

LOU BURROUGHS

# MICROPHONE FACTS

for the operating engineer

from *Electro-Voice*®

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

February 1967

## A MULTI-LEGGED MICROPHONE

By John McCulloch

With today's wide coverage of news events it is often necessary to provide several isolated feeds (legs) from one source, such as a single podium microphone.

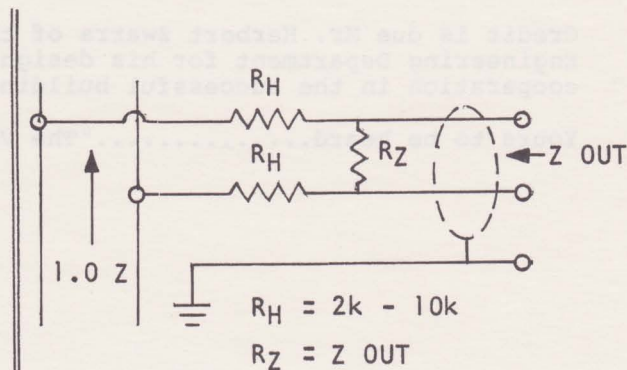
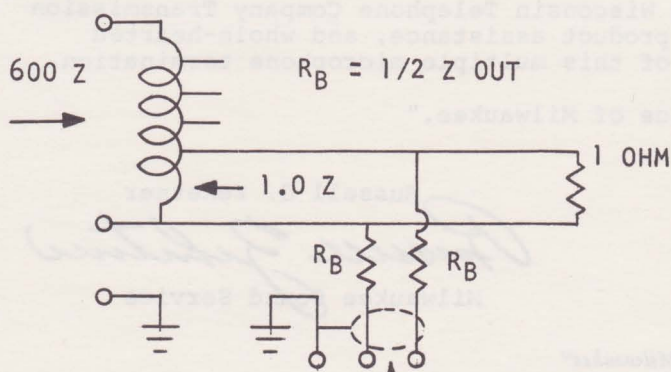
One solution is offered by Russell Zehetner of Milwaukee Sound Service, Inc. His unit, developed with the cooperation of Herbert Zwarra of the Wisconsin Telephone Company, provides twelve independent feeds without seeming to incur the usual problems of noise, mismatch, or loss of isolation between feeds.

Their circuit stems from the basic idea of a bridge circuit, wherein if each of the bridge taps is kept high in impedance, with the base circuit (or buss) terminated in a much lower impedance, then any number of bridging taps may be made.

The basic differences in the Zehetner-Zwarra circuit is that a base circuit of one ohm is selected by means of an autoformer. Then, each leg resistor of the bridge tap is selected to equal one-half the desired impedance. (Fig. 1)

An almost unlimited number of taps may be made with the reminder that each bridge must be very high in impedance compared to the base circuit ( $R_B > 50\sim$ ).

Also possible is the following minimum loss H bridge, offering hard termination of the bridge, more control of the output level, and slightly better isolation. (Fig. 2)



# Milwaukee Sound Service, Inc.

Russell G. Zehetner  
President

November 3, 1966

Mr. Lou Burroughs  
Electro-Voice, Inc.  
Buchanan, Michigan

Subject: Microphone Terminations

Dear Mr. Burroughs:

In a recent issue of the Electro-Voice Microphone Facts, I believe that you requested knowing of unusual installations of E-V microphones. Yes, I believe I have had just such a condition within the past month.

Vice President Hubert H. Humphrey made two hurried stops in Wisconsin, one a 20-minute press conference at Milwaukee's airport terminal. The second stop was at the Sheboygan Armory Building.

At each location we supplied the speaker's podium, a single Electro-Voice microphone, the sound reinforcement public address unit that we fabricated to incorporate multiple microphone outlets to the broadcasters.

The primary intent was the location of one microphone on the speaker's podium. Then following our broadcast mixer console, which was a 600-ohm balance broadcast output; we inserted a Daven variable 600/600 "T" loss pad. This was then terminated across the 600-ohm winding of our AUTO-TRANSFORMER that had about ten (10) taps between the top and bottom ends of the windings.

By placing a terminating, loading resistor of one ohm across the one ohm winding we have a circuit permitting a bridging/coupling. Each termination to the broadcasters microphone input was a Jones three terminal barrier strip, 150/250 ohm balanced circuit. The Daven master control was a volume device to all connected circuits. (Incidentally, we had more gain than we could use.) We had twelve circuits connected at the Milwaukee County Airport job, and eight circuits at the Sheboygan Armory Building. I believe that the circuits could be expanded to hundreds of terminations, if necessary. Incidentally, by changing the values of the isolating resistors, 600-ohm circuits could be accommodated. The AUTO-TRANSFORMER was a Western Electric design, but I believe that there are transformer manufacturers who have a similar unit in their production.

Credit is due Mr. Herbert Zwarra of the Wisconsin Telephone Company Transmission Engineering Department for his design, product assistance, and whole-hearted cooperation in the successful building of this multiple microphone termination.

Yours to be heard....."The Voice of Milwaukee."

Russell G. Zehetner

*Russell G. Zehetner*  
Milwaukee Sound Service

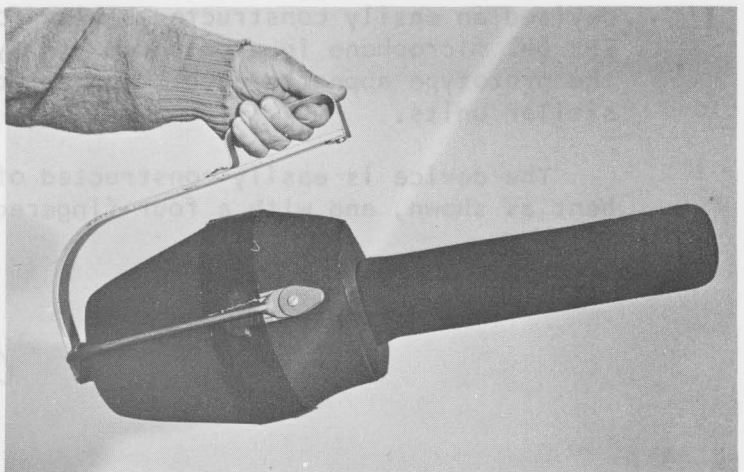
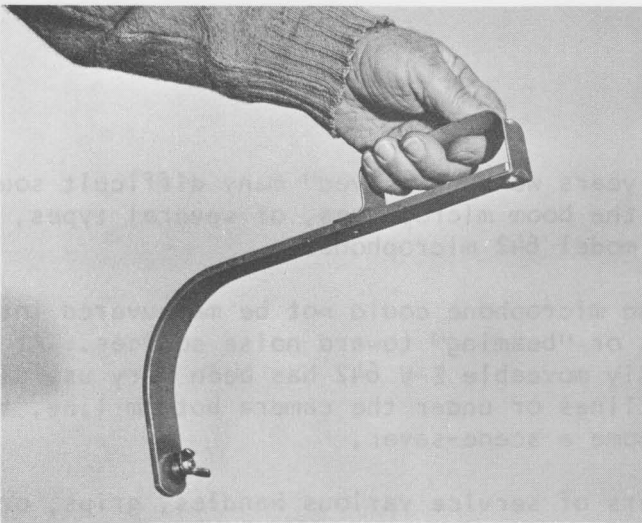
"The Voice Of Milwaukee"  
2117 West Mill Road  
Milwaukee, Wisconsin 53209  
Phone 414 351-0900

AN IDEA FROM PARAMOUNT

By Lou Burroughs

Bruce Denney (assistant head of the sound department at Paramount Pictures Corp.) and I have become good friends over the years we have worked together on ideas for new microphones and accessories. Many of the ideas supplied by Bruce and his audio personnel have been a great help in the development of new microphones that have solved some problems for Paramount and others.

The following letter describes one of the more recent problem solvers suggested by Garry Harris (sound mixer) and developed by the Paramount Sound Department. It has become so useful to them that Garry would like to pass the information along to you.



If any of you have any problem solving ideas you care to pass along, I will be happy to include them in future letters.

# PARAMOUNT PICTURES CORPORATION

WEST COAST STUDIOS



December 1, 1966

Lou Burroughs  
Electro-Voice, Inc.  
629 Cecil Street  
Buchanan, Michigan

Dear Lou:

During the past six years we have "saved" many difficult sound scenes by shifting from the boom microphones, of several types, to hand held Electro-Voice model 642 microphones.

At times the overhead microphone could not be maneuvered into position without shadows or "beaming" toward noise sources. At such times a hand held, quickly moveable E-V 642 has been very useful. Used on the camera side lines or under the camera bottom line, the microphone truly has become a scene-saver.

During these six years of service various handles, grips, or gimmicks have been devised to support the microphone. Recently, acting upon the suggestion of our sound mixer, Garry Harris, we devised an easily constructed device for comfortably supporting an E-V 642 microphone in a balanced and typically angled position. After the prototype appeared each of our production sound units has demanded similar units.

The device is easily constructed of 1/4" x 1" aluminum alloy, bent as shown, and with a four-fingered handle attached.

Best personal regards,

A handwritten signature in cursive script that reads "Bruce H. Denney".

Bruce Denney  
Assistant Head Sound Department

Enclosures: 2 stills  
2 negatives

## JACKIE GLEASON SHOW OF NOVEMBER 26

The big band show. The largest collection of big bands to appear on TV in recent years included Guy Lombardo, Count Basie, Glen Miller, Sammy Kay, Duke Ellington, Les and Larry Elgart, and Freddy Martin. One full hour of music by the top-most talent in big bands today.

If you happened to have watched the show, you couldn't have helped noticing the microphones covering a large majority of the instruments, the Model 635A. They were not there by accident but were the preferred choice of Jay Fairman, audio engineer for the Gleason Show.

After the show, I asked Jay what he and the balance of the producing crew thought of the sound reproduction. Jay's reply was, "We all thought it was great, just great. Those little mics really did an excellent job." In fact, the sound was considered so good that it may be nominated for an Emmy award.

The Model 635A has been in general use for over 18 months and has found a place in applications where I never expected to find it, actually replacing expensive condenser microphones for many purposes.





## ERRORS DO OCCUR

The MICROPHONE FACTS letter of September 1966 contained an error I would like to correct.

With the number of us reading proof on these letters I don't see how it could have happened, but it did. Under the heading "Distortion Caused by Dynamic Microphones," an additional zero was included making it 1000 cps. The latter half of the sentence should read, "150 db of sound pressure at 100 cps."

Under the same heading appeared two circuits for fixed attenuators to reduce dynamic microphone output. There is no error to correct here, but we have had a few letters stating that they would prefer a balanced H pad. Since a preference has been indicated, we will employ the H pad values shown below in the unit we will manufacture.

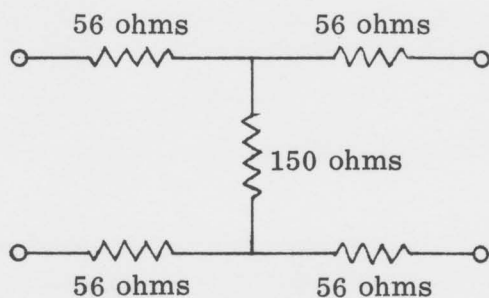


Figure 3 - Symmetrical H Pad  
10 db attenuation

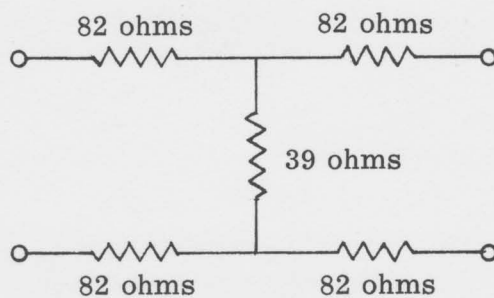


Figure 4 - Symmetrical H Pad  
20 db attenuation

*Lou Burroughs*

L. R. Burroughs  
Vice President  
Broadcast & Recording Equipment