



D. T. N. Williamson

# ADVENTURERS IN *Sound*

## *Uncle Harry in the Corner*

**D**AVID Theodore Nelson Williamson said he would meet me in a midtown New York restaurant at five o'clock — and just as my wristwatch was ticking off the zero moment, in walked Williamson.

The designer of the Williamson amplifier circuit, one of the first long steps toward quality music-reproduction in the home, turned out to be a pleasant surprise all around. I had expected a rather furious looking man, a busy-type with much audible hum, for I had seen and heard the name Williamson so often it had taken on a personality of its own.

Williamson in the flesh, I must say, looks nothing like the schematic Williamson at all. He is a lanky youth with a soft, quiet voice, and on this occasion his clothing seemed to have been chosen for the purpose of carrying him unnoticed through even the smallest crowds.

We spoke, shook hands, and he introduced a friend who had come along, Richard Davies, general manager of Ferranti Electric, Ltd., in the United States. In fact, I had first thought Davies might be Williamson, for he is a tall, athletic, alert man who appears able to design an amplifier if he wanted to.

But Davies said no, not in his line, the confusion was cleared up and we found a table. I called a waiter and suggested a drink. To get things moving I asked for a Scotch and soda and so did Davies.

But just here, let me explain why I am giving these trivial details. What Davies and I had to drink would be of utter inconsequence — except that it brings our subject into quick focus.

Davies and I may have chosen Scotch out of snap judgment, but not D. T. N. Williamson.

For a full minute he meditated. Then he spoke.

"What to have," he said. "This really calls for some thought. I had a Scotch yesterday, so I don't think I shall repeat today. I had a whiskey sour the day before, and that takes care of that."

Williamson pressed his chin, a strong well-formed chin, in a hand which is muscular and artistic in form. The brow furrowed. The dark eyes lengthened their meditative gaze.

"Do they still make much illegal whiskey in the southern mountains?" he asked.

"Moonshine," I corrected. "Yes, the mountaineers still make their mountain dew and white mule, but the biggest moonshiners are in Brooklyn and New Jersey."

I cannot recall now just how the conversation got from mountain dew to Prohibition's bathtub gin, the lethal effects of improper distilling and the proportion of fusel oil in bootleg whiskey, but Williamson seemed to have a fund of knowledge on the subject and was discussing it when I implored him to settle for a martini, a mint julep, anything, and release our stranded waiter. He settled on a Martini.

My admiration of Williamson had started to mount when he began to talk and I took this moment to fetch the conversation back to him. Digging at his background, I exposed this solid masonry of facts.

He was born in Scotland of Irish parents, and was educated in engineering at the University of Edinburgh. During World War II he was assigned to Ferranti Electric of England, sent to London and put to work on military electronics. Since the war he has been a development and research engineer with Ferranti, devoting most of his time to work on devices for the electronic control of machine tools, and on electronic computing machines.

Sound reproduction has been a hobby with him since high school days in Edinburgh, and just now he doubts that it will ever be anything more.

"But it has been a serious hobby and I intend to keep at it, as a diversion," he explained. "From time to time ideas turn up and get worked on. At the moment I am less interested in amplifiers than in the pickup and the loudspeaker, the two extreme ends in the chain of sound reproduction. I feel they have lagged behind and must now catch up with the performance and quality we now have in our amplifiers. In fact, I'd like to hear a lot less talk about improving the amplifier, and more about the speaker."

Williamson said there is no longer any doubt about the qualities of an amplifier, that it can be scientifically measured, and can be made as nearly perfect as the maker's budget will permit. Williamson himself sees little sense in spending money for merits the ear cannot hear.

The amplifier which Williamson likes best, and understandably, is an attractive two-chassis affair bearing

his signature and made in England exclusively for British Radio Electronics of Washington, D. C. This amplifier, called the Hallmark, is pure Williamson, approved by Williamson and made from components of his own choosing and to his own physical design.

"I have been told that it has attractive lines, and I agree," he said. "Like a bridge or a locomotive, if a mechanical shape reflects good engineering it will be pleasing to the eye. It is one of the laws of nature."

Williamson said American designers of electronic equipment might take a long reflective look at their own products with questions of their aesthetic appeal in mind. In most cases, he thinks, British designs have a more pleasing flow of lines, giving the appearance of being composed as an overall design, not a helter-skelter of tubes and transformers placed to match holes in a chassis.

Making but slight progress on his martini, Williamson then took off on less personal matters of music reproduction in the home.

"Both here and in England I hear endless talk of having the home sound like a concert hall, and I think it's all a little silly. Why should your living room sound like a symphony hall, and how could it?

"The thing we must all do is decide what kind of an illusion we want to listen to.

"The object in reproducing sound in the home is to create the illusion that we are hearing the original sound. Discovering that this is unattainable—except on rare occasions where favorable conditions occur—we adopt a compromise and try to create an illusion which, although distinguishable from the original, differs only by modifications which could occur in nature under the prevailing circumstances, and which, therefore, are not incongruous."

The component in the high fidelity chain which most often stands in the way of the illusion is the loudspeaker, Williamson said.

"The weakness of the speaker is due largely to the compromises we have had to adopt in order to achieve

a practical size, and to the fact that there is no clearly defined aim as to what we are trying to achieve, as there is with the other components of the system.

"One might be pardoned for thinking that the loudspeaker has progressed only in detail since the 1920's, and before it can be improved substantially we must reach a greater degree of agreement on what we are trying to do, and on how the loudspeaker must fit into the existing acoustical structure."

Williamson pushed his glass away, as if the bartender, too, had been confused as to where the vermouth fits into the martini structure.

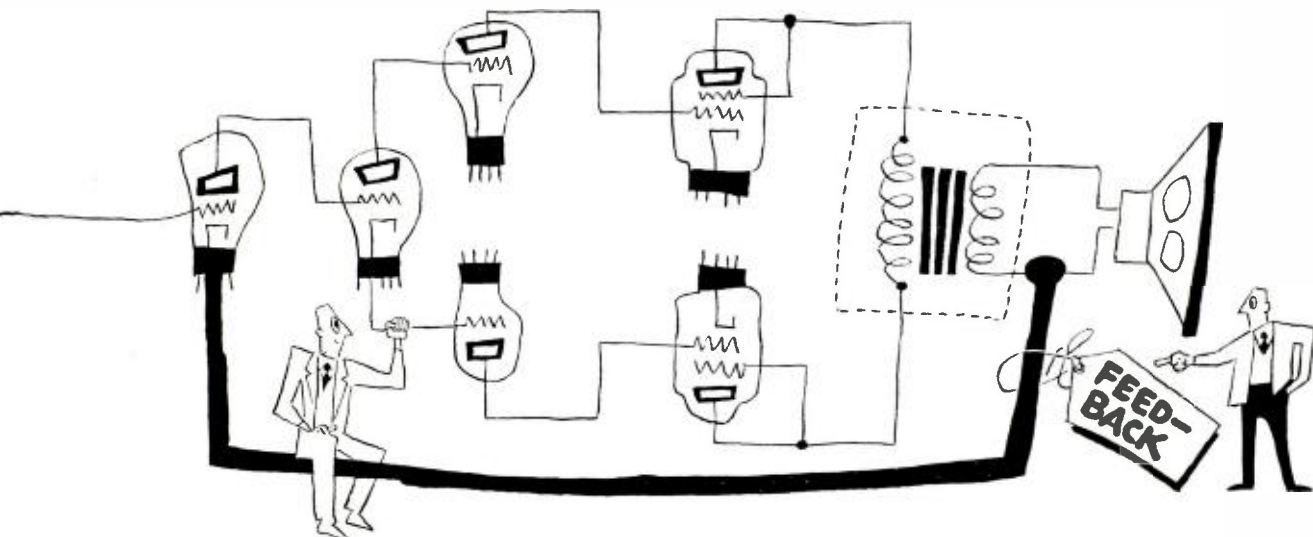
At that moment Dr. Peter Goldmark arrived, was introduced to Williamson and Davies, and sat down at the table. The inventor of the microgroove and the modern long playing record called for tomato juice without the slightest hesitation.

When Williamson took up the subject of loudspeakers again he gave thousands of high fidelity extremists an entirely new and perfectly intriguing thing to worry about. Wow, rumble and hum are now old hat. Here was something fresh and novel.

"Many loudspeakers today give us three alternatives in our search for the illusion of reality," he began. "Let us suppose we are to reproduce a talk. Do we wish the talker to sound as if he were actually in the room talking to us? Or do we wish him to sound as if he were standing on the other side of the wall, speaking through a hole in it? Or, do we wish the illusion of being transferred from our room into the studio?

"A great many loudspeakers today produce the second illusion, that the speaker is talking through a hole in the wall, the hole being, of course, the loudspeaker diaphragm set in its cabinet against the wall or actually mounted in a hole in the wall.

"Now this surely is not natural," Williamson said. "When we have friends visiting us we don't put them in the next room and ask them to speak to us through the service hatch—not unless they are scarlet fever contacts. We have them sit down, *Continued on page 104*



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## HEARING IS BELIEVING?

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building the system up component by component, thoughtfully selected component — that, sir, will make your music finer, more satisfying, than it could possibly be if provided by some ready-packaged unit someone else gave you, however fine the unit technically!

"Know thyself!" must be the ultimate ideal, and the basic instruction for enjoying life fully. But if that's too tough a job — "Know thy sound system!" Know why you've picked each component, why it is satisfying — and know that you are, yourself, part of the full system of psycho-physiological music reproduction.

And do the selecting *yourself*. No matter what the experts say, you have your own, personal "impedance"; what you want is a system that matches into that "impedance" — that matches *you*.

Necessarily, the full high-fidelity instrument system must include the load into which it works.

That's where you come in!

## ADVENTURERS

*Continued from page 33*

offer them tea, and we carry on a spirited conversation, sitting perhaps eight feet apart.

"Similarly, if someone comes to play our piano, we should be considered quite rude if we took a seat in the next room, leaving the door open. And yet, most loudspeakers today produce just this result, and we wonder why there is something unnatural."

Having long been a corner cabinet man, happy as a lark with my loudspeaker, never once having suffered any illusion or hallucination as to where all that beautiful music of Verdi, Puccini and Bizet was coming from, I tried to impart my satisfaction to Williamson.

It turned out, according to D. T. N. that I, unerringly had found the worst possible place for my speaker.

"Right where we usually put it," he said. "Screwed tightly in a corner. In this position it excites all the room resonances, fundamentals and harmonics, with the highest possible efficiency, producing a tub-thumping, apartment-shaking result which is usually blamed on the loudspeaker and leads inevitably to the divorce court!"

"Would we invite Uncle Harty along to play his fiddle, then squeeze him tightly into the corner of our living room?" our man Williamson asked. "Certainly not. A corner would cramp his style, make him cross and in peevish spite he might even cut us out of his will. In our search for realism we must always choose a position for the loudspeaker which could reasonably be occupied by a live performance."

It is possible, he said, to reproduce a solo instrument with such fidelity that it cannot be distinguished from the actual performer in the room, and often equally well with the small ensemble, but to bring a full symphony orchestra into the average

*Continued on page 106*

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**ADVENTURERS**

*Continued from page 104*

small living room is like trying to seat a hundred men around a dinner table set for two.

"I would like to see more common sense brought to bear on sound reproduction in the home," he said.

It was suggested that with recording engineers searching the audio spectrum for new colors and reality, a person listening to higher and ever higher fidelity will find himself wedged between two cellos one moment, and sitting astride the bassoon the next. What has become accepted as reality is something quite new in the enjoyment of music.

At a symphony concert the audience will be from about 40 to 200 feet from the musicians, while a person sitting near his loudspeaker is right down among the instruments — even closer than the conductor was when the recording tape was made. It is as if a listener had crept upon the stage during the scherzo of Schubert's *Symphony No. 9* and, strangely unobserved, taken a vacant chair in the string section. If this is reality, it is a reality which never existed until the high fidelity music system came along and put the listener right on the clef sign.

"Everyone must decide on the illusion he likes best," Williamson said. "Personally, I like orchestral music to sound as if I were sitting in about Row K — and on the aisle, just in case I don't care too much about what I hear."

Williamson was asked what kind of music he liked, and this very nearly precipitated a deliberative process like that which preceded his martini.

"My ears are catholic, I'd say," he said. "I like concertos and dance music. Then, I can listen to about two Dixielands a night. But may be that's because I have but two."

Williamson pulled a slender tone-arm from the breast pocket of his jacket, then fished deeper to bring out a very small magnetic cartridge which he attached to the arm. These, too, were Williamson all the way. They were pilot models he had brought with him, explaining that production would be taken over by Ferranti in Scotland.

Sight of these items brought Dr. Goldmark quickly alert, clear-headed from his tomato juice, and he and Williamson buzzed with the language of science and mathematics for ten minutes.

Later I asked him what had prompted him to design the now-famous Williamson circuit, and publish it for the free use of anyone who wanted to build it.

"Before the Williamson, nearly all amplifiers, or at least those available to the amateur or hobbyist, had five percent distortion or more. In fact, five was the standard," he said.

"This was too much for quality reproduction, so I set about to make something a bit better than necessary. I took one-tenth of one percent as my arbitrary standard, and I worked toward a circuit that would not be difficult to build. I knew more hobbyists would tackle the job that way."

*Continued on page 108*

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## ADVENTURERS

Continued from page 106

The Williamson circuit, actually, was not invented by Williamson anymore than Beethoven invented the musical notes with which he made his Fifth Symphony. The notes had all been used before, and so had everything Williamson put into the amplifier circuit. What was new, and what made the big difference was the *sequence* in which familiar ideas were put together in the new design, plus careful specifications for building a truly adequate output transformer. The latter was needed to permit use of the distortion-quelling device Williamson wanted to incorporate in his circuit — 20 db of feedback over three stages and the output transformer.

First details of this circuit were published in *Wireless World* in April 1947 and the circuit now called the Williamson was one of three which he outlined in the British periodical. This article discussed various ways to put together a high quality amplifier, together with the components required for construction and concluded by selecting one of the three circuits as the one which would be easiest to construct for the amateur technician and music lover who had but little testing equipment, no extraordinary skill and who might be limited in other ways. The other two circuits were eliminated, not because they were inferior, but because Williamson felt they would cause the novice more trouble in construction.

Williamson considers the output transformer as probably the most critical component of a high fidelity amplifier and success of the many amplifiers, built by amateurs in their home shops after publication in 1947, was due to explicit instructions given for making this component. In the past six years technical description and diagrams of the circuit have been published in all the principal countries of the world. In the United States, it is claimed by Williamson partisans, approximately 70 percent of the high quality amplifiers now being manufactured here are advertised as employing circuits of the Williamson type.

To set apart the amplifier which he, personally, approves, Williamson asked the manufacturers of the two-chassis, 12-watt, 47-pound "Hallmark" to designate each one with an attached metal tag bearing his signature, signed: D. T. N. Williamson.

I had been intrigued by the name David Theodore Nelson Williamson and asked if he ever had any tracking difficulties with such an LP name.

"I use the initials to conserve time and space," he said. "In Scotland, growing up, it was no advantage to be known as Theodore, but I understand the name is considered quite rugged over here. However, having a choice of David and Nelson, I made out very well."

After making notes on this aspect of the Scotsman whose name is perhaps the one most often heard in reference to amplifiers, I looked up to see Williamson glancing at his watch and slowly rising from the table.

Dr. Goldmark took off quickly in some predestined direction. Davies, a tall Welshman, stretched his legs and made ready to

Continued on page 110

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## ADVENTURERS

Continued from page 108

steer Williamson back into New York's bruising sidewalk traffic.

"Have I given you anything?" Williamson asked pleasantly.

"Yes," I said, putting on a cheerful face to hide my new worries. "You have given me acoustical nightmares."

Williamson peered intently for about the time it takes a 12AX7 to warm up.

"What do you mean?"

"All those people in the corner," I said. "I'd never noticed them before — but now that you've mentioned them, I do. For months I've been so happy with my corner speaker that I went about urging everyone to buy one — but all I can see now is your poor Uncle Harry and his fiddle, jammed in but trying so desperately to play."

I wished the young Scotsman calm sea and prosperous voyage, then hurried home to make a very important test, the outcome of which might well shake me out of high fidelity and back to the Victrola.

I whipped a Mozart quintet from the sleeve, then put it back. No! I would face it, all or nothing. I took Beethoven's Ninth Symphony from the album, put Side 3 on the spindle. This ought to do it, I thought. I listened to the entire side, then turned the amplifier (Williamson-type) off . . .

I don't know — maybe I'm wrong, but it sounded mighty good to me. Even with Toscanini and the NBC Symphony Orchestra, Eileen Farrell, Jan Peerce, Nan Merriman, Norman Scott, yes! and Robert Shaw and The Robert Shaw Chorale — there seemed to be plenty of room for everybody, right there in my own little corner.

Maybe it was just my imagination, but I don't think so. I believe it was an illusion. That wonderful substitute for reality which Williamson said we should look for.

## TALKING BOOKS

Continued from page 31

backbone. As one friend remarked, "it even smells like a leather-bound Bible." Actually, in spite of whatever objections one might have to a limited audio spectrum, the sound is clear and each word, even the long, hard ones, can be understood. The reading, by Marvin Miller, is clean and unpretentious — an important factor, unless we miss our guess, in making Audio Books palatable. Marvin Miller, incidentally, did the very sympathetic, very restrained job of narrating that warmhearted cartoon about a lonely child, *Gerald McBoing Boing*. Recordings of works by classic authors — the names of Homer, Descartes, Marcus Aurelius, Voltaire, and Jean-Jacques Rousseau are usually mentioned in any conversation with the producers of Audio Books — are scheduled to follow.

Only one question remains to be solved — to make room for the ambiguous newcomer, do we have to scrounge around for more space among our records, or do we shove aside the books in our library.

**CORRECTION**—A line was omitted near the bottom of page 29, an error we discovered too late to correct. So, by way of explanation: "that writing" which interested James Joyce so much was the *Arabian Nights*.

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