CQ-TV

No. 166 May 1994

SATFAX - A First !!

23cm FM ATV TRANSMITTER

The HSP Digital Test Card "C"

Narrow Video IF Filters

Beyond TTL

BATMAX - Matrix Control System

BRITISH AMATEUR TELEVISION CLUB

More of G8OZP 3cm/P

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CLOSE FOR PRESS FOR THE NEXT ISSUE .....20th June 1994

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POST & NEWS

MEMBERS' SERVICES SALE AT BATC 94

Once again a sale of PCB's and redundant bit-and-pieces from the Members' Services stock will be sold off a much reduced prices at BATC 94 and the Sports Connexion on Sunday May 1st. But the rule is - BE EARLY - or you may miss all the bargains!!

VIDEO ENHANCER ??

Dear Mike,

So far I have been unable to get on the air with ATV, although I joined the BATC about a year ago. When I do get running though, my main source of video will be a camcorder and maybe a VCR.

I intend to run a colour station on 23cm and will wish to prepare my broadcasts in advance. Therefore, some material will be on full-size tape edited from my camcorder and thus I have a problem. The BATC have some excellent circuits designed for members to utilise, but I have been unable to find just the one I need. Simply speaking, my video picture soon gets that 'washed out' look as I transfer from tape-to-tape as I edit. A video enhancer would be a major asset to me and commercially available ones are out of my pocket range at present. Could anyone supply such a circuit? I would try to reimburse their costs.

It would be a nice extra if a complete description were with it to give a full explanation of the circuit. I can make my own PCB.

Well, I hope someone can help. Thanks for the space to ask.

Yours sincerely ... Kevin J. O'Reilly G6INM, 1 Evesham Way, Longton, Stoke-on-Trent, ST3 5TP.

Our pleasure Kevin. Come on then you lot! lets have a suitable project, not just for Kevin, but for the magazine as well ... Mike

CANNON 850 CAMCORDER

Dear Mike,

At Sandown last year I bought a Cannon 850 camcorder shell with camera unit which I finally got going at Christmas. I bought the workshop manual for it from Cannon for £28, which helpfully does not include most of the circuit diagrams, but expects you to already have purchased all the previous Cannon manual too!!

I wonder if anyone who bought one and has not done anything with it yet would care to sell it to me? Also, has anyone managed to get the autofocus running without the mains controller/processor board?

Any offers/info gratefully received.

Regards ...Dominic Oskis G0DOM. Tel: 0708 222581 (5pm till late)

Editorial

Mike Wooding G6IQM

PRINTING PROBLEMS !

Well, what I should say is not *Printing Problems* exactly, but *Printer Problems.* Firstly, I would like to apologise for the extremely late arrival of CQ-TV 165, although the reason was totally out of my, and anyone else but the printer's, control. Those of you who also receive VHF Communications will already be aware of the serious problems caused by this company and I am pleased to say that we have changed to a Proper Printer, not a practising one!

It caused me a great deal of frustration to find that after slaving over the keyboard for all those hours and getting the copy to the printer by my deadline of December 31st to find that it then took him 7 weeks to complete the job, and then another 2 weeks to complete the delivery to our packing department (*Jill Marshall G6MLH and friends!*). Oh Well, you live and learn - and boy did we learn the hard way!!

Incidentally, another little thing that really cheered me up was the few inconsiderate members who just had to ring me and castigate me complain bitterly about the service I give the club as Editor of this magazine and my intransigent attitude concerning the closing date for the magazine - why? - because I had the cheek to stipulate that the closing date for this issue was March 1st, and CQ-TV 165 only landed a few days before. Thank You very much - I also have a life to live, a family, a job and also a business to run. I do not, as with all the Committee Members, charge for my services, nor do we get paid for them - we do it out of love. So you missed the deadline for the small ads - tough! It takes me something of the order of 60 hours every issue, of MY TIME, to produce this magazine - and I and ONLY I will dictate when that time is given. Closing dates mean exactly that. If you don't like it you can vote me out at this year's Bienniel Meeting!

TV on the AIR

You may remember that I put a short note at the end of TV on the AIR in the last issue, stating that Andy Emmerson had resigned etc. Well, this rumour is untrue, and was caused mainly by a misunderstanding (that's a nice way of saying that I had one of my 'Editor's pique attacks'). I am now pleased to say that Andy will be continuing to write the column and consequently will all mail for TVA please be directed to Andy and not me.

Once again, apologies Andy.

BATC 94

The following pages detail all the you need to know about BATC 94 -the BATC rally at the Sports Connexion, Coventry - no I am not misspelling it, that is the way it is spelt!!!!!

As you will also know by now the annual BATC Convention will take place at Shuttleworth College on September 11th - this will be along the lines of the 'old' style BATC shows, where members display and discuss their equipment, etc. This event will also be billed as CAT '94 (Conference on Amateur Television) but I will let Paul the organiser tell you more about this elsewhere in this issue.

Anyway, back to BATC 94. This will be one of the biggest rallies in 1994, with lots of real radio dealers, ATV specialists, as well as computer and associated traders. There will not be a lecture program at this event - I am leaving all that for Paul at CAT '94. Similarly the Biennial General Meeting will take place at CAT '94.

As usual, we will need a few volunteers on the day to help out with some of the jobs that just have to be done. I mean, if you feel like joining us at 0600 hours to help set out the tables, don't let me stop you! Realistically though, I don't expect too many of you to turn up for that chore. However, please, please, please, do donate the odd hour or so if you possibly can and come and see me at Rally Control (the KM Publications/BATC stand in Hall 1) any time during the day. If you can spare an hour at the end of the day we will need as much help as we can to clear the halls and stack tables, etc.

Please remember your committee freely volunteer their time on your behalf - perhaps it might be nice of you to show your appreciation by allowing them some time off during the show?

OK that's the end of the nagging session. Please enjoy the show - we look forward to seeing you all there.

COMMITTEE POSTS

Although it is sometime until CAT '94 and the Biennial General Meeting there will only be this issue and 167 before hand. So, may I gently remind you that there are one or two vacant posts on the committee (if anyone takes up my offer earlier in this editorial there may be at least one Officer's Post vacant HI!). I shall not list any particular 'jobs' that need filling, but instead I would like to ask if there is anyone who might be interested in taking up post as a Committee Member then please come and have a chat with us at BATC 94. You will find that we (well excluding the pragmatic Editor that is) are an easy-going bunch who have only the best interest of the BATC at heart (can you hear the violins?).

Think about it - it is your Club and it needs YOU - so does the Committee!

BATC 94

The **BATC 94 Rally** will be held at the **SPORTS CONNEXION** at **Coventry** on **Sunday May 1st**. Any of you who have been to the 'Centre of England Christmas Rally' will already know the location - as they are also held there.

The Sports Connexion lies approximately 3 miles South of the Coventry City boundary and is at the junction of the A445 and the A423 - see the map on the next page. It is within easy reach of the M45/M1/M6 and M42 and the major road links to and from Coventry, and the bypasses around the city mean that it is very easy to get to.

For those of you who wish overnight accommodation in the area, the closest hotel/motel is the Coventry Knight Hotel (0203 301585), which is approximately 2 miles from the venue. A special weekend tariff rate of £28 per person, per night, bed-and-breakfast applies. There are, of course, many other hotels in the Coventry area should this not be suitable.

For those of us who wish to caravan or camp, I have arranged a *'perfect'* site only half a mile from the venue, which is next to (and belongs to) the 'The Old Bull & Butcher' country public house. The cost is only £2.00 per night and it is available to us Friday, Saturday, Sunday and Monday. All bookings to be made through me (Mike Wooding) please. The pub also serves very good evening meals, which it is suggested are booked in advance. The Old Bull and Butcher will also be the venue for the Saturday night 'get together', for anyone who wishes to join us as usual - full details of the location in the next issue.

Entrance to the rally will be from 10 AM onwards on the day and the admission price will be £1.00. There will be over 300 trading tables and over 100 traders in the two halls and a large Bring and Buy. We shall also be providing a facility on the first floor of the building for a 'Members Only' enclosure, where Members can sit down, relax, eat, drink, discuss and display equipment, etc. The full refreshment facilities of the Sports Connexion will also be open all day.

Coventry Amateur Radio Society will be providing the talk in station operating on S22 and the Coventry 70cm repeater GB3CV (RB9). The call sign used will be **GB1ATV.**

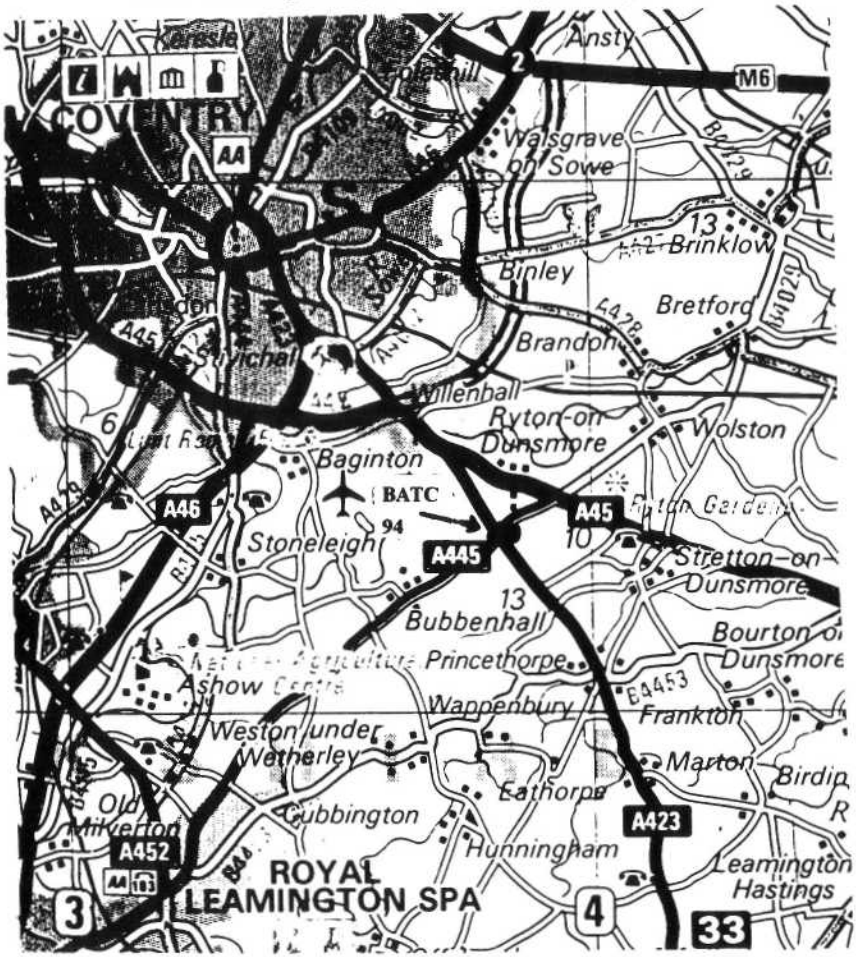
Outside there will be the now infamous display of Outside Broadcast vehicles (it gets bigger every year - and 1994 will be no exception!) and an outside boot fair/flea market area.

For this event, even more so than ever before, we shall be needing lots of volunteer helpers on the day. We only ask for an hour or so of your time, in order to let

everybody, even YOUR COMMITTEE, enjoy the event and at least get to see part of it. We shall be starting at 6 AM on Sunday morning. We shall also probably be spending a few hours at the venue on the Saturday evening. So, if you can help us by offering some help for a short while during the event please contact me at the Editorial address.

This will be the largest event ever staged by your Club. I hope it will be a success - only you can make it so. We have had many requests over the past few years to stage the event more centrally again and closer to major roads, etc. Well we are doing so, and what's more we are staging one of the largest rallies in 1994. But, it will still be the BATC Rally, which means that it is ***YOUR*** rally, so please give us your support.

Mike Wooding G6IQM - BATC Rally 94 Organiser



CAT '94

Hands up all those who remember CAT '70

Not many

Well, how about what was it? Bit better. Yes, that's right

CONFERENCE ON AMATEUR TELEVISION 1970

So what's this CAT '94?

Well, it's a BATC 'do' with all the bits you never have time to see at the Rally (May 1st, The Sports Connexion, Coventry - don't forget) and a few more things we haven't seen since 1970.

OK. What bits?

You want the full list?

Yes please.

OK.

MEMBERS EXHIBITION / DEMONSTRATION AREA
REPEATER MANAGERS AND USERS SEMINAR / FORUM
BATC BIENNIAL GENERAL MEETING
SPECIALIST ONLY TV TRADERS
MEMBERS TRADING (INSIDE AND OUT)
EXPANDED LECTURE PROGRAMME
OB VEHICLES & CAMERA DISPLAY
SATURDAY NIGHT FORMAL(ISH) DINNER
OVERNIGHT ACCOMMODATION AND CAMPING FACILITIES
ORGANISED TOURS OF SHUTTLEWORTH MANOR HOUSE & THE SHUTTLEWORTH AIRCRAFT COLLECTION
DX WORKING ATV STATION

Where did you say it is?

SHUTTLEWORTH COLLEGE (PART OF CRANFIELD UNIVERSITY) Nr. BEDFORD NOT FAR FROM 'OLD WARDEN' AND THE SHUTTLEWORTH AIRCRAFT COLLECTION

When?

Well, there is a tiny wee snag there. Two, in fact.

Go on.

The first one's very minor. In case you saw it in the mag last time the dates published were one day adrift.

And?

It clashes with the International ATV Contest. Committee reached the conclusion that, although a contest is important to some, the future of ATV into the next Century is also pretty important, and unfortunately that weekend is the only one available for a number of reasons. Something always clashes. There will be an active contest station there though.

You still haven't said when.

SAT 10th AND SUN 11th SEPT 1994

WANT TO HELP? GOT A LECTURE? WANT TO EXHIBIT?
WANT TO SELL? WANT TO MOAN? WANT TO STAY?
WANT TO EAT? &C &C &C

CONTACT THE GEN. SEC. PAUL MARSHALL ON
0522 703348 (ALSO FAX BUT PHONE FIRST)

AS WITH CAT '70 A FULL SOUVENIR BOOKLET AND BOOKING FORM WILL BE MAILED TOO.

WATCH THE NEXT ISSUE OF CQ-TV FOR MORE INFORMATION AND A SAMPLE OF THE CAT '70 BROCHURE TO WHET YOUR APPETITE.

Curiously, the slogan used in 1970 for 70cm was "Use it or lose it", now where have I heard that before?

Even stranger, CAT '70 also clashed with a contest!

23cm FM ATV Transmitter using Surface-Mount Techniques

Erhard Lüthi HB9CIZ

This article was first published in TV-Amateur (AGAF) issue 90/93 and translated from the German by Andy Emmerson G8PTH. We wish to thank the editors for permission to reproduce it here and Andy for his sterling work in translating the text from the original ... Mike

PLL-controlled transmitters and receivers are finding increasing use in amateur television. Very often these are home-built. And surface-mount technology is being exploited increasingly in this field. In order to become QRV on 23cm FM ATV I decided to acquire the appropriate hardware. After brief evaluation of the kits on the market I decided to follow the home-made route.

CIRCUIT DESCRIPTION

The transmitter is carried out in five stages. In greater detail it contains a PLL which can be preset in 100 kHz steps. An 8 MHz crystal is used as the reference. Power supply voltages are stabilised internally at five and eight volts, the 8V regulator being a low dropout version. The last two transistors operate with the full power rail voltage. The transmitter can be operated on around 9 to 14V, nominally it is for 12V. In this case the power from the BFQ34 is around one watt.

The PCB uses SMD components on the track side and conventional components on the other side. This gives the advantage of high packing density and of short conductor lengths.

The crystal oscillator is constructed from discrete components and uses a standard 8 M Hz timer crystal. If a crystal with load capacity is used, a wire strap should replace Lx32. The 8 MHz signal is brought up to the 5V level through two 74HCU04 ICs and divided by 10 in a 74HC390. This is now taken to the MC145151. The reference divider is preset to 512 (RA2 0V) and counts down to 1562.5 Hz. Together with a prescaler SAB6456A set to divide by 64 this produces 100 kHz frequency intervals across the 23cm band. The loop filter has a relatively large time constant. This necessary to ensure that low frequency components of the video signal are not regulated out by the PLL. At the same time a high division

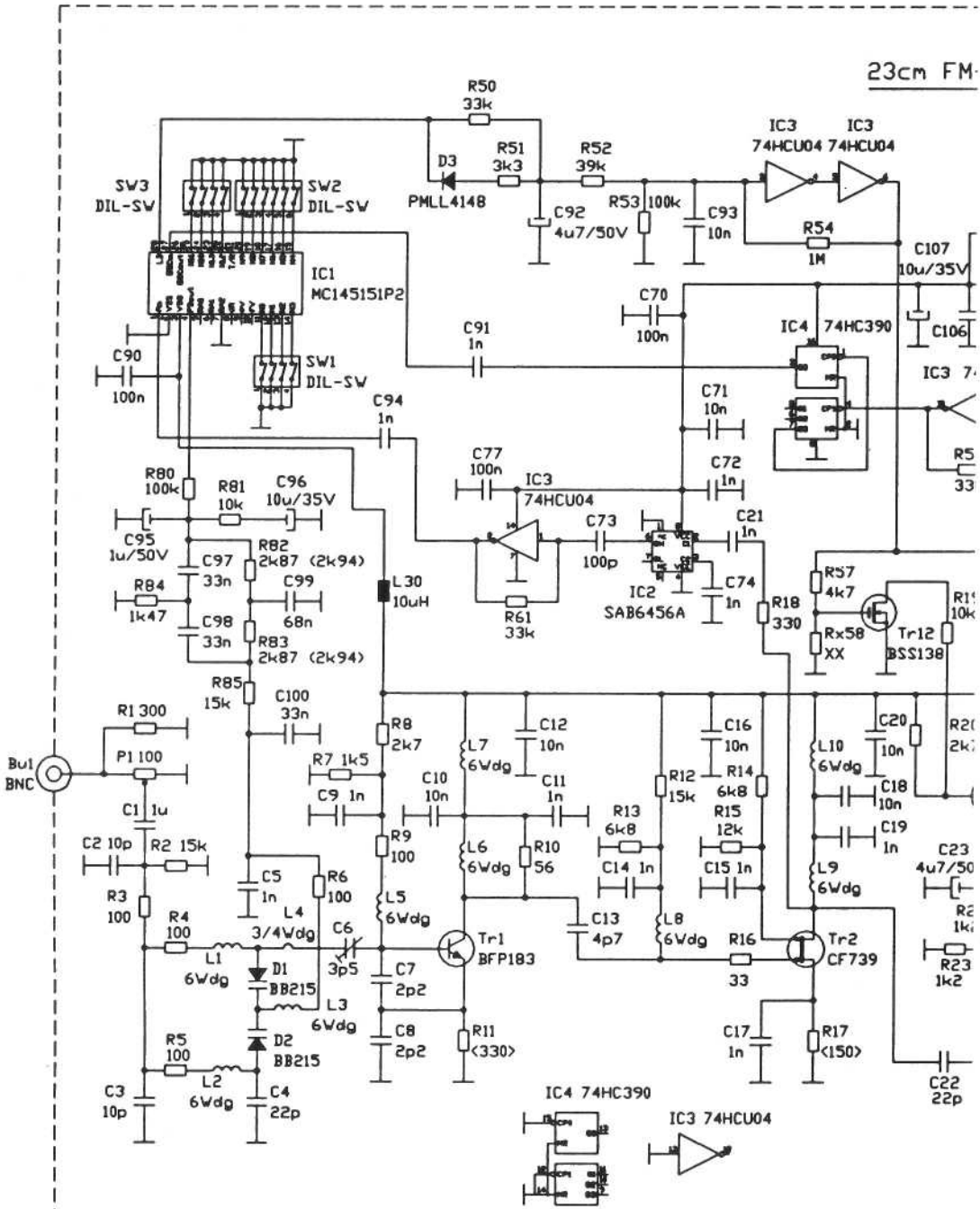
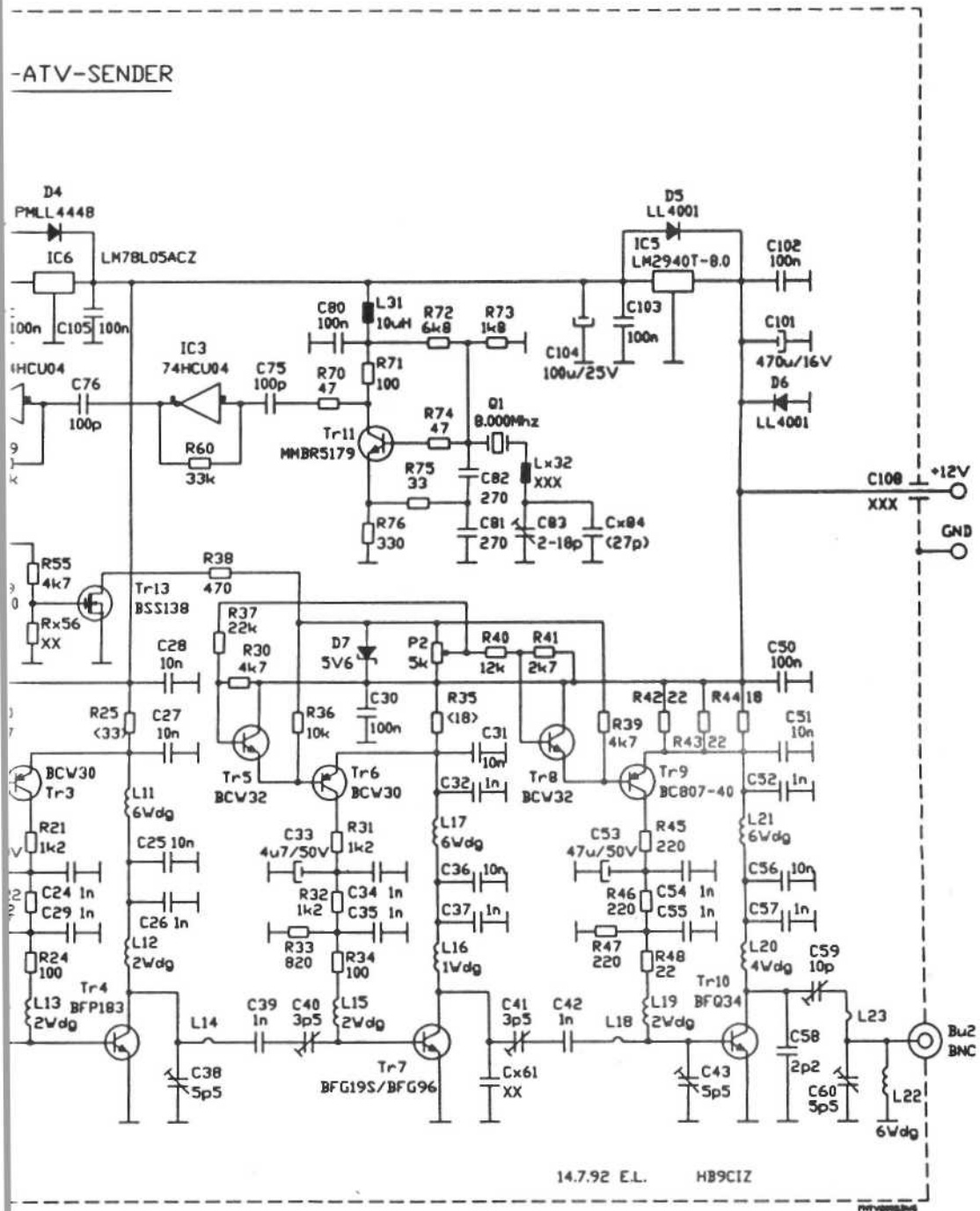


Fig.1: Circuit Diagram of the SMD FM ATV Transmitter


-ATV-SENDER
D4
PMLL4448
IC6
LM78L05ACZ
D5
LL4001
IC5
LM2940T-8.0
C102
100n
C105
100n
C80
100n
L31
10uH
R72
6k8
R73
1k8
C104
100u/25V
C103
100n
C101
470u/16V
D6
LL4001
IC3
74HCU04
C75
100p
R70
47
R71
100
C76
100p
R60
33k
Tr11
MMBR5179
R74
47
Q1
8.000Mhz
R75
33
C82
270
Lx32
XXX
C81
270
C83
2-18p
Cx84
(27p)
R76
330
C108
XXX
+12V
GND
R55
4k7
Rx56
XX
R38
470
Tr13
BSS138
R37
22k
R30
4k7
D7
5V6
P2
5k
R40
12k
R41
2k7
C28
10n
C50
100n
R25
<33>
C27
10n
R36
10k
C30
100n
R35
<18>
C31
10n
R39
4k7
R42 22
R44 18
R43 22
C51
10n
BCW30
Tr3
Tr5
BCW32
Tr6
BCW30
Tr8
BCW32
Tr9
BC807-40
C32
1n
C52
1n
L11
6Wdg
R21
1k2
C25 10n
C33
4u7/50V
R31
1k2
L17
6Wdg
C53
47u/50V
R45
220
L21
6Wdg
C24 1n
C29 1n
R32
1k2
C34 1n
C35 1n
C36 10n
C37 1n
R46
220
C54 1n
C55 1n
C56 10n
C57 1n
C26 1n
L12
2Wdg
R33
820
R34
100
L16
1Wdg
R47
220
R48
22
L20
4Wdg
C59
10p
R24
100
Tr4
BFP183
L13
2Wdg
L14
C39
1n
C40
3p5
L15
2Wdg
C41
3p5
C42
1n
L18
L19
2Wdg
Tr10
BF0234
L23
Bu2
BNC
C38
5p5
Tr7
BFG19S/BFG96
Cx61
XX
C43
5p5
C58
2p2
C60
5p5
L22
6Wdg
14.7.92 E.L.
HB9CIZ

ratio for the 1275 MHz signal contributes to making the modulation deviation adequate for satellite tuners also (+-10 MHz is no problem). Additionally the control voltage for the VCO passes through a passive notch filter for 1562.5 Hz (T bridge). This also helps remove any residual 1562.5 Hz component on the control voltage. The VCO is nothing out of the ordinary except that the adjustment voltage is applied to the cathodes of the two capacity diodes and the baseband signal to the anodes of these. This has the advantage of keeping the baseband input and the loop filter apart (phase of the loop filter not affected by the video input coupling).

The oscillator signal is fed out to the collector of TR1 and further decoupled in a Dg-GaAsFET TR2. On the drain of TR2 the 1275 MHz signal for the prescaler is also led away via the SAB6456A. This is a sensitive prescaler from Philips intended for TV tuners and has a frequency range guaranteed up to 1300 MHz.

The output signal is amplified again by a 74HCU04 before reaching the input of the PLL IC. Following on from TR2 is a three-stage amplifier with its operating point needing to be stabilised. In this way the emitters of the transistors can be connected direct to ground, which is very necessary in this frequency range (we can't have trapezium and other decoupling capacitors sticking out).

The operating points are quite stable with changes of temperature using this circuit. Using the trim pot P2 the quiescent current of TR7 and TR10 can be controlled and in this way the output power can be varied by up to 13dB. Since FM signals do not need to have amplitude linearity this is a permissible method. For linear applications the output level could not be adjusted in this way under any circumstances!. The quiescent currents of the RF transistors remain stable also with variations of power supply voltage (relative to maximum power).

Taking this further, the quiescent currents are not set until the PLL is locked. As a result the output power immediately after switch-on is minimal until the PLL notches. Unfortunately screening is necessary for the VCO and amplifier. The completed PCB, if handled with sensitivity, gives stable operation. It was built into a tinplate box 147 x 72 x 29mm and as soon as the lower lid was fixed, feedback effects were noted on the deviation of the modulation. This led me to install separate screening above and below, which got quite complicated.

ASSEMBLY

The circuit is built up on a piece of FR4 epoxy board, 71.5 x 145.7mm. Components are fixed on both sides of the PCB but without through-hole plating, hence many pieces of wire for making through contacts.

First the PCB is made the correct size to fit inside the case. Once components have been inserted no more filing is advised because the ceramic capacitors are very

Fig.2: Component Layout of the Upper Side

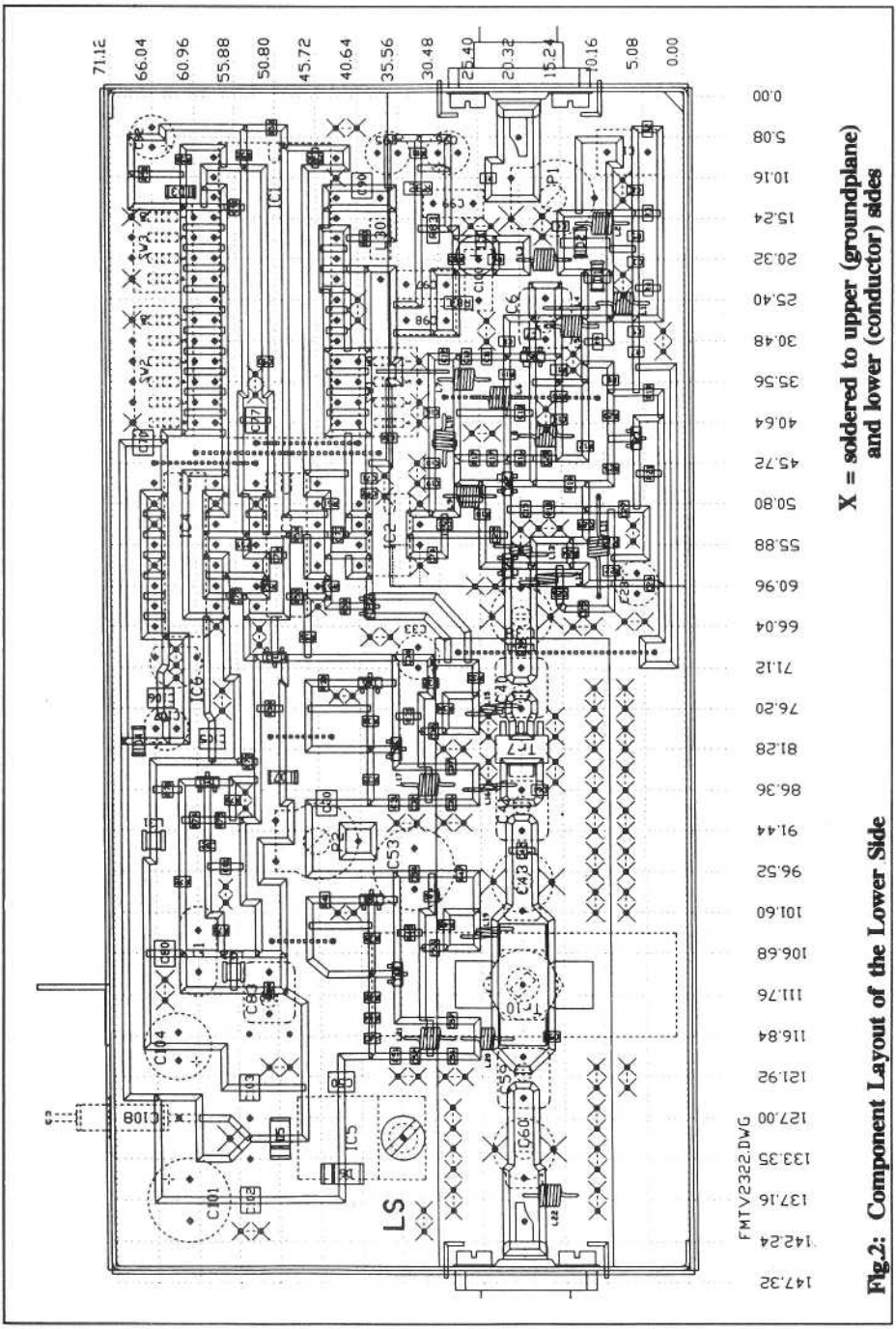


Fig.2: Component Layout of the Lower Side

fragile. Next the cutouts for the BNC connectors are filed out and room made for the BFQ34. Next we make the holes for the leads of the conventional components, after which we can solder in the pieces of wire for through contacts and the wire links (straps). The through contacts are made of 0.5mm diameter tinned copper wire, bent into a U shape with a side spacing of about 2.54mm and about 5mm length. The wire links are made of copper wire 0.35mm diameter.

The U-shaped through contacts are pushed through from above and first soldered on this side. On the other side they are shortened to about 1.5 to 2mm and then soldered. The copper foil for through contacting of the emitter connections of the BFQ34 are also offered up, trimmed and soldered in.

Next we solder to the upper side of the PCB the fixing sheet for the fixture screws of the BFQ34. Screwing in of the final transistor is done from the upper side. This gives really good heat dissipation.

Once this is all completed we can proceed with fitting the conventional components. In my three examples I used sockets for the 145151 and soldered in the remaining ICs direct. Under no circumstances should the prescaler be socketed. Last of all fit the BFQ34 but check first that it fits.

Warning. All components indicated X must be soldered to the upper side. The 8V voltage regulator is also fastened direct to the PCB with a 3mm screw to make for better heat dissipation. If threaded connectors are used, the PCB should be drilled 4.5mm, otherwise 3.3mm. Next the coils should be made up as indicated and their ends tinned. They are made from solderable enamelled copper wire (varnished copper wire).

After the SMD components the coils are soldered in. Finally the BFQ34 is fixed. If everything has been fitted according to the component list and the coordinate instructions, then nothing should have been forgotten. The coordinate list allows you to find any component on the PCB rapidly.

Following this method I built two examples of the transmitter at the same time in December 1992. It is crucial that no wire links are forgotten, also that components that need connection to ground are soldered on both sides of the PCB. The DIL switch is an exception and it will suffice to solder just the outermost connections both above and below. The screening panels are only soldered on after alignment and after the PCB has soldered into the case.

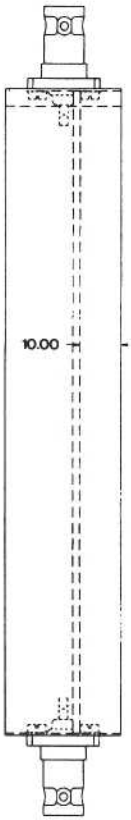
ALIGNMENT

First we make the preliminary setting for the rotary trimmers. Oscillator trimmer C6 is turned in about 30 per cent, C38 10 per cent, C40 45 per cent, C41 50 per cent,

Bu 1	BNC	
Bu 2	BNC	
C 1	1u	MKT
C 2	10p	NP0 Chip 0805
C 3	10p	NP0 Chip 0805
C 4	22p	NP0 Chip 0805
C 5	1n	NP0 Chip 0805
C 6	3p5	Teflonfolientrimmer
C 7	2p2	NP0 Chip 0805
C 8	2p2	NP0 Chip 0805
C 9	1n	NP0 Chip 0805
C 10	10n	X7R Chip 0805
C 11	1n	NP0 Chip 0805
C 12	10n	X7R Chip 0805
C 13	4p7	NP0 Chip 0805
C 14	1n	NP0 Chip 0805
C 15	1n	NP0 Chip 0805
C 16	10n	X7R Chip 0805
C 17	1n	NP0 Chip 0805
C 18	10n	X7R Chip 0805
C 19	1n	NP0 Chip 0805
C 20	10n	X7R Chip 0805
C 21	1n	NP0 Chip 0805
C 22	22p	NP0 Chip 0805
C 23	4u7/50V	50V
C 24	1n	NP0 Chip 0805
C 25	10n	X7R Chip 0805
C 26	1n	NP0 Chip 0805
C 27	10n	X7R Chip 0805
C 28	10n	X7R Chip 0805
C 29	1n	NP0 Chip 0805
C 30	100n	X7R Chip 1210
C 31	10n	X7R Chip 0805
C 32	1n	NP0 Chip 0805
C 33	4u7/50V	50V
C 34	1n	NP0 Chip 0805
C 35	1n	NP0 Chip 0805
C 36	10n	X7R Chip 0805
C 37	1n	NP0 Chip 0805
C 38	5p5	Folientrimmer
C 39	1n	NP0 Chip 0805
C 40	3p5	Teflonfolientrimmer
C 41	3p5	Teflonfolientrimmer
C 42	1n	NP0 Chip 0805
C 43	5p5	Folientrimmer
C 50	100n	X7R Chip 1210
C 51	10n	X7R Chip 0805
C 52	1n	NP0 Chip 0805
C 53	47u/50V	50V
C 54	1n	NP0 Chip 0805
C 55	1n	NP0 Chip 0805
C 56	10n	X7R Chip 0805
C 57	1n	NP0 Chip 0805
C 58	2p2	NP0 Chip 0805
C 59	10p	Teflonfolientrimmer
C 60	5p5	Folientrimmer
Cx 61	XX	NP0 Chip 0805
C 70	100n	X7R Chip 1210
C 71	10n	X7R Chip 0805
C 72	1n	NP0 Chip 0805
C 73	100p	NP0 Chip 0805
C 74	1n	NP0 Chip 0805
C 75	100p	NP0 Chip 0805
C 76	100p	NP0 Chip 0805
C 77	100n	X7R Chip 1210
C 80	100n	X7R Chip 1210
C 81	270p	NP0 Chip 0805
C 82	270p	NP0 Chip 0805
C 83	2-18p	Teflonfolientrimmer
Cx 84	(27p)	NP0 Chip 0805
C 90	100n	X7R Chip 1210
C 91	1n	NP0 Chip 0806

C 92	4u7/50V	105°%d
C 93	10n	X7R Chip0805
C 94	1n	NP0 Chip 0805
C 95	1u/50V	105°%d
C 96	10u/35V	105°%d
C 97	33n	MKT
C 98	33n	MKT
C 99	68n	MKT
C 100	33n	MKT
C 101	470u/18V	85°%d
C 102	100n	X7R Chip 1210
C 103	100n	X7R Chip 1210
C 104	100u/25V	105°%d
C 105	100n	X7R Chip 1210
C 106	100n	X7R Chip 1210
C 107	10u/35V	105°%d
C 108	XXX	Durchführungsfilter
D 1	BB215	Minimelf
D 2	BB215	Minimelf
D 3	PMLL4148	Minimelf
D 4	PMLL4448	Minimelf
D 5	BYM 10-100G	(LL4001) Melf
D 6	BYM 10-100G	(LL4001) Melf
D 7	5V6	Minimelf
IC 1	MC145151P2	
IC 2	SAB6456A	
IC 3	74HCU04	
IC 4	74HC390	
IC 5	LM2940T-8.0	8V/1A/LOW-DROPOUT
IC 6	LM78L05ACZ	5V/100mA
L 1	6Wdg	Cul 0.35mm Spule innen 2mm
L 2	6Wdg	Cul 0.35mm Spule innen 2mm
L 3	6Wdg	Cul 0.35mm Spule innen 2mm
L 4	3/4Wdg	Cul 0.35mm Spule innen 2mm
L 5	6Wdg	Cul 0.35mm Spule innen 2mm
L 6	6Wdg	Cul 0.35mm Spule innen 2mm
L 7	6Wdg	Cul 0.35mm Spule innen 2mm
L 8	6Wdg	Cul 0.35mm Spule innen 2mm
L 9	6Wdg	Cul 0.35mm Spule innen 2mm
L 10	6Wdg	Cul 0.35mm Spule innen 2mm
L 11	6Wdg	Cul 0.35mm Spule innen 2mm
L 12	2Wdg	Cul 0.35mm Spule innen 2mm
L 13	2Wdg	Cul 0.35mm Spule innen 2mm
L 15	2Wdg	Cul 0.35mm Spule innen 2mm
L 16	1Wdg	Cul 0.35mm Spule innen 2mm
L 17	6Wdg	Cul 0.35mm Spule innen 2mm
L 19	2Wdg	Cul 0.35mm Spule innen 2mm
L 20	4Wdg	Cul 0.35mm Spule innen 2mm
L 21	6Wdg	Cul 0.35mm Spule innen 2mm
L 22	6Wdg	Cul 0.35mm Spule innen 2mm
L 30	10uH	Delevan
L 31	10uH	Siemens SMD
Lx 32	XXX	Siemens SMD
P 1	100	
P 2	5k	
Q 1	8.000 MHz	
	Parallelresonanz Lastkap. 32p	
R 1	300	Chip 0805
R 2	15k	Chip 0805
R 3	100	Chip 0805
R 4	100	Chip 0805
R 5	100	Chip 0805
R 6	100	Chip 0805
R 7	1k5	Chip 0805
R 8	2k7	Chip 0805
R 9	100	Chip 0805
R 10	56	Chip 0805
R 11	<330>	Chip 0805
R 12	15k	Chip 0805
R 13	6k8	Chip 0805
R 1	48k8	Chip 0805
R 15	12k	Chip 0805
R 16	33	Chip 0805

R 17	<150>	Chip 0805
R 18	330	Chip 0805
R 19	10k0	Chip 0805
R 20	2k7	Chip 0805
R 21	1k2	Chip 0805
R 22	1k2	Chip 0805
R 23	1k2	Chip 0805
R 24	100	Chip 0805
R 25	<33>	Chip 0805
R 30	4k7	Chip 0805
R 31	1k2	Chip 0805
R 32	1k2	Chip 0805
R 33	820	Chip 0805
R 34	100	Chip 0805
R 35	<18>	Chip 0805
R 36	10k	Chip 0805
R 37	22k	Chip 0805
R 38	470	Chip 0805
R 39	4k7	Chip 0805
R 40	12k	Chip 0805
R 41	2k7	Chip 0805
R 42	22	Chip 0805
R 43	22	Chip 0805
R 44	18	Chip 0805
R 45	220	Chip 0805
R 46	220	Chip 0805
R 47	220	Chip 0805
R 48	22	Chip 0805
R 50	33k	Chip 0805
R 51	3k3	Chip 0805
R 52	39k	Chip 0805
R 53	100k	Chip 0805
R 54	1M	Chip 0805
R 55	4k7	Chip 0805
Rx 56	XX	Chip 0805
R 57	4k7	Chip 0805
Rx 58	XX	Chip 0805
R 59	33k	Chip 0805
R 60	33k	Chip 0805
R 61	33k	Chip 0805
R 70	47	Chip 0805
R 71	100	Chip 0805
R 72	6k8	Chip 0805
R 73	1k8	Chip 0805
R 74	47	Chip 0805
R 75	33	Chip 0805
R 76	330	Chip 0805
R 80	100k	Chip 0805
R 81	10k	Chip 0805
R 82	2k87 (2k94)	Minimelf
R 83	2k87 (2k94)	Minimelf
R 84	1k47	Minimelf
R 85	15k	Chip 0805
SW 1	DIL-SW	AR K40-4S
SW 2	DIL-SW	AR K40-6S
SW 3	DIL-SW	AR K40-4S
Tr 1	BFP183	SOT-143
Tr 2	CF739	SOT-143
Tr 3	BCW30	SOT-23
Tr 4	BFP183	SOT-143
Tr 5	BCW32	SOT-23
Tr 6	BCW30	SOT-23
Tr 7	BFG19S	SOT-223
Tr 8	BCW32	SOT-23
Tr 9	BC807-40	SOT-23
Tr 10	BFQ34	SOT-122
Tr 11	MMBR5179	SOT-23
Tr 12	BSS138	SOT-23
Tr 13	BSS138	SOT-23



Mounting position within Case Housing

Fig.3: Component List for the SMD FM ATV Transmitter Folientrimmer = Foil Trimmer; Durchfuehrungssfilter = Feedthrough Filter; Cul 0.35mm Spule innen xx = 0.35mm dia Enamelled Copper Wire Coil 2mm inner diam.; Parallelresonanz = Parallel Resonance; Lastkap = Load Capacitance

Bu 1	4.0	20.3	0	C 41	91.4	20.3	180	C 105	80.0	58.5	90	R 1	10.2	22.9	90	R 48	103.2	28.8	90
Bu 2	145.8	20.3	180	C 42	92.7	20.3	0	C 106	74.9	62.9	90	R 2	2.9	4.4	0	R 50	7.9	61.0	90
C 1	7.0	4.4	90	C 43	97.8	20.3	180	C 107	78.7	63.5	90	R 3	13.3	4.4	0	R 51	8.8	82.0	0
C 2	11.7	4.8	90	C 50	122.8	40.8	90	C 108	122.0	71.8	90	R 4	22.5	4.4	0	R 52	7.3	53.3	90
C 3	20.8	4.8	90	C 51	118.1	38.5	0	D 1	18.8	10.8	0	R 5	12.5	4.8	90	R 53	2.5	5.1	0
C 4	18.2	14.0	90	C 52	118.1	34.0	0	D 2	20.8	12.9	180	R 6	20.3	21.9	90	R 54	53.3	48.3	0
C 5	16.5	25.1	0	C 53	93.7	34.0	0	D 3	12.1	80.0	90	R 7	31.8	4.8	90	R 55	61.0	48.3	0
C 6	25.1	12.1	0	C 54	95.8	34.0	0	D 4	82.9	88.1	180	R 8	35.2	7.9	90	R 56	82.3	45.7	90
C 7	29.5	12.5	90	C 55	104.8	31.4	0	D 5	132.1	50.8	180	R 9	29.2	10.8	0	R 57	81.0	42.9	90
C 8	30.5	20.8	90	C 56	118.1	29.2	0	D 6	134.0	45.7	270	R 10	34.8	20.8	90	R 58	82.2	42.4	0
C 9	29.2	4.8	90	C 57	113.7	29.2	0	D 7	84.8	42.8	90	R 11	34.0	14.3	90	R 59	55.9	53.7	90
C 10	31.1	27.0	0	C 58	116.8	15.8	90	IC 1	7.8	43.2	0	R 12	43.5	11.1	90	R 60	61.0	50.5	90
C 11	31.1	24.4	0	C 59	124.5	20.3	180	IC 2	50.8	33.0	0	R 13	37.3	14.3	90	R 61	50.8	42.9	90
C 12	31.1	29.8	0	C 60	130.8	20.3	180	IC 3	48.3	45.7	0	R 14	47.0	14.3	0	R 70	81.8	54.8	0
C 13	38.1	20.3	0	C 61	86.4	16.8	90	IC 4	48.3	58.4	0	R 15	50.2	16.8	0	R 71	85.1	84.8	0
C 14	40.2	14.3	90	C 70	40.6	62.3	0	IC 5	132.1	54.8	180	R 16	43.8	20.3	0	R 72	92.8	81.8	90
C 15	50.2	19.7	0	C 71	47.8	38.1	90	IC 6	69.8	61.0	0	R 17	43.8	26.0	0	R 73	103.8	58.8	90
C 16	39.4	30.2	90	C 72	49.5	38.1	90	L 1	25.7	4.4	0	R 18	52.1	23.8	90	R 74	88.9	81.3	0
C 17	43.8	23.8	0	C 73	53.3	43.2	0	L 2	15.9	7.0	0	R 19	35.8	4.4	0	R 75	88.9	58.1	-0
C 18	45.7	30.2	90	C 74	55.9	31.4	0	L 3	20.3	14.1	0	R 20	39.7	7.9	90	R 78	82.8	55.2	90
C 19	48.3	30.2	90	C 75	61.0	55.9	0	L 4	26.4	10.2	0	R 21	45.7	4.4	0	R 80	16.5	39.7	0
C 20	42.5	35.6	90	C 76	55.9	50.8	0	L 5	26.8	10.8	0	R 22	59.1	7.9	90	R 81	7.0	31.8	90
C 21	53.3	28.8	90	C 77	32.8	53.3	0	L 6	32.5	19.7	0	R 23	55.8	7.9	90	R 82	11.4	30.5	90
C 22	53.3	23.5	0	C 80	104.1	65.1	0	L 7	35.2	24.1	0	R 24	58.8	13.0	90	R 83	14.0	31.1	0
C 23	81.9	8.0	180	C 81	94.8	57.5	0	L 8	42.2	14.0	0	R 25	48.4	7.9	90	R 84	25.7	25.4	90
C 24	59.4	4.4	0	C 82	93.3	58.4	90	L 9	49.8	23.5	0	R 30	71.8	45.1	0	R 85	20.3	7.0	90
C 25	82.5	12.7	0	C 83	108.9	52.1	0	L 10	48.0	29.8	90	R 31	75.9	34.8	0	SW 1	33.0	33.0	0
C 26	81.9	14.3	90	C 84	109.9	52.1	0	L 11	82.2	10.8	90	R 32	73.0	30.5	90	SW 2	7.9	81.0	0
C 27	50.2	7.8	0	C 90	8.6	40.0	0	L 12	80.0	14.0	0	R 33	72.4	24.8	90	SW 3	15.2	81.0	0
C 28	43.8	12.1	0	C 91	12.7	55.9	0	L 13	56.5	12.1	0	R 34	78.2	28.8	90	Tr 1	32.4	18.7	270
C 29	53.3	11.1	90	C 92	3.8	66.0	0	L 15	7.84	20.8	0	R 35	85.1	38.1	90	Tr 2	48.3	21.9	0
C 30	85.4	44.8	0	C 93	33.0	50.8	90	L 16	88.0	21.1	0	R 36	77.8	38.1	90	Tr 3	42.5	8.0	180
C 31	88.7	38.5	0	C 94	7.8	44.4	90	L 17	85.7	28.9	0	R 37	76.8	40.0	0	Tr 4	58.4	21.9	180
C 32	88.7	34.0	0	C 95	7.0	38.1	270	L 19	104.1	21.8	0	R 38	74.9	51.8	0	Tr 5	73.0	39.4	90
C 33	88.8	33.3	0	C 96	7.0	27.9	90	L 20	111.2	21.8	0	R 39	104.8	38.1	90	Tr 6	81.3	38.2	180
C 34	88.8	34.8	0	C 97	23.5	29.5	90	L 21	111.2	28.9	0	R 40	98.8	40.0	0	Tr 7	81.3	20.3	270
C 35	77.8	31.4	0	C 98	27.9	29.5	90	L 22	136.5	14.0	0	R 41	98.7	45.1	0	Tr 8	100.0	39.4	90
C 36	88.7	29.2	0	C 99	13.3	26.0	90	L 30	12.7	32.8	0	R 42	112.1	38.1	90	Tr 9	109.2	38.2	180
C 37	82.2	29.2	0	C 100	20.3	25.4	0	L 31	92.7	63.8	90	R 43	111.2	38.1	90	Tr 10	110.5	20.3	0
C 38	84.8	20.3	0	C 101	139.7	82.2	180	L 32	108.9	54.0	90	R 44	114.8	38.1	90	Tr 11	85.4	59.7	90
C 39	82.3	20.3	0	C 102	134.8	54.8	0	P 1	15.2	21.3	180	R 45	102.9	34.8	0	Tr 12	83.5	39.4	180
C 40	7.1	20.3	0	C 103	120.8	54.8	0	P 2	95.3	5.1	180	R 46	99.7	30.5	90	Tr 13	89.8	5.1	270
				C 104	115.8	63.5	0	Q 1	103.8	81.0	0	R 47	95.8	27.9	0				

Component Mounting Coordinates: Bu = connector; Winkel = angle

C43 5 per cent, C59 20 per cent, C60 20 per cent, whilst C83 is adjusted later. Now the DIL switch is programmed fro 1275M Hz, which corresponds to a division ratio of 1:12750.

This done, the current consumption can be measured. For this we connect up 12V and check the current drawn; it should be about 370mA assuming the PLL has locked and the potentiometer P2 is at the right-hand limit. Unlocked, the gate voltage of TR12 and TR13 is low and the quiescent currents are switched off, so the current consumption amounts to about 110mA.

At the same time the output is terminated in 50Ω. If all this is in order all of the trimmers can be adjusted for maximum output (except C6 oscillator trimmer). If this all works and the transmitter produces about 1 watt power, the crystal reference can be aligned. (Check output frequency of locked transmitter or IC3 pin 10 on exactly 8 MHz.)

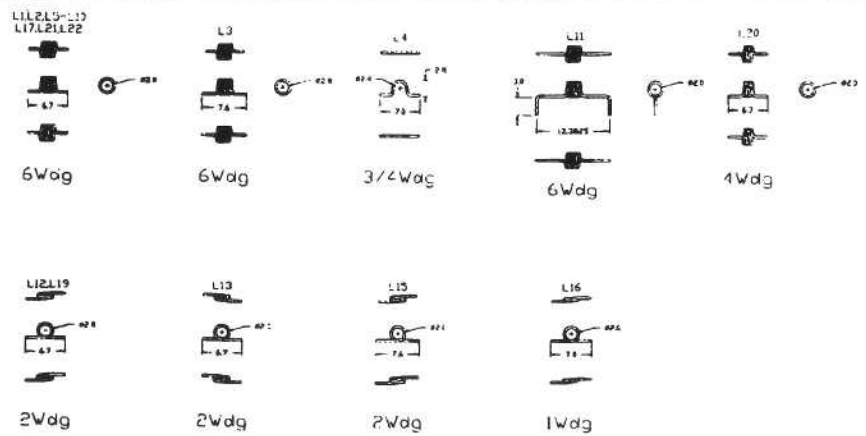
Next adjust tuning voltage for the capacity diodes using a high-impedance voltmeter at the junction of R85/C5/R6 and ground to 4V. Beyond this there is little to do.

Potentiometer P2 can be used to reduce the power, as when one wants to drive a PA using a Mitsubishi module. Modulation deviation is set using P1. Video polarity is 'upside down' on this transmitter because the baseband is applied to the cathode side of the varactor diodes but this is not a tragedy because I can change polarity easily at baseband.

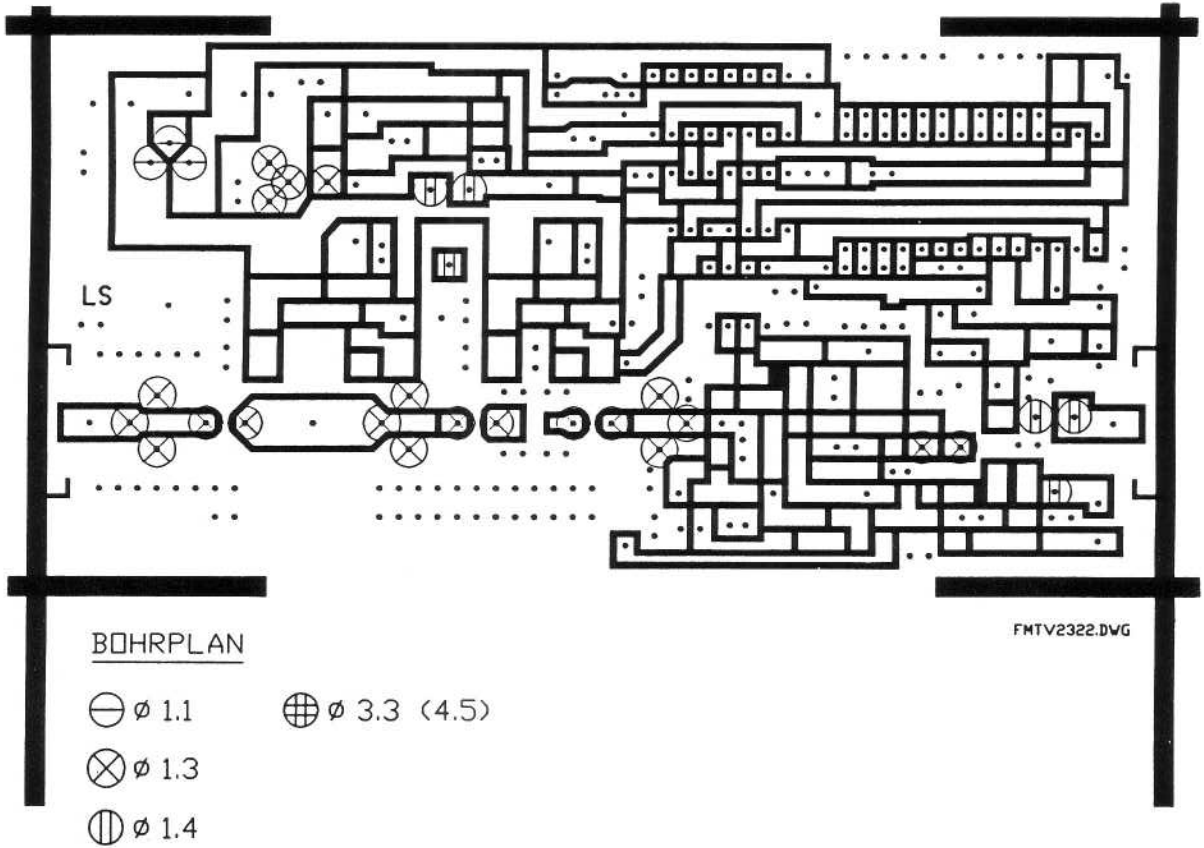
The input resistance is 75Ω. In my home-made version this is actually quite important because I have connected video and audio inputs together in a bridge circuit and the isolation is only valid when connected into a 75Ω load. In this manner the 1.07 or 2.07 MHz products (sound subcarrier 5.5 or 6.5 MHz) can be kept correspondingly small at the output of the baseband section.

Also I don't use video low-pass filters and similar frivolities. If you include a steep video low-pass with an upper limit frequency of 5.5 MHz on the output, the result is dreadful group delay time distortion in the region of 4.43 MHz. Simulations of similar filters led me to drop the idea rapidly and also to the realisation that any filter with a less than ultra-linear characteristic curve would cause the transmitter connected behind it to regenerate much that the filter had removed. If one wished to correct for the transit time of this video low-pass, a demanding all-pass would need to be connected after it. If this were of interest I could publish something about baseband signal preparation. It is specially tailored for this particular transmitter.

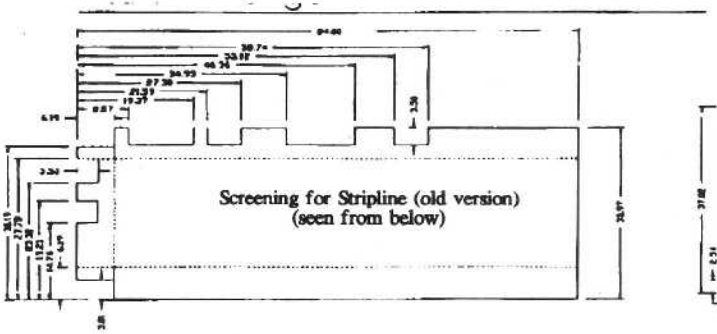
If problems arise with swing oscillations in the VCO, the feedback coupling in the VCO must be altered. This did occur in the early design stages but not in the three trial examples made with the component values shown.



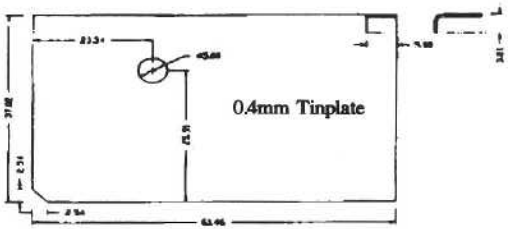
Coil Specifications for the SMD FM ATV Transmitter



Drilling Plan for the SMD FM ATV Transmitter; holes not specified = 0.8mm diam.

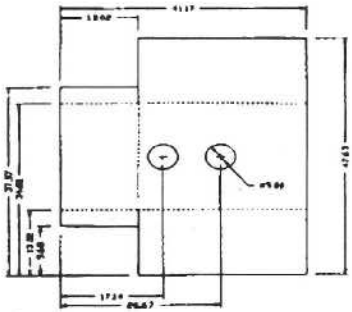


Screening for Local Oscillator (conductor side)

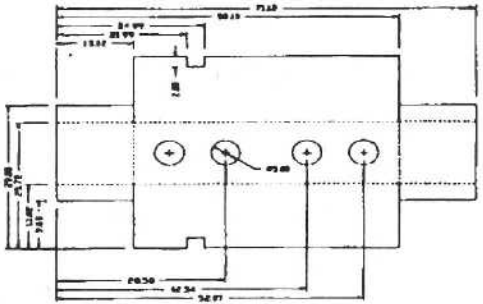


(seen from below)

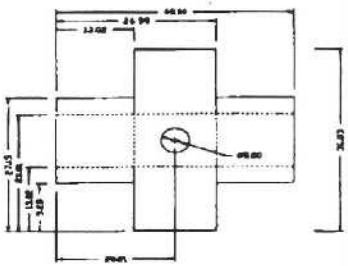
Screening for PA Trimmers



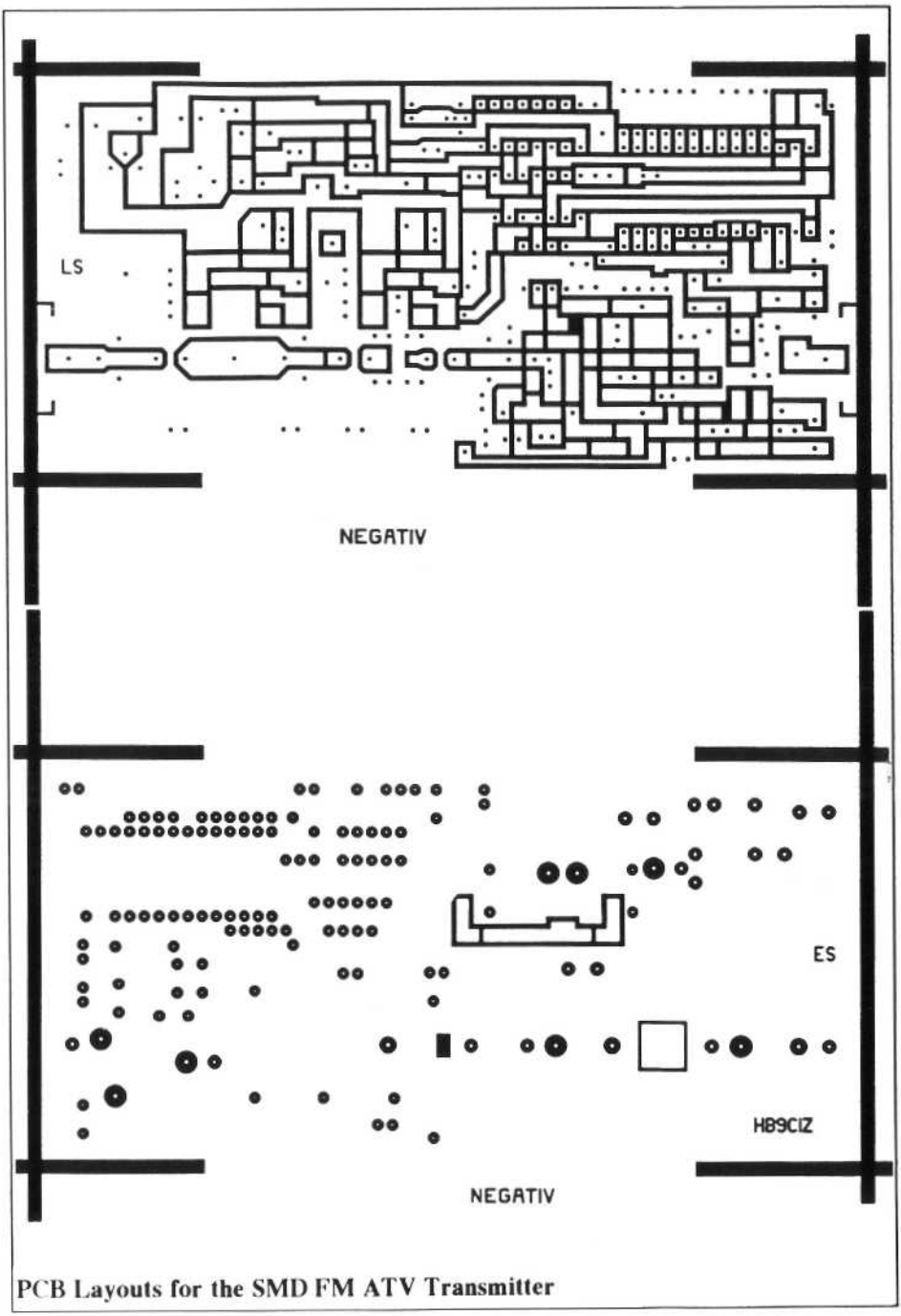
Screening for Divider Trimmers



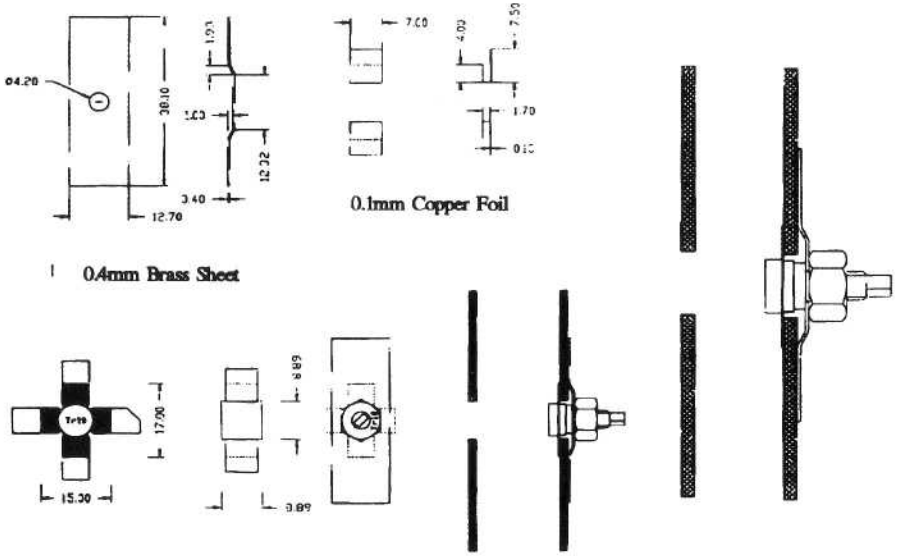
Screening for Local Oscillator Trimmer



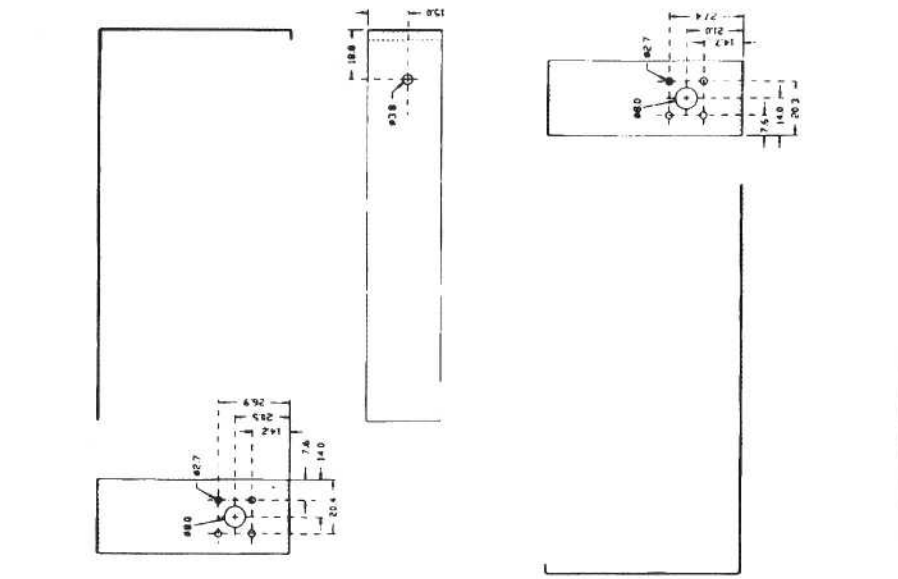
Screening Designs for the SMD FM ATV Transmitter: Material 0.1mm Copper Foil



PCB Layouts for the SMD FM ATV Transmitter



Mounting the Output Transistor



Case Dimensions; Left and Right hand sides

The Annual Severnside Fancy Dress Bash

Jean G0AWX

Once again reporting on the tiny part of the 'goings on' in the Severnside Television area... The Fancy Dress On Air night... for STG no serious technical matters are discussed on an evening such as this, just sheer fun and laughter. To commence the evening we couldn't do better than in the person of Mr.Data of the Star Trek team, the make-up and costume extremely realistic for an android. Steve, our Chief Engineer was behind the mask of make-up, but most endearing was a new member of the 'crew', suitably attired and made-up, young son Matthew, who was determined to make his presence felt by commandeering the microphone from the 'old radio Ham', we shall accept his recruitment with the Club in the near future - he is only 2 years old. There was a mysterious character who kept popping into various radio shacks in the vicinity during the evening, we all recognised him as 'Mr.Blobby'. He waved to us from each location and then disappeared. The speculation was intense, but eventually he returned to his own shack which gave the viewers a hint that it was 'our Phil', who is always having fun with us all on these occasions. His antics for the evening caused real hilarity for all the viewers, as each household heard a bell and wondered who they had to entertain whilst looking a little odd. Ian kept us smiling all evening as he caught a moment here-and-there to show us the Motor Cycling friend, the tourist came on-screen and various other impersonations, all well thought out in the spirit of the evening. 'The Blue Lamp Patrol' was very interesting. Along came 'WPC Morse 007' with her handcuffs, truncheon, whistle and even her walkie-talkie, and of course with her on patrol was 'PC Useless', sporting his magnifying glass, concerned with his investigations into the STG Repeater! I feel sure that you will already guess that Viv and Ivor put on an excellent show, with many remarks from viewers which I have no intention of repeating! For those not having already met Viv and Ivor, they are Chairman and Site Manager of our Club - and, as an aside - Husband and Wife. Each year we expect something hilarious when these two appear on our screens, they never let us down. Later in the evening a 'Punk' was displayed to us, yes Viv had felt she had more to offer, having dressed herself in black rubbish bags and horrific make-up - the main comment was 'Oh No!'.

As a group the tradition is that we all display our cuddly toys. Out came the oldies, Teddy Bears, Koala Bears, Ducks crawling across the bottom of the screen and the mysterious Rabbit. To this day we have no idea who he belongs to, but felt he was much loved!

Have you discovered that STG is crazy down here in the West Country? None-the-less,we each of us wish each of you a belated Happy New Year.

BATMAX - A Matrix Control System

Brian Summers G8GQS

The latest generation of BBC Outside Broadcast vans have a Matrix 64 by 64 (although not all crosspoints are available), this is of the order of 4000 cross-points! A lot of connections if you use one wire per crosspoint, hence the use of coded controls.

The matrix in my van is a mere baby in comparison at 23 inputs by 8 outputs. But I have still felt the need to develop a 2 wire coded control system so that the matrix can be controlled over an audio circuit from a local or remote position.

You may be wondering just what a matrix is? so a few words of explanation might be in order.

A Matrix is a group of Electronic switches (early matrices used relays!) arranged in rows and columns, so that any input can be routed to any or any number of outputs, see fig.1. In this context we are discussing a Video matrix but the principals apply to audio and other signals.

In use the matrix would be fed with all the available signals, mixer inputs, mixer outputs, test signals, special effects, TV check receivers and the matrix outputs would go to monitors, measuring equipment, recorders, transmitter inputs. Fig 2 shows a simplified plan of the matrix used in my OB van.

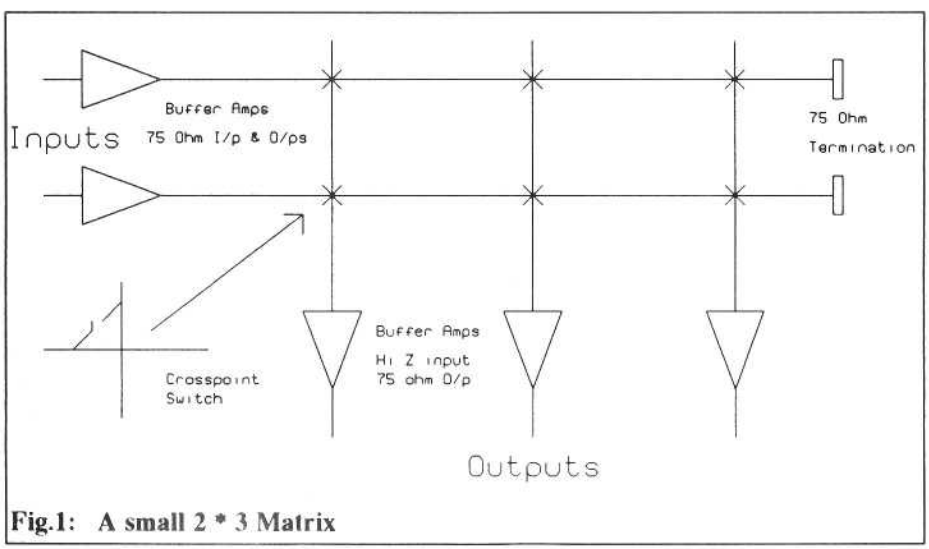


Fig.1: A small 2 * 3 Matrix

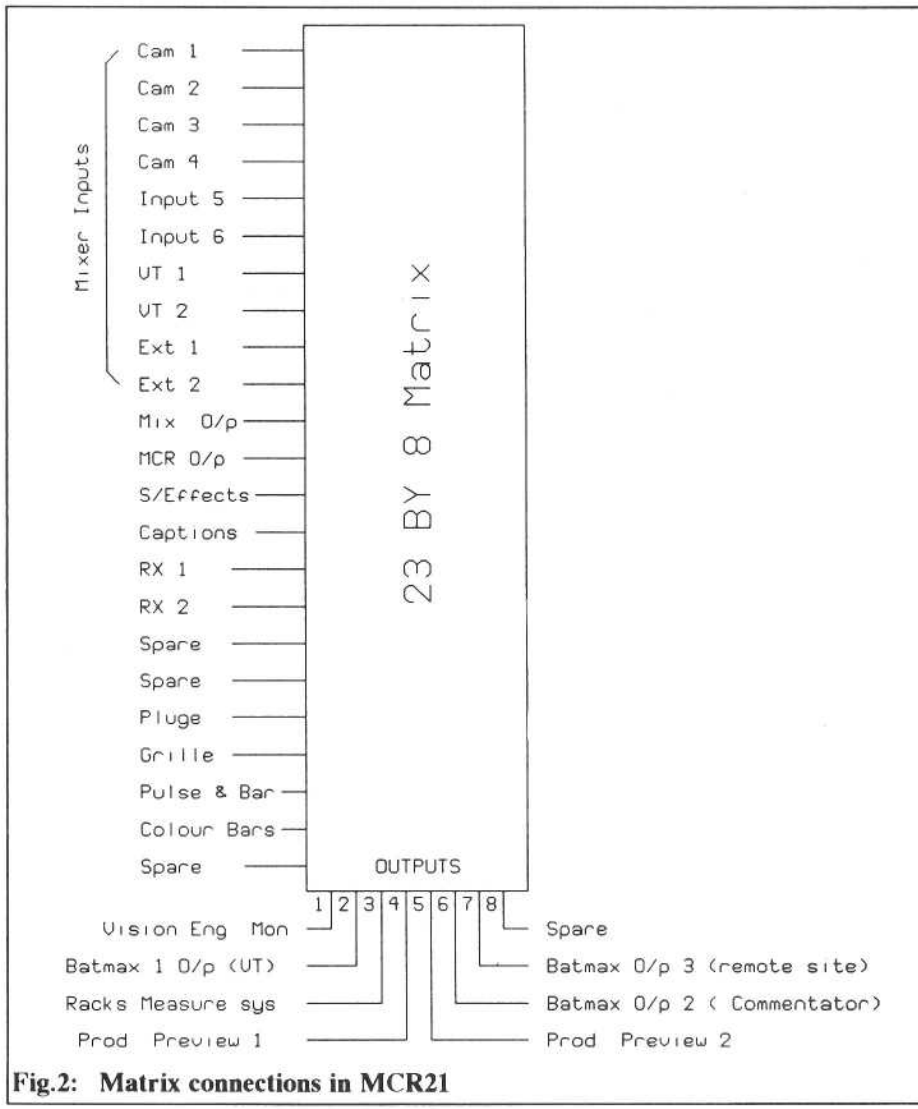


Fig.2: Matrix connections in MCR21

BATMAX is the name I have coined for the remote control system, it comes from BATC and the MAX from matrix. The syllable MAX is used in other control system's names like the BBC's Twomax system used on the type 5 CMCR's. The system I have developed uses the Plessey MV500 and MV601 Coder and decoder IC's these are available from RS Components or Electromail. The system will control up to 32 crosspoints on any one matrix output. The maximum range is over 500m. of twisted pair.

THE CODER

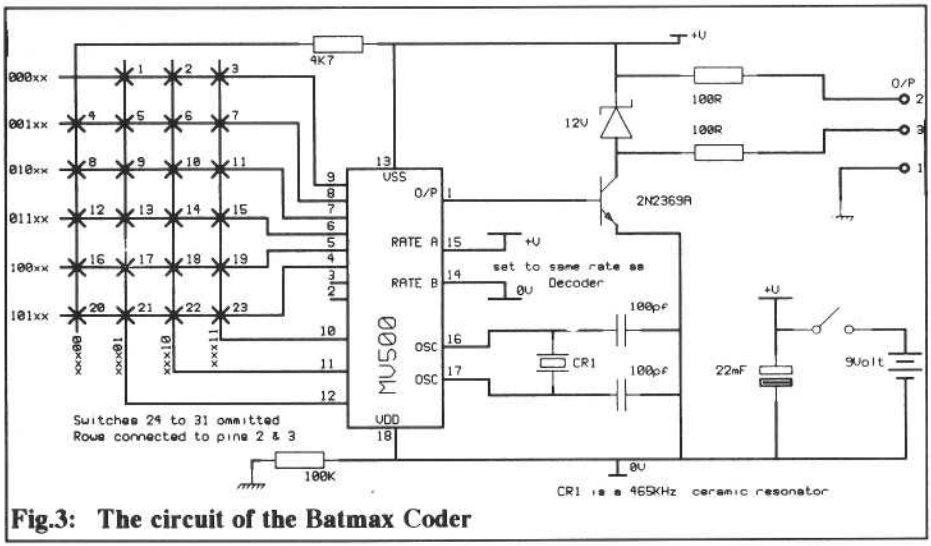


Fig.3: The circuit of the Batmax Coder

The MV500 coder IC is easy to use and the standby power consumption is low so battery operation is feasible. The switches are push to make momentary action and I used "Shadow" switches arranged in 2 rows on some Vero board. An old computer keyboard would yield plenty of switches. As current is only used when a button is pressed an On/Off switch is not needed. One small disadvantage of the MV500 is the lack of Priority Coding i.e. if two keys are pressed at the same time a spurious output code could be generated.

THE DECODER

The input circuit of the decoder has a bridge rectifier which corrects any reversals in the control wires, this connects to a 4N46 optocoupler which allows the coder to float with respect to the rest of the system. The MV601 Decoder accepts the serial data from the optocoupler and decodes it to a 5 bit data word and a data ready signal. This 5 bit data signal is latched in a 74LS374 Octal latch. I used a LM1881 sync separator to provide a field pulse to clock the data in the 74LS374 during field blanking. The Q outputs of the 74LS374 are decoded to 32 open collector outputs by IC3 to 7. 74LS145 are used as the output devices as these will handle the 15v. logic swing needed by my matrix. The rate A and rate B links control internal counters which sets the data rate as per table 1. I found the fast rate best (rate A & B high), but by switching the rate you could provide 96 control signals.

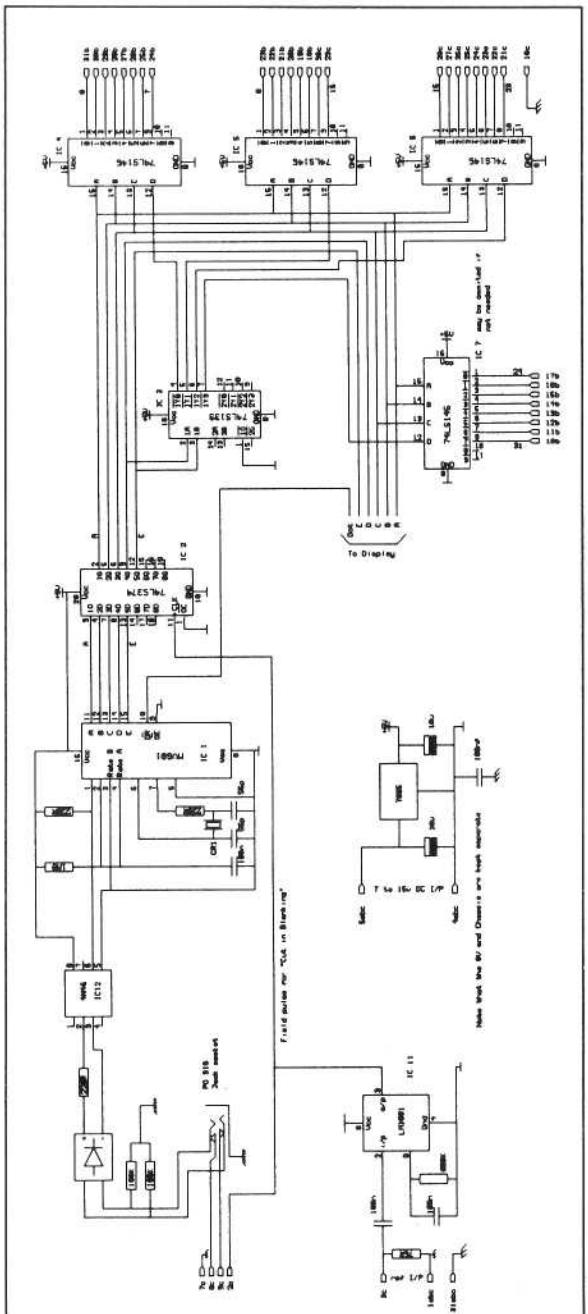


Fig.4: The circuit of the Batmax Decoder

CR1 the 465Khz. ceramic resonator is available from RS, Maplin etc. The resonator in the coder and decoder must be the same. With some ceramic resonators a series resistor of 220 ohms may be needed to stop oscillations at harmonics of the resonator. Whilst waiting for my resonators to arrive I used two identical inductors which worked well enough to test things with! Many commercial matrices, which are available on the surplus market, need the control wire pulling down to perhaps -9 or -14 volts. You can do this by connecting the decoders 0v. line to the minus voltage from the Matrix.

THE DISPLAY

It is useful to be able to see what source a remote coder has selected. The circuit with the 2716 eprom decodes the 5 bit data into 2 BCD tens and units to drive the TIL311 seven segment displays. Pin 19 of the decoder MV601 is the "data ready" output and it lights the decimal place dot of one of the seven segment displays. This is useful as an indicator of control data being received. The small amount of code in the EPROM is listed in table 2. I could supply programmed EPROMs if needed.

BATMAX IN USE

The prototype was in use at the last BATC convention and then at other events and has worked without problems. It will of course be a complete disaster now that I have written this!

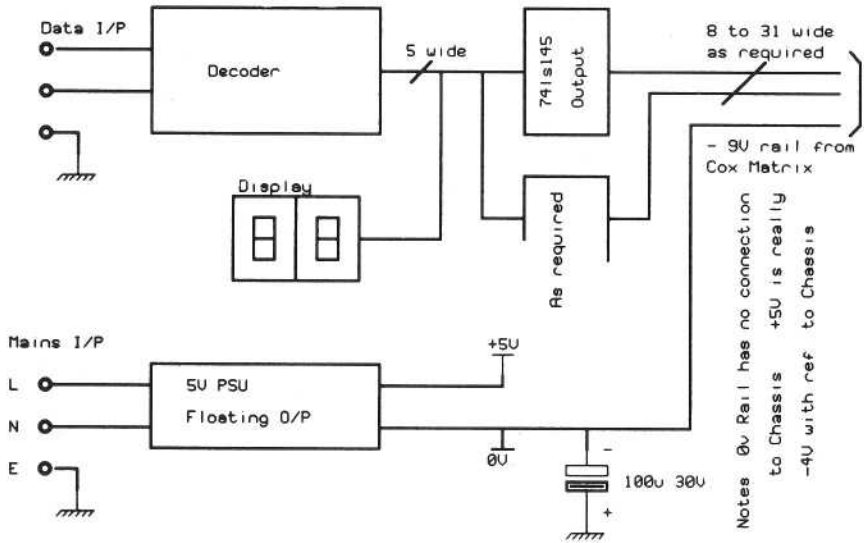


Fig.5: Connections to Cox Matrix

RATE	INPUTS	OUTPUT RATE	
A	B	(clock cycles)	
0	0	Output inhibited	
0	1	Slow	2048
1	0	Medium	1024
1	1	Fast	512

Table 1: The setting of the rate links

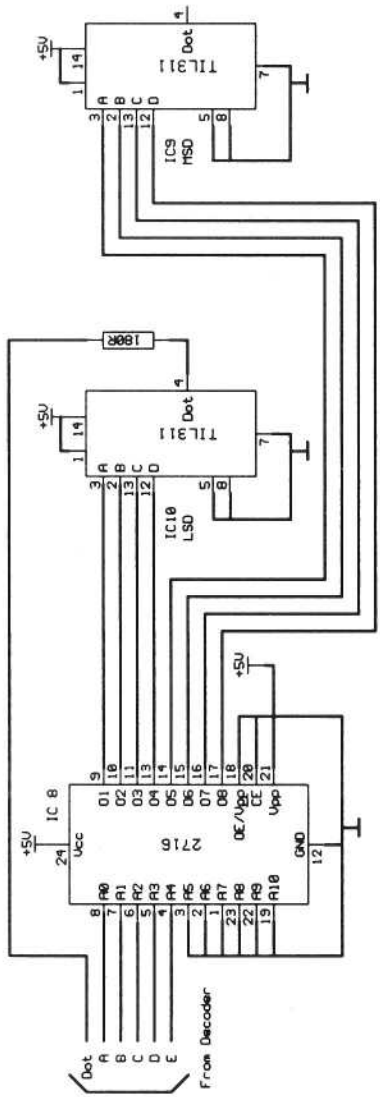


Fig.6: The Display

SPECIFICATIONS

Supply Voltage:
5V for the logic
15V max for open collector outputs
Current consumption:
250/400mA dependent on displays
Range: over 500 yards
Twisted Pair

GLOSSARY

CMCR	Colour Mobile Control Room
DA	Distribution Amp
ITS	Inserted Test Signal
MCR	Mobile Control Room
OB	Outside Broadcast
PLUGE	Picture Line Up Generator
PV	Preview
VT	Videotape

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

Note: this is in HEX!!

Table 2: The EPROM code.

SATFAX - 360 Colour Fax - A First !!

Ian McAvoy G0NKA and Ted Veall G6HMS

With the Japanese satellite FO-20 schedules and indeed being in analogue mode for the week 1st to 8th December 1993, Ted G6HMS and myself Ian G0NKA decided to have a go at passing fax pictures through it. We started on the 1st Dec and worked most passes from approximately 1600 to 2400 hours each day.

At first the technique was a bit 'iffy', but we gradually got the hang of following the Doppler on the downlink to hold the picture.

Unlike voice transmissions where the ear can compensate for frequency movement, the computers decoding fax signals are far more critical. We found that initially we could not resolve pictures of 256 grey scales and redrew the test picture in black and white, which gave us our first success.

Later we tried the 256 grey scales as we realised that the problem had been more one of technique than picture resolution.

On Monday the 6th of December we had the best black and white picture throughput and then we did a full colour transmission, with about 50% success.

Tuesday the 6th of December between 1959 and 2003 hours saw a full colour throughput with about 90% resolution.

During the week 15th to 22nd of December we continued the experiment using colour exclusively, with some very good results.

The enclosed photographs (*see front cover ... Mike*) are off-screen shots of the received signals. The software used for transmit was JV-Fax version 6 (*see CQ-TV 165 ... Mike*) and for receive a shareware version of Microfax.

The uplink frequency of 145.950 MHz lower sideband remained constant throughout the passes and the downlink was 435.820 MHz +/- Doppler shift. The pictures were computer generated for clarity.

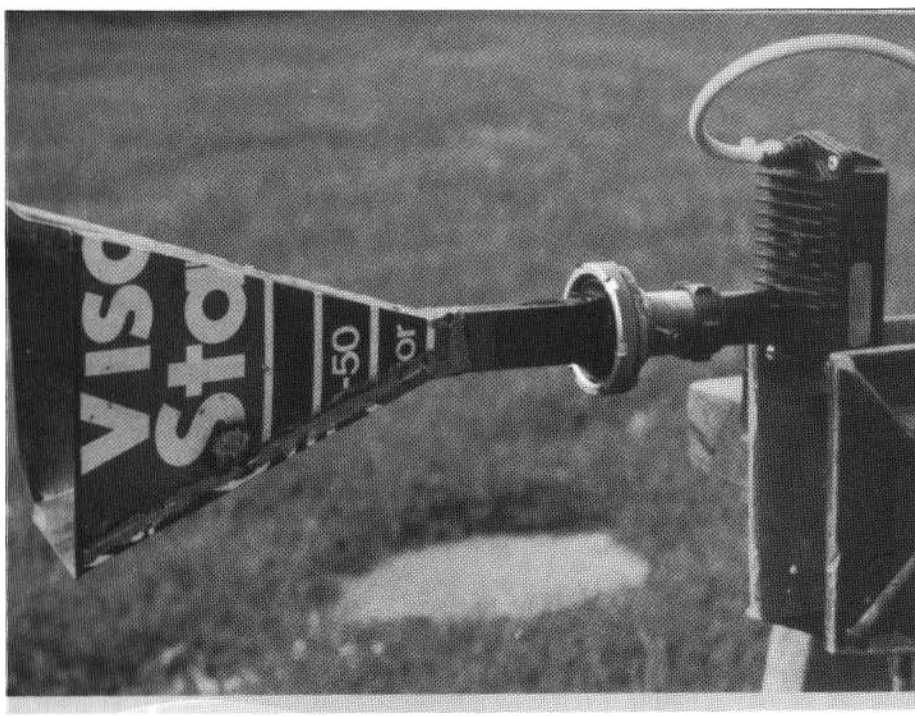
We have yet to try an image of near photographic quality, but from the results obtained we see no reason why such an image should not be successfully received by anyone with a good satellite station.

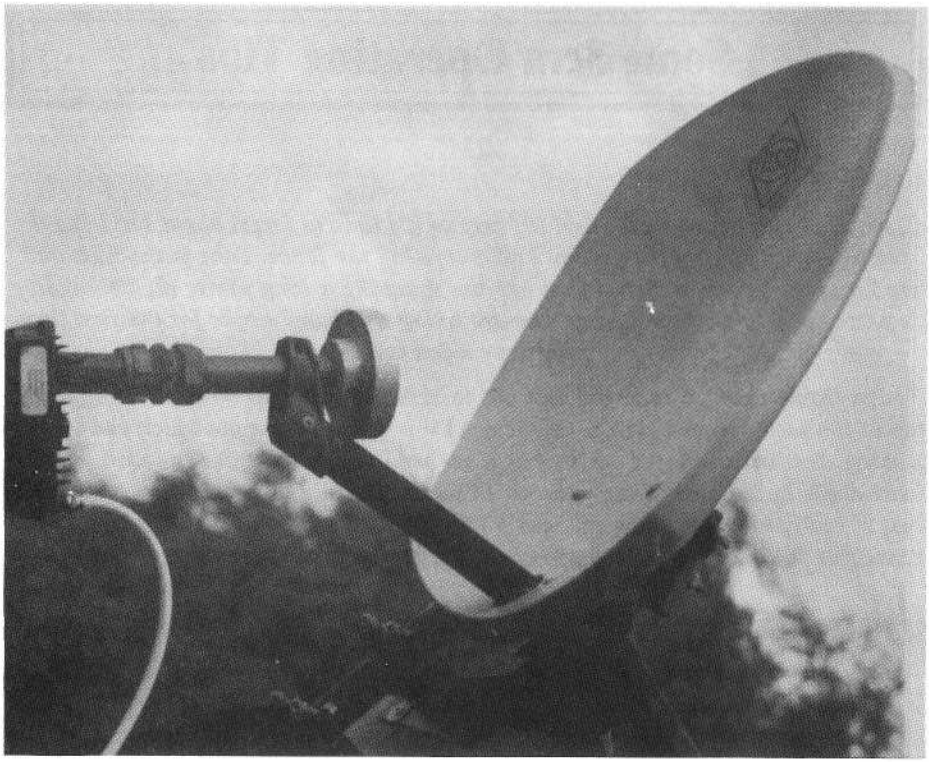
Some 3cm Operating Tips

Bob Platts G8OZP

Spring is here and summer is on it's way so it's time to forget about servicing the lawn mower, digging the garden and creosoting the fence. Take to the hills and see how that new 3cm system that one has spent those long winter nights building is performing. For those of you who are trying this band maybe for the first time, here are a few tips.

Firstly, skeds must be arranged and not to ambitious to start with. Dashing to the top of the local hill and calling CQ 3cm ATV is a lonely pastime which can lead to looking for hairs on the palm of your hand. Seek out like minded idio---- individuals in the area. Take your kit to the local radio club and show them how easy it really is to get going on 3cm ATV. Why not show the one hour tape of my lecture at the Harlaxton convention. This includes details and demonstrations of





several systems including a basic transmitter that has a total of only 4 components!. Plus a basic receiver that has only 3 !!. The only way to get local activity is to encourage it.

Testing tweaking and getting the hang of operating the equipment is a vital part of the learning curve. After proving it works across the shack and setting the TX on frequency (if you are not sure, why not bring it along to the convention, myself and others who can check it with you will be there) test with a weaker signal outdoors. The garden is the obvious, but any open space will do. It is best to avoid built up areas as buildings can cause reflections and possible false signals. These can actually be useful later as reflections can be a good local source of weak signals. It best to avoid public places such as parks as people tend to be inquisitive and ask odd and awkward questions.

An attenuator on the TX is best for final tweaking. These are available on the surplus market, however home brew one's can be just as good (and a lot cheaper). Tapered lengths of hardwood (like a wedge of cheese but pointed) within the wave guide can be very effective. Keep the angle of the taper shallow. If it is to steep it can cause bad reflections which can de-tune some types of oscillators. The longer

the taper, the greater the attenuation. The shallower the taper the less the chance of reflections. The anti-static foam used to store IC's can be very effective if used in a similar fashion. Attenuators should be fitted with the point of the taper towards the source of the signal. Yes, a double taper will work well either way round.

Now it is tweaked up, the dish feeds optimised and calibrated etc. the time has come to try some DX with a colleague. Before disappearing to the hills check your frequencies with a contact over a short distance of about 400 - 800 yards. The use of attenuators again can be very useful here. Now it is time to consult the maps. The Ordnance Survey Landranger series are ideal for local working. For longer hauls try the Routemaster series, these are not contoured but coloured with spot elevations. Generally on 3cm if you can see it, you can work it. Go for short paths first. Map reading skills can be of great benefit here, enabling one to judge if a path is L.O.S. (line of sight) by studying contour lines. Watch out for woods or large trees as these will severely attenuate any signal they intercept.

Even if you are both spot on frequency, you will probably not make contact unless your dishes or horns are pointing in the right direction. Horns generally have lower gains and wider beam widths, making pointing easier. Dishes, particularly larger ones over 75cm need accurate pointing (and secure mounting).

A method of sighting the dish is of great advantage. It is not always realised is that dishes often squint, so working out the bearing, adding 90 degrees and sighting across the rim of the dish does not always work as expected. Also, how do you know if the elevation of the dish is correct?

Why not fit a sight mounted securely to some part of the dish? If you have an old rifle sight, all the better, but it is not essential. A length of tube as a bore sight, or simply two pins or nails on a piece of wood are fine. Sights do note have to be on the axis of the dish. They can be above below or to the side, even at an angle and viewing through a mirror or prism. It all depends on your ingenuity. A sight is best set up by trial and error whilst performing short range tests. Obviously as the distance increases locations at prominent land marks are best.

Mounting a dish onto a tripod such that it can be rotated is probably best. To set the tripod so that the dish is horizontal use a spirit level, or simply a plumb bob across the front of the dish. Check at one position then rotate through 90 degrees and re-check. Adjust the tripod as required and re-check. Fixing a large protractor (try the high street stationers) combined with a sight makes setting the dish for none L.O.S. paths or for operating during misty conditions a dream. Set up the tripod and sight up on a landmark in the general direction of transmission. Draw a line on your map from your location to the land mark. Draw a line from your location to the distant station. Measure the angle and move the dish that amount. Works a treat and a lot easier than setting by a compass etc.

For those windy days, keep a couple of lengths of cord and some tent pegs handy!

TV on the Air

Andy Emmerson G8PTH

I think it was Mark Twain who said that rumours of his death were somewhat exaggerated and the same applies to my alleged resignation. So its business as usual...

EXPERIMENTAL REPEATER

Eamonn Phelan EI9GO writes from Waterford that he's trying to get the local club to put up an ATV repeater. Response from the Radio Division of the Department of Communications has been positive, indicating that they will consider applications for experimental TV repeaters in the bands 1240-1300, 5650-5680 and 10000-10500MHz bands. It is worth remembering that ATV in Ireland has a different status to Britain, in that hams there are considered experimenters rather than amateurs. You may think that's a pretty subtle distinction and it is, but there is a logic to this and it allows the authorities to grant, on occasion, extra facilities that normal amateur status would not warrant. Or so it was described to me.

Also in Ireland, Dave Hooper EI2HR advises he has moved to Tallaght and is thus still on the outer fringes of Dublin. "I am about 450 feet above sea level and it should be a good site for ATV. I don't have my antennas up yet but have exchanged pictures on 23cm with three of the locals using just an antenna on the window ledge. There are about ten active on 23cm ATV plus two or three extras with receive-only.

Talking of microwave television on the amateur bands, I had an interesting discussion recently with Bill G8CMK in St Leonards on Sea. The conversation started with his news that the existing GB3VI (amplitude modulation) repeater serving Hastings is no longer supported by the official repeater group there and will have to be established elsewhere and relicensed (I have heard nothing about this officially). He continued that Keith G8HGM was seeking to start a new East Sussex FM TV repeater group, the repeater to be sited possibly in Heathfield (a good location of course, where the BBC/ITV broadcast transmitter is).

Bill then expressed his own view that with the amateur microwave spectrum becoming more crowded, television operators might have to give up FM operation on the grounds that it occupies too much bandwidth. In the space of one FM-TV channel you could get two 8MHz-broad AM channels, he says. This is an interesting point and can be argued all day and all night. I have no doubt that an AM signal

would occupy less bandwidth but the problem of building linear power amplifiers at these frequencies forces most people to take the easy route and use Class C amplification with FM. We'll have to see if any reliable and more important, easily reproducible, designs for Class A power amplifiers are promulgated.

MUSICAL YOUTH

Another interesting thought put to me was the status of music on amateur television transmissions (I have suppressed the callsign in case he has thought better of it since!). In the olden days (when G3s were mere strips of lads) you were allowed to transmit one gramophone record a day for test purposes, and my informant suggests this facility was withdrawn only for reasons of copyright. But what if we wish to play 'test card music' to accompany beacon transmission on ATV repeaters or needs to use broad-spectrum quasi-random analogue audio tone sequences' to test the frequency transmission characteristics of our wideband audio amplifiers? If the so-called copyright-free music was used, the sort you can buy to accompany home-made camcorder movies, nobody would object on copyright grounds. At the same time, because most of this music is pretty banal, you could very reasonably argue that it was not being transmitted for entertainment purposes. What do you think? Is it worth proceeding with or arguing for?

HOW THE BATC WAS BORN

I received a fascinating letter from Arthur Bevington G5KS in Oldbury and I think it deserves reproducing in full, as it tells the story of our hobby in the early days.

"Further to your article, here is my addition to yours how it was first born. I took a course on 405-line television (positive modulation, negative sync) at Pye Ltd and also at EMI Ltd. Afterwards I went to Canada for Pye Ltd, assisting in putting down a production line for television. On my return I was employed by the Midlands Electricity Board as charge engineer in the service department. Later I was promoted and transferred to the Yorkshire Electricity Board at Sunbridge Road, Bradford.

"I was visited by a representative from A.C. Farnell Ltd. of Leeds and he handed me a leaflet telling me about the formation of the BATC. With Ernie Faulds G8MTF (now a silent key) we joined immediately in early January 1950 and I have been a member ever since. We were in fact transmitting television at the time. I was allowed by the YEB to take time off evenings to instruct on television at Bradford Technical College as there was an extreme shortage of television service engineers. A few years ago John Wood G3YQC, the then editor of CQ-TV, borrowed and then

returned some early copies of the magazine. I must add that when we first joined the club its newsletter was a single sheet of paper, so you can see I have been a member since the beginning as was Ernie.

"I must add that my wife Maud is writing this as I am still recovering from two operations on my eyes. All the best."

And all the best to you Arthur. That's no small achievement supporting the club and keeping the amateur television flag flying for over 40 years. We wish you well plus a speedy recovery from the eye operations.

REPEATER NEWS

Andy G6OHM rang from Chatteris to say that GB3PV, the Cambridge repeater, was back in action for test on the weekend of 12th/13th February. The repeater has not changed its site but power out of the transmitter has been raised to 12 watts and this in turn has improved coverage so that it now reaches 16 miles out. Using a bow tie antenna, preamp and satellite receiver, Andy gets a P5 picture from the repeater at Chatteris.

And from Wyke Regis, near Weymouth, comes an interesting letter from John Ashton G4NTS, chairman of the Dorset Video Repeater Group. "I thought you may be interested to receive our latest newssheet from the Dorset Video Repeater Group, one of the 'secret' ones! We are a relatively small group, about eight capable of receiving and transmitting, with a few viewers on the side. However, when we eventually get the licence I think this number will increase as quite a few others have expressed interest but are waiting for a repeater. Anyway, I hope you can use some of the newssheet in one of your articles to spread the word in the South West."

Great stuff, John, and here is a summary of the news about GB3WV, the proposed Dorset ATV repeater.

"The licence application was submitted to the Repeater Management Group in December 1992. The application has been cleared by the RSGB repeater management group and was sent on to the Radio Authority for their attention in February 1992. Great we thought, should only be a few months! Little did we know how frustrating the situation was to become. June arrived without having heard anything so let's try telephoning the RA. Result - no record of our application. In near panic we contacted the RMG who were adamant the application had been forwarded, a change of staff at the RA had caused a mix-up. However, a copy would be sent, we were assured, just in case. So, here we were in June back at the start of the process with 6 months wasted. You can imagine our faith in "the system" had taken a serious dent by now but all we could do was wait.

"September came and still no word, time for another call to the RA only to find they had changed staff again! The chap spoken to, whilst wanting to be helpful, did not know where to look for the info but said he would phone back. We've heard this before, we thought, but lo and behold, he did. Our application had cleared two departments and had two more to go through. At last something positive. However, more than 12 months have passed since our original application and still we wait in hope.

REPEATER HARDWARE: The beacon/repeater is now fully installed at its site on the Wyke Ridge and tests of the hardware and coverage area have proved very successful. It has been found, however, that interference from radar at the Navy base and on passing ships can be a problem at times. Does anyone know of a circuit to eliminate this?

The unit details are: Transmitter - Aztex Electronics crystal-controlled on 1316 MHz. Tx Antenna - G3JVL Alford Slot approx. 65m ASL. Filter - G3JVL 3 section interdigital tuned by G3VPF. Feeder - Andrews Heliax LDF450. PA -Mitsubishi power module 15 watts. Receiver - Wood & Douglas system or Echostar SR50 modified by G4NTS. Rx Antennas - two Double Quad Plate (Bow tie) pointing North and South-East covering Weymouth to Dorchester and Wyke to Portland areas. Filter -G3JVL 5-section interdigital tuned by G3VPF. Feeder- Westflex 103. Pre-Amp - Aztex Electronics with gain of 17dB. Control Logic - Spectrum 128 provides timing and graphics for the Test Card page and "K" page. Programme modified by 2E0ABU from BATC Handbook. Electronic hardware modified by G4NTS from BATC Handbook. A Video Recorder is connected to the receiver to manually record incoming signals if required.

ACTIVITY: Due to the amount of progress made in the installation of the unit over the past few months we have seen a steady growth in the numbers of active stations in the Weymouth and Portland areas with even a report from a portable station near Exmouth. This has proved very encouraging and provides the variety which is needed on any repeater. I must say at this stage that whilst the repeater licence has not been issued yet the unit operates under my call sign (G4NTS) when I am in attendance most afternoons and evenings. The channels used for talkback are 144.75 MHz and 433.475 MHz, where we can be found most days so if you are interested in becoming a viewer or fully operational on ATV please call in as lots of help and information is available.

FUTURE IMPROVEMENTS: Our policy to date has been to create a reliable unit which complies with all the licensing requirements, locate a site and get the thing operational. This I feel we have achieved, albeit ahead of receiving the licence to fully operate as a beacon/repeater. However, compared to other TV repeaters its operating facilities are very basic so perhaps now is the time to look at bells and whistles.

Some ideas we have for improving the unit are: Computer change to the Amiga as this provides full screen graphics using overscan. Several different screens of graphics and/or text can be employed and smoother transitions between screens can be activated. To this end Mike 2E0ABU has been busy programming in Amos and has made good progress, so this improvement should be implemented in the near future.

Receive Antennas - At present there is a sector to the west which is not covered and although there is little activity at the moment in the west we are trying to spread the word and encourage people to the mode in areas as far as Torbay. So a third bow tie has been made ready for installation on the mast. This does mean, however, that an electronic system of receive antenna selection will have to be employed and this is being investigated.

Still on the receive side of the unit some form of masthead preamplification on each antenna could prove desirable and tests are in hand using microwave monolithic integrated circuits (MMICs) with encouraging results although the ones used had quite a large noise figure (6dB).

We hope to report in the near future that the licence has been received and the unit is fully operational. Meanwhile, if you need help or information please do not hesitate to contact a member of the committee: John Ashton G4NTS Chris Stroud GlBJN Les Barnes GOFAJ 0305-783558 0305-784508 0305-770272."

SEVERNSIDE SUCCESS

Viv G1IXE writes: "We are continuing to develop the proposed 10GHz ATV Repeater, to be sited at Dundry. The licence is being applied for and the equipment is well advanced. No special equipment will be needed to receive it, since a normal satellite receiver with a slight modification to the LNB will cover the 10GHz band - more details to follow!

"The 24cm repeater continues to function well. A new 24cm receiver was installed in July last year, after much development work by Steve G8KUW. Work continues on the development of the next generation of control logic, which will be PC-based. One little niggle has been the receive aerial selector switch, which has become increasingly unreliable. Steve G8KUW found that the cost of a new one from the USA was £780.00 plus VAT.

However, we were fortunate to obtain a surplus one for just £50.00 at the Leicester Rally, although Bryan GW6BWX is still considering an electronic replacement, which would be more reliable. This would have extra ports to enable us to reach our more remote areas."

AND FINALLY

News from the Kent Television Group. Their repeater, which some time ago moved to Chris G4AYT's location high above the Grand Duchy of Whitstable, has had work done on the transmit aerial. This had become unusable due to water ingress in the slot. The system has now been encased in plastic piping, which should solve the problem. The repeater's Wednesday night activity period is being well supported, with regular contacts from several stations and reports coming in on two metres and 70cm from others. Try and join in, says Chris G8GHH.

That's your lot for this time. Let's have plenty more letters coming in for the next article.

Chez nous with Alvin Ashtead G6DTW - QRV 70cm RX & 24cm TX/RX

Beyond TTL - EPROM Programmer for PC's and compatibles

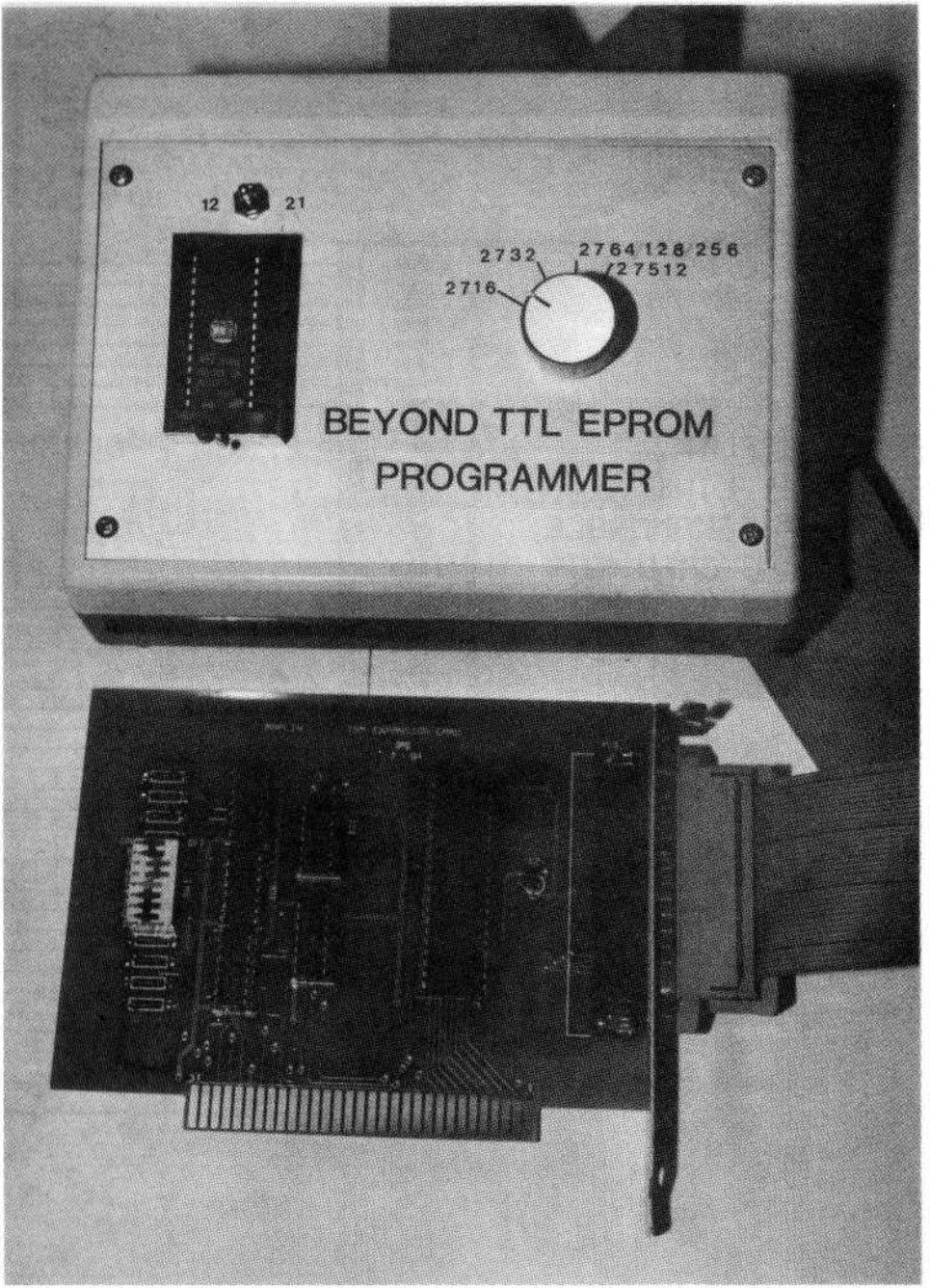
Trevor Brown G8CJS and Chris Smith G1FEF

It is no good understanding micro processor instructions and hardware configurations unless you can put the instructions into EPROM. The only EPROM programmer design we have produced so far was in CQ-TV 143. This was also reprinted in the ATV compendium. The design was dedicated to the Spectrum Computer, and limited to 2764 and 27128 EPROMs. The EPROMs were interfaced to the Spectrum computer by an 8255 PIO chip. A PCB is still available from members services for that project.

The Spectrum was an Ideal host computer for developing Z80 code, as it was itself Z80 based, so sections of the code could often be run within the host computer, before being down loaded to EPROM to run in other Z80 applications such as already covered in this series. The Spectrum is a little long in the tooth now. The following article explains how to transfer that EPROM programmer design to a PC, or PC compatible computer, and pick up one or two additional features along the way.

The new EPROM programmer is again based on the 8255 PIO that is interfaced this time to a PC. To save reinventing the wheel I have used a Maplin interface card for the PC interface, I see no reason why we should put our own card design together when one is readily available. For any overseas readers who are not familiar with Maplins. Maplins is a UK store that specialises in electronic components and kits. I can not reproduce the circuit of their card here, but if you require one please send me a self addressed envelope and I will be happy to forward you any necessary details. The Maplin card is available as a complete kit or as a bare PCB. The kit comprises of the following:- 8255, 74LS02, 74LS00, 74LS30, two 74LS86's, eight 10kΩ resistors, 8 way Dil switch, two 10µF caps, 37-way D connector (male) and a PCB. A quick look in your junk box will reveal if you need the full kit or just the PCB. The PCB plugs directly into any spare slot in the PC and has a 37-way D type connector (male) on which all the I/O lines are brought out, along with +5 and ground connections.

Fig.1 shows the circuit of the EPROM programmer and the interconnect to I/O port of the Maplin card . The circuitry was housed in a Vero box (217) and connected to the card via a 37-way D type lead. The Maplin card plugs into any available slot within the PC and the 37-way D is then available at the rear of the computer. The


12
21
2732
2764 128 256
/27512
2716
BEYOND TTL EPROM
PROGRAMMER

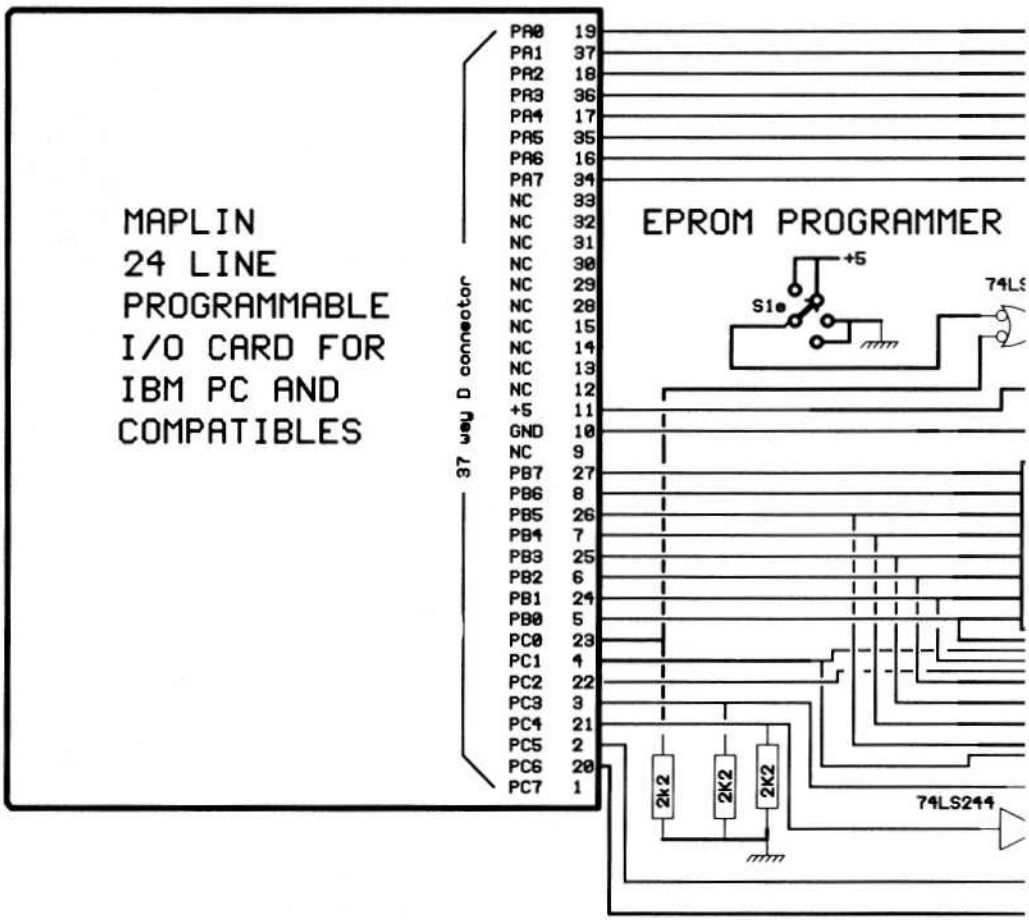
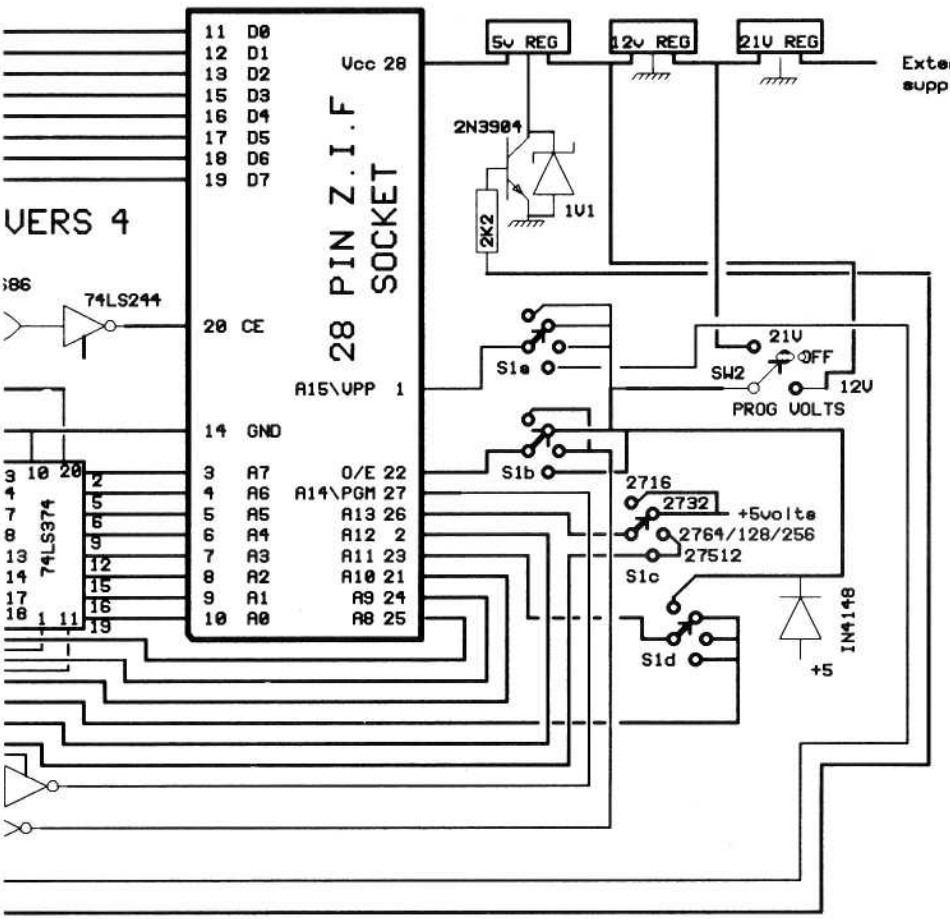


Fig.1: Circuit Diagram of the EPROM Programmer


11 D0
12 D1
13 D2
15 D3
16 D4
17 D5
18 D6
19 D7
Vcc 28
28 PIN Z.I.F SOCKET
VERS 4
74LS244
20 CE
A15\VPP 1
14 GND
3 A7
4 A6
5 A5
6 A4
7 A3
8 A2
9 A1
10 A0
O/E 22
A14\PGM 27
A13 26
A12 2
A11 23
A10 21
A9 24
A8 25
74LS374
5v REG
12v REG
21V REG
External 25v supply
2N3904
2K2
1V1
S1a
S1b
S1c
S1d
21V
OFF
SW2
12V
PROG VOLTS
2716
2732
+5volts
2764/128/256
27512
IN4148
+5

interconnecting lead between the Vero box and the card should be kept to a maximum length of 2 feet which is enough to stand the unit on top of the computer.

Inside the box the three chips are mounted face down and held in place with super glue remember to note which is pin-1, and which chip is which as this information is lost with this construction method. The +5 volts required to power these chips is available from the interface card via the 37-way D connector, pin-11 is +5 and pin-10 the ground. The 28-pin ZIF (Zero Insertion Force) socket was mounted on the control panel and again glued in place. The only other requirement is the Vpp supply which was generated in a separate power supply. Sw2 controls the Vpp supply and is centre off switch. If in doubt which setting to use try the 12 volts first. The centre position protects the EPROM from being accidentally programmed by a keyboard entry error. Always remember the EPROM needs exposing to UV light to erase it before programming. This will change all the logic states in the EPROM to Logic 1 so it should read FF at every location. The programmer can only change logic 1 to logic 0. Checking that an EPROM is fully erased is a simple menu driven function that is covered under software.

Once we have constructed and successfully got working the Basic EPROM programmer I hope we can add a few bells and whistles such as RAM memory which will enable the unit to function as an EPROM emulator. This will then enable the programmer to plug in to a piece of hardware in place of the EPROM and allow the PC host to down load code that can be tried and changed if necessary before committing the final version to EPROM.

The programmer is very similar to the original Spectrum version. Fig.1 shows the port numbers of the 8255 on the edge of the Maplin card so you can see how the EPROM and the 8255 are connected. The A port of the 8255 carries the data to the EPROM the B port carries the address lines, but via a latch that was not part of the original design. This latch enables the 8-bit B port to supply a 16-bit address. The B port first loads the 74LS374 with the 8 least significant addresses, and then supplies the most 8 significant address's direct to the EPROM. By making the B port deal with 16 address lines in this way, we have some spare capacity left in the C port, over and above the original design which did not have the data latch. The spare capacity is used to control the tri-state outputs of the latch and the inverter chips so that the address data and control bus of the ZIF socket can be floated to enable emulation features to be added later. Again this was not possible with the earlier design which used non tri-state inverters (74LS04) and did not have control over EPROM chip enable. The inverters are necessary because when the 8255 is reinitialised all its ports first go tri-state and then if they are set to outputs they default to logic 0. This is an active state for the programmer when programming 2764's through to 27512's and as such would programme locations in the EPROM whenever the 8255 was re initialised by the software. The inputs of the inverters have pull-down resistors to ensure a logic 1 is presented to the EPROM when the

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CIRCUIT DETAILS can be found as follows:

Revised ATV Handbok: PCBs 7, 17, 21, 22, 23, 24, 53, 63
Amateur TV Handbook (vol.2): PCBs 52
An Introduction to ATV: PCBs 10, 18, 25, 40, 41, 36, 47, 82, 83, 84, 85, 86
TV for Amateurs: PCBs 19, 49, 51
Slow Scan TV Explained: PCBs 59, 60, 61, 62
Amateur TV Compendium: PCBs 11, 12, 27, 28, 29, 30, 31, 54, 55, 56, 57
Micro and TV projects: PCBs 14, 33, 34
CQ-TV(xxx): PCBs 13(128), 16(134), 20(130), 26(142), 35(143), 58(139)
Item 46 is supplied with circuit details, etc.

Members of the BATC Committee are available to help and advise Club members on any ATV related subject. Please remember that all Club work is done in spare time, so please try to keep such queries to a minimum.

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TV ON THE AIR - ANDY EMMERSON G8PTH, 71 Falcutt Way, Northampton, NN2 8PH. Tel: 0604 844130.

Where possible, it is better to telephone your query rather than write. Please do not call at unsocial hours. As a guide, try to call between 1830 and 2130, and not before 1130 at weekends ... Thank you.

8255 assumes either logic 0 or tri-state, during reinitialisation. The reverse is true for 2716's and 2732's and so S1e is used to drive an exclusive or to invert this logic, but only in the chip enable line, this is enough to stop random programming when reinitialisation of the 8255 is implemented. The exclusive or gate only inverts when 2716 and 2732's are selected. The software does need to reinitialise the 8255 in order to reverse the direction of the A port to read and verify that each byte of the data has been programmed correctly.

The older 2716 and 2732 EPROMs are an addition to this updated design, and were not possible on the original Spectrum programmer. These 24-pin devices are plugged into the bottom of the 28-pin ZIF socket leaving pins 1, 2, 28, and 27 empty. These older EPROMs require a Vcc supply on pin-24 (26 on the ZIF socket). The Vpp supply is on pin-23 for the 2716 and pin 22 for the 2732. At the other end of the scale the 27512 also needs the Vpp supply on pin-22, but with the extra requirement of A15 on pin-1. The mid-size 2764's, 27128's, and 27256's require Vpp on pin-1. With these sort of requirements some switching is inevitable and this is done as simply as possible with a 4-pole 4-way wafer switch S1. If you do not need to work with 2716's 2732's and 27512's then this switch can be wired out and the circuit simplified.

S2 controls the programme volts and should be left in the 5v position except when programming is being performed, and then set to the required voltage if in doubt try the lower one first, Larger EPROMs will always be the lower voltage. The Vcc supply of 5 volts needs to change to 6V on the programme cycle of 27256 and 27512 EPROMs this accomplished by TR1 and is controlled in software to avoid S1 getting any bigger.

If you omit any features of the design remember when driving the software that you have imposed hardware limitations that the software is not aware of. It will not get upset if features are not there, as it does not check for switch positions and voltages, but it will have a very poor success rate if you have omitted S1 hard wired the programmer for 2764's, 27128's and 2725's and then select 2732 or 27256 on the menu and expect it to perform. The unit requires specialised software to drive it, the software will only run on a PC compatible machine with 512K or more of RAM, running MS-DOS 3.3 or greater. It is menu driven as follows:-

Type (Set up EPROM type)	Load (Load buffer from disc)
Save (Save buffer to disc)Read	(Read the EPROM into buffer)
Display (Display buffer on screen)	Blank (Check EPROM for erasure)

Programme (Programme the EPROM from buffer)
Verify (Verify EPROM with contents of buffer)

This software is available free of charge from Chris Smith, ring me (Trevor Brown) for this weeks address ?!?!? Please include your own formatted disc (any PC format) with a suitable mailer and postage to keep our costs to a minimum.

To Switch Or Not To Switch That Is The Question

Andy Emmerson G8PTH

It is easily forgotten that newcomers have to start somewhere and finding out isn't always simple. A lot of what seems obvious to us old hands wasn't so obvious when we started, so it's only fair to answer questions from newcomers, even 'dumb questions'! Not that the following is a particularly dumb question. Nick G0HFL asks if a coaxial relay is the only way to switch between transmit and receive at 24cm. The answer is no, but I suspect the question is not as simple as it seems, so let's look at what is involved here.

Ideally we want to save money, aerial weight and wind capture area. So a single antenna - and a single coaxial feeder - for transmitting and receiving sound like the best idea and indeed this was how it was once done. At masthead a relay system was used to bypass the masthead preamp during transmit. But in retrospect it wasn't such a good idea.

GAINIAX IS BEST

From a transmitting point of view our prime aim is to minimise feeder loss and allow the maximum transmitter power to reach the antenna. Ideally we would put the transmitter at masthead but this introduces many complications. It is possible but not very practical. Instead we go for really low-loss 50-ohms coaxial feeder at least half an inch in diameter. Take your choice from H100, that white stuff from Japan that's far more flexible than H100 and takes normal N-type connectors, Heliax or ideally that mythical product that Chris Bartram calls gainiax. In all feeders but gainiax you have losses and by using the best possible (read most expensive) coax, you can minimise transmission losses in the feeder.

But that's not the end of the story. Feeder attenuation isn't the only problem; impedance bumps lose power as well. Multiple connectors in cascade, transitions from N-type to BNC connectors and most kinds of relays are all to be avoided if possible. We want to launch as much of that hard-won RF into the antenna, whilst expecting power to worm its way through wonky connectors and across indifferent contacts inside relays is a recipe for losing a couple of dB. Perhaps superbly engineered systems don't exhibit these faults but the kind of resources available to most amateurs don't allow superb engineering.

If you're keeping up with me, you'll probably have realised this implies a dedicated feeder and antenna for transmitting. That's right! Who said ATV was cheap, anyway? Actually, the alternative of a shared antenna for transmitting and receiving would require the use of a fabulously expensive changeover relay at mast head and specialist switching to ensure it switches momentarily before the transmitter is keyed.

TWO TABOOS

Here are two 'no-nos': RF switching of changeover relays is absolutely forbidden and so is feeding DC power up the centre conductor of the coax, even though there are commercial products which employ both of these 'fixes'. Why are they fixes or bodges? If you rely on RF sensing with the unpowered relay biassed towards the receive path, that means that the transmitter has already keyed before the relay can change over to the transmit path. For an instant your expensive transmitter is firing into an open circuit and when the relay closes, it does so with an RF arc, neither of which does your hardware much good. Sure, the damage per occasion is minimal but it adds up and it's not professional to ruin your equipment deliberately.

Feeding DC up the coax is unwise too because it leads to electrolytic action at masthead. At the upper end of the feeder you will almost certainly have a junction of two dissimilar metals (e.g. the centre conductor of the feeder and the pin of the connector used). You will also have some residual dampness however well you try to exclude moisture and bingo, corrosion sets in just where you don't want it, in the feedline path. Feel free to ignore this but don't call me a liar, I've seen this too many times in real life. If you haven't, you've been very lucky!

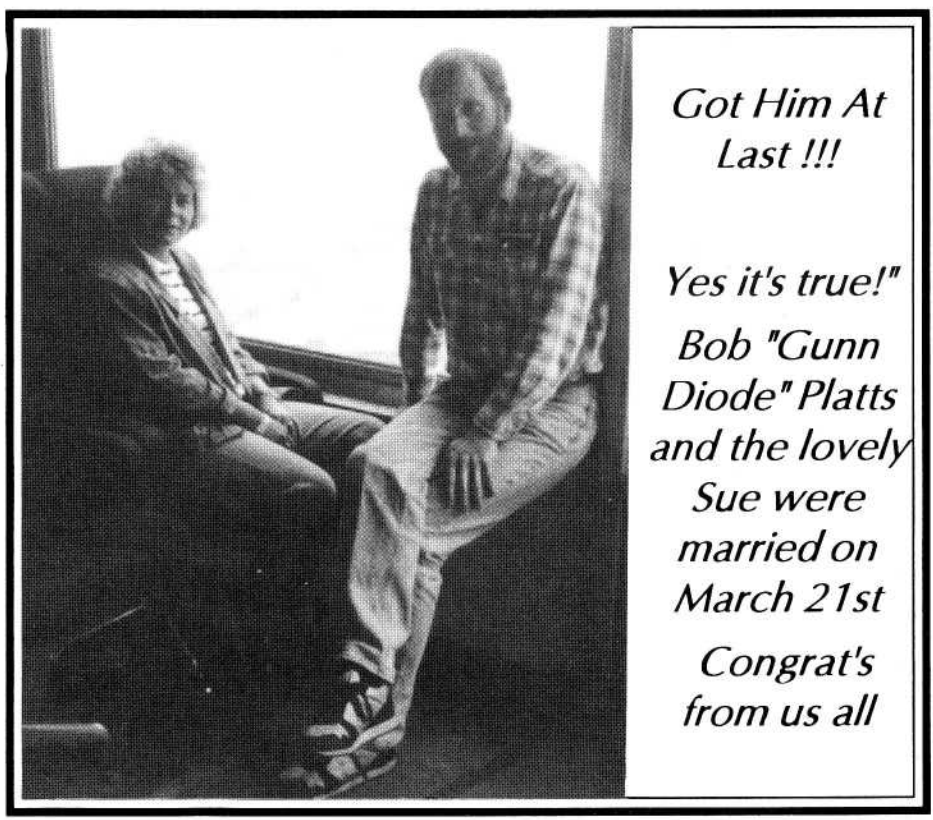
So we are resigned to separate transmit and receive antennas. Good! That means we can optimise the receive side. That means a masthead preamplifier probably and, in that case, a separate power conductor. Simple bellwire taped alongside the coax is adequate and you can use the shielding of the coax as your return conductor. With a masthead preamp you can also economise on the coaxial feeder and satellite television cable would be adequate for the downlead.

SIMPLE SWITCHERY

Back in the shack you can take the receive coax straight to the receive side of your system and hey presto, not a relay in sight. The only switchery then is at DC level, keying up the transmitter when you are sending pictures. It is optional whether you leave the receive side powered during transmit, although people who work mainly through repeaters say it is advantageous to have 'look through' on transmit and see your own pictures coming back (assuming your transmitter isn't desensing the receiver).

There is another major objection to the use of masthead relays for bypassing the receive side of things. If you are using high power (and I used to use 150 watts from two 2C39s, which is not uncommon), you need to be sure the contacts of the relay are rated to carry this kind of power. Many cheaper relays cannot handle this much. Even more important, what is the isolation? We are talking about RF, not DC, and although the contacts may be connecting to one port, this doesn't mean no power will appear at all on the other one. Some coaxial relays have poor isolation at higher frequencies and will allow your sensitive GaAsFET preamp transistors to be well and truly fried alive. Well, alive the first time only, then permanently dead...

So what started out as a simple question ended up in a complex answer. In short, the voice of experience says avoid relays at all costs at 24cm. Any more questions on ATV technology? Send them in to the editor and someone will try and answer them in the magazine. Immediate personal answers are not possible (except to questions written on £20 notes).



Video Cross Fader

Bob Robson GW8AGI

Circuit Description

The circuit is designed around the ELANTEC EL4095C integrated circuit. Within the IC are two amplifiers to condition the input videos, a fader element controlled by external voltages, and the output amplifier. The two ends of the fader element are fed by two pole switches 'wired' to allow the element to be fed by the two input amplifiers, or by either one being fed to both ends of the element, effectively allowing it to act as a 'cut' switch.

Referring to the circuit diagram, the input videos are both fed to the non inverting inputs of the input amplifiers, with the inverting inputs being fed from the output via gain control feedback resistors. The video 1 input also feeds to an LM1881 sync separator IC3whose mixed sync output triggers a 74LS221 monostable.

The monostable is adjusted for approximately 12 microseconds starting at the negative edge of the sync pulse. This pulse forces the switching within EL4095C to the input 1. This will cause the output to be the syncs and colour burst from video 1. At the end of the LS221 pulse the output will be fed by either Input 1 or 2 or a combination of both depending on the fader control signal voltages.

The fader control voltages are +/- 0.5 volts antiphase. The control voltage is from a 1K potentiometer external to the circuit drawn (Pin 28, con 1). to set the correct swing of the control voltage two preset potentiometers feed the external control pot.

The output from the EL4095C is fed to the non inverting input of an EL2020 amplifier set up by R13 and R14 for a gain of two, with R15 providing the correct send impedance of 75R for the video output signal.

Setting Up

The fade voltages will require setting up before the EL4095C is installed. The procedure is as follows:- Connect your 1k fader potentiometer (rotary or slider with a linear law (between pins 23 and 26 and the slider to pin 28.Using a high impedance meter monitor pin 23 WRT (with respect to) pin 32. Adjust RV2 for a reading of 0.5V. Move the meter to pin 26 and adjust RV3 for a reading of -0.5V. move the monitoring to pin 6 of IC4 (still WRT pin 32) and adjust the fader control to the pin 23 end. The voltage should be 0.5V, but due to the interaction of RV2

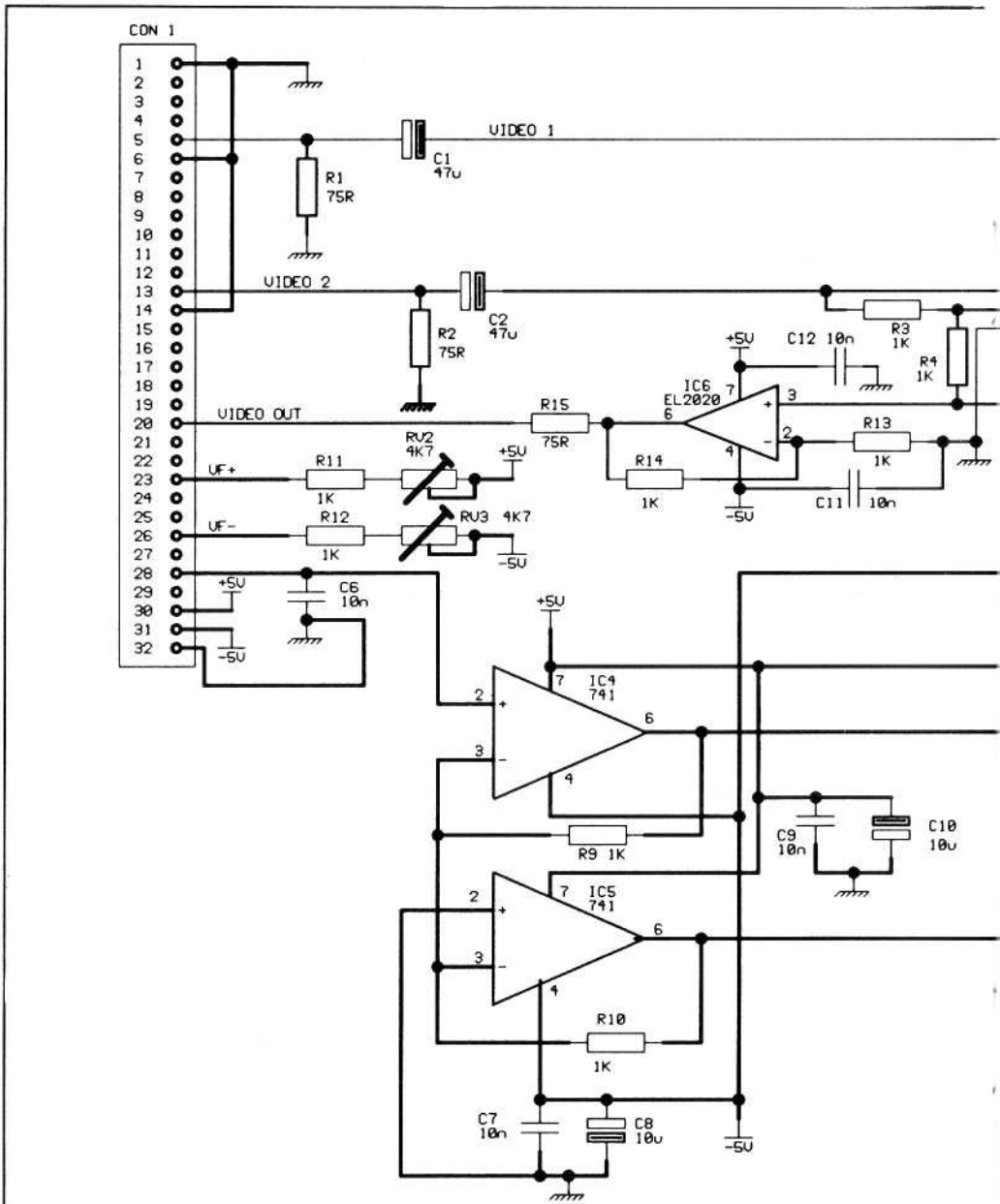
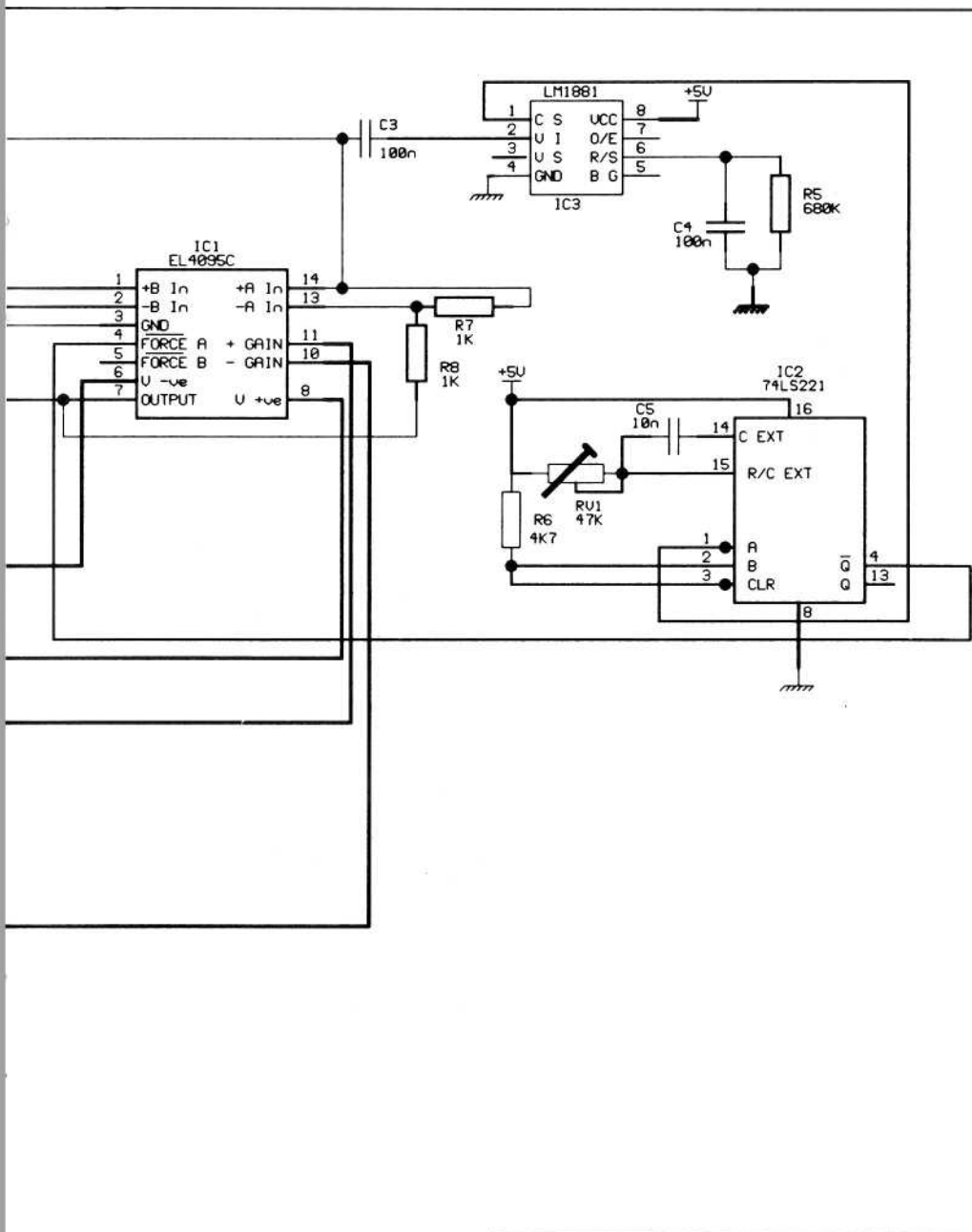


Fig.1: Circuit Diagram of the Video Cross Fader



VIDEO CROSS FADER
GW8AGI-Bob Robson

and RV3 there may be a small error. If there is an error adjust RV2 and RV3 for the correct readings when the fader control is moved to the two ends. Having got the correct reading then check that you have similar readings but of opposite polarity at pin 6 of IC5.

When the fader voltages are correct, remove the power from the unit and insert the EL4095C, and reapply power. For the next operation a video source and an oscilloscope (preferably dual trace) are required. Connect the video signal to pin 5. Monitor pin 1 of IC3. Composite syncs should be present.

Apply the video on pin 5 to trace 1 of the oscilloscope and set the display to show two lines of video. With the second channel monitor the output of the monostable (pin 4). The waveform should be a negative going pulse which starts at the negative going edge of the sync pulse. Adjust the pulse at pin 4 to be approximately 10 microseconds. i.e. it should end just before the active period of the line waveform.

Connect a monitor to the video output (pin 21 of the edge connector), and adjust the fader towards the positive end of the control. The video input to pin 5 should be displayed as a locked picture. Move the fader to the other end of its track and the picture should fade to black.

Connect a second video source, which has been locked to source 1, to pin 13. This should now be displayed on the monitor. Moving the fader should now mix between the two video sources.

If you are using two colour sources and the second picture is not displaying its colours correctly then you will have to adjust the colour phasing controls on the second source to get the colours correctly. Once you have set up the correct phasing, it is a good idea to mark all the coaxial cables used so that they can be connected to the same sources/destinations if you have to break down the system. The reason for this is that adding a couple of metres of length to one of the video paths will upset the colour frequency phase relationship of the system.

Notes from the Membership Secretary

First of all let me thank all those Members who renewed their subscription promptly, if anyone is still wondering if they have paid for this year, fear not, you would not have a CQ-TV to read if you had not paid.

The offer of a bonus of a Handbook or Badge for Members renewing for three or more years proved extremely popular. The offer only applied to those members renewing by the end of 1993, although this deadline was extended for Overseas Members to take into account the delay that can occur on overseas surface mail.

We would like to apologise for the late delivery of CQ-TV 165. This was completely out of our control, the magazine was ready for the printers on time, the mailing labels had been prepared on time, but the Printers let us down very badly by not delivering the Magazine till three weeks after the promised date.

As always, queries come to the fore at renewal time so I shall answer them here.

(1) A favourite one, Why did you not send me a renewal notice, my cheque enclosed anyway. If you were not sent a renewal notice is because you had already paid your subscription in advanced, Anyone who does send in further subscriptions is credited for future years.

(2) 1 have paid my subscription but the address label still shows the previous year. Because the BATC is run by a group of volunteers spread around the country who have to fit in their BATC activities around more mundane things, such as working for a living, it is not possible to print the mailing labels for CQ-TV, marry the magazines to the envelopes and get them into the post on the same day. It is usually around three weeks (or longer if unforeseen events occur.... Printers, etc.) between printing the labels to the magazine reaching your doorstep. So if you pay in between these times your address label will still show the old 'paid to year'. This point also applies if you send in a change of address, remember if possible to give the Membership Secretary plenty of notice of an address change so we can make sure the magazine is sent to your new address.

(3) Members requesting Receipts for subscription payment. Some of you when renewing your subscription request a receipt. This takes time and costs money in envelopes, stamps etc. I do not mind taking the time, but: **NO STAMPED ADDRESSED ENVELOPE, NO RECEIPT!**

(4) Who to write to.

Each Committee Member deals with his own section, writing to the wrong person only delays you receiving a reply. A list of 'Who to write to 'Is published in CQ-TV on page SUPP 8 of the supplement insert.

WHY, OH WHY?

Andy Emmerson G8PTH

Well, all the other papers run articles under this general heading and the other day I got thinking Ä why on earth did I ever get involved in amateur television? And for five enjoyable minutes I looked back and wandered down memory lane. Unfortunately for you, I shall now regale you with my memories but it might be a salutary experience if you did the same. Perhaps you might even care to drop a line to the editor about your own personal reasons for getting into ATV.

Can you even remember what got you into amateur television? You probably do, although it probably wasn't exactly a conscious decision. I doubt if one day you woke up and said to yourself, I think it's time I had a new interest Ä I know, I think I'll try amateur television!

For me television was a matter of wonderment when I was young. Our family first had television back in 1956 when television still was a miracle (it was certainly a miracle how my father managed to afford it, since receivers were genuinely expensive in those days, probably £1,000 in today's money. Fortunately you could rent them too, which is what and millions of other people did.)

But the technology was awe-inspiring, what with huge image Orthicon cameras, fat cables snaking across the studios and rack upon rack of valves, switches and dials. Every 'Boy's Book of Engineering Marvels' had pictures of this sort of kit and I guess it made a subliminal impression on me in the same way as any youngster who was allowed to look inside a steam engine cab wanted to be an engine driver when he grew up. That said, I was not possessed by a burning desire to have my own TV station at some tender age.

In my early teens I was very much into radio, first listening to the pop music. In the days before the offshore pirates Radio Luxembourg was my chief source of listening pleasure (I didn't go much for the Light Programme or AFN in those days), and even a disinterested listener couldn't fail to notice how Luxy faded in and out on the medium wave. When it faded out I would retune to other foreign stations and thus was born an embryonic interest in shortwave listening.

Some years later I bought my first portable TV and by accident was introduced to the pleasures of TV DXing. My first source of information was the Babani booklet on DX-TV, bought in Lisle Street (well Little Newport Street actually, you may even remember Service Trading Company who always had this book in their window). Then fate struck. Faced with an insatiable thirst for knowledge I proceeded to Foyles bookshop in London and while looking around the technical

shelves, I came upon a copy of CQ-TV and thus learned about the British Amateur Television Club. The hapless owner is probably still wondering where that issue got to, but his loss was my gain. For inside was page upon page of deeply technical stuff all about television. Best of all was the report of the CAT-70 convention, with lots of pictures of private individuals playing with real big stuff, that same old studio equipment now pensioned off. Hey, this was the game for me!

So I joined BATC and the rest is history, and I'm still fooling around with big, heavy TV technology. Amateur television has of course changed since those days and the only people who still use that old gear are nuts like me who collect and restore it for its own sake. In the ATV shack you can get away with much smaller (and far more sophisticated) equipment, with the potential to produce pictures of fabulous technical quality. Whether this promise is fulfilled is another matter but that's not the point I am trying to make. Using modern technology you can have camera, vision mixer, preview monitor and transmitter all on one desk, which is great.

That said, there are still people who enjoy creating virtually the same facilities and results at lower cost, using a mixture of second-hand and home-brew gear, and this I think is the true spirit of amateur television. But I won't argue the point, I'd much rather stimulate your thoughts!

Circuit Notebook No.52

John Lawrence GW3JGA

The first item, by Raphael Horton of National Semiconductor, Santa Clara, appeared in the 'Design Ideas' section of the American EDN Magazine of 3rd February 1994. We wish to thank the Editors for permission to reproduce it here.

Colour Video travels on Twisted-pair Cable

Telephone lines and local area networks commonly use inexpensive twisted-pair cable. Video-system designers can also take advantage of this low cost cable to transmit composite-colour-video signals. Using the circuit techniques in Fig.1, you can transmit video anywhere phone lines exist (but not through your local exchange! - 3JGA).

Although the circuit has more electronic components than the traditional single amplifier used to drive a coax cable, you can easily justify the additional electronics to drive twisted-pair cables. When you compare the cost of four wire twisted-pair cable with RG-59 coax it more than covers the cost of a few LM6181 amplifiers.

The system consists of two circuits. The first converts the composite video signal to a differential signal using IC1 and IC2. Using a differential signal reduces line loss and distortion that could occur from driving twisted pair single ended. Converting the signal to differential also removes possible ground-plane errors that occur when there is a difference in the ground potential between two pc boards.

The circuit has a minimum signal gain of two to compensate for the terminations' 6dB signal drop. You can easily adjust the gain of IC2 by decreasing the value of Rg to make up for the line losses caused by various cable lengths. Rg serves as a single system adjust and as an optional contrast adjustment for the video system.

In the second circuit, IC3 converts the differential signal back to single ended. This circuit has a gain of two to drive a back-terminated RG-59 coax cable out to a monitor. The video amplifier you choose for this application must have high-output-drive capability. The LM6181 is guaranteed to drive a back-terminated 75Ω cable over the full industrial temperature range.

This circuit treats the twisted-pair cable as a transmission line that is back-terminated with 75Ω resistors. This termination method is superior to using the 600Ω characteristic impedance of the twisted pair. A 600Ω termination results in smearing and blurring caused by the RC time constant of the cable capacitance and the termination resistance. Because an increasing RC time constant degrades sharp

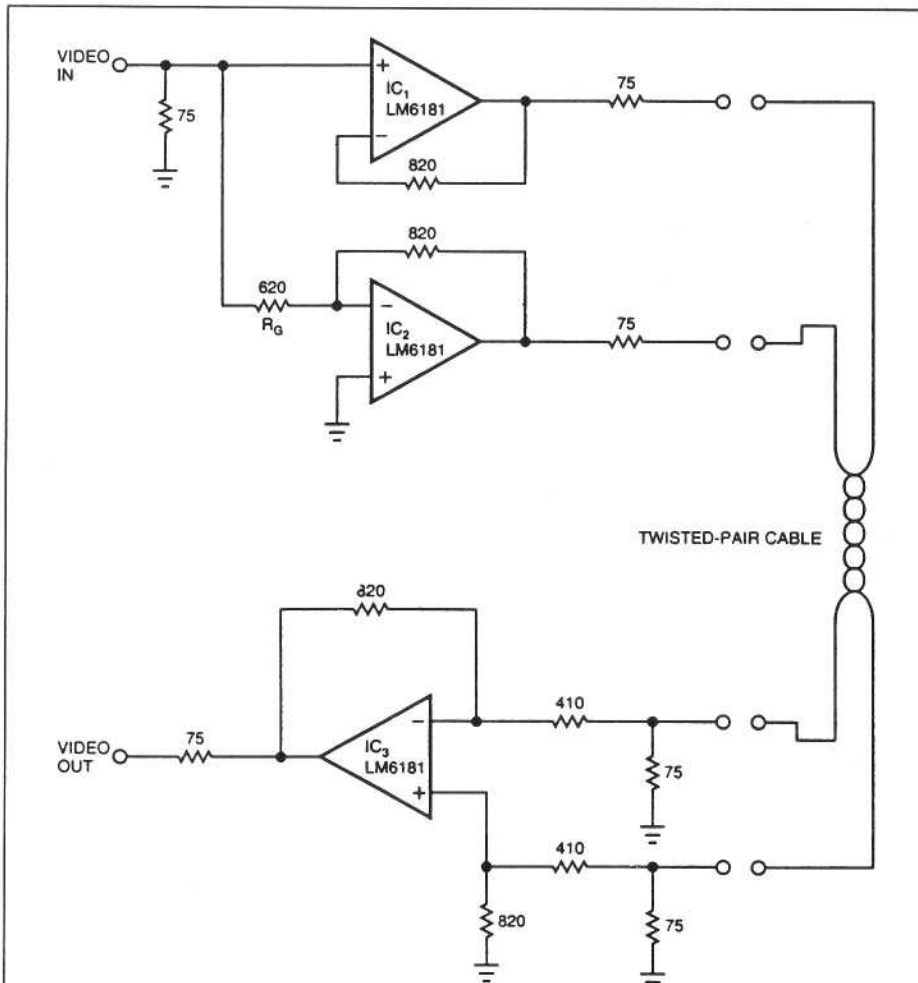


Fig 1—By transmitting differential signals and using video amplifiers with high-output-drive capability, this circuit can drive video signals down inexpensive twisted-pair cable.

signal transitions, this circuit uses standard 75Ω terminations to maintain a clear, sharp picture. This circuit does not use shielded twisted-pair cable because of its high distributed capacitance, which contributes to the RC time constant.

No visible difference exists between a reference picture and a transmitted one. Using a Tektronix-type 520 NTSC vector-scope, the measured differential gain and phase of the entire system - which comprises three LM6181 amplifiers, a 100m twisted-pair cable and a 50ft RG-49 coax cable from amplifier IC3 - was less than

0.5% and O.6°, respectively. Keeping the current-feedback amplifiers' feedback resistors equal to the recommended value of 820Ω gives the op-amp its proper frequency compensation. The feedback resistor sets amplifier bandwidth and is always required for proper operation, even in unity gain.

The LM6181 is available from RS Components (Electromail) Stock No. 310-880

The second item is by fellow ATVer John Cronk, GW3MEO, which appeared in the 'Circuit Ideas' section of the March 1994 issue of Electronics World + Wireless World. We wish to thank the Editors for permission to reproduce it here.

Noisy Video Operates Relay

Even when a video signal is almost submerged in noise, this circuit recognises it and operates a relay. The circuit is shown in Fig.2. An input tuned circuit selects the 15.625 kHz component of the signal, which is then amplified by the BC548, charging the 22uF capacitor.

After a time determined by that process, at least 1s, the BC213L draws enough current to pull in the relay, the delay being necessary to prevent noise on the signal affecting the result. The value of the 22uF capacitor may be selected to adjust the 'hang' time of the circuit.

There is sufficient input impedance to allow parallel connection to a video monitor without trouble. The circuit is less critical than the PLL often used for this purpose

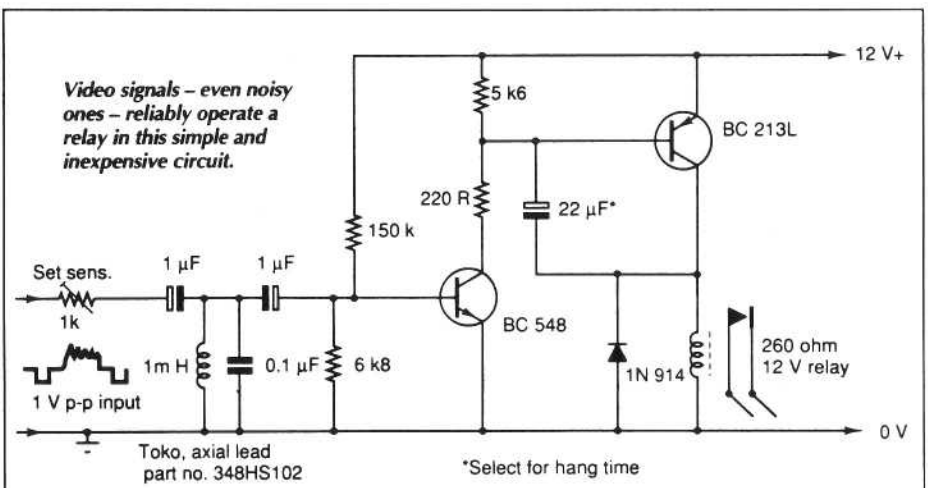


Fig.2: Video Operated Relay

Satellite TV News

Paul Holland G3TZO

This issue of "Satellite News" is somewhat shorter than normal due to the tight deadline necessary to get CQ-TV with you before the BATC Rally on May 1st.Since I last sat down to write this column there have been some significant events. Notable amongst these was the failure in January of the Ariane V63 launch which should have put both TurkSat 1 and Eutelsat II F5 in to orbit. Little has been said so far except that the failure was caused by a combination of cooling problems and a faulty bearing. I had that problem with a Ford Cortina but it wasn't so expensive!

ARIANE LAUNCH SCHEDULE

The failure of the V63 launch in January has undoubtedly set back the entire Ariane launch programme for this year. In order to see how this may affect upcoming planned launches I am reproducing the "planned" schedule up to July. I would suggest that a minimum of a three months delay should be expected.

Flight No	Launch Date	Cargo	Planned Position
V63	20/1/94	Eutelsat II F2	36 Deg E
		TurkSat 1	30 Deg E
V64	February	Intelsat 702	1.0 Deg W
V65	March	Solidaridad	116.7 Deg W
		BS-3N	110 Deg E
V66	April	Telstar 402	89 Deg W
V67	May	Panamsat 2	169 Deg E
V68	June	BrasilSat B1	65 Deg W
		TurkSat 2	42 Deg E
V69	July	DBS 2	101.2 Deg W
		Thaicom 2	101.1 Deg E

It is likely that ASTRA 1D will now move from a September to a December launch at the earliest.

INTELSAT NEWS

Another round of celestial musical chairs was announced by Intelsat affecting satellites in their Atlantic Ocean Region (AOR).The catalyst for this was to be the launch in February of Intelsat 702 which will be located at 1.0 Deg W to provide

service to the Middle East, Africa and the whole of Europe. Intelsat 512 which is currently at 1.0 Deg W will be re-located at 21.5 Deg W to replace Intelsat 502.Intelsat 502 will in turn move to 40.5 Deg W. The success or otherwise of the launch of Intelsat 702 was not known as we go to press. Each series VII satellite has 26 C band transponders and 10 Ku band transponders. Four of the Ku band transponders provide spot beam coverage and can be positioned as required to meet operational needs.

Problems were experienced by Intelsat with Intelsat K in January due to a severe solar storm. The storm produced electrostatic discharges which affected the systems that maintain orbital station keeping. The resulting effect was that the footprint "wobbled" slightly causing some minor service outages. No permanent damage has been reported.

FROM THE POST BAG

I continue to receive many telephone calls and letters regarding the various pirate smart cards which are advertised in the satellite press for both Videocrypt and Eurocrypt services. My response to those people who seek to obtain pirate videocrypt cards can be summed up as follows. The leakage of revenue to pirate card manufacturers from the UK's legitimate satellite broadcasters (whatever you may think of there owner/programmes/government policy/merits of the TV license fee, etc.) can only have one effect. With decreasing revenue there will be poorer programming, more repeats and ultimately service closures. The cost of some of these cards incredibly is higher than the official annual fee. With Sky operating a campaign of regular electronic counter measures it really is a mugs game to invest money in this way. My views on the purchase of Eurocrypt cards for use in this country is more philosophical. Until there is free availability to subscribe to the service you may want to watch there will be a market for pirate cards. The revenue is not lost to the service provider as he is not allowed to collect revenue from outside the area for which he holds broadcasting rights. However even with Eurocrypt the channels involved are regularly implementing ECM's. You pay your money and take your chance!

TRANSPONDER REPORT

Eutelsat I F5 21 Deg E

Serbian TV has moved from Eutelsat II F4 to this satellite and can be found on 11.490 GHz (V)

ASTRA 1A & 1B & 1C 19.2 Deg E

The non appearance of Sky Sports 2 shortly after Christmas was put down to a shortage of programming. Coupled with the delays to Nick at Nite and VH1 it is

more likely to be caused by deliberate delaying tactics from SKY to enable them to launch a new marketing campaign in the run up to next Christmas. My prediction is that the services will launch in October just in time to boost satellite system sales in the shops. There is still much conjecture who will take TP 47. One guess is that the Travel Channel currently on Intelsat 601 may take this transponder. Eutelsat II F1 13.0 Deg E.

Look out for a new service called Centre of Music TV (COM TV).This channel will carry German "Golden Oldies" type music and will occupy Transponder 33 11.595 GHz (H). COM TV was scheduled to launch around May.

Eutelsat II F3 7.0 Deg E

The European Broadcasting Union (EBU) is set to encrypt its daily news-feed transmissions in advance of moving to a digital format. Until now Eurovision has distributed signals using sound in synch. The encryption system to be used is the Nokia LS 256 system. LS256 encrypts PAL and Secam by a line shuffling technique.

Tele X 5 Deg E

Marco Polo 1 was eventually sold to the Swedish Space Corporation for a reported 20 million pounds. It has now been renamed Sirius and will be co-located with Tele X at 5.0 Deg E. The Tele X satellite has been causing concern of late and it is believed that transponder power has been reduced to either minimise overheating or reduce overall power consumption. Picture quality has dropped from P5 to P3 at this QTH on both TV5 and TV4.Sirius will operate on identical frequencies to the THOR satellite at 0.8 Deg W and their is some concern at the possibility of co-channel interference to domestic receivers using only 40cm antennas. Likely services from Sirius eventually are TV6, SVT 1, SVT 2, TV4 and FilmMax.

Telecom 2B 5 Deg W

March was planned for the change of analogue audio subcarriers from 5.8 to 6.6 MHz. The subcarrier at 5.8 MHz will carry Nicam audio. Many of the radio services using other subcarriers on both Telecom 2A and 2B will be transferred to a digital radio service.

Telecom 2A 8 Deg W

Reports from France suggest that the D2Mac services of Canal Plus and Cine Cinemas will cease later this year. It is suggested that they will be replaced by digital services offering up to six films on each transponder.

Intelsat 515 18.5 W

Check this satellite during the World Cup for coverage of the event from various venues across the USA.

TDF 1/2 19 Deg W

The French channel TF1 was due to launch its news and information channel on TDF 2 in April. The service will be unencrypted and will use SECAM. The service will probably move to Telecom 2B as part of a digital service in about 12 months time. Intelsat 601 27.5 Deg W Both Wire TV and the Parliamentary Channel are to be transferred to a digitally compressed service by the channel's owners United Artists. Both services will move in May to Intelsat 604 at 60.0 Deg E and will then occupy just one transponder according to Broadcast Magazine. The Travel Channel is now well established on 11.175 GHz (H).Pictures are P5 at this QTH.

Hispasat 1A/1B 31 Deg W

April was scheduled for the formal launch of the three commercial channels on Hispasat 1B. Tests on all transponders indicate P5 signals at this QTH .Transmission times will rise to about 18 hrs a day by September of this year.

NEW PRODUCTS

Mini Tuners: Philips components has launched a range of very small satellite tuners. The tuners are packaged into a module the size of a matchbox and are designed for integration into TV sets, VCRs etc. They offer 950 - 2050 MHz input frequency, 5V power supply, PLL frequency synthesiser and demodulator plus AFC circuitry. The actual size is 64 x 35 x 14 mm. They include either single or double F connector and switchable IF bandwidth. Contact: Philips Components Ltd. , Philips House, Torrington Place, London. WC1E 7HD. Tel 071 580 6633.

IRTE Motorised Arm:. For those with a single antenna who wish to enjoy multi-satellite reception IRTE have brought out a microprocessor controlled motorised arm. The IRTE arm and LNB assembly replaces the existing antenna feed holder into which the existing LNB is fitted. A coded signal instructs the IRTE LNB to move into any predetermined position across a 15 degree arc. No additional power supplies or cabling is required as power is taken from the LNB coaxial feed. Operation is from a remote handset which allows selection of up to 6 satellite positions. Cost is about 125 pounds. Contact: IRTE International, Fieldings Rd., Cheshunt, Hertfordshire EN8 9TL. Tel 0992 624777.

IN CONCLUSION

That's it for this time. In the next issue I hope to report on what was new at this years Cable and Satellite Exhibition held at Olympia in early April. Apologies for those who had written to me with contributions for "Satellite TV News" but the deadline was very early this time. I look forward to including all your contributions next time round.

The BBS is dead, long live the BBS!

Brian Kelly GW6BWX

Anybody trying to connect to the Television Club BBS will have been greeted with a message from BT announcing the number had been disconnected. Sadly, and despite valiant efforts from it's Sysop Chris Smith, circumstances forced it to close down.

However, all is not lost, the BATC files, and the modem have been transferred to another Bulletin Board "BetWiXt" where they now have a permanent (I hope!) home. To avoid any breach of confidentiality, none of the users names or passwords have been transferred, both Chris and myself pledged never to give any personal details to anybody, that includes each other. That means if you have not already registered on BetWiXt you will be treated as a new user and asked for a new password.

BetWiXt uses the Wildcat! BBS program which will be familiar to most modem users, but it bears little resemblance to the TV Club. To give you some idea of what BetWiXt is and how to navigate around it, here is a brief history lesson and "route planner" for new visitors:

The first call to BetWiXt (then called the Severnside BBS) was in January 1990 and the computer was a humble 8088 PC with a 2400 baud modem. Since then the computer has been upgraded to an 80486 running OS/2 and two new modems added, one is a US Robotics Courier which runs at up to 16,800 Baud (line 1) the other an unbranded 14,400 baud model. Both support MNP and V42bis protocols so they should connect to almost any modem on the market. If line one is busy, the call diverts to line two automatically.

BetWiXt gives each caller a security level. Each level gives the user access to different facilities within the system. New callers are given "newuser" level which allows them look inside a limited number of file areas (libraries) and message areas (conferences). I check the details of new callers most evenings and raise their level to "fulluser" status. With this new security level, all the publicly available libraries and conferences are opened and available for use. Those with "fulluser" level can reach a questionnaire about their BATC membership number. If the name and number match, I change the security level to "BATCmembr",and the private BATC library and conference become available. An "articles for CQ-TV" area is available for anybody to upload to regardless of security level, so no more excuses for not writing in!

On your first call, expect to be asked a few questions about your address, telephone number and your choice of screen display. BetWiXt is very adaptable to your needs but it has to find out your preferences first. If you have problems answering any of the questions, press "H" to display a help screen. To guarantee security, you will be asked to provide a password for use on all subsequent calls. Please write it down somewhere. I have to contact users who forget their passwords at my own expense!

All the programs on the BBS are listed in a single compressed file called "BETWIXT.ZIP", download it and uncompress it with PKUNZIP version 2.04 or a compatible utility. The file contains the name, size, date and a brief description of each of the files that can be transferred to your own system. An automatic update of the file list is made every night to keep it up to date.

I never cease to be amazed at the inefficient way some people use their modems. I have one user who has never managed to reach more than 10% of their modems top speed, simply because they can't be bothered to set it up correctly. That person has downloaded several megabytes of programs and wasted about ten hours of telephone time doing it. I'm glad its on their phone bill not mine! To help you set up your modem and computer software correctly, I've written a short guide which describes the best way to use BetWiXt and how to keep the connection costs to a minimum. It is called "BBSGUIDE.TXT" and I strongly suggest you make it the first file you download.

Please feel free to use BetWiXt as a mailbox to other members and to the committee. A huge amount of technical expertise exists amongst the users and help is on hand if you have any questions about ATV or television in general. Lively debate is always welcome.

BetWiXt is a free system, there are no charges for its use. The telephone company will charge for the call as though it was a voice connection, sadly this is beyond our control. The number to call is **0633 614765**, please note that HST modems will only connect at high speed on line 1 at present although both lines will accept all speeds up to 14,400 baud in "V" modes.

BATC BBS

0633 614765

"NOV" News

Graham Shirville G3VZV

Two ATV repeater licences have just been issued after having been in the system for over twelve months.

GB3HV has moved to a better site in High Wycombe and is now on again after a complete rebuild which was masterminded by G8LES for the Home Counties TV Group. The new box has steerable receive antennae and a host of exciting operational features including an on-site video recorder. Contact G8LES (QTHR) with an SSAE for an operating manual.

GB3WV is now on from Weymouth and will cover the surrounding coastal areas from Lyme Regis to St Albans Head and inland to Dorchester. John Ashton G4NTS is the keeper and can provide more information.

Two new 10Ghz applications are at the RA for approval.

Firstly the Stoke on Trent unit GB3UD are putting a 10 GHz input onto their existing 23cm unit. The 10Ghz input frequency will be 10.300 MHz

The Severnside Group have put in application for GB3XG a 10 GHz unit located just south of Bristol. The output frequency will be 10.150 MHz and input on 10.285 MHz.

Hopefully both of these will be licensed by the Autumn.

The reason for these slightly unusual input frequencies is that the RA have advised us that the existing RT103 input frequency is not acceptable to the Primary User for any new units. They have given us the following list of problem areas.

10250 - 10270 MHz
10360 - 10400 MHz
10300 - 10400 MHz

not acceptable within 100km of Charing Cross!

(If you are wondering about the title: NOV's are "Notices of Variation" which are issued to the repeater keepers by the RSGB on behalf of the RA. These NOV's are linked to the keeper's own existing callsign/licence and make him or her personally responsible for ensuring that the repeater performs to the specification.)

The HSP Digital Test Card "C" Generator

Keith Hamer and Garry Smith

Between 1948 and 1964, a special test pattern known as Test Card "C" was transmitted during the BBC's Trade Test Transmissions. These were radiated on Saturday mornings from 10,00 am and on each weekday from 10.00 am until 1.00 pm, and between 2.00 pm until the start of Children's Television which, in the early Sixties, began at 5.05 pm There were very few regular programmes transmitted during the day. These were normally the lunchtime News bulletin and Watch With Mother. Fortunately in that halcyon bygone era there weren't any of the sometimes dire daytime programmes now shown! The television service technician could rely upon a regular test card being shown to assist in the repair of ailing receivers.

The BBC Test Card "G" was first transmitted in January 1949 and was originally produced by hand using technical drawing methods. As technology improved, updated versions of Test Card "C" were produced using photographic techniques. Full details about all Test Cards transmitted by the BBC are included in the publication, This Is BBC-TV: The First 30 Years Of Television Graphics (1934-1964), which is available from HS Publications, price £4.95 plus 85p P&P. Articles have also appeared in various issues of Television (for example, the issues dated May 1978, January 1984, January 1990, September 1990, September 1991 and January 1993).

The final transmission of Test Card "C" took place on April 19th, 1964. On the following day, with the planned launch of BBC-2, Test Card "C" was replaced by Test Card "D". However, a modified version of Test Card "C" was radiated for several years, either on BBC-1 during Regional opt-outs or on BBC-2 when Test Card "E" was discontinued for technical reasons. The optically-generated BBC Colour Test Card "F" was introduced on July 1st, 1967 and is still occasionally transmitted, but now in a slightly modified and digitised version.

Nowadays it is very difficult indeed to tune-in to the BBC Test Card. Regular BBC Trade Test Transmissions were discontinued in May 1983 in favour of sample Ceefax pages. Unless you are prepared to tune-in in the dead-of-night, it is very unlikely that you will see the cheery face of Carole Hersee and the BBC Colour Test Card "F"! But for those frustrated television technicians (and TV enthusiasts) who require a reliable and relatively inexpensive test card source, help is now at hand. HS Publications (who are normally associated with DX-TV and archive BBC-TV material) have just introduced a unique digitally-synthesised Test Card "C" generator.

Impressive Results

The output of this compact unit really has to be seen to be believed! This is Test Card "C" as you have never ever seen Test Card "C" before - in digital format. All the features of the original Test Card "C" have been faithfully reproduced by digital techniques and stored in EPROM memory. Incidentally, it takes approximately fifteen minutes for the data to be downloaded into each EPROM. Although the output is 625-line video, the image is based on the 405-line version (there were various modifications made to the BBC's 625-line Test Card "C"). One main difference with the new digital generator is the format of the border castellations. The four small arrowheads in the original BBC Test Card "C" have been enlarged.

The digital data used for this generator has been produced after many hours of detailed work. The digitally-synthesised picture (produced by 12 MHz sampling, 8-bits, linear coding) has been devised solely by resorting to mathematical calculations rather than drawing techniques. The unit does not merely produce a digitally-generated reproduction of an existing slide or photograph of Test Card "C" with all the inherent problems such as picture distortion, poor high-frequency response, uneven lighting, poor focus, etc., etc. The HSP Digital Test Card "C" Generator is totally free from all these shortcomings. To view the output of the generator, the unit is simply connected to the video input of a VCR and the picture appears on the TV screen in the normal way - no cameras, time-consuming alignment or lighting to worry about.

The generator gives an excellent monochrome picture which can be used by television service engineers for aligning receivers in the absence of an off-air BBC Test Card. The unit should also prove to be of interest to TV enthusiasts who like to re-create television as it was in the Fifties and Sixties.

This very neat unit produces an accurate facsimile of Test Card "C" as broadcast by the BBC from January 1948. Although of course the output is monochrome, it can be used to check overall grey-scale performance, plus static and dynamic convergence, on colour receivers. So if you think your receiver is up to it, why not give it a good test using this remarkable generator? It gives a pleasing picture and would probably make customers look twice if displayed in a TV shop!

Compact And Simple To Use

The self-contained generator is housed in a rugged black plastic case measuring approximately 150 x 50 x 80mm (width, height and depth). The unit weighs approximately 200 grams. It is powered by +9V DC via a separate 240V 'plug top' mains adaptor (supplied with the unit). The components (seven IC's, twenty capacitors, two coils, one diode, nine resistors and three transistors) are neatly assembled on a small printed-circuit board.

The video output of the generator is via a BNC socket which simply connects to the video input of any conventional home VCR using a standard connecting lead (not supplied with the unit supplied for this review). The television receiver can be connected to the VCR using the normal RF aerial lead. For much improved picture quality, the video output of the VCR should be connected to the 'AV' input of the television receiver. If the television receiver is capable of accepting teletext and 'baseband' video then there is a special internally-generated full-colour information page about the generator by calling up page 100!

Limited Availability

The HSP Digital Test Card "C" Generator is available to order. Due to a special agreement with the BBC, only a limited number of generators will be produced. The fully-inclusive price for this remarkable generator is £185.

Test Card Functions

The BBC Test Card "C" was originally designed to indicate the performance of the television transmission chain from the studio to the receiver. Test Card "C" could, therefore, serve as a check on propagation and on the performance of the receiving installation.

The BBC Test Card "C" included the identification letters "BBC" in black superimposed on the designation letter "C" in white. The HSP Digital Test Card "C" Generator also features this form of identification. This was, apparently, one of the most difficult areas to synthesise.

The original BBC Test Card "C" incorporated a number of patterns, each designed to assess particular characteristics of the system. All these checks have been retained in the digitally-synthesised version. The checks are as follows:

Aspect Ratio

Concentric black and white circles which surround the two five-frequency gratings should appear truly circular when the width and height of the picture are adjusted to the standard aspect ratio of 4:3. The circles produced by the new digital generator appear truly circular and not jagged at the top and bottom due to full horizontal and vertical anti-aliasing techniques which are used throughout.

Picture Size

The test card picture should just fill the viewing aperture with the black and white border visible. The digitally-synthesised version of Test Card "C" produced by the generator features centering arrows in the border castellations which indicate the picture limits.

Resolution and Bandwidth

Within the circles are two groups of five stripes corresponding to fundamental frequencies of 1.5, 2.25, 3.0, 3.75 and 4.5 MHz. These frequencies which have been chosen for the digital generator are slightly different to the original values used by the BBC which were 1.0 1.5, 2.0, 2.5 and 3.,0 MHz. In the left-hand group, the 1.5 MHz grating is at the top, the frequency increasing towards the bottom, and in the right-hand group the order is reversed. The response of the receiver should be such that the 3.75 MHz gratings are clearly resolved. With the generator supplied for this review, the 4.5 MHz gratings were rather indistinct even when the unit was connected to the AV input of a standard receiver. We understand that when the output is displayed on a high-quality professional monitor, all the gratings are visible.

Contrast

A five-step contrast wedge appears in the centre of the Test Card. The top square is white and the lowest square is black. The three intermediate squares should be reproduced as light, medium and dark grey.

Scanning Linearity

The background of the Test Card is a medium grey, in fact exactly the same density as that used for the current digital version of the BBC Colour Test Card "F". It bears a graticule of white lines. The areas enclosed between the lines should be reproduced in all parts of the picture as equal squares.

Line Synchronisation

The border of the Test Card, which is a pattern of alternate black and white rectangles, serves as a test signal to check the line synchronisation of receivers. Faulty line synchronisation may result in horizontal displacement of parts of the picture, an effect which is readily seen on the Test Card by the central circles appearing as "cog wheels".

Low-Frequency Response and Reproduction of Edges

To check the low-frequency response, a Black rectangle within a white area is included at the top of the picture. This is often referred to as the "Letterbox" In a perfect system this pattern would be reproduced as a rectangle of uniform blackness on a clean white background, In practice there may be slight streaking of short duration at the right-hand side of the black area, but with experience it should be possible to judge whether reproduction is normal.

Reflections

The white vertical line within the black background and the black vertical line within the white background either side of the centre circles, representing pulses of

0.25 nanoseconds duration, should be reproduced without images appearing. If there are reflections present on an off-air test card (such as the BBC Colour Test Card "F", either in the receiving installation or from hills or large buildings and structures, these may result in displaced "ghost" images of any significant feature of the picture. This effect will be most readily seen as displaced positive or negative images of the vertical lines mentioned above. Reflections of this nature will not be present when using the generator as, of course, the signal is not being transmitted but simply plugged directly into the TV receiver under test.

Uniformity of Focus

In each corner of the Test Card there is a diagonally-disposed area of black and white stripes corresponding to a fundamental frequency of 1.3333 MHz. All four of these areas should be resolved uniformly throughout.

These were apparently the most difficult areas to reproduce in the digitally-synthesised generator. As mentioned earlier, the generator uses full anti-aliasing techniques which results in smooth surfaces rather than jagged edges.

Pros And Cons

The generator is certainly very compact and simple to operate. Just feed it into a VCR video input or directly into the receiver's AV socket and you should be able to obtain a very pleasing display of Test Card "C" within two minutes of unpacking the unit. There is no setting-up procedure and there are no controls to fiddle with.

The only minor disappointment was the external PSU. The polarity changeover is achieved by means of a reversible plug adaptor at the point of connection with the generator. This adaptor can occasionally come apart depending on how the user handles the plug when removing it from the generator. There is a small diagram on the plastic moulding to show which way to fit it. Fortunately this slight shortcoming is explained in the instructions supplied with the generator. In any event the generator is protected against reversed polarity so if it doesn't work, it is simply a case of swapping the adaptor around.

Further Information

The HSP Digital Test Card "C" Generator should prove to be popular with TV service engineers as it is a very useful piece of test equipment. The output would also be a focus of attraction in a TV retail shop. At the fully-inclusive price of £185, it is also relatively inexpensive. It should be noted, however, that only a limited number of generators will be produced. This very compact and lightweight unit is available only from HS Publications, so beware of imitations! Further details nay be obtained by sending a stamped-addressed envelope to:

HS Publications, 7 Epping Close, Derby DE3 4HR. Tel:- 0332 51 33 99

Contest Calendar

MAY MICROWAVE 94

Saturday 14th to Sunday 15th May
Time 1800 GMT Sat to 1200GMT Sun
Fast Scan only - 24cm and above
Entries to be posted by 30th May 1994

SUMMER FUN 94

Saturday 11th June to Sunday 12th June
Time 1800 GMT Sat to 1200 GMT Sun
Fast and Slow Scan ALL Bands
Entries to be posted by 27th June 1994

SUMMER CUMULATIVES 94

Tuesday 5th, Wednesday 13th, Thursday 21st and Friday 29th July 1994
Time 1900 GMT to 2359 GMT for ALL sessions
Fast and Slow Scan ALL Bands
Please send logs for ALL the sessions and indicate the three logs you want to include in your entry. Couldn't manage three logs? Please send one or two then! If you send four logs it helps me to cross check other entries
Entries to be posted by 22nd August 1994

THE INTERNATIONAL 94

Saturday 10th to Sunday 11th September
Time 1800 GMT Sat to 1200 GMT Sun
Fast Scan only all bands
See the International rules issued every August by the contest manager in the UK
If you want a copy, please let me know
Entries to be posted by 26th September 1994

The BATC log sheets with entry form (please copy) and rules are available from the contest manager: Richard Guttridge, G4YTV. Ivy House, Rise Road, Skirlaugh, Hull. North Humberside. HU11 5BH. Tel: 0964 562498 only between 1900 and 2200 local.

IARU Region 1 UHF / SHF ATV Contest

70cm Section 1

Pos	Call	Op's	Points	Loc	Qso	Best Dx	@Km	Pwr/W
1	F6IFR	4OP'S	16,727	JN09TT	38	PA3GCV	502	180
2	PE1HXD		9,385	JO33CF	37	F6IFR	494	100
3	F8MM		7,259	JN08WV	30	F6CMB	395	?
4	PA3BJC		7,219	JO23XG	32	ON7MB	350	100
5	PE1LZZ	2OP'S	6,831	JO21DR	38	G8EQZ/P	413	20
6	PA3DLS	3OP'S	6,532	JO21FS	38	G8MNY/P	368	100
7	F5AGO		5,281	JN06DP	18	F6IFR	365	?
8	ON6AJ		5,244	JO21MB	29	PE1OPQ/P	292	30
9	PA3FMZ	3OP'S	4,958	JO32FI	23	F6IFR	440	50
10	ON4YZ		4,932	JO20GG	30	F9ZG	474	?
11	F1FY		4,827	JN15IR	12	F6IQG	369	?
12	ON1WW/P	13OP'S	4,823	JO20RX	28	F6IFR	302	4
13	PA1ERW		4,576	JO21RK	29	F6IFR	325	30
14	F1CIA		3,962	JN08BA	13	F1UO	353	?
15	G8EQZ/P	3OP'S	3,866	IO93PV	11	F6IFR	481	400
16	G8MNY/P	2OP'S	3,710	IO91NQ	17	PA3DLS	368	400
17	G7ATV/P	5OP'S	3,701	IO81QG	15	F6IFR	341	150
18	PA3GCV		3,387	JO32LU	18	F6IFR	501	?
19	PE1OPQ/P		3,295	JO33KK	24	ON6AJ	387	50
20	DH8YAL/P		3,243	JO31MO	27	ON4YZ	229	40
21	GW7ATG/P	3OP'S	3,112	IO82JV	10	F6IFR	480	200
22	OO1ANK		3,037	JO21SE	19	F6IFR	317	30
23	ON5VL/T	3OP'S	2,906	JO20UN	16	PE1HXD	298	60
24=	EA7CU		2,900	IM86SU	10	EA9MH	180	20
24=	EA7CVD		2,900	IM86SU	10	EA9MH	180	20
24=	EA7GLU		2,900	IM86SU	10	EA9MH	180	20
27	ON5ID		2,773	JO10RN	20	F8MM	217	70
28	F6KMB/P		2,721	JO10IS	19	F8MM	217	?
29	ON7MB		2,485	JO10WT	14	PA3BJC	350	40
30	F1ACA		2,362	JN28MT	8	F6IFR	271	?
31	F6IQG		2,328	JN08BM	8	F1FY	369	?
32	PA3CVM		2,289	JO20XW	13	PA3BJC	259	15
33	F5BV		2,131	IN95MW	8	F1UO	367	?

Pos	Call	Op's	Points	Loc	Qso	Best Dx	@Km	Pwr/W
34	PA3BWG		2,043	JO21RL	14	PA3BJC	202	20
35	PA0BOJ		1,983	JO21ON	16	PE1HXD	198	25
36	F6AFW/P		1,793	JN28OP	6	F6IFR	298	?
37	ON5LK		1,751	JO20DI	18	F8MM	238	5
38	ON5IE		1,659	JO21IA	14	PE1HXD	266	25
39	F1LWN		1,465	JN19AB	17	ON4YZ	224	?
40	F1DTQ		1,456	JN18DP	19	F6AFW/P	214	?
41	F1GTP		1,406	IN93PS	4	F5AGO	330	?
42	EA9MH		1,140	IM85NG	9	EA7GLU	180	20
43	PE1HNG		1,138	JO30AT	9	PE1HXD	269	30
44=	EA9EB		1,090	IM85NG	4	EA7GLU	180	20
44=	EA9NP		1,090	IM85NG	4	EA7GLU	180	20
44=	EB9CY		1,090	IM85NG	4	EA7GLU	180	10
44=	EB9DB		1,090	IM85NG	4	EA7GLU	180	10
44=	EB9MR		1,090	IM85NG	4	EA7GLU	180	25
44=	EB9OE		1,090	IM85NG	4	EA7GLU	180	10
50	F1GBS		1,041	IN97NB	9	F1DSZ	142	?
51	PE1JAM		1,023	JO22XW	12	PE1LZZ	178	20
52	F6KFA		1,013	JN18CU	13	ON4KSI	239	?
53	DL6SL		842	JN58AK	11	HB9RRH/P	139	15
54	F1JSR		773	JN36FG	5	F1UO	206	?
55	PE1MVQ		752	JO21PU	5	DH8YAL/P	124	10
56	F6GJF		725	JN18DO	9	F6IFR	143	?
57	PA3ESB		701	JO22TE	17	PE1HXD	122	3
58	F5MQB		693	JO08SK	6	F5AGO	220	?
59	F1REP/P		671	JN19DL	7	F1DTQ	93	?
60	F2FD		517	JN18FR	8	F6IFR	135	?
61	PA3DZA		479	JO31BK	10	PA3BJC	205	?
62	PA3ECU		441	JO31CF	5	PA3DLS	130	?
63	DG1HTD/P		426	JO62GD	3	DC7BW	76	1.2
64	ON6BM		310	JO21OF	5	ON6UA	47	8
65	DL6SDO		269	JN48VX	6	DL0PT	160	50
66	F8CN		213	JN18CT	5	F6IFR	119	?
67	G6WLM		194	IO92FJ	2	G8MNY/P	91	12
68	G4TEP		164	IO91UP	3	G8MNY/P	41	10
69	DJ4AT		94	JO40KD	1	DJ4LB/A	47	15
70	EA3UM		34	JN01XG	1	EA3FGM	17	5
71	PD0RJI		16	JO21FR	2	PE1LZZ	11	?

Total entries: 71

24cm Section 1

Pos	Call	Op's	Points	Loc	Qso	Best Dx	@Km	Pwr/W
1	ON1WW/P	13OP'S	8,268	JO20RX	30	PA3FMZ	168	30
2	PA3FMZ	3OP'S	8,067	JO32F1	26	ON6AJ	174	80
3	PA3DLS	3OP'S	6,584	JO21FS	20	PE1OPQ/P	247	25
4	DH8YAL/P		5,286	JO31MO	29	ON6AJ	151	20
5	ON6AJ		5,146	JO21MB	22	PA3FMZ	174	25
6	PA3DZA		4,616	JO31BK	18	ON4YZ	171	20
7	PE1OPQ/P	4OP'S	4,584	JO33KK	16	PA3DLS	247	50
8	G8MNY/P	2OP'S	4,396	IO91NQ	15	G8EQZ/P	246	60
9	G7ATV/P	5OP'S	4,262	IO81QG	23	GW7ATG/P	185	70
10	PA0ERW		4,122	JO21RK	20	PA3FMZ	122	5
11	GW7ATG/P	3OP'S	4,028	IO82JV	10	G8MNY/P	208	30
12	G8EQZ/P	3OP'S	3,896	IO93PV	10	G8MNY/P	246	250
13	DL4EBJ		3,748	JO31BS	16	PA3GCV	133	20
14	PA3CVM		3,310	JO20XW	12	PA3ABR	149	10
15	F8MM		3,284	JN08WV	7	F5AGO	277	100
16	DL1EBR		3,252	JO31BS	16	PA3DLS	115	18
17	ON4YZ		3,218	JO20GG	15	F8MM	246	?
18	F6KMB/P		2,686	JO10IS	15	ON4YZ	141	?
19	F5AGO		2,474	JN06DP	5	F8MM	177	?
20	DL0RU	4OP'S	2,470	JO31KK	20	PA3GGV	181	90
21	PA3BJC		2,296	JO23XW	13	PA3DLS	195	20
22	PA3GCV		1,924	JO32LU	15	ON5VL	269	?
23	ON7MB		1,916	JO10WJ	10	ON1WW/P	129	20
24	PE1MVQ		1,880	JO21PU	6	DH8YAL/P	124	30
25	ON5ID		1,786	JO10RN	11	F6KMB/P	58	30
26	PA3ECU		1,761	JO32CF	20	ON6AJ	154	?
27	PE1JAM		1,674	JO22XW	12	PE1OPQ/P	83	15
28	PA0BOJ		1,490	JO21ON	7	PA3ECU	101	15
29	ON5VL/T	3OP'S	1,426	JO20UN	4	PA3GCV	269	10
30	DD3JI		1,320	JO31IE	9	PA3DLS	169	18
31=	EA3AEG		1,276	JN11FS	7	EA3UM	69	10
31=	EA3BJG		1,276	JN11FS	7	EA3UM	69	8
33	ON5IE		1,252	JO21IA	9	PA3DZA	109	25
34	F6AFW/P		1,068	JN28OP	2	F8MM	245	?
35	EA3UM		1,024	JN01XG	8	EA3AEG	70	40
36	DC4UU/P		800	JN49JE	4	F6CMB	146	10
37	EA3GAW		752	JN11BI	7	EA3BJG	54	20
38	EA3BIB		724	JN01XH	5	EA3BJG	65	1

Pos	Call	Op's	Points	Loc	Qso	Best Dx	@Km	Pwr/W
39	F1JSR		692	JN36FG	4	HB9AFO/P	65	?
40	F1GTP		580	IN93PS	1	F1JRZ/P	145	?
41	G7KAO		562	JO01CK	5	G3WEM	36	50
42	G6WLM		472	IO92FJ	5	G8MNY/P	91	6
43	F5BV		310	IN95MW	2	F1JRZ/P	117	?
44	F1ACA		264	JN28MT	2	F9FT	88	?
45	ON6BM		204	JO21OF	3	ON6UA	47	?
46	F1REP/P		142	JN19DL	1	F8MM	71	?
47	DL6SL		140	JN58AK	2	DL2MBE	52	12
48	F6KFA		78	JN18CU	2	F8MM	24	?
49	EB3EHG		20	JN01XH	1	EA3UM	5	1
50	PD0RJI		10	JO21FR	1	PA3DLS	5	?

Total entries: 51

'Gunn Diode' Platts - 3cm / Mobile

Contest News

Richard Guttridge G4YTV

At the start of a new contest year a brief look back at 1993 is in order. It was generally a poor year for entries, and conditions were equally uninspiring for most of the contests.

Although some good DX was worked during the Summer Fun and the International, all stations had to work hard for their points. Most of the long-haul QSOs occurred on Sunday morning for the portable groups. As you no doubt saw from CQ-TV 165, F6IFR was top of the pile again in the International, with John G8MNY/P heading in the UK list, with G7ATV/P, G8EQZ/P and GW7ATG/P in close order behind him.

The most encouraging development during the year was the continued emergence of 3cm as a contest band by a growing number of operators. I've received requests from a number of groups to raise the multiplier above 24cm to 10. However, I think that would distort the results, but having looked at the 3cm entries for the 93 contest season, your contest manager considers a small increase would be fair. Therefore, to make it even more worth the time and effort making contacts on that band I am going to raise the multiplier for all bands above 24cm from 3 to 5. This will take effect from the May Microwave contest. You continue to claim 1 point per km and I'll do the maths for the championship. More on the championship later.

Onto the Winter Vision, with very poor conditions and turnout. The level of QSOs was right down, with most people just working a few locals. Honours go to Terry G4XMQ of Lincoln, who won on 70cm and 24cm.

The Winter Cumulatives had a poor entry, but the distances worked were a bit better, with John G8MNY top of the list on 70cm and runner up on 24cm to Des G3NNG. One hardy soul even went portable! It was Bob G1IXE's first contest, I hope it didn't put you off Bob, but you will have the last laugh. As you were the only portable station that entered you get 1000 points in the BATC Portable Station Championship.

The BATC FIXED & PORTABLE CHAMPIONSHIPS are meant to encourage stations to enter the contests. Now, a number of stations appear for the Summer Fun and International contests and we never see them again until the next year. So, how about a change in the Championship rules. To enter the Fixed section ALL contests must have been entered from the home QTH, no change. To enter the Portable section you can make any combination of Portable and Fixed station entries. There must, however, be at least one portable entry. This change would encourage stations

to enter contests all the year round if they want a chance of winning the Portable Championship. Please let me know your views on that one before the end of 1994.

ACTION - FANFARE - ROLL OF DRUMS - CRASH OF CYMBALS

My Lords, Ladies and Gentlemen, the winner of the Fixed Station Championship is John G8MNY.

Well done John, you deserve it, having entered nearly all possible contests you get past the winning post with over 200 points to spare.

It was a lot tighter for the BATC Portable Championship, with Clive G8EQZ/P just ahead of John G7ATG/P. Well done everyone that took part in ATV contests. You made them happen.

One last note for you. The BGM at Shuttleworth College (CAT '94) clashes with the International IARU Contest! Neither can move. Sorry folks, that will cause problems for a few of us! Clive and I hope to put on a contest station at Shuttleworth. I hope you will manage to cover both events that weekend. Paul Marshall is organising a superb event that should not be missed, but before then I hope to see you at the Sports Connexion BATC Rally on Sunday May 1st.

Contest Rules and combined log/cover sheets from: Richard Guttridge G4YTV, Ivy House, Rise Road, Skirlaugh, Hull, North Humberside, HU11 5BH.

CONTEST RESULTS

WINTER VISION 93 RESULTS

70cm SECTION

Place	Callsign	Points	Best Dx	@ Km
1	G4XMQ	721	G4YTV	70
2	G4YTV	579	G0IIT	77
3	G8MNY	487	G7ATG	222
4	G7ATG	254	G8MNY	222

WINTER VISION 93 RESULTS

24cm SECTION

Place	Callsign	Points	Best Dx	@ Km
1	G4XMQ	362	G4YTV	70
2	G8MNY	234	G8VMP	30
3	G4YTV	184	G4XMQ	70
4	G7ATG	104	G7MRF	41

WINTER CUMULATIVES 94

70cm SECTION

Place	Callsign	Points	Best Dx	@ Km
1	G8MNY	2015	G7ATG	222
2	G7ATG	1598	G8MNY	222
3	G3NNG	1419	G7AVU	203

WINTER CUMULATIVES 94

24cm SECTION

Place	Callsign	Points	Best Dx	@ Km
1	G3NNG	1202	G4DVN	157
2	G8MNY	1143	G3NNG	114
3	G7ATG	1122	G3NNG	129
4	G1XIE/P	112	G3NNG	54

WINTER CUMULATIVES 94

3cm SECTION

Place	Callsign	Points	Best Dx @	Km
1	G7ATG	583	G3SMU	101
9	G4RNA	935		
10	G6MNJ	722		
11	G4TEP	370		
12	G4WGZ	330		
13	G8VMP	228		
14	G7MFO	187		
15	G0PIA	98		

THE 1993 BATC FIXED STATION CHAMPIONSHIP

Place	Callsign	Points
1	G8MNY	2575
2	G4XMQ	2370
3	G7ATG	2145
4	G3NNG	2000
5	G7KAO	1999
6	G4YTV	1452
7	G6WLM	1125
8	G4CBW	1000

THE 1993 BATC PORTABLE STATION CHAMPIONSHIP

Place	Callsign	Points
1	G8EQZ/P	1958
2	G7ATG/P	1881
3	G7ATV/P	1761
4	G8MNY/P	1227
5	G4WGZ/P	1161

Narrow Video TX Filter

John Stockley G8MNY

The need to reduce 70cm ATV vision signal bandwidth is becoming apparent with the introduction of Packet on 439, new repeaters on 437, and satellite service on 435 and 436 MHz. See the spectrum drawing.

Here is an effective WALL filter that will keep the modulation bandwidth well down. It won't give quality pictures, but it will enable you to run B & W vision closer to other services.

The design is a standard book circuit for 75Ω in and out. It passes 1 MHz at -3dB and is -50dB at 2 MHz. However, there is 20% ripple on edges, but this won't be noticed on DX working. See theoretical filter loss drawing.

Accurate 5% components are needed for this filter, and the best way to get these is to measure them! The heart if the filter is two tuned circuits that resonate at 3 MHz and 2 MHz. So by winding the coils to resonate on frequency with the associated capacitors, the best results will be assured.

Coil Winding

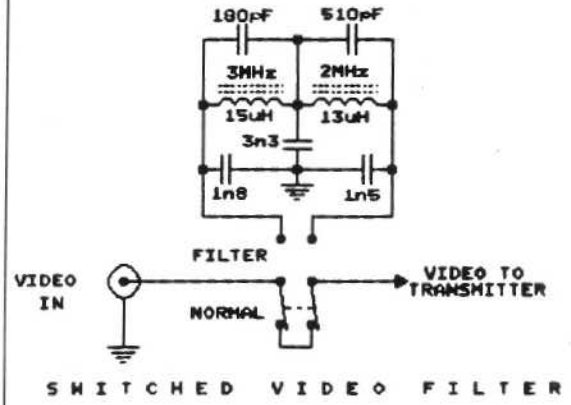
Test gear needed: RF Probe (or scope), HF Signal generator, Capacitance Meter

The coils are wound directly on small 4mm ferrite cores. About 20/40 turns of 25/32 SWG enamelled copper wire are needed, depending on the ferrite type and size. Hot candle wax is useful for holding the windings together while adjusting the turns.

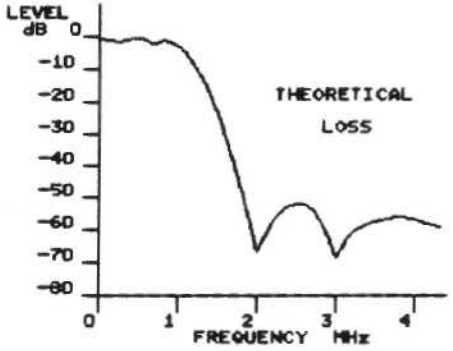
To measure the resonant frequency (inductance value), place a 390Ω resistor between the generator output and the top of the tuned circuit. Connect the other end of the parallel tuned circuit to all the test gear grounds. With the probe measure the voltage across the tuned circuit while sweeping the oscillator, note the frequency of maximum level. This should be the resonant frequency. Adjust the number of turns for correct resonance.

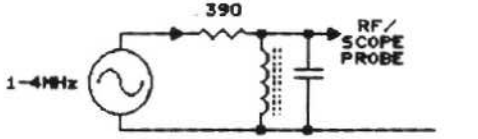
Testing

After assembly the circuit can be tested with colour bars, frequency gratings, etc. There should be no colour detectable after the filter, and the gratings should be perfectly clear up to 1 MHz, then attenuate to a smooth grey level at 2 MHz and above.

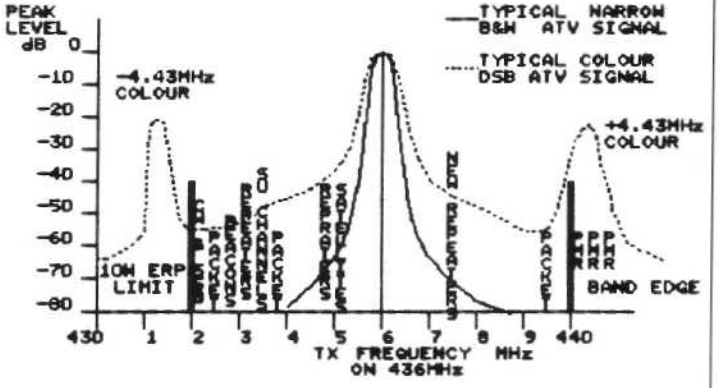


SWITCHED VIDEO FILTER





COIL TEST CIRCUIT



VHF COMMUNICATIONS

VHF COMMUNICATIONS magazine is published four times per year and is available from KM Publications, 5 Ware Orchard, Barby, Nr.Rugby, CV23 8UF, Warks. U.K. Tel: 0788 890365; Fax: 0788 891833. The yearly subscription is **£15.00**, which is payable by credit card (+ a surcharge of 75p), personal cheque (drawn on a UK bank or bearing the name of a UK banking agent), postal orders or bankers draft made payable to VHF Communications. This subscription includes surface mail charges, air mail is extra at £6.00. The magazine is a ***MUST*** for the radio amateur interested in VHF, UHF and Microwave working, containing, as it does, detailed constructional articles for equipment operating in these bands.

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Camtech Electronics

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21 Goldings Close, Haverhill, Suffolk, CB9 0EQ, UK
Tel: INT +44 (0) 440 62779; Fax: +44 (0) 440 714147

High Frequency Video Demodulator Card.

Features 130 MHz IF input frequency, Plessey video demodulator, Switchable CCIR video de-emphasis + video invert and switchable meter functions, signal strength / tuning meter. Video output - 75Ω composite video. Audio demodulated outputs available are 600Ω 0dBm and 0.5 Watt loud speaker amplifier. This unit is to the highest quality construction using plate-through hole PCBs with selective solder resist finish. Available in kit form or ready assembled.

Microwave Tuner / Down Converter.

Features the very latest in commercial microwave integrated circuits and surface mount technology. Ultra low noise PHEMT GaAsFET front end followed by stripline image filter and MMIC amplifier to a 5 GHz Gilbert cell mixer. Exhibits 35dB conversion gain and tunes (LO) 800 to 1600 MHz, with an IF output up to 200 MHz. Also features an external LO output to drive a synthesiser, such as Camtech 2.4 GHz synth board. Unit comes completely ready assembled with instructions.

TV Audio Modulator.

A full featured audio modulator to compliment your video station. Contains microphone amplifier, 50µs pre-emphasis filtering, speech compressor, 15 kHz low pass filter and modulator / 5.5 to 6.0 MHz oscillator. Output is fully buffered and filtered to provide 0dBm @ 75Ω modulated ± 50 kHz. Available in kit form or ready assembled.

For details on these items or a copy of our latest Catalogue, please write or phone to the address above. Credit card facilities available.

WORTHING & DISTRICT VIDEO REPEATER GROUP

GB3VR GB7VRB

AMIGA ATV PROGRAM

The Amiga ATV program as seen at the BATC show now has over 45 different selectable testcards with a host of additional features including 20 different wipes, full text control,now with 30 screens of text messages available, QRA calc, Testcard Music, selectable displays, all cards are overscan ie the whole screen is used.

Load in your own customised testcards, Large characters, Scrolling messages, 24Hr Clock, C/S extensions, Hot key operation, Doc reader, ATV CLI, Cross Hatch, Purity and also a comprehensive section for Gen-lock users.

If your interested in ATV then this program is for you. Two disk set, 1 Meg required. Please state callsign and QRA (if know) when ordering. £20.00

1W FM-TV 24cm TRANSMITTER

This transmitter generates its singnal directly at the wanted frequency which may be set anywhere in the band colour or B/W. On-board intercarrier sound and fixed pre-emphasis are standard features. The kit includes diecast box and cost £80.00

TWO CHANNEL PHASE LOCKED LOOP KIT

This add on vastly improves the overall frequency stability of the 1 watt transmitter. Two crystal locked channels and third free running tuning position are available. Kit price only £30.00
Crystals for the PLL on channels RMT1,2,3 or simplex 1255Mhz £8.00. Other frequencies to order.

VIDEO AGC KIT

This unit accepts a composite video signal in the range 0.15 to 2V P-P and outputs a constant 1V P-P accross 75-Ohms. This unique design is a must for TV stations and repeaters. £16.00 each.

THE SPECTRUM ATV PROGRAM

This 48K version has over 60 commands which includes 7 Testcards, memo pad, clock, maps, tones, locater calc (old & new), flag, x-hatch, various size text printing plus disk transfer command and more. All this for only £6.00 Opus disk version £6.00 a must for all spectrum owners.

BBC AMATEUR TELEVISION PROGRAM £8.50
CROPREADY ADD ON'S SAE FOR DETAILS

ORDERS TO:- TREASURER OF GB3VR, R.STEPHENS G8XEU, 21 St.JAMES AVE, LANCING,WEST SUSSEX, BN15 ONN. 0903 765760 7 to 8 pm
CHEQUES PAYABLE TO:-
'Worthing and District Video Repeater Group'

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Copy should be sent to the Editor at 5 Ware orchard, Barby, Nr.Rugby, CV23 8UF before 20th June. Tel: 0788 890365; Fax: 0788 891883.

FOR SALE

FERGUSON SRB1 RX and Chris Smith PAL/D2MAC upgrade PCB and EPROM. PCB built (with IC sockets) but not installed in RX. RX and all parts are complete ... £60. Tony Leach. Tel: 0344 762096

EV4020A VECTORSCOPE in new case with handbook. Light home use only ... £200. ITT 10 MHz transistor oscilloscope, compact size 5.5 x 4.5cm screen, very portable ... £25. 7" composite monitor, green screen ... £25. 9" monochrome monitors, selection available ... £30 each, discount if several are purchased. National Panasonic triple 5" monitors in 5" rack case ... £120. Panasonic WV-CD130/B colour CCD camera, genlockable surveillance camera ... £125. Auto-iris lens for above, 8.5mm/f1.8 ... £25. Panasonic WVP-55E Saticon colour camera, autofocus, zoom lens (mic missing) , fitted with standard 10-pin plug for portable/mains VHS recorders ... £25. Manual-iris C-mount lens, 6.5mm/f1.8 ... £10. Canon tuner/ timer/PSU for VR30 VHS recorder (also Panasonic NV-180), as new (cost £295) ... £40. Sony audio cassette recorder, only recorded one C90 cassette since new and played it back to check; interesting reason for this, phone to find out! as new ... £15. Desk case with new RS 6U sloping front panel ... £25. Offers considered but, as most items are delicate and/or heavy, would prefer buyers to collect. Also JVC KY-15 genlockable 30chip cameras/camcorders, heavy fluid-effect tripod. Polar 4 I/P vision mixer. Phone for details. David Wilson, 7 Massie Close, Milton Keynes, Buckinghamshire. Tel: 0908 665106 (answerphone).

TEST CARD GENERATOR PCB designed by G7MRF. These boards have full colour facility and also 1 kHz tone generator. Priced at £18 + £1,50pp. Trevor Burndred G0KBI, 53 Everest Road, Whitehill, Kidsgrove, Stoke-on-Trent, ST7 4DY. Tel: 0782 782886.

TELEVISION ENGINEERS POCKET BOOK, edited by J.P.Hawker. Newnes 4th ed. 1962. Illustrated with photos and diagrams. Everything about servicing and receiving TV, including a section on 'The British Television Network' as it then was. Ah the good old monochrome days ... d/w VGC ... £5. Foundations of Wireless, Scroggie. 1960 impression ... £5. ITV 1972 (the days when ITV was ITV). Lots of pictures of studios and transmitters. Slightly grubby and corner-creased cover o/w good copy ... £5. Television Engineering: Principles and Practice. Vol.1. Amos/Birkshaw. BBC 2nd edition 1963. Very clean copy covering all technical aspects of monochrome TV. Illustrated. No self-respecting television enthusiast should be without this volume. Illustrated, no d/w ... £6. All books postage £1 each. Dicky Howett. Tel: 0245 441811.

WIRELESS WORLD - VINTAGE COLLECTION, complete years of weekly issues 1935-1938, oddments 1931-1934. also other magazines from same era --5p per copy or £10 the lot. Brian Hayward G8VXQ. Tel: 021 705 3583

PORTABLE U-MATIC RECORDER, Sony VO-3800P complete with AC-3000P AC adaptor/charger. In good working order ... £80. Reel-to-reel B&W VTR, Sony AV-3670 CE, needs some attention, probably needs new heads. Ideal for spares ... £10. RGB-to-PAL converter, 3U rackmount unit ... £10. Video distribution amplifier, 2U rackmount, 1 input, 6 outputs ... £10. Vidicon tube, EEV 849D, as new - boxed ... Offers. Paul G6FRA, 69 Chesterton Avenue, Harpenden, Hertfordshire, AL5 5SU. Tel: 0582 468957; Fax: 0582 765480.

BBC T/B HEADSET 1960 STYLE ... £5. Single muff headset ... £3. Altai T/B headset ... £3. EMI 2001 manual Vol.2 ... £12. Panasonic WV341 studio camera ... £30. Sony HVC2000P camera ... £40. Hitachi GP7 colour camera ... £75. Ferrograph studio 631 tape recorder ... £70. 14/10-pin camera cable, 3 metres ... £15. Tandberg 15S tape recorder ... £20. Loftech TS-1 sinewave generator c/w dB meter and frequency counter ... £45. Bal 430ns video delay ... £10. Lexor 250ns video delay ... £10. Postage extra on all items. Nigel Phillips, 80 Johnston Road, Oakdale, Poole, Dorset, BH15 3HT. Tel: 0202 670733.

80cm BLACK MESH OFFSET DISH, with both pole and H-H motor mount ... £90. Amstrad 'Blue Cap' LNB ... £10. Racal MPS1222 V22 modem ... £30. BBC B Computer with 40/80 drive plus various books ... Offers please. HP serial data analyser model 1640B ... £125. All used and working. Russell Greenberg (NW London). Tel: 081 959 4061.

WANTED: Colour TV tube Matsushita 10-8205/370K RB22 for National Panasonic TV TC492G. Peter Connor G8XTE, 20 Longfield, Lutton, Ivybridge, Devon, PL21 9SW. Tel: 0752 837 319.

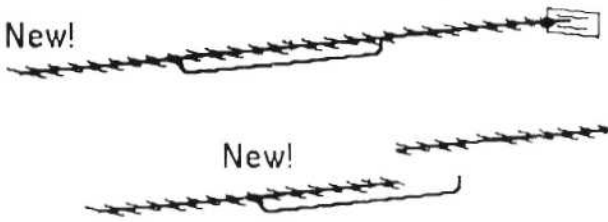
WANTED: EMI 201/203 camera Viewfinder Hood (the green one). Any condition whatsoever. Even bits missing. Also Taylor Hobson or Ballmeyer Image Orthicon camera lenses. TV88 fitting. Where the heck have these lenses gone? Come on chaps! If you have one sitting at the back of the cupboard I'll pay actual cash for it and plonk it back where it belongs - on a camera! Also required, handbooks, camera cue-light domes, logos, station ident badges. Product brochures. Anything that will throw light on the selling and use of broadcast equipment. Good money offered. Dicky Howett, 23 Micawber Way, Chelmsford, Essex, CM1 4UG. Tel: 0245 441811.

WANTED: Good 2/3 Plumbicon or Saticon tubes in exchange for new CCD colour cameras with 8:1 zoom, 400-line resolution, 7 lux sensitivity, viewfinder and fully automatic. Trevor Lumb G0ARU. Tel: 0284 754318.

WANTED: Normende (Airmec) colour pattern generator type FG387Z. Orion (Black Star) colour pattern generator. An SPG capable of 405/625 working and also able to handle colour. Also looking for a timebase corrector unit. Other items required are service manuals for the following equipment: Panasonic AG 6200 VHS VCR, JVC-Nivico PV 4500 portable VTR and National TV/monitor TC293 NSP (multistandard). Also require an 8929 Vidicon tube in good condition and a colour processor board for an IVC 700 series VTR. Terry Martini, 6 Levant House, Mile End Road, London, E1 4RB. Tel: 071 790 6807. Fax: 071 702 8774.

WANTED: Broadcast Vidicon camera such as EMI 201, plus one or two lenses as used on this camera; these have a 1.5" mount (larger than C-mount) and a toothed ring for iris operation. Manual and other parts for above. My thanks to all who have already helped. Andy Emmerson G8PTH, 71 Falcutt Way, Northampton, NN2 8PH. Tel: 0604 844130.

Severnside Television Group Aerial Products

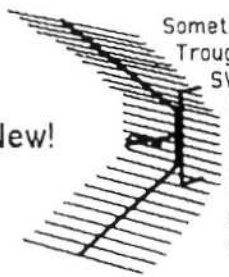


New! A 38 element high performance version of our famous 23 cm aerial 14 db gain, SWR less than 1.5:1 and 1.8 metres long. Remember - all STG aerials are wideband to cover the repeater input and output
Launch price only £25.00 each, P&P £3.50 (1 item) £5.00 (2+ items)

New! No need to buy a new aerial, our 20 element extension upgrades your existing 18 element STG aerial to the full new 38 element specification. Everything you need is supplied.
Launch price only £12.00 each, P&P £3.50 (1 item) £5.00 (2+ items)

The original 18 element wideband aerial is still available. 10 db gain SWR is less than 1.5:1, 90cm long and it covers the repeater input and output

Still only £14.00 each, p&p £3.50 (1 or 2 items) £5.00 (3+ items)



Something different for the mast! A 23 cm wideband Trough Reflector. 11 db Gain across the whole band SWR is less than 1.5:1 Overall dimensions 55cm high, 35cm wide and 30cm deep. Supplied as a complete kit of pre-formed & pre-drilled parts for easy "screwdriver" assembly, no tuning is needed
Launch price only £18.00 each, P&P £3.50 (1 item) or £5.00 (2+ items)

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Norfolk 24cm repeaters INFO
seen at Croydon by G8MNY on 2/1/93
GB3TN
NORTH NORFOLK ATV
REPEATER INFO.
INPUT 1249 MHZ.OUTPUT 1316 MHZ.FM.
SOUND INPUT 5.5/6.0 MHZ
SOUND SUBCARRIERS.....MAIN 6.0 MHZ.
.....SUB 6.5 MHZ.
S.METER FREEZES FOR 20 SEC. ON REMOVAL
OF LINE SYNCS.
REPEATER ACCESS 15.625 MHZ NEG. SYNC.
DTMF CONTROL ON 6 MHZ SOUND.
ALERTS/INFO/MAIL G4MJI 0328 851644.
2/1/93
GB3TN
INPUT SIGNAL METER
LINE HOLD
1
2
3
4
5
GB3TN