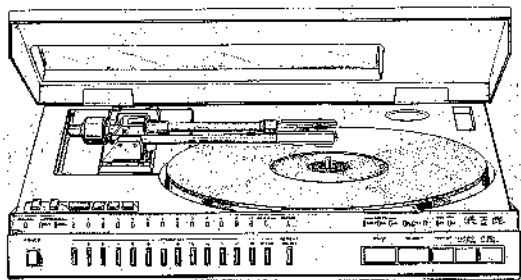


AKAI SERVICE MANUAL

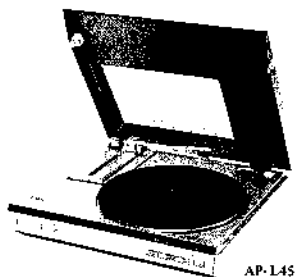


LINEAR TRACKING FULL AUTO DIRECT DRIVE
TURN TABLE

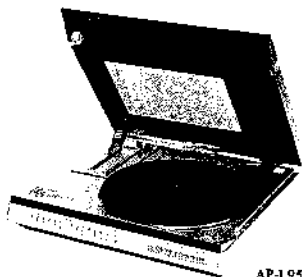
MODEL **AP-L45/C**

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
TURNTABLE	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)

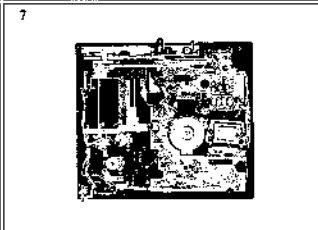
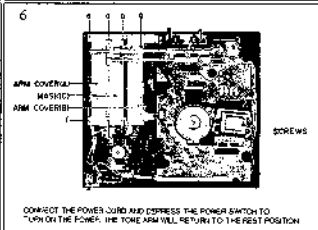
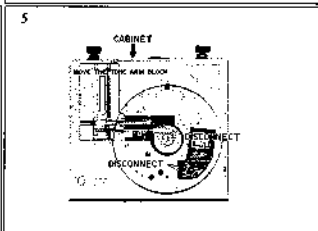
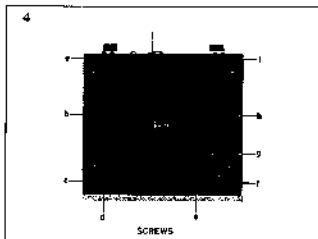
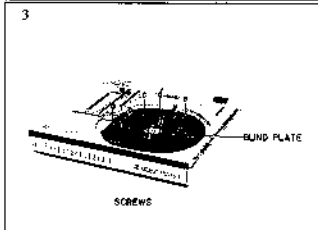
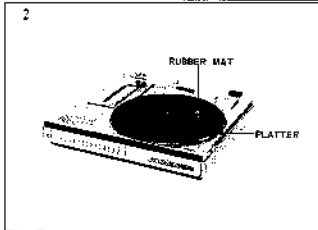
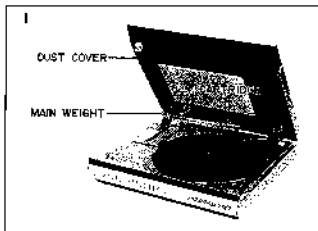
2. MODEL AP-L95/C

DRIVE SYSTEM & MECHANISM	Direct Drive (Quartz Lock) Linear Tracking Arm Fully Automatic with Random Program Search System
MOTOR	DC brush-less motor
TURNTABLE	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

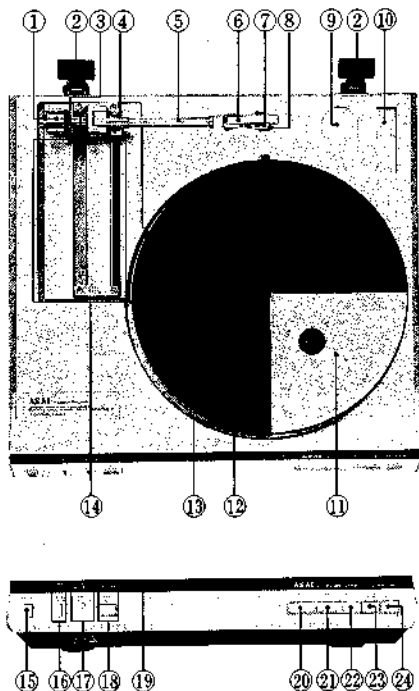


Fig. 1 Controls (Model AP-L45/C)

- | | |
|--|--|
| 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 (PWO/F. FWD) BUTTON |
| 11. PLATTER | 24. REVERSE/FAST REVERSE (REV/F. REV) BUTTON |
| 12. SPINDLE | |
| 13. RUBBER MAT | |

2. MODEL AP-L95/C

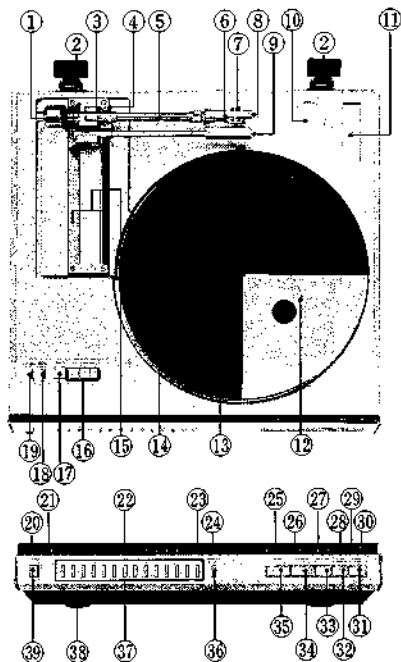


Fig. 2 Controls (Model AP-L95/C)

- | | |
|---|--|
| 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 | |
| 21. PROGRAM INDICATORS | |

IV. PRINCIPAL PARTS LOCATION

1. MODEL AP-L45/C

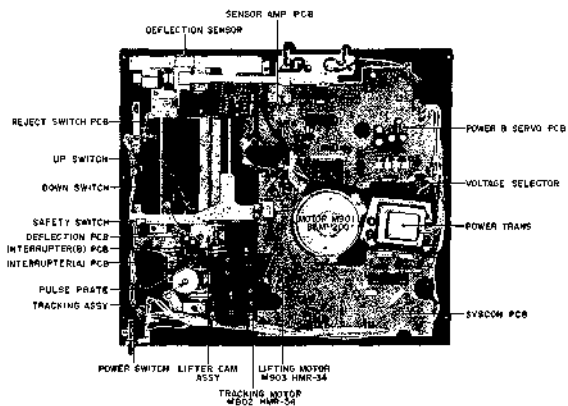


Fig. 3 Top View (Model AP-L45/C)

2. MODEL AP-L95/C

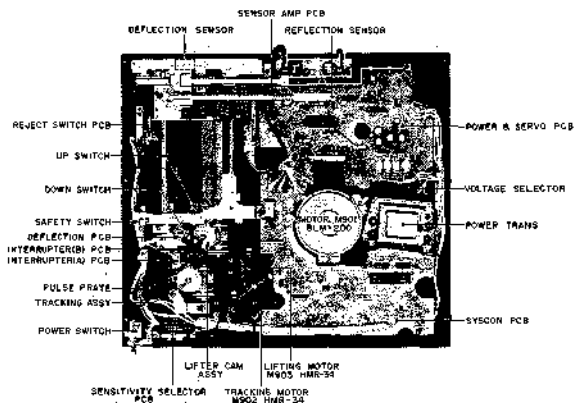


Fig. 4 Top View (Model AP-L95/C)

V. VOLTAGE CONVERSION

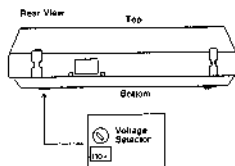


Fig. 5 Voltage Conversion

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

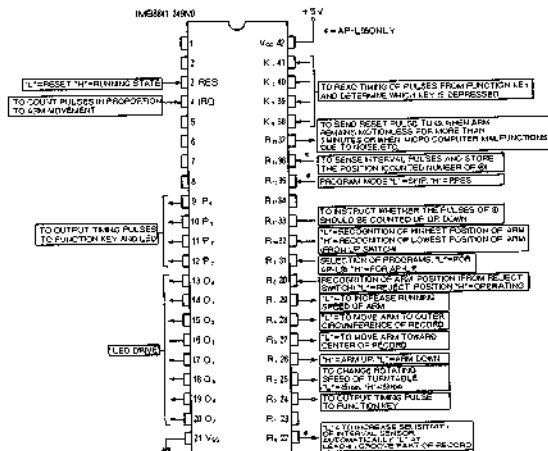


Fig. 6

3. MODEL AP-L4S/C BLOCK DIAGRAM

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

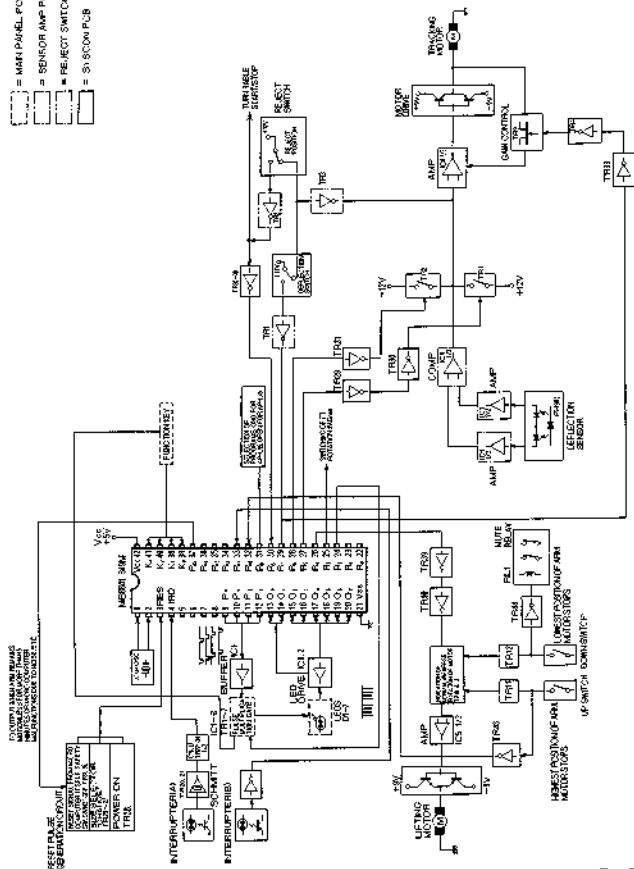


Fig. 7

5. RECEPTION OF FUNCTION KEY INPUT AND LED DRIVE

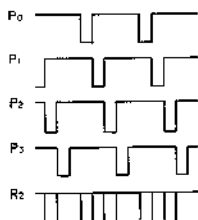


Fig. 9 Timing Pulses from Microcomputers

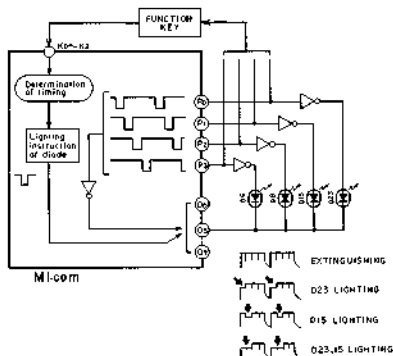


Fig. 10 LED Drive

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.

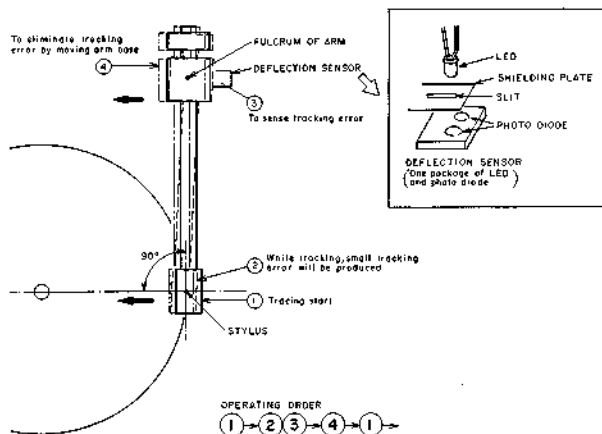


Fig. 11 Arm Movement During Playing

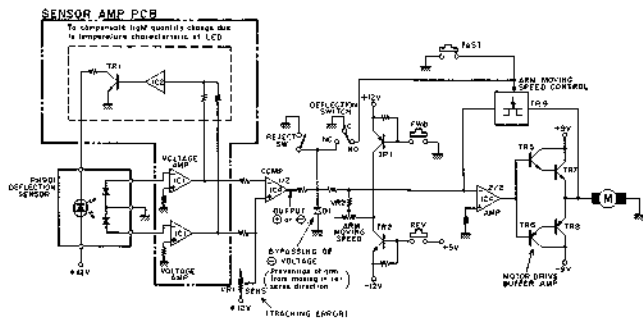


Fig. 12 Horizontal Drive Circuit of Arm

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)

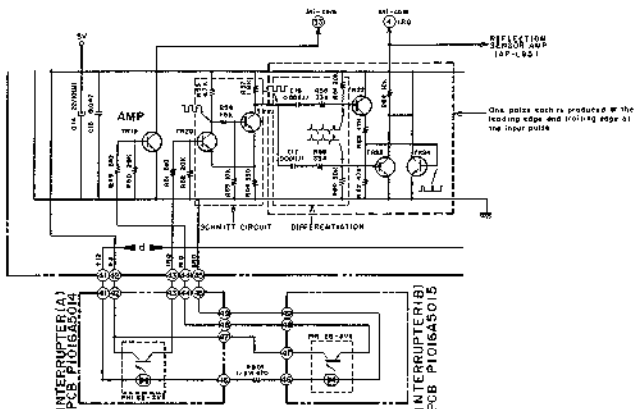


Fig. 13 Interrupter

- 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)

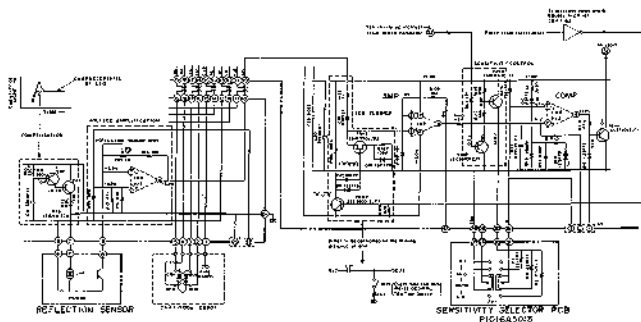


Fig. 14 Reflection Sensor

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

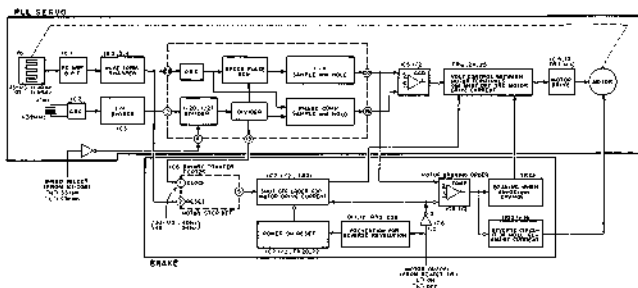


Fig. 15 Motor Control Circuit

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.

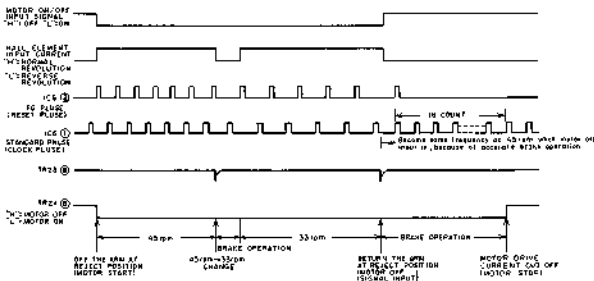


Fig. 16 Brake Circuit Timing Chart

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

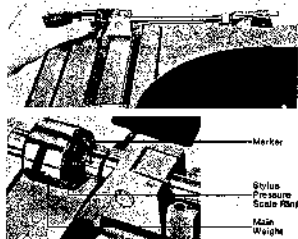
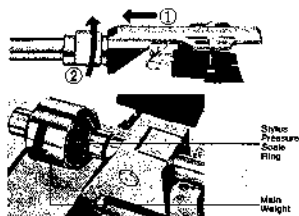


Fig. 15

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.

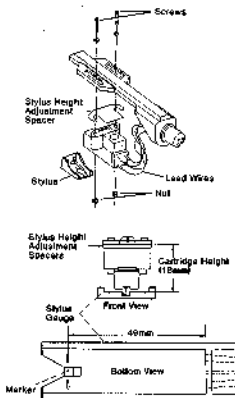


Fig. 17

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.

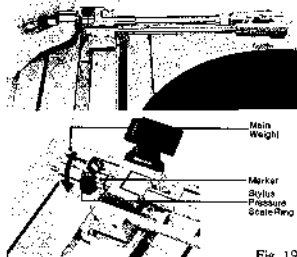


Fig. 19

VIII. ADJUSTMENT

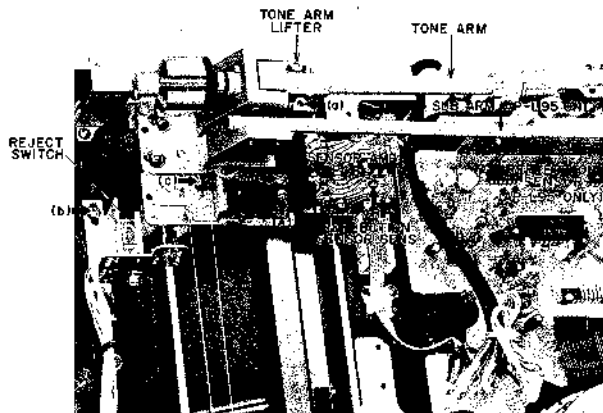


Fig. 20

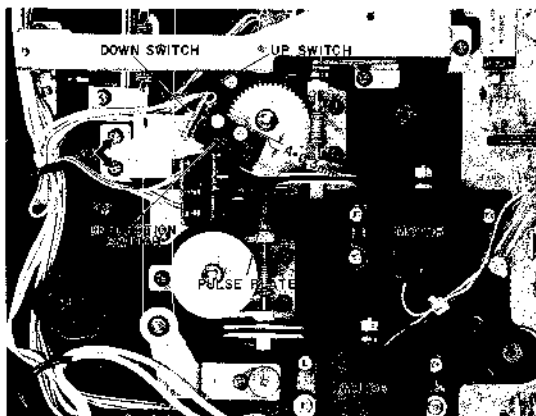


Fig. 21

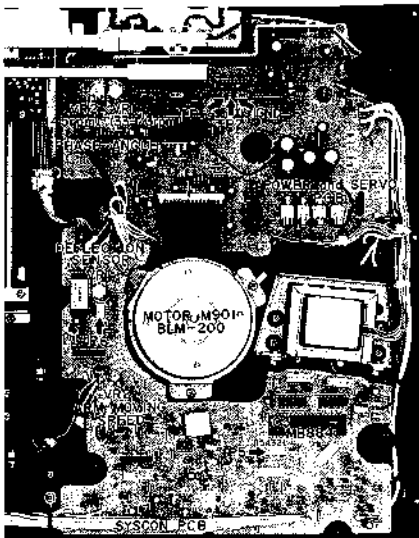


Fig. 22

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.

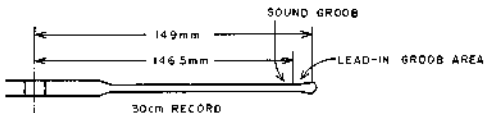


Fig. 23

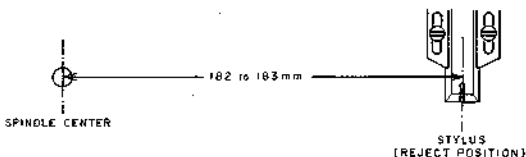
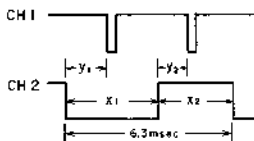


Fig. 24 Reference Value



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

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

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.

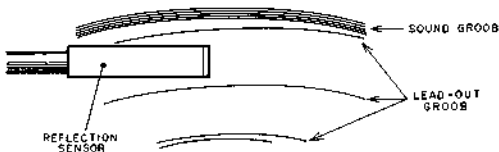
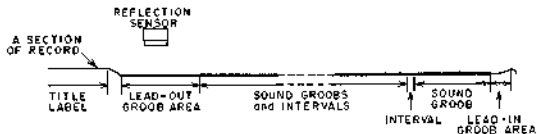


Fig. 26

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.

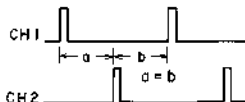


Fig. 27

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

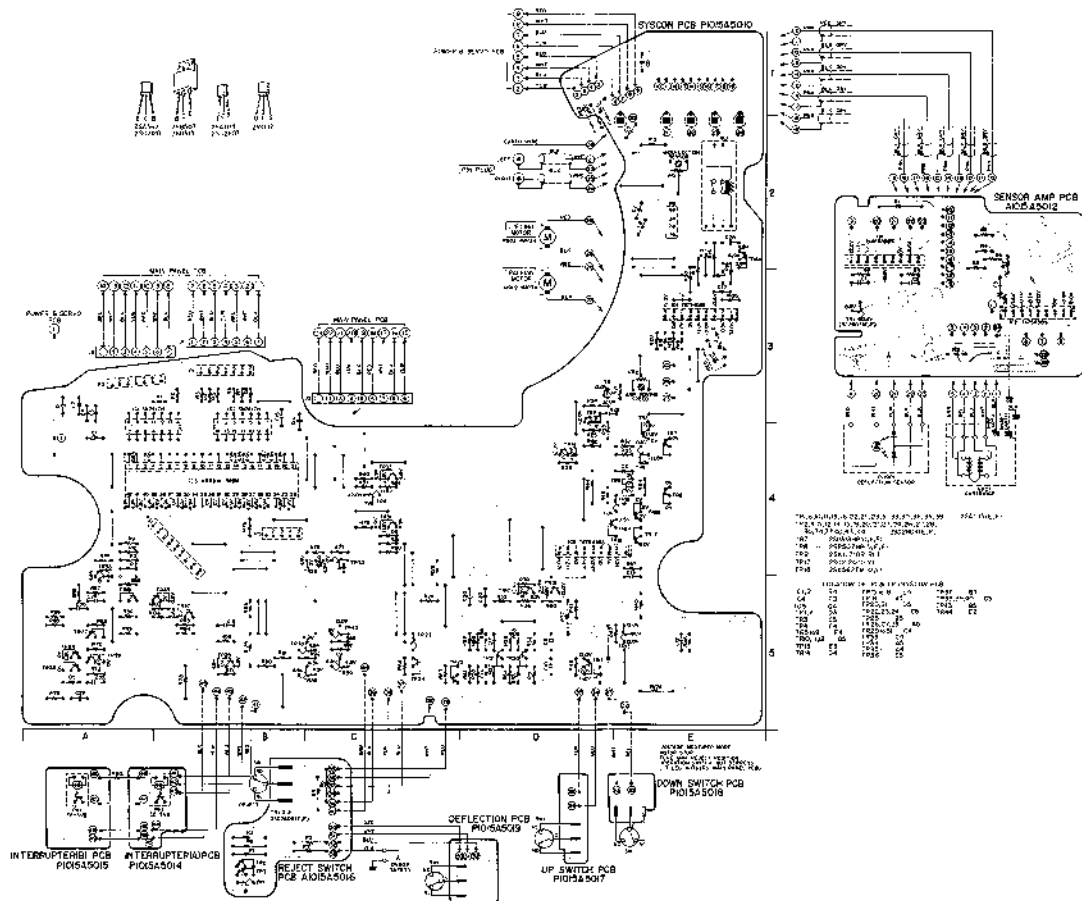
P.C BOARD TITLE	P.C BOARD NUMBER
Syscon P.C Board	P1015A5010
Power & Servo P.C Board	P1015A5011
Sensor Amp P.C Board	P1015A5012
Interrupter (A) P.C Board	P1015A5014
Interrupter (B) P.C Board	P1015A5015
Reject Switch P.C Board	P1015A5016
Up Switch P.C Board	P1015A5017
Down Switch P.C Board	P1015A5018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

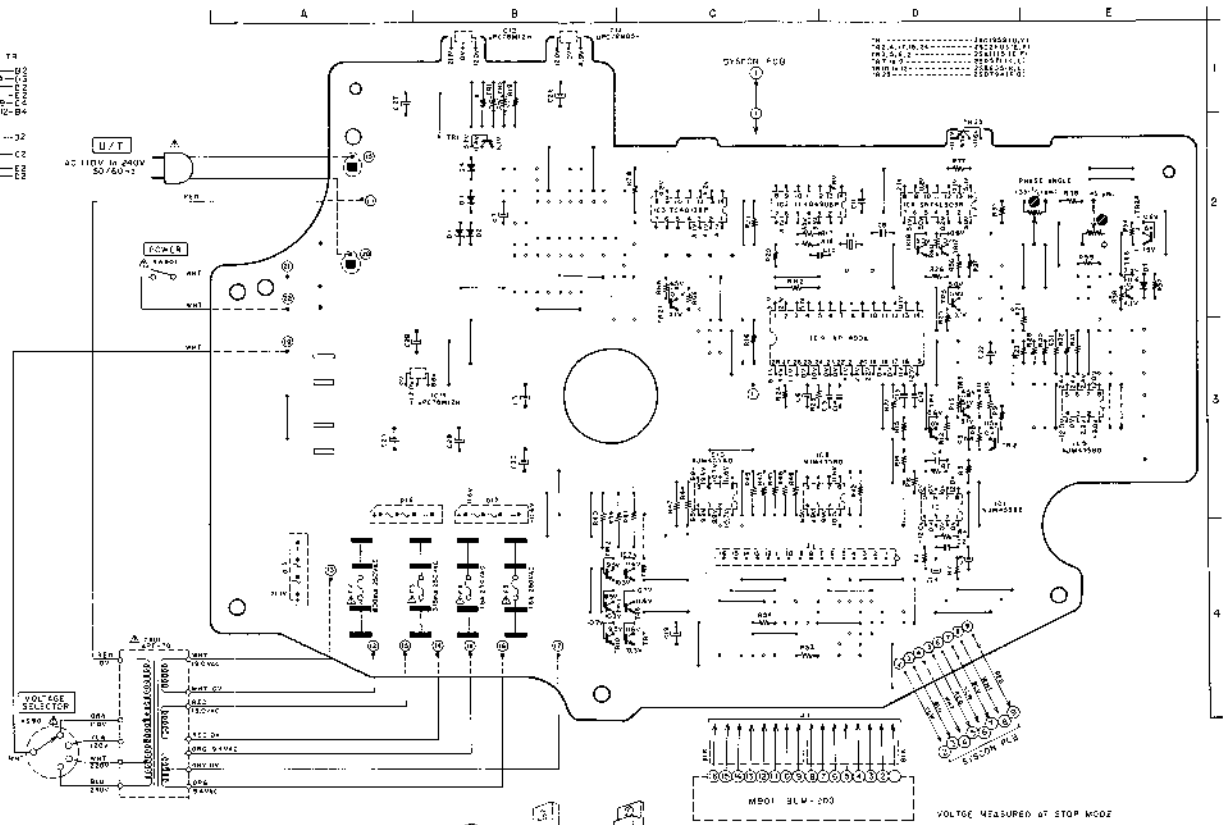
- 1) Syscon P.C Board P1015A5010 (2LD), Sensor Amp P.C Board P1015A5012, Interrupter (A) P.C Board P1015A5014, Interrupter (B) P.C Board P1015A5015, Reject Switch P.C Board P1015A5016, Up Switch P.C Board P1015A5017, Down Switch P.C Board P1015A5018 and Deflection P.C Board P1015A5019



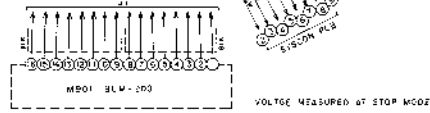
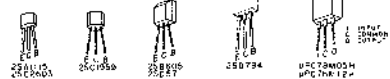
LOCATION OF C & TR

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

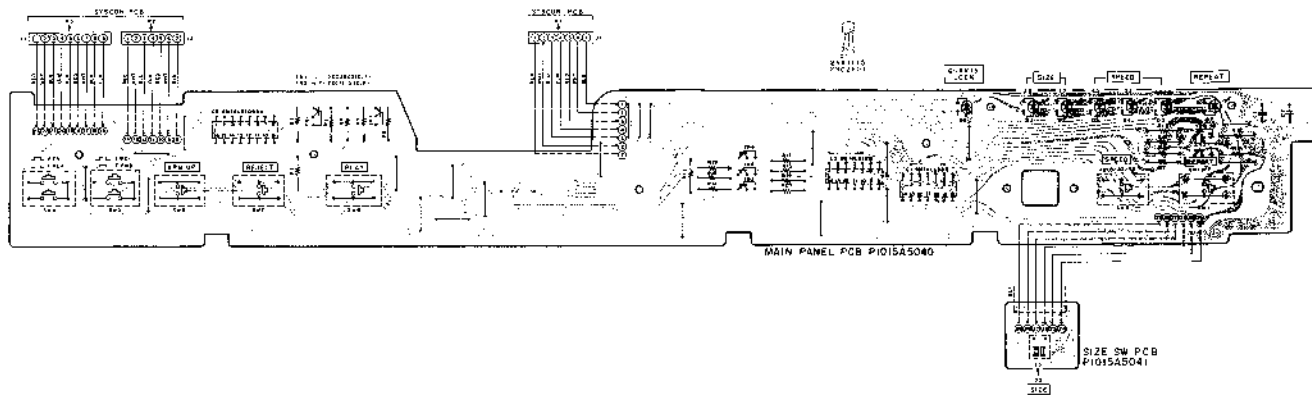
TR 1	2N2907
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TR 4	2N2907
TR 5	2N2907
TR 6	2N2907
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TR 25	2N2907
TR 26	2N2907
TR 27	2N2907
TR 28	2N2907
TR 29	2N2907
TR 30	2N2907
TR 31	2N2907
TR 32	2N2907



RESISTORS WITH TOLERANCE INDICATED ARE 1% TOLERANCE UNLESS OTHERWISE SPECIFIED.
 CAPACITORS WITH TOLERANCE INDICATED ARE 5% TOLERANCE UNLESS OTHERWISE SPECIFIED.
 ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
 DIMENSIONS IN PARENTHESES ARE FOR REFERENCE ONLY.



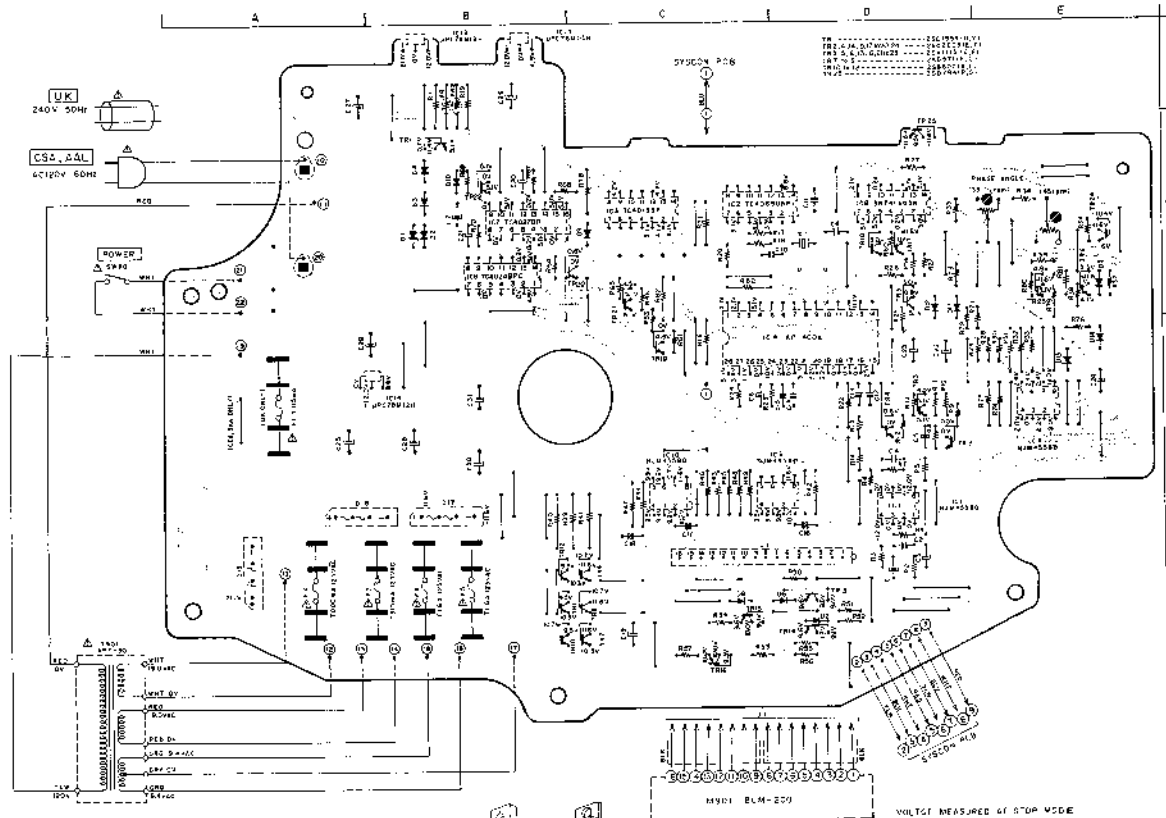
3) Main Panel P.C Board P1015A5040 and Size Switch P.C Board P1015A5041



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

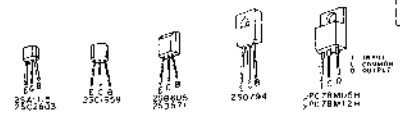
LOCATION OF IC & TR

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102	1
103	2
104	3
105	4
106	5
107	6
108	7
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112	11
113	12
114	13
115	14
116	15
117	16
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200	99

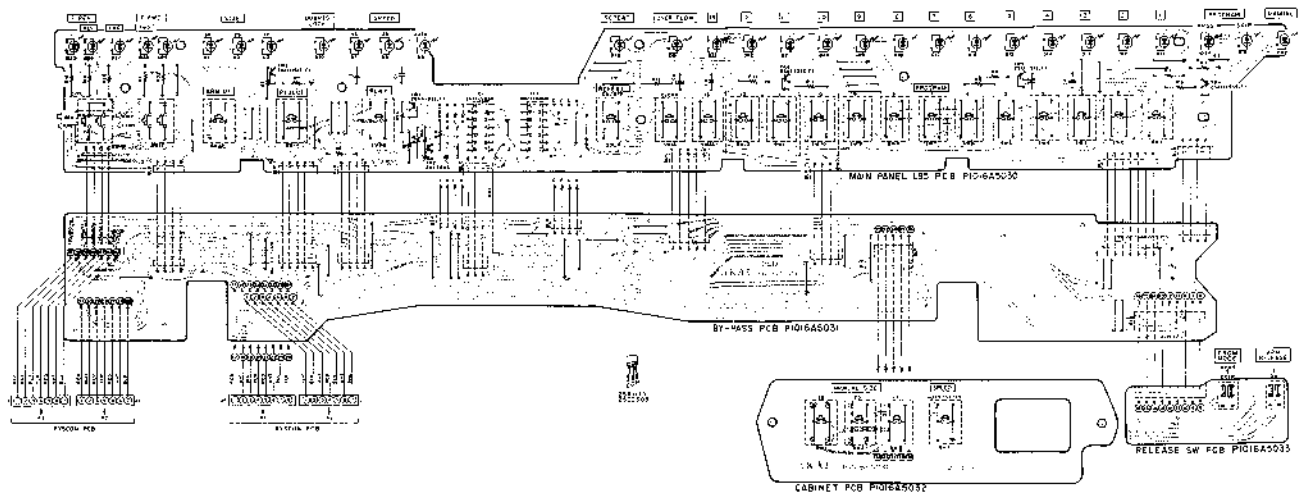


70	1000µF 25V
71	100µF 50V
72	100Ω
73	1kΩ
74	10kΩ
75	100kΩ
76	1MΩ
77	10MΩ
78	100MΩ
79	1GΩ

WARNING: READ AND OBEY ALL WARNINGS FOR CONTROLLED STATES. RESISTOR TOLERANCE: 5% UNLESS OTHERWISE SPECIFIED. MANUFACTURING TOLERANCE: 5% UNLESS OTHERWISE SPECIFIED. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.



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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4. ASSEMBLY BLOCK (1)	49
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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
HYDRAELECTRIC BLOCK #13		
12-115A	502922	Hydroblock Ass't Comp.
12-115B	244506	Hydroblock Comp.
12-115C	244507	Oil Hydroblock
12-115D	251751	Main Motor Case
12-115E	250560	Main Motor

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 DEGRE 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 APT55-10 (B)
1-4	BT321794	△ TRANS POWER APT55-30 (C,A)
1-5	BT321795	△ TRANS POWER APT55-40 (E,B,S)
1-6	BT321794	△ TRANS POWER APT55-70 (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 (J3) (D)
1-14	EF695766	△ FUSE SEMKO T 250V 0.31A (F3) (E,B,S)
1-15	EF118344	△ FUSE SEMKO T 250V 0.80A (I2) (E,B,S)
1-16	EF601964	△ FUSE SEMKO T 250V 1.00A (H4,S) (E,B,S)
1-17	EF206125	△ FUSE TSC A 250V 0.31A (F3) (L,J)
1-18	EF309383	△ FUSE TSC A 250V 0.80A (F3) (G,J)
1-19	EF311830	△ FUSE TSC A 250V 1.6A (F4,S) (H,J)
1-20	EF309391	△ FUSE TSC 125V 0.03A (D2) (G,A)
1-21	EF306058	△ FUSE TSC 125V 0.31A (D3) (H,A)
1-22	EF308491	△ FUSE TSC 125V 1.00A (F4,S) (H,A)
1-23	E1213557	IC AP-400-A (TM4104B)
1-24	E1213812	IC M80841 14051
1-25	F1213300	IC NJM4558D
1-26	F1201940	IC NJM4558S
1-27	F1310643	IC SN74LS03B
1-28	F1324790	IC SN74LS109AN
1-29	F1324789	IC SN74LS12N
1-30	F1331660	IC SN7417N
1-31	F3222499	IC TA754385
1-32	ED506727	IC TC901JBP
1-33	F3306726	IC TC90691UP
1-34	F3326796	IC uPC75105B1
1-35	F1326796	IC uPC78C12H
1-36	ED326799	OSC X TAL 4.32 MHz
1-37	F1327231	OSC X TAL 4MHz
1-38	F3321437	RELAY LEAD LABINS 2NO 5V
1-39	ER318248	△ R.F. SWITCH PFC 11-W 49dB
1-40	F5326788	△ SW PUSH 85B-99149T 01-1 C (C,A)
1-41	F5326787	△ SW PUSH 85B-99149R 01-1 E (H)
1-42	F5326786	△ SW PUSH 85B-99149S 01-1 B (U,E,B,S)
1-43	ES309920	SW 1CAF 85W-13D 01-1 NO
1-44	ES308920	SW MICRO VV S
1-45	F53228780	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	ET330142	TR 2SC1999 O.Y
1-55	ET328844	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,BL
1-61	EV317389	R S-FIX H TMAK2-15 3P 0.10W 202
1-62	EY520606	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	DA005A00F	PC SYSCON BLK AP-L45(F)(F,S)
2-5	DA005A00G	PC SYSCON BLK AP-L45(B)
PC SYSCON BLOCK		
2IC1,2	E1316000	IC SN7417N
2IC2	L1278812	IC M30841 340M
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	L1200558	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	E0308452	O 13K18A V 16344-LR 1-9
2D2	H0360913	D SILICON V 152473VE
2D5,6	E03140913	D SILICON V 152473VE
2RF,1	EP322437	RELAY LEAD LABDMS 2NO 5V
2X0	EP323731	OSC XTAL 4MHz
2XR1	EV317580	RS-FIX II TM6KV24S 3P 0.5W
2XR2	EV320406	R S-FIX H VBK9 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	E1212940	IC NIM4558D
2IC2	F1306726	IC IC0409HDP
2IC3	E1306727	IC IC0409JBP
2IC4	E1315557	IC AP400-A (TM9504P)
2IC5	L1212940	IC NIM4558D
2IC8	E1310411	IC SN74LS03N
2IC9,10	E1212390	IC NIM4558D
2IC12	E1325796	IC PC78AL2E1
2IC13	L1325798	IC PC78AC05H
2IC14	F1325796	IC PC78AL2E1
2TR1	ET200362	TR 2SC1988 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 2SD307HP E,L
2TR10,12	F1200514	TR 2SD305 K,L
2TR17,16	ET200501	TR 2SC2603 E,F
2TR17	ET200558	TR 2SA1115 E,F

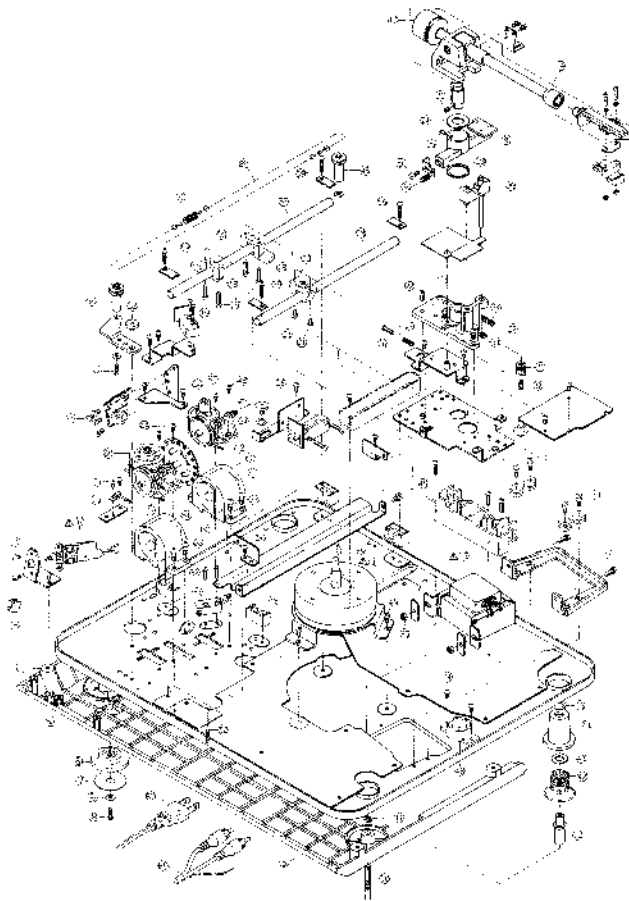
REF. NO.	PARTS NO.	DESCRIPTION
2TR14	ET200505	TR 2SC2603 E,F
2TR15	ET207349	TR 2SD3790 P,Q
2D1	E0313584	D ZENER H WZ-036
2D2,6	E0360013	D SILICON V 152473VE
2D10,11	ET202238	D SILICON 184841 100V 0A
2XR1,2	EV317580	R S-FIX II TM6KV24S 3P 0.5W
2X1	F1225799	OSC XTAL 4.32 MHz
2X1	E1312099	SOCKET 20PHT W-DIM4 KEP
2-FR1,2	E1315246	Δ K FUSE BRD PC 1/4W 47KΩ
2-C11	ET200548	C CE V F 103Z 250AL 1U J
2-C12	ET2014688	C CF V FZ 103P 125AC (C,A)
2-C13	LC127671	C MP V 103M 250AC (C,A,S)
PC SENSOR AMP BLOCK		
2IC1	L1201940	IC NIM4558S
2IC2	F1315509	IC F131558S
2TR1	F1200504	TR 2SD311HP E,F
PC INTERRUPTER (A) BLOCK		
2PH1	ET205889	PHOTO SENSOR EE-SV3A
PC INTERRUPTER (B) BLOCK		
2PH1	F1220899	PHOTO SENSOR EE-SV3 B
PC REFLECT SW BLOCK		
2TR11,12	ET200505	TR 2SC2603 E,F
PC UP SW BLOCK		
2SW1	ES308929	SW MICRO VVS
PC DOWN SW BLOCK		
2SW1	ES308929	SW MICRO VVS
PC REFLECTION SW BLOCK		
2SW1	ES308929	SW MICRO VVS

3. MAIN PANEL L45 P.C. BOARD BLOCK

REF. NO.	PARTS NO.	DESCRIPTION
3-1	DA005A00A	PC MAIN PANEL L45 BLK AP-L45 (Loc. Main Panel, SW Size P.C.B)
PC MAIN PANEL BLOCK		
3IC1	L1310042	IC SN741503N
3IC2	E1318268	IC SN74LS12N
3IC3	F1318790	IC 2N74LS104AN
3TR1	ET200505	TR 2SC2603 E,F
3TR2,10	ET200558	TR 2SA1115 E,F
3D1,6,5	E0322772	D LED SLF 1550-01 REF D
3D6	E0322773	D LED SLF 2550-01 GRN
3D7	E0322774	D LED SLF 1550-01 RED
3SW1,2	ES328777	SW TACT EVQ-PYR1 2K
3SW3,4	ES328778	SW TACT KHP10901
3SW1,6,7	ES328777	SW TACT EVQ-PYR1 2K
PC SW SIZE BLOCK		
3SW1	ES328780	SW PUSH SPK-02 2.02-02N
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	Z552402	FLX PAN30408STL CMT
4-6	8A32947	FOOT RUBBER
4-6	TP32946B	FELT RUBBER FOOT
6-8	Z5131003	FLX PAN30408STL CMT
4-9	ZW55642	PW31006A0190TL CMT
4-10	TP329469	PRF BOTTOM
4-11	ZW57012	SEVC 54008ST CMT
4-12	TP329650	PROF 9 INSULATOR
4-13	ZW332727	RING CS7408TL PKR
STONE ARM BLOCK		
4-14	TP328793	STONE ARM WASHELL
4-15	TP728013	MAIN WEIGHT 4-80079
4-16A	TP329214	STONE ARM WASHELL (BL)
4-17	TP710014	MAIN WEIGHT (BL) 4-50105
CHASSIS TONE ARM BLOCK		
4-18	TP32854	SLIDER (A)
4-19	Z5485102	PAN 5041NSTL CMT
4-20	TP328555	SLIDER (B)
4-21	Z5942076	PAN 50408STL CMT
4-22	Z5803813	PAN 50408STL CMT (PW08)
4-23	PW329657	WASHER SENSOR (A)
4-24	PW329658	WASHER SENSOR (B)
4-25	Z5146804	GEF 730408ST PKR HP
4-26	Z5049246	ADJUST SCREW (B)
4-27	Z5131178	SP C-3.5X1.5-17 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	TP3294977	SHAFT LIFTER PART
4-33	ZW653163	RING CS2508TL PKR
4-34	Z5131029	SP T1-8.0X22.22 2.4 TL 192
SENSOR UNIT BLOCK		
4-35	TP328894	SENSOR UNIT
4-36	Z5131042	SP T1-8.0X25.18 2.0 TL 145
POWER SW BLOCK		
4-37	ES328786	SW PUSH ESB-90195 01-1 U (L, B, S)
4-38A	ES328787	SW PUSH ESB-90198 01-1 J (J)
4-39A	ES328788	SW PUSH ESB-90144T 01-1 UC (C, A)
ASSEMBLY BLOCK		
4-42	Z5329667A	SP PULL INSULATOR (A)
4-43	ZW329651	WASHER INSULATOR
4-44	TP329662	CUSHION INSULATOR
4-45	Z58320743	PROF 1 PULLEY (A) PART
4-46	Z5411201	PAN40408STL CMT
4-47	TP329984	LIFTEK CAM ASSY
4-48	Z58320780	T2BR30408STL CMT
4-49	Z5329590	GRADUATED SCREW Y98J
4-50	Z5328495	T2BR30408STL CMT
4-51	Z5534478	SW MICRO K3 LOC
4-52	Z5442148	CS30408STL CMT
4-53	Z5329489	GRADUATED SCREW Y940B
4-54	ZW1260111	PW612100408NYL
4-55	Z5411150	PAN40408STL CMT
4-56	Z58320789	PROF 1 PULLEY (B) PART
4-57	TP329470A	SHAFT GUIDE (A)
4-58	TP329470B	SHAFT GUIDE (B)
4-59	Z5485282	TDR 4015STL CMT
4-60	TP328298	TRACKING ASSY AF 145
4-61	BM328192	MOTOR HMR3401-01-020

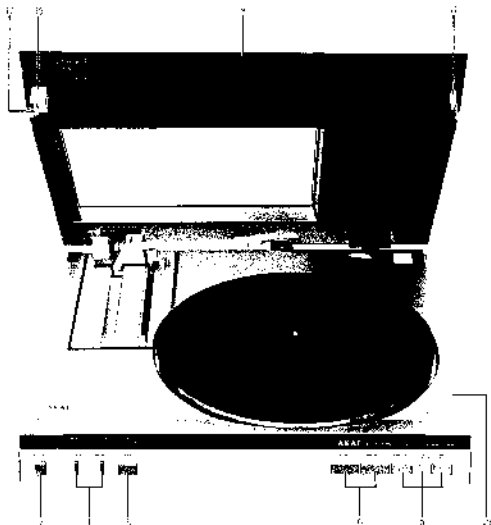
QTY.	PARTS NO.	DESCRIPTION
4-41	TP328538	CUSHION
4-42	Z5329456	GRADUATED SCREW Y206J
4-44A	Z5485207	T2BR 30408STL CMT
4-61A	Z5608174	PAN30408STL M3
4-66B	ZW329650	PW31006A0190STL CMT
4-69	Z5814013	CS30408STL CMT
4-70	ES328920	SW LRAJ ESW-130 01 1 NO
4-71	Z5608095	PAN30408STL CMT
4-72A	Z5244912	CS30408STL M3
4-73	WB329540	BOLT
4-74	ES503533	SW SELECTOR HWX09131-240 01 1
4-75	BT328782	TRANS POWER AP793-704D
4-76A	BT328783	TRANS POWER AP735-104D
4-77A	BT328784	TRANS POWER AP735-304C(A)
4-78A	BT328786	TRANS POWER AP735-404C(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	AC CORD 2 CORES KP-211 VFF
4-85A	EW305041	AC CORD 2 CORES KP-8-SPT-1 UC (C, A)
4-86A	EW315882	AC CORD 2 CORES KP-430C (LTC-2F E (E))
4-87A	EW313884	AC CORD 2 CORES GTR8-1F
4-88A	EW301515	AC CORD 2 CORES KP-60B 240 2X4 B (B)
4-89A	TP329289A	STRING WIRE (A) L-237-AMN
4-90	TP329289B	STRING WIRE (B) L-241-3MM
4-91	Z5131045	SP T1-8.0X28.25 01 1 2147
4-92A	Z531476	ASF1404408CM PKR HP
4-93	SK329629	KNOB P15H
4-94	SK309388	SW LRAJ ESW-250V 0.80A (L, S)
4-95	FF30425	FUSE T5C 1 250V 0.31A (F3)
4-96	FF311439	FUSE T5C 1 250V 1.6A (F4, S)
4-100A	FF30439	FUSE T5C 325V 0.8A (F3) (C, A)
4-101A	FF30808A	FUSE T5C 125V 0.31A (F3) (C, A)
4-102A	FF30847	FUSE T5C 125V 1.60A (F4, S)
4-103A	FF69576	FUSE SEM KO T 250V 0.31A (F1) (B, S)
4-104A	FF69576	FUSE SEM KO T 250V 0.31A (F1) (L, S)
4-105A	FF69576	FUSE SEM KO T 250V 0.31A (F3) (L, S)
4-106A	FF60196A	FUSE SEM KO T 250V 1.60A (F4, S) (E, S)
4-107A	Z5431488	T1 PAN306355TL CMT

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

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	T2BR30X065TL 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	PAN30X065TL CMT
5-30	ZS324379	GRB20X200HR5 NIA
5-31	TP324306	PLATTER
5-32	TP324307A	TABLE SHEET (A) (U,C,L,B,S)
5-33A	TP324307B	TABLE SHEET (B) (A)
5-34	TP324307C	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)	6-20	TP331935B	CLAMPER (B)-UL
6-2	SK329632B	KNOB PUSH (A)-RL	6-21	75311172	SP C J.504-10.0 C-020
6-3	SK329605A	KNOB PUSH (B)	6-22	75306456	TIBED20V8051L B/N
6-4	SK329605B	KNOB PUSH (B)-BL	6-23	TP322786A	MASK (E)
6-5	SK329603A	KNOB PUSH (C)	6-24	TP322786B	MASK (E)-RL
6-6	SK320603B	KNOB PUSH (C)-BL	6-25	TP322781A	MASK (F)
	FINAL ASSEMBLY BLOCK		6-26	TP322785B	MASK (F)-RL
6-7	SK329636A	KNOB POWER	6-27	75332788	TI0CS200808/N1
6-8	SK329636B	KNOB POWER (BL)			
6-9	BC329590C	DUST COVER AP-L45			
6-10	BC329590D	DUST COVER AP-L45 (BL)			
6-11	TP329591A	CUSHION COVER			
6-12	TP329591B	CUSHION COVER (BL)			
6-13	SE311434A	ESCUTCHION KNOB (C)			
6-14	SE311924B	ESCUTCHION KNOB (C)-BL			
6-15	TP331935A	CLAMPER (C)			
6-16	TP331935B	CLAMPER (C)-BL			
6-17	TP331936A	CLAMPER (A)			
6-18	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-200
1-2	MM328792	MOTOR HMR1400-01-020
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	EDJ28792	D LED SL P-155D 01 RED
1-10	EDJ28793	D LED SL P-255D 01 GRN
1-11	EDJ31643	D SILICON 1S2473MS F10
1-12	EDJ60913	D SILICON V 1S2473VE
1-13	EDJ22238	D SILICON 1B4841 10021 0A
1-14	ET313258	D ZENER H W7-036
1-15	ET648766	△ FUSE SEMKO T 250V 0.31A (F1) (E,R,S)
1-16	ET693766	△ FUSE SEMKO T 250V 0.31A (F1) (E)
1-17	ET252764	△ FUSE SEMKO T 250V 0.80A (F2) (E,R,S)
1-18	ET601966	△ FUSE SEMKO T 250V 1.60A (F4,S) (E,R,S)
1-19	ET300125	△ FUSE TSC A 250V 0.11A (E) (U,J)
1-20	ET100938	△ FUSE TSC A 250V 0.80A (F2) (U,J)
1-21	ET311839	△ FUSE TSC A 250V 1.6A (F4,S) (U,J)
1-22	ET300939	△ FUSE TSC 125V 0.80A (F2) (C,A)
1-23	ET300806	△ FUSE TSC 125V 0.31A (F1) (U,A)
1-24	ET300844	△ FUSE TSC 125V 1.60A (F4,S) (U,A)
1-25	ET315557	IC AP-400-A (TMA0404)
1-26	ET328812	IC M5841 349M
1-27	ET318390	IC K1M456FD
1-28	ET201940	IC K1M456DS
1-29	ET300043	IC SN74LS04N
1-30	ET331660	IC SN7417N
1-31	ET322399	IC TA7548RS
1-32	ET306127	IC TC 90138P
1-33	ET328194	IC TC 90240PC
1-34	ET324682	IC TC 90278P
1-35	ET306226	IC TC 4049UBP
1-36	ET324226	IC TC 4049UB
1-37	ET325785	IC UC74V04H
1-38	ET328796	IC UC74V04H
1-39	ET325799	OSC. XTAL 4.32 MHz
1-40	ET323231	OSC. XTAL 4MHz
1-41	EP312437	RELAY 1E4D LAB2HS 220V 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 ESB90150S 01-11C (U,E,R,S)
1-46	ES309920	SW LEAF B SW-130 01-11C (U)
1-47	ES328787	SW MICRO K3 UC
1-48	ES309920	SW MICRO VV-S
1-49	ET325799	SW PUSH SP3231 7 02 02N
1-50	ES301735	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	ET300455	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 2S8606 K,L
1-59	ET330162	TR 25C1959 O.V.
1-60	ET328944	TR 2SC2120 O.V.
1-61	ET300507	TR 25C2460 E,F
1-62	ET323366	TR 2SD1331P D.E.F
1-63	ET666404	TR 2S8711 K,L
1-64	ET301349	TR 2SD794 P,Q
1-65	ET311016	TR 2SA111 GR,B,L
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 202
1-68	ET520806	R 5-FIX H V8K4-1 3P 103
1-69	ME325530	BELT
1-70	YF32884	SENSOR 10M P
1-71	ET325793	TOPE ARM W/SHIELD
1-72	ET329217	TOPE ARM W/SHIELD (HL)

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(C)
2-3	BA7085006M	PC SYS CON BLK AP-L95(C) (CHC, A)
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	ET311660	IC SN7417N
2-3C-2	ET328812	IC M5841 349M
2-3C-3	ET322399	IC TA7548RS
2-3C-4	ET324226	IC TC4049UB
2-TR1	ET100558	TR 2SA1115 E,F
2-TR2	ET100595	TR 2SC2403 E,F
2-TR3	ET100558	TR 2SA1115 E,F
2-TR4,1	ET100585	TR 2SC2403 E,F
2-TR6	ET200458	TR 2SA1115 E,F
2-TR7	ET323366	TR 2SD1331P D.E.F
2-TR8	ET323245	TR 2SB957HP D,E,F
2-TR9	ET323816	TR 2SK137 GR, BL
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	ET200544	TR 2SC2403 E,F
2-TR18	ET328861	TR 2SA1562M O.V.
2-TR19,10,21	ET100458	TR 2SC2403 E,F
2-TR22	ET100458	TR 2SA1115 E,F
2-TR23,20	ET200458	TR 2SC2403 E,F
2-TR25	ET200458	TR 2SA1115 E,F
2-TR26,16,28	ET200458	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	ET200595	TR 2SC2403 E,F
2-TR33	ET200558	TR 2SA1115 E,F
2-TR34	ET200508	TR 2SC2403 E,F
2-TR35,36	ET200558	TR 2SA1115 E,F
2-TR37	ET200458	TR 2SC2403 E,F
2-TR38,39	ET200549	TR 2SA1115 E,F
2-TR40	ET200595	TR 2SC2403 E,F
2-TR41,42	ET200558	TR 2SA1115 E,F
2-TR43,44	ET200508	TR 2SC2403 E,F
2-TR45	ET321016	TR 2SK137 GR, BL
2-TR46,43	ET200458	TR 2SC2403 E,F
2-TR48	ET200558	TR 2SA1115 E,F
2-TR49,50	ET200595	TR 2SC2403 E,F
2-01	EDJ08592	D GERMA V 1K344-1 B F07
2-02,10,8	ET300455	D SILICON V 1S2473VE
2-03,4	ET318343	D SILICON 1S2473MS F10
2-09,6,14	ET648766	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	FV120506	R S-FIX H V8K4-J 3P 105
2-Y1 to 3	E1306821	PLUG 5P CONNECTOR 171825-1 7P
2-P4	E1316263	PLUG 5P CONNECTOR 171825-3 8P
2-P4	E1316261	PLUG 5P CONNECTOR 171825-5 8P
2-P6	E1308260	PLUG 5P CONNECTOR 171825-4 8P
2-P7	E1318259	PLUG 5P CONNECTOR 171825-3 8P
2-R116	YF308922	FW92x150x060ALM
2-R118	IR109816	K MF V 12W 150ZF
2-C26	TC117420	C SA V POS 10K 100C
2-C33	TC116669	C SA V POS 10K 25 100C

PC POWER & SERVO BLOCK

2-IC1	E1213390	IC NM54558D
2-IC2	E1306126	IC TC4069UDP
2-IC3	F1306727	IC TC4013BP
2-JC4	F1375557	IC AS400-A (TM4604P)
2-KC5	E1213390	IC NM54558D
2-KC6	E1328795	IC TC4021BP
2-IC7	E1324662	IC TC3027BP
2-KC8	E1316043	IC SN74LS03F
2-IC9 to 10	E1213390	IC NM54558D
2-IC12	E1208794	IC µPC75M11H
2-IC13	E1208795	IC µPC75M10H
2-IC14	E1325796	IC µPC78M12H
2-TR1	ET350162	TR 2SC1959 O.V
2-TR2	ET200406	TR 2SC1603 E.F
2-TR3	ET200558	TR 2SA1115 E.F
2-TR4	ET200505	TR 2SC1603 Y.F
2-TR5,6	ET200558	TR 2SA1115 E.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
2-TR14,15	ET200505	TR 2SC1603 E.F
2-TR16	ET200558	TR 2SA1115 E.F
2-TR17 to 20	ET200505	TR 2SC1603 E.F
2-TR21 to 23	ET200558	TR 2SA1115 E.F
2-TR24	ET200505	TR 2SC1603 E.F
2-TR25	ET307349	TR 2SD794 P.Q
2-D1	ED313184	D ZENER HW 2-036
2-D2 to 14	ED766013	D SILICON V 1S2713VF
2-D15 to 17	ED322136	D SILICON 1R04M 100V 1A
2-V1c1,2	FV317560	R S-FIX H TM8K(V) 3P 0.10W

PC SENSOR AMP BLOCK

2-IC1	E1201940	IC NM54558S
2-IC2	ES322599	IC TA754655F
2-TR1 to 3	ET100505	TR 2SC1603 E.F
2-YR1	EV329215	R S-FIX H TM8K(PV) 3P 0.10W
2-R13	ER329279	R OMF H FS 1W 271J

PC SENSITIVITY SELECTOR BLOCK

2-SW1	ES129077	SW SLIDF 002404X 2-02-045
2-R1	ER318323	R MF H F10 114W 1A02F
2-R2	ER329180	R MF H F10 114W 6202F
2-R3	FR329582	R MF H F10 114W 2702F

PC INTERRUPTOR (A) BLOCK

2-PH1	ET326859	PHOTO SENSOR LL-SV 1-D
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REF. NO.	PARTS NO.	DESCRIPTION
2-PH1	PC INTERRUPTOR (B) BLACK ET326860	PHOTO SENSOR LL-SV 3-B
2-TR1 to 3	PC REJECT SW BLOCK FT200406	TR 2SC1603 E.F
2-SW1	PC UP SW BLOCK ES108929	SW MICRO V.V.E
2-SW1	PC DOWN SW BLOCK ES108929	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
3-TR2	ET200505	TR 2SC1603 E.F
3-TR3 to 6	ET200558	TR 2SA1115 E.F
3-D1 to 14	ED322772	D LED SLP 15SD 013 R1D
3-D15 to 19	ED326791	D LED GL-APR3 RED
3-D20	ED327773	D LED SLP 245D 013 GRN
3-SW1 to 16	ES128777	SW TACT LVQ-PV112K
3-SW17,18	ES128778	SW TACT K111 1A00V
3-SW19,20	ES128777	SW TACT LVQ-PV112K
3-1	ZW329904	EV NPL 30X044

PC CABINET BLOCK

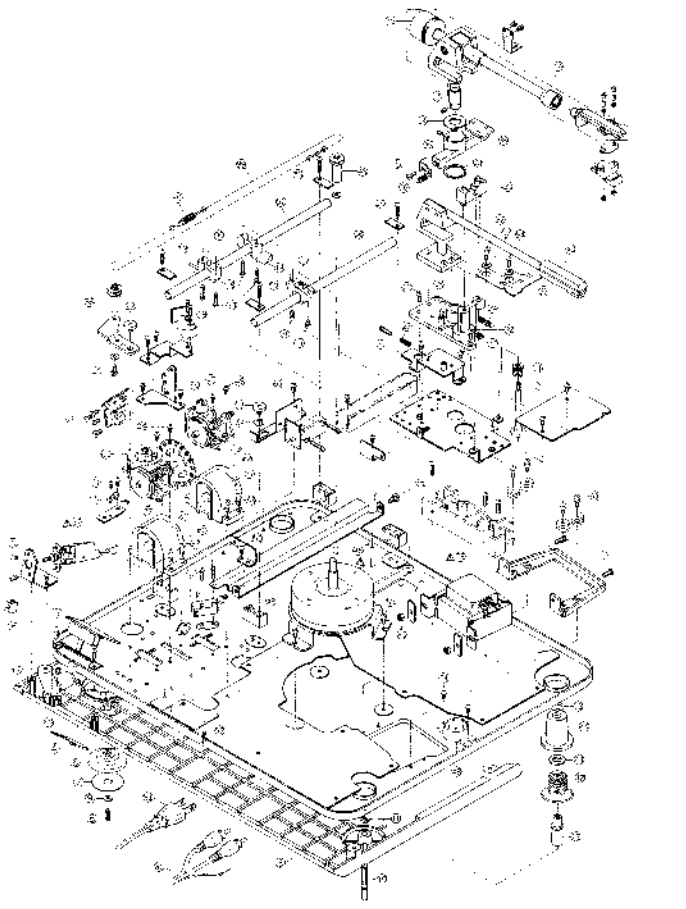
3-SW1 to 4	ES128777	SW TACT LVQ-PV112K
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PC RELEASE SW BLOCK

3-SW1,2	FS123779	SW PUSH SW122H 2-02 01N
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ASSEMBLY BLOCK (1)

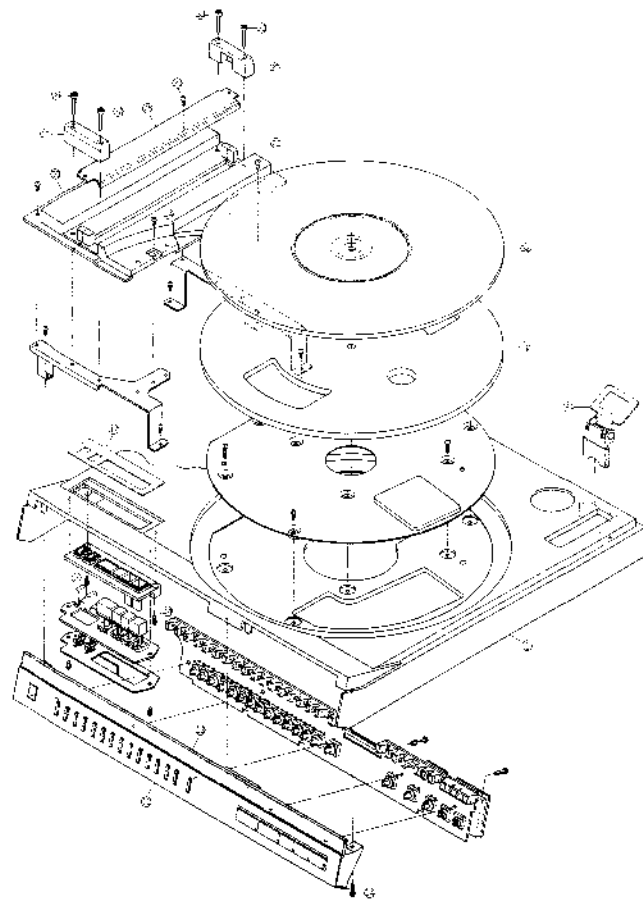
4. ASSEMBLY BLOCK (1)



REF. NO.	PARTS NO.	DESCRIPTION
MOTOR BLOCK		
4-1	BMM302AD0A	MOTOR BLM-200
4-2	E1578294	MOLL ELEMENT VIII-T11
COVER BOTTOM BLOCK		
4-3	99329641	COVER BOTTOM
4-4	TF329645	PLATE SENSOR
4-5	76324201	PLX PAN30408STL CMT
4-6	SA329647	FOOT RUBBER
4-7	TF329648	JELLY RUBBER PUCT
4-8	ZS329649	PLX PAN30411STL CMT
4-9	ZWS30642	PW314080X050STL CMT
4-10	TF329649	PROP BOTTOM
4-11	ZWS30633	RING P400SC-P1CMT
4-12	TF329649	PROP 3 SUSULTRA PRK
4-13	ZWS31321	RING C1408STL PRK
TRONE ARM BLOCK		
4-14	TP328793	TRONE ARM W/CHWEL
4-15	TP328043	MAIN W/RIGHT 4-80079
4-16	TP328217	TRONE ARM W/SHWEL (BL)
4-17	TP328044	MAIN W/RIGHT (BL) 4-80105
CHASSIS TRONE ARM BLOCK		
4-18	TF329554	SLIDER (A)
4-19	ZS329552	PAN30411STL CMT
4-20	TF329555	SLIDER (B)
4-21	ZS429276	PAN30408STL CMT
4-22	ZS408328	PAN30408STL CMT PW308
4-23	PW329557	WASHER SENSOR (A)
4-24	PW329558	WASHER SENSOR (B)
4-25	ZS329584	6SH P308405CM PPK HP
4-26	ZS329584	ADJUST SCREW (B)
4-27	ZG313178	SP C-3-1/8 X42.5 C-025
HOLDER TRONE ARM BLOCK		
4-28	TF329669	HOLDER TRONE ARM PART
4-29	TF329888A	ARM LUTER PART
4-30	TF329888B	ARM LUTER (BL) PART
4-31	ZG329677	SP PUSHER LUTER
4-32	TF329887	SHAFT LUTER PART
4-33	ZW653163	RING C1380STL P/R
4-34	ZG313029	SP T1.5-D10.32 22.4 H-142
SENSOR UNIT BLOCK		
4-35	TF328994	SENSOR UNIT
4-36	ZG313042	SP T1.5-D10.35 18.0 T1-155
POWER SW BLOCK		
4-37	E3228786	SW PUSH L5B 901595 0.1 J
4-38	E3228787	SW PUSH L5B 901498 0.1 J (C, B)
4-39	E3228788	SW PUSH L5B 901047 0.1 J (C, A)
SUB ARM BLOCK		
4-40	BZP1016A090A	SUB ARM BLK AP-195
4-41	BZP1016A090B	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	ZS329674	PROP 1 PULLEY (A) PART
4-46	ZS413201	PA340808STL CMT
4-47	TP329696	LITER CMT ASSEY
4-48	ZS449440	T2BR 0408STL CMT
4-49	ZS329400	GRADUATED SCREW Y981
4-50	ZS329494	T2BR 0406STL CMT
4-51	E3274716	SW H230 K2 UC
4-52	ZS452736	CTS30415STL CMT
4-53	ZS329989	GRADUATED SCREW Y906B
4-54	ZS274013	PW314080X050STL CMT
4-55	ZS411140	PAN40408STL CMT
4-56	ZS329550	PROP 1 PULLEY (B) PART

REF. NO.	PARTS NO.	DESCRIPTION
4-57	TF329470A	SHAFT GUID (A)
4-58	TF329470B	SHAFT GUID (B)
4-59	ZS403902	T2BR 0406STL CMT
4-60	TF329482	TRUCKING ASSEY
4-61	BM31792	MOTOR HMR3401-01-020
4-62	TF329538	CUSHION
4-63	ZS329988	GRADUATED SCREW Y206A
4-64	ZS351007	T2BR 0406STL CMT
4-65	ZS408174	PAN26A038STL N13
4-66	ZWS29510	PW314080X050STL CMT
4-67	ZS492738	PAN26A038STL CMT
4-68	SK329665	KNOB SLIDE
4-69	ZS410032	CTS30X083SL CMT
4-70	E3230920	SW LEAF BWN JDP 01 J MD
4-71	ZS408951	PAN26A038STL CMT
4-72	ZS444912	CTS30A165STL N13
4-73	MB329540	BFLT
4-74	ZS407731	SW SELECTOR HXND 131260 014
4-75	DT328762	TRANS POWER AP795 70U(C)
4-76	DT328763	TRANS POWER AP795-10U1
4-77	DT328764	TRANS POWER AP795-30U(A)
4-78	DT328765	TRANS POWER AP795-40U(B)
4-79	ZS424956	PAN40408STL CMT
4-80	ZW411188	H40STL CMT J
4-81	EW326740	CORP 21068-3P AUDIO CORD (C, L, E, B)
4-82	EW328781	CORP 1P AUDIO CORD (C, A)
4-83	EW306428	AC CORD 2 CORES KP105A
4-84	EW306427	AC CORD 2 CORES KP111 VXF
4-85	FW306561	AC CORD 2 CORES KP35PT-1 J
4-86	FW313582	AC CORD 2 CORES KP449C
4-87	FW313584	AC CORD 2 CORES OT85-1F
4-88	FW201515	AC CORD 2 CORES KP560
4-89	TF329553A	1TSA-2E5 (5)
4-90	TF329859B	STRING WIRE (A) 142-32-30MM
4-91	ZG313081	SP T1.6-3/8.5-25.0 T1 197
4-92	ZS329569	5CBFW SENSOR ARM
4-93	ZG329023	CONE DISC SPERM DB-4
4-94	ZS423210	PAN 10408STL P/R
4-95	ZS329116	6SE10404095CM PPK HP
4-96	SK329634	KNOB PUSH
4-97	TF309306	FUSE T5C A 250V 0.20A (12J)
4-98	TF306125	FUSE T5C A 250V 0.31A (F3)
4-99	TF311529	FUSE T5C A 250V 1.0A (FA)
4-100	TF330929	FUSE T5C 125V 0.08A (F2) (C, A)
4-101	TF306068	FUSE T5C 125V 0.31A (F3) (C, B)
4-102	TF308327	FUSE T5C 125V 1.00A (E4.5)
4-103	E1495166	FUSE SEMKO T 250V 0.31A (F3) (B)
4-104	FP548344	FUSE SEMKO T 250V 0.50A (P2) (E, R, 2)
4-105	FP595766	FUSE SEMKO T 250V 0.31A (F3) (E, B, 5)
4-106	TF401964	FUSE SEMKO T 250V 1.00A (F4.5)
4-107	ZS334999	T1PAN305 35 STL CMT

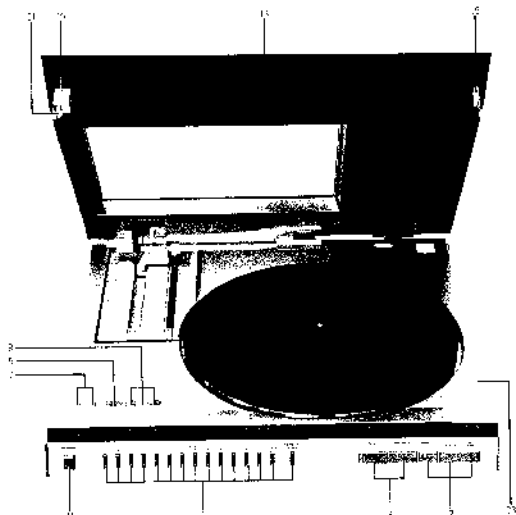
ASSEMBLY BLOCK (2)



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	PAN30x065TL CMT
5-30	ZS329479	BRB30x200BRS 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	SK329643A	KNOB PUSH (C)	6-24*	TP331937B	CLAMPER (b)-BL
6-6*	SK329643B	KNOB PUSH (C)-BL	6-25*	ZG311772	SP C.S. 378.4 10.0 C-020
6-7	SK329644A	KNOB PUSH (D)	6-26*	ZS306496	TIBID30X105TL HNI
6-8*	SK329644B	KNOB PUSH (D)-BL	6-27*	TP332786A	MASK (E)
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6-11	SK329636A	KNOB POWER	6-30*	TP332787B	MASK (F)-BL
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6-14*	BC328580B	DUST COVER AF LNS (BL)			
6-15	TP329591A	CUSHION COVER			
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When ordering parts, please quote Parts Number, Description and Model Number.

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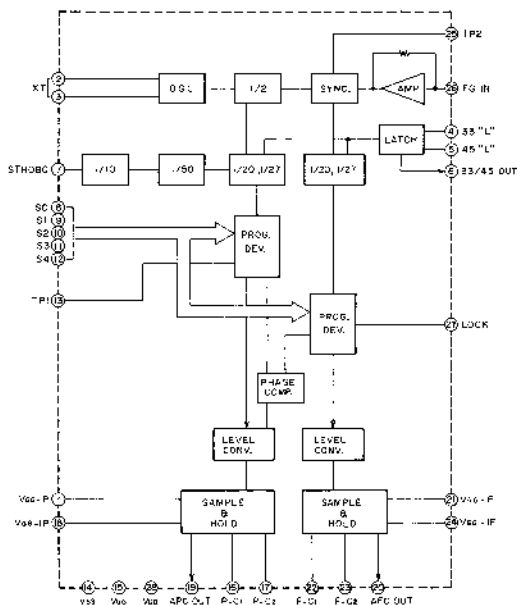
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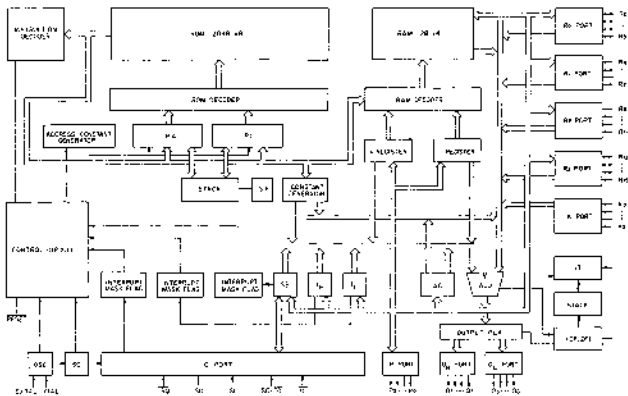
SECTION 3

SCHEMATIC DIAGRAM

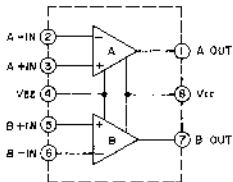
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AP-400A

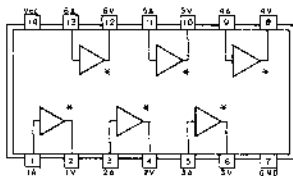




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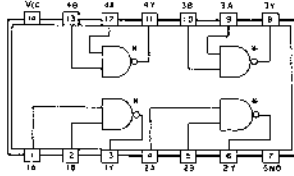


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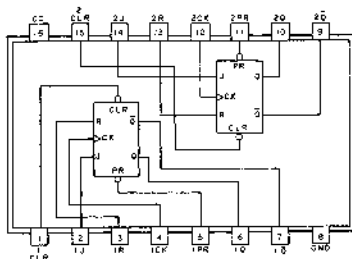
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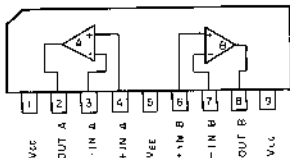


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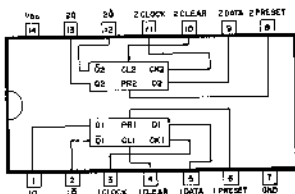
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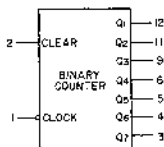
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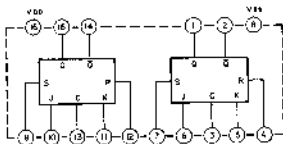


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NC : 8,10,13

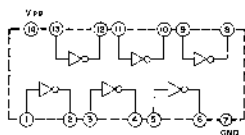
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X	H	ALL OUTPUTS="L"
f	L	NO CHANGE
f	L	ADVANCE TO NEXT STATE

Δ: LEVEL CHANGE, X: DON'T CARE

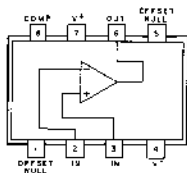
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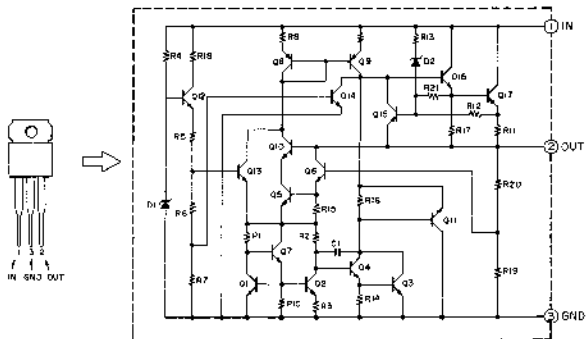
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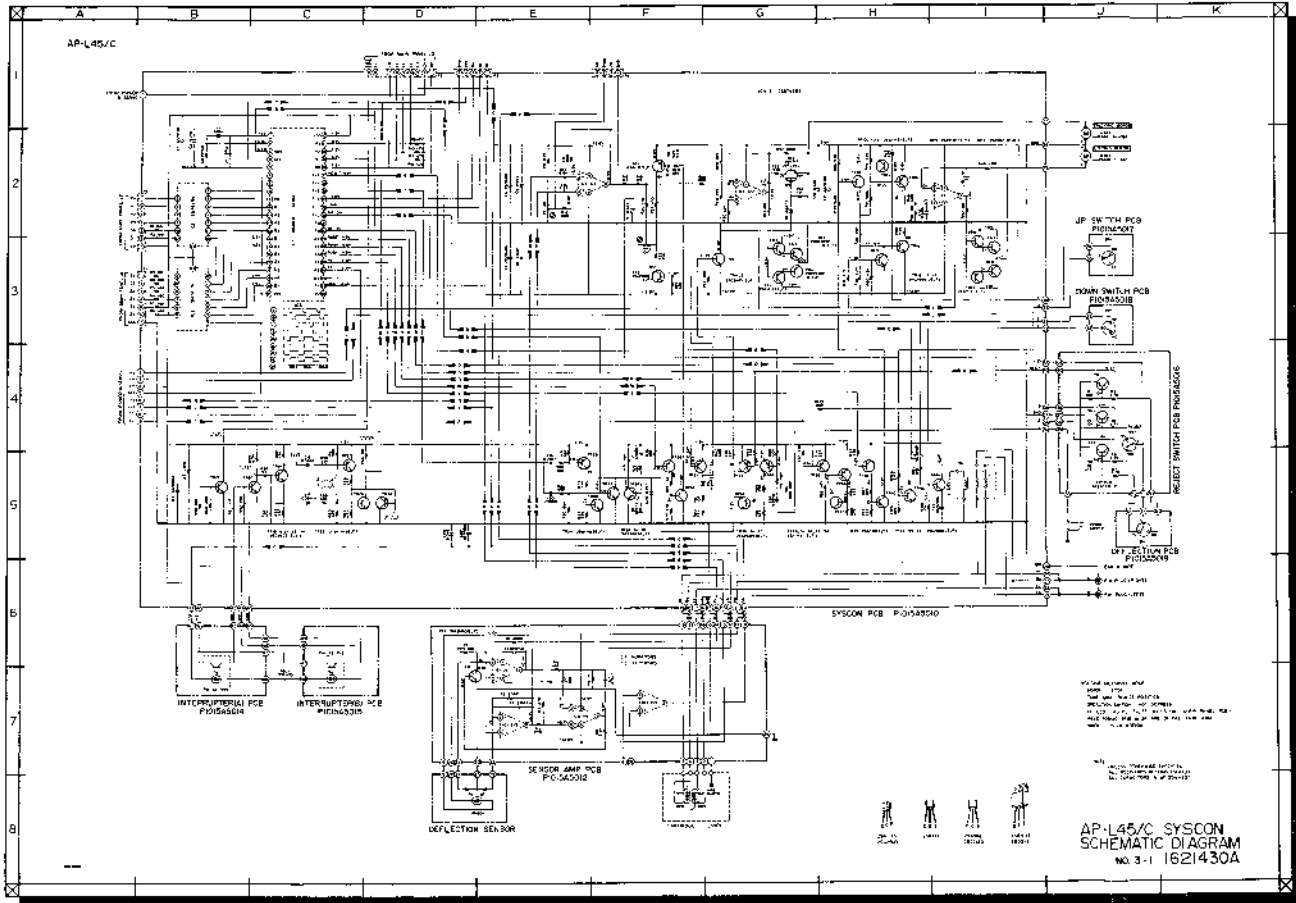


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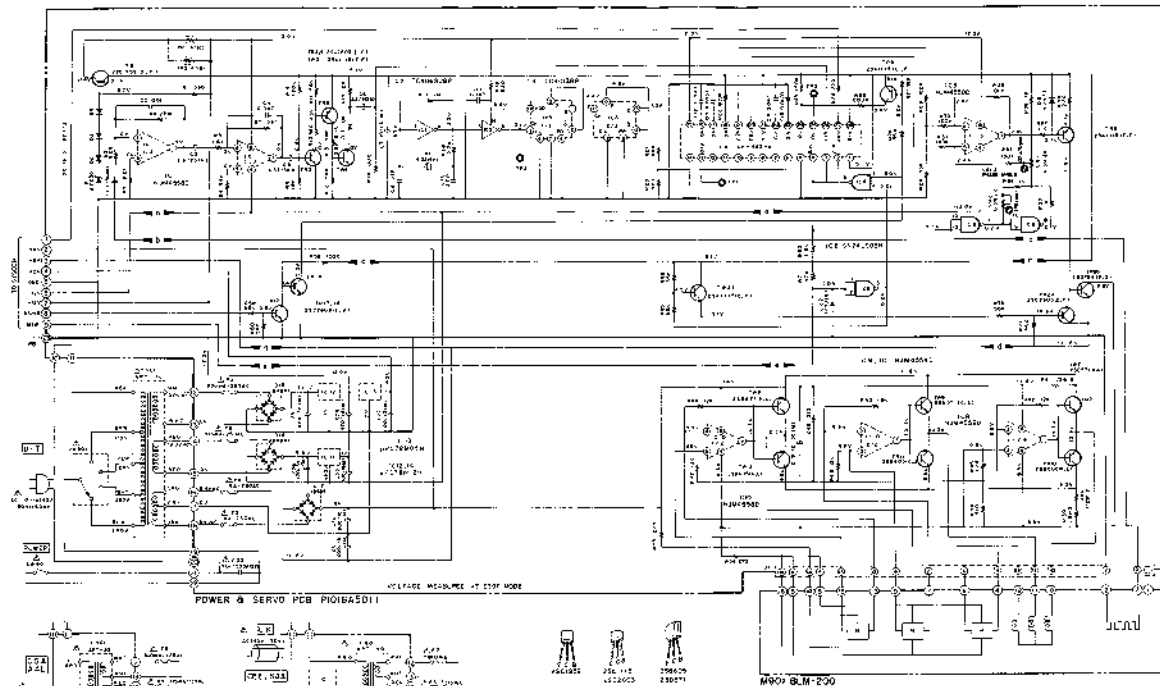




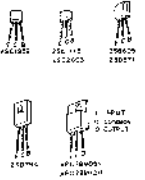
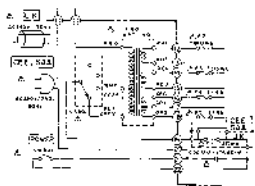
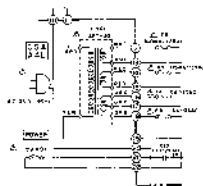
THIS SCHEMATIC IS FOR THE SYSTEM PCB ONLY. IT DOES NOT SHOW THE CONNECTIONS TO THE OTHER PCB'S IN THE SYSTEM.

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

AP-L45/C



POWER & SERVO PCB P1016A5D11



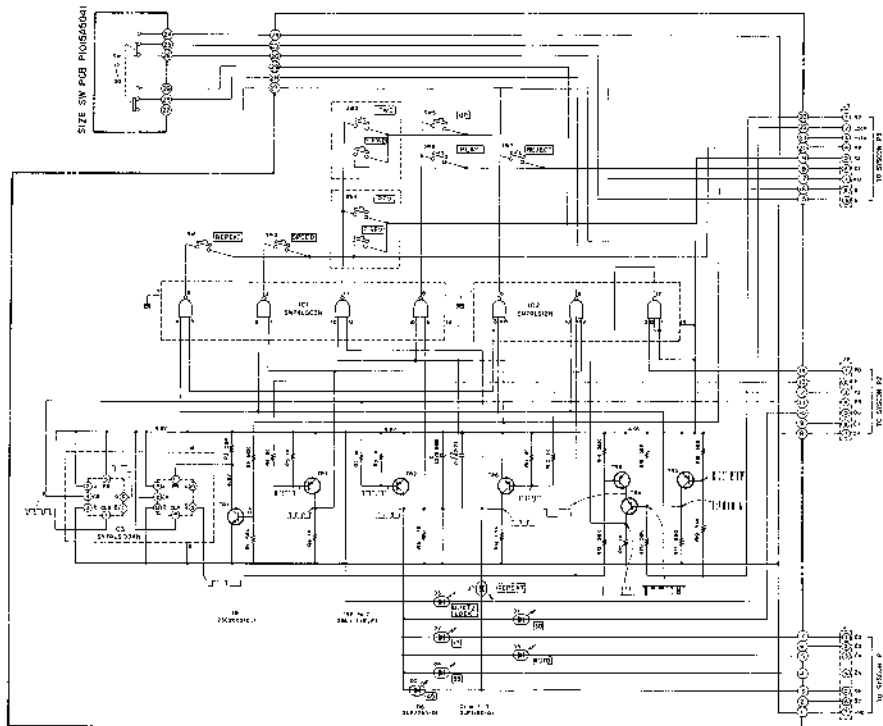
M907 G.M.-200

NOTE:
 1. ALL VOLTAGE SPECIFIED
 2. ALL RESISTORS IN OHMS UNLESS
 3. ALL CAPACITORS IN MICROFARADS
 4. UNLESS OTHERWISE SPECIFIED
 5. UNLESS OTHERWISE SPECIFIED

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

WARNING: 1. UNLESS OTHERWISE SPECIFIED, COMPONENTS FOR THIS SCHEMATIC SHOULD BE USED IN THE ORIGINAL MANUFACTURING PROCESS. 2. UNLESS OTHERWISE SPECIFIED, THE PARTS IN THIS SCHEMATIC SHOULD BE USED IN THE ORIGINAL MANUFACTURING PROCESS. 3. UNLESS OTHERWISE SPECIFIED, THE PARTS IN THIS SCHEMATIC SHOULD BE USED IN THE ORIGINAL MANUFACTURING PROCESS. 4. UNLESS OTHERWISE SPECIFIED, THE PARTS IN THIS SCHEMATIC SHOULD BE USED IN THE ORIGINAL MANUFACTURING PROCESS. 5. UNLESS OTHERWISE SPECIFIED, THE PARTS IN THIS SCHEMATIC SHOULD BE USED IN THE ORIGINAL MANUFACTURING PROCESS.

AP-L45/C

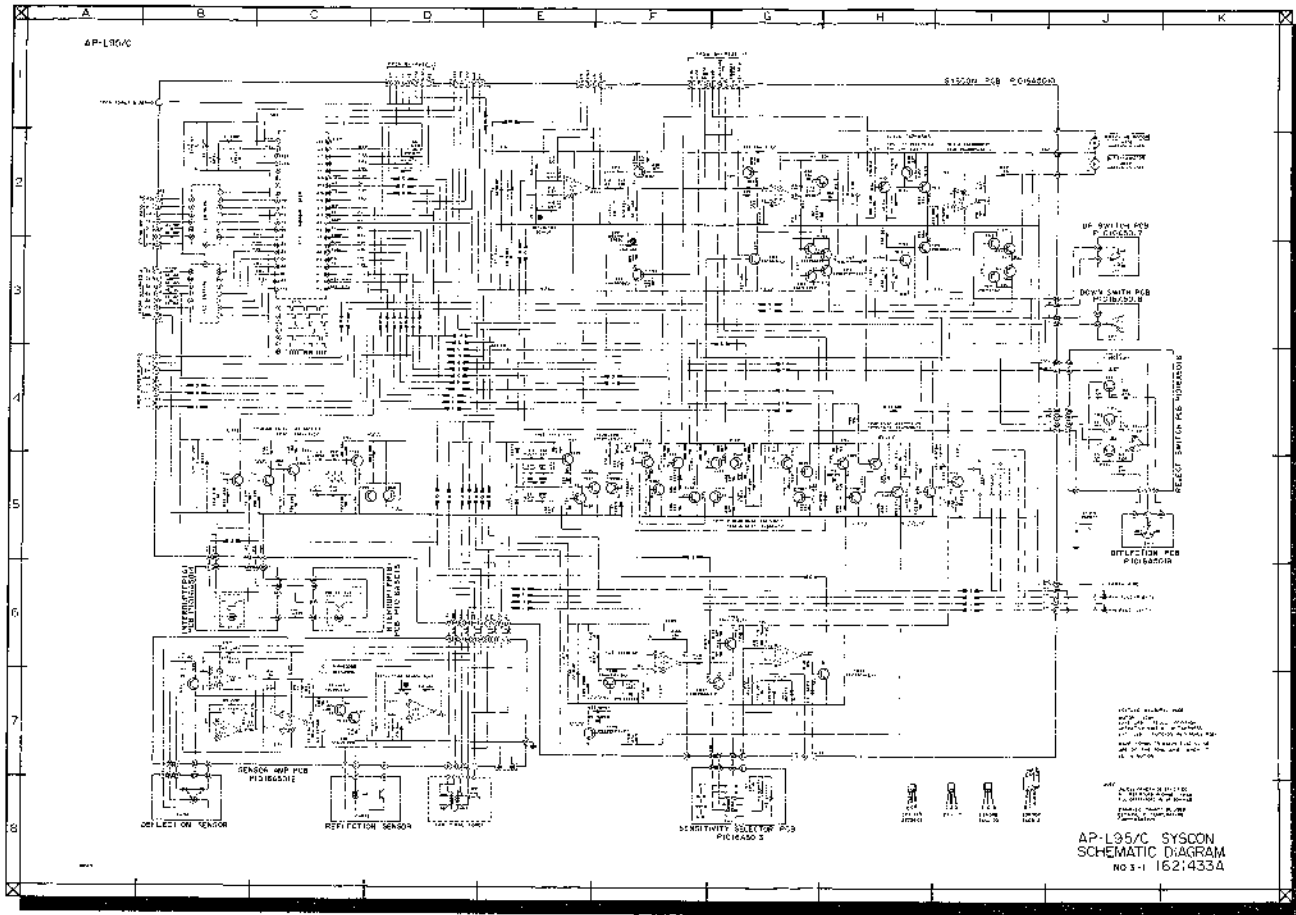


MAIN PANEL PCB PIC15A5040

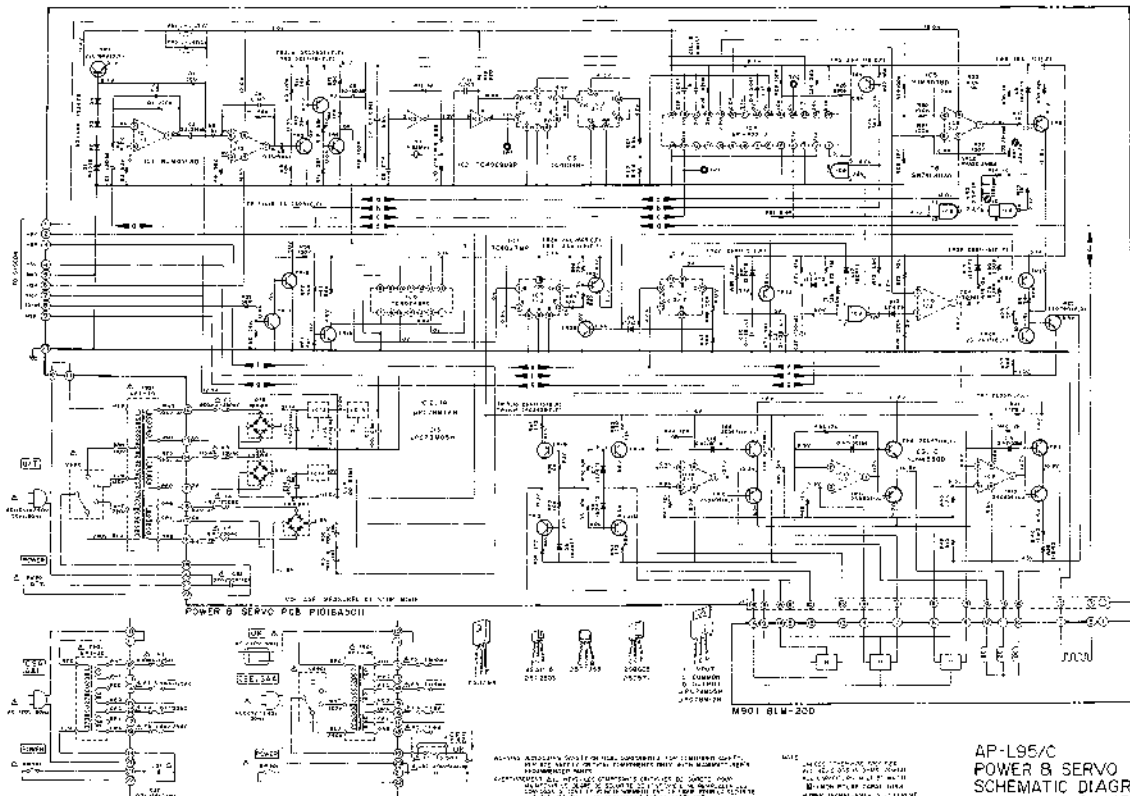
4-8000-100-0000
 ORIGINAL PANEL FOR DISK DRIVE
 1-1-77 2-77 30-77/30-77/30-77

NOTE
 ALL 220 OHM RESISTORS
 ALL CAPACITORS 0.10 MFD 50VDC
 ALL CAPACITORS 0.10 MFD 50VDC

AP-L45/C PANEL
 SCHEMATIC DIAGRAM
 NO. 3-3 1621432A



AP-195/C



POWER 8 SERVO PCB P1016AD011

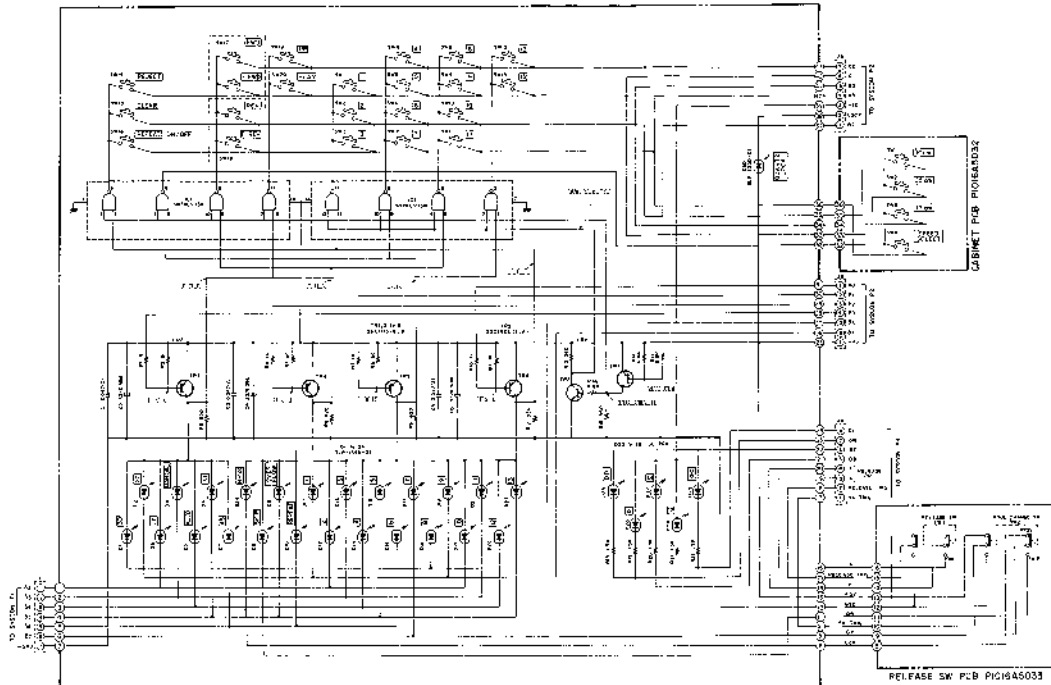
M901 BLM-200

ALL VALUES SHOWN ON THIS DRAWING ARE UNLESS OTHERWISE SPECIFIED.
 UNLESS OTHERWISE SPECIFIED, ALL COMPONENTS SHALL BE MIL-SPEC GRADE.
 DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.
 DIMENSIONS IN PARENTHESES ARE FOR INFORMATION ONLY.
 DIMENSIONS IN PARENTHESES ARE FOR INFORMATION ONLY.

NOTE:
 1. ALL DIMENSIONS ARE IN INCHES.
 2. DIMENSIONS IN PARENTHESES ARE FOR INFORMATION ONLY.
 3. DIMENSIONS IN PARENTHESES ARE FOR INFORMATION ONLY.

AP-195/C
 POWER 8 SERVO
 SCHEMATIC DIAGRAM
 NO 3-2 1621434A

AP-L95/C



MAIN PANEL L95 PCB PQ16A5030 BY-PASS PCB PQ16A5031

RELEASE SW PCB PQ16A5033



SEE P. 3
22.128

*PLUG MEASURED HERE
USE OTHER SIDE OF NOT DEPRESS
- 1 LED 8421-222

NOTE
REVISIONS: 1. REVISED
2. REVISED
3. REVISED

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