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**Newsletter of the Severnside Television Group**


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**CONTEST NEWS**

As I write this during the middle of August, we are starting to think about our major contest of the year. This is the International ATV Contest, which is held over the weekend of 11-12th September. As always, we would very much appreciate offers of help to set up and dismantle the station. We usually set the station on the Friday evening/Saturday morning of the weekend, and then dismantle it after lunch on Sunday. Even if you can't come along to help us on site, you can still perform a very useful task by coming on air to work us. We will be active on 3 bands ; 70, 23 & 3 cm, and would appreciate every point that we can earn.

We have now had news of our results in the 1992 Summerfun Contest. We came 1st on 3 cm, 2nd on 70 cm and 3rd on 23 cm. We were still the only station to submit a three band entry and I think that this must be considered a good result.

**SILENT KEYS**

We are very sorry to report that two of our members have become "silent keys" since the last issue of "P5". Ken Giles GW1XUB died on 8th July in hospital. Ken had suffered from poor health for some time, but he had made the trip over to the Bristol Rally last year and visited our stand.

Oscar Hancox G8BIY died shortly after Ken in July. He was taken ill whilst on air talking to G8CLS. Oscar was a member of the original "steering committee" that led to the formation of the Group in 1986.

Everyone in the Group extends sympathy and condolences to the families of Ken and Oscar.

**"P5" NEWSLETTER**

I have used up all of the material that has been given to me in this issue of "P5". I would be grateful if members could give some thought to preparing something for the next issue. If it is helpful, I now have an IBM compatible PC with laser printer in my office, and so can accept articles on 3½" disc in DOS/ASCII text format.

Some of you may know that I have recently made a large transition from employment to self-employment, having started my own Engineering Consultancy. One effect of this is that I do not have so many evenings and weekends free for "leisure" activity, such as producing copy for "P5". I am having to curtail some of my hobbies, and would appreciate some assistance in preparing "P5". Is there someone, or perhaps several people who might like to become Assistant Editors ? The work is not particularly onerous or time consuming, and no great technical expertise is needed - you just need an ear to the ground to know what's happening in the Group. If you have a PC, text may be exchanged on disc. The printing and distribution of the newsletters is taken care of by others, so the task just involves preparation of articles ready for photocopying.

If you think that you can help, please let someone on the committee know.

**A GUIDE TO 23cm TELEVISION**

We still have about 50 copies of our book "A Guide to 23 cm Television" left in stock. This is the ideal book for those of you that are new to the hobby, since it describes everything you need to know about setting

## DX-TV NEWS by Stephen Michie G7KXD

up your own station in a fairly non-technical way. Sales of the book seem to have reached their peak, and we probably will not re-print any once the present stock has sold out. The cost is still only £3.00 plus 60p postage within the UK. Buy now before stocks run out !

In general, sales of our products have been holding up very well. Unfortunately, we have had to discontinue a couple of items. The Test Card Generator is no longer available because supplies of the pcb's have run out. Neither our supplier or ourselves can at present justify the cost of another batch of boards, but it may be that we can produce our own modified version of the board at a more economical cost.

The RGB/PAL colour encoder is also out of production since the cost of the chip used has risen so much in the past few months. Once more, if we can find new supplies at a reasonable cost, this product might reappear. Finally, news of a product that might be re-introduced. One of Ken Stevens G4BVK's most popular AZTEX Electronics products was the 23 cm GaAsFET pre-amplifier. Since Ken finished his business earlier this year, there have been quite a few enquiries about this product, as well as his ATV transmitters. Steve G8KUW, with Ken's agreement, is looking into the possibility of re-starting production. Watch this space for further news !

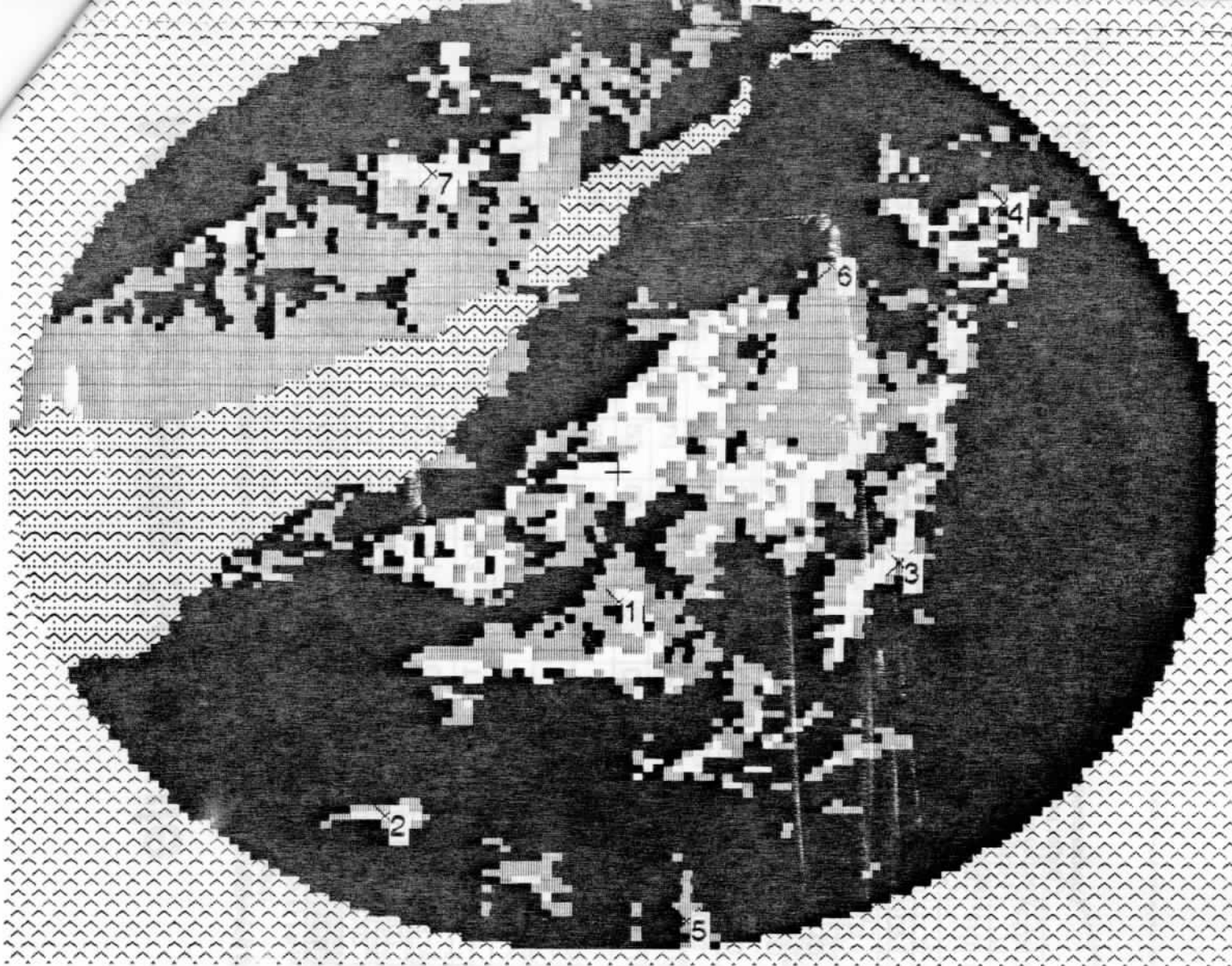
### GB3ZZ SERVICE AREA

This issue contains a computer derived plot of the GB3ZZ service area, which was provided by Ian G6TVJ. If you look carefully, you will see a " + " where the repeater is located, and six reference points where signal strength was monitored. The black areas are where it is not visible ( in theory at least, but I wonder do any of you know better ? ), and the lighter areas are where the signal is at a maximum.

I am once again grateful to Stephen Michie G7KXD for sending me details of his DX-TV logs for May to July of this year. Stephen reports that the main sporadic E season was slow starting this year, with nothing seen until 12th May. The first signals were that old reliable one, TVE1 from Spain on all 3 Band I channels, and then all the old familiars appeared over the next few weeks. On 7th June, there was a UHF tropospheric opening with signals seen from NED1 and NED2.

The first really big SpE opening took place from 9th to 12th June, with signals continuously present throughout that period. Stephen reports that virtually everything possible was seen. Some of the highlights were Austria, Canal+ from France, Hungary, Portugal, Denmark, Croatia, Ukraine, Moldavia, Albania, Romania, Estonia and Slovenia.

June 16th and July 8th produced further large openings, with the very rare Albania being visible again. I haven't had much time this summer to look for Band I DX-TV, but I don't think that Stephen has missed much of the action. I wonder if any other of our members has seen anything over the summer ?



k4S

RESEARCH DEPARTMENT LINE-OF-SIGHT PLOT (V2.02)  
 Profiles from Terrain Data Bank (Copy 602) 5- 3-1993  
 \*\*\*\*\*

| Transmitter      | N.G.R.    | Site Height | Aerial Height | Map No(s)                 |
|------------------|-----------|-------------|---------------|---------------------------|
| + FILTON REPEATR | ST601788  | 82 m        | 15 m          | (172)                     |
| Frequency        | 1.320 GHz | K-factor    | 1.33          | Rx aerial height 10 m agl |

Points within a radius of 30 km from Tx

X Marked Receiving 1/2 km squares - Centred  
 Grid Ref Map No(s)

- 1 ST600705 (172)
- 2 ST485570 (172,182)
- 3 ST740730 (172)
- 4 ST790955 (162)
- 5 ST635505 (183)
- 6 ST705915 (162,172)
- 7 ST505970 (162)

k0S

# Met 4 Satellite Schedule

Met 4 transmits a series of images of the Earth as seen from space. These images are displayed on a three hour cycle that is modified to account for the presence of sunlight, there would be little point in showing a visible image at night!

|    | 0 hr | 1 hr | 2 hr | 3 hr | 4 hr | 5 hr | 6 hr | 7 hr | 8 hr | 9 hr | 10 h | 11 h | 12 h | 13 h | 14 h | 15 h | 16 h | 17 h | 18 h | 19 h | 20 h | 21 h | 22 h | 23 h |     |
|----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----|
| 2  | D1   | D1   | D1   | D1   | D1   | D1   | C02  | C02  | C02  | C02  | C02  | C02  | C02  | C02  | C02  | C02  | C02  | C02  | D1   | D1   | D1   | D1   | D1   | D1   |     |
| 6  | D3   | D3   | D3   | D3   | D3   | D3   | C03  | C03  | C03  | C03  | C03  | C03  | C03  | C03  | C03  | C03  | C03  | C03  | D3   | D3   | D3   | D3   | D3   | D3   |     |
| 10 | D4   | T    | D4   | D4   | E1   | ADN  | D1   | D7   | C3D  | D1   | D7   | C3D  | D1   | D7   | C3D  | D1   | D7   | C1D  | D4   | D4   | E1   | T    | D4   | D4   | ADN |
| 14 | D5   |      |      | D5   | E2   |      | D3   | D8   | T    | D3   | D8   | C4D  | D3   | D8   | C4D  | D3   | D8   | C4D  | D5   | D5   | E2   |      | D5   | D5   |     |
| 18 | D6   |      |      | D6   | E3   |      | D4   | D9   |      | D4   | D9   | ADN  | D4   | D9   | T    | D4   | D9   | ADN  | D6   | D6   | E3   |      | D6   | D6   |     |
| 22 | D7   |      |      | D7   | E4   |      | D5   | D3   |      | D5   | D3   |      | D5   | D3   |      | D5   | D3   |      | D7   | D7   | E4   |      | D7   | D7   |     |
| 26 | D8   |      |      | D8   | E5   |      | D6   |      |      | D6   |      |      | D6   |      |      | D6   |      |      | D8   | D8   | E5   |      | D8   | D8   |     |
| 30 | D2   | D2   | D2   | D2   | D2   | D2   | D2   | D2   | D2   | D2   | D2   | D2   | D2   | D2   | D2   | D2   | D2   | D2   | D2   | D2   | D2   | D2   | D2   | D2   | D2  |
| 34 | D9   | D1   | D1   | D9   | D1   | D1   | C02  | C02  | C02  | C02  | C02  | C02  | C02  | C02  | C02  | C02  | C02  | C02  | D9   | D9   | D1   | D1   | D9   | D1   | D1  |
| 38 | D1   | D3   | D3   | D1   | D3   | D3   | C03  | C03  | C03  | C03  | C03  | C03  | C03  | C03  | C03  | C03  | C03  | C03  | D1   | D1   | D3   | D3   | D1   | D3   | D3  |
| 42 | D3   |      |      | D3   | E6   | E1   | C3D  | D1   | C5D  | C8D  | D1   | E1   | C3D  | D1   | C5D  | C8D  | D1   | E1   | D3   | D3   | E6   |      | D3   | D3   | E1  |
| 46 |      |      |      |      | E7   | E2   | C2D  | D3   | C6D  | C9D  | D3   | E2   | C2D  | D3   | C6D  | C9D  | D3   | E2   |      |      | E7   |      |      |      | E2  |
| 50 |      |      |      |      | E8   | E3   | D3   |      | C7D  | C2D  | C1D  | E3   | C1D  | C1D  | C7D  | D3   | C1D  | E3   |      |      | E8   |      |      |      | E3  |
| 54 |      |      | CTH  |      | E9   |      | D1   | C2D  | CTH  | D1   | C2D  |      | D1   | C2D  | CTH  | D1   | C2D  |      |      |      | E9   | CTH  |      |      |     |
| 58 | D2   | D2   | D2   | D2   | D2   | D2   | D2   | D2   | D2   | D2   | D2   | D2   | D2   | D2   | D2   | D2   | D2   | D2   | D2   | D2   | D2   | D2   | D2   | D2   | D2  |

The satellite collects the images in five formats:

- Visible (denoted as Cnn on the table, where nn is the scanned region)
- Infra red (denoted as Dn on the table, where n is the scanned region)
- Cloud top height (denoted as CTH on the table, where n is the scanned region)
- Water vapour (denoted as En, on the table, where n is the scanned region)
- Visible half resolution (denoted as CnD on the table, where n is the scanned region)

## To use the data

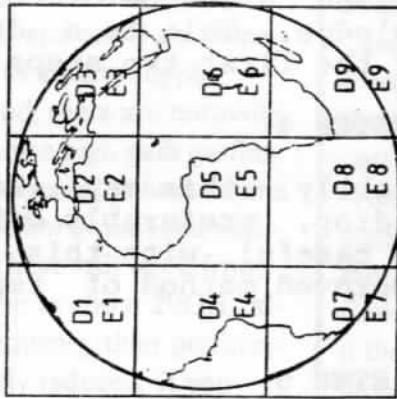
Look at the table beginning at midnight 00 hrs GMT, you can see that at 00:02 hrs a D1 is shown for Channel A1. This translates to an infrared image of the NE coast of the USA.

Channel A1 is the most useful for users of GB3ZZ. Our system defaults to channel A1 (1.691 GHz) because channel A2 (1.6945 GHz) contains mostly digital data which is not decoded by GB3ZZ.

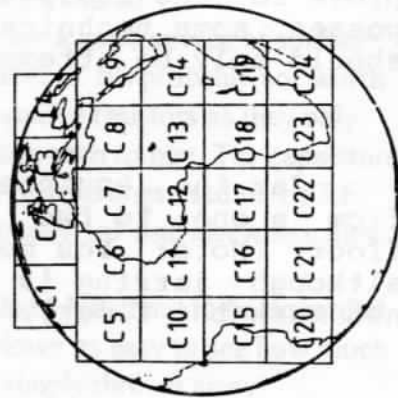
The images shown at the top of each hour in the afternoon are probably of most interest to the casual user, these show the UK and Europe as visualised by the satellites' visual band radiometer ( or camera ). Look for C02 or C2D mnemonics. The spectral radiometers send data to ESOC at Darmstadt continuously, data is formatted into a picture with sync pulses, land boundaries are added and the WEFAX image is uplinked to the satellite to be transponded down to GB3ZZ.

This table was prepared on a Lotus 123 from data obtained from Darmstadt via Terry at AMDAT. Read the GMT hour along the top row and minutes at four minute intervals down the left hand column. Note that each image takes 3.6 minutes and that there is a 0.4 minute wait between consecutive images. Where there is no entry for a four minute slot the image will be stored in GB3ZZs frame store for four minutes. T and ADN denotes a test page and admin page respectively

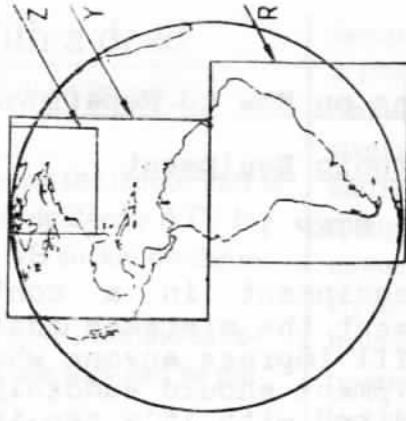
© Steve Walsh G8KLUW Aug 1993



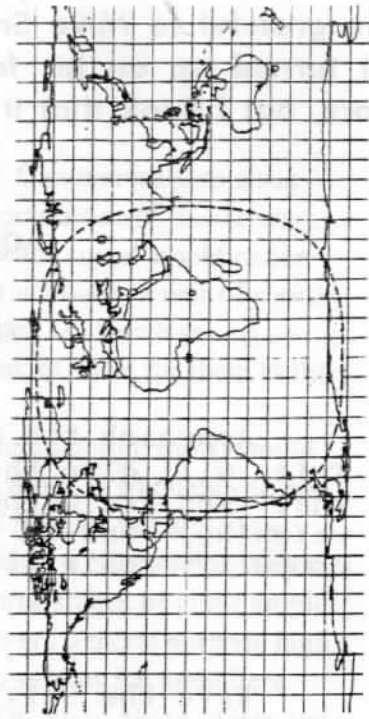
METEOSAT-4 Infrared (formats D) and water vapour (formats E) disseminated from ESOC



METEOSAT-4 WEFAX visible formats disseminated from ESOC



METEOSAT-4 WEFAX Infrared (formats R and Y) and visible (format Z) disseminated from CMS Lannion



METEOSAT-4 DC3 coverage area

I am grateful to Mike Smith GORFD at the North Bristol ARC for this little gem that turned up on his fax machine one day. Some of you might have seen it before, but I think that it bears repeating.

### Guidelines on How to Repair

#### Electronic Equipment

##### STEP 1

Approach the ailing equipment in a confident manner. This will give the equipment the mistaken idea that you know what you are doing. It will impress anyone who happens to be watching, and if the equipment should suddenly start working properly, you will be credited with it's repair.

##### STEP 2

Wave the Service manual at the equipment. This will make it assume you are at least familiar with the source of knowledge.

##### STEP 3

In a forcible manner, recite Ohm's Law to the equipment. (Caution: Before taking this step, refer to a reliable handbook to be sure of your knowledge of Ohm's Law) This will prove to the equipment, beyond a shadow of doubt, that you possess some technical knowledge. This is a drastic step and should only be attempted if the first two steps fail.

##### STEP 4

Jar the equipment slightly, this may require anything from a one to two metre drop, preferably onto a concrete floor. (Note: You must be careful with this step because, although jarring is an approved method of repair, you must not mark the floor).

##### STEP 5

Brandish a large screw driver in a menacing manner. This will frighten the equipment and demonstrate your knowledge of the deadly "short circuit" technique.

##### STEP 6

Add a valve, even if the equipment is solid state. This will prove to the equipment that you are familiar with design techniques and confuse the equipment thereby increasing your advantage. If this doesn't work, then proceed to the most dangerous and drastic step. It is seldom needed and is a final resort if all else fails.

##### STEP 7

**THINK.....**

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## Things to do with a dead

### LNB

Brian Kelly GW6BWX

Its common practice to use the indoor part of a satellite system to pick up 24cms ATV by feeding signals to the LNB socket on the indoor unit.

There must be as many LNBs around as receivers so lets see what use they can be put to.

Probably the most obvious answer is to convert them to receive 10GHz by shifting the frequency of their local oscillator by 900Mhz or so. That works fine on some LNBs but others don't lend themselves to modification or have filters that reject signals outside the normal TV band.

If you have an LNB which is unsuitable to receive 10GHz, don't throw it out, there are several useful bits inside which can be salvaged for other uses. Take a look at what happens inside an LNB and you'll get some idea of their potential as a parts supply.

Starting at the "hot" end, there are normally one or two very low noise high gain gasfets. One on units that use external polarizers and two if the unit has both horizontal and vertical antennas built in. These will work from low frequencies right up to about 20GHz although at the latter frequency their performance will be significantly reduced. If you were to buy these singly for use in a 24cms pre-amp they would cost about £10 each. Some LNBs use HEMT (High Electron Mobility Transistor) devices instead of gasfets which work even better and cost more.

Following the front-end devices there are usually two more stages of gasfet amplification. Often the first of these uses the same device as the input stage but whatever type will still make a high performance amplifier when used elsewhere.

Next in line is the local oscillator and mixer stage. The LO has its frequency fixed by the dielectric resonator (aka the puck) and uses a fet to provide gain. The fet and puck can be used as the basis of a 10GHz transmitter as

described in VHF Communications issue 2/1992. The characteristics of this fet may make it unsuitable for signal amplification stages. The mixer is usually a pair of shottky barrier diodes which are worth saving although I can't think of a use for them at the moment!

By now an incoming satellite signal would have been shifted down in frequency to between 950 and 1750 MHz but still at very low signal level. Most LNBs amplify this signal with two or three stages of mmic amplifiers. These devices are general purpose high gain ICs with many uses as RF amplifiers. They work from DC up to about 2GHz and are available in several gain bands. The type used in most LNBs is the Avantek MSA-0885 (= MAR08) which has about 22dB gain at 24cms frequencies. The Avantek device is coded "A08" while the MAR08 is identified by a blue dot on its top. These cost about £3.50 if purchased.

Lastly, LNBs are a good source of surface mounted capacitors. It's probably not worth the effort to remove resistors as they only cost a few pence each to buy. The capacitors are not coded but the ones used in the RF stages are normally 1nF and elsewhere they are 100nF.

Considering that LNBs tend to be discarded if they break down its easy to see how much technology is simply thrown away.

A few words of warning, most Amstrad LNBs are thrown out because they fail to operate on one polarity but work fine on the other, this is usually because one of the input fets has failed. Note which polarity doesn't work and don't waste time removing its device, the polarity is marked on the PCB. Secondly, ALL semiconductors in LNBs are extremely sensitive to static discharges. While taking an LNB apart take these precautions:

work on a sheet of kitchen foil, connect your soldering iron barrel through a flexible wire to the foil, loosely wrap a wire around your wrist and connect it to the foil via a 1M resistor.

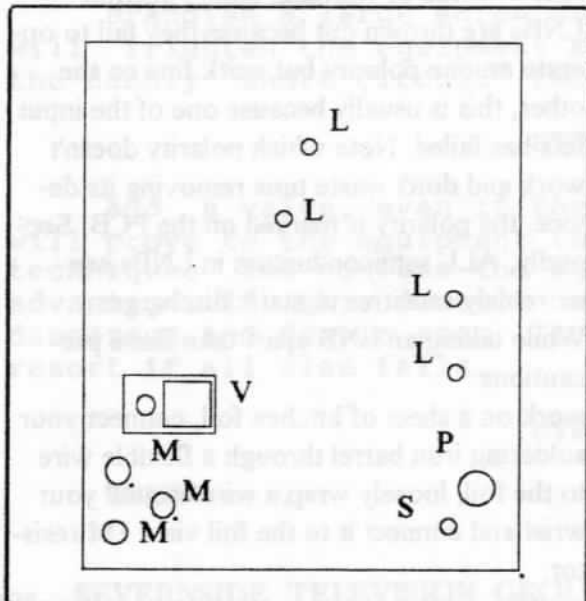
Assuming your soldering iron is grounded to the mains you and the workspace should now be at ground potential and safe to start touching the components. Keep the heat to a minimum while unsoldering the semiconductors. Use desoldering braid to remove the bulk of the solder from component legs then slide a sharp blade between the leg and the track below it to separate them. Keep all the salvaged components in a conductive container or a box lined with kitchen foil. Never wrap the transistors in foil, their legs are so delicate that they will be damaged as the foil is folded.

Now you have a selection of high grade microwave components, watch out for a design for a simple pre-amp for 24cms and a flat portable antenna which use salvaged components. Both are under development and should be in P5 shortly.

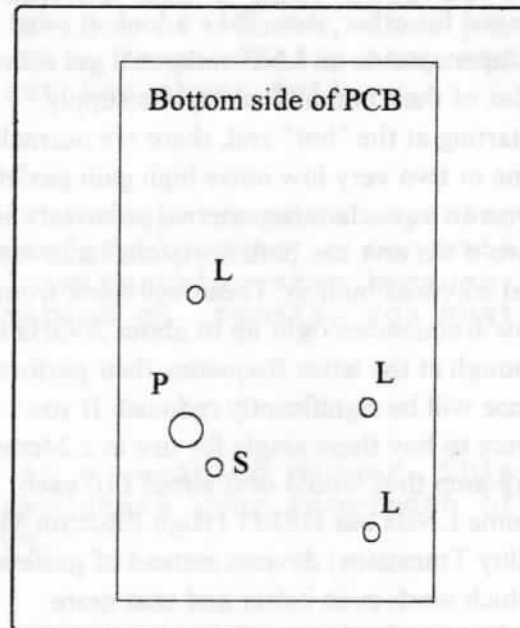
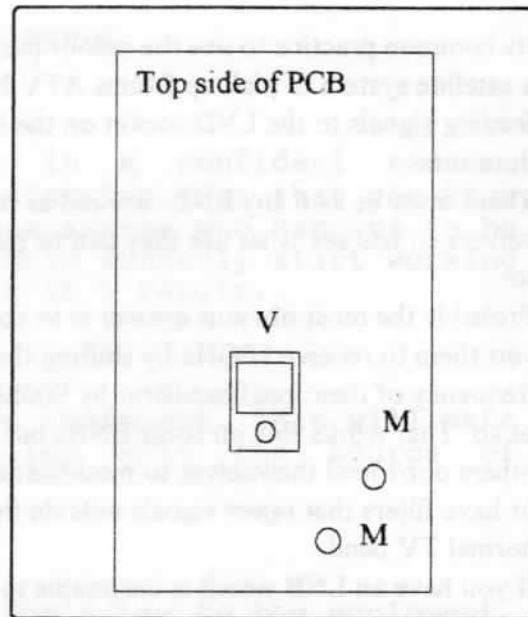
#### Guide to component locations:

- L Low noise gasfet
- S FET suitable as oscillator
- P 10GHz tuning puck
- M MMIC amplifier
- V 5V 1 amp regulator

### AMSTRAD (White) LNB



### BSB (Bullet) LNB



#### Note:

The "Squarial" BSB LNB uses a combined mixer and IF amplifier device which I have no information on. It could probably be used at 24cms but I can't confirm this.