

CHAPTER 3 ADJUSTMENT AND MAINTENANCE

CONTENTS

3.1 Handling	3-1
3.2 Adjustment of VFO circuit.....	3-1
3.3 Operation check of Q10PS board.....	3-2
3.4 Adjustment of FDD SD-321	3-2
3.4.1 Positions and functions of test points.....	3-2
3.4.2 Adjustment of disk speed	3-4
3.4.3 Adjustment of off-track.....	3-5
3.4.4 Azimuth adjustment.....	3-6
3.4.5 Adjustment of index position.....	3-7
3.5 Maintenance of FDD SD-321	3-8
3.5.1 Periodic maintenance.....	3-8
3.5.2 Check items.....	3-8
3.5.3 Cleaning.....	3-8
3.5.4 Head cleaning.....	3-8
3.5.5 Lubrication.....	3-8
3.5.6 Bonding.....	3-9
3.5.7 Maintenance Tools and measuring instruments.....	3-10

3.1 HANDLING

(1) Ambient Conditions

- Avoid use and storage in a humid place because moisture can cause troubles.
- Avoid use and storage at extremely high or low temperatures, and be careful not to expose to sharp temperature change.
(Avoid use in a place where the system may be exposed to much vibration or shock.)

(2) Handling

Storage and Use

- Place the QX-10 on a flat surface such as a table or the like.
- Be careful not to place a heavy object on the machine or twist it during storage or transit.
- The QX-10 is composed of precision-made parts so do not subject it to shock, and avoid using it without the case cover. Otherwise, dust and static can adversely affect it to cause troubles.

Care

- When cleaning the QX-10, use a dry cloth and wipe it gently. Do not use alcohol or volatile solvent.
- If an option or the cable for an option is connected to the QX-10, check the connections from time to time.

3.2 Adjustment of VFO circuit

1. Check the GND terminal and TP terminal (check points between IC8B and IC8D on the Q10 SYM board) with the synchroscope probe.
2. Adjust the synchroscope range as specified in Table 3-1.

Range	Setting
AC-GND-DC	DC
VOLT/DIN (on the screen)	1
TIME/DIV	50 μ S

Table 3-1

3. Read and write the floppy disk drive, and adjust it to obtain 2.6 ~ 2.7V as shown in fig. 3-1.

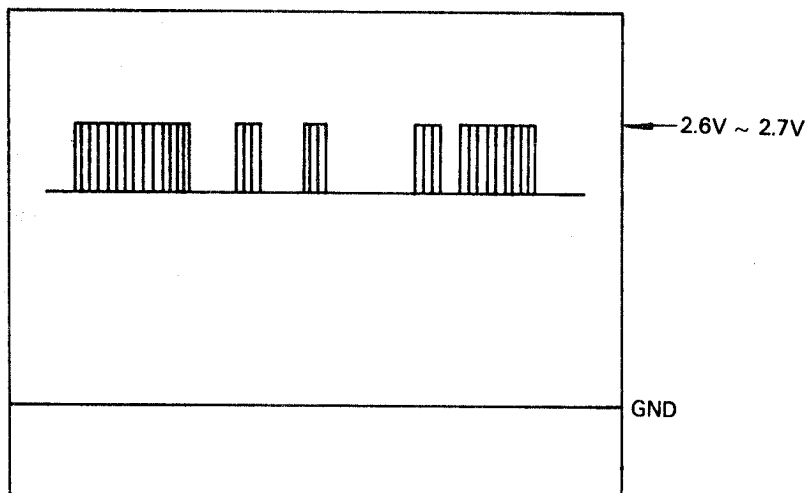


Fig. 3-1

3.3 Operation check of Q10 PS board

After the Q10 PS board is repaired, check the operation according to the following procedure:

- (1) Make connection between the Q10 PS board and connector CN1 (Q10 SYM board), and turn on the power switch.
- (2) Check pin 15 of IC1 to see if a normal waveform is obtained there.
- (3) Check R2 (10 Ω) for any abnormal heat.
- (4) Check the output voltages (+5, +12(C), +12(F), +12(L) and 12V).
- (5) Turn the power on and off, and check the PWD waveform normally appears.
- (6) Short pins 4 and 5 of PC1, and check all the out put voltages are not obtained.
- (7) Turn the power on and off, and check the voltages are normally restores then.

If any abnormality is detected by the above checks, re-check according to troubleshooting for Q10 PS board unit.

3.4 Adjustment of FDD SD-321

The SD-321 is made of precision parts and assembled with high precision. It needs no re-adjustment by the user as long as it is used normally. When it is disassembled for replacement of parts and then reassembled, the following adjustments are necessary:

- 1) Disk speed adjustment
- 2) Off-track adjustment
- 3) Azimuth adjustment
- 4) Index timing adjustment

3.4.1 Positions and functions of test points

The control circuit of SD-321 is provided with 8 test points for observing singal waveforms needed for adjustment and inspection. All the electronic elements of SD-321 are incorporated in the interior of the main unit.

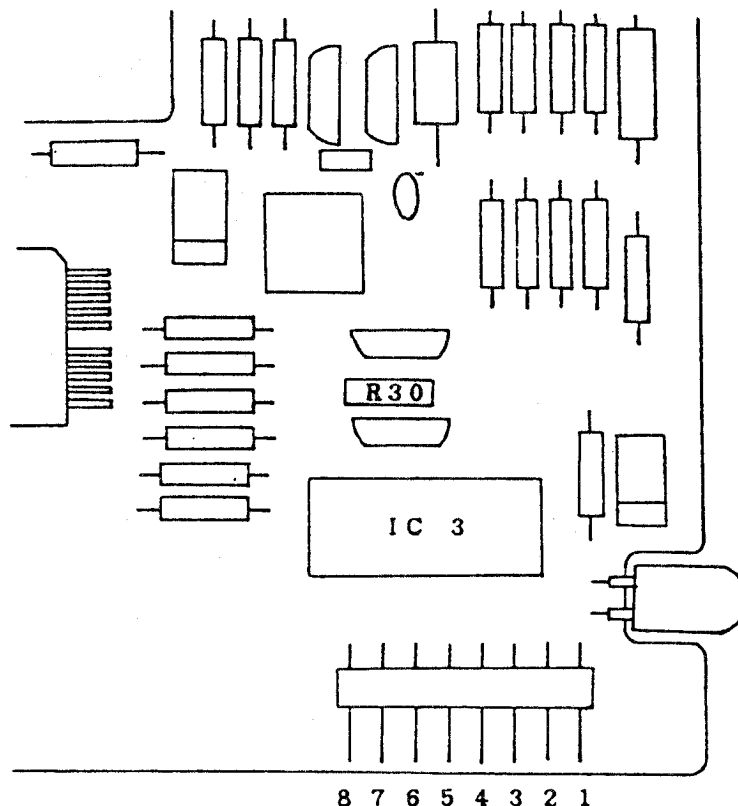


Fig. 3-2 Location of test points

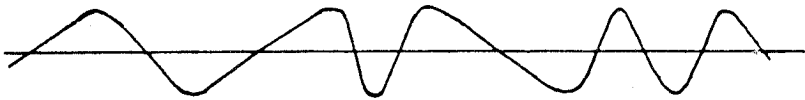
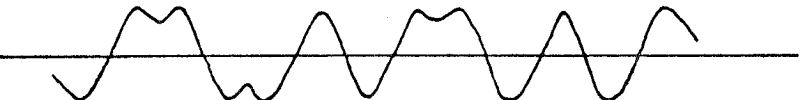


Test point	Function
TP 1	A zero volt line of the signal channel. Used as a reference point in observation of signal waveforms of TP2 ~ TP7.
TP 2/TP 3 Video amplifier outputs	Test points for observing the video amplifier ($\mu A 733$) outputs. the video amplifier has two outputs: one is displaced 180 in phase (differential) and the other is 100mVp-p or greater. Each output can be observed at TP 2 and TP 3. These test points are used for checking the read/write head characteristics and adjustment of the head access mechanism (off-track and azimuth). 
TP 4/TP 5 Differential amplifier outputs	Test points for observing the differential amplifier outputs. Like the video amplifier, the differential amplifier has two outputs: one is displaced 180° in phase (differential) and the other is greater than about 500mVp-p. Each output can be observed at TP4 and TP5. These test points are used for general checking of the read/write head and amplifier and adjustment of the head access mechanism. 
TP 6	Apply a false index signal to this test point when the main PCB is checked as a single body. Not used for adjustment and inspection.
TP 7 Index	A test point for observing the index detection output. Indicates the level inverse to the index output signal and is set to high level while the index hole is being detected. This test point is used for checking the disc speed period and trigger signals for signal observation of off-track, azimuth, etc. 
TP 8 Drive select	A test point for observing a drive select signal. Set to low level when a drive select signal is transmitted from the host controller to the FDD. 

Table 3-2

3.4.2 Adjustment of disk speed

A) Tools to be used

- 1) (-) screwdriver (2mm or equivalent tip size)
- 2) Disk
- 3) Frequency counter
- 4) FDD controller

B) Procedure (when the frequency counter is used)

- 1) Connect the frequency counter to point TP7 on the control circuit.
- 2) Rotate the disk drive motor and set the disk.
- 3) Rotate the disk drive motor and load the head
- 4) Set the head to track 20.
- 5) Adjust VR2 on the disk drive motor PCB, and set the pulse interval at TP7 to 200 ± 0.6 mS.

C) Procedure (when the strobo disk is used)

- 1) Raise the main unit so that the storobo disk can be seen.
- 2) Adjustment will be easy if the unit is set with the pushbutton switches down.)
- 2) Rotate the disk drive motor and set the disk.
- 3) Rotate the disk drive motor and load the head.
- 4) Set the head to track 20.
- 5) Adjust VR2 on the disk drive motor PCB and set it so that the stripe is seen stationary. (Adjust VR2 so that the motion of the stripe becomes less than one frame per 3 seconds.)

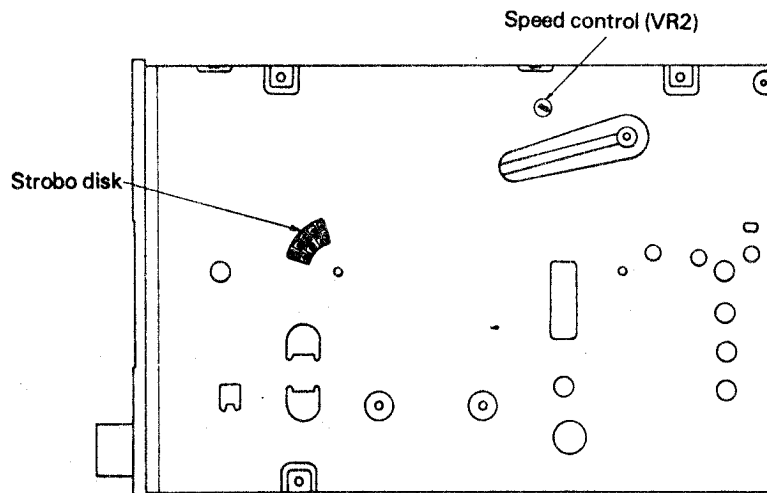


Fig. 3-3

3.4.3 Adjustment of off-track

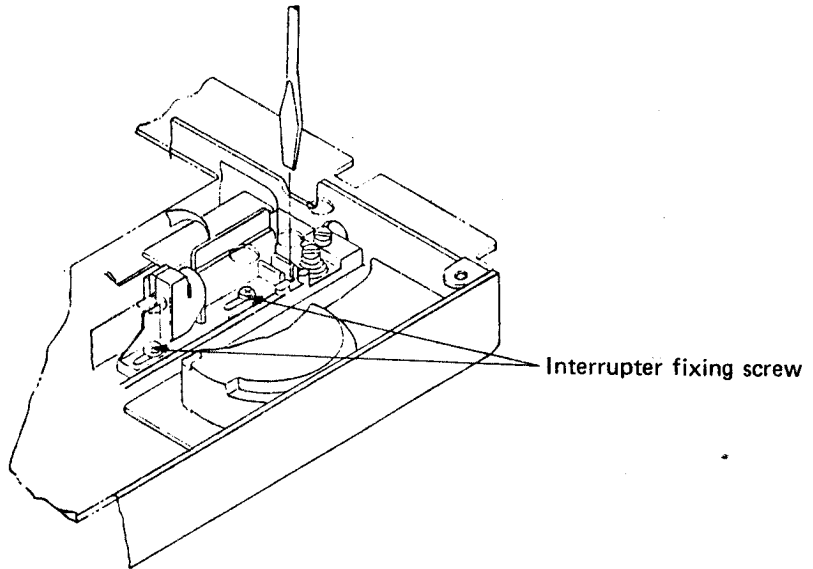


Fig. 3-4 Adjustment of off-track

A) Tools to be used

- 1) (+) screwdriver # 1
- 2) CE disk
- 3) Oscilloscope
- 4) FDD Controller

B) Procedure

- 1) Make connections between CH1 of the oscilloscope and TP2, CH2 and TP3 and the external trigger and TP7, respectively.
(The trigger should be in the positive direction.)
- 2) Set the oscilloscope signal conditions as specified below.

Switch	CH 1	CH 2
AC-GND-DC	AC	AC
VERT MODE	ADD	
INVERT	-	ON
VOLT/DIV (on the screen)	50mV	50mV
TIME/DIV	20mS	

Table. 3-3

- 3) Rotate the disk drive motor.
- 4) Set the CE disk.
- 5) Move the head to track 34.
- 6) Observe the waveforms on the oscilloscope.

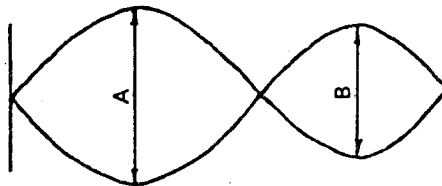


Fig. 3-5 TP2 + TP3

- 7) When the ratio (small/large) of the waveforms A to B in Fig. 3.5 is lower than 0.7, tighten the interrupter fixing screws (2) on the VCM unit.
- 8) Move the interrupter forward and backward using the (-) screwdriver so that the ratio of A to B becomes 1 ~ 0.7.
- 9) Tighten the interrupter fixing screw taking care not to move the adjusted position of the interrupter.
- 10) Apply Neji-lock green to the interrupter fixing screw. (Seea 3.5.6.)

3.4.4 Azimuth adjustment

A) Tools to be used

- 1) (-) screwdriver # 1
- 2) Hexagonal wrench key 1.5
- 3) CE disk
- 4) Oscilloscope
- 5) FDD controller
- 6) Neji-lock green

B) Procedure

- 1) Make connections between CH1 of the oscilloscope and TP2, CH2 and TP3 and the external trigger and TP7, respectively.
- 2) Set the oscilloscope signal conditions as specified below.

Switch	CH 1	CH 2
AC-GND-DC	AC	AC
VERT MODE	ADD	
INVERT	-	ON
VOLT/DIV (on the screen)	50mV	50mV
TIME/DIV	0.5mS	

Table. 3-4

- 3) Rotate the disk drive motor.
- 4) Set the CE disk.
- 5) Move the head to track 34.
- 6) Observe the waveforms on the oscilloscope.

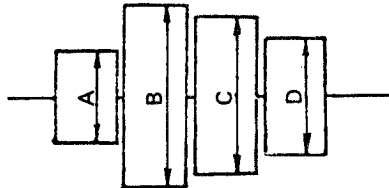


Fig. 3-6 Waveforms of TP2 + TP3

- 7) When the ratio (small/large) of the waveforms A to D in Fig. 3-6 is lower than 0.65, and the ratio of B to C is lower than 0.8, loosen the eccentric pin fixing screw with the hexagonal wrench key.
- 8) Adjust the eccentric pin so that the ratio of A to D becomes 1.0 ~ 0.65 and the ratio of B to C becomes 1.0 ~ 0.8.
- 9) Tighten the eccentric pin fixing screw taking care not to move the setting.

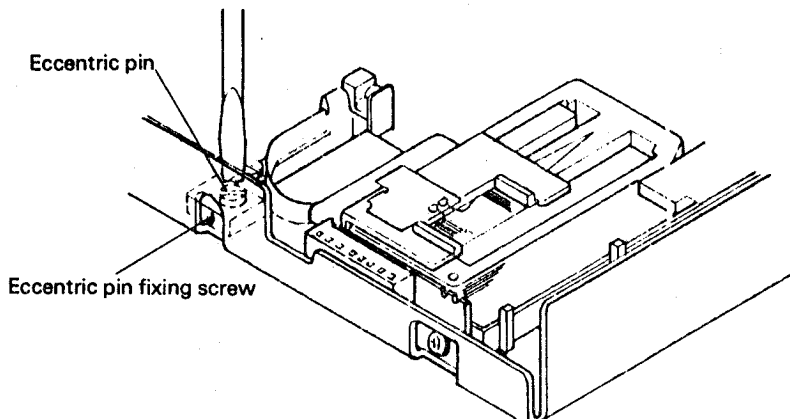


Fig. 3-7 Azimuth adjustment

3.4.5 Adjustment of index position

A) Tools to be used

- 1) (+) screwdriver # 1
- 1) (-) screwdriver # 1
- 2) CE disk
- 3) Oscilloscope
- 4) FDD Controller
- 5) FDD controller
- 6) Neji-lock green

B) Procedure

- 1) Make connections between CH1 of the oscilloscope and TP2, CH2 and TP3 and the external trigger

3.5 Maintenance of FDD SD-321

3.5.1 Periodic maintenance

Check and lubricate the SD-321 periodically every two years in order to maintain the initial performance for a long period of time and prevent faults.

3.5.2 Check items

Item	Action
Presence of foreign matter in the main unit	Remove the foreign matter.
Presence of oil at lubrication points	Lubricate.
Smudged head	Clean the head.
Smudged belt	Clean the belt.
Damaged or worn belt parts	Replace the belt.
Presence of dust and nap	Clean.

Table 3-6 Check items

3.5.3 Cleaning

The SD-321 should be carefully cleaned.

Except for the head, wipe off smudges with the gauze or cotton bar soaked with alcohol. Absorb the dust and nap using an electric cleaner. The head has been precisely adjusted in the factory. Use a cleaning disk to clean the head. Avoid cleaning it in by other methods.

Note: 1. Thinner, trichloroethylene and ketone solvents may damage the plastic parts, and must not be used for cleaning.

Note: 2. After cleaning, check the oil quantity and replenish the oil if it is found insufficient after removal of dust and nap.

3.5.4 Head cleaning

The head should be cleaned in the following manner.

- 1) Set the head cleaning disk in the main unit.
- 2) Start the disk drive motor.
- 3) When 20 seconds have passed after starting the disk drive motor, take out the head cleaning disk.
- 4) Set the disk and read and write it to check if any smudges remain.

Note: If the smudges are not removed, repeat the procedure from step 1).

3.5.5 Lubrication

the head should be cleaned in the following manner.

A) Type of oil

The type of oil has a large influence on performance and durability. Pay special attention to the low temperature characteristic. The type of oil used for the SD-321 is specified by us, based on our analysis of much technical information on various types of oil and on tests.

B) Lubrication standard

Use G-51 for lubrication of the SD-321.

When lubricating parts before starting lubrication.

For the lubricating parts, see the table of lubrication, parts or lubrication diagram.

Lubricate periodically according to the table of lubrication parts.

* For details of lubrication parts, see the disassembly diagram provided in CHAPTER 2.

C) Lubrication parts

The type of oil has a large influence on performance and durability. Pay special attention to the low temperature characteristic. The type of oil used for the SD-321 is specified by us, based on our analysis of much technical information on various types of oil and on tests.

Position in diagram	Parts to be lubricated	Classification	Quantity
G-1	Sliding parts (2) of the slide lever and washer	A	B
G-2	Latch fulcrum and latch tail	A	A
G-3	Latch groove and latch pin head	B	B
G-4	Slide roller	A	B
G-5	Part making contact between the ejector and ejector guide	B	B
G-6	Part making contact between the ejector and eject lock pin	B	B
G-7	Part making contact between the ejector and eject transmission lever shaft	B	B
G-8	Eject lock lever flucums (2)	B	B
G-9	Collet lever fulcrums (2)	B	B
G-10	Parts making contact between the slide lever and safety lever	A	B
G-11	Part making contact between the slide lever and eject transmission lever	A	B
G-12	Safety lever shaft	B	A
G-13	Part making contact between the disk guide (L) and eject transmission lever	A	B
G-14	Ejector spring and spring hook	B	A

Table 3-7 Lubrication parts

Classification: A: Lubricate every 2 years or 5,000 hours.

B: Lubricate at overhaul or every 15,000 hours.

Quantity: A: 1 ~ 2 drops

B: 2 ~ 3 drops

3.5.6 Bonding

An adhesive is used in some parts and screws of SD-321 for the purpose of reinforcement and to prevent screws being loosened during transportation. So, after disassembly or reassembly, apply the adhesive to these parts according to the table of bonding parts and the drawings.

The adhesive used in the SD-321 is Neji-lock green (Threebond).

Position in drawing	Part to be bonded
F-1	Index detector A
F-2	Interrupter fixing screw (2)

Table 3-8 Bonding parts

* For the bonding parts, see the disassembly diagram.

3.5.7 Maintenance tools and measuring instruments

The minimum required tools and instruments are shown in the following table:

Name of tool	Commercial availability
Soldering iron	Yes
Oblique blade nippers	"
Tweezers	"
Screwdriver (+) # 1	"
Screwdriver (-) # 2	"
Screwdriver (-) # 1	"
ET holders # 2 and 5	"
ET holder # 3	"
Hexagonal wrench key 1.5	"
Writing brush # 1	"
Writing brush # 2	"
Washing bucket	"
Head cleaning disk	"
Adjusting disk DYMEK No.0592-11	"
Precision screwdriver (-) # 3	"

Table 3-9 List of maintenance tools

B) List of maintenance parts

Name of part	Commercial availability
Cotton bar	Yes
Gauze	"
Pure alcohol	"
Oil (G-51, Plus guard SG)	"
Adhesive (Neji-lock green)	"

Table 3-10 List of maintenance parts

C) List of measuring instruments

Measuring instrument
FDD controller
Oscilloscope (2-channel)
Frequency counter

Table 3-11 List of measuring instruments