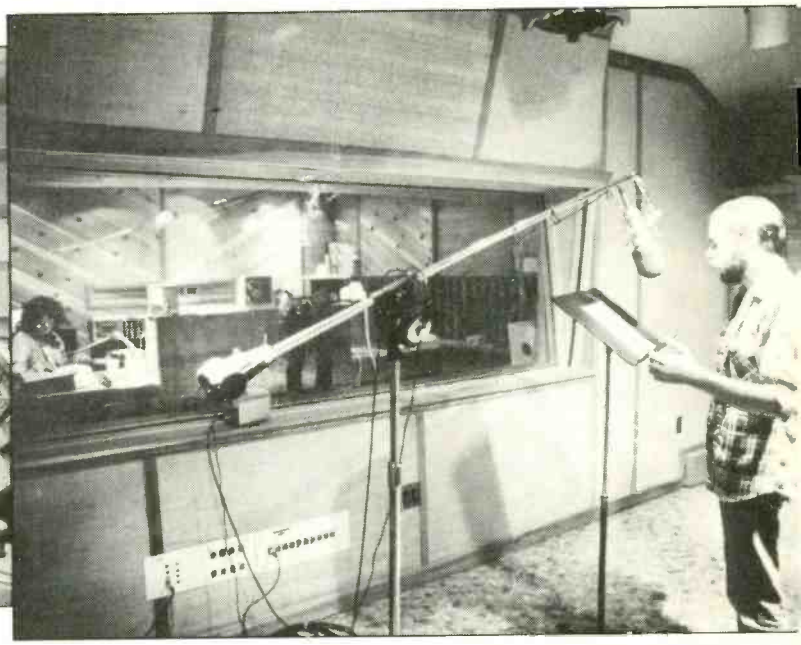
# studio diary



**Left:** *Control room of Studio A, the largest.* **Above:** *the small Studio E.*

## Filmways/Heider—San Francisco

In the October issue (p.33) we covered the Los Angeles end of the Filmways/Heider empire. This month, in strong contrast, their San Francisco studios which, although being part of a corporate giant, have a small friendly (although business-like) atmosphere —similar to many large but independent studios. However, although in operation for 10 years, Heiders San Francisco are *not* independent; their budgets are firmly controlled by the powers that be in LA, but I definitely got the impression that they'd wish to control their own destiny given the choice.

Second engineer Marnie Moore showed me the studio complex which consists of one small and three large studios; the three large studios each have a grand piano, each tuned twice a week. There is also a games/rest room, copy room, maintenance area and outboard equipment room.

The small studio 'E' on the first floor is used almost exclusively for media work and contains an extensive sound effects library. It is occasionally used for very crowded 24-track music sessions and has an in-house designed custom console with Klipsch monitors.

On the same floor is studio 'C', a favourite with many, which is equipped with MCI board, 3M and Ampex tape machines, Urei limiters and Altec *604* monitors. It's a very live studio with hard surfaces on floor, walls and ceiling. But at the same time, the characteristic of the room can be varied enormously with numerous folding wall panels. It smacks of the Sixties in terms of decor but is due for a face-lift.

Still on the first floor is studio 'D' which is in the final stages of remodelling. It will include a brand new Neve 24/32 console, replacing a custom DeMedio (a great board built for 16-track updated to 24-track but finally had its day), Urei time aligned monitors and new Yamaha amplifiers replacing the old Macintosh tube amps evidently giving a cleaner high end. The studio is 15x30x13ft, much the same size as 'C' but dimensionally different and acoustically much less live. The present reconstruction did not change the acoustics of the studio (simply the look) but the acoustics of the control room have been improved significantly: the whole back wall having been redesigned eliminating previous problems with bass standing waves. Ancillary-wise, the room is permanently equipped with Urei limiters, Eventide delay unit, API equalisers and *Kepex* gates.

Downstairs is the largest studio, 'A', it is 20x35x12ft and, on my arrival, a session using a 24-piece orchestra had just finished. The board is another Neve almost identical to that of 'D' but with four more inputs. Apart from the standard 3M 24-track 'A' also has a new *ATR100* while outboard equipment has the standard Urei limiters as well as Pultec, Lang and API equalisers.

On to the copy room, devoted mainly to media, duplicating cassettes, mono, 2-track and 4-track reels simultaneously; plus the maintenance area which is very business-like and tidier than most I've seen with a full-time crew of three by day, two by night and one on standby.

So what happened to studio 'B'? Well, it became the games room with pool table, pinball and refreshments.

The outboard equipment room is well stocked with Urei limiters, Pultec, Lang and API equalisers. Eventide DDL's, an ADR *Vocal Stresser*, which is soon to be augmented by a *Scamp* system; and probably the largest collection of microphones in the West, enabling three full sessions at any one time. In addition to all this, an echo facility consisting of two EMT plates, two large and two small live chambers—more than adequate.

Marnie had to cut off the tour at this point to do some engineering leaving me with Ginger Mews (studio manager) who gave me some background information to Heiders SF.

Ginger has been with Heiders since day one with a brief sabbatical elsewhere. On April 27, 1969, Wally Heider opened the San Francisco studios after Filmways bought his LA operation—that makes this year their tenth anniversary (and their anniversary party was a lot of fun . . .). The studio started with one room. What is now the games room was planned to be a mix room, but a space was needed for people to 'hang out' which is why there is no studio 'B'—the same thing happened in LA incidentally, eliminating Studio Two.

Jefferson Airplane were their first clients and still use the studios regularly as Jefferson Starship —but just about every local band has used Heiders—the Grateful Dead were regular customers until they built a studio of their own.

The studio was the first 16-track and 24-track in town, and in those days there was little competition making it a lucrative period for Heiders. Then in the early Seventies masses of small studios opened their doors. With the growing competition and the 'SF Sound' changing, many studios were forced out of business . . . Ginger philosophises: "What with the problems of clients always demanding the latest equipment, so much of which is fashionable and short-lived in popularity, all of which is expen-

**Above:** *Control room of Studio C.*
**Right:** *Studio D nearing completion.*

sive; if you don't have the capital to stay out front (you have to put up the money before you can get it back) and find that clients dislike what you've bought, you don't survive. For example, for years Heiders wanted a Neve console. When we finally got one, the first client to come in said: 'Oh I never work with Neve so I can't use the studio'. Whatever colour you paint the walls there will always be someone who won't use the studio because it's the wrong colour. You have to accept that you can't please everyone."

"Still, it's hard sometimes for the big studios to make ends meet unless they can charge a very low rate. Heiders finds this hard because they have a large overhead including 22 staff which makes it impossible to offer the studios for $20 an hour—the PG & E bill exceeds that."

Within the last year, San Francisco has been enjoying a renaissance while Los Angeles has remained relatively static. "A few years ago local people were saying LA is the place to record and wouldn't think of San Francisco. New producers are looking elsewhere and San Francisco is one of those places (like Seattle and Florida). New York is trying hard to improve their recording industry but are being forced to ask $250 per hour in many places plus it's an expensive place to stay."

Heiders avoids many of the problems caused by the whims of the music industry by opening its doors to the media. Advertising is a constant source of income and is good 'bread and butter' money: hence the decision to build the Media studio which allows the bigger studios to continue their function as music studios which would otherwise be tied up wasting space as well as sophisticated equipment. This also means Heiders can charge less for the Media studio. When the music studios aren't making music, then it's media that fills those too—often with very large budgets.

As to the future—opportunities in the Bay Area are improving and looking good. "There is no way of knowing how long this will last . . . record companies are not giving the budgets they used to, and of course the economy, oil and record prices going up all play their part . . . but it looks good for at least another two years."

It does indeed look good for Heiders—with as much media work as they need, several film soundtracks completed recently (including *King of the Gypsies*) and an expanding film industry in the Bay Area promising more of the same; with Sammy Hagar in 'C', June Millington in 'A', 'D' almost completed, and bookings ahead with the likes of Allen Toussaint and Greg Kihu to name but two . . . many thanks to Ginger and Marnie for a very interesting and pleasant visit to Filmways/Heider, San Francisco. **Enbee**

Filmways/Heider Recording, 245 Hyde Street, San Francisco, California. Phone: (415) 771-5780.

## Soundpush Recording Studios, Holland

When you are a leading jazz musician in a country too small to support a really top-flight jazz scene you have several choices. If dedicated enough, you can keep on playing your kind of music to a limited public for small fees, or you can go abroad. On the other hand, if you want to stay in your own country, and be happy and make money, you have to find something else to do. That was the position facing Frans Mijts, one of Holland's top horn players, some 13 years ago. Like many musicians before and since, he decided to get into the recording side of things. Unlike most musicians, he started his own studio, Soundpush, in Blaricum, and in the intervening 12 years it has won itself a good reputation as a solid, no - nonsense, friendly studio.

"The studios in the Netherlands were generally so bad 12 years ago, that I figured a decent one had to succeed. One of my first priorities was to have a different sound to anyone else, using different equipment. At that time Sony were making a cautious entry into the market, and I ordered one of their 8-track consoles. When it arrived it turned out to be fixed construction and not modular, so I sent it back. Sony then phoned me, and offered me a month's paid trip to Japan to specify what I wanted. I went, and the result was a fantastic console. It was the only one they ever made. I had it for years, converting it from 8- to 16-tracks, and used it to mix international hits like *Venus* by Shocking Blue, and *Ma Belle Amie* by the Tee Set, which was a big hit in the States. Unfortunately there wasn't enough room to expand it further, so when 24-track came along, we let it go for a 'sentimental' price to a small studio where it's still giving great service," says Mijts.

Soundpush is in fact a converted variety theatre on the outskirts of Blaricum, in the Hilversum area. There are two studios, a large 24-track, and a smaller dub studio recently converted to 24-track. Before converting it to a studio, Mijts looked at 'The Eastlakes and the Westlakes', finally doing the conversion himself with Adrian

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Kerridge of Lansdowne Studios and Clive Green then of Cadac. Being a theatre, the original building already had reasonable acoustics and the original auditorium and podium are still recognisable in the 2690 sq ft studio. The podium is still used by bands recording sessions for radio and TV. A new drum booth, with corridor, and a trapped bass cabinet were completed in 1978, when the control room also underwent a complete redesign and rebuild. Since then it has had a nasty attack of the ubiquitous shaggy red carpets, as has the control room for Studio Two.

The present set-up in the control room of Studio One is a Cadac 24-track mixing console, 16-output, four echo send and eight return channels. Recording is on Ampex *MM1200* 24-track with 15/30 in/s and Dolby *M24H* unit, two Studer *A80-RC*s with Dolby *A361* units. Studio monitoring is with JBL *4343*s, with Tannoy *HPD 385A* driver units and Auratone's. Amplification is with Harman Kardon *Citation 16*, H/H *TPA 100D* and Quad *303*s. A special Soundpush cellar, and EMT stereo and mono plates, provide reverberation. There is an impressive amount of peripheral equipment including an Altec Lansing *Acousta Voicette* 2x24-way equaliser, Rebis stereo limiters/compressors, Synton time machines and bandfilter/phaser, Audio & Design *Vocal Stressers* and sweep equalisers, Eventide *Harmonizers* and *Instant Flangers*, Aphex *Aural Exciters*, Urei limiting amps, Allison Research's *Kepex* and *Gain Brain*, an H/H echo unit and Soundpush's own special purpose limiters. Microphones include a wide range of Neumann, *U47*s, *U67*s, *U87*s, *VF14* and nuvistor, *KM84* and *86*, Sony *C38*, *CB12*, *C57* and *C500*, Electro-Voice *RE20*, Sennheiser *MD421*, Shure *SB545*, and AKGs *D707C*, *D12* and *D202*.

Soundpush specialises in shorter bookings for Studio One, and like many smaller studios it has had the galling experience of having to turn down big-name acts who wanted 3- or 4-week occupation. Both the Rolling Stones and David Bowie have been interested in Soundpush, but as Mijts says: "For three weeks, I might have to put off 20 regular customers, and you simply can't do that and survive".

However, Studio Two will be block-bookable, but for a day or days throughout the year. In other words, one might hire it for every Monday in the year. So far Monday, Tuesday and Wednesday are fully booked for the first year. So perhaps this will give better flexibility for longer bookings. Studio Two will be completely up to the standard of Studio One, when completed and the emphasis will be on easy operation (Mijts is thinking about a computerised console) as the studio will not supply engineers, merely technical backup if needed. Soundpush has two permanent engineers, Jan Schurrman and Maarten Hartrich, and uses a number of freelancers including Englishman Jay Denson. Engineers come expensive in the Netherlands, Hfl 60-70,000 per year, and Mijts is more than happy to use freelancers or for musicians to 'bring their own'. "Most engineers are virtuoso jugglers rather than technical people here, but even so it's difficult to keep up a fresh supply. It's difficult for a senior engineer to get enthusiastic about some thinly talented group. But that enthusiasm has got to be there. Even when English lyrics have literally to be added word by word the engineer mustn't get cynical. You can only do it for a while. It's a young man's game, like football. So the situation with Studio Two is perfect. The people who have hired it so far are independent producers working for big companies, the three of them all have their own key, so it makes it very easy for us from an administrative and personnel point of view."

Talk of jaded engineers and 'endless dubbing' of lyrics, points to Soundpush's main market; standard and progressive pop with a fair bit of TV and radio session recording, film music, advertising jingles etc. Most of the internationally known Dutch artists, George Baker, Golden Earring, Kayak, Lucifers Friend, Earth and Fire, Ekseption and so on have recorded here. The whole Dutch WEA stable in fact are regulars here, and Jan Akkerman and Kaz Lux recorded their album here.

"We used to be known as a jazz studio," says Mijts, fondly recalling sessions with Ted Jones and Mel Lewis. "One, two, three take, and that was it. The better the musicians the less problems you had. A lot of musicians nowadays are inclined to think they can adjust things on one of the 24-tracks, so it doesn't matter if it's not quite right."

While *Studio Sound* was at Soundpush there were two different sessions taking place; a girl singing group (who sounded like they would need every special effect known to man) and the 'Gijs Hendriks Quartet', one of Holland's top progressive be-bop groups, who complained about the difficulty of finding a good jazz studio. "Everything nowadays, in Holland at least, is geared towards the pop band. It's difficult to recreate the spontaneity and get the same feeling when you're surrounded and cut off by soundboards." It's also difficult to turn an engineer's idea around to the needs of a jazz band if he's recording pop all week. It takes a little time. However, they worked it out at Soundpush.

"All musicians are unsure," says Mijts. "If you tune the piano to 745 they want it 746; a chronically unsatisfied breed." **Bill Third**

Soundpush-CMS BV, Huizerweg 13, Blaricum, The Netherlands. Phone: (02153) 86050/86638.

## Fun Recording Studio, Munich

Situated near what one might call the 'university' quarter of Munich in a mews-like building is Fun Recording Studio. In common with some small studios, Fun is the offspring of a demo studio-cum-rehearsal room of a group, in this case the Munich based Fun Band. Because of the influx of hopeful musicians to the city, the 'studio' had an active market doing demos and similar things, thus providing the impetus to become a fully fledged professional studio catering for the up and coming groups and musicians who wanted or needed professional facilities but could not pay for long hours in a large established studio. The studio has not forgotten the Fun Band either and it is often the driving force behind the studio's productions, either on the group's behalf or providing musicians for sessions as well as bringing in customers. Though Fun Studio certainly has that 'do-it-yourself' aspect, this is in no way a derogatory way of looking at the premises which positively exude a relaxed and friendly atmosphere as well as providing a pleasant acoustic. The overall tone is fairly subdued and suitable for pop and rock recording. Musically, the lack of luxury often has a beneficial effect as some groups tend to be overawed by the slick presentation of a 'top' studio and as a result the recorded performance may be substandard. With a small studio such as Fun they immediately feel at home, as if they were in their own rehearsal room, and can get on with the job in hand without worrying about the recording process too much. Obviously, as the studio expands—and with it, hopefully, the bank balance—improvements will be made and by the end of the year the actual area will be augmented to include the second half of the present building when the lease runs out for the present occupants. However, the low-key presentation will be kept in order to maintain the studio's established identity. Roadies also like the studio because it's situated in a courtyard with direct access to the ground floor load-in, so parking and humping are no real hardship. On arrival I was met by studio manager Bernd Fricke, also PA engineer for the Fun Band, who was to show me around the premises.

Coming off the courtyard is the entrance lobby, which also serves as an office, from where you can pass directly into the studio. This could be classed as a small to medium studio as 10 musicians could play here without feeling the effects of overcrowding. Additionally there are two small isolation booths, one intended for vocal with a very low reverb time and a second for instrument overdubs giving a much more lively sound. The drum booth also displays a bit of home-grown ingenuity. Instead of being a closed box with a door or an area sealed off with half-screens, the entrance is baffled with three perspex and glass screens giving open vision into the studio for the drummer and at the same time providing a very good isolation. With the planned expansion, the drum booth will be used to form part of the new control room which, if you look at the present floor plan, would be a logical extension. Resident instruments in the studio are drum kit and concert size grand piano. However, there are usually pieces of equipment from the Fun Band trailing about and instruments can be brought in at very short notice should they be required.

In the small control room engineer Uli Rudolf was setting up for a mixing session with provision for a couple of possible overdubs. A small control room does not necessarily mean small equipment —in both senses of the word—as witnessed by the two enormous Cadac monitors (the twin 18in variety), Studer *A80* 16-track and 2-track recorders, 22/8/16 custom desk and outboard equipment. It is also easy to see why Fun want to enlarge their control room! The desk has been custom-built from GTC modules and has 22 inputs, 8-outputs, 16-track monitoring which can be used as auxiliaries during mixdown, with foldback facilities of one stereo and three mono sends. The total adds up to

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quite a flexible desk when you also include the very respectable patch-bay that has been wired in. Metering is by NTP light beam units and also built-in to the console are five Roger Mayer noise gates and Audio & Design *Vocal Stresser* and *F760RS* comp-limiter.

Other effects equipment consists of the almost inevitable A & D *Scamp* rack with noise gates, compressors and the popular *S24* ADT module, Eventide *Harmonizer*, Aphex and Countryman *968* phaser. The Aphex is there because of the magical connotations it seems to have for groups and not so much for what it does. The Countryman must be one of the nicest phasers around even if it is pretty much a rarity, capable of very subtle sounds, especially when used in conjunction with the plug-in triangle wave oscillator. It goes almost without saying that Revox are represented but this time with an *A700*. Microphones are the habitual collection of Neumann and AKG, etc though there are several valve *U47*s for the benefit of the connoisseurs. One question that posed itself was why such large monitors for a small room? Simple, they were almost new and going for a very good price! For small studios budget problems have to be carefully weighed in the balance, perhaps a bit more than with larger studios and when good equipment is selling for bargain prices it would be foolish to let it pass by. Certainly upon hearing the results their choice of equipment seems justified and once the new control room is built things will be even better.

All in all, I found Fun Recording Studio very aptly named. Towards the end of my visit the musicians for the session came in and started getting warmed up and it was evident that they were going to have fun! A welcome change from the sometimes too serious aspect of the recording world and once again demonstrating that variety is what keeps our industry from going stale. You can have fun at: Fun Recording Studio, 120 Leopoldstrasse, Munich. Phone: (089) 397868. **Terry Nelson**

*Uli Rudolf at the controls of Fun Recording.*

## Polar Music Studio—Stockholm

The ABBA studio project started way back in May 1974, when the possibility of having our own studio was first discussed. The actual studio was not opened until May 1978, so it took quite a long time, even for a project this size.

In 1974 nobody in Sweden had heard about Tom Hidley, not even about acoustical design for that matter, but during a visit to New York we came across a very strange room—it was the Record Plant of course, and we were totally impressed. We learned that a company named Westlake was responsible for this unusual design, and eventually asked Tom Hidley to help us out. By that time Westlake was Eastlake and Tom had moved to Europe.

We had this idea of a control room in the middle of the studio floor, with full 360° vision. We had been working in so many studios where the musicians were locked in separate boxes, with communication only via the headphones, that the first important goal was to get an environment with maximum communication between the control room and the musicians.

All ABBA sessions were produced by Björn Ulveaus and Benny Andersson, who 99% of the time are out playing in the studio, and that's why communication is so important to us.

Eventually we had to abandon the idea of a control room in the middle of the studio area and settle for a 180° vision instead. But even this would take up too much studio space, so we decided on placing the control room by the back wall giving more space for the studio. Naturally Tom said "You can't build a control room with that much glass, it's impossible, but I'll do it."

We had a great deal of help from Jan Setterberg, a Swedish acoustician and Michael Borowski, an architect who helped us transform the original design to a more Swedish-looking environment. We were very anxious to get away from the night-club feeling you seem to get in modern studios.

Our studio is divided into five parts, with completely different acoustical characteristics. The first room to the left of the control room, is an isolation room, reasonably tight, with a glass door to the next room, making it a very bright room. It has glass walls and marble floor and the entire ceiling is metal, so all surfaces are highly reflective, making the room ideal for strings and big choirs and adds an ambience that cannot be achieved with echo-plates. Behind the glass on the walls are paintings that look like clouds on a not-yet-polluted sky by Swedish artist and designer Rune Söderkvist.

Next to the string room, behind a high isolation door is the tightest area. It's right in front of the control room, so we usually cut all vocal and choir overdubs here because of the high degree of visual contact. In this tight section of the studio there are also traps for guitars, bass and piano—plus the drum booth. I was very insistent in demanding a drum booth big enough for two drummers, so consequently it is just big enough for one thin drummer and one midget —playing maraccas. The booth is heavily bass-trapped with soft, non-reflective walls. These walls, however, are constructed the same way throughout the studio, with a system of 3¼ sq ft frames. If you want a reflecting wall, you simply substitute one of the soft frames with a hard surface frame—so there are millions of combinations to give a total control of the acoustical response. The grand piano is a 9ft Yamaha, slightly modified by Yamaha themselves to give a brighter-than-normal sound.

The last room is the pride of the studio. From the very first day of planning, I wanted a room with a specific sound in it, as a sort of trade mark. Most studios are so tight today that it is hard to distinguish any real difference in acoustics between them—dead is dead, I mean. I wanted a room that you recognise the sound of, even if you just hear it over the Luxembourg AM.

So we built this beech-wood panelled room—and it sounds just like Hollywood 1936! Real character, but without the muddiness, thanks to heavy bass-trapping. Horn-players love it simply because the sound of their instruments isn't soaked up by heavy carpets and absorbent walls, but they can actually feel what they are playing by the response of the walls. Another important feature of the studio is the little 5-channel mixer for every musician!

Our Harrison desk is 32-out, and since most of the time we are only using 24 tracks for recording at the same time, the last eight can be assigned to the musicians mixers as four independent programmes eg: Drums and bass in stereo—channel 1, acoustic guitars—channel 2, stereo piano—channel 3, vocals—channel 4. The fifth channel is mostly used for echoes, when wanted.

Every musician's mixer has a pushbutton which activates built-in communication microphones for connecting to the headphones, so there is always a talkback mic ready for the musicians.

There is a pair of Eastlake monitor speakers, in the control room fed by two JBL *Ice-cubes* in a bi-amplified system. There is also a pair of old trustworthy *604*s, preferred by many. The philosophy behind the control room was to carefully avoid over-trapping, but to let the room have some character. I even insisted on a wooden floor on top of all that glass, so I would describe the room as fairly live, but very easy on the ears. The result is a very bright-sounding room where you can work for hours without any ear-fatigue at all. Of course there are Auratones up on the console, and another pair built in the wall above the 2-track machines. Very convenient whenever splicing. Out in the studio there are four Philips motional feedback speakers for playback. The machines are all MCI's with the two multitracks synchronised for 46-tracks.

There are all kinds of outboard equipment—almost anything you can think of. You name it—there's two of it! Even the ancient RCA valve limiters, remember? There's a pair for stereo if you like!

For once, money was no object when we built the studio, Björn and Benny like toys—so there's everything. Vocoders, exciters, echoes, synthesisers, all kinds of drums, chimes, marimba and vibraphone, White's spectrum analyser—for those of you who strive for the ultimate flat response. The console is as mentioned a Harrison *4032*, heavily modified. In fact all the IC's are substituted for faster and better amplifiers. There are Dolby's and dbx's for those who still want them. all kinds of mics, with the AKG *C34*, which is sort of a studio favourite; it's used for overhead drum miking, stereo piano, strings and vocals—everything. It's a bit brighter-than-life, so it never needs any eq, you just plug it in and go ahead.

Some studios have a tendency to overlook the importance of a good solid coffee. The Polar coffee is high class, ABBA likes it, Led Zeppelin likes it, Mike Rutherford and Tony Banks of Genesis likes it. We may have hum, distortion and noise, but everybody agrees about the coffee —it is alone worth the 650 Swedish crowns that Polar music studio charges per hour. **Michael Tretow** Polar Music Studios, S:t Eriksgatan 58-60S-11234 Stockholm, Sweden. Phone: 08 54.06.95.

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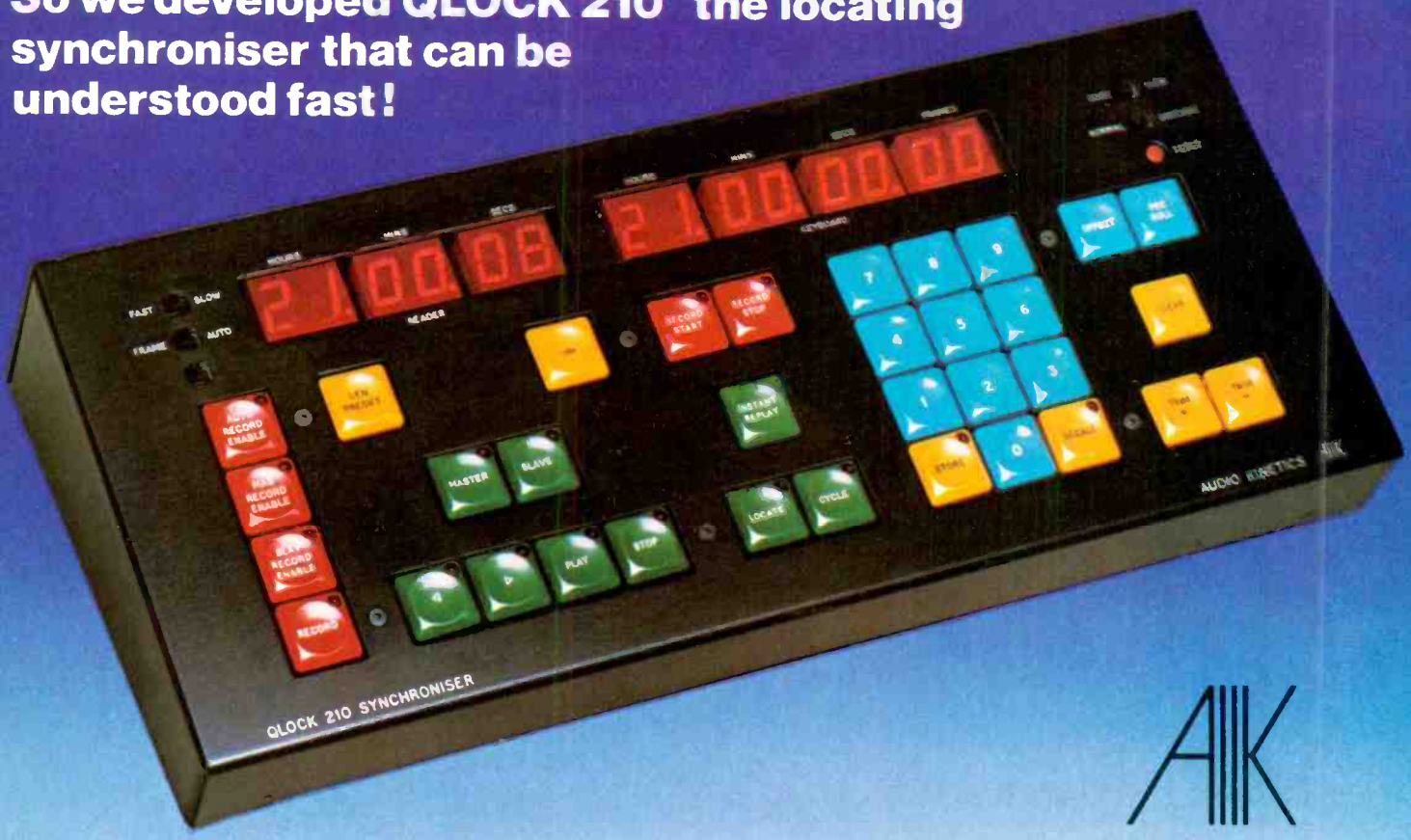


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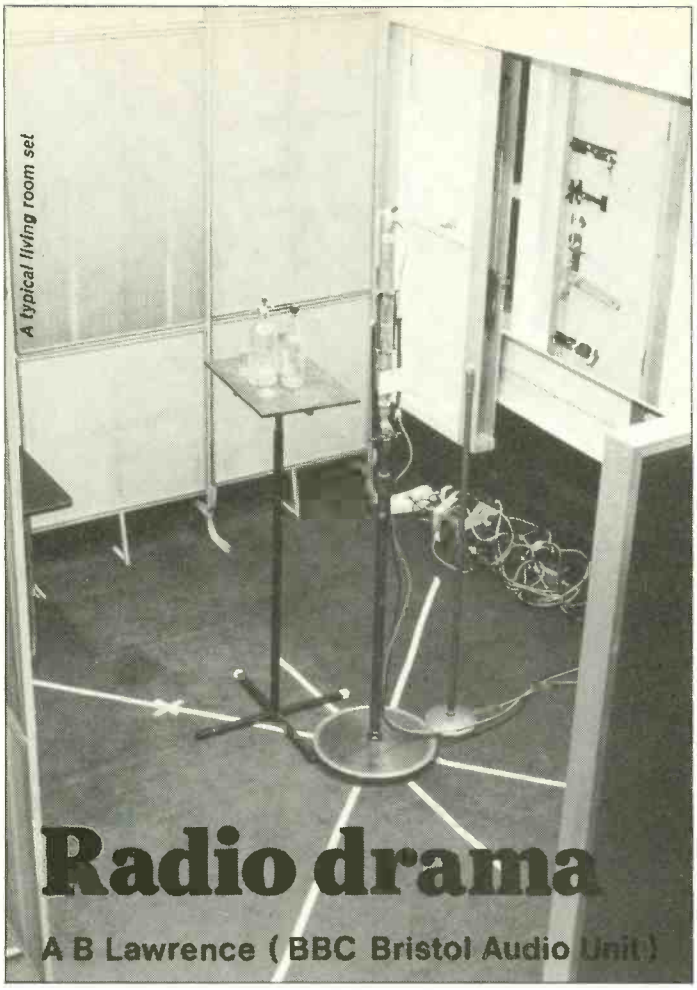


A typical living room set

# Radio drama

A B Lawrence ( BBC Bristol Audio Unit )

**Radio Drama is an area of audio engineering so far little touched on in *Studio Sound* but one where much creative work is done and on a time-scale greatly contrasting with that of most commercial music recording. The factors that control the end result in drama are more varying, more intangible, and generally more perverse than in music but they also make it a particularly interesting area to work in and one which might stimulate those readers inured to the routine of multitrack music recording. Andrew Lawrence describes how the BBC Bristol Audio Unit handles radio drama.**

RADIO Drama first started in this country in 1924 with a BBC broadcast, '*Danger*' a mining disaster lasting 20 minutes. It was a simple affair done on simple equipment and the relationship between complexity of format and equipment available was to underlie much future development. During the Thirties multi-channel control panels and multi-studios (studio complexes consisting of several differently acoustically-treated rooms) gave rise to much development of dramatic techniques—but with the abandonment of many specialised premises during the war, producers had to cope without multi-studios. Thus the techniques were modified again. Radio Drama during the war years became a major focal point for a wide audience—after the war, new production departments and networks and a host of highly talented writers ensured greater growth still.

During the early Fifties most of the plays were still broadcast live, but by the end of that decade recording was more commonplace to the extent where about three quarters of the output was recorded. The basic methods of approach had not changed greatly though, as a remote recording channel would have been plugged up to take the studio's output and then record a complete runthrough followed by retakes. But with further reorganisation in the late Sixties, on site recording became the norm. With the advent of stereo at about the same time with its more complicated settings, discontinuous recording became the accepted approach. It is these current processes which I would like to outline here in this article.

At the BBC network production centre in Bristol there is one big drama studio complex called Christchurch, a mile away from the main site. Here the whole gamut of radio plays is produced from 15-minute *Just Before Midnights* to 6-part *Sunday Serials*, from comedies and tragedies to all manner of inbetweens—experimental features, Nativity plays, historical dramas and science fiction. But different as the individual requirements of each play may be, the basic audio engineering task remains the same—to create a dramatic aural location in terms of acoustics and sound effects.

Christchurch Hall, built originally as a brewery, is a large stone structure with two main floors and a basement. It is particularly well off for natural acoustics. The main studio, called the Lower Hall, is on the ground floor and has adjustable carpeted and bare-floor areas, a dead room, a suspended ceiling area and a centrally dividing double curtain. Upstairs, a capacious Upper Hall, and in the basement seven chambers of various sizes, which include a disused bowling alley. Elsewhere in the building are a fully practical kitchen, a library, several offices and other rooms of various sizes, and hall areas with concrete and wooden staircases. Many of these ancillary areas are wired with microphone points and tie-lines back to the control room.

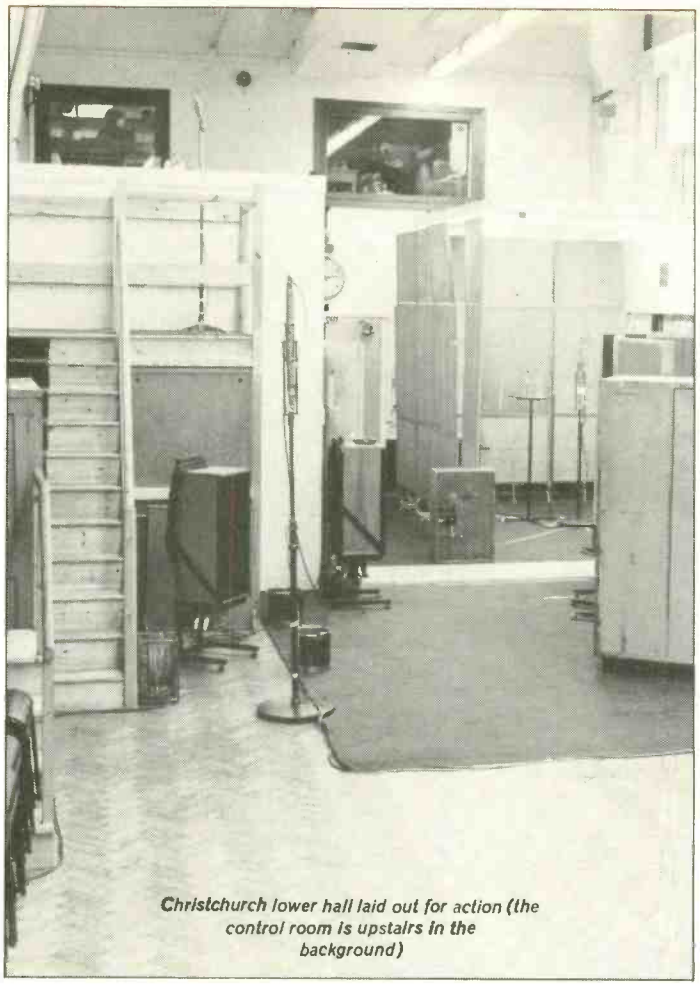
Even the exterior gets used at times, for fortunately Christchurch is situated at the bottom of a fairly quiet cul-de-sac and has cobbled courtyards on either side. Drama OB's can range as far as the nearby Clifton Downs occasionally, but this does seem to invite bad weather!

The usual crew for a radio drama is three. The panel operator (balancer) is at the helm with a tape/grams operator and a spot effects operator working to him. The tape/grams man and the panel operator work upstairs in the gallery while the spot-man looks after live effects and general stage management down on the floor.

The first job on any drama, is for the technical crew to build the sets and lay out the microphones before the rest of the participants arrive. The script and its requirements may have been looked over in a planning meeting a week or two earlier and the panel operator will from this, or from his own private study, have worked out how many different locations he has to cover and how many sets he will need to build in order to do this. Then as the actors arrive and the producer initiates a preliminary read-through, the crew members start to sort out their own particular areas of contribution. It is at this time that the spot-man may be found building a body out of carpet felt and army boots, or rummaging through the effects store to find something that will sound like a dying chicken.

There are permanent collections of spot effects items attached to most drama centres in the BBC. They contain everyday items like crockery and cutlery, glasses and bottles, boots and bells, in short anything that makes a noise. When something out of the ordinary is required, these items can usually be adapted to suit, but if not, then the required item is either purchased or borrowed.

So, the spot-man collects his



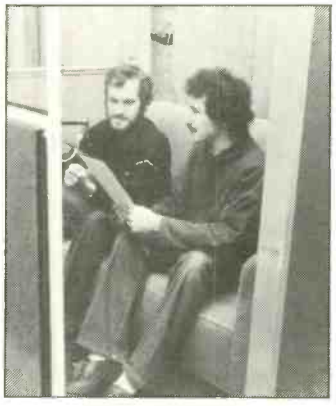
*Christchurch lower hall laid out for action (the control room is upstairs in the background)*

effects together, lays table, sorts out creaky chairs, tries to get recalcitrant effects doors to work and generally furnishes the empty sets with all the objects that will be needed to bring them to audible life.

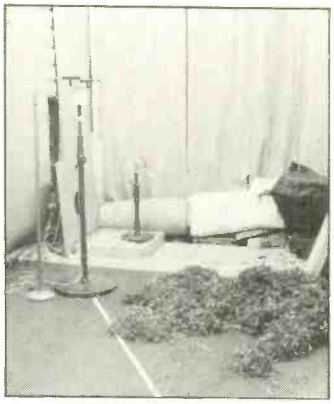
Upstairs in the control gallery, the tape/grams man will have lined up the record and replay tape machines and will now be sorting out all the recorded effects the script suggests. The present complement for Christchurch is two Studer *A80*s, three Leevers-Rich *E200*s and a Ferrograph *Logic 7* twin-track, used for tape echo and odd effects. There are also four stereo disc players (two of which have wide-range varispeed) and two mono 78 players. Each of these replay sources can be selected to one of four bussbars, three stereo and one mono, and these in turn can be plugged to the desk.

Although there is a very large permanent library of pre-recorded effects available throughout the BBC, it has been supplemented locally over the years with many tapes of successful studio effects and location recordings—mostly of backgrounds and atmospheres. Even so, there is inevitably a great deal missing, and before any recording gets under way some time is usually spent making up, say, stereo groups of horses (out of several mono discs) or building up effects montages.

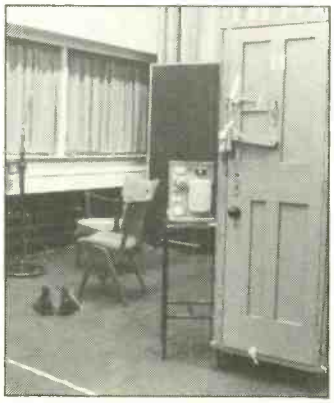
Most of those effects which require dubbing from one machine to another can be handled independently of the desk, and so this operation may go on even while the play is under way; but, due to the lack of separate loudspeaker monitoring and equalisation in this part of the system, coffee and lunch breaks are often used by the tape/grams man to put together a quick

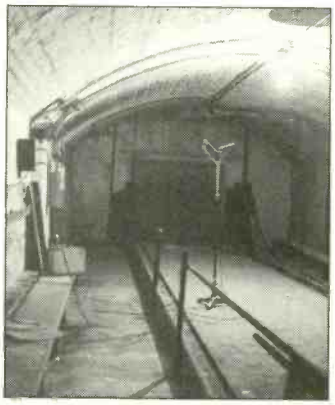


*Above: the "car" in action.*
*Below: the neighbour's typical living room set*



*Above: the dead room with rustling and gravel bed*
*Below: the basement suite No 1 the bowling alley*





naval battle or a hansom cab crash.

One of the difficulties of fitting recorded effects to a play is the elastic nature of the artistic performance. A carefully pre-timed effects sequence will quickly go astray if the actors speed up or slow down, however minimally; therefore the effects must be broken down into elements that can be handled separately and overlapped. Those all too familiar interior car scenes (changes gear, slows for light, pulls away, screech of brakes, switches off engine) look deceptively straightforward on the script but can be murder to fit in around the lines in practice. Each element may need to be on a separate replay machine from the previous one and with only a limited number of machines this may mean a lot of stopping, starting and recueing in a very short space of time!

One answer of course, would be, to dub all the effects on afterwards but this has several disadvantages. The first is that post-dubbing takes a long time. Also the absence of effects at the time of the initial recording means that the director no longer has control over all the elements under him, including the direction of actors in the correct pitch and pace relative to the overall aural context of the scene. The balancer, too, is deprived of the opportunity of match making between the studio acoustic and that on the tape/grams effects; and the cueing of the actors must now be handled separately instead of letting them take their cues from the effects.

Meanwhile, the balancer, having checked out the microphones and the desk may have a few spare moments to gather his thoughts (while horses gallop past him, or bulldozers fall over cliffs, or theatre

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balconies collapse around him) but the heavy tread of the producer advancing up the stairs means business is about to start.

In the days of live radio, the normal procedure was a series of rehearsals culminating in a full 'as-live' run-through, followed by the transmission. Even now, the odd producer will still sometimes work to the pattern established by live broadcasting, rehearsing the complete play right through once or twice and then recording the performance as a complete run. There is much to be said for it from the point of view of continuity and stylistic unity, but the extra pressure it puts on all those involved in the production may cause them to restrain from stretching themselves to their utmost, or may cause mistakes to be made which can only be rectified with difficulty. Because problems can be ironed out immediately and committed to tape while fresh in everyone's minds, a system of rehearse/recording is now more often used.

In this, the play is recorded either one scene or in groups of scenes at a time. These are rehearsed, recorded and if necessary re-recorded until they are adjudged good before there is a move on to the next recording section. The correction of small errors is often catered for by recording separate internal retakes. So, considering also that the scenes may not even have been worked on in the correct order, the reels of tape that appear at the editing session may be a lot further removed from the required end result, than would have been produced during a complete-run type recording.

Most actors seem to be able to cope with discontinuous recording and it is usually only if someone needs to leave early or arrive late, or if a musician is booked for an afternoon to do scenes at either end of a play, or if crowd scenes are to be done all together, that the written sequence of a play is broken.

By whatever method the producer works, however, he still requires plenty of intuition, inspiration and imagination from his crew and the more he can rely on them to supply his aural locations the more he can concentrate on the actors.

A complex play may have as many as 50 scripted locations and sets must be provided to cover all. This does not necessarily mean one set per location but the requirement must be broken down into how many different basic *types* of location are needed. Most simply this means looking to see which scenes are exterior, interior, or neither (thoughts, dreams and narration for example). Obviously the subtler differences between the scenes must then be analysed further. A cottage interior does not sound like a submarine, nor a railway carriage like a ballroom.

Interior locations are most often domestic rooms or offices, and these vary principally in size and acoustic 'liveness'. Usually three or four different sets will cover all the varieties of rooms required and many plays can be managed on less.

Sets will be built of different sizes and with different types of screens to control the amount of sound reflection around the set. Sometimes a roof may be added, or the permanent canopy utilised to tighten the vertical spaciousness.

The screens used are of several different types but they all have a reflective side and a sound absorbing side in common. This not only allows fine-tuning of the acoustic, by reversing selected screens, but also means that a set can quickly be changed from one sort of location to another.

**Fig 1** shows the Lower Hall studio laid out for a production requiring **A** soft interiors (bedrooms, well furnished living rooms etc), **B** hard interiors (rustic cottages, old offices and so on), **C** a small cramped room with a resonant floor (ship's cabin, attic etc), **D** a hallway with stairs and landing, **E** a telephone box, **F** a car interior and **G** various exteriors.

In addition to this there may be another set on the other side of the heavy curtains, that end of the studio usually being used for large resonant interiors like ballrooms and courtrooms. When a hard floor sound is needed, in an area otherwise laid with carpet, walking boards are sometimes used (as between sets **A** and **B**) and similarly odd rolls of carpet are available for when the reverse is required.

Otherwise the layout should be fairly self explanatory. In the hallway shown, it is intended that the listener's point of view will be from the landing so microphones have been raised to landing level on a tall stand and extra-high screens placed around to keep adequate wall reflections at this height.

Another thing worth noting at this stage is the foldback loudspeakers. These are often required to feed sound effects down into a set, sometimes just as a quiet 'bleed' from the mix upstairs to provide atmosphere or cues for the actors and sometimes as a direct feature within the set so that the effects will be modified by the set acoustics, and then reach the overall mix after being picked up by the microphones. Clocks, doors, babies and juke boxes, for instance, are often done in this way, babies are surprisingly successful, for by using a small portable loudspeaker they can be carried anywhere around the room by the 'parent'.

The usual drawback when using folded-back effects (or Acoustic Effects Reproduction, AER, as it's known) is that very often, however good the loudspeakers and microphones involved, a boxiness creeps in from the exaggeration of frequency response errors that this 'second generation' procedure produces; so more often than not a mix of direct effects and AER is used.

Exteriors are handled in two different ways in Bristol—by using the real thing or by using the dead room (a heavily padded room with a low reverberation time). It depends very much on the script and the producer's artistic intentions as to which is chosen—factors in the decision include the acceptability of extraneous traffic noise, or whether the type of exterior is easily to hand outside. More often than not the dead room is chosen because greater technical control can be exerted and communication is easier.

The room itself has its drawbacks, it is often not big enough and it sounds boomy when actors speak close to its walls. But with careful usage and the right microphones good results can be obtained. Another problem concerning its use is that exterior acoustics are seldom in fact dead—something easily verified by clapping your hands or shouting in streets, woods and open spaces everywhere. So a great deal must be done with echo, reverberation and background effects to give realism to dead room voices. However, too

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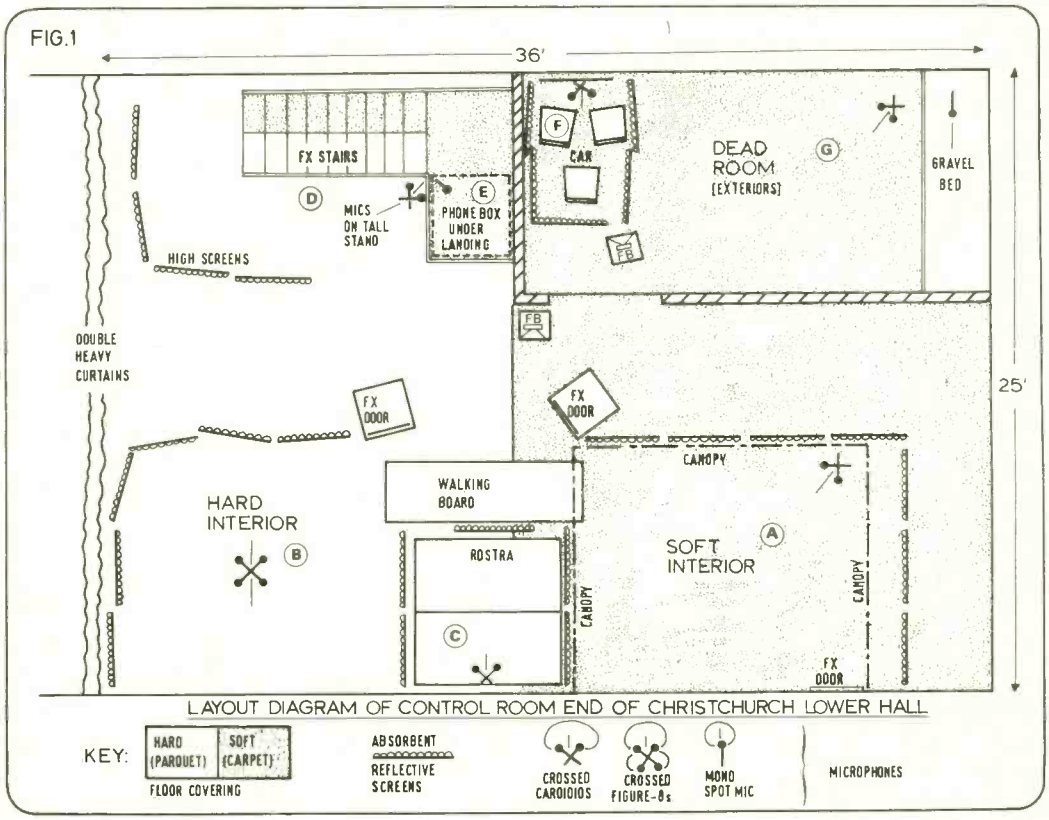
FIG.1




LAYOUT DIAGRAM OF CONTROL ROOM END OF CHRISTCHURCH LOWER HALL

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# Radio drama

exciting an exterior sound may be confusing to a listener and he may be distracted from the subject matter while he tries to work out quite where the character is. Our audio memories are far poorer than our visual ones and the complexities of exterior reverberation and ambience are best compromised with something that is at least readily identifiable and so the convention of an only slightly modified 'dead' exterior has become the normal practice.

A lot depends on the actors in this sort of scene setting. People naturally tend to pitch up out of doors, especially in windy or noisy environments, and it will make all the difference if an actor can match his delivery to the supposed location.

The Christchurch dead room is commonly used to provide an interior car acoustic. Cars are a strange combination of absorbent and reflective surfaces inside. To achieve this acoustic for radio a car set is built in the dead room made of screens and chairs laid out in a more or less realistic fashion. Even a perspex panelled screen is placed where the windscreen would be, and the microphones are placed immediately in front of this, inside the car. Interior running noises are fed in via a foldback loudspeaker to 'set the scene' (and get a few eigentones going) and the car is complete.

Special locations like this are a fairly common feature in plays and may present an interesting challenge to the crew's collective imagination. A list of past successes and failures in achieving unusual acoustics would take up too much room here, but all sorts of things have been tried over the years.

It often helps if there is a realistic element to whatever structure or layout is contemplated, for then the performers have something to fix their movements on. For instance a rowing boat is easily simulated by upturning a rostrum, and gives the bonus of realistic foot noises as people clamber in and out. Likewise rostra (the right way up) make a good cart.

In addition to the main studio, Christchurch has the benefit, as I have said, of having various ancillary areas. The basement in particular has proved very useful for providing tombs, vaults, caves and prison cells. Sheet metal was laid on the floor of one of its chambers for the copper-lined tomb of Roderick Usher's cataleptic sister (in a recent production of Poe's *The Fall of the House of Usher*) and in another production microphones were placed inside a sewage pipe around which the actor walked to simulate a well.

Other specialised locations more commonly occurring are telephone boxes and stairs. In the main studio there is a specially-built telephone box and a flight of effects stairs, with one side carpeted and the other plain. For stone stairs, the flight of concrete steps down into the basement is used—if necessary pre-recorded and played in on a cue.

An important factor in the creation of an acoustic is the microphone used to pick it up with—the actual type of microphone used and more importantly its position and directivity pattern.

Although a wide range of microphone types is available in Bristol, only three basic types are actually kept at the studio and hence these are the most commonly used. They are Calrec *CB2*/*C*s, AKG *C12*s and the ever popular ribbon *4038*s. These are supplemented by Neumann *SM69*s, AKG *C414*s, *C451*s and *D202*s, and Beyer *M88*s, the latter work particularly well in the dead room. due to their bass roll-off and presence lift.

The most useful microphones are those which have variable directivity patterns and special mounts have been made to allow the resident *C12*s to operate as coincident pairs, because they have this facility. The pattern selected in any situation is done so according to various criteria. One is that changing the directivity pattern changes the direct-to-ambient sound ratio of the output and variations from the classic crossed cardioids to crossed figure-of-eights, for instance, may well be to obtain a more open reverberant sound. Secondly, *C12*s and *SM69*s have four main directivity positions, with intermediate positions between them, and this is extremely useful for controlling the working stage width. If action is concentrated too much in the middle of the stereo sound stage, due to say limited floor space, a move from cardioid towards hypercardioid can effectively widen the action outwards.

Another use for crossed figure-of-eights is to give improved visual contact for the actors, because the double-sided working allows actors to stand opposite each other rather than side by side and this can be beneficial to them. But precise blocking—the planning of stage moves—becomes essential here or the situation easily arises where due to the inversion of the image on one side of the microphone pair with respect to the other, two actors diagonally opposite each other appear to be standing in exactly the same place in the stereo sound stage. There is also the danger that someone may wander into the out-of-phase areas at the sides and hence go into a positionless limbo for the stereo listener, and probably partially disappear in mono. To avoid these undesirable effects, the 'danger areas' are often marked off by lines taped on to the floor. Out-of-phase areas can present difficulties with other directivity patterns (the rear lobes on hypercardioids, for instance, giving problems when actors get too far round to the edge) but generally these effects are less severe.

The need to bear the mono listener in mind, whilst recording in stereo, is part of a discipline to which all technical operators in radio must work. But making compromises to achieve good mono compatibility is not hard for an experienced drama operator who is already making compromises with his effects and acoustics so as to augment the acting in a play rather than distract from it.

The actual physical position of the microphone within the set may be dictated by its mode of working, the need to pick up or suppress resonances, and the layout of doors and props around it. Any or all of these may prove problematical and sometimes subsidiary spot microphones may be needed to help out, as when we have to follow someone as they sit down on a sofa or get into bed. But before you get the impression that hundreds of pairs of microphones are liberally strewn throughout the studio, it should be said that much microphone moving goes on from set to set during recording breaks.

And so, amongst the (hopefully) clearly signposted labyrinth of sets and microphones, the actors set to work. There are so many variable factors in any scene of a radio play that perfection is not an obtainable goal much of the time, for if the performance is just right, the

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**Left:** *The basement suite No 1—rigging the prison cell*

**Right:** *The control room —with the author at work*

**Right:** *Christchurch upper hall. Ideal for very large interiors*

positioning may be just wrong, and if too much time has been spent achieving perfection on the effects then the actors may have gone off the boil. All the time the producer has to judge when he has obtained the best he is going to obtain or when to accept what he has obtained in the interests of leaving time for the rest. Obviously the better his crew's performance, the simpler his decisions become.

To illustrate just how busy it can be, let me dissect a scene from a recent Christchurch production (*Westward Ho!* by Charles Kingsley). The action was as follows:

A party of slaves is being led along a jungle track. A dialogue ensues between the soldiers driving them. Unknown to these soldiers an ambush party is watching them from under cover and we go to this party for their dialogue. We then return to the slave train, where an old man collapses—to disconnect him from the chain, his captors chop his hand off. We hear muttered comments from the slaves out of earshot of their guards and then return to the ambush party who launch their attack with a great deal of noise and hoo-hah. The scene finally goes out under music.

From the spot-effects man, the scene called for whip-cracks, hand-chopping, crashing about in undergrowth and sword-play. From tape-and-grams, it required jungle atmosphere, gunfire, the alarmed cries of monkeys and birds, and the playing in of music and pre-recorded sections. The balancer, fed with all these sources, plus, of course, declaiming and wailing slaves, guards and ambushers on the studio floor, had to devise how to handle the sequence so that it would be quite clear what was happening at any time, to the listener.

Because of the difficulty of having both ambushed and ambushers in the exterior atmosphere of the dead room, and yet retaining sufficient separation between them, when switching from one to another, it was decided to pre-record everything the slave train did and then play that in against a 'live' ambush party. Furthermore, in order to keep a good pace going and to allow natural cues, the slave train sequences were further subdivided into three.

Sequence One consisted of the basic noises and whip-cracking of the slave-party fading up into the first section of dialogue, and then continuing on as effects and noises only, to act as a distanced background behind the ambush party's dialogue.

Sequence Two was the second section of the slave train dialogue including the hand chopping sequence, the slaves' asides, and more general effects and noises to act as background.

Sequence Three was the ambush from the slave train's point of view. A further advantage here was that members of the cast were able to double up as members of both conflicting parties, which helped swell the ranks involved in the final attack. **Fig 2** shows all this diagrammatically.

The whip-cracks available on disc had turned out to be disappointing in sound and acoustic, and so live ones were needed instead; but the absence of a real whip and the obvious dangers of wielding one in a room full of actors required they be put on to tape. The final whip noise consisted of a cane swish played at half speed hard-edited on to a crack made by jerking two belts together. Several of these were made up ready to be played in.

Likewise, the problem of having to do perhaps several takes of the scene went against live amputation! So a pig's trotter and an axe were brought in and the sound pre-recorded during the lunch hour. A bonus here was an accidental and revolting noise made by a bit of trotter falling onto the floor, and this was added on as a gruesome extra to the basic chopping effect—'severed hand falls off'! (And we always thought they used a cabbage! **Ed**).

And so, in front of a main pair of *M88*s, the slave train sequences were duly recorded with whips and amputations played in, and with the spot-man rustling foliage and clinking weapons at the appropriate points. The slaves 'asides' were handled on a subsidiary pair of microphones away from the main pair, while the latter were 'distanced' on the fader during the slaves' lines. These pre-recordings were then banded up ready to be played in by the tape/grams operator.

FIG. 3
FEEDS TO THE MIXING DESK FOR 'AMBUSH SCENE' FINAL MIX

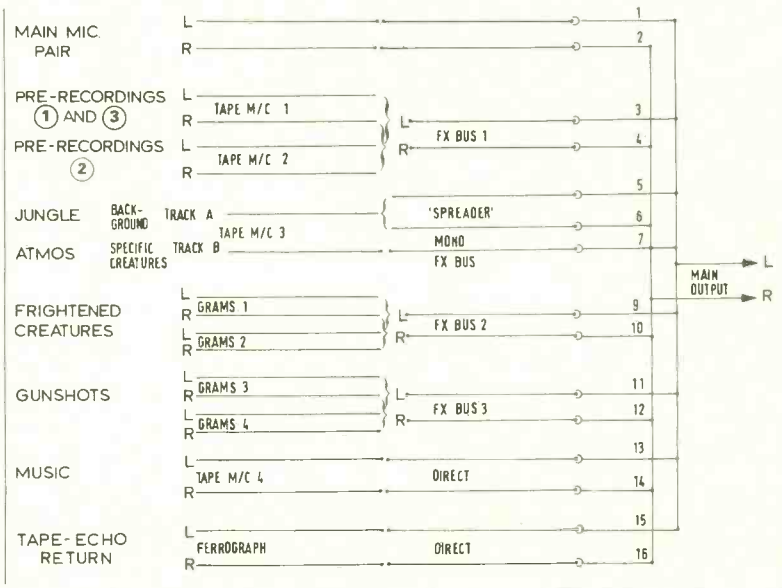
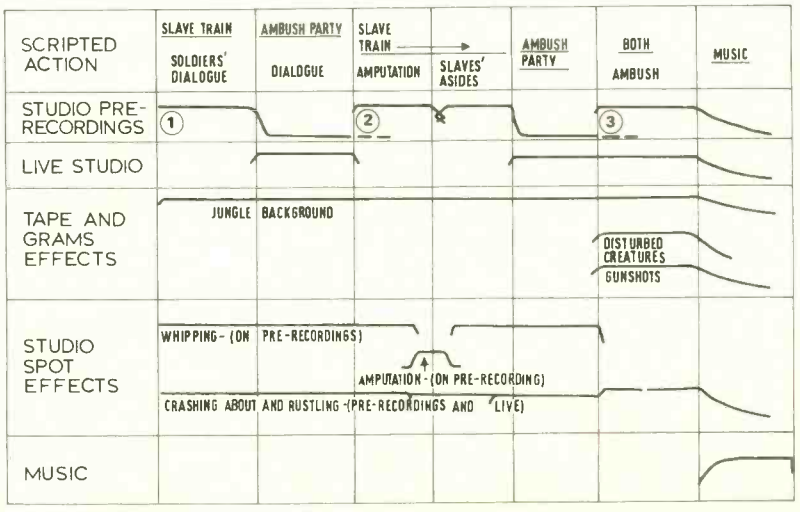



FIG. 2
CHART SHOWING THE COMPONENT LAYERS OF THE 'AMBUSH' SCENE




While the spot-man then prepared to crash, rustle and clink from the ambushers point of view, and some of the actors likewise 'changed sides', the tape/grams man set up his end of the business.

The slave train pre-recordings had been done dry of jungle background to prevent any subsequent mismatches, and this would now need to be played in throughout the scene. Stereo South American jungle atmospheres are hard to come by, so mono ones were used, played through a pseudo-stereo 'spreader', and augmented by specific animal and bird noises panned into the jungle at suitable positions. Also lined up to be played in were the noises of creatures taking fright when the ambush started, and pre-panned gunshots to

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come from the ambushers. The pre-recordings occupied two tape machines, the end music another, and tape echo was set in motion to give specific forest echoes on shots and loud shouts. The accompanying charts, **figs 2** and **3**, may help to clarify this diagrammatically.

The final assembly is now ready to commence. The pre-recorded slave train (sequence one) set off against the jungle background and proceeded to the end of the first section of dialogue, at which point the 'live' actors making up the ambush party down in the studio were cued for their lines, and the slave train was pulled back and used as a distant background behind them. Then, as soon as the 'live' ambush party had finished their lines, the slave train pre-recordings were faded forward again with sequence two played in. All this while the hot steamy jungle background played on, and added realism was gained by having no ventilation in the dead room (to avoid air-vent rumble)! When we had all winced suitably at the fate of the fallen slave, and listened to the bitter asides of those still standing, it was back to the ambush party live in the studio, and into the ambush; and following the verbal cue from the leading actor, frightened parakeets and monkeys screamed off into the jungle, gunshots played in and panned for the attackers mingled with those already pre-recorded on sequence three for the attacked, and many men, both live and recorded, stomped and yelled in a 19 × 9ft room in Bristol, recreating a great imaginary but imaginative moment in Elizabethan history. And as the final battle noises subsided under the swelling music, there was still time left to record another couple of scenes before tea-break.

Whilst most plays may have, perhaps, only one or two scenes of that technical complexity—and some none at all—it does show how much can be done in a short time. All the above was completed inside three hours including preparation and rehearsals.

Inevitably there are a few rough edges with such a scene—the odd line is a little indistinct amongst the fighting, somebody's position may inadvertently wander a little, some cues may not be taken by the participants (both on the floor and in the gallery) in exactly perfect time, but the excitement is there, and if all is going well the performance has conviction.

In some Radio Drama productions abroad and very occasionally at home, the use of multitrack working has crept in, the temptation of keeping options open to the last moment seducing some into laying submixes to be further finely adjusted at a later point. In a sequence like that above it might mean that an irritating minor error of, say, a stumbled line could be corrected, but the temptation to isolate the various elements of a drama more and more from each other, so as to give greater and greater control, can surely only be at the expense of spontaneity and of empathy between the actors, one to another and to their 'surroundings'. Greater technical control can lead, ironically, to a loss of artistic control.

In music recordings, outside of strictly 'classical' music, things are different, especially in 'pop' music, as here this detached individualistic approach has developed to where musicians can react to what is on their headphones just as well as to a live band around them; but in drama, where we are creating essentially visual images through sound, that direct connection is bound to remain essential to the process.

It is that aspect of the work which makes radio drama such an interesting field to work in. I would argue that it can be more demanding on technical skill and judgement to get a good result out of a situation where no-one has full control and nothing is quite the same twice, than out of that where almost everything is capable of control and the demands are on the ability to fine polish sound, with the only real constriction being that of the depth of the producer's purse. It would certainly be hard to think of another audio engineering job that required so much from the imagination.

And so the days go by, the scenes are all recorded, the cast says goodbye, the sets are left scattered with discarded scripts, spot effects items and full ashtrays, and the crew prepares to abandon ship to the local cider house only 45ft from the front door.

The recorded tapes will be edited the next day or so by one of the crew, and any retakes cut in, fluffs cut out, and then the whole thing fine edited to the time required to fill the available network slot. By the time the play is actually transmitted, the studio will probably have been converted from Elizabethan South America to Victorian Wapping, to present day Bristol, but with each passing play some small feature somewhere takes on a new permanent identity—"that's the body we dropped down the cathedral steps—that graffiti appeared during episode five of *The Woodlanders*—that was the guitar we broke for *The House of Usher*—Oh heavens! There's that pig's trotter we used in that amputation scene four weeks ago. Get a shovel, quick!" ■