DV-12
MIX TAPE BAND-PASS FILTER
INSTRUCTION MANUAL
WARRANTY

NF CORPORATION certifies that this instrument was thoroughly tested and inspected and found to meet its published specifications when it was shipped from our factory.

All NF products are warranted against defects in materials and workmanship for a period of one year from the date shipment. During the warranty period of, NF will, at its option, either will repair the defective product without any charge for the parts and labor, or either repair or replace products which prove to be defective. For repair service under warranty, the product must be returned to a service center designated by NF. Purchaser shall be prepay shipping charge, duties, and taxes for the product to NF from another country, and NF shall pay shipping charge to returned the product to purchaser.

This warranty shall not apply to any defect, failure or damage caused by improper use, improper or inadequate maintenance and care or modified by purchaser or personnel other than NF representatives.

NF CORPORATION
Thank you very much for procuring the DV-12 Mix Tape Band-Pass Filter. At the outset, please take a few minutes to read the Safety Precautions indicated in this manual in order to use this equipment safely and correctly.

- Warning and Caution notices
  The following Warning and Caution notices appear in this manual. These must be observed in order to protect both the user from physical harm and the equipment from damage.

⚠️ WARNING
Risk of serious and possibly fatal injury from electric shock or other cause.

⚠️ CAUTION
Risk of damage to the equipment.
SAFETY PRECAUTION

Observe the following warnings and cautions in order to use this equipment safely. No responsibility or warranty is assumed for damages arising from use in a manner contrary to these warnings and cautions.

• Observe text instructions
  This manual has been compiled in order to enable safe operation and use of this equipment. Be sure to read this manual before using the equipment. Items designated by Warning advise of serious physical hazards. Be sure to observe these carefully.

• Be sure to connect ground
  Be sure to properly connect the ground. By connecting the 3 conductor power cable to a grounded 3-terminal wall socket, the equipment is automatically grounded.

• Confirm power source voltage
  Before connecting this equipment, check that the proper voltage is being supplied to the power outlet. Refer to the Grounding and Power Supply section of this manual.

• Use only the properly rated fuse
  Improperly rated fuses present a fire hazard and other risks. Refer to the name and operating each section of this manual and confirm the fuse rating. Be sure to disconnect the equipment from the power source before replacing the fuse.

• Smoke, odor, noise
  In event smoke, peculiar odor or noise is emitted, immediately disconnect the power source and avoid and further operation. Contact service.

• Flammable gas
  Do not use this equipment in the presence of flammable gas. There is danger of fire and explosion.

• Do not remove the covers
  This equipment contains high voltages. Do not remove external covers. Refer all internal inspection and service to a qualified service technician who fully understands the hazards.
· Do not modify
Do not use parts other than specified by the manufacturer and by no means attempt to modify the equipment. There is risk of personnel hazard and damage to the equipment. The manufacturer reserves the option of refusing service in such cases.

· Safety related symbols and indications
Following are general definitions of the symbols and indications used in the text on the product.

⚠️
Advises of possible hazard to the user, as well as the need to consult this manual when using an operation or function.

⚠️ WARNING
Appears in the text and on the product to advise risk of fatal or otherwise serious physical injury.

⚠️ CAUTION
Appears in the text and on the product to advise risk of damage to product.
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1. INTRODUCTION

1-1 OUTLINE

The DV-12 is a filter set used when adjusting and inspecting a cassette tape recorder by using a mix-tape in which plural frequencies are recorded.

Using a mix-tape combined with the DV-12, it is possible to output the signal of necessary frequency by pushing buttons, so that comparing from former measuring method, the operation efficiency is much improved to eliminate searching and exchanging of a tape.

A pass band of the band pass filter is wide, approx. 12% at the point of -0.5dB, and cut-off response is sharp, approx. 35dB at 1/2 of and twice the center frequencies.

A center frequency of the band pass filter is possible to be selected out of eight points. The eight points of frequency and THRU is possible to be changed by the frequency selection switch on the front panel. The DV-12 has an external control connector on the rear panel, so that it is also possible to be changed by an external signal.

The DV-12 is composed with two channels for stereo, it is possible to measure both L and R channel together. An AC voltmeter is to be connected to be the output terminal when measuring.

The power supply voltage of the DV-12 is AC100V or either of 120V or 230V. According to the power supply voltage, turn the power supply voltage selection switch.

- The merit of using mix-tape method

1. It is possible to measure an azimuth, frequency response, wow flutter and tape speed together by using the same test tape, so that it is useful to reduction of operation.

2. It is possible to change the signal according to the skill of operation, measuring with the least time.

3. The time of exchanging a test tape is reduced.

4. Wow and flutter / tape speed is set to fixed 3kHz output, and measuring wow and flutter after checking an azimuth and frequency response. it is possible to measure wow and flutter with no response time of a meter.

5. The cost of a test tape proves economical.
1-2 SPECIFICATIONS

The specifications of the DV-12 are as follows.

<table>
<thead>
<tr>
<th>Specification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of channels</td>
<td>Input 2 channels (L and R) Output 2 channels (L and R)</td>
</tr>
<tr>
<td>Center frequency (standard)</td>
<td>63, 125, 315, 1kHz, 6.3kHz, 8kHz, 10kHz, 12.5kHz and THRU</td>
</tr>
<tr>
<td>Accuracy of center frequency</td>
<td>Within ±3%</td>
</tr>
<tr>
<td>Frequency selection</td>
<td>Front panel: by push buttons External control: option OP-01</td>
</tr>
<tr>
<td>Pass band Gain</td>
<td>0±0.5dB (at 1kHz)</td>
</tr>
<tr>
<td>Level deviation</td>
<td>0±0.5dB (against 0dB at 1kHz)</td>
</tr>
<tr>
<td>Attenuation</td>
<td>Approx. 35dB at 1/2 of and twice the center frequencies</td>
</tr>
<tr>
<td>Fixed output for wow and flutter</td>
<td>3kHz or 3.15kHz output The output is set to derive from the R channel</td>
</tr>
<tr>
<td>Input characteristics</td>
<td>Standard OP-03 (BTL input ±14V)</td>
</tr>
<tr>
<td>Impedance</td>
<td>1MΩ typ. (single-ended) 100kΩ typ. (differential input)</td>
</tr>
<tr>
<td>Max. voltage</td>
<td>±5V ±14V</td>
</tr>
<tr>
<td>Allowable Max. voltage</td>
<td>±15V ±50V</td>
</tr>
<tr>
<td>Output impedance</td>
<td>100Ω or less (single-ended)</td>
</tr>
<tr>
<td>Load resistor</td>
<td>10kΩ or more</td>
</tr>
<tr>
<td>Noise level</td>
<td>200μVrms or less (bandwidth of 500kHz)</td>
</tr>
<tr>
<td>Harmonic distortion factor</td>
<td>0.05% or less (at 1kHz, ±5V output)</td>
</tr>
<tr>
<td>Crosstalk between channels</td>
<td>-70dB or less (at 1kHz, ±5V output)</td>
</tr>
<tr>
<td>Ambient Temp and Humidity range</td>
<td>Operating: 0 to 40℃, 10 to 80% RH no condensation Storage: -10 to 50℃, 10 to 80% RH no condensation</td>
</tr>
<tr>
<td>Power requirements</td>
<td>AC 100V/120V/230V ±10% selectable, 50Hz/60Hz, 5VA max.</td>
</tr>
<tr>
<td>Insulation and Withstanding</td>
<td>Power input lines vs. chassis 50MΩ or more (DC 500V), AC 1500V for 1 minute</td>
</tr>
<tr>
<td>Weight</td>
<td>2.1kg approx.</td>
</tr>
<tr>
<td>Dimensions</td>
<td>225(W) × 67(H) × 250(D)mm (Excluding Protrusions)</td>
</tr>
</tbody>
</table>
1-3 FUNCTION OF EACH SECTION

(1) Frequency selection switch
Select the center frequency. The center frequency of the internal band pass filter is changed by this switch.
The selected frequency is indicated by a LED lit.

(2) Power switch
The unit is powered on with a LED lit by turning the switch on.

(3) External control connector
This connector is used when center frequency is to be selected by an external signal. This connector is a 24-pin multi-connector and installed on rear panel. When using OP-01 Remote controller, Remote controller is to be connected to the connector.

(4) Output terminal of wow and flutter / tape speed
Fixed 3kHz or 3.15kHz output terminal for wow and flutter. Wow flutter meter is to be connected to the terminal.

(5) Input terminal
Terminals of each L and R channel input. The output of the tape recorder is to be connected to the terminals.

(6) Power supply voltage selection switch
According to the power supply voltage, turn the switch AC100V or either of 120V or 230V.

(7) Output terminal
Terminals of each L and R channel output. A measuring instrument and such like an AC voltmeter, a VU meter is to be connected to the terminal.
(1) OP-01  Remote controller

Using the Remote controller, a remote control of center frequency selection of eight points and
THRU is possible by connecting the Remote controller to the External control connector.
The length of a cord of the Remote controller is approx. 1.5 meters. Therefore, a remote control at
hand is possible.

(2) OP-03  BTL input ±14V

BTL input ±14V is a differential input circuit used when measuring the output of a BTL amplifier
and such like a car stereo. The difference of input characteristics between standard and OP-03 is as
follows.

Install the circuit, please appoint the option when ordering the DV-12.

<table>
<thead>
<tr>
<th>Input characteristics</th>
<th>Standard</th>
<th>OP-03 (BTL input ±14V)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impedance</td>
<td>1MΩ</td>
<td>100kΩ</td>
</tr>
<tr>
<td>Max. voltage (signal + common mode input)</td>
<td>±5V</td>
<td>±14V</td>
</tr>
<tr>
<td>Allowable max. voltage (signal + common mode input)</td>
<td>±15V</td>
<td>±50V</td>
</tr>
</tbody>
</table>
1-5 BLOCK DIAGRAM

The block diagram of the DV-12 is as follows.

Fig. 1-1 Block diagram
Fig 1-2  External drawing
2. PREPARATION FOR USE

2.1 SAFETY CHECK

Before using the DV-12, refer to the Safety precautions of this manual and confirm safety.

\[ \text{WARNING} \]

Do not remove the covers.
This equipment contains dangerously high voltages. Do not remove external covers.
Refer all internal inspection and service to a qualified service technician who fully understands the hazards.

2.2 UNPACKING AND REPACKING

(1) Unpacking

After unpacking, check for any damage which may have been caused during transportation. Also check any shortage of accessories referring to 2-1 Configuration list.

(2) Repacking

When repacking the instrument for transportation, prepare a carton with proper strength and size and filters to protect the instrument appropriately.

2.3 CONFIGURATION

Table 2-1 lists the configuration list of the instrument.

<table>
<thead>
<tr>
<th>Table 2-1</th>
<th>Configuration list</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main frame</td>
<td>· · · · · · · · · · · · · 1</td>
</tr>
<tr>
<td>Instruction Manual</td>
<td>· · · · · · · · · · · · · 1</td>
</tr>
<tr>
<td>Supplied accessories</td>
<td></td>
</tr>
<tr>
<td>Power cable:(3-conductors, 2meters)</td>
<td>· · · · · · · 1 *</td>
</tr>
<tr>
<td>Adapter:(3-conductors to 2-conductors)</td>
<td>· · · 1 *</td>
</tr>
<tr>
<td>Fuse</td>
<td>(100V/120V: 0.4A or 230V: 0.2A)</td>
</tr>
<tr>
<td></td>
<td>Time lag, 250V, Φ 5.2×20mm)</td>
</tr>
</tbody>
</table>

* In the case of power supply voltage is AC100V
2-4 LOCATION

The tolerable ambient temperature and humidity ranges of the instrument are as follows.
Moisture condensation must be absent.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Temperature</th>
<th>Humidity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating</td>
<td>0 to 40°C</td>
<td>10 to 80% RH</td>
</tr>
<tr>
<td>Storage</td>
<td>-10 to 50°C</td>
<td>10 to 80% RH</td>
</tr>
</tbody>
</table>

Avid installing the equipment in the following types of locations.

- Flammable gas
  Do not use this equipment in the presence of flammable gas. There is danger of fire and explosion.
- In direct sunlight, near fire or heat source
  It may cause some failure or error.
- Corrosive gas, moisture, dust or high humidity
  It may cause the equipment corroded or some failure.
- Strong magnetic or electromagnetic fields
  It may cause some error.
- Strong vibration
  It may cause some failure or error.

2-5 GROUNDING AND POWER SOURCE

(1) Grounding

⚠️ WARNING
This equipment must be grounded in order to prevent electric shock accidents.

Confirm the protective ground terminal is connected to ground before connecting the equipment for measurements. The DV-12 protective ground is connect to ground by the 3-prong power supply plug.

Use the supplied power supply cable to connect to a 3-terminal power outlet that has a protective ground contact.

(2) Power source

⚠️ CAUTION
Be sure to observe the following in order to prevent damage to the equipment.

Confirm the power source voltage is within the range specified for the DV-12.

The DV-12 operates from the following commercial power source.

- Power supply voltage range: AC100V/120V/230V±10%
- Power supply frequency range: 50Hz/60Hz
- Power consumption: MAX.5 VA

DV-12
3. OPERATING INSTRUCTION

3-1 NAME AND OPERATION EACH SECTION

①  ———— frequency selection switch

Select the center frequency. The center frequency of the internal band pass filter is changed by this switch.

The selected frequency is indicated by a LED lit.

② POWER I/O  Power switch

The unit is powered on with a LED lit by turning the switch on.

③  ———— Power receptacle

This is to be connected by the power cord. The connector is united with a fuse folder. Including a spare fuse, this holds two time lag, 250V fuses inside.

Replacing a fuse, refer to the “Fig.3-1 The way of replacing a fuse”.

Specified rating of a fuse of the DV-12 are as follows.

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC100V/120V</td>
<td>0.4A</td>
</tr>
<tr>
<td>AC230V</td>
<td>0.2A</td>
</tr>
</tbody>
</table>

Time lag, 250V, Φ 5.2×20mm

According to the power supply voltage, specified rating of a fuse differs.

⚠️ WARNING

Use only a fuse with the specified rating.

There is risk of fire from an improperly rated fuse. Be sure to disconnect the power cord before replacing the fuse.

---

Removing the cover by hitching a thin pointed edge of a screwdriver here

Fig. 3-1 The way of replacing a fuse
REMOTE CONTROLLER  
External control connector
This connector is used when center frequency is to be selected by an external signal. This connector is a 24-pin multi-connector and installed on rear panel. When using OP-01 Remote controller, Remote controller is to be connected to the connector.

WOW FLUTTER TAPE SPEED
Output terminal of wow and flutter / tape speed
Fixed 3kHz or 3.15kHz output terminal for wow and flutter / tape speed. Wow flutter meter is to be connected to the terminal.

CAUTION
Do not apply any signal source to the output terminal of the DV-12. It may cause some failure.

INPUT L,R
Input terminal
Terminals of each L and R channel input. The output of the tape recorder is to be connected to the terminals.

CAUTION
Do not apply a signal exceeding ±15V to the input terminal. It may cause some failure.

VOLTAGE SELECTOR
Power supply voltage selection switch
According to the power supply voltage, turn the switch AC100V or either of 120V or 230V.

OUTPUT L,R
Output terminal
Terminals of each L and R channel output. A measuring instrument and such like an AC voltmeter, a VU meter is to be connected to the terminal.

Inspection clearance certifying label
This label is to certify that this unit satisfies the published specifications and our quality standard, and that has passed our inspection.

Serial No. label
Indicates the unit’s serial number.
3-2 HOW TO OPERATE

(1) Power on
After confirming that the power supply voltage according to the actual main voltage, turn the power switch on. The frequency of this unit will be set to THRU when powered on.

(2) Filter switching
Set the test tape and set the tape recorder to replay status. With the THRU button pressed, composite waveforms by-passing a band pass filter will be output directly. Press any one button for frequency selection enables any one from the composite waveforms in the test tape to be selected and output.

(3) Measurement of wow and flutter / tape speed
A 3kHz or 3.15kHz signal is to be output from the WOW FLUTTER TAPE SPEED output terminal on the rear panel, with which the measurement of wow and flutter or tape speed is possible. The output is set to derive from the R channel.

(4) External selection of frequency
A remote control of frequency selection is possible by using the external control terminal on the rear panel. The plug type is Amphenol 57-30240.

The control signal is +8V positive logic. The connector corresponds to frequencies as follows.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>Unusable</td>
<td>24</td>
</tr>
<tr>
<td>11</td>
<td>GND</td>
<td>23</td>
</tr>
<tr>
<td>10</td>
<td>Unusable</td>
<td>22</td>
</tr>
<tr>
<td>9</td>
<td>THRU</td>
<td>21</td>
</tr>
<tr>
<td>8</td>
<td>12.5kHz</td>
<td>20</td>
</tr>
<tr>
<td>7</td>
<td>10kHz</td>
<td>19</td>
</tr>
<tr>
<td>6</td>
<td>8kHz</td>
<td>18</td>
</tr>
<tr>
<td>5</td>
<td>6.3kHz</td>
<td>17</td>
</tr>
<tr>
<td>4</td>
<td>1kHz</td>
<td>16</td>
</tr>
<tr>
<td>3</td>
<td>315Hz</td>
<td>15</td>
</tr>
<tr>
<td>2</td>
<td>125Hz</td>
<td>14</td>
</tr>
<tr>
<td>1</td>
<td>63Hz</td>
<td>13</td>
</tr>
</tbody>
</table>

Fig. 3-2 Pin assignment
\textbf{CAUTION}

+8V

\begin{center}
\begin{tabular}{c}
\textbf{Tpw} \\
0V
\end{tabular}
\end{center}

The external control signal should be a pulse or contact signal as above.

\[ T_{pw} \geq 3\text{msec} \]

A switch for an external control should be a contact switch, that is ON status by the switch just pushed and OFF status by the switch untouched. A switch with which ON status is held when pushed should not be used.
3-3 OPTIONS

(1) OP-01 Remote controller

The cable attached to the remote control box should be connected to the rear panel multiconductor of the DV-12 and locked with a clasp. External control is possible by the push button of the box. The frequency setting via panel switches is also possible when the box is connected.

(2) OP-03 BTL Input ±14V

The DV-12 with an indication of BTL on the front panel has been modified to have a differential input for connection with BTL output. Either HOT and COLD of the BNC terminals of L and R input is isolated from the chassis and COLD (ground) of the output BNC terminals. Therefore, connection of the logic input to speaker’s terminals is possible without attention to the polarity. The input circuit for BTL can be used also when connected to a single-ended output signal.

The maximum input voltage of the DV-12 is ±14V for OP-03. However, please make sure to adjust the output of a tape recorder so that the input will not be overloaded by keeping the maximum input voltage of the DV-12.

Fig. 3-3 Internal connecting configuration
WARNING
In event smoke, peculiar odor or noise is emitted, immediately disconnect the power source and avoid and further operation.

CAUTION
The tape recorder-measurement equipment is a very sensitive unit, therefore we strongly request the user not to use this equipment nearby radio disturbances sending equipment.

Please make sure not to use the equipment in areas where such problems occur.

Should you recognize problems please contact the local distributor for help and advice.

Observe the warnings and cautions of this manual in order to use this equipment safely.
Front panel

Rear panel

Fig. 3-4 Panel description
4. MAINTENANCE

WARNING
Only use a fuse with the specified rating. There is risk of fire from an improperly rated fuse. Be sure to disconnect the power cord before replacing the fuse. In case that a fuse blows again after the replacement, disconnect the power cord from the mains and contact our sales network.

Specified rating of a fuse of the DV-12 are as follows.

AC100V/120V: 0.4A
AC230V: 0.2A

Time lag, 250V, Φ 5.2×20mm

According to the power supply voltage, specified rating of a fuse differs.

Trimmers on the printed circuit board have been adjusted before shipment. Please leave re-adjustment to the authorized engineers of NF CORPORATION.

Contact our sales network regarding calibration and repair.
Fig. 5-1 Band pass filter Amplitude response
If there are any misplaced or missing pages, we will replace the manual. Contact the sales representative.

NOTES
• Reproduction of the contents of this manual is forbidden by applicable laws.
• The contents of this manual may be revised without notice.
• Information provided in this manual is intended to be accurate and reliable. However, we assume no responsibility for any damage regarding the contents of this manual.
• We assume no responsibility for influences resulting from the operations in this manual.

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