

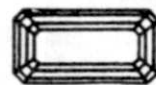
NOTE: This pamphlet contains illustrated instructions designed to assist the user of the Lee Facet Head in its operation, and is given with the purchase of each Facet Head. It is not intended to completely cover the various phases of facet cutting; such detailed information may be obtained from various books and magazines available from dealers, publishers, libraries.

THE
NEW

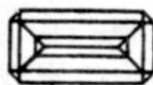
LEE



MARQUISE



EMERALD CUT



MODEL DR (Dual Index Range)

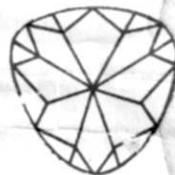
FACET HEAD



SHIELD



TRAPEZE



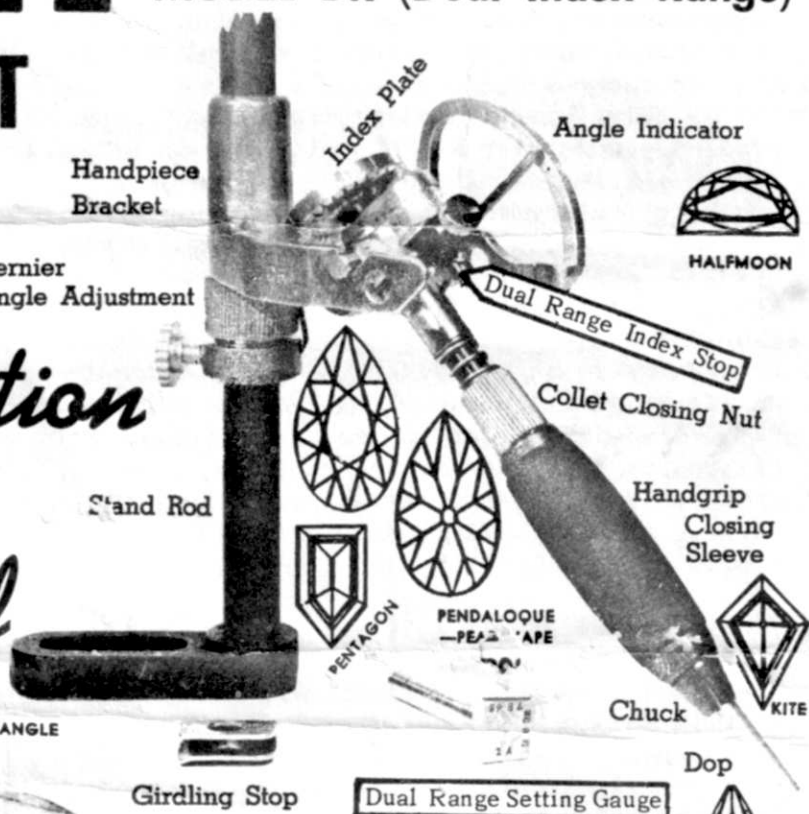
HEART SHAPE

Description

and



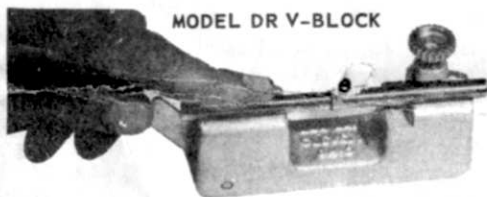
TRIANGLE



Opening the Chuck

After Backing off Closing Nut One Turn Left, Grasp Handpiece as Shown. Give Handgrip Sharp Twist Left and Towards other Hand. To Close, merely Tighten Nut.

Operation



MODEL DR V-BLOCK

REDOPPING a round brilliant for cutting pavilion facets after crown has been completed. Table of gem is cemented against flat end of dop and pushed into hole in opposite dop for perfect centering. Before wax hardens, gem is rotated to align marked main crown facet position with mark made on clamped dop and previously aligned with crown facet before gem was removed from crown dop.

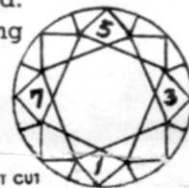
Thumb keeps key lever engaged in each instance assuring relative alignment of crown and pavilion facets. Use a small wad of paper to protect finger from heated dop. Rectangular shapes may be likewise aligned by use of the MASTER V-DOP.

Manufactured by
LFE LAPIDARIES, Cleveland, 2, Ohio

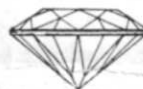
Grinding Circumference of Round Stone. Left Hand Rotates Dop in opposite direction to Wheel. Right Hand turns Vernier Feed. Note Position of Girdling Stop.



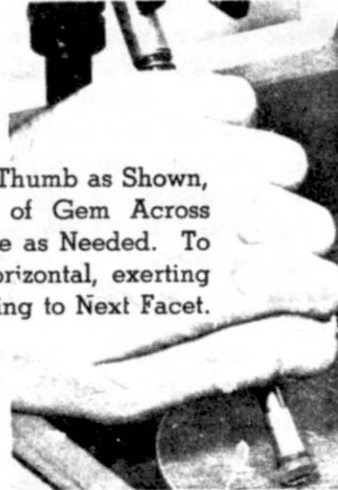
BRILLIANT CUT
BRIOLETTE



BRILLIANT CUT



Grip Lightly with Left Hand, Thumb as Shown, allowing Smooth Movement of Gem Across Lap. Use Downward Pressure as Needed. To Index, Swing up Towards Horizontal, exerting Backward Thrust While Turning to Next Facet.



The GEM TO BE FACETED should be roughed out as close as practical to finished size before dopping, care being used to make the pavilion well centered as this will determine initial centering of gem on dop. Lap the table before dopping and (unless you have the 45 DEGREE TABLE ADAPTOR) polish as well. Gems may simply be hand held for the operations or, small sizes up to about $1\frac{1}{2}$ carat may be held with the ANGLE DOP included with the DOP SET for polishing the table; set the FACET HEAD at 45 degrees with the angle dop chucked with hole downwards on the lap, raise it and place a crumb of TABLE DOP WAX in hole (heating not required), place gem directly below hole with pavilion up and press dop down over it thus aligning table perfectly to lap, then proceed with polishing. Remove all traces of Table Dop Wax by scraping with a knife, then soaking in alcohol or other solvent before subsequent dopping with regular dop wax for cutting the facets.

CUT THE CROWN FACETS FIRST, particularly if you are a beginner; choose a hollow dop slightly smaller than the diameter of the gem or, if shape is other than round, smaller than the width. The pointed bottom of gem should enter at least partly into the hollow end of dop so as to center gem while overhung portion is built up underneath with dop wax leaving edges exposed enough for final shaping. Before wax hardens, place dop in V-BLOCK so that table of gem is pressed against flat end of a solid dop which has been clamped in opposite Vee and hold until wax hardens. A round brilliant will require no orientation related to the keyway in dop at this point although it should be inserted in keyed position in FACET HEAD when ready to start cutting facets so that all gems cut in one lot can be interchanged for various operations including transfer to pavilion dops.

FINAL SHAPING OF THE GIRDLE EDGE is done before starting to cut the crown facets; on round gems this is done by moving the standrod close to the lap so that dop may be rotated in the two holes of the HANDPIECE BRACKET as illustrated at front. The GIRDLING STOP is fitted to the bracket by sliding up from underneath to serve as endstop for dops which do not have a shoulder. GEMS WITH STRAIGHT EDGES such as square, octagon, etc. have the final outline dimensioning done in the FACET HEAD by dropping to as low an angle as possible (usually around 80 degrees) and cutting and polishing edges just as the facets will be done; the slight angle does not show or matter on finished gem. Other shapes such as oval, marquise, etc. are shaped by hand or with the help of templates by grinding on a fine grinding wheel or lap, or by sanding and buffing according to available equipment. Final polishing of girdles on other than straight edged shapes is usually reserved until gem is otherwise completely cut and polished.

LEE INDEX PLATES are graduated differently from most others. Advantage is gained from the fact that most facet cuts are either directly derived from the STANDARD ROUND BRILLIANT or in some way related through it; this provides a basic standard by which to systemize all cutting and obviate reference to diagrams numbered in a complicated way for various cuts. Beginners should cut and become familiar with the Standard Round Brilliant, its facet index positions and their relation to other cuts and shapes before trying other cuts. Cut the 8 main facets first using the only numbered positions of the standard 32 notches on the INDEX PLATE; next cut the 8 star facets on the alternate notches marked by a straight line and which may be referred to as Nos. $1\frac{1}{2}$, $2\frac{1}{2}$, etc. followed by the 16 girdle facets cut on the blank notches and referred to as $1\frac{1}{4}$, $1\frac{3}{4}$, $2\frac{1}{4}$, etc. Other shapes of brilliant such as oval, marquise, heart, pear, etc. usually have 4 of the main facets alternated in equally divided index positions (1, 3, 5, 7). On oval or marquise No. 1 should be one of the large side mains whereas on heart or pear it would be the large main on the wide end. The 4 remaining mains are alternated between the first 4 using whatever notches that will best follow the outline of the gem while making written note of same; star and girdle facets are cut at whatever positions and angles that will most favorably permit proper adjoiment of the points and result in the edge finishing as near as possible to a straight, even thickness all around. A sample cut gem may be better for reference than a diagram and if the latter is used, it is advisable to disregard given index positions if they are numbered for a different type index system than LEE and which may vary anyway according to the proportions of the gem and to the material. At this point we should point out that, except for round brilliant

the shapes mentioned may be cut in the simplest manner by using the 48 index and the primary or "A" positions of the INDEX SHIFT entirely or as much as possible; however, they may be cut with the 32 index while using the secondary positions more.

After the crown facets are finished and if the table was not polished beforehand, it may now be done with the 45DEGREE TABLE ADAPTOR. The shank of the Adaptor is chucked in the Facet Head which is raised to 45 degrees while the wide end of Adaptor rests evenly on the lap surface. The dop is inserted in the Adaptor so that only about $\frac{1}{2}$ inch of dop projects below Adaptor and angle is reset to 45 degrees while table of gem rests on lap. Start the polishing lap and just touch gem to it to see if table is polishing all over; make necessary adjustments with the VERNIER ANGLE ADJUSTMENT or the INDEX SHIFT LEVER. Since the shank of the Table Adaptor is not keyed, make sure the Facet Head Chuck is tightly closed by grasping the entire HANDGRIP together with the COLLET CLOSING NUT and twisting firmly.

To TRANSFER THE GEM, prepare the MODEL DR V-BLOCK by clamping in it a hollow dop with an end diameter about the same as the round brilliant to be transferred and marked with a straight line lengthwise near the end either by pencil or by scribing. Place the dopped gem in the opposite Vee with the Key Lever engaged, then loosen the clamped dop and re-clamp it in a position where the line centers with one of the main facets. Leave it clamped while the gem is now removed from its dop by melting the wax, then soaking gem in alcohol to remove all wax; redop on a pavilion (solid) dop and return to the V-Block to center in the clamped dop and align facets as explained under illustration.

GEM SHAPES OTHER THAN ROUND usually require one of the sides or an end to be initially aligned to the lap while in the Facet Head in the starting index position. The simplest way to do this is to chuck the dop in the proper position without engaging the key and not remove it until all facets are cut and polished; if you are using V-Dops (not included in regular dop set), they will be lined up in this manner in any case and are made without a keyway. Most shapes may be keyed to round dops as explained below.

The MASTER V-DOP is clamped in the V-BLOCK so that straight sided gems may be centered on regular pavilion dops by it preparatory to cutting the pavilion facets. It centers the gem in its width when same is pushed into it but lengthwise gem must be adjusted so each end is same distance from each end of Vee. If desired to simultaneously align a straight side of gem to the keyed position, first prepare a gauge from the largest solid dop in the regular dop set by cutting two "facets" on it at 60 degree angle, one at No. 1 index position, the other directly opposite. Cut on the Cast Iron Lap with silicon carbide grit and water mixture as used for gem facets. Be sure dop is firmly chucked in keyed position and Index Shift Lever is down in "A" position. Make the facets at least $\frac{1}{16}$ " high so that the end of dop can enter slightly into the Vee of the Master V-Dop. To make sure the "facets" are equal, push the two dops together in the V-Block and see that both "facets" touch simultaneously the sides of the Vee of the Master V-Dop. By engaging this dop with the key lever of the DR V-Block while the Master V-Dop is aligned to it and clamped in the opposite Vee, the latter will serve to align dopped gems to the keyed position. The dop with the "facets" cut on it can still be used as a regular pavilion cutting dop but when again needed for alignment purposes, all wax should of course be cleaned off.

MAIN FACET ANGLES of COMMON GEMS

	CROWN	PAVILION
Titania	31	41
Zircon	43	40
Corundum, Spinel	37	42
Tourmaline, Topaz	43	39
Beryl, Quartz	45	41

(On long gems set angle for a side main; rest of mains are cut at angles they fall on as indexed)

The LEE FACET HEAD, LAP UNITS and their specific accessories are designed and manufactured by
LEE LAPIDARIES

6617 Lorain Ave.

Cleveland 2, Ohio

Dealer

Operation of ACCESSORIES for LEE FACETING Equipment and LEE PRECISION BALL BEARING SIX-INCH LAP UNITS

Products of LEE LAPIDARIES, Cleveland 2, Ohio

GRINDING WHEELS as listed may be used for cab grinding or for shaping gems prior to cutting the facets. The recessed side makes them especially suitable for use in this type of equipment as a certain amount of dressing may be done as the side wears down. Work mostly near the outer edge after raised portion is worn down, wearing edge to a bevel rather than to wear wheel generally so in that it may break while in use. Best speed up to 2000 R.P.M.; if used much slower than about 1000 R.P.M. excessively uneven wear may occur. Use with water coolant.

DIAMOND CHARGED COPPER LAP for roughing in large facets on coarse side, and cutting facets prior to polishing on fine side, at speeds up to 2000 R.P.M. although slower speeds 1000 or 500 will finish smoother on fragile or brittle gems. Use with water coolant. Due to the softness of this lap it should always be used with another lap or disc backing it and always carefully handled. Use with water.

CAST IRON LAP with silicon carbide-water mixture for facetting gems below hardness 9. Use 500 grit generally or 600 for smaller stones; 220 or 320 for fast roughing in. Speed may be 1000 R.P.M. or even faster; speed about 500 or less cuts slower but does not throw off or dry the grain as fast and is simpler to work with.

TIN LAP with LINDE "A" water mixture will polish facets of practically all gems up to hardness 9 at speeds up to 1000 R.P.M. and more although speeds under 500 are simpler to handle especially when polishing large or fragile gems. **CONCENTRATED CERIUM OXIDE** for gems such as quartz and beryl polishes faster but requires greater care to obtain a fine polish. The **LUCITE LAP** works very well with **CERIUM OXIDE** but not at speeds much over 500 which may overheat and fracture gem.

WATERPROOF SANDING CLOTH DISCS are fastened against the **DISC SANDER** with the nut and washer of lap unit; the cloth discs have a plastic coating on back which stiffens them, whereas ordinary discs are too soft to use in this way. Use mainly for cabochons, 320 first, then 600 prior to buffing. Speed preferably near 2000; slow speeds much below 1000 do not spread cloth stiffly enough. Water coolant.

FELT BUFF with **TIN OXIDE** or **CERIUM OXIDE** water mixture for polishing most common gems; **LINDE "A"** works better for jade, etc. **SQUEEZE BOTTLES** are ideal for applying mixture to buffs made of absorbant materials. **WOOD LAPS** and **PELLON DISCS** can also be used in place of felt buffs for cabochon polishing; they can also be used to polish flats as well as tables and large facets. **PELLON** discs have a self adhesive back; simply peel off the backing paper and press on to any clean hard lap surface of wood, metal, etc. Speeds recommended about 1000-1800.

Please note that any of the accessories except the Lucite Lap may be used with the **DIRECT DRIVE LAP UNIT** although, of course, its single speed cannot be ideal in each case but rather a compromise between the varied operations. **BELT DRIVE UNITS** can be set up either at a single speed or at two or more speeds by use of step pulleys or by having two or more pairs of pulleys to be interchanged as required. Suggested speeds below according to operators requirements.

FACET	1 speed,	400-500 R.P.M.;	2 speeds,	400-500 and 1200-1400 R.P.M.
CABOCHON,	1 speed	1700-1800	2 speeds,	800-1000 1700-2000
BOTH	1 speed	1000-1200	2 speeds,	400-500 1700-2000