the upper edge of the left channel playback head core.

b) At Reverse Playback mode, adjust playback head height by turning screw (E) shown in Fig. 19 to left and right until the lower edge of the tape is the same height as the lower edge of the right channel playback head core.

## 2. HEAD AZIMUTH ALIGNMENT ADJUSTMENT

1) Playback Head
   a) Connect a high sensitivity V.T.V.M. to the line output terminals.
   b) Set both the Tape Speed Switch and Equalizer Switch to 7-1/2 ips (19 cm/sec), depress STEREO Track Selector, and set the Monitor Switch to TAPE position.
   c) In case of model GX-225D, set Noise Reduction Switch to OFF position.
   d) Playback an 8,000 Hz 3-3/4 ips recorded Ampex Alignment test tape.
   e) At Forward Playback mode, turn Azimuth Alignment Screw (F) shown in Fig. 19 to obtain maximum line output level on both channels.
   f) After the adjustment in Item e) above has been completed, loosen screws (I) shown in Fig. 19 and move the head gap side of the playback head to left and right. When tension is applied to the supply reel side and the line output level of both channels do not fluctuate, (maximum allowable fluctuation within +0.5/–0 dB) fix screws (I) to maintain this condition.
   g) At reverse playback mode, make the same adjustment as outlined above until the line output level of both channels do not fluctuate.

2) Recording Head
   a) Connect an audio frequency oscillator to the line input terminals, and connect a high sensitivity V.T.V.M. to the line output terminals and load a blank tape.
   b) Set both the Tape Speed Switch and Equalizer switch to 7-1/2 ips (19 cm/sec.), depress STEREO Track Selector, and set the monitor switch to TAPE position.
   c) Record a 16,000 Hz audio frequency at –10 dB recording level.
   d) At recording mode, turn Azimuth Alignment Adjustment Screw (D) shown in Fig. 19 to left and right until the line output level of both channels is maximum and does not fluctuate.
   e) After completing adjustment in Item d) above, adjust gap side of recording head by bending installation angle (J) shown in Fig. 19 to left and right until the line output level of both channels do not fluctuate (maximum allowable fluctuation within +0.5/–0 dB) when tension is applied to the supply reel side.

**3. To obtain best results, repeat adjustments outlined in paragraphs 1 and 2 above 2 or 3 times.**
**New blank tape should be used when making these adjustments.**

# VII. AMPLIFIER ADJUSTMENTS

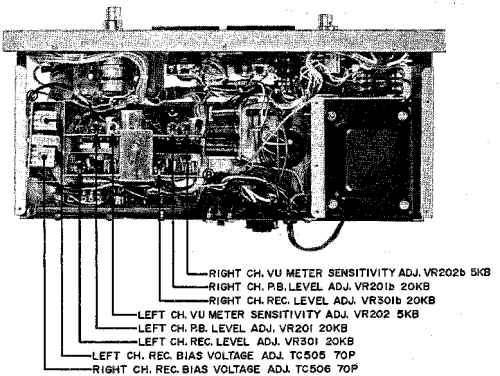



Fig. 20

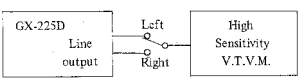



Fig. 21

## 1. PLAYBACK OUTPUT LEVEL ADJUSTMENT

1) Connect a high sensitivity V.T.V.M. to the line output terminals.
2) Set both the Tape Speed Switch and Equalizer Switch to 7-1/2 ips (19 cm/sec.), depress STEREO Track Selector and set the Monitor Switch to TAPE position.
3) In case of model GX-225D, set Noise Reduction Switch to OFF position.
4) Playback a 250 Hz "0" VU pre-recorded test tape.
5) Adjust P.B. Amp. P.C. Board playback level adjustment semi-fixed resistors VR201 20 kB (Left Channel) and VR201b 20 kB (Right Channel) shown in Fig. 20 to obtain a High Sensitivity V.T.V.M. indication of 4 dB (1.228 V)

## 2. VU METER SENSITIVITY ADJUSTMENT

After the playback output level adjustment has been completed, adjust P.B. Amp. P.C. Board VU meter sensitivity adjustment semi-fixed resistors VR202 5 kB (Left Channel) and VR202b 5 kB (Right Channel) shown in Fig. 20 to obtain a VU meter indication of "0" VU on both channels.

## 3. HIGH FREQUENCY DEVIATION CHECK

1) Between Channels
When an 8,000 Hz 3-3/4 ips Ampex Alignment test tape is played back, check to confirm that the difference in high range output level between the left and right channel is within 2 dB.
2) Between FWD and REV Playback
Playback and Alignment test tape and check to confirm that the difference in high range level output between FWD and Reverse playback mode is within 3 dB.
3) If Items 1) and 2) above are not within specifications, repeat Head Azimuth Alignment adjustment.

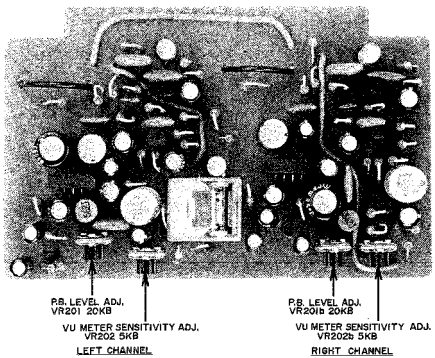
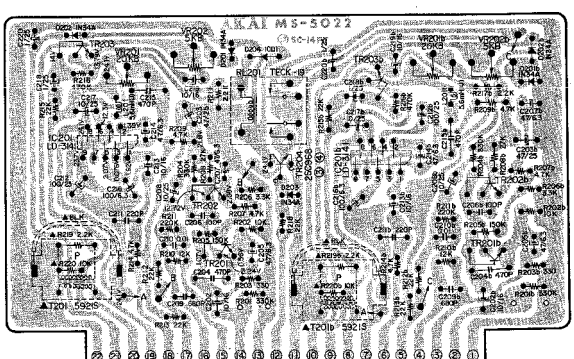



Fig. 22 P.B. AMP. P.C. BOARD (Face Side)




| MODEL | T201 | R219 | R220 | LEAD WIRE (BLK) |
|---|---|---|---|---|
| GX-221 | X | O | X | O |
| GX-2210 | O | X | X | X |
| GX-2250 | X | O | O | X |

Fig. 23 P.B. AMP. P.C. BOARD MS-5022 (Reverse Side)

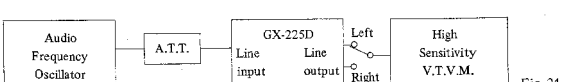



Fig. 24

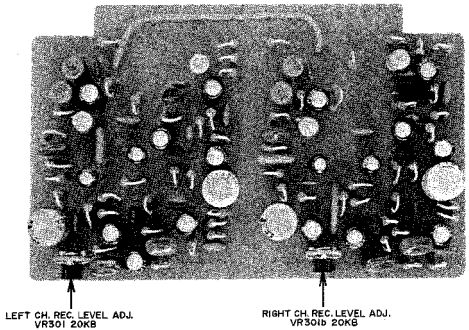



Fig. 25 REC. AMP. P.C. BOARD (Face Side)

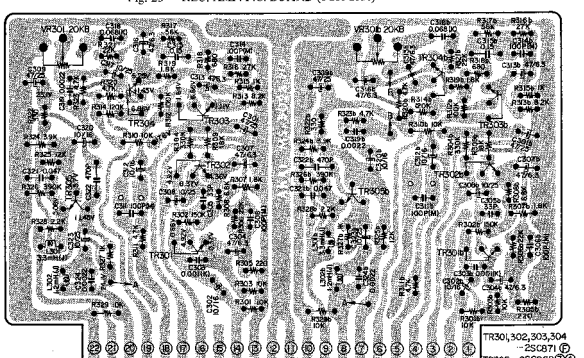



Fig. 26 REC. AMP. P.C. BOARD MS-5023 (Reverse Side)

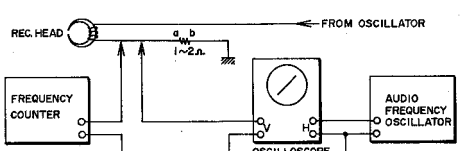



Fig. 27

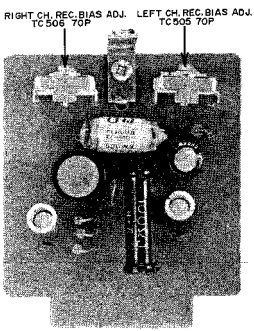



Fig. 28 OSC. P.C. BOARD (Face Side)

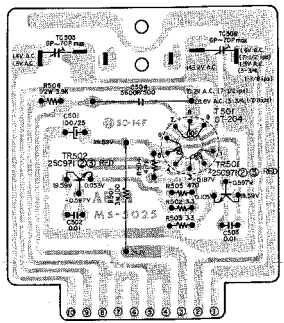


Fig. 29 OSC. P.C. BOARD MS-5025 (Reverse Side)

## 4. RECORDING LEVEL ADJUSTMENT

1) Connect an Audio Frequency Oscillator to the line input terminals through an attenuator, and connect a high sensitivity V.T.V.M. to the line output terminals.
2) Set both the Tape Speed Switch and the Equalizer Switch to 7-1/2 ips (19 cm/sec), depress the STEREO Track Selector, and set the Monitor Switch to TAPE position.
3) In case of model GX-225D, set Noise Reduction Switch to OFF position.
4) Set Recording Level Controls to maximum and load a blank tape (AKAI 100L Tape).
5) Set recorder to recording mode, and supply a 1,000 Hz signal from the Audio Frequency Oscillator. Adjust attenuator to obtain a V.T.V.M. indication of 4 dB.
6) Set Monitor Switch to SOURCE position, and adjust Rec. Amp. P.C. Board recording level adjustment semi-fixed resistors VR301 20 kB (Left Channel), and VR301b 20 kB (Right Channel) shown in Fig. 20 to obtain a V.T.V.M. indication of 4 dB on both channels.

## 5. RECORDING BIAS FREQUENCY MEASURING METHOD

**Method 1**

1) As shown in Fig. 27, install a 1 to 2 Ω resistor in series with the recording head and connect the vertical input of an oscilloscope to these terminals (a and b).
2) Supply a sine wave signal from an Audio Frequency Oscillator to the horizontal input of the oscilloscope.
3) Set the recorder to recording mode, and vary the oscillation frequency of the Audio Frequency Oscillator until the waveform of the oscilloscope displays a circular or linear pattern.
4) At the time of a circular or linear pattern display, if the audio frequency oscillator indication is within a range of 100 kHz ±5%, the recording bias frequency is correct.

**Method 2**

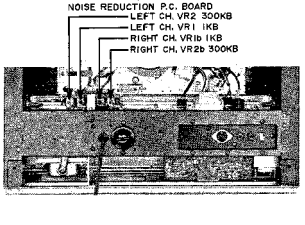
As shown in Fig. 27, connect a frequency counter to terminals a and b, set recorder to recording mode, and take a frequency counter reading.

## 6. RECORDING BIAS VOLTAGE ADJUSTMENT (Frequency Response Adjustment)

1) Employ the same measuring instruments used in Recording Level Adjustment procedure and connect them in the same way.
2) Foollow Recording Level Adjustment procedure through Item 5), and then set the attenuator to −20 dB.
3) Under these conditions, adjust OSC P.C. Board recording bias voltage adjustment trimmer condensers TC505 70P (Left Channel) and TC506 70P (Right Channel) shown in Fig. 20 to obtain an equally flat response at 1,000 Hz and 10,000 Hz.
4) Recording bias voltage, following frequency response adjustment, is from 1.3 to 1.4 V A.C.
5) Ideal erase voltage is 70 V A.C.

NOTE: The frequency response will vary depending upon the tape being used. As a rule, AKAI 100F Tape (Fuji F tape) is used for this adjustment.

# VIII. AUTOMATIC NOISE REDUCTION AMPLIFIER ADJUSTMENTS (Model GX-225D only)



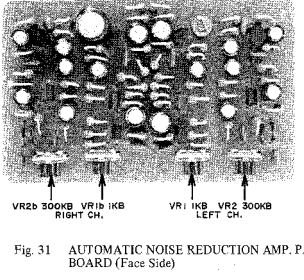




Fig. 31 AUTOMATIC NOISE REDUCTION AMP. P.C. BOARD (Face Side)

## 1. A.N.R. AMP. ADJUSTMENT

1) Connect the various measuring instruments as shown in Fig. 24.
2) Set recording level adjustment volumes VR1a 50 kA (Left Channel) and VR1b 50 kA (Right Channel) to maximum.
3) Set the Noise Reduction Switch and the S.O.S. Switch to OFF position, and set Monitor Switch to SOURCE.
4) Set tape deck to recording mode, and supply a 100 Hz signal to the line input terminals from the Audio Frequency Oscillator. Adjust attenuator to obtain a high sensitivity V.T.V.M. indication of 4 dB (VU meter indication "0" VU).
5) Adjust Noise Reduction P.C. Board semi-fixed resistors VR2 300 kB (Left Channel) and VR2b 30 kB (Right Channel) shown in Fig. 30 so that when the Noise Reduction Switch is set to ON position, a line output level of 4 dB is maintained.
6) Return Noise Reduction Switch to OFF position and set the oscillation frequency of the Audio Frequency Oscillator to 10 kHz. Then adjust the attenuator to obtain the same results as outlined in Item 4) above.
7) Set Noise Reduction Switch to ON position, and, at this time, adjust Noise Reduction P.C. Board semi-fixed resistors VR1 1 kB (Left Channel) and VR1b 1 kB (Right Channel) shown in Fig. 30 to obtain a line output level decrease of 2.5 dB.
8) After the adjustments in Items 1) through 7) have been completed, decrease the 10 kHz signal by 30 dB and supply this signal to the line input. Confirm that the line output level is 6 ± 0.5 dB lower when the Noise Reduction Switch is at ON position than when at OFF position.

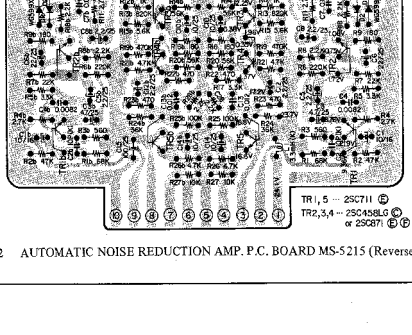



Fig. 32 AUTOMATIC NOISE REDUCTION AMP. P.C. BOARD MS-5215 (Reverse Side)

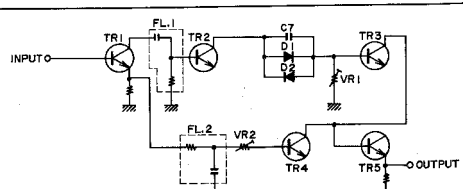



Fig. 33 A.N.R. AMP. BLOCK DIAGRAM

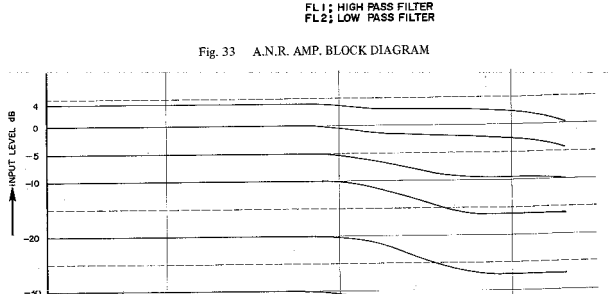


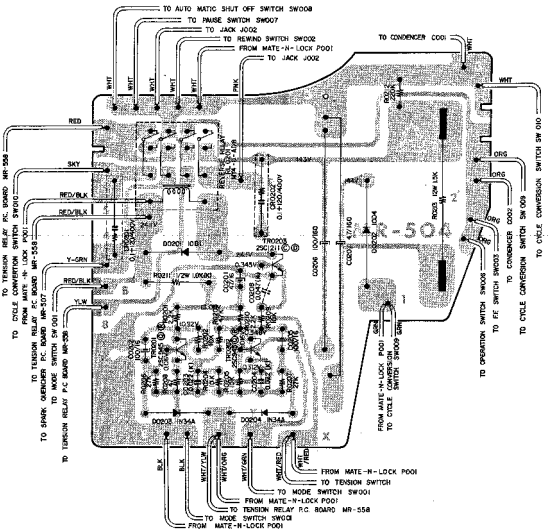

Fig. 34 AUTOMATIC NOISE REDUCTION AMP. CHARACTERISTICS

## 2. A.N.R. OPERATION AND CHARACTERISTICS (Refer to Fig. 33 & 34)

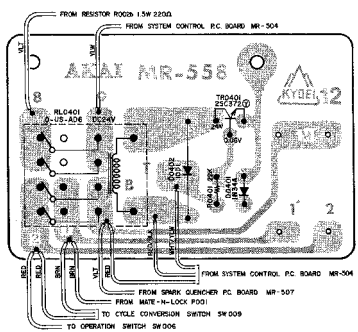
1) The TR1 output signal passes the high pass filter and the low pass filter and is supplied to TR2 and TR4 respectively.
2) The TR2 output passes diodes D1 and D2 as well as condenser C7 and is supplied to TR3. In case the input signal is high, D1 and D2 decreases the impedance and the signal supplied to TR3 is unchanged. Also the signal which passed FL2 is amplified at TR4 and the TR3 and TR4 signals merge at the input side of TR5 and become a composite signal.
3) In case the level of the signal which passed High Pass Filter FL1 is small, diodes D1 and D2 increases the impedance relative to this signal level and the signal supplied to TR3 is even smaller. The signal which passes Low Pass Filter FL2, because there are no variable impedance components such as D1 and D2, is supplied to TR4 unchanged. Consequently, both signals merge, becoming a composite signal and the output becomes a high frequency reduced signal in relation to a low level input.
4) The characteristics of diodes D1 and D2 increases the impedance of low level signals (the lower the level, the more the impedance is increased) so that the signal supplied to TR3 is close to zero. Consequently, the purpose of condenser C7 is to prevent decrease below a certain level.

# IX. COMPOSITE VIEWS OF COMPONENTS

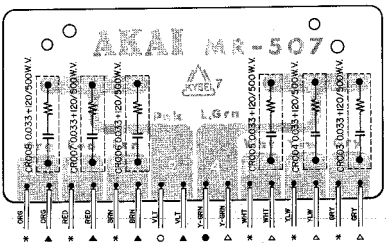
## 1. SYSTEM CONTROL P.C. BOARD MR-504




## 2. TENSION RELAY P.C. BOARD MR-558

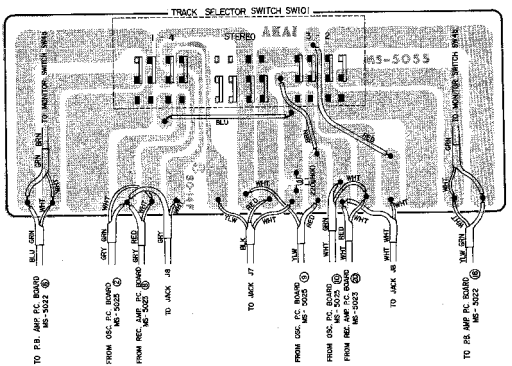


## 3. SPARK QUENCHER P.C. BOARD MR-507

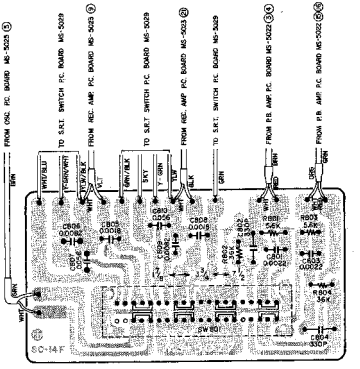



NOTE
- ✱ ; TO CAPSTAN MOTOR TYPE HC-I8X
- ▲ ; FROM TAPE SPEED SWITCH SW 005
- △ ; FROM TAPE SPEED SWITCH SW 004
- ○ ; FROM TENSION RELAY P.C. BOARD MR-556
- ● ; FROM SYSTEM CONTROL P.C. BOARD MR-504

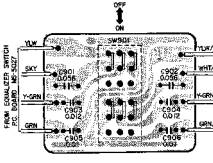
## 4. TRACK SELECTOR P.C. BOARD MS-5055



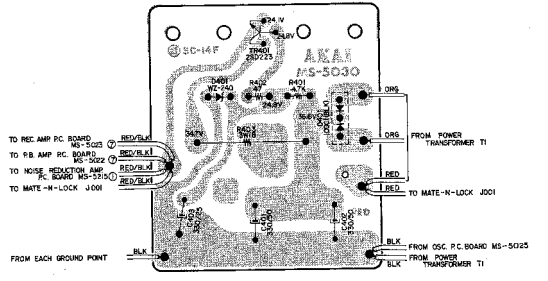
## 5. EQUALIZER SWITCH P.C. BOARD MS-5027



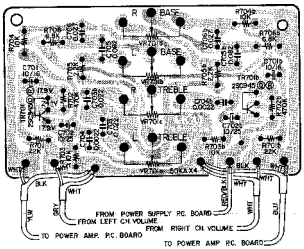

## 6. S.R.T. SWITCH P.C. BOARD MS-5029



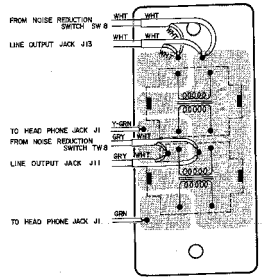

## 7. POWER SUPPLY P.C. BOARD MS-5030



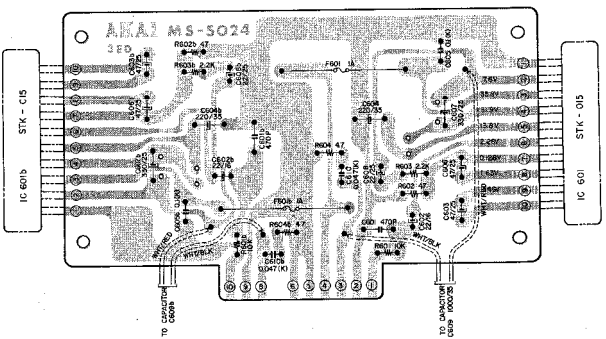
## 8. TONE CONTROL P.C. BOARD MS-5028




## 9. HEAD PHONE TRANS. P.C. BOARD MS-5216




## 10. POWER AMP. P.C. BOARD MS-5024



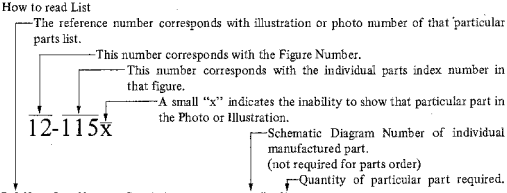
SECTION 2

# PARTS LIST

## TABLE OF CONTENTS

## HOW TO USE THIS PARTS LIST

1. This parts list is compiled by various individual blocks based on assembly process.
2. When ordering parts, please describe parts number, serial number, and model number in detail.
3. How to read List




| Ref. No. | Parts No. | Description | Schematic No. | Q'ty |
|---|---|---|---|---|
| | | **FLYWHEEL BLOCK #13** | | |
| 12-115x | 800425 | Flywheel Block Assy. Comp. | BDGP 12 | 1 |
| 12-116 | 244506 | Flywheel Only | RD-233 | 1 |
| 12-117x | 244754 | Felt, Flywhoel | RD-275 | 1 |
| 12-118 | 251324 | Main Metal Case | RD-236 | 1 |
| 12-119 | 253080 | Main Metel | RD-237 | 1 |

4. The symbol numbers shown on the P.C. Board list can be matched with the Composite Views of Components of the Schematic Diagram or Service Manual.
5. The indications of Resistors and Capacitors in the photos of P.C. Board are being eliminated.
6. The shape of the parts and parts name, etc. can be confirmed by comparing them with the parts shown on the Electrical Parts Table of P.C. Board.
7. Both the kind of part and installation position can be determined by the Parts Number. To determine where a parts number is listed, utilize Parts Index at end of Parts List.
   It is necessary first of all to find the Parts Number. This can be accomplished by using the Reference Number listed at right of parts number in the Parts Index. (meaning of ref. no. outlined in Item 3 above).
8. Utilize separate "Price List for Parts" to determine unit price. The most simple method of finding parts Price is to utilize the reference number.

# ELECTRICAL PARTS TABLE

ELECTRICAL PARTS LIST TABLE
Because the inclusion of resistors and capacitors in the P.C. Board photos are being eliminated, please confirm parts name and shape by comparing them with the parts shown in this table.

1

Solid Resistor

2 Stopper Type

Insulator Type
Carbon Resistor

3

Metal Oxide Film Resistor

4

General Resistor

5

Wire-Wound Resistor

6

Thermistor

7

Enamel Resistor

1

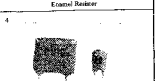
MP Capacitor (Tubular Type)

2

Plastic Capacitor

3

Mylar Capacitor

4

VPM (Hi-Q) Capacitor

5

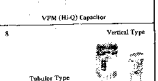
Mylar Capacitor

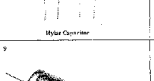
6

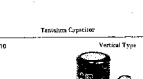
Tantalum Capacitor

7

Oil Capacitor (Tubular Type)

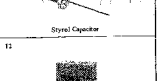
8 Vertical Type

Tubular Type
Styrol Capacitor

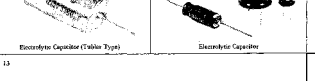
9

Electrolytic Capacitor (Tubular Type)

10 Vertical Type

Tubular Type
Electrolytic Capacitor

11

Ceramic Capacitor

12

Metallized Mylar (Paper Capacitor)

13

Trimmer Condenser

VR

Semi-Fixed Volume

L

Ferri Inductor

TR

Transistor

CR

Spark Quencher

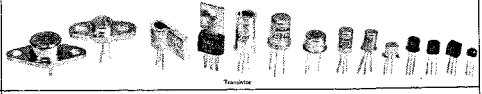
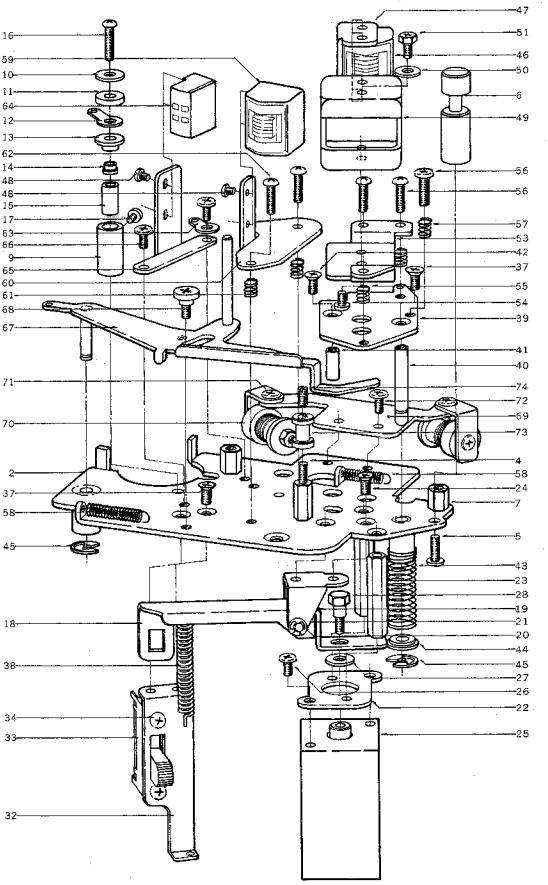
D

Diode (Silicon, Zener, Germanium)

FIG. 1 ILLUSTRATION OF MS HEAD BLOCK



## MS HEAD BLOCK

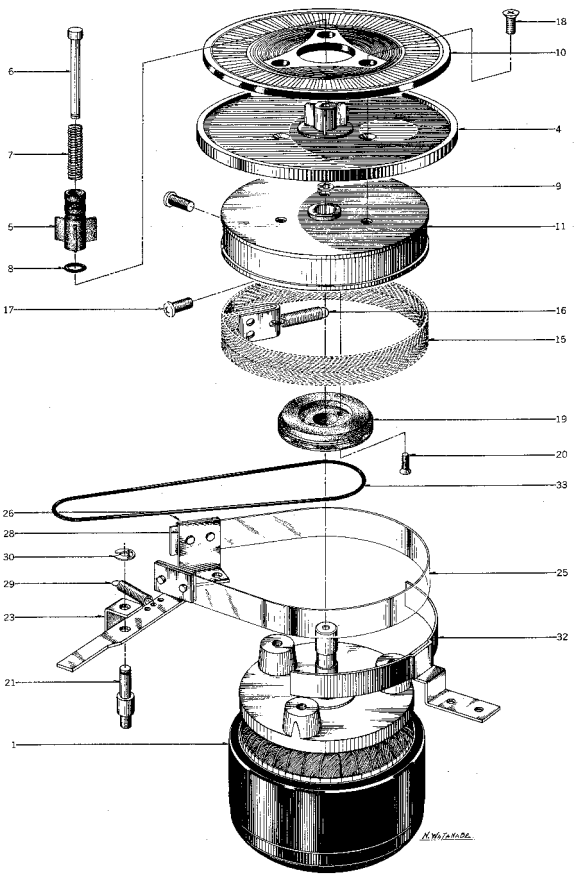
| Ref. No. | Parts No. | Description | Schematic No. | Q'ty |
|---|---|---|---|---|
| 1-1x | BH426047 | MS Head Block Comp. | | 1 |
| 1-2 | HZ425417 | Head Base Plate, w/metal | MS-0001 | 1 |
| 1-3x | MZ303298 | T Arm Cushion (Rubber) | RD-581 | 2 |
| 1-4 | HZ425542 | Tape Guide Prop B | MS-0003 | 1 |
| 1-5 | ZW417025 | Screw, binding head 3x8, w/washer | | 3 |
| 1-6 | HZ425597 | Tape Guide Prop C | MS-0011 | 1 |
| 1-7 | HZ425586 | Head Cover Post | MS-0004 | 1 |
| 1-8x | ZW413188 | Nut, M4 | | 2 |
| 1-9 | HZ425430 | Tape Guide Prop A | MS-0015 | 1 |
| 1-10 | ZW396786 | Tape Guide Washer | KD-0035 | 1 |
| 1-11 | HZ396505 | Insulator Collar | KD-0007 | 1 |
| 1-12 | ZW273778 | Earth Lug, M3 | | 1 |
| 1-13 | HZ396595 | Sensing Guide D | KD-0016 | 1 |
| 1-14 | HZ317632 | Insulator Collar A | MR-56 | 1 |
| 1-15 | HZ396797 | Sensing Guide | KD-0036 | 1 |
| 1-16 | ZW262252 | Screw, round head 2.3x12 | | 1 |
| 1-17 | ZW432674 | Screw, pan head 3x3 | | 1 |
| 1-18 | HL317676 | Plunger Lever | MR-16 | 1 |
| 1-19 | HZ317687 | Lever Support | MR-15 | 1 |
| 1-20 | ZW257477 | Connecting Pin | RD-213 | 1 |
| 1-21 | ZW270088 | 'E' Ring 1.9M | 6-1-9 | 1 |
| 1-22 | HZ317698 | Plunger Base | RD-21 | 1 |
| 1-23 | HZ317700 | Plunger Retaining Prop | MR-6 | 2 |
| 1-24 | ZW432685 | Screw, countersunk head 3x6 | | 2 |
| 1-25 | EP318115 | Plunger Solenoid RGA10143 | 44-1-25 | 1 |
| 1-26 | ZW413223 | Screw, binding head 3x5, w/washer | | 2 |
| 1-27 | ZW450753 | Washer (Nylon) D4.1x9x1t | | 1 |
| 1-28 | ZW317711 | Plunger Bolt | MR-17 | 1 |
| 1-29x | EJ299788 | 6P Plug | 42-1-21 | 1 |
| 1-30x | EJ425632 | 4P Plug, Consent S-15908 | 42-1-23 | 1 |
| 1-31x | MZ314403 | Nylon Clip HP-2N | | 3 |
| 1-32 | HZ317733 | Slide Switch Base | MR-18 | 1 |
| 1-33 | ES317744 | Slide Switch SL-242B4V | 55-3-28 | 1 |
| 1-34 | ZW432696 | Screw, round head 2.6x5 | | 2 |
| 1-35x | ZW317801 | Tootthed Lock Washer, M2.6 | | 2 |
| 1-36x | EJ308981 | Mold 4P Plug | 42-1-22 | 1 |
| 1-37 | ZW200417 | Screw, countersunk head 3x6 | | 3 |
| 1-38 | ZG317766 | Plunger Lever Spring | MR-19 | 1 |
| 1-39 | HZ425507 | P.B. Head Hold-down Table | MS-0005 | 1 |
| 1-40 | MS317891 | PH Shaft | MR-13 | 1 |
| 1-41 | HZ298012 | 4-TR Hold-down Base Guide | 3A-69 | 1 |
| 1-42 | ZW432663 | Screw, countersunk head 2.3x6 | | 1 |
| 1-43 | ZG317902 | PH Spring | MR-13 | 1 |
| 1-44 | ZW317913 | Spring Holder | MR-12 | 1 |
| 1-45 | ZW290283 | 'U' Ring 2.85M | 6-1-1 | 2 |
| 1-46 | HP384524 | P.B. HEAD P4-200 | | 1 |
| 1-47 | HZ428387 | Head Angle | MS-0007 | 1 |
| 1-48 | ZW201475 | Screw, pan head 2x3 | | 6 |
| 1-49 | HZ382667 | Triple-shield | RD-A3 | 1 |
| 1-50 | ZW426622 | Washer (SPC) D3.4x7.5x0.51 | | 2 |
| 1-51 | ZW403312 | Hexagon Bolt 3x4 | | 2 |
| 1-52x | EA463206 | P.C. Board, Terminal A | RD-A26 | 4 |
| 1-53 | HZ425520 | P.B. Head Adjust Table | MS-0006 | 1 |
| 1-54 | ZW202691 | Screw, round head 3x4 | | 2 |
| 1-55 | ZG425531 | P.B. Head Spring | MS-0008 | 3 |
| 1-56 | ZW345914 | Screw, round head 3x10 | | 4 |
| 1-57 | ZG303300 | Angle Adjust Spring B | RD-55 | 1 |
| 1-58 | ZG315011 | Brake Lever Spring | MR-116 | 2 |
| 1-59 | HR384513 | REC. HEAD R4-200 | | 1 |
| 1-60 | HZ425564 | RH Angle | MS-0009 | 1 |
| 1-61 | ZG206144 | Angle Adjust Spring | RD-16 | 3 |
| 1-62 | ZW336868 | Screw, round head 3x12 | | 3 |
| 1-63 | ZW273881 | Earth Lug, M4 | | 1 |
| 1-64 | HE412187 | ERASE HEAD E4-250 | | 1 |
| 1-65 | HZ425575 | Erase Head Base | MS-0010 | 1 |
| 1-66 | ZW323728 | Screw, binding head 3x5 | | 2 |
| 1-67 | HL425608 | Shifter Lever B, w/shaft | MS-0012 | 1 |
| 1-68 | ZW340672 | XR Idler Lever Screw | XR-370 | 1 |
| 1-69 | HZ425643 | Cancel Coil Table | MS-0016 | 1 |
| 1-70 | EO537208 | Hum Backing Coil 15T | 23-1-17 | 2 |
| 1-71 | ZW413223 | Screw, binding head 3x5, w/washer | | 2 |
| 1-72 | ZW323728 | Screw binding head 3x5 | | 2 |
| 1-73 | HZ231584 | Tape Guide B | RD-5 | 1 |
| 1-74 | ZW384840 | Set Screw 3x5 (cup) | | 1 |

## REEL MOTOR & REEL TABLE BLOCK

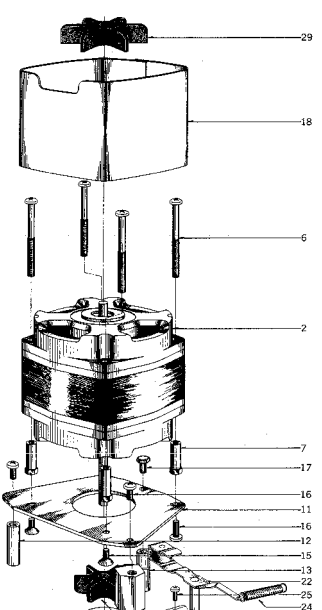
| Ref. No. | Parts No. | Description | Schematic No. | Q'ty |
|---|---|---|---|---|
| 2-1 | BM314741 | Reel Motor Block Comp. 24x0.2 | MS,MC, MR,KD | 1 |
| 2-2x | BR426036 | Reel Table Block Comp. (Take-up) | MS | 1 |
| 2-3x | BR426025 | Reel Table Block Comp. (Supply) | MS | 1 |
| 2-4 | MT425970 | MS Reel Table Disc | MS-2001 | 1 |
| 2-5 | MT255420 | Reel Retainer | SR-102 | 1 |
| 2-6 | MS342000 | Reel Shaft | SR-108 | 1 |
| 2-7 | ZG255633 | Reel Spring | SR-109 | 1 |
| 2-8 | MT297663 | 3R 'O' Ring 2.9x1.65M | 3R-139 | 1 |
| 2-9 | ZW270088 | 'E' Ring 1.9M | 6-1-9 | 1 |
| 2-10 | MT397225 | Reel Table Rubber | KD-2017 | 1 |
| 2-11 | MT495606 | Brake Drum (R) A (Take-up) | MR-216 | 1 |
| 2-12x | MT495617 | Brake Drum (L) A (Supply) | MR-216 | 1 |
| 2-13x | ZW273778 | Earth Lug, M3 | | 2 |
| 2-14x | ZW425981 | Screw, binding head 3x3 | | 2 |
| 2-15 | MT436860 | Brake Cloth Comp. | MR-269 | 1 |
| 2-16 | ZG317496 | Felt Tension Spring | MR-269 | 1 |
| 2-17 | ZW424056 | Screw, pan head 4x10 | | 2 |
| 2-18 | ZW425992 | Screw, countersunk head 3x8 | | 3 |
| 2-19 | MR426958 | Counter Pulley (Take-up) | MS-6012 | 1 |
| 2-20 | ZW516656 | Screw, countersunk head 2.3x8 | | 2 |
| 2-21 | MZ317373 | Brake Lever Prop | MR-102 | 2 |
| 2-22x | ZW413188 | Nut, M4 | | 2 |
| 2-23 | ML314976 | Brake Lever A (Take-up) | MR-210 | 1 |
| 2-24x | ML396810 | Brake Lever B (Supply) | KR-1018 | 1 |
| 2-25 | MR314987 | Brake Band | MR-213 | 2 |
| 2-26 | MZ314998 | Brake Band Retaining Plate | MR-212 | 4 |
| 2-27x | ZW417137 | Screw, binding head 3x4 | | 8 |
| 2-28 | MZ315000 | Brake Band Support | MR-214 | 2 |
| 2-29 | ZG315011 | Brake Lever Spring | MR-116 | 2 |
| 2-30 | ZW290283 | 'U' Ring 2.85M | 6-1-1 | 2 |
| 2-31x | ZW323728 | Screw, binding head 3x5 | | 4 |
| 2-32 | MZ317406 | Brake Band Guide, w/base | MR-120 | 2 |
| 2-33 | MB303535 | Counter Belt D91x1.6 | 3A-617 | 1 |

When ordering parts, please describe Parts Number, Serial Number, and Model Number in detail.

FIG. 2 ILLUSTRATION OF REEL MOTOR & REEL TABLE BLOCK



## FIG. 3 ILLUSTRATION OF MAIN MOTOR BLOCK

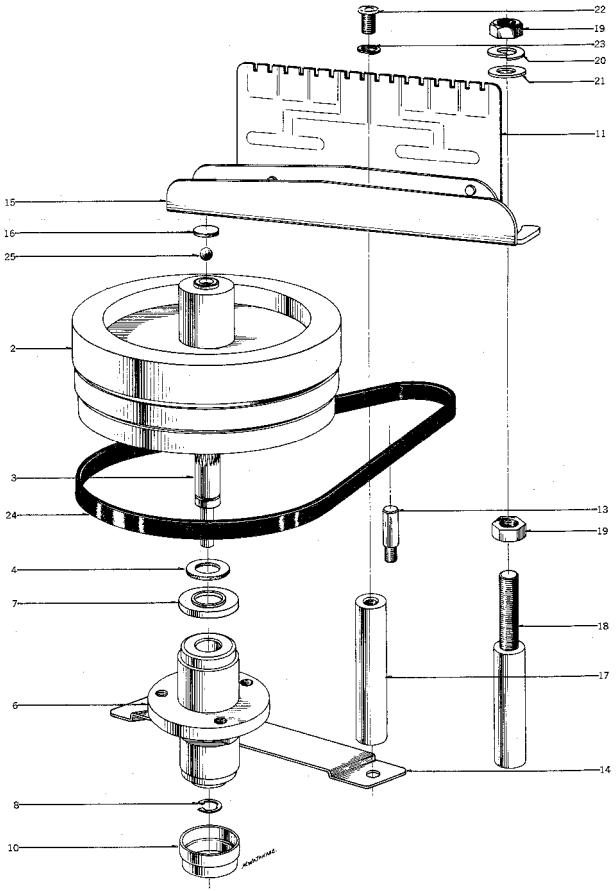



## MAIN MOTOR BLOCK

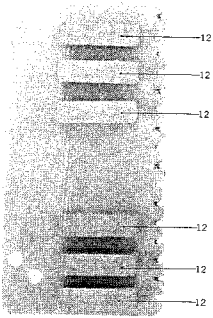
| Ref. No. | Parts No. | Description | Schematic No. | Q'ty |
|---|---|---|---|---|
| 3-1x | BM437040 | Main Motor Block Comp. | MS-3.3.MR | 1 |
| 3-2 | MZ448222 | 24 Motor Cover, w/metal | 24X-781 | 2 |
| 3-3x | ZW228025 | Thrust Adjust Washer A 0.1t | 24X-714 | 8 |
| 3-4x | ZW228036 | Thrust Adjust Washer B 0.25t | 24X-715 | 8 |
| 3-5x | ZW228194 | Thrust Washer (Nylon) 0.5t | 24X-717 | 2 |
| 3-6 | ZW201745 | Screw, pan head 4x50, w/washer | | 4 |
| 3-7 | MZ254327 | Motor Mt. Prop | 16X-707 | 4 |
| 3-8 | MZ316247 | MR Motor Fan | MR-719 | 1 |
| 3-9 | MR437602 | MC Motor Pulley | MC-7002 | 1. |
| 3-10 | ZW203016 | Screw, oval countersunk head 3x15 | | 4 |
| 3-11 | MZ316293 | MR Motor Mt. Plate | MR-717 | 1 |
| 3-12 | MZ254160 | Motor Prop A | 24X-730 | 1 |
| 3-13 | MZ254182 | Motor Prop B | 24X-731 | 1 |
| 3-14 | MZ316304 | MR Motor Prop | MR-706 | 1 |
| 3-15 | ZW427026 | Screw, countersunk head 4x10 | | 2 |
| 3-16 | ZW424056 | Screw, pan head 4x10 | | 4 |
| 3-17 | ZW272395 | M-7 Motor Prop Retaining Screw | 24X-732 | 1 |
| 3-18 | MZ316326 | Motor Out-side Shield (large) A | 10R-714 | 1 |
| 3-19x | MZ337724 | Motor Out-side Shield (large) B | 10R-716 | 1 |
| 3-20x | MZ292364 | XR Motor Shield Plate B | XR-705 | 1 |
| 3-21x | BL437038 | Belt Change Lever Block Comp. | B | 1 |
| 3-22 | ML437591 | Belt Change Lever D (small), w/roller | MC-7011 | 1 |
| 3-23 | MZ248354 | Belt Guide Stop, w/metal | 4TR-221 | 1 |
| 3-24 | ZG217337 | Belt Return Spring | 4TR 224 | 1 |
| 3-25 | ZW417150 | Screw, pan head 4x6 | | 1 |
| 3-26x | ZG217394 | Belt Change Spring B | MH-125 | 1 |
| 3-27x | ZW260054 | Washer (SUF) D6.1x10x0.25t | | 1 |
| 3-28x | ZW290283 | 'U' Ring 2.85M | 6-1-1 | 1 |
| 3-29 | MZ254441 | Motor Fan (large) | BD-640 | 1 |
| 3-30x | MZ404820 | Dust Cover Plate (Nylon)D24x1t | BD-A640 | 1 |

When ordering parts, please describe Parts Number, Serial Number, and Model Number in detail.

FIG. 4A ILLUSTRATION OF FLYWHEEL BLOCK



## FIG. 4B PHOTO OF FLYWHEEL BLOCK

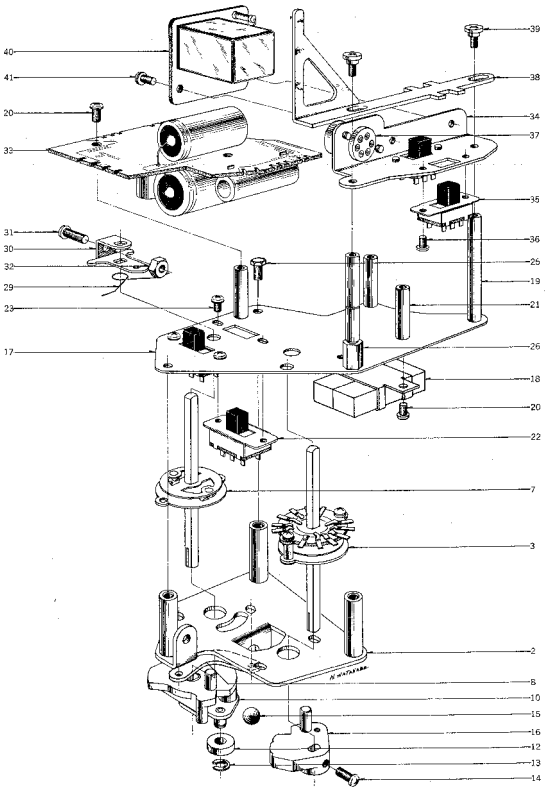



## FLYWHEEL BLOCK

| Ref. No. | Parts No. | Description | Schematic No. | Q'ty |
|---|---|---|---|---|
| 4-1x | BF476550 | Flywheel Block Comp. | MS 1.1,MR | 1 |
| 4-2 | MZ296245 | Flywheel 24 | MR-202 | 1 |
| 4-3 | MS476572 | D6 Main Shaft | MR-1005 | 1 |
| 4-4 | ZW447208 | Flywheel Thrust B D7.9x13x0.5t | 101025 | 1 |
| 4-5x | ZW373577 | Set Screw, hexagon socket 5x6 (flat) | | 2 |
| 4-6 | MZ296256 | Main Case A 24, w/metal | MH 206 | 1 |
| 4-7 | MZ446635 | Thrust Cap, Main Metal B2 | LF-2096 | 1 |
| 4-8 | ZW244710 | Flywheel Fixing Pin | 990-250 | 1 |
| 4-9x | MZ244113 | Felt D12.5x16x2t | | 1 |
| 4-10 | MZ253113 | Main Metal Cap B | MH-208 | 1 |
| 4-11 | BA334541 | Spark Quencher P.C. Board Comp. (MR-507) | | 1 |
| 4-12 | ER450797 | Spark Quencher U/L 0.033μ+120 400WV | 41-1-24 | 6 |
| 4-13 | MZ248343 | Belt Guide Pin | 478-109 | 1 |
| 4-14 | MB439525 | Flywheel Belt Holding Plate B | MS-1014 | 1 |
| 4-15 | MZ314897 | Flywheel Supporting Plate MR | MR-121 | 1 |
| 4-16 | ZW392681 | Washer, without hole (Nylon) D8x1t | | 1 |
| 4-17 | MZ273036 | M9 Flywheel Prop A | M9-310 | 1 |
| 4-18 | MZ273047 | M9 Flywheel Prop B | M9-311 | 1 |
| 4-19 | ZW413280 | Inch Nut, 1/4" (P20) | | 2 |
| 4-20 | ZW393232 | Spring Washer, 1/4" | | 1 |
| 4-21 | ZW413998 | Washer (SUF) D6.8x12.7x1t | | 1 |
| 4-22 | ZW413201 | Screw, pan head 4x8 | | 1 |
| 4-23 | ZW273914 | Spring Washer, M4 | | 1 |
| 4-24 | MB437703 | MC Flywheel Belt | MC-1015 | 1 |
| 4-25 | MV269965 | Steel Ball D4 | | 1 |
| 4-26x | ZW323728 | Screw, binding head 3x5 | | 2 |

When ordering parts, please describe Parts Number, Serial Number, and Model Number in detail.

FIG. 5 ILLUSTRATION OF SWITCH BLOCK



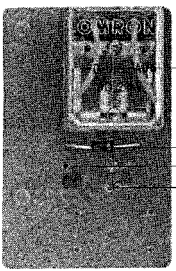
## SWITCH BLOCK

| Ref. No. | Parts No. | Description | Schematic No. | Q'ty |
|---|---|---|---|---|
| 5-1x | BS433787 | Switch Block Comp. | MS | 1 |
| 5-2 | HZ402390 | Switch Table A-2 (MR), w/prop | MR-201 | 1 |
| 5-3 | ES425924 | Play Shaft (Y Type) Y-263-2 | 25-7-24 | 1 |
| 5-4x | ZW460157 | Washer (SPC) D3.1x8x0.8t | | 2 |
| 5-5x | ZW346107 | ISO Nut, M3 | | 2 |
| 5-6x | ER345756 | Carbon/R. RD1/4 68k (J) (Insu. type) | 25-8-5 | 1 |
| 5-7 | ES316934 | Y type Rwd Shaft | 25-8-5 | 1 |
| 5-8 | MZ316945 | Nut Plate | MR-245 | 1 |
| 5-9x | ZW413728 | Screw, binding head 3x6, w/washer | | 2 |
| 5-10 | MZ316956 | Cam A-3, w/plate | MR-242 | 1 |
| 5-11x | ZW259942 | Washer(Fiber) D5.1x10.3x0.5t | | 1 |
| 5-12 | MK269730 | Cam Roller D12 | 900-218 | 1 |
| 5-13 | ZW290283 | 'U' Ring 2.85M | 6-1-1 | 1 |
| 5-14 | ZW413201 | Screw, pan head 4x8 | | 2 |
| 5-15 | MV270066 | Steel Ball D8 | | 1 |
| 5-16 | MZ217271 | Cam B, without tap | 900-206 | 1 |
| 5-17 | MZ316967 | Control Chassis | MR-202 | 1 |
| 5-18 | ER477663 | Cement/R. H (15+15) H1A (22.5+22.5) K220J | 35-16-33 | 1 |
| 5-19 | MZ316978 | Cycle Switch Prop | MR-207 | 1 |
| 5-20 | ZW413223 | Screw, binding head 3x5, w/washer | | 7 |
| 5-21 | MZ364691 | Sys. Con. P.C. Board Prop | MR-284 | 3 |
| 5-22 | ES375478 | Slide Switch ESD-279DU | 25-3-23 | 2 |
| 5-23 | ZW371856 | ISO Screw, binding head 3x5 | | 3 |
| 5-24x | ER376413 | Spark Quencher U/L 0.033μ+120 500WV | 41-1-37 | 1 |
| 5-25 | MZ425935 | Hexagon Bolt 4x8, w/washer | | 2 |
| 5-26 | MZ317046 | Rec. Lever Prop | MR-206 | 1 |
| 5-27x | MZ373318 | Nylon Clip HP-3N | | 1 |
| 5-28x | ZW321298 | ISO Screw, binding head 3x8 | | 1 |
| 5-29 | ZG225516 | Switch Spring | MR-255 | 1 |
| 5-30 | MZ317024 | Switch Cam | MR-204 | 1 |
| 5-31 | ZW424056 | Screw, pan head 4x10 | | 1 |
| 5-32 | ZW413188 | Nut, M4 | | 1 |
| 5-33 | BA324088 | Sys. Con. P.C. Board Comp. (MR-504) | | 1 |
| 5-34 | MZ425946 | Frequency Switch Table | MS-1902 | 1 |
| 5-35 | ES317531 | Slide Switch ESD-271DU | 25-3-24 | 2 |
| 5-36 | ZW384131 | Screw, round head 3x5 | | 4 |
| 5-37 | EJ365703 | 6P Socket | 31-1-67 | 1 |
| 5-38 | ML317542 | Cycle Change Lever MR | MR-209 | 1 |
| 5-39 | ZW207314 | Amp. Lever Set Screw | 3A-737 | 2 |
| 5-40 | BA317081 | Tension Relay P.C. Board Comp. (MR-558) | | 1 |
| 5-41 | ZW413223 | Screw, binding head 3x5, w/washer | | 2 |
| 5-42x | EJ293062 | 12P Mate-N-Lock Cap Housing 1-480278-0 | 52-1-1 | 1 |
| 5-43x | EJ373623 | Pin Contact 61116-1 | 52-1-1 | 12 |
| 5-44x | EJ317125 | 5P TV-Consent-Plug | 42-1-6 | 1 |

When ordering parts, please describe Parts Number, Serial Number, and Model Number in detail.

| Ref. No. | Parts No. | Description | Schematic No. | Q'ty |
|---|---|---|---|---|
| 6-84x | ZW330434 | Adjust Washer(U) D4x13x0.5t | | 1 |
| 6-85x | ZW330445 | Adjust Washer (U) D4x13x0.8t | | 1 |
| 6-86 | ML314763 | MR Lever B, w/lever D | MR-122 | 1 |
| 6-87 | MR314785 | Cam Roller D9 | MR-257 | 1 |
| 6-88 | ZW290283 | 'U' Ring 2.85M | 6-1-1 | 6 |
| 6-89 | ZG314818 | D Lever Spring | MR-134 | 1 |
| 6-90 | ML334506 | MR Lever A, w/metal | MR-126 | 1 |
| 6-91 | ML314842 | MR Lever C | MR-106 | 1 |
| 6-92x | ZW419826 | Washer (Fiber) D6.2x10x1t | | 2 |
| 6-93 | ML314864 | IB Lever | MR-113 | 1 |
| 6-94 | MZ260662 | AS Lever Prop Base, w/prop | 4TR-136 | 1 |
| 6-95x | ZW302116 | Screw, binding head 3x5, w/lug | | 1 |
| 6-96 | MZ218125 | Gear Stopper | 4TR-126 | 1 |
| 6-97 | ZG226697 | Stopper Spring | 4TR-123 | 1 |
| 6-98 | ML228868 | Auto Mech. Control Lever | 4TR-125 | 1 |
| 6-99 | ZW260087 | Washer (Fiber) D6.1x10x0.5t | | 1 |
| 6-100 | ML314932 | MR Pinch Roller Lever | MR-119 | 1 |
| 6-101 | MS243404 | Pinch Roller Shaft C | 4TR-102 | 1 |
| 6-102x | ZW259975 | Washer (SUP) D5.1x10.3x0.8t | | 1 |
| 6-103 | ZW413188 | Nut, M4 | | 4 |
| 6-104 | MR269763 | Cam Roller D13 | 901-154 | 1 |
| 6-105 | MS217192 | Cam Roller Shaft A | 900-170 | 1 |
| 6-106 | ZG455692 | Pinch Roller Spring (MS) | MS-1015 | 1 |
| 6-107 | ML453790 | Shifter Lever A | MS-1003 | 1 |
| 6-108x | ZW413223 | Screw, binding head 3x5, w/washer | | 2 |
| 6-109 | MZ425801 | Shifter Stand, w/pin | MS-1004 | 1 |
| 6-110 | ZW323728 | Screw, binding head 3x5 | | 1 |
| 6-111x | ZW314943 | D8 Washer | MR-113 | 1 |
| 6-112 | ML314976 | Brake Lever A (Take-up) | MR-210 | 1 |
| 6-113 | MB314987 | Brake Band | MR-212 | 2 |
| 6-114x | MZ314998 | Brake Band Retaining Plate | MR-212 | 4 |
| 6-115 | ZW417137 | Screw, binding head 3x4 | | 8 |
| 6-116 | MZ315000 | Brake Band Support | MR-214 | 2 |
| 6-117 | ZG315011 | Brake Lever Spring | MR-116 | 2 |
| 6-118x | ML396510 | Brake Lever B (Supply) | KD-1038 | 1 |
| 6-119 | HZ315077 | Reverse Guide Base w/prop | MR-229 | 1 |
| 6-120 | HZ315090 | Reverse Guide | RD-225 | 1 |
| 6-121x | ZW344463 | Set Screw, hexagon socket 4x6 (cup) | | 1 |
| 6-122 | ES488935 | Tension Switch Comp. MS-2 | MS-1011 | 1 |
| 6-123 | MZ381701 | Switch Angle Base | MR-262 | 1 |
| 6-124x | ZW273778 | Earth Lug, M3 | | 1 |
| 6-125x | ZW427048 | Screw, round head 3x3 | | 2 |
| 6-126 | MZ210071 | Auto. Switch Plate | MR-134 | 1 |
| 6-127 | ES375478 | Slide Switch ESD-279DU | 25-1-23 | 1 |
| 6-128 | ZW440291 | ISO Screw, countersunk head 3 x6 | | 2 |
| 6-129 | ES438535 | Micro Switch V-1A442 U/L | 23-1-15 | 2 |
| 6-130x | ER376435 | Spark Quencher U/L 0.1μ+120 250WV | 41-1-25 | 1 |
| 6-131x | ZW486358 | Screw, round head 3x15 | | 3 |
| 6-132x | ZW439514 | Screw, binding head 3x18 | | 1 |
| 6-133 | ML316396 | Operation Switch Lever | MR-112 | 1 |
| 6-134x | ZW270088 | 'E' Ring 1.9M | 6-1-9 | 1 |
| 6-135 | ZW425788 | Screw, round head 3x4 | | 3 |
| 6-136 | ML316427 | MR Pause Lever, w/lever B | MR-233 | 1 |
| 6-137 | ZW217877 | Pause Lever Retaining Screw | 900-136 | 1 |
| 6-138 | MZ316451 | M-7 Pause Stopper | MR-136 | 1 |
| 6-139 | ZG301061 | Pause Spring 990A | 4TR-128 | 1 |
| 6-140 | ML316440 | Shut-off Switch Lever | MR-234 | 1 |
| 6-141 | ZW323728 | Screw, binding head 3x5 | | 6 |
| 6-142 | ZW207314 | Amp. Lever Set Screw | 3A-737 | 1 |
| 6-143 | MC399521 | Counter M-470D | 9-1-14 | 1 |
| 6-144 | MB303535 | Counter Belt D91x1.6 | 3A-617 | 1 |
| 6-145 | MZ317406 | Brake Band Guide, w/base | MR-120 | 2 |
| 6-146 | BL316484 | AS Lever Comp. | MS,MR,MC | 1 |
| 6-147 | ZG260706 | AS Lever Spring | 4TR-138 | 1 |
| 6-148 | ZW290294 | 'U' Ring 2.55M | 6-1-1B | 1 |
| 6-149x | MP271170 | LC Pinch Roller | LC-231 | 1 |
| 6-150x | EJ205975 | Cramp Terminal 1-SD | 32-1-7 | 2 |
| 6-151 | ZG217394 | Belt Change Spring B | μB-125 | 1 |

## FIG. 7 PHOTO OF TENSION RELAY P.C. BOARD (MR-558)

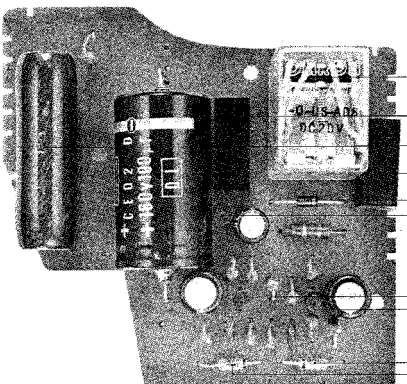



## TENSION RELAY P.C. BOARD (MR-558) BLOCK

| Symbol No. | Parts No. | Description | Q'ty |
|---|---|---|---|
| 7-1x | BA317081 | Tension Relay P.C. Board Comp. (MR-558) | 1 |
| 7-TR0401 | ET234808 | Transistor 2SC372(Y) | 1 |
| 7-D0401 | ED219464 | Germanium Diode 1N34A | 1 |
| 7-D0402 | ED224526 | Silicon Diode 10D1 | 1 |
| 7-RL0401 | EP325585 | Relay MY2-O-US-AD6-24V | 1 |
| 7-R0401 | ER212264 | Carbon Resistor RD1/4 22k(J) (Stop. type) | 1 |

When ordering parts, please describe Parts Number, Serial Number, and Model Number in detail.

## FIG. 8 PHOTO OF SYS. CON. P.C. BOARD (MR-504)

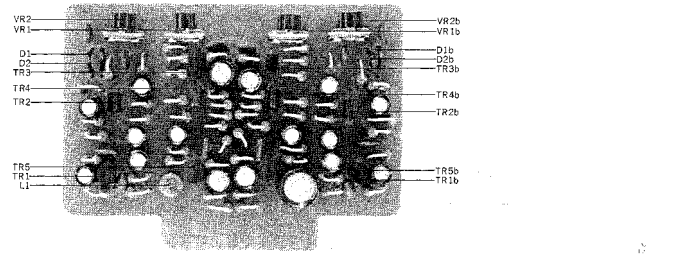



## SYS. CON. P.C. BOARD (MR-504) BLOCK

| Symbol No. | Parts No. | Description | Q'ty |
|---|---|---|---|
| 8-1x | BA324088 | Sys. Con. P.C. Board Comp. (MR-504) | 1 |
| 8-TR0201,2 | ET398711 | Transistor 2SC945(Q)(R) | 2 |
| 8-TR0203 | ET430907 | Transistor 2SC1211(C)(D) | 1 |
| 8-D0201 | ED224526 | Silicon Diode 10D1 | 1 |
| 8-D0202 | ED224550 | Silicon Diode 10D4 | 1 |
| 8-D0203,4 | ED219464 | Germanium Diode 1N34A | 2 |
| 8-CR0201 | ER376424 | Spark Quencher U/L 0.1μ+120 500WV | 1 |
| 8-CR0202 | ER450786 | Spark Quencher U/L 0.1μ+120 400WV | 1 |
| 8-RL0201 | EP316001 | Relay MY4-O-US-AD8 20V | 1 |
| | | **Capacitor, Vertical Type** | |
| 8-C0201 | EC320040 | Elect. 47μF 16WV | 1 |
| 8-C0202 | EC220127 | Elect. 100μF 16WV | 1 |
| 8-C0203,4 | EC251087 | Mylar 0.022μF(K) 50WV | 2 |
| 8-C0205 | EC220127 | Elect. 100μF 16WV | 1 |
| 8-C0206 | EC316091 | Elect. 100μF 160WV (Tub. type) | 1 |
| 8-C0207 | EC316113 | Elect. 47μF 160WV (Tub. type) | 1 |
| 8-C0208 | EC308711 | Mylar 0.047μF(K) 50WV | 1 |

| Symbol No. | Parts No. | Description | Q'ty |
|---|---|---|---|
| | | **Resistor, Stopper Type** | |
| 8-R0201 | ER357456 | Carbon RD1/4 2.2k(J) | 1 |
| 8-R0202 | ER336442 | Carbon RD1/4 10k(J) | 1 |
| 8-R0203 | ER346601 | Carbon RD1/4 47k(J) | 1 |
| 8-R0204,5 | ER336442 | Carbon RD1/4 10k(J) | 2 |
| 8-R0206,7 | ER342933 | Carbon RD1/4 27k(J) | 2 |
| 8-R0208 | ER361642 | Carbon RD1/4 47(J) | 2 |
| 8-R0209 | ER336442 | Carbon RD1/4 10k(J) | 1 |
| 8-R0210 | ER357456 | Carbon RD1/4 2.2k(J) | 1 |
| 8-R0211 | ER316078 | Solid RC1/2W 1.8k(K) | 1 |
| 8-R0212 | ER380711 | Carbon RD1/4 220k(J) | 1 |
| 8-R0213 | ER316080 | Enamel RWH15G 1.5k(J) (Term. type) | 1 |

## FIG. 11 PHOTO OF NOISE REDUCTION P.C. BOARD (MS-5215)



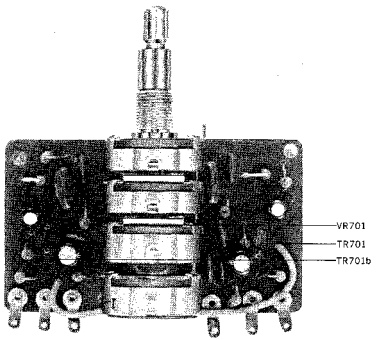

## NOISE REDUCTION P.C. BOARD (MS-5215) BLOCK

| Symbol No. | Parts No. | Description | Q'ty |
|---|---|---|---|
| 11-1x | BA487405 | Noise Reduction P.C. Board Comp. (MS-5215) | 1 |
| 11-TR1 | ET380834 | Transistor 2SC711(E) | 2 |
| 11-TR2,3,4 | ET234854 | Transistor 2SC458LG(C) | 6 |
| 11-TR5 | ET380834 | Transistor 2SC711(E) | 2 |
| 11-D1,2 | ED514721 | Silicon Diode WG-599 | 4 |
| 11-L1 | EO243988 | Ferri inductor FL7H 3.3MH(J) | 1 |
| 11-VR1 | EV498071 | Semi-fixed Volume V10KB-1-5 1kB (4US) | 2 |
| 11-VR2 | EV499353 | Semi-fixed Volume V10KB-1-5 300kB | 2 |
| | | **Capacitor, Vertical Type** | |
| 11-C1 | EC320051 | Elect. 10μF 16WV | 2 |
| 11-C2 | EC474671 | VFM 10PF(K) 50WV | 2 |
| 11-C3 | EC450527 | Elect. 4.7μF 25WV | 2 |
| 11-C4 | EC411827 | Mylar 0.0082μF(J) 50WV | 2 |
| 11-C5 | EC220432 | Elect. 2.2μF 25WV | 2 |
| 11-C6 | EC478945 | Elect. 2.2μF 25WV(Noiseless) | 2 |
| 11-C7 | EC350875 | Mylar 0.001μF(J) 50WV | 2 |
| 11-C8 | EC220432 | Elect. 2.2μF 25WV | 2 |
| 11-C9 | EC380621 | Mylar 0.0068μF(J) 50WV | 2 |
| 11-C10 | EC220994 | Elect. 10μF 25WV | 2 |
| 11-C11 | EC350875 | Mylar 0.001μF(J) 50WV | 2 |
| 11-C12 | EC220432 | Elect. 2.2μF 25WV | 2 |
| 11-C13 | EC311793 | Mylar 0.012μF(J) 50WV | 2 |
| 11-C14 | EC220994 | Elect. 10μF 25WV | 2 |
| 11-C15 | EC220151 | Elect. 100μF 25WV | 1 |

| Symbol No. | Parts No. | Description | Q'ty |
|---|---|---|---|
| | | **Resistor, Stopper Type** | |
| 11-R1 | ER350100 | Carbon RD1/4 68k(J) | 2 |
| 11-R2 | ER346601 | Carbon RD1/4 47k(J) | 2 |
| 11-R3 | ER363644 | Carbon RD1/4 560(J) | 2 |
| 11-R4 | ER343078 | Carbon RD1/4 2.7k(J) | 2 |
| 11-R5 | ER212477 | Carbon RD1/4 3.3k(J) | 2 |
| 11-R6 | ER380711 | Carbon RD1/4 220k(J) | 2 |
| 11-R7 | ER212264 | Carbon RD1/4 22k(J) | 2 |
| 11-R8 | ER357456 | Carbon RD1/4 2.2k(J) | 2 |
| 11-R9 | ER361563 | Carbon RD1/4 180(J) | 2 |
| 11-R11 | ER343078 | Carbon RD1/4 2.7k(J) | 2 |
| 11-R12 | ER211465 | Carbon RD1/4 1k(J) | 2 |
| 11-R13 | ER362024 | Carbon RD1/4 820k(J) | 2 |
| 11-R14 | ER361528 | Carbon RD1/4 56k(J) | 2 |
| 11-R15 | ER213030 | Carbon RD1/4 5.6k(J) | 2 |
| 11-R16 | ER361563 | Carbon RD1/4 180(J) | 2 |
| 11-R17 | ER212477 | Carbon RD1/4 3.3k(J) | 2 |
| 11-R18 | ER357456 | Carbon RD1/4 2.2k(J) | 2 |
| 11-R19 | ER429996 | Carbon RD1/4 470k(J) | 2 |
| 11-R20 | ER361528 | Carbon RD1/4 56k(J) | 2 |
| 11-R21 | ER212883 | Carbon RD1/4 4.7k(J) | 2 |
| 11-R22,23 | ER304402 | Carbon RD1/4 470(J) | 4 |
| 11-R24 | ER420322 | Carbon RD1/4 36k(J) | 2 |
| 11-R25 | ER211757 | Carbon RD1/4 100k(J) | 2 |
| 11-R26 | ER212883 | Carbon RD1/4 4.7k(J) | 2 |
| 11-R27 | ER336442 | Carbon RD1/4 10k(J) | 2 |
| 11-R28 | ER357456 | Carbon RD1/4 2.2k(J) | 2 |

When ordering parts, please describe Parts Number, Serial Number, and Model Number in detail.

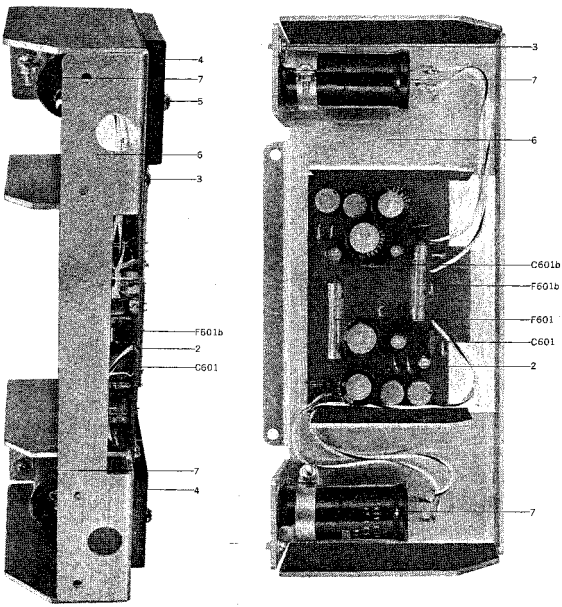
FIG. 12 PHOTO OF TONE CONTROL P.C. BOARD (MS-5028)




## TONE CONTROL P.C. BOARD (MS-5028) BLOCK

| Symbol No. | Parts No. | Description | Q'ty |
|---|---|---|---|
| 12-1x | BA426126 | Tone Control P.C. Board Comp. (MS-5028) | 1 |
| 12-TR701 | ET398711 | Transistor 2SC945(Q)(R) | 2 |
| 12-VR701 | EV424743 | Dual-axial 4-throw Volume KJ-60R 50kAx4 | 1 |
| | | **Capacitor, Vertical Type** | |
| 12-C701 | EC320051 | Elect. 10μF 16WV | 2 |
| 12-C702 | EC220994 | Elect. 10μF 25WV | 2 |
| 12-C703 | EC368335 | Mylar 0.022μF(J) 50WV | 2 |
| 12-C704 | EC250683 | Mylar 0.0022μF(J) 50WV | 2 |
| 12-C705 | EC438041 | Mylar 0.082μF(J) 50WV | 2 |
| 12-C706 | EC329861 | Mylar 0.027μF(J) 50WV | 2 |
| | | **Resistor, Stopper Type** | |
| 12-R701 | ER212264 | Carbon RD1/4 22k(J) | 2 |
| 12-R702 | ER429996 | Carbon RD1/4 470k(J) | 2 |
| 12-R703,4 | ER336442 | Carbon RD1/4 10k(J) | 4 |
| 12-R705 | ER357456 | Carbon RD1/4 2.2k(J) | 2 |
| 12-R706 | ER306360 | Carbon RD1/4 6.8k(J) | 2 |

FIG. 13 PHOTO OF MAIN AMP. BLOCK




## MAIN AMP. BLOCK

| Symbol No. | Parts No. | Description | Q'ty |
|---|---|---|---|
| 13-1x | BA432742 | Main Amp. Block Comp. | 1 |
| 13-2 | BA426183 | Main Amp. P.C. Board Comp. (MS-5024) | 1 |
| 13-3 | ZW200687 | Tapping Screw #2 3x6 (round) | 8 |
| 13-4 | EI425193 | Power Amp. I.C. STK-015 | 2 |
| 13-5 | ZW325056 | Tapping Screw #2 3x12 (round) | 4 |
| 13-6 | EZ425204 | Main Amp. Head-sink | 1 |
| 13-7 | EC233100 | Elect. 1000μF 35WV (Lug. type) | 2 |
| | | **MAIN AMP. P.C. BOARD (MS-5024) BLOCK** | |
| 13-2 | BA426183 | Main Amp. P.C. Board Comp. (MS-5024) | 1 |
| 13-F601 | EF460653 | Fuse ST-1 1A | 2 |

| Symbol No. | Parts No. | Description | Q'ty |
|---|---|---|---|
| | | **Capacitor, Vertical Type** | |
| 13-C601 | EC337487 | Hi-Q 470PF(J) 50WV | 2 |
| 13-C602 | EC331705 | Elect. 22μF 16WV | 2 |
| 13-C603 | EC220678 | Elect. 47μF 25WV | 2 |
| 13-C604 | EC372148 | Elect. 220μF 35WV | 2 |
| 13-C605 | EC251291 | Mylar 0.1μF(K) 50WV | 2 |
| 13-C606 | EC220678 | Elect. 47μF 25WV | 2 |
| 13-C607 | EC324538 | Elect. 330μF 25WV | 2 |
| 13-C608 | EC350684 | Elect. 22μF 25WV | 2 |
| 13-C610 | EC308711 | Mylar 0.047μF(K) 50WV | 2 |
| | | **Resistor, Stopper Type** | |
| 13-R601 | ER336442 | Carbon RD1/4 10k(J) | 2 |
| 13-R602 | ER361642 | Carbon RD1/4 47(J) | 2 |
| 13-R603 | ER357456 | Carbon RD1/4 2.2k(J) | 2 |
| 13-R604 | ER399723 | Carbon RD1/4 4.7(J) | 2 |

When ordering parts, please describe Parts Number, Serial Number, and Model Number in detail.

FIG. 14 PHOTO OF
OSC. P.C. BOARD (MS-5025)

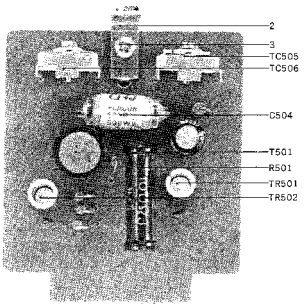
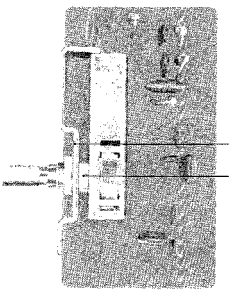



FIG. 15 PHOTO OF
EQUALIZER P.C. BOARD (MS-5027)



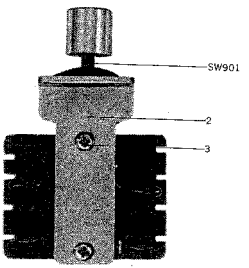

## OSC. P.C. BOARD (MS-5025) BLOCK

| Symbol No. | Parts No. | Description | Q'ty |
|---|---|---|---|
| 14-1x | BA426194 | OSC. P.C. Board Comp. (MS-5025) | 1 |
| 14-TR501,2 | ET304255 | Transistor 2SC971(2)(3) (Red) | 2 |
| 14-T501 | EO383365 | OSC. Coil OT-204 | 1 |
| 14-TC505,6 | EC425250 | Trimmer Condenser A-1P3-3 70PF | 2 |
| 14-2 | FZ425226 | P.C. Board Retaining Metal | 1 |
| 14-3 | ZW413155 | Screw, binding head 3x6 | 1 |
| 14-4x | ZW273756 | Nut, M3 | 1 |
| 14-5x | ZW780401 | Nut, M3 | 1 |
| | | **Capacitor, Vertical Type** | |
| 14-C501 | EC220151 | Elect. 100μF 25WV | 1 |
| 14-C502,3 | EC250841 | Mylar 0.01μF(J) 50WV | 2 |
| 14-C504 | EC520492 | Styrol 5600PF(J) 50WV (Tub. type) | 1 |
| | | **Resistor, Stopper Type** | |
| 14-R501 | ER425237 | Wire-wound 3WL 100(J) (L type) | 1 |
| 14-R502,3 | ER315944 | Carbon RD1/4 3.3(J) | 2 |
| 14-R504 | ER212883 | Carbon RD1/4 4.7k(J) | 1 |
| 14-R505 | ER304402 | Carbon RD1/4 470(J) | 1 |
| 14-R506 | ER538536 | Carbon RD1/2 3.9k(J) (Insu. type) | 1 |

## EQUALIZER P.C. BOARD (MS-5027) BLOCK

| Symbol No. | Parts No. | Description | Q'ty |
|---|---|---|---|
| 15-1x | BA426115 | Equalizer P.C. Board Comp. (MS-5027) | 1 |
| 15-SW801 | ES424710 | Rotary Switch SRG-R083 | 1 |
| 15-2 | EZ424721 | Equalizer Switch Base | 1 |
| | | **Capacitor, Vertical Type** | |
| 15-C801 | EC250683 | Mylar 0.0022μF(J) 50WV | 1 |
| 15-C802 | EC336216 | VFM 330PF(J) 50WV | 1 |
| 15-C803 | EC250683 | Mylar 0.0022μF(J) 50WV | 1 |
| 15-C804 | EC336216 | VFM 330PF(J) 50WV | 1 |
| 15-C805 | EC424708 | Mylar 0.0018μF(J) 50WV | 1 |
| 15-C806 | EC411827 | Mylar 0.0082μF(J) 50WV | 1 |
| 15-C807 | EC368357 | Mylar 0.056μF(J) 50WV | 1 |
| 15-C808 | EC424708 | Mylar 0.0018μF(J) 50WV | 1 |
| 15-C809 | EC411827 | Mylar 0.0082μF(J) 50WV | 1 |
| 15-C810 | EC368357 | Mylar 0.056μF(J) 50WV | 1 |
| | | **Resistor, Stopper Type** | |
| 15-R801 | ER213030 | Carbon RD1/4 5.6k(J) | 1 |
| 15-R802 | ER420322 | Carbon RD1/4 36k(J) | 1 |
| 15-R803 | ER213030 | Carbon RD1/4 5.6k(J) | 1 |
| 15-R804 | ER420322 | Carbon RD1/4 36k(J) | 1 |

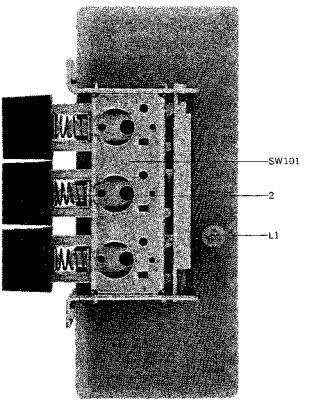
FIG. 16. PHOTO OF
SRT P.C. BOARD (MS-5029)




## SRT P.C. BOARD (MS-5029) BLOCK

| Symbol No. | Parts No. | Description | Q'ty |
|---|---|---|---|
| 16-1x | BA426093 | SRT P.C. Board Comp. (MS-5029) | 1 |
| 16-SW901 | ES426971 | Push Switch UEG-62L, without Knob | 1 |
| 16-2 | EZ424653 | SRT Holder | 1 |
| 16-3 | ZW375107 | Screw, pan head 2.6x4 | 2 |
| | | Capacitor, Vertical Type | |
| 16-C901,2 | EC368357 | Mylar 0.056μF(J) 50WV | 2 |
| 16-C903,4 | EC311793 | Mylar 0.012μF(J) 50WV | 2 |
| 16-C905,6 | EC250841 | Mylar 0.01μF(J) 50WV | 2 |

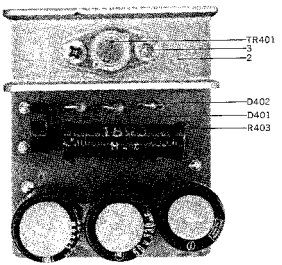
FIG. 17 PHOTO OF
TRACK SELECTOR P.C. BOARD (MS-5055)




## TRACK SELECTOR P.C. BOARD (MS-5055) BLOCK

| Symbol No. | Parts No. | Description | Q'ty |
|---|---|---|---|
| 17-1x | BA426104 | Track Selector P.C. Board Comp. (MS-5055) | 1 |
| 17-SW101 | ES448053 | Push Switch SPT-034A13 | 1 |
| 17-L1 | EO374681 | Ferri Inductor FL7H 220μH(K) | 1 |
| 17-2 | SK383095 | TUM Knob | 3 |

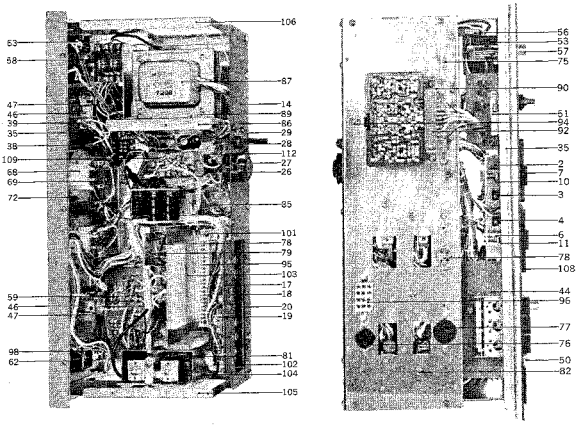
FIG. 18 PHOTO OF
POWER SUPPLY P.C. BOARD (MS-5030)




## POWER SUPPLY
## P.C. BOARD (MS-5030) BLOCK

| Symbol No. | Parts No. | Description | Q'ty |
|---|---|---|---|
| 18-1x | BA426150 | Power Supply P.C. Board Comp. (MS-5030) | 1 |
| 18-TR401 | ET424833 | Transistor 2SD223(Y)(G) | 1 |
| 18-D401 | ED329130 | Silicon Diode 10DC-1(black) | 1 |
| 18-D402 | ED511918 | Zener Diode WZ-240 | 1 |
| 18-2 | EZ315426 | Heat-sink Plate | 1 |
| 18-3 | ZW413741 | Screw, binding head 3x8 | 2 |
| 18-4x | ZW273756 | Nut, M3 | 2 |
| | | **Capacitor, Vertical Type** | |
| 18-C401,2 | EC403468 | Elect. 330μF 50WV | 2 |
| 18-C403 | EC324538 | Elect. 330μF 25WV | 1 |
| | | **Resistor, Stopper Type** | |
| 18-R401 | ER212883 | Carbon RD1/4 4.7k(J) | 1 |
| 18-R402 | ER361642 | Carbon RD1/4 47(J) | 1 |
| 18-R403 | ER413717 | Wire-wound 3WL 18(J) (L type) | 1 |

FIG. 19 PHOTO OF AMPLIFIER ASSEMBLY BLOCK



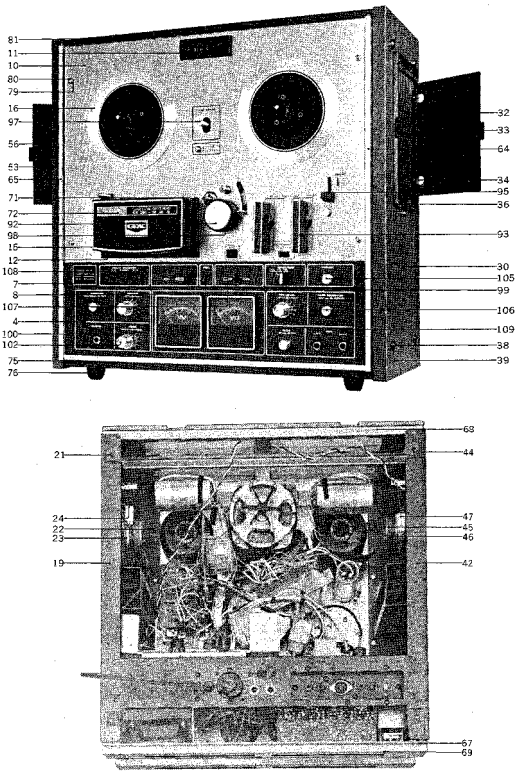
# AMPLIFIER ASSEMBLY BLOCK

| Ref. No. | Parts No. | Description | Schematic No. | Q'ty |
|---|---|---|---|---|
| | | **DS SWITCH BLOCK** | | |
| 19-1x | BZ426082 | DS Switch Block Comp. | MS | 1 |
| 19-2 | EZ424574 | DS Switch Table | MS-5002 | 1 |
| 19-3 | ES424585 | Leaf Switch A LSA-1127A (Right) | 25-10-2 | 1 |
| 19-4 | ES424596 | Leaf Switch B LSA-1127B (Left) | 25-10-1 | 1 |
| 19-5x | ZW355601 | Screw, binding head 2x5 | | 2 |
| 19-6 | EZ424607 | Direction Change Plate | MS-5003 | 2 |
| 19-7 | SB424618 | Direction Change Bottun | MS-5004 | 2 |
| 19-8x | ZW424620 | Screw, pan head 3x10 | | 2 |
| 19-9x | ZW388618 | Spring Washer | CS-2054 | 2 |
| 19-10 | ZG388607 | Function Spring B | CS-2053 | 2 |
| 19-11 | ZW391206 | Spring Washer B | CS-2054B | 2 |
| | | **REAR PANEL BLOCK** | | |
| 19-12x | SP432606 | Rear Panel Block Comp. (Deck) | MSD | 1 |
| 19-13x | BZ426137 | Rear Panel Block Comp. (GX-221) | MSA | 1 |
| 19-14 | EZ424776 | Rear Chassis B | MS-5031 | 1 |
| 19-15x | EZ424765 | Rear Chassis A (GX-221) | MS-5031 | 1 |
| 19-16x | BZ426148 | Jack Plate Block Comp. | MS | 1 |
| 19-17 | EZ373511 | DPS Terminal Plate | 31-5-20 | 1 |
| 19-18 | EZ424787 | Jack Plate Holder | MS-5009 | 1 |
| 19-19 | EJ331435 | Lug Plate VB2L | 33 4-6 | 1 |
| 19-20 | ZW383951 | Screw, truss head 3x5(black) | | 5 |
| 19-21x | ZW273756 | Nut, M3 | | 5 |
| 19-22x | EJ378966 | Mic. Jack 2PMJ2 (GX-221) | 31-2-26 | 2 |
| 19-23x | ZW224976 | Jack Thin Washer | DX-509 | 2 |
| 19-24x | ZW375153 | E Jack Nut | | 2 |
| 19-25x | ES375478 | Slide Switch ESD-279DU (GX-221) | 25-3-20 | 1 |
| 19-26 | EJ233370 | Power Plug Socket S-18010 | 40-2-3 | 1 |
| 19-27 | ZW372035 | ISO Screw, truss head 3x6 | | 2 |
| 19-28 | EZ382263 | Strain Relief SR-4K-4 | 2-7-12 | 1 |
| 19-29 | EZ374894 | U/L AC Cord 3M | 26-3-19 | 1 |
| 19-30x | EF338387 | Fuse ST-2 1.5A | 39-1-25 | 1 |
| 19-31x | EF424811 | Fuse ST-2 2.5A (GX-221) | 39-1-28 | 1 |
| | | **SUB PANEL BLOCK** | | |
| 19-32x | BZ487214 | Sub Panel Block Comp. (GX-225D) | | 1 |
| 19-33x | BZ487236 | Sub Panel Block Comp. (GX-221D) | | 1 |
| 19-34x | BZ487225 | Sub Panel Block Comp. (GX-221) | | 1 |
| 19-35 | SP487653 | Sub Panel C (GX-225D) | MS-5001 | 1 |
| 19-36x | SP424462 | Sub Panel B(GX-221D) | MS-5001 | 1 |
| 19-37x | SP424451 | Sub Panel A (GX-221) | MS-5001 | 1 |
| 19-38 | EJ331435 | Lug Plate VB2L | 33-4-6 | 1 |
| 19-39 | EJ255115 | Lug Plate VB2L2 | 33-4-3 | 1 |
| 19-40x | ER329308 | Carbon/R. RD1/4 47k(J) (Insu. type) | R1.4 | 2 |
| 19-41x | ER345712 | Carbon/R. RD1/4 22k(J) (Insu. type) | R1.2 | 2 |
| 19-42x | EA388574 | Lamp P.C. Board (Rec.) | CS-1134 | 1 |
| 19-43x | EL295312 | No. 2 Lamp 8V 0.2A(Rec.) | 28-2-8 | 1 |
| 19-44 | BA426104 | Track Selector P.C. Board Comp. (MS-5055) | | 1 |
| 19-45x | BZ426082 | DS Switch Comp. MS | | 1 |
| 19-46 | ES374051 | Push Switch UEG-22CP | 25-5-26 | 2 |
| 19-47 | EZ424517 | Switch Holder | MS-5006 | 2 |
| 19-48x | ZW432843 | Screw, pan head 2.6x4 | | 2 |
| 19-49x | ZW323728 | Screw, binding head 3x5 | | 4 |
| 19-50 | SK487675 | Knob C | CG-2007 | 4 |
| 19-51 | BA426115 | Equalizer P.C. Board Comp. (MS-5027) | | 1 |
| 19-52x | ZW323728 | Screw, binding head 3x5 | | 2 |
| 19-53 | ES469541 | Push Switch JB-52 | 25-5-40 | 1 |

| Ref. No. | Parts No. | Description | Schematic No. | Q'ty |
|---|---|---|---|---|
| 19-54x | MZ397394 | Power Switch Table | KD-2028 | 1 |
| 19-55x | ZW371856 | ISO Screw, binding head 3x5 | | 2 |
| 19-56 | ER376413 | Spark Quencher U/L 0.033μ+120 500WV | 41-1-27 | 1 |
| 19-57 | SK487697 | Knob B | CG-2007 | 1 |
| 19-58 | BA426093 | SRT P.C. Board Comp. (MS-5029) | | 1 |
| 19-59 | EV487822 | Volume V24N 50 kA | 36-2-28 | 2 |
| 19-60x | EV398575 | Double/Vol. (FR.) DJ20A 50kx2 (GX-221) | 36-3-25 | 2 |
| 19-61x | BA426126 | Tone Control P.C. Board Comp. (MS-5028) | | 1 |
| 19-62 | EJ391083 | Mic. Jack 3PMJ1P | 31-2-28 | 1 |
| 19-63 | EJ391094 | Mic. Jack 2PMJ1P | 31-2-27 | 2 |
| 19-64x | EZ225180 | Nylon Collar, Jack | LD-520 | 3 |
| 19-65x | ZW488946 | Washer (Lumilar) D9.2x18x0.25t | | 3 |
| 19-66x | ZW375153 | E Jack Nut | | 3 |
| 19-67x | ZW260368 | Washer (Fiber) D9.2x18x0.5t | | 1 |
| 19-68 | EM487710 | VU Meter KL-251A-7 (GX-225D) | 46-1-58 | 2 |
| 19-69 | EA487708 | VU P.C. Board | MS-5049 | 2 |
| 19-70x | EM424484 | VU Meter KPM-7E (GX-221/D) | 46-1-39 | 2 |
| 19-71x | ZW424495 | Washer (SPC) D3.1x8x1t | | 4 |
| 19-72 | ZG290878 | VU Meter Spring | DX-586 | 4 |
| 19-73x | ZW348107 | ISO Nut, M3 | | 4 |
| 19-74x | EL295312 | No. 2 Lamp 8V 0.2A | 28-2-8 | 2 |
| 19-75 | EZ424225 | Amp. Chassis | MS-5008 | 1 |
| 19-76 | EJ426532 | 4P Socket S-16304 | 31-1-59 | 1 |
| 19-77 | EJ277108 | 5P TV-Consent-Socket | 31-1-19 | 1 |
| 19-78 | EJ298607 | 4P Jack | 31-1-10 | 1 |
| 19-79 | EZ426576 | Connector Shield | MS-5016 | 1 |
| 19-80x | ZW200687 | Tapping Screw #2 3x6(round) | | 1 |
| 19-81 | EZ411276 | P.C. Board Retaining Metal Prop | LF-5011 | 2 |
| 19-82 | ZW417025 | Screw, binding head 3x8, w/washer | | 2 |
| 19-83x | ED224572 | Silicon Diode 5B2 (GX-221) | 45-2-20 | 1 |
| 19-84x | EC401580 | Elect./C. 2200μF 50WV (Lug type) (GX-221) | 24-10-44 | 1 |
| 19-85 | EJ255082 | Lug Plate VBL2 | 33-4-16 | 1 |
| 19-86 | EZ424260 | Trans. Hanger | MS-5010 | 1 |
| 19-87 | BT424282 | Power Trans. MST-1 (Deck) | 38-4-121 | 1 |
| 19-88x | BT424271 | Power Trans. MST-3 (GX-221) | 38 4-122 | 1 |
| 19-89 | ZW200700 | Tapping Screw #2 4x8 (round) | | 4 |
| 19-90 | EZ487080 | Multi Holder (MS-2) | MS-5018 | 1 |
| 19-91x | EZ424304 | Multi Holder (GX-221) | MS-5017 | 1 |
| 19-92 | EJ292961 | 10P Multi-Jack 500-010-005 | 31-4-4 | 2 |
| 19-93x | ZW487091 | Screw, pan head 2.3x8 | | 2 |
| 19-94 | EZ487315 | NRP Holder | MS-5210 | 1 |
| 19-95 | EJ347670 | 22P Multi-Jack-3 3250-022-001S | 31-4-10 | 2 |
| 19-96 | EJ293073 | 12P Mate-N-Lock Plug Housing 1-480275-0 | 52-1-1 | 1 |
| 19-97x | EJ373634 | Socket Contact 61115-1 | 52-1-1 | 12 |
| 19-98 | ES374051 | Push Switch UEG-22CP | 25-5-26 | 1 |
| 19-99x | EZ424517 | Switch Holder | MS-5006 | 1 |
| 19-100x | ZW432843 | Screw, pan head 2.6x4 | | 1 |
| 19-101 | ZW200665 | Tapping Screw #2 3x10 (round) | | 4 |
| 19-102 | EZ487203 | Multi Hanger | MS-5212 | 1 |
| 19-103 | EZ424236 | Pre-amp. Shield | MS 5014 | 1 |
| 19-104 | EZ424258 | OSC Shield | MS-5015 | 1 |
| 19-105 | EZ424326 | Side Chassis A (Right) | MS-5012 | 1 |
| 19-106 | EZ424337 | Side Chassis B (Left) | MS-5032 | 1 |
| 19-107x | EZ411287 | P.C. Board Retaining Metal | LF-5007 | 1 |
| 19-108 | EZ487258 | VU Meter Escutcheon A | MS-5203 | 2 |
| 19-109 | EA487350 | HT P.C. Board | MS-5216 | 1 |
| 19-110x | BT247746 | Head Phone Trans. NJ9-228S | 38-2-11 | 2 |
| 19-111x | ZW323728 | Screw, binding head 3x5 | | 4 |
| 19-112 | MH223108 | Prop | XR-226 | 2 |

When ordering Parts, please describe Parts Number, Serial Number, and Model Number in detail.

FIG. 20 PHOTO OF FINAL ASSEMBLY BLOCK



# FINAL ASSEMBLY BLOCK

| Ref. No. | Parts No. | Description | Schematic No. | Q'ty |
|---|---|---|---|---|
| | | **AMP. PANEL BLOCK** | | |
| 20-1x | BZ487271 | Amp. Panel Block Comp. (GX-221) | | 1 |
| 20-2x | BZ487282 | Amp. Panel Block Comp. (GX-221D) | | 1 |
| 20-3x | BZ487260 | Amp. Panel Block Comp. (GX-225D) | | 1 |
| 20-4 | SP487732 | Amp. Panel D GX-221 | MS-5018 | 1 |
| 20-5x | SP487743 | Amp. Panel E GX-221D | MS-5018 | 1 |
| 20-6x | SP487721 | Amp. Panel C GX-225D | MS-5018 | 1 |
| 20-7 | SM487754 | Amp. Panel Name Plate | MS-5202 | 1 |
| 20-8 | SZ409320 | Illumination Escutcheon | 61-5033 | 1 |
| | | **MECH. PANEL BLOCK** | | |
| 20-9x | BZ487462 | Mech. Panel Block Comp. | MS-2,3 | 1 |
| 20-10 | SP487473 | Mech. Panel C | MS-6014 | 1 |
| 20-11 | SZ397618 | Counter Escutcheon | KD-6008 | 1 |
| 20-12 | SZ487440 | Head Cover Table A | MS-6203 | 1 |
| 20-13x | SZ425070 | Head Cover Prop | MS-6018 | 2 |
| 20-14x | ZW200384 | Screw, countersunk head 3x6 | | 2 |
| 20-15 | ZW425125 | Screw, oval countersunk head 3x6 | | 2 |
| 20-16 | SZ435082 | Panel Ring | KD-A6004 | 2 |
| | | **SIDE PLATE (RIGHT) BLOCK** | | |
| 20-17x | BZ432461 | Side Plate (Right) Block Comp. (GX-221) | | 1 |
| 20-18x | BZ432527 | Side Plate (Right) Block Comp. (Deck) | | 1 |
| 20-19 | SZ424901 | Side Wall B (GX-221) | MS-6001 | 1 |
| 20-20x | SZ540281 | Side Wall B2 (Deck) | MS-6001 | 1 |
| 20-21 | ZW290250 | U type Speed Nut, M4 #1 (large) | 6-3-2 | 2 |
| 20-22 | ZW290248 | U type Speed Nut, M4 #1 (small) | 6-3-2 | 2 |
| 20-23 | SS391342 | Speaker SK-2187E (GX-221) | 29-5-3 | 1 |
| 20-24 | ER364713 | Cement/R. SW 27(K) (Wire-wound type) | 35-16-1 | 1 |
| 20-25x | ZW355487 | Screw, binding head 3x10 | | 4 |
| 20-26x | ZW425002 | Washer (SPC) D3.1x8x0.5t | | 4 |
| 20-27x | ZW273756 | Nut, M3 | | 8 |
| 20-28x | MZ447592 | L Metal Fitting B | MS-6039 | 1 |
| 20-29x | ZW447840 | Tapping Screw #2 3x8(BR) | | 2 |
| 20-30 | SZ424923 | Side Plate A (GX-221) | MS-6003 | 1 |
| 20-31x | SZ424934 | Side Plate B (Deck) | MS-6003 | 1 |
| 20-32 | SZ424945 | Speaker Grill(GX-221) | MS 6004 | 1 |
| 20-33 | SZ424967 | Reflection Plate (GX-221) | MS-6006 | 1 |
| 20-34 | SZ237508 | Reflection Plate Retaining Metal | 3A-419 | 2 |
| 20-35x | ZW201183 | Screw, truss head 3x8(black) | | 2 |
| 20-36 | ZW425046 | Screw 3x25 (truss), without groove | | 4 |
| 20-37x | ZW259593 | Washer (BSP) D3.4x7.8x0.5t | | 4 |
| 20-38 | ZW437444 | Screw, oval countersunk head 4x25 | | 5 |
| 20-39 | ZW462150 | Decorative Washer, M4 | | 5 |
| | | **SIDE PLATE (LEFT) BLOCK** | | |
| 20-40x | BZ432516 | Side Plate (Left) Block Comp. (GX-221) | | 1 |
| 20-41x | BZ432538 | Side Plate (Left) Block Comp. (Deck) | | 1 |
| 20-42 | SZ424890 | Side Wall A (GX-221) | MS-6001 | 1 |
| 20-43x | SZ540270 | Side Wall A2 (Deck) | MS-6001 | 1 |
| 20-44 | ZW290250 | U type Speed Nut, M4 #1 (large) | 6-3-2 | 2 |
| 20-45 | ZW290248 | U type Speed Nut, M4 #1 (small) | 6-3-1 | 2 |
| 20-46 | SS391342 | Speaker SK-2187E (GX-221) | 29-5-3 | 1 |
| 20-47 | ER364713 | Cement/R. SW 27(K) (Wire-wound type) | 35-16-3 | 1 |
| 20-48x | ZW355487 | Screw, binding head 3x10 | | 4 |

| Ref. No. | Parts No. | Description | Schematic No. | Q'ty |
|---|---|---|---|---|
| 20-49x | ZW425002 | Washer (SPC) D3.1x8x0.5t | | 4 |
| 20-50x | ZW273756 | Nut, M3 | | 4 |
| 20-51x | MZ447996 | L Metal Fitting A | MS-6039 | 1 |
| 20-52x | ZW447840 | Tapping Screw #2 3x8(BR) | | 1 |
| 20-53 | SZ424923 | Side Plate A (GX-221) | MS-6003 | 1 |
| 20-54x | SZ424934 | Side Plate B (Deck) | MS-6003 | 1 |
| 20-55x | SZ424945 | Speaker Grill(GX-221) | MS-6004 | 1 |
| 20-56 | SZ424967 | Reflection Plate (GX-221) | MS-6006 | 1 |
| 20-57x | SZ237508 | Reflection Plate Retaining Metal | 3A-419 | 2 |
| 20-58x | ZW201183 | Screw, truss head 3x8 (black) | | 2 |
| 20-59x | ZW425046 | Screw, 3x25(truss), without groove | | 4 |
| 20-60x | ZW259593 | Washer (BSP) D3.4x7.8x0.5t | | 4 |
| 20-61x | ZW437444 | Screw, oval countersunk head 4x25 | | 5 |
| 20-62x | ZW462150 | Decorative Washer, M4 | | 5 |
| | | **ASSEMBLY BLOCK** | | |
| 20-63x | SZ425024 | Panel Support | MS-6008 | 2 |
| 20-64 | SP487506 | Sash (Right), w/pin | MS-6009 | 1 |
| 20-65 | SP487528 | Sash (Left), w/pin | MS-6009 | 1 |
| 20-66x | ZW323728 | Screw, binding head 3x5 | | 6 |
| 20-67 | ZW447772 | Tapping Screw #2 3x6(BR) | | 20 |
| 20-68 | SZ454893 | Channel A | MS-6038 | 1 |
| 20-69 | SZ454904 | Channel B | MS-6041 | 1 |
| 20-70x | SZ433956 | Head Cover Shield | MS-6035 | 1 |
| 20-71 | SC487541 | Head Cover A | MS-6204 | 1 |
| 20-72 | SM487563 | Head Cover Name Plate GX-221 | MS-6205 | 1 |
| 20-73x | SM487574 | Head Cover Name Plate GX-221D | MS-6205 | 1 |
| 20-74x | SM487552 | Head Cover Name Plate GX-225D | MS-6205 | 1 |
| 20-75 | SZ425160 | Bottom Plate | MS-6021B | 1 |
| 20-76 | SZ377190 | LM Rubber Foot | LM-404 | 8 |
| 20-77x | ZW419646 | Washer (SPC) D4.5x9.8x0.5t | | 8 |
| 20-78x | ZW487776 | Screw, truss head 4x18 | | 4 |
| 20-79 | ZW408478 | Panel Washer | KD-6019 | 4 |
| 20-80 | ZW411660 | Screw, oval countersunk head 3x6 | | 4 |
| 20-81 | SZ425171 | Upper Plate (Ceiling) | MS-6021 | 1 |
| 20-82x | ZW463037 | Washer, M3 (Mountain type) | | 4 |
| 20-83x | ZW425125 | Screw, oval countersunk head 3x6 (black) | | 4 |
| 20-84x | SZ425316 | Change Name Plate | MS-6024 | 1 |
| 20-85x | ZW432944 | Push Nut 3x10x0.3t | | 1 |
| 20-86x | ZW332065 | Lock Screw | MR-648 | 1 |
| 20-87x | ZW259514 | Washer (Nylon) D3.1x8x1t | | 1 |
| 20-88x | SZ488801 | Back Cover A-1 (GX-221) | MS-6023 | 1 |
| 20-89x | SZ488812 | Back Cover D-1 (Deck) | MS-6023 | 1 |
| 20-90x | ZW462194 | Tapping Screw #2 3x8(pan), w/washer | | 4 |
| 20-91x | ZW200643 | Tapping Screw #1 4x25(truss) | | 4 |
| 20-92 | SK425158 | Pinch Roller Cap | MS-6020 | 1 |
| 20-93 | SK487585 | Mech. K ob A | MS-6206 | 2 |
| 20-94x | ZW253405 | Mech. Knob Screw | 7-1-46 | 2 |
| 20-95 | SK476752 | Pause Knob | MR-612 | 1 |
| 20-96x | ZW433001 | Set Screw, hexagon socket 3x5 (cup) | | 1 |
| 20-97 | SK409498 | Lever Switch Knob A, B | 61 5027,8 | 1 |
| 20-98 | MP271170 | LC Pinch Roller | LC-351 | 1 |
| 20-99 | SK487293 | Equalizer Knob | MS-5206 | 1 |
| 20-100 | SK487326 | Volume Knob A (GX-221) | MS-5303 | 3 |
| 20-101x | ZW200766 | Set Screw 3x5 (cup) | | 3 |
| 20-102 | SK487337 | Volume Knob B (GX-221) | MS-5304 | 3 |
| 20-103x | ZW200733 | Set Screw 3x4 (cup) | | 3 |
| 20-104x | SK476111 | Amp. Knob (Deck) | MR-6010 | 2 |
| 20-105 | SK487697 | Knob B | CC-2007 | 1 |
| 20-106 | SK487675 | Knob C | CC-2007 | 4 |
| 20-107 | SB424618 | Direction Change Bottun | MS-5004 | 2 |
| 20-108 | SK383095 | TUM Knob | RD-A507 | 3 |
| 20-109 | EZ424383 | Collar, Jack | MS-5033 | 3 |
| 20-110x | EF424811 | Fuse ST-2 2.5A | 39-1-16 | 1 |
| 20-111x | EF394773 | Fuse 2A 250V | 39-1-38 | 1 |
| 20-112x | EF338387 | Fuse ST-2 1.5A | 39-1-26 | 1 |
| 20-113x | EF304626 | Fuse ST-4 1A | 39-1-58 | 1 |

When ordering parts, please describe Parts Number, Serial Number, and Model Number in detail.

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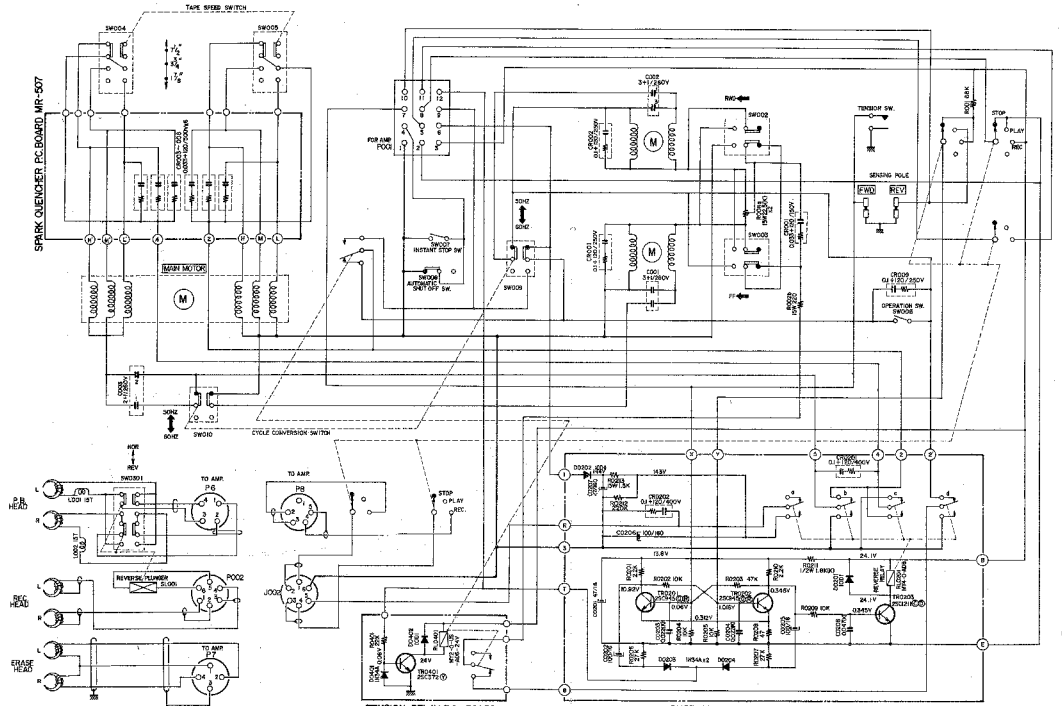
# INDEX

SECTION 3

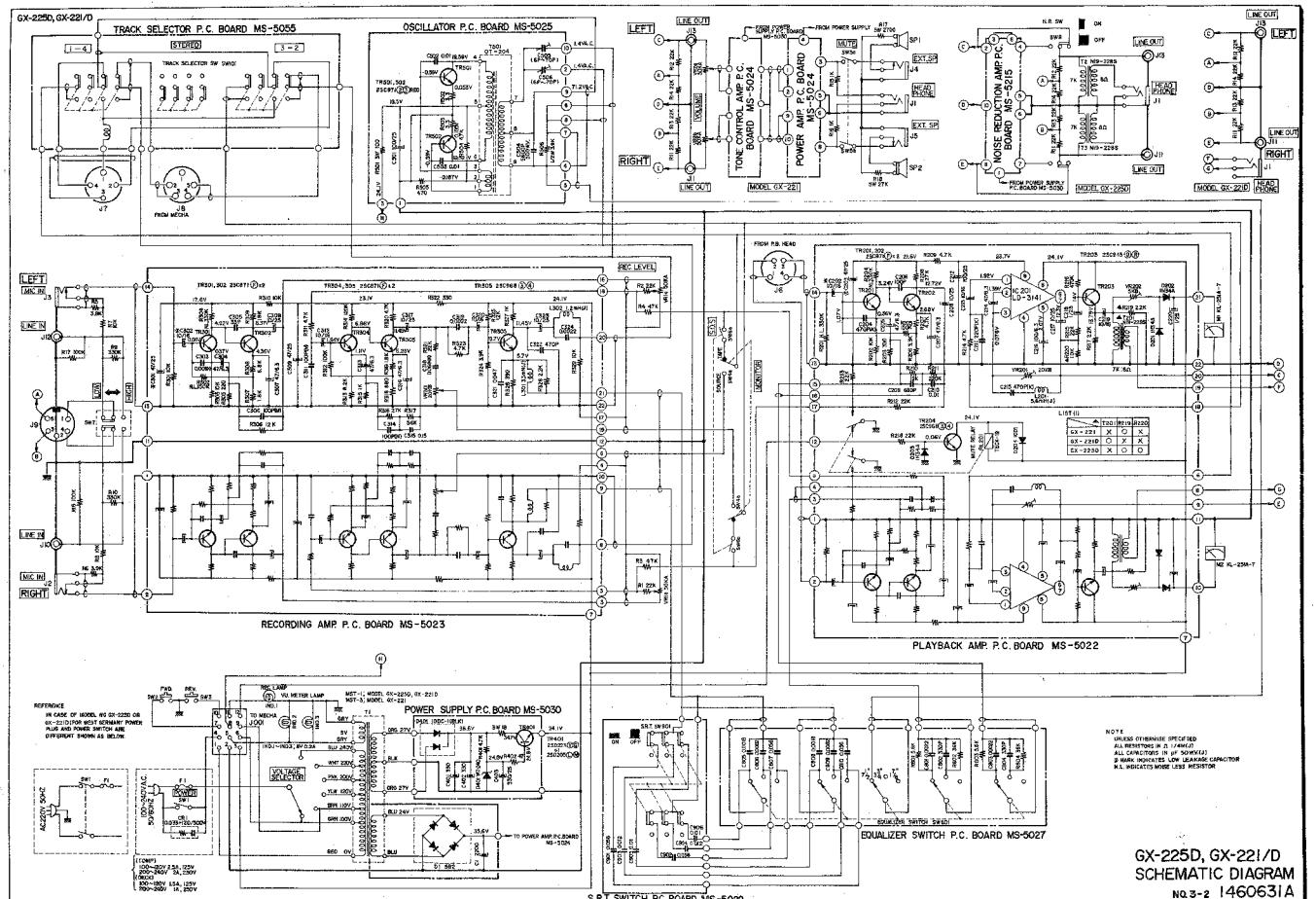
# SCHEMATIC DIAGRAM

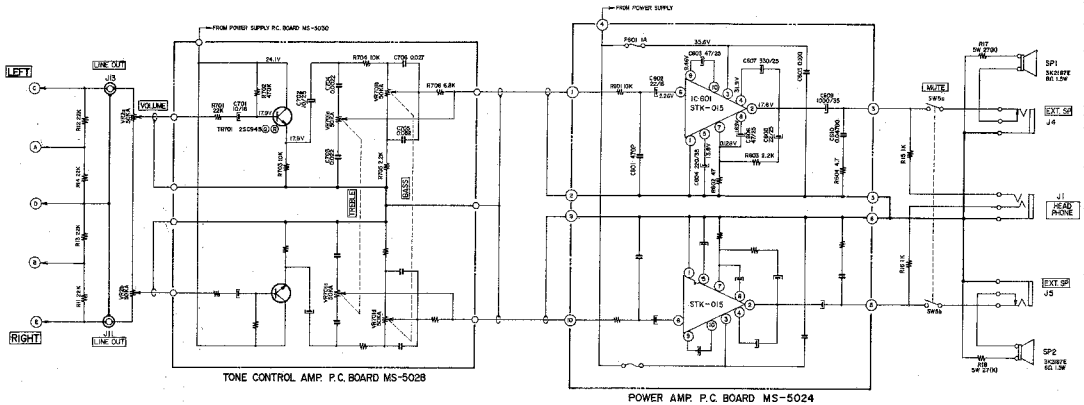
1. GX-225D SCHEMATIC DIAGRAM
2. GX-221 SCHEMATIC DIAGRAM
3. GX-221D SCHEMATIC DIAGRAM

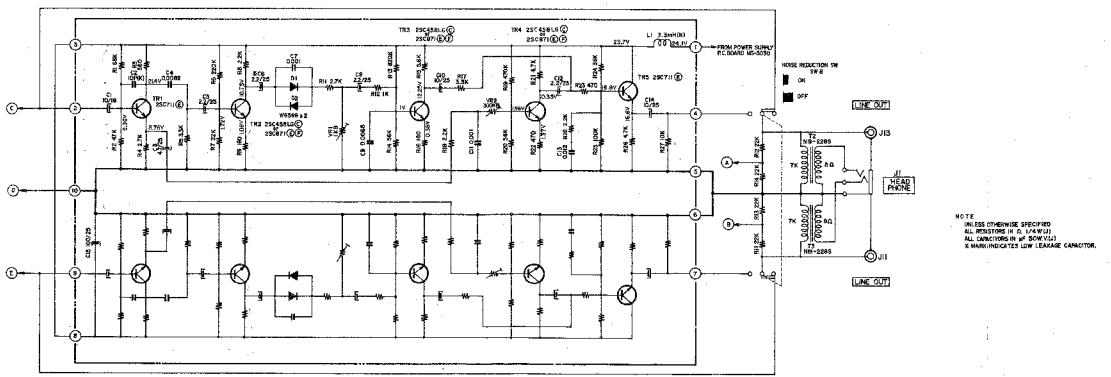



NOTE
UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN Ω 1/4W(Ω)
ALL CAPACITORS IN μF 50WV.(μ)

GX-225D, GX-221/D
SCHEMATIC DIAGRAM
NO.3-1 1460630A
2C


GX-225D, GX-221/D
TRACK SELECTOR P.C. BOARD MS-5055
OSCILLATOR P.C. BOARD MS-5025
TONE CONTROL AMP P.C. BOARD MS-5026
POWER AMP. P.C. BOARD MS-5024
NOISE REDUCTION AMP P.C. BOARD MS-5215
RECORDING AMP. P.C. BOARD MS-5023
PLAYBACK AMP. P.C. BOARD MS-5022
POWER SUPPLY P.C. BOARD MS-5030
EQUALIZER SWITCH P.C. BOARD MS-5027
S.R.T. SWITCH P.C. BOARD MS-5029
GX-225D, GX-221/D
SCHEMATIC DIAGRAM
NO.3-2 1460631A




NOTE
UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN Ω, 1/4W (J)
ALL CAPACITORS IN μF 50W (J)
& MARK INDICATES LOW LEAKAGE CAPACITOR.

GX-225D, GX-221/D
SCHEMATIC DIAGRAM
NO.3-3 1460632A
2C