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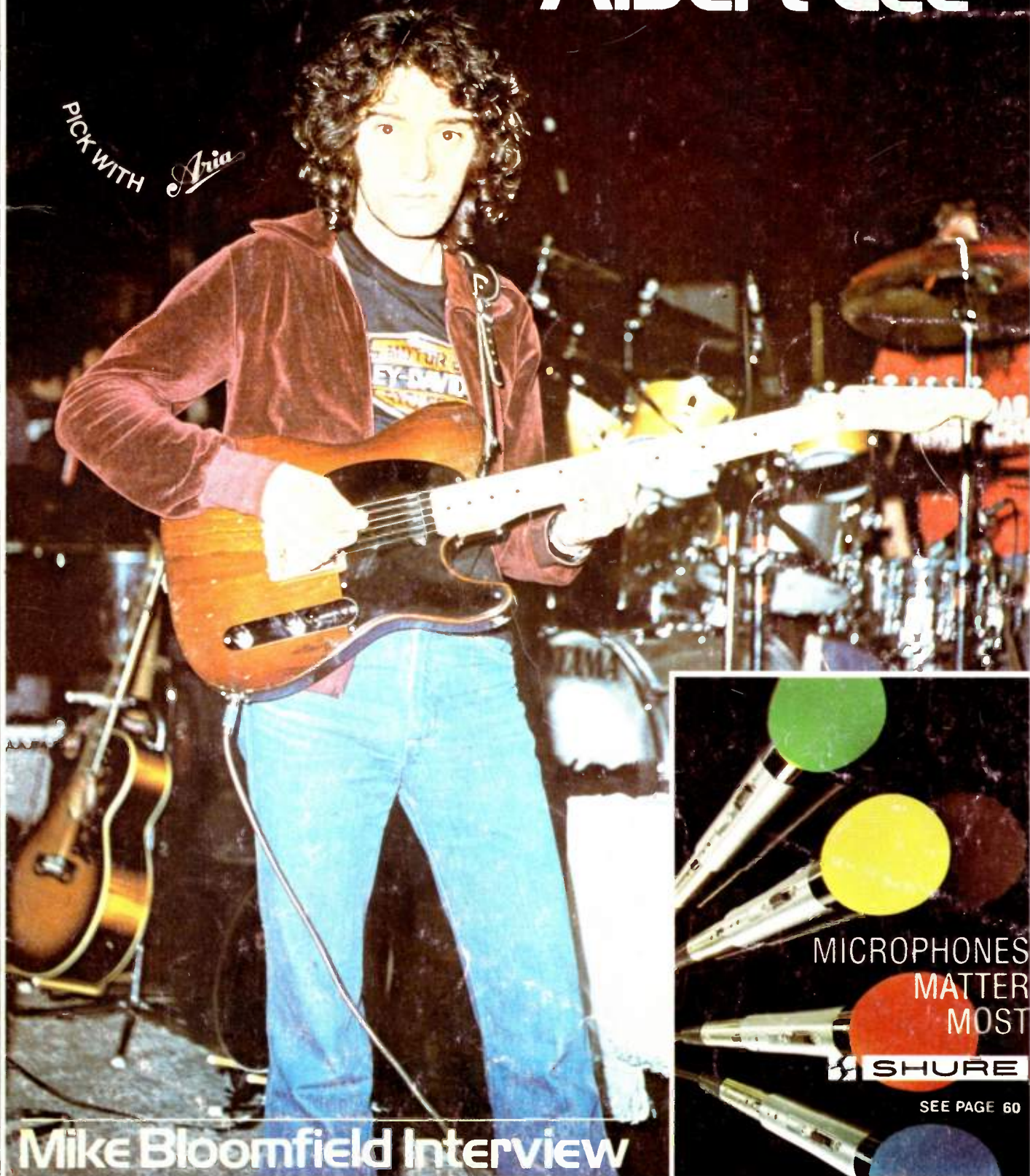
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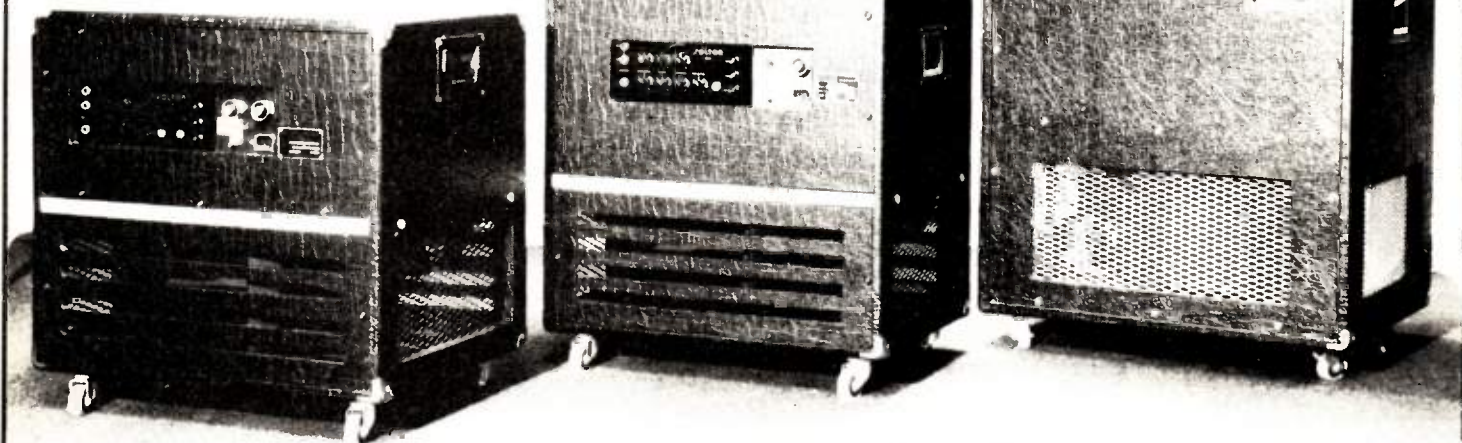
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This month Ken really does put a host of 15" units through their paces (not last month as we said in the Test Section).



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on the lower strings of certain recently made bass guitars. That is not really the same as your interpretation that the use of maple wood could account for a lack of resonance on bass guitars low E. That is not what I said at all. I agree that Precision basses are generally very resonant instruments. I regret that at the moment it would be difficult to explain opinions about mechanical impedance and string vibration envelopes without giving specific examples and to be fair to all manufacturers concerned I would need to take a very large sample in order to get a representative result. As time prevents this at the moment they must remain an opinion of mine and I would rather not say anything more publicly at the moment.

I shall try in the near future to provide a short article as you request on things to look for when buying a guitar and bass and I shall certainly attempt to review more bass guitars. Very few seem to have come for review recently, I don't think there is any particular reason for this but I shall try to put the balance right in the next few months.

Stephen Delft.

Shining a Les

Dear Sir: I recently purchased a beautiful new Gibson Les Paul Custom (Ebony) which I am delighted with, unfortunately I cannot polish it up to a very glossy, smear free finish. I have tried Gibson and Selmer polishes but they aren't very good, could you suggest a good polish?

The other day I was reading an Ovation catalogue and it said they use some kind of a Polyester finish which is scratch-proof, could you coat my Gibson with something like this as the black tends to show up any tiny scratches on the surface, and if something like this was applied would it really prevent these small scratches and how much would it cost me.

P.S. Keep up the good work in International Musician.

Keith More,
Edinburgh.

It is just possible that there may be some manufacturing problem with the lacquer on your new Les Paul if you cannot polish it to a very glossy, smear free finish, as you say. The polish that I use on difficult finishes which ought to come up well and don't is made by Herco and I think it is distributed by Strings and Things which you can get from your local music shop if you try hard.

You also mention that your guitar marks easily. This seems strange for a black guitar. You might be well advised to take the advice of a good repairman at this stage on whether the lacquer is as hard and well finished as it ought to be.

As for the Ovation lacquer it may be possible to put a Polyester finish over the Gibson. This would depend entirely on what the Gibson is finished with and what sort of Polyester and although it may be possible, the chances of success are very small. I would certainly not

advise it. I think you should consider how to get your present guitar lacquered into a smooth and glossy state if that is what you want.

If your guitar is very new it is also possible that the lacquer hasn't hardened sufficiently yet. Again a good repairman should be able to tell you this.

Stephen Delft.

Sixties' Freak

Dear Sir: I am an ardent collector of US/UK released Sixties records. A friend of mine recently told me that you may be able to direct me to retailers or magazines dealing in this type of output.

I would like to point out that I am interested in the US released items as well as those to be found in our own country. I would be very grateful if you could help, and when you do reply could you tell me what you specialise in, in order that I can direct any interested parties to you.

Rob Lythall,
Leicester.

You might be able to find what you want at the following addresses:

Cruisin' Records, 27 Turnpike Place, Crawley, Sussex.

Oldies Unlimited, Department M., 6/12 Stafford Street, St. Georges, Telford, Shropshire, TF2 9NQ.

Record & Tape Exchange, 90 Goldhawk Road, London W12.

Curio's, 453 Edgware Road, Maida Vale, London W9.

Hope this is what you are after!

Beyer Mike

Dear Sir: Living on a remote but well-populated Scottish island I find your magazine provides an absolutely essential service. Not having a specialist dealer within reach, local musicians tend to rely on mail order for the purchase of instruments and equipment, and to base their choice very much on tester's opinions.

I was very pleased to read Ian White's brief report on one of my favourite microphones, the Beyer M260N, in this month's issue of I.M.; if this is identical to my mike, however, it is neither new nor a dynamic microphone. Having owned one for 12 years. I can assure you that it works on the unfashionable ribbon principle. This accounts for the proximity effect noticed by the lead singer in the report — i.e. the bass tip-up on close working. Some vocalists see this as a disadvantage although careful attention to tone controls should remove any problem. I can vouch for all the good points mentioned, and can add two of my own; firstly, although ribbon mikes are supposed to be more fragile than dynamic types, mine has withstood 12 years of hand-to-hand combat in various groups and bands; secondly, it makes an excellent recording mike. Mine is now in service here in the studio, and giving a top-end performance unmatched by the dynamic products of your "major American manufacturer".

Noel Eadie,
Isle of Lewis, Scotland.

According to Beyer the M260N is a brand new model and although the mike is indeed a ribbon mike, Beyer Dynamic is the name of the brand.



Steve Howe: Imagine his Les Paul polishing problems!

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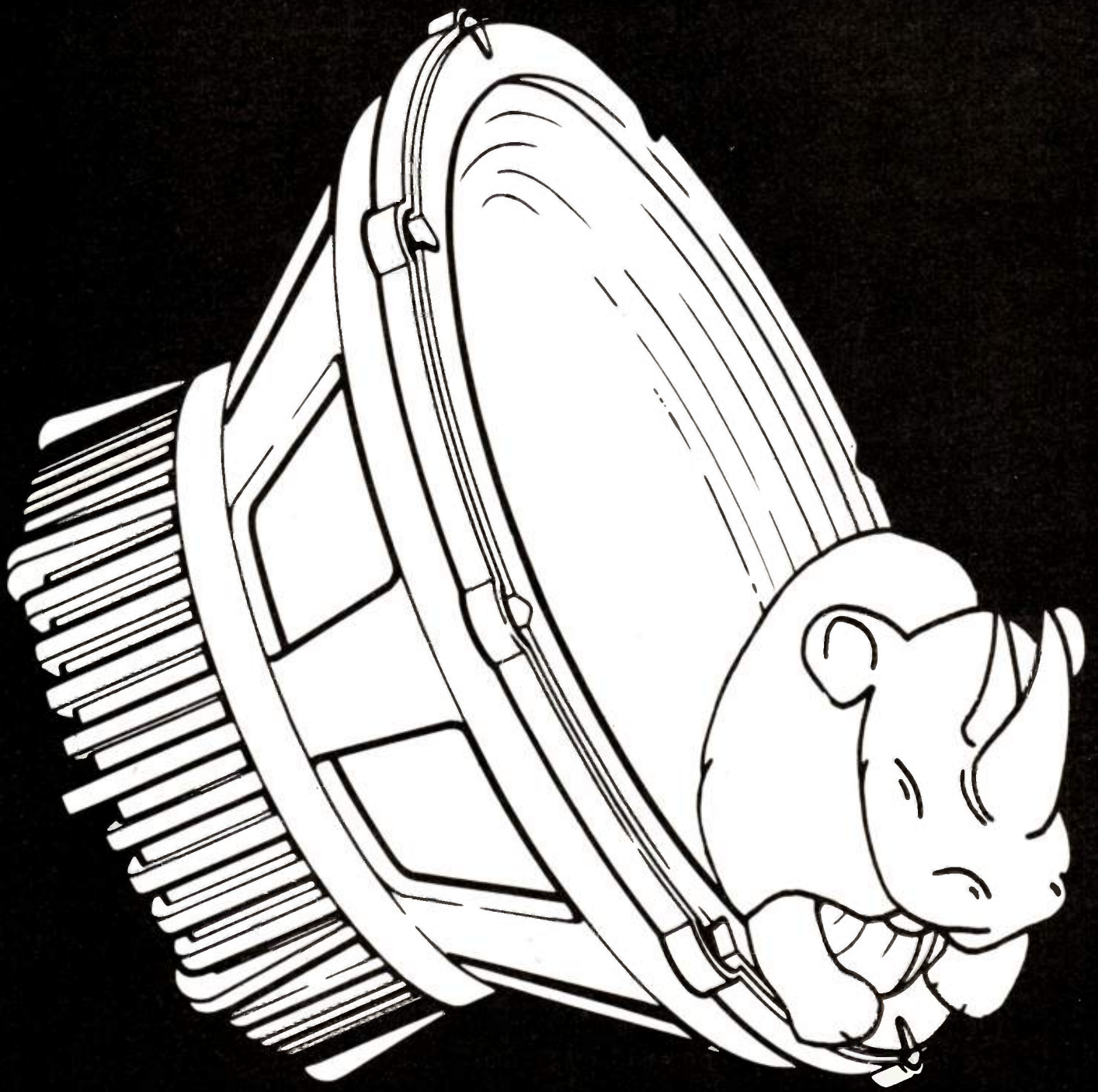
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Marshall make the bass more perfect

The new Marshall 1992 bass amplifier and 1984 bass cabinet are the good news bass players have been waiting for! In effect, the famous Marshall bass stack has been revamped and improved to cater for the changing needs of today's bass players.

Cosmetically, the appearance of the stack hasn't changed. It still looks like the Tower of Power it undoubtedly is! However, advanced technology plus Marshall's lively research and development programme has meant that the circuitry of the amplifier has changed considerably — all for the better of course!

Reduced sensitivity in the circuitry means that you can obtain a much cleaner sound at higher levels, without losing that famous Marshall "bottle". The tone circuit has also been dramatically re-designed and upgraded. The top and bottom ends of the tonal range are now much cleaner and the mid has been dropped slightly. In effect, this means that a lot more of the natural harmonics will come out. This eliminates the rather middly sound usually associated with bass amplifiers.

All the controls you'd expect to find on a Marshall are still there — volume, bass, middle, treble and presence controls together with the new design rocker switches for Power on/off and Standby. With the fabulous 1992 bass amplifier, you can now get the bass sound YOU want.

The 1984 bass cabinets have been designed specifically for use with the new bass amp. Each cabinet houses four specially-developed 12" heavy-duty Celestion loudspeakers. Each cabinet has a fantastic handling power of 120 watts and the drivers' sensitivity has been increased so distortion occurs at a much higher level.

The design of the new Celestion speakers means better response on top and bottom ends of the tonal range can be obtained so they match the 1992 amplifier perfectly!



New Wave roll with Marshall



When Marshall gear first appeared in the Sixties, the big names of that period immediately latched on to the fantastic sound the equipment produced. Hendrix used the beautiful "overdrive" tone to provide that famous controlled distortion and sustain he used to such incredible effect. Townshend utilised four 4 x 12 cabinets and two 100 watt tops linked together for his powerhouse "wall of sound". The list was endless... and still is.

Times change, music changes, but musicians today still find Marshall the gear for them. New Wave bands like The Motors, Vibrators, Tom Robinson Band, Depressions, Wire, Dr. Feelgood, Ramones, Blondie and hundreds more all use Marshall equipment. Although a lot

of the New Wave bands may reject the Sixties superstars, they still cannot find any substitute for Marshall, which proves that a timeless winner Marshall gear is!

Brian James of The Damned rates his Marshall 100 watt valve top as the best money can buy. "It's got a gutsier sound than other amps", he says, "and there's loads of power there. Mine's about five or six years old and it's still going strong. The sound is just what I'm looking for. It distorts easily but it's a clean distortion. I can adjust the amp for any tone or sound I want".

The Vibrators are another band who rate Marshall equipment. Rhythm guitarist and lead vocalist Knox uses a 100 watt Master Volume amp through a Marshall 4 x 12

cabinet.

"I've been using Marshalls for years now, I've always used them", he says, "because they give the sound I'm looking for. They've got quite a dirty sound, and it's a fabulous sound when it's wound up high. I nearly always use the same settings no matter where we're playing. The joy of it is that the road crew can set the gear up for me and I can just plug in and know I'm going to get the same sound. It's ideal for me".

"They're very powerful amps. It's nice to know that you've got all the power you want. I usually have the pre-amp all the way up and then set the m.v. on 3 or 4. With the pacing of our show, I go for simplicity and that's the best thing about Marshall. It's easy to get the sound I'm after".

A Rose-Morris Advertising Feature

Your fingers tell you the difference

The top of a guitar must be strong enough to withstand the pressure of the strings, but must also vibrate in a manner which will produce an acceptable tone. Spruce is the most popular and effective wood in this respect and a high-quality spruce table will improve with age as the fibres of the wood settle.

The famous Suzuki and Terada guitar ranges are available from Rose-Morris and are all fine instruments in their

own right. Your fingers tell you the difference and you will notice the difference with these beautifully-made instruments. The guitars are constructed from the best woods and each instrument produces a full, rich tone.

There is no substitute for high standards in the making of a fine instrument. All woods used in the Terada and Suzuki ranges are carefully selected and well-seasoned.

The fingerboard and frets of the guitar receive more wear than any other part of the instrument so the wood used here must be strong and durable. Rosewood or ebony are best suited for fingerboard material and, again, all the guitars in the Terada and Suzuki ranges use either rosewood or ebony.

There is an excellent range of folk guitars in the Suzuki line, one of the most popular being the F-120. It has a spruce top with Nato back, sides and neck. The fast and accurate fingerboard is top-quality rosewood and the machine heads are single, nickel-plated units. Also available is a beautiful 12-string version, the F-120-12.

The Suzuki F-200 is in a class of its own! This magnificent Dreadnaught-size guitar again features a spruce top and a nato neck, but the back and sides are made from carefully-selected rosewood. The rosewood fingerboard has beautiful pearloid block inlays and it also has a "big brother" 12-string version, the F-250.

Under the Suzuki banner, there is a handsome range of classics. Spruce is used for the tops throughout the range and, depending upon which model you choose, there is a choice of rosewood or Nato for the back and sides, nato or mahogany for the neck and rosewood or ebony for the fingerboard.

For a carefully-crafted and beautifully-finished folk guitar, look no further than the Terada TW90! This handsome instrument is a winner all round. It features a solid spruce top and Purple Wood sides and three-piece back. The fingerboard is a pleasure to play with its beautiful pearl block position markers and the pearl inlay work also surrounds the edges of the guitar and the soundhole.

The FW-615 is a superb Dreadnaught-styled guitar with a laminated spruce top, rosewood sides and back and multiple black and white celluloid inlay. It also features Deluxe non-slip individual machine heads. The W645 is the 12-string version and has all the same top quality features that makes the FW-615 a winner!

The Terada range of "classic" classics again utilises only the best woods and materials. All machine heads are deluxe gold-plated units and each instrument is a joy to play!

The Terada 3046 is a top class classical instrument for the professional performer or serious student. The solid spruce top gives a bright round tone with plenty of bass. The rest of the guitar is made from top quality rosewood with a lighter timber for the neck to balance the "feel" of the guitar.

The Terada 3045 is similar to the 3046 in construction but this slightly superior instrument uses Makassar wood instead of rosewood. The fingerboard and bridge are rosewood and the deluxe gold-plated machine heads are of a very high quality. The heel of the neck is very comfortable on the thumb, an important consideration for the serious player, and the neck has a splice to keep it perfectly straight.

These are just a few examples of the beautiful instruments available in the Suzuki and Terada ranges from Rose-Morris. It's impossible to detail every guitar in the ranges — why not check them out for yourself?

A Rose-Morris Advertising Feature

Many guitars look the same and choosing an instrument can be perplexing to the uninitiated. Quite often, the woods and components will be basically the same in many guitars but an experienced musician will be able to distinguish a good guitar from a bad one by simply strumming a few chords. Naturally, not everyone can discriminate so easily — in the end, it's all down to the player to decide which instrument is ideally suited to his style and ear.

Synths for all the music you'll ever need

Korg is the name that is about to set the synthesizer world on fire. Korg is rapidly becoming a world-beater in the synthesizer industry and this year's new models are more exciting than ever. Rose-Morris has promised to bring to musicians everywhere the full range of Korg products.

Whether you want polyphonic or mono synths, VCO's or envelope followers, Korg offers everything you need and more. Take the fabulous **PS3300** polyphonic synth. This dream machine is one of the most impressive synths you can buy anywhere. Where else can you find an instrument which has three polyphonic systems, signal mixers, and controls that produce thousands of sounds from fuzz guitar to barroom piano.

The **PS3100** is a younger brother of the PS3300 and its brilliant layout and design makes it a joy to play on stage and in the studio. Imagine having virtually 48 synthesizers at your control on one keyboard enabling you to play chords and melody lines at the same time.



Bar Switch in front of the keyboard can add special effects to your performance with one hand while playing keyboard with another.



For a wolf in sheep's clothing, look no further than the **800DV**. This is basically two synthesizers in one! This amazing machine has two completely independent Hi/Low Traveler filters twin voltage controlled oscillators and twin envelope generators. Each function on the upper section can be operated completely independently from the lower section.

Appearances can also be deceptive with the **Korg Mini 700S** which is reckoned to be the ultimate in note stability with more than enough effects and controls to give the musician an entire spectrum of sounds. The 700S quite simply gives you the sound of any instrument you desire.

Another top Korg model that is always in tune is the **Korg Preset**. This wonder machine takes the sounds of everyday instruments and introduces them to your audience at the touch of a button. A Touch

All the sounds of the cello, trombone, oboe, mandolin, trumpet, clarinet, accordion and many more instruments are yours with the Korg Preset.

Want high performance for a low price? Look no further than the **Korg 770** synthesizer. Two built-in oscillators give you not only two different tone colours simultaneously but also two sounds with different intervals and three to five parallel tone colours. The 770 eliminates the embarrassment of an out-of-tune performance. Although most synthesizers are notorious for going out of tune, the Korg 770 gives you perfect tuning as soon as it is turned on. Plug in any mike, guitar, piano or second synthesizer to the 770 for added versatility.

If you're looking for a strong synth bass line, the **Synthe-Bass** is the one to go for. This Korg product gives specially tailored sounds ideal for bass synthesis. If you want even more sounds, just plug in

a volume pedal and use a bass amp.

For a new breed of synthesizer check over the **Korg Polyphonic Ensemble 1000**. Here you have individual tuning for each note and a mix of synthesizer and piano qualities. Preset controls give you String, Pipe Organ, Brass, Electric Piano, Harpsichord and Piano sounds at the touch of a button.

A whole new world of orchestral sound opens up with the fabulous **Korg Polyphonic Ensemble "Orchestra" 2000**. After much experimentation and research, Korg have come up with yet another winner in the world of string synths. Even the most demanding keyboard player will sit up and take notice of the outstanding features of the Orchestra 2000.

Two Chorus, two Pipe Organ, two Brass and two String presets are incorporated in the design and these sounds can

be further enhanced by the bass and treble controls. Attack and sustain are also controllable and a master phasing control adds that extra "magic".



Whether you're a professional keyboard wizard or a player just entering the world of electronic keyboard instruments, you will appreciate the versatility and compactness of the **Micro-Preset M-500**. All the controls are laid out on a raised panel to the left of the keyboard so it's easier than ever to play. Thanks to advanced integrated circuit technology, the M-500 is one of the lightest and most compact preset synths.

The pre-sets which include Trumpet, Violin, Recorder, Whistle, Flute, Cello, Oboe, Clarinet and a whole lot more, are linked to five different footages from 2' to 32'. Other controls provided include Vibrato, Repeat, Portamento Modulation Speed and Depth, Pitch, Attack and Sustain. In fact, all you would expect from a much larger synthesizer. Like the rest of the Korg range, it only needs tuning once after being switched on — the pitch stays accurate to the end.

A Rose-Morris Advertising Feature

The Sound Projector Pushes Your Sound

Whether you're a drummer in a small, local band who has to rely on beating the drums as hard as possible to get the sound to cut through, or playing in a name band with a massive PA system to help your drums get across, the new **Ludwig Sound Projectors** can help your sound and, ultimately, your playing.

They are new devices to enable drummers to increase playing volume by projecting sound more efficiently. The projectors are "scoop shaped" and are made from durable, lightweight, high-impact material. They are also available in all Ludwig's vialite colours in the following sizes: 10", 12", 13", 14", 15", 16" and 18".

It's important to note that they can be fitted to any make of drum and fitting them is simplicity itself. They are secured to any suitably sized tom-tom by Velcro tape (which is supplied with the Projector, but is also widely available) stuck to the drum and Projector so they can be fitted or removed in seconds.

Not only do these Projectors boost your volume, but they also enhance the tonal qualities of your drums. The use of a Projector automatically deepens the tone of a drum, producing a better basic sound with less "ring". Thus, the drummer can tighten the drum head for better playing response and still get a full, deep sound.

If you have always had to compromise between preferred tuning and playing volume, the Ludwig Sound Projectors are the answer! With the aid of the Projectors you can at last tune your drums the way YOU want them and still keep up with the other amplified instruments in the band.

The Sound Projectors are at their most effective when used in conjunction with the new deeper Ariel tom-toms which Ludwig have recently introduced. There are



four new kits, available in wood and vialite shells. Note the special tom-tom sizes.

The 2100 seven-drum outfit consists of a 22"x14" bass drum, 10"x9", 12"x11", 13"x12" and 14"x13" Ariel tom-toms with Sound Projectors, a 16"x16" floor tom-tom with Sound Projector and a 14"x6 1/2" snare drum. Naturally the kit includes the relevant accessories. The 2101 is a similar kit but has a larger 24"x14" bass drum.

The 2110 nine-drum outfit is a real

giant! It consists of a 22"x14" bass drum, 10"x9", 12"x11", 13"x12", 14"x13", 15"x14" and 16"x15" Ariel tom-toms with Sound Projectors, an 18"x16" floor tom-tom with Sound Projector and a 14"x6 1/2" snare drum. Again the kit comes complete with stands and fittings and there is an alternative version, the 2111 outfit, with a 24"x14" bass drum.

These fantastic new Ariel tom-toms are also available separately.

New Ludwig Six-Ply Kit

The name of Ludwig, without doubt, has been a legend in the drum world for many years. It's not only the famous Super Classic kit that is a super classic! The list of Ludwig users reads like a Who's Who of top drummers and they chose Ludwig because of the unbeatable quality and tonal response.

The experts at the Ludwig plant are constantly researching and developing new ideas to further their drums and the big news of the moment is the new six-ply kits!

The drums are produced by a completely new method called the "di-electric process". On normal 3-ply kits, the seams are lined up side by side. On the six-ply drums, the

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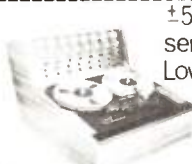
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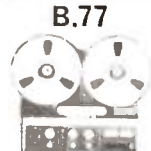
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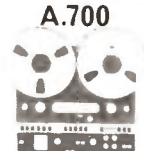


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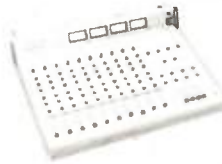
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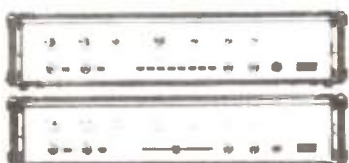
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compiled by Eamonn Percival

A band presently hoping for bigger and better things are **Dealer** from Mitcham in Surrey. They are currently working three or four nights a week in London pubs playing their own material interspersed with rock 'n' roll and blues standards and are looking for somebody to help them on their way to turning pro and working abroad. Their average age is 20 and the lineup is: Mike Brown (lead vocals/rhythm guitar), Gordon Russell (lead guitar/vocals), Dave Wells (drums/vocals) and Martin Dines (bass/vocals). If anyone is interested in an up and coming group, Dave Wells can be contacted after 7 p.m. on 01-648 2811...



First Aid

First Aid are a new band from the Hackney area of London and have been together for four months. They evolved from two bands, the **Hugh Jarse Band** (influenced, no doubt, by Benny Hill) and **Valkyrie**. They have been working regularly at notable ale venues including the Jolly Farmers, the Rochester Castle, the Bridgehouse and the Freemason's Tavern. Not only do they play their own material, but they also manage themselves and design and produce their own publicity material. Their line-up is: Colin Jones (drums/vocals), Steven Pope (bass/vocals), Jane Larnie (lead vocals/keyboards/guitar) and Tony Larnie (lead guitar/vocals). They say their future plans include domination of the entire galaxy. Close Encounters of the Worst Kind? ... From Scotland comes news of a five piece "lunatic" rock band called **Pallas**. Based in Aberdeen, they play all over Scotland performing what they describe as "original, energetic, cynical music". They will be turning pro in the summer and have recorded an EP at their own expense which, they hope, "will prove to the record companies that there is talent worth signing up further north of Potters Bar". Pallas are Craig Anderson (vocals), Dave Holt (lead guitar), Graeme Murray (bass/12-string), Mike Stobbie (keyboards) and Derek Forman (percussion) ... **Stepper** are a five-piece Manchester-based band led by former guitarist in Alvin Stardust's band, Alan

Doyle. The rest of the line-up is Ged Green (guitar), John Cellario (bass), Stuart Stead (drums) and Art Collit (keyboards). They are very active on the local pub scene and are currently recording demos with a view to getting a recording contract. They play 90 per cent original material and describe it as "five boring old farts trying to stamp out New Wave"! Be careful what you tread in, boys ... Good news for a band who have been together for just over a year



Key West

called **Key West** — they have just secured the all-important record deal. They've just signed with CBS Records and are currently working on an album and single, produced ex Marmalade mainman Junior Campbell. The band, Dave Sanger (lead vocals/keyboards/guitar), Mick Groome (bass/vocals), Dick Scarfe (guitar/vocals) and Geoff Isaacs (drums/vocals), did their apprenticeship in Spain last year and are soon to be found doing the round of London clubs and pubs ... **The Truth** are a four-piece band from Manchester who play regularly at The Oaks in nearby Chorlton. A relatively new band, formed in September 1977, they are: Steven Evans (guitar), Gary Short (bass), Dave Hurst (guitar) and Alan Cannon (drums). All their material is self-penned and they are shortly to produce and record a demo tape and possibly their first single. They have a custom built PA system with HH

mixer, Gauss bins, MM power amps and Peavey backline gear and, when they're not gigging, hire it out to other bands. They say their music is "popular, but not pop and heavy but not headbanging". Glad you know the difference, lads ...

Race Against Time are a young three-piece from Derbyshire who play a mixture of their own material and numbers by Black Sabbath, Judas Priest, Rush etc. Combining visual as well as aural presentation, the band consist of

David Halliday (guitar/vocals), Kev Windle (drums) and Al Short (bass/vocals). If you live around the Chesterfield area, get there early and be the first to stick your head in their bass bin.

Enthusiasts of classica guitars will welcome the opening of the **London Classical Guitar Gallery** this month at 19a Lavender Hill, London SW1. The plan is to exhibit instruments made by British luthiers and the exhibition will consist of purely hand-made British instruments which will be for sale (Tel: 01-228-0036).

... Last but not least, here's a photo of the very latest in Powerpop, **Brute** and **The Silhouettes**. Recently signed to Columbia, the line-up is (left to right) **Brute Force** (vocals), **Bruise Welsh** (rhythm), **Tony Meanman** (drums), **Harry Jettison** (bass) and **Hank B. Marvellous** (tremelo). With vintage Fender and Vox gear, the lads are all set to go.



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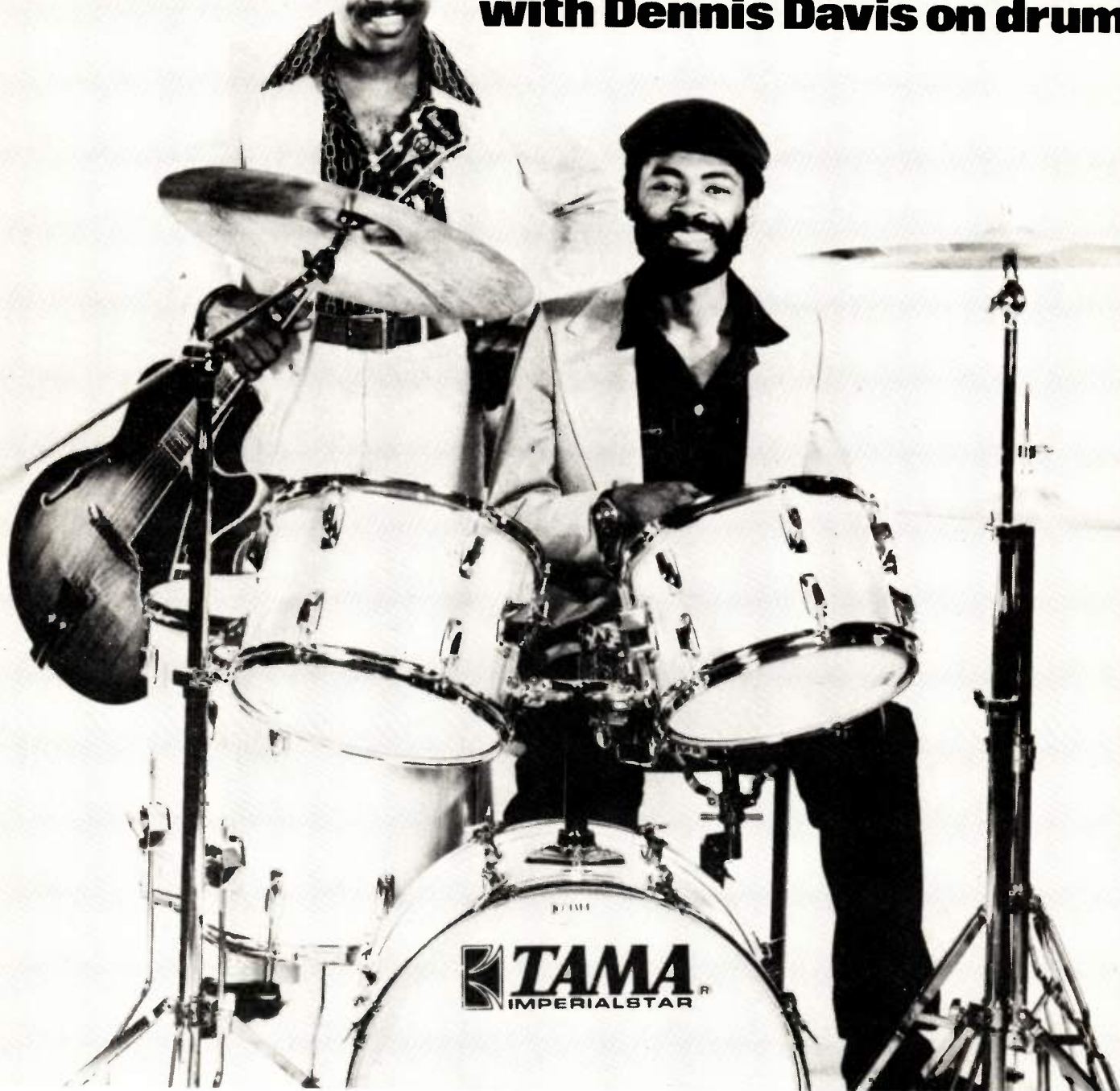
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COUNTRY BOY

by Ian White

Albert Lee: the man who makes the Nashville Cats sound like kittens

It's a measure of Albert Lee's astounding ability as a guitarist that he not only beat the best American country pickers at their own game but took over from his "idol" James Burton in one of the most sought-after gigs as lead guitarist with Emmylou Harris and the Hot Band.

Apart from being one of Rock's real gentlemen, Albert is probably one of the world's most underrated players. Luminaries no less than Eric Clapton, Jimmy Page, and Dave Davies rate Albert among their favourite players.

If you ever get the idea that you are a fair guitarist, one listen to Lee's "Country Boy" will put things in their right perspective.

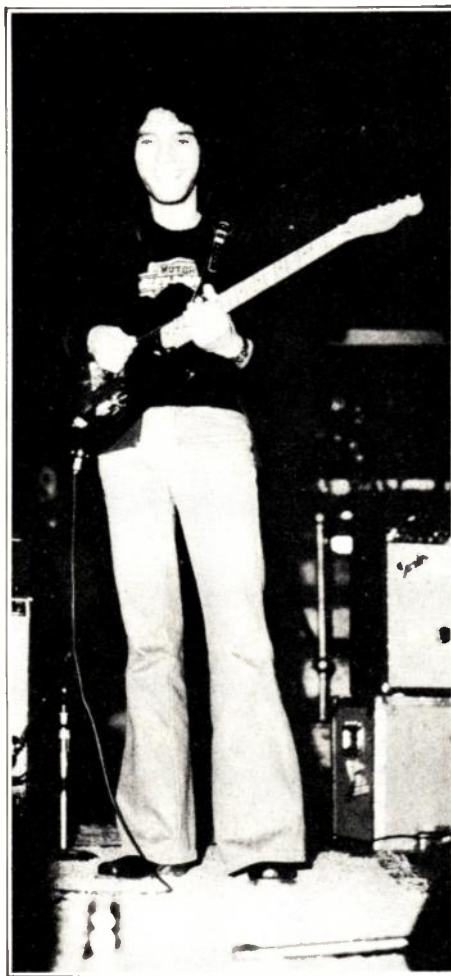
Albert has been a professional player since the age of 16 when he first went out on the road with the Larry Parnes rock stable backing people like Dickie Pride and making £12 a week brandishing a Hofner Futurama guitar.

Since then Albert's track record has included playing for Chris Farlowe and the Thunderbirds, the Crickets, backing Clodagh Rogers, Joe Cocker, and being a key member of the very fine, but ill-fated, Heads Hands and Feet which was formed by Tony Colton and Ray Smith in 1970. The band broke up in 1972 after cutting three albums for Island leaving Albert free to realise an ambition to work in Los Angeles.

After a couple of years gigging with legends like Burton, Glen D. Hardin, Jerry Allison and Sonny Curtis among others Albert was invited to replace Burton in Emmylou Harris's Hot Band. Albert was in Britain last month on a whistle-stop tour with Emmylou to promote her new album and IM finally cornered him in the lounge of London's Kensington Hilton.

"I'd wanted to go to the States since about 1963 when I met the Everley Brothers. Everybody wanted to go to Nashville but I always wanted to go to Los Angeles because I always thought there was good Rock 'n' Roll coming from there. At that time, in 1963, it seemed like a good place to be. People like James and Glen Campbell were doing sessions out there. That was in '63 so it took me a long time to get there".

"How it happened was that Glen D.



"IT'S AMAZING THE NUMBER
OF GIGS I OWE INDIRECTLY
TO ELVIS"

Hardin was with the Crickets at that time and they were going to tour Britain. Glen D. was going to be with Elvis for a week and asked did I want to sit in with the Crickets for a week. I ended up staying with them for a year and we played variety clubs and workingmen's clubs and it was a lot of fun".

"I became very friendly with Glen D. Jerry Allison, and Sonny Curtis and when they got a record contract they flew me over to LA to do an album with them. I hung around LA for a while and got to know lots of people. I started sitting in on sessions and gigs which made it worthwhile for me to stay in LA. Things then started to get shaky and I was just about to come back to Britain when my manager at the time was also managing Joe Cocker when their band broke up. So I stepped into that gig and I was with Joe for about a year. We toured the States three or four times and I quit after getting a contract to do a solo album for A&M".

"I started the album but everything was done wrong. We shifted from studio to studio, started off with 24-track and then changed to 16-track which didn't please us much. I did the best part of an album in 1975 and around Christmas I was sitting in LA really homesick wondering what to do when I got a call from Glen D".

"He asked if I fancied sitting in for James Burton for a couple of gigs with Emmylou because James was going away with Elvis. It's amazing the number of gigs I owe indirectly to Elvis. I'd have loved to have played with him".

"At that time James was going between Elvis and the Hot Band, which wasn't very good for Emmy because she couldn't rely on him and he wouldn't commit himself. To be truthful he wanted the best of both worlds. He wanted to work with Emmy when he wasn't with Elvis. That wasn't satisfactory for Emmy because Elvis was starting to do more gigs at that time".

"They gave me a tape and I already had the two albums (Pieces of the Sky, Elite Hotel) because I really liked the band. I got a call from Glen D. saying James had the flu and could I play that night? I went in cold, no rehearsal or

“I'm very lazy because I don't practise”

anything and I was in the Hot Band from there on. They seemed to like the way I played and they offered James an ultimatum of was he going to be in the band or not? He wouldn't commit himself so I was in the band from there on”.

Like most first generation British rock guitarists, Albert looks to Lonnie Donegan for his first inspiration and recently recorded with Donegan for the latter's “come-back” album along with people like Rory Gallagher and Elton John.

But it was always the early Rock and Roll that fired his guitar playing and led to his love for country music. Albert, along with hundreds of other players, acknowledges his debt to Burton.

“I suppose my biggest influence was James. I was 13 when I first started playing and I was always into Elvis and Ricky Nelson. At 16 I was trying to copy James using really heavy strings. I didn't realise he was using banjo strings. No-one ever said ‘this is the way you should play’. In recent years I've seen guys I've probably learnt from like Jimmy Bryant. He is definitely one of my Number One guitar players. Jerry Reed really turned me on to gut string but I'm nowhere near as efficient on gut string as he is”.

Albert's first guitar was a Hofner Futurama although he is a dedicated Telecaster user at the moment playing a beautiful refinished '51 Tele.

“My first decent guitar was a Les Paul Custom. I think I had one of the first in the country in 1961. I was friendly with Jimmy Page at the time and he went out and bought one. I was crazy on Scotty Moore at the time and he was playing what I thought must be a top line Gibson so I sold the Les Paul and bought a Super 400. That was a big mistake because it wasn't raunchy enough. So I got rid of that, walked into Selmers where a friend was working. They had this old Tele and he said ‘try this, it's instant James Burton’. I plugged it in and it was great. My first Telecaster was one of the early rosewood neck models which came out in about 1960. It doesn't really matter to me whether I play maple or rosewood. The maple is a bit slicker, not because of the wood but because it is lacquered”.

Although essentially a purist, Albert has used one gadget extensively, a specially modified Telecaster which enables a player to bend the B string by pushing down on the strap.

“The string works with a mechanism in the back of the guitar which is attached to the strap button. You pull down on the neck and it pulls the strap button up. There is a little pivot just behind the bridge and it pulls the B string back. You can adjust it and tune it to anything you want from a semitone up to about three tones if you want it. When I first got it I went crazy with it just trying to fit it in everywhere and it really affected the way you play. It makes you lazy in a way but the guitar is quite hard to play because it is really heavy. They're laminated with about five different types of wood in them and they really make your shoulder ache after playing them. I've got two of them, one with regular Fender pickups and the other has DiMarzio humbucker”.

Albert uses Music Man amp on stage and is well pleased with the equipment. He was one of the first artists to start using Music Man.

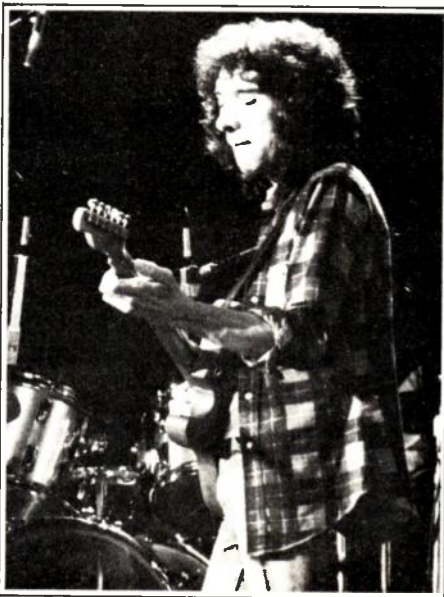
“One of my best friends in LA is Stirling Ball, one of Ernie Ball's sons. His godfather is Tom Walker who designed the Music Man amps.



I tried one out and I was knocked out by it. I had always sworn by Fender Twins but these have got more power and they are the ideal size for me. I use JBL speakers because they seem to cut through for me. But I really do love those Music Man amps and not just because I get them free.

“I set them with the master volume on full and the channel volume on about seven normally. I've got the first Music Man guitar as well, the Stingray, but I'm not quite sure about it. I tried it a couple of times with Emmy and if I'm not comfortable about the sound I just change back to the old Tele. I came back to England last Christmas and I didn't have any guitars and I had to go out on a gig so I started using it and learning how to get some really good sounds out of it. It's a lot closer to the Fender Jazzmaster or Jaguar. The new Music Man Sabre is more like a Strat.

“But I'm really into Telecasters now. You really do base your style and sound on your guitar and I love really twangy strings and I could never get that sound out of a Gibson,



only out of a Tele. I swap around a lot with strings. I used to use Fender 150 regulars for about 10 years and then I started experimenting using light strings and I thought they were too light and then I changed back to the 150 regulars.

“I realised one reason James gets the sound he does is because he uses ridiculously light strings. At the moment I'm using Fender Superlight which is an 8 on the top and a 38 on the bottom. I changed the 4th from a 22 to a 24. It's not too heavy. There are so-called rock and roll sets which have a 42 on the bottom. I bend all my strings and with those gauges it feels really comfortable. I use a 14 on my third string but James uses a 12 which is how he is able to get those really smooth sounds”.

Like many fine guitarists, Albert cannot really describe his technique. It is just something he does. But a Lee solo is instantly recognisable for its incredible swiftness and machine-gun-like precision of his picking. Neither does he feel he has reached his full potential.

“I hope I've got a lot further to go. But I'm very lazy because I don't practise. I know I've got the technique and I think I am as fast as I ever want to be. A lot of these fast guitarists go over most people's heads. I'm lazy about sitting down and working out the licks to utilise my technique

“I can't really describe how I do it except I use a flat pick and whatever finger is closest to whatever string I use. It's not very classical in its approach. If I want to pick three strings I don't alternate the fingers. I don't think about it, I just do it. The solos and things come from just playing”.

On the title track of the Emmylou Harris album ‘Luxury Liner’, Albert plays a stunning solo. How for example did that come about?

“The solos and things just come from playing. ‘Luxury Liner’ came in the studio. We worked out the song and we were just playing the end and it started to rock and the band started to slot into something. It just seemed to fit so I developed a few licks that fitted in. I like to think that it is a cross between James, Jimmy Bryant and steel licks as well.

Does Albert think he now actually is a better player than his main influence James Burton? “A couple of people have told me that I am better but I don't think I am. We are on a different track. I do a song and if I can hear that it is crying out for a James-style guitar I'll try to play like it”.

“James has got a different approach. I don't think he plays as fast as I do, he has a different way of playing fast. I alternate between the pick and fingers sometimes damping at the same time.

Surprisingly, for someone who has done so much studio work, Albert doesn't read. “I've thought about reading for the past 20 years, but I still haven't got round to it yet. If I don't want to go on the road anymore and the only thing to do is become a studio musician, I'll probably learn to read”.

“At most of the sessions I do I just do my own thing or use chord sheets”

After two years with the Hot Band, Albert is considering his future which will probably mean the overdue solo album. His contract with A&M has been given new life and in April he is scheduled to go into the studios to add tracks to the ones that are already in the can. The album, when it comes out, is bound to inspire sales of a few thousand Teles.



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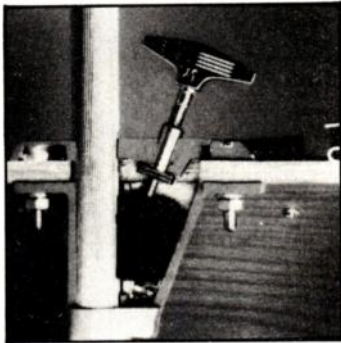
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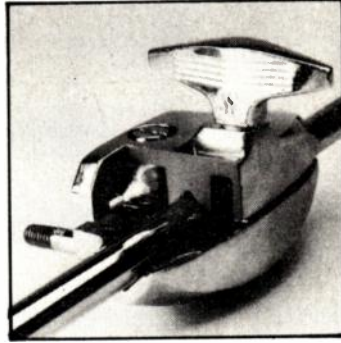
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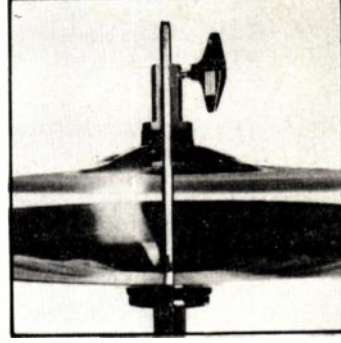
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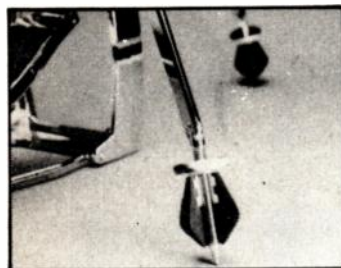
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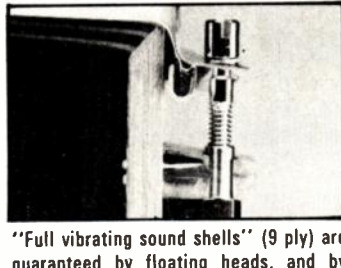
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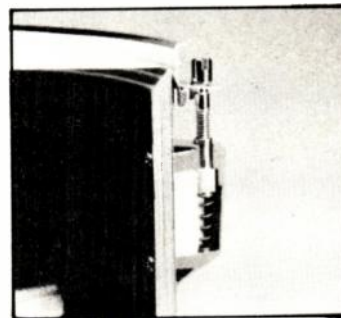
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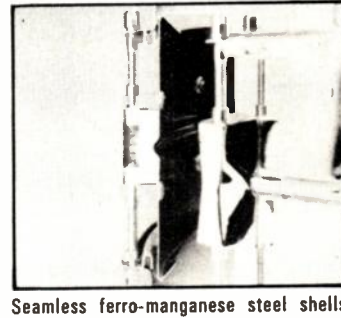
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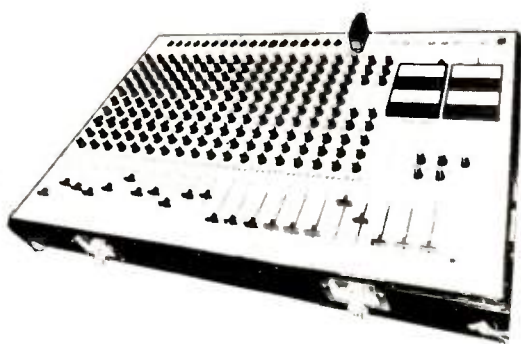
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An Old Farfisa won't ever let you down



Jimmy Destri is the leader of a keyboard revolution. No, he hasn't produced an astounding new concept album or completed a tour with the London Symphony Orchestra — he plays with an American pop band called Blondie!

Jimmy is one of a new breed of musicians who are reacting against the idea that to be good, keyboard players must be surrounded by thousands of pounds worth of equipment and constantly take long extended solos.

Now, largely thanks to advent of New Wave, people are realising that it is not essential to have a Hammond organ, Fender piano and numerous synthesizers in order to make music and create interesting sounds.

In Britain, the sound of the Vox Continental organ on the recordings of Elvis Costello has proved a revelation, while Destri's use of an old Farfisa with Blondie is spearheading a revival of the instrument.

Both the Vox and the Farfisa were symbols of rock music in the early Sixties on both sides of the Atlantic, but their resurrection is no mere nostalgia trip, although Jimmy admits that the reasons

BY
DAVID LAWRENSON

for his original choice of instrument were financial.

Jimmy explained: "I used to hang about in a place called CBGB's in New York where I met Chris (Stein) and Debbie (Harry) and we eventually formed Blondie".

"I had no money, but two years before I had bought a beat up old Farfisa which was in my basement. That was the only thing I could use in Blondie at that time because I didn't have the money to buy anything else and it accidentally became the top end sound of the group".

"Now I wouldn't change, they are such fantastic instruments. When you hit the high end register it sounds like stepping on a live animal in an alleyway, you can always tell a Farfisa organ a mile away".

Blondie have been together for about three years in various forms, although it is only in the last year they have begun to make an impact with two albums and a worldwide tour.

They are one of the rising American New Wave bands.

Their music is inventive and hard hitting while retaining a distinct commercial edge — on stage the sound is matched only by their stunning lead singer Debbie Harry. Their second album, "Plastic Letters" is brimming with ideas most of them coming from Jimmy's various keyboards.

He said: "I want to use the Farfisa differently, I do succeed to a certain extent, but a producer will see the instrument differently than I will. On the first album Richard Gottferrer, our producer, used it as a tinny little toy piece that had character, the second album is totally different".

"A Farfisa organ has the capabilities to be worked on. If you open it up and fiddle around you can make it sound like a space machine. People don't realise that that organ is probably the most primitive synthesizer made".

"When I open it up and play around with it, like on the second album, it does some strange things. I have a Polymoog and a Roland synthesizer, but a lot of the stuff on the second album that people

says Blondie keyboards player James Destri

think are the Polymoog and Roland is just the Farfisa through EQ. It works really well like that, and is so versatile you can do anything with it".

Jimmy insists on using the old Farfisa models because he claims the new ones just cannot produce the same sounds. He even asked the Farfisa company to build him one, but the results weren't very satisfactory so Jimmy has resigned himself to picking up old ones when he can.

"It is only the old ones that you find in basements and stores that have the sound. I've got three at the moment but we're always shopping around for them", he said.

"We found the one that I'm currently using in a store in Sweden. The store didn't know how much it was worth to me, they just thought it was crap and wanted to get rid of it. I suppose by talking about them more and more the price will go up. People don't realise how valuable they are and the amazing things that can be done with them, they sound like no other organ in the world".

"I HATE THE FENDER RHODES I WANT TO PUKE EVERY TIME I SEE ONE"

He refuses to use a Hammond organ, because, while realising they are beautiful instruments, he feels that the tone of the organ always remains the same whatever you do to it.

Jimmy is equally critical about that other keyboard standby the Fender Rhodes electric piano. He said: "I hate the Fender Rhodes, I just want to puke every time I see one. They are terrible instruments and just sound like a wad of cotton. I guess they are OK for Herbie Hancock and the jazz people, but not for me".

"There are no electric pianos that I really like, there's none that can simulate the sound of a real piano. If you have to use an electric piano then the best thing to do is buy a secondhand RMI and put it through a valve amp. I used to use one and it was pretty good".

"On the second album I use grand piano, but not on the road because I have not found a good enough piano to take around with us although I'll probably buy a Yamaha because I believe they are very good".

"I played a lot of piano on the second album because I really like it, it

is the root of all keyboards, an orchestra in itself. If I had to choose between any instruments I would settle for a piano and that is what I do most of my writing on — either that or the guitar".

His choice of Polymoog and Roland synthesizers are the result of careful consideration of the type of sounds he wants and the situation they are likely to be used in.

He explained: "The Polymoog has the best strings of any synthesizer. Most string synths sound echoey, but on the Poly you can pull all the echo out and actually simulate the frequency response of a real violin, so it sounds like those dry strings on old Beatles records".

"The Roland on stage is like my axe, my solo synthesizer. It is not as good as Minimoog, but it is easier to operate. When you are operating something as complicated as a Polymoog on stage you have to have something really easy over on the other side of the stage or you'd go crazy".

"People think I am mad to bring a Polymoog out on the road because

chord and celeste doing the exact same line with a guitar, then it will all sound like one massive instrument going along with the vocals".

"I think the best thing to do when you find a sound is to use it economically. Once you have used it, then you should go and find another one, that way you can build unique sound upon unique sound".

"I really like recording, the place we use in New York is Plaza Sound studios which is a really big hall. It is usually sectioned off for recording, but when I'm recording pianos and organs I just open up the whole studio. I take the top off the piano, stick the Leslies up full for the organ, and it just reverberates through the whole hall. It sounds great, just like you're playing in a tunnel".

"The Farfisa is the only organ in the world that feeds back. You can get almost guitar feedback on it, by tilting it certain ways it will feedback into the Leslies, it is really strange".

"On some of the tracks on the album I turn the volume up, the Leslies up and then stick a microphone in the studio. I put the organ on a truck and move it towards the Leslies and the sounds are fantastic".

"I've just started to get into harmonizers and I want to start using tapes. I used to use them a long time ago, but haven't introduced them to Blondie yet".

He does not use any effects or pedals with the Farfisa because the stops on it offer an incredibly wide range of sounds, so there is no real need for anything else.

There is no one keyboard player that Jimmy particularly admires although he liked a lot of the King Crimson stuff and the piano from Procol Harum recordings. He added: "I think the keyboards on Bowie's albums are great".

"I don't think its particularly Eno, it is just Bowie's production but there has never been any all round keyboard player that I liked, I probably listen to more guitarists".

Jimmy's work on the "Plastic Letters" album shows just what can be done with the minimum of equipment and the maximum amount of thought and experimentation. The range of sounds on the album is incredible although all are an integral part of the overall music of the band, and help to make Blondie — and Destri in particular, so distinctive.

He sums up by saying: "I think what makes Blondie unique, is the fact that we are aware of everything that is going in music. We are a pop band, but there is no reason why we cannot experiment".



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The Synthesizer

The function of the instrument as a synthesizer trigger, is a unique and simple concept, and unlike its competitors very easy to obtain pleasing results. Basically, the fingerboard fretwires, take the place of a keyboard, in as much as to obtain a note from the synthesizer section, you just depress the string of your choice, on the fret of your choice, and the resulting contact is the same as a keynote being depressed onto it, contact on a synth keyboard.

This of course allows you to play left-handed only if you so desire, as the right-hand is only used for string plucking to give an adequate signal to the bass guitar pickups.

Simply speaking, each fret is connected to a piece of computer wire running internally, the complete length of the neck. This is connected to a digital electronic circuit, on a small PC-board installed in the guitar body as are all the strings. The digital circuit in the guitar is constantly scanning the strings and frets at great speed, and when a string is fretted, the digital code selects which string-fret contact has been made, as each of the possible combinations on the fretboard has its own digital code.

There is a simple on-off rocker switch located just in front of the volume and tone controls on the guitar body which brings in, or cuts out the synthesizer circuitry at will. Both circuits are completely independent, and there are two outputs from the guitar, a simple jack socket for straight bass sound, and a five pin "din" output which allows both, pickups signals, and synthesizer trigger signals, to pass independently through a multicore lead, to a controlling foot pedal. This foot pedal developed by Ampeg, in direct conjunction with Hagstrom on this project, adds greatly to the expressive possibilities of this concept of synthesizer playing, although I feel it could easily have offered more, even in this, its almost prototype form. This pedal is then connected to a synth of your choice, or in my case to one provided by "Fletcher, Coppock & Newman", the importers. This was a Steiner-Parker "Microcon", which was developed with the Patch 2000 in mind. It is a keyboardless mini-synth, that fits neatly into the guitar case, and was a delight to use, with its extremely simple control layout allowing me to find the sounds I wanted quickly and easily. Its filter unit gave a similar "bassy" sound to the "Mini-Moog", and I found myself playing left-hand only many times, even on the gigs, and amazing the audience with the constantly changing sounds my free right hand allowed me to select.

The pedal board further alters or changes the pitch of the synthesized notes thus:- there are two pedals on the board, the left sided pedal changing the note one octave between the "toe" and "heel" position, and any harmony in between. This allows you to bend a note or pitch any harmony to your bass guitar note that you desire, but this technique would require much practice.

A direct harmony facility is supplied by a footswitch between the two pedals which automatically, and immediately,

and returns the synth, a fifth above the normal tuning. It is here I feel they could have gone further, and provided at least two more options, say major 3rd, and minor 3rd switches. But of course if you use this unit with a multi-oscillator synthesizer, then these options are already open to you. The right sided pedal is simply a glide control, that is it determines at the "Toe" position a long slow "Portamento" effect between notes, and at the "Heel" position instant, spot on, pitching of notes.

The sounds produced are wholly dependent on the synthesizer you use, and the world of synthesized sound and expression is completely open to you, as it is to the keyboard player, dependent on your musical talent and vision, plus of course your financial investment into this expensive, but epidemically expanding field. You are really in the possession of a monophonic synthesizer trigger connected to the simplest, or the most complex synthesizer system you could possibly conceive, and in the latter sense, the possibilities are almost endless.

The mind boggling concept of adding octaves and harmonies to the rich sound of the basic tonic note of a chord, with a multi-oscillator synth is further enriched by the possible addition of a sequencer.

The only real criticism to be levelled at the concept, is that it is not polyphonic, in other words, you cannot play more than one note at a time. But the redeeming factor lies thus:- to trigger a synth circuit satisfactorily, and obtain the required sound on each note, a constant valve surge must be transmitted to the electronics, independent of the physical execution of the selection of notes.

This is what happens with the depression of keynotes, regardless of force, on the synth keyboard, and with the contact of string to fretwire on the Patch 2000 bass. Although its main competitor is polyphonic, the touch sensitivity factors are infinitely more instrumental in there successful execution.

The other big criticism I have is that open string playing cannot be synthesized

because, if the nut-piece was wired, the open strings could be making constant contact, and therefore droning endlessly, this is also why the bridge saddles are insulated.

If you are playing more than one string at a time, it is always the highest fret position on the lowest string that is synthesized, so with a little practice and thinking some extremely interesting patterns and harmonies are conceivable.

It must be remembered that the bass guitar sound is still coming through uninterrupted through the multicore and Ampeg pedal to your amp, and that the synthesizer facility can easily be switched out by the simple rocker switch on the guitar, so that if you are in danger of going "over the top" with your synth concepts, you can quickly revert to your basic role in the band. Also the synthesized notes sustain as long as your finger depresses the string on the fretwire, plus any delay time you may have set on the synth.

Conclusion

Clearly, the Hagstrom Patch 2000 Swede bass guitar is an extremely advanced and refined musical instrument. As outlined before it is an excellent bass guitar, but as a guitar synthesizer, it is still I feel an instrument for the professional.

In the wrong hands it is possible to make it sound horrendous, through inexperience and ignorance. Its rapid acceptance in the USA will help its development and understanding through all the musical ranks, with its increasing use on live concerts and studio recordings, but it's early days yet especially in the U.K. and I feel wider professional use and explanation is needed before it could take off in the home market. Despite this, I predict a brilliant future for this instrument, as I believe the greatest most complete musical vision comes from the great bassists.



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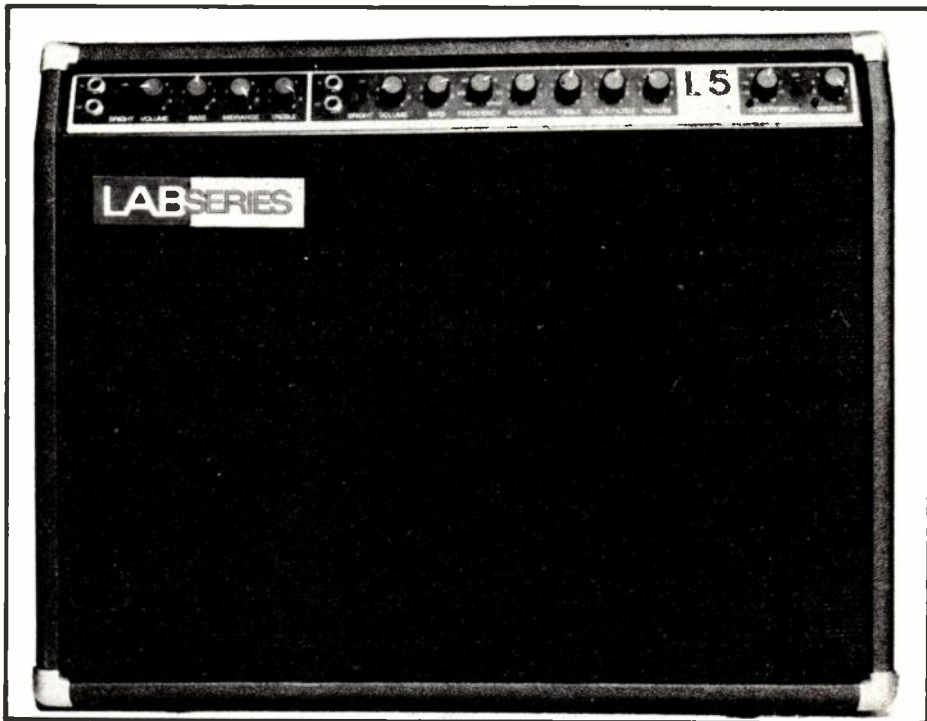
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The 'Lab Series' range of amplifiers was first introduced by Norlin to the music world in June 1977 at the NAMM show in Atlanta. Norlin, one of the giants of the music industry, were obviously determined to get it right with an amplifier range of their own. They therefore pooled their skills and resources on a long development program in order to achieve this. Design engineers and musician consultants from both Moog Music Inc. and Gibson were employed in the development stages and the end result, the 'Lab Series' range, has turned out very interesting. At the present time there are six models available, the L5 being the only 2 x 12 combo in the range.

My first impression of the L5 combo was one of slight disappointment. Having read up a little on the 'Lab Series' I was anticipating a rather 'Larger than Life' amplifier to arrive. In fact a sturdy but fairly traditional-looking combo turned up covered in black PVC, with a sloping recessed front panel, metal corner caps, good castors and the usual type of handle on the top. After getting over my initial disappointment and accepting the fact that a combo is still a combo and has to keep within fairly strict mechanical design limits I got into finding out what really made it tick. In order not to mislead anyone however I should point out that the overall standard of finish and construction were excellent although a little dull from my viewpoint. I say dull perhaps because of the black knobs, black panel with graphic in grey reversed out, black PVC and the black patterned speaker grill cloth. This observation however is very subjective and probably results from being brain-washed by the more 'Glittery' type of amplifiers that one sees around.

One criticism on the constructional side before we get into the electronics. The unit is open-backed and has a wide cross-member going the length of the cabinet just below the rear panel of the amplifier section. This rather flimsy panel has been provided to protect the electronic components that protrude down from underneath the amplifier section. Two large electrolytic smoothing capacitors like in wake behind this panel and I feel, without any exaggeration, that should a severe blow land on this panel that the capacitors could get damaged. An extra millimetre or two on this panel would sort this potential hazard out.

On the electronic assembly design and layout side the amplifier is well thought out and adequately protected from open/short circuit, mis-match and overheating conditions. The wiring is a



little untidy but sturdily done with cable ties, and there is not too much of it to bother a service engineer. The PCB's are reasonably laid out and the components are high grade. All the high power rated resistors are of the flame proof type, hopefully not required to be put to the test!

The circuit boarder are not annotated but a well drawn circuit diagram is supplied with the amplifier. The main power stage or output stage is a quite beefy push-pull type with ten (5 pairs) of RCA 410 silicon power transistors wired in parallel. Access to the amplifier chassis is easily made by removing four 2BA Phillips headed bolts from the top of the combo cabinet and by removing the light cross-member at the rear of the cabinet. The whole amplifier chassis can then be removed from the speaker enclosure. A good point to note is to stand the combo on end before commencing the unscrewing operations otherwise the amplifier chassis will fall down into the speakers!

The L5 amplifier's front and rear panels are neatly laid out and easy to work with. I will start with the least exotic of the two, the rear panel. There are five small areas drawn graphically as boxes. Looking from left to right they are as follows:

Box 1 - An accessory Outlet socket (AC 120 volts 60Hz), which you can ignore as it has been disconnected for UK use. It would probably be better to remove it on UK models! Near to it is the on/off red push button and red switch. The button pushes for on and the switch operates for off. A circuit breaker is combined with this switch which protects the amplifier from overload. This replaces the facility of the usual AC fuse found on most amplifiers.

Box 2 - Is simply the maker's plate showing the model number, serial number operating voltage, frequency, current and so forth.

Box 3 - Contains the jack socket for the (reverb footswitch). The footswitch is not included in the amplifier

price by the way (see below).

Box 4 – Contains two jack sockets, one being at a pre-amplifier Signal Out and the other for taking a remote signal in to the power amp stage.

Box 5 – Simply contains the speaker jack and connection to the integral speakers.

The front panel is laid out in three sections. Two of the sections are two separate channels each with twin inputs (Hi and Lo), Bright switches, and Volume Bass, Mid-range and Treble controls. Channel Two contains some of the extra circuitry innovations and controls which gives the Lab Series its unique sounds and the third section of the front panel contains a Compressor and the Master Volume control. The special controls on Channel Two are marked Frequency and Multifilter and there is also a reverb control. The Frequency control is marked from 100Hz to 6.4KHz in six octave bands and works very effectively in conjunction with the mid-range control which incidentally operates in a different way and serves a different purpose to the mid-range control on Channel 1. With the mid-range control set to "0" the Frequency control has no effect. Once the mid-range control is set from "0" in the twelve o'clock position to either 1 to 4 clockwise or 1 to 4 in the anti-clockwise direction,

the frequency control can be set to any particular frequency specified on the control to dramatically change the tonal balance of the sound. The Frequency and mid-range control settings in conjunction with the normal tone controls give both a dramatic and wide tonal response which I would recommend to any guitarist to sample.

Another really interesting control which affects the tone shapes is the multi-filter. This works well in conjunction with the treble control and by backing off the treble and increasing the multi-filter control to about six or seven some extremely interesting and pleasant harmonic sounds can be produced. With all the interesting sound enhancement effects or controls on channel two, it is easy to almost overlook the reverb. The reverb should not be overlooked as it gives a good reverb sound with an effective range. The reverb spring is actually housed in the bottom of the speaker enclosure and is protected by a waterproof cover.

Getting a good sustain sound at high or low level coupled with different levels of distortion can be obtained by first setting the channel volume control and master volume control to the desired position. The inputs on each channel marked "Hi" and "Lo" are not sensitivity

markings by the way; "Hi" means for high output guitar and "Lo" for low output guitar.

An overdrive situation can be easily found by selecting either one of these inputs and adjusting the channel volume to the distortion level that you like, then bring in the Master Volume if required. The compressor circuit can then be switched in and the degree of compression can then be applied to increase or reduce sustain. An LED indicates when compression is working. When the compressor knob is set to "0", the compression comes in at 100-watts, at -3, 50 watts and at -6, 25-watts. The compressor limits the output power and does not affect the input level at all.

In conclusion I would say that I was impressed by the amplifier. The L5 is tastefully presented although traditional in some respects. The tonal range available and the equalisation effects work superbly. The price in the UK is around £100 more than the average British combo on the market but there again this is not an average combo.

The amplifier comes complete with a waterproof cover, good castors and a good user handbook. A twelve month guarantee covers the amplifier for normal use.

PARAMETER	RESULT	TEST CONDITION	COMMENTS
Specific Power Output Watts (RMS) Ref. 1.0KHz	128.02 W r.m.s. 112.05 W r.m.s.	Onset of clipping into 8 ohms Onset of clipping into 16 ohms	Manufacturer claims a 100 W r.m.s. (into 8 ohms speaker load), which can be smoothly limited by a specially provided compressor circuit, without effecting input level.
Total Harmonic Distortion THD (%) Ref. 1.0KHz	1.25% 1.03% 3.81% 4.72% 4.07% 0.95% 0.43%	@ 100 W r.m.s.) @ 80 W r.m.s.) In to 8.0 ohms @ 60 W r.m.s.) Ref. @ 40 W r.m.s.) 1.0KHz @ 20 W r.m.s.) @ 10 W r.m.s.) @ 5 W r.m.s.)	At high outputs the distortion is mainly the 2nd harmonic. This amplifier produces basically less THD at high than low power levels
Input Sensitivity for 100 W RMS (28.2 V RMS) Output signal – mV (RMS) Ref. 1.0KHz	Lo: 12.5mV r.m.s.) Ch. 1 Hi: 62.8mV r.m.s.) Lo: 2.6mV r.m.s.) Ch. 2 Hi: 5.5mV r.m.s.)	Bass/Mid-range/Treble – flat (5) Master – (7) Bright switch – (Off) Bass – (5), Frequency – 1.0KHz/ Mid-range – (0), Treble – (4) Multi-filter – (1) Master – (7) Bright switch – (Off)	On both Channels. The "Hi" input refers to a high overload point and should be used for guitars with high output. Likewise the "Lo" input is for lower power guitar. This is a little bit confusing as traditionally "Hi/Lo" terms are used differently (i.e. sensitivity at impedance)
Tone Controls Range Swing in [dB]	Swing of 23.0dB) 16.0dB) Ch. 1 28.4dB) Swing of 22.2dB) 19.5dB) Ch. 2 24.2dB)	Bass @ 50Hz, Middle/Treble – (5) Middle @ 500Hz, Bass – (7), Treble (5) Treble @ 5.0KHz, Bass/Middle – (5) Bass @ 50Hz, Middle – (0), Treble – (5) Middle @ 500Hz, Frequency – 500Hz, Bass/Treble – (4) Treble @ 5.0KHz, Middle – (0), Bass – (5)	These standard controls let you adjust overall tonal balance. Mid-range in Ch. 2 works with "Frequency" (100Hz–6.4KHz) control. These two controls combine to let you emphasize any portion of 100Hz to 6.4KHz range. "Frequency" adjusts where (like a radio's tuner) and "mid-range" adjusts how much (like a radio's volume) "Frequency" control has no effect when "mid-range" control is at "0"
"Frequency" – Range (Ch. 2 only)	100Hz – 6.4KHz	Continuously variable control	Like it!
Signal/Noise Ratio in [dB]	Better than 80dB	All tone controls flat Measured at 1.0KHz into 8.0 ohms dummy load. "BRIGHT" – Off	Very good. (Unweighted RMS reading), with reference to nominal power output
Compressor – Range	–18 to +6	@ "0" compression begins at 100 W r.m.s. @ "–3" compression begins at 50 W r.m.s. @ "–6" compression begins at 25W r.m.s.	Smoothly limits power output without affecting input level. As control is turned clockwise from "0" it raises the maximum output level. Counter clockwise lowers maximum output, calibrated in 3dB points referred to rated power
Slave In (Sensitivity)	1.25 V r.m.s.	Ref. 22K ohms i/p impedance	Quite low, however typical for U.S. equipment
Capacitive Load Test	OK	2.0 uF – capacitor into 8. ohms of dummy load	Very good stability
Short Circuit Test	60 second		No ill effects, worked when short was removed.



delft's GUITARCHECK

TEST ON: Aria PE1000

DATE: March 1978

PRICE: £294.70 (inc. VAT) \$590

You may not agree with this, but I suspect the most interesting ads in this magazine are in a little cluster about 5 to 10 pages from the back. If anyone develops a new pickup or an everlasting guitar string, or a gadget to make your guitar sound like your Mother-in-Law, it seems to end up between 5 and 10 pages from the back. On occasions I even read the back ads before my own articles.

On one such occasion I discovered a full-page colour advertisement from the Aria people showing a most interesting guitar. In fact, it looked so interesting that I suspected it would never get past the prototype stage. In a way I was right, because it is now available in limited quantities in England under the title of the Aria Pro II Masterpiece Prototype. I am very conservative about the use of the term "Masterpiece": I have seen perhaps two only of many vintage Les Paul guitars which are truly masterpieces of their kind. The term "Professional" has, in many fields, been applied to devices intended for knowledgeable and ambitious amateurs — that is, by definition, non-professionals. If 'Masterpiece' is to become the next word to be made of less value, I will have no part of it. Equally, to claim that a guitar which is in production, (even relatively small-scale production), is a "prototype" is just a little tenuous.

I think what Aria would like to say is that this is a special guitar, made with rather more integrity than is commonly found in the average factory-made guitar, and owing more of its design and construction to craftsmen than to production engineers. That much I would agree with.

I do feel, however, that the manufacturer's literature on this model is written in an extravagant style, more appropriate to the "hype" of less distinguished instruments than the PE1000. While most of the facts presented are no doubt correct, some of the inferences you may draw from reading them could be a little misleading. I am not in a position to say whether this promotional material is suitable for other countries, but I do not think it is appropriate for England.

This is not a beginner's guitar (although a beginner who could afford to buy one would not go far wrong, and would probably not pay more in the end than the total cost of a series of "trade-ins"). It is likely that this instrument will be offered to (and will be of interest to) guitarists with some experience of music and the music business. It may come as an unpleasant surprise to the advertising industry, but most experi-



enced musicians can detect a "hype" at several hundred yards with the wind behind them. It would be a pity if they were deterred from trying this interesting and impressive guitar, simply because of the unfortunate style of the promotional material. I suggest the English importers keep the pretty Japanese pictures and write their own words.

While I am on the subject, it may help to avoid confusion if I mention that the name "Pro II" is applied to a whole range of Aria Guitars. There are two variations of the "Pro II Masterpiece Prototype" and three separate Aria catalogues all headed "Aria Pro II

Electric Guitars" and showing different ranges of instruments. If the quality of this review guitar is anything to go by, we shall be seeing a lot more of Aria guitars, and you may find it easier to ignore their names and recognise them by their specific model numbers.

This PE1000 is a most unusual instrument and, on first appearance, looks more like the product of an individual maker. On closer examination, a legend on the head announces that this model was designed and approved by H. Noble. I have not met Mr. Noble, but I think he is more likely to be American than Japanese. I also think he

knows what he is doing. I have so far seen two samples of the PE1000. Unless my memory deceives me, the earlier sample was slightly better than the one presented for review. This model is probably made in relatively small numbers and it is quite likely that there will be individual differences between instruments.

There are two features of this instrument which tend to attract attention: the shape of the body and the "antique-effect" finish. The finish is quite well done, if you like that sort of thing, but I spend so much time trying *not* to rub the colour off the corners, that I find it a little difficult to come to terms with the same effect produced deliberately. I would find the instrument more attractive with the same shaded finish but without the imitation "worn-off" edges. I would also prefer to see the bindings scraped clean or more evenly tinted, before lacquering. There is a very subtle line which divides an appearance of cared-for old age, and the visible results of neglect and hard usage. I happen to find the first more attractive than the second, although the concept of a 'knocked-about' guitar carries so many false but commercially useful associations that Aria may understand only too well the image which they are trying to project.

This is only a question of cosmetic images. What I feel is of much greater importance is the unusual shape of the body on the PE1000. Viewed from the front, it is obvious that there is an extensive cutaway to permit left-hand access to the higher frets. What is not so obvious is that the back of the cutaway is relieved much further than the front, and that the heel where the neck joins the body is virtually non-existent. This gives much easier access to the top frets than is found on most guitars of conventional construction. I have seen this sort of neck-to-body arrangement on guitars with a one-piece neck right through the body and also on instruments with metal necks, but Aria have managed to achieve the same advantage of good access without incurring the high cost of either of these methods of construction. This neck joint must present considerable problems in the finishing of the instrument but, by virtue of careful design and fitting, it is potentially just as robust and reliable as most conventional neck joints.

The neck is nicely-shaped although not particularly slim. It is rather difficult to arrange an exceptionally slim neck without losing something in tone or sustain. I think this is a reasonable compromise between the two requirements. The fingerboard on this sample is Rosewood, has 22 medium width frets and real pearl dot markers. There are also small plastic dot markers in the bass-side edge of the fingerboard.

I think the heel, where the head joins the back of the neck, looks a bit square and lumpy, although it probably does strengthen this area which is notoriously weak on many guitars. It could be shaped a little more gracefully, while continuing to provide strengthening at this point. In other respects, the head is a pleasant and original shape, and is in proportion to the rest of the

guitar. The machine heads are one of the several Japanese imitations of Grovers and this set is just about acceptable.

At the other end of the guitar, the bridge is a very solid looking bit of work, obviously related in principle to the Badass and its imitators but with slightly different mechanical arrangements. If the string bearers are made from Mazak, they will need replacing from time to time, and it is to be hoped that the importers will keep a stock of such small items. It is possible to fit the strings either through holes in the end wall of the bridge, or from the front, by putting the ball ends into key-hole slots in the base of the bridge with the adjusting screws. Each method has its advantages and disadvantages but in this case, you have a choice. The Japanese literature claims this to be the "perfect bridge". I have yet to see the perfect bridge, but this one is well thought out and should give very little trouble. It is also heavy and firmly fixed to the guitar via its support pillars. If you want a guitar with good sustain, both these would seem to be important considerations.

The body is made from two layers of matched strips of Maple, glued together to make a solid block, and the front and back are carved to gentle, arched contours. The single volume and tone controls and the pickup selector switch are partly recessed into the arched front. This is a sensible way of fitting the controls to a curved surface, and also gives an unusual and pleasing appearance. The volume and tone controls turn with delightful smoothness, but I would be happier to see a more robust form of selector switch used. Switches similar to this one are used on some inexpensive electric guitars, and some samples seem to break rather too easily. The internal wiring is neatly arranged and soldered, and the cavity in the body is treated with screening paint.

It would appear that Aria have been doing a bit of work on pickups recently. Their new range of guitars includes types using at least two different sorts of Alnico Magnets and also the "Proto-Matic 1" units fitted to the PE1000 and the LS700 which seem to use ferrite magnets. What this means in practical terms is that the guitars in the Pro II range are not all going to sound the same. The pickups on the present review guitar are fairly typical of recently designed "hot" Ferrite magnet pickups, and are not unlike the Ibanez "Super 90's" and the Gibson units used on the L5 and L6 solid guitars.

The overall sound of the guitar gives the impression of a relatively high output, with plenty of deep bass and a rather punchy sound. The three switch settings give three distinctly different sounds, all at approximately the same level.

I was very impressed with the action and fretting of the first sample of the PE1000 which I saw some time ago. The fretting is not quite so good on the sample presented for review, and there is a slight tendency for the strings to rattle on certain frets. Also the tuning is "out" at the nut end of the fingerboard, because some of the slots in the nut are not deep enough. If this were corrected, the

intonation would improve and, if the bridge were then raised to return the action to its previous setting, there would be less fret rattle. A slight adjustment to the truss rod and a further adjustment to the bridge would improve the instrument's performance again.

Beyond this point, any further improvement would require a fair amount of work on the frets. As supplied for review, the instrument is well playable and the only essential adjustment would be the deepening of some of the nut slots. However, it would be possible to improve the playability to a worthwhile extent, if the owner should wish it.

It is possible to see in this guitar, the influences of several old established designs. I see nothing wrong with that, and the Pro II makes a serious attempt to combine the best of old guitars with some of the features of more recent ones. There have been several such attempts — most of them unsuccessful. Although there may of course be little things wrong with any individual instrument, generally speaking, this guitar design must be considered a success. Whether the model is successful in production quantities will depend, as ever, on how closely the makers adhere to the designers original intentions, and on the presence of or lack of, stringent quality control measures.

This guitar appears in my lists at £294.70. There may be an alternative version available with DiMarzio pickups called PE1500 at £366.20. Both these prices include VAT and both seem to be very good value for money. However, it would be nearly as cheap to buy your own DiMarzio (or other) pickups and fit them yourself, if you must have different pickups. These guitars are in very short supply and if you want one, you will have to search for it. It is probably one of the few Japanese guitars which might be a reasonable investment for the future as well as a good musical instrument.

Measurements on the Aria PE1000 (It does not seem to have a serial number)

Scale Length	647mm
String spacing at bridge	50mm
String spacing at nut	35.5mm
Fingerboard width at nut	43mm
Action as supplied	1.2 treble/ 1.9 bass

(already too low without some small adjustments)

I shall be including three other measurements in future:-

Depth of neck. Nut end	20mm at first fret
Depth of neck. Body end	24mm at at 12th fret 25.5mm at 15th fret

On electric guitars, the 'nut end' measurement is taken from front centre to back centre adjacent to the first fret on the side nearest the body. The 'body end' measurements are taken in a similar way but adjacent to the 12th and 15th frets.

Also:- Weight of guitar	4.6 Kilos
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delft's GUITARCHECK

TEST ON: Raimundo Model 140 Classical Guitar. Imported by Rosetti

DATE: March 1978 PRICE: £109.50 (inc. VAT) S220

Some time ago I reviewed one of the cheaper guitars in the Raimundo range and found it to be a simple but well-made guitar, offering good value for money. I also expressed an interest in seeing a more expensive guitar from the same maker, and the importers have recently provided for review two instruments from near the top of the Raimundo range. While both instruments were pleasant and reasonably well-finished, I did not feel that the more expensive of the two, at £350, was sufficiently better than the Model 140 to justify its higher price, and I consequently decided to review only the Model 140. It is just possible that the more expensive guitar was a little below average and that I received a particularly good 140, thus narrowing the gap between the instruments. However each model must also compete with instruments of other makes at similar prices, and on these grounds also, I felt that the cheaper Model 140 would be of greater interest.

In common with many classical guitars under £300, the back and sides of this instrument are laminated. There is Rosewood on the inside and Rosewood on the outside, and presumably some unspecified timber in the middle. This form of construction *can* produce an insensitive, heavy-bodied guitar, or a brittle and fragile one. The Raimundo 140 is neither insensitive, nor unusually fragile. It is on the heavy side, by comparison with top quality, finely-made soloists' guitars, but this is probably not a fair comparison, considering the great differences in prices.

The soundboard is Spruce (not laminated) and is braced inside in one of the minor variations of standard classical guitar fan-strutting. All the internal work is very neat and clean with the exception of a bit of excess glue where the back joins the neck on the inside, and some external lacquer which has been accidentally sprayed on the inside of the back through the soundhole. These are only cosmetic points, and they are only visible inside the guitar. However, the lacquer sprayed through the soundhole is consistent with the rest of the external finish, which gives the appearance of having been slightly rushed. There are bumps in the lacquer film around the soundhole and on the head and bridge caused by uneven or too generous spraying.

Personally, I do not see the necessity for a musical instrument to be finished off to the standard of a piece of jewellery, unless it is in other respects of master-piece standard. The finish on this sample is pleasant and relatively hard wearing. It also enhances the attractive appearance



of the woods used in this instrument. Unless you want a guitar as a status symbol, that should be all that is required of a lacquer finish. It is likely that at this point, some of you will be thinking that the best Spanish guitars were always finished with French Polish/Shellac/Dragonsblood/Amber Varnish (or insert your own favourite finishing material). Some of them probably were finished with any or all of these materials, and I am not attempting to prove that Cellulose Lacquer is the ideal finishing material for guitars. However in lower and middle-priced guitars, one does not have much choice these days. The most common finishing materials in use today are probably Cellulose and Polyester. Of the two, I find Cellulose preferable. You may also be concerned that the finish is applied by spray, instead of "by hand". I have seen many Spanish-made guitars made around 10 years ago, when most of them claimed to be "hand polished". Some of the finishes were excellent and some of them, while undoubtedly hand-applied, were unattractive, full of blemishes, and presented in a cloudy, yellow appearance. Hand finishing (whatever that means), is no guarantee of good finishing. As long as the end result is suitable for the instrument, I am not particularly worried how it was applied.

While on the subject of finishing, I would find this particular sample more attractive if the golden tint used on the soundboard could be made a little more brown and a little less greenish-yellow. Many Japanese guitars have this slightly greenish-yellow colour on the soundboard and I suppose *someone* must want it. I believe the tradition was started by one of the better-known Spanish makers, who tinted his soundboards to look like well-aged wood. Somewhere along the line of imitations, Spanish golden brown changed into Japanese duck-egg yellow. I prefer golden brown.

The machine heads on this sample are almost certainly made in Japan (and possibly also part of the decoration round the soundhole). It is very difficult for any company producing fair quantities of classical guitars to avoid Japanese machine heads. They are cheap and are available with imitation engraving which looks very impressive from a distance. Regrettably, the gear mountings are not as impressive as the engraving. Two of the gears on this set are rather stiff, and this seems to be roughly typical of such machines. There is at the moment very little which is better unless one is willing to pay five times the price, and therefore make the finished instrument uncompetitive.

It is just possible that we may see properly-made machine heads from an English manufacturer in the near future. If nothing else, it should finish off the virtual black market in Leinsdorfer machines caused by the demand for these machines vastly exceeding the possible supply. I wish the company concerned every possible success, and I shall be happy to give you further details just as soon as they are officially in production. Meanwhile, there are a lot of Japanese machines on classical guitars and some of them are too stiff for comfort. To get the best from them, remove the string, and tighten the adjusting screw until the string roller just turns freely, or until the screw becomes tight, whichever occurs first. Apply Myford Lathe oil (Esso Nuto H32) or Molybdenum Disulphide Oil to all rubbing or bearing surfaces in very small quantities. You can be a little more generous when oiling the mating surfaces of the gears. Then take a string-winding crank and wind each gear for about 5 minutes. They should become smoother. If any one becomes steadily stiffer, something is seriously wrong: take the guitar to a repairman.

The machines on the review sample can be considered as satisfactory after this treatment, whereas a simple replacement with the same or similar Japanese machines could leave you with exactly the same problem from the new set. Incidentally, while I have yet to see really good classical guitar machines from Japan, and the best ones so far, happen to be made in Germany, I have also seen poor machines made in various parts of Europe, some of them considerably worse than the set on this review sample.

Although some of the machines are a little stiff, this can be remedied, and it is not the main reason for the slight difficulty I experienced in tuning this sample. The more significant problem is that some of the strings are sticking in the grooves in the nut. In most cases, the short-term cure is to rub the slots with a soft pencil. The alternative is to re-cut the slots, or to use a large piece of bone or Ivory and a lot of time making a properly fitted nut with shallow, polished grooves. While the end result should function better, it will not look much different from the present nut. This is one of many reasons why really good guitars often look the same as middling guitars, although they may cost far more.

It may be necessary to adjust the machine heads yourself. However I think it would not be unreasonable, when buying a guitar in this price-range if you request the shop selling the guitar to make any necessary adjustments to the nut grooves before you buy it. Most makes of guitar have some samples which need this sort of attention, and some shops make this sort of adjustment as

a matter of course. Others will do so when asked. If you meet with a refusal, or if the adjustments are unsatisfactory, you are then in a position to make certain very pertinent decisions before you part with your money.

If you should happen to find that some shops offering very large discounts are less than happy about adjusting guitars, try not to look surprised. If, on the other hand, you can find a guitar shop offering fair prices and good service, my comments on the nut of this Raimundo are not relevant. It should all be taken care of, before you even see the guitar. Just in case it is not, you know what to look for. Strings which creak when tuned, also strings which do not change in pitch when you first turn the machine-head button, and then suddenly jump up or down in pitch, as you continue tuning. You may be surprised how many instruments of various makes exhibit this fault. I am tempted to say practically all of them to some extent, but that might be considered unkind.

In keeping with what I believe to be good practice, the fingerboard of the 140 is Ebony and the bridge is Rosewood. Each of them is the colour that nature intended, and in my opinion, looks better for it. It is perfectly normal for some Ebony to have *faint* brown stripes.

The front of the fingerboard is polished to a smooth dull finish and the nickel-silver frets appear to be accurate and well finished. There are no sharp ends or edges and the top surfaces of the frets have been polished smooth to avoid buzzing strings and rapid wear on the covered strings.

The neck is either Cedar or Mahogany, and considering the thick Ebony fingerboard, I think there is rather more wood left on the neck than is either necessary, or comfortable for the player. I would find this guitar more attractive with a slimmer neck. The previously reviewed and much cheaper Raimundo had a more comfortable neck. I think perhaps that there is some variation between batches of necks, and I happen to have a particularly thick one on this sample. In this respect, my sample compares unfavourably with some of the better Japanese classical guitars. If other players and teachers share my feelings about this, I see no reason why the maker could not be asked to shave a little more off the back of the neck, particularly on the better guitars.

Tone quality

I always find this difficult, because tastes vary so much, but if I make no comment on the tone of a guitar, people write to complain. I distrust the principle of 'review by committee' and it would appear that at least some of you would prefer my own opinion, to none at all. So be it.

My impression of this Raimundo 140 is that it is going to need a lot of

"playing in" before anyone can be sure what sort of tone it will have. At the moment the bass strings 'growl' impressively, the mid-range is warm and well-balanced, and the top string tends to sound a bit thin, unless played forcefully and with careful technique. I have known such guitars to develop a more mellow treble when played regularly, and to become generally more responsive.

Allowing for this, I think it is likely that this instrument will always have a rather bright tone, and it may be of interest to players who like European guitar music which is not in a Spanish style. One example would be guitar settings of some of the works of J.S. Bach, although so many guitarists perform these pieces that it must be very difficult to offer anything new.

This instrument is also rather similar in tone to some of the 'classical' guitars made in America by companies who are better known for their steel string guitars. I suspect that many of these American-style classics are intended for folk music and general song accompaniment, while being easier on the fingers than the Steel-string guitars from the same maker. Guitarists brought up on steel-string instruments often seem to be happier with this style of classical guitar, and if they do not wish to pay American prices, for a nylon-string guitar they might do well to look at the middle of the Raimundo range.

Conclusion

This sample needs much more playing before I could really assess its worth as a classical guitar. As it has a clear and bright tone it will certainly be of interest to singers, school-teachers, and nocturnal guitarists who are cursed with thin walls and touchy neighbours. (The sound of nylon strings does not penetrate through the fabric of a building as far as the sound from a steel string guitar.

Measurements on Raimundo Model 140 (No serial number)

Scale length	662mm
String spacing at bridge	57mm
String spacing at nut	44mm
Fingerboard width at nut	53mm
Action as supplied	3.2mm Treble/ 4mm Bass

So that you may more easily compare different guitars, I shall in future be including three more measurements:-
Depth of neck (head end)
Depth of neck (body end)

These are measured from front centre of fingerboard to back centre of neck. For all guitars, the head-end measurement is taken adjacent to the first fret, on the side nearest the body. For classical guitars, the body-end measurement is taken in the same way but by the 10th fret.



argent's KEYBOARDCHECK

TEST ON: Elka X705 Organ

DATE: March 1978 PRICE: £2,420.28 (Inc. VAT) UK



To call the Elka X705 an organ is in a way to do it an injustice; it's much more an electronic keyboard, period, as it contains many features – including two synthesizers; one a string synth which is polyphonic, the other a purely monophonic “solo” synth – which really places the instrument in a much grander category. And yet I really can't help seeing it as a sort of super “home” organ, the answer to a solo club player's dream! It's probably the incorporation of the rhythm machine which makes me think this way.

However, to deal with matters in a logical way; the X705 is, amongst other things, a drawbar-regulated organ and we should perhaps consider the upper manual drawbars first. Nine flute bars provide a comprehensive selection of voicings; 16', 5 1/3', 8', 4', 2 2/3', 2', 1 3/5' and 1'. I tested the X705 with two Elka amplification cabinets; one a “straight” cabinet, the other an “Elka-

tone” rotary. The flute drawbars could be directed through either, and the placing of drawbars through, say, the rotary coupled with perhaps a solo voice “straight” made for some very pleasant stereo effects. Percussion may be added to the upper manual by means of seven percussion harmonics set at 8', 5 1/3', 4', 2 2/3' and 1'. These voicings can be applied loud or soft, short or long. Percussion, like the flute drawbars, can either be routed “straight” or through the rotary cabinet. The flute drawbars may be further modified by the introduction of sustain; a panel set to the right of the upper manual allows for a variable degree of sustain to be added separately to the several sections of the instrument – drawbars, piano and clavichord and strings form the separate sections and may be individually controlled on both upper and lower manuals.

A series of useful organ presets, in effect polyphonic synthesized sounds, are

provided and each voice has its own indicator light which comes on when in use. ‘Tabs’ introduces the upper manual flute drawbars and piano and string voices. Other presets are ‘Theatre’, ‘Beat’ Brass One and Brass Two.

Eleven monophonic presets, physically neighbours to the polyphonic section controls form what is in effect the synthesizer section. This section makes perhaps the most interesting contribution to the organ as far as sound and textural areas are concerned, and some of the sounds are very nice indeed. The voices are marked Trombone, Trumpet, Sax, Clarinet, Oboe, Guitar, Hawaiian Guitar, Violin, Flute, ‘Telstar’, and ‘Cosmic’, and each comes with its own indicator light. Some of the sounds are very realistic; all are pleasant and all may be modified by a panel on the left of the organ. This, marked ‘solo variations’, provides for VCA and VCF envelope controls as

well as separate filter, vibrato and pitch bend faders.

An 'octave down' control is also provided which has precisely the effect its name suggests. A tab is provided whereby any of the solo presets can be transferred onto the 13-note pedal board. The two keyboard manuals, by the way, are standard 49-note (C-C).

The 'string synthesizer' section is, as you might expect from Elka, very good. It consists of two basic string selections, cello and 'strings ensemble' and two other effects, piano and clavi-chord. Volume slides for the bass, strings ensemble (upper/lower) piano and clavi-chord (upper/lower) bass presets and solo presets are all situated to the far left of the console. All the effects can be used separately or in any combination. 'Cello' and 'strings ensemble' are realistic; 'piano' and 'clavichord' tabs provide more of a tonal area than a direct imitation. Some very nice effects are possible using a combination of the piano and sustain settings.

And now the rhythm box! Normally I hate such things; they usually sound very wooden, stilted and 'ricky' tik'. I'm happy to report that this one is the exception to the rule; it's extremely good both in terms of sound and in the 'feels' it provides. Sixteen rhythms are listed; "Tango", "March", "Waltz", "Slow Rock", "Swing", "Rhythm and Blues", "Jazz", "Rock", "Shake", "Boogie Woogie", "Afro", "Beguine", "Samba", "Mambo", "Rhumba", "Cha-Cha" and "Bossa Nova". All "swing" and you can

build up your automatic rhythm section using any combination of drums, bass, piano, guitar and brass, all of which play automatically if selected. The rhythm section basically works like this; select your instruments and hit a single bass note. You will find that the bass pattern will form around the tonic and fifth of the chord whose root note is what you have played. However, play a three-note chord, and a more complex configuration of bass will ensue! One feature which delighted me was as follows; the rhythm box finds the harmonically correct bass line no matter what inversion of a chord you might play. In other words, it doesn't simply take the bottom note of a left-hand chord and assume that it's a root; it analyses the chord and then plays the shape!

There is a 'drum break' control fixed to the side of the organ's expression pedal. Hit this with your foot and you introduce pattern variations and drum breaks which greatly help relieve the monotony of an automatic drum pattern. Other modifications to the rhythm box: a 'walking bass' selector, sustain and computerised 'memory' buttons which retain the selected chord indefinitely. The overall tempo is controlled by a slider. Drums, bass and 'accompaniment' all have separate volume faders.

Voicings which may be selected for the bass pedal unit are Flute 16' and Flute 8'. An 'attack' control is provided to add the possibility of a percussive edge to the bass note. Sustain is available and a slider is provided to control over-

all volume. A very useful 'Pedal Bass to Manual Bass' button introduces the possibility of the bass pedal tabs being used for a left hand bass on the bottom twelve notes of the lower manual and if the solo voices have been switched to the pedalboard at the time by means of the "Upper Bass" tab, then when you press the button, they too will be transferred to the lower manual.

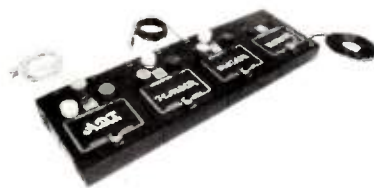
All the usual organ modifications are of course included. Two degrees of vibrato can be applied to upper or lower manual, or both. Reverberation is controlled in degree by a fader. Other controls include 'swell cancel' by which three sections "piano and claw", "solo effects" and "rhythm unit" may be made to bypass the swell pedal; "solo tuning", which separately tunes the monophonic synthesizer part of the instrument and a volume fader panel wherein all the different sections of the X705 may be balanced.

Externally, there are outputs marked 'general', 'Brass, solo, strings' and 'piano, bass, rhythm' as well as one for a rotary cabinet. The dimensions of the instrument are as follows; Height 100cm Depth 133cm, Width 68cm, Net weight 80 kilos, Gross weight 98 kilos.

In conclusion then, I found the Elka X705 to be impressive. Already three good instruments in one, it boasts the addition of the best rhythm unit I've seen, and I should think might well provide the ultimate answer for the club solo organist or home player.

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IN BRIEF IN BRIEF

On Test: Sony CF-900S rhythm and studio mixer cassette-corder Price: £180 (inc. VAT) \$360

How would you like a compact unit that offered you a practice amp, rhythm box, FM/MW/SW radio, cassette recorder, and full mixing facilities? Sony have produced such a package with their incredibly versatile Rhythm Capsule 900S.

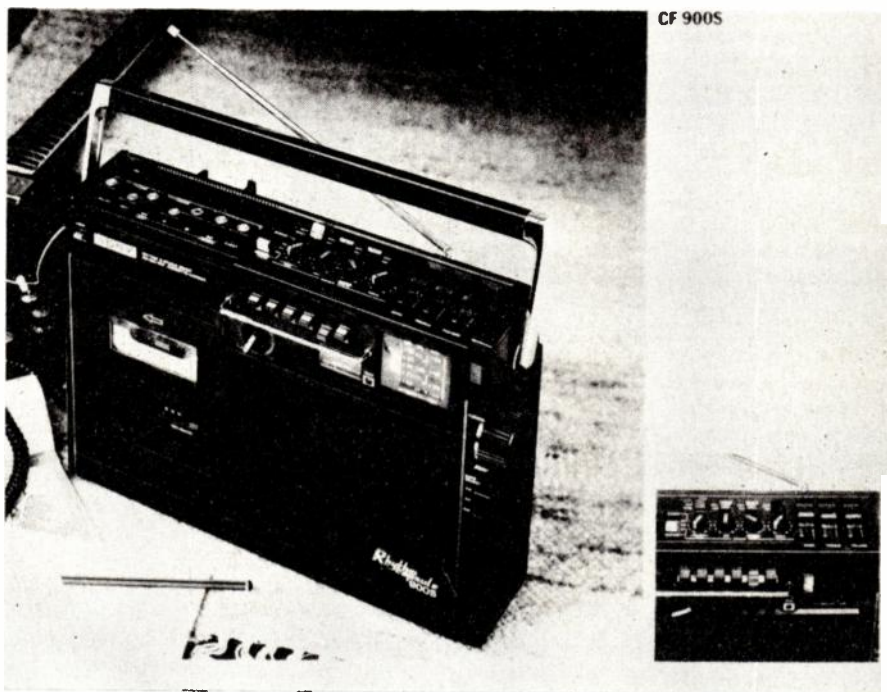
Unlike most cassette-corders on the market, this machine is ideal for musicians in that it gives unlimited scope for both practice and recording. The most obvious application for IM readers would be a function of recording both a rhythm track and vocal at the same time with convincing percussive accompaniment which gives bass drum, snare drum, cymbal, and high-hat choke at the same time.

The unit offers the choice of six rhythms: waltz, ballad, bossanova, swing, rock 1, rock 2. With the guitar directly injected, you can record a convincing basic drums and rhythm guitar track without the problem of ambient noise leaking on to your tape. You can then play lead and do vocals over this track which can easily be recorded through a second tape recorder and presto! you have your instant demo.

The machine also lets you play along and record directly with whatever is coming over the radio so you can mix your own solo into the latest chart-buster. I found the machine ideal for practice because playing along to the strict timing of a rhythm track is far more demanding than just doodling away on the fretboard alone. If you have a second cassette recorder you can listen back to the whole distressing story!

Of course the CF-900S also has normal record and playback functions that can be found in any one of a hundred cassette recorders. But it is the special mixing and rhythm functions that make the product of specific value to musicians.

The unit's controls are well-laid out and become familiar after half an hour experimenting. One hang up I had with the machine was that I couldn't get the mike to work with the selector lever set in the "mix" mode. This may be down to me working the controls incorrectly but no amount of twiddling could get the mike mixed in with the rhythm and guitar. When the selector is set to "Mic" the rhythm and mix facilities are shut off. That is the one criticism I have of what is one of the most versatile cassette players on the market. When you consider all the facilities it offers the price doesn't seem too high.
Ian White



Test On: Electro — Harmonix Zipper Envelope Follower Price: £27.77 (ex. VAT) \$60

With terms like Envelope Follower becoming common jargon in music these days, the humble musician could be forgiven for thinking that he needs an electronics degree to choose a pedal these days.

When I picked up the Zipper, I had no real idea what an Envelope Follower was, so it was really a question of sitting down with the thing and fiddling about with it to see what it could do. This situation was further complicated by the lack of any explanatory leaflet, so the test was very much a case of trial and error.

The first thing that struck me about the Zipper was its design. The case is made of two interlocking pieces of sheet metal which give a rugged but smart appearance and it is also a spacious and well laid out unit. A big advantage for working musicians is the AC/DC operation which eliminates the fag of having to change batteries frequently.

Basically, the sound the Zipper gives you is a wah-wah effect which is triggered when a note is passed through it. This makes it excellent for lead breaks, but not so suitable for a chuck-a-wah sound commonly used by soul rhythm guitarists.

On the face of the unit are three

controls, ranged along the top and the push button on/off switch on the bottom. The centre control is a two-way switch marked Attack. As the name implies, this controls the attack, giving either a fast, snappy twang or a slower "wah" sound.

The left control is a knob marked Range which appears to control the frequency range most effectively. The sounds produced when rotating this range from a tinny scream at the top end, to a growl at the bottom.

The final control on the right is the rather mysteriously marked Q, which controls the depth of effect. In addition to the three controls on the face of the unit, there is a slide switch marked LP — BP which is situated between the two front facing jack sockets.

Once again, because of lack of information, it was difficult to see what this switch actually did, as it appeared to have little effect on the sound. I have since learned that this control switch is to provide equalisation.

The Zipper was tried out by a number of friends using different guitars — a standard Telecaster, an SG and a Strat, and it was found that with each guitar there was an ideal setting which if not used then the sound would either be too topky or too muddy. Incidentally, the most favourable sound generally

agreed upon was the Zipper with the SG.

The unit was also tried out on a bass guitar, where it was possible to get a synthesized type bass sound out of it. This could prove a useful sound, but not one to be used too often!

Just to round off the whole thing, the Zipper was tried on a couple of keyboards, but the effect was minimal. This is probably due to the fact that the unit is touch sensitive, which means the harder you play the more effect works.

So, on cheaper keyboards which aren't touch sensitive themselves the amount of effect would be negligible however, on a top class electric piano or organ it might well be a different story.



Still, the main use of this effect would be on guitar and because of its touch sensitivity the musician must play clean and hard as sloppy playing will come out sounding even sloppier.

Having seen the pedal work on stage, it is obvious that the Zipper is best used for live work presenting the musician with an impressive effect for the minimum amount of fuss.

Overall the unit is very good value and has enormous potential given the time to experiment with it.

Dimensions: 5½" x 6¾" x 2¼".
Weight: 1lb 10ozs.

David Lawrenson

Review On: Rock Guitarists (Volume II)

Price: \$5.95 (Guitar Player Books/Records, Box 615 Saratoga, CA 95070, California)

If you want to know what strings and picks are used by your favourite guitar hero, this is the book for you. Basically it is a collection of all the best

interviews that have appeared in the excellent American publication "Guitar Player" which carries interviews as technically detailed as you could wish for.

Here, in one attractive volume you can get inside the brains of such ace axemen as: Jeff Beck, Roy Buchanan, Amos Garrett, Eric Clapton, George Terry, Joe Walsh, and Lowell George to name a few. There are a total of 64 musicians featured altogether.

The interviews are a compilation of work done by Guitar Player correspondents including International Musician's own Steve Rosen. The interviews are excellent in the detail they reveal about the players and how they get their specific sounds.

What comes across is the total normality of many revered names who still have feelings of always trying to find the right sound and improve themselves. It's almost heartening to hear people like Roy Buchanan say they wish they could play better and improve their technique. It is comforting to know that star players suffer the same frustrations with their instru-

ments as us "mere mortals".

There are many guitarists who may not mean much to British musicians and there are interviews with musicians who are not exactly everyone's idea of guitar heroes (i.e. Jackson Brown, Dave Davies, Lindsay Buckingham and Buck Dharma). Nevertheless the material contained in these dialogues is still of value.

Every player interviewed talks at length about his style and method of achieving their own sound. There's even an interview with the elusive J.J. Cale and a four-page guide to Jimi Hendrix's equipment.

One quote, for me, had a lot of impact. It is when Denny Dias of Steely Dan describes his goal as a guitarist is to get better "which is a never-ending search. . . the more you know, the more you find out stuff you don't know. You have to get close enough to the edge of the canyon before you can find out how deep it is".

This is a compelling book for every one with an interest in the guitar and is well-worth having. British readers should write to the above address to order their copies.

Ian White



Erratum-Hohner Pianet T.

The price of the Hohner Pianet T reviewed in last month's issue is £320.23 (ex. VAT. \$640) and not the price we printed.

simmons' SYNTHESIZER CHECK

Dave Simmons is an expert on synthesizers. He understands them both musically and technically and his background has made him uniquely qualified to be I.M.'s Synthesizer Consultant. For two and a half years he was UK Service Manager for ARP Synthesizers and today he's a partner in a highly specialised company called Music Aid in St. Albans, Hertfordshire where he undertakes all types of synthesizer modification and servicing.

TEST ON: ARP Odyssey

DATE: March 1978 PRICE: £992 (+ VAT) \$1984

All the ARP synthesizers have gone through a "face-lift" in the last few months, presenting much the same instruments in different packages. Since the Odyssey was first produced it has had white panels with black lettering, black panels with gold lettering and the new model has a black panel with fluorescent orange lettering. ARP have done away with the wrap-around plastic case and have gone for an all steel assembly.

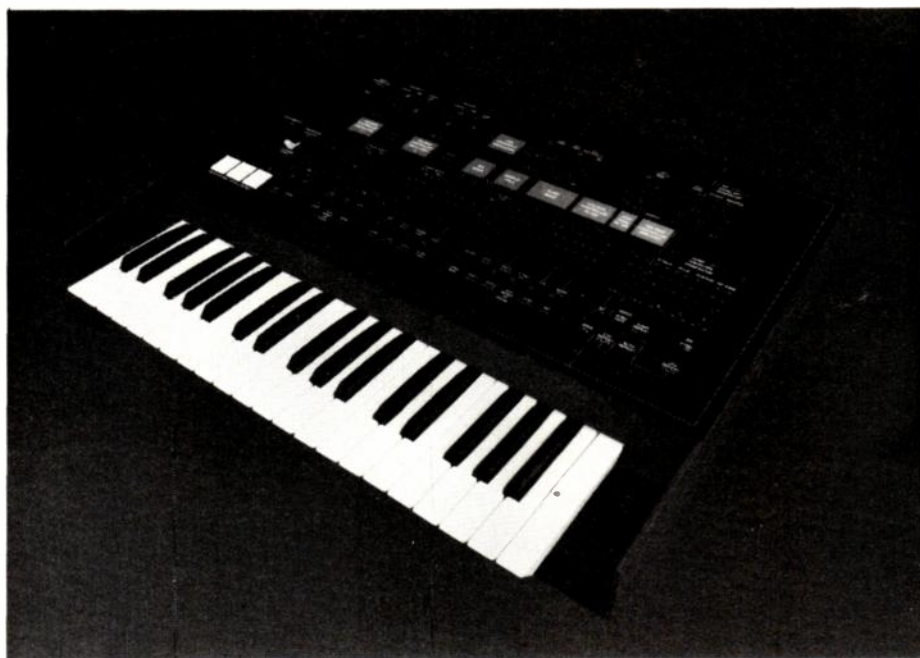
Through all these changes, the layout electronics and sound of the instrument have remained much the same, so for those of you who are already familiar with the Odyssey, the next paragraphs will be incidental so pass on to "New Features".

FACILITIES

Oscillators

The Odyssey has two voltage controlled oscillators tunable over the range 20Hz to 20KHz and controlled by a three octave keyboard with the added feature of being able to switch VCO 1 to lower frequencies (2Hz to 20Hz). Both oscillators have two outputs - Ramp (or Sawtooth) and Pulse - the width of the pulse being variable from 50% (Hollow) to 5% (Reedy) or by the control waveforms produced by the Low Frequency Oscillator (LFO), or Attack, Decay, Sustain, Release (ADSR) envelope generator, producing a dynamic pulse. FM (frequency modulation - sweeping) inputs to the VCO are via two sliders, and switchable between LFO square and sine waves and S&H (Sample and Hold) + ADSR, although VCO 2 has the facility of FM by an external pedal or the signals present at the output of the S&H mixer.

VCO 2 can be phase-linked to VCO 1 enabling the two to be perfectly tuned together and when used in configuration with VCO 2, FM inputs (i.e. ADSR or LFO) produce interesting harmonic sweeping effects. Vibrato and Pitch Bend up and down are achieved by the new method (P.P.C.) which is discussed in "New Features". The range of the oscillators can be switched up, or down two octaves by the Transpose switch.



Filter

A single low pass filter (voltage controlled) is supplied, the cut-off frequency being variable from 16Hz to 16KHz and resonance can be added at that cut-off frequency variable from zero to self-oscillate.

The Audio inputs to the filter are via three sliders, switchable to noise generator, VCO 1 sawtooth, VCO 2 sawtooth or ring modulator, VCO 1 Pulse and VCO 2 Pulse. Control inputs are again variable via three sliders and switchable to keyboard control voltage, S&H, ADSR, S&H mixer, external pedal, LFO's sine wave and AR generator.

The output of the filter is fed via a high-pass filter (Bass cut-off variable from Off to 16KHz) to a voltage controlled amplifier (VCA) which has a control input that can be switched to the ADSR or AR envelope generators. The VCA has a dynamic range of 80db and can be by-passed by use of the VCA Gain slider.

Envelope Generators

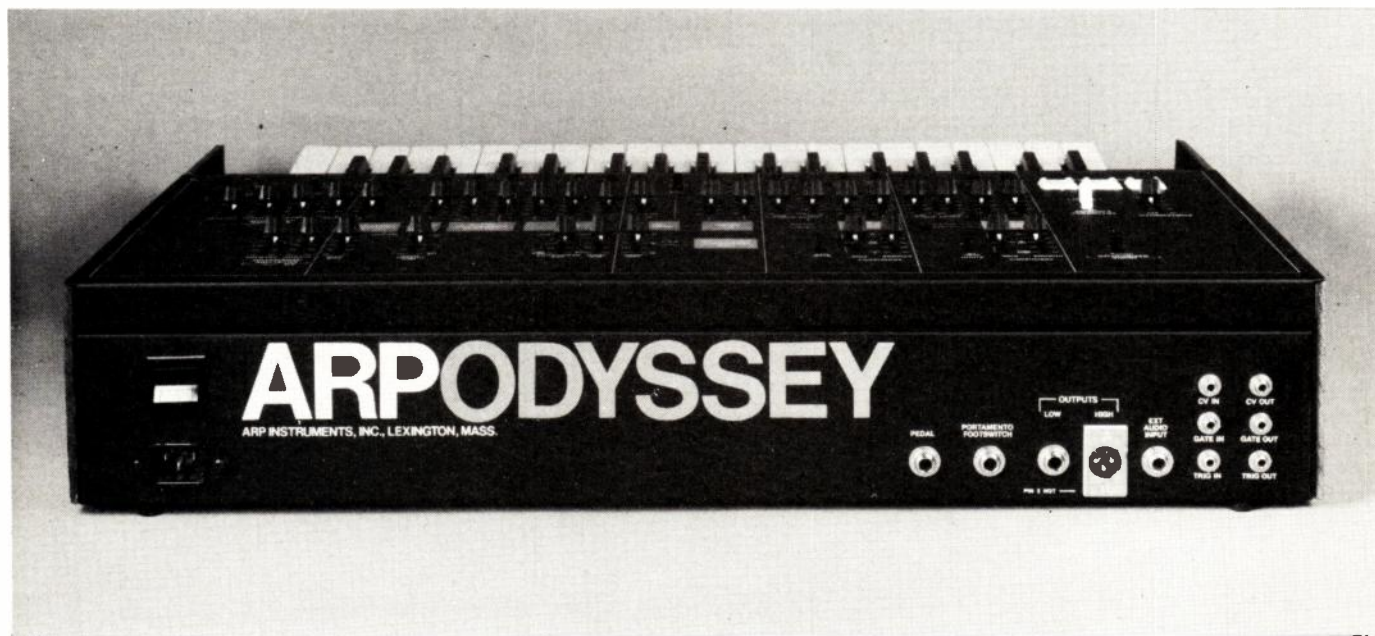
Two envelope generators are supplied ADSR and AR generator, the attack and decay times are variable from instant to about 10 seconds.

Noise Generator and S&H Generator

The noise generator supplies eight white or pink noise. The S&H generator produces a series of random or semi-sequenced voltage levels that, when fed into the VCO's produce a series of pitches. Inputs to the S&H generator are via the two sliders switchable to VCO 1 sawtooth, Noise generator, VCO 1 pulse and VCO 2 sawtooth.

Sounds

I have often heard the Odyssey criticised for its sound. comments like "I use the Odyssey for sound effects but not for lead lines" are common and certainly, mainly due to its graphic layout (slider positions are instantly assessed) and switch - patching system,



many and varied effects can be obtained quickly and easily but I have found that the lead synth sound a la George Duke etc. can also be obtained as well as a beautiful thick bass sound which I think is unique to the Odyssey. Use of the filter as a tone source is often overlooked as is use of the S&H mixer output as a control input to the filter. There are a couple of things that have always bugged me about the Odyssey. One is the two voice system, because the instrument has only a single CV memory the two voice facility will not work when the keys are released, i.e. on the longer envelope decay settings VCO 2 (the second voice) will drop to the same pitch as VCO 1. Secondly the LFO re-set; every time a key is depressed, the LFO is re-set to the beginning of its cycle, which makes it impossible to use the LFO to slowly open and close the VCF whilst playing. However these are small points on an otherwise excellent synthesizer renowned for its reliability and stability. In fact, VCO drift is absent completely after the first ten minutes warm-up time during which there is a 1/30th of a tone drift.

New Features.

As I have already said, the new Odyssey has been re-packaged in a new case and this is my only criticism of the instrument. The old plastic case was tough and was proud of the keys and

sliders, if the instrument was dropped on its front, the sides and front of the case would take most of the impact. However, the new packaging leaves the keys overlapping the front of the cabinet work by an inch. The sides have a thin wooden block fixed to them and offer no protection to the front panel and slider controls. Time and time again I replace broken slider controls that have been 'sliced' off by rough handling and this is on the older type instruments which have a modicum of protection.

On the back panel of the instrument are 'Interface' connectors consisting of six 3.5mm jack sockets marked CV in and out, Gate in and out, and Trig in and out, which enable the Odyssey to be linked up with string machines, sequencers etc. ARP have also fitted an XLR three pin socket on the back for studio use.

P.P.C.

P.P.C. (proportional pitch control) is the latest device in the long stream of 'expression' controls that are fitted to synthesizers. It consists of three pads on the left hand side of the instrument. Pressing the far left pad flattens the note, the right hand pad sharpens the note and the centre pad feeds the LFO sine to both oscillators. The pads themselves are cleverly designed so that there is a pressure gradient from the back to the front of the pad i.e. you can press hard

on the front of the pad and the VCO's will sharpen only a fraction of a tone whereas the same pressure on the back of the pad raises the pitch by about a fifth. The most useful intervals of pitch bend (2nd and 3rd) are obtained in the middle of the pad.

This is the third time that I have played an ARP with PPC and I have still not quite mastered the use of the PPC. I found it difficult to equate pitch with pressure, especially when trying to bend to a specific interval. With a knob or thumb-wheel you soon get to know how far to turn the knob to get the desired interval but with PPC, move a fraction too far to either side of the centre of the pad, and the note either bends too little, and you are pressing furiously to sharpen it, or you go over the top and sound like a banjo with elastic strings. Even so, there will be a lot of people who like it. Pitch bending systems are a matter of personal taste (I know people who like the ribbon controller) and it is nice to have sharpen, flatten and vibrate controls, literally at your fingertips.

Conclusion

A re-packaged Odyssey with the same sound but prettier in appearance. The PPC will keep people interested (It can be fitted to the older models incidentally) and I'm sure that this instrument will be around for years to come.

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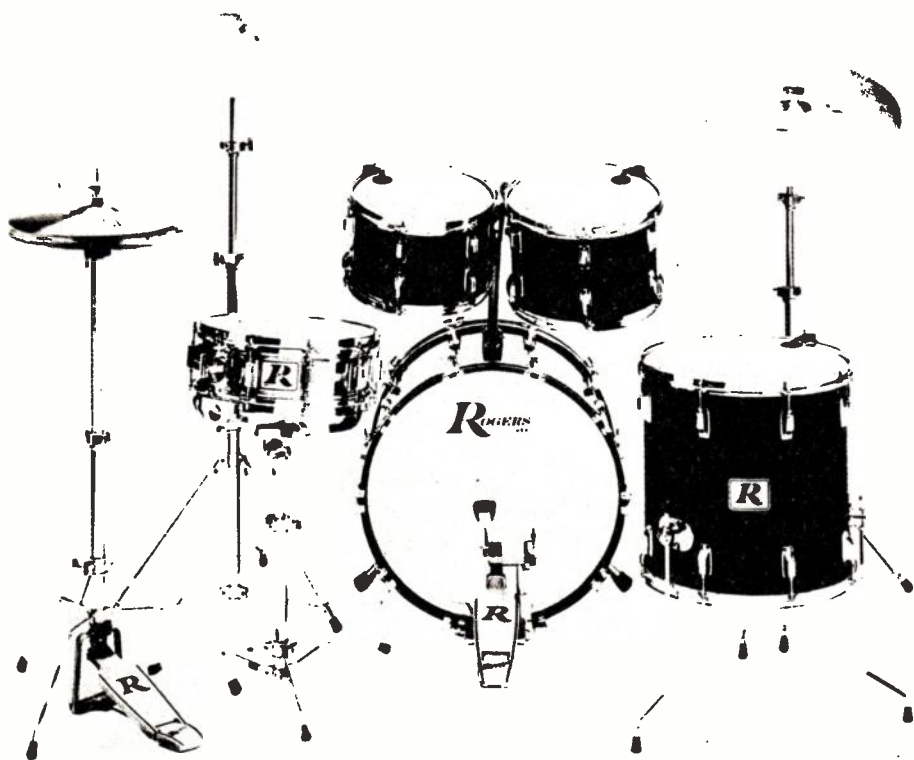


mattacks' DRUMCHECK

Dave Mattacks is one of Britain's top session drummers who has worked extensively with dozens of top artists including Andy Fairweather Low, Kiki Dee, Brian Eno and Rick Wakeman. Although he works mainly freelance, Dave is a full time member of the Albion Band. He has been playing drums for 14 years and was with Fairport Convention between 1969 and 1974.

TEST ON: Rogers Londoner VI

DATE: March 1978 PRICE: £746.06 plus VAT \$1,500



Introduction

The Londoner VI has a 22x14 bass drum; 12x8, 13x9, 14x10 and 16x16 toms; 14x5 Dynasonic snare drum; two cymbal stands; snare drum stand and bass drum and hi hat pedals.

Sound

The bass drum had no felt strips fitted and consequently was very 'gong-y'. However, some basic tuning ensued and I ended up with a (naturally!) loud, live sound. With the front head off, the drum gave an excellent "up-front" studio sound — very solid but without being excessively "dead". The four toms sounded excellent. With every little tuning I got a very full sound — a lot of tone as well as volume. Slackening the heads gave a slightly deader "studio type" tom sound, but still retaining an excellent full tone. The snare drum I've saved till last because frankly I'm in a bit of a quandry about it. I spent a fair portion of the review time tuning it this way and that — snare head flat then tighter at the snare bed; tight/slack; tight/loose batter head; damped; snares tight/loose in frame; tight/loose against the snare head; etc., etc., etc., — and at the end of that, I still didn't like it at all. I KNOW it's a well-made drum

and Harvey Mason and hundreds of other drummers I've heard on record (and liked the sound) use it, but I have to say that subjectively speaking, it's not the drum for me. I might add, incidentally, that in the past I've had a 5" and a 6½" Dynasonic on the road — and in the studio — and after weeks of perseverance I finally gave up and went back to my old Rogers wood shell Powertone with a straightforward snare mechanism.

Bass Drum

The 22x14 bass drum has ten "beavertail" lugs, steel claws and tensioners per head. I thought the wooden hoops were rather flimsy — a thicker hoop or the metal type would have been preferable. The tom tom holder has a strong support tube fitted inside the drum which stabilizes the whole fitting — essential with three toms mounted. The standard Memriloc receiver unit is also used for the spurs which are a "disappearing" large tube version of the bent rod type. Underneath the rubber tip, the tube is cut step-like which gives a double corner on each spur. The surface on which I tested the kit was carpeted, so it isn't possible to comment on the spurs' effectiveness on a hard wood floor for example, but the principle behind the

idea is certainly sound. As on the other drums with the kit, Rogers/Remo ruff-coated heads are fitted.

Tom-Toms

No internal dampers are fitted to the four toms. Instead, a rather ingenious external muffler is used, which can be taken on or off in seconds. It's a piece of sprung steel one end of which clips easily onto the counter hoop and the other stretches out over the drum head. At this end is a felt washer and as you tighten a small wing nut on the device itself, the felt gradually comes into contact with the head. I've been using one on my snare drum in the studio for some time now and it really works well. A great idea.

The shell construction on the toms — and bass drum — is 5-ply cross laminated with reinforcing glue rings. The insides of the shells are coated with a dense grey-flecked substance which looks like Portafleck.

The 12" and 13" diameter drums have 6 lugs per head and the 14" and 16" diameter toms have eight lugs per head. All drums are fitted with triple flanged hoops and square-headed tension rods and the 16x16 floor tom has three wide angle (Knobby) legs and brackets.

Snare Drum

The Dynasonic shell has two concave strengthening beads (above and below the lug) and 45 degree inverse flanges with flat bearing edges. I found the triple flange hoops with which the drum is fitted too heavy for my taste — they produced a very "clanky" rim-shot sound, not unlike that from a cast hoop. The ten double ended lugs — like the single lugs fitted on the other drums — have a small spring clip around the threaded inserts which effectively prevents any buzzing or rattling. The clip makes internal springs unnecessary and keeps the insert in place but still allows it to self-align. Each lug is kept in place by two self tappers. An effective internal damper is fitted, a variation on the screw-up type.

The snare mechanism is exclusive to Rogers. The snares themselves are apparently fixed to the snare butt with epoxy resin, not by soldering. The epoxy resin method is said to improve resilience and make for stronger wire. The snares and butt are then mounted on a die cast

TEST

frame just a little longer than the snares. The tension is variable by turning a thumb screw which stretches or loosens the snares across the frame itself. This is independent of how tight — or loose — you have the snares against the snare head. Instead of the string going through the snare butt each end of the snares, it goes through two holes in each end of the cast frame and ties to the snare release in the conventional way. The release itself is basically a side to side lever type with a roller mechanism. The tension screw is spring-loaded thereby eliminating slipping whether the snares are on or off. The action is excellent. The theory behind the whole mechanism is that you can have the snares tensioned tight without them “choking” the drum. It also eliminates string or snare butts touching the snare head.

I must admit my prejudice against snare mechanisms other than ordinary or “conventional” types, but I’ll always try them out before coming to any conclusion whether they be Parallel action, Dynasonic or whatever.

Stands/Accessories

The basis of the Memriloc System is that an enlarged version of a jubilee clip, a clamp, fits around the stems of the tom-toms arms, cymbal stands, etc. and this clamp mates with the receiving unit on a drum or stand. The receiver units have wing nuts fitted which tighten onto a groove in the clamp. The clamp is adjustable along each tube and is tightened by applying a drum key to a short, square-headed screw, which in turn squeezes the clamp around the tube. Once the height of your stand or tom holder is where you want it, you tighten the clamp which then stays put and each time you set up, it locks into the appropriate receiving unit always at the same angle and height.

For the spurs and tom holders, 1” diameter tubing is used. All tubes where locking and adjustment are needed have a textured chrome finish that looks a little like a light sand-blasted effect. This is to ensure the clamps don’t slip when tightened. All the other areas have regular chrome plating.

The tom-tom holder receiver unit on the bass drum is the same type for the spurs and the toms. Where the wing nut screws through the casting to tighten onto the groove in the clamp, I felt that a removable nut set into a slot in the casting would improve matters, as threads tapped through Mazac-type castings (as opposed to a steel block) tend to wear and strip. At the top of the tom-tom stem that fits into the bass drum is a substantial cast block with three vertical holes set in a triangular pattern. Each of the three hanging toms has an “L”-shaped arm (the angle being adjustable by a spring-loaded wing nut locked ratchet device) one end of which goes into the tom-tom and the other shorter arm goes into one of the three holes in the casting. Two screws set in the casting tighten onto

corresponding grooves on the short arm thereby fixing the horizontal axis setting. The other end of the arm which fits into the tom-toms is fixed by the Memriloc clamp and receiver device. The whole unit is incredibly strong and it’s actually possible to pick up all three toms mounted and the bass drum all in one go without any sign of anything wobbling or slipping. It was easy to position the three toms very close to each other without difficulty of access to the tightening wing nuts on the receiver units. I’m personally not keen on the idea of three toms being mounted on a bass drum, but if it’s what you want, this is definitely the fitting to use.

The snare drum stand had a flat base and the height adjustment utilised the Memriloc idea. The angle adjustment is via a ratchet and wing nut and once it’s set, doesn’t have to be undone as all three arms fold upward — another time saving device. However, with ratchet tilters, whether on snare stands, tom holders or cymbal stands, I invariably find an angle I want in between the grooves, although I must admit that this stand does have particularly fine teeth/grooves and I did manage to find a comfortable playing angle. The clamping mechanism is unconventional. Turning a spring-loaded wing nut pulls one of the arms in toward the centre of the cradle. The tips of the arms were not rubber covered and you would have to make sure you didn’t overtighten the wing nut on the clamping mechanism and bend the bottom counter hoop out of shape. The snare arms themselves adjust to take 12” through 15” diameter drums.

The Supreme hi-hat has a wide-angle tripod base, Memriloc height adjustment and a bottom cymbal tilter screw fitted to the upper 1” diameter tube. The height adjustment is a great improvement on the earlier conventional type, for even after Rogers brought out the model with the indentations in the top tube, it was still prone to slipping. The pedal is the centre pull type with a strong plastic link between the large cast hinged heel footplate and the centre rod. The spring tension is adjustable and the action was excellent — one of the smoothest and quietest pedals I’ve tried. Rogers excellent top cymbal clutch has been around for quite a time and as far as I can tell, is virtually unchanged and still about the best there is. The only thing I didn’t like — and this applies to the new Supreme bass drum pedal as well — is the extremely large footplate. Although the action on the hi-hat and bass drum pedal is excellent, I preferred both pedals when they had the narrower footplate with the long slots in them. I never experienced any strength problems with that type of footplate, but presumably I’m in the minority which is why they’ve grown in size.

The bass drum pedal is the upgraded version of the excellent Swiv-o-matic

model with several new features, some of which I liked. I didn’t like the split heel footplate, as I mentioned, with its toe stop which is big enough to be termed “hoof” stop and I didn’t like the new clamping mechanism. A lever using a cam action mechanism locks the pedal onto the bass drum hoop in one movement. However, the pedal slipped sideways even when “locked” on. I find the earlier clamp and screw-up wing nut much more secure.

I did like the new swivel unit clamp that holds the rod from the heel plate. The rod now snaps into place inside a spring clip instead of wobbling around like it used to. The angle of the footplate in relation to the bass drum is still adjustable. I also liked the thicker beater rod and the new two-way beater head made from some synthetic hard material but lighter than wood in weight. Press the head of the beater down and turn and you have the “felt beater” side! Unchanged is the single post, adjustable in height, the needle bearing action and the stroke adjustment and spring tension method. Despite my reservations about certain “improvements”, it still is a very good pedal.

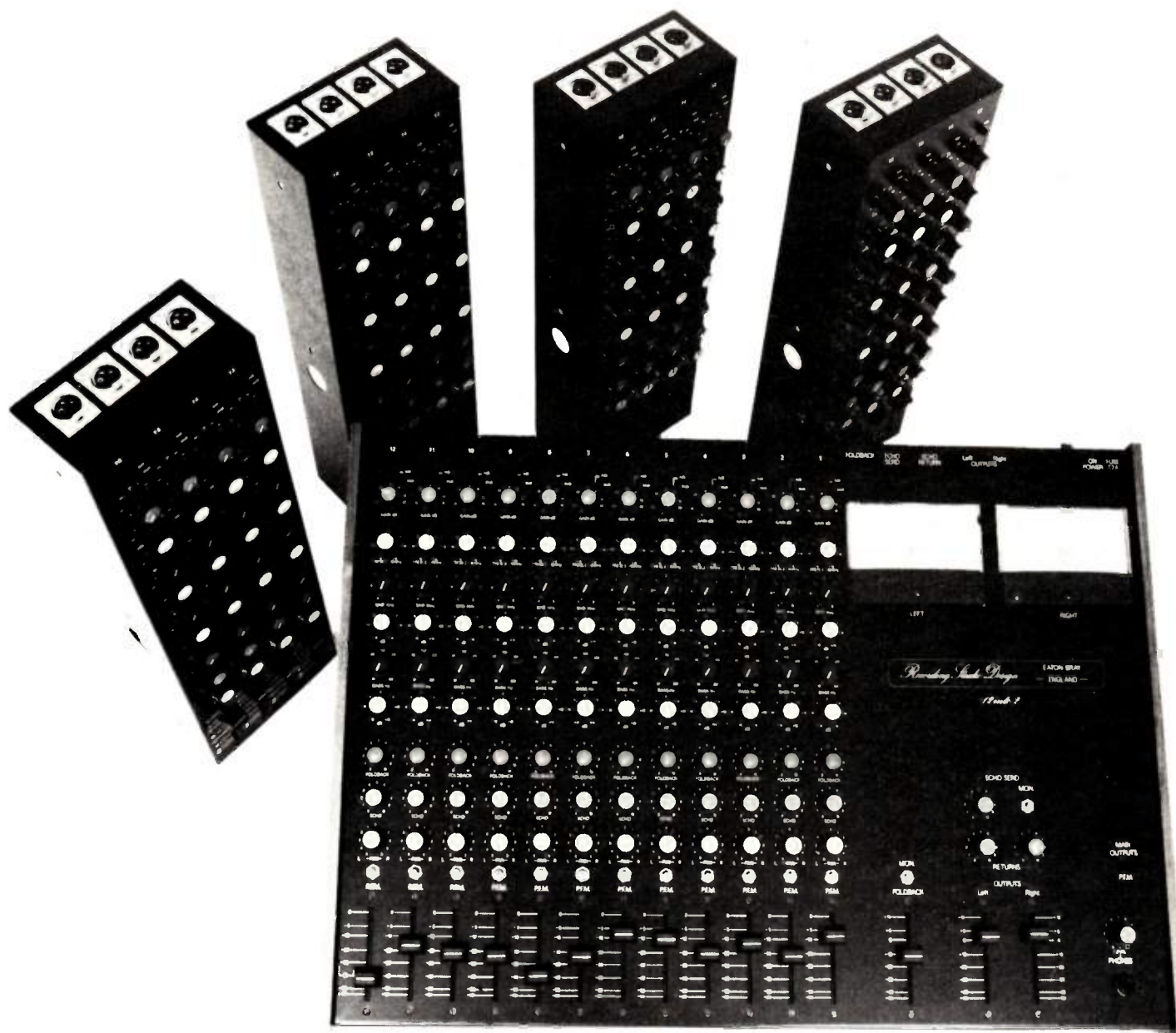
The two cymbal stands are four tier with wide angle tripod bases. All height adjusting stages utilise the Memriloc device and at the top is a wing nut locked ratchet tilter that’s very large. Instead of a metal washer and a plastic sleeve, Rogers fit a moulded plastic cymbal seat to the top of the cymbal stands. A small point: when these cymbal seats first came out, they had larger diameter bases than the present ones. If you use a 20” diameter or 22” diameter cymbal on these, it’s going to rock about just a bit too much with heavy use. Otherwise an excellent stand.

Appearance/Summary

The kit I saw is finished in metallic silver and looked great — a really smart finish. According to the catalogue there are a total of ten finishes, the others being: block, koa, new mahogany, ebony, New England white, metallic gold, Spanish gold, Pacific blue and Mojave red. Of the others I’m not keen on the first three as synthetic wood finishes always bring Fablon to mind and I’m also not too sure about metallic gold, but the others all look good — very up-to-date and smart. I don’t like the new “R” badge, preferring the smaller, earlier “written” metal plate one — more subtle. The drums themselves, though, look great as does the hardware — definitely one of the most pleasing sets from an aesthetic viewpoint. I think the Memriloc hardware is one of the best inventions in drum hardware in recent years and when drummers catch on to the two great advantages of consistent positioning when setting up and great stability, it’s going to do for Rogers Drums what Swiv-o-matic did in the sixties. One final point: why did they change those marvellous old wing nuts?!

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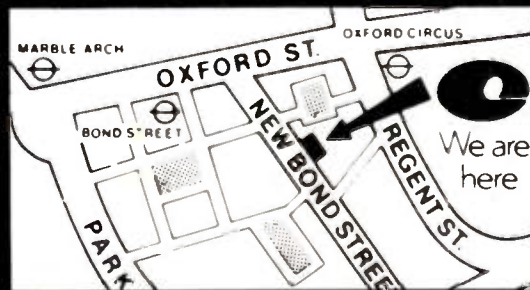


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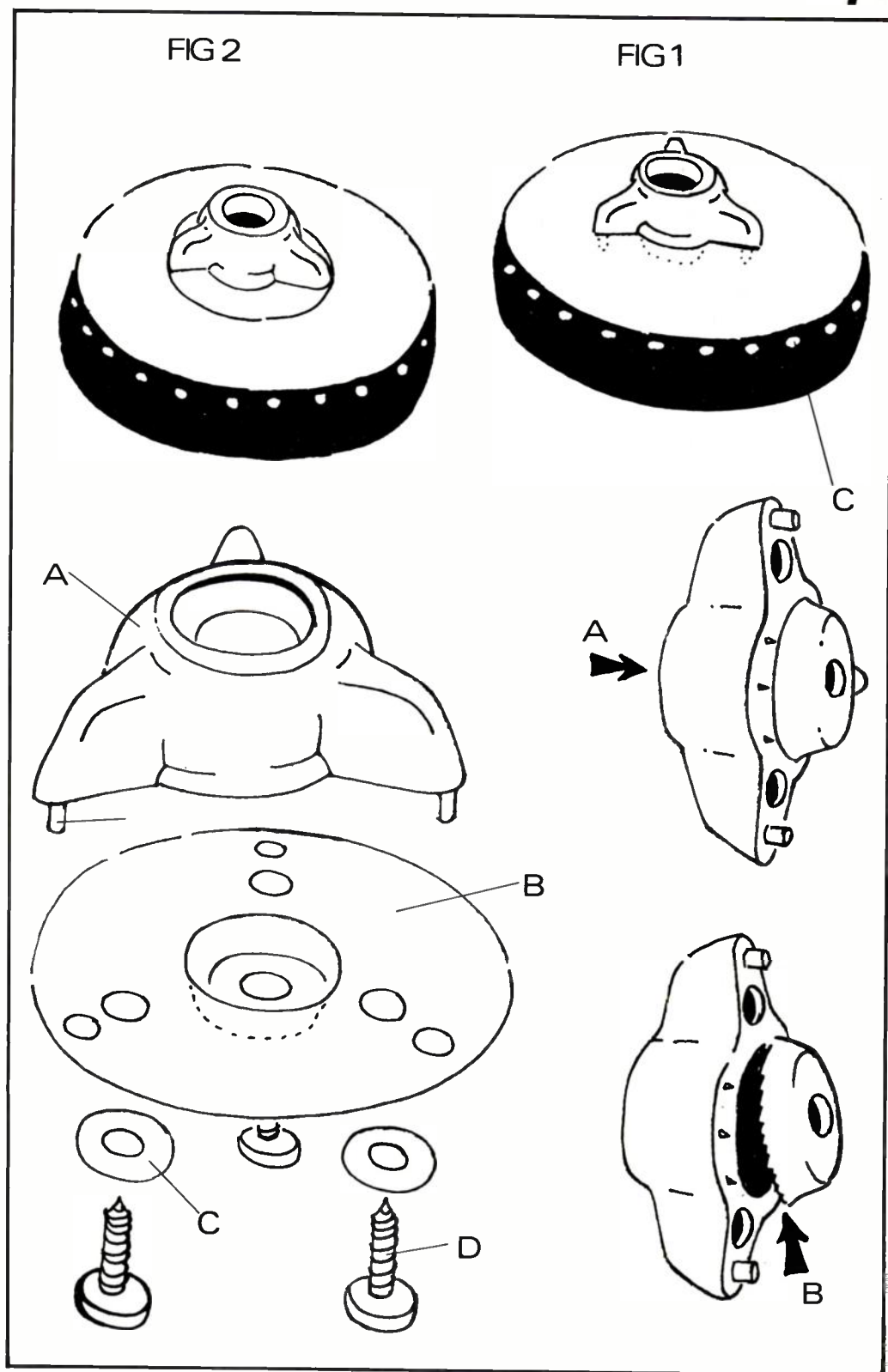
Modification to the Premier stool top

This modification is necessary for anyone who owns the old style stool as shown in Fig. 1 and can be either the round deluxe top (as illustrated) or the saddle type. The problem that arises is that the pressure of the tube on the base (Fig. 1A) can, after much use, fracture the back of the tube locating cup (Fig. 1B) and bring tears to the eyes of the unfortunate occupant of the seat at the time! So, if your seat top is the least bit wobbly or feels unsafe, it is as well to strip th top down and carry out the modification as follows.

First remove all the pins holding the seat cover in place (Fig. 1C). These pins have a split down the centre and sometimes come out damaged. Don't worry about this as it is easier to fit new brass upholstery pins when we come to re-assemble. On the saddle type and older deluxe seats, ordinary stationery staples are used so they must be removed and discarded, with all the pins or staples out. The outer covering will come away with the shaped foam padding. Remove the three large Phillips screws with an equally large Phillips screwdriver. This last point about a large screwdriver is important when we come to the re-fitting of these screws. The damaged socket can now be pulled away from the wooden base. We are now ready to fit the new parts.

The modification kit consists of a new socket (Fig. 2A) the re-enforcement plate (Fig. 2B), three large washers (Fig. 2C) and three Phillips self-threading screws (Fig. 2D).

First place the re-enforcing plate on to the wooden base so that the six holes line up. The new socket can be fitted making sure that the protrusions (Fig. 2E) locate with the holes. Now turn the wooden base upside down and fit the three screws.



These screws need a fair amount of pressure as the holes in the socket are not threaded hence the reason for a good-sized screwdriver.

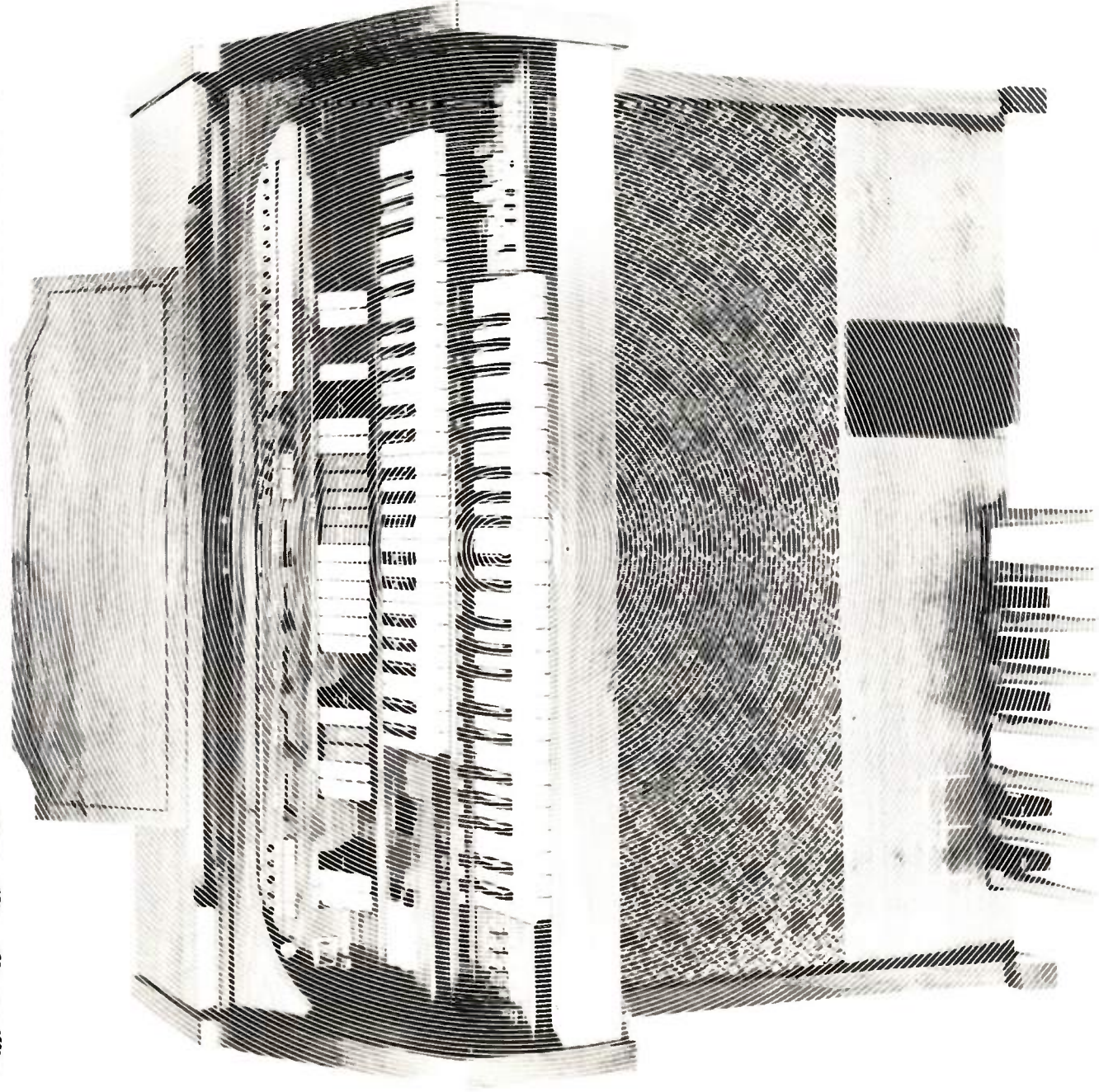
When you are happy that the three screws are really tight, the foam pudding and the outer covering can be re-

placed. In the case of the saddle type or old style round top, try to get your hands on a stapling machine. When stapling, make a neat job of it by using the existing holes in the cover but try to miss the old holes in the wood. As far as the uphol-

stery pins are concerned, the same thing applies; try to miss the existing holes in the wood and this will make it a stronger job.

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The main reason that most aspiring stars find themselves back as a 9 to 5 wage slave after a year or so is money, or rather the lack of it.

Survival of the fittest

There are always going to be the guys who can't stand the pressure in the fight to get on the first rung of the ladder. Those who don't make it past the first year are usually those with a dominant girlfriend or wife chipping away at them to "get a proper job". This, combined with a few debts and the first couple of records sinking without trace. These are the broken men who haunt the dressing rooms of bands, smiling a twisted smile, wishing they had stayed for the next record which zoomed up the chart like a rocket and now the album is doing the same, haunted by "if only" and tortured every time their mates appear on television and the fact that it could have been them instead of the new guy. You have to want success very badly to put up with the hardships and indignities at the bottom of the ladder and perhaps it's just as well that those with one foot still in their day job soon go back to it as it's easier with guys who are 100% committed.

But if only you could make enough so that you can stick at it for another year...

How do you pay the bills while you are waiting for the big break, assuming that you are being honest and are not drawing unemployment benefit?

Additional incomes

The immediate problem of fast money is solved if a mate rings you to put down the backing tracks for his album and you get four sessions a day for five days and collect £500 for a week's work. This can be fatal and as bad as having a big win on the horses first time out as you become hooked and sit watching the phone all day frightened to go out in case someone rings you for a session. Every wrong number is a sinking feeling in the stomach and you become unfriendly to anyone who just rings for

Taking Care of Business

PART 4

BY ALAN HOLMES

a chat! The answer is you can't be like "Pavlov's Dog" and live your life by the ringing of the telephone. Even if you get the odd session now and again this only makes the condition chronic as just a small number of guys get enough sessions to make a living and they all get paranoid and go round thinking that everyone is getting more sessions than they are. They all lie to one another about how much work they are doing, "bad form" to have gone a whole week without a session.

If you get a session, great, but you have to be able to say "I need to get some money to pay that bill this week" and go out and get it without relying on anyone else. Music can be just a very expensive

Keeping The Wolf From The Door



LAURA LEE

hobby at first and you've got to be prepared to finance it by grafting at something else. It's rather like doing the football pools — you can't win if you don't fill them in, which in our case is making singles and you need stake money to stay in the game, so here are a few ways to keep solvent;

Cab driving

Most musicians can drive and if you own a car with four doors you can work for a radio cab company. I am reliably informed that, after paying between £30 to £50 per week for insurance and hire of the two-way radio, a week of twelve hours a day can earn you over £200. The cab firms advertise in the evening papers and occasionally have their own cars so that you can still work, admittedly for less, if you *don't* own a vehicle. If your car is tatty or you have the group's van, you can work on parcel deliveries only which does lessen the number of jobs you can call in for but I believe there are some firms who just deal with parcels. The advantage of this form of employment is that you can work your own hours, do a week when you need to and they don't mind how regular you are, so this can fit in with any gigs or recording without any hassles. If you have a cassette player in your car it can be quite a painless way of getting some money providing you can read an 'A to Z'!

Teaching

There are some quite good jobs with local education authorities teaching children instruments in schools but this does involve a commitment to do a regular number of days a week.

Alternatively, you could advertise in the local paper offering lessons and will probably get kids to teach and can fit their lessons in with your schedule. At around £1.50 to £2.50 an hour you need quite a few pupils to make ends meet, not to mention incredible patience.

Making things to sell

You obviously need to have a natural skill for this and also will need to invest



some money in materials but it has the advantage that you can work at home and fill in any spare time you have in a constructive and profitable way.

When you have enough stuff finished you will then need to get a stall at a market or sell to shops for quite a bit less.

Silver jewellery

Requires quite high outlay for material but if you do good stuff and can bear to part with it when its finished, then there is always a market plus commissions for one offs from friends.

Leather

A bit over-crowded this one but if you like it then no doubt you will make a success of it.

Flight cases

If you're handy with a pop rivet gun and have capital to invest in wood and fittings plus a garage or similar space then this is a good sideline as the sums involved are fairly high which means good profits.

Electrical gadgets

OK for the electronics wizards but almost impossible, as if you make say a really good lead tester or whatever you need to sell in quantities of 200 upwards and this is really difficult plus you have to make commitments on delivery. Alternatively you might make one offs and custom wiring jobs but then you are dependent on being given work.

Demo recording

If you have the necessary equipment then you might as well use it when you are not gigging. You need at least a Revox and decent mixer with, for bands, at least eight-channels: guitar, bass, drums, bass drum, keyboards, vocal and two brass or backing vocal. Echo or reverb is a must too along with six mikes and a lot of leads. Around £2 an hour or whatever the market will stand.

Hiring out the PA

Usually a roadie's perk this and is what a lot of them get instead of a retainer when the band is off the road for a while. But if you personally own a PA then it's possible to get £10 a night for 100 watts and so on up the scale. It's not much good splitting this sort of money five ways if you all own the PA though.

Casual bar work

Say no more. We all know the chaps who will go for this one. Advertised in local papers around £3 per session lunch-time or evening, possible £6 to £7 a day seven days a week. Useful if you can see a whole blank month looming up as pubs like regular people.

Songwriting and composing

This is where long-term benefits and

high income can result if you are successful. But it doesn't help in the short term as, even if you were to get a song recorded now and it was to become a hit single, it could be six months before any royalties were payable and two years before the last of the money reached you.

The established big publishers will probably give you an advance on signing with them plus they will pay for demos: £500 advance and £250 for three titles to be demoed. April Music, ATV Music, Carlin, famous Chappell, Essex Music, Leeds Music, Southern Music, are all proper established publishers who would give you a fair deal. I'm going to be doing a piece on publishers in a later part of this series. But for now ***Don't put more than three songs on a demo to a publisher.*** If they like them they can ask for more. But tapes of 25 songs don't get listened to. Obviously make sure that they are the three best songs for A sides you have.

If you haven't written anything yet you should make a point of trying to do at least four songs a month so that you have a number to pick from. If you only write one song it might be the bad one and unusable. The other three or more that you didn't get round to writing might have been the hits.

It's not necessary to be able to write music to write songs as a lot of people think that this is what it means. The Beatles couldn't write music so all you need is a cassette recorder and somebody or something to play chords.

If you are into lyrics only, having a lot of tunes but no words, try using a typewriter. This method triggers the word banks in the brain's memory that usually help in the reading process by completing sentences for you so that you don't read every word on a page only half.

If you type the first line you will find more possibilities open up from the typed words than hand-written ones.

There is a creative cycle to writing music and you can get all your writing done in one or two days if you can just find out when your cycles occur.

To write jingles for radio and television you have to be given the brief on time, tempo, mood and construction before you can begin, so unless you have any contacts in this field, forget it.

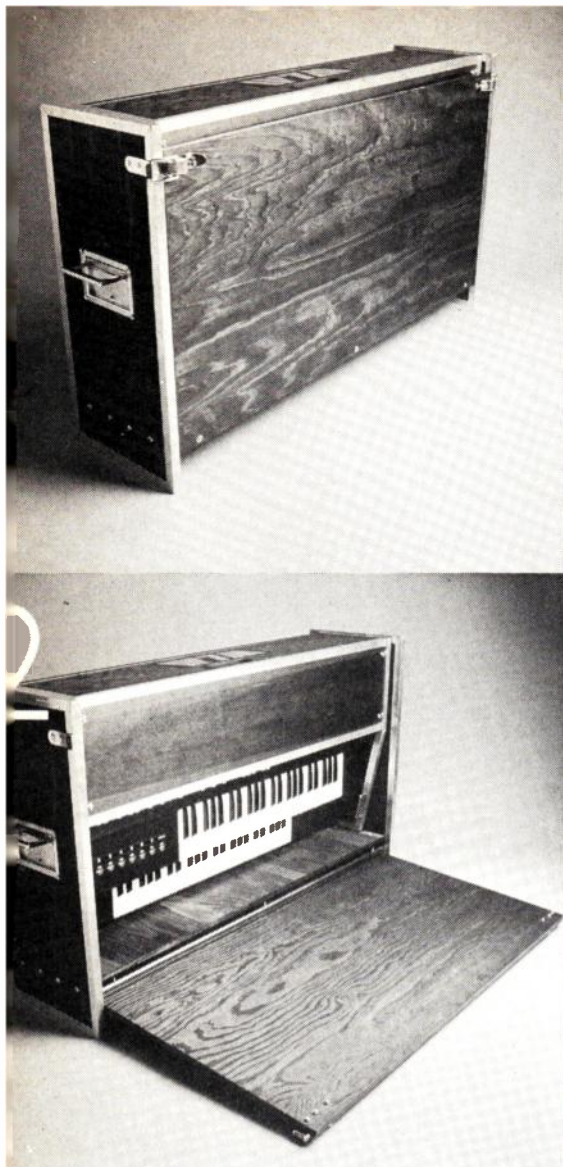
Next month I hope to continue with management or agencies (if they put the phone down for long enough for me to get through).

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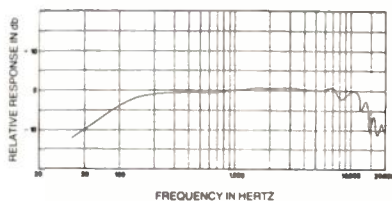
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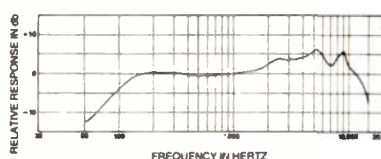


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BLOWING IN THE WIND

Alan Holmes tells you everything you'll want to know about mouthpieces in PART ONE of his new series

The most misunderstood part of a saxophone is the mouthpiece. For the performer, the wrong choice can mean torture, with blood flowing from lips bitten through, agonies of cramp in the jaw and the frustration of hearing a sound in your head, yet never being able to produce anything like it on the instrument. Not to mention careers held back for years because of the huge obstacle presented by too wide a mouthpiece and too hard a reed, which also causes the fingers to stiffen and causes the technique to be slow and jerky.

The mouthpiece is important because it is the means by which the input of the performer is converted into sound. It is like a very special jack plug which plugs into the performer's mouth. If it does not match exactly, its resistance and response causes distortion of the tone and a short circuit in the brain. Ideally it is a transformer which converts breath, muscular pressure, and brain waves into music.

In a completely different context it can be likened to a set of false teeth. A perfect fit for one person would be totally wrong for another. While it is true that some combinations of reed and mouthpiece can be played successfully by beginner and expert alike, the best result can only be achieved by carefully tailoring the choice of mouthpiece to the performer's style of playing and the sound that is in his head.

The mechanical function is to act as carrier and resonator for the reed, which is clamped to it, whilst maintaining perfect tuning throughout the range, and imparting the desired tone. This requirement of playing in tune eliminates about 50 per cent of the available choice as many of the constricted tone chamber models have impossible intonation.

Materials

Traditionally, mouthpieces were made from ebonite, which was one of the first synthetic materials. Its main advantage is that it is easy to machine and is not prone to cracking or warping.

The majority of mouthpieces are still made from ebonite as its tone records well. Cheaper student models are made from plastic (which warps) a new material used by Yamaha, (polycarbonate) which doesn't warp but can still be moulded saving the drilling and machining required to form the shapes from solid ebonite.

The sound of the ebonite mouthpiece can be very edgy as in the case of models with a small tone chamber. But the standard models tend toward the rather heavy woolly classical sound.

Around the late forties, with the



dance band boom in the post war years, the Brillhardt mouthpieces were very popular. These were usually white with a black square insert on the bite. Towards the fifties, the bronze metal "Otto Link" became the standard issue of the jazzers followed by the gigsters. It was the 'Super Tonemaster' model of the Link which caused the mass switch as it combined the excellent intonation of the unconstricted tone chamber with ease of blowing and very good projection and brightness. It also seemed to produce a wide variety of tones depending on the type of reed and the player. This could range from the hard, edgeless, hollow sound of John Coltrane to the hoarse buzzing bark of Lockjaw Davies. It could also, produce the most bland, boring, anonymous tone you can hear from any of the jobsworth, regular B.B.C. bands.

In the early sixties, a new piercing penetrating scream was heard. This was the sound of King Curtis and the stainless steel creation of Berg Larsen. They have an amazing sound which is great for solo playing. But when you need to play in a section with other brass and reed players the turning of a current metal Larsen is terrible and a possible career wrecker. The ones that Berg Larsen himself made were OK but since they changed over to smaller casting, the original pattern has been altered with disastrous results. The ebonite models are still to the original pattern and play reasonably well in tune and are used by some top jazz and jazz funk players.

The Brillhardt Level Air is also made from stainless steel and has fair intonation but is rather expensive.

The Selmer metal mouthpieces which I use on Soprano (F), and Alto (Jazz E) are made from a white metal alloy, Lead, Tin, Zinc, etc. without the addition of Copper which Bronze contains and this stops the green verdigris forming when the plating wears off.

The Selmer is silver-plated very thickly and, although gold plating is harder, it is normally half the thickness owing to

the cost so it doesn't make any difference which is used. As one would expect from the makers of the world's finest saxophones they have near perfect intonation when used together.

The wheel has now turned full circle with a return to popularity of ebonite. Players like Grover Washington and Ronnie Laws switched to ebonite Larsens as did King Curtis on his last album before his untimely death. Tom Scott, won the big influences on younger players has an old mouthpiece with an adjustable tone chamber called a Strathborne in ebonite. Another busy LA session player Ernie Watts is also blowing ebonite.

The mouthpieces that these guys are using differ from the classical models in that they all have constricted tone chambers which brings us to the next factor.

Shape of interior

Back in the early sixties, players were experimenting by sticking pieces of chewing gum or plasticine in the interiors of their large chambered mouthpieces and liked the ease of blowing a buzzy sound they got as a small interior makes for easy blowing and a bright sound and a large interior means a dull, woolly, muffled sort of tone.

Each manufacturer has their own patent design and; basically, it is a matter of getting the constriction to speed the air flow without sacrificing the tuning which is at its best with the straight through large classical models.

The height of the 'baffle' (the part directly behind the rim tip—also plays a large part in the ease of blowing and brightness of the sound although if this is too high it causes 'frying up'; saliva bubbling between the reed and mouthpieces.

The angle of slope between the reed and the interior as it leads into the tone chamber called the 'tacle' is also very important in determining the tone and ease of blowing. A very constricted mouthpiece of the type used by Tom Scott would have this angle nearly parallel to the reed where a classic model would shelve steeply away from the reed.

Shape of the exterior

The amount that the jaws are open, governed by the thickness of the reed and mouthpiece sandwich at the point where the teeth bite, is also a factor in determining tone.

To a lesser extent, the width of the mouthpiece has an effect too, as this makes a difference to the cavity and initial tone chamber inside the mouth.

The thickness of the material is also an influence on tone. I have been testing

some mouthpieces by H. Couf and they have a standard exterior model and an S model which has the same interior and lay but is smaller and thinner to make it easier to switch between alto and tenor.

Reed wraps

The width of the rails each side of the window into the chamber, are also important, in the performance of a mouthpiece. It is nearly impossible to play good harmonics with wide rails. Narrow rails give a bright overtone to the sound but can cause squeaks if extreme and are in conjunction with a narrow tip rail. This is the main cause of squawks when it is too narrow but if it is too thick it makes for a dull sound with no life to it.

Some makers have quite a thin tip but quite wide side rails and Selmers have a way round it by having wide rails at the point where they meet the tip which waist in after 3/8" or so and then taper out into the normal way to meet the radius at the end of the window.

The tip opening

The gap between the tip of the mouthpiece and the tip of the reed is the amount the reed is allowed to travel and is called the Tip Opening. This distance (from 60 thousandths of an inch to 120 thou) is the main factor in determining the resistance of the mouthpiece to blowing.

A narrow opening will 'clap up'. This means the reed stops vibrating when blown very hard. You can put a harder reed on but this will change the tone by less of the reed vibrating.

A very open mouthpiece is just very hard to blow and requires a lot of effort. So much so that the tension this produces in the body makes the fingers go stiff so you can't hold a note for long and can't play much when it is going.

With a medium reed, 2½ to 3, the correct tip opening for ease of blowing

all over the instrument are:

Alto 75, 80, 85 thou or 6*, 6*

Tenor 95, 100, 105 thou or 6*, 7, 7*

The length of lay

The "lay" refers to the flat part of the mouthpiece to which the reed is clamped and particularly to the working part where it is shaped into a shallow curve, allowing the tip of the reed to curl against it.

This curve generally follows a perfect circle. But, by varying the diameter of the circle, the performance and tone of the reed is affected. The length of the reed that is left to vibrate is the length of lay and this affects the controllability of the tuning.

A very long lay (as on the Berg Larsen) at 1" for the tenor is very much harder to control than the .875 length of the Otto Link or Lawton. This 1/8th" in the length of lay can make the difference between acceptable tuning and very poor intonation. If you have very thick lips this difference is taken up by the increased area of contact. If the lay is too short it causes difficulty with the bottom notes.

The Player

This is the last and biggest factor. A poor embouchure, lack of breath support, and a poor musical ear can all make a mockery of the best-designed and most carefully-made mouthpiece. So, assuming that you can operate a mouthpiece correctly, how do you go about choosing the right one for you?

How to choose

The first consideration is the sound. Having suffered for years from hearing a sound in my head yet not being able to get near it on the instrument I think this makes all the difference between enjoying playing and cringing every time you hear yourself on a record. If you make a noise you like, you want to go on making it. If you don't, you stop. And this means less playing hours and less progress.

The first step is to find a player whose sound is close to the one you would like and study the album cover or go up to them after the gig and find out what make and model they use.

In 'Saxophone Styles' (IM July '77) I described sax, mouthpiece and reed used by some of the great sax players and am a firm believer that to play better than somebody, you first have to be able to do everything they can do.

So, having found a player with a sound you like, write to the record company, or the player personally if necessary, or squinting at the album cover, you then are going to get that model in one of the tip openings suggested earlier.

It doesn't matter who you are, or how good you are playing at the moment, you will play better on an Alto mouthpiece less than 90 thou 7* or Tenor less than 110 thou 8. Used in conjunction with a 2½ or 3 reed you will be able to play the instrument from top to bottom with ease and get more notes per lungful, as well as standing a much better chance of being in tune. Never mind that your idol plays a 15* or 140 thou tip opening his mouth is probably so strong that the reed is being closed up to a 7* anyway.

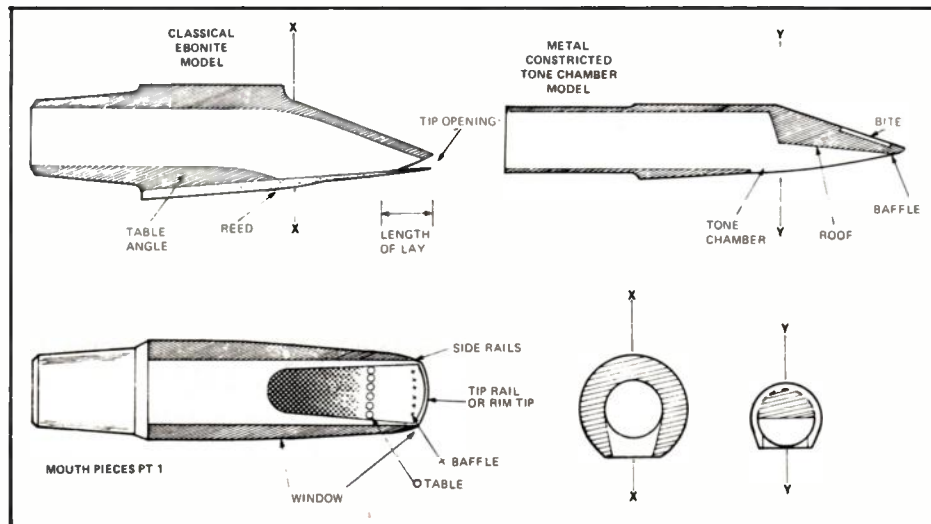
For any of you who are eventually going to be making recordings of commercial music, my personal recommendations would be:

Alto, Selmer Jazz metal E, Lawton 6*, Meyer ebonite 6* medium lay and chamber, link ebonite or metal 6*, Brilhardt level air 5.

Tenor, H. Couf (Armstrong) ebonite 7* JS Artist, Beechler ebonite S7S, Berg Larsen ebonite 100/0 or 1/M, Lawton metal 7*B, Selmer metal Jazz G, Otto Link 7* ebonite on metal.

All of these will give professional results. The Lawton, Link, Selmer and Meyer are what the majority of the top session players are using and all have excellent tuning, but ultimately, the final choice is yours.

One place in England that has a really good stock of mouthpieces is Leslie Evans 275 Colney Hatch Lane, London N11 3DH telephone (01) 368 4137. They usually have a good selection of Larsen, Lawton, Link, and Selmer and operated a seven-days trial on receipt of the full price. *Next month The results of the mouthpiece survey.*



COMPARISON CHART							
LARSEN		LINK		LAWTON		SELMER	
alto	tenor	alto	tenor	alto	tenor	alto	tenor
75		6		6*		D	
80	95	6*	6*	7	6*	E	F
85	100	7	7	7*	7	F	G
	105		7*		7*		H



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The Studio Tape- Recorders PART 2

In the February edition, we began to discuss the vital studio hardware; tape machinery, and, as this is a somewhat wide subject, I divided it into two instalments, (but interrupted by last month's discourse on cutting discs, so as you didn't get too bored!) Anyway, the story so far: we've discussed multi-track machinery to a certain extent, and we left plucky Reg Tritt cornered in a bar on 57th Street, armed only with a Studer A80, and with a mere six inches of tape left in the magazine. This thrilling episode will reveal all about the usage of 1/4 inch tape machines and also will include a word about 48-track recording; the next step upwards in studio complexity.

Now 1/4-inch tape recorders are something that non-studio persons can at least relate to, as they are the kind of tape-width machines that you probably have at home. Their studio equivalents are, however, a little more complex, and of course, expensive.

The primary use of 1/4-inch wide tape machines (that's not the width of the machine, it's the width of the tape, clever clogs) is the mixing process. As we've discussed before in these pages, the end result of a mixing session, using multi-track recorded tapes, is to transfer everything onto a reel of 1/4-inch tape, so that a disc may be cut from the finished recording. So, no matter the size or sophistication of the studio, they'll all have the best mastering 1/4-inch recorder they can afford to buy, as the final quality of any product leaving their studio will depend on the capabilities of this machine.

Smaller demo studios may even have the A77 Revox, which is a tape machine catering for both the professional and domestic markets. And being, to all purposes a "baby Studer", the Revox can be used to master on, given certain parameters as to the final quality. The bigger studios, however, will almost certainly have 1/4-inch stereo versions of their 24-track machines to use as master recorders: for example, if they've got a Studer A80 24-track

they'll probably master on to a Studer A80 1/4-inch recorder.

These 1/4-inch decks are usually two-speed jobs; either 7 1/2 ips (inches per second) and 15 ips, or with some of the newer ones, 15 ips and 30 ips, as lately, cutting room technology has been able to accept tapes for cutting at 30 ips, rather than the previously standard 15 ips.

But it is during the mixing stage that 1/4-inch machines are used in a more creative sense; for example, as loop machines that provide delayed echoes, phasing, and ADT effects. Let's look at these one at a time, and talk about delayed echo. Well, as you know from reading these pages each month we can select an echo plate from the mixing desk, so that any given signal, be it guitar, voice, piano, or whatever, has echo added to it.

Now, using a 1/4-inch tape machine, we can cause the moment that echo appears on the signal, to be delayed, so that the echo starts a short time after the sound that triggered it. The effect can be demonstrated onomatopoeically thus: BANGbangbangbangbang: which is a sound plus its immediately following echo. And the delayed echo would then be as follows: BANG bangbangbangbang. If you have survived this analogy you will now know what delayed echo means. It is achieved by routing the signal of what is to be echoed, to a tape machine, where it is recorded, and then immediately played back (from the next head along).

The played back signal is then routed to the plate, and thus does not cause an echo for a very short time after the original signal is heard. By varying the tape speed of the 1/4-inch machine, this delay time can be made longer or shorter. Delayed plate echo can be an especially pleasant effect on electric or acoustic pianos, and snare drums, although you can try it on anything you like.

When you hear talk of "7 1/2 delay plate" and "15 delay plate" this is simply referring to the effect gained when the machine is run at one of its fixed speeds, rather than having the use of a variable speed oscillator to work at any other speed.

Now, about the uses of 1/4-inch machines for phasing. Well, obtaining the well-known studio effect by tape machine was the original way it was done, before the invention and adaptation of digital and analogue delay systems. These two electronic systems are

the ones used in the ready made phasing devices you can buy for stage as well as studio. But, tape phasing is still probably intrinsically "better" than any other system, and works as follows:

Taking the sound which is to be phased, (e.g. acoustic guitar: that usually sounds nice when phased), we route its signal from the multi-track tape, and record it on a 1/4-inch tape machine, and immediately play it back from another head, all at the same time that the multi-track version is running. By fractionally altering the speed of the 1/4-inch machine, using a variable speed oscillator, the two signals drift in and out of phase with each other and provide that special sound of whooshiness to the original signal.

ADT

And as for the last main use of the 1/4-inch deck, ADT stands for Automatic Double Tracking. Normal double tracking is when a musician repeats an already recorded performance exactly, so as to provide an extra thickness to whatever he has just played or sung. The human element makes an absolutely identical performance impossible, but the charm of a double track often lies in the slight differences between the two.

However, sometimes an absolute double-track is required, and this is when an ADT system becomes useful, as well as for when a double track performance would be impossible to play (perhaps a complex, million-notes-per minute guitar or mini-moog solo, for example). Using the variable speed oscillator again, the set-up is the same as for phasing, except that the delay is set and fixed at a certain number of milliseconds between the original signal, and the repeat, or double track. The time gap for a nice-sounding DT can be anything from 25 milliseconds to 60 odd milliseconds. Most ADT jobs, however, are done these days using the electronic delay systems on the market, such as the Eventide Digital Delay.

48-track recording

And finally as threatened, a word or two about 48-track recording. I've just finished the mixing of my first 48-track album (the Rod Argent epic) and I am completely sold on the idea of the extra tracks. The principle is to employ two 24-track machines running in tandem, and linked together by a code system, so that they stay exactly in

synchronisation with each other. In fact, one track on each of the two 24-track tapes is taken up by the code, which is an electronic signal that is scanned 2,000 times per second by an additional "black box". Thus the togetherness of the running of the two machines is checked at this rate, and so therefore the machines run correct to the nearest 2,000th of a second.

With two of the 48-tracks used for the code, the system is strictly speaking, a 46-track, but who is quibbling over a couple of tracks when so many advantages are offered?

For a start, the system is not operated as a 48-track from the beginning. Recording can start using one reel of 2-inch tape on one 24-track machine in the normal way, but with the usage of tracks, of course, planned differently. If you feel extravagant, you can use two or three tracks for drums alone! When the rhythm tracks have been recorded and you've nearly run out of channels, the second 24-track machine is brought in, the coding system applied, and a monitor balance of all that has been recorded on Reel One bounced over to the second machine, (perhaps on three or four tracks). Overdubbing then continues using just the second reel, thus saving the rhythm track reel from being continually bashed through a tape-transport during the overdubbing. The two machines are finally linked up for the mixing.

Extra quality is obtained because the freshness and brightness of the original reel of backing tracks are preserved unworn from the day they were done. Also, less bouncing between tracks has gone on during the recording sessions, because more tracks are available in the first place. Of course, the studio time costs a bit more than for 24-track, and more tape is used, but overall, the quality, clarity, and ease of recording make life in the studio well-worth the extra complications.



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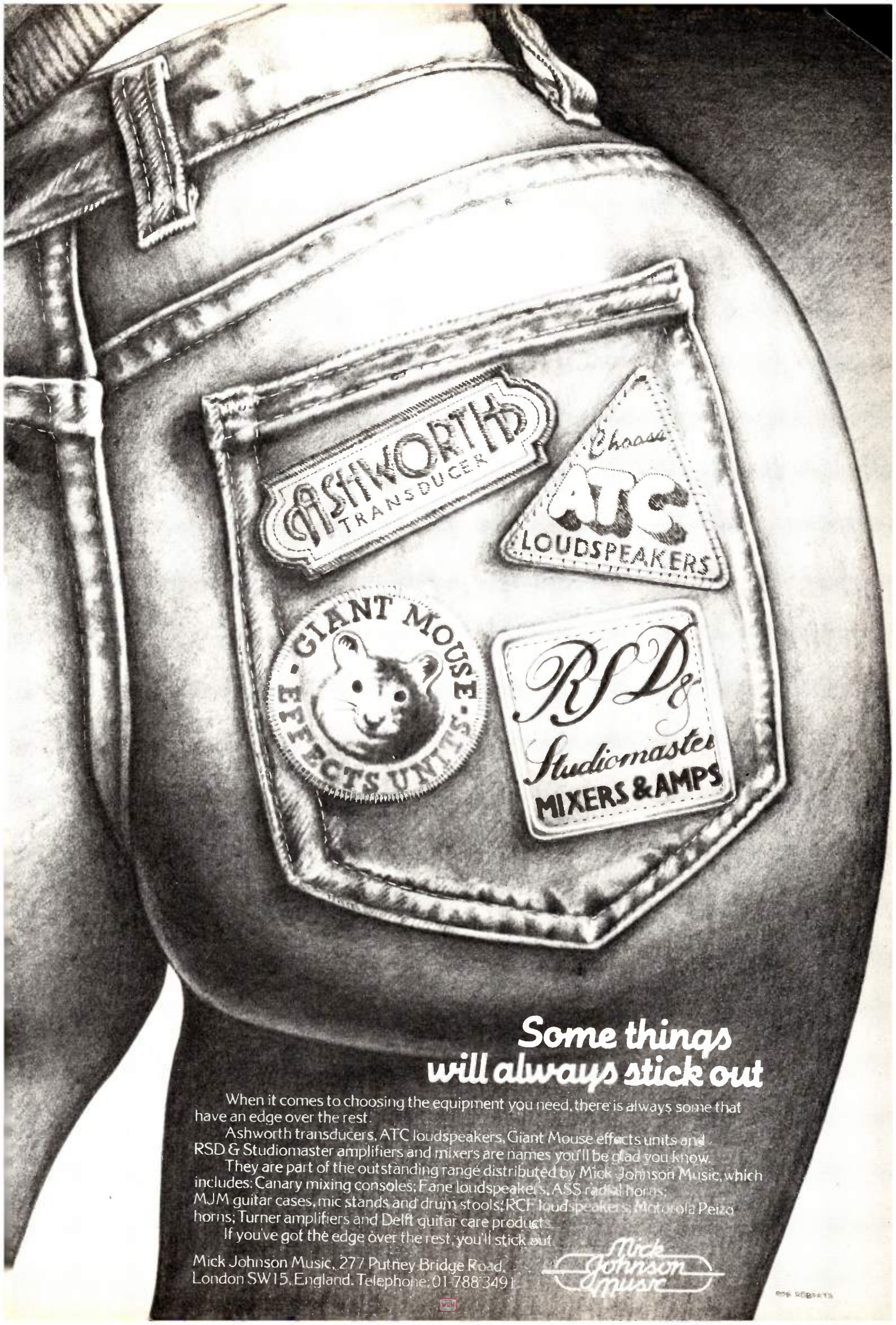


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MC1030

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MC1230

12-Channel Mixer for P.A. systems, housed in aluminum flight case. 12 unbalanced microphone inputs, each with level, bass, treble, presence, panorama, volume, and echo control; 3 output jacks with separate controls left, right, and monitor; outputs left/right with separate bass and treble controls. Output level switchable from 0 dBm to +6 dBm; two echo return controls; echo connector also takes stereo tape deck for playbacks. Switch for prelisten per master channel and to listen into master channel (stereo) or master channel (mono); 2 LED peak reading indicators. Connectors for stereo tape deck with a level control, echo units, and docking systems for sub-mixers.

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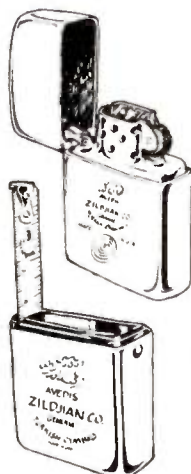


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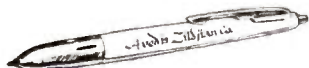


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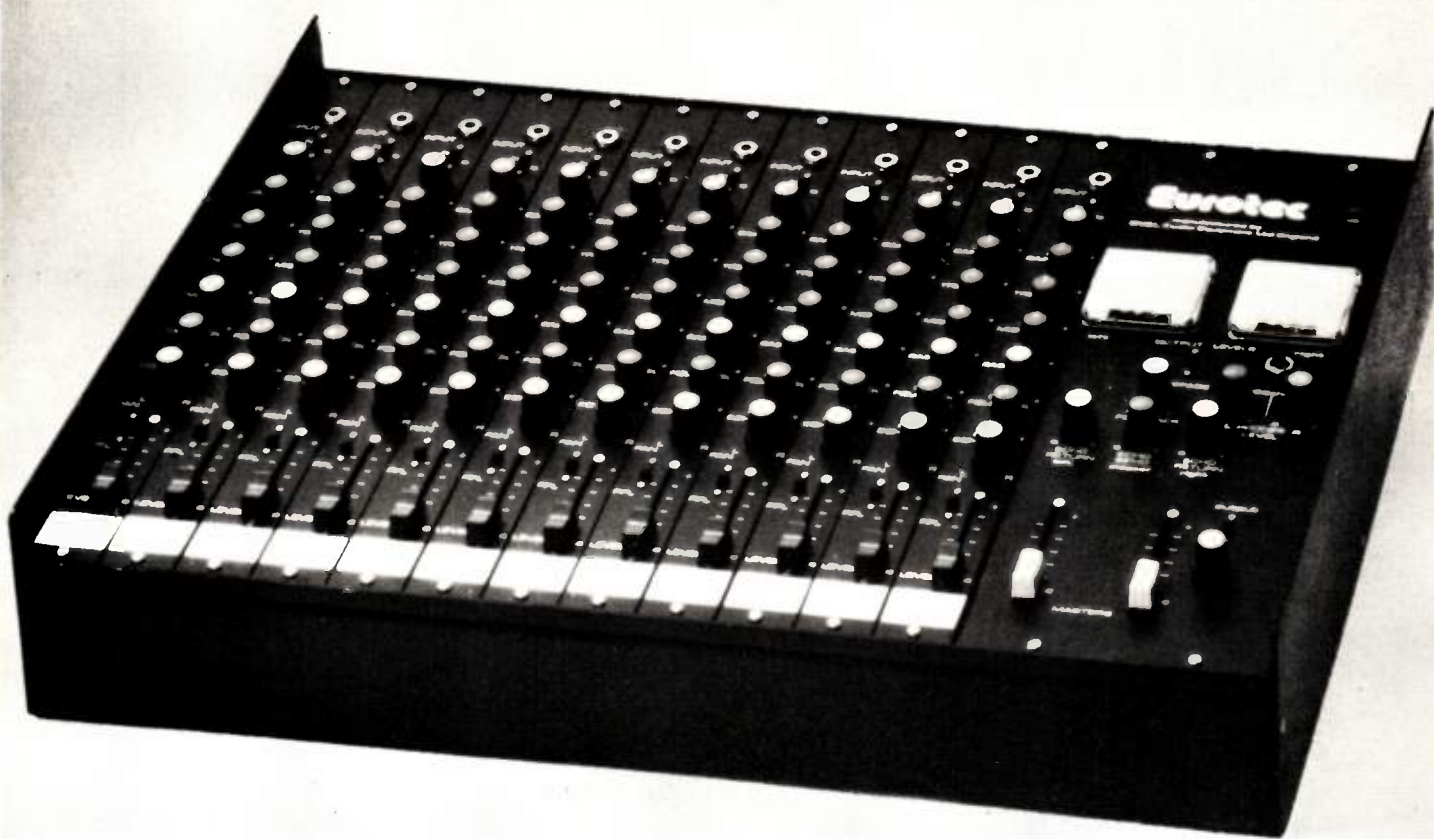
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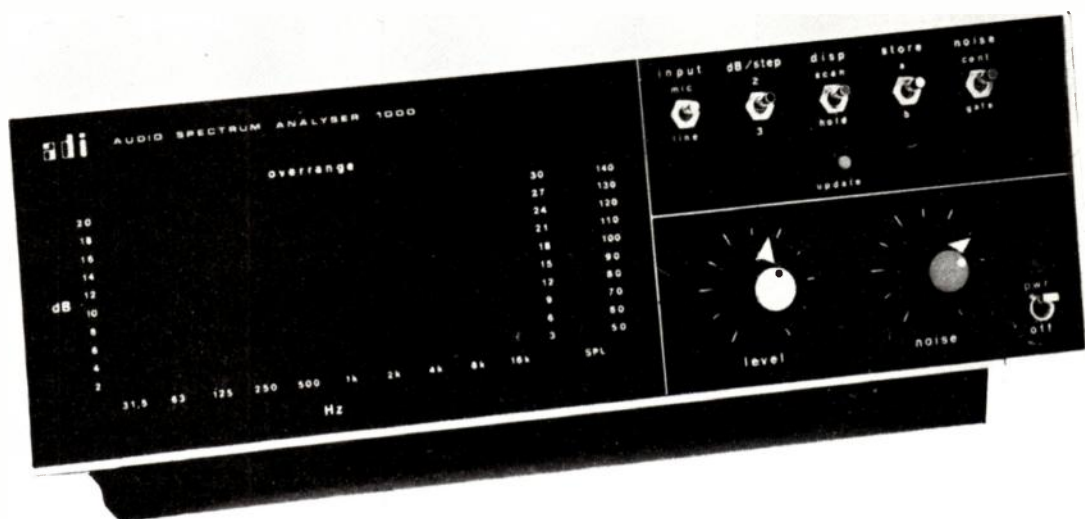
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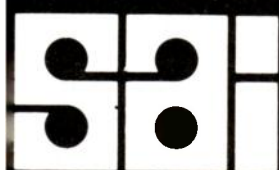
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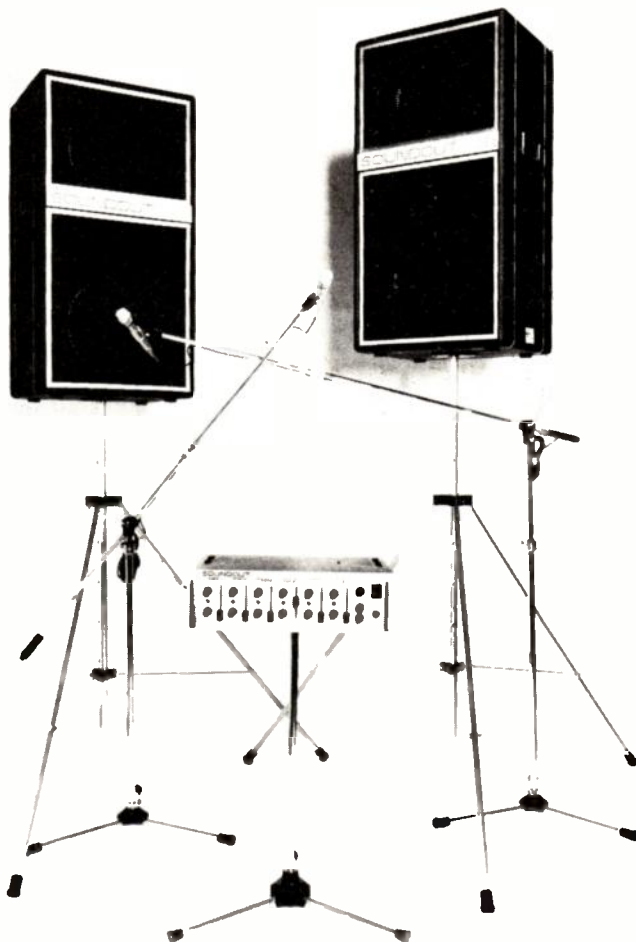
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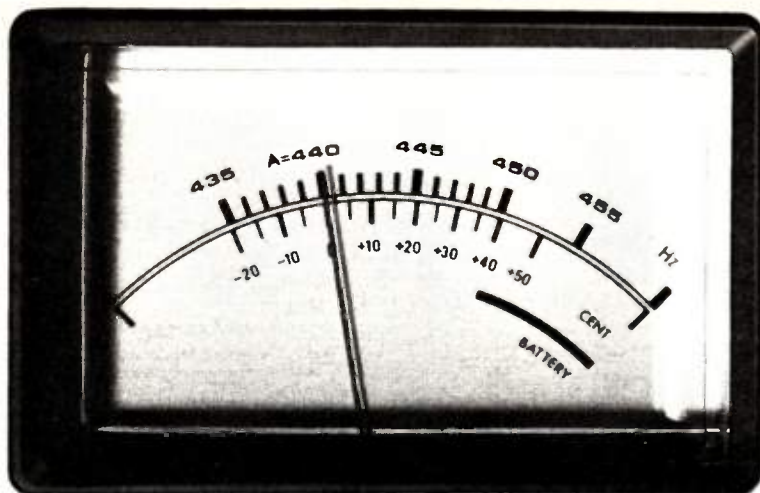
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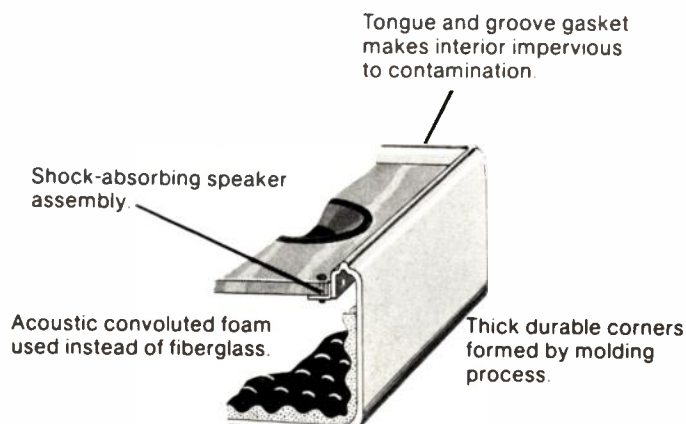
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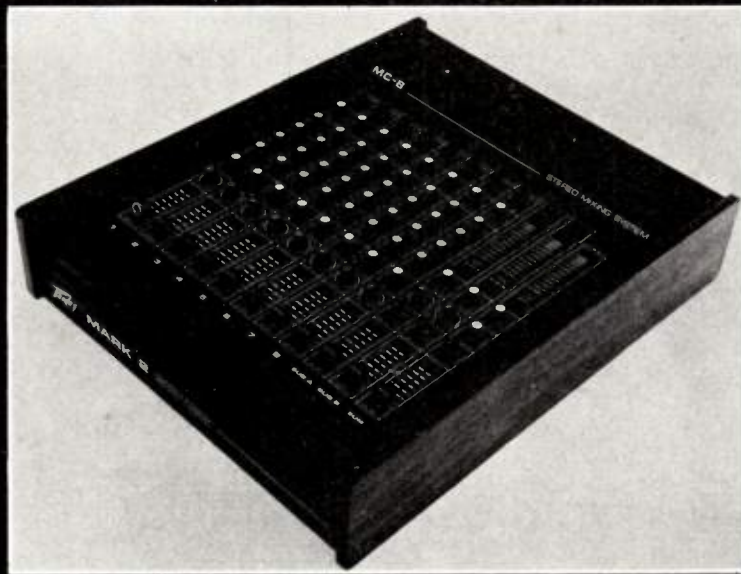
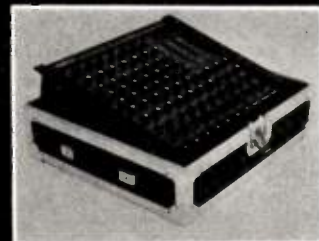
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Cliff Richard: Small Corners (EMI EMC 3219)

The man just gets better and better. His last two albums, "I'm Nearly Famous" and "Every Face Tells A Story", brought Cliff Richard a whole new bunch of fans, people who weren't ready to believe that he could actually sing anything other than "Summer Holiday".

Just as "Face" was an improvement on "Famous", this album is another leap forward. Unlike his last two albums, "Small Corners" has a general theme running throughout — a kind of contemporary gospel feel in that all twelve songs refer either directly or indirectly to God. However, it's not church organ and brass bands that provide the backing, but the guitars of Terry Britten and Bryn Haworth, the bass of Alan Tarney, drums and percussion courtesy of Brian Bennett and keyboards by Graham Todd. Add to this the superlative vocals of Tony Rivers, John Perry, Stewart Calver and Cliff himself and you have one of the most pleasing combinations around.

The other main difference about this album is that Cliff produced it whereas Bruce Welch was in charge of the last two. In this case, it's not an ego trip. I was present during part of the recording and Cliff proved himself more than worthy of the title. On intricate vocal harmony passages, of which there are many on the album, Cliff can spot a wrong note from three hundred yards with the wind behind him.

Three Larry Norman songs are included, the best of which to my mind is "I Wish We'd All Been Ready". It has a

beautiful melody over a thoughtful arrangement. As always, special credit is due to Tony Rivers for his superb vocal arrangements. The song fades out on the phrase "Don't get left behind" being repeated and "answered" in three-part harmony with subtle differences in phrasing each time. A medal to whoever worked that one out!

It's not all slow material either. There are two really solid rockers on the album, "Hey Whatcha' Say" and "Why Should The Devil Have All the Good Music". The latter was written by Larry Norman again and the lyrics explain Cliff's philosophy — "there's nothing wrong with playing blues licks . . . why should the devil have all the good music". The tongue-in-cheek false endings should throw a few DJ's too.

Other magic moments on the album include the middle vocal section on "Good On The Sally Army" — the harmonies are constructed so that each line takes the part of a brass band instrument. Very effective, it sounds like The Beach Boys meet The Salvation Army. The last track, "When I Survey The Wondrous Cross", is a traditional hymn, arranged by Tony Rivers and performed acapella. Again, it sounds more like Brian Wilson & Co. than a church choir, but the arrangement really lends itself well to the song.

No matter what your religion, if you really want an uplifting experience, listen to this album.

Eamonn Percival

Produced by Cliff Richard, engineered by Tony Clark and recorded at Abbey Road.

The Buzzcocks: Another Music In A Different Kitchen (United Artists UAG 30159) 999:999 (United Artists UAG 30199)

These debut albums from two of the most popular punk outfits of the moment represent an interesting milestone in the development of New Wave in Britain. It is some two years since Johnny Rotten and Co. began their assault on the music scene, and whatever else they certainly haven't made life dull.

The Buzzcocks and 999 are, if anything, bands who have come along on the Second Wave, treading the path already blazed by the Pistols, The Clash and The Damned. This always happens with any new musical phase be it Merseybeat, Psychedelia or Glitter Rock with the likelihood of success being limited.

To my mind these two albums come about one year too late, because they already sound a little dated. Both suffer from being terribly one-paced, the majority of the numbers being 90 mile-an-hour thrashes which have become the cliched punk sound.

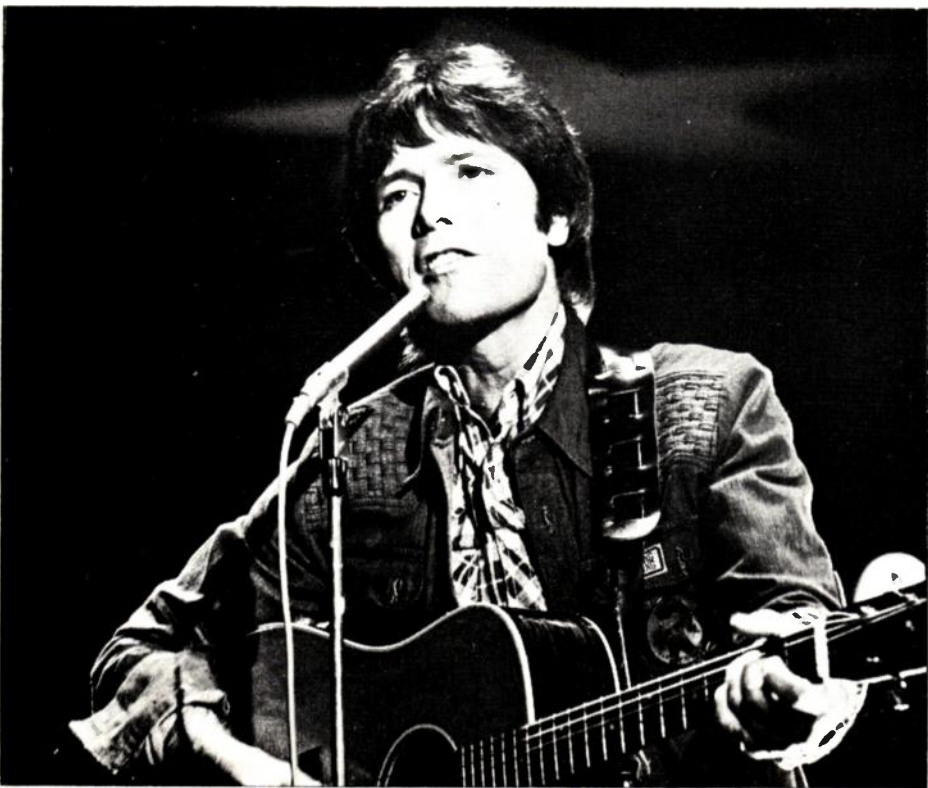
The worst offenders are the Manchester-based Buzzcocks, whose former frontman, Howard Devoto, is being tipped for stardom. The band comprise Steve Diggle, guitar/vocals, Pete Shelley, guitar/vocals, Steve Garvey, bass, and John Maher, drums/vocals, and have already built up a formidable reputation in this country.

Whatever the strengths of their live work, it does not transfer successfully to an album which shows little use of light and shade. Only on "Fiction Romance", the second track of the second side, which has a notable guitar riff over an insistent beat does the pace let up, and the following cut "Autonomy" shows the type of ideas which the rest of the album lacks. For the first time there is a different guitar sound which has a fuzzy but clean tone, used in a short, effective solo.

999 almost fall into the same trap, but their album is saved by the first three tracks of the second side. "Titanic (My Over) Reaction", is a song about paranoia on the London Underground and opens with bass and drums before Guy Daze's guitar crashes through for a real maniacal build-up. "Pick It Up" is another good track, but let down by some poor vocals.

"Emergency" is the track which has been pulled out for a single release, and is a jerky number which is not unlike the beginning to King Crimson's "21st Century Schizoid Man" and displays the same psychotic trait which vocalist Nick Cash and the rest of the band seem to have settled for as part of their sound and image.

Once again, 999 are a band with a hard core following, particularly around London, who became more accessible to





punk fans than the infamous Sex Pistols. On the evidence of those three tracks, they have the ability to create an original sound of their own which might lead to a vastly improved second album.

One cannot help but notice the comparison between these two albums and those of some of the second division blues/heavy metal outfits of the late Sixties. In fact both albums employ similar little studio gimmicks such as speeded up tapes, a random twiddling of mixing desk controls and telephones ringing, which plagued albums of 10 years ago.

Vocally, the bands leave much to be desired, content with sub-Johnny Rotten impersonations which make you realise just how powerful and original the Sex Pistols' front man was.

Rock music has always displayed built-in obsolescence, this year's new music is next year's cliché, which is what makes the whole business so exciting. Only the bands with true ability to play well and write good songs will survive, and this still applies to New Wave.

The debut albums of the Sex Pistols and The Clash are arguably the definitive punk albums and will undoubtedly stand the test of time as powerful rock albums. Although the 999 and Buzzcocks' albums were recorded in late '77, their appearance some 12 months after the height of punk cannot help but date them.

However, there is evidence on both albums that ability and talent do exist in these bands which could be realised with a more imaginative and thoughtful approach.

David Lawrenson

Another Music In A Different Kitchen, recorded and mixed at Olympic Studios, London. Produced by Martin Rushent, engineered by Doug Bennett. 999 mixed at Olympic Studios, London. Produced by Andy Arthurs, engineered by Alan Winstanley.

Joe Ely: "Honky Tonk Masquerade" (MCA 2832)

The term "country rock" should have been invented for Joe Ely. This Texas singer is one of the best things going in cowboy music at the moment. In "Honky Tonk Masquerade" Ely has come up with a worthy successor to his acclaimed debut album.

Producer Chip Young seems to be the ideal foil for Ely's talent bringing out a gutsy performance that never sinks into bland country maudlin. If you get off on steel guitar and tasty country picking you'll drool over the licks that embellish this record. Lloyd Maines and Jesse Taylor are the respective musicians in this department.

Ely and co-writer Butch Hancock have come up with another set of irresistible songs and Ely's strong voice just bursts out of the speakers.

If you have ever dismissed country music as being soporific and slushy don't make the mistake of missing out on new performers in this field like Ely. He can rock and roll with the best of them with music that makes it on pure musical proficiency rather than clever studio over-dubs or other effects.

It's hard to point to one song on this album that is either a filler or a let down. Even Hank Williams would be pleased at the modern treatment given to his old classic "Honky Tonkin".

I think I still prefer Ely's first album but that's probably because I've lived with it longer and use it for instant happiness. Oh to hell with it ... go and buy the pair of them.

Ian White

Produced by Chip Young, Recorded and Remixed at Youngun' Sounds Studios Tennessee.

The David Bromberg Band: "Reckless Abandon" (Fantasy FT 536)

David Bromberg has earned himself a reputation for being one of the hottest pickers around. An ex-Dylan session man, Bromberg runs a band of incredibly proficient musicians who are at home in any style of music from blues, rock, and country, to traditional Irish jigs and New Orleans jazz.

Bromberg, live and on form is a treat. Unfortunately his on-stage exuberance and the chemistry between his musicians doesn't transfer easily to disc. Add to this the fact that he is forsaking what he does best (i.e. high velocity blues guitar and speed-of-light acoustic picking) for mellow MOR songs, and it ends up in a rather frustrating album.

"Reckless Abandon" covers most of the Bromberg band genres with some standout Irish jigs and a great version of Rick Danko's "What a Town". But either Bromberg or producer Jim Price have slipped up in filling precious album time with poor material. "Baby Breeze" sounds like "Positively Fourth Street Meets Ray Conniff" and a seven minute mish-mash like "Beware, Brother Beware" spoils the album.

Perhaps this reviewer has too high an expectation of what a Bromberg album should hold. There is no doubt that a live outing from the David Bromberg Band would really sizzle the stylus.

As it happens I'll now have to wait another 12 months for a record that delivers what "Reckless Abandon" promises. On second thoughts I'll just be happy with a few tickets to the man's next gig.

Ian White

Produced by Jim Price, Recorded at Fantasy Studios, Village Recorder and United Western Studios



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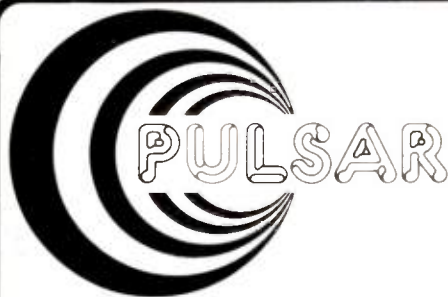
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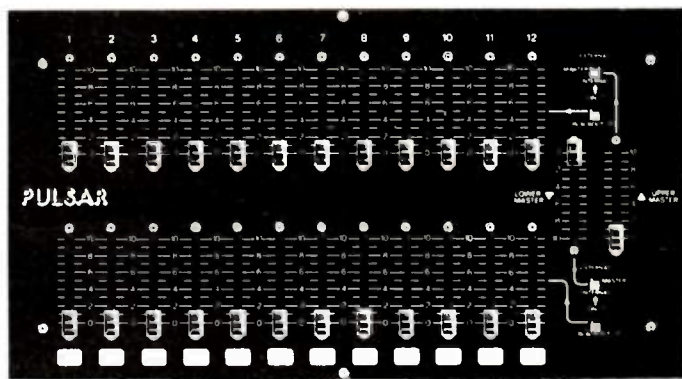
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Summerfields' Guitar Clinics

Summerfields of Gateshead, exclusive importers of Ibanez guitars in Great Britain, are sponsoring two important guitar clinics this year.

The first will be held in conjunction with Chappells of London and is a one-day clinic by Joe Pass. It will take place on June 10th at Chappells studio, 20 New Bond Street, London WC1. Tickets are available from Summerfields, Saltmeadows Road, Gateshead, NE8 3AJ at £5 (\$10) each.

For the sixth year running, Summerfields are sponsoring the famous four-day seminar, "The Effective Guitarist", held by the legendary jazz guitarist Barney Kessel. This year, the dates are October 26th - 29th inclusive and the venue is the Imperial Hotel, Newcastle-on-Tyne. A free 10-page booklet on the course is available on application to Summerfields.



Rose-Morris & Korg - A New Deal



Rose-Morris & Co. Ltd., have been granted the exclusive marketing rights for Korg products in the U.K. Tom Katoh, President of the Keio Electronic Laboratory Corporation is seen here with Peter J. Clarke, Executive Chairman of Rose-Morris.



"Fumble", who play and perform in "Elvis" (Evening Standard Musical of the Year) and Keith Strachan, the M.C. of the show.

three will be available in the UK and prices will range from around £600 (\$1200) to £1000 (\$2000).

The first supplies of these instruments will be arriving shortly and will be available through a limited number of dealers.

The London Music Shop Opens

The London Music Shop at 218 Great Portland Street, W.1, has been extended and modernised and now includes a new "rock" department that deals in Amps, Keyboards, Synthesizers and Drums. Pictured above are shop staff and manage Rod Alexander (far right).

This new department was christened on the 2nd of March with a boozy, well-attended reception. The guests included



Hornby Skewes Takes On Hamer

John Hornby Skewes & Co. Ltd. of Leeds recently announced the acquisition of the sole UK distribution of Hamer guitars. Hand-made from start to finish, these instruments are already being used by the world's leading professional guitarists. The guitars use the choicest mahogany, and rosewood and are made by master craftsmen. They also utilise specially designed DiMarzio pickups to help ease of playing and to best possible response.

At the moment, the Hamer range consists of three models: the Hamer Standard, the Crown Sunburst and the Dot Sunburst. All

New AR Speaker System

Teledyne Acoustic research recently introduced a new four-way, floor-standing speaker system called the AR9. The cabinets each house two 12" drivers, connected in parallel. These woofers are faced sideways eliminating any output dip resulting from phase cancellation. An 8" low midrange driver, a 1½" dome upper midrange driver and a ¾" dome tweeter are also utilised with level controls for each range.

The crossover networks in the AR9 are the most expensive and sophisticated ever used in an AR speaker system and their response curves show it is the flattest speaker they have ever built with the highest power handling capacity.

Peavey Seminar

A special Peavey seminar took place recently at the Bloomsbury Hotel, London. People who were there included Sid Bishop (Top Gear), Jude (Music City), Colin Lewis (Rhyll Sound Centre), Edmund Jones (Chappells Pianos), Dave Wilkinson (Live Music), Graham Hobbs, Alan Townsend and Len Morphew (Peavey UK) and Julius Graifman and Richard Desmond (International Musician).

As you read this, we should be somewhere around the beginning of April, a time when the hard-working musician's fancy turns (amongst other things) to the dream of an idyllic little cottage in the middle of Wales. Bearing in mind that such idyllic cottages are usually at least five miles from the nearest mains electricity and that the cost of running anything larger than a Pignose from batteries can come as a nasty surprise, if you are trying to live by subsistence farming, I offer the following abridged patent specification for an Acetylene-powered amplifier. I feel sure that with slight modifications it could be converted to work from Bottled Gas.

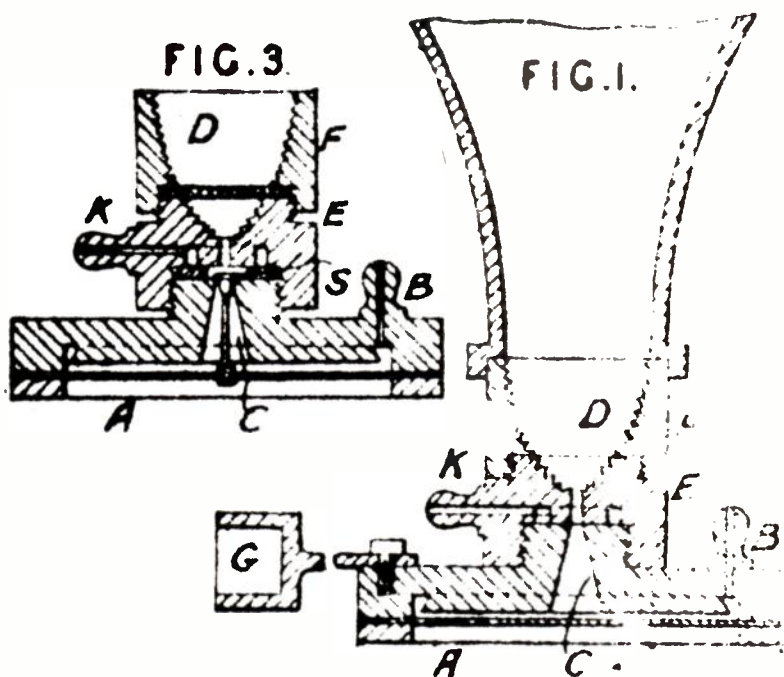
SMALL THINGS

by Stephen Delft

Stephen digs up an amp design that could offer interesting sounds

15,294. Laudet, G. Dec. 6, A.D. 1902, (date applied for under Patents Act, A.D. 1901)

Sound-magnifying appliances; brass and liloe wind instruments — Sonorous waves of any origin effect the expansion, combustion, and explosion of gases, vapours or liquids, in suitable chambers, thereby producing sound waves of the same pitch but increased amplitude, which may issue from resonators. For waves capable of such collection, a membrane A, Fig. 1, is employed, and its vibrations cause the expansion or explosion in the chamber D of gases, liquids, or vapours, such as hydrogen, acetylene, coal gas, ether, petrol, alcohol, or the like, which enter by the pipe B and fill the chamber C. The roughened sides of the chamber D increase the effect, and there may also be single or multiple resonators above this chamber. A metallic gauze screen, Fig. 3, may be arranged between the parts E, F to check the violence of the expansions or explosions, and there may also be a valve S with rod attached to the centre of the membrane for impeding the passage of the fluids into the chamber D. A second pipe K permits the introduction of a second fluid which has already had sonorous vibrations imparted to it, which may be harmonics of the note received by A, so as to produce a resultant compound wave. Where the sound-producing body to which the apparatus is to be applied has a vibrating surface or membrane, the membrane A may be dispensed with, and this is the case when applied to telephones, phonographs, reed instruments, and the like.



Phoenix amplification dealers

London
W1 Sounds, Shaftesbury Ave.
WC2 F, D & H Music, Charing Cross Rd.
W12 Maurice Plaquet, Shepherds Bush
W13 Tempo, Ealing.
E11 Freedmans, Leytonstone.
N17 Nth London Organs, Tottenham.
SE13 S Eastern Entertainments, Lewisham.
SW17 Session Music, Tooting.
Ashford Accent Music
Barnsley Kitchens
Bath Assembly Music
Bexhill-on-Sea Birds
Birmingham Yardleys
Blackpool Music Stores
Boscombe Eddie Moor's Music
Bradford Kitchens
Brentwood Soundwave
Bristol John Holmes
Bury St. Edmunds Albert Ballam
Canterbury Socodi
Carlisle Studio Music
Chester Dawsons
Dudley Modern Music
Exeter Greenhalgh Music
Fleet Kingfisher Music
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Hanley/Stoke-on-Trent Chatfields
Helston Tottles Music Shop
Hereford Picton Music
Hove/Brighton Southern Music
Huddersfield Dandelion Disco
Hull Cornells
Ipswich Albert Ballam
Launceston Tottles Music Shop
Leeds Kitchens
Leicester Sound Pad
Lowestoft Morlings
Luton Luton Music Centre
Maidenhead The Sound House
Maidstone Sharon Studios
Manchester A.I. Music
Manchester Carlsbro Sound
Middlesborough Cleveland Music
Newton-le-Willows Newton Music
Newcastle Rock City Music-Co
Norwich Cookes Band Instruments
Northampton Alan's Music Centre
Oxford Taphouse & Sons
Portsmouth Courtney & Walker
Reading Rumbelows
Rochdale Starnicks & Sharnick
Salisbury Mitchell Music

Scarborough B. Dean
Sheffield Johnsons Soundaround
Southend Chris Stevens Music
Stockport Dawsons
Sunderland White Sound Equipment
Tunbridge Wells Sharons Music
Wallasey Rumbelows/Strothers
Warrington Dawsons
Wigan Dawsons
Winchester Whitwams
Scotland
Aberdeen Bruce Miller
Bathgate Music Box
Glasgow McCormacks Music
Nth. Ireland
Belfast Marcus Musical Instruments

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Carmarthen Picton Music
Cardiff Sound Centre
Colwyn Bay Memphis Music

Merthyr Picton Music
Newport Sound Centre
Swansea Picton Music
Tredegar Sound Centre
Eire
Dublin McCullough Piggott
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See Phoenix April Clinics, page 35.



For our last column on the Country Blues Guitar, I thought it would be interesting to look at the work of a teacher and his student.

Rev. Gary Davis taught many black as well as white musicians. One of his early pupils was Blind Boy Fuller. Rev. Davis mentioned that Fuller came to him only with the knowledge of playing with a knife and in open tunings (what Rev. Davis used to call 'cheating on the guitar'). After several weeks, Fuller was picking in that North Carolina style that Davis and Willie Walker had perfected. Blind Boy Fuller's early recordings show a strong Rev. Davis influence. One of Fuller's best known songs was 'Weeping Willow'. This was unique in country blues as it introduced a major/minor feel. He originally picked up the tune from Rev. Davis who called it Mine Ail Troubled Blues.

On the Country Blues Guitar album (Kicking Mule Records, Snkf 129) there is a version which features a vocal by Mike Cooper. During the verses, the guitar plays a Blind Boy Fuller arrangement while, for the breaks, the texture and arrangement changes to a Rev. Davis feel. We have transcribed both sections and you can study the differences. The Fuller part tends to flow easily while the Rev. Davis section is more complex in melody and chord structure.

This column brings our discussion of Country Blues Guitar to a close. In the coming months we will explore Ragtime Guitar as well as the styles and techniques of such guitarists as John James, Davey Graham, Dave Evans, John Renbourn and Duck Baker. If there is anyone else you'd like to see mentioned, any questions or suggestions should be sent to Kicking Mule Records, Box 1M, 125 Studdridge Street, Fulham SW6.

BY STEFAN GROSSMAN

Weeping Willow

Guitar instrumental solo

First system of musical notation for 'Weeping Willow'. It features a treble clef, a key signature of one sharp (F#), and a 12/8 time signature. The melody is written on a single staff. Below the staff, there are six lines of guitar tablature, numbered 1 through 6. Chords are indicated above the staff: Am, A7, Dm, D, Am, and A7.

Second system of musical notation for 'Weeping Willow'. It continues the melody and tablature from the first system. Chords indicated are Am, A7, Dm, D, Dm, and D.

Third system of musical notation for 'Weeping Willow'. It continues the melody and tablature. A chord of E7 is indicated above the staff.

Fourth system of musical notation for 'Weeping Willow', ending with 'End'. It continues the melody and tablature. Chords indicated are D7, F, E, A, Adim, and E7. The tablature includes various techniques such as bends, slides, and vibrato, indicated by symbols like 'b', 's', 'v', and 'tr'.

Guitar behind verse

Musical notation for the first system, featuring a treble clef staff with a key signature of two sharps (F# and C#) and a 6/8 time signature. The guitar part is written in a single staff with a key signature of two sharps. The notation includes a (P) marking and a (0) marking. The guitar part is written in a single staff with a key signature of two sharps. The notation includes a (P) marking and a (0) marking.

Chord progression: A, Dm, A

1- 1-2 2 0 2 1-2 0 2 1-2 0 2 4 2 0 0 0 1-2 0 2 4 2 0

(P) (0)

Musical notation for the second system, featuring a treble clef staff with a key signature of two sharps (F# and C#) and a 6/8 time signature. The guitar part is written in a single staff with a key signature of two sharps. The notation includes a (P) marking and a (0) marking. The guitar part is written in a single staff with a key signature of two sharps. The notation includes a (P) marking and a (0) marking.

Chord progression: Dm

1- 1-2 2 0 2 1-2 0 2 1-2 0 2 4 2 0 0 0 1-2 0 2 4 2 0

(P) (0)

Musical notation for the third system, featuring a treble clef staff with a key signature of two sharps (F# and C#) and a 6/8 time signature. The guitar part is written in a single staff with a key signature of two sharps. The notation includes a (P) marking and a (0) marking. The guitar part is written in a single staff with a key signature of two sharps. The notation includes a (P) marking and a (0) marking.

Chord progression: A, E7

1- 1-2 2 0 2 1-2 0 2 1-2 0 2 4 2 0 0 0 1-2 0 2 4 2 0

(P) (0)

Musical notation for the fourth system, featuring a treble clef staff with a key signature of two sharps (F# and C#) and a 6/8 time signature. The guitar part is written in a single staff with a key signature of two sharps. The notation includes a (P) marking and a (0) marking. The guitar part is written in a single staff with a key signature of two sharps. The notation includes a (P) marking and a (0) marking.

Chord progression: D7, Adim, E7

1- 1-2 2 0 2 1-2 0 2 1-2 0 2 4 2 0 0 0 1-2 0 2 4 2 0

(P) (0)

★PLAYING★

JIM RODFORD: Bass Guitar

Harmonic Tuning

This month I'd like to talk about an aspect of bass playing and technique that is used for a very basic, fundamental, but extremely important function i.e. tuning up, and also for advanced tonal, and expression concepts. I am referring of course to the execution of harmonics.

When I first started playing bass guitar, the only harmonic I thought possible to obtain was at the 12th fret position, which was, and still is, used to check the string length adjustment, and for beginners who don't know how to do this, I'll explain the method later in this article.

The only bass guitar strings available in the early days were heavy gauge, flat wound, generally, and their response was not conducive to easy harmonics application. But as discussed at length in my first article for I.M., when John Entwistle got together with James How, pioneer string researcher and boss of "Rotosound", and conceived the modern "roundwound" bass guitar string, it opened up the instrument in terms of sound, and the liberation of its function, and expression concept, within a musical combo.

The high "ringy" "trebly" properties obtainable from these strings also opened up the world of harmonics to the bass player, but as I've intimated before, readers will range from complete novices to pros, so I'll have to start at the beginning when discussing their execution and various uses.

The theory and thinking around the general topic "harmonics", is a deep and involved subject, and to deal with it in depth could become a mini "thesis" project on my part, verging on a "teaching" concept from these articles, whereas these words are intended as hints and advice.

To simplify matters, I've decided, this month, to explain basically how to physically obtain a harmonic note at various positions on a bass guitar, and how to use them for the more basic functions.

The easiest and strongest harmonic is at the twelfth fret position on the G string, and the first fundamental use of this technique is to check the bridge string length adjustment, on all four strings.

The method involves any one of the fingers of the left hand being placed lightly on one of the chosen four strings, directly above the twelfth fret, but not pushing the string all the way down to connect with the fretwire. Pluck the string in the normal way with your right hand, preferably with a hard surface like a plectrum or your nail, and simultaneously and rapidly remove your left hand digit from the string. With a little "touch" practice and perseverance, a harmonic note will be produced, distinguished by its high, clear pure, ringing tone. In this case, the harmonic is the same pitch as the fretted note.

It logically follows then that, if the fretted note and the harmonic at the twelfth fret are not in tune, then the string length adjustment at the bridge must be altered to

achieve this state.

This rule applies to all four strings, and unless this is carried out properly the guitar will not play in tune, all the way up the fretboard. Simply, if the fretted note at the twelfth position is say, flat to the harmonic, then the bridge string saddle must be adjusted to move towards the nut, therefore shortening the string length between the bridge and the twelfth position, and sharpening the note. The same applies in reverse of course.

At varying positions on the fretboard, different harmonics to the fretted note can be obtained, predominately fifth intervals and octaves, at the easiest positions i.e. the 3rd, 5th, 7th, 9th and 12th positions.

It is possible to obtain harmonics at any position but this involves a more advanced technique, and I'll discuss this all more fully next month. For now, I'll explain the use of harmonics in tuning up this most difficult of instruments to tune, without the aid of their high tonal qualities. For some of you this is all common knowledge, but I know to many it is an undiscovered asset.

Trying to tune a bass by plunking away at the open strings is difficult and very hit and miss, as the frequency of the notes especially the lower strings is very low and hard to judge finely. The harmonics at the positions used, raise the frequencies to an audibly comfortable tuning level, simplifying the job.

Firstly tune the G string by matching the pitch of the harmonic at the 12th fret, which is G an octave above the open string, to a tuning fork, or a piano note, or any electric keyboard.

The note to which you are tuning must be straight, and pure, and unaffected by any deviation such as vibrato, or a "Leslie" effect. This is to allow you to hear the "vibrations" that are set up between the two notes, as they "come together" tuning wise. By using the G harmonic and a G on a piano keyboard of the same octave pitch, it's possible, if you are already near to the correct tuning, to slow down the pulse of the vibrations to a point where they appear to come together and stop inter-vibrating, this means they are closely in tune.

This same method can be applied to the other three strings, but in my opinion, only as a guide, because you are then dependent on whether the instrument you are tuning to, is perfectly in tune with itself.

To finely tune the bass, I prefer to start with the G string, as explained above, and then "vibration tune" the D string to it thus: Hit the harmonic at the seventh fret position on the G string, and the note produced is a D one octave above the fretted note at this position also D of course. Whilst this harmonic is still ringing on, hit the harmonic at the fifth fret position on the D string and the same note is produced a D at the same octave pitch as the one ringing on the G string.

The fretted note at this position is a G, and the harmony interval of the harmonic

note just obtained is one octave and one fifth above it. These two harmonics, unless already perfectly in tune, should be inter-vibrating rapidly or slowly depending on how far out they are. With the tuning peg, flatten or sharpen the D string harmonic to the G string harmonic as required to slow the vibrations down until they stop. The speed of vibrations does not indicate flatness or sharpness just "out of tuneness" on either side so be careful at the critical point as it's easy to go over into the reverse state from which you have come.

This procedure is then repeated in the same way with tuning the A string to the now in tune D string, using the same fret positions for harmonics, although you may find it more difficult at first to obtain harmonics on the lower, thicker strings the same procedure and harmonic positions are used to tune the E string, and new, preferably roundwound, strings make this much easier.

The advantages of using harmonics for tuning become increasingly apparent on the lower strings especially the E of course, where to tune the open string exactly can prove to be extremely difficult due to its low pitch.

When all four strings have been tuned in this way, re-check the G string twelfth fret harmonic with its original tuning source, as the now slightly different tension on the neck, could have altered its pitch slightly.

If so, go through the whole procedure again, until the bass is completely in tune with itself and concert pitch, which a tuning fork or decent keyboard should be.

If after all this, you find that some fretted octave intervals are out with themselves, then either your bass needs more attention to the string length bridge adjustment, or more seriously, bad fretting or warping may have occurred.

Next month I'll touch on more advanced harmonics technique use, but in the meantime try to get hold of the first Jaco Pastorius solo album, and listen to the track "Portrait of Tracy" to hear mind-boggling bass guitar harmonics application.

I'm giving the competition riff a rest this month but will continue it next month as response has been pleasingly good.

The answer to February's competition was of course "Chameleon" by Herbie Hancock, and there were four correct entries, which is surprisingly good considering the copying errors, that caused some controversy last month. The winners:- Martin West of Hampton Hill, Middlesex, Paul Isaac of Plymouth, Devon, Tom Killian of Dublin Ireland, and Ray Cooper of Malton Road, York. The Rotosound strings of their choice should now be in their possession.



Phoenix April Clinics



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FRANKFURT REVIEW



Packhorse did phenomenal business at the show with their new economy range of cases, and Peter Robinson did a wonderful job as host with the drink cabinet!



Jeremy Symons had a good display of Vortex products in hall 5A.

52201 Re-an Products Ltd



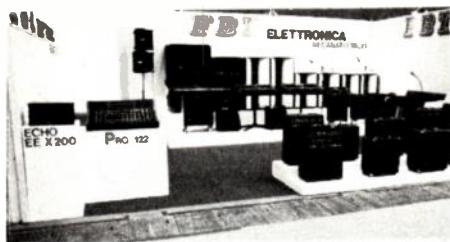
John Weatherley of Re-An had a very smart display and some very interesting new speakers at the show.



Carlsbro were showing their new 12/2 mixer, the Cobra combo and the 1000 echo effects pedal for the first time.



Allen & Heath's new 20 into 4 mixer drew the crowds onto their corner stand.



FBT one of Italy's major amplification companies with their wide product range of combos, bins and mixers.



A tower of Vox strength; we couldn't resist this collection.

50153 Peter & Nicholas Engineering



Good business was done with mic stands and accessories or the Peter and Nichols Eng stand.

50251 Hornby Skewes



David Barnet (back towards us) was kept busy throughout the show on the J.H.S. stand.

50249 Reslosound



Reslo's fine radio microphones created plenty of interest, and so did the porters!

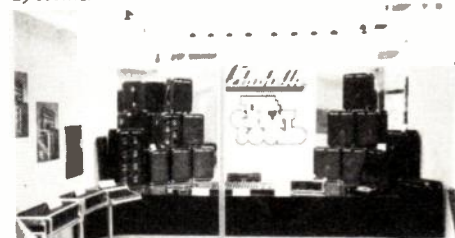


Jeff Jeffries had his Sounder range of half-round guitar and bass strings on show for the first time at Frankfurt.

52108 Funkshun



Doug Marriott was showing his new range of fibre cased valve amps and mixers. Funkshun were also showing ASS horns, which they distribute in Europe for Acoustic Sound Systems.



Echolette has come a long way from the days when the company was principally known for its excellent echo machine. Today a full range of amplification is offered but highly sophisticated echo and reverb devices are still very much in the forefront.

52106 Banc

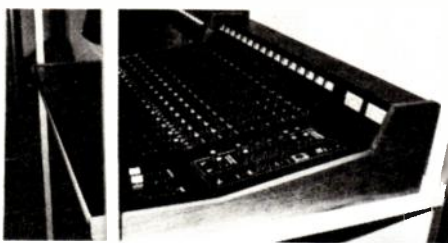


Paul Lammin was showing his new C2100 2x12 combo which created a lot of interest at the show.



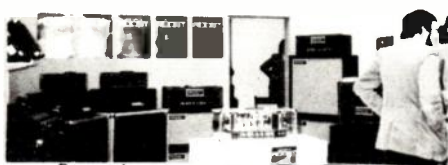
Asba the impeccable French drum company were showing their new wood finishes at the show.

FRANKFURT REVIEW



Canary were showing their new competitive 16/2 mixer for the first time at Frankfurt.

50154 Roost Sound Equipment



Roost had a good range of valve amps to show the followers of the heavy brigade sound.



Cleartone Musical Instruments Ltd. re-introduced 'Park Amplification for the Show. Rene Marshall a director of the company is seen here with Keith Carnall their new M.D.



A fabulous display that tells its own story.



C.B.S./Arbiter's genial chairman Ivor Arbiter is seen here with two executives of the Gemlnhardt flute company whose products are now distributed by his international organisation.



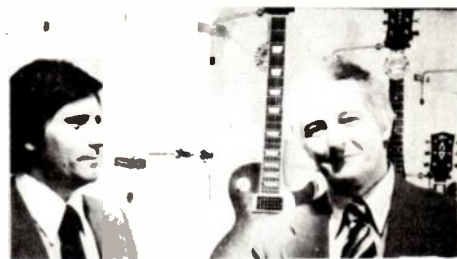
James Coppock (left) and Jim Weedon show one of their attractive guitar straps on the Fletcher, Coppock and Newman stand.



Lights galore on the Cerebrum stand always pulled the crowds.



Gerd Kiihn the man behind ATC and Mega in Germany on the cases stand.



Terry Maybee and Pete Tullett of Gigsville U.K. the proud British distributors of Aria Instruments seen here on the Aria stand.



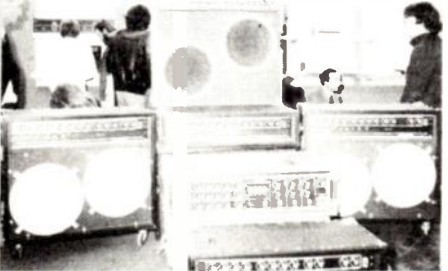
The C.F. Martin Organisation don't have to work terribly hard to get over the message when they are showing such superb instruments as Martin and Levin guitars. This year was no exception but their stand - directly opposite ours - was busy throughout the show.



H/J had a rather large stand in hall 5A and were showing new mixers and a concert PA speaker system.



WEM were showing their smart new range of combination amplifiers.



Redmere and Intermusic amps from PA:CE a great British tour de force, were in hall 5A.

52110 Bell Electrolabs Ltd



Mike Bell was very pleased with the interest shown towards his modular effects (Fx) units, by the foreign dealers.



If you could
play this page,
you'd hear what
great pickups
are all about.



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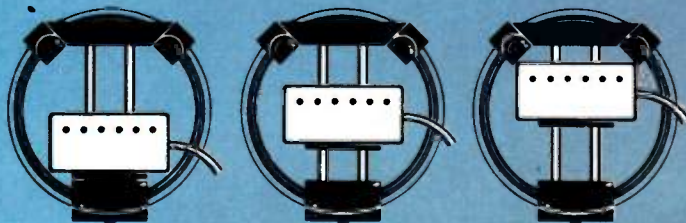
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sound of
playing electric...

The DiMarzio Acoustic

The Acoustic Model II is a humbucking, magnetic pickup for steel string acoustic guitar. A simple, sliding rail arrangement gives the Model II the unique ability to tune any acoustic guitar for harmonic balance — a player can emphasize overtones or fundamentals in any proportion he chooses.

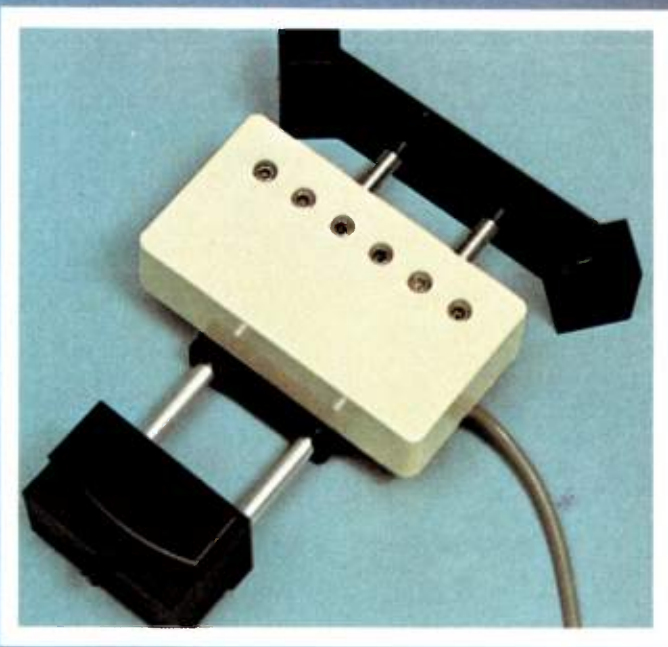
The Model II also features six adjustable pole pieces, shielded cable and jack clip. All mounting parts are nylon, so there's no danger of guitar damage. Full mounting instructions included for easy installation.

The new DiMarzio Acoustic Model II. You know what we've done for electric guitarists. Come hear what we can do for you.



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FRANKFURT REVIEW



One of the new British companies showing keenly priced amp products in hall 5A.



Barry Phillips and his charming wife Marcia soon had the continentals flocking into their sound booth!



Picato were right up there with their new half ground, long-scale set of bass strings.



Never a dull moment on the Dave Simms stand with lots of people looking over the products.



There seemed to be everything for the percussionist on the P.S. stand in hall 5A.



EMS with their 'on the frontiers of science' stand drew a lot of interest.



We're always interested to have a look and see new products shown on the Davoli stand. This range of mixers and amplification equipment has to be one of the most attractive in the world.



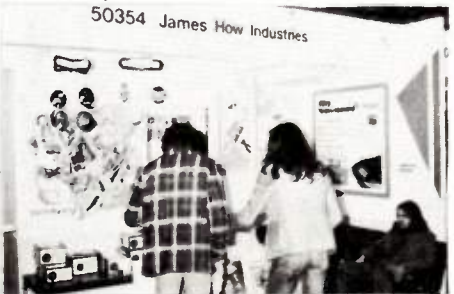
David Biggs of Fane wrote down plenty of export business at the show.



The Celestion boys were knocking everyone cold on prices we heard at the show.



Krumar has one of the best keyboard ranges in the world. Collectively the products undoubtedly outsell all others.



James How created quite a buzz with their busy stand their Superwound strings.



Bob Thomas of Laney Amplification was showing his complete new range of products at the show.



As usual the happy team of Larry Macari and Brian Butcher greeted visitors to the Colorsound/Eurotec stand. Big news this year is the new Eurotec electric piano.



Keith Hitchcock genially takes it all in his stride as he gets his Sound Around.



New products on the Soundout stand were the 200W and 200W slave amp and the six-channel PA with reverb. Soundout were also showing Fylde guitars and the Elvins TS55 electric piano.



Fletcher Coppock & Newman writing down the business, and that's what it's all about

FRANKFURT REVIEW



Both JBL and Teac showed their wares under a common roof. Teac's penetration of the musicians market is really quite phenomenal.



Arbiter Auto Tune Kits and the ubiquitous Vox amps always create a lot of interest at the show.



A new contender in the speaker market with OEM products both in special speakers and the general purpose category.



John Hey had a very nice 12/2 Mixer on his stand. The mixer has 4 band E.Q., PFL, Hi-Lo Balanced and Unbalanced inputs for less than £300 UK retail.

50352 Leech Mfg. Company



David Shinn launched a new amplification range of the show.



Premier Drums are one of Britain's most successful exporters — they have won some highly coveted awards in this area — and their display this year was as forceful as ever. High spot was the new range of Resonator drums.



Insufficient exposure has been given to Welson who make some particularly fine keyboard instruments in Italy. The ones to watch for are the portables!



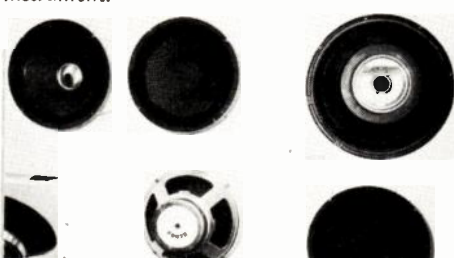
It's very much a "home match" for Hohner who showed the trade an extremely wide range of musical merchandise.



30 Rosettis display of products on their open corner stand drew lots of attention from visitors.



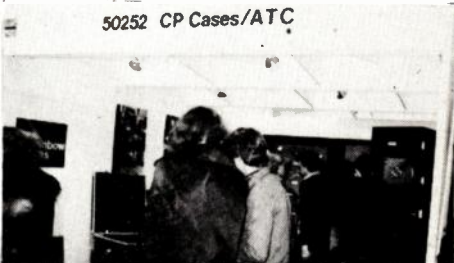
A new portable made a great debut on the Farfisa stand and U.K. demonstrator Les Bonner did full justice to this exciting and new instrument.



A close up of the new McKenzie range of speakers that opened a lot of eyes at the show.



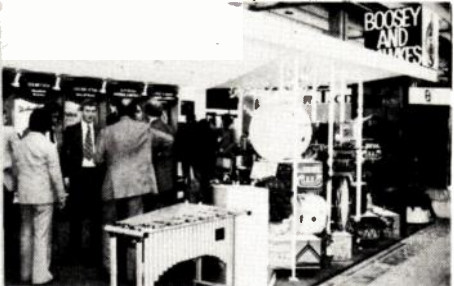
There were some very big news from Ibanez this year. No less than 40 new guitars were shown as well as several new percussion items. The guitar range has to be the most comprehensive available from any quality world manufacturer.



Rainbow products and accessories together with Mega P.A. equipment were shown by C.P. Cases. Hans Fretag also exhibited RSD mixers and the ubiquitous ATC speakers on the stand.



An important part of the A.K.G. displays is always the demonstration of their fine range of headphones. On the public day — Sunday — queues formed to hear a variety of sounds delivered via these cans.



Boosey and Hawkes have been visiting the Frankfurt show as exporters since it first started in the 1950's. As one of the world's most famous manufacturers and exporters the stand was busy throughout the exhibition.



Dynachord is an almighty strength on its home German market. The range of amplifiers, mixers and accessories is really impressive.



Yet another first for Westmill

Only a short time ago we told you about the Compression loaded 2 x 9 radial midhorn, the most compact and efficient mid range transducer on the market today.

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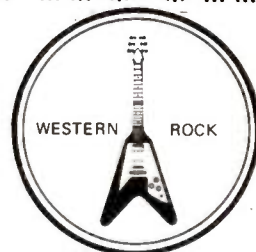
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S/H Gibson LP Deluxe £280
S/H Gibson LP Bass £350
S/H Gibson Grabber 3 £180

Plenty of other new and secondhand guitars in stock including Fender, Epiphone, Guild, Ovation, Rickenbacker etc.

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112-65	Pro Reverb	£245
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65 Head	Bassman 50	£165
115-RH65	Deluxe Reverb	£175
	Bassman 100 Cab	£180

Marshall/Yamaha/H/H/Ram Amps also in stock and plenty of secondhand bargains.

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H.P. arranged, Part exchange always welcome

FRANKFURT REVIEW



As well as being one of the most attractive ranges of amplification available Maine is also a very comprehensive range. Andy Cannon was on hand to greet visitors.
52211 Westmill



The Pearl Company never cease to surprise and this year was no exception. They very quietly showed a new piano which we expect will become an important instrument in the next 6 months.



Wurlitzer don't seem to modify their stage piano a great deal but then they don't really have to. It is one of the most successful models ever and as usual it collected excellent business for the company.



Giles Neville (left), Bill Worton (centre) and Neal Grant M.D. of Westmill discussing the hire business.



Remo Drumheads seem to become almost a generic name for plastic heads. Their display at this years fair was highly professional.



A new range of super speakers for the pro P.A. user was shown by the Zoot-Horn company.



The Finish company W.L.M. mounted an extremely attractive stand with their excellent sounding organ the "Hit". They claim that this instrument actually reproduces the sound of early tone-wheel instruments and we think they are right.



Several new organs appeared on the Elka stand this year. This company really seems to be investing in R&D to produce some outstanding instruments.

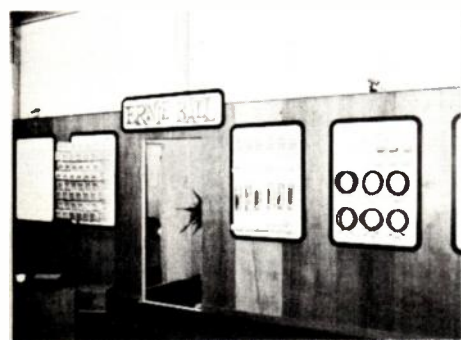


This magnificent Yamaha drumkit was just one of the many interesting exhibits in the Yamaha display. From what we hear Yamaha seems the one line that really worries the big names in the percussion field.



Big news on the Hammond Organ stand was the introduction of a completely new portable - B200 - and a complete range of home organs called the Romance series. One particularly excited and enthusiastic host on the stand was Ray Hammond the new boss of Hammond U.K. Limited.

AMERICANS in FRANKFURT



Ernie Ball - one of the nicest men in the business - and his son Stirling were in Frankfurt to greet visitors concerned with the finest guitar strings. As usual the company were very pleased with the outcome of the fair.



Acoustic Control Systems were very proud to show their new bass amp set-up. Already the makers of some of the best bass amplification in the world, the company has improved the lot of bass players even more by offering this new set up which includes some laterally mounted drivers.



To people outside the world of percussion drum heads seem a relatively minor accessory. Visitors to the Evans stand were however far better informed and took a great interest in some of the unique features of these heads from Dodge City.

FRANKFURT REVIEW



Despite the fact that we primarily associate Schaller with very high quality machine heads. The company also produces a complete range of amplification.



Big news on the Norlin stand was the new Gibson RD series of guitars. These feature a longer scale fingerboard and active electronics.



Music Man showed their new Sabre guitar along with some new combo amps.



From the same parent company as the makers of Ovation guitars comes a new budget priced range of fibre glass backed acoustic guitars called Applause.



Ludwig Drums always present a high spot of the exhibition and this year was no exception. Among the many celebrities visiting was Ed Thigpen world famous jazz drummer.



The MXR Professional Products Group took great delight in showing an unsuspecting world their new graphic equalisers.



Guild Guitars adopted something of a low profile at Frankfurt.



Pete Wood, export director of Peavey seen here sitting on top of a new Peavey combo amp.



You have to admire the effort Norlin puts into Music Trade Fairs. Their stand was undoubtedly the biggest and best and perhaps that is only right considering some of the brand names they manufacture.



(34) The underexposed but much appreciated Shure equipment was, as usual, in full evidence at the Frankfurt Fair.



Kustom is now looking to establish itself more firmly in Europe. George Mantoan was on hand to greet export customers.



Zildjian's booth is always pretty because they take on the Turkish theme that represents so clearly the company's 360 year pedigree. Bob Zildjian greeted friends and customers.



Mighty Mite — the makers of hot pickups and accessories — showed their full range to an appreciative world market.



No Frankfurt would be complete without a prominent display from DiAddario strings.



Larry Knight is a busy man. As well as being the bass player with the legendary California group Spirit he also heads up Silver Eagle Designs who make the unique "pick-pocket" hand-crafted guitar straps.



Our friends from Amanita Sound of California Ed Alford and Tim Griffin came to visit us during the show. Their unusual range of speaker enclosures were a talking point amongst the "heavy sound" companies.



DiMarzio had a fantastic Frankfurt Fair and Steve Kaufman reported to us a quite staggering volume of business.



Two of the nicest professionals in the business seen here on the Randall stand. On the left Don Randall and on the right Chuck Widener.



Electro Harmonix of New York really pushed the boat out this year with a large booth displaying their equally large range of sound modification equipment.



Bose argue that once the concept of small drivers in a PA enclosure has been accepted the automatic choice must be their units.



A shot taken at the bar beside the Norlin exhibit. L to R Harry Stoneham (Star organist), Jean Ashworth of Chingford Organ Studios and Ray Dunk of Lowrey.

Expanding the Boundaries of Creativity

New levels of musical imagination present themselves to the creative musician with the application of the MXR Digital Delay. The diverse effects offered by the Digital Delay, when used with individual instruments, vocals, PA and recording mixes, offer a whole new range of musical creativity.

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Effects that can be obtained with fixed time delays include echo, vocal doubling and hard reverb. The MXR Digital Delay contains sweep circuitry which allows additional effects such as flanging, vibrato, pitch bending and frequency modulation. The MXR Digital Delay is also capable of repeat hold (infinite non deteriorating regeneration).

Rack mountable for sound studio installation, it is also available with an optional road case for onstage use or location recording mixes.

MXR's Digital Delay can lead the way to new possibilities in creative sound at a price considerably lower than any comparable delay.

For more information see your MXR dealer. MXR Innovations, 247 N. Goodman St., Rochester, New York 14607, (716) 442-5320. Distributed in Canada by Yorkville Sound Ltd., 80 Midwest Road, Scarborough, Ontario.

MXR Professional Products Group



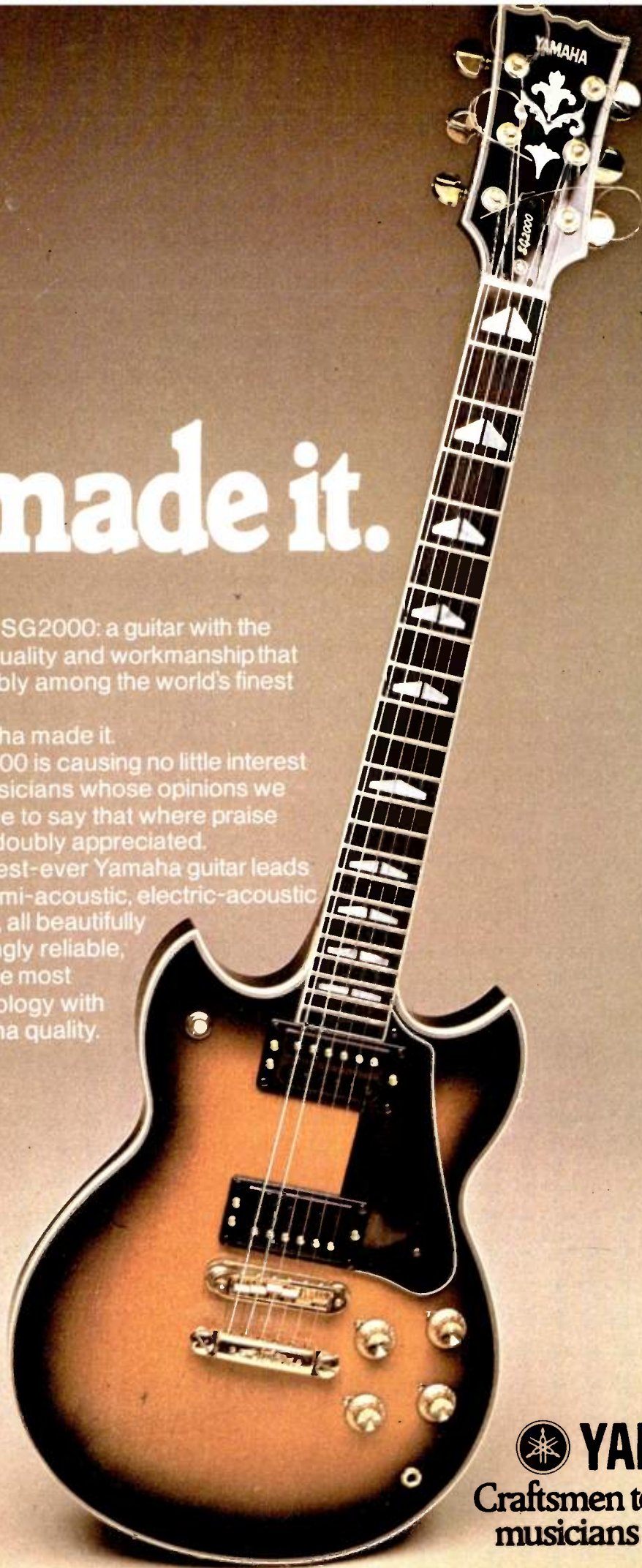
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The SG2000 is causing no little interest among those musicians whose opinions we value; and it is true to say that where praise is hard won, it is doubly appreciated.

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market report

Marshall

One name in amplification has, more than any other, been responsible for being the foundation upon which an entire generation of musicians founded their sound. From early Who and Hendrix through to today's bands like The Stranglers, Marshall is the name which has been the backline for thousands of gigs.

No-one has yet discovered how to emulate the Marshall sound which is distinctive for its rich harmonic content and soaring overload characteristics.

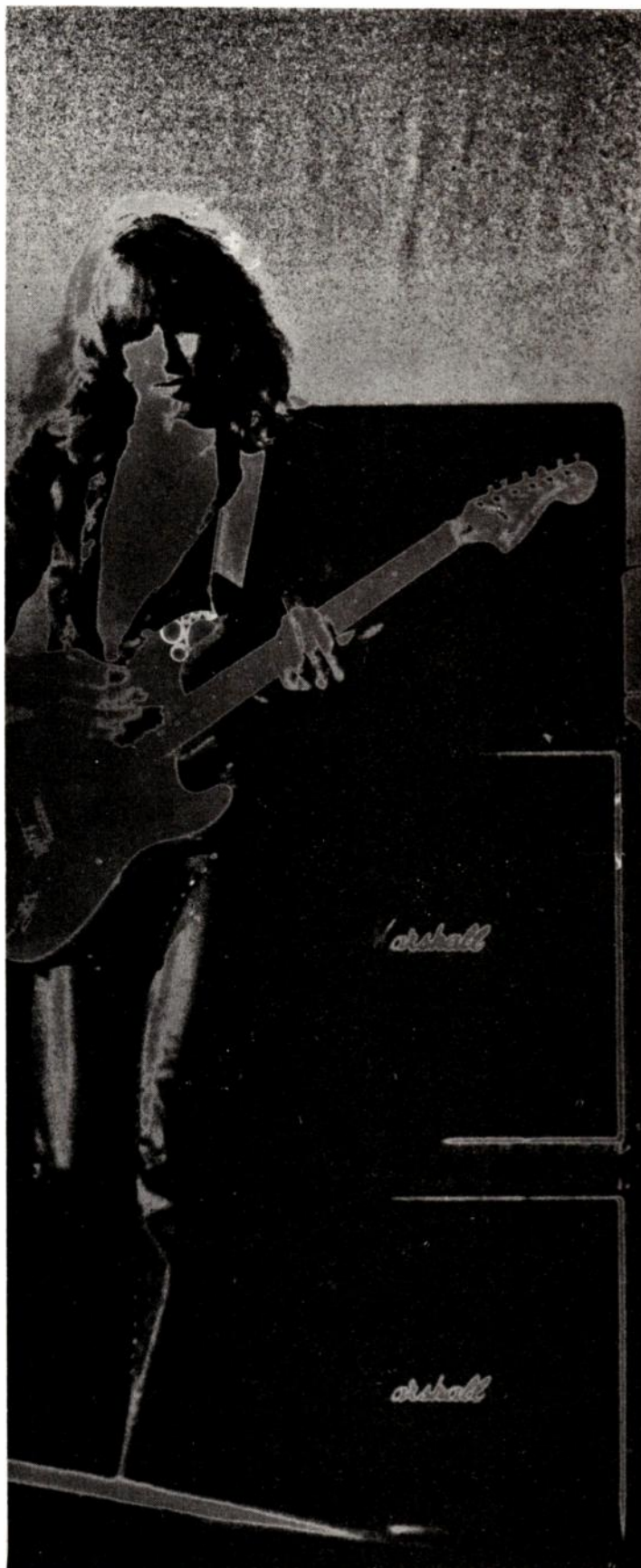
The Marshall story began in the early sixties when Jim Marshall put together his first amp which was quickly snapped up by The Who. Following their specifications, Marshall evolved the first stacks of 4x12 cabs and soon Marshall gear was pounding out rock music all over the land.

Marshall got a huge boost when Jimi Hendrix and bands like Jethro Tull, Deep Purple, and Free began changing to that equipment. Undoubtedly, Marshall have made their name on the strength of their 50-watt and 100-watt heads although the company has recently launched a range of quality 50-watt combos as well as a solid-state amp which is said to retain all the "valviness" of the original Marshall product.



Dealer list

1. Terry, Approximate Music, 244 Ham Road, Worthing, Sussex.
2. Dick Middleton, Dick Middleton, 51 Quarry Street, Guildford.
3. Brian, South Eastern Entertainments, 373/377 Lewisham High Street, London SE13.
4. Eric Lindsay, Eric Lindsay, Gig Sounds Ltd., 85 Mitcham Lane, Streatham, London SW16.
5. Trevor, Kennards, 10 New Rents, Ashford.
6. Ian, John King, 8 Richmond Road, Kingston-upon-Thames.
7. Kim, ABC Music, 14/16 High Street, Addlestone.
8. Mike Coombes, Whomes, 292 High Street, Croydon.
9. Bernard Jones, F.D. & H. 138/140 Charing Cross Road, London WC2.
10. Phil, Roundhouse Music, 72/73 Chalk Farm Road, London NW1.
11. John Ward, Dave Simms Music Centre, 1-5 The Grove, London W5.
12. Colin Pimcott, Top Gear, Denmark Street, London WC2.
13. John Ward, Supersounds, 2 Highgate Road, London NW5.
14. John Holk, Andertons, 5 Stokefields, Guildford.
15. Paul, Barratts, 72/74 Oxford Street, Manchester.
16. Dave Gregory, Jones and Crossoland, 6 Smallbrook, Queensway.
17. Barbara, Coventry Music Centre, 3/4 White Friar Street, Coventry, West Midlands.
18. Graham Pell, Soundpad, 64 London Road, Leicester.
19. John, Harker and Howarth, 26-32 Churchgate, Bolton.
20. Keith Woodcock, Carlsboro Sound Centre, 182/184 Chesterfield Road, North Mansfield.
21. John Wright, Farnsworth Music, 134 Radford Boulevard, Notts.
22. John Grindle, Centre Sound, 5 Albert Street, Rugby, Warwicks.
23. Paul, Coda, 28 Churchbank, Bradford.
24. John Gothard, J.S.G. 108b Main Street, Bingley, West Yorks.
25. Alan, Guitarzon, Bongo Bills, 28/30 Middlesbro Road, Southbank.
26. Graham, Rock Shop, 201-203 Stourbridge, Holly Hall, Dudley.
27. John Wiltschinsky, Music Ground, Station Road, Dunscoft, Doncaster.
28. Rod Millgate, Mean Machine, 70 Bongate, Darlington, County Durham.
29. Dave, J.G. Windows, 1-7 Central Arcade, Newcastle.
30. Neil McCormack Snr., McCormack's Music Ltd., 29-33 Bath Street, Glasgow.
31. Mr. Stilwell, Socodi, 9 The Friars, Canterbury, Kent.
32. John, Soundwise, 27-29 Norwich Road, Ipswich.
33. Harry, Baird Electronics, 208 York Street, Belfast.
34. Kevin, Rhodes Music, 22 Denmark Street, London.
35. Mr. Gray, Peter Gray Music, 212a Wellingborough Road, Northampton.
36. John Read, N.E. Read and Son, 20 Church Street, Oswestry, Shropshire.
37. Mr. Pete Brewer, Honky Tonk Music, 300-302 London Road, Hadleigh, Essex.



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3. They are very reliable.
4. They are totally reliable especially from the service angle.
5. They are pretty good.
6. It depends on the type of amp.
7. They are pretty reliable, the valve amps more so than the transistors.
8. Fairly.
9. Very.
10. They are the most reliable amp that we sell.
11. Most of the models are O.K.
12. Very.
13. Very.
14. They are extremely reliable.
15. They are very reliable.
16. Very.
17. They are very good.
18. The valve amps are very reliable.
19. They are fairly reliable.
20. Fairly.
21. Very.
22. Ultra reliable.
23. I use them myself, they are very reliable.
24. Very.
25. They are very reliable.
26. They are no trouble at all.
27. The valve amp is the most reliable amp around but the transistor is no more reliable than any others.
28. Hundred per cent reliable.
29. They are very reliable.
30. Valve amps quite reliable. Transistor amps can be troublesome.
31. Very reliable.
32. I use them myself!
33. Valve amps reliable, transistors have problems.
34. The most reliable on the market.
35. Pretty reliable.
36. Very reliable.
37. Very reliable.

What criticism do you have of Marshall Amps?

1. On the valve combos they used to have reverb, they should bring it back as standard.
2. They have no reverb as standard.
3. The price.
4. They should have reverb as standard on the Master Volume amps.
5. The slow delivery;
6. None.
7. Not very versatile.
8. None.
9. None.
10. None.
11. The Transistor Lead Bass 100 is unreliable.
12. The transistors are not as hot as the valves but they are much cheaper.
13. None.
14. None.
15. The tone controls don't work as well as they should.
16. None.
17. None.
18. The price.
19. They are sometimes damaged in transit.
20. None.
21. None except that you cannot get replacement badges for the front of the speakers.
22. None.
23. None.
24. Just that you can't get enough of them.
25. None.
26. They are the best around.
27. None.
28. The 50-watt models don't have enough bass tone.
29. None.
30. Impedance selectors are usually loose.
31. None.
32. They should do reverb.
33. Transistorised amps are not very well protected.
34. None.
35. No reverb on combos.
36. Haven't seen the rep for weeks.
37. None.



Which Marshall amps are the most popular and why?

1. The valve amps have a good name for reliability and they are good retail value.
2. The 50-watt combo amp (valve) because it is a small amp which is very powerful and also good value for money.
3. The Master Volume 50 and 100 because of the power.
4. The 50-watt Master volume because it is as good as any 100-watt amp and you can get a good rock and roll sound at any volume.
5. The 100-watt Master Volume and stacks because all the rock bands want them.
6. The 50 and 100 watt Master Volume combos because of the overload sound.
7. The Lead Bass Transistor Top because of the price.
8. The valve 50-watt combos, most of the young schoolboys want them because of the price.
9. The valve 100-watt Master Volume because it has more control and the Transistor 100-watt Lead Bass because of the price.
10. The 100-watt Master Volume amp because it is a good amp.
11. The 50-watt Master Volume because it is the right size for the market.
12. The 100 and the 50 watt valve because they are the best value.
13. The 50-watt Master Volume and the 50 amp top Master Volume because they suit the market.
14. The 100 and 50-watt Master Volumes because no other amp can get the sound that they give.
15. The Master Volume Lead amps because of the distortion facility.
16. The Master Volumes because of the distortion control.
17. The 50-watt Master Volume because it is designed to give the heavy sounds that the punk bands want.
18. The 100-watt valve tops and the 4X12 cabinets.
19. The 100-watt valve because of the power and the sound.
20. The Master Volume because of the authentic Marshall sound and the modern approach on sustain.
21. The pre-amp.
22. The 100-watt valve lead. It's the sound that musicians are looking for.
23. The Transistor for the price and the valve for the reliability.
24. The Transistor for the price.
25. The valve because it has been tried and tested.
26. The valve tops because of the good deep sound.
27. Any with the Master Volume because they work better than most and they have a good overload.
28. The 50-watt combo because of the compact loud sound and it has the Marshall name on it.
29. The Master valve top because of the distortion at any volume.
30. 100-watt Master Volume.
31. 100-watt tops.
32. 50-watt and 100-watt tops and combos.
33. Valve tops and valve combos.
34. 100-watt valve tops.
35. Valve amps are selling a lot.
36. Couldn't really say.
37. The Master Volume valve models because of the overload facilities.

How do you find Marshall/Rose Morris back-up service?

1. Excellent.
2. We can't get them in quickly enough.
3. Excellent.
4. Excellent.
5. It's usually okay.
6. Fine, no problems.
7. Not as good as it could be but pretty good anyway.
8. Excellent.
9. Superb. They are always very helpful.
10. Good.
11. It could be better.
12. Very good.
13. Very good.
14. Variable.
15. Fine.
16. Very good.
17. Very good.
18. It's okay.
19. Quite good.
20. Good.
21. They are a bit slow on their delivery but generally they are quite good.
22. Very good.
23. We haven't had to use it yet.
24. Excellent.
25. Good.
26. No complaints.
27. Good.
28. We've never had to use it.
29. We haven't had to use it yet.
30. Above average.
31. Very helpful.
32. Quite good. Haven't had to use it much.
33. Excellent.
34. Good.
35. No complaints at all.
36. Not very good.
37. Very good.

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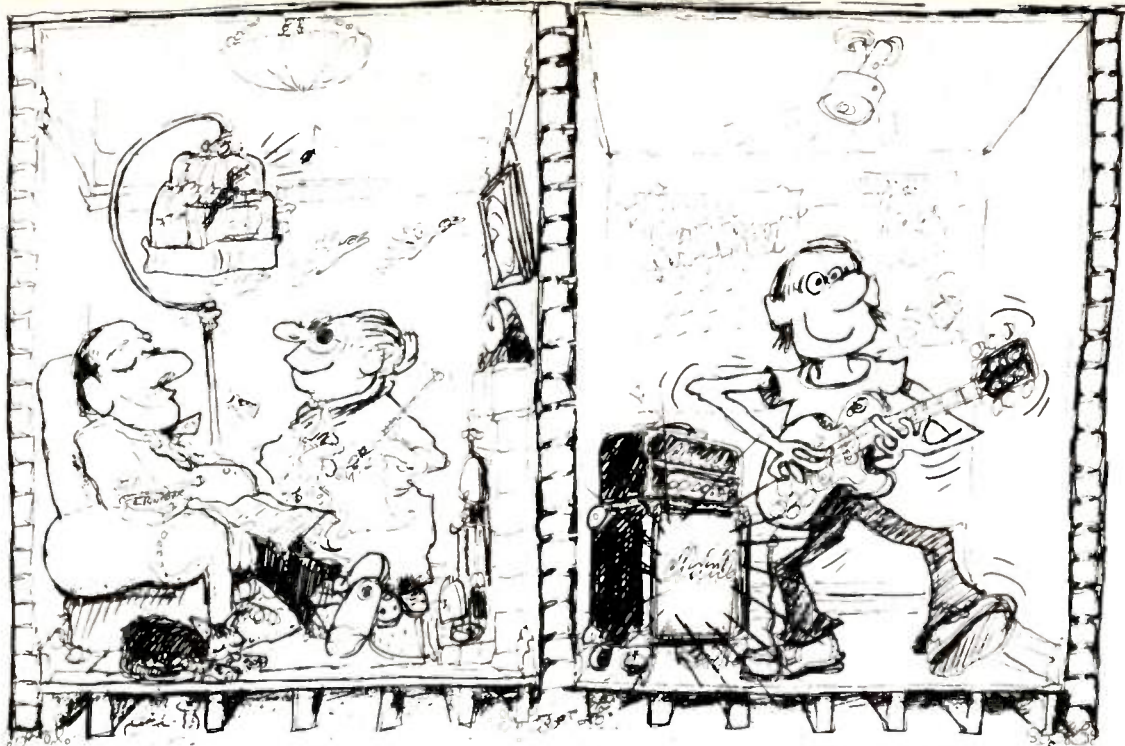
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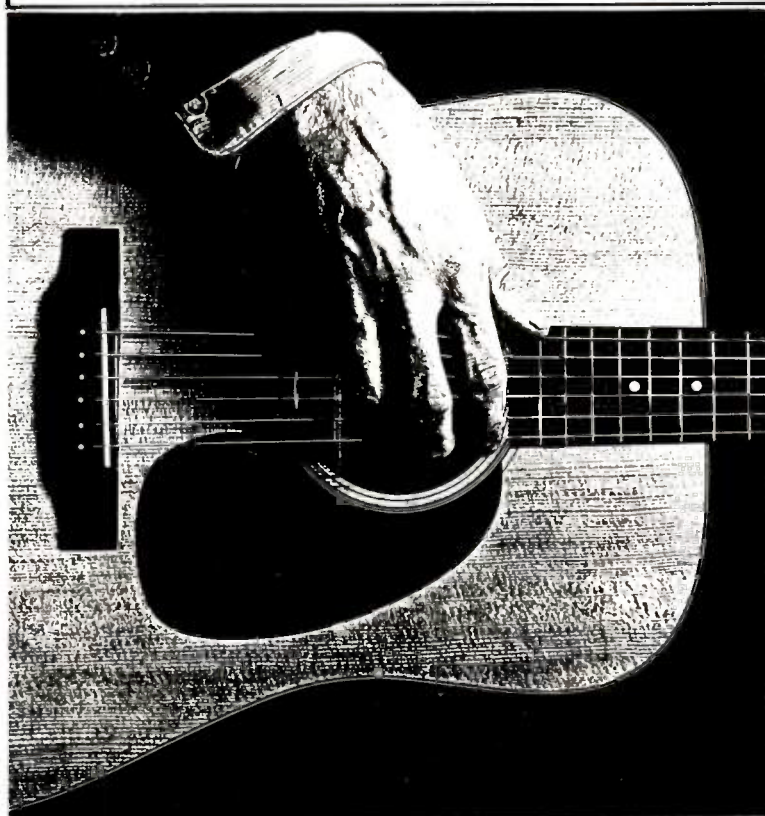
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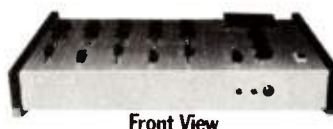
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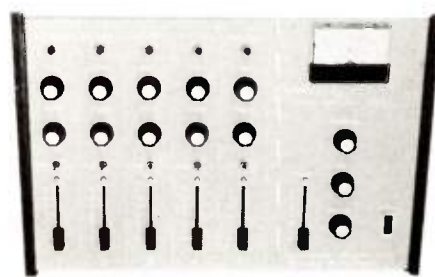
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Rear Panel View



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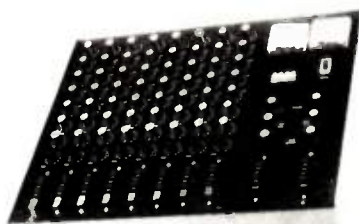


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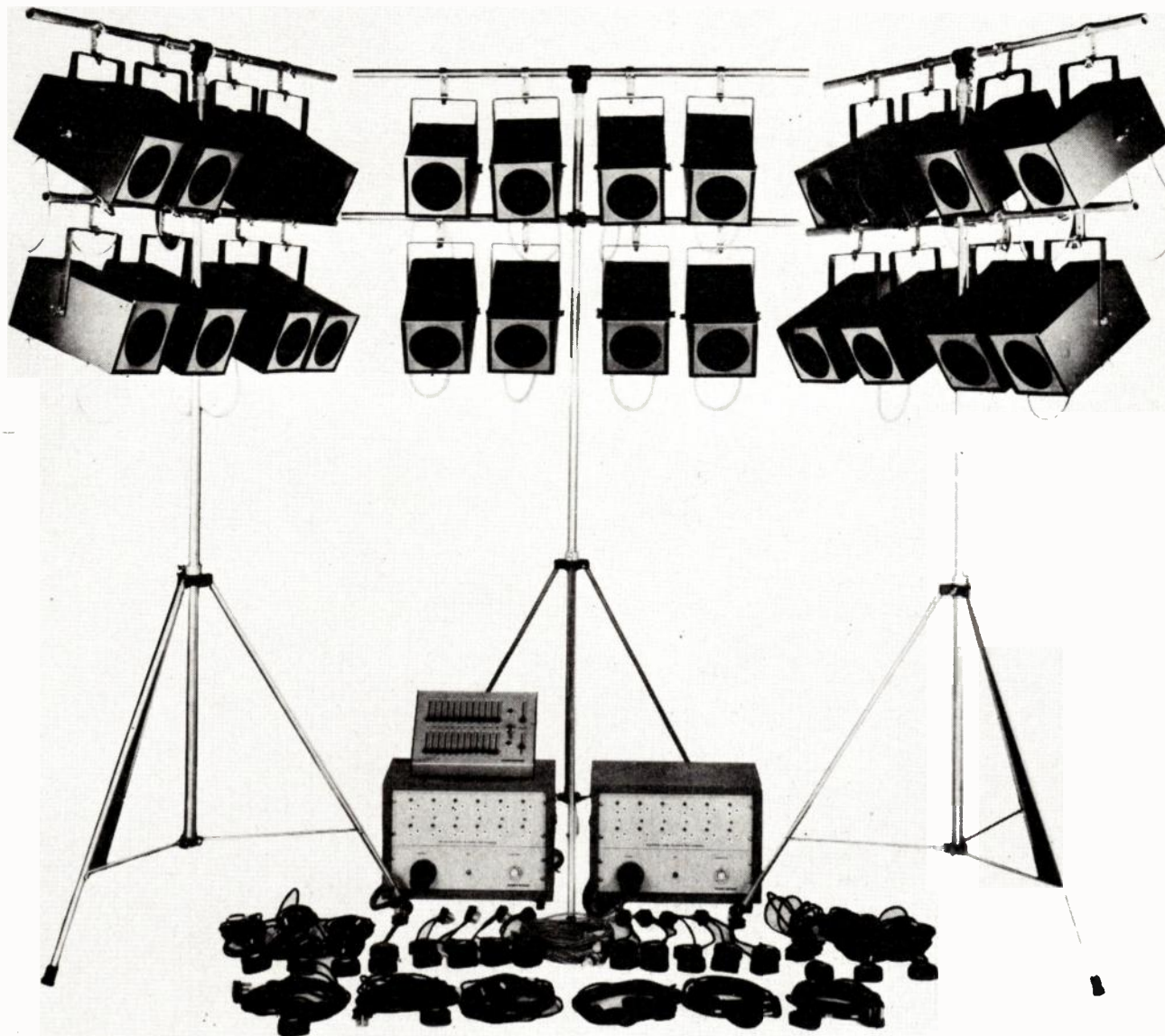
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Dibble's



The 15" units included in this report are the type of loudspeaker likely to be used for a heavier sounding lead guitar system, for keyboard instruments, in some cases for bass instrument — although they are not designed specifically for this application, and for use as the bass section of a PA system. The cream of the market are included among the sample tested and prices range from the upper 60's to almost £200.

From comments received following the summary of the test results at the end of last month's report, it would seem that this was found to be of some value and so I shall try to make this a regular feature of the test result presentation. It must however be appreciated that these comments are my own personal observations of the results of the tests and must be taken as such. I can however assure readers that I have no personal or financial interest in any loudspeaker manufacturing or marketing concern and will therefore be as fair in making such an assessment as my own experiences with loudspeakers will allow.

In this test we have probably gathered the best loudspeakers of their type available, and all the units tested gave a good account of themselves, making any real assessment very difficult indeed. I think that the best overall performance must be split between the American Electrovoice EVM-15/L and JBL K130, and the Italian make RCF L15P/

100A. The selection between these three units must depend upon which criteria is most important to you and on your application. For use as the low frequency section of a large PA rig, the EVM-15/L has the lowest effective resonance, the lowest distortion and by far the smoothest response.

For instrument applications, the RCF has the widest frequency response and is the most sensitive, while the JBL K130 is almost as good in these respects and has a much lower distortion figure. When price is to be taken into account, then the RCF unit emerges the clear leader at some £50 cheaper than the other two American units.

Very close on its heels however comes a trio of British units, all selling at under £100, these being the Celestion Powercel 15, the Fane Crescendo 15/A and the Goodmans Audiomax 15AX with little to choose between them except in terms of price and presentation. Bearing these factors in mind, my own preference would probably be in the order as listed, but the choice is marginal. The Roland C-2038, the first loudspeaker to be submitted from a Japanese manufacturer, and the Gauss 5841 and Altec 418-8H from America are by no means out of the picture, but are comparatively expensive for the results shown.

Next month we really will, all things being equal, do the standard 15" units. We still have 18" units, various types of horn and driver units and a whole list of complete systems to test in future reviews, so there is a lot of interest in store for several months ahead.

I did finish last month's tests by stating that we would be looking at 'standard' or lower price-bracket 15's this month, but due to one or two difficulties, we have had to go straight on to the 'special' fifteens and I apologise if this causes inconvenience to any of our readers.

In fact, we are having to do a couple of re-tests on the standard 15's, and as well as this, three manufacturers are just about to introduce new products or product variations so that by the time we publish, the reports would not be representative of the market anyway.

This month we have again some interesting results to comment on. Most of the 15" units tested are simply big brothers of the special 12" units tested last month and so I was wondering if my findings might prove to be somewhat repetitive. However, this was not at all the case.

From a constructional aspect the two loudspeaker types are frequently identical except of course for a larger diameter frame

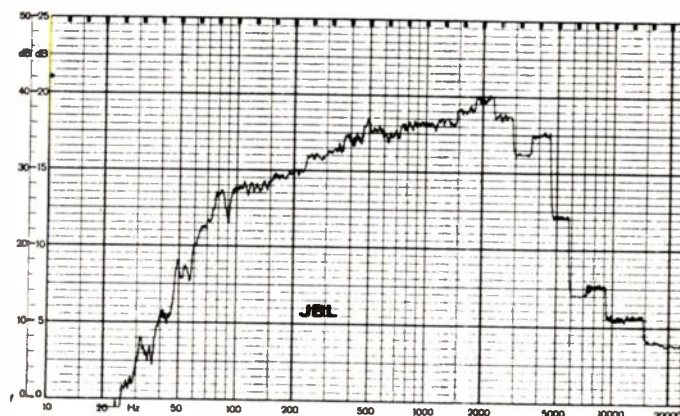
and cone assembly, but in most cases, the performances are quite different. For example, the Celestion Powercel 15, whose 12" counterpart, the Powercel 12 fared particularly badly last month, now comes out as one of the better units tested. Also, the distortion figures on the Gauss 12" commented on last month are very much reduced on the 15" version on the same loudspeaker.

The Electrovoice EVM/15 benefits in a similar way. This pattern of results leads me to wonder whether these loudspeakers were in fact originally designed as 15 inch units and simply scaled down to fit a 12" chassis without a proper re-design exercise. This is obviously only conjecture on my part, but would certainly fit the facts. I also wonder whether there might not be some physical barrier governing the amount of energy a paper piston moving a mass of air can be expected to cope with, for as soon as we get a very efficient loudspeaker driving at much more than 100 or 150 watts, up goes the distortion level. I note that Celestion are in the process of upgrading some of their products to 200 and 250 watts, and it will be interesting to see the sort of distortion levels achieved by these in due course.

I have received comments from one or two manufacturers complaining that the prices being quoted for some of the units tested are higher than those actually charged by certain suppliers. I do not deny that you will be able to purchase certain of these at a considerably lower price than we have indicated, but in the interests of giving a fair representation, we have quoted the listed recommended retail price inclusive of VAT and this puts all products on a common footing for comparison purposes. If you can buy cheaper, then the best of luck. Goodmans have pointed out to us that their Audiomax 12AX is being offered at £57 by some mail order companies. The RRP (inc. VAT) in the March issue of IM was £88.

The details of the tests we carried out were fully described in the December 1977 issue in the introduction to the series. A good deal of this was summarised and repeated with the first actual test results in the February 1978 issue. Further, typical radiation plots and impedance curves were shown in the February issue, and the effects of cabinet loading, typical distortion plots and a further polar plot were fully discussed in the March issue. I therefore do not propose to cover all that ground again in this article but suggest that reference be made to the appropriate issue for any information required.

JBL	K130	RRP incl. VAT £130
Parameter	Manufacturer's Rating	Test Result
Power	125w cont. RMS 250w cont. prog.	125w RMS Sine Wave
Distortion	Not Stated	4% at 125w
Sensitivity	103db @ 1w @ 1m	101db @ 1w @ 1m
Resonance	40Hz free air	80Hz in 90 ltr. 1B encl.
Impedance	8 ohm nominal	8 — 30 ohms
Useful Frequency Response	50Hz — 6KHz unqualified	50Hz — 6KHz @ -20db See Graph



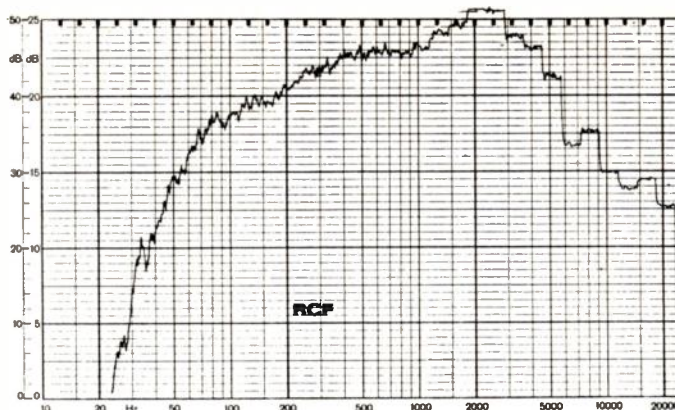
Whilst one would reasonably expect to find that a 15" loudspeaker has a restricted top-end frequency response when compared to a 12" unit of similar design, it is nevertheless surprising to find that this loudspeaker, almost identical to its 12" counterpart, the K120, exhibits a response that is a whole octave down. I cannot immediately offer any explanation of this peculiarity, although it exactly confirms the makers' specification in this respect. This unit would seem to be of identical construction to the K120 except that the strength, as well as the size of the superb chassis has been increased to carry the extra weight of the larger magnet structure used.

In every respect, this product is of the highest quality and is a fine piece of engineering as evidenced by the number of other manufacturers who copy its design features. Like the K120, this loudspeaker also justifies its reputation, but is expensive.



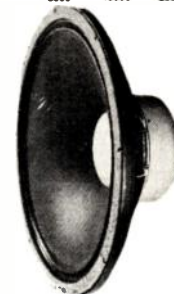
RCF L15P/100A RRP incl. VAT £96

Parameter	Manufacturer's Rating	Test Result
Power	150w RMS	Just confirmed
Distortion	Not stated	6% @ 150w
Sensitivity	Not stated	103db @ 1w @ 1m
Resonance	45Hz free air	80Hz in 90 ltr 1B encl.
Impedance	8 ohm nominal	7.5 – 12 ohms
Useful Frequency Response	45Hz – 10KHz unqualified	45Hz–18KHz @ –20db See Graph



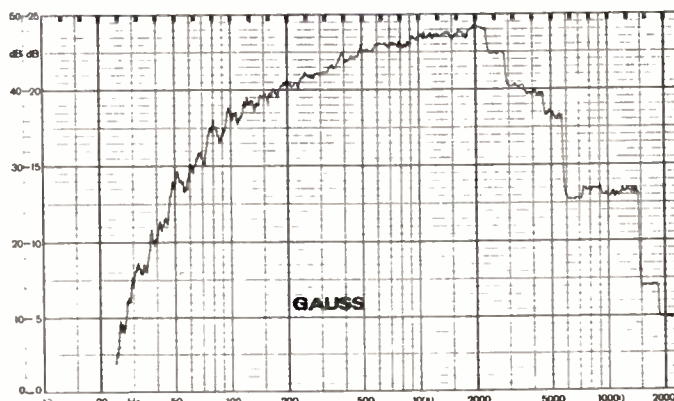
This loudspeaker is to all intents and purposes, an exact replica of the JBL K130. The nicely finished cast alloy chassis is adequately strengthened to carry the weight of the magnet structure and is fitted with a light, shallow cone assembly with dural centre dome and doped linen suspension. In effect, it is a larger version of the L12P/11 reviewed last month. Like so many other units tested, the L15P/100A again only just scrapes through on the makers' power rating figure on account of a high second harmonic distortion of 6%, but in all other respects, it performed impeccably by returning the highest sensitivity figure of any loudspeaker yet tested of 103db.

Note also the amazingly wide frequency response for a unit of this type and the exceptionally linear impedance characteristic. I begin to wonder whether RCF have somehow cracked the problem of designing a constant impedance transducer, as the only other unit to contain its impedance range within reasonable limits was another RCF unit, the L12/31 reviewed in the February issue – although to be fair, the Goodmans Audiomax 15AX included in this report is also a good deal better than most in this respect. This loudspeaker was again delivered bolted to a hardboard panel and adequately boxed to ensure delivery in one piece after shipping from Italy. This is another very nice product from this manufacturer, especially so at this price.



GAUSS 5841 RRP incl. VAT £140

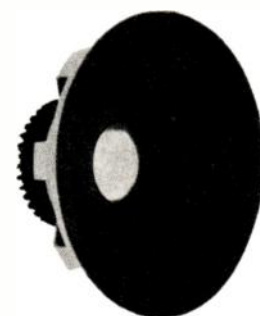
Parameter	Manufacturer's Rating	Test Result
Power	150w RMS	Not confirmed
Distortion	Not Stated	8% @ 150w 6% @ 100w
Sensitivity	57db EIA*	101db @ 1w @ 1m
Resonance	40Hz free air	75Hz in 90 ltr 1B encl
Impedance	8 ohms	7.5 – 30 ohms
Useful Frequency Response	35 Hz – 5KHz @ –10db	50Hz 15KHz @ –20db



Here again, we have a larger version of the 12" type 2841 tested last month and the sample submitted in this instance is equally impressive from a presentation and finish aspect. A very rugged cast alloy chassis supports a very large magnet assembly contained within a cast iron 'pot'. The same twin suspension system is used, along with a similarly light weight cone and dural centre dome. I am pleased to be able to report that the 15" version shows a considerable improvement over the performance of the 2841 and apart from the high levels of distortion still being measured, it gave quite creditable results.

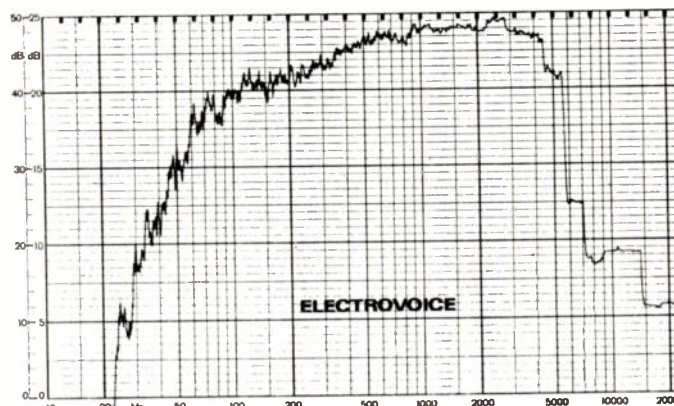
Although the distortion in this case is about half that measured on the 12" unit, it is still too high, and if we are to adhere to our self-imposed guidelines in this respect, the unit still does not comply with our requirements for verification of the makers power rating. In all probability the voice coil assembly and cone structure will withstand higher input levels without damage, but at these levels of distortion, this will serve no useful purpose.

I was particularly surprised at the marked improvement in sensitivity and also by the amazingly wide frequency response – which is not only better than the 12" unit, but also one and a half octaves better than the makers own figures. Even so, at this price, it seems to me to be a lot of money to pay for the overall performance capability shown by our results.



ELECTROVOICE EVM-15/L RRP incl. VAT £116

Parameter	Manufacturer's Rating	Test Result
Power	100w cont. sin.	100w RMS Sine Wave
Distortion	Not Stated	3% @ 100w
Sensitivity	53db EIA*	101db @ 1w @ 1m
Resonance	50Hz + 10%	70Hz in 90 ltr 1B encl.
Impedance	8 ohm nominal	7.5 ohm – 35 ohm
Useful Frequency Response	Not Stated	40Hz – 7KHz @ –20db See Graph

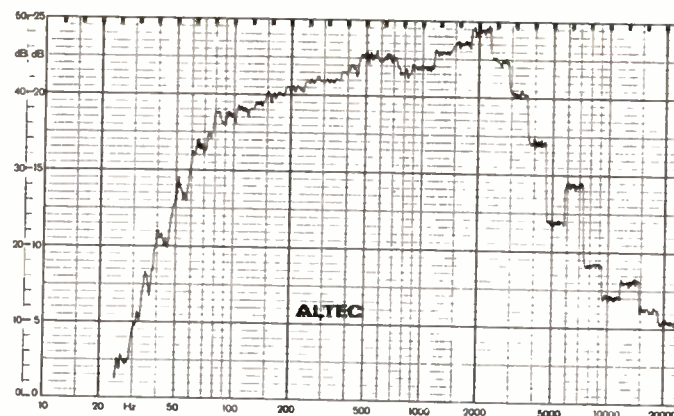


Although almost identical in appearance with the EVM 12 reviewed last month, this loudspeaker has a much improved performance and is much more in keeping with the performance we have come to expect from this stable than the results of its 12" counterpart tested last month. Comparing the two result tables will show that this loudspeaker is 4db more sensitive (which is as good as more than doubling your amplifier power for the same sound output!), its in-cabinet resonance is 10Hz lower and the low frequency response is a good 20Hz lower. Considering this and its unusually smooth frequency response curve, this unit would be ideal as the bass section of a large PA rig or as a bass instrument reproducer. I am still of the opinion that far too high a percentage of the cost of these loudspeakers is due to the elaborate finish, but this is certainly a very fine loudspeaker indeed.



ALTEC 418-8H RRP excl. VAT £130

Parameter	Manufacturer's Rating	Test Result
Power	'May be used with amplifiers having up to 150w cont. RMS power rating'	150w rating just confirmed
Distortion	Not stated	6% at 150w RMS sine wave
Sensitivity	100db @ 1w @ 3ft	98db @ 1w @ 1m
Resonance	Not stated	85Hz in 90 ltr 1B encl.
Impedance	8 ohms	6.5 - 28 ohms
Useful Frequency Response	45Hz - 8KHz unqualified	50Hz - 7KHz @ -20db See Graph



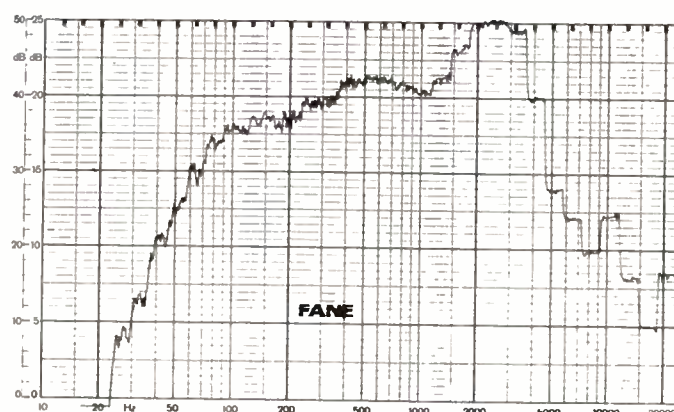
Another American loudspeaker of impeccable presentation and finish, very nicely made and built on a substantial cast alloy frame. Again, it is almost identical to its baby brother, the 417/8H reviewed last month and so we will not repeat the construction details here. It will be seen that with a second harmonic distortion figure of 6%, this unit only just scrapes through on its power rating of 150w.

The sensitivity figure is the lowest of the 15" units tested and is certainly below that which would be expected from a loudspeaker of this type and at this price - especially as the manufacturers brochure claims '... Altec musical instrument loudspeakers represent the ultimate in increased efficiency, tonal response and reliability'. This is a statement that our results certainly do not confirm. Although far from bad, the performance of this loudspeaker is certainly disappointing in view of the excellent standard of finish and its price.



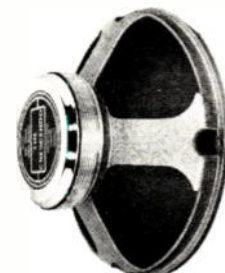
FANE Crescendo 15/A RRP incl. VAT £73.60

Parameter	Manufacturer's Rating	Test Result
Power	100w RMS cont.	100w RMS sine wave
Distortion	Not Stated	4% @ 100w
Sensitivity	'Considerably higher than even our very efficient 17000 line models'	101db @ 1w @ 1m
Resonance	50Hz free air	90Hz in 90 ltr. 1B encl.
Impedance	8 ohm	9.5 - 30 ohm
Useful Frequency Response	35Hz - 11KHz unqualified	50Hz - 6KHz @ -20db See Graph



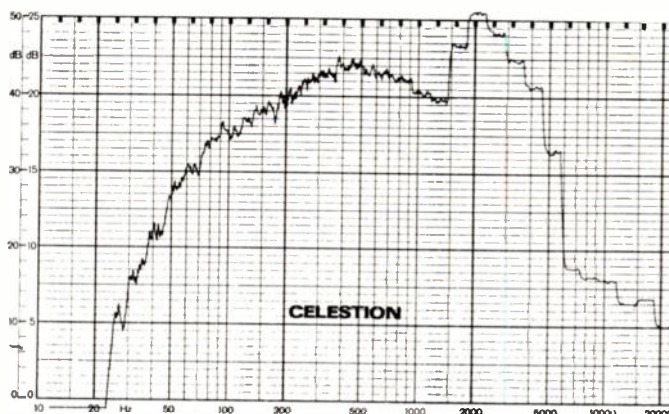
The Crescendo 15/A is built on a pressed steel chassis that is not unlike the chassis used for the Celestion 'G12' range. It is well braced and of adequate strength to carry the very heavy magnet structure fitted. Suitable for front or conventional mounting although gasket only fitted to the front rim for conventional mode. A stiff ribbed cone is fitted with integral, heavily-doped suspension and small vented aluminium centre dome. Termination is by a pair of small solder tags on paxoline panel.

The unit certainly performed well, by confirming the makers' power rating at 4% distortion, returned a sensitivity figure well up among the best measured and an adequate frequency response curve despite the makers' somewhat exaggerated claims in this respect. I often wonder just who the manufacturers are trying to impress when claims are stretched in this fashion, or when extravagant statements are made like the one made here relating to the sensitivity. This is obviously a good loudspeaker but a truthful, technically accurate specification in standard form would carry more weight than the 'airy-fairy' specification given by the maker. However unimpressive the loudspeaker may look, it certainly performed very well indeed and at this price, must be a very good buy.



CELESTION Powercell 15 RRP incl. VAT £69

Parameter	Manufacturer's Rating	Test Result
Power	125w RMS	125w RMS Sine Wave
Distortion	Not Stated	4% @ 125w
Sensitivity	Not Stated	100db @ 1w @ 1m
Resonance	Not Stated	70Hz in 90 ltr 1B encl.
Impedance	8 ohm	8.5 - 33 ohms
Useful Frequency Response	35Hz - 8KHz unqualified	50Hz - 6KHz @ -20db See Graph

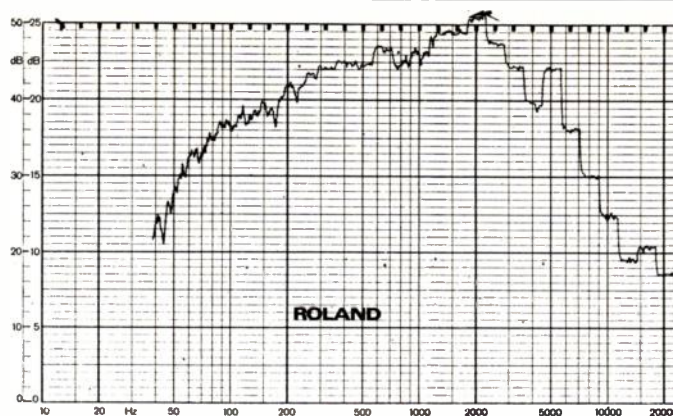


Although constructionally identical in every respect to its 12" counterpart tested last month, from a performance aspect the Powercell 15 is altogether a different loudspeaker. In producing a larger version of the chassis to accommodate a 15" cone assembly (or was it the other way round?), the thickness and overall proportions of the frame have been similarly increased resulting in an adequately braced structure to carry the large magnet assembly fitted to this loudspeaker. The cone has an unusually compliant suspension for a unit of this type, is fitted with a dural centre dome and has a nice 'feel' to it.

I am particularly pleased to report that unlike the 12" unit, this loudspeaker behaved very well under test. It really met the makers' 125W power rating at a second harmonic content level of about 4%, its sensitivity, whilst not the best measured, was certainly of the higher order and the frequency response was quite acceptable for a 15" unit, even though it does not meet the makers' claims in this respect. I am of the opinion that this is another manufacturer who could usefully tighten up on specifications. The Powercell 15 is without doubt a good product from a well-established manufacturer, and it is nicely finished. It also performed well and must be a good buy at this price.



ROLAND		C2038	RRP incl. VAT £177
Parameter	Manufacturer's Rating		Test Result
Power	200w RMS		Not confirmed
Distortion	Not Stated		10% @ 150w
Sensitivity	1.4db/w @ 1m		100db @ 1w @ 1m
Resonance	Not Stated		75Hz in 90 ltr 1B encl.
Impedance	8 ohm		7.5 – 28 ohms
Useful Frequency Response	50Hz – 10KHz Graph given		50Hz – 9KHz @ –20db See Graph



This is the only loudspeaker unit so far submitted for test from a Japanese manufacturer and it certainly is a beautifully finished speaker. A superb 16-spoked, fabricated alloy chassis carries a very large magnet assembly enclosed with an elaborately finned cast iron cover, the dissipating fins of which are continued across the back plate of the magnet and up inside the rear vent passage. Whether this arrangement actually contributes in any real terms to the cooling of the voice coil is hard to say.

Like the Gauss units, the voice coil terminations are not visible from without and the spring release terminals are found recessed among the finning on the back plate of the magnet of all places and I was unable to see – without dismantling the unit, how such an arrangement had been achieved. A shallow, textured, medium weight cone fitted with a dural centre dome is carried by a fairly stiff varnish impregnated linen front suspension.

An exceptionally thick, solid neoprene front gasket is fitted for mounting to the rear of the baffle board, while a rubber 'O' ring is supplied for mounting from the front of the cabinet. One problem however is that the chassis is of a non-standard size being considerably larger than most of its competitors and, for this reason, it cannot be readily fitted to a standard enclosure. In fact, we had to cut away the aperture of our test enclosure before we could mount the unit at all and as it was by then 6.30 in the evening and we were almost the last people left in the lab, this was not at all appreciated.

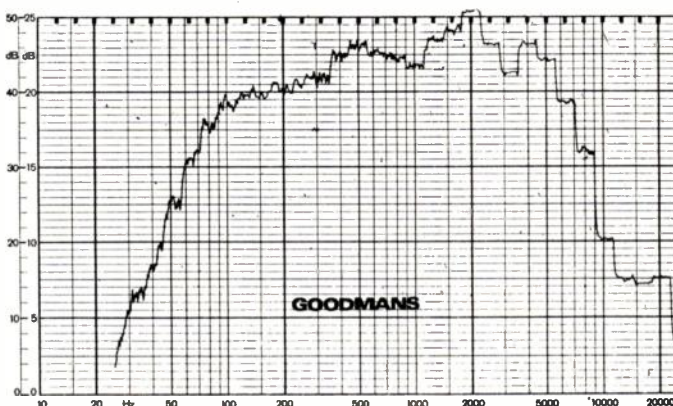
The unit generally performed well by confirming almost exactly the makers' frequency response figures and showed an acceptable, though not particularly high, sensitivity. The in-cabinet resonance will be seen to be of a sensible order and the impedance range within some sort of reason. Then we come to the usual problem of power rating, and here we find that second harmonic distortion is in the order of 10% at any level between 100 and 150 watts and this is well outside our acceptance level. In fact, we were not supplied with a specification for this unit prior to testing and therefore were testing blind.

Therefore, when the distortion reached 10% at 150 watts, we did not carry out a further test for fear of damaging the unit – there being no marking on the unit itself to indicate that it was in fact rated at 200w. In all probability, the distortion figure would not have increased much further at 200w, but this is only surmise based on the behaviour of other similar loudspeakers under similar conditions. In any event, the unit did not meet our requirements in this respect.

This was for me an interesting test, having not previously encountered a loudspeaker of this type. It is superbly made and presented and looks most impressive. Its performance is fair for a unit of its type but by no means exceptional. Its second harmonic distortion is far too high and it is very expensive indeed.



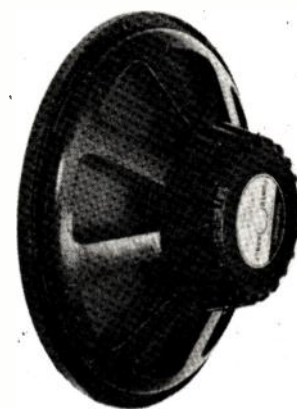
GOODMANS		Audiomax 15AX	RRP incl. VAT £59
Parameter	Manufacturer's Rating		Test Result
Power	100w to DIN 45.573		100w RMS Sine Wave
Distortion	Not Stated		4% @ 100w
Sensitivity	96db @ .25w		100db @ 1w @ 1m
Resonance	60Hz free air		100Hz in 90 ltr 1B encl
Impedance	8 ohm nominal		5.5 – 17.5 ohm
Useful Frequency Response	Graph Given		50Hz–9KHz @ –20db See Graph



This loudspeaker is in every respect similar to its 'baby brother', the 12AX reviewed last month. It has a very stiff cone system utilising a heavily doped front suspension and fitted with dural centre dome. The cast alloy chassis, although adequate, could usefully be strengthened to avoid the possibility of fracture due to the very heavy magnet structure it is required to carry. As the results table above shows, the loudspeaker gave a very creditable performance indeed and distortion did not exceed 5% at 150w.

I would however comment on one or two peculiarities, in that the sensitivity figures for the 12AX and 15AX are virtually identical from our tests, while the makers figures show the 12AX to be 3db more sensitive at 96db for just .12w as compared with .25w for the 15AX. Also, both units exhibit the same in-cabinet resonance, while one would expect the 15" unit to be noticeably lower. In fact, the only differences between the two units would seem to be 10Hz in downward response and a much better impedance characteristic which would result in a more linear performance.

Another very nice loudspeaker from – in my own opinion, a British manufacturer who does not seem to enjoy the market respect that the product deserves. Maybe this has something to do with their being part of the British Radio Corporation – I seem to remember a similar situation happening to Wharfedale when they were taken over by Rank back in the early sixties. Markets often seem to react in an illogical fashion to such irrelevant factors.



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Isis Win FIRST TEAC/ TASCAM SESSION

Isis were the first band to be recorded as a result of International Musician's recent recording competition. Based in Blackpool. They consist of Sandy Leigh (lead vocals), Chris Whalley (guitar), Nigel Foster (keyboards), Brian Howarth (bass) and Jon Blacow (drums). They have been playing mainly colleges and clubs in the Lancashire area and write and perform their own material.

The session took place at Ivan Berg Associates new studio in Hampstead, London. The 450 square feet studio is fully air-conditioned. The air-conditioned control room is a totally isolated structure floating on a system of rubber jacks. Tascam/Teac equipment is used throughout the control room. Two Tascam Model 5 mixers are linked to provide a 16/8 facility and the purpose-built console also houses a Rebis parametric equaliser, a 120-way Future film patchfield, an Allen & Heath stereo ADT unit and three Teac A650 stereo cassette decks. The Tascam 80/8 eight-track machine has DBX Interface and uses the new 1/2" eight-track format. Teac 7300 and Teac 3340 machines complete the recording equipment line-up. Two KEF 104 speakers driven by Quad 50E's are used for studio playback while another pair of 50E's drive two Lockwood Academy II monitors in the control room.

The band were produced on this occasion by David J. Clamage of The Buckwheat Companies Inc., Denver, Colorado. David is over here producing and signing new artists and, in the past, has worked with many top artists in the States for his company which is involved with production, management, publishing and designing sound systems.

After getting a balance on the instruments, Isis proceeded to lay down the backing tracks for two originals, "To Find You" and "Wasn't It The Day?".

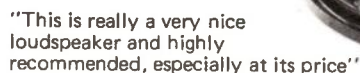
The next step was to add overdubs to the backing track. Chris tracked on a couple of impressive solos while Nigel added some weaving synth lines.

Very few mistakes were made and it was soon time for Sandy, who only joined the band last year, to go in and put on the lead vocals. She got both vocal tracks right on the first takes and finished off the tracks by singing harmony parts.

The band admitted they found the role of a producer a critical one and gladly accepted David Clamage's direction and criticisms.



A high-contrast, black and white photograph of a large, dense crowd of people, likely at a concert or festival. The image is characterized by extreme contrast, with deep blacks and bright whites, giving it a graphic, almost stencil-like quality. In the foreground, several individuals are clearly visible, including a man with a beard and a striped shirt. The crowd extends far into the background, filling the entire frame. Many people have their arms raised, and the overall atmosphere is one of excitement and celebration.



"The whole finish and presentation of this unit is very good indeed and totally functional, with no pretentious magnet cover or so-called cooling fins"

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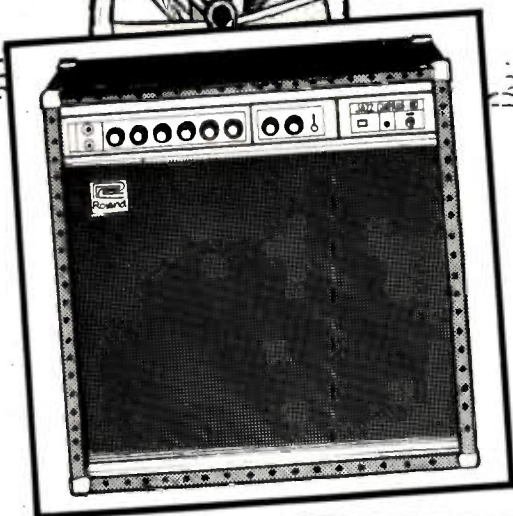
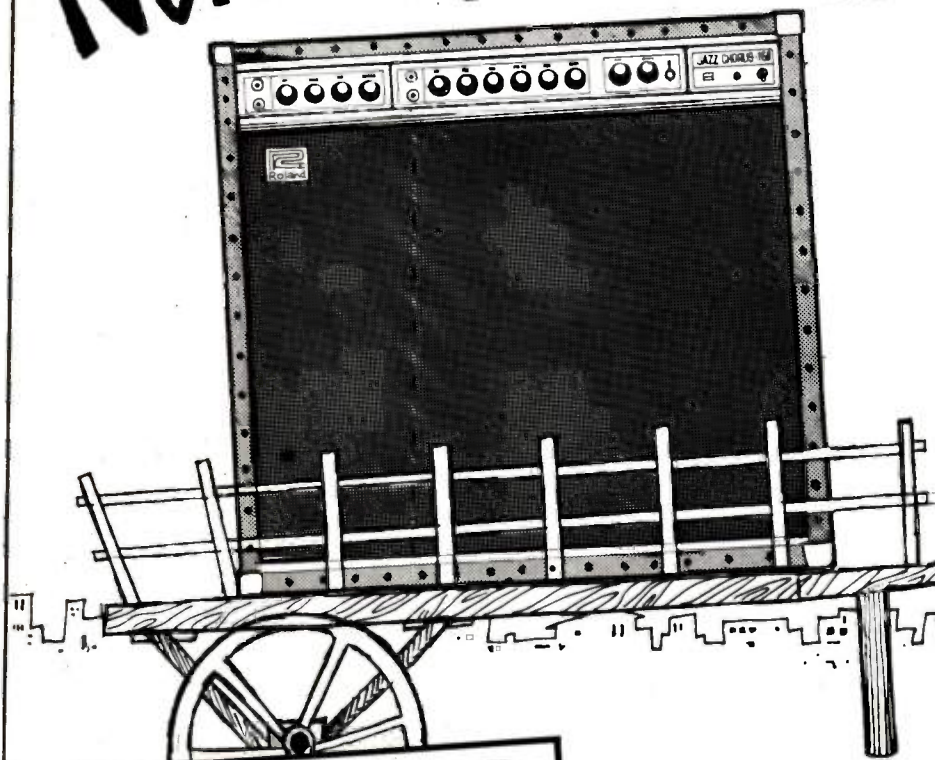
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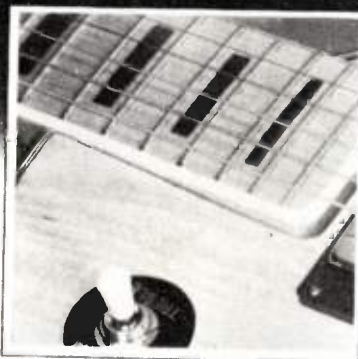
Take a long, close look at a Hondo II guitar and you'll be amazed at the quality of the finish, the fidelity of sound and the superb feel of the instrument. Now take a look at the price — you'll be in for a pleasant surprise. The famous style guitar illustrated model HLP2N costs around £75.00 (incl. VAT)

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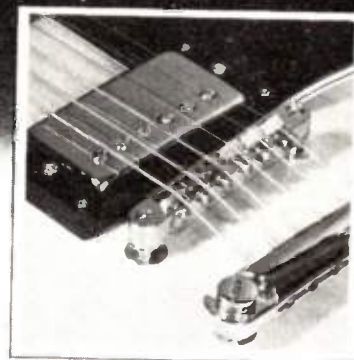
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Arp/London Synthesiser evening pulls in the crowds

The world of ARP synthesisers was brought to a packed audience at London's Ambassador Hotel recently, courtesy of the London Synthesiser Centre. This demonstration of the ARP range was the second to be organised by Chase Musicians, and proved every bit as successful as the first.

Synthesisers can be forbidding instruments even to the seasoned musician, which is why the London Synthesiser Centre, one of the country's leading synthesiser dealers, take the trouble to organise special demonstration evenings to unravel some of the mysteries which surround the instrument.

ARP's top demonstrators, John Shuykun and Bill Singer, were present to put the products through their paces, and reveal some of their incredible possibilities. John is ARP's top American keyboard player, while Bill is the expert on ARP's guitar synthesiser, the Avatar.

Chase Musicians found once again that Omni and Odyssey synthesisers, together with the Axxe, ARP 2600 and the Pro Soloist, proved to be the most popular keyboard synthesisers with the audience.

John Shuykun astounded all onlookers with the space-age sounds he extracted from the Omni. This really is an amazing machine for the price – virtually unbeatable in this range of synthesisers. It is the first polyphonic keyboard from ARP, and gives unlimited orchestral and symphonic sounds as was aptly demonstrated by John.

He displayed the instrument's ability to produce a number of different sounds simultaneously e.g. playing violins and horns together with a separate string bass on the left end of the split keyboard.

Arguably the most popular of all the ARP synths, according



ARP demonstrators Bill Singer (guitar) and John Shuykun go through their paces

to the London Synthesiser Centre and witnessed at the demonstration evening, is the Odyssey. The Odyssey offers the musician unequalled flexibility and reliability.

In the hands of John Shuykun, it is easy to see why such musical giants as Stevie Wonder and Weather Report use the ARP 2600. This incredible piece of technology is the ultimate in professional portable synthesisers.

At the other end of the scale is the Axxe which is low-priced, portable but features the same components used in the Odyssey 2600. The demonstration showed the range of easily programmed sounds which the instrument possesses, while retaining a simple layout and colour-coded sliders which allow instant sound selection.

Bill Singer's virtuoso performance on the Avatar guitar synthesiser showed why top guitarists such as Jimmy Page and Jim Sullivan have been so keen to get their hands on one.

The Avatar quite simply supplies the guitarist with more

different sounds than the whole range of effects pedals put together and is destined to open up a whole new musical spectrum for the modern guitar player.

The complete range of ARP products can be seen at the London Synthesiser Centre in Chalton Street, London W1, where expert staff will advise and assist on any aspect of the synthesiser world.

Visitors to the demonstration evening did not leave empty handed each being given a London Synthesiser Centre T-shirt, plus a variety of stickers, a copy of International Musician and even free refreshments!

Mr. Amrik Singh-Luther, Director of Chase Musicians, was in no doubt about the success of the demonstration evening both from the Centre's point of view, and that of educating the public in the use of synthesisers. Mr. Richard Desmond, Advertising Director of IM, was also present at the evening and praised the work of Chase Musicians in popularising the growth and use of synthesisers.

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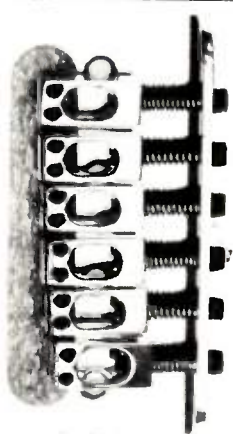
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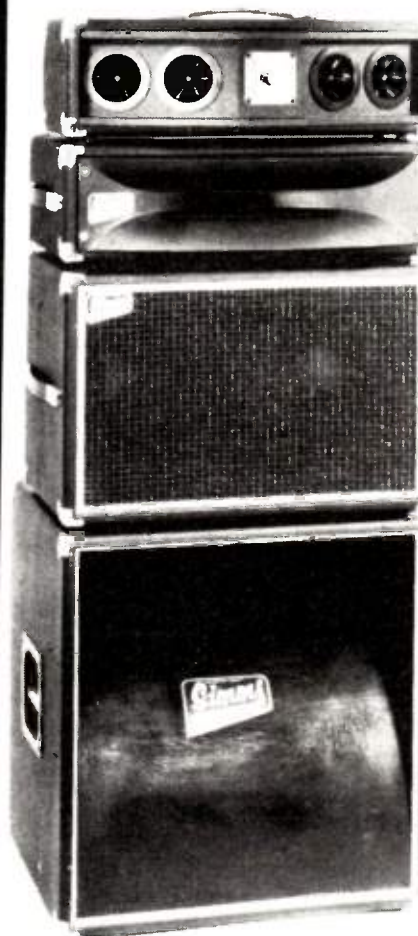
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+4dBm fixed output with XLR connectors. And it comes with the latest plug-in card electronics. The compactness and performance make it ideal for live recording.

In short, the MX5050-8SD is an exception of eight-track professional recorders with performance, reliability and economy internationally proven in hundreds of applications producing high quality 15 and 7-1/2 ips masters. For the full story of this unique model, get in contact with your nearest Otari distributor.

**Please send me details on
MX5050-8SD**

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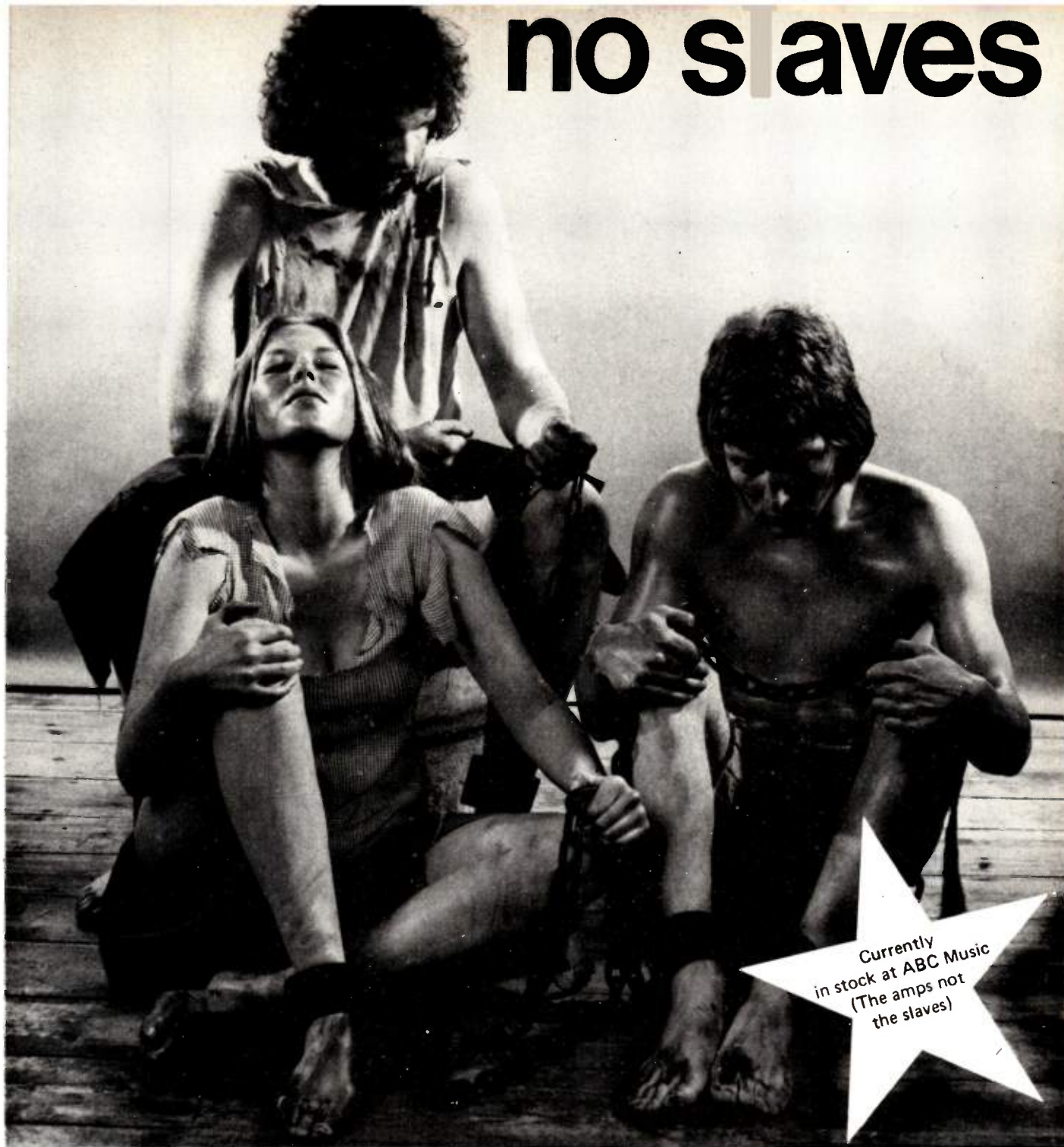


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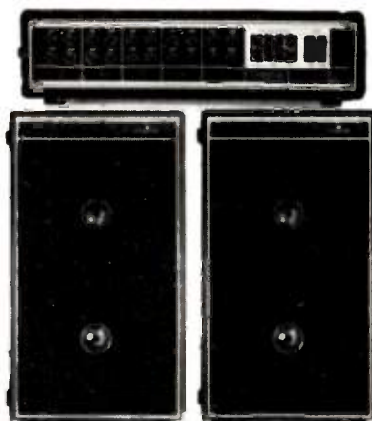
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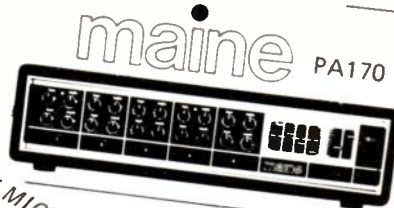
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ABC MUSIC

Deep in the heart of the Surrey stockbroker belt is an oasis for musicians called ABC Music. Contrary to popular belief, it's not all pin stripes and bowler hats as Mark Joseph has found out.

Nine years ago, Mark took over a struggling music shop in the High Street at Addlestone and proceeded to transform it into the most important music centre in the area.

The story of Mark's involvement in the music trade is a tale which bears retelling. Nine years ago he was Publicity Director with a local firm and had two sons, Kim and Mervyn.

He explained: "We realised that our eldest son, Mervyn, was not the academic type at school and were naturally concerned about his future. We decided to do something about it, and so began thinking about what we could do".

"Both the boys had always been interested in music, and so one evening the idea of a music shop came up. It was no more than just a vague idea at the time, but the very next day there was an ad in the local paper about a music shop for sale".

"The shop was in Addlestone, near to where we lived, so we went down to look at it. It was run by two partners, and had only been going about four months before one of the partners wanted out and they were selling up".

"I was warned by everyone not to have anything to do with the place, but I decided to take the risk and have a go at running the business".

Mark had no experience whatsoever of running a music shop and did not

exactly inherit a thriving business. There was only £700 worth of stock in the place, and an early attempt to use a shop manager did not prove suitable so Mark's wife assumed much of the responsibility for the day-to-day running of the business.

Mark added: "Everything was done very much by trial and error in those early days. I knew nothing about the music business, but after we had been at it a year, I realised how interesting it was".

"In that first year we found out just what the public wanted in this area, which I believe is very important. After 12 months, business really started to take off and the shop began to get its own identity".

Mark depended on his two sons to keep the shop up to date with constantly changing musical trends. Both played in local groups, which proved invaluable for contacts among local musicians.

The shop initially dealt almost solely in secondhand equipment, but Mark gradually introduced a wide range of new gear. The High Street premises now holds over £50,000 worth of stock, although secondhand items still form an important part of the store's range.

As business began to take off, Mark realised that he would have to give up his job as a Publicity Director and enter the music business full time — a decision he has never regretted.

The Addlestone venture proved such a success that he went on to open up two more shops, both in Esher, but each catering for different markets and with different identities.

However, all the shops share the same outlook on the music business which Mark Joseph insists on, and that is giving the customer the best possible service. Mark believes in employing staff who know the business, can demonstrate the instruments they are selling and can

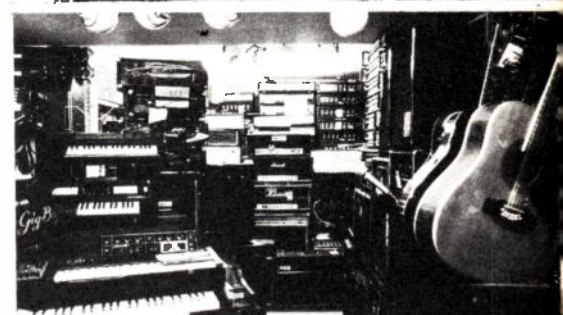
iron out any difficulties that crop up.

The Addlestone store is a real treasure trove of musical equipment, stocked with keyboards, guitars, amplification. Being surrounded by gear adds a great atmosphere to the shop, but it does present difficulties at busy times.

This has led to Mark having a new extension built on to the shop which immediately doubles the size of the premises. The rooms above the store are also being brought into use to give more demonstration space and allow for sets of drums to be stocked.

ABC Music is a complete shop in every way, stocking all the biggest and best names in the business. For example, on the amplification side, you can choose from HH, Marshall, Music Man, Carlsbro, Peavey, Maine and many more.

Still, they cater for the student musician with a vast range of sheet music,



Top: Inside one of Esher stores of ABC Music
Above: A typical corner of the store

and a free display for musicians looking for gigs or forming bands.

Customers cover the whole music spectrum from local semi-pro musicians, through new wave bands like The Jam and Generation X, to such household names as Gilbert O'Sullivan and songwriter Roger Greenaway from nearby Weybridge.

However, the reputation of the shop has spread far and wide with customers regularly travelling from Wales, Plymouth and Portsmouth, and they even had one musician coming all the way from Huddersfield.

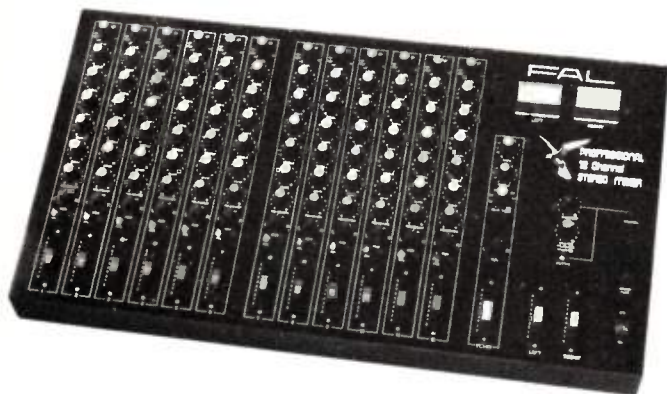
Apart from Mark and his sons, the staff at ABC comprises Chris Hodgkinson (Manager), Chris West (Assistant Manager) and newcomer Gary Stephenson.

The ABC Music shop staff (left to right) Gary Stephenson, Chris West, Kim Joseph and Mark Joseph



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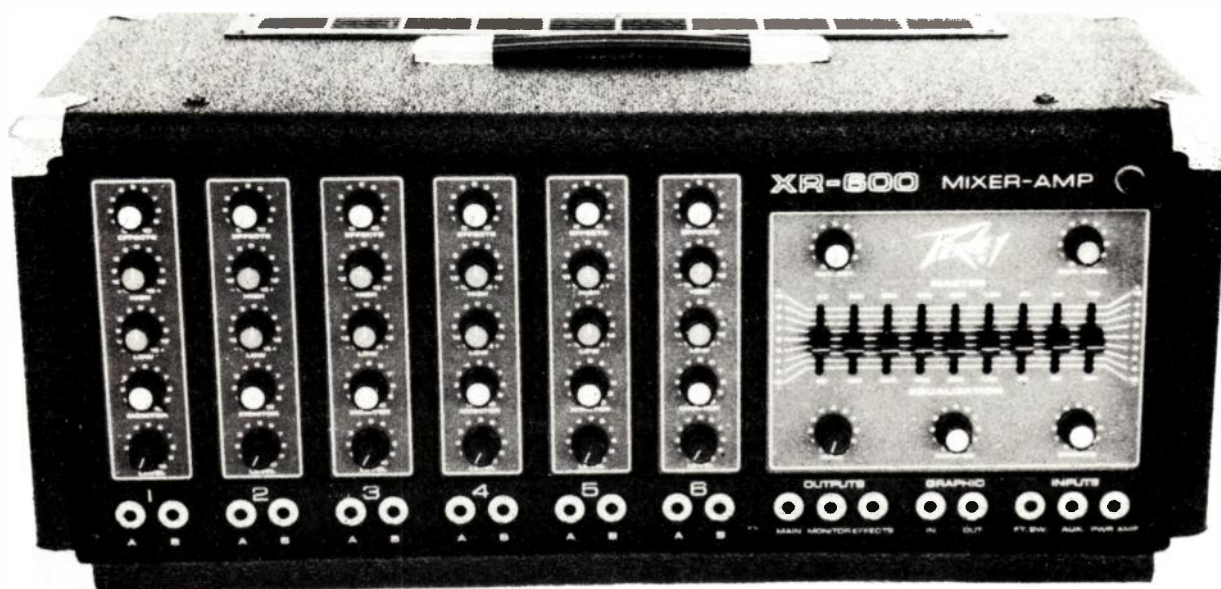
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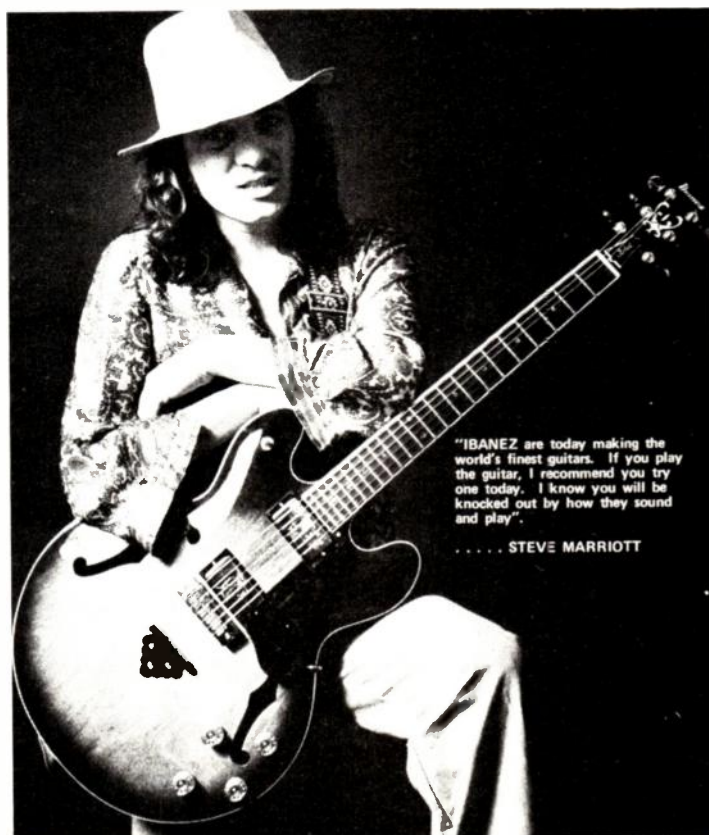
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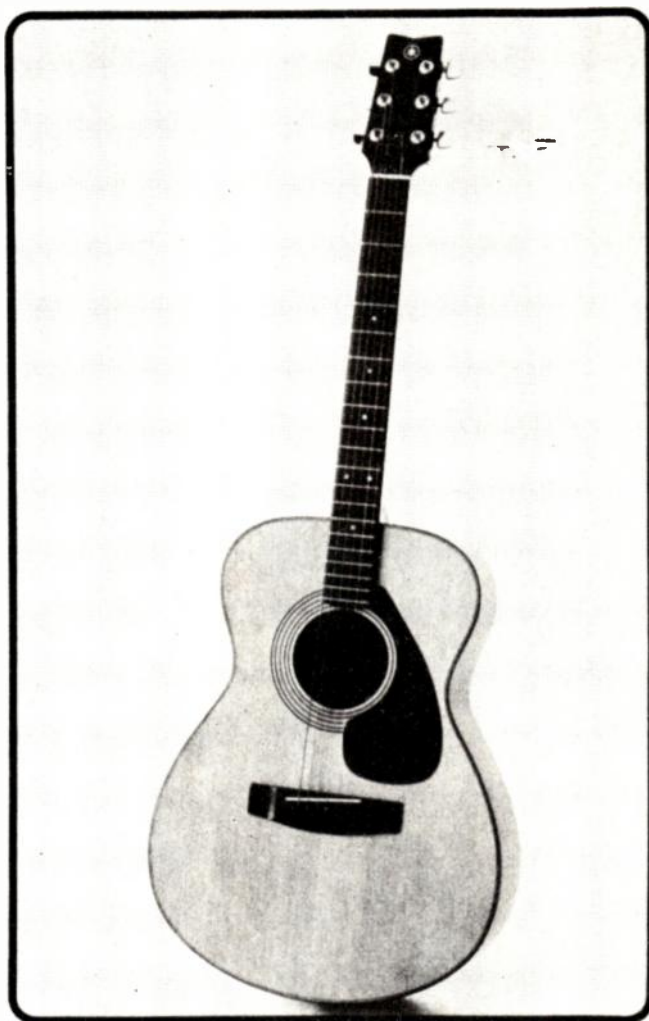
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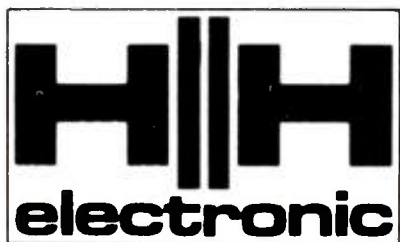
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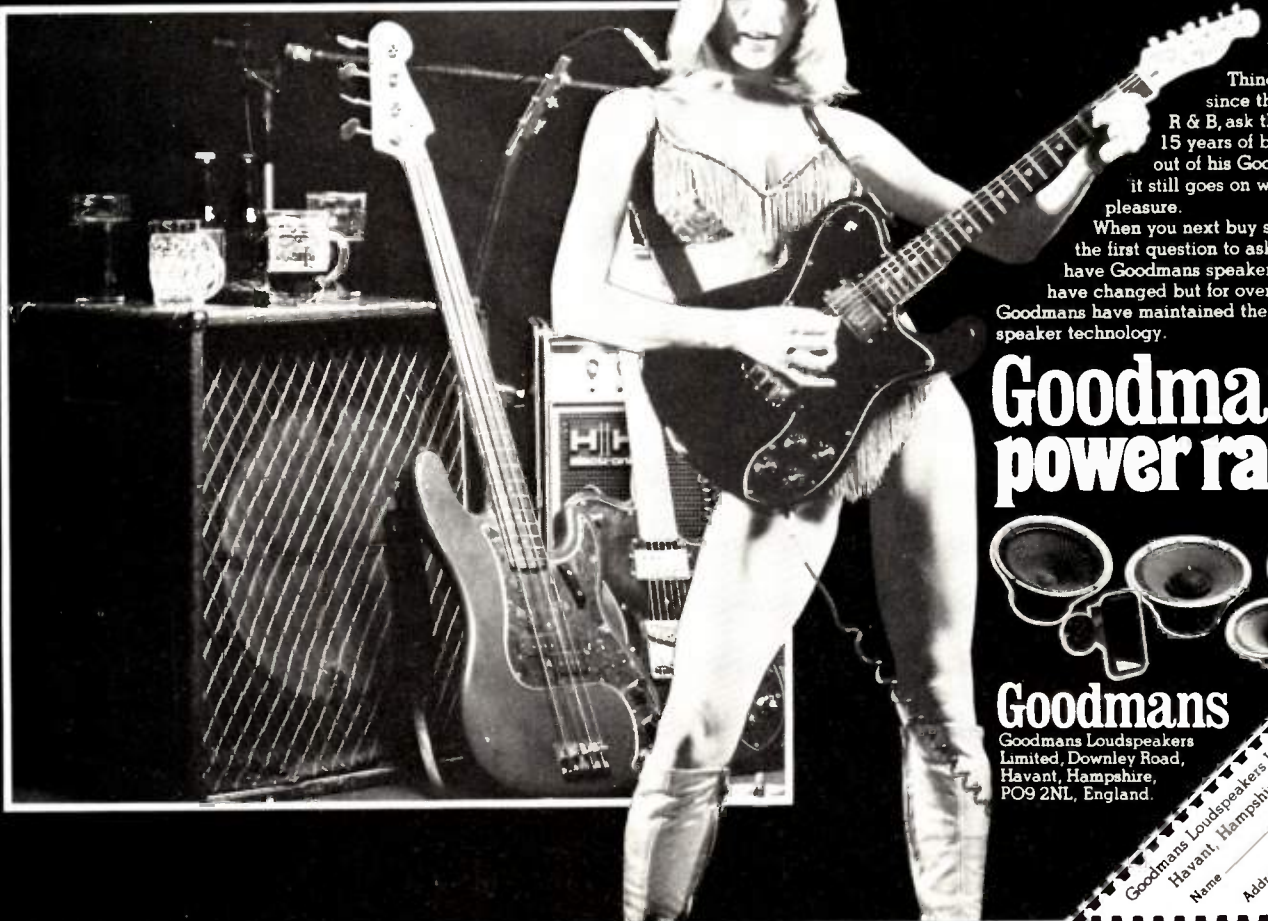
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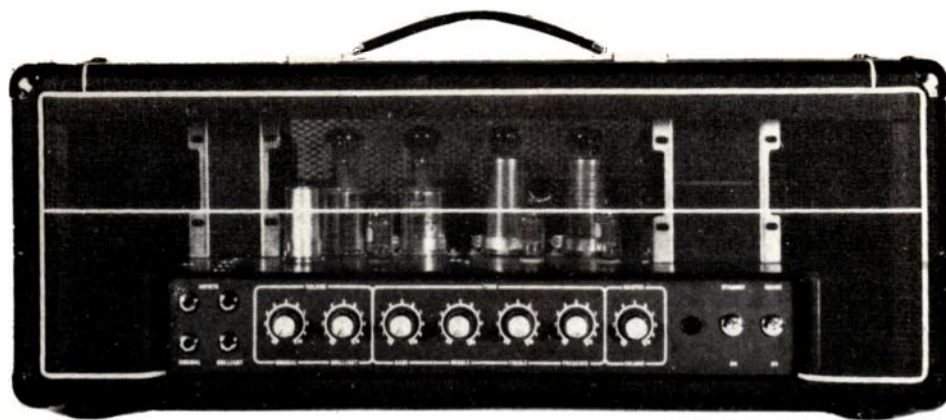
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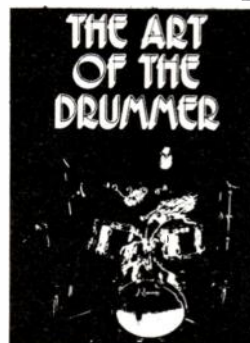


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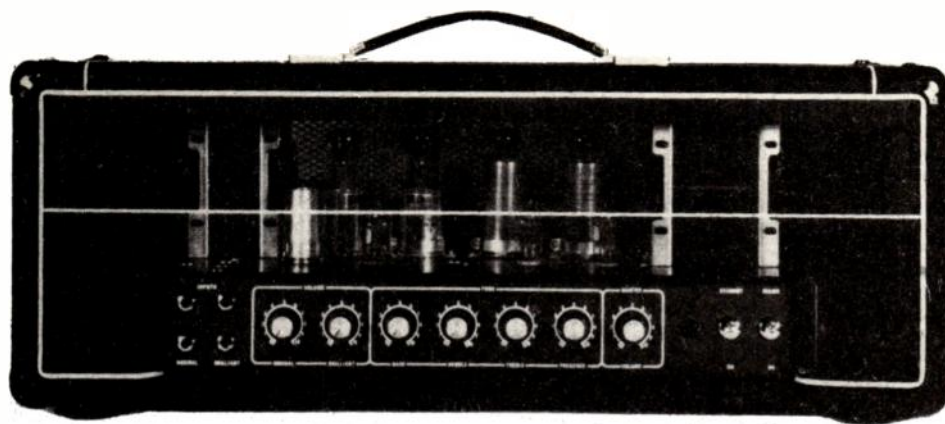
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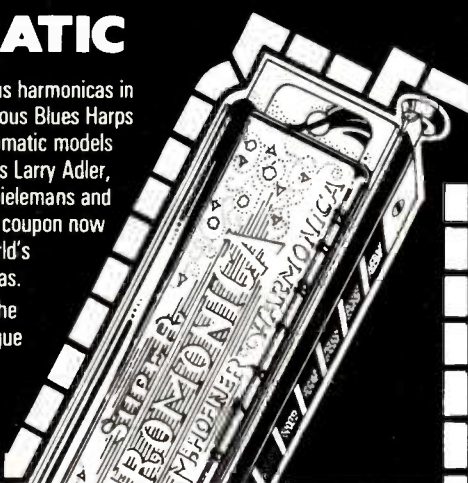
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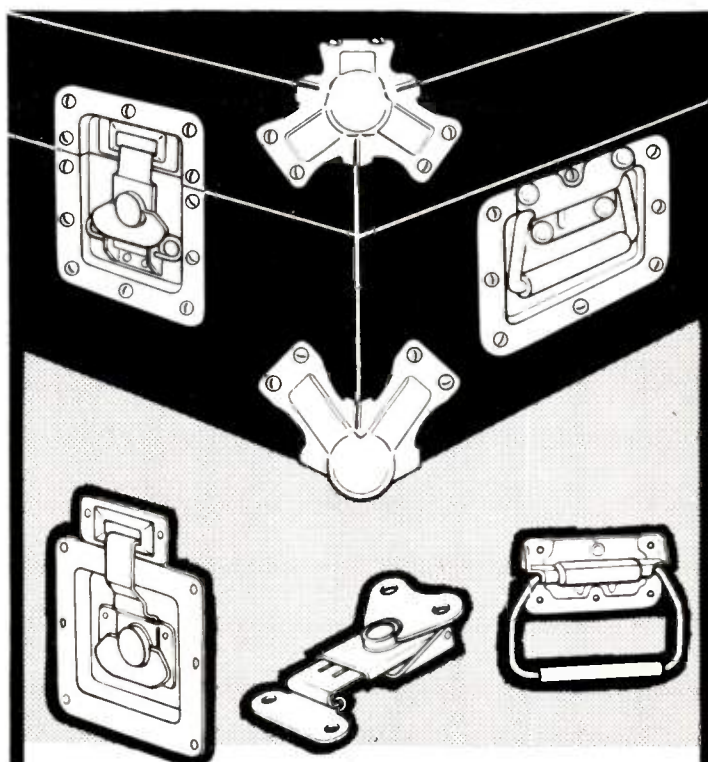
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JIMMY PAGE RECORDS WITH A ROLAND GUITAR SYNTHESIZER

Jimmy Page had been up all night, "I've just been recording with my Roland Guitar Synthesizer", he told us. "It's really great. I'm only just beginning to find out some of the things I can get from it".

Jimmy picked up his G500 and G500S when he was in the States just before Christmas and he is really knocked out by it. He is one of the few Superstars who work religiously at finding out about new products and new instruments and the Guitar Synthesizer is especially important in Led Zeppelin's developing career.

Zeppelin have always been one of the most innovative bands around. All of their albums exhibit superb technical competence and Jimmy Page's desire to come to grips with this new form of music is typical of the band's attitude. The Roland guitar synthesizer is indeed a new instrument. All guitarists can instantly play it but what they are in fact playing is a standard high quality guitar which controls a full synthesizer section.

Every guitarist — whether he is a member of Supergroup like Led Zeppelin or an amateur working in local pubs — needs a Roland Guitar Synthesizer. It offers the guitarist a chance to be a bass player, a string section, a poly ensemble (which is like a normal synthesizer) and a guitarist all at the same time. The G500S has 3 separate outputs and this means that three of these instrumental sounds can be routed

to different amps at the same time. Thus the guitarist on stage has the ability to make his instrument appear to be delivered out of three separate speakers.

Jimmy Page is only the latest of a long line of Superstars to be working with the Roland Guitar Synthesizer. The instrument was first introduced in the middle of last year and its inventor Ikataru Kakehashi — the boss of the Roland Corporation — claims that this instrument will revolutionise music.

"I believe that at last a musician has a really good way of using and expressing himself through a synthesizer", said Mr. Kakehashi. "It is an exceptionally expressive way of using a synthesizer because even when a guitarist is bending all of his notes, the synthesizer produces these bands exactly".

Today the Roland Guitar Synthesizer is widely available. Techniques of high technology mass production allow Roland to produce the guitar synthesizer in the quantities that the world's musicians' demand. The sound of small combo groups has been changed for ever! Every guitarist now has the chance to augment his group with strings, brass and synthesizer. This means that the sound of hit records is changing and the sounds of groups on stage is changing.

Jimmy Page is one of the first to be using the Roland Guitar Synthesizer on tape. The rest of the world is following.

Other users of the Roland Guitar Synthesizer include: Jeff Baxter (Doobie Bros.), James Vincent, Don Keltner (Eagles), Stevie Wonder, Steve Miller, Mike Rutherford, Pete Townshend, Jackson Browne, Steve Hackett, The Bay City Rollers, John Miles, Hot Chocolate.



READY FOR A



THE ROLAND VK9
"At last an organ
built for rock and roll"

REAL ORGAN?

Organs were very important to "beat" music during the middle sixties. All over Britain bands such as Georgie Fame, Herbie Goine and the Nightimers, Zoot Money and the Big Roll Band and many others were blasting out their version of rock/soul night after night. At the heart of this sound was a very well-known organ. We don't need to mention the name but it was so popular that groups of this kind would frequently have the organ sawn in half to facilitate transportation.

The organ market has evolved considerably since that time. The big money for the mass producers is in the home organ market and regrettably production for organs suitable for high power rock/soul/jazz work were phased out of production at the turn of the decade.

Roland have now introduced an organ to replace all of the organ sounds that rock music is based on. This organ does not use unreliable valves and old-fashioned circuitry. It is a brand new technological package designed for the road and designed to stand up to the road life. The organ is a Drawbar organ and this means that millions of sounds are instantly available.

It is possible to pre-set four sections of drawbars. And LED indicates which set has been selected.

Other important features of this organ include independent bass envelope sections and radiating pedal boards. When coupled with Rolands phenomenal Revo speaker system this organ offers a wealth of acoustically perfect expressions never before possible with conventional portables.

This is a truly professional instrument. Specifications include two 61-note manuals and a 25-note pedal board all on the C scale, full manual drawbars, bass drawbars

and presets, external synthesizer portamento, upper sustain 1 and 2, percussion sustain selector, bass presets, a control for the Revo rotary speaker system, vibrato with 2 depths, and connection sockets for any one volt, one octave synthesizer.

It is important to stress that this instrument is completely compatible with the new generation of synthesizers. This means that the addition of a synthesizer on top of a VK9 makes the organ effectively a synthesizer within its own two manuals.

For transportation the VK9 system breaks down into easy to carry sections and the organ weighs only 72.6 kgs. Set up only takes minutes.

But a brief outlining of specifications does nothing to show musicians what the new VK9 sounds like. Think back to days when organs had bite, were aggressive, had real attack. These qualities have been completely recaptured in the VK9 and they have been married together with the very latest sounds that technology can develop. The result is an organ capable of expressing and delivering every sound that made the old "tone wheel" so popular coupled with the latest music that technology can develop.



Three Hot New Kramers

In the remarkably short time of about two years, Kramer have become established as one of the leading names in the guitar field. The unique feature of Kramer guitars — aluminium necks that do not warp or twist — is just one of the reasons why they are so sought after by musicians. Their growing reputation for quality is undoubtedly the principal reason for their rapid success.

Following considerable research into what musicians really want, Kramer have now produced the DMZ-1000 Series which they are confident will fill a gap in the market for guitarists.

Kramer have been making some of the best guitars in the world for the last few years. They are one of the pioneers in the use of metal and metal guitar necks and they have now announced three new guitars which feature the very special pickups and electronics produced by the DiMarzio company.

The new Kramers are unique in several ways, firstly they have several new features that Kramer have not incorporated into the instruments before, secondly they incorporate active electronics by DiMarzio.

DiMarzio have not previously produced any active electronic circuits but Larry DiMarzio told us that he plans many more active circuits will come from the company in future years. The new Kramers were specially designed to accomodate DiMarzio pickups. Kramer boss Peter LaPlaca told us that he felt he had wanted to design a guitar especially for DiMarzios for quite some time and that after their efforts he and Larry DiMarzio were particularly pleased with the end result.



GD-1:

BODY STYLE: 450-G

WOOD: Maple

PICKUPS: 2 DiMarzio Dual
Sound Humbuckers

The GD-1 guitar satisfies the need of players who want both the hot, full sound of the GS-1 and the bright sound associated with guitars like the Stratocaster and Firebird. This is accomplished by two miniature switches placed by the control knobs. This set-up gives the artist 8 different tonal choices at his fingertips.



GS-1:

BODY STYLE: 450-G

WOOD: Maple

PICKUPS: 2 DiMarzio Super Distortion Humbuckers

When played wide open, the CS-1 will produce a rich, biting sound with incredible sustain and power. When turned down, the CS-1 becomes a warm, mellow guitar, useful for all of today's quieter styles.



BA-1:

BODY STYLE: 450-G

WOOD: Maple

PICKUPS: 1 DiMarzio P-Bass with an active tone circuitry

The BA-1 produces three distinct sounds similar to those made by the Fender Precision, Rickenbacker and Kramer's 350-B. A miniature mode selection switch, placed by the control knobs, offers the discriminating bassist a boost or cut in output using the active circuitry or bypassing the active circuitry for a normal response.

Argent Takes On Roland

Rod Argent, one of Britain's top keyboard players, is now stocking in his new Denmark Street keyboard shop the top of the Roland range. Now musicians will be able to try out the Roland System 700 and MC8 Micro-composer which will be set up for permanent demonstration at the shop.

This means that, for the first time in the heart of London, Roland's top products will be able to be seen, and heard and tried just by taking a trip to Rod's shop.

The shop is fast becoming one of the most luxurious and popular keyboard havens in London and this latest move in stocking the top of the Roland range will mean Roland and Rod will bring the latest developments in music synthesis to musicians everywhere.

The System 700 for example is the last word in a synthesizer system. Having a System 700 is like having all the synthesizers and sounds of the world in one instrument. With this and the Micro-Composer you have the ideal set-up to create limitless sounds and music.



Tips and Hints for Roland users

When you buy your Roland gear you'll need to know a few simple things to get the best from your equipment. One thing that might confuse newer players is the "high" and "low" input jacks on the amp. Basically this means the high input is more sensitive than the low.

Use the high input if you have a guitar such as a Fender with single-coil pickups. High output instruments such as those with double-coil humbucking pickups (Gibsons, Guild etc.) tend to distort on full chords when the volume on both guitar and amp

is up. If you want to minimise this distortion, plug into the low input.

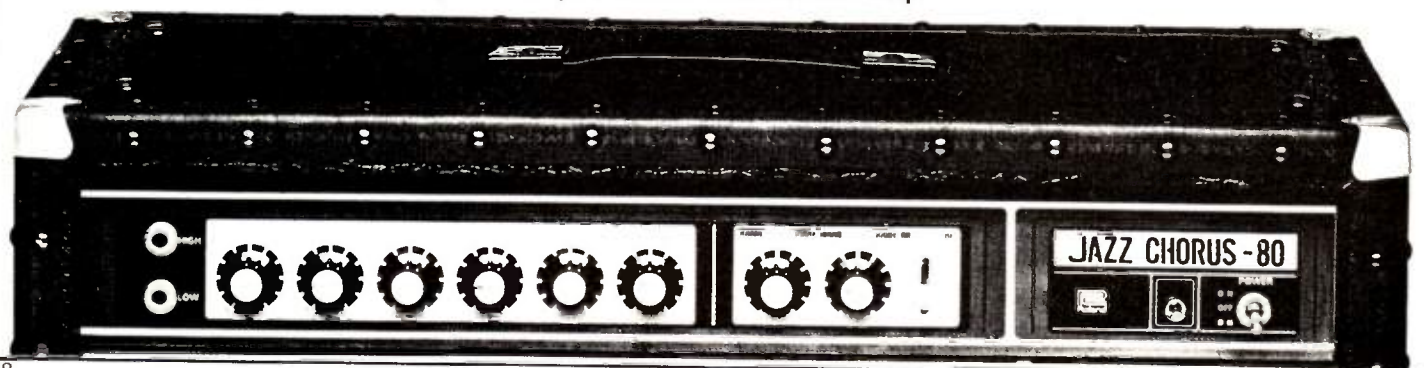
Generally, rock players should plug into the high input regardless of their guitar, while jazz musicians would be advised to use the low input to obtain the cleanest sound possible.

Use the low input also for other high output instruments like electric pianos. With keyboards, keep the volume on the instrument down and use the amp volume control to prevent overloading of the speaker.

If you have a Jazz Chorus amp

and there is a "wobble" or pitch change with the effect, this means the chorus intensity is too high. The JC amps have an adjustment for intensity on the back, but this should not be tampered with unless there is something drastically wrong with the chorus speed.

Ideally the chorus has a pleasant "spacey" effect. If on the back of the JC amp is a rubber grommet which pulls out to reveal an adjustment trimpot. Normally this should be set to maximum anti-clockwise positioning.



Profile on four Roland dealers

BJ NEWS

Sound Pad

Sound Pad in London Road, Leicester, is one of the most popular music shops outside London. A lot of that is due to the friendliness and expertise of the staff. The shop is run by Graham Pell and the staff includes his brother Phil, his wife Evelyn plus Denis Stanshall, Paul Fairall and Nigel Downey. All the top names in guitars, keyboards, amps, drums and accessories are in evidence at the Sound Pad. Roland is featured heavily in the shop – all the effects units, amplifiers, keyboards and

synthesizers are in plentiful supply. In fact, Sound Pad was one of the first shops to take delivery of the Roland guitar synthesizer.

"To be successful in the business, you've got to offer service, efficiency and stock everything that's available on the market". Explains Graham. "Not only that, but you've got to do it with conviction. We're all young enough to be in touch with the customers and keen enough to know where it's at".



Carlsbro Sound Centre

The Carlsbro Sound Centre in Mansfield, Nottinghamshire is the largest of the three Carlsbro shops in England. Carlsbro, of course, is a name known to musicians throughout the world. Their range of amplifiers and electronic items have become extremely successful but despite the fact that the shops and the manufacturing company share the same name, all leading makes of musical equipment is available in the shops.

The Mansfield shop (in Chesterfield Road North) is huge. The Soundhouse idea of scaffolding is employed to dis-

play the breathtaking amount of musical goodies. The sheer size of the shop and its double-tiering means that an enormous stock can be carried at all times. Even strings, effects and accessories have their own counters.

Keith Woodcock reports big sales for Roland equipment: "We've always got a big stock of Roland equipment. We have most of the keyboards, synthesizers, effects units, amps and the guitar synth. It's very good. Excellent gear and we've been with them right from the start".

Macari's

Larry Macari is probably the best known musical instrument dealer in London's West End. His two shops in Charing Cross Road are always a hive of activity with musicians trying and buying every type of musical merchandise from picks to pianos. Larry believes in keeping as wide a range of stock as possible and as many different lines as possible. Both shops have a highly specialised staff capable of dealing with any enquiry relating to any instrument.

Apart from being very busy with his Sola Sound, Colorsound and Eurotec

projects – merchandise which has been tried, tested and proved over the years – Larry still finds time to talk to his customers and offer helpful advice. "The most important thing of all is talking with musicians and discovering what they want" he says.

Since his shops carry nothing but the best, Roland equipment naturally plays an important part in Macari's stock situation. Everything is there – effects pedals, amplifiers, synthesizers, electric pianos and the amazing guitar synthesizer.



CHASE MUSICIANS THE LONDON SYNTHESISER CENTRE



London Synthesiser Centre

There can't be many keyboard players who haven't heard of the London Synthesiser Centre. This is an incredible achievement since the shop only opened last June and, in that short period, has virtually changed the face of the synthesiser world because now there is a specialist synth shop where all the world's leading makes of synthesiser can be played and compared.

Since the start of the London Synthesiser Centre, Roland has been one of their main lines. They stock all the Roland range and usually are one of the

first shops to take delivery of each new Roland item as it comes off the line.

Of Roland equipment, shop owner Amrik Luther-Singh says: "The First instrument from Roland I tried was the SH2000. I thought it was an incredible instrument compared to some others that I had played and I immediately started to investigate the entire range. To my astonishment I discovered that almost every item in the Roland range was an improvement on most of the similar products on the market".

New Boss Sound effects from Roland

The new Boss sound effect series available from Roland has been specifically designed to meet the demands of today's musician for greater depth and versatility in the sound that he can create. Each model in this latest series has new features that offer limitless potential for sound creation talent.

DB-5 Driver

Producing sound textures that range from heavy to gentle when used with an electric guitar, and wood bass and bass drum sounds when linked up to a bass guitar, the DB-5 is equipped with a five-element graphic equalizer and mode selection for distortion and attack. Ideally suited for synthesizer use, it is both AC and battery-powered, making it especially suitable for long performances.



OD-1 Over Drive Δ

Subtle shades of sound can be expressed with high fidelity response to attack by using this unit's overdrive and level controls. Soft, clear sound distortion and natural trebles are produced by the OD-1 exactly like those of a tube-type amplifier.

BF-1 Flanger

A wide range of rich flanging effects is available from the BF-1 through the continuously variable settings of its manual, depth, rate and resonance controls. Equipped with an AC adaptor for long performances, it is particularly suitable for guitar, keyboards and tape dubbing.

KM-6A Mixer ▽

This multi-channel mixer is ideal for drum mixing, multiple keyboard mixing and recording. Capable of accepting any type of input, the KM-6A offers monitoring facilities via stereo headphones.



GE-10 Graphic Equaliser

Designed to produce the ultimate in sound, the GE-10 offers precise control of 10 equaliser elements with octaval centre frequencies of 31Hz to 16KHz and a +12dB adjustment range.

PH-1 Phaser ▽

Departing from the traditional phase shifter image, the PH-1 produces a rich, distinctive sound varying from brilliantly fast to funnily slow. Features of this colourful phaser are rate (effect speed) control, and depth (effect strength) control.



KM-4 Instrument Mixer ▷

Although weighing only 1.7kg, this small, compact unit incorporates four input channels and all the essential functions for instrument mixing.



DM-1 Delay Machine

The most revolutionary delay unit to be developed for many years, the DM-1 features an exclusive FCF (Frequency Controlled Filter) circuit that creates astonishing frequency response, ease of control, quietness of operation and versatility of performance. All this is achieved without moving parts, tapes or tape heads. Tape echo effects can be reproduced varying from single delay to multiple repeats. Delay time ranges from 25 to 500ms.



GE-6 Graphic Equalizer Δ

Versatility is the feature of this unit. Designed for a wide range of applications in the home, studio or on stage, it can be operated by battery or AC adaptor. Silent operation makes it eminently suitable for recording use and although it is extremely compact it boasts six bands ranging from 100Hz to 3.2KHz. Each slider boosts or cuts a bandwidth of one octave by +15dB, and incorporates centre clicks for easy reference to "0" settings. The Effect/Normal changeover switch has been laboratory tested for 50,000 on/off operations.

SP-1 Spectrum ◁

The outstanding feature of this unit is its unique tone which is produced by emphasizing a limited frequency range, continuously variable between 500Hz and 5KHz. Ideal with bass guitars, the unit is particularly efficient when used at high frequencies.

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MAKING A SOLID GUITAR

by Stephen Delft

In the course of the next few paragraphs I shall refer to fingerboards as being both curved and straight. Perhaps I should clarify this, as both aspects are relevant to a good instrument which will accept a low action setting without producing fret buzz when you try to "bend" the strings. Firstly, the fingerboard should be nearly straight when viewed along the same direction as the strings. The word "nearly" used here, avoids a lot of argument about whether the ideal neck should or should not, have a minute amount of curvature, for optimum playing conditions. Opinions about this differ; I prefer straight fingerboards on electric guitars, but as I set up the final adjustment by feel, rather than with a straight-edge, I may not even be quite correct about this statement. In any case, if the neck has no adjustable truss rod, it will usually pull forwards a little under string tension, and you will have little choice in the matter. If it has an adjustable rod, you can experiment with different neck settings after the instrument is complete. In either case, I strongly suggest that you plane the fingerboard as straight as you can at this stage — and you will need to use a straight-edge for this.

So for all practical purposes, at this stage the fingerboard should be straight along its length. It may, however, be either straight or cambered across its *width* according to your preferences. If it is cambered too much, you will find that "bent" strings will touch nearby frets and lose their sustain unless you can tolerate a fairly high action. Some players don't much bend strings, and some who do like a fairly high action anyway. If you want a low action and the possibility of bending strings halfway across the fingerboard, you must accept a fingerboard which is practically flat across its width.

I have had one Travis Bean guitar for review some time ago and its fingerboard was more or less flat. The company didn't exactly say it was flat. They just implied that on their guitars, you wouldn't have any trouble with "bent" strings catching on adjacent frets. Of course they were quite correct. I suspect quite a few guitarists find Travis Bean fingerboards perfectly acceptable, but if *told* that they had no camber, would probably find the same fingerboards uncomfortable. Obviously, in any guitar, if the frets are not level with each other, or if the neck is warped, or if the action is too low, you may get string buzzes, with or without string bending. I am assuming, for the moment, that the neck, fingerboard and frets are perfect. For any given action, the amount of strings bending possible, while preserving a cleanly sustaining note, is finally limited by the amount (and shape) of camber on the fingerboard. I have never seen this point mentioned in print before, but it seems to be one of the immutable laws of guitar design.

You will notice that I have slipped in a small reference to the *shape* of the camber. I generally shape my fingerboards by feel and I know that the shape I produce is not a section of a circle. I also know that the shape does not remain in the same in all parts of the

fingerboard. At this stage, things become rather complicated. I would suggest that a reasonable compromise would be to put a simple curve on the fingerboard, using a template cut from part of a 400mm *radius* circle. The same template will service for any part of the fingerboard and the result will work well. Classical guitars usually have flat fingerboards. If you have no difficulty playing classical guitar, you may prefer to make your electric guitar fingerboard practically flat. Use a template cut on an 800mm radius instead. If you like very cambered fingerboards, use a 300mm radius, but it may require a slightly higher action if you want to play solos.

Once you have a fretting jig as described in last month's article, you can also use it to make the job of planing the fingerboard much easier. You will need three shims of 17 or 18mm plywood. (If this material is not available, you can, of course, use any hardwood, planed to this thickness). You will need one piece 75mm by 120mm to go under the head, and two pieces 35mm by 8mm to go each side of the neck tenon. The neck must be clamped in the jig just as firmly as when cutting the frets, but because of the shims, the top of the fingerboard will project above the top of the jig as shown in Photo 1. I have marked the shims with thick crossed lines so you can see where they fit.

The head shim is clamped down between the head and the head-shelf on the jig, but there should be no significant downward pressure on the shims by the neck tenon. They are only spacers, to help in setting the neck and fingerboard straight in the jig. Any down-pressure on these shims would tend to loosen the end of the fingerboard. As with the re-fretting process, the neck tenon is actually held only by the sideways grip of the jig when clamped as shown. If this end of the neck lies above the shims when the head end is clamped down, or if the ends of the fingerboard are pressed down hard onto the end shims, your head shim is probably slightly tapered. Try turning it round, or make another one. If the gap is small, you could make another pair of small shims to fit, but however you solve the problem, the neck must *not* be made to fit the jig under stress. This can easily happen un-noticed, if you clamp up the tenon end of the neck before the head end.

Ideally, you should have a plane, similar to the one in the photograph and the following advice assumes that you have one, or can borrow one. However, the job can be done with coarse industrial abrasive paper (or a piece cut from an unused abrasive belt) glued to a *straight* piece of hardwood about 50mm square, and a little longer than the fingerboard. Keep the abrasive free from clogging, with a brush and a spare rubber shoe-heel, and when it no longer cuts with light pressure change it at once. Cow Gum is a suitable rubber adhesive, and you will need 40 or 60 grit for rough shaping. Follow with 80 and then 120. Check constantly with a straight-edge as described below for planing the fingerboard.

If you have a plane, it should be kept constantly sharp, and the blade edge, blade setting, and cap-iron setting, should be checked *each time* after sharpening, on a piece of

planed hard wood, before you start again on the fingerboard. First, plane the fingerboard flat both ways using a straight-edge along, across and diagonally, corner to corner. The plane must be sharp enough to cut with little downwards pressure beyond its own weight. If you have to press downwards, the resulting surface may be smooth, but it probably won't be flat.

You may find it helpful to make a little block from about 20mm softwood which just wedges across the inside of the jig, and just touches the underside of the neck around the middle of its length. It will reduce the tendency for the neck to sag under the weight of planing or sanding, but it should only just *touch* the neck. Don't attempt any sort of compensating stresses while working on necks: the end result is usually worse rather than better. Even so, a long plane is no guarantee of straight work, and you should continually check your work with a straight-edge. If you are planing Ebony, the blade will lose its edge after five or six strokes, and will need re-sharpening very often, even though it may still appear to cut.

When the fingerboard is flat both ways, you may mark off a 10mm band along each edge with a pale-coloured drawing pencil. Lime Green or white are probably best. Draw a faint scribble, or cross-hatching, over each band, so that you can see where you are removing wood with the plane. Plane each band down at a slight angle, so that the edges of the fingerboard are reduced by about 0.5mm. This is not very much, and requires a finely set plane, which may not at first appear to be removing *anything* from the corner. Try the plane first on the piece of smooth-planed hardwood recommended earlier, and adjust it to take off fine shavings. Use the same setting for the fingerboard, and patiently work the plane at roughly the right angle, in long even strokes until you begin to see some of the scribbled marks disappearing. This will guide you with the exact angle at which to hold the plane. Replace the scribbles as you go.

When you have bevelled each edge of the fingerboard, check with the camber-template which you have chosen, and make smaller bevels by planing of *part* of the corners left by the first bevels. Check again, and plane off part of the corners left by the second lot of bevels. This is a standard way of approximating a curved surface with a plane. Because the neck and fingerboard are tapered in width, it will be very difficult to finish the curve more closely than this with a plane. However, I would in any case suggest that you finish the shaping with a template, a straight-edge and a hard sanding block about half the length of the fingerboard and about two thirds of the width at the nut end. Use something like 120 grit industrial paper such as 'oper-coat' Garnet or Aloxite. Replace the abrasive paper when it begins to clog and cannot be cleaned with a brush and a rubber shoe heel.

Because the fingerboard is now cambered, you cannot check it casually with a straight-edge, you must pencil in the exact lines of the strings each time, and place the straight-edge along these lines. In any other direction

Setting up the fingerboard

the straight-edge will give misleading readings.

If you have fretwire by now, measure the depth of the tang which is to be fitted into the fret slots. Mark the fretting saw with tape, or with quick-dry engineers' blue marking ink and a scribe, to indicate a cutting depth 0.5 to 1mm deeper than the greatest depth of the fretwire tang. While the neck is clamped in the jig, *on its raising shims*, deepen the slots all the way across, to the marked line on the saw. Do not try to do this using the saw-guide slots in the jig. Unless lined up again precisely, (which is unlikely) you will probably make the slots wider as well as deeper, and the frets will not hold in place. Use soap on the saw while cutting, and make sure the jig is clamped firmly to the bench. (If you do not yet have fretwire, this job should be done sometime before the neck is glued on to the body, and preferably before the edges of the fingerboard are finally shaped).

This is the stage at which I put inlays or dots in the front of the fingerboard and make and fit the head-facing. (Dots in the *edge* of the fingerboard are fitted when the neck and fingerboard are almost completely finished off). I have dealt with decoration in an earlier article. David Russel Young's book, "The Steel-string Guitar, Construction and Repair" gives good advice on pearl inlay work. Before finalising the shape of the head and the positions for the machine-heads, make a drawing of your intended design, full size, include nut and

strings, and check that strings 2,3,4 and 5, clear adjacent machine heads when they are carrying at least one layer of string. The thickness of the bottom strings, wrapped round the rollers can make the difference between touching and clearance. This is not just a cosmetic point. Strings touching adjacent machines can produce "sympathetic" buzzes. Also, no string should make too steep an angle sideways as it leaves the nut. 10 degrees is about the limit for reliable working.

Within these limits, I shall leave you to design and fit your own choice of decoration. Try not to lose the shape of the fingerboard, while filing the inlays level. You can reduce the risk of this by filing them nearly to size and shape, while set in a recess in a false fingerboard made to the same shape as the real one out of any hard wood. Then cut the fingerboard recesses carefully until the curved top of the inlay can just be felt above the level of the fingerboard all round. Leave the final finishing of the inlays until next month.

If you are going to use a head facing, and you have cut the head to the smaller dimension on the plan, the facing will be about 2mm thick. This is thick enough to be inlaid in the same way as the fingerboard and fitted to the head when complete and satisfactory. Trim it nearly to size before gluing on with a pair of thick wooden packing blocks, one of which should be trimmed to fit the slight curve on the back of the head. Don't worry about

the middle, but you will need strong clamps all round the edge of the packing blocks as the glue will cause the edges of the head, and particularly the facing, to curl apart. Put masking tape on the head to protect it from glue runs, and put two layers of strong paper over the packing blocks.

When the head is dry, remove the clamps and blocks, and allow it at least another week to dry properly at room temperature, before you try to finish it to size.

While waiting, you can finish the neck to exact size and shape with sanding blocks and sharp scrapers, paying constant attention to the position of the truss rod inside the neck. Don't try for a super-slim neck first (or even second) time. By the time you have this right, the head will probably be dry enough for the same treatment.

Try not to let the sanding distort the shape of the body joint, or round over the edges which are to fit against the body. If in doubt, leave this end until later when the neck and body will be glued together.

Remember it is the neck which should be near to exact size, and the body is still a little oversize around the joint, to allow for trimming after assembly, so don't make the end of the neck any smaller than it is shown on the plans, and leave the end corners and edges sharp and square. This means you must use abrasive paper on appropriately shaped blocks, not over your fingers.



Planing fingerboard



Abbey Road

Abbey Road is the most famous thoroughfare in the world of music. The road and its recording studios were immortalised in the legendary Beatles' album of the same name and today still hold their position as one of the world's top recording centres.

To many people, Abbey Road is synonymous with the heady days of Sixties pop music, but the history of the studios and breadth of music it encompasses goes much deeper than that.

In 1931 the recently formed Electric and Musical Industries company, now the EMI Group of Companies, were looking for somewhere to site new studios. An old Victorian house at No. 3 Abbey Road in the St. John's Wood area of North West London seemed to be ideal for the purpose, so the building was purchased.

The facade was repaired but otherwise unchanged, and has remained so to this day blending in with the tree-lined streets and spacious houses that surround it. The house was converted into offices and a connecting block built in the large garden consisting of three studios, transfer or mastering rooms, workshops and listening rooms etc.

The opening ceremony was marked by a recording of the London Symphony Orchestra directed by Sir Edward Elgar which was attended by such notables as George Bernard Shaw and Sir Landon Ronald. The musicians who began using the studios reads like a Who's Who of music with such names as Fats Waller, Yehudi Menuhin and Glenn Miller, who recorded there during the war when the premises were used mainly for armed forces entertainment.

The introduction of magnetic tape after the war provided a medium whereby high quality programmes could be recorded, edited and replayed without any processing. It was these facilities which allowed the exploitation of the newly developed long playing micro-groove record introduced by Professor Goldmark of CBS.

Abbey Road kept pace with all the new developments in studio recording techniques, EMI themselves pioneering many of the features which became standard throughout the



Inside the control room of Number Three studio at Abbey Road

industry.

The Fifties brought four track recording to Abbey Road first for pop work and then for certain classical pieces. The shift from four to eight, eight to 16 and finally in 1975 to 24-track brought with it much change and many complications.

A vast quantity of electronic aids were devised to assist the balance engineer with his ever more complicated equipment. Organs, pianos, harpsichords, synthesizers and electric instruments of all kinds were increasingly used in the pop field, while limiters, compressors, reverberation units and sound reinforcement systems also became available.

It also became necessary to reconsider the working conditions of both artists and engineers. Extensive alterations were made to the studio and control room decor to provide comfortable and relaxed conditions.

Abbey Road today remains an enigma, it still retains its simple Victorian appearance, and but for a small discreet sign over the doorway, could be mistaken for just another splendid town residence.

However, passing through its portals you cannot help but realise that you are in a very special place. Peter Vince, the senior pop balance engineer, knows all about it as he says: "There is a special atmosphere at Abbey Road, I don't know what it is but it's there. When I left here for a while and then came back I felt it as soon as I walked into the place."

"Musicians like the feel of the place and don't want anything to change which presents problems when you want to modernise and

try and keep the place up to date".

Nowhere is this better illustrated than the famous Studio Two where the Beatles recorded most of their albums. It looks exactly the same today as it did when the Fab Four were shaking the world, and makes it even easier to conjure up visions of those moments of magic from the lofty control room.

Peter says that the number of musicians from all over the world who want to record in there, simply because of its history, is staggering. However, this is not to say that Abbey Road has become merely a museum piece, their facilities for any kind of recording are unbeatable.

At Abbey Road, EMI have one of the biggest studio complexes in the world. Studio One is a huge hanger-like building where mainly classical recording or any work needing the presence of a full orchestra is done — an idea of the size can be gleaned from the fact that there is a three second reverberation delay.

The legendary Studio Two is usually the home of MOR sounds, although some nostalgia freaks will always clump for this one. Studio Three is a thoroughly more modern set-up with the very latest studio hardware installed in comfortable surroundings complete with sympathetic lighting. All the top rock acts record here, and, as Peter points out, it does have one unique feature in a couple of windows which keep the boys in the control room in touch with the outside world.

Complementing the studios is the mobile recording



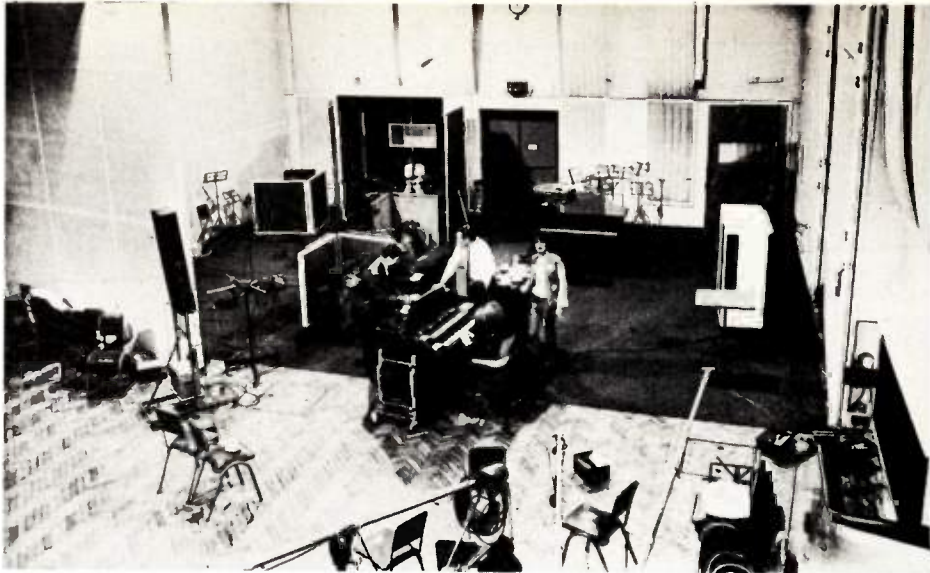
Abbey Road

unit, Anyone who thinks that mobile recording is a comparatively new thing will be shocked to find that EMI had a mobile in the Twenties.

It consisted of a purpose-built body on a Lancia two ton chassis and was equipped with a complete recording system including two weight driven lathes. A jacking system was arranged to support each corner of the van during recording, to level the machines with their 55lb lead weights for the gravity motors. The power for the amplifiers, suction and heating of waxes was derived from batteries which re-charged during rest periods.

The whole process involved in making a record is housed under the one roof at Abbey Road, from the first stage of the musicians trooping into the studio to the final transfer of the master tape to a cellulose-coated aluminium disc called a lacquer which is then dispatched to the pressing plant.

One of the most fascinating aspects of the Abbey Road set up is the way in which apparent idiosyncracies abound. For example, transfer engineer Chris Blair, who is responsible for cutting the lacquers, insists on having the cheapest and worst sounding portable record player by the side of his computerised machinery. This is merely part of quality control, because he reckons that if a record will play all right on that primitive machinery it will play on anything!



History in the making — the Beatles recording in Abbey Road's legendary Studio Two with George Martin

Similarly they have a digital echo chamber the size of a suitcase which can reproduce any type of acoustics imaginable. Yet there exists on the premises a bomb shelter shored up with huge drainage pipes and a small hut on the roof which resembles a family sized bathroom where the Beatles and Pink Floyd have tinkered for hours to get a particular echo sound.

It is not only the stars who benefit at Abbey Road as Peter Vince is quick to point out. The engineers who come to work there acquire a versatility which few other studios can match, and often those who are only initially interested in rock music find themselves working on classics and become hooked on the music.

*Although the studios are EMI owned and used by their artists anyone can hire them, in fact the amount of outside work far outweighs that of the EMI stable.

The range of equipment at Abbey Road is literally endless, in keeping with its world ranking status, and visitors will soon be able to relax in a new licensed bar and lounge which is being planned for the basement area.

One unique feature of Abbey Road must be the guided tours which they lay on specially for members of the public. For any confirmed Beatlemaniac this surely is a treat not to be missed, although be sure to book in advance.

The usual question asked of studios is, "What famous artists have recorded there?", in the case of Abbey Road it would be much easier to ask who hasn't!

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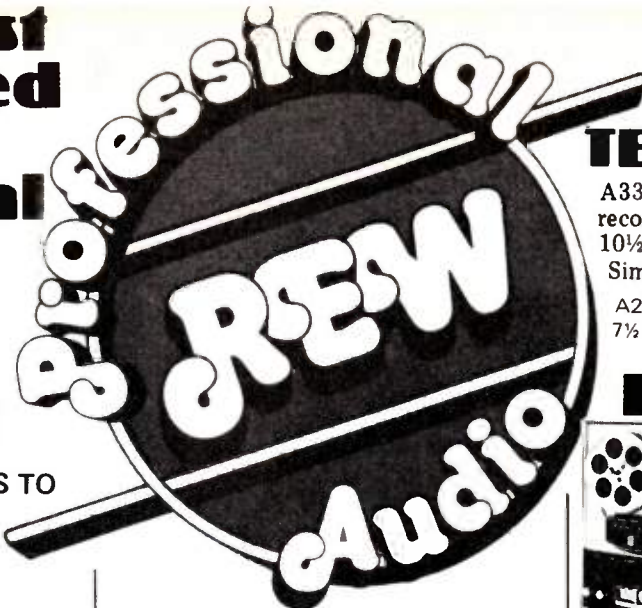
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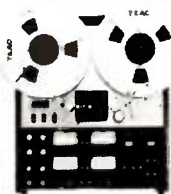
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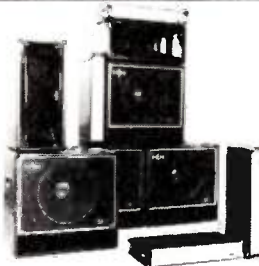
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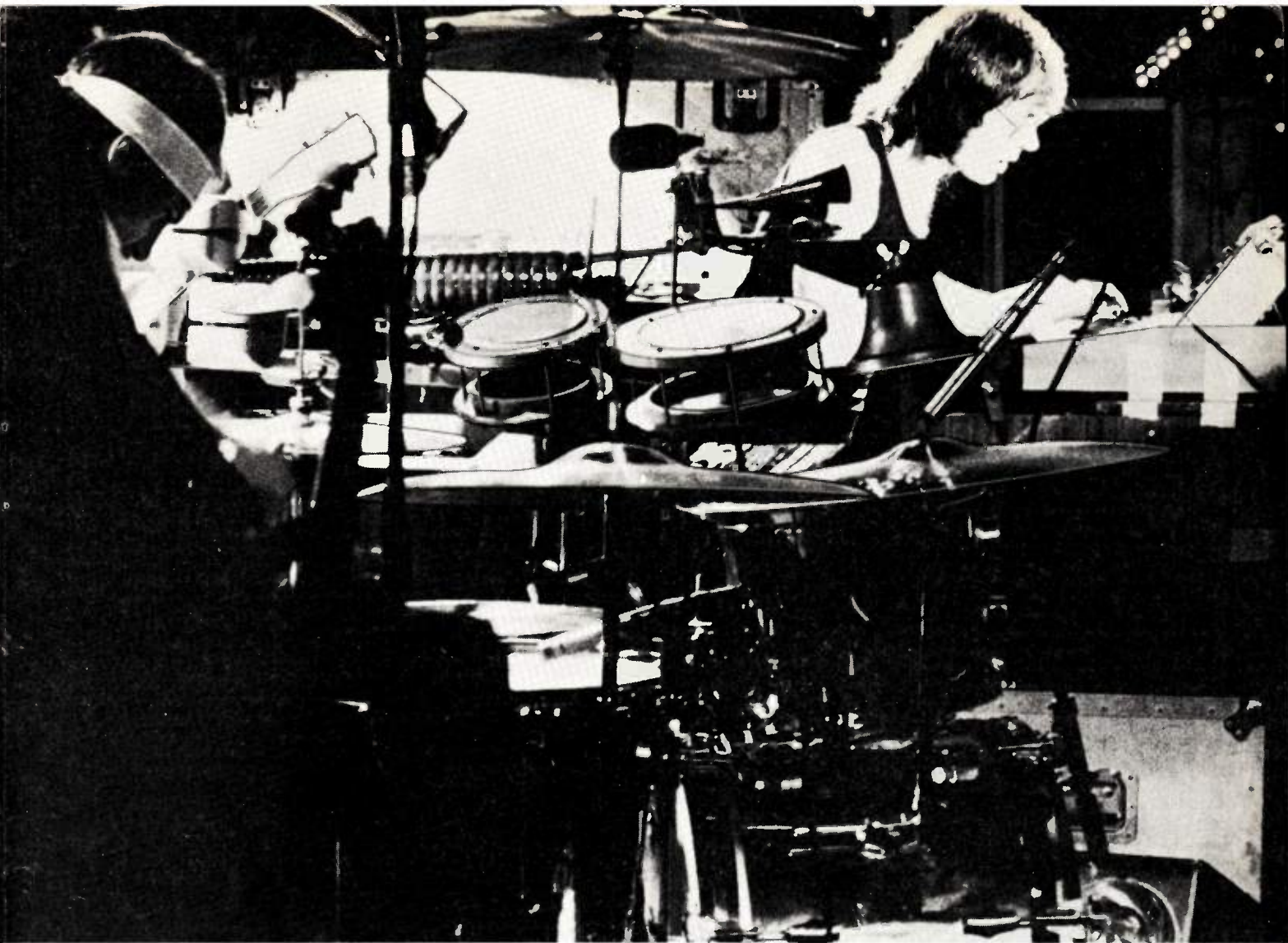
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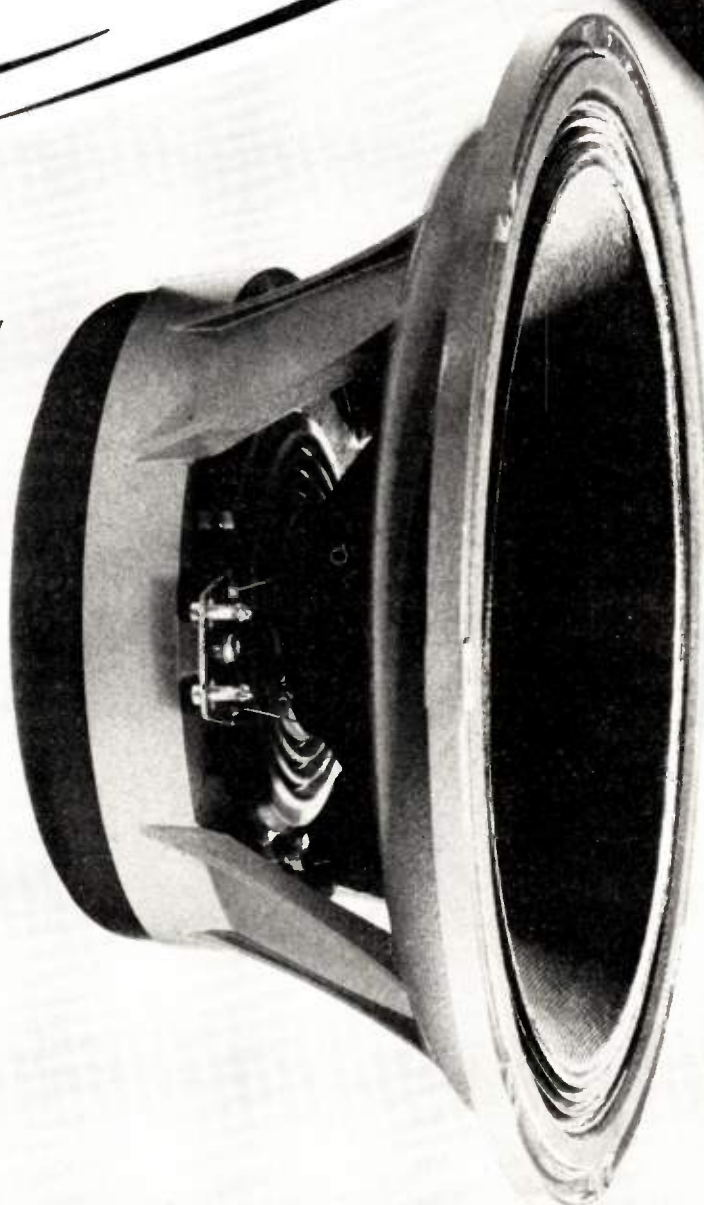
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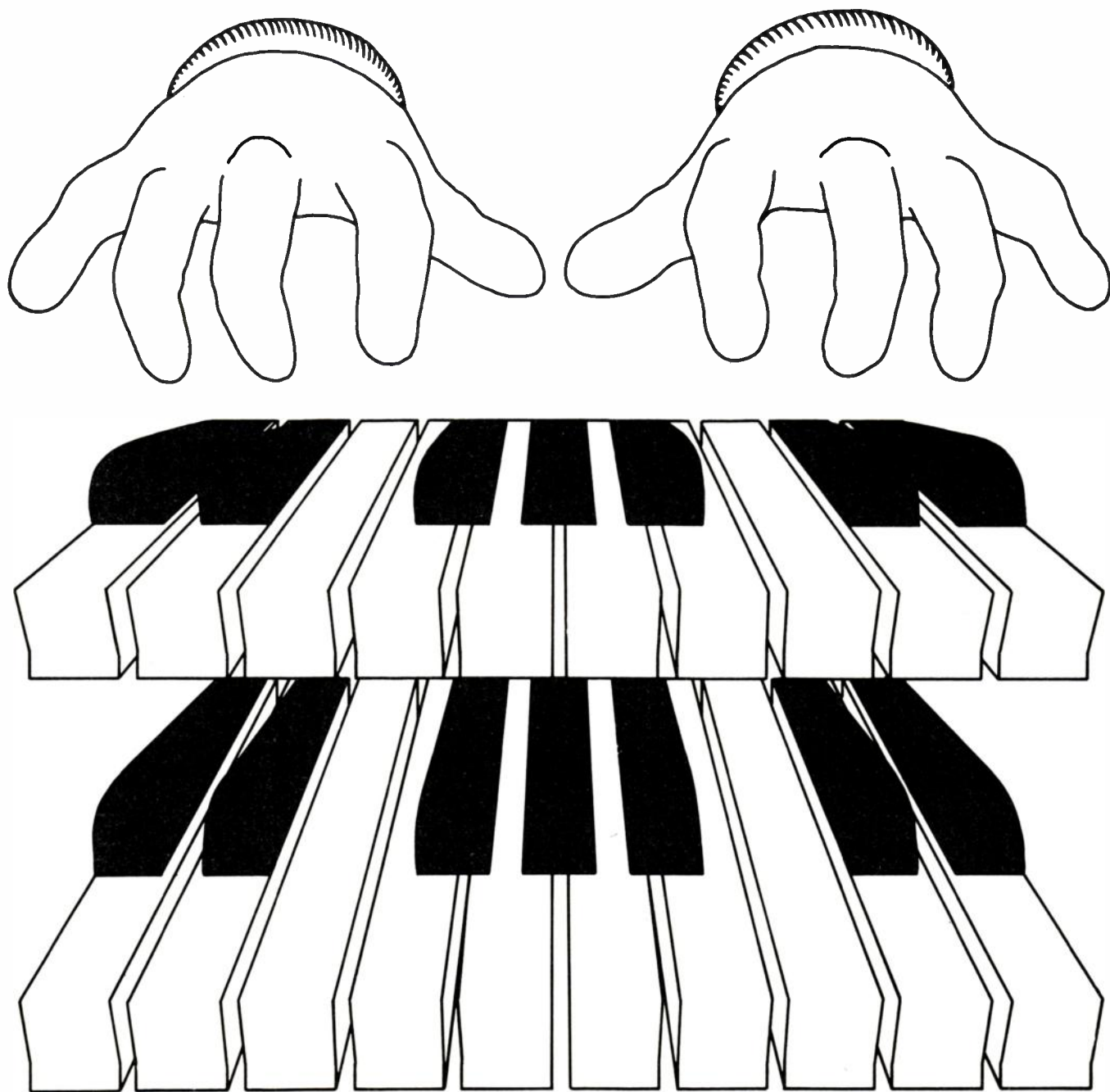


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Deciding on a Mixer

The variety of mixing systems on the market makes it difficult to judge which is best for you. Features blend together forming a mirage of switches, controls and pots; all looking alike. Therefore, we've come up with the *sound artist's guide to mixing buys*. It will give you independence when it comes to buying a mixer. The following is an abbreviated version of the guide, which you can send for free of charge. We hope it serves you well and would appreciate hearing from you.

The Sound Artist's Guide to Mixing Buys

What is a sound artist? We've come to realize the existence of a new category of performer. This is the person who creates, through the use of various tools a sound that appeals to the audience: therefore the sound artist. How well the information communicates is left to the talented ears of this individual, and the manner in which these tools are utilized. The sound artist, with today's technology, has become an instrumental part of the performance.



Mixer is the Basic Tool

The basic tool of the sound artist is the mixing board; with it he can create a myriad of sounds from his fingertips. It not only has to sound good, be reliable and versatile, as well as having excellent specifications, but has to have just the right touch. For the person mixing relies upon his hands as much as he does his ears.

DESIGNED ON THE ROAD

It is for this reason that Uni-Sync, in designing the Trouper Series is extremely innovative in the choice of front panel controls. Michael V. Ragsdale, president of Uni-Sync as well as chief designer of the Trouper Series, has built, serviced and most of all, operated sound systems prior to forming Uni-Sync. The Trouper Series was designed on the road, the true proving ground of sound

reinforcement equipment, from a practical viewpoint. For example, the use of slide faders as opposed to rotary pots was an extremely important decision based on ease of operation as well as visual and tactile indication of position. Rotary pots are hard to read under the dimly lit conditions of sound reinforcement, whereas a slide pot gives instantaneous recognition.



Live or Recording

One of the most important decisions to make is where your mixer will see the most use. Is it for a "Home Studio" or to be run live. Live boards have different gain and level structures. In a studio, you are dealing with a controlled environment, but live sound is just that; live and wide open. To handle that kind of sound you need to have a mixer that has been specifically designed for that purpose. This is the Trouper Series, designed and built for the road or permanent installation for mixing live sound...it is a live music mixing system.



Inputs You Can't Grow Out Of

Next on our list of important decisions, is to determine how many and what type of inputs you need. Mixers come in various configurations, application determines the

need. The Trouper I, for example, has on each channel: low Z balanced and high Z inputs, and an in/out jack. This allows for maximum flexibility.

Now, how many inputs do you need? Most mixers come in fixed quantities; for example, six, twelve, or sixteen. Once you grow out of it, you have to buy a new board. Not so with the Trouper Series. The basic mixer is an eight input/output control module that is expandable through the addition of a ten input expander module, that simply plugs in. You never grow out of a Trouper.

Build Yourself a Custom Board

If you had the freedom or ability to build a mixing board perfectly suited for your needs, what would you put in it, how big would it be? The Trouper Series gives you this freedom at an affordable price. Our mixers are big boards in little packages, giving you the opportunity to custom design a system that is tailored for your specific needs. You build what you want, not what someone else thinks you need.



Dollars Per Input

An excellent way of determining the value of the mixing board being considered, is to divide the cost of the board by its total number of inputs. This gives you an objective analysis of the mixer, and by comparing and contrasting features per dollars, you can arrive at a decision. For instance, the mixer at \$100 per input may have

far greater features than the one at \$85, and would be a more valuable purchase.



Mono or Stereo

The Mono/Stereo issue is one of the most controversial at hand today in the retail sales of mixers. Most installations and gigs are best handled in Mono. But many groups today, want the added flexibility of a Stereo board. We are presently introducing the Trouper I Stereo, which is probably the most flexible and versatile mixer on the market for its price. At \$898 (suggested price), each channel features a house pan pot along with an echo pan pot enabling you to pan the echo to or away from the house signal. A little imagination can create some very interesting effects.

The choice for Mono or Stereo is based on budget and application. Practically speaking, Mono will satisfy most of your needs.

Send For Your Free Guide

That's the abbreviated version. If you'd like the complete guide fill out the attached coupon and send it in to us right away. You may want to get some of the other Trouper Series goodies like T-shirts or director's chairs for a comfortable place to mix from. We're looking forward to hearing from you.

Thanks,
Larry Jaffe
Marketing Manager

Dear Larry,

I'm interested in what you have to say. Why don't you send me a copy of SOUND ARTIST'S GUIDE TO MIXING BUYS. While you're at it send the goodies I've checked off.

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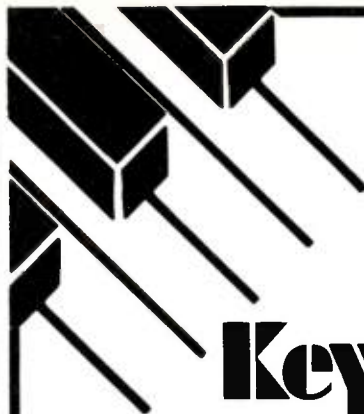
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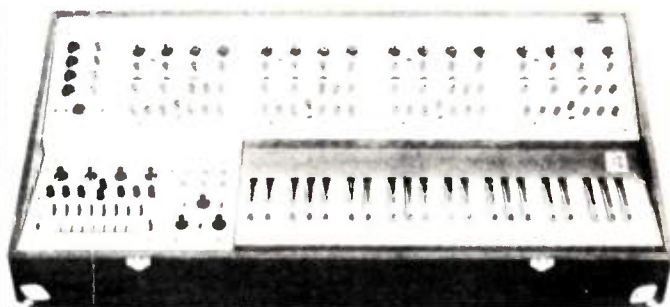
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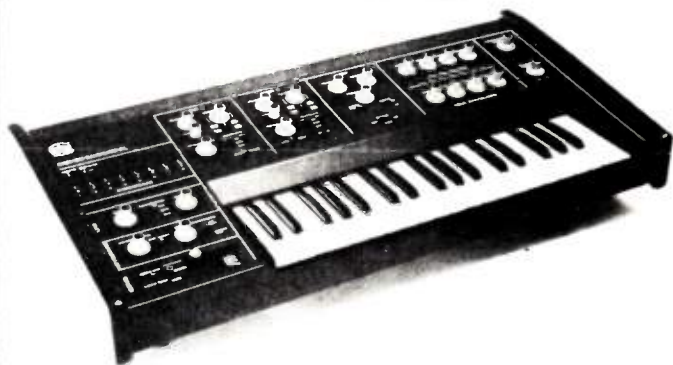
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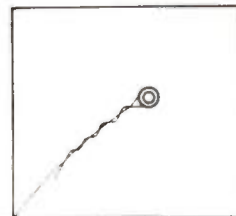
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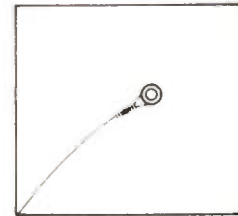
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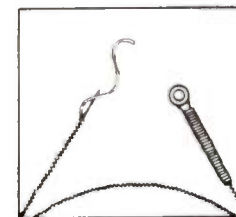
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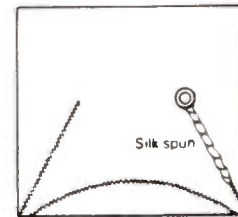
Usual method



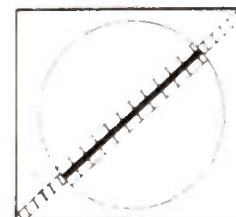
Sounder method



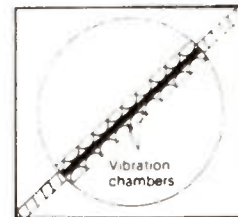
Usual method



Sounder method



Usual method



Sounder method



Usual result



Sounder result

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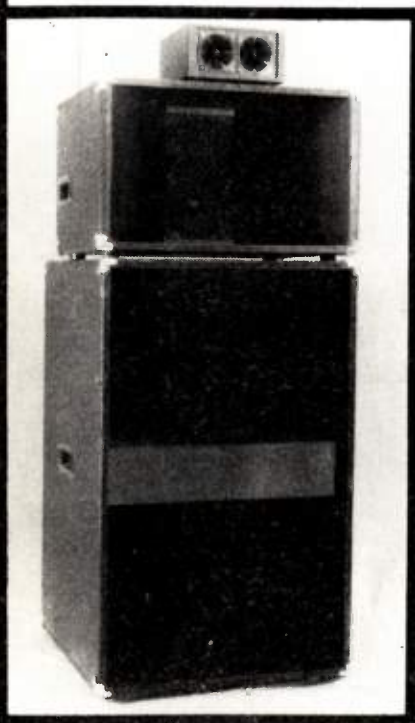
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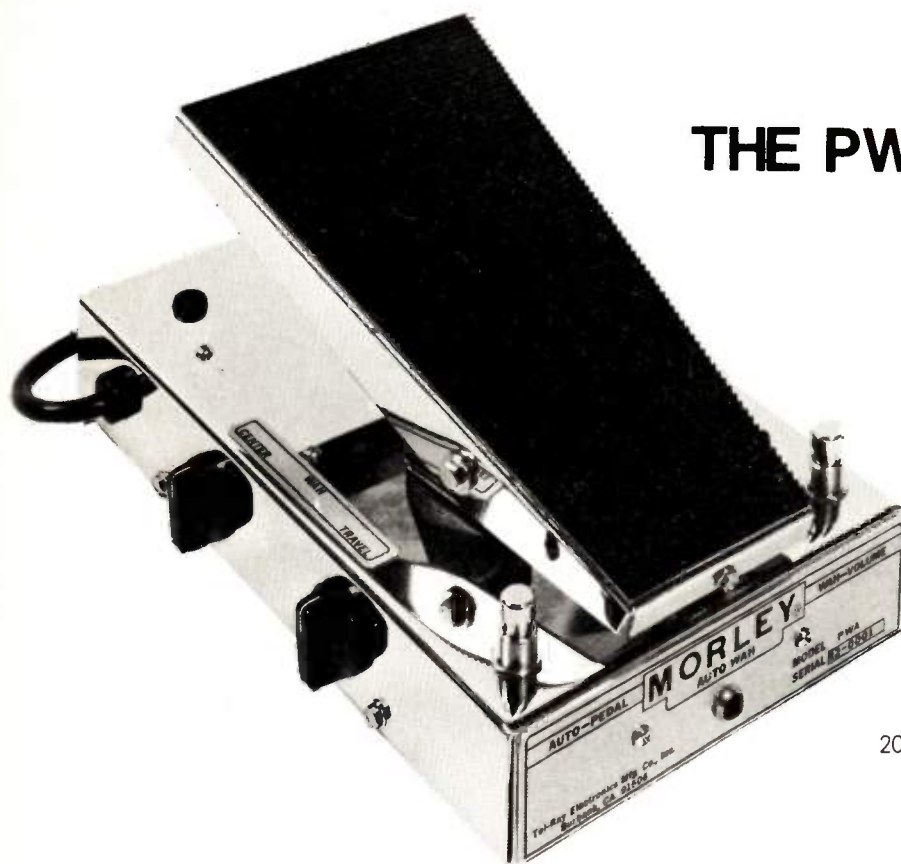
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The Stingray Bass gives you:-

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Power at clippoint	130 watts into 4 ohms. 85 watts into 8 ohms.
Power at 5% T.H.D.	150 watts into 4 ohms. 105 watts into 4 ohms.
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PRE AMPLIFIER

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"BAND PASS FILTERS"	Provide Boost as follows:- LO 360Hz + 10dB. 860Hz + 10dB. MID 2KHz + 15dB. 4KHz + 15dB. HI 6KHz + 15dB. Treble + 45dB at 10KHz. Middle+ 15dB at 300Hz (T & B at Max). Bass + 30dB at 40Hz.
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Build a Mixer

Part 7

by Mark Sawicki MSc (Eng), Assoc MIEEE, MAES

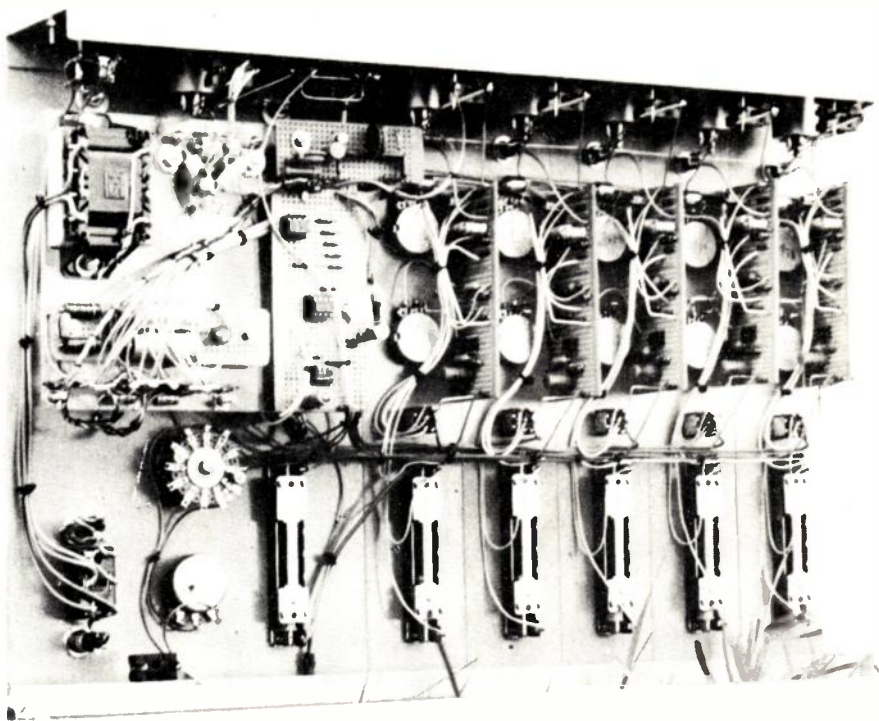
During the last couple of months we have discussed all the sub-assemblies of the mixer and I hope that they have been presented in a clear and informative manner allowing you an easy and painless set-up of all the presented schematics as well as the preparation of the basic hardware. At this stage, the prototype has been built step by step and the progress can now be seen with the actual state of work as shown in Fig. 1.

As you can see in Fig. 1 all the small components other than Pre-amplifier and Tone Controls Circuit (Ch. 1–5) are soldered in three small vero-type strip-boards and attached directly to a piece of perspex, which is mounted directly on the VU meter terminal bolts. This method not only simplifies the assembly work but at the same time allows you to omit a couple of time-consuming metal brackets (a nasty job for those of you who are purely electronically-minded). You may remember from last month the description of the Test oscillator alternatives that the output signal from "Output Level Potentiometer" provides the necessary sinusoidal test signal to all pin A's in Ch. 1–5. One of many ways of wiring this arrangement is shown in Fig. 2.

When comparing this with Fig. 1 you may notice that we are using tinned copper wire to make certain inter-channel connections, for example in between the Test Oscillator push-button Pb1 – Pb 5 pins and for all five-channel positive supply (+US) negative (–US) and OV (ground). A wiring example of this type of construction is given in a close-up photo in Fig. 3.

Very little has been said so far about the two sub-miniature rocker (single pole) switches acting as Test Oscillator power ON/OFF (Part VI) and AUX/PFL

Fig. 1



selector switch (see Fig. 1 in Part IV). In the prototype construction they were mounted on the front side of the mixer console, near the headphones outlet socket. When describing the mixer hardware in Part II, we mentioned the mixer console's sides – both left and right can be cut out from veneered plywood or chipboard and finally fixed to the main mixer frame with the help of four simple metal brackets. To give you an idea of the proposed form and outlay, a basic sketch is shown in Fig. 4.

This now completes the fundamentals of both mechanical and electron-

ic assembly procedure.

I strongly recommend that, before switching on the power for the first time, you double check all soldering joints, interconnections, mains transformer, fuse circuit, ON/OFF power switch etc. Also, before placing all the ICs in their sockets, make absolutely sure that the voltage polarity and magnitude in each IC socket is exactly as it is supposed to be. Assuming that this careful inspection has been carried out, and everything is in order we can turn to the next step, in which we will discuss adjustments and final mixer settings.

Fig. 2

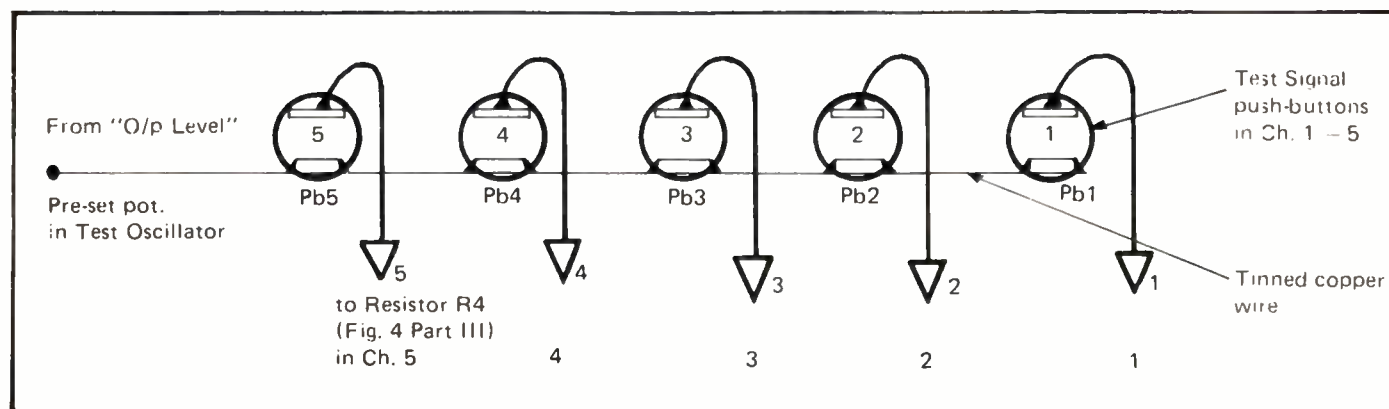


Fig. 3

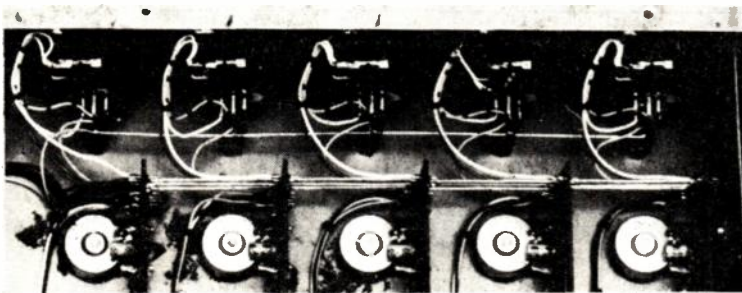
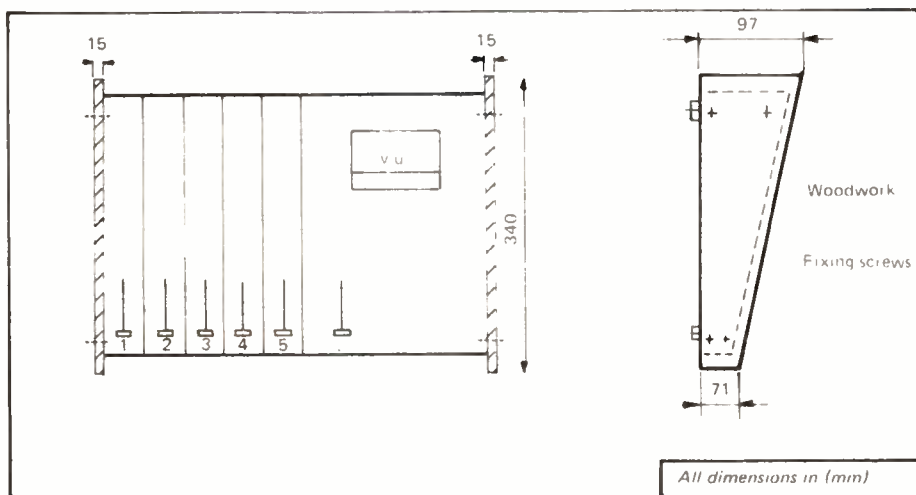


Fig. 4



Adjustments and Final setting

Three things must be adjusted before the mixing console will be ready to use.

- (1) Individual channel relative gain — adjust pre-set pot. RV4 in Fig. 1 Part III.
- (2) V.U. Meter calibration pre-set pot RV3 in Fig. 1, Part IV.
- (3) Test Oscillator "Frequency" and "O/P Level" pre-set potentiometers. Fig. 1 and 2, Part VI.

1

Pre-set pot RV4 (Fig. 1 Part III) acts as individual relative gain sub-control and allows you not only to increase/decrease each channel gain but also to adjust all five channels' gain and should be set at precisely the same level. This is technically necessary because of the tolerance of components (i.e. capacitors, resistors etc). The easiest way to do this, after switching power on into the unit, is to connect the "sinusoidal" 1.0KHz output signal from the external oscillator to the jack input socket of the mixer. Check the impedance matching between oscillator output and the mixer input. If close matching is required you can construct a simple pad (i.e. voltage divider network). However, this is not too critical in test work. Firstly, adjust the oscillator output level at approx. 7mV

RMS @ 1.0KHz frequency and then with the "Channel Fader" and "Tone Controls" at MAX, "Master Fader" at approx. 5, "Gainswitch" in HI position, the output signal from the mixer should be adjusted (individually in each channel) using the above mentioned RV4 pre-set pot to an approximate 1.228 V RMS (use an external high quality AC voltmeter). N.B. When adjusting each individual channel, be sure that all other channel faders are at MIN and their GAIN switches in an OFF position. This procedure should be repeated on all the other mixer channels in exactly the same order.

2

At the same time you can adjust the VU Meter calibration pre-set pot RV3 (Fig. 1 Part IV) to read 0.VU which we assumed earlier should be set as: 0.VU = 4.0 dBm = 1.228 V RMS = 1.0KHz

Of course without the help of a digital voltmeter you cannot possibly set this level with three decimal place of accuracy. Ordinarily a good class AC voltmeter (set into the range 0–3 volts for example) will do the job perfectly, reading simply 1.2 volts.

3

The "Frequency" in the Test Oscillator should be adjusted in a region

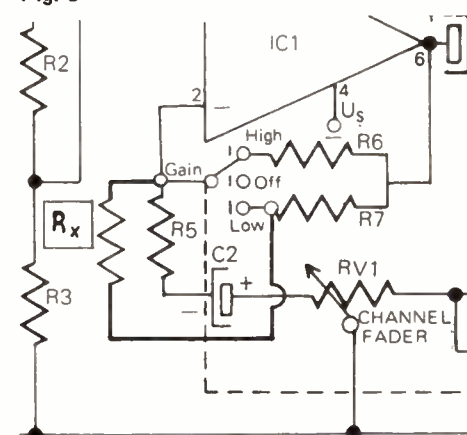
of approximately 1.0 KHz which is the standard audio frequency widely used in testing and measurement techniques. However, in this case, this is not too critical and any method of frequency measurement is allowed (i.e. direct frequency measurements, Lissejous figures etc.) When high accuracy is not especially required and you have no access to the above mentioned facilities set the "Frequency" pre-set pot at approx. 1/3 of its own rotation for an approximate frequency reading. As far as the "O/P" level from the Test Oscillator is concerned, this magnitude can be adjusted using the VU meter which is already calibrated and ready to use, by switching the GAIN switch into HI position (make sure that Tone Controls, Channel Fader, are at MAX and Master Fader at approx. 5 as before). Note: Test signal oscillator works only when "Oscillator" power ON/OFF switch is turned ON.

This procedure completes our mixer adjustments. Good Luck!

Missing Resistor

In Fig. 1 Part III of the "Build A Mixer" Project, we lost one resistor marked Rx here. The proper value of 1 M ohm should be placed as shown in Fig. 5.

Fig. 5



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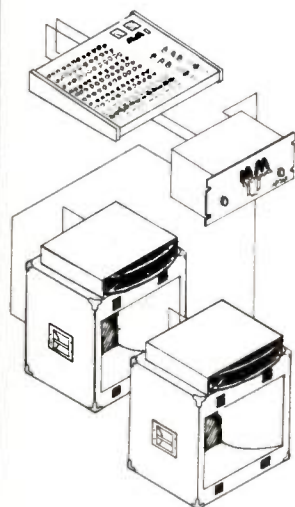
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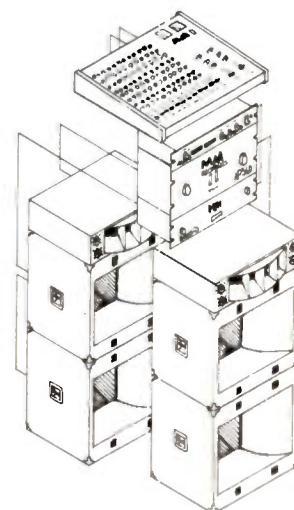
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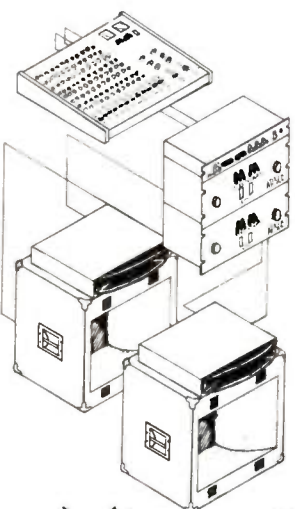
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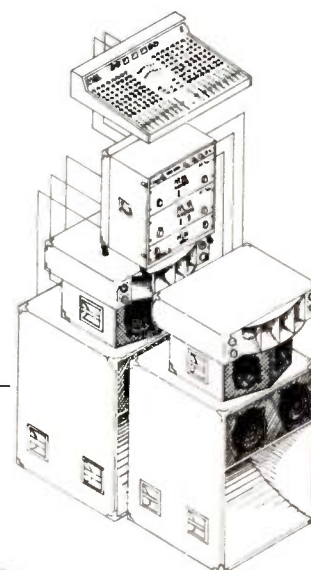
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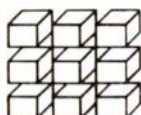


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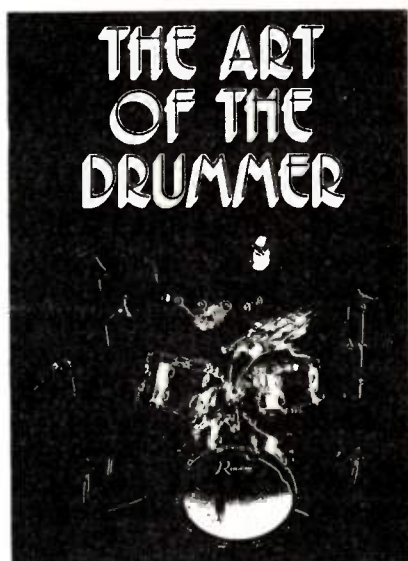
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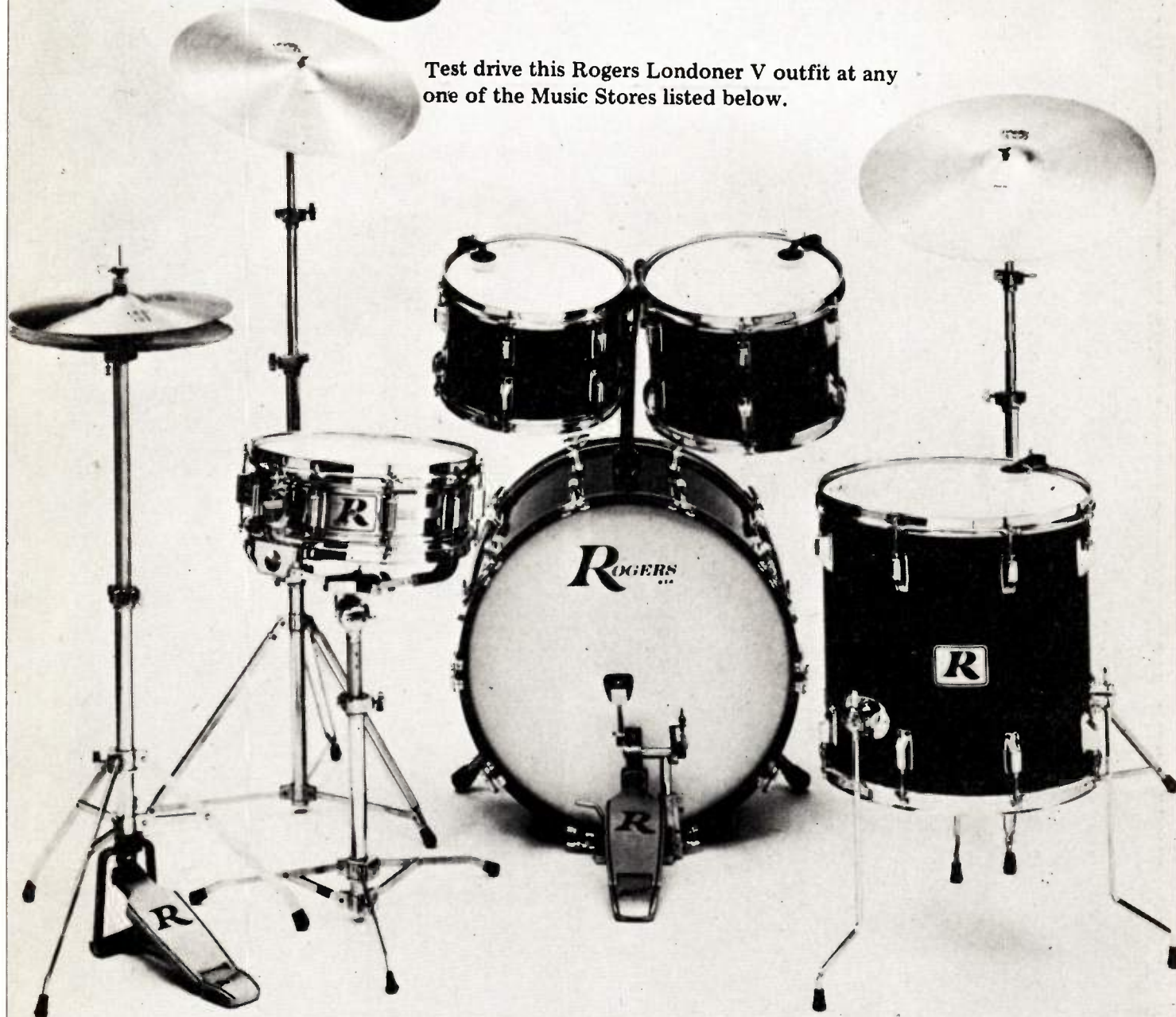


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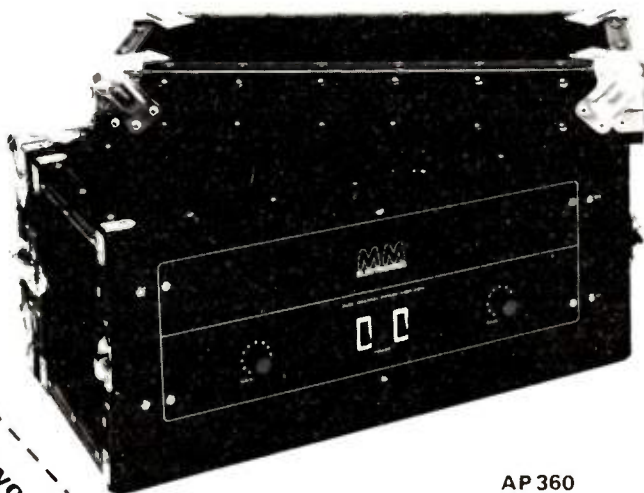
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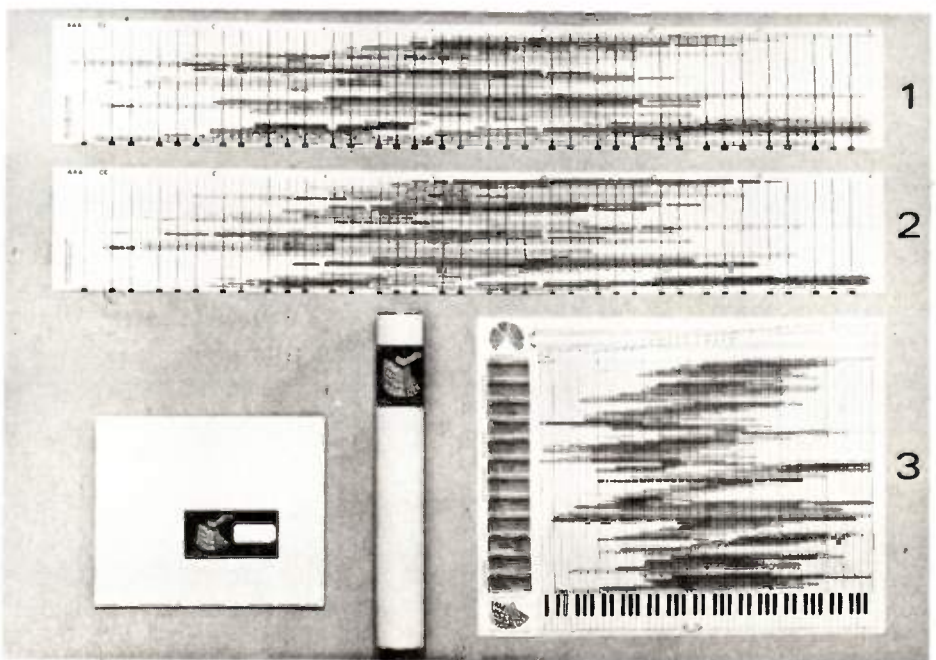
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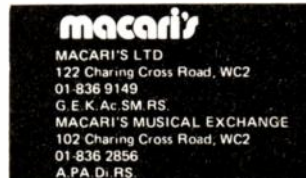
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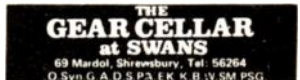


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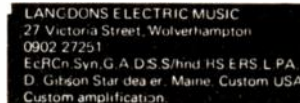
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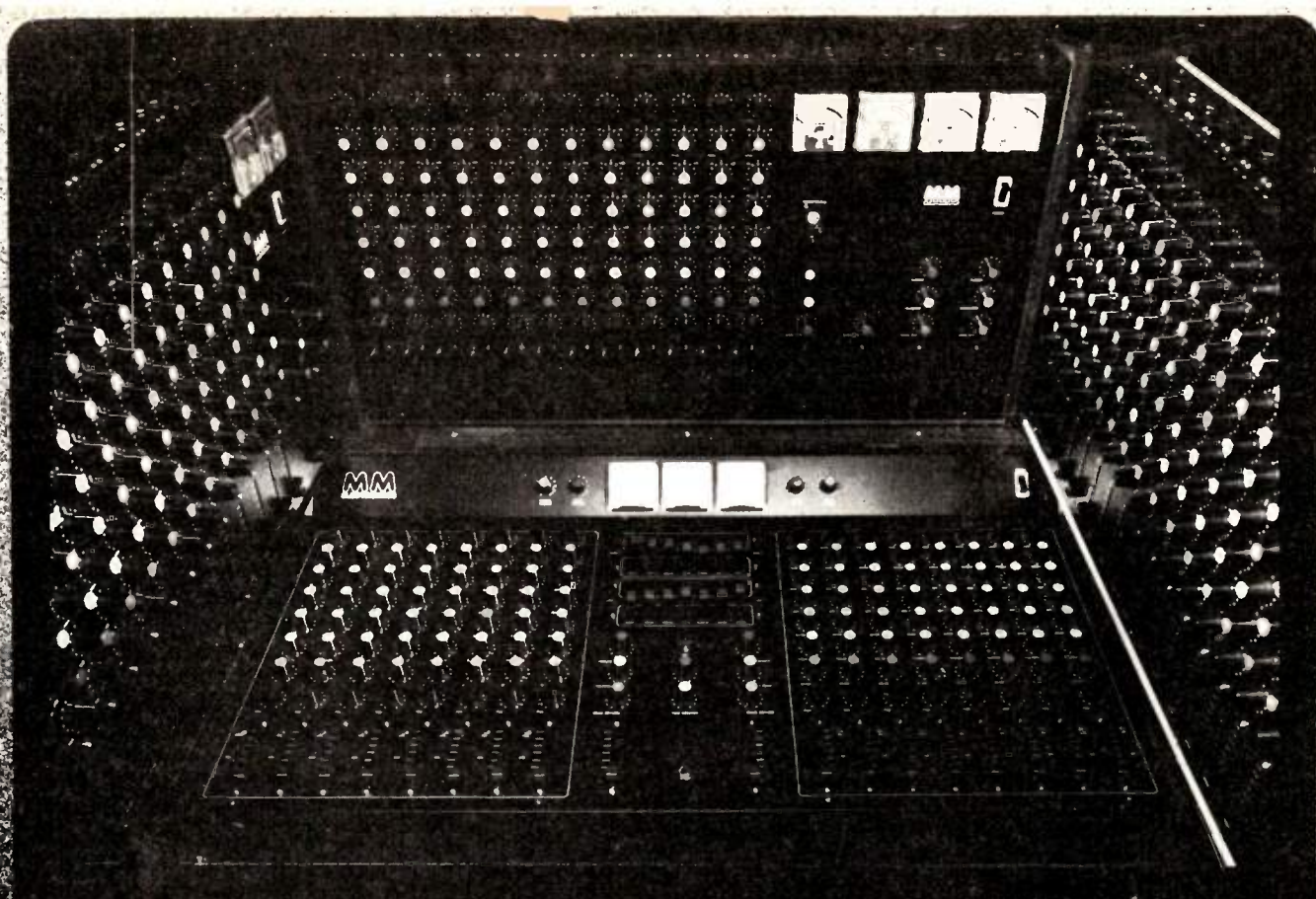
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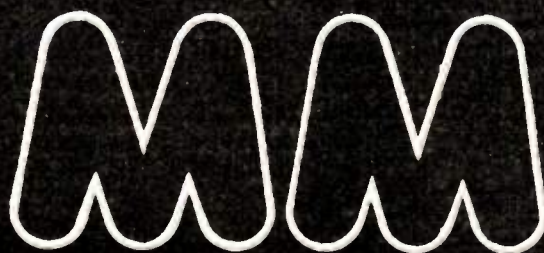
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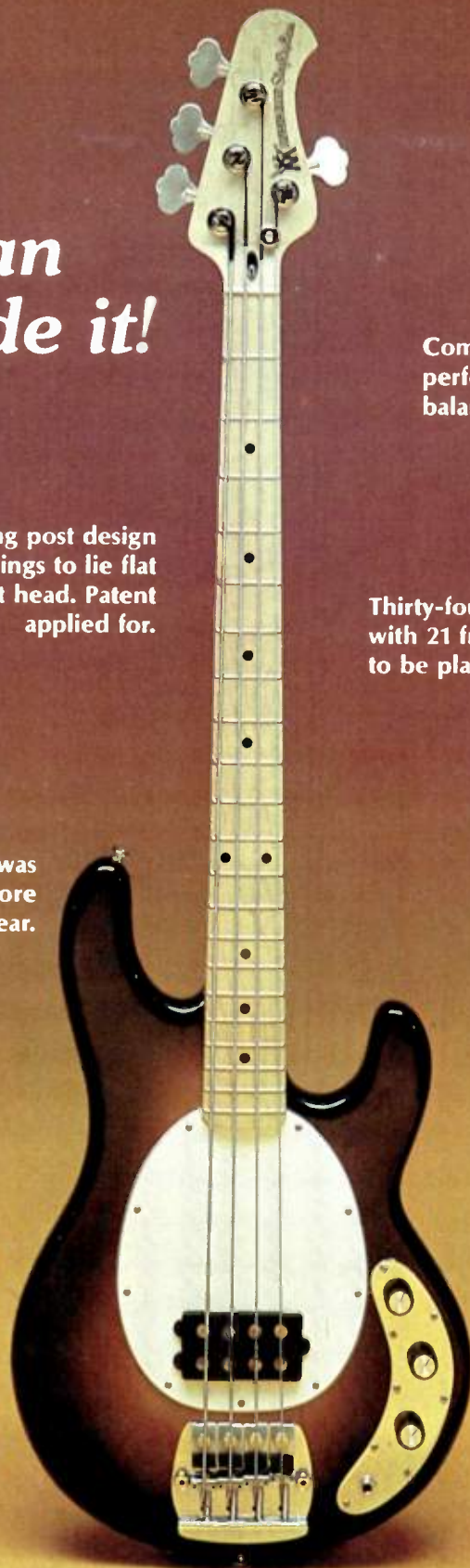
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