

INSTRUCTION MANUAL



Jarrell
—Ash

Division of Fisher Scientific Company

16-830 Dual Purpose Seven Step Filter Assembly

JARRELL-ASH DIVISION/FISHER SCIENTIFIC COMPANY, WALTHAM MASS 02154

16-830

DUAL PURPOSE SEVEN STEP FILTER ASSEMBLY

CONTRACT DATA

Manufacturer's Model Number

Manufacturer's Serial Number



Engineering Pub. No. 16-830/Rev. 2

\$2.50

May 1970

Warranty

All Jarrell-Ash products are guaranteed against defective parts or workmanship for one year, except for electronic components which carry the guarantee of their manufacturer. In keeping with a policy of continued research and improvement, the Jarrell-Ash Division reserves the right to alter specifications and to supply equipment differing from that described. Defective items will be replaced free of charge, transportation charges to be borne by the customer.

DAMAGE IN SHIPMENT

IT IS THE RESPONSIBILITY OF THE BUYER TO INITIATE ANY CLAIMS FOR SHIPPING DAMAGE.

On all shipments the customer is responsible for reporting any damage in shipment to the carrier and for arranging inspection of any damaged parts. In the case of shipment F. O. B. Waltham, the customer is responsible for filing any damage claims with the carrier.

Although Jarrell-Ash instruments are sturdily constructed, they can be damaged through severe handling in shipment. The Jarrell-Ash Division cannot make any adjustment for such damage and will charge for any repairs and/or parts necessary.

Carefully examine the crate for superficial evidence of rough treatment. Even if such evidence is not apparent, do not waive claim for damage, since hidden damage can often be revealed only by close inspection of the assembled instrument. Reimbursement from the carrier will be facilitated, if the preceding recommendations are followed.

REPAIRS

The entire instrument has been constructed of rugged components selected for long life provided reasonable care is shown. If any major parts need repair or replacement, contact the nearest Jarrell-Ash Division representative or the factory for advice.

Investigation of failures, and repair of electronic components should be performed only by qualified personnel.

RETURN OF GOODS

Jarrell-Ash sales policies do not permit goods to be returned to the factory for credit, repair, restocking or replacement under existing warranties including goods damaged in transit, without prior authorization. Indicate serial number of any instrument being returned.

CONTRACT DATA

Manufacturer's Model Number 16-830
Manufacturer's Serial Number 559
Customer's Contract Number _____

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SECTION I • INTRODUCTION

1. DESCRIPTION

The Model 16-830 Filter Assembly serves two purposes for the spectrograph: it can be used for normal seven-step spectrograms in the vertical position; and also provides two-step spectrograms, with the lower step adjustable over the seven values. The density steps on the filter are 0, approximately 0.2, 0.4, 0.6, 0.8, 1.0 and 1.2. The slide has an aperture for normal operation with the slit fishtail, and notches that position the aperture and each density step.

TABLE OF TESTED DENSITY AND TRANSMISSION VALUES

<u>Step</u>	<u>Approximate Transmission</u>	<u>Actual Density</u>	<u>Actual Percent Transmission</u>
1	100.0	0	100.
2	63.9	.173	67.1
③	39.8	.338	45.9
4	25.1	.535	29.1
⑤	15.9	.733	18.4
6	10.0	.916	12.1
7	6.4	1.105	7.8

2. COMPONENTS (Figure 1, page 2)

- 2.1 Open Aperture (A) : 3/16-inches wide x 3/4-inches long for normal operation with the slit fishtail.
- 2.2 Rotating Eccentric (B) : A knurled edge for gripping, and a notch inside the slide body (away from the handle) to place the filter precisely in the correct vertical and horizontal positions.
- 2.3 Filter Notches (C) : Seven notches which engage in a spring-loaded ball at the bottom of the filter way housing.
- 2.4 Filter Position for Two-Step Spectrograms (D) : The bottom half of the area.
- 2.5 Filter Position for Seven-Step Spectrograms (E): Vertical.

SECTION I - INTRODUCTION

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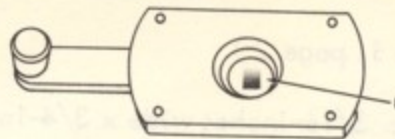
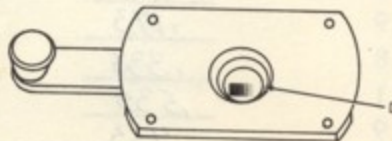
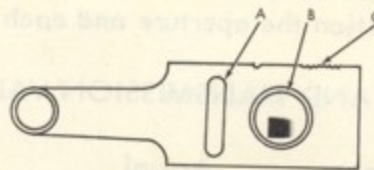


Figure 1

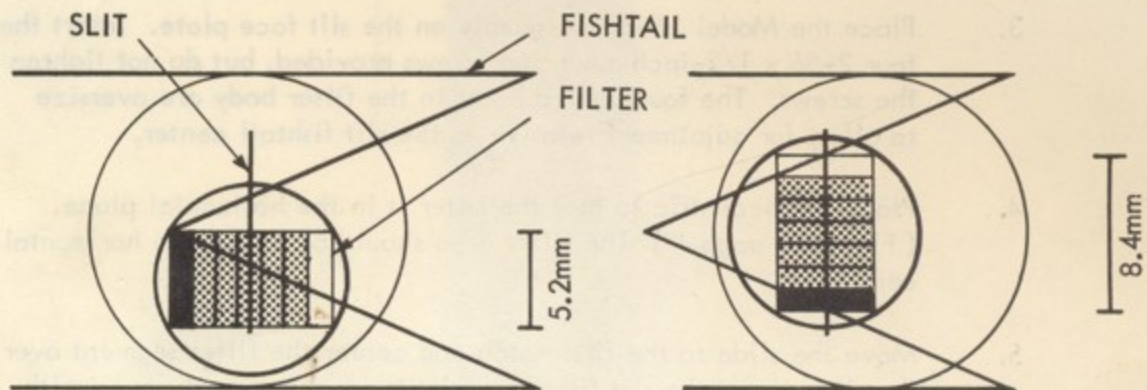
MODEL 16-830 DUAL PURPOSE SEVEN STEP FILTER ASSEMBLY

SECTION II • INSTALLATION

1. Remove the 450mm focal length cylindrical quartz condensing lens cell from the slit face.
2. The 15-800-U (or T) Focus Mount includes a spacer block (part 15-800-U84) for instruments equipped with a direct-reader attachment. Remove the spacer block from the assembly to obtain clearance for the Filter Assembly.
3. Place the Model 16-830 Assembly on the slit face plate. Insert the four 2-56 x 1/2-inch mounting screws provided, but do not tighten the screws. The four drilled holes in the filter body are oversize to allow for adjustment relative to the slit fishtail center.
4. Place the eccentric so that the filter is in the horizontal plane. (Fig. 2A , page 4) The filter area should be below the horizontal centerline.
5. Move the slide to the first notch and center the filter segment over the slit. Insert the slit fishtail until its apex is exactly even with the edge of the filter step used. (Fig. 2A ,page 4)
6. Move the Model 16-830 body up and down until the top edge of the evaporated area of the filter bisects the apex of the fishtail. (Figure 2A) Carefully tighten the four mounting screws and check assembly for orientation. Move the slide from notch to notch, and ensure that all filter steps center over the slit. The top edge of every step bisects the apex of the fishtail.
7. Remove the slide from the body and rotate the eccentric to the vertical position. Reinsert the slide. The filter should be upright and vertically centered over the slit. (Fig. 2B , page 4) Check that 100% transmission step is on top.
8. Move the slide to the fourth notch to center it horizontally. See Figure 4, for assembled bilateral slit, Model 16-830, and lens mount.

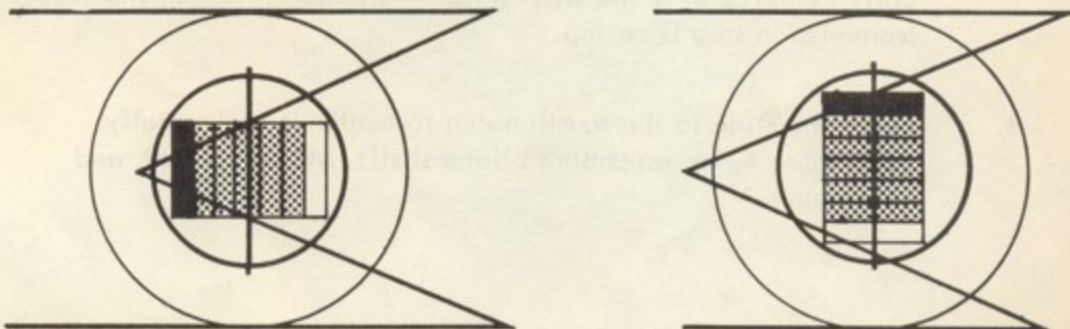
ADJUSTMENT OF SEVEN-STEP FILTER

MODEL 16-830



MODEL 16-840

The positions below show obsolete Model 16-840 when used for uniform attenuation of the entire spectrum and as a seven-step filter.



16-830A5

SIMILAR TO 16-830: FOR ORDER SORTER ONLY

FIGURE 3

SECTION II • INSTALLATION (continued)

9. Attach the 450 cylindrical quartz assembly to the Model 16-830 body. Align the lens as follows:
 - 9.1 The 450mm lens must be set precisely: spectrum quality is dependent upon this critical adjustment.
 - 9.2 Hold the lens at its circumference and clean it thoroughly with lens tissue or a suitable soft material. Place it in the lens retainer with the axis in a horizontal plane (thickest section) and the plane (flat) surface away from the front plate of the lens retainer.
 - 9.3 Insert a sufficient number of cork washers in the lens retainer to ensure that the lens will not rotate when secured to the front plate of the filter assembly. Lens thickness will vary slightly so that the number of washers necessary for each mount cannot be specified.
 - 9.4 To ensure proper adjustment of the lens in its retainer, follow the procedure below:
 - (1) Hold the lens assembly at arms length, with the engraved lines on the retainer in a vertical plane (X axis).
 - (2) Sight through the lens to an object with a vertical edge (a door or wall corner is suitable).
 - (3) If the lens adjustment is correct, the vertical edge will be seen as a straight line congruous with the engraved lines.
 - (4) If the vertical edge appears to be rotated about its axis with reference to the engraved lines, rotate the lens in either direction, clockwise or counterclockwise.
 - (5) Whenever the lens is to be rotated, use lens tissue to ensure cleanliness of the lens surface.
 - (6) When the correct lens adjustment is achieved, secure the assembly to the face plate of the filter assembly. The cork washers will be in contact with the face plate; if an adequate number of washers have been used, the lens will not rotate.
10. Replace the entire assembly on the spectrograph and take photographs with the filter in the various positions, as a final check.

BILATERAL SLIT ASSEMBLY • SHOWN WITH SEVEN-STEP FILTER MOUNTED

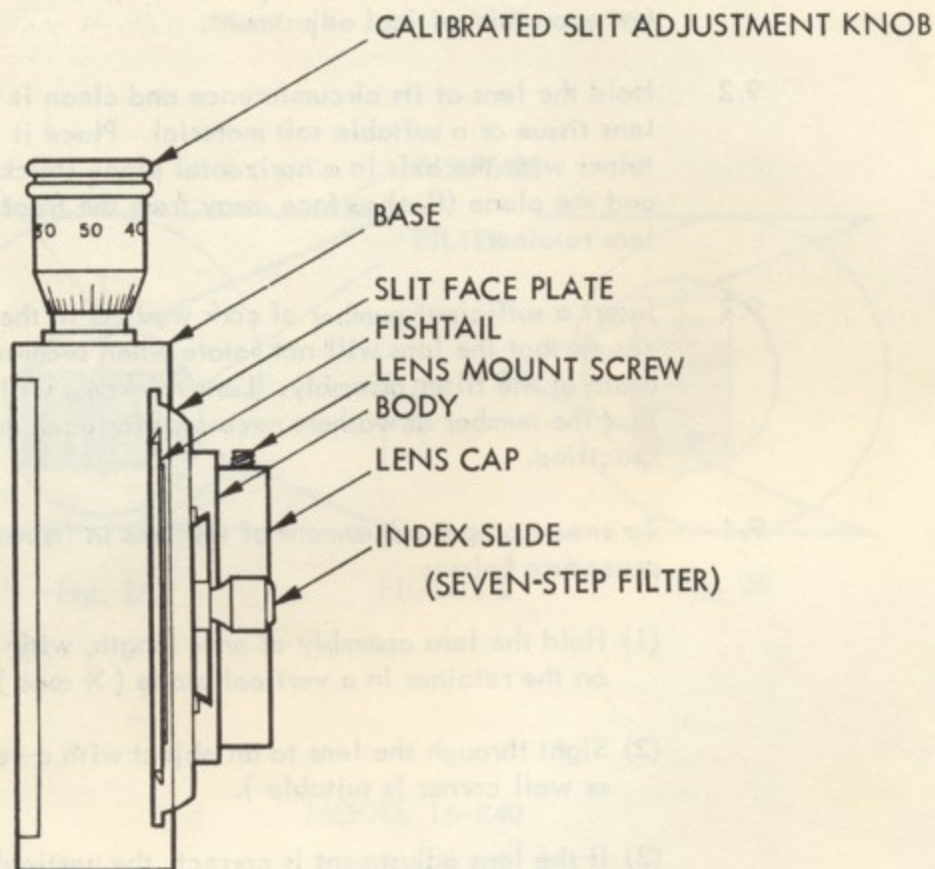


Figure 4

SECTION III CLEANING THE FILTER ASSEMBLY

1. Remove the filter slide from the housing.
2. Carefully dislodge the retaining ring and remove the filter.
Do not touch the evaporated surface.
3. Clean the surface by flushing with ether, grade U. S. P. (ethyl oxide N. F.).
CAUTION: Do not use petroleum ether.

Spare unmounted filter, part JA-16-830-A5