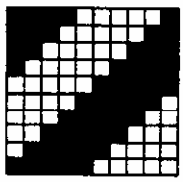
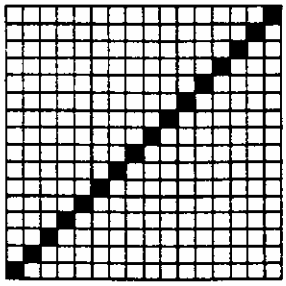
KH970
SERVICE MANUAL

KH970 TEST PATTERNS

THE KH970 HAS FOUR BUILT-IN NEEDLE SELECTION TEST PATTERNS. 881,882,883 & 884 (see diagram below).

Pattern 1 : 1 x 1 alternative needle selection 

Pattern 2 : 5 x 5 alternative needle selection 

Pattern 3 : 1/16 needle selection 

Pattern 4 : 1/5 to 5/5 needle selection 

PROCEDURE FOR KNITTING TEST PATTERNS.

1. FROM THE MAIN MENU, USING DIRECTION KEYS, SELECT PATTERN POSITIONING PROGRAM.  **PRESS STEP.**

2. SELECT STITCH PATTERN PROGRAMMING & POSITIONING.  **PRESS STEP.**

3. SELECT KNITTING CARRIAGE.PRESS STEP.

4. SELECT ALLOVER PATTERNING. PRESS STEP

5. ENTER PATTERN NUMBER. 881,882,883 OR 884. PRESS STEP.

6. CONFIRM CENTER POSITION OFFERED BY PRESSING STEP.

7. SCREEN APPEARS SHOWING PATTERN CHOSEN. PRESS STEP TO RETURN TO MAIN MENU.

8. SELECT KNITTING SCREEN.  **PRESS STEP.**

9. BRING FORWARD 40 NEEDLES EITHER SIDE OF ZERO, TAKE CARRIAGE OUTSIDE THE LEFT OR RIGHT SENSOR & SELECT KCII. MOVE CARRIAGE OVER NEEDLES TO CHECK FOR CORRECT NEEDLE SELECTION.

CB-1 TEST PROGRAM

The CB-1 has a built in TEST PROGRAM in order to check the machine as follows;
TEST C: Checking the SRAM on the CB-1
TEST 0: Checking the ROM on the CB-1
TEST 1: Checking the Keys on the CB-1
TEST 2: Checking the Display (LCD) on the CB-1
TEST 3: Checking the Cartridge
TEST 4: Checking the Floppy Disc Drive
TEST 5: Checking the Carriage type
TEST 6: Checking the Needle Number Indication

How to start the TEST PROGRAM.
1) Turn the power switch off.
2) Connect the CB-1 to the KM.
3) Turn the power switch on while pushing "STEP" key and "DOWN" key.
4) After the buzzer sounds, "((((TEST))))" will be indicated on the display.

((((TEST))))
CB VER. 01.00
KH VER. 1.1
KH TYPE. 01

- Version of CB-1
- Version of KM body
- Type of KM (KH-970)

When the CB-1 is not connected to the KM, the display will be as follows;

((((TEST))))
CB VER. 01.00
KH VER. 0.0
KH TYPE. 00

When the " " mark appears on the LCD.There is inferior correspondence between the CB-1 and the KM body.See checking the MD cable for the 970.If there is no problem with the cable, replace the Main PC board assembly and repeat test program.If the same problem occurs, replace the Control PC board.

Select the test item.
After checking the Version and Type of KM, push the "STEP" key.The test screen will appear as follows.

0 ROM	4 FB
1 KEY	5 KLG
2 LCD	6 POS
3 CART	C RAM

TEST PROCEDURE.

TEST 1 (C RAM): Checking the SRAM on the CB-1.
This is to check the SRAM on the Control PC board assembly.
Push the "C" key.The screen will show.

/ SRAM /
ON BOARD
CHECK .....

If there is no problem, the CB-1 will beep & return to the test screen.

After checking TEST 1, all data in the CB-1 is cleared. (the data of pattern creation, garment creation, position program, language etc.) Turn power off & on. Then select language.

***When there is a problem, the screen will show.**

```
/// ERROR ///
ON BOARD
ADDRESS ####
```

Replace the Control PC board.

TEST 2 (0 ROM): Checking the ROM on the CB-1.
This is to check the ROM on the Control PC board assembly.
Push the "0" key.The screen will show.

```
/ PROM TEST /
BANK # CHECK
```

The Bank will count up to 7.If there is no problem the CB-1 will return to the test screen.

***When there is a problem, the screen will show.**

```
/ PROM TEST /
BANK % CHECK
CHECKSUM ####
```

Replace the PROM control assembly or the Control PC board.

TEST 3 (1 KEY): Checking the keys on the CB-1.
This is to check the keys on the Control PC board assembly.
Push the "1" key.The screen will show

```
/ KEY TEST /
  1 KEY
```

According to what appears on the screen,push the corresponding key.when the key is pushed and there is no problem with the circuit, the next key to push will appear.
After pushing the "RIGHT" key, the CB-1 will return to the test screen.

***When there is a problem, the screen will show**

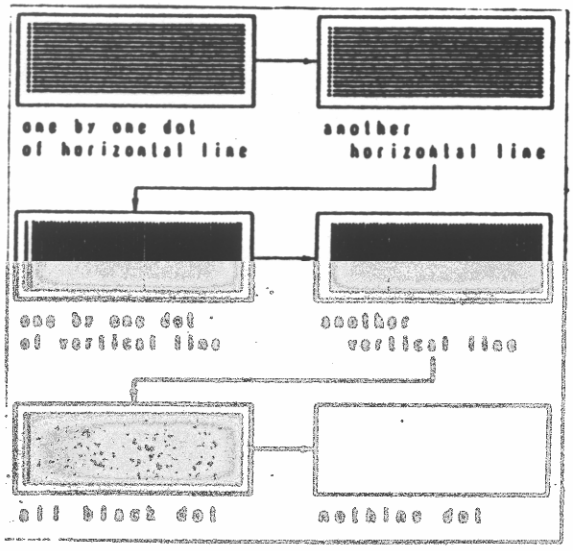
```
/ KEY TEST /
%%% KEY

KEY ###
```

Replace the Control PC board.

Note: The keys have to be pushed in the order the screen shows.If not the test will not be performed correctly.

TEST 4 (2 LCD): Checking the LCD on the CB-1.
This is to check the line on the LCD.

Every time a key is pushed the screen will change as follows.



***When there is a problem, check the connector of the LCD unit assembly.If the connector is ok, replace the LCD unit assembly.**

TEST 5 (3 CART): Checking the Cartridge.
This is to check the connection of the Cartridge with the CB-1.

Note: Do not insert the cartridge with the power on.The data in the Cartridge will be damaged.

Push the "3" key.The screen will show.

```
/ SRAM TEST /
CARTRIDGE
################
```

"##########" Appears as follows

"NO CARTRIDGE"	**No cartridge in the slot.**
"PPD110 - KH900"	**Set for mode KH900 by PPD120.**
"PPD110 - KH940"	**Set for mode KH940 or KH965i by PPD110 or PPD120.**
"MOYOU"	**Stitch Pattern Cartridge EXTRA'S.**
"NOT FORMAT"	**Cartridge not formatted.**
"OTHER"	**Other Cartridges.**

***When there is a problem, ie. correct information is not shown.Replace the control PC board assembly.**

TEST 6 (4 FB):Checking the Floppy Disc Drive.
***Note:Before checking, connect CB-1 to FB-100 with the power off.**

Push the "4" key.According to the floppy disc, the screen will show.

When it is not formatted,

```
//FB TEST//
  SEC-%%
  ID-##,##
```

When it is formatted,

```
//FB TEST//
  SEC-%%
  E-7
```

When there is no floppy disc inserted,

```
//FB TEST//
  SEC-%%
  E-3
```

*When there is a problem, the screen will show

```
//FB TEST//
  SEC-%%
  TIME UP
```

1)The batteries are dead on the FB-100.
2)The AC adapter is not connected to the FB-100.
3)The interface cable is not connected to the CB-1 & FB-100.
If all of the above points are ok.Replace the Control PC board.

If the screen shows,

```
//FB TEST//
  SEC-%%
  E-2
```

The FB-100 is faulty.

TEST7 (5 KLG): Checking the carriage type.
This is to check the Right & Left position sensor & row counter.Also to check if the computer recognizes which carriage passes the position sensor.
Push the "5" key.The screen will show.

```
((KLG TEST))
K
L
G
```

When each carriage passes the Right, Left & row counter sensor.The screen will show

```
((KLG TEST))
K ****  *  ****
L ****  *  ****
G ****  *  ****
```

- K carriage
- L carriage
- G carriage

Left sensor Right sensor
Row counter

TEST PROCEDURE.

(1) On the K carriage, set the row counter tripper to working position & change knob to "KC(1)".
(2) Set all needles to A position.
(3) Move the K carriage from outside the left or right sensor and passed the row counter trigger.
(4) Repeat the process from the opposite direction.
(5) The same test can be done with the Lace & G-carriage.

If there is no problem, the screen will show

```
( ( KLG TEST ) )
K 0000   0   0000
L 0000   0   0000
G 0000   0   0000
```

***When there is a problem.**
If the buzzer does not sound when the carriage passes the L & R sensors or the row counter. Adjust the mounting position (left & right, front & rear) of the main PC board assembly or left position PC board.

	Left position sensor	Right position sensor
1000	Leans toward the inside	Leans toward the inside
0100	Leans toward the outside	Leans toward the outside
0010	Leans toward the front side	Leans toward the front side
0001	Leans toward the rear side	Leans toward the rear side

If the adjustments do not remedy the problem, change the relevant part ie. Main PC board or Left position sensor.

TEST 8 (6 POS): Needle Number Indication.
This is to check the needle number indication of the carriage.
Push the "6" key.The screen will Show.

```
( ( POS TEST ) )

      L100
```

When the K carriage passes from outside of the right or left position sensor, the carriage position will appear on the screen.

TEST PROCEDURE.
(1) On the K carriage, set the change knob to "KC (1)".
(2) Set all needles to A position.
(3) Pass the K carriage from outside of the right or left position sensor, operate a few times at high speed between the right and left position sensors.
(4) Set the K carriage to the centre of the needle bed.If the screen shows between L3 & R3 there is no problem.
(5) Push the "STEP" key to return to test screen.

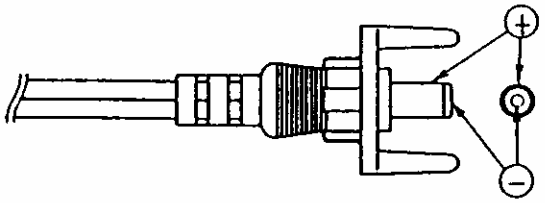
***When there is a problem.**
Check TEST 7 (5 KLG). If there is no problem on TEST 7, replace the Main PC board.

CHECKING THE AC ADAPTER.

1. CHECK THE FUSE AND WIRING IN THE MAINS PLUG.

2. CHECK OUTPUT VOLTAGE OF THE DC PLUG.

POLARITY OF THE DC PLUG; **OUTSIDE --------- (+)**
INSIDE --------- (-)



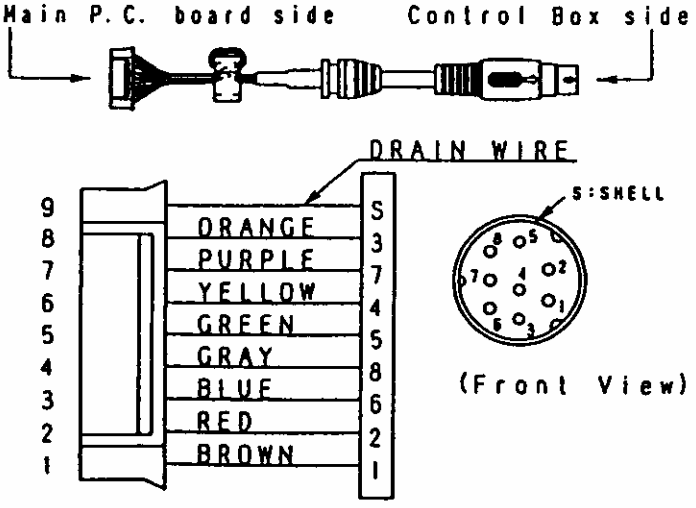
NORMAL OUTPUT VOLTAGE ---------- DC 10v ~ 16v

3. IF THE OUTPUT VOLTAGE IS INCORRECT, REPLACE THE AC ADAPTER AS IT IS NOT SERVICEABLE.

CHECKING THE MD CABLE.

1. DISCONNECT THE MD CABLE FROM THE KNITTING MACHINE MAIN PC BOARD.

2. MEASURE THE RESISTANCE OF EACH TERMINAL AS PER DIAGRAM BELOW.



IF THE RESISTANCE READS 0 ohms, THERE IS NO FAULT ON THE CABLE.

CHECKING THE SOLENOID UNIT.

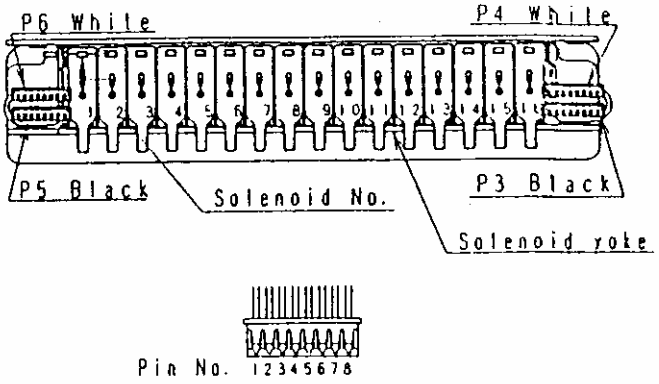
1. Turn power switch off and disconnect the connectors P3,P4,P5 & P6 on the main PC board.

2. Measure the resistance of each solenoid. Refer to list & diagram below.

3. The resistance should be within 137~192 ohms. If the resistance is incorrect, replace the solenoid unit assembly.

4. The solenoid numbers are 1 to 16 from left to right.

P6, WHITE.	Orange & White	= Solenoid 1
	Red & White	= Solenoid 2
	Blue & White	= Solenoid 3
	Yellow & White	= Solenoid 4
P5, BLACK.	Orange & Black	= Solenoid 5
	Red & Black	= Solenoid 6
	Blue & Black	= Solenoid 7
	Yellow & Black	= Solenoid 8
P3, BLACK.	Orange & Black	= Solenoid 9
	Red & Black	= Solenoid 10
	Blue & Black	= Solenoid 11
	Yellow & Black	= Solenoid 12
P4, WHITE	Orange & White	= Solenoid 13
	Red & White	= Solenoid 14
	Blue & White	= Solenoid 15
	Yellow & White	= Solenoid 16



CHECKING THE FUSE.

THE CB-1 HAS A FUSE SOLDERED ONTO THE MAIN PC BOARD. IF AFTER CHECKING THE AC ADAPTER THERE IS NO POWER TO THE CB-1,THE FUSE MAY HAVE BLOWN ON THE MAIN PC BOARD.

1. REMOVE CB-1 LOWER CASE

2. MEASURE THE RESISTANCE OF TERMINAL JW23 (see diagram below), IF THE RESISTANCE IS 0 ohms THE FUSE IS OK. IF THE RESISTANCE IS∞ ohms, THE FUSE HAS BLOWN.

3. DE-SOLDER THE BLOWN FUSE AND REPLACE WITH NEW ONE (2amp BUS FUSE).

4. IF THE FUSE IS OK, AND THERE IS STILL NO POWER. REPLACE THE MAIN PC BOARD.
AFTER REPLACING THE MAIN PC BOARD, RUN THROUGH THE TEST PROGRAM AGAIN.