



TECHNICAL BULLETIN

OUTPUT COUPLING
LOOP REORIENTATION
FOR USE WITH THE
4KM100LF-H &
4KM150LF-H

For proper output coupling, the output coupling loop #CL-309 *must* be inverted from the present position when used with the high-efficiency 4KM100LF-H and 4KM150LF-H.

Procedure:

1. Remove the load coupled assembly from the output cavity. Place it in a working position with the coupling loop up.
2. Loosen the four Phillips-head screws accessible through the four holes in the end of the coupling loop.
3. Raise the coupling loop until the screws just clear the holes in the center conductor (approximately 3/8").
4. Rotate the coupling loop 180° and reseal carefully onto the center conductor. Retighten the four screws.
5. Disregard the word "Up" on the end of the coupling loop. The arrow will now point in the direction of the klystron collector ("Down") when the load coupler is set at 10 on the scale.



Pub No. 4364 5/80

If You Didn't Get This From My Site,
Then It Was Stolen From...
www.SteamPoweredRadio.Com



COUPLING LOOPS FOR EXTERNAL
CAVITY UHF-TV KLYSTRONS

Design changes in the external cavity UHF-TV klystrons to obtain higher efficiencies have brought to light some incompatibility in some coupling loops being used in older UHF-TV transmitters (pre-1970). These older loops are found to be too small to adequately couple the rf signal to the klystron and in the case of loading loops, to provide sufficient loading to properly correct the bandpass. Use of these loops makes it difficult, and at some frequencies impossible, to achieve full rf power output with the rated DC input power.

If you are encountering difficulties in tuning your present 'H' Model klystron, or installing a new one, check the loops and replace, if necessary.

A list of the correct loop assembly model numbers for the specific klystron model is provided.

<u>Klystron Model No.</u>	<u>Input & Loading Loop Model No.</u>	<u>O/P Loop Model No.</u>
4KM100LA-H	LC-333A (3 3/8" x 2 1/16")	CL-302
4KM150LA-H	LC-333A (3 3/8" x 2 1/16")	CL-302
4KM100LF-H	LC-344A (1 1/2" x 1 1/2")	CL-309
4KM150LF-H	LC-344A (1 1/2" x 1 1/2")	CL-309

All loops should be installed with the loop opening down unless otherwise specified on the test performance sheet accompanying the klystron. Varian Publication No. 4364, 5/80, gives instructions for inverting the LF-H output loop. Replacement parts for all cavities and associated hardware are available. For ordering or information please contact:

Varian Associates, Inc.
M.C.S. Division
3200 Patrick Henry Drive
Santa Clara, CA 95050

Tel: 408 496-6273

If klystron difficulties are encountered please contact UHF-TV Engineering at (415) 493-4000.



Foreign deposits on klystron ceramics should be removed periodically to prevent ceramic heating or arc paths which can lead to klystron failure. The recommended cleaning procedure is as follows:

1. Remove loose debris with a soft fiber bristle brush.
2. Clean the ceramic with a mild abrasive kitchen cleanser, preferably with a bleaching agent, such as Comet, Ajax, etc.

CAUTION

Do not apply excessive force to ceramic. Broken ceramics will cause the klystron to lose vacuum.

NORMAL hand pressure will be sufficient to effect cleaning.

3. Flush ceramic with clean water to remove cleanser.
4. Flush again with clean alcohol.
5. Air dry – make sure material or moisture is not trapped in obscure locations (e.g., behind seal rings, etc.).



TECHNICAL BULLETIN

COLLECTOR COIL RING INSULATOR FOR EXTERNAL CAVITY TV KLYSTRONS

Varian has developed a new Collector Coil Ring Insulator, P/N 127153, for use with external-cavity TV klystrons. This insulator should extend collector-coil life indefinitely.

Collector coil failures have occurred in some older installations due to spilled coolant collecting between the coil and the klystron mounting collar. When the coolant is not removed, it can cause corrosion buildup in the trap area, shown below at the left. Also, a leakage path can be created between the coil and frame which may eventually result in insulation breakdown and severe coil damage.

The new insulator is designed to eliminate the trap area. Together with 1/4" drain holes which should be drilled in the frame bottom plate close to the klystron collar, it also reduces the likelihood of any coolant collecting between the coil and collar.

The new insulator may be purchased from Varian, MCS Division. Any TV station which still has the old style (disk) insulator is urged to replace it with the new style ring insulator having the protective collar. Replacement can be made most conveniently during a regular maintenance shut-down period.

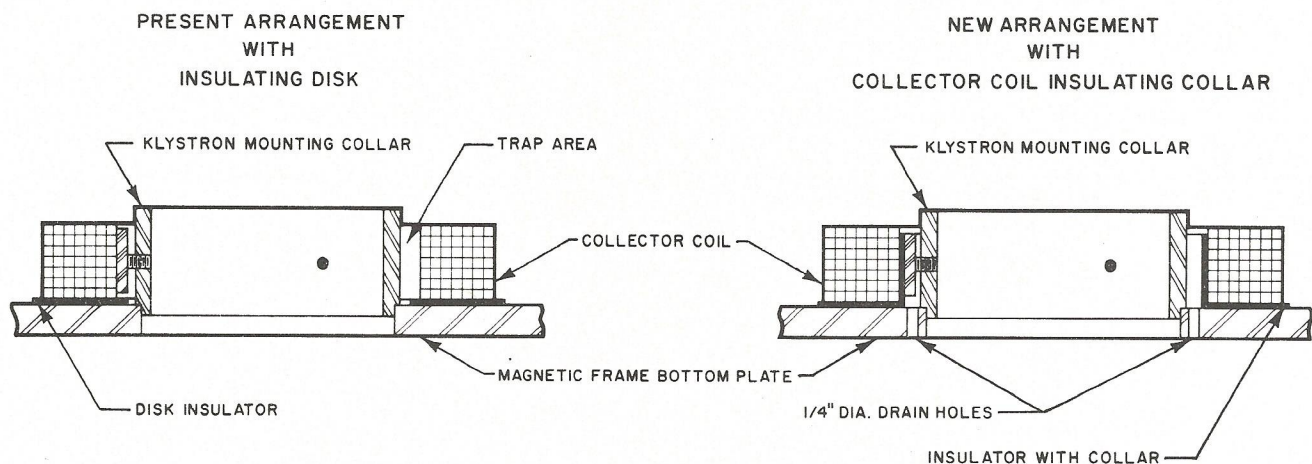
To install the new insulator, the klystron should first be removed from the circuit. Then, the three insulated coil-centering pads should be loosened and the collector coil and the old ring insulator removed. Next, at least two (2), preferably four (4), equally-spaced 1/4" diameter holes should be drilled in the bottom plate of the frame close to the outside of the klystron mounting collar.

Before installing the new ring insulator, the collector coil should be carefully inspected, cleaned, and re-varnished, if necessary. The area of the magnetic frame bottom plate around the klystron mounting collar should be thoroughly cleaned and repainted if needed.

After refurbishing the collector coil and bottom plate of the frame, place the new insulator around the klystron mounting collar as shown in the righthand sketch below. Reposition and center the collector coil using the three insulating pads and adjusting setscrews.

Finally, replace the klystron and the modification is complete.

The sketches below show the differences between the old and the new Collector Coil Ring Insulators.



Information contained herein is furnished as a free service to users of Varian products, to aid in their maintenance, alignment, or possible modification. By furnishing this information, Varian assumes no obligation or responsibility to supply parts, to pay for the cost of modifications, to exchange existing products for new production models, or otherwise. Any prices which may be mentioned herein are those prevailing at the time of publication and are subject to change without notice at any time.



OPERATION OF 4KM-H SERIES
KLYSTRONS FOR OPTIMUM
EFFICIENCY

To take advantage of the increased efficiency available in the external cavity high efficiency klystrons, the dc input power should be reduced from existing levels.

This can be accomplished by mod-anode biasing (as used in the aural socket) to reduce the visual beam current, with the addition of a resistive divided network or a variable mod-anode power supply.

The new maximum dc input power requirement is:

- 83 kW for 30 kW klystrons (100 series)
- 145 kW for 55 kW klystrons (150 series)

The typical operating levels are:

Biased:	30 kW operation	EB: 19 kV	IB 4 Amps
Biased:	55 kW operation	EB: 24 kV	IB 6 Amps

The actual efficiency achievement is very dependent on the availability, amount and use of rf drive signal pre-correction. The greater the amount of correction used the closer the klystron can be operated to saturation (highest efficiency). The dc input power can be reduced from the typical levels indicated earlier in the bulletin if the rf drive signal correction permits an acceptable rf output signal.

For design or addition of a visual socket mod-anode resistive divider network or a mod-anode power supply, it is recommended that the transmitter manufacturer or their approved source be contacted.



TECHNICAL BULLETIN

CL-309

OUTPUT COUPLING LOOP FOR UHF-TV KLYSTRONS

Varian offers an Output Coupling Loop, CL-309, for use with 4KM100LF, 4KM100LF-H, 4KM150LF, 4KM150LF-H UHF-TV klystrons. This coupling-loop design provides increased tube protection against damage from external arcs.

The original Output Coupling Loop, CL-308, supplied with the klystron hardware has been completely satisfactory in most installations. However, a few stations have experienced arcing severe enough to cause tube destruction. Varian is convinced that these failures were caused by system malfunctions external to the tube. Under these circumstances, the terms of the tube warranty do not apply.

As added insurance for extended tube life, Varian urges UHF-TV stations using any of the above tube types to replace CL-308 Coupling Loops with the new CL-309.

CAUTION — Because of the differences in coupling loop design, settings for couplers using the original and new coupling loops are significantly different. With the new CL-309, optimum coupling is obtained with the coupler control shaft pointer set between 3 and 4 (30% and 40% coupling); the original CL-308 provides optimum coupling at settings between 8 and 9 (80% and 90%). As of October 1, 1970, coupling figures supplied with each new tube mentioned above were based on performance values obtained with the tube operating in equipment using the new coupling loop. These figures are not usable with couplers having the original CL-308 Coupling Loop.

For more information, send inquiries to:

VARIAN
MCS Division
3200 Patrick Henry Dr.
Santa Clara, CA 95050

or call:

(408) 496-6273

Information contained herein is furnished as a free service to users of Varian products, to aid in their maintenance, alignment, or possible modification. By furnishing this information, Varian assumes no obligation or responsibility to supply parts, to pay for the cost of modifications, to exchange existing products for new production models, or otherwise. Any prices which may be mentioned herein are those prevailing at the time of publication and are subject to change without notice at any time.