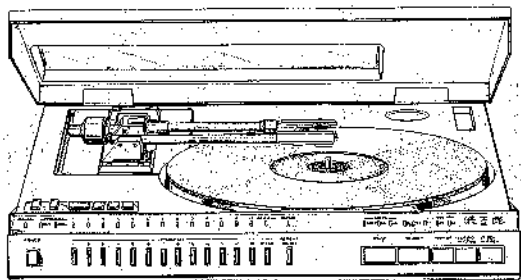


AKAI SERVICE MANUAL

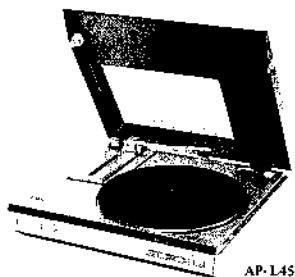


LINEAR TRACKING FULL AUTO DIRECT DRIVE
TURN TABLE

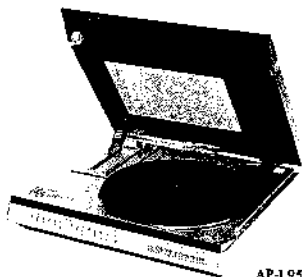
MODEL **AP-L45/C**

LINEAR TRACKING PROGRAMABLE FULL AUTO
DIRECT DRIVE TURN TABLE

MODEL **AP-L95/C**



AP-L45



AP-L95

LINEAR TRACKING FULL AUTO DIRECT DRIVE TURN TABLE

MODEL AP-L45/C

**LINEAR TRACKING PROGRAMABLE FULL AUTO
DIRECT DRIVE TURN TABLE**

MODEL AP-L95/C

THIS MANUAL IS APPLICABLE TO BOTH SILVER AND BLACK PANEL MODEL.

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SECTION I

SERVICE MANUAL

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For basic adjustments, measuring methods, and operating principles, refer to GENERAL TECHNICAL MANUAL.

I. SPECIFICATIONS

1. MODEL AP-L45/C

DRIVE SYSTEM & MECHANISM	Direct Drive (Quartz Lock) Linear Tracking Arm Fully Automatic
TURNABLE	Zinc alloy die-cast
MOTOR	DC brush-less motor
SPEED	33-1/3 rpm \pm 0.002%, 45 rpm \pm 0.002%
WOW AND FLUTTER	0.04% (DIN), 0.02% (JIS)
RUMBLE	44 dB (DIN A), 75 dB (DIN B), 55 dB (JIS)
-tone ARM	Static balanced type linear tracking arm
EFFECTIVE ARM LENGTH	184 mm
STYLUS PRESSURE ADJUSTMENT RANGE	0 to 3 grams
APPLICABLE CARTRIDGE WEIGHT	4 to 10.5 grams
ARM LIFTER	Power Assisted cam drive
HORIZONTAL TRACKING ANGLE ERROR	\pm 0.2°
SHELL WEIGHT	7.5 grams
CARTRIDGE	PC-95 (MM type; Dual magnet type) (Model AP-L45 does not include a cartridge)
OUTPUT VOLTAGE	5 mV (DIN 45541)
CHANNEL SEPARATION	More than 25 dB (DIN 45543)
OPTIMAL STYLUS PRESSURE	2 grams
STATIC VERTICAL COMPLIANCE	18×10^{-6} cm/dyne
STATIC HORIZONTAL COMPLIANCE	29×10^{-6} cm/dyne
POWER REQUIREMENTS	120V, 60 Hz for USA and Canada 220V, 50 Hz for Europe except UK 240V, 50 Hz for UK and Australia 110V, 120V, 220V or 240V, 50 or 60 Hz for other countries
DIMENSIONS	440 (W) x 124 (H) x 410 (D) mm (17.3 x 4.9 x 16.1 inches)
WEIGHT	11.0 kg (24.2 lbs)

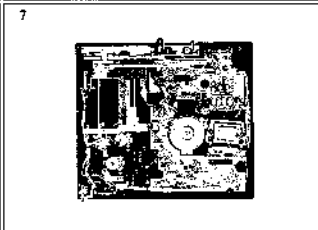
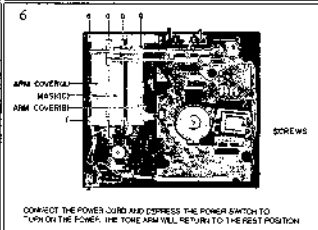
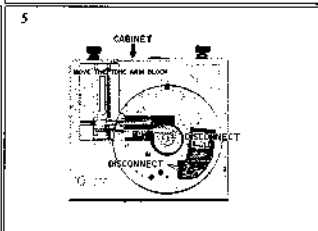
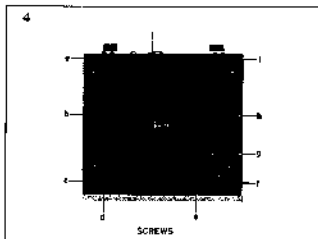
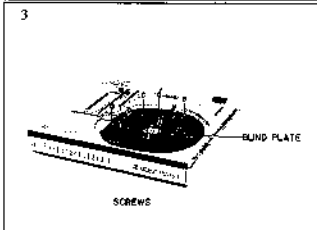
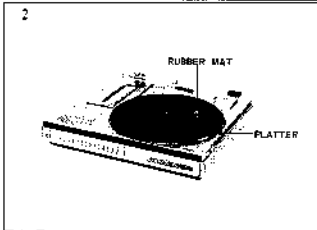
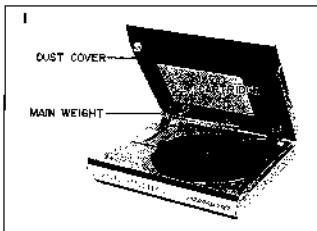
2. MODEL AP-L95/C

DRIVE SYSTEM & MECHANISM	Direct Drive (Quartz Lock) Linear Tracking Arm Fully Automatic with Random Program Search System
MOTOR	DC brush-less motor
TURNABLE	Zinc alloy die-cast
SPEED	33-1/3 rpm \pm 0.002%, 45 rpm \pm 0.002%
WOW AND FLUTTER	0.04% (DIN), 0.02% (JIS)
RUMBLE	44 dB (DIN A), 75 dB (DIN B), 55 dB (JIS)
tone ARM	Static balanced type linear tracking arm
EFFECTIVE ARM LENGTH	184 mm
STYLUS PRESSURE ADJUSTMENT RANGE	0 to 3 grams
APPLICABLE CARTRIDGE WEIGHT	4 to 10.5 grams
ARM LIFTER	Power Assisted cam drive
HORIZONTAL TRACKING ANGLE ERROR	\pm 0.2°
SHELL WEIGHT	7.5 grams
CARTRIDGE	PC-95 (MM type; Dual magnet type) (Model AP-L95 does not include a cartridge)
OUTPUT VOLTAGE	5 mV (DIN 45541)
CHANNEL SEPARATION	More than 25 dB (DIN 45543)
OPTIMAL STYLUS PRESSURE	2 grams
STATIC VERTICAL COMPLIANCE	18×10^{-6} cm/dyne
STATIC HORIZONTAL COMPLIANCE	29×10^{-6} cm/dyne
POWER REQUIREMENTS	120V, 60 Hz for USA and Canada 220V, 50 Hz for Europe except UK 240V, 50 Hz for UK and Australia 110V, 120V, 220V or 240V, 50 or 60 Hz for other countries
DIMENSIONS	440 (W) x 124 (H) x 410 (D) mm (17.3 x 4.9 x 16.1 inches)
WEIGHT	11.2 kg (24.6 lbs)

* For improvement purposes, specifications and design are subject to change without notice.

II. DISMANTLING OF UNIT

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



III. CONTROLS

1. MODEL AP-L45/C

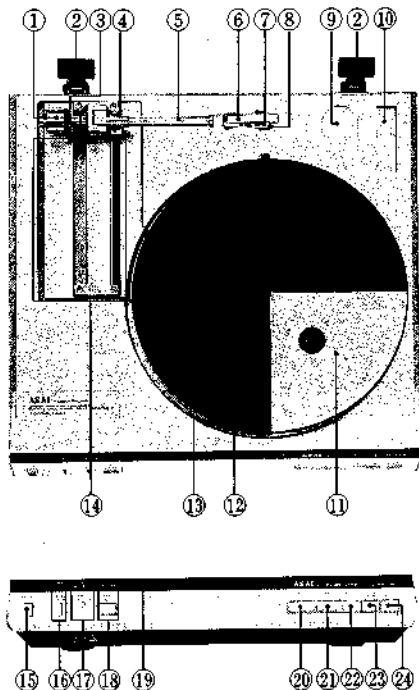


Fig. 1 Controls (Model AP-L45/C)

- | | |
|--|--|
| 1. MAIN WEIGHT | 14. TONE ARM TRACK |
| 2. HINGES | 15. POWER SWITCH |
| 3. STYLUS PRESSURE SCALE RING | 16. REPEAT SWITCH AND INDICATOR |
| 4. TONE ARM LIFTER | 17. SPEED SELECTOR AND INDICATORS |
| 5. TONE ARM | 18. SIZE SELECTOR AND INDICATORS |
| 6. CARTRIDGE SHELL | 19. QUARTZ LOCK INDICATOR |
| 7. CARTRIDGE RE-SETTING SCREWS | 20. PLAY BUTTON |
| 8. CARTRIDGE "A" CARTRIDGE IS NOT SUPPLIED WITH AP-L45 | 21. REJECT BUTTON |
| 9. 45 RPM ADAPTER HOLDER | 22. ARM UP BUTTON |
| 10. STYLUS GAUGE HOLDER | 23. FORWARD/FAST FORWARD (FWD/F. FWD) BUTTON |
| 11. PLATTER | 24. REVERSE/FAST REVERSE (REV/F. REV) BUTTON |
| 12. SPINDLE | |
| 13. RUBBER MAT | |

2. MODEL AP-L95/C

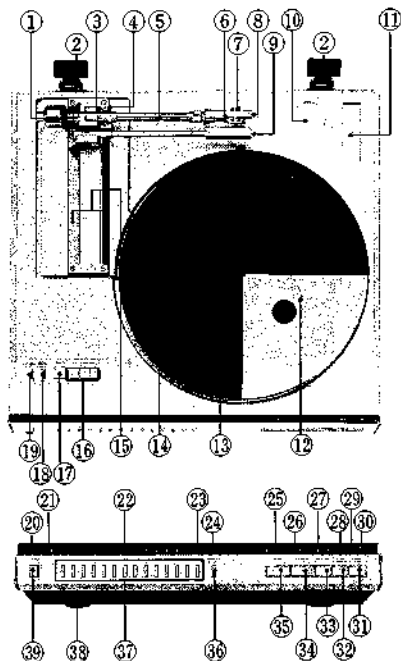


Fig. 2 Controls (Model AP-L95/C)

- | | |
|---|--|
| 1. MAIN WEIGHT | 21. PROGRAM NUMBER INDICATORS |
| 2. HINGES | 23. OVERFLOW INDICATOR |
| 3. STYLUS PRESSURE SCALE RING | 24. REPEAT INDICATOR |
| 4. TONE ARM LIFTER | 25. SPEED INDICATORS |
| 5. TONE ARM | 26. QUARTZ LOCK INDICATOR |
| 6. CARTRIDGE SHELL | 27. SIZE INDICATORS |
| 7. CARTRIDGE RE-SETTING SCREWS | 28. FORWARD/FAST FORWARD (FWD/F. FWD) INDICATOR |
| 8. CARTRIDGE "A" CARTRIDGE IS NOT SUPPLIED WITH AP-L95 | 29. QUE INDICATOR |
| 9. PHOTO SENSOR | 30. REVERSE/FAST REVERSE (REV/F. REV) INDICATOR |
| 10. 45 RPM ADAPTER HOLDER | 31. REVERSE/FAST REVERSE (REV/F. REV) BUTTON |
| 11. STYLUS GAUGE HOLDER | 32. FORWARD/FAST FORWARD (FWD/F. FWD) BUTTON |
| 12. PLATTER | 33. ARM UP BUTTON |
| 13. SPINDLE | 34. REJECT BUTTON |
| 14. RUBBER MAT | 35. PLAY BUTTON |
| 15. TONE ARM TRACK | 36. REPEAT SWITCH |
| 16. MANUAL SIZE BUTTONS | 37. PROGRAM BUTTONS |
| 17. SPEED BUTTON | 38. SENSOR SENSITIVITY SELECTOR (LOW (LO)/NORMAL (NORM)/MIDDLE (MD)/HIGH (HI)) |
| 18. PROGRAM (PRGM) MODE BUTTON (\square RPSS \triangle SKIP) | 39. POWER SWITCH |
| 19. ARM RELEASE BUTTON | |
| 20. MANUAL INDICATOR | |

IV. PRINCIPAL PARTS LOCATION

1. MODEL AP-L45/C

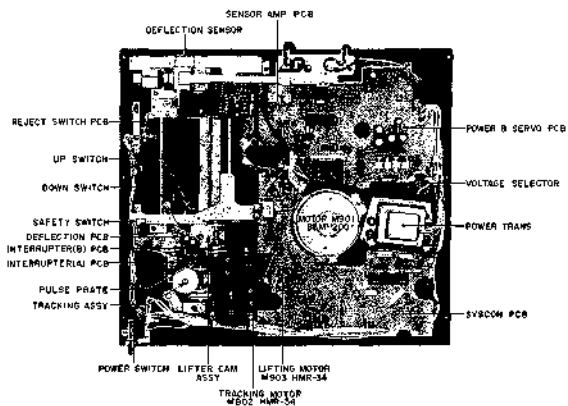


Fig. 3 Top View (Model AP-L45/C)

2. MODEL AP-L95/C

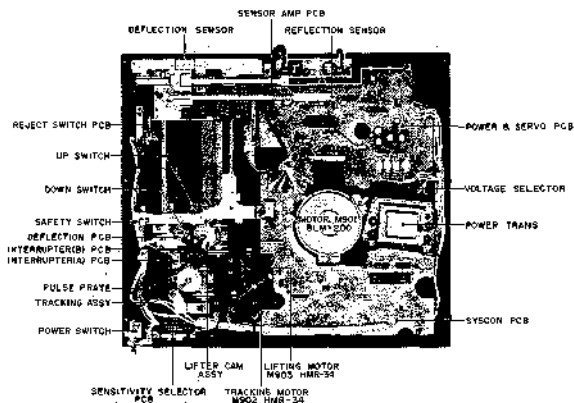


Fig. 4 Top View (Model AP-L95/C)

V. VOLTAGE CONVERSION

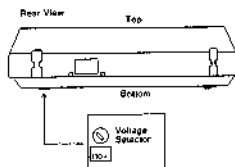


Fig. 5 Voltage Conversion

Models for Canada and USA are not equipped with this facility. Each unit is preset at the factory depending on its destination. Please confirm that the Voltage Selector on the bottom of the equipment is set to the voltage for your area. If not:

1. Disconnect the Power Cord.
2. Turn the Voltage Selector with a screwdriver until the correct voltage for your area appears.

VI. OPERATION OF VARIOUS PARTS

1. FEATURES OF LINEAR TRACKING ARM

1) The linear tracking arm means that the locus traced on a record by the stylus point is linear. Since this tracking method has the same movement as that of the cutter head when it cuts a master disk, the tracking error is greatly reduced. (The ordinary offset arm (turn table has the tracking error angle of $\pm 1 - 2^\circ$, but AP-L45/L95 has only $\pm 0.2^\circ$).

For this reason, there is less high frequency distortion and less crosstalk.

2) Because the inside force is not produced, the cross

modulation distortion is reduced. (In the case of offset arm turn table, the complete elimination is impossible because the friction force between the stylus and record is constantly changing even if adjusted by a canceler).

3) The effective arm length can be shortened and it is advantageous in trackability and rigidity (If the offset arm is shortened, the tracking error will be increased).

4) Because of the dynamic lateral balance provided, vibration will not occur so easily around the arm supporting shaft.

2. INPUT/OUTPUT AND FUNCTION OF MICROCOMPUTER TERMINALS

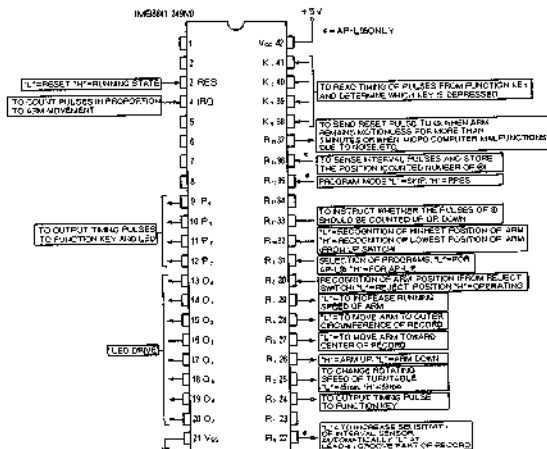


Fig. 6

3. MODEL AP-L4S/C BLOCK DIAGRAM

- = MAIN PANEL PCB
- = SENSOR AMP PCB
- = REJECT SWITCH P-3B
- = S1-900H PCB

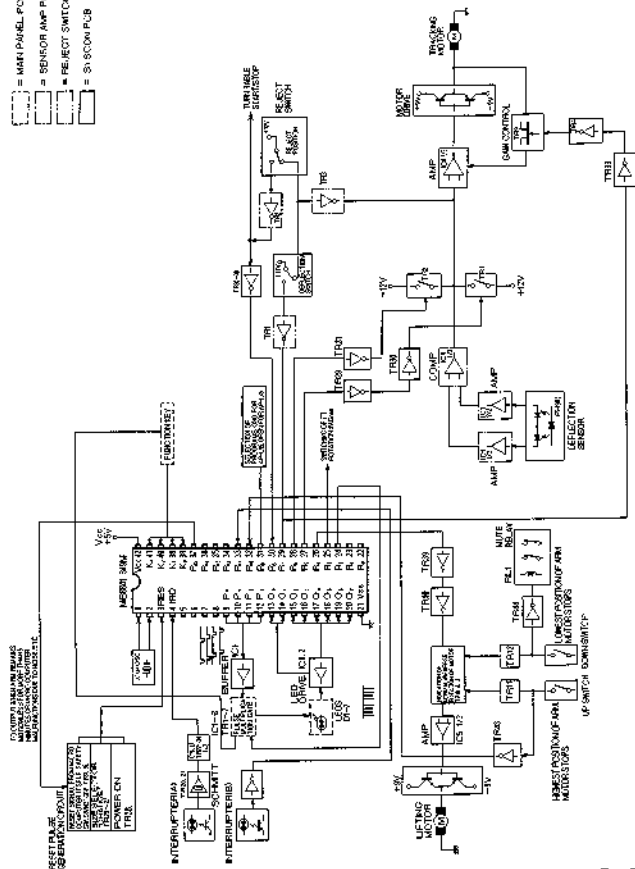
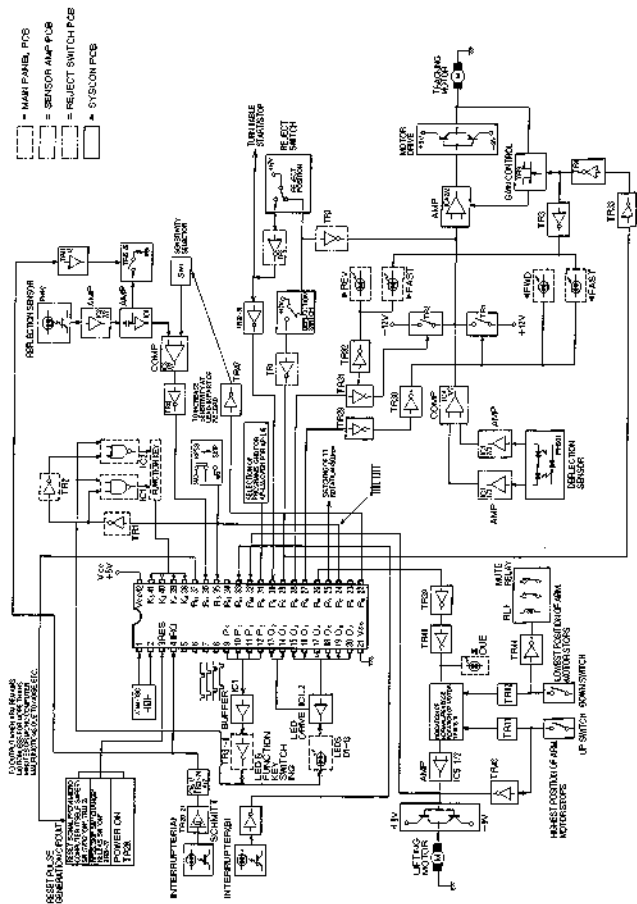


Fig. 7

4. MODEL AP-L95/C BLOCK DIAGRAM



5. RECEPTION OF FUNCTION KEY INPUT AND LED DRIVE

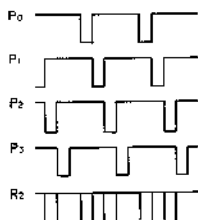


Fig. 9 Timing Pulses from Microcomputers

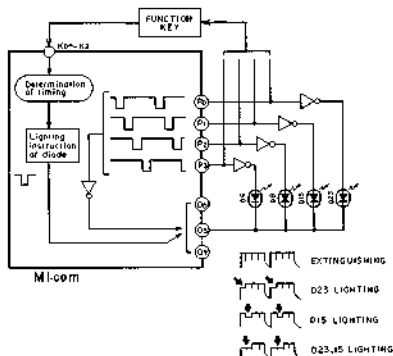


Fig. 10 LED Drive

1) Reception of FUNCTION KEY Input

The microcomputers P_0 – P_3 output pulses of different timing. These pulses are combined with the pulse coming from the microcomputer R_2 terminal and inputted into the FUNCTION KEY (matrix switch). When the key is depressed, the combined pulses is inputted in any one of the microcomputers K_0 – K_3 . The microcomputer reads the pulse timing, recognizes which key was depressed and starts the operation (memory, output, LED drive, etc) (AP-L95). AP-L45 adopts the same method except that the combined pulses are added to the switch.

2) Lighting of LED

The LED is lit up by the dynamic lighting method. The LED is driven by the microcomputers O_0 – O_7 and the timing is that of the pulses of the microcomputers P_0 – P_3 . A portion of it will be described here (See Fig. 10). The pulses from the microcomputers P_0 – P_3 are added to the respective LED anode. To the cathode side, the pulses of P_0 – P_3 are combined and added. If the FUNCTION KEY is depressed instructing "light D23", a minus pulse with the same timing as for P_0 is added to the microcomputer O_2 to light D23 only. The above concerns the operation of AP-L95/C, but AP-L45/C operates in the same manner, although the number of LEDs is different.

6. HORIZONTAL DRIVE CIRCUIT OF ARM

The signal from the deflection sensor or from the micro-computer drives the DC motor to move the arm.

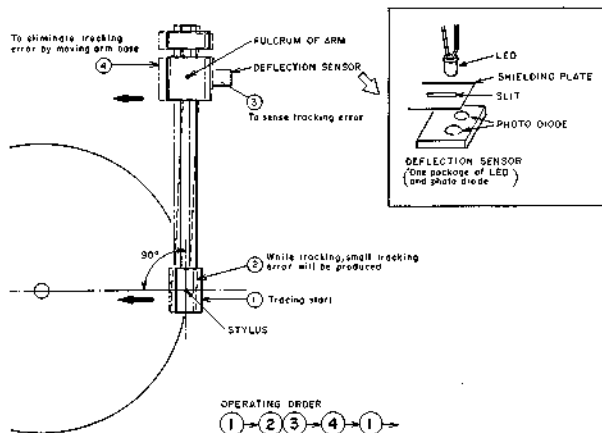


Fig. 11 Arm Movement During Playing

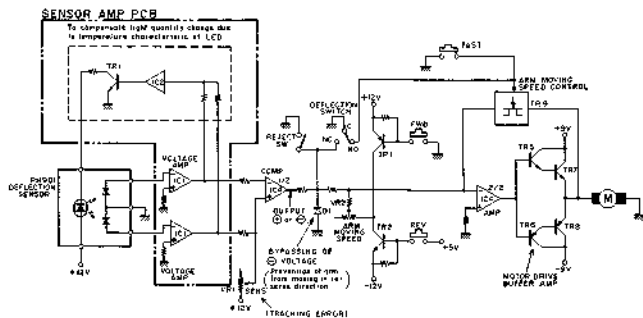


Fig. 12 Horizontal Drive Circuit of Arm

1) Operation during Playing

During playing it is ideal that the line between the stylus point and the spindle center crosses the centerline of the arm at right angles, and to achieve it, it is necessary to move the arm base in combination with the movement of the stylus point. AP-L45/L95 uses the following method. The arm movement is detected by the deflection sensor (LED and two photo diodes) and the voltage of the output is amplified by the inversion amplifier (Sensor Amp PCB IC1). The two amplified voltages are compared by the comparator (IC4 1/2) to produce the output \oplus or \ominus . The \oplus output is when the stylus point is shifted toward the center and \ominus output is when it is shifted toward the outer circumference. The voltage enters the inversion amplifier (IC4 2/2) and the output drives the buffer amplifier to supply current to the motor. Since it is not necessary to move the arm toward the outer circumference during playing, any \ominus output from IC4 1/2 is cut by DI.

○ Additional circuit

IC2, TR1 of the Sensor Amp PCB is a circuit to control the current to be supplied to the LED of the deflection sensor and to compensate the change in the quantity of light caused by the temperature characteristic of the LED. It controls so that the sum of the two photo diode outputs is always constant.

REJECT Switch. To cut the sensor output at the REJECT position.

DEFLECTION Switch: Switch interlocked with the arm's up/down movement. When the stylus point is positioned above the record, NC and C are connected, and when it is lowered to the same height as the record, NO and C are connected.

NC—C= Sensor output is cut.

NO—C= Gain of motor drive amp is increased.

2) Arm Movement When Arm is in Up Position

When FWD or REV signal comes from the micro-computer, \oplus or \ominus voltage is added to the inversion amplifier (IC4 2/2) through TR1 or TR2, and the output drives the motor. If \oplus voltage (FWD signal) is inputted in the IC4 2/2, the output becomes \ominus because it is an inversion amplifier, and the motor is driven by the \ominus voltage through TR6 and 8. TR9 feeds the \ominus voltage to the IC4 2/2 to control the gain of the drive amplifier (NFB).

In the absence of the FAST signal, the impedance of TR9 is low, the feedback amount is large, and the motor rotates at low speed.

When the fast signal comes, the impedance of TR9 becomes high and the motor rotates at high speed. Here the two kinds of moving speed of the arm (FAST/SLOW) are changed.

7. FUNCTION OF INTERRUPTERS (A) AND (B)

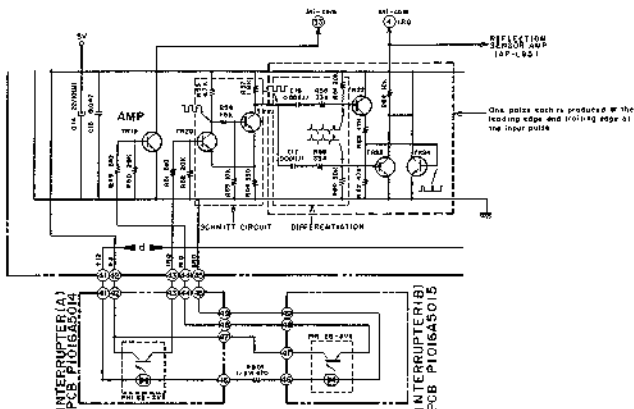


Fig. 13 Interrupter

- 1) The interrupter is intended to send the pulse in proportion to the arm movement to the micro-computer, and the pulse is generated by the pulse plate interlocked with the tracking motor. The pulse from the interrupter (A), after the waveform is shaped in the Schmitt circuit of TR20 and 21, is passed through the differentiation circuit, and is added to TR22, 23 and 24. This circuit produces one pulse each at the leading edge and the trailing edge of the pulse coming from the Schmitt circuit, i.e. the number of pulse is doubled. The pulses from here are added to IRQ terminal of the microcomputer and the number of pulses is counted within the microcomputer. The pulse from the interrupter (B) is added to the microcomputer (33) to determine whether the pulses put into the IRQ terminal of the microcomputer should be UP counted or DOWN counted. The interrupters (A) and (B) are provided so that the phase difference of the pulses produced is at 90°. The phase difference is read within the micro-computer to recognize the rotating direction of the pulse plate (moving direction of arm) and to determine whether the pulses should be UP counted or DOWN counted.
- 2) Moving Distance of Arm and Number of Pulses Entering IRQ
Each time the arm moves 0.05 mm, one pulse enters.
- 3) All the automatic operations of the arm are governed by the pulses coming from the interrupters.
 - a. AUTO LEAD IN
In the ROM of the microcomputer there are written in advance the counted numbers (addresses) from the REJECT position to the lead-in position of each size. When the counted number of the pulse from the interrupter conforms to the number, the arm is instructed to stop the horizontal movement and to go down.
 - b. AUTO RETURN
Like the AUTO LEAD IN, when the address in the ROM agrees with the counted number of pulses from the interrupter, the reject instruction is issued. Also when the interval of the pulses from the interrupter is narrowed while the arm is in down position, i.e., when the pitch between the grooves of the record becomes wider and the moving speed of the arm becomes faster, the reject instruction is issued.
 - c. RPSS/SKIP (AP-L95)
When the reflection sensor detects the interval between turns, it memorizes the counted number of pulses from the interrupter and the arm accesses.

8. TUNE INTERVAL DETECTION CIRCUIT (AP-L95)

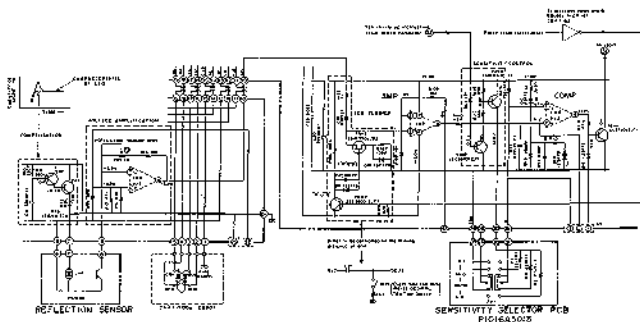


Fig. 14 Reflection Sensor

AP-L95 has a sub-arm which detects the record size and the tune interval and carries out RPSS, SKIP or record size selection.

AP-L95 features the possibility of detecting the tune interval even if the moving speed of the arm is not constant, i.e., it can detect the tune interval whether the arm is moved slowly or fast, or the record is being played.

This makes possible the direct access from tune to tune. This operation can be done by providing a filter to be controlled by the moving distance of the arm between the output of the reflection sensor and the amplifier. The pulses from the interrupter are shaped in TR41 and 42 to switch TR46 and 45 to achieve the ON/OFF of the differentiation circuit consisting of C31 and R107. The interrupter produces one pulse each time the arm moves 0.05mm.

The output from the filter is amplified by IC6 and enters the comparator IC5 2/2. The sensitivity is adjusted by changing the reference voltage of the comparator. TR47 and 48 increase the sensitivity at the lead-in part of the record in accordance with the instructions from the microcomputer. The output of the comparator (IC5 2/2) is passed through TR49 and inputted in the microcomputer as the tune interval pulse.

9. MOTOR CONTROL CIRCUIT

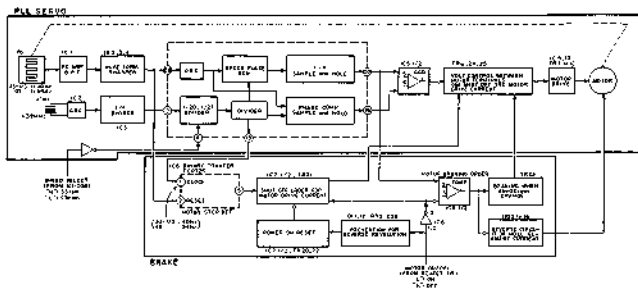


Fig. 15 Motor Control Circuit

1) Motor Drive Circuit

A DC brush-less motor is used, and to obtain the rotation torque, the current to be supplied to the stator coils of 3 systems is switched by a hall device arranged at the phase difference of $2/3\pi$ with 80 pole rotor magnet.

The current to the stator coils is supplied through an operational amplifier and a push-pull amplifier and the operational amplifier is switched by the hall device. The principle is same for the motor of GX-F90.

2) PLL SERVO Circuit

This circuit is our PLL IC AP-400 which has been used for the turn table for some time. The sin wave generated by the motor FG is amplified by ICT and shaped into the square wave (50% duty)

On the other hand, the pulse (Frequency 4.32 MHz) from Xtal OSC is divided into 1/4.

These two pulses entering AP-400A are F-V converted into voltage V_f by the sample & hold circuit and into voltage V_p by the phase comparison sample & hold circuit. V_f and V_p are combined by the operational amplifier to control the base current of TR25 through TR6. TR25 control the interterminal voltage of the motor to control the rotation of the motor. In AP-Q50 and AP-Q60, the current to the hall device was controlled, but in this AP-L45/L95, TR25 controls the interterminal voltage of the motor while a constant current is supplied to the hall device.

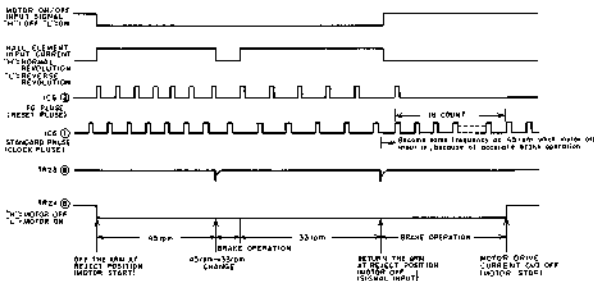


Fig. 16 Brake Circuit Timing Chart

3) Brake Circuit (AP-L95)

This circuit works to stop the rotation of the platter swiftly when the arm returns to the reject position, and also works to reduce the speed of the rotation swiftly when the number of rotation is changed from 45 rpm to 33 rpm while the platter is rotating. The braking method is to invert the direction of the current supplied to the hall device of the motor to generate the reverse rotation torque.

a. Stop in Steady Rotation

During the steady rotation, (1) of the comparator IC5 has about +12V and is supplying the current to the hall device through TR14 and 15. If the arm returns to the reject position and (3) of IC8 becomes "L", (1) of IC5 will have the voltage of about -9V. The hall device is supplied the current in the reverse direction as to the current during the steady rotation by TR16 and 13 and the reverse rotation torque is generated in the motor to brake the rotation. But if it is left as it is, the motor will start the reverse rotation, and therefore, it is necessary to cut off the current running to the stator coils by detecting the stop of the motor, and this is done by IC6, 7 and TR21. IC6 is a binary counter which counts the pulses coming from pin (1) (clock). Pin (5) is the output of fifth figure, and each time 16 pulses from the clock are counted, the output of "H" is produced. The pulses from the X'tal OSC are always added to the pin (1) (clock), but it is always reset by the pulses from FG during steady rotation, and therefore, no 16 count is available, and no output of "H" from (5). If the motor is sufficiently braked, the interval of the reset pulses from FG is widened, and the counter counts 16 before the reset pulse is added, (5) will produce the output of "H". This is the signal to indicate that the rotational speed of the motor is sufficiently reduced.

If (5) of IC6 becomes "H", the flip-flop IC7 is set, and Q becomes "L". TR21 is turned ON and TR25 is turned OFF through TR24 to break the motor driving current.

b. Speed Change from 45 rpm to 33 rpm

If the speed is changed from 45 rpm to 33 rpm when the platter is rotating, the voltage V_f of (2) of AP-400A becomes high to reduce the motor current. (usual servo operation). Because V_f is also added to IC5 (2), the output (1) becomes minus and the current to the hall device is inverted as in the case of the stop in steady rotation. At the same time, TR23 is turned on for the charging time of C24, increases the reduced motor current, and momentarily brakes. When the rotation of the motor becomes 33 rpm, V_f is reduced, IC5 (1) returns to positive voltage, and the motor starts the steady rotation.

VII. ORDINARY ADJUSTMENT

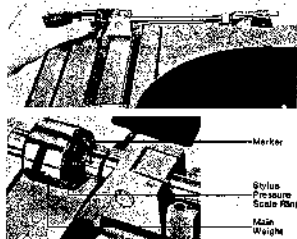
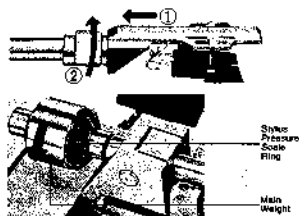


Fig. 15

2. STYLUS PRESSURE ADJUSTMENT

1) MODEL AP-L45/C

1. Remove the Stylus Guard being careful not to damage the Stylus.
2. Adjust the Main Weight until the Tone Arm is slightly above the Tone Arm Lifter and balanced.
3. Without moving the Main Weight, rotate the Stylus Pressure Scale Ring only, to match the "0" mark with the mark on the weight shaft.
4. Rotate the Main Weight towards you, as viewed from the front operating panel (the Stylus Pressure Scale Ring will move with it), until the desired Stylus Pressure Scale Indication is at the mark on the shaft. The range of adjustment is from 0 to 3 grams.

* For AP-L45C only: the recommended stylus pressure for the cartridge supplied, PC95, is 2 grams.

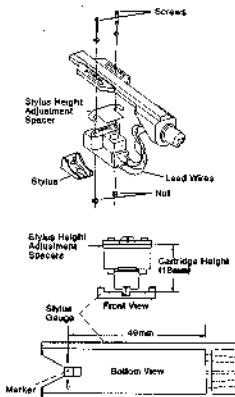


Fig. 17

1. ATTACHING A CARTRIDGE

Cartridge is not included with the AP-L45/L95 turntable. Read the operator's manual carefully before attempting installation. Cartridge Shell lead designations are as follows:

- BLUE: Left Ground (Earth) (-)
- WHITE: Left Output (+)
- GREEN: Right Ground (Earth) (-)
- RED: Right Output (+)

Attach the cartridge lightly to the Cartridge Shell. Adjust the height of the stylus with the Stylus Height Adjustment Spacers. Place the Cartridge Shell into the Stylus Gauge. Attach the Cartridge securely to the Cartridge Shell so that the Stylus is positioned as shown in the illustrations.

- Place the spacers to adjust the height.
- The Stylus should be over the 49 mm marker.

2) MODEL AP-L95/C

1. Depress the POWER Switch to turn on the power.
2. Remove the Stylus Guard being careful not to damage the Stylus.
3. Depress the ARM RELEASE button. The Tone Arm will descend.
4. Adjust the Main Weight until the Tone Arm is in perfect horizontal balance.
5. Without moving the Main Weight, rotate the Stylus Pressure Scale Ring only to match the "0" mark with the mark on the weight shaft.
6. Rotate the Main Weight towards you, as viewed from the front operating panel (the Stylus Pressure Scale Ring will move with it), until the desired Stylus Pressure Scale indication is at the mark on the shaft. The range of adjustment is from 0 to 3 grams.
 - * For AP-L95C only: The recommended stylus pressure for the cartridge supplied, PC-95, is 2 grams.
7. Depress the ARM RELEASE button again, the Tone Arm will rise.

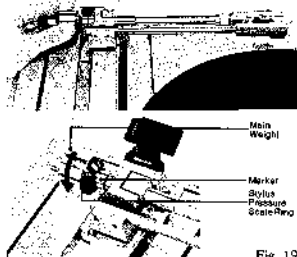


Fig. 19

VIII. ADJUSTMENT

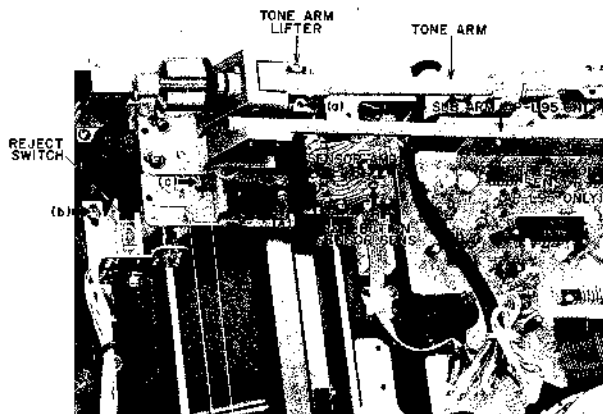


Fig. 20

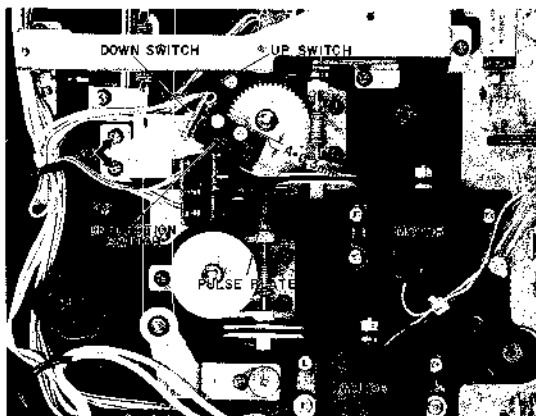


Fig. 21

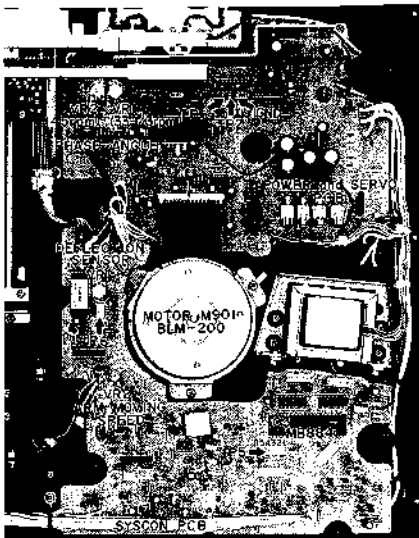


Fig. 22

1. TONE ARM LIFTER HEIGHT ADJUSTMENT (Refer to Fig. 20)

- 1) Check that the cartridge is mounted in the shell at the proper height.
- 2) Set the platter and rubber mat in place, and push the power switch on.
- 3) Push the manual size selector 17 or 25, and advance the arm inwards by means of the FWD switch. (If the arm is advanced by the PLAY switch, the arm will lower to damage the stylus point).
- 4) When the arm stops, push the power switch off.
- 5) Remove the screw (a) from the tone arm.
- 6) Turn the single-groove screw located under the screw (a) until the distance from the rubber mat surface to the stylus point is 8 mm.
- 7) Tighten the screw (a) again.

2. REJECT SWITCH INSTALLATION POSITION ADJUSTMENT (LEAD-IN, LEAD-OUT POSITION ADJUSTMENT)

(Refer to Figs. 20, 23, 24)

- 1) Place a 30 cm record on, and push the power switch on.
- 2) Push the PLAY button to lead the stylus in.
- 3) See that the stylus lowers into the lead-in groove (radius 146.5 to 149 mm) at this time.
- 4) If the stylus lowers at a point too far out or in, loosen the screw (b) (Fig. 20), and adjust by changing the position of the REJECT switch. (The stylus' lowering position will change inward if the REJECT switch is moved to the front, or outward if the switch is moved to the rear).
- 5) After retightening the screw (b), check by using several 30 cm, 25 cm and 17 cm records that the stylus will not lower into the sound groove or out of the record.
- 6) After this confirmation of stylus operation, lock the screw (b) by painting.

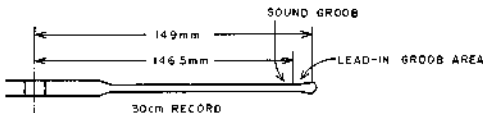


Fig. 23

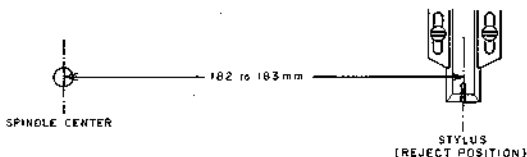
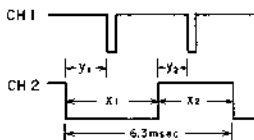


Fig. 24 Reference Value



$$a = \frac{y_1}{x_1} \times 100 = 50\% \pm 25\%$$

$$b = \frac{y_2}{x_2} \times 100 = 50\% \pm 25\%$$

Fig. 25

3. ARM MOVING SPEED ADJUSTMENT

(Refer to Figs. 22, 25)

- 1) Push the power switch off.
- 2) Remove the rubber mat and platter.
- 3) Short Pin (3) and Pin (5) of Syscon P.C Board P5.
- 4) Connect Pin (5) of P5 to GND of oscilloscope CH1, and Pin (4) of the same to CH1 (+). Also connect Pin (2) to CH2 (+). (Use a probe).

CAUTION: Exercise good care in connecting the pins because their spacing is very small.

- 5) When the power switch is pushed on, the arm starts moving back and forth, and waveforms appear on CH1 and CH2 of the oscilloscope. (Fig. 25)
- 6) Adjust VR2 on Syscon P.C Board until the period of the waveform on CH2 is 6.3 msec. (If the periods of the arm movements forward and back are different, adjust the shorter period to 6.3 msec).

- 7) Check that the phase difference a, b between the waveforms on CH1 and CH2 (Fig. 25) is $50\% \pm 25\%$
- 8) Push the power switch off, and disconnect the pins mentioned in Steps 3) and 4).

4. DEFLECTION SENSOR POSITION

ADJUSTMENT (Refer to Figs. 20, 22)

- 1) Check the arm that it is in the REJECT position.
 - 2) Lightly tap the arm lifter with your finger so that the arm will seat well on the arm lifter.
 - 3) Push the power switch off.
 - 4) Short Pin (1) and Pin (3) of Syscon P.C. Board P6.
 - 5) Connect Pin (1) of P6 to the digital voltmeter's (-) and Pin (2) to its (+).
 - 6) Push the power switch on.
 - 7) Adjust the screw (c) (Fig. 20) until the digital voltmeter reads $-0.25 \pm 0.55V$ DC.
 - 8) After the adjustment, lock the screw (c) by painting, and applying a bond.
 - 9) Push the power switch off.
 - 10) Disconnect the pins mentioned in Steps 4) and 5).
- CAUTION: Exercise good care in connecting the pins because their spacing is very small.

5. DEFLECTION SENSOR ELECTRICAL

ADJUSTMENT (Refer to Figs. 21, 22)

- 1) Check the arm that it is in the REJECT position.
- 2) Check that the stylus pressure has already been adjusted.
- 3) Remove the rubber mat and platter.
- 4) Turn Syscon P.C. Board VR1 (Fig. 22) counterclockwise all the way.
- 5) Set the manual size selector to the position 30, and push the PLAY button. (The arm goes down to the 30 cm lead-in position)
- 6) The arm starts moving as VR1 is slowly turned clockwise.

CAUTION: The arm will be rejected if the arm moving speed gets too fast. If this occurs, repeat from Step 4).

- 7) Slowly turn VR1 counterclockwise until the arm stands still.
- 8) Check that, when the arm is raised or lowered at that position, the pulse plate will not move (the arm will not move horizontally).
- 9) If the pulse plate moves, turn VR1 slightly counterclockwise, and repeat Step 8).
- 10) Push the REJECT button, and disconnect the wire from the main motor Power & Servo P.C. Board J1.
- 11) Place the platter and rubber mat back on.
- 12) Set the manual size selector to 17, and push the PLAY button. (Lower the stylus onto a still rubber mat).
- 13) Turn the pulse plate clockwise (in the arrow direction shown in Fig. 21) by about 5 mm with your finger, and check that the pulse plate returns to its original position. If the pulse plate does not return, repeat from Step 4).
- 14) Reconnect the motor (J1).

6. REFLECTION SENSOR SENSITIVITY

(AP-L95/C) (Refer to Figs. 20, 26)

- 1) Push the power switch off.
 - 2) Disconnect the motor (Power & Servo P.C. Board J1).
 - 3) Connect Pin (1) of Syscon P.C. Board P6 to the digital voltmeter's (-) and Pin (4) to its (+).
 - 4) Place the platter and rubber mat on.
 - 5) Clean a record which has a wide lead-out groove pitch and set it in place.
- CAUTION: 1. Use neither a mono-sheet nor a color record.
2. Use a record which is free from defects, dirt and dust.
- 6) Push the power switch on.
 - 7) Advance the reflection sensor (with tone arm block) over the lead-out groove area by means of the F. FWD button. (Fig. 26)

CAUTION: Turn the record by hand so that the groove will not be directly under the reflection sensor. (Fig. 26)

- 8) Adjust VR1 (Fig. 20 Sensor Amp P.C. Board) so that the digital voltmeter reads $-1.0 \pm 0.2V$ DC at this time.

CAUTION: If the sensor is over the lead-out groove area, VR1 cannot be adjusted because it is under the platter. In that case, it is necessary to temporarily move the arm to a point where VR1 can be turned. (REV or REJECT).

- 9) Repeat Steps 7) and 8) a few times, and check again with other record.

7. REFLECTION SENSOR POSITION ADJUSTMENT (AP-L95/C) (Refer to Fig. 20)

- 1) Set a record, having as narrow intervals as possible, in place.

CAUTION: Use neither a mono-sheet nor a color record.

- 2) Using a stylus gauge (a standard accessory), check that the stylus is in the proper position.
 - 3) Program a suitable tune. (RPSS)
 - 4) Push the PLAY button, and check that the stylus properly goes down at the center of the desired interval.
 - 5) If the stylus fails to go down in the interval center, loosen the screw (d) (Fig. 20), and adjust by turning CAM (e).
 - 6) Repeat Steps 3), 4) and 5) a few times.
 - 7) Retighten the screw (d).
 - 8) Confirm as mentioned in Steps 3) and 4).
- If good, lock the screw (d) and CAM (e) by painting.

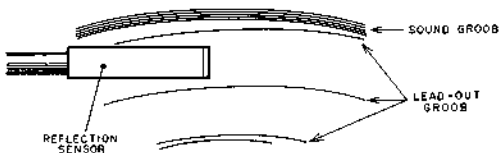
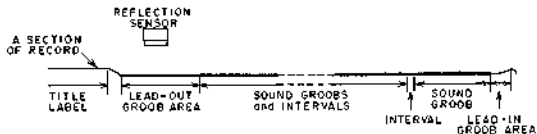


Fig. 26

8. DEFLECTION SWITCH POSITION

ADJUSTMENT (Refer to Fig. 21)

- 1) Push the ARM RELEASE button to lower the arm.
(AP-L45/C. Remove the platter and rubber mat, and lower the arm at the 30 cm or 17 cm position).
- 2) The clearance A (Fig. 21) should be about 0.3 mm at this time.
- 3) It can be adjusted by loosening the screws (a) in Fig. 21.

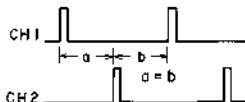


Fig. 27

9. QUARTZ LOCK PHASE ANGLE

ADJUSTMENT (Refer to Figs. 22, 27)

- 1) Connect TP1 and GND shown in Fig. 22 (Power & Servo P.C Board) to the oscilloscope's CH1 (+) and GND, and TP2 to CH2 (+). (Use a probe).
- 2) Place the platter and rubber mat on.
CAUTION: Be careful not to let the probe and platter contact with each other.
- 3) Set the speed to 33, and the size to 30. Advance the arm and turn the platter by operating the FWD button. Do not lower the arm.
- 4) Turn VR1 (Fig. 22 Power & Servo P.C Board) until the phase relationship between CH1 and CH2 is as shown in Fig. 27.
- 5) Change the speed to 45.
- 6) Turn VR2 (Fig. 22 Power & Servo P.C Board) until the phase relationship between CH1 and CH2 is as shown in Fig. 27.
- 7) Push the power switch off, and disconnect those mentioned in Step 1).

IX. CLASSIFICATION OF VARIOUS P.C BOARDS

1. P.C BOARD TITLES AND IDENTIFICATION NUMBERS

1) MODEL AP-L45/C

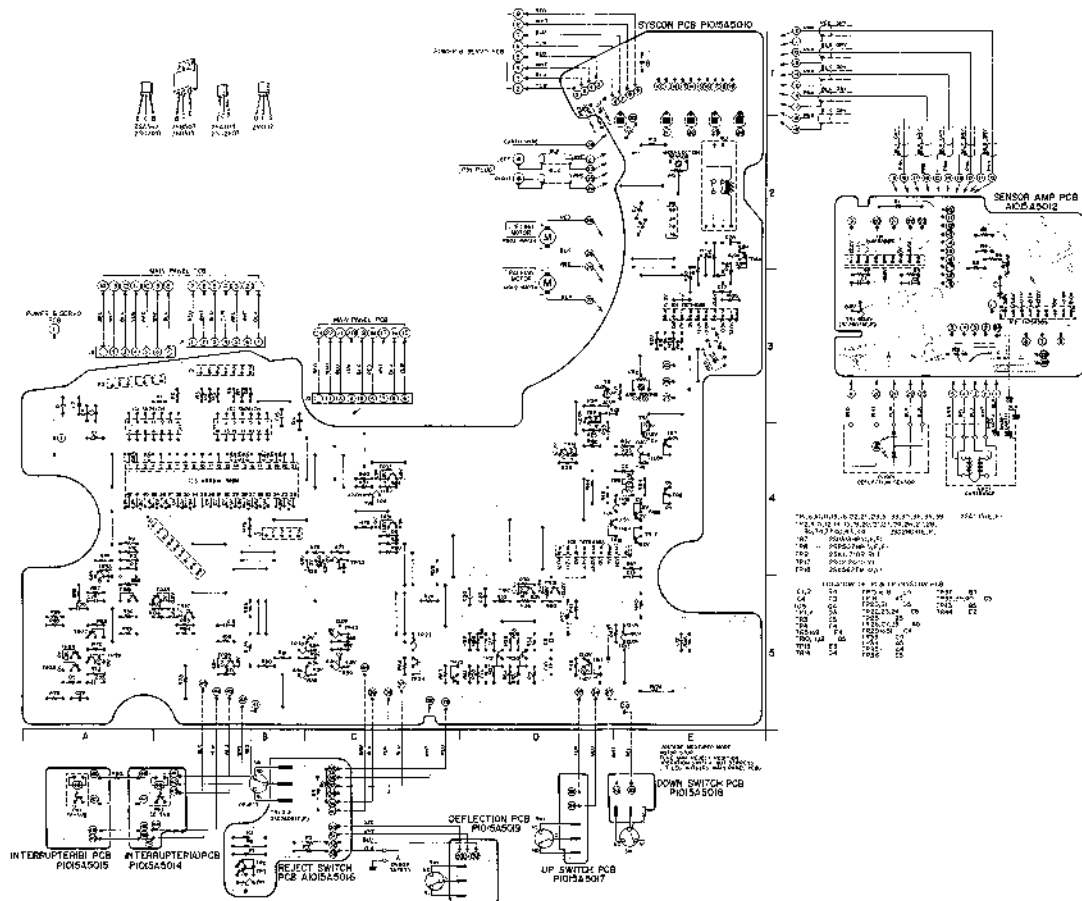
P.C BOARD TITLE	P.C BOARD NUMBER
Syscon P.C Board	P1015A5010
Power & Servo P.C Board	P1015A5011
Sensor Amp P.C Board	P1015A5012
Interrupter (A) P.C Board	P1015A5014
Interrupter (B) P.C Board	P1015A5015
Reject Switch P.C Board	P1015A5016
Up Switch P.C Board	P1015A5017
Down Switch P.C Board	P1015A5018
Deflection P.C Board	P1015A5019
Main Panel P.C Board	P1015A5040
Size Switch P.C Board	P1015A5041

2) MODEL AP-L95/C

P.C BOARD TITLE	P.C BOARD NUMBER
Syscon P.C Board	P1016A5010
Power & Servo P.C Board	P1016A5011
Sensor Amp P.C Board	P1016A5012
Sensitivity Selector P.C Board	P1016A5013
Interrupter (A) P.C Board	P1016A5014
Interrupter (B) P.C Board	P1016A5015
Reject Switch P.C Board	P1016A5016
Up Switch P.C Board	P1016A5017
Down Switch P.C Board	P1016A5018
Deflection P.C Board	P1016A5019
Main Panel L95 P.C Board	P1016A5030
By-Pass P.C Board	P1016A5031
Cabinet P.C Board	P1016A5032
Release SW P.C Board	P1016A5033

2. MODEL AP-L45; COMPOSITION OF VARIOUS P.C BOARDS

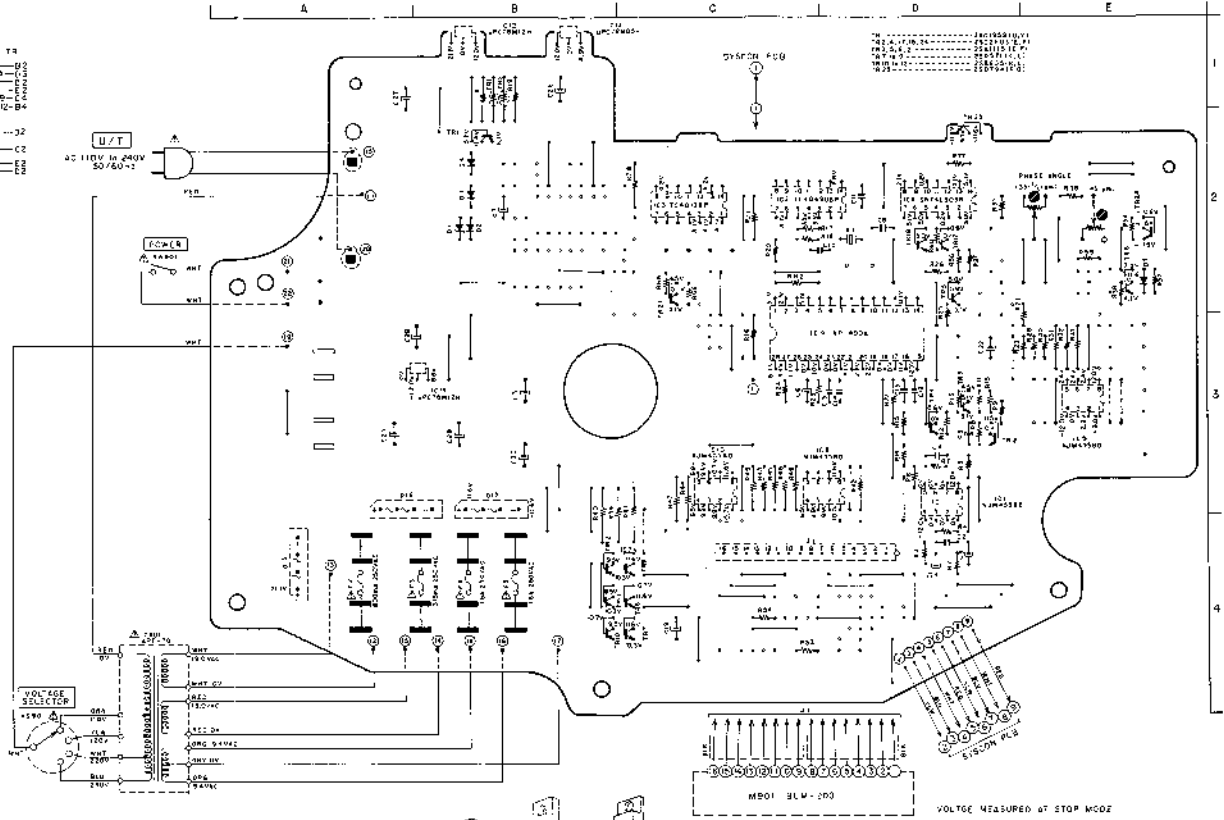
- 1) Syscon P.C Board P1015A5010 (2LD), Sensor Amp P.C Board P1015A5012, Interrupter (A) P.C Board P1015A5014, Interrupter (B) P.C Board P1015A5015, Reject Switch P.C Board P1015A5016, Up Switch P.C Board P1015A5017, Down Switch P.C Board P1015A5018 and Deflection P.C Board P1015A5019



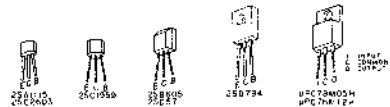
LOCATION OF C & TR

LOC C	TR 1
LOC B	TR 2
LOC A	TR 3
LOC 0	TR 4
LOC 1	TR 5
LOC 2	TR 6
LOC 3	TR 7
LOC 4	TR 8
LOC 5	TR 9
LOC 6	TR 10
LOC 7	TR 11
LOC 8	TR 12
LOC 9	TR 13
LOC 10	TR 14
LOC 11	TR 15
LOC 12	TR 16
LOC 13	TR 17
LOC 14	TR 18
LOC 15	TR 19
LOC 16	TR 20
LOC 17	TR 21
LOC 18	TR 22
LOC 19	TR 23
LOC 20	TR 24
LOC 21	TR 25
LOC 22	TR 26
LOC 23	TR 27
LOC 24	TR 28
LOC 25	TR 29
LOC 26	TR 30
LOC 27	TR 31
LOC 28	TR 32

TR 1	2N2907
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TR 3	2N2907
TR 4	2N2907
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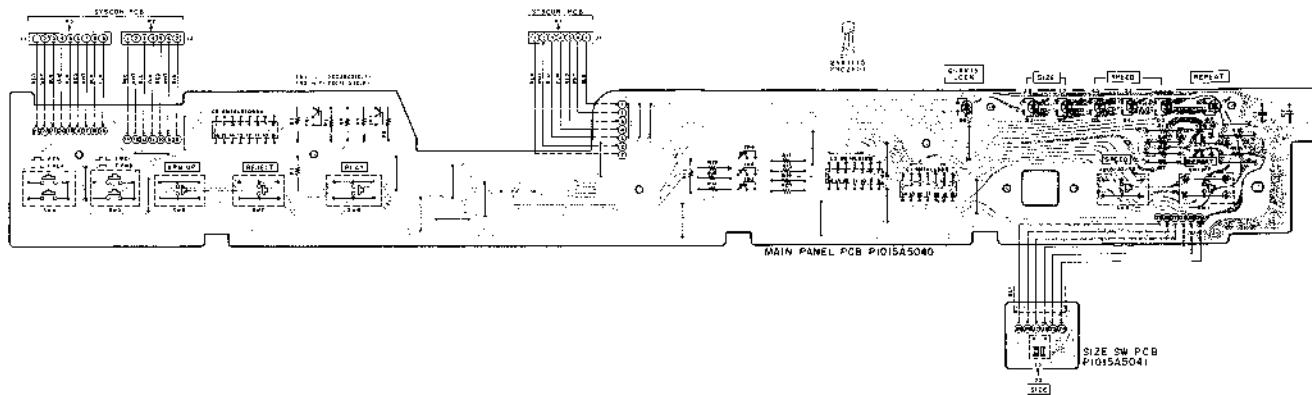


RESISTORS WITH NO VALUE SPECIFIED ARE 1/4W 5% TOL. UNLESS OTHERWISE SPECIFIED. CAPACITORS WITH NO VALUE SPECIFIED ARE 50V UNLESS OTHERWISE SPECIFIED. ALL CAPACITORS ARE POLYESTER UNLESS OTHERWISE SPECIFIED. ALL CAPACITORS ARE POLYESTER UNLESS OTHERWISE SPECIFIED.



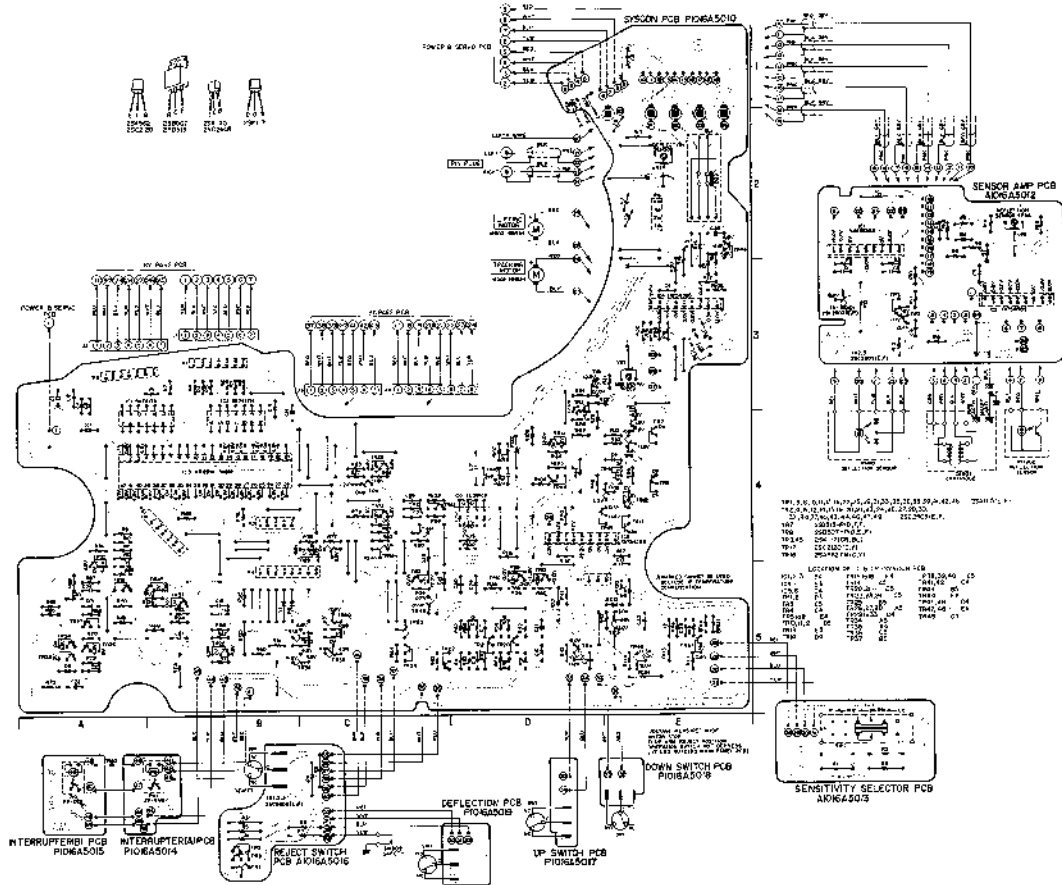
VOLTAGE MEASURED AT STOP MODE

3) Main Panel P.C Board P1015A5040 and Size Switch P.C Board P1015A5041



3. MODEL AP-195/C COMPOSITION OF VARIOUS P.C BOARDS

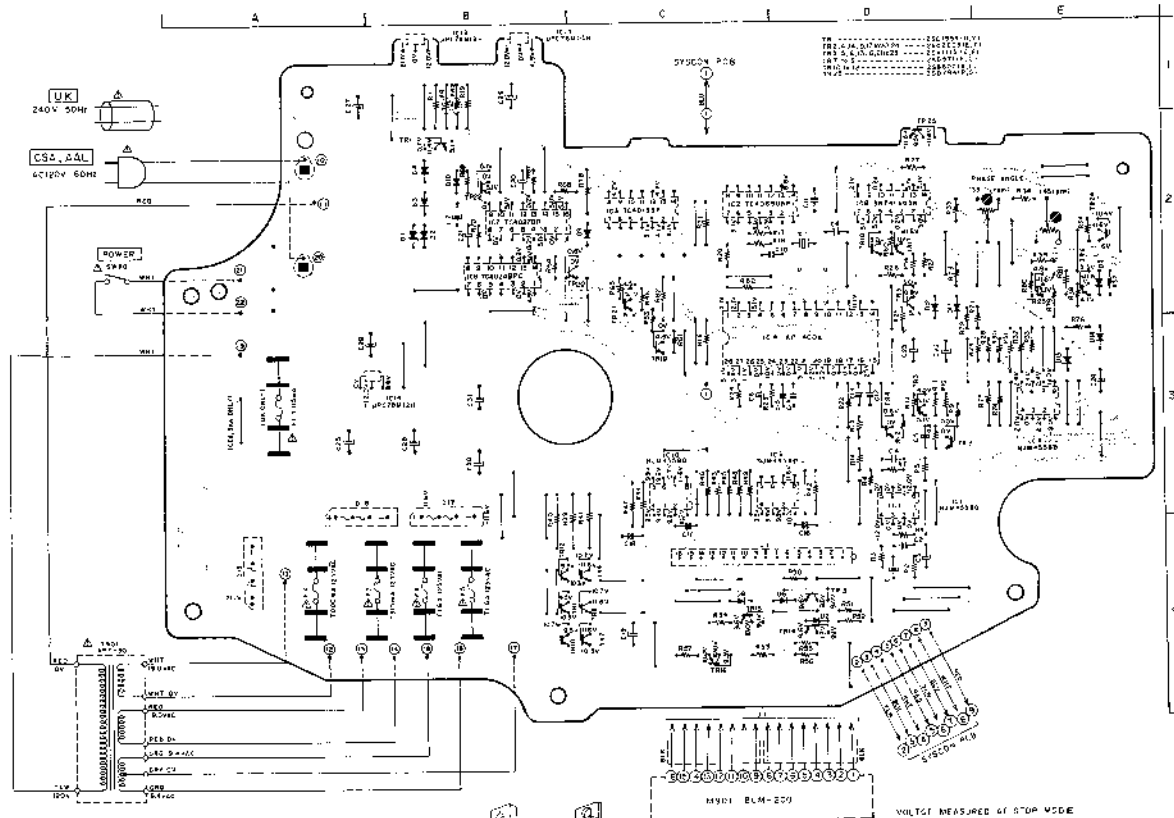
- 1) System P.C Board P1016A5010(3LD), Sensor Amp P.C Board P1016A5012, Sensitivity Selector P.C Board P1016A5013, Interrupter (A) P.C Board P1016A5014, Interrupter (B) P.C Board P1016A5015, Reset Switch P.C Board P1016A5016, Up Switch P.C Board P1016A5017, Down Switch P.C Board P1016A5018 and Deflection P.C Board P1016A5019



2) Power & Servo P.C Board P1016A9011 (CED)

LOCATION OF IC & TR

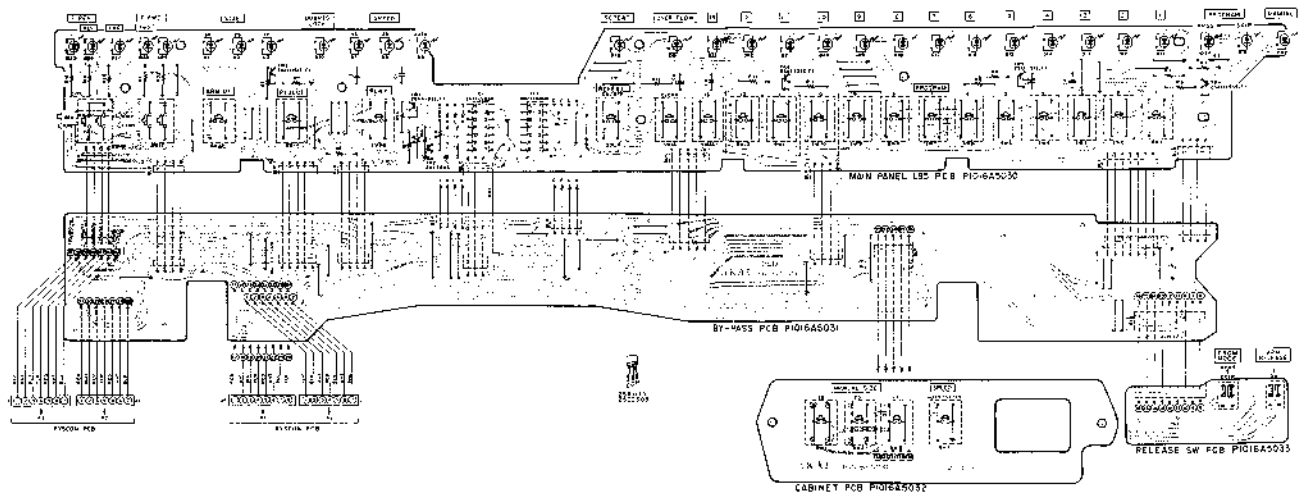
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WARNING: READ AND OBEY ALL WARNINGS FOR CONTROLLED STATES.
 BEFORE SERVICE, REFER TO PROCEDURES AND ALL WARNINGS AND
 REQUIREMENTS.
 THIS BOARD IS A PART OF THE POWER & SERVO P.C BOARD P1016A9011.
 IT IS NOT A STAND ALONE BOARD. IT IS A PART OF THE POWER & SERVO P.C BOARD P1016A9011.
 IT IS NOT A STAND ALONE BOARD. IT IS A PART OF THE POWER & SERVO P.C BOARD P1016A9011.

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- IC885 250794
- IC886 250794
- IC887 250794
- IC888 250794
- IC889 250794
- IC890 250794
- IC891 250794
- IC892 250794
- IC893 250794
- IC894 250794
- IC895 250794
- IC896 250794
- IC897 250794
- IC898 250794
- IC899 250794
- IC900 250794

3) Main Panel L95 P.C Board P1016A5030 (2ED), By-Pass P.C Board P1016A5031, Cabinet P.C Board P1016A5032 and Release SW P.C Board P1016A5033 (2ED)



SECTION 2

PARTS LIST

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Resistor and Capacitor which is not listed in this parts list, please refer to COMMON LIST FOR SERVICE PARTS.

HOW TO USE THIS PARTS LIST

1. This parts list is comprised by various individual blocks based on assembly process.
2. When ordering parts, please indicate parts number, serial number and model number, if total flow is read list.
3. How to read list:
 - The reference number corresponds with illustration or photo number of that particular part (ref.).
 - This number corresponds with the Figure Number.
 - This number corresponds with the individual parts index number in that figure.
 - A small "X" indicates the ability to show that particular part in the Photo or Illustration.

12-115X

Ref. No.	Parts No.	Description
HYDRAEEL BLOCK #13		
12-115A	502922	Hy wheel block Ass't comp.
12-115B	244506	Hy wheel caps
12-115C	244753	Oil: Hy wheel
12-115D	251754	Main block Case
12-115E	250560	Main block

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 indicators 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. That can be accomplished by using the Reference Number listed to right of parts number in the Parts Index, (starting at ref. no. contained 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.

CAUTION:

1. When placing an order for parts, be sure to list the parts no., model no., and description. There are instances in which if any of this information is omitted, parts cannot be shipped or the wrong parts will be delivered.
2. Please be careful not to make a mistake in the parts no. If the parts no. is in error, a part different from the one ordered may be delivered.
3. Because parts number and parts unit supply in the Preliminary Service Manual (Basic Parts List) may be partially changed, please use this parts list for all future reference.

WARNING: 1. INDICATE SAFETY CRITICAL COMPONENTS. FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS.

AVERTISSEMENT: 2. IL INDIQUE LES COMPOSANTS CRITIQUES DE SURETE. POUR MAINTENIR LE DEGRÉ DE SECURITE DE L'APPAREIL NE REMPLACER LES COMPOSANTS DONT LE FONCTIONNEMENT EST CRITIQUE POUR LA SECURITE QUE PAR DES PIECES RECOMMANDEES PAR LE FABRICANT.

I. MODEL AP-L45/C

I RECOMMENDED SPARE PARTS

Because, if the parts listed below are on hand, almost any repair can be accomplished, we suggest that you stock these Recommended Spare Parts Items

REF. NO.	PARTS NO	DESCRIPTION
1-1	B3M3182A018A	MOTOR BF-3100
1-2	BT321792	△ TRANS HMR3441-01-020
1-3	BT321793	△ TRANS POWER APT65-10 (B)
1-4	BT321794	△ TRANS POWER APT65-30 (C,A)
1-5	BT321795	△ TRANS POWER APT65-40 (E,B,S)
1-6	BT321794	△ TRANS POWER APT65-70 (H)
1-7	ED302452	D GERMA V 1K34A-LR 100
1-8	ED322772	D FED SLP 85SD-01 RED
1-9	ED322773	D 1TD SLP 25SD-01 GRN
1-10	ED560913	D SILICON V 152P7JVE
1-11	ED322235	D SILICON 1B4D41 100/1 0A
1-12	ED313284	D ZENER 11 W2-030
1-13	EF695766	△ FUSE SEMKO T 250V 0.31A (F3)(D)
1-14	EF695766	△ FUSE SEMKO T 250V 0.31A (F3)(E,B,S)
1-15	EF118344	△ FUSE SEMKO T 250V 0.80A (F2)(F,R,S)
1-16	EF601964	△ FUSE SEMKO T 250V 1.00A (F4,S)(E,B,S)
1-17	EF206125	△ FUSE TSC A 250V 0.31A (F3)
1-18	EF309383	△ FUSE TSC A 250V 0.80A (F3)(L,J)
1-19	EF1311830	△ FUSE TSC A 250V 1.6A (F4,S)(H,J)
1-20	EF209091	△ FUSE TSC 125V 0.08A (D)(G,A)
1-21	EF206058	△ FUSE TSC 125V 0.31A (F3)(H,A)
1-22	EF308841	△ FUSE TSC 125V 1.00A (F4,S)(H,A)
1-23	E1213557	IC AP-400-A (TM4104P)
1-24	E1213812	IC M80841 14051
1-25	F1213300	IC NJM4558D
1-26	F1201940	IC NJM4558S
1-27	F1310043	IC SN74LS03N
1-28	F1324790	IC SN74LS109AN
1-29	F1324789	IC SN74LS12N
1-30	F1331660	IC SN7417N
1-31	H322389	IC TA754385
1-32	H306727	IC TC901JBP
1-33	H3061726	IC TC90691UP
1-34	H326756	IC uPC75105P
1-35	F1326796	IC uPC78C12H
1-36	E1326799	OSC X TAL 4.32 MHz
1-37	F1327231	OSC X TAL 4MHz
1-38	F9321437	RELAY LEAD LABINS 2NO 5V
1-39	ER318248	△ R.F. SW TRHPFC 1-4W 49R6C
1-40	F5326788	△ SW PUSH 85B-99149T 01-1 C (U,A)
1-41	F3218787	△ SW PUSH 85B-99149R 01-1 E (H)
1-42	H3318786	△ SW PUSH 85B-99149S 01-1 B (U,F,R,S)
1-43	ES309920	SW 1CAF 85W-13D 01-1 NO
1-44	ES308920	SW MICRO VV S
1-45	F3228780	SW PUSH 85K-03 3-02-02N
1-46	KS305733	SW SELECTOR HXW0151-240 01-4
1-47	F5324731	SW TACT EQ-Q-PYR12K
1-48	F5328776	SW TACT KHFI09B1
1-49	ET328889	PHOTO SENSOR EF-SV3-B
1-50	ET200358	TR 2SA1135 P.F
1-51	ET326861	TR 2SA1621 P.O.Y
1-52	ET323345	TR 2SB507HP D.E.F
1-53	ET666415	TR 2SB605 K.L
1-54	ET330162	TR 2SC1999 O.Y
1-55	ET308844	TR 2SC2120 O.Y
1-56	ET160805	TR 2SC2603 P.F
1-57	ET323366	TR 2SD313HP P.E.F
1-58	ET666404	TR 2SD571 K.L

REF. NO.	PARTS NO.	DESCRIPTION
1-59	ET307349	TR 2SD294 P.O
1-60	ET321916	TR 2SK117 G.R,DL
1-61	EV317389	R S-FIX H TMAK2-1S 3P 0.10W 102
1-62	EY520686	R S-FIX H V8K4-1 3T 103
1-63	MR529550	BLT7
1-64	TP328793	TONE ARM W/SHIELD
1-65	TP329217	TONE ARM W/SHIELD (BL)

2. SYS. CON. P.C. BOARD BLOCK

REF. NO.	PARTS NO.	DESCRIPTION
2-1	DA005A00A	PC SYSCON BLK AP-L45(U)
2-2	DA005A00B	PC SYSCON BLK AP-L45(U)
2-3	DA005A00C	PC SYSCON BLK AP-L45(F)(C,A)
2-4	DA005A00E	PC SYSCON BLK AP-L45(F)(F,S)
2-5	DA005A00F	PC SYSCON BLK AP-L45(B)
PC SYSCON BLOCK		
2IC1,2	E1316000	IC SN7417N
2IC2	L1278812	IC M30841 30VM
2JC4,5	C1215999	IC TA7948S
2TR1	ET200558	TR 2SA1115 E,F
2TR2	ET200505	TR 2SC2603 E,F
2TR4,5	ET200505	TR 2SC2603 E,F
2TR6	ET200558	TR 2SA1115 E,F
2TR7	F1202366	TR 2SD311HP D,E,F
2TR8	L1323248	TR 2SD307HP D,E,F
2TR9	L1321016	TR 2SK1117 GK,HL
2TR10,11	ET200558	TR 2SA1115 E,F
2TR12	ET200505	TR 2SC2603 E,F
2TR13	ET200558	TR 2SA1115 E,F
2TR14,15	L1200507	TR 2SC2603 E,F
2TR16	ET200558	TR 2SA1115 E,F
2TR17	L1324444	TR 2SC2120 O,V
2TR18	F1252668	TR 2SA1115 TM O,V
2TR19,20	F1200501	TR 2SC2603 E,F
2TR21	L1200558	TR 2SA1115 E,F
2TR22,23	ET200505	TR 2SC2603 E,F
2TR24	L1200558	TR 2SA1115 E,F
2TR26,28	ET200505	TR 2SC2603 E,F
2TR29	ET200558	TR 2SA1115 E,F
2TR30	ET200501	TR 2SC2603 E,F
2TR31	L1200558	TR 2SA1115 E,F
2TR32	F1200558	TR 2SA1115 E,F
2TR33	F1200558	TR 2SA1115 E,F
2TR34	L1200505	TR 2SC2603 E,F
2TR35,36	L1200558	TR 2SA1115 E,F
2TR37	F1200505	TR 2SC2603 E,F
2TR38,39	ET200558	TR 2SA1115 E,F
2TR40	ET200501	TR 2SC2603 E,F
2TR42,44	ET200505	TR 2SC2603 E,F
2D1	E1308452	O OSCRTR V 16344-LR 1-9
2D2	H3360913	D SILICON V 152473VE
2D5,6	ED3140913	D SILICON V 152473VE
2RF1	FR322437	RELAY LEAD LABDMS 2NO 5V
2X0	FR323731	OSC XTAL 4MHz
2XR1	EV317580	RS-FIX IITM6KV24S 3P 0.5W
2XR2	EV320406	R S-FIX HVBK9 1.3F 103
2XR3	E1306812	PLUG 7P CONNECTOR 171825-7 7P
2P3	E1316366	PLUG 9P CONNECTOR 171825-9 9P
2P5	E1318261	PLUG 5P CONNECTOR 171825-5 5P
2P6	E1315286	PLUG 4P CONNECTOR 171825-4 4P
PC POWER & SERVO BLOCK		
2IC1	E1212900	IC NIM4558D
2IC2	F1306726	IC IC4049HDP
2IC3	E1306727	IC IC4049JBP
2IC4	E1315557	IC AP400-A (TM9504P)
2IC5	L1212900	IC NIM4558D
2IC8	K1310411	IC SN74LS03N
2IC9,10	ED123890	IC NIV4582D
2IC12	H325796	IC PC78AL2E1
2IC13	L1325749	IC PC78AC05H
2IC14	F1325746	IC PC78AL3H
2TR1	ET200362	TR 2SC1989 O,V
2TR2	ET200505	TR 2SC2603 E,F
2TR3	F1200538	TR 2SA1115 E,F
2TR4	F1200508	TR 2SC2603 E,F
2TR5,6	F1200558	TR 2SA1115 E,F
2TR7,10	F1200504	TR 2SD307 E,L
2TR10,12	F1200514	TR 2SD305 E,L
2TR17,18	ET200501	TR 2SC2603 E,F
2TR19	ET200558	TR 2SA1115 E,F

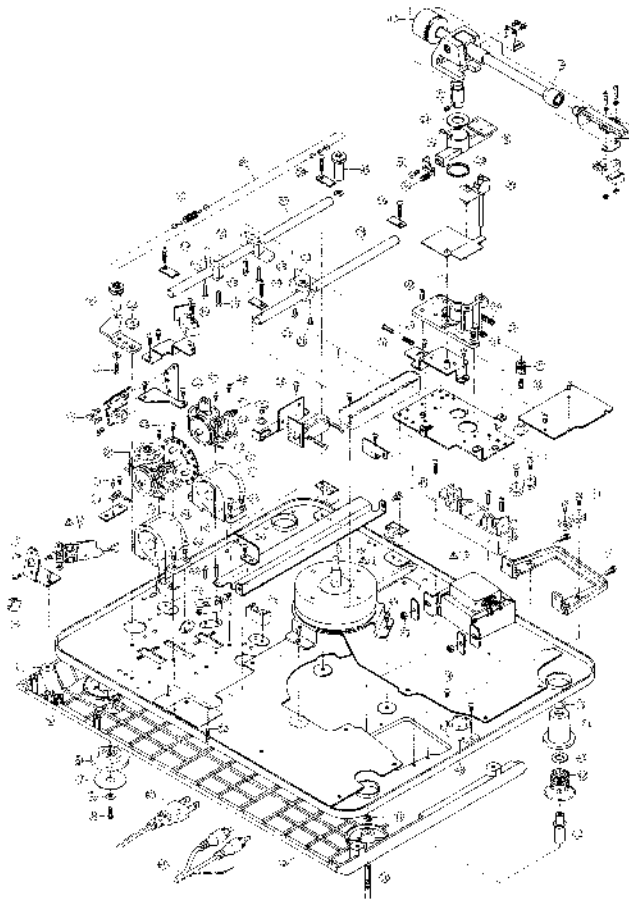
REF. NO.	PARTS NO.	DESCRIPTION
2TR14	ET200505	TR 2SC2603 E,F
2TR15	ET207349	TR 2SD390 P,Q
2D1	ED313584	D ZENER H WZ-036
2D2,6	ED360013	D SILICON V 152473VE
2D10,11	ET202238	D SILICON 184841 100V 0A
2XR1,2	EV317580	R S-FIX IITM6KV24S 3P 0.5W
2X1	F1225799	OSC XTAL 4.32 MHz
2X2	E1312099	SOCKET 20PITH W-DIM 4EP
2-FR1,2	LR315246	Δ R FUSE BRD PC 1/4W 47KΩ
2-C1	FR320548	C CE V F 103Z 250AC 1U3
2-C2	FR314688	C CF V FZ 103P 125AC (C,A)
2-C3	LC327671	C MP V 103M 250AC (C,A,S)
PC SENSOR AMP BLOCK		
2IC1	L1301940	IC NIM4558S
2IC2	F1315509	IC FA1548S
2TR1	FR200504	TR 2SC2603 E,F
PC INTERRUPTER (A) BLOCK		
2PH1	ET205889	PHOTO SENSOR EE-SV3A
PC INTERRUPTER (B) BLOCK		
2PH1	ET206899	PHOTO SENSOR EE-SV3B
PC REFLECT SW BLOCK		
2TR11,12	ET200505	TR 2SC2603 E,F
PC UP SW BLOCK		
2SW1	ES308929	SW MICRO VV-S
PC DOWN SW BLOCK		
2SW1	ES308929	SW MICRO VV-S
PC REFLECTION SW BLOCK		
2SW1	ES308929	SW MICRO VV-S

3. MAIN PANEL L45 P.C. BOARD BLOCK

REF. NO.	PARTS NO.	DESCRIPTION
3-1	DA005A00A	PC MAIN PANEL L45 BLK AP-L45 (Inc. Main Panel, SW Sock Pl B)
PC MAIN PANEL BLOCK		
3IC1	L1310042	IC SN741503N
3IC2	E1318269	IC SN74LS12N
3IC3	F1318790	IC 2N41309AN
3TR1	ET200505	TR 2SC2603 E,F
3TR2,10	ET200558	TR 2SA1115 E,F
3D1,6	ED323772	D LED SLF 1550-01 RED
3D4	ED323773	D LED SLF 2530-01 GRN
3D7	ED323774	D LED SLF 1510-01 RED
3SW1,2	ES328777	SW TACT EVQ-PYR12K
3SW3,4	ES328778	SW TACT KHF10901
3SW10,11	ES328777	SW TACT EVQ-PYR12K
PC SW SIZE BLOCK		
3SW1	ES328780	SW PUSH SPK-02 2.02-01N
3-2	ZW 324494	RV NVT-30A04

ASSEMBLY BLOCK (1)

4. ASSEMBLY BLOCK (1)

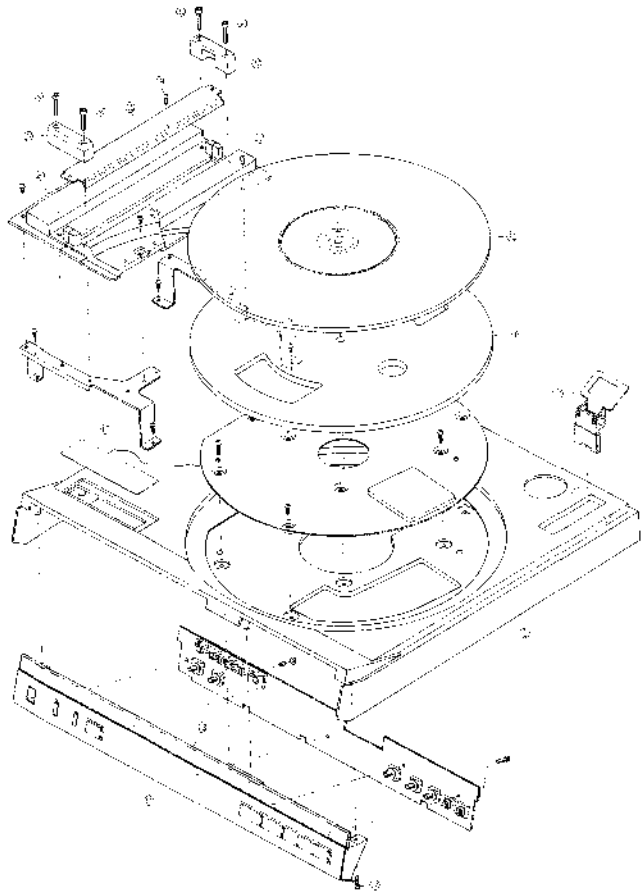


QTY.	PARTS NO.	DESCRIPTION
MOTOR BLOCK		
1-1	BM32828DA	MOTOR ELEM 300
4-2	EM12824J	HOLL ELEMENT VHE-T1J
COVER BOTTOM BLOCK		
4-3	SP31864	COVER BOTTOM
4-6	Z55240C	FLX PAN30408STL CMT
4-6	8A32947	FOOT RUBBER
4-6	TP32948	FELT RUBBER FOOT
6-8	Z5131003	FLX PAN30408STL CMT
4-9	ZW55642	PW31006A0190TL CMT
4-10	TP32949	PRF BOTTOM
4-11	ZW57012	SEVC 54008STL CMT
4-12	TP329650	PROP 9 INSULATOR
4-13	ZW332723	RING CS740STL PKR
TOPE ARM BLOCK		
4-44	TP328793	TOPE ARM WASHELL
4-45	TP728013	MAIN WEIGHT 4-80079
4-46A	TP329214	TOPE ARM WASHELL (BL)
4-47A	TP740014	MAIN WEIGHT (BL) 4-50105
CHASSIS TONE ARM BLOCK		
4-18	TP32854	SLIDER (A)
4-19	Z5485102	PAN 5041NSTL CMT
4-20	TP32855	SLIDER (B)
4-21	Z5422076	PAN 50408STL CMT
4-22	Z5803123	PAN 50408STL CMT (PW08)
4-23	PW329657	WASHER SENSOR (A)
4-24	PW329658	WASHER SENSOR (B)
4-25	Z5146804	GEF 730408STL PKR HP
4-26	Z5049246	ADJUST SCREW (B)
4-27	Z5131178	SP C-3.5X0.5-17 5-C-015
HOLDER TONE ARM BLOCK		
4-28	TP328609	HOLDER TONE ARM PART
4-29	TP329885A	ARM LIFTER PART
4-30A	TP329885B	ARM LIFTER (BL) PART
4-31	Z51329537	SP PUSH LIFTER
4-32	TP329497	SHAFT LIFTER PART
4-33	ZW653163	RING CS250STL PKR
4-34	Z5131029	SP T1-8.0X0.22 2.4 TL 192
SENSOR UNIT BLOCK		
4-35	TP328804	SENSOR UNIT
4-36	Z5131042	SP T1-8.0X0.25-1.8 D T1-115
POWER SW BLOCK		
4-37	ES328786	SW PUSH ESD-90195 03-1 B (L, B, S)
4-38A	ES328787	SW PUSH ESD-90194R 01-1 J (J)
4-39A	ES328788	SW PUSH ESD-90144T 01-1 UC (C, A)
ASSEMBLY BLOCK		
4-42	Z5329667A	SP PULL INSULATOR (A)
4-44	ZW329651	WASHER INSULATOR
4-45	TP329662	CUSHION INSULATOR
4-46	Z58320743	PROP 1 PULLEY (A) PART
4-47	Z5411201	PAN40408STL CMT
4-47	TP329984	LIFTEK CAM ASSY
4-48	Z58320780	T 2BR30408STL CMT
4-49	Z5329990	GRADUATED SCREW Y98J
4-50	Z5328495	T 2BR30408STL CMT
4-51	Z5534478	SW MICRO K3 LOC
4-52	Z5442148	CS20408STL CMT
4-53	Z5329949	GRADUATED SCREW Y940B
4-54	ZW1260111	PW612100408NYL
4-55	Z5411150	PAN40408STL CMT
4-56	Z58320789	PROP 1 PULLEY (B) PART
4-57	TP329470A	SHAFT GUIDE (A)
4-58	TP329470B	SHAFT GUIDE (B)
4-59	Z5485282	TDR 4041NSTL CMT
4-60	TP328298	TRACKING ASSY AF 145
4-61	BM328192	MOTOR HMR3401-01-020

QTY.	PARTS NO.	DESCRIPTION
4-41	TP328538	CUSHION
4-41	Z5329956	GRADUATED SCREW Y206J
4-44A	Z5485207	T2BR 30408STL CMT
4-61A	Z5608174	PAN30408STL M3
4-66A	ZW329650	PW31006A0190STL CMT
4-69	Z5814013	CS20408STL CMT
4-70	ES328920	SW LRAZ ESW-130 B 1 NO
4-71	Z5608095	PAN30408STL CMT
4-72A	Z5244912	CS20408STL M3
4-73	WB329540	BULT
4-74	ES503533	SW SELECTOR HWX09131-240 01-2
4-75	BT328782	TRANS POWER AP793-704D
4-76A	BT328783	TRANS POWER AP793-104D
4-78	BT328784	TRANS POWER AP793-304C(A)
4-78A	BT328786	TRANS POWER AP793-404(B,S)
4-79	Z5412456	PAN40408STL CMT
4-80	ZW331318	CORD 216A-3 2P ALDJO CORD
4-81	EW326740	(U, J, B, S)
4-82A	EW328781	CORD 2P ALDJO CORD (A)
4-83	ZW306428	AL CORD 2 CORES KP-205A
4-84A	EW306427	AL CORD 2 CORES KP-211 VFF
4-85A	EW305041	AL CORD 2 CORES KP-8-SPT-1 UC (C, A)
4-86A	EW135882	AL CORD 2 CORES KP-430C (LTC-2F E (E))
4-87A	EW133884	AL CORD 2 CORES GTR8-1F
4-88A	EW301515	AL CORD 2 CORES KP-60B 240 2X4 B (B)
4-89	ZW329894	SP TL-8.0X0.25 0119-2107
4-90	TP329890	STRING WIRE (A) L-237-AMN
4-91	Z5133045	STRING WIRE (B) L-241-3MM
4-92A	Z5301476	SP TL-8.0X0.25 0119-2107
4-93	SK329629	ASST 4X0.448CM PKR HP
4-94	SK329628	KNOB P15H
4-95	BT309388	FUSE 15C A 250V 0.80A (L2)
4-96	FF30425	FUSE 15C A 250V 0.31A (F3)
4-97	FF311439	FUSE 15C A 250V 1.6A (F4, 5)
4-100A	FF304391	FUSE 15C 125V 0.80A (F3) (C, A)
4-101A	FF308084	FUSE 15C 125V 0.31A (F3) (C, A)
4-102A	FF308447	FUSE 15C 125V 1.60A (F4, 5)
4-103A	FF695766	FUSE SEM KO T 250V 0.31A (F3) (B)
4-104A	FF695766	FUSE SEM KO T 250V 0.80A (F3) (L, B, S)
4-105A	FF695766	FUSE SEM KO T 250V 0.31A (F3) (L, B, S)
4-106A	FF601964	FUSE SEM KO T 250V 1.60A (F4, 5) (E, B, S)
4-107A	Z5431486	T1 PAN306355TL CMT

When ordering parts, please quote Parts Number, Description and Model Number.

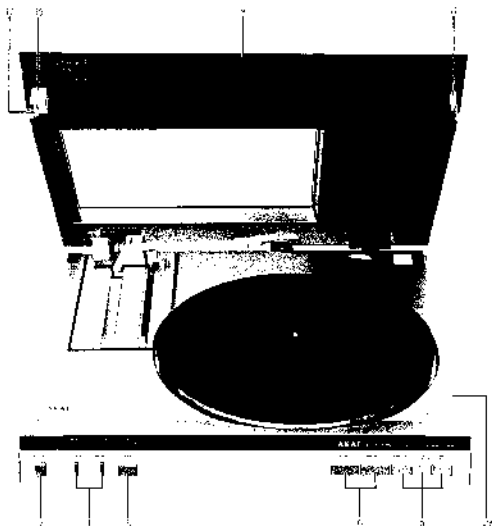
ASSEMBLY BLOCK (2)



5. ASSEMBLY BLOCK (2)

RFD. NO.	PARTS NO.	DESCRIPTION
CABINET BLOCK		
5-1	DL128195A	CABINET
5-2A	BC324595B	CABINET (BL)
5-2X	SL324625A	ESCUTCHEON FRONT
5-2L	SL324625B	ESCUTCHEON FRONT (BL)
5-5A	SE324629A	ESCUTCHEON POWER
5-5X	SE324629B	ESCUTCHEON POWER (BL)
5-7X	SE324631C	ESCUTCHEON KNOB (A-2)
5-8A	SE324631D	ESCUTCHEON KNOB (A-2)-BL
5-9A	SE324634A	ESCUTCHEON KNOB (B)
5-10X	SE324634R	ESCUTCHEON KNOB (B)-BL
5-11	TP324973A	PLATE OPERATION (B)
5-12A	TP324973B	PLATE OPERATION (B)-BL
5-13	SZ324639B	END PLATE LFD (A)-L45
5-14	ZS324750A	PLX PAN36X1251L CMT
5-16	TP324959A	PLATE AP-L45
5-17X	TP324959D	PLATE AP-L45 (BL)
5-18X	TP324663A	SHIELD ANTI-REFLECTION
5-19X	TP324663B	SHIELD ANTI-REFLECTION (BL)
ASSEMBLY BLOCK		
5-20	TP324577A	COVER ARM (A)
5-21X	TP324577B	COVER ARM (A)-BL
5-22	TP324582A	COVER ARM (B)
5-23X	TP324582B	COVER ARM (B)-BL
5-24	ZS324495	T2BR39065TL CMT
5-25	TP324586C	MASK (D)
5-26A	TP324586D	MASK (D)-BL
5-27	TP324589A	HOLDER MASK
5-28A	TP324589B	HOLDER MASK (BL)
5-29	ZS324360	PAN36X065TL CMT
5-30	ZS324379	6RB20X200RS NIA
5-31	TP324316	PLATTER
5-32	TP324307A	TABLE SHEET (A) (U,C,L,B,S)
5-33A	TP324307B	TABLE SHEET (B) (A)
5-34	TP324314S	HINGE (D) PART A1-D30

FINAL ASSEMBLY BLOCK



6. FINAL ASSEMBLY BLOCK

REF. NO.	PARTS NO.	DESCRIPTION	REF. NO.	PARTS NO.	DESCRIPTION
	CABINET BLOCK		6-19	TP331935A	CLAMPER (B)
6-1	SK329632A	KNOB PUSH (A)	6-20x	TP331935B	CLAMPER (B)-BL
6-2x	SK329632B	KNOB PUSH (A)-BL	6-21x	75311172	SP C J.504-10.0 C-020
6-3	SK329605A	KNOB PUSH (B)	6-22x	75306456	TIBED 20V8051L BNI
6-4x	SK329605B	KNOB PUSH (B)-BL	6-23x	TP332786A	MASK (E)
6-5	SK329603A	KNOB PUSH (C)	6-24x	TP332786B	MASK (E)-BL
6-6x	SK320603B	KNOB PUSH (C)-BL	6-25x	TP332781A	MASK (F)
	FINAL ASSEMBLY BLOCK		6-26x	TP332785B	MASK (F)-BL
6-7	SK329636A	KNOB POWER	6-27x	75332788	TIICS200808M1
6-8x	SK329636B	KNOB POWER (BL)			
6-9	BC329590C	DUST COVER AP-L45			
6-10x	BC329590D	DUST COVER AP-L45 (BL)			
6-11	TP329591A	CUSHION COVER			
6-12x	TP329591B	CUSHION COVER (BL)			
6-13x	SE331934A	ESCUTCHION KNOB (C)			
6-14x	SE331934B	ESCUTCHION KNOB (C)-BL			
6-15	TP331935A	CLAMPER (C)			
6-16x	TP331935B	CLAMPER (C)-BL			
6-17	TP331936A	CLAMPER (A)			
6-18x	TP331936B	CLAMPER (A)-BL			

When ordering parts, please quote Parts Number, Description and Model Number.

II. MODEL AP-L95/C

1. RECOMMENDED SPARE PARTS

Because, if the parts listed below are on hand, almost any repair can be accomplished, we suggest that you stock these Recommended Spare Parts Items.

NET NO.	PARTS NO.	DESCRIPTION
1-1	MM3101A01BA	MOTOR R.M-2cm
1-2	MM328792	MOTOR HMR1401-01-020
1-3	ET328793	△ TRANS POWER AP75-10 (3)
1-4	ET328794	△ TRANS POWER AP75-30
1-5	ET328795	△ TRANS POWER AP75-40 (C,A)
1-6	ET328792	△ TRANS POWER AP75-70 (B,S)
1-7	EDJ08592	D GERMA V 1K344-1 B F07
1-8	EDJ28793	D LED CF-MFR4 J LED
1-9	EDJ32772	D LED SL P-155D 01 RED
1-10	EDJ32773	D LED SL P-255D 01 GRN
1-11	EDJ31643	D SILICON 1S2473MS F10
1-12	EDJ60913	D SILICON V 1S2473VE
1-13	EDJ32238	D SILICON 1B4841 100μ1 0A
1-14	ET313258	D ZENER H W7-036
1-15	ET64766	△ FUSE SEMKO T 250V 0.31A (F1) (E,R,S)
1-16	ET693764	△ FUSE SEMKO T 250V 0.31A (F1) (E)
1-17	ET252764	△ FUSE SEMKO T 250V 0.80A (F2) (E,R,S)
1-18	ET601964	△ FUSE SEMKO T 250V 1.60A (F4,S) (E,R,S)
1-19	ET306125	△ FUSE TSC A 250V 0.1A (E) (U,J)
1-20	ET109585	△ FUSE TSC A 250V 0.80A (F2) (U,J)
1-21	ET311839	△ FUSE TSC A 250V 1.6A (F4,S) (U,J)
1-22	ET309391	△ FUSE TSC 125V 0.08A (F2) (C,A)
1-23	ET306066	△ FUSE TSC 125V 0.31A (F) (U,A)
1-24	ET306044	△ FUSE TSC 125V 1.60A (F4,S) (U,A)
1-25	ET315557	IC AP-400-A (TMA104B)
1-26	ET328812	IC M5841 349M
1-27	ET313390	IC K1M456FD
1-28	ET201940	IC K1M456BS
1-29	ET306043	IC SN74LS04N
1-30	ET331660	IC SN7417N
1-31	ET322399	IC TA7548BS
1-32	ET306127	IC TC 90138P
1-33	ET328794	IC TC 90240PC
1-34	ET324682	IC TC 90278P
1-35	ET306226	IC TC 4049UBP
1-36	ET324226	IC TC 4061CP
1-37	ET325785	IC JRC 4060-H
1-38	ET328796	IC JRC 78M12H
1-39	ET325799	OSC. XTAL 4.32 MHz
1-40	ET323231	OSC. XTAL 4MHz
1-41	EP312437	RELAY 1E4D LAB2HS 250V 5V
1-42	ES1818248	△ SW PUSH ESB9144T 01-11C (U,A)
1-43	ET328788	△ SW PUSH ESB90144T 01-11C (U)
1-44	ES328787	△ SW PUSH ESB-90149R 01-11C (U)
1-45	ES328786	△ SW PUSH ESB 90150S 01-11C (U,E,R,S)
1-46	ES309920	SW LEAF B SW-130 01-11C (U)
1-47	ES3273475	SW MICRO K3 UC
1-48	ES3099249	SW MICRO VV-S
1-49	ES325779	SW PUSH SP3231 7 02 02N
1-50	ES305735	SW FLUCTOR HXW0131-260 01-4
1-51	ES324027	SW SLIDE 0924001X 2 44-04S
1-52	ES328777	SW TACT FV-04-PYR1C
1-53	ES316736	SW TACT KHF 10901
1-54	ET328689	PHOTO SENSOR FE-SV3 B
1-55	ET306155	TR 2SA1115 E,F

R.F.F. NO.	PARTS NO.	DESCRIPTION
1-56	ET328861	TR 2SA1562M O.V.
1-57	ET323348	TR 2SM59713P D.E.F
1-58	ET666415	LR 2S868E K,L
1-59	ET330162	TR 25C1959 O.V.
1-60	ET328944	TR 2SC2120 O.V.
1-61	ET300587	TR 25C2460 E,F
1-62	ET323366	TR 2SD1331P D.E.F
1-63	ET666404	TR 2S9711 K,L
1-64	ET303149	TR 2SD794 P,Q
1-65	ET310116	TR 2SA111 GR,B,I
1-66	ET329415	R 5-FIX H TMSK (PV) JP 0.30W 10S
1-67	ET317380	R 5-FIX H TMSK V2 JS 3P 0.60W 20Ω
1-68	ET520806	R 5-FIX H Y8K4-1 3P 10Ω
1-69	ME325530	BELT
1-70	YF32884	SENSOR 10M P
1-71	ET325793	TOPE ARM W/SHIELD
1-72	ET329217	TOPE ARM W/SHIELD (H,L)

2. SYS. CON. P.C BOARD BLOCK

R.F.F. NO.	PARTS NO.	DESCRIPTION
2-1	BA7085006P	PC SYS CON BLK AP-L95(C)
2-2	BA7085006H	PC SYS CON BLK AP-L95(J)
2-3	BA7085006M	PC SYS CON BLK AP-L95(CHC,U)
2-4	BA7085006P	PC SYS CON BLK AP-L95(C,E,S)
2-5	BA7085006K	PC SYS CON BLK AP-L95(B)
PC SYS CON BLOCK		
2-3C-1,1	ET313660	IC SN7417N
2-3C-2	ET328812	IC M5841 349M
2-3C-5	ET322399	IC TA7548BS
2-3C-6	ET324226	IC JRC 4061CP
2-TR1	ET100558	TR 2SA1115 E,F
2-TR2	ET200595	TR 2SC2403 E,F
2-TR3	ET200588	TR 2SA1115 E,F
2-TR4,5	ET100585	TR 2SC2403 E,F
2-TR6	ET200558	TR 2SA1115 E,F
2-TR7	ET323366	TR 2SD1331P D.E.F
2-TR8	ET323245	TR 2SB957HP D,E,F
2-TR9	ET323316	TR 2SK137 GR,B,I
2-TR10,13	ET200555	TR 2SA1115 E,F
2-TR12	ET200508	TR 2SC2403 E,F
2-TR13	ET200558	TR 2SA1115 E,F
2-TR14,15	ET100595	TR 2SC2403 E,F
2-TR16	ET200558	TR 2SA1115 E,F
2-TR17	ET323544	TR 2SC320 O.V.
2-TR18	ET328861	TR 2SA1562M O.V.
2-TR19,10,21	ET100458	TR 2SC2403 E,F
2-TR22	ET200458	TR 2SA1115 E,F
2-TR23,20	ET200458	TR 2SC2403 E,F
2-TR25	ET200558	TR 2SA1115 E,F
2-TR26,16,28	ET200504	TR 2SC2403 E,F
2-TR29	ET200558	TR 2SA1115 E,F
2-TR30	ET200595	TR 2SC2403 E,F
2-TR31	ET200558	TR 2SA1115 E,F
2-TR32	ET200558	TR 2SA1115 E,F
2-TR33	ET200558	TR 2SC2403 E,F
2-TR34	ET200504	TR 2SC2403 E,F
2-TR35,36	ET200558	TR 2SA1115 E,F
2-TR37	ET200504	TR 2SC2403 E,F
2-TR38,39	ET200549	TR 2SA1115 E,F
2-TR40	ET200549	TR 2SC2403 E,F
2-TR41,42	ET200558	TR 2SA1115 E,F
2-TR43,44	ET200504	TR 2SC2403 E,F
2-TR45	ET321016	TR 2SK137 GR,B,I
2-TR46,43	ET200504	TR 2SC2403 E,F
2-TR48	ET200558	TR 2SA1115 E,F
2-TR49,50	ET200549	TR 2SC2403 E,F
2-01	EDJ08592	D GERMA V 1K344-1 B F07
2-02,10,8	ET306127	D SILICON V 1S2473VE
2-03,4	ET318443	D SILICON 1S2473MS F10
2-09,11,14	EDJ60913	D SILICON V 1S2473VE

REF. NO.	PARTS NO.	DESCRIPTION
2-R11	YF221437	RELAY LEAD LAR2NS 2ND SW
2-X1	E1323231	OSC XTAL 4MHZ
2-V1C1	EV317560	R S FIX H TM8K(V) 3P 0.10W
2-YR2	EV420506	R S-FIX H V8K4J 3P 105
2-Y1 to 3	E1306821	PLUG 5P CONNECTOR 171825-1 7P
2-P4	E1316263	PLUG 5P CONNECTOR 171825-5
2-P1	E1316261	PLUG 5P CONNECTOR 171825-5
2-P6	E1316260	PLUG 5P CONNECTOR 171825-4
2-P7	E1316259	PLUG 5P CONNECTOR 171825-3
2-R116	YW308922	FW92X150X050ALM
2-R118	IR309816	K MF V 12W 150ZF
2-C26	TC117420	C SA V POS R10K 100C
2-C33	JC116669	C SA V 15K R22K 25 100C

PC POWER & SERVO BLOCK

2-IC1	E1213390	IC NM54358D
2-IC2	E1306126	IC TC4069UDP
2-IC3	F1306127	IC TC4013BP
2-JC4	F1375557	IC AS480-A (TM4604P)
2-C65	F1213380	IC NJ164558D
2-C74	E1328795	IC TC4021BDC
2-IC7	E1324682	IC TC3027BP
2-IC8	E1316043	IC SN74LS03F
2-IC9 to 10	E1213380	IC NJ164558D
2-IC12	E1207946	IC µPC75M11H
2-IC13	E1207995	IC µPC75M05H
2-IC14	E1325796	IC µPC78M12H
2-TR1	ET350162	TR 2SC1959 O.V
2-TR2	ET200406	TR 2SC1603 E.F.F
2-TR3	ET200558	TR 2SA1115 E.F.F
2-TR4	ET200505	TR 2SC1603 Y.F.F
2-TR5,6	ET200558	TR 2SA1115 E.F.F
2-TR7 to 9	ET664004	TR 2SD175 K.L
2-TR10 to 12	ET66418	TR 2SD866 K.L
2-TR13	ET200558	TR 2SA1115 E.F.F
2-TR14,15	ET200505	TR 2SC1603 E.F.F
2-TR16	ET200558	TR 2SA1115 E.F.F
2-TR17 to 20	ET200505	TR 2SC1603 E.F.F
2-TR21 to 23	ET200558	TR 2SA1115 E.F.F
2-TR24	ET200505	TR 2SC1603 E.F.F
2-TR25	ET307349	TR 2SD794 P.Q
2-D1	ED313184	D ZENER HW 2-036
2-D2 to 14	ED766013	D SILICON V 1S2373VF
2-D15 to 17	ED322136	D SILICON 1R04M 100V 1.5A
2-V1E1,2	FV317560	R S-FIX H TM8K(V) 3P 0.10W

PC SENSOR AMP BLOCK

2-IC1	E1201940	IC NM44358S
2-IC2	ES322599	IC TA754655S
2-TR1 to 3	ET100505	TR 2SC1603 E.F.F
2-YR1	EV329215	R S-FIX H TM8K(PV) 3P 0.10W

PC SENSITIVITY SELECTOR BLOCK

2-SW1	ES329077	SW SLIDF 002404X 2-02-045
2-R1	ER318323	R MF H F10 114W 100ZF
2-R2	ER329180	R MF H F10 114W 620ZF
2-R3	FR329582	R MF H F10 114W 270ZF

PC INTERRUPTOR (A) BLOCK

2-PH1	ET326859	PHOTO SENSOR LL-SV 1-D
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REF. NO.	PARTS NO.	DESCRIPTION
2-PH1	ET326859	PC INTERRUPTOR (B) BLACK PHOTO SENSOR LL-SV 3-B
2-TR1 to 3	PC REJECT SW BLOCK FT200406	TR 2SC1603 E.F.F
2-SW1	PC UP SW BLOCK ES308929	SW MICRO V.V.E
2-SW1	PC DOWN SW BLOCK ES308929	SW MICRO V.V.E
2-SW1	PC DEFLECTION BLOCK ES308929	SW MICRO V.V.E

3. MAIN PANEL L95 P.C BOARD BLOCK

REF. NO.	PARTS NO.	DESCRIPTION
3-1	EW016400A	PC MAIN PANEL L95 BLK AP-1 21
3-IC1,2	F1310043	IC SN74LS03F
3-TR1	ET200558	TR 2SA1115 E.F.F
3-TR2	ET200505	TR 2SC1603 E.F.F
3-TR3 to 6	ET200558	TR 2SA1115 E.F.F
3-D1 to 14	ED322572	D LED SLP 15SD 013 R1D
3-D15 to 19	ED326191	D LED GL-APR3 RED
3-D20	ED322773	D LED SLP 245D 013 GRN
3-SW1 to 16	ES328777	SW TACT LVQ-PV112K
3-SW17,18	ES328778	SW TACT K111 100V1
3-SW19,20	ES328777	SW TACT LVQ-PV112K
3-1	ZW329904	EV NPL 30X044

PC CABINET BLOCK

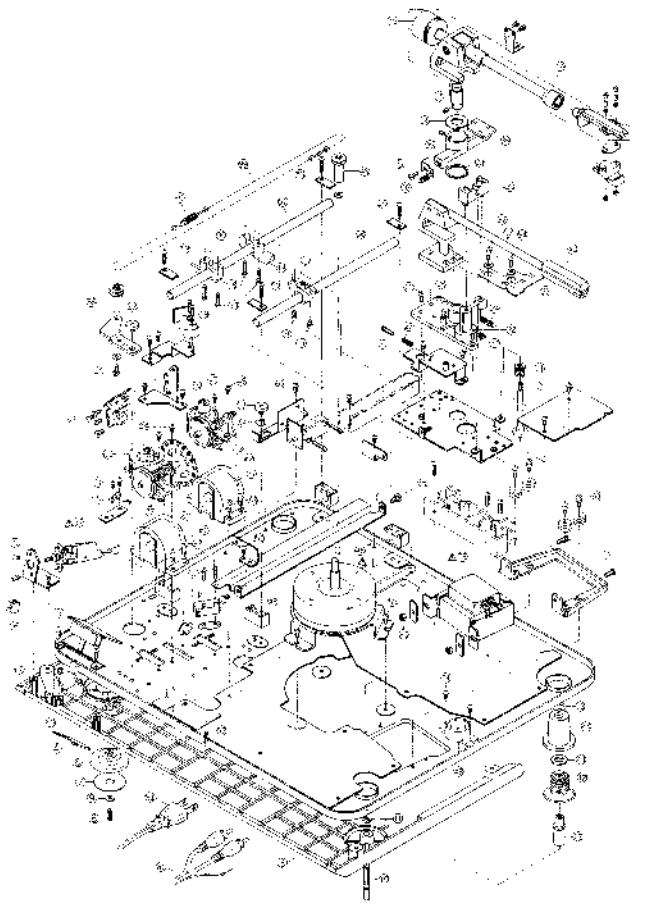
3-SW1 to 4	ES328777	SW TACT LVQ-PV112K
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PC RELEASE SW BLOCK

3-SW1,2	FS323779	SW PUSH SW122H 2-02 01N
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ASSEMBLY BLOCK (1)

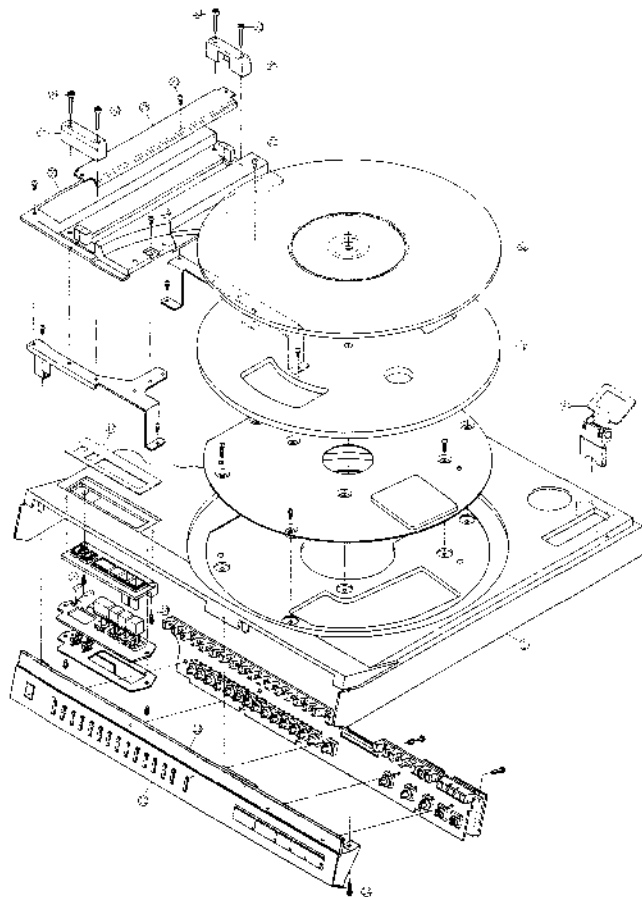
4. ASSEMBLY BLOCK (1)



REF. NO.	PARTS NO.	DESCRIPTION
MOTOR BLOCK		
4-1	BMM302AD0A	MOTOR BLM-200
4-2	E1578294	HOLL ELEMENT VIII-T11
COVER BOTTOM BLOCK		
4-3	99329641	COVER BOTTOM
4-4	TF329445	PLATE
4-5	76312401	PLX PAN30408STL CMT
4-6	SA329647	FOOT RUBBER
4-7	TF329648	JELLY RUBBER PUGT
4-8	ZS329583	PLX PAN30411STL CMT
4-9	ZWS30642	PW314080X050STL CMT
4-10	TF329449	PROP BOTTOM
4-11	ZWS30633	RING P400SC-P1CMT
4-12	TF329450	PROP 3 SUSULTRA PRK
4-13	ZWS31321	RING C1408STL PRK
TRUCK		
4-14	TP328793	TRUCK W/SHIELD
4-15	TP780043	MAIN WEIGHT 4.80079
4-16	TP328747	TONE ARM W/SHIELD (BL)
4-17	TP780044	MAIN WEIGHT (BL) 4.801015
CHASSIS TONE ARM BLOCK		
4-18	TF329554	SLIDER (A)
4-19	ZWS35382	PAN30411STL CMT
4-20	9F329555	AMPLIF (B)
4-21	ZS429276	PAN30408STL CMT
4-22	ZS408333	PAN30408STL CMT PW304
4-23	PW329557	WASHER SENSOR (A)
4-24	PW329558	WASHER SENSOR (B)
4-25	ZS358884	6SH P3040805CM PPK HP
4-26	ZS358546	ADJUST SCREW (B)
4-27	ZG313178	SP C-3.1/8 X42.5 C-0245
HOLDER TONE ARM BLOCK		
4-28	TF329669	HOLDER TONE ARM PART
4-29	TF329885A	ARM LIFTER PART
4-30	TF329885B	ARM LIFTER (BL) PART
4-31	ZG329487	SP PULLEY LIFTER
4-32	TF329487	SHAFT LIFTER PART
4-33	ZW653163	RING C1380STL P/R
4-34	ZG313029	SP T1.5/16 X32.24 R1-142
SENSOR UNIT BLOCK		
4-35	TF328994	SENSOR UNIT
4-36	ZG313042	SP T1.5/16 X51.18 R1 T1-155
POWER SW BLOCK		
4-37	E3528786	SW PUSH L5B 901595 0.1 J
4-38	E3528787	SW PUSH L5B 901498 0.1 J (C, B)
4-39	E3528788	SW PUSH L5B 901047 0.1 J CC
SUB ARM BLOCK		
4-40	BZF1016A090A	SUB ARM BLK AP-195
4-41	BZF1016A090B	SUB ARM BLK AP-195-BL
ASSEMBLY BLOCK		
4-42	ZG329673	SP PULL INSULATOR (A)
4-43	ZW329651	WASHER INSULATOR
4-44	TF329652	CUSHION INSULATOR
4-45	ZS329723	PROP 1 PULLEY (A) PART
4-46	ZS413201	PA30408STL CMT
4-47	TP329694	LIFTER CMT ASSEY
4-48	ZS449440	T2BR 0408STL CMT
4-49	ZS329400	GRADUATED SCREW Y931
4-50	ZS329494	T2BR 0408STL CMT
4-51	E3573476	SW H320 K2 UC
4-52	ZS452736	CTS30415STL CMT
4-53	ZS329589	GRADUATED SCREW Y906B
4-54	ZW780131	PW31408080STL
4-55	ZS411140	PAN40408STL CMT
4-56	ZS329550	PROP 1 PULLEY (B) PART

REF. NO.	PARTS NO.	DESCRIPTION
4-57	TF329490A	SHAFT GUID (A)
4-58	TF329490B	SHAFT GUID (B)
4-59	ZS403902	T2BR 0408STL CMT
4-60	TF329492	TRUCK ASSEY
4-61	BM31792	MOTOR HMR3401-01-020
4-62	TF329538	CUSHION
4-63	ZS329588	GRADUATED SCREW Y206A
4-64	ZS353507	T2BR 0408STL CMT
4-65	ZS408174	PAN26A03STL N13
4-66	ZWS29510	PW3140808050STL
4-67	ZS492378	PAN26A03STL CMT
4-68	SK329665	KNOB SLID
4-69	ZS410033	CTS30408STL CMT
4-70	E3530920	SW LEAF BWN J 09 01 J MD
4-71	ZS408951	PAN26A03STL CMT
4-72	ZS444912	CTS30415STL N13
4-73	MB329540	BFLT
4-74	ZS407731	SW SELECTOR HXND 131260 014
4-75	DT328762	TRANS POWER APTR5 70U(C)
4-76	DT328763	TRANS POWER APTR5-10U1
4-77	DT328764	TRANS POWER APTR5-30U(A)
4-78	DT328765	TRANS POWER APTR5-40U(B)
4-79	ZS424956	PAN40408STL CMT
4-80	ZW411818	H40STL CMT J
4-81	EW326740	CORD 11068-3P AUDIO CORD (C, L, E, S)
4-82	EW328781	CORD 1P AUDIO CORD (L, A)
4-83	EW306425	AC CORD 2 CORES KP105A
4-84	EW306427	AC CORD 2 CORES KP111 VXF
4-85	FW306549	AC CORD 2 CORES KP35PT-1 J
4-86	FW313582	AC CORD 2 CORES KP449C
4-87	EW313584	AC CORD 2 CORES OTBS-1P
4-88	EW201515	AC CORD 2 CORES KP56R
4-89	TF329553A	STRUNG WIRE (A) 142.37.40MM
4-90	TF329553B	STRUNG WIRE (B) 1462.1MM
4-91	ZS313081	SP T1.6/32.5-25.0 T1 197
4-92	ZS329549	5CBFW SENSOR ARM
4-93	ZG329023	CONE DISC SPRING DB-4
4-94	ZS423710	PAN 10408STL N13
4-95	ZS391416	6SE1040820SC M P/R HP
4-96	SK329634	KNOB PUSH
4-97	TF309306	FUSE TRC A 250V 0.20A (12J)
4-98	TF306125	FUSE TRC A 250V 0.31A (F3)
4-99	ET311529	FUSE TRC A 250V 1.0A (FA)
4-100	TF330920	FUSE TRC 125V 0.08A (F2) (C, A)
4-101	TF306068	FUSE TRC 125V 0.31A (F3) (C, B, S)
4-102	TF308327	FUSE TRC 125V 1.00A (E4, S)
4-103	E1495166	FUSE SEMKO T 250V 0.31A (F3) (B)
4-104	ET358344	FUSE SEMKO T 250V 0.50A (F2) (R, B, S)
4-105	ET309576	FUSE SEMKO T 250V 0.31A (F3) (C, B, S)
4-106	TF401964	FUSE SEMKO T 250V 1.00A (F4, S)
4-107	ZS334999	T1PAN305 35 STL CMT

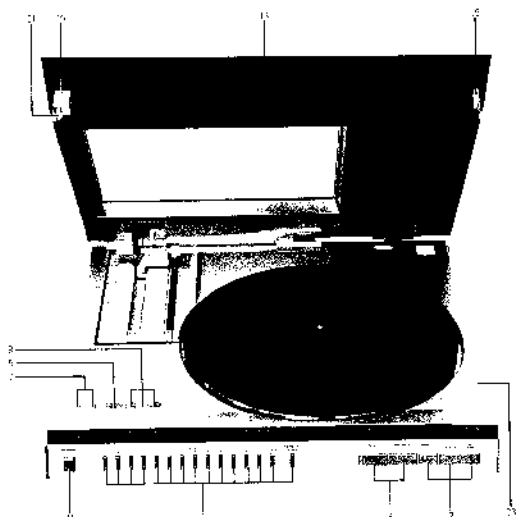
ASSEMBLY BLOCK (2)



5. ASSEMBLY BLOCK (2)

REF NO	PARTS NO	DESCRIPTION
CABINET BLOCK		
5-1	BU329595A	CABINET
5-2a	BU329595B	CABINET (BL)
5-3a	SE329625A	ESCUTCHION FRONT
5-4a	SE329625B	ESCUTCHION FRONT (BL)
5-5a	SE329639A	ESCUTCHION POWER
5-6a	SE329639B	ESCUTCHION POWER (BL)
5-7a	SE329631A	ESCUTCHION KNOB (A-1)
5-6x	SE329631B	ESCUTCHION KNOB (A-1)-BL
5-8x	SE329631C	ESCUTCHION KNOB (A-2)
5-10a	SE329631D	ESCUTCHION KNOB (A-2)-BL
5-11	TP329629A	PLATE OPERATION (A)
5-12a	LP329629B	PLATE OPERATION (A) BL
5-13	SP329630A	IND PLATE LED
5-14	ZS323593	PLX PAN30x125TL CMT
5-15	SE329599A	ESCUTCHION SUB OPERATION
5-16x	SE329599D	ESCUTCHION SUB OPERATION (BL)
5-17	TP329598A	PLATE SUB OPERATION
5-18x	TP329598B	PLATE SUB OPERATION (BL)
5-19x	TP329663D	SHIFT ANTI-REFLECTION (BL)
ASSEMBLY BLOCK		
5-20	TP329577A	COVER ARM (A)
5-21x	TP329577B	COVER ARM (A)-BL
5-22	TP329581A	COVER ARM (B)
5-23a	TP329581B	COVER ARM (B)-BL
5-24	ZS323595	TJBR J06045TL CMT
5-25	TP329586A	MASK (C)
5-26x	TP329586B	MASK (C) BL
5-27	TP329584A	HOLDER MASK
5-28x	TP329584B	HOLDER MASK (BL)
5-29	ZS329150	FAN30x065TL CMT
5-30	ZS329479	FRB30x200RS N13
5-31	TP329306	PLATTER
5-32	TP329307A	TABLE SHEET (A) (G,C,F,B,S)
5-32a	TP329307B	TABLE SHEET (B) (A)
5-34	YPR320745	JUNCL (D) FARE AP-D JO

FINAL ASSEMBLY BLOCK



6. FINAL ASSEMBLY BLOCK

REF. NO	PARTS NO	DESCRIPTION	REF. NO.	PARTS NO	DESCRIPTION
CABINET BLOCK			[FINAL] ASSEMBLY BLOCK		
6-1	SK329632A	KNOB PUSH (A)	6-20*	TP331935B	CLAMPER (C)-BL
6-2*	SK329632B	KNOB PUSH (A)-BL	6-21	TP331936A	CLAMPER (A)
6-3	SK329640A	KNOB PUSH (B)	6-22*	TP331936B	CLAMPER (A)-BI
6-4*	SK329640B	KNOB PUSH (B)-BL	6-23	TP331937A	CLAMPER (B)
6-5	SK329640A	KNOB PUSH (C)	6-24*	TP331937B	CLAMPER (B)-BL
6-6*	SK329640B	KNOB PUSH (C)-BL	6-25*	ZG311772	SP C/S 378.4 10.0 C-020
6-7	SK329644A	KNOB PUSH (D)	6-26*	ZS306498	TIBID30X10STL HNI
6-8*	SK329644B	KNOB PUSH (D)-BL	6-27*	TP332786A	MASK (E)
6-9	SK329640A	KNOB PUSH (E)	6-28*	TP332786B	MASK (E)-BL
6-10*	SK329640B	KNOB PUSH (E)-BL	6-29*	TP332787A	MASK (F)
6-11	SK329636A	KNOB POWER	6-30*	TP332787B	MASK (F)-BL
6-12*	SK329636B	KNOB POWER (BL)	6-31*	/S332788	[10031003888]
6-13	BC328580A	DUST COVER AP LNS			
6-14*	BC328580B	DUST COVER AP LNS (BL)			
6-15	TP329591A	CUSHION COVER			
6-16*	TP329591B	CUSHION COVER (BL)			
6-17*	SE331934A	ESCU LCH (ON) KNDB (C)			
6-18*	SE331934B	ESCU LCH (ON) KNDB (C)-BL			
6-19	TP331735A	CLAMPER (C)			

When ordering parts, please quote Parts Number, Description and Model Number.

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BAF005A060J	2-4	F5309778	2-5W, 3	SE329631D	5-5X	ZG513029	4-24
BAF005A060K	2-3	F5309780	4-5W, 1	SE529636A	5-5X	ZG513041	4-26
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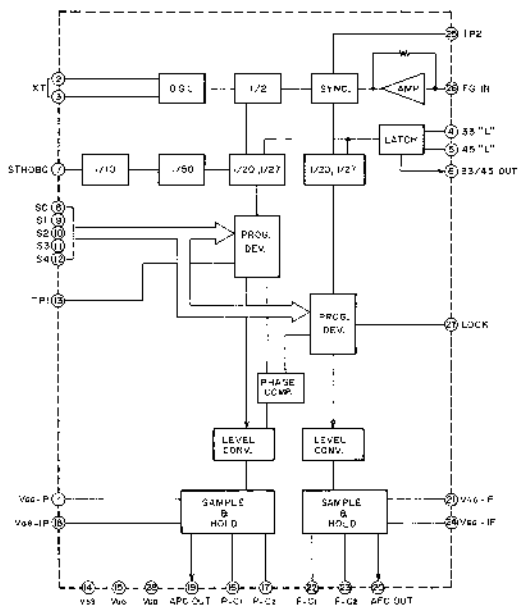
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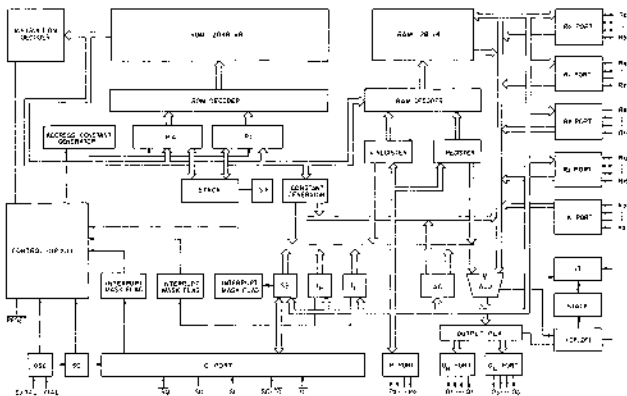
SECTION 3

SCHEMATIC DIAGRAM

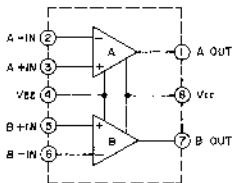
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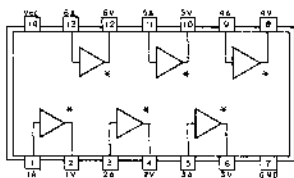




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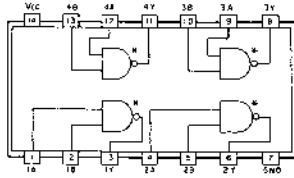


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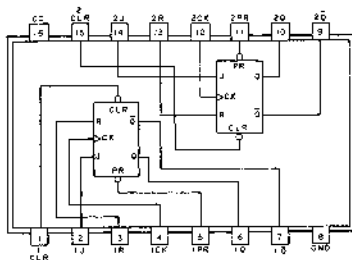
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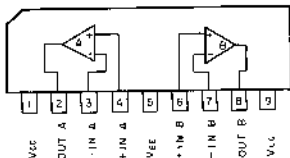


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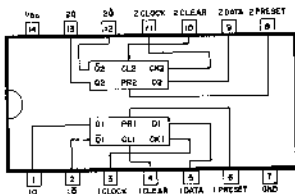
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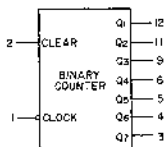
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TC4013HP



TC4024BPC

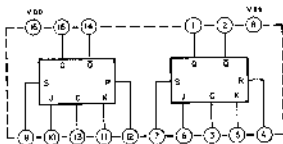


V_{DD} : 14
V_{SS} : 7
NC : 8,10,13

CLOCK Δ	CLEAR	OUTPUT STATE
X	H	ALL OUTPUTS="L"
f	L	NO CHANGE
f	L	ADVANCE TO NEXT STATE

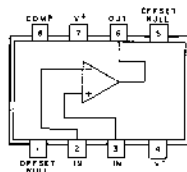
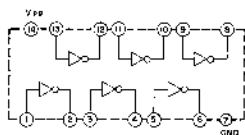
Δ: LEVEL CHANGE, X: DON'T CARE

IC4027BP

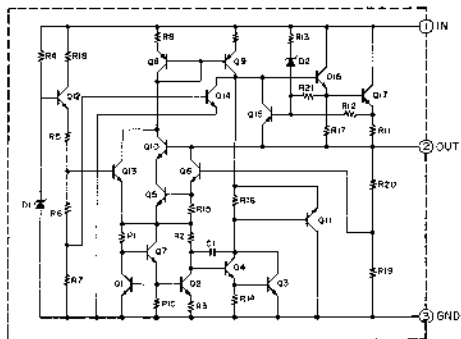
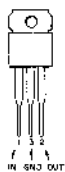


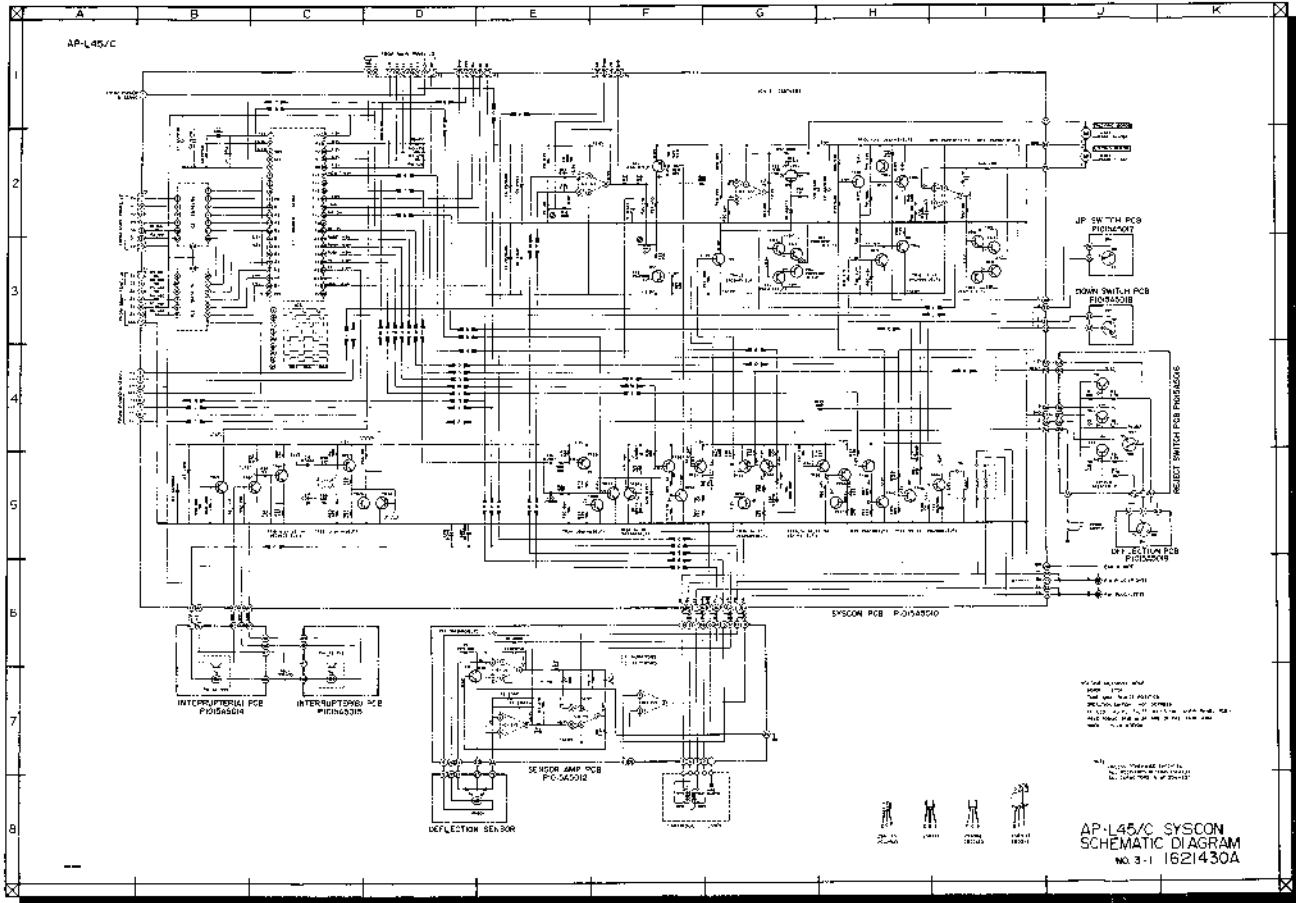
TC4069UBP

TL081CP



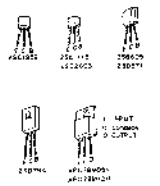
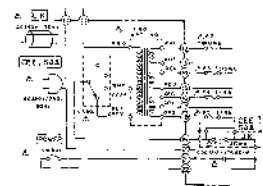
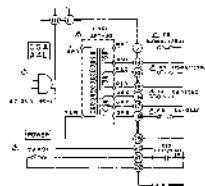
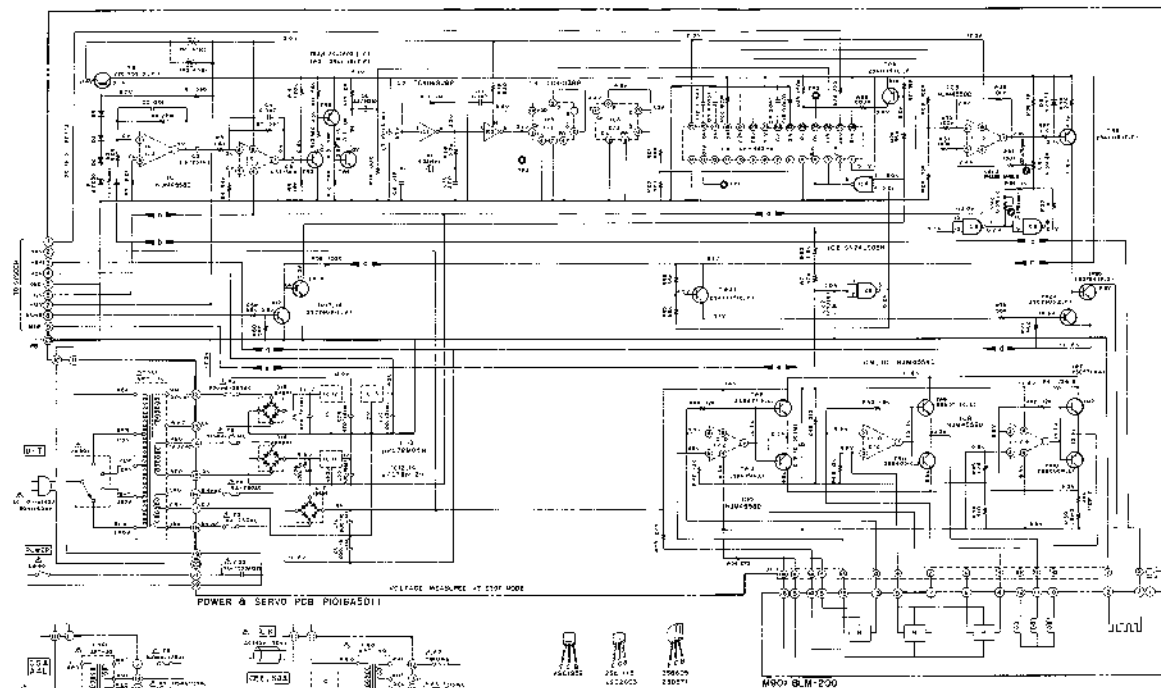
μPC78M05H
μPC78M12H





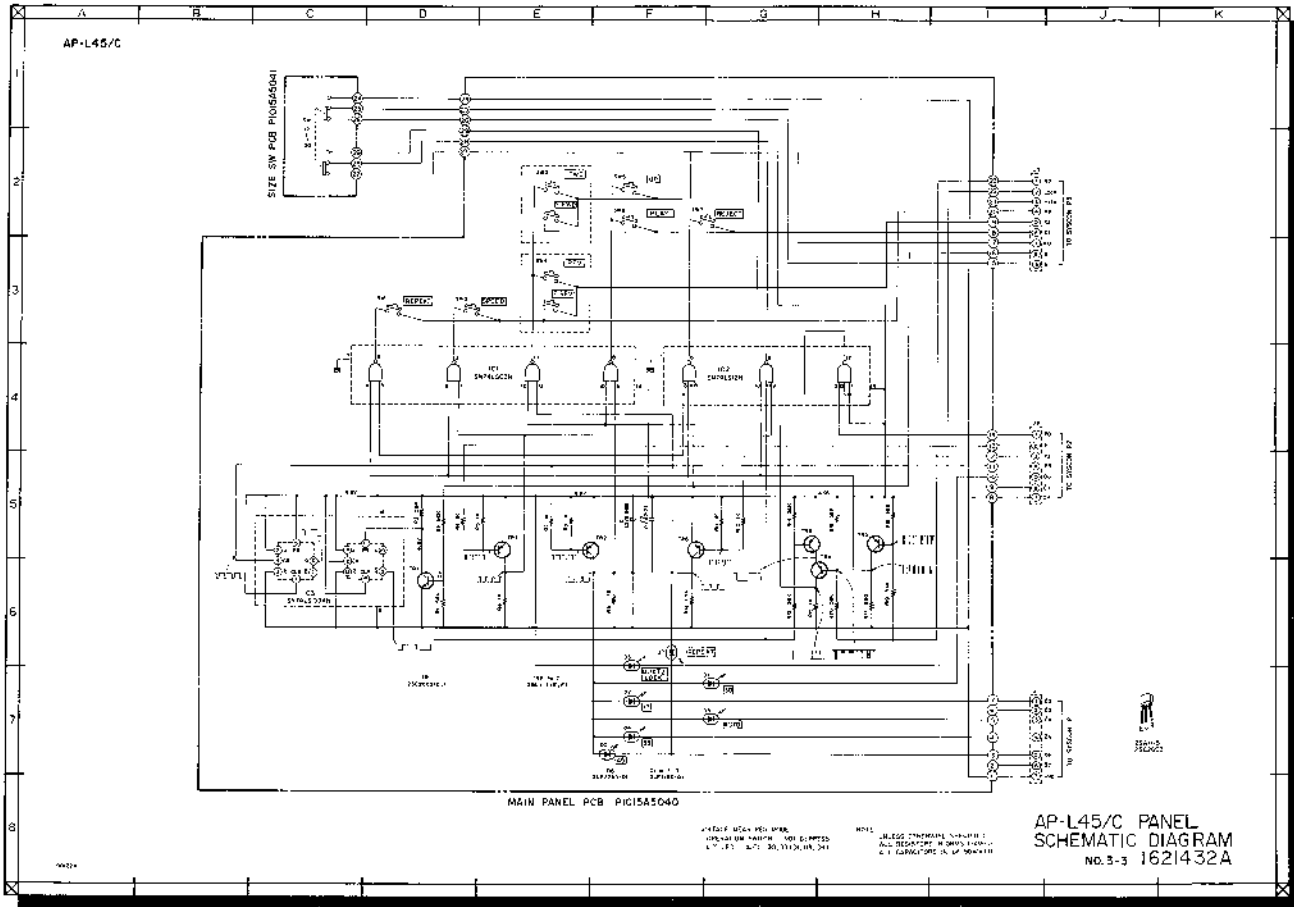
AP-145/C SYSTEM
 SCHEMATIC DIAGRAM
 NO. 3-1 1621430A

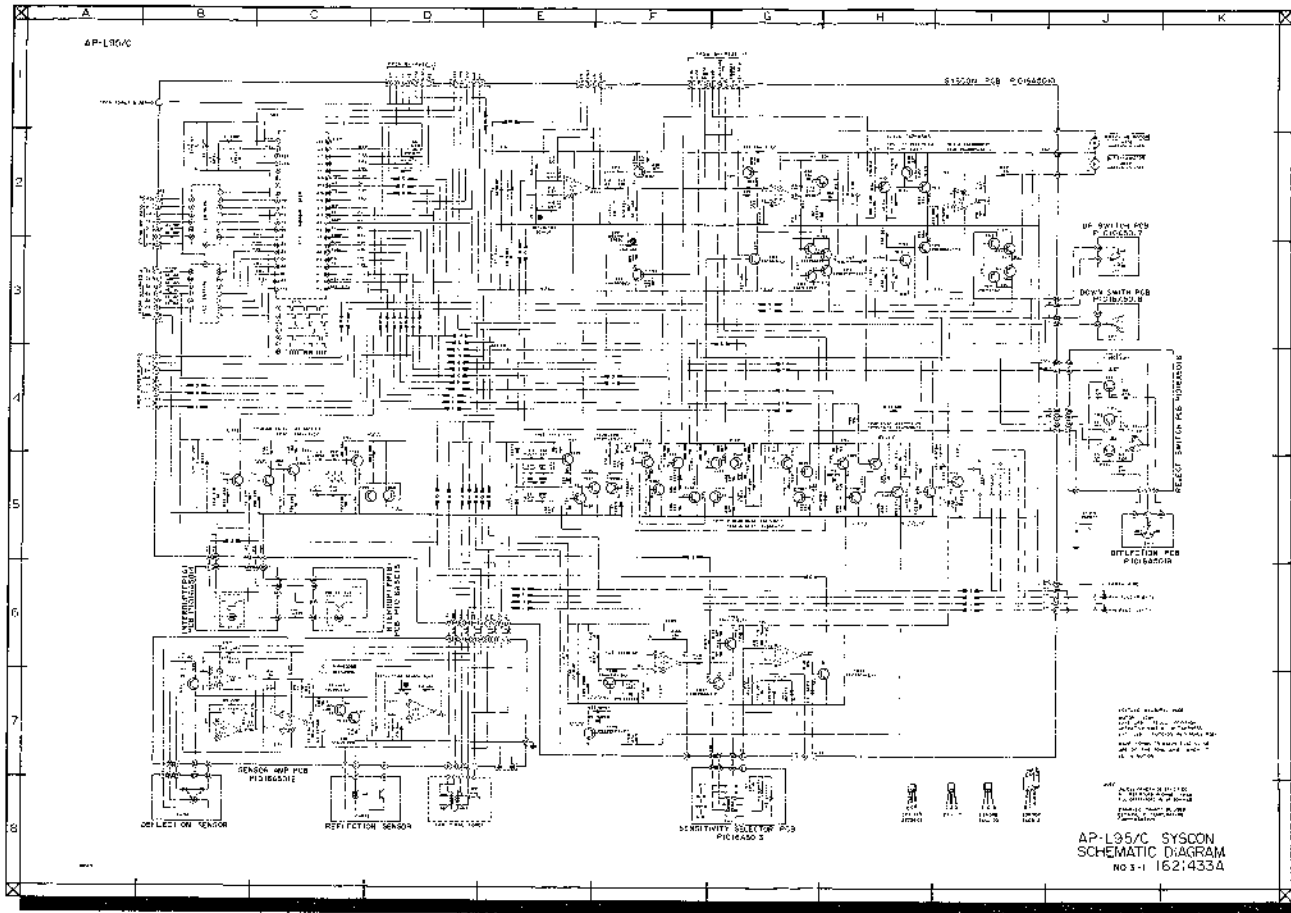
AP-L45/C



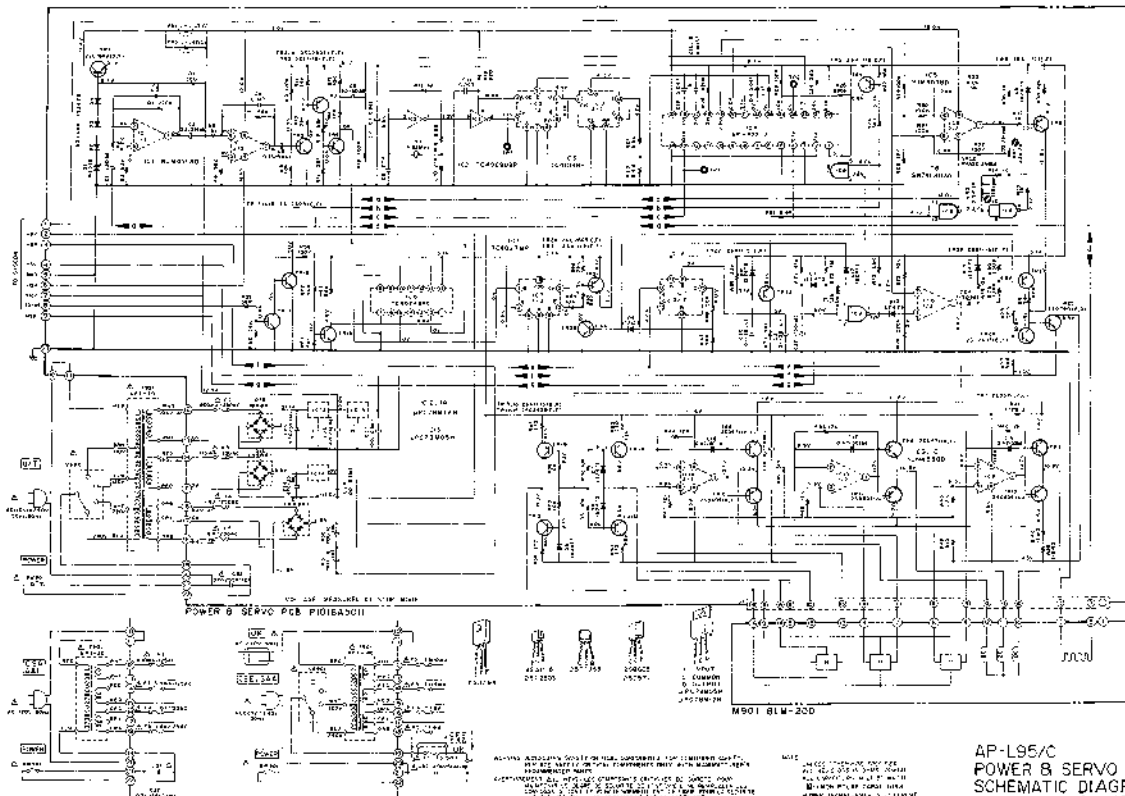
WARNING: 2. MOUNTED COMPONENTS ONLY TO COMPLETE FOR FURTHER SERVICE.
 3. REPAIRS SHOULD BE MADE BY QUALIFIED PERSONNEL ONLY. UNAUTHORIZED
 REPAIRS MAY BE DANGEROUS TO LIFE AND PROPERTY.
 4. THE USER SHOULD BE ADVISED THAT THE USER IS RESPONSIBLE FOR THE
 SAFETY OF THE USER AND THE USER'S PROPERTY. THE USER SHOULD
 BE ADVISED THAT THE USER IS RESPONSIBLE FOR THE SAFETY OF THE USER
 AND THE USER'S PROPERTY. THE USER SHOULD BE ADVISED THAT THE USER
 IS RESPONSIBLE FOR THE SAFETY OF THE USER AND THE USER'S PROPERTY.

AP-L45/C
 POWER & SERVO
 SCHEMATIC DIAGRAM
 NO. 3-2 1621431A





AP-195/C



POWER & SERVO PCB P016A0011

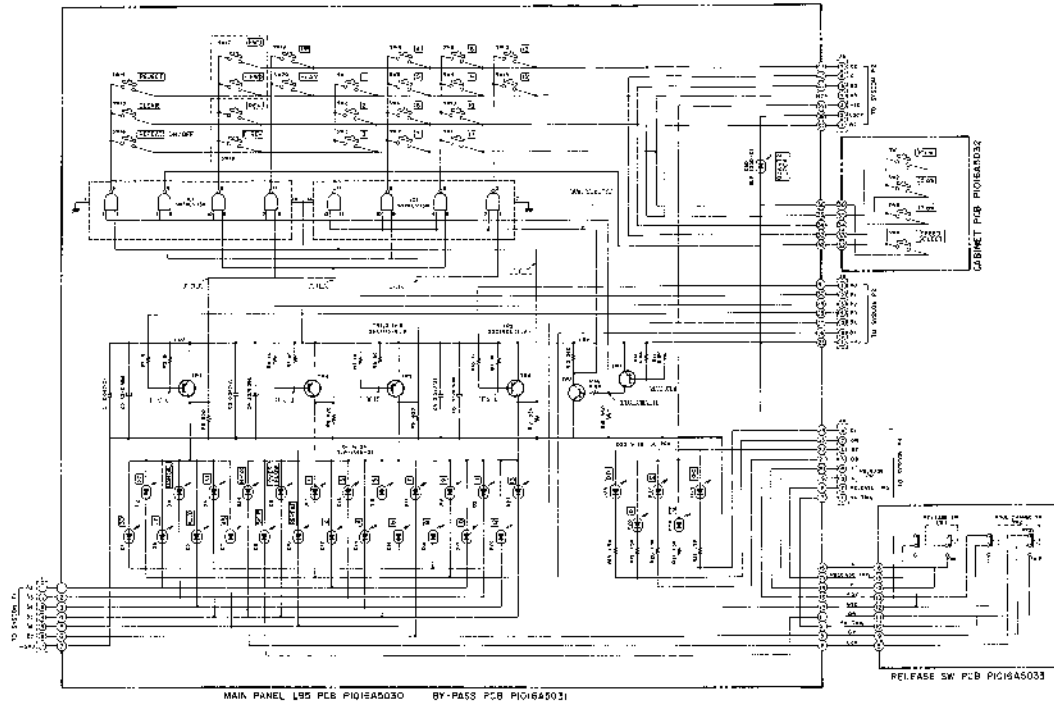
M901 81M-200

ALL DIMENSIONS SHOWN ON THIS DRAWING ARE UNLESS OTHERWISE SPECIFIED IN MILLIMETERS OR INCHES. DIMENSIONS ARE GIVEN IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.

NOTE: ALL DIMENSIONS SHOWN ON THIS DRAWING ARE UNLESS OTHERWISE SPECIFIED IN MILLIMETERS OR INCHES. DIMENSIONS ARE GIVEN IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.

AP-195/C
 POWER & SERVO
 SCHEMATIC DIAGRAM
 NO 3-2 1621434A

AP-L95/C



MAIN PANEL L95 PCB PIQ16A5030 BY-PASS PCB PIQ16A5031

RELEASE SW PCB PIQ16A5033



22 1 3
22 PCB

* PLEASE MEASURE HERE
USE OHMMETER SET TO 100 OHMS
- 1 LED 8411-122

NOTE
REVISION 12/81/82
ALL REVISIONS ON THIS SHEET
BY: 12/81/82
M: 12/81/82

AP-L95/C PANEL
SCHEMATIC DIAGRAM
NO. 3-3 162135A