



LOU BURROUGHS

MICROPHONE FACTS

for the operating engineer

from *Electro-Voice*®

ELECTRO-VOICE, INC.
BUCHANAN, MICHIGAN
PHONE OX 5-6831

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MODEL 513 FILTER

A NEW NOISE REDUCER

This is the history of another Electro-Voice problem solver, the Model 513 low frequency rumble filter. (Refer to enclosed specification sheet.) It was designed specifically for use with the Model 642 Cardiline microphone, but it may be used with any low impedance unit.

USING THE MODEL 513 FOR DIALOGUE

While working with users of the Model 642, it was found that a low frequency rumble condition existed in large studios. This was proving to be bothersome. Many of these studios had no serious rumble problems when working the previous microphone at close range, but with the Model 642 working distances were being increased two to three times. The studio that was formerly considered good proved to have a low frequency problem, particularly where the pickup of dialogue was concerned.

The Model 642 will reduce the pickup of random noise and reverberation to a far greater extent than any other microphone, but its effectiveness will be seriously reduced when unwanted sound is reflected into the front of the microphone along with the wanted sound. Since it is impossible to separate these sounds, something else must be done. The surfaces causing reflection will have to be altered or the response of the microphone altered to eliminate this rumble pickup. It is impractical or the cost is too high in many instances to attempt correcting the problem acoustically, but is is very simple to eliminate the troublesome frequencies with the Model 513 filter.

Many filters were field-tested before the curve of the 513 filter was established. It was found that by cutting response sharply at 110 cps, a high percentage of the noise was eliminated without noticeable change in voice response. In several instances, reach was greatly extended. Where the 642 had formerly been used at about five feet from the subject, it was now possible to increase distances to from ten to fifteen feet with no serious rumble pickup.

When using the Model 513 filter with a 642 microphone, be sure to try each of the three bass control positions on the microphone. You may find that where you were using #1 or #2 position, you can now employ F position on the 642. Since the filter is taking over the rumble problem you may find that you no longer need to sacrifice anything above 100 cps.

The Model 513 proved so successful when used with the 642 that tests were made using it in various size studios, announce booths, master control rooms that are used for announcing, and for remote pickups and outdoor activities.

The following is a summary of reports from users who have been conducting tests for us from coast to coast under many conditions of every-day use. The Model 666, when used with the Model 513 filter in small studios and announce booths, greatly reduced or completely eliminated low frequency rumble and the tight barrelly sound so often found in small rooms. More than this, air-conditioner noise and the hum from lights was eliminated in most instances. Noise from motors, generators, fans and the like was greatly reduced. When used on outdoor pickups, it had a very noticeable effect on wind noise. Where a wind screen was employed, it improved its effectiveness by as much as 80%.

USING THE MODEL 513 FOR MUSIC

A few of those involved in the above tests also reported on tests where the 513 had been used on problems of musical pickups. A summary of their reports show that it is also a handy tool for this use.

Where low frequency reverberation and/or low frequency ambient noise is a disturbing factor, it was found that a compromise had to be made in order to produce a satisfactory pickup. On the face of it, the thought of eliminating all response below 100 cps seemed impossible and still have satisfactory music reproduction. However, after tests were made, it was found that the elimination of response, muddied and degraded by noise and reverberation, was a worthwhile compromise. Eliminating the diffused and dull-sounding bass put life back into what remained, and the overall reproduction was considered much more satisfactory. Naturally everyone would like to be able to reproduce the entire range of every musical instrument in a band, but this is seldom possible without including undesirable noise. Unclean music is certainly not very enjoyable. It is the opinion of all that where bass is degraded, boomy, and dead-sounding, its elimination will improve the overall reproduction. You will have to be the judge as to the value of the Model 513 in your trouble spots.

USING THE MODEL 513 IN P.A.

A public address installation in a large theater was recently completed using five Model 642 microphones mounted in the footlights and distributed approximately ten feet apart. This arrangement proved satisfactory for working distances varying from five to about fifteen feet from the microphones without feedback. This was over double the working range that had been possible with the former installation, but it still fell short of the desired working range of over twenty feet. After everything was complete and the maximum reach was established, a 513 filter was inserted in each microphone line with the result that the output level (before feedback) was doubled, allowing an increase in working distance to the required maximum.

It was found that low frequency reverberation was the key to feedback in this installation even though the audible feedback was at a much higher frequency.

You may find the Model 513 filter to be a solution to your problem. After you have tried it, please let me hear from you. Information from you in the field resulted in the design of the Model 513, and continued information from you will bring more answers to your problems. If you have an idea, let's hear about it.

THE MODEL 643

A LOOK INTO THE FUTURE

For about two years, four prototypes of the future Model 643 microphone have been on field-test by the networks and others requiring ultra-directional microphones. They have been used everywhere possible in an effort to find what they would accomplish, where they will be used, and to arrive at the form factor best suited to its many applications. After many months of testing, we believe we have the answer required, and we are now in the process of tooling for this six-foot brother of our Model 642.

You probably have seen the Model 643 in use at one or more of these events: ABC Rose Parade band pickup on January 1, 1960 and 1961, many football game-of-the-week telecasts, Roosevelt Raceway and other race tracks, to pick up the band and hoofbeats of the horses. It has been used at Olympic games to pick up sound effects, such as skate-sounds, and the slap of skis as they hit the runway. Its most recent application is the pickup of questions asked by newsmen at the Kennedy news conferences in Washington. Reports from ABC, CBS, and NBC, are that the 643's have done a remarkable job.

Since these news telecasts, we have had a greatly increased number of requests for information on the Model 643. It is for this reason I thought it advisable to let you know how we are progressing with the development of this instrument. At the moment, I can only say that we are pushing this project, and we hope that it will be a very few months at the most before we can give you concrete information on the finished product. As soon as it is ready, you will receive all the specifications in a Microphone Facts letter.

WELCOME NEWCOMERS

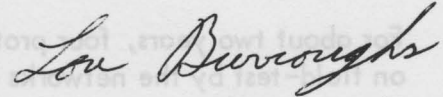
I want to welcome the audio personnel of Revue and Paramount studios to the mailing list of my Microphone Facts letters. Many of you I have met and worked with on tests, and I want to thank you all for your generous cooperation. I hope I will have the opportunity to get together with the rest of you very soon.

THE WHY OF MICROPHONE FACTS

The Microphone Facts letters are intended to bring you information on new microphones and operating techniques as related to all phases of broadcasting, motion pictures, recording, and public address. When you have either questions or answers you care to talk about, I will be most happy to hear from you. Our very existence depends on the problems you bring to us, and the answers in the way of products we are able to supply to you. Working as a team, we both have much to gain. Let's get together.

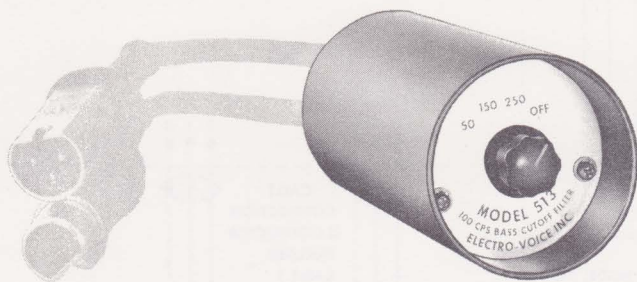
Cordially yours,

ELECTRO-VOICE, INC.



L. R. Burroughs
Vice President
Broadcast & Recording Equipment

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The Model 513 Filter is a sharp cutoff, high pass filter with severe attenuation of frequencies below 100 cps, as shown in Figure 1.

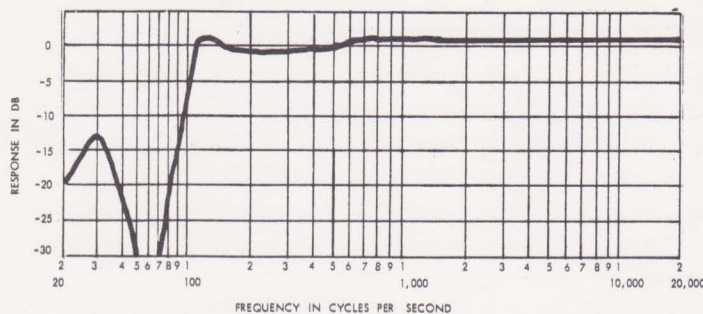
Designed to be used in line between a microphone and preamplifier, the Model 513 rejects unwanted noise and reverberation components below 100 cps. Maximum attenuation occurs at 60 cps (over 30 db) reducing pickup of acoustic A.C. machinery noise.

The Model 513 is designed for use with low impedance microphones (50, 150, and 250 ohms) and its input impedance must be adjusted to equal the microphone's impedance. An external switch is provided for this purpose. The "off" position on this switch connects the filter input directly to the output by-passing the filter.

SPECIFICATIONS

Controls:	on-off impedance
Hum Pickup:	less than -120 dbm for .001 gauss field
Cutoff Frequency:	100 cps
Insertion Loss:	less than 0.5 db
Maximum input level:	-20 dbm
Attenuation at 60 cps:	30 db minimum
Impedance Taps:	50, 150, 250 ohms
Weight:	1 lb.10 oz.
Dimensions:	2-1/4" diam., 5-5/8" long including cable clamps

FIGURE 1 FREQUENCY RESPONSE MODEL 513 HIGH PASS FILTER



INSTALLATION

Remove screws holding cable clamp plate and remove plate from housing.

Loosen cable clamp screws and insert cable through clamps. Wire cables to terminal board according to wiring diagram. Install cable clamp plate and tighten cable clamp screws.

IMPORTANT: Adjust impedance switch to match the impedance of the microphone.

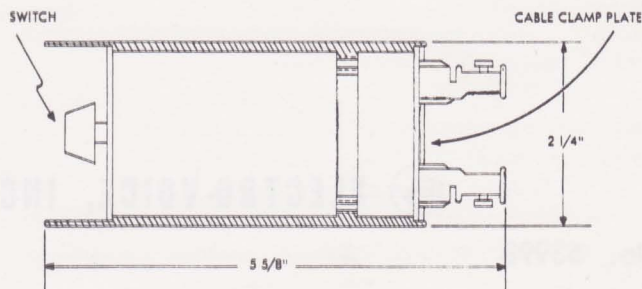
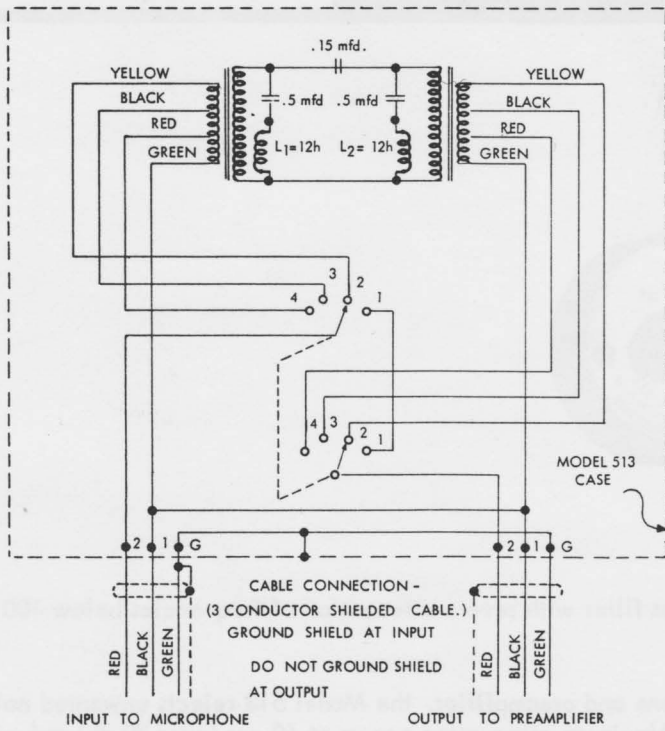
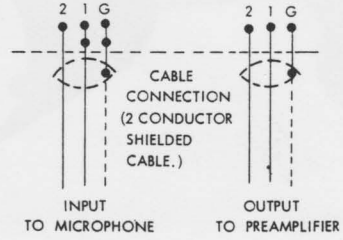


Figure 2



SCHEMATIC DIAGRAM

B1



Switch Positions

- 1 - Off
- 2 - 250 ohm microphone
- 3 - 150 ohm microphone
- 4 - 50 ohm microphone

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