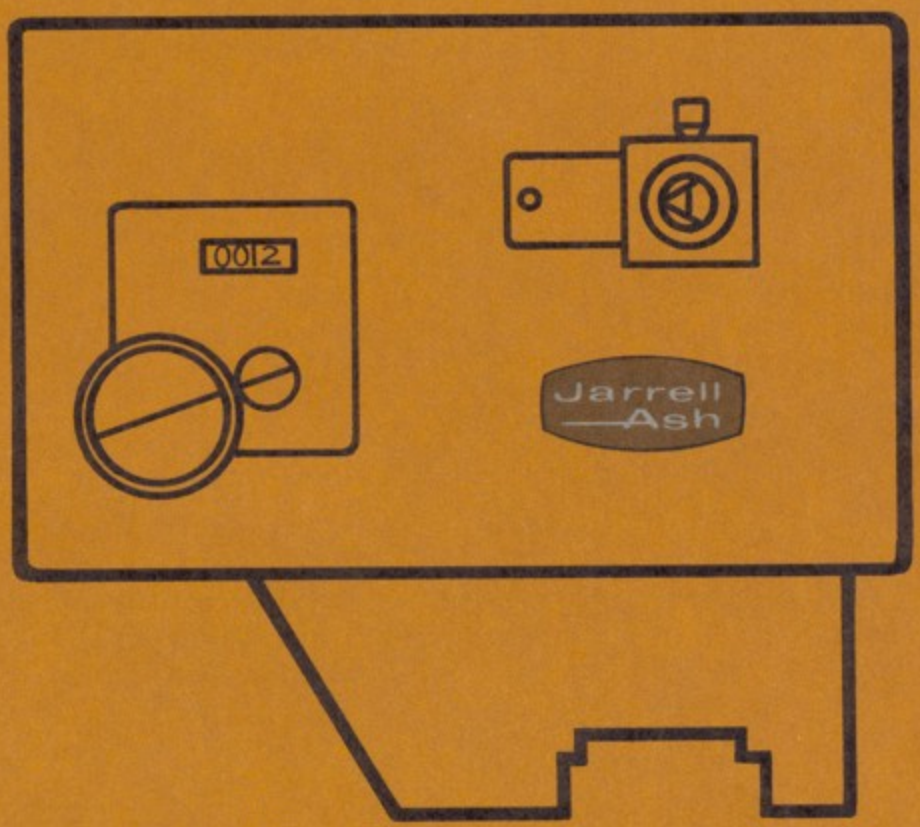
1.5 METER WADSWORTH SPECTROGRAPH

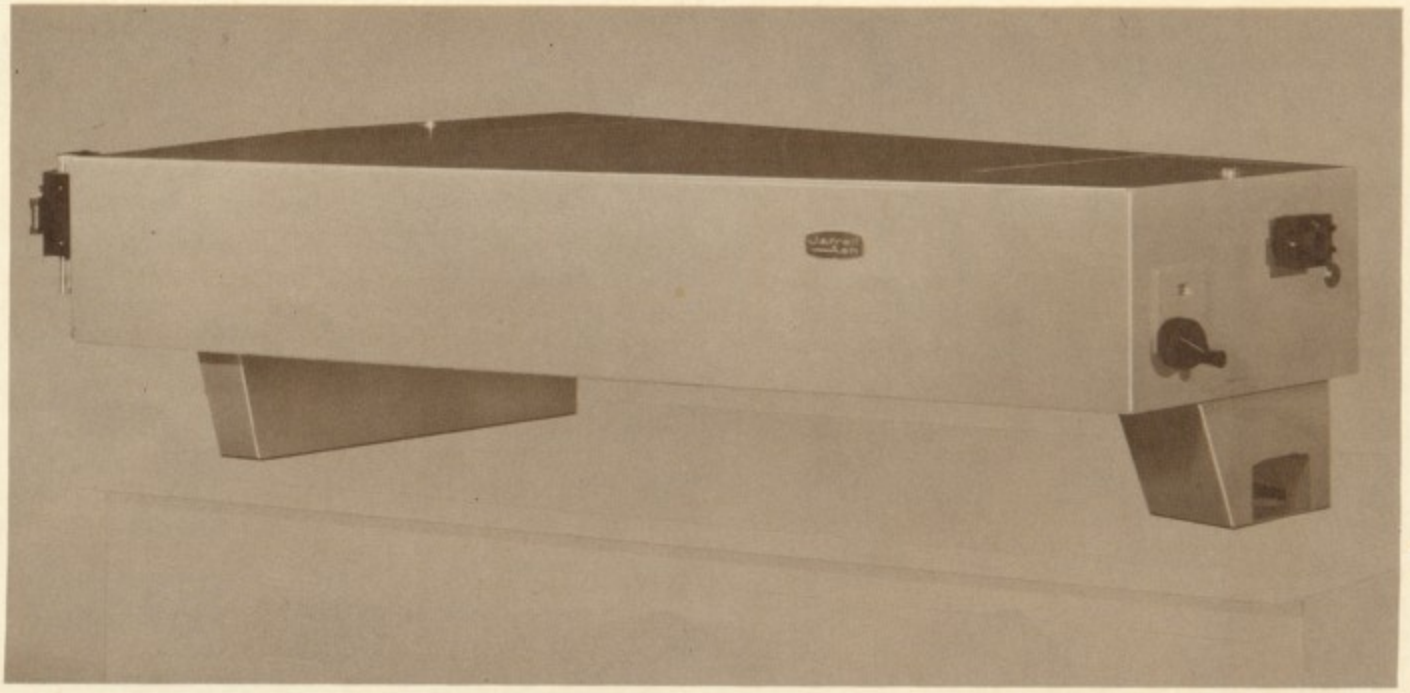


A COMPACT, LOW COST, SPECTROGRAPH OFFERING EXCELLENT PERFORMANCE, VERSATILITY, AND OPERATIONAL ECONOMY

Since 1947 the Jarrell-Ash Company has offered a high quality, low cost 1.5 Meter Wadsworth Spectrograph. Its sound design and workmanship are time-tested in laboratories which represent such divergent fields as industry, medicine, agriculture, research, and the academic.

The Jarrell-Ash Company also manufactures a 3.4 Meter Ebert, Convertible Spectrograph. This large grating instrument provides more versatility with the best possible resolution of any commercial instrument.

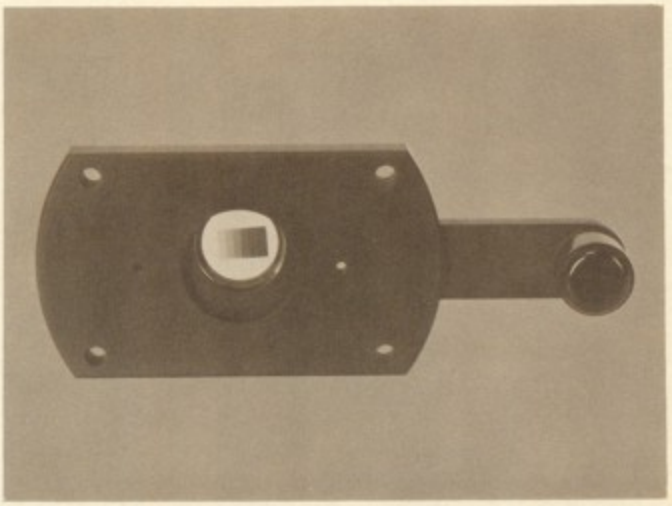
The 1.5 Meter Wadsworth Spectrograph meets the need for a simple, compact, low cost, fixed position instrument of professional quality which is not a compromise, but will meet most laboratory requirements. One of the three models offered herein will fill these requirements.



FEATURES

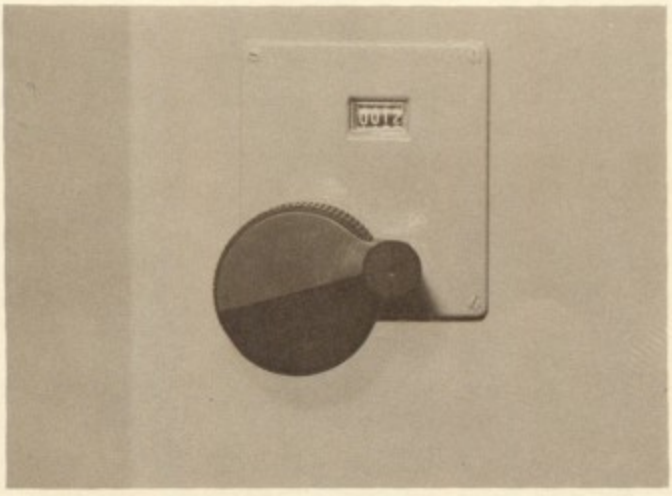
FULL 20 INCHES OF QUALITY STIGMATIC SPECTRA

Unlike other concave grating mounts, the Wadsworth produces stigmatic spectra by using a concave mirror to illuminate the grating. The spectrum, therefore, has a point-to-point correspondence to the source, producing sharply defined lines having a high ratio of signal-to-background.



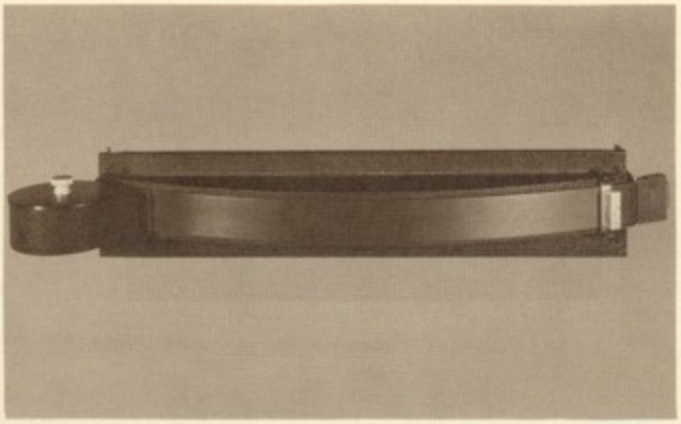
A neutral density filter or stepped sector can be used at the slit for wavelength calibration of the entire range of the instrument.
A "fishtail" can be used at the slit to set the height of the spectrum.
A Hartmann diaphragm can be used at the slit to compare a series of exposures.

CAMERA RACKING



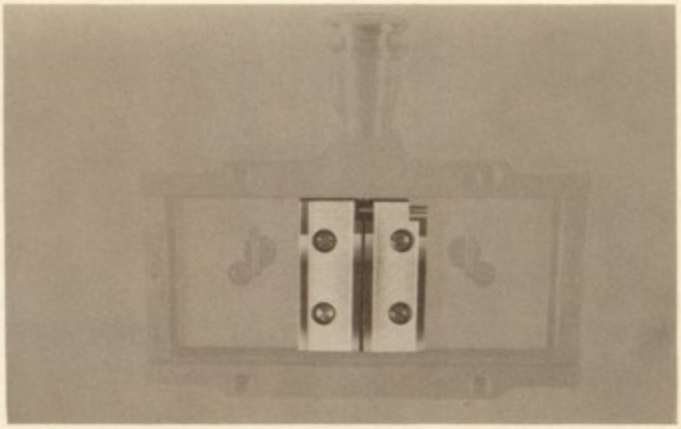
The complete 20" camera is racked by a precision gear system controlled from the slit end of the spectrograph.
As many as twenty sets of spectra .9 mm high can be obtained on one film. Each set is the image of the same slit position. Different positions of the slit are not used to obtain successive exposures.

100 FOOT CASSETTE



For convenience, the full 100' roll of film is placed in a cassette which feeds into the film holder. The entire assembly can be brought into the dark room and the 20" strip cut off. An extra assembly can be used if more than one film type is employed routinely.

STAINLESS STEEL PRECISION SLITS



Because the spectrum recorded is the image of the slit, it is imperative for quality spectra that a sharp evenly spaced slit be employed. Bilateral adjustable or fixed bayonet type precision ground stainless steel (not evaporated) slits are employed.

SPEED

The f/24 spectrograph is illuminated with a highly effective cross cylindrical system to fill the collimator completely. High efficiency precision gratings ruled by Jarrell-Ash for the most effectiveness at the wavelengths required yield working spectra in fractions of a second.

STURDY CONSTRUCTION

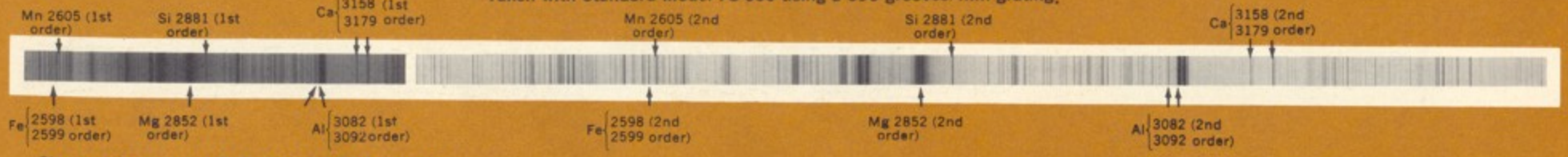
Steel U-beams of ⅛" stock make up the frame of the spectrograph. A 16-gauge aluminum case provides convenient access ports to the grating and mirror.

PORTABILITY

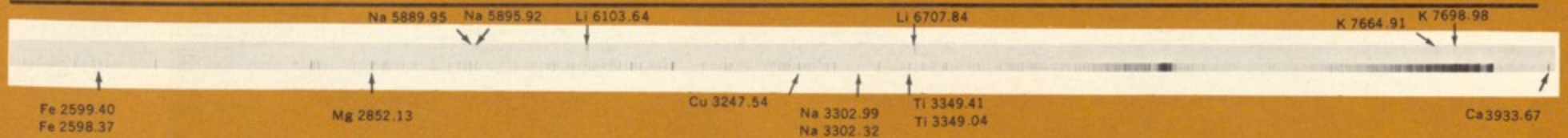
Total weight of the spectrograph is only 325 lbs.
A dolly is available for convenience in moving to various instruments.

TYPICAL SPECTRA

Taken with Standard Model 78-000 using a 590 grooves/mm grating.

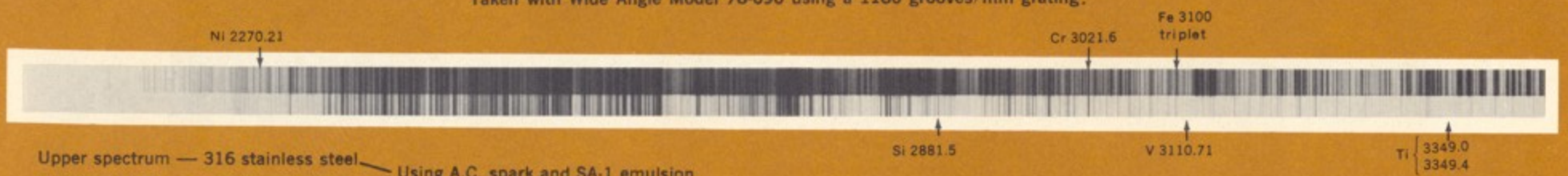


Slag spectrum using D. C. Arc and SA-1 emulsion

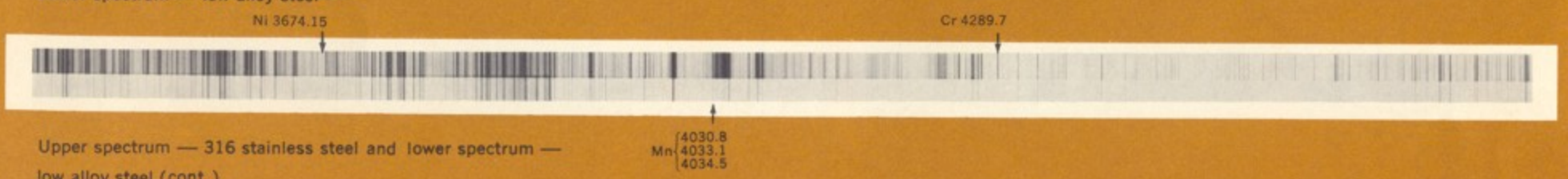


S. Q. Powder spectrum using D. C. Arc and 1-N Emulsion with set of two filters. Upper spectrum shows 5600-8000A — Lower spectrum shows 2500-4000A

Taken with Wide Angle Model 78-090 using a 1180 grooves/mm grating.



Upper spectrum — 316 stainless steel
Lower spectrum — low alloy steel
Using A.C. spark and SA-1 emulsion.



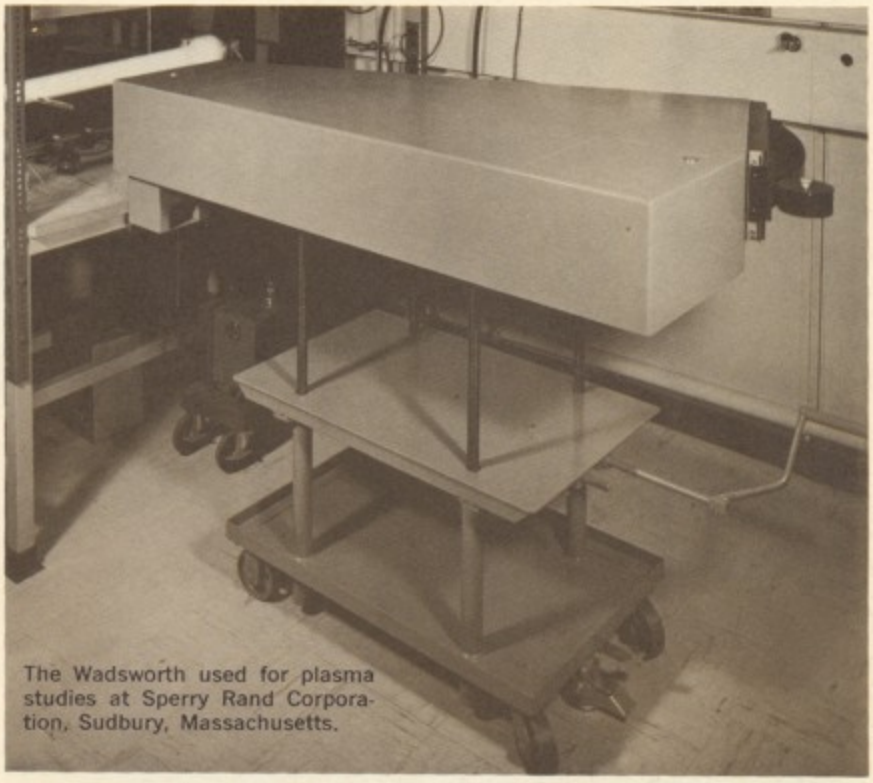
Upper spectrum — 316 stainless steel and lower spectrum — low alloy steel (cont.)

Taken with Wide Angle Model 78-090 using a 590 grooves/mm grating.

Portion of Silver spectrum in Argon filled hollow cathode lamp using D.C. source and SA-1 emulsion.

Portion of Copper spectrum in Neon filled hollow cathode lamp using D.C. source and SA-1 emulsion.

THE 1.5 METER WADSWORTH SPECTROGRAPH FOR RESEARCH



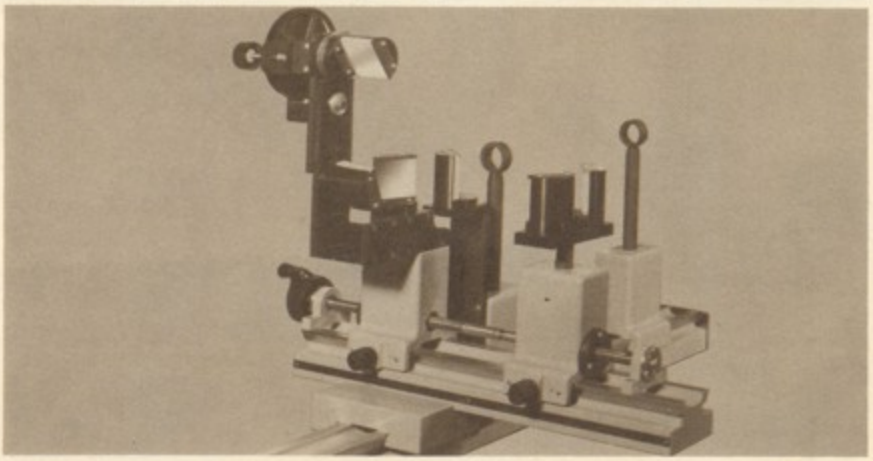
The Wadsworth used for plasma studies at Sperry Rand Corporation, Sudbury, Massachusetts.

The requirement for a portable spectrograph of moderate speed with a broad wavelength coverage is often found in a research laboratory. The 1.5 Meter Wadsworth meets this requirement. Mounted on an adjustable dolly, the Wadsworth can be wheeled up to an experiment and quickly obtain the required spectra.

Emission spectral studies of combustion in a rocket engine with a 1.5 Meter Wadsworth at NASA Lewis Research Center, Cleveland, Ohio.

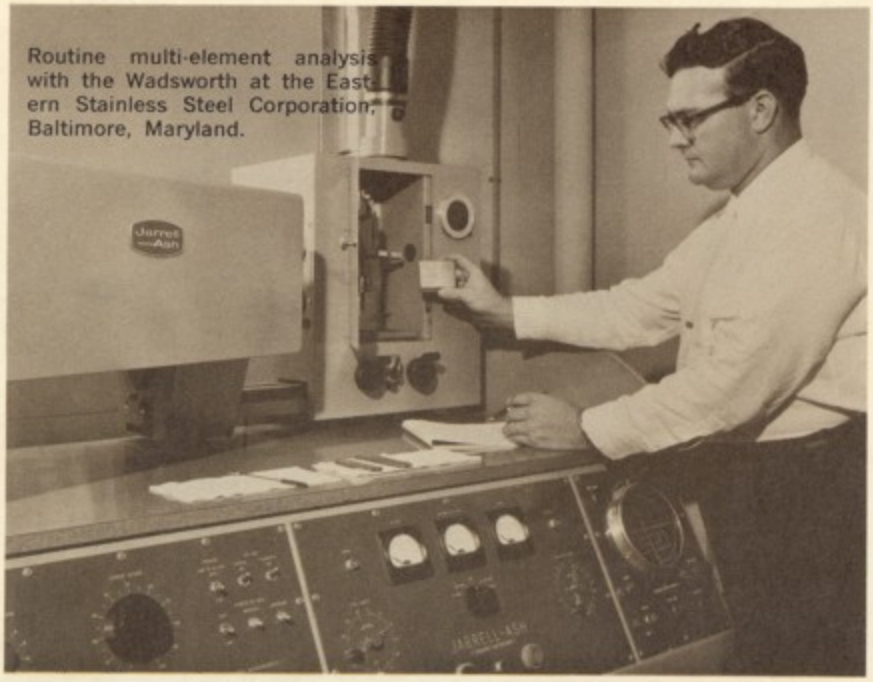
Spectra of short-life species occuring in a shock tube can be recorded. The broad wavelength coverage guarantees that nothing will be missed. Since only one shot is often all that will be taken, the lower cost of film is an obvious advantage.

Other typical uses include combustion studies of flames, temperature measurements of plasma arcs, missile exhausts, incandescent materials. The Wadsworth is the ideal instrument for the varied requirements of a research operation.

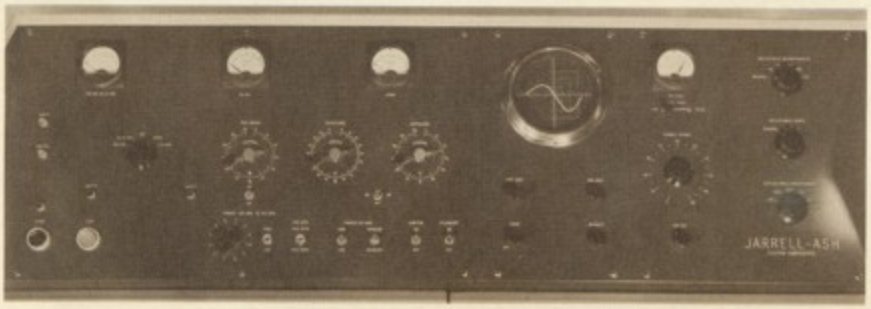


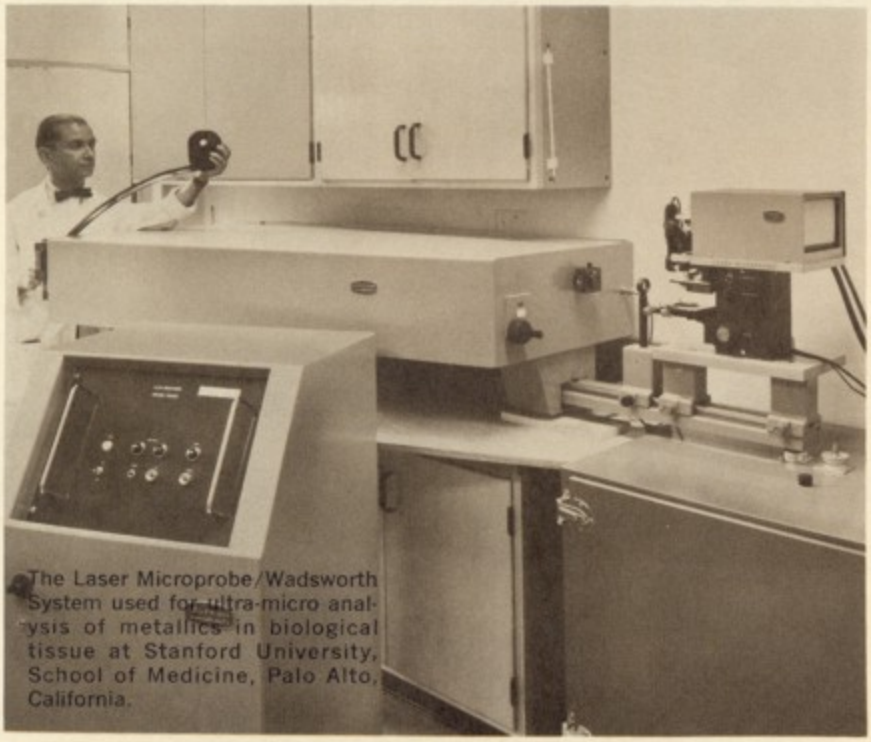
Auxiliary apparatus such as the model 18-022 optical scanning condensing system enables portions of an extended source to be studied.

THE WADSWORTH 1.5 METER SPECTROGRAPH FOR CHEMICAL ANALYSIS



Routine multi-element analysis with the Wadsworth at the Eastern Stainless Steel Corporation, Baltimore, Maryland.





The Laser Microprobe/Wadsworth System used for ultra-micro analysis of metallics in biological tissue at Stanford University, School of Medicine, Palo Alto, California.

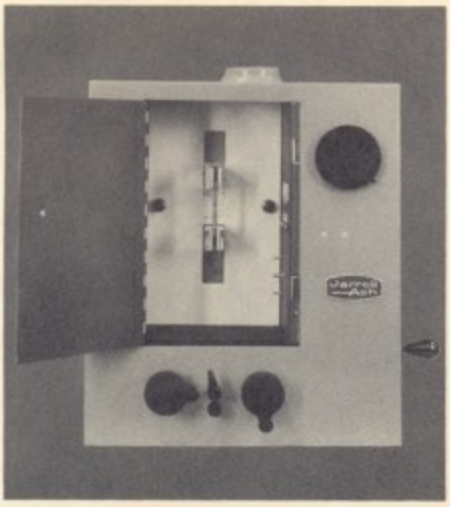
The Jarrell-Ash Wadsworth Spectrograph is currently used in many diverse fields as an analytical tool. It was chosen by these laboratories because it met their particular needs at the lowest cost. The versatility of the Wadsworth Spectrograph is demonstrated by the diversity of the industries represented, such as chemical (both organic and inorganic), biological, toxicological, geological, metal and semi conductor, academic, forensic, testing labs and even art museums.

The mode of exciting the sample is as varied as the laboratories using the spectrograph. It is most important to choose the correct source to go with your spectrograph. The Jarrell-Ash Varisource is a time tested source which provides a large number of parameters, convenient and safe operation. Types of excitation available are: DC Arc, High Voltage AC Spark, Unidirectional DC Arc (Half wave and full wave), Low Voltage DC Arc, Self-Sustaining Low Voltage AC Arc, and High Voltage AC Arc. Safety lock controls also enable the operator to choose the resistance capacitance and inductance required. For full particulars see the Varisource catalog.

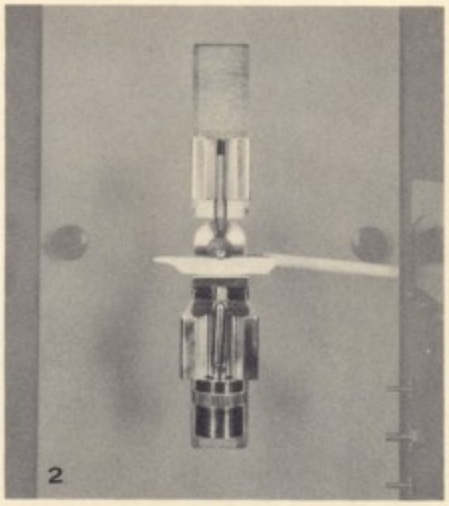
LASER MICROPROBE SOURCE

The laser microprobe is a unique mode of sample excitation. The analysis of small spots or inclusions (50 microns) in conducting or non-conducting materials can be quickly performed with virtually no previous sample preparation. Metals, refractories, biological materials all can be analyzed. See the Laser Microprobe catalog for full particulars.

ARC-SPARK STAND

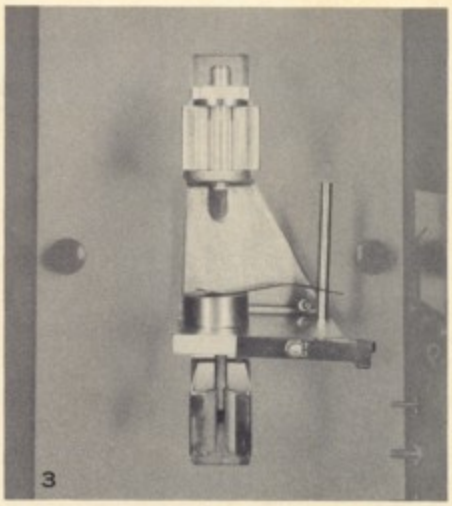


A convenient, easy-to-use arc and spark stand enables pins, flats, and solution samples to be excited. The stand is designed so that only the electrode clamps project into the chamber. Removable G.S.G. silicone inserts are used to line the chamber. These features reduce the possibility of contamination and permit easy cleaning. All control knobs are located in logical, easy-to-use positions. The electrodes can be viewed during exposure through a polarizer window at 6x magnification. The electrode jaws open bilaterally. They are made of nickel-plated brass coated with Rhodium to minimize any possibility of corrosion and contamination. The electrode clamps are internally cooled to withdraw any heat generated. Attachments for handling various forms of samples are available.



2. ROTATING DISC OR ROTATING PLATFORM ATTACHMENT

For solution samples, the Model 19-330 solution attachment is installed in the arc stand. Solutions are placed in a ceramic boat. A disc type of electrode dips into the solution. Rotation of the disc brings a fresh solution to the counter electrode at a rate dependent on the drive motor employed.



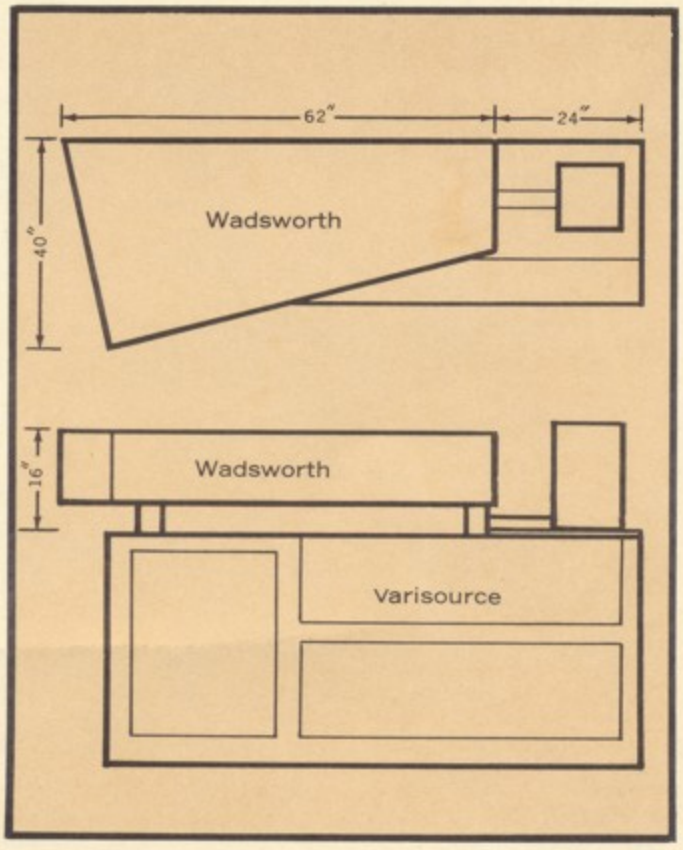
The rotating platform attachment Model 19-340A enables samples such as powders which are formed in disc shape to be rotated such that a fresh area is exposed to the counter electrode. This technique is also used when thin samples are encountered.

3. PETRY STAND

Flat samples of varying sizes and shapes are often encountered. The Model 19-310 Petrey stand is the conventional method for holding such samples. The counter electrode is placed in the lower clamp and a fixed gap spacer is used to assure repeatable spacing.

SPECIFICATIONS

	STANDARD MODEL	WIDE ANGLE MODELS	
CATALOG NUMBER	78-000	78-090	78-090
RULING OF GRATING GROOVES/mm	590	590	1180
WAVELENGTH RANGE A			
First Order	2100-7800	4200-9600	2100-4800
Second Order	2100-3900	2100-4800	2100-2400
Third Order	2100-2600	2100-3200	
RECIPROCAL LINEAR DISPERSION A/mm			
First Order	10.9	10.8	5.4
Second Order	5.45	5.4	2.7
Third Order	3.6	3.6	
THEORETICAL RESOLVING POWER			
First Order	33,700	33,700	67,000
GUARANTEED RESOLUTION	.1A	.1A	.1A
NET WEIGHT	295	315	315
SHIPPING WEIGHT	365	425	425



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