

Tiny Tim's Testing Time

Les Lawry-Johns

Things had been slack for some months and Tim was beginning to get used to it, even to like it. Except for the bills that kept coming in.

Then, last Friday, the avalanche started. The first one came in at nine o'clock.

"I'm just off down town. Be back in half an hour. Don't want to spend more than ten quid. Ta Ta."

Before Tim could say "...off" the chap had gone, leaving neither his name nor any other information. So Tim wrote PIG on the sheet and started to lift the set on to the bench. Another car then pulled up outside and a bloke staggered in carrying a 26in. Bush set of the Z718 variety. He panted out his name and address and Tim felt sorry for him. "Call back at lunchtime" he said, after being told that the screen kept going blue before the tuner selectors failed. As the chap went out someone else came in. A music centre this time. None of the lights lit, one side was dead and the stylus was broken. Tim's eyes noted the Shure cartridge.

"Call back on Monday."

"But we want it for our party tonight."

"I'll try but can't promise."

Tim put the jobs in line and was about to start on the first when a woman came in with a white portable of the Thorn 1690 variety.

"I can't stop and talk about it. I want it for Sunday and the only time I can call to collect it is on Sunday morning at about ten o'clock. Do whatever needs doing. Bye for now."

She trotted off before Tim could say a word. His Sunday had gone for a Burton as usual. Oh well, mustn't moan.

Minutes later a large ITT FT110 was brought in. "Picture's very dull and it won't respond to the contrast."

Tim's mind said "beam limiter", but he didn't actually say anything. He didn't like the FT110, mainly because he'd not done a lot of them. And he couldn't remember how the beam limiter worked. But he knew the owner quite well. "Phone me tomorrow and I'll tell you all about it."

Left alone Tim started on Mr. Pig's set. It was a Pye CT200. He hardly had time to note the smashed tube base when another lady came in.

"Would you lift my record player out of the car for me?"

Tim went out to the blue Volvo estate and noted what appeared to be a radiogram standing in the back. It was one of the large, old HMV ones. A record player indeed, with a Garrard unit, twin speakers, etc.

Tim lifted it out while the woman chattered. "It was going all right except it wouldn't play the records right through, then it went dead. I said to my husband I don't want you mucking about with it, I'll take it to that little man down the road. They say he can do things all right and doesn't charge much. Not like some of these people do nowadays and you don't know what they get up to, do you? I think it's all wrong that people should take your things and interfere with them like they do, then charge you through the nose."

Tim put a tenner on the bill right away but he didn't say

much. "Pop in tomorrow" he suggested.

"Oh dear, I'll have to do without my Mozart tonight" she moaned. Tim took her name etc. and off she went, talking away to herself nine to the dozen.

The Pye's Problems

Back to the Pye. After a bit of a struggle Tim repaired the tube base socket and refitted it. When the juice was applied the heaters lit. There was a blurred raster and Tim realised he'd left the focus lead off. With that refitted the raster could be resolved but there was no picture or sound however much he fiddled with the tuner selectors. So he went down to the rear left side where the tuner joins the i.f. gain and filter unit. He removed the latter and resoldered all the contacts, noting that the one from the tuner had a track crack. Ah ha! This done the sound boomed out and a grossly misconverged picture appeared. This was attended to and he was left with a nice teletext message wishing him a pleasant day. Hardly had he finished when the owner appeared.

"Ah Mr. Pig, your set's ready after all."

"Name's not Pig, it's Sty."

"Nearly right sir."

"Actually I was only joking about calling back for it in half an hour. I've been told it's beyond repair. Thought you might give me a chit to that effect."

Tim got a bit angry. He switched the set on and showed the Sty man.

"Good lord, as quick as that. You must be a genius."

"I am but I don't let it show" said Tim modestly. He wrote the bill out and handed it to the Styman.

"Heavens. That much for such a short time?"

"Cheap for a genius, sir."

So off he went and Tim was left wondering. The set had been knocked over or off, and seeing the broken tube base someone had assumed that the tube was cracked. Oh well.

The Big Bush

Tim next turned to the big Bush. He soon found that it was a nightmare. First he took the tuner out and renewed the plastic nuts - one of the four had cracked open and was jamming the channels, as the blue ones do.

With the tuner refitted he could get a picture and was better able to see the effect of the blue flashing. He went over the blue drive from the TCA800 chip to the driver and output transistors and found that the voltages at all points varied with respect to the red and green channels. The most marked variation was at the collector of the blue output transistor.

Removing all three c.r.t. drives should have left a blank screen. It flashed blue. Tim's diagnosis was immediate and wrong. A heater-cathode short-circuit in the blue gun he thought. So he carefully removed the heaters' chassis connection and wired a resistor between the blue cathode and the heater. No change. It then dawned on him that the short-circuit was between the grid and cathode. His muddled mind recalled the adaptor he'd invented years ago to deal with a grid-cathode short in a tetrode tube by

shorting the grid to the cathode and transferring the drive to the first anode. "All right with a monochrome set but you can't do that with a colour tube with its three guns, you fool!" he scolded himself. The things that go through your head when you're faced with a problem. Tiny Tim's trouble is his tiny mind. Not like you lot out there.

But he had to make up his little mind. He'd render the blue gun inoperative. He disconnected the supply to the blue gun's first anode. This left a slight blue haze in the centre. It wouldn't worry anyone but of course the picture was only a pleasant red and green, with no blue apart from the faint glow. The owner didn't complain and said he's seen enough blue to last him a lifetime...

Ribald Club Strikes Again

Next on to the bench was the FT110. Tim surveyed the displayed picture and again thought to himself "beam limiter" – and remembered that he'd been proposed as president of the Ribald Club (removal of beam limiters). He studied the tripler and its earth return circuit, then checked all the components here. Each one checked out perfectly so he moved over to the left-hand side and studied the transistors concerned with beam limiting – three of them, T212, T213 and T214. He checked these and the associated components – quite a few of them – and again each one checked out all right. He then removed the front panel to ensure that all the connections were good and that the controls were working. He refitted the panel and injected signals here and there from the final i.f. stage to the luminance delay line. The signals were lost somewhere between the distribution amplifier stage T211/T206 – the stage that provides separate feeds

to the a.g.c., luminance and chroma circuits – and the luminance delay line. The beam limiter transistors act on the distribution amplifier stage and Tim found that the voltages in the beam limiter circuit were wrong. He got more and more confused and after an hour or so he did something very naughty, he shorted out the first transistor in the beam limiter circuit, T213, by linking its collector and emitter. The picture was immediately restored to normal. He removed the short and made further investigations but still couldn't find anything wrong. He finally lost his temper, shorted T213 again and left it shorted. Ribald indeed.

Tim's Audio Department

He now turned his attention to the record player and heaved this on to the bench. On moving the pickup arm over towards the centre he found that it stuck before it got there. This was an old one indeed (the fault, not the deck). He took the turntable off and freed the small swing arms on the toothed wheel, removed them and cleaned the centres with easing oil. They now swung happily and the turntable was reassembled. He turned the unit on its end and removed the bottom cover. A fuse had gone though it didn't look like it. First bit of luck today thought Tim. It now played records and changed properly, so it was returned to the corner.

The Fidelity music centre was the one with the Shure cartridge, a fact that worried Tim a bit. He had the stylus in stock but they're costly. In fact when he'd got the whole thing working and the lamps fitted etc. the stylus cost more than the rest of the repair (shouts of traitor!), but they wanted it for that night and they happily popped down to the bank to draw out the money (why they didn't want to write out a cheque Tim couldn't say, but they paid cash and departed happily).

The Portables

Tim finally turned to the Thorn 1690 – and some other portables that had been brought in during the day. The 1690 gave him a stiff time. There were shorted turns in the line output transformer's e.h.t. overwinding. Tim selected an overwinding from the shelf – he'd sent for some a week before. He fitted the winding with care and confidently switched on. The result was a faint, small raster with poor sound. A check on the stabilised supply line showed that it was at 8V instead of the expected 11V. So Tim checked the regulator circuit thoroughly and noticed that it was running warm. He went through everything in this area and was getting more and more angry. At last he removed the new overwinding and prepared to give up the job. Then a thought struck him. He switched on again and the sound boomed out while the tube's heater glowed brighter. He couldn't believe it. Another overwinding was quickly fitted and a perfect picture appeared.

Tim said (shouted) some naughty words and the dogs hid away in shame. The cat licked her paws, having heard it all before. Tinker Bell appeared and announced that the vacuum cleaner had failed. Tim shouted at her as well but repaired it anyway. The Electrolux had shed a connection at the suppressor (remove four screws and take the top off to gain access). The connection was soldered back on and peace was restored. Tim then returned to the other portables and waded through half of them, the other half being deemed not worthwhile after an initial inspection.

The rest of the jobs had to wait another day. Tim hoped the whisky wouldn't be too cold.

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further.

After some years of service the carbon track of the special, chassis-mounted R/G scan-correction potentiometer R478 (5k Ω) tends to flake off. As a result it goes open-circuit. This potentiometer is no longer available from ITT, but as a hole was provided on the chassis for the knob to go through it's usually possible to obtain a

similar or larger wattage replacement and fit it so as to give screwdriver adjustment.

Note that the usual static convergence magnets are supplemented by three potentiometers at the base of the convergence box, R682, R684 and R689. These should be set to the centre of their travel before adjusting the magnets.

Bless 'em All

Les Lawry-Johns

Having seen the Singing Detective on TV I was reminded of that awful period last autumn when I was covered with psoriasis. It appeared just as my usual mild summer attack was waning. Perhaps the shock of my friend's suicide upset the whole system, for within a matter of days I was covered with it – except for my face which was relatively free. In this condition I went to see Laura Lovitt – the one who used to have the dicey Decca.

The Singing TV Engineer

This time it was a TX9, suffering I hoped from nothing more than a failed fuse. I took the back off, pulled off the fuse cover and checked the fuse. It was open-circuit with no sign of blackening. So I slipped in a new 2.5A fuse and switched the set on. A nice picture appeared and Laura came over and placed her hand on my badly affected shoulder. I had to shake the hand away and Laura stared at me.

"Can't I touch you now?"

"Not at the moment dear. I'll show you why."

So saying I pulled back my sleeve to show her the mess. She backed away.

"It's VD you see."

"Ahh" she screamed. "Keep away from me you beast."

I laughed as I pulled down my sleeve. "Don't worry Laura. It's actually psoriasis and I can't give it away. It'll go when it's ready, which shouldn't be long now. A friend of mine hung himself and this came up all over me. Nice isn't it?"

I could see that Laura was glad to see me go. Fortunately it did clear up soon afterwards.

The Prinzvision

Back at the ranch I found a Prinzvision TV171 17in. monochrome portable on the bench. The tag said intermittent field collapse. I didn't have a circuit and I couldn't see the field output transistors, only those around the height and hold controls – and they were small ones. When I switched the set on the raster was fully scanned. I directed the hairdryer around the height control area and the raster collapsed. I then sprayed the area with freezer, but the white line remained. I sprayed here and there until it looked like something from the depths of the Yukon (which I wrote about some time back but the editor cut out because he doesn't like Eskimo Nell, spoil-sport that he is...).

At last I got around to making a more intelligent examination and followed the scan coil leads down to chassis, then looked underneath to see where they went. They sloped off up to the left-hand side, to a raised heatsink panel where the two output transistors lived. I

never thought of looking up there. I sprayed them and the front one turned out to be the culprit. It was replaced in a flash, restoring peace on the home front.

The Pye 741

The chap who brought in this Pye set (741 chassis) said "it comes up from the bottom and pokes a finger up at you". This I had to see. I connected the set, switched on and a perfect picture appeared.

"I'll leave it with you so you can look at it."

"Thanks very much, very nice of you" I said.

Well after about an hour the bottom of the picture came up about four inches (26in. tube) and a black finger poked up at the bottom right side of the reduced picture, just like the chap said it would. I was shocked. Fancy it doing that to someone who was going to try to make it better.

The set had vertical panels like the 725 series and I thought that the trouble would be on the upper right side field output panel. I tapped around this and even pulled the earthing tag off. This relieved the load on the supply, which is derived from the line output stage to the left of the tube. The voltage rose and the 30V stabilising zener diode decided to go short-circuit. This destroyed the 6.8 Ω filter resistor which didn't even spring open. I was a bit upset by this since these items are not in the most accessible of positions. Some time was spent on replacing them. When peace was restored and a raster at last appeared on the screen it was fully scanned.

I examined the field output panel with ice cool eyes (glasses off). There appeared to be many dry-joints which were attacked with my usual ruthlessness, iron and solder. Nothing escaped. After this the set remained stable for about four hours and I concluded that I'd won. The owner returned to pick up the set and paid – all in ten pence pieces. His son later told me that they were from his money box. The swine!

Later that night, as we were drinking our whisky coffee, we heard a bang on the shop door and the dogs went mad. I slipped down the stairs and found the same bloke standing there.

"It's gone again and I paid you."

"O.k. old chap, bring it back tomorrow and I'll give it a longer test. At the moment I'm entertaining the Queen and Prince Philip."

"Posh, aren't we?"

"Not really. They often pop in when passing."

So it came back next day and I spent some time trying to find out what had damaged the zener diode. The one I'd fitted was big enough for gawd's sake but it had gone short-circuit. I took it out and switched the set on. There was full scan and the chap who'd brought it back admired it, together with half his family – whom I wanted to get rid off as quickly as possible.

"That's it. You've done it."

I protested weakly that it could well happen again and that he wouldn't like it much if it did.

"It's not me mate, it's the wife. She screams the place

down when the finger comes up."

"Get rid of her, that's the best thing. Or tell her to repair it herself."

And off they went, doubtless to return another day.

A Call from Mrs Furnace

Mrs. Furnace had phoned to say that her Philips G6 (the one I bragged about some time ago, having given sixteen years long and faithful service) had given up the ghost. I rushed up to her house to hear her sad story and took the back off the set while I listened. As I could find no juice at the on-off switch I lay on the floor and played

with the two-pin plug that went into a shaver socket that went into the mains switched socket. There was juice there all right. Mrs. Furnace accused me of looking in the wrong place.

"My light lights when I plug it in there, so it must be all right."

I undid the two-pin plug and found a lead out. This was refitted and we tried again. The set now came on and worked fine.

"Could I have done that myself?"

"Yes dear. You didn't need to spend that long and lonely evening on your own. But how were you to know that?"

TV Fault Finding

**Reports from Philip Blundell, Eng. Tech.,
D. Burke, L. Dinsdale, Roger Burchett,
Paul Hardy and Michael Dranfield**

Philips K35 Chassis

This set was suffering from a very bad case of hooking on video playback. There have been quite a few modifications to the chassis to improve the performance with VCR operation but this set had the latest version (BY05) of the sync module and should have been all right. A stock BY02 module was tried and gave correct operation, so the two circuits were compared to see what the differences were. One was that C375 had been removed. Fitting this capacitor produced a stable picture. **P.B.**

Telefunken 415 Chassis

Continental TV sets with multi-band tuners catch me out every time! This example had very bad patterning on ITV only and I'd changed the tuner and half the components in the i.f. strip before I thought to check the band switching voltages. Yes, the set was trying to receive Bands I, III and u.h.f. all at the same time due to a leaky band switching transistor. **P.B.**

ITT Digi-3 Chassis

Intermittent operation of the remote control system was the problem with this set. Substitution proved that the fault was on the control panel, but a change of all the socketed chips had no effect. The supplies were o.k. and the remote control signals were reaching pin 12 of the microcomputer chip which was intermittently ignoring them. Applying freezer around the clock oscillator seemed to instigate the fault so T1410 (BC238) was replaced. This restored normal operation. **P.B.**

Philips G11 Chassis

Dry-joints on R4059 (15k Ω) on the power supply panel are becoming a problem with this chassis and can result in a blown BU208 line output transistor. **D.B.**

ITT CVC45/1 Chassis

This set would trip ten seconds after switching on. The delay threw suspicion on the line output stage – maybe the tripler was faulty. Sure enough disconnecting this stopped the tripping, but a new tripler failed to provide a cure. It was next assumed that an excess current rip was operating due to some other fault in the line output stage. Turning down the brightness and contrast controls stopped the

tripping, so the service manual was consulted. This revealed that the set doesn't have an excess current trip, only an over-voltage trip. As the h.t. was correct at 127V it seemed that there was a fault in the trip circuit. Removal of the chopper drive panel revealed a couple of likely looking resistors in the trip circuit. When R806 (470k Ω) was removed it was found to read 594k Ω while R809 (220k Ω) had risen in value to 4.3M Ω . Replacing these two resistors cured the fault but left us with the puzzle as to why disconnecting the tripler had stopped the tripping. We can only assume that the reduced line output stage loading affected the supply to the trip circuit. **M.D.**

Decca 80 Series Chassis

Here's a warning for some of you. The set was dead with a blown mains fuse. No shorts could be found so a new fuse was tried. At switch on the line output stage showed signs of distress and the fuse blew. Without doubt the tripler was faulty, so I proceeded to disconnect it from the nipple on the line output transformer overwinding. Guess what? The nipple fell off, so a new line output transformer had to be fitted free of charge. So be warned: use only light pressure when applying the soldering iron to the joint to remove the tripler connection from the transformer. **M.D.**

Philips TX Chassis

The fault with this set was field collapse. It's not uncommon with these portables and is usually due to the field scan coils being open-circuit. Sure enough there was no continuity across the coils, but a closer look revealed that the wires connected to the scan coil pins had broken off. New wires were very carefully soldered on to the copper wire, then on to the pins, providing a cure. It seemed that the set had been dropped: the cabinet was slightly cracked and the vibration had probably jolted the scan coils, causing the wires to snap. **M.D.**

Grundig 45in Projection TV

A local pub asked us to look at this set which was reported to have a very poor picture. After taking a look I can only describe the picture as being like that produced by a G8 with a dud tube. The picture was very dull and

Dog Watch

Les Lawry-Johns

Most of you naval types will recognise the name Dog Watch. There are two Dog Watches, from 16 hundred to 18 hundred hours in the afternoon and from 18 hundred hours to 20 hundred hours. These are the only two-hour watches, the others – middle, morning, forenoon, etc. – all being four-hour watches which can seem an awful long time apassing. You don't like naval terms? Well what about Gunscrew – Guns Screw not Guns Crew. It's true, or was true.

What's this all about? Well, I've come to the conclusion that we need a Dog Watch here (and there). You see just before Christmas Honey Bunch bought, amongst other things, a nice three-pound gammon steak. After boiling it she put it on the table to cool off, then popped into the shop next door to natter to Dianne and get some cigarettes, dog food, etc. I said natter to explain why she was away a while. I was working on a set at the time and was fully occupied. When she came back and went into the kitchen I heard her say "where did I put it?". It wasn't in the fridge and it wasn't in the cooker, but the dogs were licking their lips – or rather clearing their teeth. When we realised who the culprits were we had a good laugh at the thought of how thirsty they were going to be. They were, and drank gallons during the afternoon watch. When H.B. told Dianne she said we were lucky: her dogs had eaten the turkey. Subsequently our lot pinched a one-pound cheddar cheese. So Dog Watch it's going to have to be.

Back to Work

Now to the TVs. We've had a lot in lately. Lots of nice easy ones like G11s and T20s, but some have been a pain in the neck – mainly TX10s. One in particular got me down, and I do mean down. It was a late version, with the plastic chassis wrap – PC1560 main panel. When switched on it tripped for about ten seconds or so then went dead. During the tripping I could see the tube's heaters lighting up and going out, and the sound came on in sympathy. This seemed to rule out the focus unit, which is the most common failing with this chassis, but I disconnected it anyway. The tripping continued. I replaced R813 (121k Ω) which is another common cause of tripping but this wasn't at fault either. I then earthed pin 8 (error input) of the TDA2582 chopper control chip IC801. The tripping continued, at a subdued rate. Changing IC801 made no difference so I followed the "pull out plugs" routine. This didn't make any difference either. I remain confused.

The Fidelity CTV140

This portable also got me going. We sold quite a lot of these so I took on the repair without a second thought. It seemed to be dead when I plugged it in so I thought the power supply was at fault. It wasn't. When I plugged in an aerial the sound came out loud and clear and I realised that this model has the advanced noise suppression which the earlier models didn't have.

I checked the tube base voltages and found that the first anode voltage was low. On this model it's derived from

the line output transformer which has two knobs sticking out, the upper one for focus adjustment and the lower for the first anode supply. The tube's heaters also appeared to be underrun. I suspected the transformer, as the e.h.t. and focus supplies were correct but the other supplies derived from it were all low. The line output stage itself seemed to be working all right, so without further ado I removed the transformer and fitted a new one. The same conditions continued and I could see that with the station tuned in the screen was not completely blank. I turned up the presets on the tube base and obtained an acceptable picture, though somewhat lacking in attack. So the whole thing seemed to revolve around the low first anode supply. The RC network on the tube base was in order but the heaters were also definitely low and I just couldn't find a common cause.

I shorted out the 1.8 Ω resistor in series with the heaters and this improved things a bit. The owner returned and said it was the best picture he'd ever seen on the set, but I was left feeling guilty and inadequate. I'm getting too old to think straight. The doctor says it's vertigo and suggests that I stop trying to do complicated things, but I hate the thought of giving up and I can't afford to anyway. Plod on.

In fact the set came back within the hour, the picture having faded right out. This time there was no first anode voltage and the previously checked decoupling capacitor (C201, 0.01 μ F) on the tube's base panel was found to have a heavy leak. Removing it restored high brightness and the base panel presets could be returned to their original settings. My guilt vanished, to be replaced by shame. To be fooled by a stupid capacitor, just because it didn't record a leak. Wait a minute, what about the tube heaters? Oh well, the picture was good.

The Fidelity CTV14

I'm sorry to keep on about this model but if you haven't had much to do with it the chances are that you will. These sets are giving a lot of trouble and the more you hear and remember the better equipped you'll be. The original CTV14R is particularly likely to give you heart-ache because of the oft repeated chain reaction. Here's an example.

The set came in because the line output transformer had been shorting. In addition to the transformer, one must expect quite a few other things to have suffered. We found that the line output transistor was short-circuit and the 10 Ω h.t. smoothing resistor R828 was open-circuit. This is a very common occurrence and we've mentioned it before. Replacing these items was only the start however. First the chopper transistor TR13 (BUX84 or BUV46) was short-circuit. When we switched the set on after fitting a replacement it coughed and spluttered and through it all we saw that there was no field scan. A new TDA1170 field timebase chip was required, and fitting this took a bit of patience. When it was installed the tripping continued but we could now see a full scan trying to appear.

Careful adjustment of the h.t. preset stopped the tripping and a bright blue raster appeared. We tried resetting the blue gain and background controls but this made little difference. The voltage at the base of the BF460 blue output transistor TR10 on the tube base panel was 6V while the bases of the red and green output transistors were at the correct 2V. We felt really fed up because this meant that the 28-pin TDA1365 colour

decoder chip was faulty.

This chain of events is not unusual and we often find that the rectifier diodes fed from the line output transformer are also short- or open-circuit. Quite often the customer is not prepared to meet the estimate and doesn't believe that all this can be caused by a faulty transformer. It's true though, it's true. I wonder what else we could do for a living?

Letters

THE FERGUSON 3787 AGAIN

Here's a further note on trouble we've had with the Ferguson 3787/NordMende 8180. Random tripping and failure to start up can sometimes be caused by dry-joints on the combi coil UA01 and/or the line output transformer UA02. Resoldering the PCB is not enough: it's necessary to remove these components from the board and also to resolder the wires at the tops of the pins.

A point about my article on these sets as it appeared in the October 1986 issue. In the section on fault finding the comments on the line output transformer's top core section were edited to say that the result of it being missing is low voltages from the transformer. This is not the case. Without a complete core the set will either not work at all or fast tripping will occur. Even a wider than normal gap between the core sections results in no-go or tripping.

Colin Boggis,
Woking, Surrey.

SONY SLC30

In the January VCR Clinic Martin Pomeroy commented on the problem of beat patterning experienced with the Sony SLC30. His suggestion of adding a resistor in the UN12V line merely masks the fault however. The cause of the fault lies in the power supply. We've had this problem on several occasions and have each time found that the cause is C319 on board PS23. This capacitor decouples the UN12V line.

R.E. Foster,
Nottingham.

SOFT-START – AND REMINISCENCES

Whilst browsing through some back numbers I spotted D.R. Bracknell's suggestion in the September 1985 issue for adding soft-start to the Philips G8 chassis. Having two of these sets (22 and 26in.) I made a couple of these circuits up. One set sprang to life but the other didn't – it was necessary to add several components to the power panel to make the circuit compatible (there were several versions of the G8 power supply – editor). The h.t. still rose rather too quickly for my liking however. The rise was made more sluggish by changing the value of C2 to 4.7 μ F instead of 1 μ F. This appears to work well.

I've also noticed a few letters recently on the "old days". This has prompted me to recall my own early experiences – perhaps they will stir the memories of a few others.

In March 1952 my late father drew my attention to an advertisement for the then *Practical Television* in a daily paper. It said "Build a TV set for under £20". This

referred to the Argus, a 21-valve set using an ex-government VCR97 radar tube which gave a green and black picture measuring about 4 x 3in. I'd always been interested in electrical things, but at fifteen the only previous project I'd attempted to build had been a 4W amplifier described in *Hobbies Weekly*. My attempt to solder it together was done with a small fire-heated iron, so I think it must have been my father's apparent confidence that led me to send for my first *Practical Television*, which contained a free blueprint, then to build the set.

My father owned a car repair garage and I constructed the set on an unused bench. As far as I know there weren't any kits for this sort of project and the Argos was built on five separate chassis that were bolted together. I purchased aluminium sheet, bending, drilling and hand cutting/filing all the valveholder positions etc. I doubt if it would have gained many points for neatness. Not surprisingly in view of my lack of experience the set didn't leap into life for some months (it may have been years). Many of the valves and components were not new and the EF50 valves had short pins that made poor contact. The hand-made H aerial was also blamed – two strong men were needed to erect it. Quite honestly I hadn't a clue about what to expect and which knob did what as we didn't own a TV set. I'd also hand-wound the coils. I eventually bought a set of ready-wound coils and rebuilt some of the chassis using new components including some much posher "Red Sylvania" EF50s. This produced quite good results. I never did make a case, and the set sat on a table around which the family watched. It was occasionally necessary to twiddle a coil former with a knitting needle when the sound wandered.

The mains transformer was a big beast giving 425-0-425V at 200mA. The e.h.t. transformer was also deadly, giving 2.5kV at 5mA. I still have a lot of the constructional data, the blueprint, the transformers, valves and the e.h.t. smoothing capacitors.

In that same year, 1952, there were details of a £9 television using an ex-type 62 indicator unit. In 1953 came the "PT Supervisor" and in 1954 a 13-valve set called the "Simplex". The latter could be built for less than £16. In May 1954 there was mention of the TV licence fee having risen from £2 to £3 . . .

John F.J. Kendall,
Herne Bay, Kent.

INTERFERENCE AND VCRs

In the December issue J. LeJeune commented on interference problems with VCRs. During the six-seven years I've been working with VCRs the only problems of this sort I've had have been striations down the screen on playback and herring-bone type interference. If the VCR is mounted beneath the set the first problem can be cured by fitting a sheet of aluminium cooking foil beneath the TV set, i.e. under the top shelf of the TV plus VCR cabinet. This has worked in every case we've had. In our area the second problem is caused by co-channel interference – the main transmitter here (Caradon Hill) uses channels close to the one used by most VCR modulators. The interference can thus be cured by adjusting the VCR modulator. These two simple methods of dealing with interference problems don't require removal of the top, bottom or sides of the VCR.

A.R. Lloyd,
Plymouth, Devon.

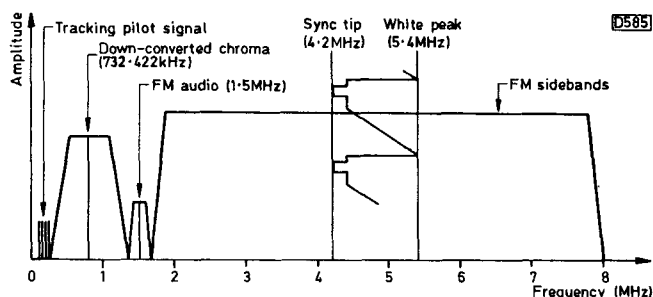


Fig. 8: Video 8 system signal frequency spectrum.

Fig. 8 shows, the carrier frequency is somewhat higher than normal, deviating between 4.2MHz (sync tip) and 5.4MHz (peak white). This upward shift of the f.m.

carrier and its sidebands is facilitated by new head and tape manufacturing techniques, and leaves room at the bottom end, below the lower vision sideband, for the audio f.m. signal centred on 1.5MHz and with a bandwidth of 200kHz. The chroma signal is down-converted in the usual way and then added to the f.m. luminance signal which acts as an a.c. bias for the chroma. The chroma spectrum is centred on 732.422kHz, with a maximum bandwidth of just over 1MHz. This leaves room at the lowest end of the recorded frequency range for pilot tracking signals that are similar in frequency and purpose to the DTF (dynamic track following) signals used with the Philips V2000 format – indeed it was Philips who proposed the use of this technology with the Video 8 system. We shall be examining the operation of this part of the system in a later instalment.

On the Pill

Les Lawry-Johns

Yes, I'm on the pill and it hurts. Why? Because when you're taking Stemetil you have to knock off the booze. No whisky . . . it's murder! I must admit that I cheat a little, sort of forget to take the damned things and take my proper medicine instead. Why Stemetil? Because I tend to topple over when I'm sober, and that's not nice when you're carrying a TV set. The other effect is that my mind is muddled every now and again. This tends to get me into trouble with the customers who think I'm taking the mick because I look past them and forget what I'm saying. Never mind, I can't expect to be clever all the time. It's my heart you see: hasn't got the heart to pump enough stuff up into my brain, causing vertigo or something.

The Murphy V1400

This small monochrome portable was made in Japan. It was brought in suffering from a faulty tuner. This is of the rotary type and I didn't have one in stock. So I removed the top cover and inspected the interior. Movement of it either lost or restored reception so I checked here and there for dry-joints, noting that the voltages remained correct. I found that the spindle produced the greatest effect.

The spindle carries the tuning capacitor vanes, as with the tuner in the Thorn 1500 series chassis etc. So I attacked it by spraying the spindle clips to remove the grease, and made sure that the earth contacts were good. After this the tuner performed well and couldn't be made to play up at all. I just thought you'd like to know, because it's a repeat of an old story we all know so well.

Fidelity LOPTs

David Botto wrote recently (September) of having had no trouble with the line output transformer used in the Fidelity ZX3000 chassis. They've been a nightmare here. I've had dozens sparking over. When this happens various i.c.s are dealt a death blow. When the TDA2578 timebase generator chip is killed the symptom, after replacing the transformer, is no raster. This is because the field oscillator has died. Since the fault could also be due to the colour decoder chip a simple check is to apply 4.5V

(approximately) to the top preset on the tube's base panel. This should reveal a single blue line if the TDA2578 is at fault. Having said this it will probably be the field output chip that fails next time. So far we've not had this i.c. fail.

This behaviour is in direct contrast to the earlier ZX2000 chassis, where the line output transformer's habit is to develop a short between windings with the result that the 10Ω h.t. smoothing resistor R828 goes open-circuit. This is usually the end of the story. If R828 holds out too long or a higher wattage resistor has been fitted (2W is correct) the chopper transistor TR13 (BUX84 or BUV46) could well fail, perhaps taking with it the 39Ω resistor R826 which is just inboard of it (rear left). This resistor, which is part of the damping network across the chopper choke, is essential to the correct working of the chopper transistor. I have spoken, and having spoken will now move on to something else.

The TX10

Do you recall the TX10 that had me by the short and curlies last month? I did do it in the end and feel thoroughly ashamed of myself. I'd removed the plugs in the order suggested in the manual, but the tripping had continued. I'd replaced the chopper transistor and its control chip, also the 121kΩ resistor (R813) that's so often talked about. The tripping had continued. So I sulked.

Some time later I thought I'd have another go and went through the same routine – plug removal etc. The tripping stopped when the scan coil plug was removed. This surprised me because it hadn't last time. So like a fool I hunted through the line output stage, checking this, that and the other and getting nowhere. Then a thought struck me. Before replacing the chopper I'd altered the setting of the h.t. control. I hurriedly set it up again and the tripping stopped. A nice picture with nice sound. It's the vertigo you know.

Remember Jason?

Nearly five years ago, in the June 1982 issue to be precise, I wrote about Jason the wonder dog and the Dynatron owned by Mr. Daines. Well Phil who pops in on Saturdays to pick up a few things (like TV sets) and to put me right now and again was sorting through some old copies of *Television* he'd not seen. He was reading the June 1982 issue and enjoyed the bit about Jason putting me right on the Dynatron. At this moment the phone rang. It was Mr. Daines. After five years his set had gone

wrong again. He'd moved (a bit nearer, as it happens) and is now resident at Park Avenue. I said I would call next morning (Sunday) to restore his field scan but it didn't at the time dawn on me that this was Jason's owner and that it was the same Dynatron. To be certain that it was a G11 I checked the model number (CTV55) with the list. It certainly was a G11, and I was quite happy. Then I realised who it was – and here was Phil sitting reading about the same set and dog.

Next morning I packed my gear and selected a spare timebase panel – without checking it closely. I sped out to Park Avenue and looked for the large house that lay back. Having found it I was most impressed. Mr. Daines came out to meet me and we went into this very nice house where we were greeted by Jason, his tail wagging and eager as ever to tell me what was wrong with the TV set. He led me over to it and barked when I turned it around.

I removed the rear cover and switched the set on. A white line appeared across the screen so I turned down the brightness. I checked the voltage at the upper left side (field timebase supply) to ensure that the fuse was intact. It was, and I could see that the TDA2600 field timebase chip's holder was feeling ill. To save time I removed the panel and fitted the one I had with me. The field scan was now full, but the picture was marred by patterning and was rolling. Jason barked because he could see it wasn't right. So I took the panel out and looked at it closely. At

some time it had been subjected to rough handling and was cracked at the top and bottom corners where the holes are.

It seemed best to repair their panel by fitting a new i.c. holder. I searched through my boxes but couldn't find one. I'd not packed one because I'd thought a spare panel would do. Idiot. I'd done the wrong thing again. I should have repaired the cracks in the spare panel, but I didn't. I removed the holder instead and it shed its legs. I had to tell Mr. Daines I'd been a fool and that I'd have to go back to the shop to get the part required.

So I left things as they were and drove back to the shop, to be greeted by loud barks from Tessa and Zeb. They knew another dog had been around me. Only Spock was quiet. I selected the right holder and sped back. It was fitted in a thrice and the set received its own panel back. A good, clear picture was obtained. Jason wagged his tail and Mr. Daines wrote out his cheque.

Back at the shop Fred Cole was waiting with the G8 he'd bought from me some ten or eleven years earlier. The picture could hardly be seen so I reactivated the tube and adjusted the presets to get a good picture.

"Well done Lawry" said Fred. He always calls me Lawry. Lots of people do. They seem to think it's my Christian name. Never mind. We were now clear and could get washed and brushed and have a drink upstairs before dinner. I hadn't taken the pill. I'd forgotten again.

Micro Clinic

*Reports from Nick Beer
and Roger Burchett*

Commodore 64

We've had several of these machines in with a defective 6510 chip. The symptom is a blank, black raster. Be patient after you've replaced the 6510. After switching on it can take up to five seconds before that black raster clears to give the Commodore prompt. You may switch on, see the black raster, switch off and think you've not cleared the fault.

Intermittent black streaks across the picture, which intermittently blanked out, was traced to the 8501 VIC chip. **N.B.**

Sinclair Spectrum

A blank, black raster – slightly snowy on two occasions – has been traced to a faulty 6C001E ULA chip.

A thin liquid had been tipped inside one of these machines that was brought to us – it had run considerably. The customer accepted a large estimate so I set about putting it right. First I replaced the usual faulty transistors (ZTX650 and ZTX213) in the 5V regulator circuit, also the coil. All the 4116 RAMs had internal short-circuits (shown up by the fact that they got very hot very quickly). After replacing these the machine still didn't initialise. The CPU, ULA and ROM chips were all found to be faulty.

Sinclair power supplies give a lot of trouble. Leads and plug problems are cured by replacing the whole lead – a five minute job and the leads cost less than a pound. Several of these machines have come in where the lead

has gone short circuit and the diodes have caught fire, burnt the panel and the only economical answer has been a new unit – they are clearly not adequately protected.

Don't forget the thermal fuse on the primary of the transformer when servicing these! **N.B.**

Commodore 1571 Disc Drive

A Commodore 1571 disc drive intermittently wouldn't read from the disc. The trouble was due to an intermittent lead between the computer and the drive unit. **N.B.**

Amstrad PCW8256

We are beginning to get PCW8256 word processors back with power supply faults. The raster produced is small and the STK7308 chopper control chip IC5001 screams. All is returned to normal when the i.c. is replaced.

Although sales of Amstrad machines have been good we've had few faults. One that does crop up from time to time is misadjusted heads on the cassette units, such as the CPC464. We suspect that these have all been "adjusted" by their owners. **R.B.**

Commodore 64

Hear tearing out time: a Commodore 64 wouldn't load from a 1530 (Taiwan made) data cassette. The head was slightly worn but fitting a new one made matters worse – now programs couldn't be found at all. Just to be perverse I fitted an old, worn head which had across it a groove that was plainly visible to the naked eye. We could now load some of the programs before they crashed! If you come across this apparently absurd reversal of what you'd normally expect look at R6 on the cassette. It should be 2.2M Ω but some were made with 220k Ω . I have to admit to some hours wasted and a bad night's sleep on this one. **R.B.**

The Return of Madame Martine

Les Lawry-Johns

Some while back I wrote about a seaside fortune teller who warned me about the blue tant. I mentioned that a while later I delivered a new set to a customer who was a friend of mine. As we were watching the golf the colour faded out – Bob didn't notice this as his hero was in a bunker. I related that I'd traced the fault on the decoder panel and that it turned out to be due to a blue tant. Time passes, and alas poor Bob has passed on. But the memory remains. Last Saturday as I was working on a set on the bench an old girl came in. She looked at me and I had this feeling I'd seen her before.

Good fortune is coming

"You've a lucky face. Good fortune is coming to you."

"It's about time" I commented.

"Be patient" she said, "good things are worth waiting for."

"I've been waiting for years dear, and I'm still scratching a living mending these things."

"Give me your hand and put a five pound note on it. I will reveal all."

I looked at her hard. "I have to work to earn five pounds. Often for a bloody long time. You want five pounds for a couple of minutes' waffle?"

"It's not waffle: it's the truth and you'll see later on."

It dawned on me whom I was talking to. The blue tant lady. Oh dear. I whipped a five pound note from the till. She whipped it from my hand like lightning. She then grabbed my hand and traced lines down it to my wrist.

"You've a long life and a happy one. It wasn't always so. You were unhappy some years ago but that's behind you. You're happy now and good fortune is coming to you soon."

"As soon as it came to you?" I queried.

She gave me an impatient look. "Now screw thirty pounds up and put it on your hand. I'll put the crystal ball on it."

I scraped around until I had found thirty pounds and screwed it up as I was told. She stroked my hand.

"Now you wouldn't begrudge me that small amount, would you?"

"Oh yes I would" I snapped. "You've already conned me for a fiver. Make do with that."

Her attitude changed immediately. "You're mean, that's what you are. Begrudging an old woman an honest living. You'll regret it."

Just then Phil came in and she started on him. He too parted with a fiver and she told him he'd marry a girl with an M and an L in her name. Phil's loved one is called Sarah. Oh well. How easily we part with our hard earned cash. Seeing that she wasn't going to get any more she departed, saying as she went "beware the white cap".

The next witch on the scene was Honey Bunch.

"You dozy oafs, parting with a fiver each to that old hag. She can't tell fortunes but she seems to be able to grab them off fools like you two. I can tell fortunes better than she can any day of the week."

She can too. Sometimes when she holds something of mine she can say what's going to happen next, and she's always right. But I don't want any of you lot calling here to have your fortunes told. If you do I'll be the one to tell them.

Universal triplers

Do you remember me telling you about Keith from Pompey who called to bring me some scan coils I didn't need after all? While he was here I sold this chap a universal tripler to fit to his CVC30 and told him to join the diode and earth leads together to the earthy side of the focus control. The right and proper thing to do . . . with the ITT set. Keith had commented that the tripler wouldn't last long connected that way and I'd wondered why.

Well the other day I had a call-out to fix a G8. It needed a tripler and I didn't have the G8 one with me, so I dug out a universal tripler and trimmed the leads, soldered the cap on, etc. I joined the diode and earth leads together and soldered them to the clip. On switching on there was a humming noise and very little e.h.t. The new tripler was getting hot. I switched off and clipped through the diode lead. Everything then came on fine and I felt daft. You see I'd always fitted the original Philips type tripler in a G8, never having had to use a universal one before.

When I got back to the shop I looked up the leaflet and it clearly tells you to trim off the diode lead and insulate. Connecting the diode and earth leads together on the G8 had meant that the clipper diode had no load. Sorry Keith, I was right about the ITT, but wrong about some of the others. I didn't know the G8 was amongst them. I'm amazed at the things I don't know. And a little bit ashamed.

Washers

A set fitted with the Philips CTX chassis came in the other day – I think it was the E version. The chopper transistor was faulty so I fitted another without trouble and checked around to see whether there was a cause for the chopper's demise. There was. The line output transistor was short-circuit. I decided to use a BU508A but found that the original transistor didn't use an insulating washer, being solid plastic. So I had to fit a washer in order to use the BU508A. Why's this worth mentioning? Restricted space, that's why. I had to use a pair of tweezers to fit the transistor and washer in position – the gap between the line output transformer and the side wall is about half an inch. The chopper needed the same treatment, but in this case there was plenty of room.

Talking about washers, the rubber ones used in the Ferguson TX100 chassis are beginning to give trouble. Apparently they tend to puncture, probably due to slight irregularities in the surface of the transistor or the heatsink. I thought I'd pass this on to you in case you have one of these sets and are puzzled by the transistor being all right but an obvious short being present.

The white cap

I know you thought the white cap would probably be an 0.47 μ F, 1kV type living in a CVC5 or something like that. Well you were wrong. It lived on the head of a pretty girl who, believe it or not, popped into the shop to tell me I'd

a lucky face and would live a long time and would have good fortune. She looked at Phil and asked him to go away. She then said in a low voice "don't trust that man, he's after your business."

I called Phil back and we had a bit of a laugh. Phil said to the girl "you don't happen to know Madame Martine by any chance?"

The girl looked sort of funny and replied "she's my grandmother and told me this gentleman was generous. You are dear, aren't you?"

"Sorry dear but this drain on my hard earned cash is

getting a bit much. Would you take a couple of quid and clear off like a nice girl now?"

"That won't help me. I need folding money."

"Well you'll have to clear off without then and leave me to earn my dishonest living."

"It's only he who stopped you giving me a tenner. I know. I'll see you again."

And she went, white cap and all, leaving me a little uncertain and a little bit angry at the way some people expect to be able to make a living. I suppose I'll have a lot of bad luck now . . .

Servicing Mechanical VCRs

Part 3

Mike Phelan

In conjunction with the pinch roller the capstan drives the tape along the tape path at a constant speed. It forms part of the drive train, and a rather important part at that. Due to the critical mechanical tolerances it can give a lot of trouble.

Capstan Drive System

Fig. 1 shows the capstan drive system in detail. The motor is mounted in an inverted position below the deck, with the pulley protruding above. A short flat belt goes from this pulley to the relay pulley, which runs in ballraces. The lower part of this pulley drives the capstan flywheel via a flat belt: it also provides the power for the reel idlers, via a square section belt. We'll deal with the latter part of the mechanism in a later article.

The capstan itself consists of a hardened, ground steel spindle which is pressed into an alloy flywheel – see Fig. 2. The spindle runs in a sintered bronze bush and to form a lower bearing there's a polypropylene plug in the retaining strap on which the rounded lower end of the spindle runs. A plastic oil fence is pushed on to the spindle above the bearing to prevent oil from the bearing creeping up the capstan spindle and getting on to the tape.

There are one or two slight differences here between models. The original 3292 capstan ran in ballraces and had no lower bearing. In the 3V16 the lower bearing is in the form of a plate rather than a strap, to carry the PCB with the capstan servo tachometer printed coil. This is why the other models appear to have a few spare pillars on the deck. With the exception of the 3V16 the machines have two magnets in the flywheel rim and a pickup head on the deck chassis, the servo being a simple speed control system which compares the capstan speed with a crystal frequency (Models 3V00/3V22) or a tuning fork (Model 3292).

Solenoid Operation

It may be worth mentioning that the portable Model 3V01 (an excellent though heavy machine) employed a very similar deck mechanism, the main difference being the way in which the stop solenoid operates. On the mains models the stop solenoid and the pinch solenoid (except for the 3292) have two windings. One consists of a few turns of thick wire and is supplied with a short, heavy current pulse to pull in the armature. The other winding consists of many turns of fine wire and is subsequently energised to hold in the solenoid. This arrangement

avoids the need to pass a heavy current through the solenoid for any length of time. Even this system would not be really suitable for a portable machine however, as the power required to operate the stop solenoid under stop-start conditions would load the battery excessively.

The solution adopted with the 3V01 is to have a small solenoid with one winding and allow the inertia of the flywheel to do the work! The flywheel rim is castellated, and when the stop solenoid operates the pivoted armature engages with the castellations. The flywheel rotation moves the armature at right-angles to its original direction of travel and operates the stop mechanism. Similar in fact to the autostop arrangement on many audio tape decks. Later portables use a permanent magnet as a hold for the solenoids.

The Pinch Roller

The pinch roller is another very important part. It consists of a rubber covered brass tube with a tiny ballrace within. The circumference is ground to extremely fine tolerances. Fig. 3 shows the way in which the pinch roller is attached to a steel pin mounted on the pinch roller lever. The loading mechanism moves this lever almost into position, the final movement being provided by the solenoid. Except, that is, for the 3292: this model has no pinch roller solenoid, the roller being moved fully into position by the mechanism, the pause key pulling it back against a spring.

Routine Maintenance

Most of the components mentioned here form part of the regular maintenance schedule. All the belts should be removed and cleaned and if necessary replaced. Clean the pinch roller (it's safer to remove it first). Don't use any downward pressure when removing or replacing the pinch roller screw – the lever is easily bent and this can give rise to all sorts of problems. Clean all the pulley surfaces, paying special attention to the brass part of the relay pulley – this seems to have a greater affinity for belt material! To remove the capstan belt it will of course have been necessary to remove the lower bearing strap or plate. This will enable you to remove the capstan assembly – take care that the oil fence doesn't get mislaid.

Clean the capstan spindle and apply *one* drop of oil near the bottom. You'll have to clean it again after replacing it, in case any oil has been picked up during its passage through the bearing. On the 3V16 you'll also have

Mr Doublecheck and Mrs Tart

Les Lawry-Johns

We've had some odd ones in here recently, and they're getting odder. Take Mr. Doublecheck for example. He's from some east European country and his use of the English language is on the quaint side to say the least. He carried in an old Ferguson record player with a BSR deck.

"It doesn't speak properly."

"Right oh! sir, we'll make it speak properly. Call for it tomorrow."

"No, I'll call for it on Wednesday" – which was tomorrow.

So we got down to it. The stylus had no tips and on auto it didn't land in the right place. This was seen to and the next item was that the turntable made a grinding noise. So we oiled the centre spindle then saw to a couple of other points. It now played *La Boheme* beautifully in rich Italian. Jim Reeves sung in rich English.

He came back the next day and asked to hear it working. So I plugged it in and put on *La Boheme*.

"It still doesn't speak properly."

I snatched off the record. Jim Reeves now sang in English.

"Ah, now it speaks properly – but what's that noise?"

I listened very carefully and turned the sound down. Yes, I could just hear a faint thump I'd not noticed before. I took off the turntable and inspected the rubber drive wheel. This had a slight dent where it had been in contact with the spindle and left there motionless for some time. I selected a new one from the shelf. It now played without the slight thump. Jim Reeves sang again and Mr. Doublecheck nodded cautiously. He produced a length of lead from his pocket, and a 13A plug.

"Put this on for me. My landlord doesn't like me doing these things."

I sighed and fitted the plug.

"How do I run my light and record player from this?"

"You put a socket on the end of the lead and fit a two-way adaptor."

"You do this for me. I don't mind waiting."

So I fitted a socket and supplied an adaptor.

"Thank you. I'll bring the money in tomorrow."

Mrs Tart

Some time later a tall, fashionably dressed lady came in carrying a 12in. monochrome portable. She spoke in a very la-di-da manner, obviously not her usual voice. I wondered what she had to hide.

"I've been given this TV set for my son to use in his room. The picture's very dark. Can you do something about it?"

I said I'd do my best and that she could probably have it later that day. Left alone I tried the set and found that the whites were silvery, suggesting that the tube was low or underrun. I checked the heater supply and found it to be 12V near enough. All the other tube base voltages seemed to be right except for the first anode voltage which was under 200V. The manual didn't specify what it should be so I checked the resistors and capacitors in the circuit and found them to be within specification. I reactivated the tube and was rewarded with a nice clear picture.

When Mrs. Tart returned I showed her the picture.

"Oh yes. That's a little better – but not as good as that one there."

She pointed to the TX9 14in. colour portable which had a needle-sharp picture and was for sale.

"That's a beauty" I said proudly.

"Is it for sale?"

"Yes indeed. It's eighty pounds."

"Will you take weekly payments? Say 50p a week?"

"No madam, I'm afraid I can't."

"Well, how much is my little portable?"

"Five pounds, madam."

"That much? I can't afford that much."

"Well take it away and don't come back any more."

"I don't mind giving you a pound."

"Just take it and go, *please*."

So she went, in her fashionable clothes and her put-on talk. I must be barmy.

The CVC30

Next came an ITT colour set with a 26in. tube – CVC30 chassis. For some peculiar reason I didn't tackle it the way I usually do. I checked the h.t. voltage and found none. Next I checked the chopper transistor which was in order. It had –320V at its emitter and base, so it wasn't being turned on. The driver transistor had no voltage at its collector. I put a short across its base and emitter and h.t. appeared at its collector. As a quick check I fitted another CMP30 switch-mode power supply control panel. Still no joy. So I dug out the circuit and studied it. I moved and the edge of the manual touched the upper right EW modulator drive panel. The whole thing then came on and a nice picture appeared. I tapped here and there, hoping to find a dry-joint. I just couldn't make it go off, so I proceeded to deal with the other complaint, intermittent height.

This was an easy one, the fault being on the correction board over the scan coils. There was a nice dry-joint here which I corrected with a short length of wire. The height was now steady and I returned to investigate the mystery shut-down. I couldn't make it repeat its original performance no matter how many times I switched off and on again. The customer returned and I related the sad tale. He expressed satisfaction with the set and carted it off. Next day he phoned to say that it was dead again and he'd be bringing it in.

This time I tackled it the usual way. I tapped the line output transistor and the set came on immediately. The usual dry-joint on the collector tag. I could have kicked myself but got Honey Bunch to do it instead. Not that hard you cruel bitch . . .

The customer carried his set off again and we haven't seen him since.

How Not to Repair Sets

When Beardy and Non-beardy carried an old Thorn 3500 in I cleared my throat ready to tell them to . . . off.

"We will pay you well to repair this TV for us."

"And guarantee it for ever no doubt."

"No, no. That was just a misunderstanding. You mis-

understood us you see."

"Oh, all right. Leave it here and pick it up later today."

"We'll call for it on Friday morning." Good Friday. Another holiday lost.

When they'd gone I started on the most horrific job I've mucked up for a long time. I think I did everything wrong.

I noted that the red button had tripped, so I checked for shorts and found one straight away. A BU208 had been fitted in place of the R2010 chopper transistor. After a struggle I removed it and checked it with a meter. In the set it had recorded a dead short: now it was clear of shorts. I checked the set again. No shorts. I fitted a new R2010 and switched on. There was a click and some smoke. The R2010 was dead short. I removed it and it was still short-circuit. I called the set some nasty names, removed the power supply panel and fitted a spare. As there were no shorts I switched the set on. It coughed and the 2.5A h.t. fuse failed. I again checked for shorts and found none. What I should have done was to disconnect the tripler, but I didn't, being the fool that I am.

I decided to change the timebase panel. When I switched on the new fuse failed (not blew). Now I

disconnected the tripler, and now the fuse held. I kicked myself (softly, not like H.B. does). I tried again after fitting a new tripler. This time the picture came on but was far too bright: with the aerial out the raster was over bright.

The first anodes were at 800V, but with the controls turned down the raster was still too bright even with the brightness control at minimum. Like a fool I checked the beam limiter panel carefully and found nothing amiss. A check on the grids revealed that they were at the same voltage as the cathodes, well over 100V. A check at the tube bias preset R450 showed that there was no negative voltage here. The feed resistor was all right but there was no negative supply at connector 18/1. It then dawned on me. I'd fitted the new tripler plug without seeing it properly. On inspection only this end was contacting, the far end wasn't even in. I called myself every rotten name I could think of, like the chief P.O. had called me when I swiped his head with my rifle in 1942. Now the picture was good and the controls had to be turned up to their previous settings. I didn't have the nerve to fit the original panels. I just wrapped it up and waited for Beardy and Non-beardy to collect it. They still haven't.

Cable and Satellite 87

Harold Peters

The Cable and Satellite 87 exhibition was held at the Wembley Exhibition Centre on March 26-29th. It was organised by Montbuild Ltd. in association with 21st Century Publishing Ltd., publishers of *Satellite TV Europe*, the space watchers' *Radio Times*. There were over 60 stands in the Centre, the attendant dish farm being outside in the car park.

Although there have been no new satellite launches recently there were nevertheless several items to attract the enthusiast, especially out in the dish farm. Dishes now come in all shapes and sizes, though the 1.5m offset-fed type is almost standard for inclusion with the average TVRO package. A huge 5m dish was receiving C-band pictures from the USA. At the other end of the scale Matsushita was showing a range of light, wafer thin flat-plate aerials with the capability of lateral stacking to increase the gain.

The flat-plate aerial could well be the shape of things to come. It was jointly developed by the COMSAT Corporation in conjunction with Matsushita Electric Works. COMSAT's contribution was the development of what is referred to as a "multilayer planar array structure" that provides high efficiencies (60-70 per cent) over a wide bandwidth – comparable to that of a conventional parabolic aerial. MEW will be manufacturing the aerials and have contributed printed circuit technology and low-cost manufacturing capability. It seems that inside the flat panel there's a phased microstrip array. This technology calls for quite elaborate design work to get optimum characteristics. Matsushita will be marketing a range with dimensions of typically 354 × 20mm and 720 × 20mm. The aerials are expected to be available later this year at prices some 30 per cent higher than conventional parabolic aerials. Large-scale production should see lower prices.

Receivers now come with built-in aerial control. Skyscan offer two handsets with theirs, a simple one for the user and an "all-dancing, all-singing" one for the

person who has to do the programming. Drake dispense with the spaghetti bunch of wires: their control unit can be housed in the garage, with only a single coaxial connection to the receiver(s) in the house.

The broadcasters took a lot of floorspace, each trying to attract a wider audience. The Luxembourg Astra stand attracted most attention, to the chagrin of the MAC-D2 DBS protagonists.

There was some simple test gear too. Handies' precision inclinometer uses a diffraction grating to give an accuracy of 0.2 per cent. From the Cotswolds, Satellite Systems offer the "Squawker" signal strength meter and also a portable site survey viewfinder.

Even with all this gear around we noticed, as we left, a dish being lined up in the old-fashioned way – by watching the output on a portable TV set!



The Matsushita flat-plate satellite TV aerial.

Now Read This

Les Lawry-Johns

I'm told that some of you who repair Ferguson videos don't recognise a fuse when you see one. Now I don't care to get involved with VCRs myself but when I was given this information I thought it would be prudent to pass it on, although the majority of you probably know what it's all about already. The point is that the fuses concerned don't look like fuses, they look more like a small diode or a transistor with two legs. They're called Wickman fuses and are rated at 150V. Close scrutiny of the list given in Table 1 reveals that the current rating is obtained by multiplying the type number by 40, for example type ICP-F10 has a rating of 400mA ($10 \times 40 = 400$). Cries of never... Table 2 lists the range of Wickman fuses available from Philips Service, and their code numbers for ordering purposes. I hope you find this of interest. Take a note of it, just in case.

The Big Roberts

This large set was brought in the other day by two big fellows who puffed a bit. It turned out to be fitted with the Philips G9 chassis, which was bad news for uncle Les. There was about four inches of field scan on the 26in. tube, almost full width, no control of brightness and very little sound. Now as you know the first thing to do with this chassis is to check the condition of C138 (2,200 μ F) which decouples the emitter of the BU208 line output transistor, serving as the reservoir capacitor for the 42.8V supply. I didn't suspect it of being the cause of the fault conditions but checked it just the same. It was on the way out, emitting thick black fluid. I changed it and tried the set again. Still the same. The BU208's emitter voltage was low at about 20V, thus explaining the poor field scan, low sound, etc. I removed the plug connected to the timebase panel (line oscillator, field timebase, EW correction circuit etc.) and the BU208's emitter voltage rose to 40V.

Like a fool I fitted another timebase panel. The symptoms remained the same. So I concentrated on the line

output panel and found a leaky diode (D176) in the beam limiter circuit. Replacing this didn't alter things one jot and I was getting fed up. After further checks I found that the "lower" diode in the diode modulator circuit, D156 (BYX55-600), was open-circuit. Heaving a sigh, I replaced this and put the panel back in. It worked. Full voltage at the BU208's emitter, a lovely field scan, full control of brightness and good sound. I would have thought that an open-circuit diode in this position would have had a more drastic effect on the width, but it didn't. Something else to remember.

The Pye 196

This set gave me a bit of a headache. It's a small monochrome portable fitted with the Philips TX chassis. The complaint was that the picture would go off at irregular intervals, leaving a blank raster with slight radio music or talking sounds in the background. To me this meant trouble in the i.f. strip. My problem was that the fault just wouldn't put in an appearance. The picture stayed on for days. Eventually, one morning, the picture did go off, leaving a blank raster.

I leapt at it and found that the voltages at the base and emitter of the first i.f. amplifier transistor were higher than they should have been – about the same as at the collector. If I switched off to check the transistor however the fault would be gone and we would be back to normal. So I followed the base bias back to the a.g.c. amplifier transistor TS351 and found that this had no base bias. Its collector voltage was thus high and the i.f. amplifier transistor TS217 was being turned on excessively. The base of TS351 is biased by R353 (820k Ω) which was open-circuit. After replacing this the set behaved itself for several days and the owner was glad to collect it.

The set was used in a caravan and had always behaved for the husband but always gave his wife trouble. She blamed him and he was glad to be out of the doghouse. It's all right for him. I live in one all the time. Tessa and Zeb are good really: it's the cat that leads me a dog's life.

The Radio Set

This was a killer. A shop (I won't say who it was, Peter) had told this chap that the only place where he would get his radio set repaired would be here. I said I would have a look at it if he brought it in. Shortly after this he appeared with his wife, carrying a small wooden box. His wife explained the trouble.

"When we turn up the volume it screams at us."

I took the back off and looked inside. On the right-hand side there was a tall object which I took to be the dropper. Next to this there was a valve which seemed to be a 6Q7. It was obviously a double diode triode anyway. There were two further valves to the left, both with top caps connected to the tuning gang (two sections). I looked for an output valve and rectifier but they weren't there.

"Did you say this set goes?"

"Yes, but it howls at you."

I plugged it in and switched on. Something flashed and went bang underneath. I unplugged it and removed the chassis screws and the knobs at the front. The whole thing came out, including the speaker. When I turned it over I saw that the mains filter capacitor had disintegrated. So I clipped it out. "We'll fit another if a strong station has a hum behind it" I explained.

I switched it on again and was aware of an obnoxious smell.

Table 1: Wickman fuses used in Ferguson video equipment.

| Type | Rating | Part no. | Used on |
|---------|--------|--------------|------------------------------------|
| ICP-F10 | 0.4A | 01X0-042-112 | 3V33/38/39/42/43/45/47/48/49/54/56 |
| ICP-F15 | 0.6A | 01X0-040-407 | 3V29/30/35/36/38/39/49/50 |
| ICP-F20 | 0.8A | 01X0-086-061 | 3V46/50 |
| ICP-F38 | 1.5A | 01X0-057-320 | 3V38 |
| ICP-N10 | 0.4A | 01X0-058-395 | 3C01, 3V44/45/48/50 |
| ICP-N25 | 1A | 01X0-085-007 | 3V44/45 |

Table 2: Wickman fuses from Philips Service.

| Rating | Code no. | Rating | Code no. |
|--------|-----------|--------|-----------|
| 63mA | 253 10058 | 1.25AT | 253 10075 |
| 160mA | 253 10054 | 1.6AT | 253 10046 |
| 250mA | 253 10071 | 2A | 253 10051 |
| 315mA | 253 10074 | 2AT | 253 10039 |
| 400mA | 253 10064 | 2.5A | 253 10082 |
| 500mA | 253 10041 | 2.5AT | 253 30089 |
| 630mA | 253 20089 | 3.15AT | 253 10048 |
| 800mA | 253 30104 | 4AT | 253 10047 |
| 1AT | 253 10052 | 5AT | 253 10065 |

Note: T after A indicates time-lag type.

"It's the smell that's getting us down" he said.

I sniffed around and it seemed to come from the dropper. I looked at it closely. It wasn't a dropper, though it looked like one. It was an old selenium rectifier. I disconnected one end and fitted a BY127. "It won't smell any more" I said.

"That little thing in place of that big one?" he queried.

"The march of time" I explained.

I examined the set in more detail and came to the conclusion that the double diode triode drove the speaker, that what I had assumed was the i.f. amplifier was in fact the second r.f. amplifier, and that what I had assumed was the frequency changer was the first r.f. amplifier. It wasn't a superhet at all, it was a t.r.f. receiver. This meant that the "volume control" was in fact a reactance control, hence the oscillation when it was turned up. I connected the short aerial lead to the braiding of a TV aerial and the set started to perform. With the set tuned to the h.f. end of the medium wave band I tuned the trimmers on top of

the gang. The stations now came through loud and clear. I turned up the "volume control" and the set howled, so I turned it down for comfortable listening.

"How long an aerial lead do you use?" I enquired.

"About four feet, connected to a water pipe" he replied.

"Well don't connect the aerial lead to a water pipe unless you use it as an earth. Use a bloody great length of single lead and don't connect it to anything."

"Why?"

"Because the ideal length for an aerial is half a wavelength. Radio four on the long wave is 1,500 metres. The aerial length for this is therefore 750 metres. Get the drift?"

"Yes. Thanks very much."

So they went off leaving me feeling full of nostalgia for the old days. I thought I'd forgotten it all but back it came. I still wonder about that double diode triode driving the speaker.

Product Report: Glue Guns

Harold B. Berkley

For some time now I've been using a glue gun for both field and bench work. It's proved to be so useful that I never venture into the field without one. Traditionally we seem to carry in our kit everything for repairing the set, but seem to overlook damage to the cabinet, knobs and other bits and pieces. Very often a second, wasteful call is needed. With a glue gun in your hand you can eliminate many of these problems.

The Weapon

Glue guns use hot-melt adhesive sticks – many types of glue sticks are available for bonding different materials. I prefer the clear, general-purpose sticks usually provided with the gun. These will deal with most plastics, wood, fabric, paper, etc.

There's no shrinkage of the glue and the bond is ready when cool. The material is a good insulator and can be used as a sort of potting compound.

For around £10 you can pick up an electric glue gun, with glue sticks, and get started. There are two types of sticks: short, manual fed ones and longer, trigger fed sticks. Both types are o.k.

Camping Gaz have introduced a cordless glue gun. One of these (type P500) has been supplied to me for evaluation and I'll be reporting on it at a later date. It's powered by a Camping Gaz CV360 butane gas cartridge which should give around four hours' continuous use. Ignition is electronic, using one small battery. Two of the longer glue sticks (11mm × 210mm) are provided. The catalytic heating system means that there's no naked flame. The gun is good but not cheap at around £35.

Applications

You will doubtless find many uses for your glue gun. Here are some of mine.

Cabinet repair is where the glue gun really shines – in the field instead of having to cart a set in for repair or even cabinet replacement. Repairs that are possible in the field include: cracked cabinets and fascias; internal damage to plastic mouldings; switch and push-button

mountings.

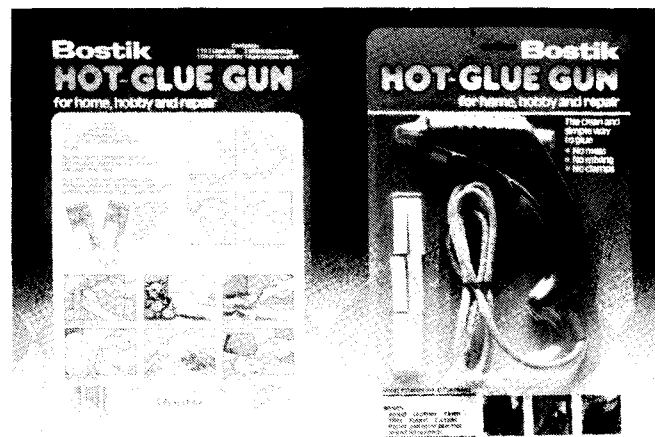
The gun can be of great help with older and obsolete sets for which parts are no longer available. Have you ever been to an older set which has push-buttons that go flying across the room when you change channels? No problem with the glue gun!

The above remarks also apply to bench work and refurbishing of course.

Here are some specific uses. With whistling line coils, for example in the Thorn 9600 chassis, a quick squirt of glue will usually provide a cure. This is worth a try on other noisy chokes and transformers. Where an on/off switch has been pushed into the set, breaking the plastic moulding, a new switch can be glued in – allow to cool before testing. When the aerial socket comes away from the cabinet, for example in Korting sets, a glue gun will come to the rescue. In fact the list is endless.

In Conclusion

In conclusion, this must be one of the few gadgets that will earn its keep very quickly. With the new cordless type giving greater convenience ever more uses will be found. If anyone finds some good ones, let us know!



The Bostik thumb-operated hot-glue gun in blister pack.

Tiny Tim's Triple Trouble

Les Lawry-Johns

Tim sat behind his bench and looked out at the world, or some of it. Pretty girls looked at the door to get a reflection of themselves – this was apparently their favourite occupation. How could they tell their boy friends they loved them? There just wasn't room. Not till they got older and told their children they were selfish.

It's a funny place this world, thought Tim. Then he realised he was the same himself. It was just that he didn't show it so blatantly. He sort of covered it up and pretended he cared for others. Like Tinker Bell really did – not for Tiny Tim of course, but she seemed to care for others.

His eyes strayed under the bench. How did those books of naked girls get mixed up with his service manuals? Oh yes. He was saving them for his brother who liked things like that since he couldn't do anything other than sit in a chair all day and read and watch videos and things. Tim didn't like these rude books. It was just that he had to make sure that his brother wasn't going to see something that would upset him. Besides, he would have to keep them until Saturday so that Phil could read them too.

Mr Golightly's K40

Just then Mr. Golightly opened the door and carried in a Philips K40. "It goes off just when it's getting interesting, and my wife's getting fed up with it and with me" he explained.

Intermittent operation. Tim's heart sank. He wasn't keen on K40s as he hadn't had much to do with them as yet – not like the KT3, which he was always pleased to see, with its unreliable tripler and probably a faulty chip or two, or the usual problem of the 4.7Ω resistor without chip faults.

He removed the rear cover warily, switched on and connected an aerial. A lovely picture appeared and remained. Tim got out the hairdryer but nothing responded to it. He then drew out the lower, centre power panel to see whether heat on this would do anything. Now to get this panel out you have to lower the main panel. Having pushed the power panel back in Tim raised the main panel and the set went off. He lowered it and the set came back on.

"There you are" said Mr. Golightly, "on off, on off".

Tim sighed and peered at the main board closely. A tiny spark caught his eye. Yes, on one of the line output transformer pins. Quick as a flash it was resoldered. "All done Mr. Golightly. See you next year perhaps."

"What? When? Wait a minute!"

Tim moved the main board about and tapped it with the screwdriver handle. "All done. Next gent please."

He wrapped it up and put it back in the car while Mr. Golightly muttered about what his wife would say if it happened again. We haven't seen him since – except when he popped in with half a bottle of Bells for Tim. In fact the poor joint hadn't been cleared that quickly. The pin had been scraped clean before resoldering.

Tim's Second Trial

When two fellows staggered in carrying a big TV set with doors Tim wondered what it was. It turned out to be

a fairly old 26in. GEC set of the C2110 variety. Tim felt at home with this type of set and had no qualms about undertaking the repair. The two chaps departed, having given their details, and said they would return later that afternoon.

Tim removed the back cover and went straight to the fuse on the upper left side. It had failed but wasn't blackened. Tim fitted a new one and switched on. The sound came on and the e.h.t. rustled up and Tim felt pleased that he had taken this short cut. The fuse then curled up and failed, and Tim stamped his foot in anger.

He checked the lower centre power unit which said it was in order – the thyristor, the electrolytics, everything. He then checked the line output stage carefully. Again no fault. He remembered Beardy's 3500 and disconnected the tripler, then fitted a new fuse and tried again. The sound burst out but the new fuse died as the previous one had. Tim reconnected the tripler and disconnected the line output transistor. Another new fuse was fitted and this time it held. Tim didn't suspect the line output transistor but changed it just the same. He disconnected all the l.t. lines from the line output transformer just in case then tried again. The fuse failed after thirty seconds. Feeling a bit fed up, Tim tested all the items associated with the line output transistor's base. Everything was in order, but then they would be if the failure occurred only when the set was working. So it would have to be panel replacement.

Tim thought hard, which was something he was not used to doing. What if a replacement panel was fitted? Would they be prepared to pay? Tim put the set to one side.

When the owners (carriers) returned, Tim asked them how much they were prepared to pay for the job. "Somewhere between five and ten pounds" was the answer.

"Clear off" said Tim angrily. So they carried it off and Tim sulked. All that time and worry wasted. He would have to change his ways. But why should he? He'd been doing this job for forty years or so and he wouldn't change now. Oh for a couple of nice G11s.

Mrs Fidler and the G11

Just then the phone rang. It was nice Mrs. Fidler who lives on the outskirts of town. Tim had sold her a Pye G11 some years ago and this was the first time she'd been in trouble. Nice Mrs. Fidler, a young sixty year old, who had her mother living with her.

"Hallo Mr. Tim. Can you come and fix my telly? The tube's gone."

"How do you know the tube's gone Mrs. Fidler?"

"Because there's a white line across the screen. Our neighbour had the same thing and Snappy Repairs took the set away and fitted a new tube. It only cost them eighty pounds."

"I'll come and see to it Mrs. Fidler, and promise it won't cost you eighty pounds." Tim packed his bags and made sure he had some 800mA fuses, a TDA2600 chip and a chip holder. He sped up the road avoiding the dogs who were chasing a bitch on heat. When he arrived he whipped the back off the set and switched it on. There was a supply to the field output stage so the fuse was

intact. He unsoldered the TDA2600's heatsink and removed it, having checked that the base of the holder had not been overheating and had no dry-joints. The new TDA2600 was fitted and the heatsink replaced. Upon switching on a nice picture appeared.

"Oh Mr. Tim. It wasn't the tube after all."

"No dear. You're not the only fiddler in town I fear."

By the time Tim got back to the shop the phone was ringing. "The white line is back Mr. Tim."

Tim cursed himself. He hadn't checked the $470\mu\text{F}$ h.t. reservoir capacitor. He sped back, carrying a replacement capacitor and another TDA2600. Tim looked sheepish when he got there. He removed the $470\mu\text{F}$ capacitor from the power board. It was a red one and the tags were blackened. After fitting the new welded one and the TDA2600 Tim was rewarded with a nice clear picture. "You're lucky Mrs. Fidler. This could have cracked the tube."

"That's what I told you, Mr. Tim."

"I . . . er. Oh, never mind. Just joking. Goodbye Mrs. Fidler. Have a nice day."

Tim slunk back to his little shop and told Tinker Bell all about it.

"I've heard you tell a million people about that capacitor and what it can do. And when it comes to it you don't bother to check it yourself" she said.

"I know, I know. Silly me."

Wickman Fuses

Oh, incidentally, Wickman fuses (see last month). Ferguson don't call them that. They refer to them as "circuit protectors". They seem to be the same however, like a small black transistor with two legs. But order them as circuit protectors from Ferguson, Wickman fuses from Philips.

Letters

THE TX9 THYRISTOR PSU

Gordon Haigh's article on servicing Ferguson TX9 thyristor power supplies, in the July issue, was timely and interesting. Anyone who has to face these sets in the field will welcome the wealth of advice and information given in the article. Although the TX9 chassis was basically very reliable, the PC1001 and PC1040 versions were prone to fuse blowing caused by repetitive spikes on the mains supply at or near the a.c. waveform's zero-crossing point. Ferguson introduced several modifications, mentioned in the article, in an attempt to overcome the problem. These were successful to some extent but the problem of fuse blowing persisted until the arrival of the PC1044 version with its switch-mode power supply.

If the fuse blows while the receiver is working, a replacement fuse restores normal operation and all seems to be as it should be in the receiver it's likely that the cause of the fuse failure is a spiky mains supply – domestic appliances in the same house could be producing the mains interference.

A few years ago an "unofficial" modification appeared. This altered the operation of the power supply in a way that avoided the spiky mains problem. It consisted of adding a second thyristor to the circuit. An outline sketch of the arrangement is shown in Fig. 1. Both thyristors are triggered via transformer T1 and both are fed with mains a.c. at their anodes. Ferguson made the modification

available for the PC1040 board and developed a small modification kit which was issued to some of the more desperately plagued dealers. It can also be applied, with care, to the PC1001 version. The extra 470Ω resistors are $\frac{1}{8}\text{W}$ types and the thyristor labelled SCR4 should be of the same type as SCR1. Where W66 is fitted it can be removed: the network C142/R173/W74 across SCR1 can also be removed.

This modification made life a lot easier for many service engineers.

Harold Raven,
Nottingham.

THE FLAT SATELLITE TV AERIAL

Publicity has been given recently to a small, flat, wall-mounted domestic aerial for satellite TV reception. It's certainly an extremely appealing idea and has been generally welcomed. For the present and for the foreseeable future however it's likely to remain just a concept. There's no question of a new generation of flat "dishes" suddenly replacing the conventional parabolic dish. In the fullness of time the flat satellite TV aerial will undoubtedly come into its own, but at the moment its development is inhibited by manufacturing costs and the challenge of perfecting viable electronic steering from satellite to satellite.

It's claimed that the cost of a flat dish aerial is thirty per cent higher than that of a parabolic dish giving the same performance, and that a smaller surface area is required for the same performance. This cost figure could be a gross underestimation in view of the fact that the main receiving elements on the flat aerial must be etched to provide $\frac{1}{4}$ or $\frac{1}{8}$ wave sections with a manufacturing tolerance of less than a thousandth of an inch. The distances between the large number of these sections have to be maintained at an even closer tolerance. In addition, the surface must be kept perfectly flat. If these criteria are not meticulously adhered to the signal picked up by some of the sections may be out of phase with the signal picked up by other sections, the result being phase cancellation.

At its current stage of development the flat aerial, whether mounted on a roof or wall, would need a conventional azimuth/elevation mount and would require the same degree of care in alignment as a conventional parabolic dish. An electronically steerable flat aerial could indeed be mounted in an arbitrary position, but electronic steering is a long way off and is unlikely to be available in

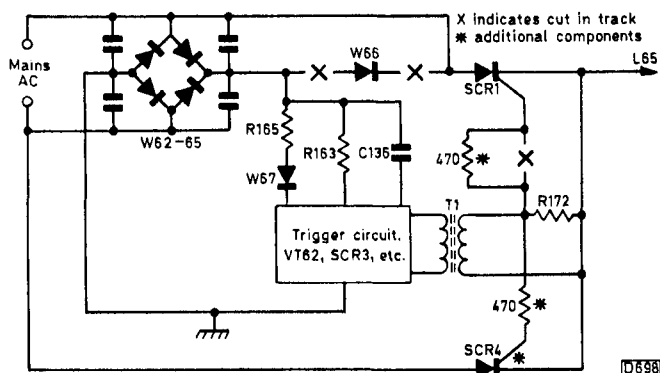


Fig. 1: Thyristor power supply modification for the Ferguson TX9 chassis. Note that in the PC1040 version W66 is omitted and R165/W67 are interchanged.

Mr Harass and Mrs Corker

Les Lawry-Johns

Mr. Harass originally phoned to say that his Bush T20 was ghostly for the first two minutes or so, after which it was all right. Now I've had this business several times with T20s and T22s, and the cause has been the 47 μ F electrolytics in the switch-mode power supply. I looked for a spare unit and called out for one to show itself. Nothing doing, so I thought I'd call in on Geoff to see whether he would lend me one and, to be on the safe side, I took a couple of 47 μ F electrolytics with me.

Eddy's Advice

I landed at Moon Lane and slipped up the stairs to see Geoff. Having picked myself up, I could hear Geoff laughing and saying to Eddy "the silly old sod can't even walk up the stairs without falling over. Oh, hallo Les. Sure footed as a mountain goat as usual."

I smiled in my usual composed way and enquired about the availability of a T20 power supply.

"Certainly old chap, are you sure you need it?"

Ignoring the implication of this remark or query, I described the symptoms. "Ghostly for the first two minutes."

Eddy spoke up, "You need a tube base socket, not a power supply unit."

I smiled. "Thank you Eddy, but I'll borrow the power supply if I may."

With the unit clutched in my hand I left the shop of doubt and headed for Hollyberry Lane, trying to remember what it was that Honey Bunch had asked me to get from the corner shop next to where Mr. Harass lives. I thought I'd fit the power supply unit first and get the ham later.

"Good morning Mr. Harass. Are you the gentleman with the dicey power unit?" After being ushered into the room where the T20 lived I whipped the set round, removed the rear cover, hooked the chassis into the service position, lowered the timebase panel and had the power supply unit out before you could say dozy. I slipped the spare one in and connected it up. When I'd fitted the aerial and switched the set on the sound boomed out and a picture tried to appear. It was miles out of focus. I smiled a sickly smile at Mr. Harass. "Sorry sir, I'll have to pop it back to the shop for a few minutes, to make it better so to speak."

The T20's own power supply was refitted, the rear cover replaced and the whole lot was then carted back to the shop, pausing only in Moon Lane to return Geoff's power supply.

"Sorry Eddy. You were right as usual. The silly bugger didn't say it was out of focus. Have a nice day."

Back at the shop I removed the faulty tube base socket and fitted a new one. The picture was good from switch on. Only a slight touch on the focus control was required (remember that). In a trice the set was taken back home to beam its lovely picture at Mr. Harass. "LLJ triumphs again" I snarled as I sped back to the ranch.

Two Days Later

Two days later Mr. Harass phoned again, this time because of sound hum that varied with picture content. I

selected my spare decoder/i.f. panel and wound my way up to his house. Oh yes, I'd forgotten to get the ham last time . . . I listened to the sound from his set and it did have a hum which changed when the scene changed. On fitting the spare panel the hum had gone.

"The picture's nowhere as good as it was" said Mr. Harass.

I adjusted the preset contrast control.

"That's better."

So off I went, hoping to hear no more. Some hope.

Two days later he was on again. "The picture's terrible. Can't see the stumps and can't read the score. I want my panel back."

Now I had spent hours on his panel, painstakingly removing every suspect capacitor and finding it good. I resolved to refit his panel and if necessary swap over the i.f. subpanel and tweak up his focus control. Have you noticed that if you alter the focus potentiometer setting you have to reset it back later? Not every time of course, just nearly every time.

So off we went again. I removed the rear cover and reset the focus control for a clear picture. I then refitted his panel and there was no hum at all.

"Ah, that's better" said Mr. Harass. "I knew that panel you fitted was no good."

I heaved a sigh and left it at that. I hope the focus control holds its contact this time.

Mrs Corker's KT3

I was busy talking to the dogs, telling Tessa what a pretty girl she was, when the phone rang. It was Mrs. Corker, her with the legs. She'd called to say that her Philips TV set (KT3) was on the blink. In fact it wasn't doing anything except stand there, and it wasn't doing that very well either. I promised to call during the afternoon.

I was greeted at the door by Mrs. Corker, who was wearing the shortest of short skirts. I swallowed hard and allowed her to precede me into the drawing room. She immediately lay under the set and gestured for me to do the same. I've been caught by this one before, and hesitated to tell her I was beyond it.

"Get up Mrs. Corker. We'll turn the set on its side."

She scrambled to her feet, looking I thought a little annoyed.

When the set had been turned on its side I tightened up the loose screw. I wonder who'd loosened it? After putting the set upright I switched on. Nothing.

"It's the switch" she said.

"Funny how all you women say that" I commented.

With the rear cover removed I found that there was h.t. at one end of the 4-7 Ω surge limiter resistor but nothing at the other end. I removed it and fitted a more manly type. The set now came on but was tripping. After disconnecting the lead from the line output transformer to the tripler the tripping stopped.

"You need a new tripler Mrs. Corker."

"Will that stop the colour keep going off half way through the evening?"

"No dear. That's a little something that can be done in no time and I'll do it before I go."

So I fitted the tripler, taking the diode and earth leads

over the top, and soldered them together where the original single lead had come through, in my usual lazy way. I took out the left upper panel, cleaned the contacts, and refitted it. After switching on I was rewarded with a lovely clear picture in full colour, except for a predominant green which sorted itself out in a couple of minutes.

"What about the colour going off?" asked Mrs. Corker.

"That won't happen again, I promise you. Well not for a year or so anyway."

"I didn't see you do it."

"You were looking at that bird in the garden."

"Oh, lovely, I must give you something before you go."

"Yes dear. Thirty quid."

"Not negotiable?"

"Sorry."

The Thorn 9000

I limped back to the shop and found a Thorn 9000 on the bench. Now I'm not keen on these sets as they tend to play tricks on me. This one had had a new tripler fitted recently. I disconnected this, though I didn't suspect it. Switching on rewarded me with sullen silence, though there was h.t. on the syclops wall. I turned it over and checked the usual places. As all seemed to be in order I disconnected one end of R709, the 47Ω resistor connected between the base and emitter of the syclops transistor. It read something like 10Ω. I pushed the free end through, out of harm's way, and fitted a new 47Ω resistor on the underside (lazy me . . .). The thing then started up, leaving me just to reconnect the tripler. This resistor seems to be really playing up nowadays, but it makes a nice, easy repair. What we need is nice easy repairs. Where did they go?

Teletopics

ALL CHANGE

Following last month's announcement of the sale of Thorn-EMI's consumer electronics products manufacturing subsidiary Ferguson to the French firm Thomson Grand Public, this month brings news that Thomson has established a major presence in the US consumer electronics goods market by taking over General Electric's interests in this field. General Electric's share of the market increased considerably when it took over RCA in early 1986 – the two brands GE and RCA together form the market leader in the USA, with some 23 per cent of TV sales.

Thorn-EMI has announced completion of the sale of Ferguson to Thomson, the consideration, which includes repayment of loan accounts, being £90m. In addition Thomson will be acquiring, in separate deals, Ferguson (Ireland) Ltd. and Thorn-EMI's one third interest in the joint VCR manufacturing venture J2T. In the year to end-March 1987 Ferguson made a loss of £12m, including rationalisation costs of £8m. Its net assets are valued at £81m.

As we go to press Thorn-EMI has announced a major acquisition in the USA. It is taking over the US Rent-A-Centre group for £371m in a bid that has the backing of the Rent-A-Centre board. Rent-A-Centre is one of the three leading consumer electronics rental companies in the USA with an estimated nine per cent of the market. In the last five years the firm's net profits have risen from

\$2.8m to \$9.9m – a further substantial increase is expected in the current year. In addition to consumer electronics goods, mainly TV sets and VCRs, Rent-A-Centre handles some furniture products.

For further information and comment on these moves see page 741.

DBS LATEST

British Satellite Broadcasting (BSB), which has the UK DBS franchise, has been holding talks with semiconductor manufacturers with the aim of ensuring that chips to decode the MAC signals will be available for incorporation in receivers by the time the service starts in late 1989. BSB has gone as far as offering to help fund the development of chip sets. One problem that seems to be holding the semiconductor manufacturers back is the fact that the transmission standard has not been decided: while BSB and the UK government favour the D-MAC standard it's likely that the French and W. German DBS services will use D2-MAC. The Norwegian semiconductor design firm Nordic claims to have developed a dual-standard chip set capable of handling both D-MAC and D2-MAC. A consortium that calls itself Euro-MAC and includes Philips and Thomson is urging the adoption of a common standard for European DBS transmissions.

Plessey Semiconductors has announced a down-converter chip, type SP5062, for use in satellite TV head-end units. The circuitry makes use of Plessey's s.h.f. bipolar technology.

Meanwhile two consultancy organisations have issued reports that cast doubt on the prospects for BSB's DBS service, at any rate in the early years. Logica Consultancy's report suggests that only around 600,000 UK homes will be able to receive the service after the first five years. CIT Research's report suggests that BSB would have 150,000 subscribers after five years and 500,000 after ten years. BSB's business plan assumes the installation of some 350,000 receivers at the start of the service and five million receivers in use after five years. CIT's managing director Patrick Whitten points out that if cable TV is taken as a guide only ten per cent of consumers are prepared to pay extra for a premium service. At the moment of course all this is pure guesswork.

SUBSCRIPTION TV RECOMMENDED

The report by CSP International, briefly mentioned last month, advocates the start of a subscription TV channel for UK viewers, using conventional terrestrial broadcasting. This report suggests that thirty per cent of households would be prepared to pay £10 a month for an additional, scrambled, premium channel. It says that plenty of spectrum space is available for such a service. If allocating further space to TV or finding ways of making greater use of the space already available proves to be unacceptable the report suggests curtailing the current services to slot in scrambled programming, or alternatively using periods when transmitters are at present off-air to download programmes. Such ideas are expected to be welcomed by those members of the government who favour a move to viewer payment for services provided.

CITIZEN'S POCKET COLOUR TV

Citizen is shortly to launch in the UK a colour pocket portable TV set using an LC display. The set, Model TC53, is expected to be the only PAL-I standard LCD set available in the UK before Christmas. The NTSC version has been on sale in Japan and the USA for some time.

Keith and Alex

Les Lawry-Johns

Keith and Alex have been up again from Pompey to straighten me out. They keep having to do it. If you recall, on the last occasion they were in the shop I'd sold a chap a tripler and told him to join the diode and earth leads together, whereupon Keith had commented "it won't last long like that". I wondered about this as I've always joined them for use in the ITT CVC32 chassis. Apparently the receiver had been a CVC5, not a CVC32 – the evidence being the tripler he'd had in his hand. Now I honestly didn't see a tripler of any type and understood that he wanted one for a CVC32. Hence the confusion. The chap never came back, so I assume that he must have read the leaflet and connected it correctly. My apologies, all round.

The Philips G11

While Keith and Alex were paying their latest visit I told them about the Philips G11 that had me going for some time. In a nutshell, it blew the BU208A line output transistor every four days, despite fitting a nice new 470 μ F h.t. reservoir capacitor – on the first day. Three times it came back, and each time I went over the joints, resoldering every suspect and non-suspect. I could have fitted a new line scan panel but wasn't happy with this approach to the problem. When I'd fitted the last BU208A I kept the set on test for several days.

One morning I switched it on and it refused the start. The h.t. fuse was intact – it had always blown when the BU208A had gone short-circuit. The set started when the top plug supplying the BU208A was touched. My troubles were over when I connected an extra lead from the socket's base connector to the base of the transistor. The set's been going all day every day since but the owner hasn't been back to collect it. I suppose he was a bit fed up with it and with me.

The joke was when a gentleman came in to buy a black-and-white receiver since he's colour blind. Said he'd been everywhere (I doubt that) but hadn't been able to purchase one. He looked at the G11's picture – a black-and-white film happened to be on.

"I like that" he said.

I told him that one wasn't for sale, so he bought a 20in. Thorn 1500 which had had a new tube fitted. He told me that he could identify the balls on a snooker table without seeing the colours. Well I never . . .

The Bush T20

Shortly after this a Bush T20 came in and a quick test proved that the BU208A was short-circuit. I fitted another one and resoldered all suspect joints. After switching on there was a lovely picture – for three minutes. Bonk. The BU208A had bit the dust. I did everything I could think of, including the addition of an earth lead from the timebase panel to the line scan panel, renewed the BU208A and the driver transistor and tried again. Two and a half minutes later the BU208A died. I put the set to one side and got on with some more rewarding jobs – not that there are many about nowadays.

I eventually tackled the T20 again. After fitting yet

another BU208A I concentrated on the joints that looked good and resoldered all that played a part in driving the line output stage. When I removed the solder from the legs of the line driver transformer I noticed that they weren't clean. I scraped them until they were shiny and resoldered them. This time the BU208A survived and so did I. Fooled by an old one like that!

Dr Dicey's Dynatron

When Dr. Dicey phoned I knew I couldn't ask him to bring his set in – it's a great big 26in. Dynatron. So I would have to go to see him, and I didn't have a car. Mine had broken down on the way to Heathrow a few days earlier and as the cylinder head was now warped I would be without it for some time. I remembered my friend Les whose Dynatron I'd fixed a couple of days previously. He'd said he would like a new set but would like to have it fitted into the existing cabinet. I'd declined to do this on the grounds that it would be difficult to get one to fit. As Les is retired I got on the phone to him to see whether he would run me up to Dr. Dicey. He said it would be no trouble at all and he'd like to see Dr. Dicey again – he'd not seen him for some years.

"But he was a woman's doctor, one of those gynaecologist fellows" I said.

"Yes of course. I knew him outside his practice."

By now we were almost there and soon came to a halt in his drive. I went in and examined the patient, which had severe damage to the power supply and remote control receiver boards. The chassis is similar to that used in the Pye 731 series.

The doctor commented that had it been a woman he'd have sorted out its inside, but a TV set was another matter and he didn't feel inclined to have it repaired. He wanted to retain the cabinet and fit a new set inside it. I knew that this would mean two transplants, one for the doctor and one for Les. Oh well.

I carefully measured the inside of the cabinet and jotted down my findings. We returned to the shop to pick up a G11 in good working order to serve as a loan set while I ordered a new one. This kept him happy for a few days, and in the meantime I picked out the Pye 59KE2703 as the most suitable candidate for the operation. This arrived a few days later. It had a dark cabinet (anthracite) and a remote control handset. I quickly unpacked it and lined up the programmes.

The 24in. FST screen looked lovely and flat and I felt it would fit nicely into the doctor's cabinet, being 27in. wide and just over 18in. high. I contacted Les who was only too pleased to assist with the fitting, knowing that if all went well there'd be a repeat performance with his own set.

Up we steamed and I ripped out the panels and removed the tube. Then came the job of removing all the bits and pieces that would have impeded the entry of the new set. The Dynatron's nice looking front panel had to be removed, but shortly afterwards the new Pye looked out over the doctor's lounge and produced a good picture. All that was now necessary was to line up a programme for the doctor's video, which was quickly done.

I piled all the panels into a bin liner and struggled out with the tube, the G11, etc. while the doctor wrote out his cheque. On the way back Les said he wanted a set just like that and a video to go with it. When I ordered these the chap at the other end was interested to hear about our success in fitting the 24in. Pye into the Dynatron cabinet. Apparently he has one of them himself and wanted just this information . . .

Caught Again

Les Lawry-Johns

First of all I'd like to thank John Wakely of Colliers Wood for his kind letter. It's nice to know that someone has long memories of the years gone by and has benefited from time to time from my jottings. I'm sorry if I'm not as bright as I used to be, but it's over thirty years since I started to write on TV servicing. I was in my thirties then, so we haven't done too badly – with a bit of luck and some help from the little angel who sits on my shoulder.

The ITT CVC30 Series

Now a word of warning that concerns the ITT CVC32 chassis and its relatives. They keep coming in with the BU208 line output transistor short-circuit. You fit another one and everything is lovely – for a day or perhaps a week, then the nice new BU208 bites the dust for apparently no reason. When this first happened to me I went to bed and dreamed of a Bush T20. The next morning it dawned on me. If you have this sort of thing with a T20 you don't hesitate to look at the scan coil connection plug, and you are not surprised to find the end pin burnt. You wire the lead with solder and the battle is over. With the CVC32 etc. the orange lead, second from the bottom, requires the same treatment. Cut it at the plug and solder it to the panel. The rule is to look at this plug to see if any of the pins show signs of scorch marks and check the panel above the scan coils for dry-joints. I know that the ITT experts will be laughing at this "old one". But we can't all be ITT experts, and we can all be caught at some time or another.

Notes on GEC Sets

If we get an old GEC C2110 series receiver – this includes the later C2219H etc. – that mucks about heightwise, varying with heat etc., we tend to charge the field driver transistor TR453 with being heat sensitive. This may well be so, but often the 47 μ F field charging capacitor C457 connected to its base is leaky, upsetting the AC128, BD150 or whatever is fitted in the TR453 position.

Now to something more up to date, the C1403H etc. These little sets are fitted with the ITT CVC1100 series chassis and we get a number in with the 1A chopper power supply fuse Si651 blown. The cause is usually the 120V over-voltage protection zener diode D658 (type ZPY120) going short-circuit. These little diodes seem to have a short life expectancy. Order some now.

Driven to Drink

A Philips monochrome portable (TX chassis) nearly drove me barmy the other day. It had a very grainy picture that wouldn't respond to anything I did. I looked at it and it sneered.

"You think I don't know you need a new tuner, don't you?"

It didn't answer so I sucked off all the solder from the tuner's legs and selected a new U321 off the shelf. I looked at its legs (I always look at legs) to ensure that it hadn't seen service previously. They were bright and clean and had not seen solder. So I fitted it and switched on,

expecting to see a nice, clear picture. It was the same as before.

I checked the first i.f. stage and the a.g.c. circuit carefully. The latter wasn't working properly. It took me quite a long time before I found a leaky diode. This was replaced and I switched on again. Exactly the same results.

I put the portable to one side and got on with more fruitful activities, to wit a Philips K30 that arced viciously all over the tube base after switching on. I stared at it and then listened carefully. A spitting noise was coming from the line output transformer. Ah, ha! I just happened to have a spare transformer which was fitted in a trice. The spitting stopped and no damage had been done to anything else. At last a success. Now back to the portable.

I checked here, there and everywhere and got nowhere. At last I gave up, removed the new tuner and refitted the old one. Just for fun I gave it one last try. Perfect! The new tuner was faulty, the old one was o.k. and the set's trouble was the a.g.c. fault. What kind of fool am I?

The Ferguson TX9

The next set in was a Ferguson Moviestar 14in. colour portable (TX9 chassis). It was brought along on a trolley to which the set was securely strapped. We unstrapped it and put it on the bench. "I dropped it" its owner – a lady we know well – said, "and when I put it on it went pop."

I took the chassis out and examined it. There were cracks in a dozen places but the tube was all right. Its owner keeps half a dozen dogs at any one time, so I thought I'd do my best for her. I asked her to call back in a couple of days' time.

It took me a fair amount of time to join up the tracks. I then closely examined the rest of the panel and checked for shorts – there weren't any. With the set still on its side I fitted a new 1.6A mains fuse and switched on. The set started up all right. The tube's heaters glowed and e.h.t. was present. I wrongly thought that the sound was muted because no aerial was connected, but at the time I was more interested in whether the fuse would hold. It did.

I put the set upright and the fuse immediately blew. I turned the chassis up and checked very carefully. No shorts. I put the set upright and checked the h.t. line etc. Many fuses and a mains filter capacitor later I found that with the chassis on its side a track became open-circuit, removing the 24V line output transformer derived supply to the TDA1170S field timebase chip. In short, the TDA1170S was short-circuit and the supply track to it was cracked. The crack was invisible to the naked eye (mine anyway). A meter check proved the point.

A length of wire was used to bypass the faulty track and a new TDA1170S was fitted. This time the fuse held and the screen lit up too brightly, with loud sound. The controls had no effect. This was traced to an open-circuit, which couldn't be seen, on the chassis socket.

Everything was fine until the chassis was put upright. With the set upright there was no sound and no picture. Only the tube heaters glowed. This time an open-circuit track to the 12V regulator was eventually found. It was again invisible and made with the chassis on its side. After this had been attended to everything in the garden was rosy and I regained a trace of my always shaky self-confidence.

When its owner came back with her trolley I was worried in case the set would get shaken up, probably opening more cracks. I asked whether I could run her home in the car, but she declined on the grounds that she

had only a few yards to go up the road. So I laid the set on the trolley carefully, resting it on a thick pad. She had a dozen straps with clips at either end and placed these carefully round the set – without attaching any of them to the trolley! I just had to speak when she came to the last two.

“Uh, the set’s completely covered with straps, none of which is attached to the trolley. What’s to stop it falling off?”

“Oh, I’ll hold it on.”

“What are the straps for then – to keep the set together?”

“You put the last two on then.”

So the set was secured to the trolley and its owner departed, bumping the trolley off the path into the road. Oh well . . .

The Grundig

A Grundig 2210 with the two-thyristor line output stage was given to us by its owner. He didn’t say why he was parting with it. On examination the only fault seemed to be an open-circuit surge limiter resistor (12Ω , 17W). There are two of these in series with the mains bridge

rectifier. We replaced the resistor, checked everything else and switched on. The tube had a lazy green gun but the picture was fair. I left the set on test.

The next day, a few minutes after switching on, it went bonk. This time the other surge limiter had failed. After replacing it I studied the circuit. There’s no fuse in the supply to the line output stage. I looked at the scan coil plug and decided to clip the h.t. loop and fit a 1A fuseholder. At least this would narrow down the fault possibilities. An hour later the fuse failed.

I changed both thyristors and their mica washers, fitted a new fuse and tried again. The set continued to work all day. Next day the fuse failed. This time I found a leaky diode in the beam limiter circuit, on the earthy side of the e.h.t. supply. I replaced it without much confidence. About an hour later the fuse again failed. By now I was getting fed up. I went over all the soldered joints, particularly those in the line output stage and the connections to the scan coils – remembering the ITT sets etc. All the contacts were found to be good. The set now rests, showing its magenta picture, and I’m expecting the fuse to fail at any moment. Why? Perhaps I’ll be able to tell you next month. Then again, perhaps I won’t.

A Versatile Bench Transformer

Albert L. Hitchings

Often a particular transformer voltage is required and although you search through your Aladdin’s Cave of electrical goodies Murphy’s Law says ‘you won’t find one’. You need worry no more. All you need is an old transformer with a sound mains primary winding, or you can purchase a kit. RS Components sell suitable kits, cost depending on VA rating of course. They consist of a transformer with a primary already wound. You merely have to put on your own secondary and assemble the laminations etc. Instructions and technical information are supplied with the kit.

Let’s assume that you are going to use an old transformer however. First decide whether it will supply your power demands – it’s always a good idea to make one a little larger than your expected uses require. Check the transformer and measure some of the secondary voltages. Make a note of these, as you will be using this information to work out how many turns-per-volt will be required on the secondary you are going to wind. I suggest rewinding the secondary to provide a 40V output, obtained by connecting four separate windings in additive sequence. Make these secondary windings for 1V, 3V, 9V and 27V. This gives four windings, each one of which is three times the value of the previous one. As a result you can have any voltage you want between 1V and 40V in 1V steps.

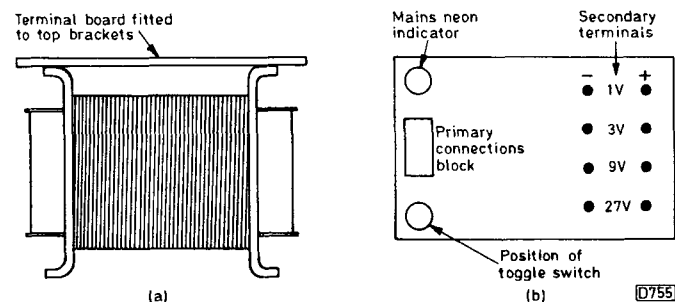


Fig. 1: Suitable transformer termination (a) and terminal/component layout (b).

Note that you should always check the transformer’s output voltage before you connect it to your circuit.

Fig. 1 shows at (a) a simple way of terminating the transformer to provide for the addition of a switch, a neon indicator light and a fuse – always a good feature in any electrical arrangement – and at (b) a suitable layout for the termination board. Fig. 2 shows at (a) the connections for two voltages available, 4V and 18V – the actual links are shown in (b). It may be thought strange to put positive and negative markings on an a.c. supply, but I find that this is a help in adding up or subtracting voltages.

Here are some more examples. 1V added to 9V gives 10V of course. 3V connected in opposition to 27V gives 24V. Should you require higher voltages, add a $3 \times 27V$ winding, i.e. an 81V winding. You will now have available any voltage up to 121V in 1V steps.

Don’t forget to check voltages before making an external connection, and to earth the transformer, i.e. make sure that the iron laminations and frame are effectively earthed.

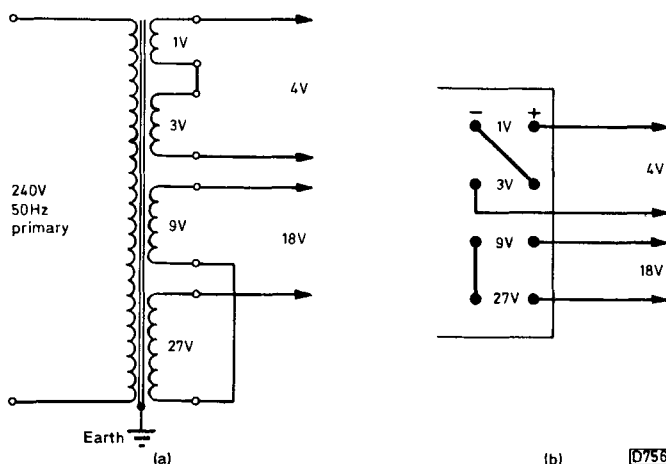


Fig. 2: Transformer windings, showing how to obtain 4V and 18V outputs (a). Links for 4V and 18V (b).

Despite this digression we must stress that a computer can be used and programmed by someone with no knowledge either of its workings or of binary arithmetic.

All the data that comprises a program is stored some-

where in the computer's memory, and must be put there to start with. Somehow the microprocessor must be told where it is and how to start fetching instructions. For this and other exiting revelations, stay tuned!

Fings aint what they used to be

Les Lawry-Johns

I kid you not. Things are getting awkward. Some of the sets that come in now just don't want to be done and were apparently put together with this in mind. "Don't try to mend me" they seem to say, "buy another one". Even old favourites are getting stubborn. Or is it just me? (Chorus: "course it's you".)

Susan's Fidelity CTV14S

Take for example Susan's Fidelity CTV14S – the Mk. II that is, with the ZX3000 chassis.

"It keeps changing channels on its own and will often switch itself off, though the handset is in the other room."

So I ruled out the handset and its battery. I checked here and there on the control panel, changed chips, but still the set would do it. Eventually I phoned Fidelity.

"The amplifier chip IC1 in the screened remote control receiver section could be producing spurious pulses. To check this, cut the track going to pin 2 of the ML923 decoder chip IC2 and wire a 10kΩ resistor from this pin to chassis. If the set no longer changes channels, change the chip in the receiver unit, then restore the link to IC2 and remove the 10kΩ resistor."

So I did the first bit and the set worked fine all day. I phoned Susan and her mother answered. "Is Susan keen on having the remote control handset?" I asked.

"Of course she is" replied her mother.

So I stripped down the receiver unit and replaced the chip, then restored the link between IC1 and IC2 and removed the 10kΩ resistor. The set continued to change channels and switch off without being told to.

Susan came in to find out about her set.

"It's fine without the remote control facility" I told her.

"I never use it anyway" said Susan.

In a flash the track was open-circuit again and the 10kΩ resistor was fitted. She carried the set off and later reported that the picture had never been so good. This made me scratch my head a bit. What had the handset to do with the picture? Never mind.

Another One

Another of these sets has been causing me a real headache of late. It just won't start. When it was brought in the BU426A chopper transistor had gone short-circuit, the 2.2Ω surge limiter resistor R80 had burnt out and the d.c. fuse F2 had gone open-circuit. I fitted a BU508A in place of the BU426A and replaced the other items.

When I switched on all I got was a high d.c. voltage reading at the collector of the chopper transistor and at a couple of other points, but no controlled output from the chopper circuit. So I checked everything in sight and changed the TDA4600 chopper control chip. Still no joy. I now found that there was no start-up voltage at pin 9 of the chip due to an internal short. So I fitted another one. This gave me the start up voltage but nothing much else. I've tried a dozen times and Phil had a go all day on

Saturday, all to no useful end. I'll let you know what it turns out to be – the bloody transformer no doubt. No not the line output transformer. I've got plenty of those in stock and I'd opened the h.t. feed to the line output stage and still got no output from the chopper circuit. I mean the chopper transformer. I don't keep those in stock.

A Thorn 9000 Chassis

Now everyone can repair a set fitted with the Thorn 9000 chassis, can't they? One came in the other day with the report that it failed after a couple of hours. I was a bit busy at the time and jumped at the thick-film over-voltage unit. A new one was fitted in no time. The set then sat there working for four hours. The owner came and collected it. Next day he brought it back again and told H.B. that it had failed after a couple of hours, adding that it came back on immediately.

Now he hadn't told us this the first time, i.e. that the set tripped at erratic intervals. I kept it on with the sound turned up slightly so that I could hear when it tripped. This it duly did. The sound went off and the picture collapsed to the centre for a brief moment before recovering and looking as good as it had done. This time I disconnected the tripler, and when this had been done the sound never faltered. A new tripler was fitted and the set gave no more trouble. Silly me!

A Word of Warning

A couple of months ago I told you about us fitting a new 24in. Pye set in Dr. Dicey's Dynatron cabinet. I mentioned that it fitted well and looked out over his lounge. When I say "us", I mean me and Les who ran me up there. I also said that Les wanted a similar job done on his Dynatron.

So I ordered the same Pye model for Les. Unfortunately his cabinet housed a Pye hybrid colour chassis whereas the good Doctor's had housed a Pye 731 solid-state chassis. The upshot is that Les now keeps the cabinet in another part of the room (to house his booze, I think) while the Pye stands on its stand as it's supposed to do.

Transport

I also mentioned that I was waiting to get my car back. I never did. I had to get another one. It's a gold (the colour!) Renault 18. Honey Bunch loves driving about in it and I suppose I'll get used to it in time. It's just that I don't find it easy nowadays to take to anything new or different. Which is why I find it difficult tackling these modern sets and trying to make sense of the circuit diagrams. I thought it was me but apparently there are a lot of others who find it hard to adapt to these new conditions, especially when they have a cat and two dogs to help them. Oh well, never mind, we've coped so far and I dare say we'll continue to do so.