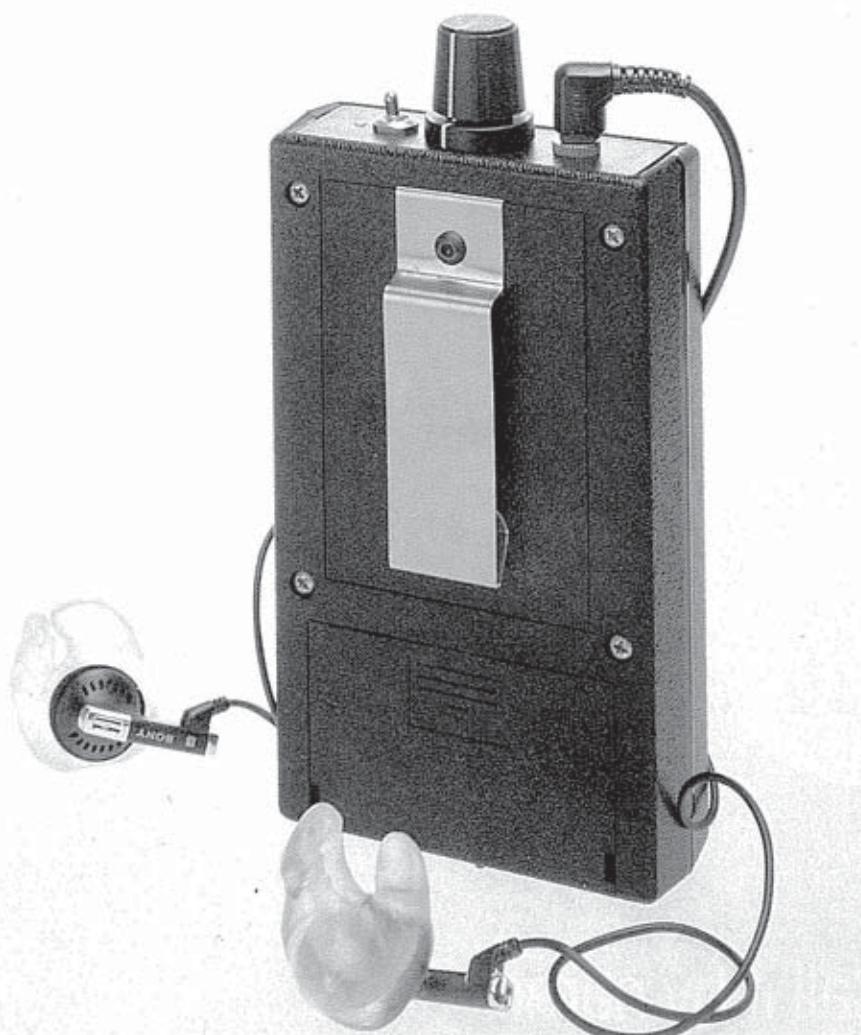


THE STAGE RADIO STATION

Ben Duncan looks into a well-researched British product which seems set to revolutionise stage monitoring and freedom of performance, as well as improving outfront sound quality



The Radio Station designed by Martin Noar and distributed by Personal Radio Systems.

Stage monitoring began on the rock 'n' roll stage circa 1966. Despite the sophistication and brute power of modern systems, many artistes still have difficulty hearing themselves on stage. There are three fundamental problems. Because a lot of artistes insist on using 'Name mics' (the SM58 is notorious), the flat acoustic response needed for maximum gain before feedback isn't achieved, even assuming the monitor's speakers' response is flat. The outcome is that quite stringent EQ is needed to prevent howlround at the SPLs required.

The EQ creates its own problems. The second problem is one for the audience: the monitors' output impinges on the microphones, meaning the monitor mix becomes a part of the live sound outfront. Turning down the levels helps, but how many red-blooded performers rely on their monitors for the adrenalin that high SPLs produce?

The 'muddying' of outfront sonic quality can be judged by the fact that the monitor mix is itself composed of numerous individual mixes, and their individual sound-fields have random phase relationships with the original sound, as well as slight, but highly variable acoustic delay. If the time

delay is greater than 15 to 20ms, it will be perceived as reverb, adding richness to the sound. But usually it's shorter, so it ends up conflicting with the direct soundfield.

Thirdly, the musicians' own monitor mixes are coloured, by each other and by reflected sound from the outfront PA. He or she who turns up loudest wins. . . Similarly twisted considerations apply to monitoring in the theatre and 'electrified' opera: Artistic discipline is higher, so monitoring levels are lower. Ironically, this makes the outfront sound all the more likely to prove distracting!

Direct Injection

Ways to overcome these setbacks are just beginning to emerge. Last year, Crown introduced 'The Differoid', a microphone which cancels out distant sound sources in favour of local ones. Next month, the developments in stage monitor speakers will be discussed. Right now, **Personal Radio Systems UK** have a product which deftly side-steps the problems of providing high SPLs on stage: the monitor mix is 'direct injected' via personally moulded earpieces! Suddenly, the monitoring system is following performers to the edge of the apron, or even into the auditoria. The system relies on pro-

ven radio mic technology, albeit reversed: Artistes wear easily concealed belt-pack receivers (instead of the usual transmitters), while the transmitter resides in the wings.

The transmitter operates in stereo. Personal Radio Systems conservatively quote a range of 'up to 60 metres', with an antenna clamped or screwed to a mic stand. Although radio mics makers optimistically cite ranges of up to 200 metres, **The Radio Station's** range is inherently superior on any given power, as the base station's transmitting aerial can obviously be so much more efficient.

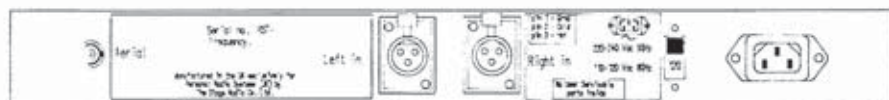
Input drive is monitored on the transmitter's three colour LED bargraph, so the monitor engineer can set the optimum level, as well as keeping an eye on it from a distance in the dark. Input interfacing is transformer balanced, via XLR sockets. The engineer has a local monitoring socket for cans, with a volume control. It's taken off the final audio drive to the transmitter's modulator.

The performer's belt-pack is similar in size to the genre worn for radio mics, measuring about 4 x 3 x 1½" (110 x 70 x 35mm). It almost raises the question, 'If artistes who already use radio mics begin to wear any more belt-packs, won't they begin to look like soldiers?' One thing is certain: the aerial is discrete, being integrated with the cable which feeds the earphones. Realising that the individuality of performers' is heightened as soon as you start interfacing with the intimacies of their anatomy, Personal Radio Systems' package price includes an appointment to Harley Street (or other hearing specialists). The intention is to arrange for earpieces to be created and tailored to be comfortable and acoustically matched to their ears. Two sets will be made. Personal Radio Systems intend to keep one to be rushed to the artiste, should they ever lose their own set. In use, the earpieces press-fit into a pair of Sony earphones (model MDR-E464-EX), supplied with the package.

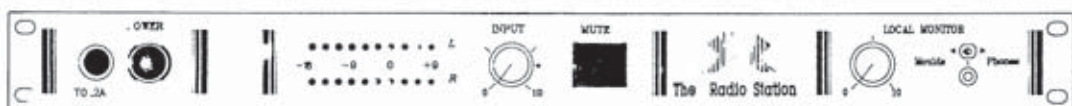
Real World Design

The Radio Station has been designed in close consultation with rental companies and artistes; a lot of thought has gone into the practicalities of its use and anticipating potential problems. Martin Noar who is the designer at **The Stage Radio Company** (who manufacture the unit) has spent five years developing the system after 10 years experience with radio mics.

Recognising that some performers would be lost without the physical sensation of bass, the system has been tested and proven alongside conventional monitors fed with low frequencies alone. There's also the possibility of setting up ambience mics on stage, so the monitor signal fed to the earpieces doesn't make the artistes feel so isolated. In fact, The Radio Station can be used by individual musicians alongside full-blown conventional monitors. The earpieces provide enough acoustic isolation to override any spurious phase relationships between the two systems.



I.E.M. Tex Panels



What happens to musos who cast their earpieces to the audience - or who just prefer cans? The receivers feature a two position EQ switch. The alternate position provides EQ for conventional headphones, which can plug into the receiver belt-pack. The transmitter's monitoring section has a complementary EQ switch too, so that the monitor engineer can verify the sound experienced by performers who've chosen this option. One apparent snag is that the jack socket is the 3.5mm kind, hardly the most rugged connector in the environs of the stage. However, most monitor engineers accept that this makes emergency replacement easy (in case a new headset or earphones have to be bought in a hurry from a local hi-fi shop). The problem of accidental withdrawal is something that many sound engineers will have already perfected; generally, it involves gaffer tape.

Radio headphones are by no means new, witness Stevie Wonder's use of just such a system over four years. But past systems were custom engineered, cumbersome and moreover, incompatible with European and UK transmission standards. In other words,

ILLEGAL. . . For UK users, The Radio Station system radiates 10mW ERP on the frequencies presently allocated by the DTI for the entertainment biz. Any other frequencies in the 174 to 125 MHz range can be supplied to order for overseas users. A UHF option is anticipated in the future. This will open up the number of channels available.

Early User Reports

Cane Green are the first UK rental company to equip with The Radio Station. They've been running a pre-production prototype for four months. They plan to have six Radio Stations on the road as soon as they're available. By the time this article is published, production will have begun. Sound engineer, Chrys Lindop, is a great advocate of 'discrete' monitoring, having first experienced it when mixing for Stevie Wonder. He's set to use Personal Radio's system during the Rick Astley US tour this autumn.

He reports: "For a sound engineer, it's wonderful, because it brings down levels on stage. . . making it easier to operate because there's less spill. The whole sound tightens up significantly. My pet hate used to be that

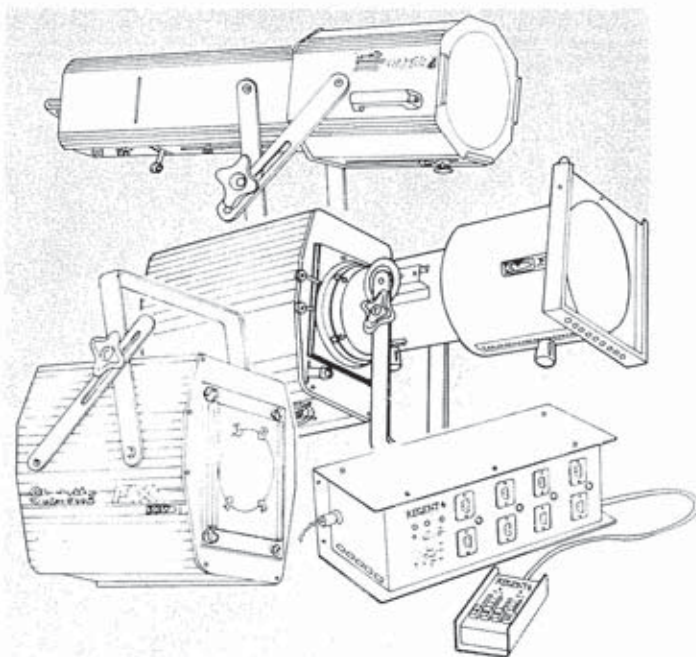
almost everytime I was called up to the stage, it would be to sort out the monitors. It was timewasting and frustrating. . . I wanted to be outfront, mixing, not worrying about monitors!"

Another system is already in use by 'The Outfields' drummer, Paul Reed, and touring the USA. Paul reports: "It would be impossible to improve this system of monitoring. At first I was using it along with my ordinary bi-amped wedges as I wasn't sure about it. But now I've dropped the wedges altogether and used The Radio Station totally. I can't see anything bettering it."

The Stage Radio System is distributed by Personal Radio Systems (UK) Ltd., Unit 2, 12/48 Northumberland Park, London N17. Telephone 01-801 8133. Export enquiries: Roma Vincent. Telephone (0372) 728481.

Personal Radio Systems are able to demonstrate The Radio Station. Although specially moulded earpieces are obviously ruled out, there's a choice of four sizes of off-the-shelf earpieces.

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