



Formerly  
R. M. Jordan Co., Inc.

## REFLECTRON TIME OF FLIGHT (RETOF) COMPONENTS

### ANGULAR REFLECTRONS, MICROCHANNEL PLATE DETECTORS, SOLID SAMPLE PROBES

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D-850 Bipolar AREF (RETOF) Components

#### ANGULAR REFLECTRON D-850

Designed for the researcher who requires higher resolution than can be obtained using our linear instruments. Modular construction from standard vacuum hardware makes custom variations or later modifications easy. Although this type of equipment is complicated in theory, it is mechanically quite simple and easy to use. Reports indicate that our customers spend very little time getting their systems up and running. Resolution of 1500 has been obtained without extensive tweaking or other techniques to enhance initial performance. Resolution of over 4000 has been obtained when used with our Shroud, Skimmer, Pulsed Valve and Egun. Sensitivity has so far been good with both pulsed beam and surface ablation experiments.

#### D-850 AREF ASSEMBLY COMPONENTS:

**C-870 ION SOURCE ASSEMBLY** consists of Repeller plate, Extraction Grid, Acceleration Grid, Einsel lense and Steering Plates. It is designed to protrude into the chamber approximately 6 inches from the face of an 8 inch O.D. CONFLAT flange.

**C-854 OFFSET ADAPTOR ASSEMBLY** is the chamber to flight tube adaptor which provides the correct offset from the Reflector centerline and serves as a mounting base for the 40mm MCP Detector and its 50 ohm anode.

**C-852 REFLECTOR ASSY** is a two stage design composed of an Entry grid which is normally at ground or Flight Tube potential. Behind this is the Retarding Grid, followed by several plates which give a uniform repelling field. More plates are used than are actually required in order to guarantee uniformity and prevent ion scattering and loss of sensitivity. The last element is the Reflector Grid which can run at reflection potential, or grounded to enable the ions to pass through and be detected by the 18mm MCP Linear Mode Detector.

**C-855 FLIGHT TUBE ASSY** is 8 inch tubing with 10 inch O.D. CONFLAT flange on each end. It may have extra ports for access or supplemental pumping. An elevated potential liner can be provided if needed.

**D-679 FLIGHT TUBE LINER/SHIELD** is a 7 inch diameter stainless steel cylinder which electrically isolates the ions from the ground potential of the flight tube. It is mounted to insulating spacers and can be easily removed. Screened openings allow improved conductance to the pumping sideport in the flight tube.

(Click image to enlarge)



C-852 Reflector Assy

(Click image to enlarge)



40mm Z-Gap MCP Detector Mounted on AREF (RETOF)

**C-726 40mm DUAL MICROCHANNEL PLATE DETECTOR** is designed to handle the fast ion pulses provided by the Angular Reflectron Time Of Flight Mass Spectrometer. The 40mm MCP Detector mounted on the Offset Adaptor (C-854) has 50 ohm output and provides high gain ( $10^6$  to  $10^7$ ) with sub-nanosecond rise time.

The MCP Detector is fitted with an input grid. This presents a flat, field free plane to the incoming ions. It can be operated at ground or elevated potential as required. Two microchannel plates are used. Special Z-Gap configurations are available which use three plates for increased sensitivity.

If not utilized in the reflectron configuration, 40mm MCP Detectors can be mounted on a 6 inch or larger CONFLAT flange, baked and pinched off in its own vacuum housing. For use in special applications it can be easily modified to triple Z-Gap MCP, post acceleration and other configurations. Materials of construction are 304 Stainless Steel, Nickel, Aluminum and Alumina Ceramic.

[Z-Gap MCP Detector Technical Note \(PDF\)](#)

**C-701 18mm MCP DETECTOR ASSY** is mounted on a 6 inch O.D. CONFLAT flange with 50 Ohm Anode. It is mounted behind the reflector to detect ions when the instrument is used in the linear mode. It will also detect more energetic ions which pass through the Reflector Grid while less energetic ions are reflected.

[D-850 Literature, Drawings and Illustrations \(PDF\)](#) *Click on link to open*  
[D-850 Bipolar \(Pos and Neg Ions\) Drawings and Illustrations \(PDF\)](#) *Click on link to open*



C-870 Ion Source Assy

*(Click images to enlarge)*



C-855 Flight Tube Assy  
C-679 Liner/Shield



C-701 18mm Dual MCP Detector Assy

*(Click image to enlarge)*



D-803 AREF Power Supply

**D-803 AREF POWER SUPPLY** is designed for use with our D-850 reflectron Time Of Flight. It is a single compact source for all the voltages used to operate the D-850 Angular Reflectron. It comes complete with all the cables. All voltages are monitored by the same meter. A voltage is only displayed while its monitor button is depressed. Six individual voltage modules can be easily removed for replacement or servicing. They can also be replaced with modules of different polarity and/or voltage range.

Size (approximately), rack mounted. 19"W x 5.25"H x 14.5"D  
 Input voltage (power requirements) 100/120/220/240, 50/60 Hz

[D-803 AREF \(RETOF\) Power Supply Specifications \(PDF\)](#) *Click on link to open*  
[D-803 AREF Power Supply and D-850 Instrument Manual \(PDF\)](#) *Click on link to open*

Manual includes power supply specifications, wiring diagrams, and installation procedure for the 40mm detector assembly.

**Accessories:**

**B-682 SHROUD AND SKIMMER FOR DIFFERENTIAL PUMPING** can increase resolution as high as 4,000 when used with a supersonic jet.

**C-872 MASS GATE** is a steering plate located at the entrance to the flight tube. Used to reject unwanted species from the mass spectrum. Usually pulsed to stability after unwanted low masses have passed by, or pulsed to instability before unwanted high mass ions have passed by.

The accuracy with which masses can be selected is limited by the mass separation which occurred between the ion source and mass gate, approximately 250mm apart.

**C-1551 SAMPLE PROBE AND LOAD LOCK** is a simple mechanism for introducing test samples without breaking vacuum. The probe body is a polished 3/8" diameter stainless steel rod. It is sealed with lightly lubricated Viton o-rings and passes through a ball valve into the high vacuum. The valve is mounted to the assembly by Swagelok fittings using TFE ferrules so that everything can be taken apart and reassembled easily.

*(Click image to enlarge)*



B-682 Shroud/Skimmer Mounted on D-850 AREF

*(Click to enlarge)*



C-1551 Solid Sample Probe and Load Lock Assy  
C-1570 MALDI High Voltage Source Mounted on RETOF

Sample tips fit into a 1/4" diameter socket in a TFE insulator on the end of the probe. This provides electrical isolation for applications such as MALDI where the tip is a part of the high voltage repeller plate. The customer can fabricate custom sample tips in special configurations. He can also design custom probe features such as heated tips as long as the diameter is the same.

The inlet can be pumped by membrane or ballasted rotary vacuum pumps. The latter will reduce the pressure in the dead volume to a low enough value to minimize the pressure surge in the chamber. This dead volume is small enough to operate with a rotary pump which is ballasted to 200 milliTORR with dry gas. Although oil free, membrane pump baseline pressures are marginal so that it may be necessary to turn off all voltages in the chamber each time the inlet ball valve is opened. This also depends on the chamber pumping capacity.

The inlet can be furnished mounted to a flange or vacuum quick coupling. The flange must be machined at the time of assembly fabrication to assure smooth, leak free operation. Other flange features can also be machined at this time such as tapped holes, electrical feedthroughs and source elements.

*Click Images to Enlarge*

Description of Images and Product Information Downloads:



C-701 18mm Dual MCP Detector Assy (left)  
 C-855 Flight Tube Assy and C-679 Liner/Shield (right)



**Reflectron Ion Source, Shroud with Skimmer / Differential Pumping and Offset Adaptor Assy**

C-870 Ion Source Assy Mounted on C-854 Offset Adaptor Assy (left)  
B-682 Shroud with Skimmer / Differential Pumping / Cross Beam (right)



B-682 Shroud with Skimmer and C-685 Test Chamber (left)  
B-682 Shroud with Skimmer / Differential Pumping / Cross Beam (right)



**Solid Sample Probe and Load Lock (MALDI):**

C-1551 Sample Probe / Load Lock and C-1570 MALDI Source / 20kV (left)  
Shown with High Voltage / 20kV C-852 Reflector Assembly (right)



C-1551 Sample Probe / Load Lock on 2.75 Conflat Flange (left)  
Removable Tip Detail (right)



**Electron Gun Ionizers and EGUN Power Supply:**

D-903 Electron Gun Power Supply (left)  
C-950 Electron Gun Ionizer Mounted to Ion Source / Shroud (right)  
[EGUN Literature, Drawings and Wiring Diagram](#)  
[EGUN Mount Detail for Shrouded Ion Source Assy](#)



**High Voltage Pulser and Power Supply:**

D-1003 Pulser Power Supply (left)  
D-1040 High Voltage Pulser (right)

*Click Images to Enlarge*

[D-850 Reflectron \(RETOF\) Time Of Flight Price List](#)

User Manuals: *Click on links to open*

[D-803 AREF Power Supply and D-850 Instrument Manual \(PDF\)](#)

[C-701 18mm Dual Microchannel Plate Detector Manual \(PDF\)](#)

[D-950 Electron Gun and D-903 Power Supply Manual \(PDF\)](#)

[D-1040 High Voltage Pulser and D-1003 Power Supply Manual \(PDF\)](#)

Manuals include specifications, operation, and maintenance procedures.



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