BACKTALK

How High The Fidelity

DEAR SIRS:

THE ARTICLE by Cooke and Fletcher entitled, "Cathode-Follower Loudspeaker Coupling" (ELECTRONICS, Nov. 1951, p 118) represents another attempt to make music sound more realistic than it actually is. ELECTRONICS has done a great service by publishing this lampoon of the fetishes which are current among groups of audio enthusiasts.

Such superstitions as requirements for audio bandwidth in excess of human hearing, zero electrical phase shift in spite of huge acoustical phase shifts, elimination of the output transformer at any cost, thoughtless applications of rules of thumb, and the cathode-follower myth are carried to absurdity.

The following deathless quotations illustrate our point:

(1) Page 121, third column, last paragraph: ". . . better results at the high frequencies are obtained, especially in the reproduction of percussion instruments. Here step wave fronts require a frequency response possibly as high as 100 or even 200 kc."

We want to know what improvements in humans the authors recommend so that such frequencies may be heard.

(2) Page 119, first column, third paragraph: "A balance should be maintained in extending frequency response at both ends of the audio (?) spectrum; that is, if an extension of upper frequency response is made to 200,000 cps, then an extension of the lower response frequency should be made to 2 cps. One rule of thumb has been to make the product of the upper and lower half-power frequencies equal to 400,000."

(3) Page 119, third column, first paragraph: "This requirement (on the power supply) was easily accomplished by using four rectifiers, type 872/872A. . . ."

(4) Page 120, first column, second paragraph: "It might be pointed out that there is no hum pickup problem here such as that

encountered with output transformers owing to winding linkage or magnetic coupling."

(5) Page 121, third column, second paragraph: "The reaction after several months of listening to this system may be likened to living with a great painting."

Great paintings are often spoken of as having great power. This amplifier beats all by several hundred watts. The authors should have pointed out that this amplifier eliminates the need for a heating plant.

WILLIAM L. HATTON
ROBERT A. RAPUANO
Newton, Massachusetts

Authors' Rebuttal

DEAR SIRS:

ELECTRONICS readers, Mr. Hatton and Mr. Rapuano (see above letter) must be acquainted with the analog of the motor car. Many manufacturers design cars capable of speeds approaching 90 miles an hour. These manufacturers do this in order to improve the operation and performance of these cars at more conservative speeds. An amplifier response of 2 cps to 200,000 cps at the half-power points permits excellent phase and amplitude characteristics from 20 to 20,000 cps.

The cathode-coupling unit will hold the 18-inch woofer cone at a half-inch displacement with a suitable d-c signal. In spite of such low-frequency coupling and the 2-cps cutoff of the earlier stages of the amplifier, no hum is audible at full gain setting, even if you place your head inside the cone.

We hasten to explain to readers Hutton and Rapuano that the authors are not proposing such a direct coupler as a commercial amplifier, but simply as a power transfer unit which has the ability of reproducing in a pure 16-ohm resistor a voltage exactly like the voltage output of a microphone placed judiciously in Symphony Hall. If this contributes to the house heating to the tune of about a penny an hour, there are several scores of ELECTRONICS readers who have, are, and will accept such by-products graciously in return for superior low-frequency results, as

well as high-frequency response as good as the best amplifiers available.

Now the game is to find much better speakers, so that the authors may avocationally brew a pot of witchcraft and superstitions that will correlate laboratory measurements with listening judgments.

EWAN W. FLETCHER
Cruft Laboratory
Harvard University
Cambridge, Massachusetts
AND
STUART P. COOKE
Case Institute of Technology
Cleveland, Ohio

Re-rebuttal

DEAR SIRS:

THIS might be titled "Re-rebuttal" for the "Cathode Follower Loudspeaker Coupling" discussion.[1,2,3]

May I call your attention to some remarks by Irving Langmuir in the current GE advertisement "What GE people are saying" and also to an article by H. B. Phillipps in the *Technology Review* for June 1948, as familiarity with at least one of these is germane to what follows.

It is very comforting to know that one lives in a society which, at least electronically speaking, permits such wild excursions as that of the subject article, for this is clearly what pays off. What both Messrs. Langmuir and Phillipps failed to point out, presumable because it is so self evident, is that individual freedom is only a good idea if or when there is available means for determining which wild excursion was wise and which turned out to be a waste of time and money.

Can't we somehow keep this subject warm long enough to forget about trying to prove that a $782 cathode follower is better than a $15 transformer and try to steer some of this energy into loudspeaker design. Something truly revolutionary might easily alter the whole course of radio, f-m, tv and electronics. For the better, I might add.

BENJAMIN B. DRISKO
Hingham, Massachusetts

P. S. If the authors of the subject article will pick up the sound emitted by their plaything when it is held "at a half inch displacement with a suitable d-c signal"[1] with a microphone whose frequency response is flat from 0 to 20,000 cps and examine its output they may get some clues as to why the subjectively heard sounds depart noticeably from those of the instrument being reproduced.

REFERENCES

(1) E. W. Fletcher and S. F. Cooke, Cathode-Follower Loudspeaker Coupling, ELECTRONICS, p 118, Nov. 1951.

(2) William L. Hatton and Robert A. Rapuano, How High The Fidelity, ELECTRONICS, *Backtalk*, p 18, Mar. 1952

(3) Ewan W. Fletcher and Stuart P. Cooke, Authors' Rebuttal, ELECTRONICS, *Backtalk*, p 420, Mar. 1952.

(Editor's Note: We gratefully accept Mr. Drisko's suggestion for titling his letter. We have received a number of letters regarding the cathode-follower loudspeaker coupling article and the discussion printed in Backtalk pertaining to it. Judging by this voluntary display of interest, we feel safe in assuring Mr. Drisko that the subject will be kept warm—if not, sizzling—by the readers of ELECTRONICS. At present, the audio boys seem to have the lead with their endorsements of Fletcher and Cooke's work.)