

tied correctly.

Another thing that can be overlooked when a cap is replaced is the series resistor (if one is fitted). If at all possible, save the original one. It's usually fitted in the neck of the cap, so bear this in mind before removing the old one.

Finally on the subject of caps don't smother them with silicone grease, rubber or other gunges. This will only attract muck and start the problem up again. Look at a new set: it doesn't have gunge around the cap does it?!

Leads from diode-split line output transformers are another favourite for this kind of trouble – I think of Philips, ITT and B and O sets in particular. The leads usually plug or push into the transformer at one end, with the cap on the other end. Again, replace the lead if you are in the least bit suspicious. Don't do what I've seen done – the lead taped up or a section cut out. Remember that the leads are tuned lengths, and again usually have a series resistor. It's perfectly in order to fit a new cap to one of these leads so long as the rules outlined above are observed.

### **Triplers and LOPTs**

If the case of a tripler or line output transformer breaks down the action required is replacement without question, not as some people would have it a quick squirt of plastic

seal over the fracture. These items are critical to safety. The cost of replacement may be high, and this could mean writing a set off and loss of a repair job, but is this worse than being sued for damages when the customer's house burns down as a result of the economy repair? Don't say this won't happen – it has.

### **Plastic Sealing and Silicone Rubber**

I am absolutely against the use of plastic sealing material in e.h.t. areas: it just seals in the fault which will reappear soon. As an aside however I would recommend the use of plastic sealing as the perfect solution for noisy transformer coils, transducers and suchlike – forget wood glue and rawlplugs or whatever else you might use. This is far and away the easiest and cleanest as well as the most effective way of silencing wound components, but always allow plenty of time for the sealing to set before switching the receiver on again.

Silicone rubber, which again shouldn't go within a mile of e.h.t. areas, is perfect for repairing VCR fronts where the buttons that are hinged by the elasticity of the plastic have snapped, usually necessitating replacement which is expensive.

If you're thinking what a load of rubbish this concern for correct action is, just remember Denis Mott's article on "The Legal Aspect" (July 1988).

## **Still Confused**

**Les Lawry-Johns**

I'm still confused but people keep asking me to do things they can't do. Like the Decca set that came in yesterday. The owner asked if he could stay as he lives a long way from here.

### **Trouble with Triplers**

As it was tripping I started by disconnecting the tripler. This stopped the tripping so I told him how much it was going to cost him. He agreed and I reached for the last new universal tripler. I didn't get it down but instead I looked at the one fitted. As it didn't have a diode lead I decided to fit a spare Philips G8 tripler which was next to the universal one. This was duly fitted and connected – as the e.h.t. lead was a bit short it had to be fitted with the chassis lowered. I then switched on. The sound boomed out and I waited for a picture to appear. And waited. I turned up the brightness. Still no picture.

I checked the e.h.t., which was present, so I moved to the tube base voltages. No first anode supply. Something stirred in my befuddled mind. I cut the mauve lead at the bottom of the right side panel, intending to try an alternative supply. Big sparks came from under the line output transformer, so I hurriedly reconnected the cut lead. There was no model number on the rear cover but I was pretty certain it was an 80 series chassis, so I looked up the circuit, aware that I'd done this only a short time ago. There's no separate rectifier diode for the first anode supply. I then recalled that last time I'd changed the tripler I'd fitted a universal type with the diode and earth leads connected.

So I reached up for the last universal type and hurriedly

fitted it. A picture appeared, too bright because I'd turned up the first anode controls. I turned them down and then turned down the colour to set up a good black-and-white display. Having done this I turned the colour up and the customer commented that it was the best picture he'd seen on the set. I apologised for the delay and he continued:

"You ought to be working in a government factory experimenting with things that won't go right . . ."

He paid up and departed and just at that moment Rick Kinslow drew up in his car. In his hand he had a tripler that looked like the one I'd just changed.

"Have you got a tripler for a Decca Les?"

"I've just used my last one."

He looked up on the shelf. "There's one" he said.

He took down one that I'd taken to be another type, but I could see the difference.

"Take it and try it" I said, ashamed of myself for not having seen it. All the trouble I'd brought upon myself for not looking properly. Oh well.

### **Processions**

I then had to cross the road to post a letter. Half way across I was amazed to see an army of ants marching down the road in perfect step, carrying banners.

"What's that on the banner?" I asked.

The ant carrying it looked up and angrily snapped "it's God of course".

"But it looks like an ant to me."

"Of course it does. What do you think God looks like?"

"Well", I faltered, "God made man in His own image".

"What do you mean His own image? You've given Him a gender!"

"Those males always do" a female ant shouted. "They think they're God and they could well destroy our planet within a few years. Why doesn't their God stop them?"

I ran over to the post box, a bit fed up with these processions that keep coming by. They'd gone by the time I got back.

# Still Swimming

Les Lawry-Johns

First I'd like to thank John de Rivaz for his helpful suggestions on medical matters. I think however that for the time being I'll carry on in this daze and see how things turn out. Maybe it's something to do with all those TV sets over the years. It could of course be the effects of whisky, about half a bottle per night, just to keep the blood thin you understand. But it could affect my head as well. Something's wrong, because I can't repair some of the Bush models that keep coming in – the T20s and T22s I've written so much about over the years. Lately they seem to be beating me.

## The Decca/Tatung 120

Then there was the Decca (Tatung) set that came in the other day. Fitted with the 120 series chassis. It kept blowing the 1A d.c. fuse in the power supply. I checked the BU426A chopper transistor and found that it was short-circuit, so I looked around for a reason. R810 was open-circuit. It's 150kΩ, so I fitted two 330kΩ resistors in parallel in its place. With these, a new BU426A and fuse the set worked all right, making me feel a little better. But I still wish all these people wouldn't keep coming in and expecting me to work miracles on their sets for nothing, saying things like "I'd do it myself but I haven't got the time".

## Arcing

This happened when a bloke brought in a Ferguson set fitted with the TX10 chassis. The focus unit was arcing over and I'd just used my last one. I released the screws that secure it to the chassis, hoisted it up and secured it well clear of the metalwork with insulating tape. After that it performed quite well and the chap was pleased to take it away, tending not to hear me say "on your head be it". A similar sort of thing happened some time ago when I was out of triplers for an hour or two. A Ferguson set was brought in with the tripler arcing over to the metal frame on which it's mounted. I released it from the frame and let it hang down by an inch or two, suspending it in this position with tape. Once again the remedy was successful and the customer departed in high spirits, having had an estimate for a lot of money somewhere else. I'll learn, some day. Cries of "when?".

## A Relative's G11

Look what happened when a relative brought in a large Philips set fitted with the G11 chassis. He complained about the bottom of the set scratching the large table on which he kept it at home. Not looking at the set properly I turned it on its side and removed the screws securing the bottom box. When I swung the box open I was surprised to find a large panel containing over sixty i.c.s and lots of other stuff.

"It's got teletext and viewdata" explained my relative. I unplugged the panel and removed it. Next I tucked all the leads inside the cabinet and, after a struggle, removed the housing. The set looked more normal and we swung it

upright to test it. On switching it on there was a good picture with normal sound on all channels.

"You won't get teletext and all that lark" I told him.

"That's all right Les, as long as that bottom bit's no longer there."

I helped him take the set out to his car and he drove off in good humour, leaving me with his unwanted bits and pieces, including the complicated panel. I kept looking at it and felt pleased that I wasn't expected to repair it.

## The Decca Hybrid CTV

Here's another example of the daft things that keep happening here. A Decca colour set was brought in, fitted with the late hybrid chassis. The complaint was excessive red. To save me having to think I changed the video panel. The resultant display was nicely balanced. I tried the pushbuttons and tuned one of them for London reception, at the same time noticing that the others weren't all that good at holding in. The owner had said however that all he wanted done was the red picture, nothing else. When he came to collect it I showed him the panel and mentioned the pushbuttons. He said they were all right and agreed that the picture was good. So he paid up and left.

Just as I was eating my lunch the phone rang. It was him again, moaning his head off about the buttons and saying it must be because of the new video panel I'd fitted. I told him that the panel had nothing to do with the buttons, and that there was nothing more I could do as he didn't want to bring it back to the shop. So that's it. He'll have to keep hitting the buttons until they click in.

Well that's it for now. Be seeing you!

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# Failure and Success

**Les Lawry-Johns**

I seem to be giving up more often when confronted with faults I could put right without thinking about it a couple of years ago. Take the Fidelity CTV14R that came in the other day. The rear-mounted 18k $\Omega$  wirewound resistor that feeds the 12V zener diode ZD5 was open-circuit so I replaced it. Switching on brought no response however. There was h.t. at the collector of the chopper transistor but it wasn't being switched on. I checked the driver transistor and all the components associated with the TDA2581 control chip, including ZD5. A couple of items didn't read right: I replaced these but the set still didn't work. So I gave up and admitted defeat.

Then look what happened just before Christmas. A woman brought in an ex-rental Multibroadcast set for repair. I told her I'd phone when I'd found out what was wrong. It turned out to be fitted with the Thorn 9000 chassis. The tripler and a couple of other things had gone, par for the course with these sets. I phoned her and gave her an estimate for thirty pounds. At this she said most emphatically that she didn't want the set done because she'd paid only seventy pounds for it about two years previously and had had to spend money on its since. She

told me not to do it and the set stayed in the shop into the new year.

Honey Bunch started to moan about the sets that had been left with us. Said they were cluttering up the shop. So when this chap came in and asked if we wanted anything dumped I pointed to the front row and he took them away. This included the Multibroadcast set. Several weeks later a chap came in and asked to collect it. I told him it had been dumped and told him he could take another working set in exchange for it. He took a nice 20in. Ferguson model and I didn't hear any more for a week or so. Then the woman phoned to say that she wanted her Multibroadcast set back. I told her it had been disposed of as she hadn't wanted it done and I couldn't keep sets that weren't collected. She said she'd sue me unless I could produce an identical set. I'm still waiting and the threat has been repeated. Oh dear!

I do have the occasional success however, sometimes after a struggle. Take the Philips G11 that came in recently. I repaired the line output panel and thought that was that. It wasn't. The picture was dark and the brightness control had no effect. Checks showed that there was a short from one end of R6065 to chassis until plug 6C was removed. This led me to the power supply panel where zener diode D4090 (BZX79-C4V7) in the beam limiter circuit had gone short-circuit. Fitting a replacement produced a good picture with full control. I'm still waiting for the set to be collected . . .

## Book Reviews

**An Introduction to Satellite Television, new edition, by F.A. Wilson, published by Bernard Babani (publishing) Ltd., The Grampians, Shepherds Bush Road, London W6 7NF at £5.95.**

Such is the interest in satellite TV that a new extended and updated edition of this book, which first became available early last year, has now been published. It's a useful handbook for any technician thrown in at the deep end by the coming of Astra and BSB, beginning with the basics and ending with the maths. Its prime virtue is that it deals with today's requirements in the UK – so many recent books have been written mostly with the C band used in the Americas in mind. **H.P.**

**Getting the Most from your Multimeter by R.A. Penfold, published by Bernard Babani (publishing) Ltd., The Grampians, Shepherds Bush Road, London W6 7NF at £2.95.**

Electronics changes so fast that the basics tend to be ignored – with test equipment meters are neglected in favour of more sophisticated gear. A good multimeter will however usually tell you just about all you need to know about a circuit, provided you use the right sort and apply it correctly. This book shows you how. **H.P.**

**Newnes Guide to TV and Video Technology by Eugene Trundle, published by Heinemann Professional Publishing, Halley Court, Jordan Hill, Oxford OX2 8EJ. Paperback edition £8.95.**

This book is a successor to two well-known Newnes Guides – to colour television and VCRs. The material from the earlier books has been revised, updated and added to for this single-volume presentation. Its well over

400 pages contain a great deal of basic information on television and video including such up-to-date subjects as MAC encoding, satellite TV reception and S-VHS. The book is not intended for those well versed in these matters, but can be recommended as an easy to follow introduction for those new to these subjects. A careful study will provide a good grounding in TV receiver and VCR operation in fair depth, and the book will afterwards serve as a handy reference. It can be obtained by post at an inclusive price (in the UK) of £9.95 from Paul Richards Books, 28 Boscobel Road North, St. Leonards on Sea, E. Sussex TN38 0NZ. **J.A.R.**

**More Advanced Power Supply Projects by R.A. Penfold, published by Bernard Babani (publishing) Ltd., The Grampians, Shepherds Bush Road, London W6 7NF at £2.95.**

This sequel to "Power Supply Projects" is really intended for the enthusiast. Because it features modern regulator chips however it's a handy book to have around. Particularly useful if you have a power supply problem with an older piece of equipment and decide to replace the whole thing with one of the current three-legged devices. **H.P.**

**IBA Technical Review No. 24: The D-MAC/packet System for Satellite and Cable. Available to bona fide technical personnel, engineers and students by application to the IBA, Engineering Information, Crawley Court, Winchester SO21 2QA.**

The IBA began publishing this series of Technical Reviews in 1962 – No. 2, the Technical Reference Book, has become almost the standard work defining the parameters of System I. This latest book looks like becoming the standard work of reference on D-MAC, and is a must for those who will have to deal with MAC equipment or explain its operation to others. The overview alone settles a lot of previously unanswered questions, especially as to how the system is intended to be progressively developed

# Strange Things

**Les Lawry-Johns**

Some odd things have been happening to sets around here. Take the two Ferguson TX9s that came in recently.

## **A Couple of TX9s**

The first was brought in by a chap from just over the road. He said the colours were wrong – blue faces etc. I told him to call back later and started on it. The faces were certainly blue, as was the colour of the snooker table. I checked everything thoroughly, first the resistors etc. on the tube base panel then back to the output transistors on the main panel. There was nothing amiss so, feeling a bit of a fool, I removed the RGB drive leads from the tube's base panel. Red at the bottom, blue in the middle and green at the top. I put the red lead at the top and the green one at the bottom. The faces then looked all right but the fields were blue. So I changed over the green and blue leads, which produced green fields and a green snooker table. We now had the blue lead at the bottom, the green lead in the middle and the red one at the top. I didn't like doing this and it worried me. The set was left working all day and when the chap came back I told him what I'd done. He looked at the picture and said it was perfect. I asked him whether anyone had worked on the set and he said no.

So what had gone wrong to make it necessary to swap over the drive leads? The manual says that the green lead should be at the bottom, the red one in the middle and the blue one at the top. Surely the cathodes can't change their colours in this way? The leads looked to be undisturbed, correctly wrapped round – now they are soldered on. The set continues to work well. Strange.

The second TX9 came in with intermittent field collapse. I fitted a new TDA1170S field timebase chip and the set worked for several hours. Then suddenly the field collapsed again and when I pulled the chassis out the field scan was restored. I tapped around and it collapsed again. Next I found that there was no voltage at D94, the rectifier that provides the 24V supply for the field timebase. After a lot of mucking about I discovered that the field collapse came and went when pin 12 of the line output transformer was tapped – it connects the earthy side of the winding that feeds D94 to chassis. I cursed myself for not thinking of this earlier and remade the joint. No amount of tapping had any effect after that. Another easy job made difficult by my bungling.

## **Fidelity Problems**

Fidelity CTV14Rs (ZX2000 chassis) never used to give me any trouble. One came in the other week and seemed to work fine after I'd fitted a new line output transformer. Shortly afterwards it came back. This time I found that the BU208 line output transistor was shorting intermittently. On the last time it had done so it had blown the BUW84 chopper transistor. So I replaced both transistors and the set worked fine. Until next morning, that is. When I switched it on there was a loud bang. This time the BUW84 had shorted, blowing the mains fuse. I checked everything and fitted a new line output trans-

former, a new BU208 (just in case), two new bridge rectifier diodes, another BUW84 and a mains fuse. The set then worked normally but next morning there was another loud bang at switch on and I was back at square one. Why should a set that works perfectly when repaired go bang next morning? To cut a long story short, apart from two line output transformers, three BU208s, several BUW84s and of course fuses I must have fitted at least a dozen mains rectifier diodes before the set would work reliably.

When the owner came back I told him what had been happening to the set, and to me. He took it away and gave me back an aerial amplifier he'd purchased a week before, refusing to take any money for it. There are some nice people about – I'd begun to think that they were getting to be a bit thin on the ground.

Incidentally I'd like to thank those nice TV boys in Plymouth who repaired my daughter's Fidelity set – the one I'd given her some time ago. I hope it didn't give them as much trouble as the set just mentioned. I also wish they'd come and fix this CTV14 (ZX3000 chassis) that came in with a blank white screen. The lady who brought it in said there wasn't much wrong with it and I'd be able to do it in no time.

I thanked her and started on it. The screen was bright with white lines across it. So I turned down the first anode knob on the line output transformer and changed the TDA3562A colour decoder chip. With the new chip installed a picture appeared. I'd turned the brightness down, and when the controls were readjusted there was a good monochrome picture. But when the colour control was turned up the picture remained in black and white. She said the set required only minor treatment so I gave it up and returned it. I feel ashamed of myself, but there it is – I'm getting old and don't want to do things for nothing.

## **The Pye G11**

A Pye G11 came in recently with no sound or vision. I did my usual checks before switching on – the mains and h.t. fuses all seemed to be intact. So I switched on and heard the e.h.t. rustle up. But there was no l.t. supply at the lower left side i.f. panel. When the line output panel was swung out I found that the lower, 1A l.t. fuse was open-circuit. After switching off I checked from the fuseholder to chassis. There was a dead short which disappeared when the long socket was unplugged. So I turned my attention to the lower left side i.f./tuner panel, having refitted the socket on the line output panel.

As the short was still present I suspected the 12V regulator. When I removed the power input socket however the short disappeared. I started to frown at this and went back to the line output panel. Removing the socket here once more cleared the short. So what was I up against? A short in the wiring? I checked for this but there were no shorts.

It appeared that the short was present only when the socket was connected. I then did what I should have done in the first place. I again removed the socket, then checked from the fuseholder to the panel's true earth (not the frame). This time the short showed. A look at the circuit suggested that the LT1 supply's reservoir capacitor C1350 was the culprit, and when this was removed all was well. A new 150 $\mu$ V, 50V electrolytic restored the sound and vision and after a final check it was time to write out the bill. Another example of making life difficult for myself . . .

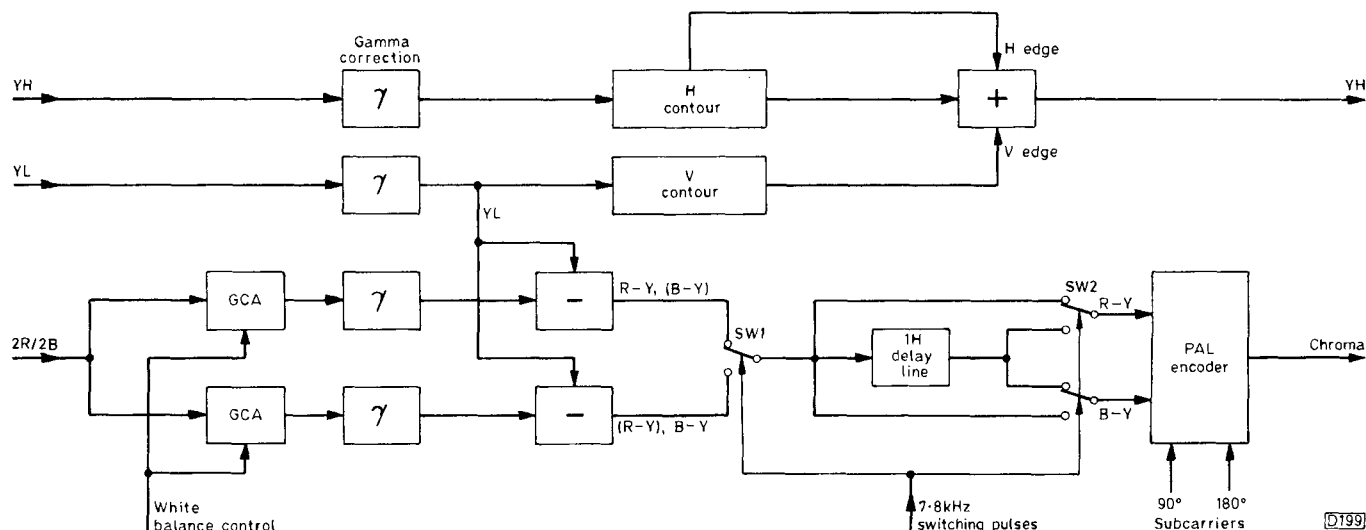


Fig. 9: Block diagram of the circuitry used to produce Y plus simultaneous colour-difference signals.

applied to add and subtract circuits which produce YL and, on alternate lines, 2R/2B as in the previous example.

The line-sequential R and B signals must next be converted to simultaneous R - Y and B - Y colour-difference signals. This is where the one-line delay line comes in. Fig. 9 shows the arrangement used. The two luminance signals are passed through individual gamma correctors to ensure linear light input/output voltage characteristics. Horizontal and vertical edge correction is then applied to the full-bandwidth luminance signal to crisper the picture. The 2R/2B information is fed to two separate paths each incorporating gain-controlled amplifiers for white balance and gamma correction. Subtract circuits then introduce the low-frequency Y signal, resulting in line-sequential colour-difference outputs (R - Y/B - Y). Use of a delay line and half line-frequency switches SW1

and SW2 finally provides simultaneous R - Y and B - Y inputs for the colour encoder. A point to note when servicing is that the two 2R/2B channels are designated the red and blue channels respectively, which could be confusing.

Our account of the colour signal processing in this article has been somewhat simplified to make it more readily understandable on first acquaintance. Those who would like to follow through a more detailed account may refer to pages 178-183 of the present (third) edition of my book "Videocassette Recorders - a servicing guide", published by Heinemann Professional Publishing at £20. Another point to note is that a four-phase clock pulse drive system is used for the vertical shift registers in CCD-type solid-state image sensors. Again you will find more on this in the book.

## The Party's Over - Well Almost

Les Lawry-Johns

It's time to call it a day. Not only the song goes like that. We don't get any younger and the health problems are very persistent. As far as the business is concerned the party is over and we have to pick up the pieces and pay our debts, if we can. Us careful ones haven't got much to worry about but I know that there are a lot who have. Some years back I wrote about my Grandad. He was the skipper of a ferry boat and it was only when he bumped into Tilbury landing stage that it came out he couldn't see. After that my mum had to go across the road to get his pint of beer. The last act was on for him then, and it seems like only yesterday. Some sixty years ago I think. If anyone wants to look up the issue where I wrote up the story it was in October 1979. Yes the party is finally over as far as this shop is concerned. We're moving out soon, into a small bungalow not too far away. So we'll get a bit of a rest, but I'll still do my bit of writing to keep in touch with you.

### More Sets

In the meantime the sets keep coming in.

Take the Philips CTX-E for example. The note said "no go". So I immediately dived for the switch-mode

power supply. The BUX84 chopper transistor was open-circuit. I replaced it and plugged the set into the mains again, having left it switched on. Nothing happened. I checked around the BUX84 and found that it wasn't being driven. So I checked through the circuit but couldn't find anything wrong. When the owner came for it I had to tell her that I hadn't been able to find the fault. She left with the set and it was only later that I realized it had been a remote control model without the remote control unit. I hadn't done anything other than plug it into the mains. What kind of fool am I?

To show you what kind of fool, I've been looking through past issues of the magazine to try to refresh my failing memory. What about this? In the March 1982 issue I was rabbiting on about the weather and mentioned about my friend Ridley coming in. "If we keep burning fossil fuels at this rate Leslie, the greenhouse effect will become so serious we'll all be dying of heat."

Ridley was a solicitor, and that was back in 1982. How did he know then?

Well, that's all I can think of at the moment. People keep calling in to look around the shop and the accommodation upstairs. If we didn't own the joint the party would probably have been over some time back.

reliably displayed on an oscilloscope. By means of thumbwheel switches one of up to 1,250 possible lines in the display (interlaced or non-interlaced) can be selected. The unit works by providing a pulse for the scope's external trigger input. The unit is battery powered for portability and uses PLL circuitry to eliminate jitter. Price is £340 plus VAT.

Rendar Ltd., Durban Road, South Bersted, Bognor Regis, West Sussex PO22 9RL has introduced a comprehensive range of quality BNC, TNC, F and MIL-specification N connectors manufactured in Japan by Marushin. The firm also has a large selection of adaptors to make cross-connection between different types of connector easy.

Litesold has introduced the Project ETC-5 range of soldering stations with electronic temperature control. There are three models, Viper (20W), Cobra (50W) and

Mamba (80). Each has its own dedicated soldering iron with the 5-pin DIN plugs differently wired to prevent damage from wrong insertion. All control units are housed in similar enamelled steel cases that provide full screening and earthing. For further details apply to Light Soldering Developments Ltd., Spencer Place, 97/99 Gloucester Road, Croydon CR0 2DN.

Schlumberger has introduced a new signal generator for testing D-MAC and D2-MAC packet transmission paths and reception equipment. The SI7765 provides comprehensive test patterns and signals to EBU specifications to simplify installation and maintenance of DBS equipment. The price is £4,300-£5,950 depending on the facilities incorporated. A colour brochure is available. For further details apply to Schlumberger Technologies, Instruments Division, Victoria Road, Farnborough, Hants GU14 7PW.

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## Here We Are Again!

Yes, we're still here, but I wonder for how long?

It's thirty five years since I wrote my first article for *Practical Television*, as this magazine was then called. It was the first one in the "Servicing TV Receivers" series. Seems only yesterday, honest. Many of my articles over the years have appeared under pen-names, such as S. Simon. Did you get the joke I wonder? Simple Simon you see! When I read some of those articles now I'm quite surprised. Did I really know all that? There was also Peter Gaymead Frazer and, going back to earlier days, N. Mead. So I must have been a clever fellow, though I didn't realise it.

There must be many of you who can write a lot better than I can and haven't yet reached the winding down stage. You will though. It seems that in my case I've done so much earlier than most people do. I find myself doing daft things but there have been no complaints so far – except from that lady who is going to sue me for chucking out her set after she told me she didn't want it done as it was going to cost thirty quid to replace the tripler etc. and then left it for some time in the shop. She still hasn't returned the set I gave her in exchange and I do wish her solicitor would stop writing to me. I've told him I'm trying to get a white portable, Thorn 9900 chassis, with remote control sticking out the front, but they seem to be a bit thin on the ground. Frankly I'd thought it was the 9000 chassis, but Keith and Alex put me right about that – they popped up from Portsmouth the other day. I've not been right for a long time, which is perhaps why I've not yet sold this shop though I've bought a bungalow and am now in debt to the bank because of a bridging loan. Not for long, I hope.

Sets still come in, though there are very few of them. I never got around to taking in videos for repair. The family's videos, including our own, are taken to Geoff's at Moon Lane for repair. Geoff isn't upset by this as he too is short of TV repairs. I suspect that there are a lot of you in this situation, what with all these imported sets being sold with guarantees that last for years. They'll start to give trouble eventually, but will it be worth repairing them when spares and data are expensive and difficult to obtain?

Be that as it may, perhaps I can briefly return to those early days thirty five years ago. The editor then wasn't our

John. It was F.J. Camm, the magazine's founder, who had his name up front. F.J.'s brother was Sir Sidney Camm of Hawker aircraft fame – he designed the Hurricane, the Fury and all the other famous Hawker aircraft made before and during the second World War. I could give you a long list as aircraft were my all consuming hobby at that time – I can remember giving lectures on aircraft recognition when I was in the Fleet Air Arm – but this interest began to wane as I worked on the aircraft in this country, Gibraltar and Alexandria (just past the stinking tannery). I still have photographs taken at the time and the memories keep flooding back, more so than of what happened yesterday but I dare say there are lots of you like that.

### The Fidelity CTV14R

We had another Fidelity CTV14R (ZX2000 chassis) in the other day. I expected to have to fit a new line output transformer but this wasn't necessary. The complaint was that the picture kept rolling and going off. After a while I discovered that the focus control was damaged. This was no problem since we keep having to remove the focus control in these sets, together with the first anode control, when fitting the ZX3000 series line output transformer. A new focus control was fitted in no time and the picture no longer rolled and hopped on and off. I then noticed the matchstick in the on/off switch. When this was pulled out the switch no longer worked. So in went another, complete with the remote contacts.

I phoned the owner and she agreed to pay what I asked (none of your business!). Anyway she came in later and handed me a twenty pound note and I handed her a fiver.

### Colour Changeover

I'm sorry about the set that changed its colours. Should have realised it was the degaussing unit. But honestly the changeover was so complete I didn't think it could be that. The set lives over the road so I'll hear about it if it mucks about again, and so will you.

That's all for now. Anyone who to buy a famed store in a prestige position? Mr. Fayed from Alexandria perhaps?

divided by two as shown at (b) so that the digital audio information is now in the form of 24 8-bit symbols. Fig. 11(a) and (b) is an expanded form of Fig. 9(a) and (b). In (c) a number of 8-bit symbols containing the subcode and CIRC data have been added. Following this all the 8-bit symbols are translated to 14-bit form and merging bits are added between each symbol, including the subcode and CIRC symbols, as shown at (d). Finally 24 bits of data are added for frame sync. The complete frame consists of 588 bits.

## Summary

The principles we have been looking at, i.e. sampling, quantization, AD conversion etc., are not peculiar to the CD system. As more analogue signals are converted to digital form for various purposes engineers will become all too familiar with these principles. Don't be discouraged if you find it difficult to remember the finer points in digital encoding — this won't in any way prevent you from servicing CD players. As I pointed out in my introduction at the start of this series, an appreciation of the theory on which the equipment you are servicing is based will give

# Thanks a Million

**Les Lawry-Johns**

Thank you for all the kind letters that have been arriving day by day — also the retirement card from John Boyd. I'm glad to know that you are all keeping well (sorry about the thyroid, Harold). You just don't know what these letters mean to me. Although we've bought the bungalow to retire to it looks as if we shall be here in the shop for a while yet — it just won't sell. Plenty of people have come to see it, but it either doesn't suit them or they don't want to borrow the money with the economic situation being as it is.

So I'm sitting here singing to myself with almost no customers, no money coming in and plenty going out. No old age pension either. But I mustn't bore you with the morbid details. You've probably got worries of your own, maybe more than I have.

Anyway we're still dealing with a few sets, like the ITT CVC20 that came in about a week ago with very poor field scan. The picture was only a few inches high, with a bright line across the bottom. I always dread this because it just has to be the most awkward transistor to get at, T10 (TIP33). The voltage readings confused me a bit, but then they always do. Collector right, base about right, emitter high — above the base voltage. So out came the transistor, after the usual struggle, and in went in a new one. A TIP3055, which is what I usually fit. In its cramped position at the top of the chassis, under the line output transistor, bolted to the metalwork. Once it was in there was full height and the picture looked good.

It was collected but came back a few days later, tripping for the first few seconds then lapsing into sullen silence as these sets do when an overload is present. I dived for the tripler and unhooked it from the line output transformer. This didn't make any difference so I checked the line output transistor carefully. It had a leak. I fitted one of my thick BU208A transistors and left off the tripler's contact just in case. This time the set came on, but went off again when the tripler was connected. So I had to fit a new

## APOLLO LANCASHIRE

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you greater confidence and, sometimes, help you to make an informed decision as to where the fault actually lies.

Next month we'll continue with the theory by taking a look at the frame sync, the error correction techniques used and the content of the subcode.

tripler as well. Nothing to do with the first repair, but how do you charge a realistic price?

Shortly afterwards another ITT set came in, this time a 26in. model fitted with the CVC32 chassis. "Dead" they said, and dead it was. I checked the mains input and traced it through to the main deck. My suspicions centred on the CMP30 chopper control subpanel, so I took it out and checked all the resistors etc. As these seemed to be in order I changed the TDA2640 chip and replaced the panel. The set then started up without trouble and a good picture appeared.

A young lady brought in a Fidelity CTV140, saying that the screen was brightly illuminated and couldn't be turned down. When I switched it on there were some sparks inside the tube's neck and further sparks on the tube base. A check on the components mounted on the base panel revealed that the small 33kΩ resistors (three groups of four, acting as collector loads for the RGB output transistors) were overheating. The usual cause of this is incorrect drive from the TDA3330 colour decoder chip, so I checked the voltages at the output pins. The readings were wrong and I suspected that the chip had been damaged by the sparking. Despite a search I couldn't find a replacement. This meant ordering one or two, then seeing them fail after a short time.

I decided to be the coward I've always been. I reassembled the set and when its owner returned I advised her to take it to someone who would have more confidence in themselves, like Moon Television in Moon Lane. Sorry Jeff. Sooner or later I'll have to tell them that you're actually Sun TV in Sun Lane . . .

As I've been busy typing this two women have been standing outside the shop gossiping away. For about half an hour. At last one of them said something that upset me. "As sure as the sun rises in the east and sets in the west . . ." At this I rose and opened the shop door. "The sun doesn't rise in the east and set in the west," I told them, "it only appears to do so because this little planet is spinning around the enormous sun. Now go and do some thinking instead of gossiping all day."

Sorry about that. Cheers to you all. Love from Zeb, Tessa, Spock and that bad-tempered bird. And Honey Bunch of course.



- (62) Sticks on one channel. ICC5, ICC6 or ICC7.
- (63) Won't memorise a station. ICC5, ICC6, DC8, TC5 and CC21 have all caused this fault.
- (64) Scans tuning but doesn't stop when station found. CC12, CC13, CC18, RC31, TC1, TC2, TC3, RC35. Clean the contacts of the plugs and sockets on the microcomputer panel.
- (65) Set won't sweep tune. ICC2, ICC3, ICC1 and CC17.
- (66) Set runs but no control operation, no display of channel number etc. ICC1 or if accompanied by a tick on sound check the smoothing of the 15V rail (CC1, 470 $\mu$ F). This should be checked whenever a segment display fault is noted (see below).
- (67) Display doesn't alter, e.g. stuck on no. 1. ICC1 and check for hum on 15V rail – see (66).
- (68) Segment display goes out intermittently. ICC2 and check 15V rail for hum.
- (69) Green bar tuning display does not disappear from screen. ICC2 and TC4.
- (70) Tuning drift. ICC3, CC12, CC13. See also (16) and (83).
- (71) No control operation for a few minutes from cold. Ensure that TC9 is type BC307B not BC307A.
- (72) Clock runs slow (1F4/8). ICC1 and ensure that RC7 is 1k $\Omega$  not 2.7k $\Omega$ .
- (73) No sweep tuning, display blank. ICC3, ICC6.
- (74) No u.h.f. indicator. ICC7.
- (75) One row of keyboard not working. Check continuity and replace keyboard as necessary.

- (76) One segment in channel display not illuminated. DS1.
- (77) Remote control not working, handset o.k. Check adjustment of RTUA1 (see below) or suspect ICUA1 or CUA2 incorrectly fitted.
- (78) Remote control range poor. CUA8 not earthed or check adjustment of RTUA1 (see below).
- (79) Set intermittently starts from standby on its own. Faulty self-wiping contact.
- (80) Tuning display incorrect. ICCN2 or short out DCN2.
- (81) No display. ICCN2.
- (82) Display always on screen. ICCN1.
- (83) Tuning drift. Add a 2.7M $\Omega$  resistor between pins 6 and 9 and an 8.2M $\Omega$  resistor between pins 3 and 9 of ICC3. Remove the 10M $\Omega$  resistor from pin 6. Also check the 33V regulator ICC4. Add a 1N4148 diode from the 33V rail to (cathode) pin 11 of ICC3, cutting the print to connect the diode in series. See also (16) and (70).
- (84) Set intermittently shows an erroneous channel display. Replace CC4 and CC5 (previously 82pF) with 100pF or add 20pF in parallel with each. If the fault persists replace ICC3.

To adjust RTUA1 (remote control receiver) transmit from the handset and find the ends of the range of adjustment of RTUA1 where the IR receiver LED (on the channel display LED) lights, then adjust it for the centre of this range.

## The Pretty Weightlifter

**Les Lawry-Johns**

I was sitting here minding my own business when a car drew up outside. A pair of pretty legs swung out, and a delightful young lady walked into the shop.

"Will you fix my TV for me?" she asked.

"Of course my dear, what name is it?"

"Wade" she replied. Wade? I'd grown up with these people, known them all my life. As I was writing this down she went back out front and opened the car's boot. I thought it would be a portable. She leaned over, and we saw more of the pretty legs. She then lifted out a 22in. Bush T22A. I've seen substantial men falter when lifting one of these out of a boot. She trotted in however and placed it on the bench.

"How did you manage that?" I asked in awe.

"No trouble" she smiled, "how much will it cost?"

"Not more than fifteen pounds" I said, resisting the temptation to say I'd do it for nothing.

"O.k. then, when shall I call for it?"

"This afternoon, please."

### The T22A's Problem

So off she went. What a swinger! I took the back off and switched on. The power was present but nothing started. After disconnecting the tripler I tried again. Still nothing, but this time I heard the timebase start up and the sound began to hiss. I switched off and checked 5R13 (330 $\Omega$ ), over on the front right side at the bottom, in the tripler's earth connection. It was open-circuit, killed by the tripler. I fitted a replacement and removed the faulty

tripler. In doing so the focus unit broke up. I shouldn't be so rough. With patience I installed a universal tripler, cut the leads to size and fitted a new focus unit. The set now worked well, displaying a good picture.

The young lady returned as promised and paid by cheque. This time I insisted on carrying the set out and putting it in the boot.

"Thank you, it nearly killed me bringing it in" she said.

"Anything for you, but don't do it again" I smiled. I was going to continue but Honey Bunch had by now taken an interest in what was going on and I had to behave myself.

### A Tripping Thorn 8800

The next one in was a Thorn 8800 which really showed how stupid I've become. It was tripping, so I removed the e.h.t. rectifier's lead from the line output transformer. The thing then started up. Being the oaf that I am, I fitted a new e.h.t. unit and tried once more. After a delay the tripping started. Instead of disconnecting the focus unit I concluded that the e.h.t. rectifier I'd fitted was faulty. I fitted another one and this time smoke came from the focus unit then the tripping started again.

Fed up with myself by now I removed the focus unit and saw that there was a dent in its back. I searched high and low for another but couldn't find one – all the stuff is in sacks ready for the move, so I could have missed one. There was nothing for it but to nip along to Geoff's in Sun Lane. He was able to help out but with the new one fitted we still had tripping. To cut a long story short, the faulty focus unit had destroyed the e.h.t. units I'd fitted. I shouted at the cat and pushed her off the bench, then started the search for another e.h.t. unit. At last I found one and, with my fingers crossed, fitted it. Three had been destroyed but this time everything came on o.k. and I breathed a sigh of relief.



Honey Bunch appeared and commented that I always get the easy jobs . . .

### Thanks

I'd like to thank all of you who've written. But don't come down to see me – I'm ashamed of the shop, the way

I've let it go. Unless you want to buy it of course! I'd also like to thank Rick Kinslow for bringing in that bottle of 100 Pipers scotch. H.B. doesn't like it, so I had to drink it all myself. It was lovely and has lifted the depression that's been engulfing me lately, try as I might to throw it off. But I know there are a lot more out there worse off than I, so I mustn't moan.

## Review: Tatung's Early Bird

**Eugene Trundle**

Quite a wide range of satellite TV receiving systems have become available since Astra was launched. Many are aimed at the volume market with prices in the under £300 region. A typical example is the Tatung Early Bird Model TRX1801, which has a suggested retail price of £250-£329 depending on the choice of dish size and LNB rating. I installed one at home and have lived with it for many weeks. We are also deeply involved in selling, installing and servicing these packages and sorting out any problems that arise. Thus this review takes a look at all aspects of the system.

### General Description

A wall-mounted offset aluminium dish finished in white is supplied in either size 60cm or 80cm. The LNBs have HEMPT devices, the noise rating being 1.5 or 1.8dB to order. The receiver has IR remote control, with 19-channel selection from a small, simple handset whose ten keys are duplicated on the receiver's front panel, along with  $\pm$  tuning buttons and a memory key. Station tuning and polarisation data are held in a non-volatile memory which is preprogrammed at the factory to the Astra channels for easy dish installation. A 1½-digit seven-segment red LED display provides channel identification (1-19).

Audio capability is single-channel (6.5MHz), i.e. mono only. The audio and video signals are modulated on to a u.h.f. carrier preset to ch. 38 but tunable over chs. 32-39. There's also a scart output connector providing mono sound in/out, MAC/PAL and baseband outputs. The u.h.f. input socket provides a loop-through facility. Other connections, at the rear, are for the LNB download (F connector) and the polariser supply. The receiver's main electrical characteristics are as follows: input 950-1,750MHz; threshold 6.5dB; power consumption 20W. It's a compact unit, measuring 250mm wide, 170mm deep and 63mm high, with a black plastic case.

### Outdoor Unit

I believe that the dish assembly is one of the best in the budget range. The dish itself is elliptical and is mounted on a very heavy and sturdy wall bracket made of tubular steel. Its tilt and pan actions are positive, making alignment easy. Once these are set the clamping action is strong and rigid with virtually no "twang".

The LNB and feedhorn are mounted on a single, rigid tubular steel arm that sets the focus point without any need for adjustment. The magnetic polariser is incorporated in the feedhorn and is supplied by a separate twin-core cable which takes a constant bidirectional current of about 35mA. Its insertion loss is very low at

around 0.3dB. The combination of this polariser design and the LNB pickup probe gives excellent polar isolation – exceeding 18dB for the Astra channels.

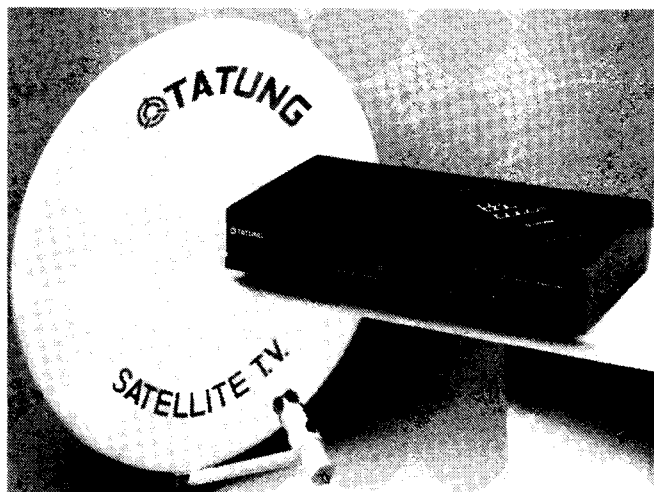
The LNB typically beats its noise rating by up to 0.2dB. Feedhorn and LNB are well protected from the weather and creepy-crawlies. I tried both the 1.5 and 1.8dB noise versions at different times with 60cm dishes and got good results from both at this part of the country within the 52dBW footprint.

All in all the design of the external unit is excellent, both physically and electronically. If properly installed it should be capable of standing up to the worst of the increasingly freakish British weather.

### Indoor Unit

The indoor receiver, which is literally a black box, is capable of giving excellent pictures and passable sound, though in this price range the facilities are necessarily limited. The mono sound is fine so long as you don't intend to hook up to a stereo TV or hi-fi system, but there's no facility for reception of extra carriers (i.e. radio, alternate language or stereo) unless and until scart-linked add-ons become available. I found that the reproduced pictures are very good via either the r.f. or AV links, the exception being some very early production models whose energy-dispersal clamping was not fully effective, giving rise to vertical judder effects with some VCRs and TV sets. There's a modification available for those receivers that left the factory without it being done.

The receiver is easy to program. At the end of each



*The Early Bird package. Several detail changes have been made since this photo was taken: the LNB is now square in cross-section and has a feedhorn; the front panel has ten numerical keys with  $\pm$  tuning and memory buttons; and the handset is smaller and simpler.*

# You Won't Believe This . . .

**Les Lawry-Johns**

We've had a wall built around the rear garden of the bungalow. Not to keep intruders out but to keep the dogs in. The rear garden has also been concreted, again for the dog's use. As repair business at the shop dried up we moved to the bungalow, with the dogs, cat and bird, hoping that the shop will sell before long.

The bungalow is in a secreted part of a housing estate built well after the war on a site previously occupied by Gravesend Airport, which was used by Fighter Command during the war. When an invasion was expected in 1940 all the runways were mined. The public was not informed of course. All these years later the Royal Engineers have been instructed to locate the long tubes of explosives and make them safe. So two days after we arrived we were told that the whole area is to be examined, using metal detectors, and eventually made safe. What a welcome!

Anyway, we've not been blown up yet and the shop telephone number has been transferred to the bungalow.

The other day a man phoned to say that the Decca TV set (80 series chassis) he bought from us some years ago suffered from field collapse after it had been on for about fifteen minutes. He said that hitting the top of the set restored the picture, so I thought it would be a dry-joint. I told him I would be at the shop in ten minutes. When I got there I waited for him to appear. He didn't. So after half an hour I drove to his house. He opened the front door and said "I thought you said ten minutes?"

"I said I'd be at the shop in ten minutes. That way you'd have avoided the call-out charge."

After removing the right-hand side timebase panel I resoldered all the field timebase connections. I then turned the set round and fitted an aerial. There was a good picture when I switched on. It was still there half an hour later.

I replaced the back and suggested a charge of £20. He flinched. "That includes the call-out charge," I explained.

He paid me and I drove off. Before I got very far I was held up by traffic. While waiting I saw the chap I'd just left chasing up the road, so I backed down to meet him.

"It's gone again."

Back to the house again. When we got there the set looked perfectly all right.

"Blast. It's come back again."

"I bet your wife was upset," I said.

"Oh no, this is my set. She's watching hers in the front room."

I took the back off again and watched for another half an hour. It was obvious that the fault was not a dry-joint as I'd assumed. It occurred only when the back was on and the temperature rose. I'd no hairdryer with me to make heat checks on the components and it struck me that this would be best done in the shop. I told him I'd call later to pick the set up.

When I got it to the shop I managed to create the fault by pulling away at the upper left plug and socket on the right side timebase panel. So I took the panel out and resoldered all the connections. There was a clear picture when I switched on again. After refitting the back I let the set run for an hour or so. Then, confident that all was well, I put it into the estate car carefully and returned it to Mr. Evans.

I was similarly gentle with the set when I got to his house. I plugged it in and connected the aerial. There was a white line until I clouted the top of the set and a picture appeared. This was too much. I returned the £20 and apologised. In fact I practically ran out of the house. But I've an idea that the set will be all right after this.

## **The Midday Clinic**

When I got back to the bungalow the phone was ringing. A G11 I'd repaired several weeks ago had gone wrong. I asked the owner to bring it to the shop at about twelve the following day. Shortly afterwards a lady rang to say that her ITT portable had a funny fault – the sound would go off until the aerial plug was waggled about. I asked her to bring the set to the shop midday tomorrow.

So just before midday I packed my stuff into the car and sped off down to the shop. The G11 was the first one to arrive. The holder at the back didn't hold a remote control unit. I switched on and a red light appeared. Nothing happened when I pressed the button, and switching off and on again made no difference. There was life on the power supply panel, but only 50V at the fuse. I checked here, there and everywhere but couldn't get the h.t. to rise. The reservoir capacitor was of the blue welded type. I'd fitted it some time ago and it checked o.k. After spending some time checking through the power supply circuit I'd got no further and gave up. Another failure.

Shortly after the ITT portable arrived. I removed the cover and found that the sound came on and went off as the coaxial aerial lead was juggled about over the tuner and i.f. unit. No dry-joints could be seen when the chassis was taken out, but I did find that when the tuner etc. was held in one position the sound didn't go off. So I fitted a wedge. I showed the lady what I'd done and explained that in my opinion the fault was in the tuner-i.f. unit, but that I didn't have a replacement. She seemed happy enough and left me a pound for my trouble. I know that I should have removed the unit and stripped it down, but I didn't have the patience. Sorry.

## **Another G11**

Another call had come in while I'd been away. A G11 with field collapse. When I arrived at the house I found that the owner was the best friend of an old friend of mine, so I resolved not to give up this time.

After removing the rear cover I checked that voltage was present at the TDA2600 field output chip. I then fitted a new TDA2600, with the clip under it, and refitted the heatsink. The line was still there. I told the owner I wouldn't be long and sped off to the shop, hoping to find another panel. As luck would have it I'd kept an old G11 with a duff tube. After extracting the upper left panel I hurried back to the house and fitted it. I crossed my fingers and switched on. The picture appeared and I was greatly relieved.

I felt guilty about charging them £25, but they seemed to be quite happy and I went off with the faulty panel. I'll find the fault on it when I have time. Meanwhile all the best to you all.

bandwidth despite the effects of shunt capacitance which, as we've just seen, produces a cut-off at 1.4MHz. To offset the effect of the capacitance, the  $LR$  circuit must similarly have a "cut-off" at 1.4MHz and the inductive time-constant must be equal to the capacitive time-constant, i.e.  $0.12\mu\text{sec}$ . Now the time-constant of an inductive circuit is given by  $L/R$ . Thus the inductance required is  $L = tR = 0.12 \times 10^{-6} \times 4 \times 10^3 \text{H} = 480\mu\text{H}$ .

If this value was used in our video amplifier the results obtained would be disappointing – a check on the frequency response would show it to be far from level over the passband. This is because two important factors have been overlooked. The first is that we've not allowed for resonance. Since the inductance and the capacitance form a tuned circuit, by making both time-constants  $0.12\text{sec}$  we've ensured that the resonant frequency is 1.4MHz – right in the middle of the video bandwidth. True, the  $4\text{k}\Omega$  load resistor in series with the inductor provides a high degree of damping, but the response curve will nevertheless have a significant hump centred at 1.4MHz.

To keep the boost to an acceptable level and ensure a reasonably level response the value of the inductance should be significantly less than the value worked out above. The mathematical concept of maximal flatness gives some idea of the inductance value to use. A maximally flat curve is one without maxima and minima.

falling away from the ideal level response very gently as the frequency rises. This response can be obtained by using an inductance with a value of  $0.41$  of that previously calculated, i.e.  $196\mu\text{H}$ .

The second factor overlooked so far is that with an amplifier designed to handle pulse-type signals the shape of the frequency-response curve is not the best criterion of performance. Phase response also matters, and to secure a good response with pulse signals it's useful to aim at securing a maximally-flat group-delay/frequency curve. This is attained by using an inductance value  $0.32$  times that initially calculated, i.e.  $154\mu\text{H}$ . So an inductance value between  $154\text{--}196\mu\text{H}$  would be suitable, suggesting a value of around  $175\mu\text{H}$ . If inductive compensation is to be used a medium-wave tuning inductor could, if available, be used, saving a lot of work.

This final example of inductance calculation has led us into the further subjects of resonance and maximal flatness. It was worth including in order to illustrate the problems that inductors can introduce. The capacitive examples were straightforward and illustrated the simple method of calculating the component values required to obtain the desired response. The shape of the curve can be sketched once the cut-off frequency is known, the only figures required being the 3dB point (gain or loss at cut-off) and the 1dB gain or loss an octave away.

## *A Day in the Life of . . .*

**Les Lawry-Johns**

I'd been at the shop on the previous day and decided to pay another visit after lunch to make sure that everything was all right and to attend to any customers. As there weren't many I thought I'd pop into the Coach and Horses next door to have a word with the landlord Dave. Perhaps he might know about the surveyor who'd called at the shop yesterday? I knew that he was looking it over on behalf of a building society, but didn't know who had initiated the interest. Dave's son had been looking around lately, and I felt he might know something. He didn't, so I sat back and started on my half of bitter, which is all I drink when driving.

A magician friend of mine sat nearby, with his daughter and her husband. I showed them the August issue which contained those lovely letters about my retirement. I've said thanks before for all your good wishes, but must do so again. I really didn't know you cared so much.

After finishing our drinks we went our various ways. Shortly after I'd returned to the shop Bob appeared. He looks after the radio bits and pieces at the local hospital and entertains the patients with music etc. With him was the hospital's ITT TV set which had given up the ghost. He plonked it on the bench and after removing the rear cover I switched it on. Apart from the degaussing buzz there was no response. It was an ex-rental set and I'd not seen one like it before, so I can't tell you the model number.

H.T. was present at the collector of the line output transistor, and when I went on to check the components in its base circuit the set started up. So I switched off and checked carefully for dry-joints. There were a few around the coil in the base circuit. After resoldering these and some more in the vicinity the set started up each time I

switched on. I replaced the back and asked Bob for a couple of quid. He insisted on making it a fiver. So I wrote him out a bill and he carted the set off happily. That was about all the servicing required. A few friends popped in to pass the time of day, and shortly afterwards I locked up and drove back to the bungalow.

That was yesterday. I was up early this morning. Slide out of bed and step carefully over the dogs. Then start to dress, making a point of pulling my socks on whilst standing up. I'm determined to keep this up because when I have to sit down to do it I'll know I'm really getting old. Dressing complete, I walked up the road to collect the morning paper. We don't have it delivered to ensure that I keep active first thing. Back for breakfast and to feed the cat who won't live in the house but spends her time out on the roof of the shed. I hope she'll change her mind about this when winter comes. Spock's over sixteen now and won't last much longer.

After H.B. had departed on her morning's run around I looked out and saw someone familiar coming towards the front door. It couldn't be, but it was. Stan from SEME. He looked over the bungalow and the dogs didn't bark once. They know him well. After a few pleasantries Stan departed, without an order. H.B. returned shortly after and announced that one of her daughters wanted a remote control unit for her Philips TV set. So having seen Stan off I had to phone SEME for the unit.

Later another of H.B.'s daughters called, bringing with her an Alba PTV10 portable radio/TV set. I couldn't get a reading across the mains input, so I checked the transformer. It said there was a thermal fuse in series with the winding but I couldn't find it. In fact I destroyed the winding while trying to do so. Another order to make.

bound in improved hard-cover form. For a colour leaflet listing the models included and price, apply to U-View, 29 Warmsworth Road, Doncaster, Yorkshire DN4 0RP (telephone 0302 855 017).

### **HINARI's NEW CHAIRMAN**

Brian Palmer, who established Hinari Consumer Electronics in 1985, has resigned as chairman and chief executive. He is handing over to John Robinson who is ex-managing director of Electrocomponents. Hinari grew rapidly from a turnover of £10m in 1985-86 to £65m in 1988-89. It evolved from the wholesale distributor Trical, which Brian Palmer also started. It seems that he

prefers the challenge of the new to running an established firm.

### **RUMBELOWS – A CORRECTION**

We must apologise for a most unfortunate error in our news item last month on the Rumbelows reorganisation. Our suggestion, due to a misinterpretation, that the servicing side will be contracted out to other companies is quite wrong. What we should have said was that servicing work carried out for other companies will be gradually reduced. Solutions has ceased to trade, the servicing side becoming an integral part of Rumbelows' customer offer, organised on a local, regional basis.

# **What Next?**

**Les Lawry-Johns**

Still more letters and cards have arrived! My thanks to you all. Because of my muddled head I can't write like I could just a few years ago, but I can manage to repair a few TV sets that people phone up about. Unfortunately it seems to take me a lot longer to do these sets than it did just a short time back, but I still try.

### **The Philips G11**

Take the Philips G11 that someone phoned up about recently. I've repaired more of these sets than any other type. He asked me to call at his house to have a look at it. I did and couldn't find a thing wrong. He said it suffered from field collapse every day or so. The only thing to do was to cart it off down to the shop to have a closer look. When it was on the bench I couldn't induce field collapse however much I tapped around, but every now and then the picture went red then failed completely. This was soon traced to a poorly fitting plug on the video panel. I thought I'd leave the set on for a while to see what happened. While waiting I popped into Dave's Coach and Horses next door, leaving a note to tell prospective customers where they could find me. Just half a bitter, because more than that makes my mind even more cloudy and I had to drive quite a way. The set was still all right when I got back, so I resoldered every joint around the TDA2600 field timebase chip, its supply, etc., after which I kept an eye on it for another hour or so. Then I carted it back to its owner and asked him to let me know if it misbehaved again.

Next day he phoned to say that it was doing something different. Every now and again the field varied and curved. So I drove off for a further inspection. As the height was varying I thought I'd have another go at finding a dry-joint. The upshot of this was no field scan at all. After checking that the supplies to the field timebase were present I fitted a new TDA2600. With the heatsink back on everything seemed to be o.k. I watched for several minutes, then checked the video plug and socket again. After that I left. I've not heard further, so I must conclude either that the set's now all right or that the owner is fed up and has bought a new one.

Back to the shop to meet a couple who are thinking of buying it and using it as a hairdressers. I showed them over the place but they didn't show any signs of

eagerness to buy. I suppose I'll just have to wait until the Indian solicitors down the road have made up their minds, which they've been trying to do for several months without actually showing their hand . . .

### **Another Philips Set**

As I was about to leave a chap came in with this 20in. Philips colour set – Model 20/CT4636/05T (KT4 chassis). It wasn't necessary to let down the main panel because I could see that the trouble was over on the right-hand side: the line output transformer had an obviously poor contact, which I carefully resoldered along with the connections to several of the other pins, just to be sure. This seems to be a common fault condition that affects many models nowadays. The transformer does lead a busy life of course. I wrapped the set up and tried it once more, for the young fellow's sake. He then departed in high spirits, having had to pay me only a fiver.

After this I locked up and returned to the bungalow to see how Gunga Din was coping – our new dog, a pal for Zeb and Tessa. As usual he started a scrap with Zeb as soon as I reached the gate – he seems to be possessive and wants to show Zeb that I'm his. Tessa has to come between them to stop any real damage being done. She does this with amazing ability and they don't argue with her – she's the boss! Incidentally Spock (the cat) still hasn't come in. She sleeps outside, coming up on the shed when she wants to be fed.

Later I had to return to the shop to show it to another chap, a second-hand furniture dealer who is looking for premises in the town or just outside it. He was impressed with the place (heaven knows why) and said he would contact me later if he could raise the cash.

### **Loss of Picture**

While I was dealing with him someone else brought in a portable TV set with the complaint that the picture failed every time the aerial plug was touched. Memories of that other portable flooded back – the one with just the same symptoms, caused by the aerial cable disturbing the tuner unit. This time however nothing went wrong when I fitted my own aerial. He'd brought with him his short piece of aerial cable. I checked this and then fitted new plugs. This done there was no further disturbance no matter how much the aerial plug was waggled about. I charged him a couple of quid and he left quite pleased.

Back at the bungalow I wondered whether the shop would soon be a hairdressers, a second-hand furniture emporium or a solicitors' office . . .

was plunged into gloom.

Ralph Topcut, who had been demonstrating a compact disc player in the shop, scurried through and began complaining. Norman grabbed his tools, Gareth some fuses and a card of fusewire, while Andy found a torch.

They dashed around making a great commotion. In the midst of all this Sid yawned, picked up his jacket and strolled out through the yard to the Belvedere Cafe, his usual lunching place. The toaster could wait till this afternoon.

## *A Bout of Despair*

**Les Lawry-Johns**

When an old friend carried in his almost new colour portable I thought it was going to be a five minute job. I started by assuming that it was a Fidelity receiver hiding behind another name (Goodmans), but though I looked here, there and everywhere I couldn't find the correct circuit diagram. It seemed to be similar to the ZX3000 chassis, but the layout was different. The line output transformer was at the rear centre. It looked like the one in the earlier Fidelity ranges, with the integrated focus and first anode supply knobs sticking out. The chopper transistor and its control chip were where you'd expect them, on the left side viewed from the rear, but the chip was a TDA4601 instead of a TDA4600. I checked the legs, and they seemed to have the same layout. Anyway, as the set wasn't working I fitted a TDA4600 and checked the voltages, which all seemed to be low.

Perhaps there was an overload? I checked the line output transformer etc. carefully and got nowhere. In fact I spent a whole week on it, checking this, that and the other. When I say a whole week what I mean is that during the course of a week I spent several hours on it without achieving anything. I don't spend all that much time in the shop nowadays – I suppose I'm getting lazy in my old age. Finally I decided to let someone with a more active mind have a go. So I carted the set off to Geoff in Sun Lane. He kept it a week and then asked me to collect it before it drove him barmy. He'd thought it was the line output transformer loading down the supply, and I'd run one up to him just in case I'd made a mistake earlier. As it was my last one I ordered another from SEME Stan, along with some other items I might require. Geoff didn't need the transformer however as the replacement didn't make any difference. So out it came and back went the original. He also checked the field output stage, in case an overload there was shutting everything down.

What was I to do when it came back? I assumed that there was a problem with the start-up system, and ordered a TDA4601 just in case. This didn't make any difference either, so I got down to checking every component in the chip's supply circuit, taking each item out in turn to be sure. In due course I came to a 100 $\mu$ F, 25V electrolytic which acts as the reservoir capacitor for the start-up and also the running supply to the chip – it's connected to pin 9. I checked it carefully and it claimed to be in order. Substitution seemed to be a sensible double-check however, and when a replacement had been fitted normal results were restored.

At this I went into seventh heaven. I can't tell you the hours I'd spent checking various possible culprits, as well as phoning up everyone I thought might be able to help. I feel ashamed at troubling so many people, but there

you are – all because of an electrolytic that tested o.k. The start-up feed comes via a 15k $\Omega$  resistor, and I noticed that one end of this is very close to the h.t. fuse. Maybe the electrolytic had been disturbed by a nasty shock at some time. If all this sounds trivial to you, just wait until you get something like it!

Things have been much as usual here apart from that wicked set. The shop still hasn't sold, the cat still won't come in, the two male dogs still can't agree not to fight, the weather seems to be getting colder and H.B. has decided to sell our car which I've just taxed and reinsured. She's going to sell it to her sister's husband who is not having much luck with his car at the moment. Our Renault 18 has been very reliable and just as it's in sparkling form she's going to pass it on. Apparently we are going to get a smaller car, a Renault 5 or something like that. I don't seem to have too much say in our business lately.

### *The Lady with the CVC5*

As I was jotting that down the phone went and a sexy sounding lady asked me to call and look at her set which had gone on the blink. It turned out to be an ITT CVC5 that had been left on with a faulty tripler. This hadn't done the line output stage much good of course. A new tripler and a PL509 line output valve restored fairly good results, but I replaced the PY500 efficiency diode as well in case it had suffered. What about payment? It seemed that the lady had other ideas. Other than cash, that is. But I didn't fall for it and asked for my money. I told her I was sixty six and couldn't even if I wanted to. After a small argument she paid up and I departed in haste.

### *A Waltham Portable*

An old customer phoned to say that he wanted to bring a Waltham portable along to the shop. I got there just in time and when I put the set on the bench I found that there was a small, dark picture, with pulling all over the place. I thought it would be the reservoir capacitor, but bridging this with a 4,700 $\mu$ F test capacitor made no difference. I then looked carefully for a cracked track as I'd had this trouble with the panel before. All relevant tracks showed continuity however. So I dabbed around with the 4,700 $\mu$ F capacitor to see whether I could find a point where it did any good. At one point the picture cleared up wonderfully, though there was still a slight gap at either side of the raster. I couldn't see exactly where this point was – it was not far from the bridge rectifier. As I wasn't prepared to argue about it I left the set on soak test for a while. I then ran it back to its owner and showed him it working with a good picture. He paid his fiver (he's an old man) and I departed for the bungalow.

I'm getting worried about having this bungalow since the bridging loan is costing me plenty and the shop just doesn't seem to attract any serious buyers. I feel sure that something will happen soon however. Is anyone out there interested?