65p

The SHORT WAVE Magazine

VOL. XLI FEBRUARY 1984 NUMBER 12

LOWE SHOPS

LOWE ELECTRONICS IN MATLOCK, located on the Chesterfield road out of Matlock, that is the A632 and open Tuesday to Friday from 9 am to 5.30 pm (closed for lunch 12.30 to 1.30) and Saturday, open all day from 9 am to 5 pm. A visit to Matlock can be an outing for the family, the local scenery, the Heights of Abraham, Lovers Walk, etc. Ample free parking in our car park and when you have browsed then lunch in one of the towns pleasant restaurants. Amateur Radio with the family in mind.
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if I am absolutely honest,

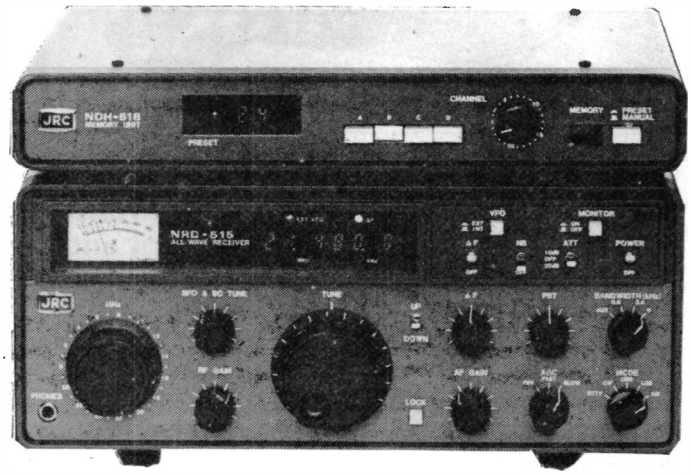
I am not certain whether I own a NRD515 because of its unbelievable performance as a general coverage receiver or just for the sheer pleasure of having and constantly admiring probably the finest piece of equipment available today.

Perhaps it comes down to the same thing, certainly the other NRD owners I have spoken to have all expressed the same feelings, that the NRD515 is a receiver in a class of its own.

As a person not owning the receiver, you may ask what sets this particular one above all the others. This is difficult to define—the feel of the equipment when wandering over the crowded band, its signal handling capability and selectivity can only really be appreciated by use. Technically, the equipment is above reproach. JRC's manufacture and production control methods as applied to other items in the range are equally applied to their amateur products. The other items referred to, only a small part of the vast range, are marine radio equipment, Marisat mobile terminal, Omega navigators, Doppler sonar, echo sounder/fish finders, communication satellite earth stations and a complete range of avionic beacons, radar and associated products. Indeed, a wider range application of electronic and radio technology for land, sea and air.

You may be forgiven for associating such advanced technology with complexity of operation, a piece of equipment that needs an operator with an electronics degree. However, this assumption is incorrect. The NRD515 is easy to use with the minimum of controls to ensure the operator really enjoys his listening time. Digital readouts, MHz, mode and filter bandwidth switches together with a VFO knob that will tune the band continuously without using any other control, from 100KHz to 30MHz or vice versa. To assist with difficult band conditions the NRD515 has pass band tuning and the medium wave broadcast section to 600KHz to 1.6MHz has a preselector control to cope with crowded conditions.

To give real "armchair copy" JRC have introduced the NCM515 remote control keypad. As its name suggests the NCM515 enables frequencies to be quickly keyed into the receiver. Four memories are provided, two rates of frequency stepping in increments of either 100Hz or 10MHz and finally the ability to add to or subtract from the operating frequency by any frequency step. Add the optional 600Hz CW filter and the 96 channel memory unit and, as the other NRD515 owners would say, "a joy to own".



the NRD 515

NRD515	monitoring receiver	£965.00 inc vat.
NDH515	96 channel memory unit	£264.00 inc vat.
NCM515	remote frequency controller	£125.00 inc vat.
NVA515	speaker	£34.50 inc vat.
CFL260	500Hz CW filter	£39.10 inc vat.
CFL230	300Hz CW filter	£64.00 inc vat.

LOWE ELECTRONICS

Chesterfield Road, Matlock, Derbyshire. DE4 5LE.
Telephone 0629 2817, 2430, 4057, 4995. Telex 377482.

TR9130 TWO METRE ALL MODE TRANSCEIVER

This rig is proof, if one needed it, that TRIO do not bring out new models just for the sake of it. The TR9000 is remembered as a classic rig and today people are still asking for second hand ones, even they are a rarity on our S/H shelf. The TR9130 incorporates the improvements that all amateurs asked for, green display, reverse repeater, tune whilst transmitting, higher power, more memories and of course memory scan. TRIO's answer, the TR9130.

TR9130. . . . . £442.52 inc vat.

TS780 DUAL BAND BASE STATION TRANSCEIVER

The TS780 is the perfect base station VHF/UHF transceiver for the enthusiastic operator. The rig has all the necessary control functions essential for operating on both today's busy two metre band and the wide spaces of seventy centimetres. Full repeater facilities plus reverse repeater are included and the transceiver has the usual memory channels (10), two VFO's, up/down frequency shift microphone, IF shift, two priority channels, memory and band scan, etc. A superb rig, I have one myself, ring for a full enthuse!

TS780. . . . . £795.00 inc vat.

TR7930 TWO METRE FM MOBILE TRANSCEIVER

Those who have used or owned a Trio TR7800 will know what I mean when I say that Trio, with the introduction of the TR7930 have improved on the unimprovable. The Trio TR7930 improves on the TR7800 by giving a green floodlight liquid crystal display, extra memory channels, both timed and carrier scan hold, selectable priority frequency and correct mode selection (simplex or repeater). The most significant change is the liquid crystal display, but closely following this must be the ability to omit specific memory channels when scanning and the programmable scan between user designated frequencies.

TR7930. . . . . £312.11 inc vat.

R2000 GENERAL COVERAGE RECEIVER

The amateur bands are only a very small part of the radio spectrum, many other transmissions are available for the short wave listener. Broadcast stations provide an alternative source of current information both political and regarding the life style of the country. Fitted with the internal VHF converter the R2000 covers continuously frequencies from 118 to 174 MHz giving access to amateur two metre transmissions (am, fm, ssb and cw) plus a lot more. Having 10 memories, memory scan and programmable scan the R2000 provides in one rig the perfect receiver.

R2000. . . . . £421.36 inc vat.

TS930S HF TRANSCEIVER WITH GENERAL COVERAGE RECEIVE FACILITIES

Much has been said about the TS930S transceiver and it now has a place high in the affection of those amateurs fortunate enough to own one, indeed it has become the "flagship" of the TRIO range. Providing full amateur bands plus a general coverage receiver (150kHz to 30MHz), the TS930S has every conceivable operating feature for today's crowded frequencies.

TS930S. . . . . £1150.00 inc vat.

TR2500/TR3500 HANDHELD TRANSCEIVERS

Two first class hand held transceivers, one for two metres and the other for seventy centimetres. Ten memory channels, band and memory scan, repeater shift, reverse repeater and a low power position make the rigs extremely useful for the radio amateur who wishes to keep in touch with his local scene. A comprehensive range of accessories, base station charger, speaker microphone, mobile mount, etc, can be added to enhance operation, accessories used with one rig being compatible with the other.

TR2500. . . . . £237.82 inc vat.
TR3500. . . . . £256.45 inc vat.

TS530SP HF AMATEUR BAND TRANSCEIVER

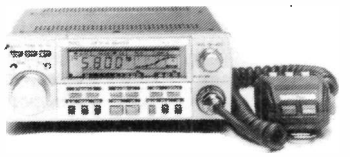
A logic progression from the reliable TS520 series the TS530SP as the most popular HF rig in the range. I use the term "was" because TRIO decided to cease production and supplies were no more, however the demand from radio amateurs worldwide for the transceiver have continued and TRIO have reintroduced the rig. A standard HF valve transceiver without the frills but providing today's amateur with all necessary facilities for reliable world wide communication, the TRIO TS530SP. Now fitted with notch filter.

TS530SP. . . . . £638.00 inc vat.

TW4000A DUAL BAND FM TRANSCEIVER

I have been waiting for this rig for the last three years, now it is here and I am using one, words fail me. Send for details.

TW4000A. . . . . £469.00 inc vat.



just a part of the range

Securicor carriage on the above items £6.00

LOWE ELECTRONICS

Chesterfield Road, Matlock, Derbyshire. DE4 5LE.
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SHORT WAVE MAGAZINE

(GB3SWM)

ISSN: 0037-4261

VOL. XLI FEBRUARY, 1984 No. 484

ADVERTISERS' INDEX

CONTENTS

Editor: **PAUL ESSERY, G3KFE/G3SWM**
Advertising: **Charles Forsyth**

Published at 34 High Street, Welwyn, Herts. AL6 9EQ, on the last Friday of the month, dated the month following. *Telephone: 04-3871 5206 & 5207*

Annual Subscription: *Home: £9.60, 12 issues, post paid*
Overseas: £9.60 ($17.00 U.S.), post paid surface mail

Editorial Address: **Short Wave Magazine, 34 High Street, Welwyn, Herts. AL6 9EQ, England.**

Prices shown in advertising in this issue do not necessarily constitute a contract and may be subject to change.

AUTHOR'S MSS

Articles submitted for Editorial consideration must be typed double-spaced with wide margins on one side only of A4 sheets. Photographs should be lightly identified in pencil on the back with details on a separate sheet. All drawings and diagrams should also be shown separately, and tables of values prepared in accordance with our normal setting convention — see any issue. Payment is made at a competitive rate for all material used, and it is a condition of acceptance that full copyright passes to the Short Wave Magazine, Ltd., on publication.

E. & O. E. VAT Reg. No. 239 4864 25

FOR THE RADIO AMATEUR AND AMATEUR RADIO

The SHORT WAVE Magazine

EDITORIAL

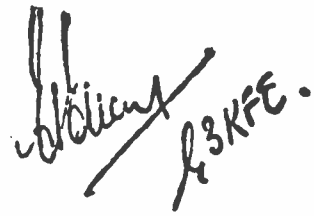
New Cover from Next Month!

As well as being the first issue of Volume 42, the March issue is going to be very special for another reason. From then onwards we shall not be using the front cover for advertising, but instead will have our own full-colour, graphic design cover which will be completely different — and we hope, striking — every month.

So when you go to your newsagent for your copy of the March issue, remember that *Short Wave Magazine* will have an all-new-look cover. It shouldn't be hard to find as it will be the magazine cover design which jumps off the shelf and hits you in the eye!

We hope you will like it.

The March issue is due out on February 24th, and demand will be high. Why not make sure of your copy by placing a regular order with your newsagent now, or through a direct subscription?



WORLD-WIDE COMMUNICATION

VHF BANDS

NORMAN FITCH, G3FPK

The 1983 Tables

LAST year, new records were set by those participating in the Annual Table. The overall winner was Denis Jones, G3UVR, who entered the race in the April issue and remained the clear front runner all the way. His total of 269 scoring points will be a formidable target. Earlier in 1983, he calculated that a score of 283 was possible, based upon stations known to be active, but the missing fourteen were never heard.

In second place was Chris Easton, G8TFI, who amassed 239 points, while Dave Robinson, G4FRE, ended up with 200 points to claim third spot. Of the 43 participants, 24 were Class A licensees and 19 Class B, the top ten places being shared equally between the A and B folk.

In the individual tables, G3UVR was top scorer on 4m. with 68 points, followed by Bill Hodgson, G3BW, who made 48. Only one point behind was his old rival, Arthur Breese, GD2HDZ. On 2m. G3UVR was the leader with 116 points, Mick Cuckoo, G6ECM, being a close second with 114. Bryn Llewellyn, G4DEZ, the 1982 winner, was third with 108 points.

As in 1982, G8TFI won the 70cm. section with 90 points, again working 21 countries as Chris did in 1982. G3UVR's 85 points earned Denis second place and G4FRE was third with 80 points. 32 readers took part in the 70cm. table. Without doubt, it is the 23m. table which has been most interesting, attracting 18 entries, 50% up on 1982. In '82, the top score was 25 points, but this year, winner G8TFI led the field with 62 pts. and worked 16 countries. Ray Cox, G8FMK, was second with 51 pts. and John Lemay, G8KAX, third with 46, both the latter working 10 countries.

G3UVR says he will not take part in this year's table as he wants to spend more time on constructional projects; however, he will update his 23cm. All-time figures from time to time. Congratulations to all who did well and thanks to everyone who entered. Now will anyone break the 100 points barrier on 70cm. this year?

Awards News

Two more readers have become members of the 144 MHz QTH Squares Century Club this month. Member no. 31 is Václav Homolka, OK1GA, from Kutná Hora in Czechoslovakia. His certificate was issued on Jan. 3 and he has exactly 100 squares confirmed from HJ07a. A breakdown shows 76 tropo, 11 *Auroral* and 13 *Sporadic E* contacts. CW accounted for 75 QSOs, SSB for 20 and FM for the remaining 5. Unfortunately, Vásek did not send along any personal or station details.

John Quarmby, G3XDY, from Rushmere St. Andrew in Suffolk, (AM77g) is member no. 32, his certificate being dated Jan. 4. He was 101 confirmed comprising 72 on SSB and 29 on CW. 82 were tropo QSOs, 11 *via Ar*, 6 *via Es* and two on random MS. John's original station consisted of a *Yaesu* FT-101 transceiver, transverter and two times 4CX250B amplifier. This gradually evolved to a *Trio* TS-770E with either a 60w home made amplifier or a two times 4CX350A, 400w PA. The antenna is a 9-ele. *Tonna Yagi* at 45ft., the site being 130ft. *a.s.l.* The QSLs took ages to arrive in some cases, and the operation was from a previous QTH about 4km. from the present one, for many of the contacts.

Claus Neie, DL7QY, editor of the popular VHF/UHF quarterly *DUBUS Informationen,* has written to say that the QTHCC listings up to no. 30 will be published in issue 1/84, along with the rules.

Beacon Notes

DL7QY has sent along the latest *DUBUS* beacon list, updated to Jan. 2. It is in two sections, the first in order of increasing frequency, starting with GB3SIX on 50.020 MHz and ending with DB0AS in GH22h, on 24.192805 GHz. The second list is by countries, again in ascending QRG order. In both lists, the "Maidenhead," or World Locator code of the beacons is given in addition to the QTH Locator codings, however, they are all wrong!

In the *RSGB* and *DUBUS* beacon lists, it is stated that EA1VHF (VD59e) on 144.867 MHz beams towards 40° or due North. Reg Woolley, GW8VHI, was in contact with the *La Coruna ARC* members and was told it now beams at 60°, thus favouring central France and Germany.

Contests

Results:— The results of the *IARU* VHF/UHF/SHF Contest on Oct. 1/2 last year have been broadcast. On 70cm., the single-op. section winner was G4CQR who made 153 contacts worth 26,055 pts. G4PUB/P won the multi-op. part with 330 QSOs and 88,839 pts. G3JXN won the single-op. part of the 23cm. event with 59 QSOs worth 7,822 pts. and G4ALE/P were first in the multi-op. category with 103 contacts for 24,484 pts. G3JXN also won the 13cm. section with 1,564 pts. from 12 QSOs, while the multi-op. part winner was the G3ZIG/P team whose 17 contacts netted 3,917 pts. Activity on 9, 6 and 3cm. was minimal.

Coming events:— The first three legs of the 70MHz *Cumulatives* are on Jan. 29, and Feb. 12 and 26, 1000-1200 GMT, chances for 4m. operators to achieve some useful points for this year's table. *The Swale ARC's* 432 MHz contest is on Jan. 29 from 1400-1800 — see p. 582 last month. The 144 MHz CW contest is on Feb. 5, from 0900 to 1500 and is a single section affair. On Feb. 19, 0900-1500, the 432 MHz Fixed Contest takes place. This is a two section, single-op. and multi-op. promotion. The weekend March 3/4 sees the 144/432 MHz Contest, 1400-1400, another two section affair, fixed station and all-other.

Satellite News

In the December, 1983 column, mention was made of *UOSAT-B.* in a news release dated Dec. 20, the *University of Surrey* reports the team working flat out to complete everything in time for the projected March 1 launch, between 1759 and 1809 GMT. The plan was to have the spacecraft ready for environmental testing in January, followed by transportation to the U.S.A. in February. The launch will be from the Western Test Range at Vandenburg in California, *UOSAT-B* being a secondary payload on a *Delta 3920* launch vehicle.

The planned orbit is a sun-synchronous one at 700 kms. which will provide a maximum pass time of 14 minutes. This type of orbit means that the spacecraft will be overhead at the same time each day; around 0900 and 2100. The period should be about 98.8 mins. and the planned working life is three years. If successfully launched, the spacecraft will be known as *UOSAT-2,* the present *A-O-9* being re-identified as UOSAT-1.

UOSAT-B is slightly smaller than *UOSAT-1,* weighing 60 kgs. 35 of the 36 PCBs are completely new. Attitude and stabilisation will be controlled by three magnetorquers for spin-axis and spin-plane control. Low-cost sun-angle and earth-horizon sensors are incorporated, plus an improved navigational magnetometer. All this should make it much easier to control than *UOSAT-1.*

The scientific and educational experiments comprise:— a particle-wave experiment using three *Geiger* counters for magnetospheric studies; an earth imaging experiment using an improved charge-coupled device. The CCD "camera" will see an area of 1,600 × 1,600 kms. to a resolution of about 2 kms. The stored images will be transmitted to earth, the idea being to decode and display the pictures on a domestic TV set. Another speech synthesiser will be carried with a greater vocabulary that the very successful *Digitalker* in *UOSAT-1.*

AMSAT-USA and *AMSAT-Canada* are providing a digital communications

experiment (DCE) better known as *Packet Radio*. This system would allow an amateur radio operator to load a message into the spacecraft's 96k-byte RAM, addressed to a particular station anywhere in the world, for subsequent retrieval. This experiment is primarily designed to test the reliability of solid-state memory devices in space conditions.

A space dust experiment will be carried, using technology developed for the *Giotto Halley* mission. This is to detect and measure the presence of cosmic dust particles and man-made space debris from rockets, in low earth orbit. There is an operational 2.4 GHz beacon to carry telemetry and experimental data as a prime downlink. *NASA* is providing a free launch opportunity for what is scheduled to be the last *Delta* mission planned for a polar orbit.

The Russian satellites have been on a restricted schedule recently because there were in the earth's shadow much of the time. However, by Jan. 31, all should be out of this shadow so normal operation on a daily — except Wednesday — basis should be possible, once again.

As for *Oscar-10* only Adrian Chamberlain, G4ROA, mentions this satellite and was looking forward to the low pass on Jan. 5. In mid-December, when such a pass occurred, he worked many Californian stations. Ron Broadbent, G3AAJ, reports various difficulties in providing a reliable satellite news bulletin service. The Sunday broadcasts on 145.972 MHz are not always received very well. The main problems are getting enough input to the 435 MHz receiver when other high power stations are using the Mode B transponder, and deliberate interference on the uplink. For example, the Sunday morning transmission on Jan. 8 was marred by a strong German station working a Frenchman, neither of whom would move when asked.

DX-Pedition

Operation again from Iceland on 2m. is planned by Johannes Baardsen, LA6HL, according to information *via* Walt Davidson, GW3NYY. LA6HL/TF should be there from July 26 through Aug. 16 for MS work, taking in the *Perseids* shower. Skeds can be arranged by letter to QTHR, or *via* the 20m. VHF net. Johannes also uses the *O-10* satellite and plans to be QRV from the Faroes, OY, on Aug. 17-19 on the satellite only.

It would be appreciated if others planning trips to rare places for VHF/UHF activity would send details in good time for the widest publicity.

Six Metres

The Department of Trade and Industry has agreed to the granting of more 50 MHz transmitting permits to bring the total up to 100. The *DTI* has asked the *RSGB* to make recommendations on this matter. Those Class A licensees genuinely interested in this experiment should write to the Society's VHF Manager Keith Fisher, G3WSN, for a questionnaire, at *RSGB* HQ, marking the envelope, "The Secretary — 50 MHz." However, those who applied before, but who were unlucky, need only write to confirm that they are still interested. Closing date for the receipt of completed questionnaires is March 31. Following that date, the *RSGB* will make recommendations to the *DTI* which will select the 60 new stations.

The only reader reporting on 6m. is Dave Sellars, G3PBV, (Devon) who has a dipole antenna to which a reflector will be added later. He has heard G4IJE and G3OHH on MS on Jan. 1. G3NOX is heard quite regularly. Crossband QSOs have been made with GJ3YHU and GJ3RAX with Dave using 2m. and 70cm. respectively. On one QSO, while the 6m. signal was subject to slow and deep QSB, the 70cm. signal was steady.

Four Metres

Only one report this time, from G3UVR (Merseyside). Denis did not expect to add to his 1983 score but, when he got home on Dec. 30 at 1800, an *Aurora* was in progress. He contacted GM3JFG on 2m. and asked Iain to QSY to 4m. where they managed a QSO for a new square, XR, and region. G3UVR uses a home built, all-valve transverter with a QQV06-40A PA running 50w. This is driven by a *Heathkit* SB-301/SB/401 combination on 28 MHz, the antenna being a 4-ele. *Jaybeam*.

Two Metres

Two reliable meteor showers occurred in the period covered this month. In mid-December there was the *Geminids* which John Hunter, G3IMV, (Bucks.) found poor during the morning hours, but better in the late evenings. On the 13th, skeds with OH7PS (OX), UA3IDQ (QQ) and OH7UV/8 (NY) brought nothing, but one with SM1GFX (HP) on SSB was completed. On the 14th, nil from OH7UE (OW) but John completed in under 30 mins. with EA3IH (BB) at 2100. In the *Quadrantids*, he found reflections very poor. On Jan. 3, from 1000, he got three bursts from OH6CH (NV) who then disappeared, but again nil from OH7UE and OH7PS. Midday was supposed to be good in the NE/SW path but proved to be quite poor. From IN3TWX (FG) on SSB, nothing received, while from IW2BNA (EF), lots of pings but no bursts. The

ANNUAL VHF/UHF TABLE

Final Placings at December 31, 1983

Station	FOUR METRES Counties	FOUR METRES Countries	TWO METRES Counties	TWO METRES Countries	70 CENTIMETRES Counties	70 CENTIMETRES Countries	23 CENTIMETRES Counties	23 CENTIMETRES Countries	TOTAL Points
G3UVR	61	7	90	26	67	18	*30*	*7*	269
G8TFI	—	—	68	19	69	21	46	16	239
G4FRE	40	6	58	16	60	20	*34*	*9*	200
G8FMK	—	—	64	14	54	12	41	10	195
G3PBV	*3*	*1*	56	24	51	18	33	9	191
G6DER	—	—	64	20	56	17	23	5	185
G8PNN	—	—	62	16	48	12	29	9	176
G3BW	42	6	57	21	37	6	*5*	*4*	169
GD2HDZ	42	5	56	13	39	12	*4*	*4*	167
G8OPR	—	—	69	20	62	15	—	—	166
G2AXI	34	6	58	14	38	9	*6*	*2*	159
G8ULU	—	—	51	22	39	14	23	10	159
G4STO	—	—	55	17	40	8	28	8	156
G4ROA	—	—	50	11	42	11	29	9	152
G4MUT	30	4	53	17	32	10	—	—	146
G8HHI	—	—	47	17	41	13	18	7	143
GW3CBY	25	7	56	15	26	10	*6*	*4*	139
G4ARI	28	2	85	20	1	1	—	—	137
GW8UCQ	—	—	61	18	42	14	—	—	135
G8KAX	—	—	34	11	35	8	36	10	134
G4NBS	*12*	*1*	54	12	38	13	15	2	134
G6HRI	—	—	69	13	42	10	—	—	134
G4FRX	—	—	59	19	33	11	—	—	122
G6PFR	—	—	64	15	32	9	—	—	120
G6ECM	—	—	81	33	—	—	—	—	114
G4DEZ	—	—	81	27	—	—	—	—	108
GW4TTU	—	—	75	29	1	1	—	—	106
G3FPK	—	—	81	21	—	—	—	—	102
G3FIJ	17	1	39	10	18	2	—	—	87
G6TTU	—	—	66	16	—	—	—	—	82
G6CSY	—	—	10	5	23	8	30	4	80
G8VFV	—	—	55	18	—	—	—	—	73
G8RWG	—	—	59	14	—	—	—	—	73
G8XTJ	—	—	56	15	—	—	—	—	71
G6HDD	—	—	56	13	—	—	—	—	69
G4BVY	—	—	—	—	45	17	—	—	62
G8KMT	—	—	47	12	—	—	—	—	59
G4NRG	4	1	29	12	8	4	—	—	58
GU4HUY	—	—	42	12	—	—	—	—	54
GM4CXP	2	1	26	15	6	3	—	—	53
GW4HBX	36	6	2	2	—	—	—	—	46
G4FKI	7	1	20	2	1	1	—	—	32
G2DHV	5	1	7	2	5	1	—	—	21

Three bands only count for points. Non-scoring figures in italics.

TWO METRES ANNUAL TABLE

Final Placings at December 31, 1983

Station	Counties	Countries	Total
G3UVR	90	26	116
G6ECM	81	33	114
G4DEZ	81	27	108
G4ARI	85	20	105
GW4TTU	75	29	104
G3FPK	81	21	102
G8OPR	69	20	89
G8TFI	68	19	87
G6DER	64	20	84
G6TTU	66	16	82
G6HRI	69	13	82
G3PBV	56	24	80
GW8UCQ	61	18	79
G6PFR	64	15	79
G3BW	57	21	78
G4FRX	59	19	78
G8PNN	62	16	78
G8FMK	64	14	78
G4FRE	58	16	74
G8ULU	51	22	73
G8VFV	55	18	73
G8RWG	59	14	73
G4STO	55	17	72
G2AXI	58	14	72
GW3CBY	56	15	71
G8XTJ	56	15	71
G4MUT	53	17	70
GD2HDZ	56	13	69
G6HDD	56	13	69
G4NBS	54	12	66
G8HHI	47	17	64
G4ROA	50	11	61
G8KMT	47	12	59
GU4HUY	42	12	54
G3FIJ	39	10	49
G8KAX	34	11	45
GM4CXP	26	15	41
G4NRG	29	12	41
G4FKI	20	2	22
G6CSY	10	5	15
G2DHV	7	2	9
GW4HBX	2	2	4

FOUR METRES ANNUAL TABLE

Final Placings at December 31, 1983

Station	Counties	Countries	Total
G3UVR	61	7	68
G3BW	42	6	48
GD2HDZ	42	5	47
G4FRE	40	6	46
GW4HBX	36	6	42
G2AXI	34	6	40
G4MUT	30	4	34
GW3CBY	25	7	32
G4ARI	28	2	30
G3FIJ	17	1	18
G4NBS	12	1	13
G4FKI	7	1	8
G2DHV	5	1	6
G4NRG	4	1	5
G3PBV	3	1	4
GM4CXP	2	1	3

shower peaked around 01-02 GMT on the 4th.

G3IMV was on in the *Ar* of Dec. 10 and worked LAs in ES and FT, and SMs in HT and JT. RQ2GAG was heard. Another event next day produced only a few GIs and GMs. On tropo, John worked EB1MS/P (XC01b) on SSB for a new square on Dec. 31. A QSL from EB7MF for an earlier *Es* contact confirmed XW square.

G3PBV reports an *Ar* on Dec. 9 at 1741 but only a few weak GMs heard. Dave did not get on till 1430 on Dec. 31 and called EB1MS/P in vain. By this time, José's signals were fading. Later in the evening, strong signals were heard from AD square though, and at G3FPK, EB1AVV (YD42f) was loud just before midnight. At 0020 on Dec. 30, G3UVR heard EI5BOB/M calling "CQ" and turned out to be in Co. Laoighis (Leix?). At 0035 on New Year's Day, HB9HB was S3, but half an hour's "CQ-ing" on CW brought nothing, by which time the beacon had faded out.

Peter Atkins, G4DOL, has two 9-ele. *Yagis* with 1.8 dB feeder loss. Even so, in the second part of the *E-M-E* Contest on Nov. 26, he copied 14 seconds of CW from K9HMB at 1245. These were the first signals he has heard *via* the Moon. More conventionally, Peter reports tropo QSOs on SSB on Dec. 4 with OZ1HXL and OZ6OL in FP; SM7IZA and OZ1RH in GP; SM7ASN (GQ); SM7IPZ (HQ); DG1YCL (EM) and SM7MRJ (GP) who handed out an S9-plus-20 dB. report.

Martin, G4HFO, and Julian, G4TJX, Blyth, (Cornwall) wrote to update their scores, the latter picking up F1SA (CI) for a new square on Dec. 28/29. Ken Osborne, G4IGO, (Somerset) has started square hunting again from his new QTH from the end of November, with QRP and a low antenna. In his letter, he has typed CW QSOs in red and SSB ones in black, which is much appreciated by your scribe. On Dec. 3, he lists tropo SSB QSOs with DL2LAH (EO); F1CYB (BH); DF2ZC (EO) and DC2BV/P (DM), with SM7WT (GP) on the key. The following day brought LX1JA (CJ); DG5BO (EM); SM7LXV (GP); SM7MBH (HP) and DH2LAJ (EN) on SSB, with CW yielding OZ1FOW (GO) and OZ1CLL (GP). The *Ar* on the 10th was at QTE 10° from 1650-1810 with GMs and GIs heard. On the 11th, the *Ar* was from 1420-1457 in which GM4CXM (XP) and GM4IAO (YR) were worked on CW. Ken took advantage of the Dec. 28/29 tropo and worked LX1JX (DK) and G4FDX/LX (CJ) plus assorted Fs and Ds in a mix of CW and SSB.

Nick Peckett, G4KUX, (Co. Durham) now has four 19-ele. *Yagis* which are naturally very sharp. One effect has been the different areas that he can now pick out in an *Aurora,* whereas before this was not noticed. For example, on Dec. 10, the SM1, SM4 and SM5 stations were at QTE 30° and the UAs at 40°. On the 18th, he worked OY9JD, and some GM, and LA stations. Mick Cuckoo, G6ECM, (Kent) exchanged RS59 reports with EA1OD (XD) at 1710 on Dec. 1. On the 3rd, he worked SM5CNQ (HS); SM6KEG (GR) and SM7OBV and SM7WW in GP. The next day, Mick worked 19 OZs, assorted SMs in FR, GP, HQ and JR, and SP5TPT in KM65j for a new country and square. Y22HA (GO) and Y37WB/P (FN) rounded off this excellent tropo period. In the *Ar* on the 10th, he contacted GM4ENZ (ZR51g).

Richard Mason, G6HKS, (Cambs.) was on for the end-of-year tropo and on the 27th, worked Fs in BH, ZF and ZG, plus F6IPG (YH) for a new square. F6DKQ (DH) was contacted on the 29th, but the best day was the 31st when the openings seemed very selective. He lists EA1TA (VD); EB1MS/P; F6FPQ (ZE); F1FFP (BE); F1FIC, F1HI and F1EHT in AD, F1GTU (AF) and the last QSO of 1983, EB1AVV. The AD stations were weak and watery and inaudible in ZM square according to G4DHF and G4LOH. In the *Quadrantids,* he did not complete with YU7AU (KE) and heard nothing from DG5CH, but thinks he worked IK4DCO on random SSB MS. OE6NVG (HG29b) was worked on 23 mins. with 36 and 26 reports, but the best QSO took just 75 seconds with OE1APS (II63g). Richard was using 80w to a 16-ele. beam. He says G8XVJ heard RA3RKO "reasonably consistently" on the random SSB QRG.

Gordon Emmerson, G8PNN, found conditions from Northumberland in the Dec. 4 Fixed Contest average and he added Avon and Central Region for his 1983 score. Neil Clarke, G8VFV, (W. Yorks.) sent in his final score which was down on 1982 due to lack of *Auroral* activity; only Strathclyde and Grampian Regions were worked, north of the border.

John Fitzgerald, G8XTJ, (Bucks.) is satisfied with his "best so far" results on the band and reckons it will be difficult to improve upon with his present level of activity and without better antennas. Three new ones were netted in the Dec. 28-30 period; EB1AVV and F1AIW (AH) on the 28th, and F6DKQ (DH) the next day. John heard hordes of F, D, ON and PA stations but nothing further east than EM square. Normally under such conditions, he finds CQ calls go unheeded but this time, DX stations *did* come back.

Derrick Dance, GM4CXP (Borders) has not been very active in 1983 but has now renovated his antennas for various bands and hopes to be more active this year.

Walt Davidson, GW3NYY, (Swansea) has been active on *E-M-E,* tropo, MS and *Ar* modes. For *E-M-E* he put up four, 14-ele. *Cushcraft Yagis* for the second leg of the *ARRL* Contest on Nov. 26/27. However, that weekend saw the worst gales in the four years at his QTH and at 2 a.m. on the Saturday and Sunday mornings, he was out in a sea of mud and driving rain struggling to lash down this array. Azimuth and elevation control were by the legendary "Armstrong Method". The feeder was ten metres of *LDF4-50* to a *Tonna* four-way power splitter, with a BF981 preamplifier in the shack. Some 14 stations were heard and positively identified:—I2ODI, SM2GGF, SM7BAE, VE2DFO, VE7BQH, WA4NJP, WA4LYS, W5LUU, W5UN, WA1JXN/7, W4WD/7, KB8RQ, K9HMB and KX0O. The sky was completely overcast, so Walt relied on his computer program which worked perfectly.

GW3NYY took advantage of a tropo opening to Spain on Dec. 1/2 and on RTTY, contacted EA1QJ (VD). SSB brought EA1s NU and OD (XD) and EB1MS/P (XC). Numerous Fs were also worked and, on the 3rd, F1BRV (BG) was a new square. On the 4th another four EA1s, all in VD square, were worked. In

23 CENTIMETRES ANNUAL TABLE

Final Placings at December 31, 1983

Station	Counties	Countries	Total
G8TF1	46	16	62
G8FMK	41	10	51
G8KAX	36	10	46
G4FRE	34	9	43
G3PBV	33	9	42
G4ROA	29	9	38
G8PNN	29	9	38
G3UVR	30	7	37
G4STO	28	8	36
G6CSY	30	4	34
G8ULU	23	10	33
G6DER	23	5	28
G8HHI	18	7	25
G4NBS	15	2	17
GW3CBY	6	4	10
G3BW	5	4	9
GD2HDZ	4	4	8
G2AXI	6	2	8

70 CENTIMETRES ANNUAL TABLE

Final Placings at December 31, 1983

Station	Counties	Countries	Total
G8TF1	69	21	90
G3UVR	67	18	85
G4FRE	60	20	80
G8OPR	62	15	77
G6DER	56	17	73
G3PBV	51	18	69
G8FMK	54	12	66
G4BVY	45	17	62
G8PNN	48	12	60
GW8UCQ	42	14	56
G8HHI	41	13	54
G8ULU	39	14	53
G4ROA	42	11	53
G6HRI	42	10	52
G4NBS	38	13	51
GD2HDZ	39	12	51
G4STO	40	8	48
G2AXI	38	9	47
G4FRX	33	11	44
G8KAX	35	8	43
G3BW	37	6	43
G4MUT	32	10	42
G6PFR	32	9	41
GW3CBY	26	10	36
G6CSY	23	8	31
G3FIJ	18	2	20
G4NRG	8	4	12
GM4CXP	6	3	9
G2DHV	5	1	6
G4ARI	1	1	2
G4FKI	1	1	2
GW4TTU	1	1	2

the Dec. 28/29 period, he too found great activity, with some colossally strong signals from the Paris area and DK and DL squares, but nothing heard beyond the "D" squares. Of some 40 stations contacted, best DX were F0CZG (DG72e) near Geneva, and LX1JA (CJ).

In the *Geminids,* Walt had nine complete QSOs. On the 11th, OK1OA (HK) on random CW; on the 13th, CW skeds with SP6AZT (IL), SP6ASD (HL) and SM3JAW (JX) a new sq. The 14th brought a CW sked with YU7MAU (JF) and the rest were on random SSB with YU3FM (HG), I1ANP (EE), I1KTC (EF) and I4YNO (FE). Nil from skeds with YO7VS, OH6NU and OH3MF and Walt describes the shower last year as "decidedly unspectacular." Reflexions were poor apart from a very pronounced peak between 0330 and 0600 on the 14th. The *Quadrantids* shower was just starting when Walt wrote and was "not impressive", up to then. A brief *Aurora* on Dec. 10 brought some GMs, and SMs in HT and JT.

Reg Woolley, GW8VHI, (W. Glam.) thought the *Geminids* were very poor and none of his skeds were completed. However, he has some tropo successes with several EA1s on Dec. 1, 2 and 4. On the 28th and 29th, he lists Fs in various DX-ey squares and on the 31st, at 0022, EI9FE (VM39d) at S9. He then worked EA1TA again who said he had now worked over one thousand U.K. stations. Reg mentions he would like to try some back scatter MS tests with U.K. stations. His station is a *Trio* TS-770E and 4CX350 amplifier. The *muTek* MGF1402 preamp. is used and the antenna is a 9-ele. *Tonna Yagi.*

Seventy Centimetres

Claus Neie, DL7QY, (FJ61e) was QRV for the opening to western France and central/northern England on Dec. 29/30. He worked G8ECI (AN), G8SMQ (AM), G6RJJ (ZN), G3WZT (ZK), G4RXR (ZO) and G4ERX (AL). The contact with G3WZT was most odd as Claus had to beam at 320°, *i.e.* towards northern Scotland. The great circle azimuth, just north of west, produced nothing at all. Wonder if G3WZT noted any anomaly from his end?

G3PBV listened in this period too but did not hear anything beyond the "E" line of squares. The FX4UHF beacon in ZD square was heard but there did not appear to be any other activity that way on the 31st. On the 29th, G3UVR contacted GU2FRO on Sark on SSB for county no. 67 in 1983. Denis's 70cm set up is a home built transverter and *Microwave Modules* 20w amplifier, the prime mover being a *Kenwood* TS-430S on 28 MHz. The antenna is a 21-ele. *Tonna Yagi.*

From Cornwall, the G4HFO/G4TJX team worked F6HEO (BG06b) to fill in a gap in the French squares map, leaving just the most southerly, Mediterranean ones to seek. G4HFO got PE1JIZ/A (CM56j) but he faded out before G4TJX could get at the microphone. Due to rising terrain, they have difficulty working stations any more than slightly north of east. To illustrate this, the first solid contact with a station in ZL square was on the Dec. 28/29 lift with G1AWD (ZL45e). Also worked was G4LOJ (AM37c). G4ROA reports much activity on Dec. 29, but nothing new. Adrian worked the special station DL5WCY (DK) and there were many of these *World Communications Year* stations on every band, from 80m. up.

Andy Renouf, GJ8SBT, took part in the Dec. 28/29 lift and worked several German stations to bring his squares total to 35. GW8VHI is up to 30 squares and worked some EA1s on Dec. 1 and 2 in XD and VD squares. A four-way contact with EA1ED, EA1QJ and EA1TA produced an S9-plus-30 dB signal from 'ED from 2025 on the 2nd. Later he and Reg tried FM on 432.5 MHz and Reg was still readable at S1 just using 100 milliwatts to a 19-ele. *Yagi.* Was this a first GW/EA FM QSO on the band? ON5NY (BK05d) was Reg's first Belgian QSO on the 2nd. On the 28/29 Dec. GW8VHI worked F1GTR and F6CCH in ZG, F5NS/P (ZJ) for a new square, and GU2FRO on Sark for a new county.

Microwaves

Chris Bartram, G4DGU, is now listening off the Moon on 23cm. with satisfying results. He has a 12ft. dish but will not use it until the better weather comes; it should give about 31 dB gain. DL7QY only worked one G station on 23cm. on Dec. 29/30: G8ECI (AN), but Claus contacted lots of PAs in CL and CM, and F6DZK (AI) who was S9-plus-30 dB. On Dec. 28, G3PBV heard a "beacon" F9YD in ZH36d at about 1,296.64 MHz. It had a considerable chirp and drifted a few kHz HF in the day. Dave worked GJ8SBT at last, and F1FHI. The next day, 23cm. propagation was better to the east and GB3BPO was S9 and ON5SHF was quite loud. The only QSOs were with DK5IE (EJ), DJ6GQ (EI) and PE1HQO (DN), EJ and DN being new squares.

G3UVR worked his first ON on 23cm. on the 29th, ON6OO, and ON1JE (BL) was a new square. Denis's set up is a *MM* "old type" one watt transverter, urged by the *TS-430S* and home built 28/144 MHz converter. XK is a rare square on 23cm. as G4HFO and G4TJX realise, since they are always being asked if they are QRV on the band. So they reckon they must do something about it this year.

G4ROA found 23cm. signals good on Dec. 29, but not as good as in the early December opening. GJ8SBT, and G3OBD in Dorset were worked, so Adrian reckons the new H-100 *Pope* cable is paying dividends. G8PNN enjoyed the Dec. 2 lift on 23cm. and contacted G4NQC (London), G3XDY (Suffolk) and G3TDG (Kent) plus others in Humberside, N. Yorks. and Cleveland.

GJ8SBT found conditions excellent on 23cm. on Dec. 28/29, 80% of his QSOs being made directly, rather than from 70cm. 13 stations were worked, best being DK5IE, DJ6GQ, LX2RV (DJ) a GJ/LX "first", G3ZYC (ZN) and G4ROA (ZM). Ducting was very selective, though. GW8VHI mentioned that the EA1s in VD square are contemplating 23cm. activity, which should prove very popular.

Deadlines

It would be appreciated if readers would date their letters. Most do, but some forget so occasionally it can be a little confusing. The next deadline is **very early — Feb. 1** — so please make a note in your dairies. The following month it will be March 7 in time for your reports on the 144/432 MHz contest on Mar. 3/4. As usual, everything to:— "VHF Bands," SHORT WAVE MAGAZINE, 34 High Street, WELWYN, Herts., AL6 9EQ. *73 de G3FPK.*

TRAPS AND TRAPPED ANTENNAS FOR THE HOME CONSTRUCTOR, PART 1

ALL YOU NEED TO KNOW!

A. P. ASHTON, G3XAP

Introduction

ON the bands from 1.8 to 28 MHZ, it is probably true to say that the vast majority of antennas used by radio amateurs employ one or more traps. It is probably also true to say that the vast majority of these trapped antennas are commercially produced devices, and even those antennas which are home constructed probably employ commercially produced traps. The number of antennas in use that are both home-made *and* use home-made traps is very, very small indeed.

In his series "Antennas—the Weak Link",[1] the author made reference to home-made 7 MHz traps for incorporation into dipoles and multi-band inverted-L antennas, and the response he received from readers suggested that there was interest in the idea of both home-made traps and trapped antenna, but that more detailed information was probably required before the 'average' amateur could be persuaded to "give it a try".

There are two distinct reasons why the author would advocate home construction in these areas of amateur radio—one being the high cost of commercially produced traps and trapped antennas, and the other being the sense of satisfaction that results from home-brewing any part of the amateur radio station—plus the increased knowledge that the exercise invariably engenders.

Regarding the cost of commercially produced units, the author does not mean to imply that manufacturers and retailers are charging exhorbitant prices for their products, simply that the total cost of any product must include such items as development costs, manufacturers' and retailers' profit margins, distribution and packaging costs, etc., in addition to the more obvious charges such as labour and materials. The real saving for the home-brewer results from the fact that his cost is almost solely for materials, and in the case of both traps and antennas, this is a very small proportion of the total. Any amateur (or SWL) who has constructed a piece of equipment in use in his station will know both how satisfying it is to use that item and how his knowledge was increased as a result of constructing it. We live today in a "consumer world" in which we are more and more conditioned into a state of mind that expects to acquire everything in a ready-to-go state, and as a consequence we lose our ability to do things for ourselves; and, more important, we progressively understand less and less about the numerous pieces of equipment that we use, both at work and in the home. The state of the art in electronics is such that items like transceivers are becoming increasingly complex, and the author would not suggest that we should all build our own; but ancillary equipment such as test gear and antennas are well within the capabilities of most of us and this, perhaps, is the province of the modern "home-brewer".

There is a natural feeling that the home construction item will be in some way inferior to its commercially produced counterpart, but in actual fact an HF antenna will certainly be its equal and, as will be discussed later, can be made to operate in a more efficient manner. However, in order to achieve this equality (or superiority), the constructor must understand his subject, and this series of articles attempts to impart the necessary knowledge in order that the reader can meet this aim.

Trap Theory

There are two ways in which an inductor and a capacitor can be connected together to form a resonant circuit, *i.e.* in series or in parallel. Fig. 1 shows the two configurations, plus the impedance of the circuits at frequencies at and near to their resonant frequencies. It will be noted that the series resonant circuit displays a low impedance to energy at its resonant frequency, and high impedance at all other frequencies, whilst the parallel resonant circuit acts in the opposite manner, displaying a high impedance at its resonant frequency. Hence the series circuit acts as an "acceptor" circuit, and the parallel circuit as a "rejector", and it is this property of the latter device to reject energy at a specific frequency that is made use of in the construction of trapped antennas.

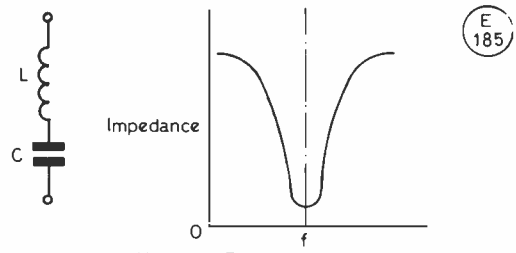


Fig. 1a SERIES RESONANT CIRCUIT

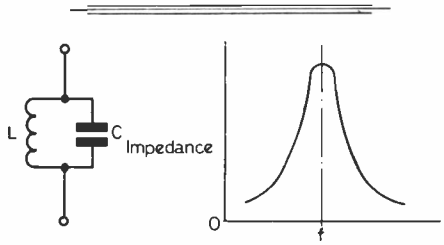


Fig. 1b PARALLEL RESONANT CIRCUIT

Right from the outset it must be appreciated that there is no such thing as a perfect trap, and not only will a parallel resonant circuit permit the passage of some energy at its resonant frequency, but it will also attenuate energy at all other frequencies. It is the degree to which a trap displays these two unwanted properties that determines it quality or efficiency, and hence its effectiveness when incorporated into an antenna. The trap properties that affect performance are the Q of the coil used and the quality of the capacitor. Provided that either mica or ceramic capacitors are used, and that their voltage handling capability is sufficiently high, capacitor losses will be acceptably low. In the case of coaxial traps (which will be discussed later) the dielectric material untilised is important, and high losses can result if care is not taken. The major trap losses come, in fact, from the coil itself and a high Q must be aimed for if an efficient device is to be produced. The properties required to produce a coil of high Q are:

(a) A high ratio of coil diameter to coil length.

(b) A coil former that is not "lossy"—*i.e.* it should not absorb RF energy, neither should it conduct.

(c) As far as possible no metal should be positioned within the field of the coil.

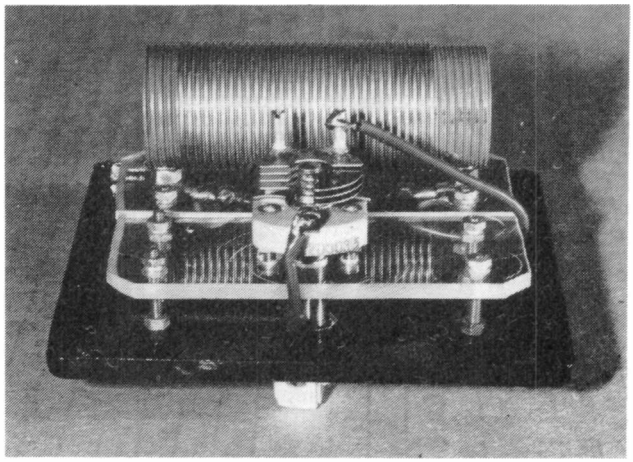


Fig. 2(a). The G3XAP Capacitor Comparator — internal view.

(d) As large a diameter wire as possible should be used, (within the limitations of the overall coil dimensions, of course).
(e) Coil turns should be spaced at least one wire diameter apart.

Suggested dimensions and materials for trap coils will be given later, but it is important to realise that major departures from the information quoted can lead to inefficient trap action. The effect of a low Q coil is that it will tend to act as an RF choke at frequencies at which a very low attenuation is required, leading to reduction in both transmitted and received signal strengths and the generation of heat during transmission which can lead to distortion of the trap—especially if a plastic coil former is employed.

At frequencies other that the resonant frequency we have seen that the parallel resonant circuit will offer a low impedance to RF energy, but it should be appreciated that under this condition the device will display reactance. This reactance will 'load' the antenna, the actual loading experienced depending on the frequency to which the circuit is subjected. If the frequency of operation is lower that the trap's resonant frequency, the loading will be inductive—*i.e.* the trap will act purely as an inductor. Conversely, at frequencies higher than the resonant frequency, the trap will act as a capacitor. The actual value of reactance also varies with frequency; hence if we subject a 7 MHz trap to 14 MHz energy it will display capacitive reactance, while at 21 MHz it will also display capacitive but to a different degree. The loading effect of traps at frequencies other than their resonant frequency has great importance in determining the physical size of trapped antennas and is an important concept to grasp.

Obviously, the resonant frequency of the parallel resonant circuit is determined by the actual values of inductance and capacitance used in its construction, the relationship between these values being as per the formula:-

$$f = \frac{1}{2\pi LC}$$

where: f = frequency (Hz)
L = inductance (Henrys)
C = capacitance (Farads)

It is obvious that there are an infinite number of combinations of values of L and C which will resonate to any given frequency, so it is equally obvious that if we have two traps at, say, 7 MHz, each having been made by a different manufacturer (although they may have identical resonant frequencies), the actual values of inductance and capacitance used in the two devices could be very different.

Let us assume that we have two such traps and that one has components of 120pF and 12.7μH, whilst the other has values of 40pF and 12.7μH. Reference to the above formula shows that both devices resonate at 7.05 MHz, but it is clear that if the two traps were subjected to RF energy at other frequencies, the reactance displayed by them would be very significantly different—with the result that they would load an antenna by very different degrees. The significance of this fact is two-fold; firstly, it is not possible to quote trapped antenna dimensions by reference simply to the resonant frequency of the trap(s) employed and, secondly, that if the antenna is of the dipole type (and this includes Yagis), it is important that the pairs of traps employed are as near identical as possible.

Some years ago the author had a frustrating experience with a 5-band trapped dipole antenna, on which it was found that after resonating the 7 MHz portion of the device, there were two resonant frequencies on or close to each of the 3.5, 14, 21 and 28 MHz bands. Both traps (commercially produced) were found to be resonant at the same frequency (about 7.15 MHz), and it was soon established that both halves of the dipole were identical physically. It was not until the traps were taken apart and the components compared that it was realised that one coil had two more turns than the other. Subsequently measurement of the values of the capacitors employed showed that although they were marked "60pF ± 20%", their measured values were 55pF and 69pF—both well within specification but significantly different!! The manufacturer (who shall remain nameless) either had not realised the degree of mismatch, or did not appreciate its significance—or had ignored it. More recent examination of pairs of traps has shown that such discrepancies still occur, although none have been as poor as the example quoted above.

Trap Matching

The author works on the basis that if the capacitors in a pair of traps are identical and the traps are resonated at the same frequency, then the inductances will be identical also, and to this end he matches capacitors to within 0.2pF before incorporation into a pair of traps, this matching being by comparison of capacitance rather than by measurement of the actual capacitor values. In order to carry out this matching, a capacitor comparator was devised which is depicted in the photographs (Figs. 2a and 2b) and also in the diagram (Fig. 3). It will be seen that the device consists of a coil plus variable capacitor in parallel, these components also being in parallel with a socket into which the capacitor under test is fastened. For use at, say, 7 MHz, the coil dimensions are such that the test capacitor plus the coil will

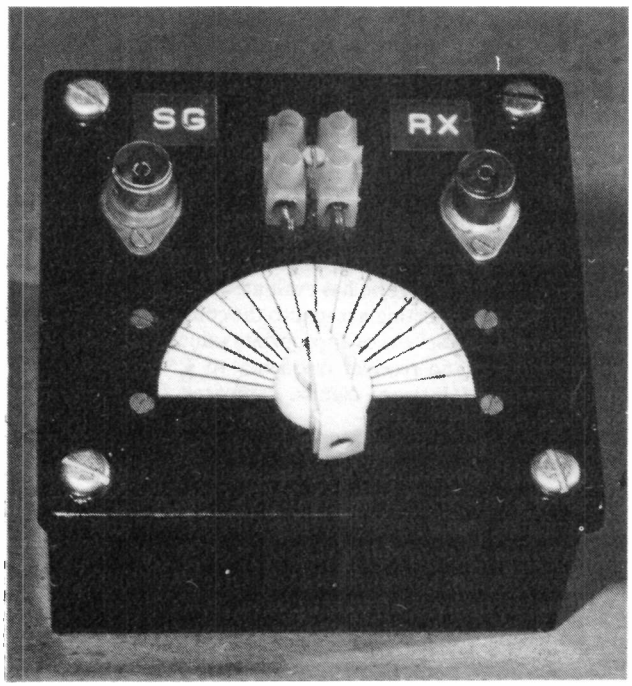


Fig. 2(b). An external view of the G3XAP Capacitor Comparator.

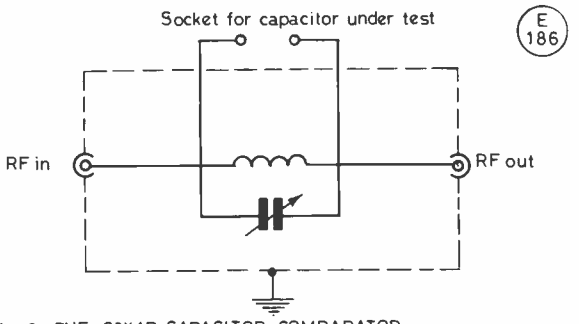


Fig. 3 THE G3XAP CAPACITOR COMPARATOR

resonate at a frequency somewhat higher than 7 MHz so that adjustment of the variable capacitor will enable the resonant frequency of the three components together to be varied through 7 MHz.

The device is set up as in the diagram (Fig. 4), a test capacitor is inserted in the test socket and the frequencies of the signal generator and the receiver are adjusted until the generator's output is heard on the receiver. The output of the generator is attenuated in level to give a reading of the receiver's 'S' meter of about S9, and the variable capacitor in the comparator is adjusted to give a null in 'S' meter reading. The scale on the variable capacitor is read, the value noted and the procedure repeated for all the capacitors available, again noting the capacitor value required to give a null on the 'S' meter. It should be possible to pick a pair of capacitors of practically identical value for incorporation into a pair of traps. Further description of the device should be unnecessary, but for anyone wishing to duplicate the device for capacitor matching, the following points may prove helpful.

1. The components and wiring must be extremely rigid, and a substantial steel box is probably mandatory.

2. The author measured the actual value of capacitance of his variable device and the scale on his model is calibrated in pF, enabling differences in capacitance to be expressed as actual values.

3. The variable capacitor should be a 360° rotation (no-stop) device as this will prevent the knob being inadvertently rotated on the spindle when the end stop is reached—this would lead to erroneous results!

4. The chocolate-block type connector was found to make the best test sockets since it permits capacitors to be rigidly clamped in a very reproducible manner.

5. Obviously, the signal generator and receiver's frequencies should not vary during any set of comparisons!

At G3XAP capacitors are obtained in large batches (50+), compared on the comparator and "grouped" into pairs whose values differ by 0.2pF or less—this is considered to be adequate and in any case is as good as, or better than, any of the many pairs of commercial traps that he has evaluated.

Note that by connecting a trap into the comparator, in parallel with additional capacitors of appropriate value, and changing the signal generator and receiver frequency to 3.5 MHz, a pair of ready-made 7 MHz traps can be compared for the value of capacitance to resonate them at 3.5 MHz (or any frequency below identical, they will require the addition of equal values of capacitance to resonate them at 3.5 MHz (or any frequency below 7 MHz for that matter). Consider an example of two 7 MHz traps with capacitors of 50pF and 47pF and corresponding inductances of 10.34 and 11.00μzH; from the formula for resonance quoted earlier it is possible to calculate that the traps would require additional values of 150pF and 141pF respectively in order to resonate them at 3.5 MHz.

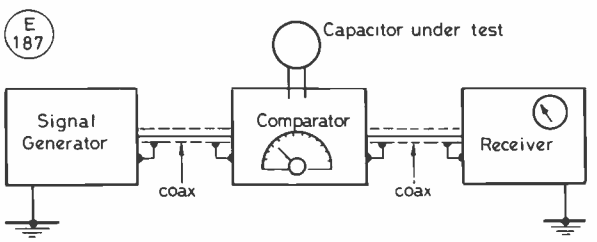


Fig. 4 TEST SET-UP FOR USING THE CAPACITOR COMPARATOR

Trap Losses

Brief mention was made above to trap losses, and it must be realised that the "trapping" method of obtaining multiband operation from an antenna is a compromise, and that the antenna must be inferior to a monoband device. One of the severest critics of the trap method is Les Moxon, G6XN[2] and the author must agree with his comments—however, the desire to work several bands with one antenna and one feeder remains a powerful attraction for many within our ranks and, provided that power loss is understood and accepted by the user, the use of traps is deemed to be justified. In any case, the author has carried out comparisons between a trapped 80/40 metre dipole and separate full-sized dipoles for each band and was unable to detect significant differences in received field strengths over a fairly lengthy period of investigation. Comparisons of a three band 20/15/10 metre dipole however, did yield differences compared with full-sized dipoles—on 10 metres differences were negligible but even on 15 and 20 metres differences were only of the order of 2dB or so. This latter test was with dipoles constructed of tubing—the multiband device being the driven element of a triband trapped Yagi constructed by the author.

Freq MHz	Capacitor pF	Inductance H	Coil diameter Inches	No. of turns	Approx wire length ft/ins
7	47	10·8	1·625	20	9′ 0″
10	47	5·3	1·625	12	5′ 6″
14	22	5·7	1·000	25	7′ 0″
18	22	3·5	1·000	16	4′ 6″
21	22	2·6	1·000	13	4′ 0″
24	22	1·9	1·000	10	3′ 0″
28	22	1·4	1·000	8	2′ 6″

Fig. 5 Dimensions for Discrete Component Traps. All coils wound at 11 turns per inch with 16 swg tinned copper wire (see text). E 188

Types of Trap

There are basically two types of trap; the type using a coil plus capacitor as discussed earlier, and the coaxial trap which still uses a coil, but uses the capacitance that exists between two concentric (or coaxial) lengths of metal tubing. For identification purposes the author will refer to these as 'discrete component' and 'coaxial' traps respectively. The discrete component type is normally used in wire dipole type antennas, whereas the coaxial types are normally seen in multiband Yagi and vertical antennas. However, there is no reason why the coaxial type should not be used in wire antennas (at least one manufacturer does this) or why the discrete component type should not be used in antennas constructed of tubing—provided that this can be made mechanically feasible.

Another difference between the two types is that when we use a capacitor such as a disc ceramic or mica type, adjustments to the resonant frequency can only be made by adjustment to the associated coil; whereas with coaxial traps the tendency is to have a coil of fixed proportions and to alter the capacitance by

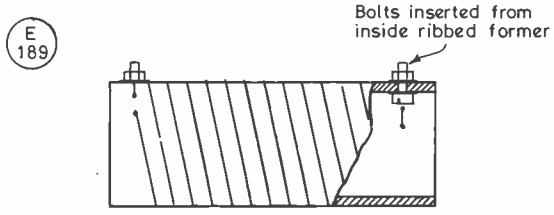


Fig. 6a DISCRETE COMPONENT TRAP - General appearance

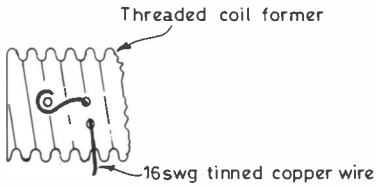


Fig. 6b. COIL CONNECTION DETAIL

adjustment of the length of overlap of the concentric tubes. For the home constructor the discrete component trap is the easier to make, although the coaxial type is not impossible. However, the latter device does call for some lathe work and this may deter many, although this work can be carried out by a local engineering company if the reader is unable to carry out the work himself. The cost of this will still be low enough to ensure that the home-made article will still be cheaper than a commercial device of comparable quality. It is also possible that a member of the local radio club will either have a lathe or have access to one—ask around—it's surprising what turns up when you enquire! (The author is indebted to G8HDJ for carrying out the lathe work for coaxial traps made at G3XAP).

One final word on trap types—some manufacturers incorporate both 21 and 28 MHz coaxial traps in one enclosure, giving the impression that a triband beam only has one pair of traps per element, whereas there are two. It is suggested that this method of construction is beyond the scope of the typical amateur constructor since such traps are essentially non-tunable; the dimensions of the trap are so precisely specified by the manufacturer that he is assurred of resonance on the desired frequencies after assembly, and tuning is not required. For the amateur this is likely to become a very long "trial and error" exercise and in the long run it will prove simpler (and possibly less expensive) to construct separate devices for 21 and 28 MHz!

Since we have seen that traps fall into two broad categories, it is proposed to discuss construction under the same two headings, starting with the simpler discrete component type.

Discrete Component Traps

As we saw earlier, this type of trap requires a coil (on a suitable former) plus a capacitor. We have discussed to some extent the need for a coil of suitable Q and listed those requirements to give us this property. The author uses plastic tubing for coil formers, though this is, in fact, a compromise in that most plastics are lossy at radio frequencies. However, it has been found that coil stability and ease of trap tuning are enhanced if the coil is wound onto a threaded former and plastic tubing is eminently suitable for threading. Most engineering companies and many plumbers have pipe-threading tools (the author is fortunate in having access to one of these devices and is, therefore, able to thread his own formers). The standard for water pipes is to thread at 14 turns per inch for small diameter pipes and 11 turns per inch for the larger diameters—this latter figure being just about acceptable, although something around 8 turns per inch would be better. Eleven t.p.i. is equivalent to 0.091 inches per turn, which means that if the coil is wound with 16 s.w.g. wire (0.064 inches diameter) somewhat closer than the one wire diameter spacing mentioned earlier for high Q is being wound. The alternative is to use 18 s.w.g. wire (0.048 inches diameter) which will result in a wider spacing in terms of wire diameter but will increase the 'skin resistance' of the coil. However, coils would with 16 s.w.g. at 11 t.p.i. have been found to produce traps of quite acceptable quality.

The other requirement for high Q is that a large ratio of diameter-to-length should be used, and this is an important consideration. Most commercial producers seem to favour small, compact traps, and some of these have a coil diameter of less than an inch for a 7 MHz trap. Measurement shows that such traps can be very lossy when subjected to energy at frequencies other than their resonant frequency, although their attenuation at resonance is perfectly acceptable.

One of the results of the move toward all solid-state circuitry in recent years has been the gradual disappearance of high voltage components from the catalogues, and this has made it rather more difficult to obtain the high voltage capacitors required for trap construction. Mica capacitors are probably the best devices for the job with ceramics a very close second — both types displaying the stability required for use in traps where they will be subjected to very high impedances and see some very large changes in temperature. Disc ceramic capacitors are available with a rating of 6kV DC at values in the 10 to 100pF range, and these are adequate for trap usage at the legal U.K. power limit. As for the actual value of capacitance used, the value is not critical, but, as mentioned above, the L:C ratio of a trap affects its loading characteristics at frequencies other than its resonant frequency. This accounts for some users of the W3DZZ-type trapped dipole finding that it works well on all 5 bands (80-10 metres), whilst others find that although it works on 3.5 and 7 MHz, it does not work well on one, two, or even all three of the other bands (14, 21 and 28 MHz). The W3DZZ antenna will be discussed in detail later, and is almost certainly the most common wire antenna used by amateurs throughout the whole world.

A rough rule-of-thumb for capacitance values is to use between 1 and 2pF for each metre of wavelength at the resonant frequency — for example at 7 MHz (40 metres) this works out at 40 to 80pF. The author uses capacitors of two values only — 47pF and 22pF — these being the only values he has been able to obtain at suitable voltage ratings, and they have proved to be suitable for all seven frequencies for which he has constructed traps. The table (Fig. 5) gives full details of dimensions and component values for discrete component traps for all bands from 7 MHz to 28 MHz (including the new ones), although the numbers of coil turns quoted are average figures and may require adjustment during the tuning process — *see* later.

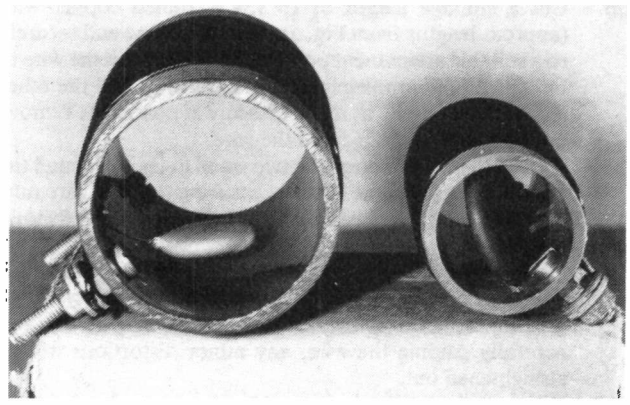


Fig. 7. Discrete component traps; note the capacitors located inside the coil formers.

Fig. 8. A partly-assembled mould, plus a fully encapsulated trap.

Fig. 6, and the photograph (Fig. 7), show the construction method clearly and it will be noted that the disc ceramic capacitor is located inside the coil former, its leads being soldered to lengths of 16 s.w.g. tinned copper wire and threaded through holes in the former to be attached to the same bolts as the ends of the coil. For ease of description the steps used in the construction are listed below in the most logical sequence, and should be adequate for anyone attempting trap construction.

(*1*) Determine the number of coil turns required from the table (Fig. 5) — allowing 1 extra turn for frequencies from 28 to 18 MHz (inclusive), and 2 extra for 14 to 7 MHz (inclusive).

(*2*) Add a further 12 turns and cut a length of the threaded former corresponding in length to this total number of turns.

(*3*) Smooth off the ends of the former with a file to remove burrs, and then wash it in hot water plus a little washing-up liquid to remove all traces of dirt and grease (thread cutting machinery normally uses a cutting oil).

(*4*) Dry thoroughly — preferably standing in a warm place overnight.

(*5*) Drill holes 5 turns in from each end of the former, using a drill size appropriate for either 5m or 0BA bolts.

(*6*) Two turns further in, drill two holes at each end with a ⅛-inch drill in positions corresponding to those seen in Fig. 6.

(*7*) Insert either 5mm or 0BA bolts into the large holes from the inside of the tube — *i.e.* with the threads protruding as per the diagram and photograph.

(*8*) Cut a suitable length of 16 s.w.g. tinned copper wire (approx. lengths from Fig. 5), and fasten one end securely to a suitable attachment point which will permit the wire to be pulled out completely in a straight line. Pull the other end of the wire with as much pressure as possible to remove any severe distortions from the wire.

(*9*) Thread the wire through the two small holes and round the bolt at one end of the former, ensuring that the wire runs round the bolt in a *clockwise* direction — again Fig. 6 shows the detail.

(*10*) Holding the coil former in such a way as to keep the whole length of the wire under tension, rotate it slowly whilst guiding the wire into the thread — by working slowly, and carefully guiding the wire, any minor distortions will be straightened out.

(*11*) When the winding is complete, cut the wire from its fastening whilst holding the last turn in place and pass the free end of the wire through the two small holes in the last groove, tightening it by pulling with a pair of pliers if necessary.

(*12*) Twist the wire round the bolt in the same manner as before — again ensuring a clockwise direction.

(*13*) Solder a 2-inch length of 16 s.w.g. tinned copper wire onto each lead of the disc ceramic capacitor (use a heat shunt during this operation as it is important that this component is not subjected to high temperatures which could alter its characteristics.

(*14*) Position the capacitor inside the former and thread its leads through the holes through which the coil wire is threaded, and twist them round the bolts with the coil wire — again in a clockwise direction.

(*15*) Cut any excess wire away from the bolts, add a washer and nut to each bolt and tighten securely.

In this form the trap is not really suitable for outdoor use since moisture lying on the coil will have a detuning effect; however this effect is not as serious as is the build-up of dirt and grease between the turns, which can become so thick that it will practically short-out adjacent turns. The actual process of waterproofing should not be carried out until the resonant frequency of the trap has been determined (and adjusted if necessary), but it will be discussed here as it does come under the broad heading of "construction".

There are two basic approaches to waterproofing, one of which is to simply apply a thin coat of some suitable material such as polyurethane varnish, the other being the complete encapsulation of the trap in a resin such as epoxy or polycarbonate. One point to note is that either process will lead to a change in the resonant frequency of the trap because the coil windings are now separated by a material other than air. Typical frequency changes noted at G3XAP will be discussed later in the section on trap tuning, but it is worth noting that complete encapsulation leads to a bigger frequency change than does simply coating the trap with varnish. Coating with varnish is probably the simplest procedure for the home constructor and can be carried out by immersing the trap in a tin of the liquid, allowing excess varnish to drain off and then leaving to dry. A good quality polyurethane varnish should be used, although electronic coating materials are available from specialised companies. An alternative method is to brush on the varnish, although it may be difficult to apply a complete coating to the capacitor if this is located inside the tubing as suggested above. However, other constructors may prefer to simply fasten the capacitor between the two terminals of the coil and leave it outside the coil. A thicker layer of protection can be built up, of course, by applying extra coats of varnish after the previous coat has dried.

Complete encapsulation produces a more stable, robust product but suffers from the following disadvantages: most resin catalysts and hardeners are very toxic, encapsulation is a more costly process, the fabrication of moulds is necessary, and the detuning effects on the trap can be severe. The author has experimented with several encapsulation materials and has constructed moulds from rubber bungs and lengths of plastic tubing of appropriate diameters. The photograph (Fig. 8) shows a typical G3XAP mould plus a fully encapsulated trap which was produced in it; again it is considered that the photograph shows sufficient detail to enable constructors to make a copy — all that remains to be said on the subject is that the mould requires a liberal application of a suitable release agent or the mould itself will be forever bonded to the trap! Details of release agents,

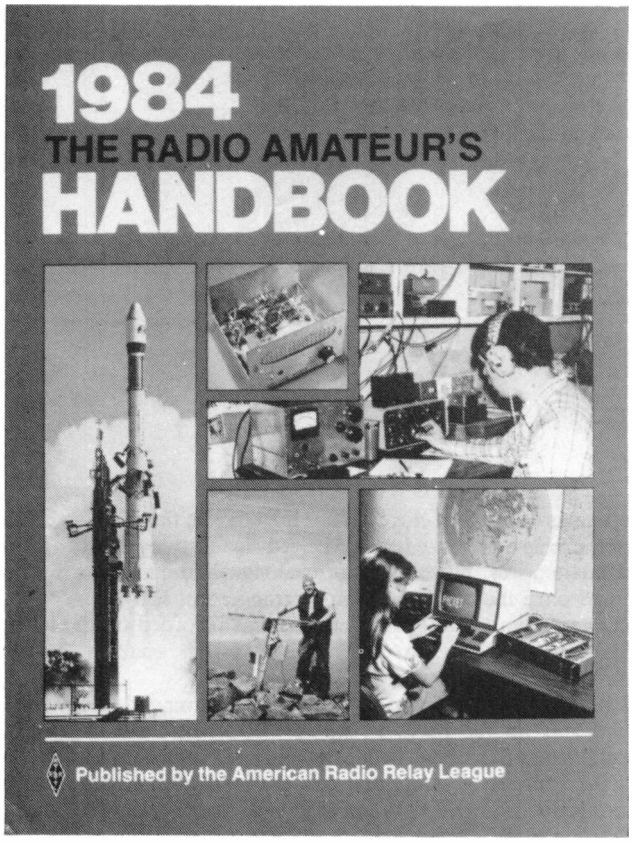
methods and times of curing, etc., will normally be supplied with the resin, two acceptable types of which are the epoxy type which can be obtained from toy, model or craft shops, or the type intended for the bonding of glass fibre (of which *David's* Isopon Resin is an example and is available from car accessory shops). This latter type is brittle when dry, however, and care should be taken not to drop the completed trap.

Whichever type of resin is used, it must be stressed that its usage and curing must be carried out in a well ventilated room, and prior to curing, neither the resin, the catalyst, nor a mixture of the two, should be allowed to come into contact with the skin. During use the eyes must be protected — the author would recommend the use of goggles or a pair of sunglasses.

The next part will discuss an alternative construction method for discrete component traps, coaxial traps and the tuning of traps of both types.

to be continued

References:
[1]"Antennas — The Weak Link", by A. P. Ashton G3XAP, *Short Wave Magazine*, March 1978-January 1981.
[2]"HF Antennas for All Locations", by L. A. Moxon G6XN, *RSGB*, available from *S.W.M.* Publication Dept. at £6.10 inc. post/packing.



The front cover of the 1984 edition of the ARRL's *The Radio Amateur's Handbook*. As well as much new and revised material, this 61st Edition features an improved index and a full-colour foldout spectrum chart. The *Handbook* is available from "S.W.M." Publications Dept., 34 High Street, Welwyn, Herts. AL6 9EQ, and costs £12.50 in soft cover and £15.75 in hardback, including post/packing.

A TEN-METRE HELICAL MOBILE ANTENNA

E. W. McLEAN, GM4EWM

HAVING become hooked on 29 MHz FM using a converted Icom ICB-1050 CB rig into the base station dipole, I decided to try mobile working on this popular band. To this end, I used the top section of a fibre-glass fly fishing rod wound with 16 feet of 7/0.2mm plastic covered wire (available from *R.S. Components),* starting at the bottom.

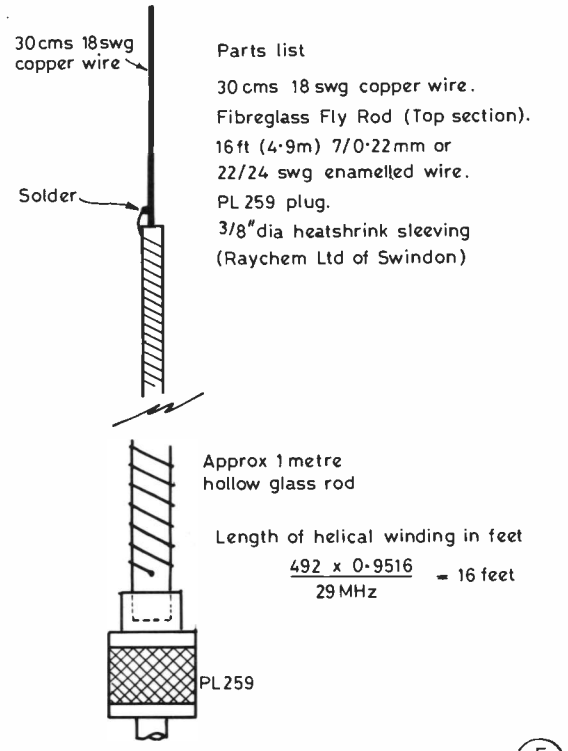


Fig. 1 10 METRE HELICAL MOBILE ANTENNA

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Construction

See Fig. 1. A PL-259 plug is drilled to fit the thick end of the rod and glued in place with epoxy adhesive. A small hole the size of the wire diameter is drilled just above the plug, the wire fed through and soldered to the plug centre, and then wound onto the rod by holding the reel of wire in one hand and turning the rod with the other; spacing is about 6mm. at the bottom, closing to about 3mm. at the top with the final turns held by adhesive tape. A stiff copper wire (18 s.w.g.) is inserted in the rod top and glued in place, the helical winding then being soldered to the copper wire.

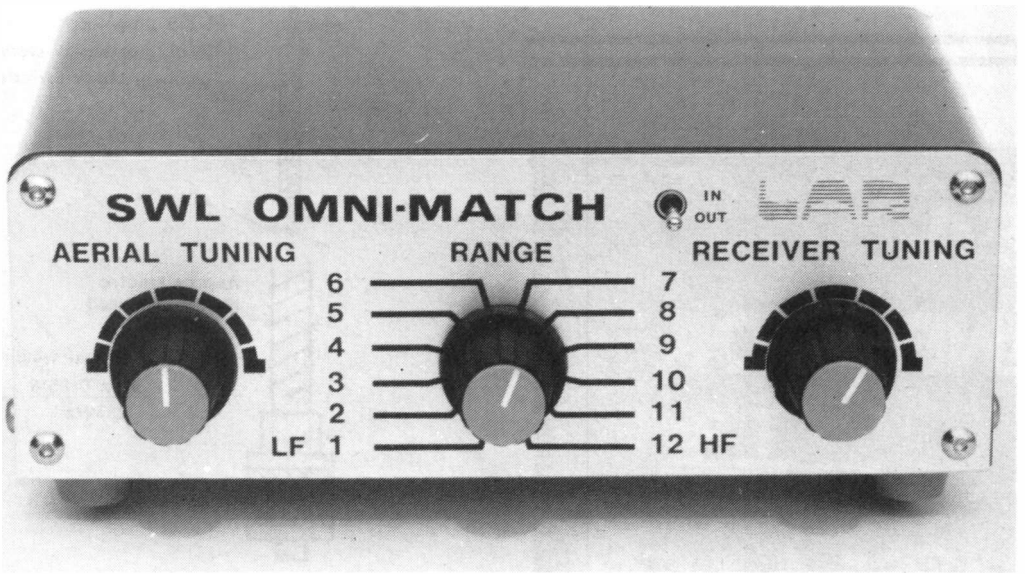
Tuning is carried out by trimming the copper wire and adjusting the helical winding, from the top downwards, while maintaining even spacing; a VSWR of 1.1:1 can be achieved. When satisfied with the tuning, cover the entire length with heat-shrinkable sleeving.

Reports indicate a two 'S' point improvement over a base-loaded ex-CB antenna.

EQUIPMENT REVIEW

THE LAR MODULES SWL OMNI-MATCH

NOWADAYS, amateur bands and most general coverage receivers are designed for a 50 ohms impedance, unbalanced input. Short wave listeners, who listen on the broadcast and amateurs bands, are unlikely to have resonant, 50 ohms antennas on all these bands and probably make do with random length wires. Some kind of matching arrangement is necessary, such as an antenna tuning unit. In the June, 1982 issue of the *Magazine,* the HF Omni-Match was reviewed. The product featured here is the version for non-transmitting applications, the **SWL Omni-Match** made by **Messrs LAR Modules Limited.**



Circuit Description

The **SWL Omni-Match** is a *pi*-network matching circuit. The input and output capacitors, labelled "aerial tuning" and "receiver tuning" respectively, are twin-gang types with the two sections wired in parallel to give a total variation of about 50-650 pF. The coil consists of about seven turns of ten-way ribbon cable on a 37mm. former, the appropriate amount of inductance being selected by a single pole, twelve-way switch labelled, "range".

Construction

The ATU is built on a U-shaped, 18-gauge chassis with a plated and passivated finish. The plastic coil former is 135mm. long and the two capacitors are *Dilemin* types as used in small receivers. The range switch is directly soldered to a fibre-glass PCB on which the ends of the coil cable are terminated. The rear panel accommodates the SO-239 "aerial" and "receiver" sockets, a banana socket for single-wire antenna and a wing nut for earthing purposes. The front panel is a silver colour anodised aluminium plate with bold, black lettering and there is a sub-miniature DPDT toggle switch to bypass the ATU. The cover is a piece of U-shaped steel, painted brown and there are four plastic feet on the bottom. The unit measures 150mm. wide and 60mm. overall height. The case depth is 96mm. and the antenna sockets and knobs project from this.

Packaging and Instructions

The **SWL Omni-Match** came in a cardboard box, 175 x 150 x 80mm., with a single-page leaflet describing the installation and use of the device. It includes a diagram showing the approximate range switch settings for various frequencies in the range 1-30 MHz. There is a warning that this ATU should only be used with receivers.

Results

This ATU was used with amateur bands and general coverage receivers, both with resonant antennas and random lengths of wire. As it is difficult to optimise the tuning of an ATU on signals subject to fading, a signal generator was used as a signal source. A short-wire antenna was attached to its output socket, the generator being set about twenty metres from the antennas connected to the ATU. As expected, when using resonant antennas of more-or-less 50 ohms impedance, the ATU made no measurable difference to the received signal strength. With non-resonant wires, however, improved signal strength was always noted once the optimum tuning arrangement had been found. Enhancement up to four 'S' points was recorded on the lower frequencies. The "In/Out" toggle switch enabled instant comparisons to be made.

A reliable earth connection is to be recommended using the wing nut on the back of the ATU. Oriental and American equipment often comes with a two-pin mains plug moulded on, so in the interests of safety and proper operation a separate earth connection is essential. When used with the receiver "floating", hand capacity effects were noted when tuning the ATU, the S-meter reading changing as the ATU was touched.

The frequency *versus* range switch setting figures in the leaflet did not correlate too well with those found in practice. For example, a setting of '3' for the 80m. band is suggested, whereas '6' or '7' proved optimum, and for 20m. where '8' was indicated, '10' was the best. However, it is pointed out that, "In practice there is considerable overlap".

Conclusions

The **LAR SWL Omni-Match** is very robustly made and simple to install and use. Being a *pi*-network, it has the advantage of acting as a low-pass filter. This is important when using modern receivers with broadband RF stages which accept signals over a whole octave, *e.g.* 15-30 MHz in a typical case. For instance, a receiver tuned to a weak signal in the 19m. broadcast band, would be wide open to very strong signals in the 16m. and 13m. bands, but the use of an LPF would provide some useful attenuation of those unwanted signals. Therefore, this product can be recommended to any SWL who needs a ready built ATU. The manufacturer is *Messrs LAR Modules Limited,* of 27 Cookridge Street, Leeds LS2 3AG, to whom thanks are due for the loan of the review model. The U.K. price, inclusive of VAT at 15% is £39.95, plus £2.00 for postage.

N.A.S.F.

THE "MAYFLOWER" EVENT

A TRANSATLANTIC LINK

PETER JACKSON, G3ADV

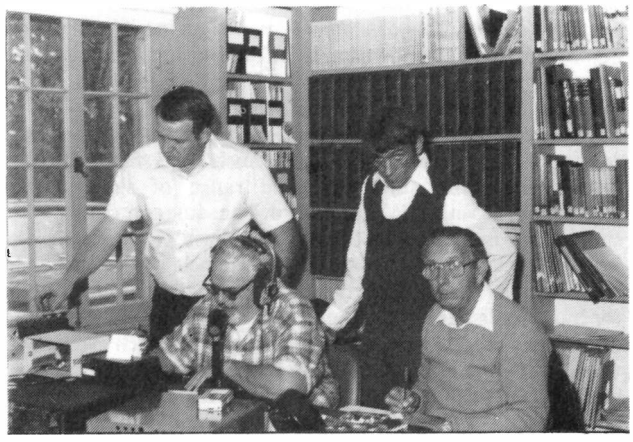
RIGGING the antennas at Plimoth Plantation, near Plymouth in Massachusetts, for the "Mayflower" station Thanksgiving Day link with the U.K. last November was not made any easier by the onset of the high winds and near-blizzard conditions which subsequently brought sub-zero temperatures to the New England coast.

After considerable struggling and a great deal of organised effort on the part of the membership, the Whitman (Mass.) Radio Club got the two crank-up masts vertical, topped by a 3-element mono-bander for 20 metres and a Mosley 3-band 3-element beam used on 15 metres. And thus WA1NPO became operative simultaneously on the two bands at 1300 GMT, and contact was established with the supporting stations GB0UST in Nantwich, South Cheshire, and SM0FQW in Stockholm, before the U.S. station began to work Europe in general and U.K. in particular — which was the object of the exercise.

Inter-U.S. traffic was handled by a separate 40-metre station, and although conditions on 20 metres were poor, and even worse on 15 metres, a total of more than 500 contacts were made in the 7-hour operating span, 257 of them on 20 metres and a respectable proportion with British stations. There were undoubtedly a great many more calling WA1NPO, but whose efforts were frustrated by the steadily-deteriorating conditions.

The great majority of the 20-metre contacts were handled by Jim Russell, WB1CNM, who was the instigator of the whole exercise; Jim retired at the end of it, somewhat depleted in the vocal chords, to the traditional Thanksgiving Day turkey dinner. Now that the event is established as an annual U.K./U.S. link, he is already planning this year's station on Thursday, 22nd November 1984, and hoping for *your* participation to make this one the largest ever. Whitman Club is looking for 1000 contacts during the 1984 event, given anything like reasonable propagation across the Atlantic. Details will appear in *Short Wave Magazine* in due course — see you then!

G3ADV was the operator of GB0UST, and is QSL Manager for U.K. contacts with WA1NPO.



Above, getting there with the mast! Left to right, Jim WB1CNM, Don N1BVZ, Joe KA1JBE and Jack KA1FAP. Below, WA1NPO on the air during the Thanksgiving Day event. Left to right, Jim WB1CNM, Ray W1TC, Don N1BVZ and Mike WA1FSD.

"KITCHEN-TABLE TECHNOLOGY"

A SERIES OF OCCASIONAL ARTICLES TO PUT THE 'AMATEUR' BACK INTO AMATEUR RADIO

REV. G. C. DOBBS, G3RJV

No. 4: Boxing It Up

IT has been said that amateur-built equipment comes in two types: that which is constructed beautifully and thrown in a rough old box, and that which looks elegant on the outside but with inside wiring that looks like the nest of a small mammal. Although this might be a cynical view, I have seen plenty of both examples. In an age when presentation seems all, perhaps the average constructor shows his amateur status most of all in the final appearance of his equipment. Most of the appearance of the completed equipment is focused upon the front panel and that is what a lot of us find difficult. Perhaps, like me, you may lack the facilities and skills in metal working. As I have mentioned before in *S.W.M.* my case and cabinet construction can only be called "Aluminium G.B.H." In spite of a lack of workshop facilities, it is possible to produce quite an attractive finish to amateur-built equipment. It is ironical that my method of finishing-off front panels has been copied by some amateurs whose workshop skills make mine look like a slug peeling an orange. I have outlined the method before but several new constructors have written to me for more details so I offer a fuller guide on what is just one amateur's way around the problem of making finished equipment look presentable.

Choosing a Case

One of the alarming facts of life about amateur radio construction to the newcomer is that the external hardware, like cases, knobs, drives and meters, can cost more than the entire cost of the circuitry inside the box. The aware constructor puts such items high on his priority list when looking for bargains at radio rallies and junk sales; these are things to horde. It is possible to use an old case or cabinet and make the equipment still look very attractive; it is also possible for amateurs, without full workshop facilities, to make simple housings for their equipment. The simplest enclosure is the "double U" interlocking case which I described some time ago in *Short Wave Magazine*. The method of making such cases is shown in Fig. 1. The finished article is usually better if the top and side panel section is a little longer and overlaps the front, back and bottom panel section.

These cases are simple to make but they can also be bought at reasonable cost. I usually buy any such cases from *Minfford Engineering*[1] who supply a good range of sizes in plain aluminium, or with a PVC coated lid. The same company will also supply cases made to order of any size and will, for the really faint-hearted, drill and cut front and back panels to the customer's specification. The pleasant thing about this design of case is that for most applications only the front and back panels require any drilling and cutting work and these are easy to reach even if extra work is required after the circuitry is in place. How the panels are worked depends upon the tools which are available but a lot happens at G3RJV with just a power drill and a few files.

Finishing the Front

The commonest approach to front panel titivation for the amateur appears to be once or twice over with an aerosol car paint spray and then add legends with rub-down lettering such as Letraset. This is fine when the job is first done and can look very smart. However, car spray, even with the surface well prepared, seems to chip off with every slight knock. Rub-down lettering is notorious for peeling off or being chipped off and really does require extra protection; some people use a clear lacquer sold by some of the rub-down lettering companies but these finishes seem to attract dirt. I use a method for my front panels which, almost literally, papers over the cracks.

The basis of this method is to use a false front panel which is made from stout paper or thin card. Hands are thrown up in horror! It is also possible to re-use old cases in some instances without making a new metal front panel to cover the old holes. The final finish on the front is the paper or the card protected with plastic film. The card is easy to work, takes several types of lettering very well and hides any blemishes or even unwanted holes in the metal front panel. The ideal material should be very stiff paper or thin card which is slightly tinted although some people

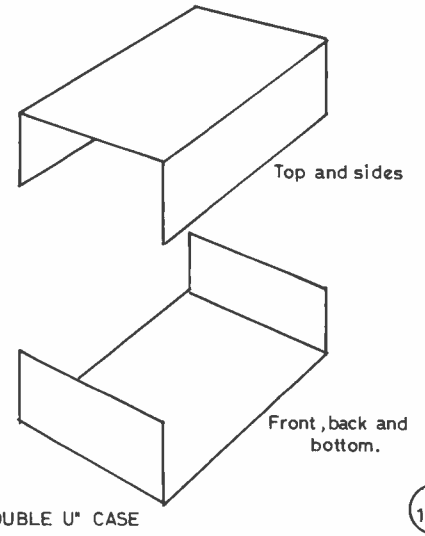
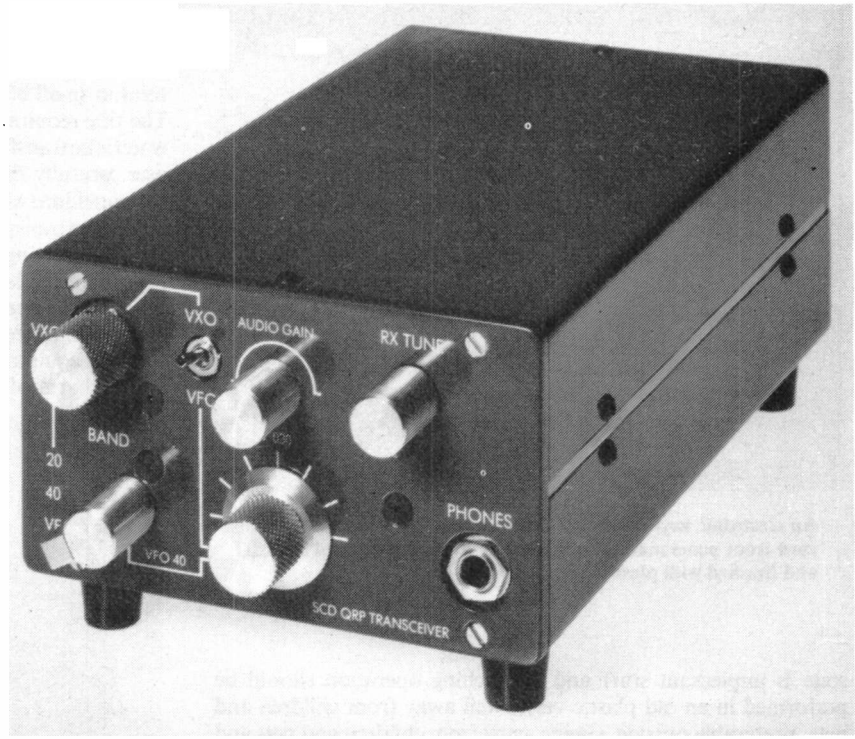


Fig.1 "DOUBLE U" CASE

prefer a white front panel. It is not too difficult to obtain suitable card from a good art shop or even use cheaper alternatives that appear. I have made several attractive front panels from card-board folders designed to hold papers for filing; these come in a variety of colours. I happen to have a lot of them in a pale orange so I have a whole brace of equipment with orange front panels. It may not be everyone's taste but it *is* distinctive!

How It's Done

Assuming that a front panel with several controls and other features on the front is being prepared, the first stage is to remove all the controls to leave a clear metal panel. The piece of card has to be marked to the size of the panel and also for all the cutouts. I find it easier to do the markings on the front panel if the sheet is quite large so I begin with an oversized sheet and do not cut it to fit the panel until all the markings have been made. There are several ways to mark out the size of the panel and control positions — the most obvious is to mark it on the back with a sharp pencil. It is important that the card be held firmly in place during the marking out and I find that "Blutack" or similar stationery putty is ideal for this job. If this is being done from the back with a pencil, place the panel face down onto a firm surface and draw around the panel and through the holes to obtain the markings. Another, rather crude, method I like to use — with thinner card — is just to attach the card to the front panel and rub edges of the panel and



A fine example of G3RJV's S.C.D. Transceiver (*Short Wave Magazine*, May, July, August 1981), built by John Kaine, G4RPK. The case is home-made on what John calls the "bedstead design" — centre base plate with front and back panels. The case is marked using the water-slide transfers now produced and sold by G4RPK. His address is: 74 Camden Mews, London NW1 9BX.

the holes to produce a small indentation which can be drawn over in pencil; this gives the advantage of markings on the front. If the markings have been made on the back, the edges of the panel will have to be outlined by pressing on hard with a pencil to give a guideline on the front. The edges of the front panel and the positions of the controls have to be seen on the front before lettering can begin.

At this stage the holes can be cut in the card for the controls. I use a pair of pointed, curved, nail scissors and a bit of care. Because the size of the control knobs will exceed the hole sizes these have to be placed upon the front of the card, in position, and marked around with a light pencil line. One of the added advantages of this method is that pencil lines can be made to indicate the layout, as well as guides for straight lettering, and these can all be rubbed off before the final process. Perhaps the easiest, and neatest, way to do the lettering is with rubdown letters working along a pencil guideline. I happen to have a fairly extensive set of "Rotring" pens and stencils with a marking board and do all my panels in ink. This is quite effective, but expensive if the drawing equipment is not required for other applications. Card is a super material for lettering and marking when placed flat on a board or table. Additional features such as lines, callsigns and a club or personal logo can be added.

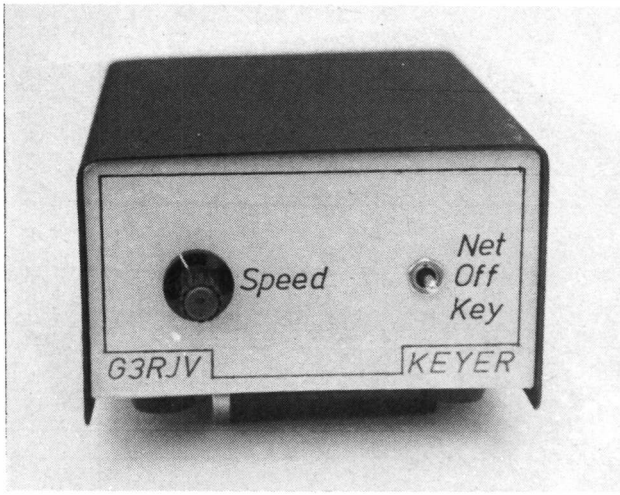
When the front panel card is completed it has to be stuck in place on the metal front. Choose adhesive with care because some types adversely affect the plastic film which is to be added. I use the common paper adhesive called "Pritt" which comes in sticks like a lipstick; this seems to hold the card adequately and is clean to use. At this stage trim off the edges of the card around the front panel; this ought to be done with care but if the basic "double U" case is used the overlap of the sides and top will hide any uneven edges. The front is only card or paper and requires protection and this is provided with clear sticky backed plastic film; the type to use is that sold for covering the dust-jackets of books. This comes in small rolls and must be applied with some care to avoid bubbles of air spoiling the surface. Spare edges can be tucked around the back of the front panel to provide extra adhesion and holes have to be cut in the film for controls. The simplest method is to carefully cut the film around the inside of the holes using a small modelling knife with a pointed sharp blade. The front panel controls may now be mounted back into place. This has to be done with some care as screwing a nut down tightly onto the plastic film can pull it and distort the finish. Wherever possible it is a good idea to put a washer between the front panel and any screws which are to be used to hold controls in place. The panel is now completed and, if care has been taken, should enhance the project.

When the front has been finished the top and side of the case need to look attractive. These are several ways of doing this. The aluminium can be etched to a satin finish in caustic soda — *see* later in this article. It can be covered with sticky-backed PVC plastic if an appropriate finish or design can be found, or it can be sprayed with paint. I have pleaded caution with car spray paints but one of the more usable sprays is the matt-black finish paint; it is possible to lay several layers down onto a well-prepared aluminium surface and get a surprisingly durable finish. The best way of all is to buy the type of case that already has a PVC finish to the sides and top!

Aluminium Finish Panels

Some constructors prefer to retain the metallic effect of an aluminium front panel. This is possible if the aluminium can be cleaned up to look attractive. Aluminium is easy to work but it is also easy to mark and score and after drilling and cutting has been done the front can look quite a mess. The essential process is to clean up any unwanted marks before the finish is applied.

There are those who do this with household scouring powder but I have yet to obtain an attractive finish in this way. The best option is to etch the panel clean with strong caustic soda. Caustic



An electronic keyer mounted in a "double U" type case, with a card front panel marked with lettering (*Rotring* pen and stencil) and finished with plastic film.

photo: Jo-Anna

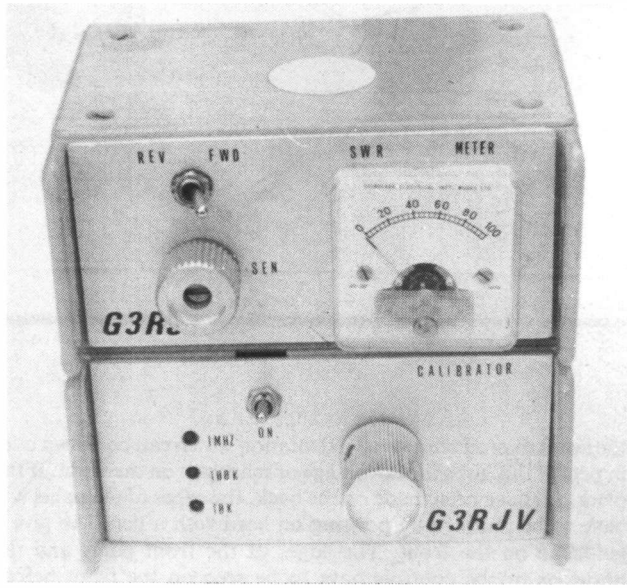
soda is unpleasant stuff and the etching operation should be performed in an old plastic vessel well away from children and pets, preferably outside. (Being away from children and pets and outside is not a bad idea anyway!) Needless to say, rubber gloves or photographic tweezers are required to avoid sore, albeit clean, hands. The process is aided by cleaning up the panel, especially from pencil marks and grease, before the etching begins. I use the strongest solution I can make up and just dunk the panel until the etching process produces a pleasing satin finish. Even in strong solution this can take some time and the panel ought to be removed from time to time for inspection. Take it out of the solution and wash it — I use a watering can. Ensure that every trace of the solution is removed before any more work is done to the panel.

The lettering is probably best done with the rub-down lettering. Pencil lines cannot be drawn onto the panel without making unremovable marks so great care is required to get the letters in line. The panel can then be covered with the layer of sticky backed plastic film. The whole process is rather more troublesome and messy than the cardboard front method but for those who like it, it produces an attractive finish.

Matt Black Finish

A lot of modern equipment is finished in sleek black with white lettering and the constructor may want to match up existing equipment. Matt black car spray, if applied with care in several coats, is quite durable. The completed panel may be treated with this paint but the problem can be lettering: white rub-down lettering is less easy to obtain and the plastic film effect does not look so good on a matt black paint. Recently I have tried a technique for black front panels which proved successful and I will use it again. Several years ago, before dry rub-down lettering was around, wet slide transfer lettering was a common way to mark front panels. This year water slide transfers have become available again for amateur use, in experimental production by G4RPK[2]. These transfers are produced in large sheets of amateur radio legends and titles, in white, suitable for black panels. The transfers consist of whole words and titles, including band numbering. They are not made up from individual letters which have to be laid side-by-side but consist of complete words and titles in small blocks which have a protective transparent sheen. The title required is cut out from the card and laid in a saucer of water; the transfer curls up, uncurls, and is then ready for use. The user carefully slides the transfer off the paper and slides it along the panel into place; once dry the transfer sticks and is protected by its own transparent film. These transfers can produce neat and durable lettering on a black panel, and there is no need to cover the completed lettering with plastic film or spray lacquer.

I hope these ideas from a very 'amateur' amateur will encourage others to be bold in their presentation of home-built amateur equipment. I have never been party to the idea that part of the charm of amateur constructed equipment is that it looks scruffy.



Two front panels in aluminium finish using the technique described in the article. The cases are surplus G.P.O. plastic boxes with added aluminium fronts. The units are the SWR Bridge and Calibration Oscillator described in the *Short Wave Magazine* series "Plug in Your Soldering Iron and Begin Here".

photo: Jo-Anna

References:

[1] Minfford Engineering, Sun Street, Ffestiniog, Gwynedd LL41 4NE, supply a useful and inexpensive range of cases, or make them to order. A list can be supplied in return for a stamped addressed envelope.

[2] Water slide transfers are available from John Kaine, G4RPK, 74 Camden Mews, London, NW1 9BX. The cost is £1.25 for a large sheet of amateur radio symbols, legends and numbers.

COMMUNICATION and DX NEWS

E. P. Essery, G3KFE

The Bands

YES, we've all been griping about conditions, but in all fairness, we are still way above anything which we could reasonably have expected this far past the peak of the cycle — for all practical purposes we have been through a three-year plateau! But, of course, the human lot would be quite intolerable without an unjustified grouse a day!

Seriously, one would have thought to see Ten dead and deserted by now for a year or more; but in fact the dedicated ones are able to show lots of openings, admittedly mostly north-south and of fairly short duration. And activity — which we suspect was, in the past, a main scapegoat for conditions — is much higher. The FM activity at the upper end, the satellite activity (and please, FM-ers, don't mix up the two frequencies!), and of course the need to drive strayed CB-ers out of the bottom end of the band have done worlds for the amateur activity there too, so Ten is much livelier and likely to benefit the punters when a lift is on. But — we *must* keep up the activity, as there are enough people casting great gooey sheep's-eyes at the band for such things as PMR.

Fifteen has been like Ten, and Twenty has been reduced to being the main DX band — although there is much of interest to be found on Forty and Eighty. Only the other evening, G3TVW was commenting on the fact that he had found DX about on various parts of the band where it was unexpected, and which he snaffled . . . to sit back after, and listen to the eruption from EU, he says, is a bit like the feeling the cat got when it swiped the cream!

So — while the bands are groused about by the newcomers those who have been through a sunspot minimum take it all philosophically. However, it is a pretty new operator who has not at some time suffered an 'artificial sunspot minimum' which may be related very clearly to a sick aerial feeder-line. Even if thoroughly sealed, this old cynic seems to find his coax run outside needs renewing once every couple of years, and that *certainly* is a point with TV aerials and feeders.

Ten Metres

For all those who have modified UK FM CB rigs, it is a point worth noting that the rig *can* be cranked into the satellite down-link band, 29.3 to 29.55 MHz. But quite clearly, to do so would be detrimental — to put it mildly — to the *Oscar* series. So please, fellows, keep your FM contacts out of the satellite's hair — there is room for all on this widest of bands.

G3NOF (Yeovil) says he found conditions very patchy; some Europeans in the mornings and in the afternoons a few Americans and South Americans, the latter two areas only on a few days. Don worked DF3NZ/ST2, J28DX, K6Y RA, TU2NW, V3CQ, W6KG/HK0 and 3B8FK.

Now to G4LDS (Chelmsford) who has at least looked at the band even though he has become somewhat obsessed with the idea of feeding his tower as a vertical for the LF bands — a subject on which more anon. SSB came up with 9Y4WCY, then in the CQ WW contest PJ7A, 9Y4W, CX4BW, HC1HC, PJ2FR, VP2VDH, 4V2C; later came KT1C, VK6ADF, H5AE, VE3AIU, VE3GCO/VE3WCY, VE4AB, VK3BEC, VK6NQE, KY2W, W1HH, KA1ATS, K6AYA, VE3GI, WA2AUF, W8RDX and K3PFV, while on CW there were exchanges with KA1EYY, N3BQS, KA5RRB and KA8OFP.

G4LZD (Dartmouth) found himself some new ones by way of sessions on 28.5 MHz on December 10 and 11, which gave contacts with CT2FH, 5B4XX, VK6NCW, VP2KBZ, KA5BPE/C6A, W9NXD/HR2, all on 10th, plus HC1HC, ZF2AG, VP2EEW, FM7CD, and XE1MDX. And, would you believe, *all* new countries!

Most days the African beacons were to be heard, says G4HZW (Knutsford), but there certainly wasn't the activity from the Dark Continent to support all the stories of the beacons. Nonetheless, there were also a few half-hour openings to U.S.A., and contacts were made with KA5BPE/C6A, CT2FH, EA8AAS, EI8EN, FM7CD, HH2VP, HI8GB, HK3DFT, KP4AXC, WU4P/KP4, OD5TBM, PA2TMS, PI4DEC, PT7WA, SV1RP, TU2NW, UA1-2-3-4-5-8-9-0, RI8WCY, UM8MCY, W1-2-3-4-5-8-9-0, VE1-2-3, VK6ET, VP2EEW, VP2MFL, VP8LP, XE1J, YV3IUP, YV4CMA, YV7QP, ZF2AG and DF3LK/ZS3.

The SSB signals from G6QQ (Hoveton) were applied to the band on the same two days as G4HZW, and for David it came to HK3NBB, YV3IUP, LU1E, TG9GI, LU6AKG, CX5AO, HC1HC, CE3DNP, VP2EEW and ZF2AG, plus CW contacts to HK1BAU, HH2VP, HK3NBB, LU8DQ, VP2MFL, and East Coast W stations on both CW and SSB.

Fifteen

No JAs heard on this band, says G3NOF, and only a few VKs over the short path; some West Indies signals and South Americans were heard in the time-slot 1200-1500, and, on the days when they have been present, North Americans from noon onwards, with a rapid fade out of the whole shooting-match just as soon as it gets dark. SSB contacts were made with A71BK, AP2P, C6ADJ, CP8HD, DK5EK/VP9, EC9HB, EC9HR, FM9BX, FM7WD, FR7FLO, GB0WCY, HI3AAI, J6LOV, J88AJ, KA6FXJ/HI8, KB7YS (Arizona), KT7V (Wyoming), KW7Y, RD6WCY, RL7WCY, RV0WCY, VK2KAA, VK3VSL, VP2EEW, VP2KBZ, VP2KX, W6KG/HK0 (San Andreas Is.), W6QL/HC1, W7OAX (Oregon), YC2DBL, 5H3WCY and 6V3HL.

G4LDS looked at the SSB of PY1NEZ, ED9CM, EA9IB, NP4Z, 4V2C (HH2 would be more recognisable!), VP2KBZ, XE2SI, VK2KMN, VK5NDB, VK3NIH, VU2BMT, VK3PRG; and CW went out to KA4WNO, WB3EPH, KA4IQB and OH8EC.

An interesting first letter came in from G4LZD who mentions a couple of QSOs of note: 5T2QRD, and TA2WCY with DJ0UJ winding the handle, which was of particular interest insofar as Steve was told that there would be no more amateur operation in Turkey in the New Year. One wonders why.

At G6QQ, as in so many other places, the activity in the past month has been somewhat down; apart from the usual seasonal excuses(!) David adds a couple of reasons, in the shape of a dose of 'flu and some aerial and TVI problems at the beginning of the period. However, he continues to increase his score, with SSB to TI2BEV, HH2WL, WA4JVN/P/KV4, V3TV, W6KG/HC8 (on CW), ZL4AS, PT7XO and VP2MSS.

Twenty

Where the pay dirt is, the more so when the going gets rough with lower sunspot activity.

The writer can normally only get on in the mornings or evenings nowadays, and neither of these times has been very productive. However, it has been observed, at the policeman would say, that the SWR on the coax to the HF aerial has been rather too good and too flat of late, and we harbour dark suspicions of the feedline; a new one sits here already made up, and

only waits the chance to fit it.

G6QQ says he worked quite a few W and VE stations on Twenty but didn't include them in his list unless they were West Coast types; thus he offers his pick as W3TB/P/TF, K6PKO, W2NQ/W7, TA2WCY, WA7TZL and W7GQM.

G2HKU (Sheppey) has been finding his ZL skeds running a bit rough these last few days, thanks to poor propagation (perhaps a sack of *John Innes* potting compost heaved at the sun?), but we notice his contacts with ZL1NW, ZL3FV, ZL3RS on SSB, and then, on CW, 4O3WCY, PY1QN, and RC2WCY.

Turning now to G4LDS, he offers SSB contacts with HZ1AB, RF6V, 6W8HL, JF1ZRQ, JA2YKA, JA3YBF, VS5GA, LU1MBB, VP2VDH, VP9AD, VE1DX, VE1DXA, AI6V, HI8KW, 9Y4W, all in the CQ WW contest, while outside that weekend there were notable contacts with 9Y4WCY, KA8OUT, WA2YMK, WG4J, AA4BF, W2NQ/7, 9H1HA, KH6AT, ZL0AH (long path), ZL2BFU and VK3AYI.

G3NOF found conditions poor on the whole, citing the Jarvis Is. AD1S/KH5 DX-pedition where, when they were known to be on, their signals were so low as to be uncopiable. After their return, Don spoke to WA2MOE, one of the operators, and was told that the DX-pedition was running 300 watts into a TH3 beam, and were hearing Europeans well enough but just not radiating enough signal; indeed, they reckoned they needed a linear and a four-element beam. However, to turn to G3NOF's tally, he made SSB contacts with VKs who were on most mornings on the long path; there were also a few, short path, around 1600. VE7s were heard between 1600-1800 along with some W7s. QSOs were made with A71BK, FB8WJ, FY7YE, HB0P, J28DX, N7ARA in Montana, ON4VY/PJ7, VE5BAX, VE7AGE, VE7ATV, VE7DGI, VE7FBW, VE7NI, VE7XM, W6KG/HK0 and 9J2JI.

Crystal Ball

A little cloudy, but let's at least take a look. First from *The DX Bulletin* (TDXB), XU1SS in Cambodia is on 5-6 days each week around 14025 kHz or lower, but the latest news we have is that only one QSL from this station had been received at the DXCC desk for credit, as of late December.

The Kermadec imbroglio between Jim Smith and NZART seems to have been resolved, and at the time of writing there is *hope* of a three-week operation in February; hope but no certainty, as VK9NS is in a mighty scramble to put the jigsaw together in time. However, having said that, Jim is not the man, we feel, to let the expedition turn into a busted flush without a lot of effort. We have fingers crossed for his good luck.

Clipperton is slated for March 5-23, signing FO0XA, having been on the cards since last July, and there seems no real reason to doubt it will all come together; however, your scribe must add that whenever he has a gut reaction like that it usually turns out wrong!

It may be recalled that originally the Andamans was on the cards along with Laccadives; the latter duly happened and we are hearing the odd small noises which indicate that things might — just might — be going to happen in the way of an opening of the Andaman situation.

Looking for YV0, Aves Is., activity? According to *DX News Sheet,* DL2GG will be one of the operators on this expedition, and that the plan is to set off from YV on February 28, arrival therefore being a couple of days later.

Forty

Much maligned or much loved, depending on your taste in hard work! What a pity that so few people report their successes. Of course it's a night-time band, but DX can be heard surprisingly early, so a spin round is the interesting alternative to watching the idiot's lantern — unless you have a neighbour with a video recorder that is, and don't know how to deal with TVI.

"CDXN" deadlines for the next three months:

March issue—February 2nd
April issue—March 8th
May issue—April 5th

Please be sure to note these dates

G3ZPF (Kingswinford) is now in his new home and has so far managed to get an inverted-vee up to eighteen feet. Before leaving the old place, the aerials were the last things to be packed, and W6SZN/TI2 was heard but David couldn't crack the pile-up. DL1RK/CT3 was under a bigger pile-up still, but this one was cracked, and for a new country at that. At the new place a few sorties in between washing, cleaning, working, shopping have raised the odd DX station, but nothing really new or interesting yet. David has, however, created a couple of firsts for the district and himself: first he *bought* an aerial (a *Sagant* EL4OX) which he is going to write up for us, all being well, and secondly he has been heard on VHF — and FM at that . . . not repeaters though, he draws the line at that!

Now, let's look at the activity from D. Whitaker in Harrogate. David listened around 0700 to VK9WCY, 6VODY, HC1EA, 3X4EX, OA4WL, CE0AE, JA8BOF, EL9A, JF1IST; at 0800, D44BC, C21RK. Then a re-start was made at 1700, for YB2CR, TA1SU, HV2VO, ZS6WV, ZS5BH: at 1800 6W1DY surfaced, and at 1900 VO1CV was 59-plus. A gap till 2200, when TU2LE and SV9SK were noted, and in the last hour of the day A71AD and YC4FW logged.

Turning to G4LDS Chris has been concentrating on the LF bands somewhat, and wondering how he can turn his tower into an LF vertical. Meantime the inverted-vee aerial has managed to get out to FC9UC, IS0WOW, IK0BYO, OK1DWA, with Gotaways VO1, SV1 and SV5.

New Bands

Nobody said nuffin'!

But — we do know of people approaching or over the 100 countries-worked mark on 10 MHz, and we do very much think that everyone who can do so should be putting out the odd CQ call on 18 and 24 MHz, if only to keep things warm . . . and of course if a few more did that then there would be a few more replies to the CQs, so there would be more activities which would attract more people on to the band, and so on and so forth. . . .

Awards & Contests

Firstly, the award. This one is from the *Yeovil* club, and we rather like the idea. Basically, you have to work a total of twenty-two stations in U.K. so selected that the *last* — yes, repeat, last — letter of their callsign can be used with the others to make up the phrase "Yeovil Amateur Radio Club". Valid contacts start after July 1, 1983. Any band, any mode, and send certified log extract to F. W. Parkhurst, 56 Cromwell Road, Yeovil, Somerset, England together with 10 IRCs, 2 dollars US, or £1 sterling. They have printed a little slip with the details on so doubtless the same address will obtain one for reference purposes while chasing-up the contacts.

B.A.R.T.G. have notified us of their latest RTTY contest which runs over the weekend March 24-26. The rules look to be somewhat similar to past years, but as they come to a full A4 sheet of close typing, we must refer you to G6LZB, 464 Whippendell Road, Watford, Herts. WD1 7PT, for a copy. Logs go to the same address, and the name to put on the envelope is Peter Adams — doesn't seem right, somehow, after all these years, not to say Ted Double! Logs are to arrive by May 31, 1984 to qualify, and we would note the rules specify what *must* be logged and that incomplete loggings will not be eligible and will be treated as check logs. Perhaps this will help to raise the sometimes abysmal standard of contest logging, and maybe other contest organisers should copy the idea.

The RSGB 7 MHz contests are due this month; the Phone one on February 4-5 and the CW one on February 25-26. A couple of good 'uns, these, and usually scare up something of interest on the band. Details from the appropriate issue of *Radio Communication*, or RSGB Hq; and as far as the Phone leg is concerned, confined to the region 7.04 MHz upwards, may we remind U.K. operators that this means a need for split-frequency capability as a look at the current U.S.A. phone band on Forty will show.

February 18-19 is the weekend for the ARRL DX CW Contest — rules are the same as for last year. No 10 MHz, /AM or /MM stations for contest credit. Non-American stations to dish-out an over comprising RST plus a three-figure number indicating power input, in watts. DX gets 3 points for each W/VE contact, and the multiplier is the U.S. States, and VE districts plus VO, giving a maximum multiplier of 57 per band. Mailing deadline March 3, to ARRL DX Contest, 225 Main Street, Newington, Connecticut 06111. Incidentally the Phone end is down for March 3-4, and we were amused to see the normally so accurate W1WY column saying the same mailing date for both legs — which would imply sending in the Phone log before the start to the contest . . . new technology?

Looking a little further ahead into March we have the ever-popular Bermuda Contest on March 17-18, and on March 24-25 the CQ WW WPX SSB contest.

Eighty

First, G2HKU, who dusted off his QRP rig, and used its CW to enable him to make a QSO with OZ9WCY.

We have various notes from G2NJ (Peterborough); the first one was posted minus page 1, but we noted GB0WCY appearing in the TOPS CW club net on December 7 from Scarborough. GM2CNN/A had been noted as a good signal with his QRP from the Inverness area, where he said he was suffering severely from fish-phone interference. We gather that by the time this comes to be read, GM2CNN/A will have upped sticks and headed for EA6-land, with his HW-8 is the luggage. On a slightly different tack, Nick notes SM6YF/MM, running five watts, and working another QRP station, F2WW — the /MM said his QSL route was *via* CT4CH. Another QRP signal noted was PA0GG, again heard sending his beacon-style signals on 3550 kHz and asking for reports. In a more DX business, G2NJ heard SM6CPY calling CQ DX as early as 1415z, and at 1445 the SM raised JA1CAJ, name of Hiro, to whom the SM6 gave a 559 report; this is of interest because Nick noted the same sort of happenings back in '81 and '82.

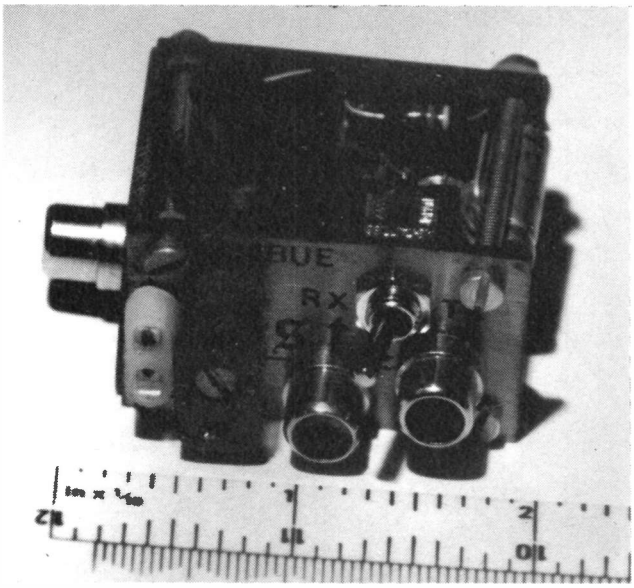
Also from G2NJ, a late letter which just caught us in time, which asks us to mention that the TOPS CW club, which has many members on the Continent, intends to try a European net on 3592 kHz from 1930 to 2030z, with the net control station G4RAR, who is located near Derby. This is in addition to the nets on Wednesdays and Sundays from 1400-1600 clock on 3508 or 3512 kHz, with GW6AQ, the net control station, being the TOPS club call.

G3ZPF we have already mentioned elsewhere, and it only remains to add that his low-low bit of wire seems to be hearing the UA9 and UA0 stations as well as the wire at his previous QTH. Perhaps when the aerial gets up higher David will find he has landed a super new location!

Operating /MM is not always as relaxing as one might suppose! Pictured here is Bob Salmon, G4LJX/MM, arriving in Antigua in November, after having been dismasted while on passage from the U.K. The mast went overboard some 350 miles from journey's end following a structural failure. Having recovered the mast and rigging (which took several hours) before it holed the hull, Bob, determined to get back on the air, used a telescopic nylon pipe to form a support right aft, and the antenna, which had been an insulated section of the backstay, was replaced with copper/terylene wire made into an inverted-L from the yacht's bow. Within an hour of starting he was getting 5 and 8 reports from England! G4LJX/MM was using an Icom IC-720A feeding through a Drake MN-7 tuner.

Some readers may not know of the regular /MM nets. The Trans-atlantic Net at 1300z on 21.400 MHz is concerned primarily with yachts crossing the Atlantic or cruising the Caribbean; the U.K. /MM Net at 0800z and 1800z on 14.303 MHz covers sea areas from the eastern Mediterranean to the Caribbean Sea, and sometimes much further afield.

From D. A. Whitaker we have a list which makes it clear he spends quite a lot of time chasing the DX on Eighty SSB, even though David suffers quite a lot with TV timebase interference. For instance: at 0400, 8R1RBF, 6Y5IC; at 0500, TI2CCC, FM7CD; at 0600, FY7AN, FM7WS; at 0700, ZL4PO/C, ZL4OY/C, 6Y5IC, J73AH, W5-0, CU3AR, C6AEY; at 0800, HC2RG, YV5ANJ, JA6IEF, HI8MRF, AA6AA, W7ZRC, NA6T, ZL4AP, 8P6OV, CE8ABF, JA0RR, CP8IH, VP9AD, and KP4AAQ. Evenings weren't quite so productive, but one notes such as W6s in mid-afternoon, JA and DU at



The tiny STX transmitter with which G4BUE made 28 QSO's (including 13 East Coast U.S.A. stations) during the CQ WW CW Contest. *See* "Odds and Ends" in last month's *CDXN*.

teatime, VK3AOF as an appetiser for dinner, A92DU with the port, and VS6DO plus HZ1AB as nightcap.

It was a frustrating month for G4SXE (Rolleston), who found everyone calling CQ DX and no-one wanted a call from him — the best he got was "Sri, DX only!" However, there were three QSOs worth reporting; G4TEV in Derby, who was running five watts of QRP; G2MJ (Blackburn) who was mistaken initially by Brian for G2NJ which caused a little confusion — all well-taken, though; and DL4BA in Bremen for the only non-G contact of the month. On a different tack Brian is gathering the bits together for the 'Acme Foolproof' rig featured by George, G3RJV, in last October's *Short Wave Magazine*.

Finally, G4LDS, who says not only has he been operating on the lower bands but also he has taken to the key — slow as yet, but finding it quite enjoyable and intending to pursue it more in the future. In the way of contacts it included OK, Y23, CT2, SP, HB0P, LX1JA (for a new one), and gotaways W1, W2, and W8. Chris also adds a note that KH6AT is QRV around 0500, and looking for European contacts.

Top Band

This last season has been livelier than for some time. It was nice to hear from GW3YDX, summarising events in November and December's beginnings. Ron managed to pick up six new ones during the CQ WW 160 SSB contest, but the CQ WW 160 CW leg, of which much was expected was ruined by awful conditions. The ARRL contest weekend was very variable, with no East Coast Ws, although stations from Montana and Oklahoma were heard and one from Kansas worked. Ron has been on from GW since January 1982, and since then has managed, with a struggle, to amass the 100 countries worked; ambition number two was to make it 100 confirmed in the two years, but that is beginning to look remote with some eleven to go when he wrote, and forty days for them to arrive. On a totally different tack, GW3YDX gently puts us right about the CQ WW 160 CW 1982 results; W1WY passed on these but either he omitted the multi-op results, or old cloth-brain at the typewriter here missed them, because we should have noted that GW3YDX was World Number 2, to NP4A, and World Number 1 in the multi-op single transmitter category — his second op was, as always in the past, the late and deeply lamented G3XTJ. What a fine result to remember G3XTJ by!

Another one chasing the 100 countries is G4AKY (Harlow) who was, when last we spoke, up to 93 countries worked on the band from Harlow. We must be selective from Dave's long list, since space closes in on us, but his best included W9ZR, 3V8AG, JX5DW, CN8ES (QSL *via* WA3NCP); gotaways included YV2IF on SSB, K0RF, and various W6s, while Dave also notes that ZD7BW and JW5NM are known to be active on the bands. Dave now has his grey-line propagation computer programme going well, and has a master and a slave tape thereof, in case he has a mishap(!) with it; it has shown itself to be quite useful with a last-minute 9M2 contact when the quarry rose dead on the predicted time, so that he and G3PQA were able to get in quick, leaving all Europe calling and the DX gently sliding back into the noise!

Turning now to G3BDQ (Hastings), who is quite amazed at the reliability of the path between himself and VK6HD. He received a mystery call from a station having the last letters 'HY' at 0728 on December 22; this, John figures, may have been his pen-pal ZL1HY who helped set up G3BDQ's ZL skeds and contacts. Other bits of interest included JW5NM at 0715 on December 10 with a strong auroral-type flutter and on a dead band, UH8HCA and TF3KG on December 24 at 0703, EL0AC/MM in the North Sea on 26th, a mysterious 86AJZ (could it have been 0I6?) at 2248 on 26th with name Walej — could be Polish? — and G6ZY/EA6 back on Ibiza and putting down a very strong signal. However, nothing from South America. In the spare time, work is going on on re-equipping for the 144 MHz season, after Top Band folds for the summer.

G2HKU refers simply to his PA0GE and PA0PN SSB contacts and to a single CW contact, with UK9CAA.

Now a couple of listener reports. R. Stone (Plymouth) follows the signals of G3SZA around quite a bit, and hears quite a lot thereby; he was a bit puzzled by hearing PH0HIP, and wonders at the significance of the prefix. Bob is one of the few SWLs who take a serious interest in getting the best possible aerial system organised into the space available, and it obviously pays off. Of interest were a couple of D2 stations, neither of whom were completely copied, and a strange hearing which was 'interpreted' as BAHI3 or maybe BAHJ3 . . . any offers as to what they might have really been?

Our last report is from D. A. Whitaker; David was on at 0100 to hear SSB from 4Z4DX, W1OJ, W1CF; at 0200, 4X4NJ was quite strong, along with N4MM; a bit of sleep, and then at 0700, VE3MFA, ZL2BT, WA2SPL, WB3GCG and W0IFH — *real* DX in any man's language for this band this last one — then at 2200, TF3JX, and finally RA9AKM, VE1IYX and W1FC at 2300.

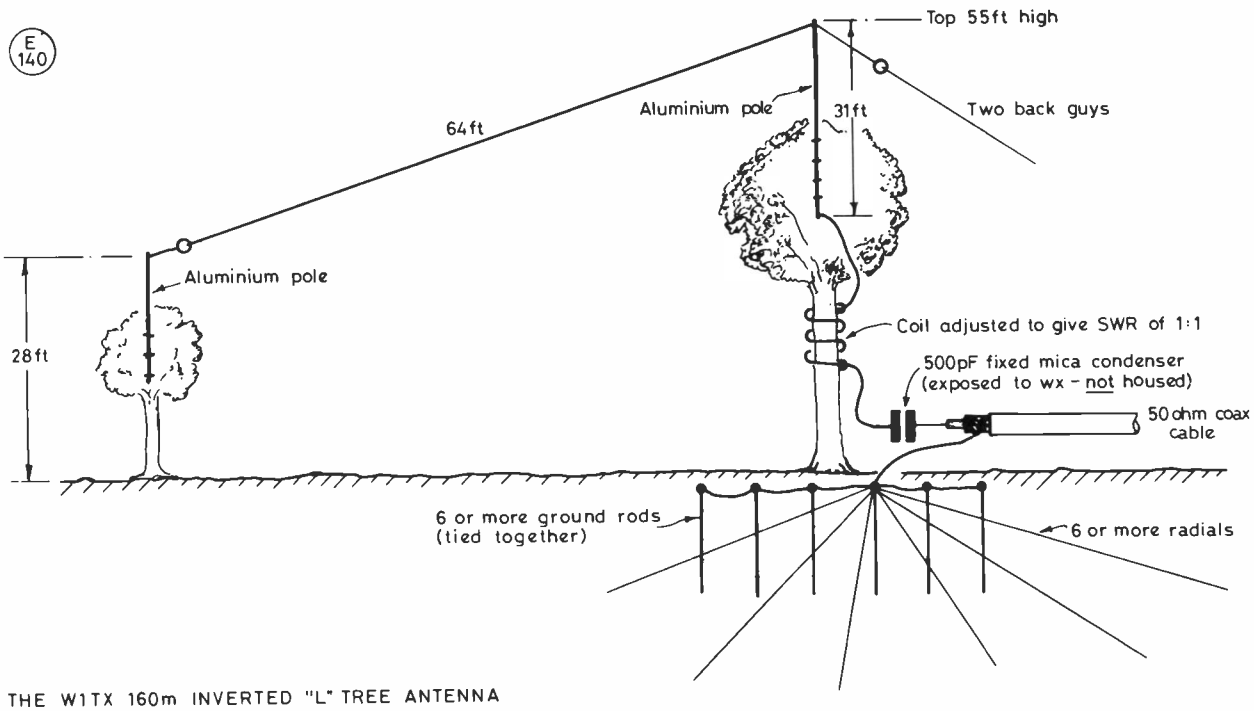
Finale

That's it for another month; thanks to all you good people for your reports, and we'd like to see yet more reports on all the bands. Send your letters and comments for the March issue to arrive by **February 2** — forward dates are in the 'box' as well — addressed, as ever, to your scribe, "CDXN" SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts. AL6 9EQ.

The W1TX Tree Antenna

While delving into some files recently, we came across details of the late Roy Fosberg's, W1TX, tree antenna, which had been sent to us by Stew Perry, W1BB. Roy was a well-known Top Band exponent from the Forties until his death in 1977, and among his many contributions to amateur radio was this highly original Inverted-L antenna shown here in the photograph and drawing. The vertical portion was taken up the trunk of a maple tree, through a base loading coil using the tree trunk as core, and then on to a vertical pole which elevated the wire above the top of the tree; the horizontal part was then taken to another tree-top pole. Radials and ground rods were buried around the base of the maple, the whole thing being fed with 50-ohm co-ax cable through a series condenser.

In this country, Angus Taylor, G8PG, carried out experiments using trees as radiators some years ago, and his article "Trees as Radiators" appeared in the October 1977 issue of *Short Wave Magazine*.



THE W1TX 160m INVERTED "L" TREE ANTENNA

DIGITALISATION OF THE KW-2000B TRANSCEIVER, PHASE II

A SIMPLE ADD-ON VFO STABILISER TO COMPLEMENT THE DIGITAL DISPLAY DESCRIBED IN LAST MONTH'S ISSUE

PETER J. COOK, G4NCA

ONE of the fascinating aspects of modernising older equipment (or for that matter, prototype construction) is that no sooner has a problem been identified, solutions found and modifications completed, than attention is brought (as a result of the initial modification) to other, often more subtle, shortcomings within the equipment. A consequence of this is that a continuous process is set up of successive modifications, with (hopefully) an end product that performs exactly to the individual's wishes. This approach is undoubtedly the best for home construction, ensuring that individual circuit elements do in fact work before stringing them all together. There is nothing more frustrating, having neatly built a large project, than turning on to find nothing happens (and even worse, seeing it go up in smoke!), to be faced with the prospect of breaking it down to fault-find. It was for this reason that the above title was chosen, this unit being the second modification undertaken on the 'old faithful' KW-2000B.

Having constructed a digital frequency display for the KW-2000B, it rapidly became apparent just how much the VFO drifts from initial turn-on, and indeed for several hours after. When using the rig for CW or SSB contacts this drift is quite tolerable, simply necessitating a slight tweak of the tuning every now and again. However for the more frequency 'sensitive' modes such as RTTY or SSTV the problem becomes more acute; for instance, in the author's case, obtaining reliable copy from the Sunday morning GB2ATG RTTY broadcasts on 80m. would involve tracking the VFO throughout the transmission. Additionally, this inherent drift proves to be very annoying for the distant receive station during transmission, in turn having to track his/her VFO, often resulting in the QSO wandering up and down the band at an alarming rate.

As much of the work in producing some type of digital stablisation unit had already been undertaken with the construction of the digital display, a simple add-on unit became a very attractive solution to the problem.

Within the VFO tank circuit of the '2000B there are (very conveniently) two DC controlled varicap diode branches; one of which is used in the IRT circuitry, the other involved in the calibration adjustment of the now obsolescent analogue dial. Use is made of this in the stabliser circuitry, enabling any offset frequency to compensate for drift to be created by a small change in the steady reverse bias DC voltage across the varicap diode. An increase in this voltage will reduce the capacitive effect of the diode and cause the frequency to rise. Correspondingly, a reduction in voltage will increase the capacitive effect and the frequency will fall.

Operation

The basic outline of the system is shown in Fig. 1, all power, control and timing signals being derived from the digital display board. Input pulses, supplied by the subtractive mixer (IC7) in the display board are applied to the clock input of the BCD counter, IC14. The signal applied to the clock enable input of the counter is, in fact, exactly that applied to the counters in the display board.

Tables of Values

Fig. 2

R18 to R21, R23 to R25 = 47K
R22 = 1M
R26, R27 = 1K
R28 = 470K
C5 = 100 µF
C6 = 1000 µF
C7 = 220 µF, 12V elec.
C8 = 100 nF polyester
IC14 = 4518
IC15 = 4042
IC16 = 4063
IC17 = 4081
Q3, Q4 = BC109
Q5 = BC212
D4, D5 = 0.2-in. LED

Note: capacitors C5, C6 should be preferably low-leakage types, such as tantalum 10V working.

Fig. 4

RA, RC = 10K
RB, RE = 3K3
RVD = 1K linear

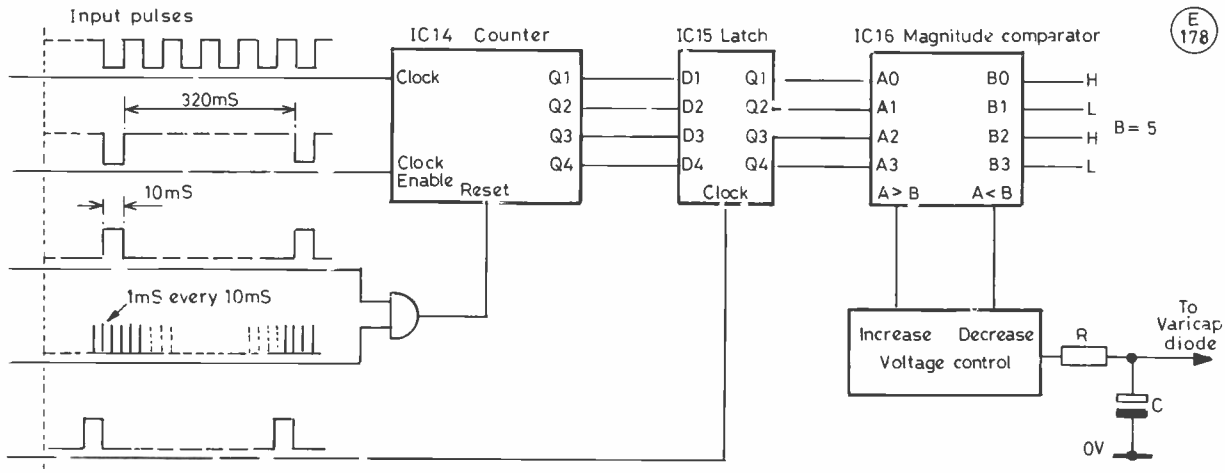


Fig. 1 BLOCK DIAGRAM

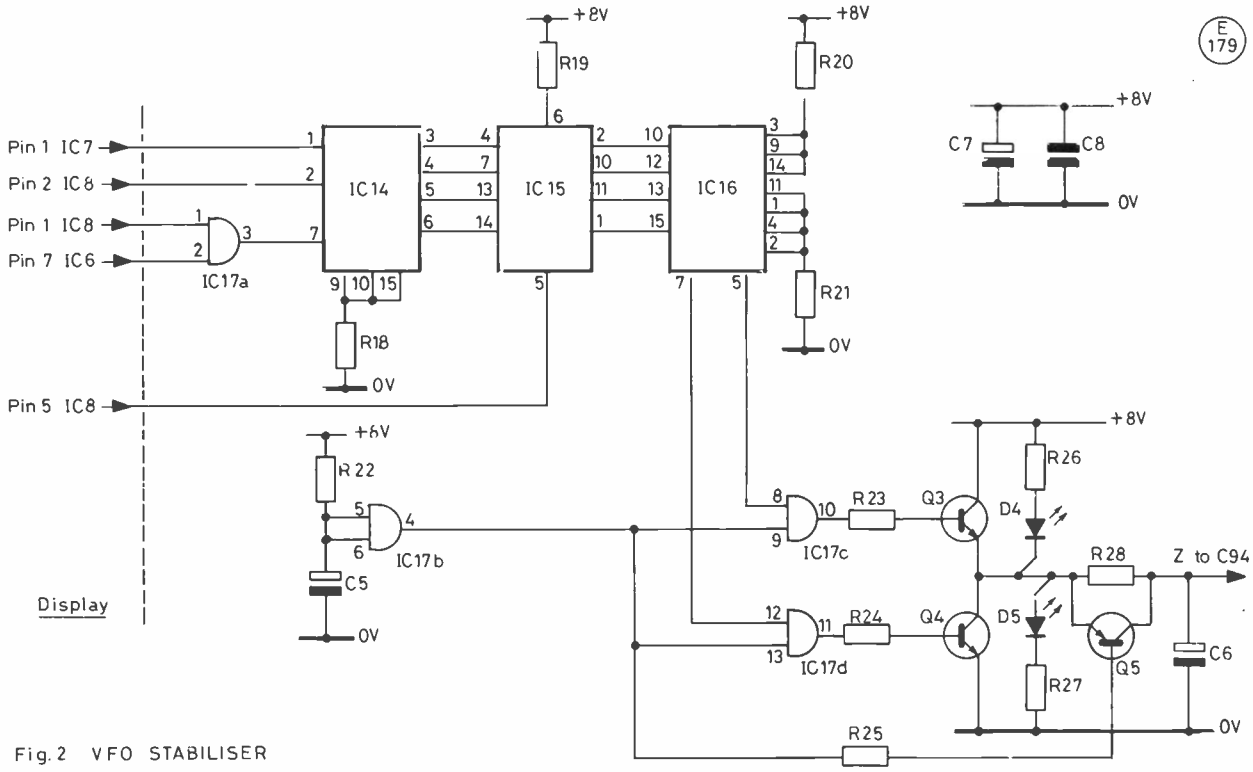


Fig. 2 VFO STABILISER

In this case however, as this signal is connected to the clock enable input (as distinct from the clock inhibit input), the count will be for 320mS, followed by a 10mS inhibit period. As the count is operational for approximately ⅓-second, the output from the counter will consist of the four least significant bits representing the frequency in 3 Hz steps. during the 10mS inhibit period the count is applied to the latch, IC15, and the counter is subsequently reset in anticipation of the next count period. The output of the latch is applied to the 'A' input of IC16, a 4-bit magnitude comparator; the 'B' input is set to denary 5 (0101 in binary). Two

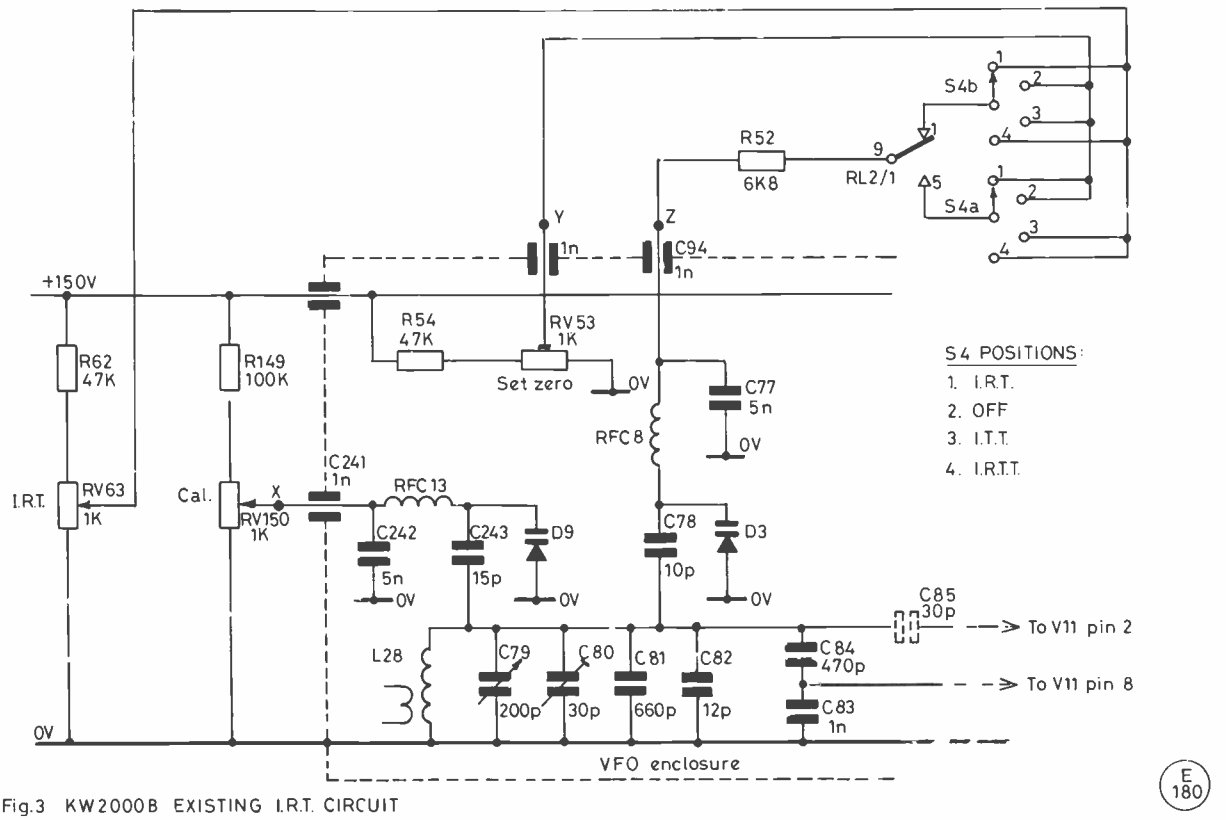
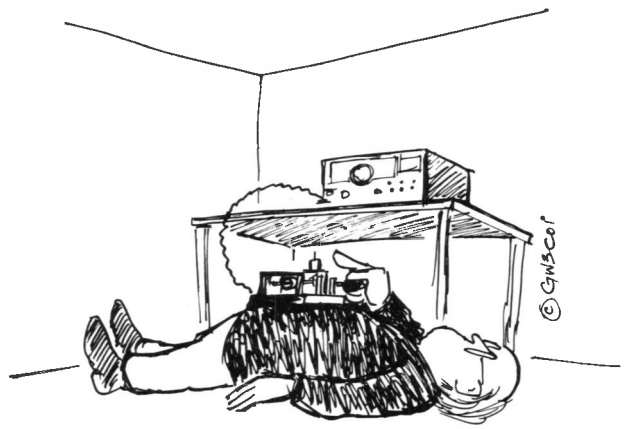


Fig. 3 KW2000B EXISTING I.R.T. CIRCUIT

out of the three outputs from the comparator are used, A>B which will go high when the magnitude of input 'A' is from 6 to 9 and A<B, which will go high when the magnitude of 'A' is less than that of 'B', *i.e.* from 0 to 4. These outputs are fed to the voltage control unit, which applies a voltage (*via* the high resistance resistor, R) to the capacitor C and the varicap diode within the VFO tank circuit. The voltage control unit will increase the voltage across C when A>B, maintain a constant voltage when A = B and decrease the voltage on the capacitor when A<B. The rate of change of voltage is controlled by the values of R and C and the time constant was found to be fairly critical in the author's unit for smooth operation of the stabiliser, although a large range of values was tried and gave satisfactory results.

If either R or C are of too small a value, a noticeable 'warbling tone' is produced due to rapid changes in the value of voltage as the stabiliser overshoots its locking point. Conversely, if R and C are of too large a value, the stabiliser will not be able to cope with the large frequency drifts occurring soon after turn-on and lock will be lost. The locking point exists when the condition A = B = 5 occurs within the magnitude comparator, at which point a constant voltage will be present on the varicap diode. The locking points occur at approximately 33 Hz steps, once the tuning is set onto a specific frequency, and the unit will lock to the nearest step and remain there until the tuning is again adjusted. Assume that the VFO drifts slightly high of the locking point (*i.e.* by more than 3 Hz): as the VFO frequency rises, the output from the subtractive mixer will fall, in turn causing the magnitude of 'A' to fall. A<B will go high, decreasing the voltage on the varicap, increasing the effective capacitance in the tank circuit and lowering the VFO frequency. This action will take place until the condition A = B = 5 is attained, upon which the voltage once again returns to a constant value. Using this method of locking, drifts in either direction can be catered for, enabling even the most stubborn of oscillators to be 'tamed' easily.

Fig. 2 details the schematic diagram of the unit. The operation follows that of the block diagram but with one important additional facility. For the effective operation of the unit it is essential that the capacitor C (C6 in Fig. 2) is charged to its steady state value (in the case of this unit, 4 volts) before any attempt at stabilisation is made; failure to do this will result in the capacitor being only partially charged on the formation of the first locking point, and if a positive VFO drift occurs (causing A<B) then the amount by which the capacitor can discharge will be severely limited — in turn limiting the amount of stabilisation possible.



"I picked up this tummy bug at a recent rally. . . ."

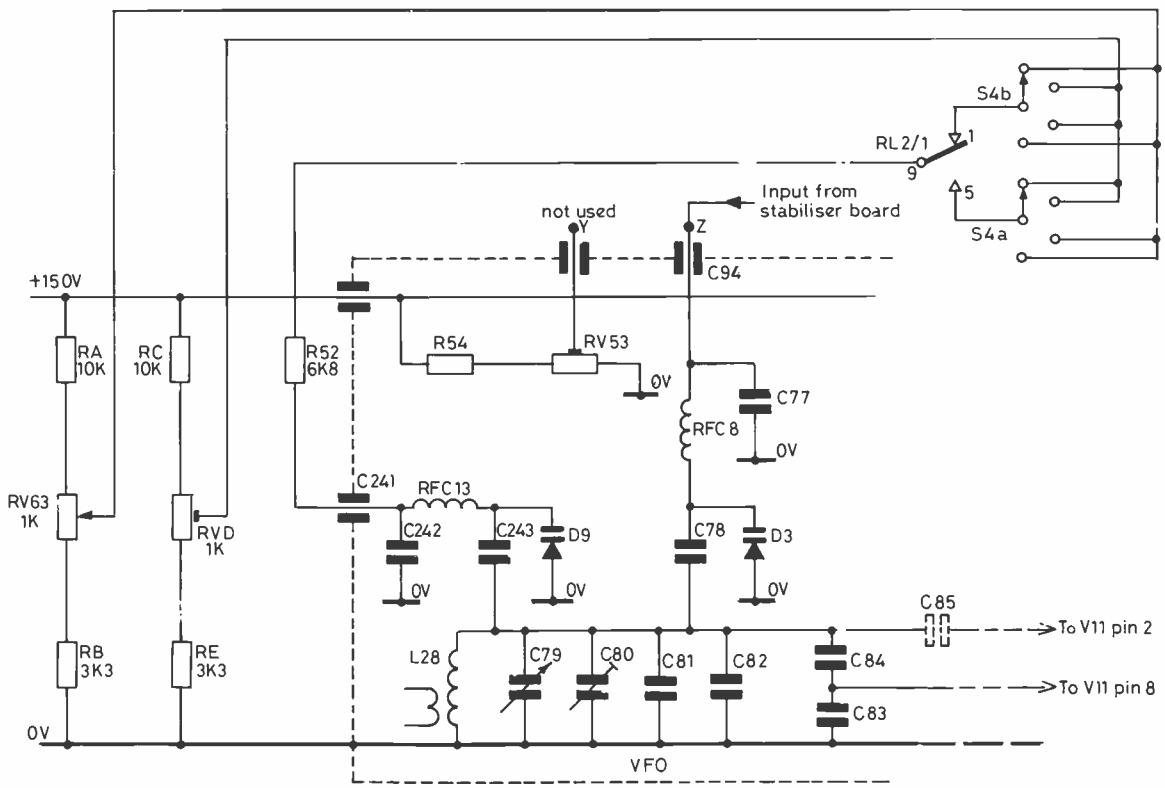


Fig. 4 MODIFIED I.R.T. CIRCUIT

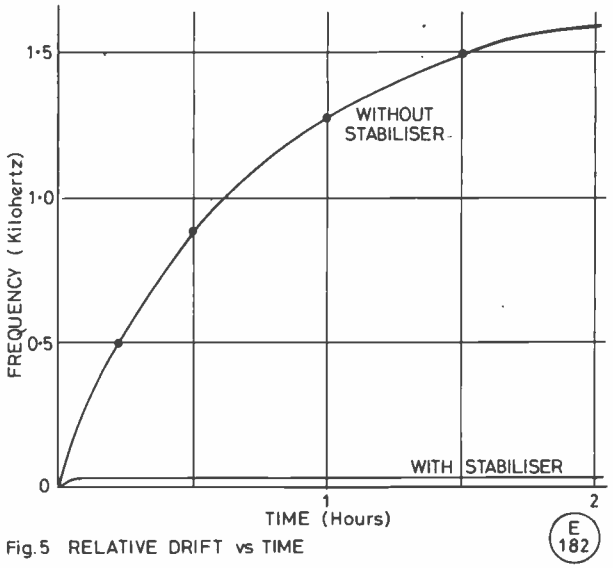


Fig.5 RELATIVE DRIFT vs TIME

Conclusion

The improvement in stabilisation is best illustrated with the aid of Fig. 5, graphically showing drift of the VFO with and without stabilisation, relative to the frequency at transceiver turn-on (valves having warmed up of course!). In both cases the drift was measured at an initial frequency of 2.600 MHz, at an ambient temperature of 15°C, ensuring similar heating cycles. Operation of the transceiver is made much simpler, frequency stability being in the order of that given by most present day synthesised transceivers — admittedly without some of the facilities of the modern 'Far East wonders', but then again at a fraction of the cost.

Undoubtedly, within a few weeks the lid will be off the rig again as yet another mod. is performed — in fact the author has already some ideas on improving sensitivity on the higher frequency bands; well, fingers crossed. . . .

It is also pointless attempting to stabilise the VFO frequency immediately following turn-on, as drift during the first minute or so is inevitable in any valve equipment. Both the initial charging circuit and stabilisation inhibit circuits are controlled by the one-shot monostable consisting of R22, C5 and IC17*b*. When the supply voltage is connected, C5 charges *via* R22, causing a low output from the gate IC17*b* until a threshold voltage is reached, upon which the output goes high. The delay produced by the circuit is in the region of two minutes, after which control signals are extended *via* IC17*c-d* to the voltage controller transistors Q3 and Q4; if neither Q3 or Q4 are conducting, a voltage of 4V will be present at point 'M' and both LEDs will glow dimly. If Q3 is conducting, a voltage of approximately 8V will be present at 'M' and D5 will glow brightly, indicating a charge condition. Similarly, when Q4 conducts, a voltage of approximately 0V will be present at 'M' and D4 will be illuminated, indicating the discharge (or A<B) condition. From the table of values, it can be seen that R28 (shown as R in Fig. 1) and C6 (C in Fig. 1) are of comparatively large value. To effectively charge C6 to the 4V value was found to take around 10 minutes; obviously this time interval is excessive. The addition of R25 and Q5 will effectively short-circuit R28 for the duration that the output of IC17*b* is at logic 0, becoming a virtual infinite resistance as soon as the output flips to the '1' state. In this way, very effective initial turn on charging occurs, whilst maintaining a sufficiently high R, C time constant.

Modifications

Figs. 3 and 4 detail the relevant parts of the VFO circuitry before and after modification, points 'X' (connected to purple wire), 'Y' (blue wire) and 'Z' (yellow wire) being connections to feedthrough capacitors on the bottom of the VFO enclosure. Note that the roles of the varicap diode branches are in fact reversed; that is, the one which was used for the IRT circuitry before modification is now used for the stabiliser, the diode branch previously used in the calibrate circuitry now being used for the IRT. The addition of the four resistors, RA to RE, will reduce the effective spread of the IRT control from ±6 kHz (which the author found very awkward — requiring 'safe cracker' fingers to net precisely on frequency) to a less daunting ±600 Hz. The complete stabiliser should be placed in a screened box (in the same box as the display unit if possible), with D4 and D5 mounted in the lid of the box so that operation of the stabliser may be readily checked.

Comtech **announce the introduction of the new DB-1 series of desk microphones. Features include a wide range of inserts of various impedances, p-t-t or on-off switching, and models are available with integral microphone pre-amplifiers or line amplifiers, 'busy' signal lights and 'time-out' timers. For full details contact R. L. Glaisher,** *Communication Technology Ltd.*, **279 Addiscombe Road, Croydon CR0 7HY. Tel: 01-656 3631. Telex: 269738.**

A QRP TRIP TO A QRO STATE

A QUICK SKETCH OF A VISIT TO THE ARRL NATIONAL CONVENTION IN HOUSTON, TEXAS

REV. G. C. DOBBS, G3RJV

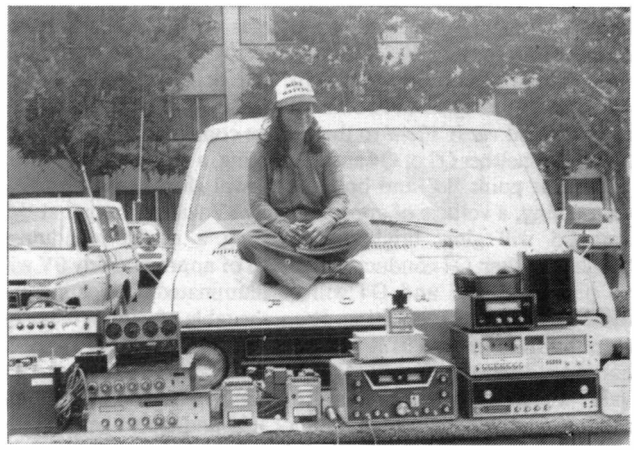
IT is interesting that when the ARRL National Convention was planned for Houston in October, 1983, it should be the first occasion on which a major QRP Section was included. Texans are generally associated with all that is big, an association confirmed by their favourite expression "Y'all." This slurring of "you" and "all" is more often used as a singular address commonly in shops when a departing customer will be told "Y'all come back now". Etymologists put it down to the Texan dislike of the singular or small, perhaps due to the long association with large herds. The Texas QRP Committee, a group consisting mainly of officers from the American QRP Amateur Radio Club International, invited three members of the G-QRP Club to lecture at the Houston Convention. These were George Burt, GM3OXX, Christ Page, G4BUE, and myself with my wife as chaperon. Trying to avoid the egotistic tedium of someone showing their favourite holiday slides, I will attempt to share some of our experiences of the Convention and amateur radio in Texas.

We arrived in Texas from cold, wet England on October 3rd to our first surprise — 88°F and 90% humidity; we had overlooked the fact that Houston is on the same latitude as New Delhi, Lhasa and Kuwait. Houston is an interesting city, essentially a boom town, based upon the oil trade, that just grew. I cannot be blamed for Frank Lloyd Wright's view, "Houston is an example of what happens when architecture catches venereal disease" but it is quite a hotch-potch of a place. Our host was Leo Delaney, KC5EV, who lived in a suburb of Houston which proved to be some 40 miles out from the city centre. Like most of Texas it is a cheerful, self assured place; where else would people say, "There are only two certainties: Death and Texas". Leo, like all Texans, turned out to be an excellent host. Many are the stories of American hospitality told by visitors on their return but sadly much of it seems superficial. The Texans, however, are gregarious by nature and with the appropriate responses from the visitors, will extend a generous welcome.

Since clergy, when they go to see places generally look at the people instead, a few words about the Texan culture. There are still cowboys in Texas, we saw a few genuine ones in the west of the State and lot of non-genuine urban ones all over Texas. The latter are the dangerous ones! The horse has been superceded as the chief mode of transport by the pickup truck. Again these come in two types, country and urban. The urban pickup has lots of lights, big wheels, too much chromium, a prominent empty gun rack and bumper stickers relating to beer, nightclubs or armadillos. The country pickups are of unrecognizable colour or make, full of junk and look as if a collection of small animals once lived in them.

Food in Texas is a subject of singular importance. My wife refuses to tell how much weight she gained but I am sure that had I stayed longer I would have died young, fat and happy. The commonest dish is not chilli but 'chicken fried steak'. A nice, usually large, piece of beef fried in a manner more usual to a southern American gentleman's treatment of fowl. Like most Texan food, it is invariably good and I must confess to having eaten it at breakfast. Mexican food is very common, not surprising if one recalls that not so long ago Texas was part of Mexico until a little battling around The Alamo and other local shrines enabled the Scots and English to give Texas to the Texans. Some of this Mexican food is the genuine stuff but most of it is a perversion called "Tex-Mex". The language is a delight, my favourite being "'mayon" (man) and "'bob war" (barbed wire); the chief linguistic sin is to call a RO-dee-o a re-DAY-o.

The Texan attitude to amateur radio was just about what we had feared. Most of the stations had a large array of the latest, and most expensive, commercial equipment. I have often complained that amateur radio in the U.K. had largely become a user hobby, controlled by the chequebook and credit card. Texas was proof that we caught that demise from America. In general conversation I found that a lot of amateurs consider a complete change of station over a period of three or four years to be quite normal. It could be called, and is, a place of consumer excess—and that spills over into hobbies. The contrast to the U.K. is that overt consumerism is so much part of life that I found little of the "I've got the latest rig" snobbery that sometimes occurs here. In spite of the commonplace expensive commercial set-ups most Texans appeared to retain a high level of interest in their hobby. Perhaps changing equipment often keeps the interest alive. I visited large amateur radio retailers in Houston, Austin and Dallas and was impressed by the high level of technical expertise, helpfulness and

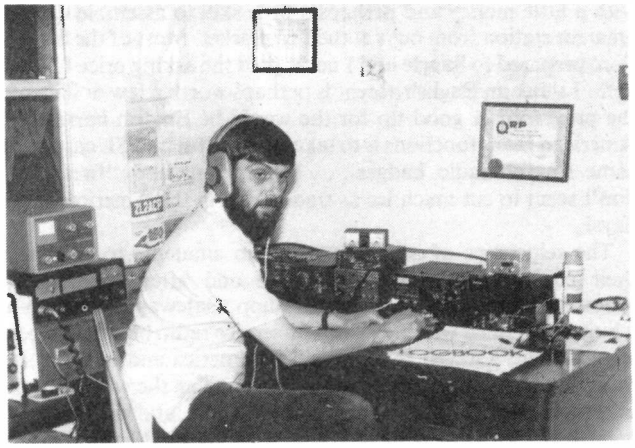


Above, not all of the small traders were gentlemen in the tailgating section of the Flea Market at the ARRL Convention, Houston. Below, bargain hunters in the covered part of the Flea Market.
photo: Jo-Anna

sheer good manners of the traders. One useful spin-off is that good quality, secondhand equipment is considerably cheaper than in the U.K. Beautiful items of equipment like fine Drake receivers of yesteryear and the classic 75A-2 receiver were available at very reasonable prices.

The chief task of the three British QRP-ers visiting the colonies was to lecture at the ARRL National Convention. The Convention moves from State to State each year. The site chosen in Texas was the Astro Village, a conference and convention complex adjacent to the massive baseball Astrodome and the Astroworld amusement park. The site includes three hotels, an exhibition hall, suites of meeting rooms, a row of shops and the local KGOL radio station. The convention is far more than the U.K. style of amateur radio exhibition, it is a real convention with hundreds of amateurs staying on the site. The pleasant result of this is that the chief attraction becomes meeting, eating and drinking with lots of other radio amateurs; each specialist group at the convention extended hospitality to the visiting amateurs. The QRP Committee, like several other groups, rented a suite of rooms as a 'hospitality suite'. The pleasant lounge, with a small bar, provided something sadly missing from many U.K. radio events, a chance for likeminded people to meet and talk together.

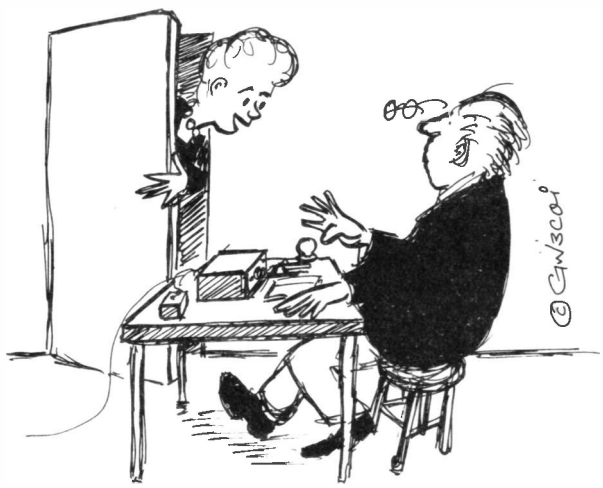
The actual exhibition section of the convention was surprisingly small. Smaller, for example, than either the RSGB Exhibition at the Birmingham NEC or the ARRA Exhibitions held in the Midlands. The usual type of trader stands were all present, perhaps a little more lavish, but very much like the similar U.K. trader stands. The number of dealers in components and small bits and pieces was noticeably less than at a U.K. exhibition. Alongside the exhibition were a number of events unknown in the U.K. A series of breakfasts for specialist groups, a complete programme of ladies activities and lectures, a series of FCC examinations for upgrading the licence and the mysterious Wouff Hong Ceremony. Two conducted tours were also offered, one to the Celestial Suite, the world's most expensive hotel suite (according to the *Guinness Book of Records*) and a tour of the Johnson Space Center. The former was carefully missed by the U.K. QRP-ers but they were invited on the VIP version of the latter as guests of the ARRL. The Space Center tour, as guests of NASA, is a real delight although a little slow moving at times. The first surprise was literally bumping into John Allaway, G3FKM, on the tour; amongst many other things John is also a member of the G-QRP Club. Perhaps the highlight was visiting the press gallery of the main Mission Control Room, that well televised site. The Mission Control Room has complete control of each space mission once the vehicle has cleared the tower on launch. Do you remember the words, "Columbia has cleared the tower"? Well that is the signal for Houston to begin their work.



Rev. George Dobbs, G3RJV, operates as G3RJV/W5 at the QTH of Leo Delaney, KC5EV. The station is situated in Spring, Texas, on the northern edge of Houston. *photo: Jo-Anna*

The main planned events for the convention, and again this differs from U.K. events, was the extensive programme of seminars and lectures. These covered a vast range of subjects from the mundane "Amateur Radio Teletype" and "EME Techniques" to the intriguing "Holographic Videa" and "The Collapse of the 2,000-ft. Secior Road Tower". The QRP Forum section offered a series of six lectures through one day. I gave an Americanised version of my lecture "Amateur Radio on a Shoestring". George Burt, GM3OXX, lectured on "QRP Design and Construction Techniques" and Chris Page, G4BUE, lectured on "Milliwatting in the U.K". We were joined by two American lecturers, Ade Wiess, W0RSP, the QRP Editor of *CQ* magazine, who lectured on "Single-Hop Propagation to Great Distances and QRP", and Wes Hayward, W7ZOI, who lectured on "QRP Equipment in the Mountains" and "Single Phase Lock Loop Design". W7ZOI is perhaps one of the most respected amateur radio writers being, with W1FB, the joint author of *Solid State Design for the Radio Amateur,* believed by most of us to be the definitive book on amateur radio home construction. The QRP lectures were all full to capacity and received by a very interested audience who not only asked many questions after the lecture but continued the discussion later in the hospitality suite.

One of the paradoxes about the Texan radio scene was comparing the high level of commercialism with the inexpensive fun of the large outdoor flea market. The flea market was held at the back of the main hotel and was really unlike U.K. radio junk sales. Small traders and individuals could either rent a stall in a large covered area (advisable as the temperatures touched the 90's at midday) or rent space to park their car or van and "tailgate"—sell goods from the vehicle. I enjoyed it! The selection, the quality and the prices were, on the whole, much better than in the U.K. I even went without lunch on the day of the QRP Forum, and I had been up since 5 a.m. to explore the little junk tables. The only real problem was fighting with crowds of big Texans in the heat of the day! It would be possible for someone



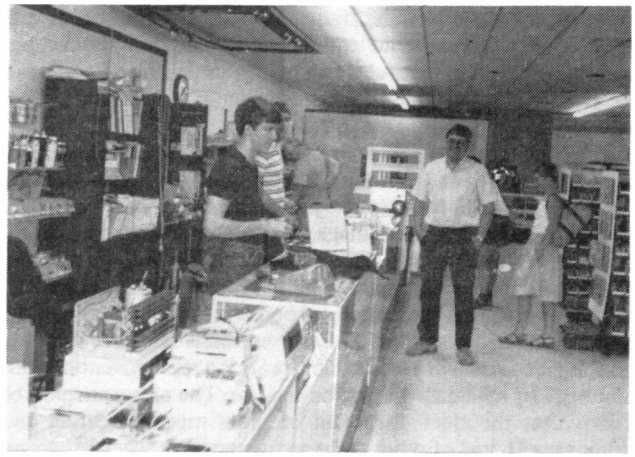
"It's somebody from the QRP Club to measure your input, dear."

with a little money and perhaps a little skill to assemble a good amateur station from buys at the flea market. Most of the traders were prepared to haggle and I never paid the asking price for any item. I think an English accent is perhaps worth a few dollars off the price too! A good tip for the would-be English barterer at American radio functions is to take a pocketful of QSL cards and some English radio badges . . . beads, pans and "firesticks" don't seem to cut much ice as trade items in the Americas these days!

The reluctance of many Texan radio amateurs to construct their equipment seemed even more odd after our visit to Houston's largest radio component shop. Gateway Electronics is a huge shop filled with racks of self-service radio bits and pieces. My wife and I stayed for a month in America and I gather she thought there was some danger of me spending the whole of it in that shop. The cheerful manager, Dan Bretch, and his staff were helpful and knew their stock and its possibilities. Much of it was surplus and compared well with similar U.K. items although the new manufacturers' items seemed to be highly priced. Another "radio goodies" place was the surplus shop attached to Collins Radio (a name to conjure with!) in Dallas. This hard-to-find Aladdin's cave was filled with junked manufactured items, test equipment and prototype boards. All good stuff but they appear to know the worth of their junk when working out prices.

G3RJV/W5 did a little HF and VHF operating in Texas by borrowing equipment and stations. Texas is not a good DX site, the number of countries I heard on the HF bands was very limited—it's a long way from many of them, but hearing XE as local was novel. My one experience of operating near the centre of Houston on the LF bands showed that the local noise level is horrific. K5GHB was kind enough to lend me a 2-metre mobile rig for driving around the west of the state in a hired car. This was great fun as U.K. amateurs, in fact almost any non-local amateurs, are rare in the remoter rural areas. Being a DX station on small, local private repeaters is perhaps as near as I will ever get to the real thing. The good manners on the 2-metre band FM was astounding and I was offered continual good wishes, local tips and route information. My only notable QSO was a two-way QRP CW contact on 10 metres between myself in Austin (on 4 watts) and G-QRP Club Chairman G3DNF (on 3 watts) in Leeds. An unplanned QSO that made the day for both of us.

I have enough Texan anecdotes to bore a barber, the splendour of Austin and its radio club, Galvaston and the Gulf of Mexico, the cowboy country of West Texas, "Gillys" (the biggest nightclub in the world), a genuine Old Western dance hall, seeking the sin in New Orleans . . . and so on. But this is a small report on a radio convention and having paid good money for this magazine, you will not want to be bored by me. Of all the American States, I would not have chosen to go to Texas but I am pleased I did. Americans from other States sometimes like to deny that it is a real part of America, and a lot of Texans agree. But in the classical turn of phrase from the Brazoria County bullbreeder, "It sure beats anything I've ever helt, smelt, felt, slept with, or stepped in!"



Gateway Electronics in Houston, with manager Dan Bretch (hands in pockets). *photo: Jo-Anna*

Wes Hayward, W7ZOI, gives a lecture on simple phase-lock-loop design. Wes is the joint author of ARRL's "Solid State Design for the Radio Amateur", and a frequent magazine writer. *photo: Jo-Anna*

CLUBS ROUNDUP

By "Club Secretary"

The Mail

ABERGAVENNY and Nevill Hall notify us of a change of address of their Hon. Sec. which we have taken in the Panel. Find the group every Thursday evening in the room above Male Ward 2 at Pen-y-Fal Hospital, Abergavenny. Their RAE class is held on Tuesdays in the Seminar Room at Nevill Hall Hospital — but we would think you should go to the club and talk to the Hon. Sec. about the starting date for the next course.

At **Acton Brentford and Chiswick** they will be having a discussion on February 21 at Chiswick Town Hall, High Road, Chiswick; the topic this time will be receiver pre-amplifiers. The start is at 7.30 p.m.

While 7.30 is early for London clubs it is much more usual elsewhere, such as at **Axe Vale**, where the gang will be in the "Cavalier Inn", Axminster, on February 3 for a junk sale; the routine is to foregather on the first Friday of each month.

On **Bangor's** seafront is the Sands Hotel, where the February meeting will be addressed by Hugh Irvine, GI3TLT, on the subject of towers, aerials and associated topics. Friday, February 3 is the date, and we understand that after the talk they will have an Extraordinary General Meeting to discuss some constitutional matter, so all should try and attend.

Still over there we have **Belfast College of Technology**; they have a film night on February 29, in Room B10 of the Millfield complex of the college starting at 1900z sharp — and these events are open to the public. The Hon. Sec. can be contacted at the college on Belfast 227244, ext. 243, except Thursdays.

February 21 is the next meeting of the **Biggin Hill** club, which will have moved by then to St. Mark's Church Hall where they will have future meetings, starting at 8.30 p.m. February's bash is a talk and demo on 10 GHz.

At **Bishops Stortford** they have just passed the AGM, so the new committee will be organising the programme for '84. Find them on the third Monday of the month in the British Legion Club in Windhill for the formal nights, and on the first Thursday informally in the "Nag's Head" on the A120 Dunmow Road next door to the Golf Club, in the saloon bar.

Following that same A120 will take you through Dunmow to **Braintree**, where they forgather at the Community Centre, Victoria Street, which is next to the bus station in the centre of Braintree, on the first and third Monday of each month. February 6 is a talk on the theory of transmitters and on 20th the collection and renovation of old radio equipment.

Next down to **Brighton** where they now foregather in the Seven Furlongs Bar at Brighton Racecourse, lying at the northerly end of the Stand complex. For more details we must refer you to the Hon. Sec. — *see* Panel for his details.

B.A.R.T.G. is the one for all exponents of the RTTY mode of operation, whether they use the older mechanical teleprinter type set-up, AMTOR, or a home-computer type operation. Details from the Hon. Sec. — *see* Panel.

Bromsgrove A.R.C. have their meetings on the second Friday of the month at Avoncroft Arts Centre. More details from the Hon. Sec. — *see* Panel.

The other **Bromsgrove A.R.S.** is a new one, based on Rigby Lane School, Rigby Lane on the second Tuesday of the month. Again details from the Hon. Sec. — *see* Panel.

Now up to **Bury** which means the Mosses Community Centre, Cecil Street, Bury, every Tuesday evening. The main meeting is on the second Tuesday, and in February it will be hearing all about earthing from G3NKL. In addition they will have a 'Ham Feast' at Hq. which they describe as a rally with a difference — doors open on Sunday, February 5 at 11 a.m. talk-in on S22, and there will be a bring-and-buy, and food will be available.

The Visual Aids Room on the ground floor of Coleridge Community College, Radegund Road, off Coleridge Road, is the home of the **Cambridge** club; February 3 and 17 are informals, and on 10th there is a video show. For more details, contact the Hon. Sec. — *see* Panel for his details.

Cambridgeshire (Repeater Group) have a real extravaganza set up for February 21 at the "Golden Hind", Milton Road, Cambridge, starting at 7.30 p.m. There will be a surplus equipment sale, trade stands, an RTTY demonstration, raffle, licensed bar, and of course a Repeater Group stand. More details from the Hon. Sec. — *see* Panel.

Cannock Chase comes next, and they are to be found every Thursday evening at Bridgetown War Memorial Club, Bridgetown, Cannock, where they have chat nights, lectures, films or whatever, and at each meeting a bit of Morse practice for aspiring G4s.

At **Cheltenham** they have a booking at the Stanton Room, Charlton Kings Library, Cheltenham; they don't say so but we believe their booking is first and third Fridays.

The **Chesham** crowd foregather in the Stable Loft, Bury Farm, Pednor Road, Chesham at 8 p.m. on Wednesdays. New members are more than welcome. More details from the Hon. Sec. — *see* Panel.

Deadlines for "Clubs" for the next three months—

March issue—January 27th
April issue—February 24th
May issue—March 30th
June issue—April 27th

Please be sure to note these dates!

Cheshunt are to be found on Wednesdays too, their base being the Church Room, Church Lane, Wormley, near Cheshunt, in Hertfordshire. February sees natter nights on 1st, 15th and 29th; February 8 is an equipment evening, and on 22nd G4OAA will be talking about the Sierra Leone Beacon Project.

Down south now, to **Chichester**, and here they have a visit on February 7 from *Solent Component Supplies*, in the Long Room; February 16 sees them back in the Green Room, for a talk on the GB3VR Video Repeater. Both at the Fernleigh Centre, 40 North Street, Chichester.

The design and construction of printed circuit boards is the topic on February 9 at **Colchester**, the speaker being Bev Clues. Robin Cobbold takes the stand on 23rd, to tell the group "how to make the micro work". The venue is the Colchester Institute, Sheepen Road, Colchester.

The first Thursday in the month it is for **Cornish**; but we are not sure whether they will be at the Church Hall, Treleigh, or whether their old Hq. will be ready for re-occupation in time — so we suggest you check with Hon. Sec. — *see* Panel.

For details of the **Crawley** doings after the AGM we will have to refer you to the Hon. Sec. — even if he has changed we feel sure the name and address we have on record will be enough to get you into contact with the gang. *See* Panel.

On February 18 the **Crystal Palace** crowd have their AGM and constructional contest; the venue for this is All Saints Parish Room, which is at the junction of Beulah Hill and Church Road, Upper Norwood, opposite the IBA mast.

Now **Derby**, which must mean 119 Green Lane, Derby, where the club have the whole top floor. February 1 is the junk sale, and

Names and Addresses of Club Secretaries reporting in this issue:

ABERGAVENNY: D. F. Jones, 80 Craesonen Parc, Abergavenny, Gwent NP4 6PE. *(0873 78674)*
ACTON, BRENTFORD & CHISWICK: W. G. Dyer, G3GEH, 188 Gunnersbury Avenue, Acton, London W3 8LB.
AXE VALE: P. L. Peach, G3GOS, The Firs, Goldsmiths Lane, All Saints, Axminster, Devon. *(Axminster 34259)*
BANGOR: S. Mackay, GI4OCK, 11 Dellmount Park, Bangor, Co. Down BT20 4UA.
BELFAST (College of Technology): J. Barr, GI1CET, 121 Kitchener Street, Belfast BT12 6LF.
BIGGIN HILL: I. Mitchell, G4NSD, 37B The Grove, Biggin Hill, Westerham, Kent TN14 3TA. *(09594 75785)*
BISHOPS STORTFORD: B. J. Salt, G4ITL, 135 Kingsland, Harlow, Essex. *(0279 20478)*
BRAINTREE: Mrs. P. Penny, G6TAF, 13 Newnham Close, Braintree, Essex. *(0376 26487)*
BRIGHTON: N. V. Hewitt, G8JFT, 36 Princes Terrace, Kemptown, Brighton, Sussex BN2 5JS.
B.A.R.T.G.: E. Batts, G8LWY, 27 Cranmer Court, Richmond Road, Kingston-on-Thames.
BROMSGROVE (ARC): J. Calder, G6EAM, 30 Camberley Road, Kingswinford, W. Midlands. *(Kingswinford 8580)*
BROMSGROVE (ARS): A. Kelly, G4LVK, 8 Greenslade Crescent, Bromsgrove, Worcs. B60 1DS.
BURY: B. Tyldesley, G4TBT, 4 Colne Road, Burnley, Lancs. *(Burnley 24254)*
CAMBRIDGE: D. Willcock, G2FKS, 6 Lyles Road, Cottenham, Cambridge CB4 4QR. *(Cottenham (0954) 505917)*
CAMBRIDGE (Repeater Group): C. Lorek, G4HCL, 11 Bevills Close, Doddington, March, Cambs. PE15 0TT.
CANNOCK CHASE: K. T. Ward, G4RJW. 2 Tame Grove, Cannock, Staffs. WS11 1LL.
CHELTENHAM. Mrs. G. Harmsworth, G6COH, 42 Leckhampton Road, Cheltenham, Glos. *(Cheltenham 25162)*
CHESHAM: J. Alldridge, G6LKS, 15 Wichcote Gardens, Chesham, Bucks. *(Chesham 786935)*
CHESHUNT: R. Frisby, G4OAA, 2 Westfield Road, Hoddesdon, Herts. EN11 8QX.
CHICHESTER: T. M. Allen, G4ETU, 2 Hillside, West Stoke, Chichester, Sussex PO18 9BL. *(West Ashling 463)*
COLCHESTER: F. R. Howe, G3FIJ, 29 Kingswood Road, Colchester, Essex. *(0206 70189)*
CORNISH: J. J. Vinton, G6GKZ, Cheriton, Alexandra Road, St. Ives, Cornwall. *(Penzance 795860)*
CRAWLEY: D. L. Hill, G4IQM, 14 The Garrones, Worth, Crawley, W. Sussex RH10 4YT. *(Crawley 882641)*
CRYSTAL PALACE: G. M. C. Stone, G3FZL, 11 Liphook Crescent, London SE23 3BN. *(01-699 6940)*
DERBY: Mrs. J. Shardlow, G4EYM, 19 Portreath Drive, Darley Abbey, Derby DE3 2BJ. *(0332 556875)*
DERWENTSIDE: Mrs. J. Wallis, G1AAJ, 10 Middlewood Road, Lanchester, Durham DH7 0HL.
DROITWICH: E. G. Taylor, G4HFP, 6 Marlborough Drive, Stourport-on-Severn, Worc. DY13 0JH *(S-o-S 3818)*
DUDLEY: Mrs. C. Wilding, G4SQP, 92 Ravenhill Drive, Codsall, Wolverhampton WV8 1BW. *(Codsall 5636)*
EAST KENT: S. Alexander, G6LZG, 66 Downs Road, Canterbury, Kent CT2 7AY.
EDGWARE: H. Drury, G4HMD, 11 Batchworth Lane, Northwood, Middx. *(Northwood 22776)*
EXETER: R. Tipper, G4KXR, 11 Chancel Court, Chancel Lane, Pinhoe, Exeter. *(Exeter 68065)*
FYLDE: H. Fenton, G8GG, 5 Cromer Road, St. Annes, Lytham St. Annes, Lancs. FY8 3HD.
GLENROTHES: A. Givens, GM3YOR, 41 Veronica Crescent, Kirkcaldy, Fife KY1 2LH. *(Kirkcaldy 200335)*
G-QRP: Rev. G. C. Dobbs, G3RJV, 17 Aspen Drive, Chelmsley Wood, Birmingham B37. *(021-770 5918)*
GREAT YARMOUTH: A. D. Besford, G3NHU, 49 Blake Road, Gt. Yarmouth, Norfolk NR30 4LT.
GREATER PETERBOROUGH: F. Brisley, G4NRJ, 27 Lady Lodge Drive, Orton Longueville, Peterborough. *(0733 231848)*
HARROW: C. D. Friel, G4AUF, 17 Clitheroe Avenue, Harrow, Middx. HA2 9UU. *(01-868 5002)*
HASTINGS: G. North, G2LL, 7 Fontwell Avenue, Little Common, Bexhill-on-Sea. *(Cooden 4645)*
HAVERING: A. Negus, G8DQJ, 17 Courtenay Gardens, Upminster, Essex RM14 1DH. *(Upminster 24059)*
HEREFORD: S. Jesson, G4CNY, 181 Kings Acre Road, Hereford. *(Hereford 273237)*
HORNDEAN: P. Phelps, G6IOV, 152 Cherrytree Avenue, Cowplain, Portsmouth, Hants.
HORNSEA: N. A. Bedford, G4NHP, 39 Hamilton Road, Bridlington, Yorks. YO15 3HP.
IPSWICH: J. Tootill, G4IFF, 76 Fircroft Road, Ipswich, Suffolk, IP1 6PX. *(0473 44047)*
I.R.T.S.: S. Nolan, EI7CD, 68 Ratoath Estate, Ratoath Road, Dublin 7.
JERSEY (AEC): P. Johnson. GJ8KNV, Mon Repos, Fauvie Grauville, Jersey. *(Jersey 53333)*
LINCOLN: Mrs. P. Rose, G8VRJ, Pinchbeck Farmhouse, Mill Lane, Sturton-by-Stow, Lincoln, LN1 2SA *(Gainsborough 788356)*
MIDLAND: N. Gutteridge, G8BHE, 68 Max Road, Quinton, Birmingham B32 1LB. *(021-422 9787)*
MID-SUSSEX: R. Hodge, G4MMI, Corner House, Manor Gardens, Hurstpierpoint. *(Hurstpierpoint 833559)*
MID-WARWICKSHIRE: Mrs. C. Finnis, G4TIL, 37 Stowe Drive, Southam, Warks. CV33 0NZ. *(Southam (092681 4765)*
NENE VALLEY: L. Parker, G4PLJ, 128 Northampton Road, Wellingborough, Northants NN8 3PJ.
NORTH WAKEFIELD: S. Thompson, G4RCH, 3 Harlington Court, Morley, LS27 0RT. *(0532 536603)*
PLYMOUTH: C. Stevens, 196 Lipson Road, Plymouth.
R.A.I.B.C: Mrs. F. Woolley, G3LWY, 9 Rannoch Court, Adelaide Road, Surbiton KT6 4TE.
REIGATE: C. S. Barnes, G8FEE, 25 Hartswood Avenue, Woodhatch, Reigate, Surrey RH2 8ET.
ROYAL NAVY: M. Puttick, G3LIK, 21 Sandyfield Crescent, Cowplain, Portsmouth, Hants. PO8 8SQ. *(Waterlooville 55880)*
SALOP: Ms. D. E. Parslow, G6UDB, 1 Willington Close, Little Harlescott Lane, Shrewsbury SY1 3RH. *(0743 62737)*
SOUTH BRISTOL: L. Baker, G4RZY, 62 Court Farm Road, Whitchurch, Bristol, Avon BS14 0EG.
SOUTHDOWN: T. Rawlance, G4MVN, 18 Royal Sussex Crescent, Eastbourne.
S.E. KENT YMCA: A. Moore, G3VSU, 42 Nursery Lane, Whitfield, Dover, Kent *(0304 822738)*
SOUTH MANCHESTER: D. Holland, G3WFT, 32 Woodville Road, Sale, Greater Manchester. *(061-973 1837)*
STOURBRIDGE: M. Davies, G8JTL, 25 Walker Avenue, Quarry Bank, Brierley Hill, Staffs. *(Lye 4019)*
SURREY: R. Howells, G4FFY, 7 Betchworth Close, Sutton, Surrey SM1 4NR. *(01-642 9871)*
SUTTON & CHEAM: J. Korndorffer, G2DMR, 19 Park Road, Banstead, Surrey.
SWALE: B. Hancock, G4NPM, Leahurst, Augustine Road, Minster, Sheerness, Kent ME12 2NB.
THANET: I. B. Gane, G4NEF, 17 Penshurst Road, Ramsgate, Kent. *(Thanet 54154)*.
TODMORDEN: Ms. J. Gamble, 283 Halifax Road, Todmorden, Lancs. OL14 5SQ.
VALE OF WHITE HORSE: I. White, G3SEK, 52 Abingdon Road, Drayton, Abingdon, Berks. *(0235 31559)*
WEST KENT: P. Reeve, G4GTN, 2 Court Road, Tunbridge Wells, Kent. *(Tunbridge Wells 24689)*
WIRRAL: N. B. McLaren, G4OAR, 596 Woodchurch Road, Oxton, Birkenhead. *(051-608 1377)*
WORCESTER: A. C. Lindsay, G4NRD, 11 Durcott Road, Evesham, Worcs. WR11 6EQ. *(Evesham 41508)*
YEOVIL: E. H. Godfrey, G3GC, Dorset Reach, 60 Chilton Grove, Yeovil, Somerset BA21 4AW. *(0935 75533)*
YORK: K. R. Cass, G3WVO, 4 Heworth Village, York.
308: D. Davis, G6YQD, 13 Maple Road, Surbiton, Surrey KT6 4AA.

on 8th G4PMM will talk about the Salem Repeater; a film show on February 15 is followed on 22nd by a talk "Forensic Science and Failure Investigation" by Jim Campbell. That leaves February 29 for a talk on choosing your rig — an explanation of the performanace claims and their worth in practical terms.

Nice to hear again from **Derwentside,** who are to be found at the R.A.F. Association Hq., Sherburn Terrace, Consett, every Monday evening. We rather gather that they have had a good year in 1983, and are looking forward to more expansion. Details from the Hon. Sec. — *see* Panel — or why not just turn up?

Looking at **Droitwich,** we find they have their base at the Scout Hq. in Droitwich on second and fourth Mondays; March 26 will see a 'special' with G3RJV giving his talk on QRP.

Every second and fourth Tuesday the **Dudley** crew go to the Central Library in Dudley; contact the Hon. Sec. for February's activities.

According to our records, **East Kent** are at the Cabin Youth Centre, Kings Road, Herne Bay; from their letter, we see February 2 is a junk sale, and on 16th there is a natter and the club project. For more details, contact the Hon. Sec. — *see* Panel.

February 9 for **Edgware** should be of interest, as they have a Bosch representative coming along to talk about mobile radio interference; February 23 is the informal date for this month. Find them on the second and fourth Thursday of any month at 145 Orange Hill Road, Burnt Oak, Edgware.

Down at **Exeter** the venue is the Community Centre, St. Davids

Hill, and on February 13 they have a talk on transmitter valves by G3AOJ — should be something of interest for the newcomers!

On the first and third Tuesdays the **Fylde** club foregather at the Kite Club, Blackpool Airport; this change of venue, about a year ago, has resulted in a rapid gain in membership and facilities. February 7 sees a talk on public service radio by G6DNK, and on 21st they have the informal meeting with a Morse class thrown in.

Up to Scotland now, to **Glenrothes** who have their base at Provosts Land, Leslie, Fife. Every Wednesday evening and third Sunday is what our records say, but the only date mentioned in the current newsletter is February 19 — so a call to the Hon. Sec. should resolve the question; his details are in the Panel.

The **G-QRP Club**, going from strength to strength, has now well over 2000 members; this is one for anyone who has an interest in low-power operating or home-brew equipment. Details from the Hon. Sec. — *see* Panel for his details.

At **Great Yarmouth** the group has a place in the STC Sports and Social Club, Beevor Road, South Denes, where the past year has well justified the move. Visit them on February 2 or 16; details of the programme will have been settled by now, but at the time of writing awaited a committee meeting.

February 16 is the date for **Greater Peterborough**, at Southfields Junior School, but at the time of their last letter the details had not been finalised. Try the Hon. Sec. — *see* Panel — for the latest gen.

At **Harrow** the lads are all at Harrow Arts Centre, High Road, Harrow Weald, on Friday evenings; February 3 sees them in the Belmont Room for a contest forum and on 10th they will be in the Roxeth Room for an informal. As the given programme stops there we can't say what happens for the rest of the month, but it does seem as though the Roxeth Room is the one for the informals and that these are on alternate weeks.

Hastings have a complex programme to sustain their 187 membership . . . the third Wednesday in the month is the main meeting at West Hill Community Centre. Tuesdays, other Wednesdays, Thursdays and Fridays are taken at Ashdown Farm Community Centre and cover specialist interests save for the Friday evenings which are set aside for chat nights.

February at **Havering** means: February 1, surplus sale; February 8 an informal; February 15, part-two of a talk by G3EUR on war-time wireless. February 22 is a pre-contest briefing and then an informal, while the month ends on 29th with G8APZ talking about the HADRABS DX-pedition to Andorra. All are at Fairkytes Arts Centre, Billet Lane, Hornchurch.

After all the months of waiting the **Hereford** club are back in their old Hq. at County Control, Civil Defence Hq., Gaol Street, Hereford. See the palatial new home on February 3 for the AGM, or February 17 which is the informal evening.

If you are in the **Horndean** area you could try looking in at Merchistoun Hall, London Road, Horndean, Portsmouth, on the first Monday of every month. G3JFF has the stand on February 6, to talk about award hunting.

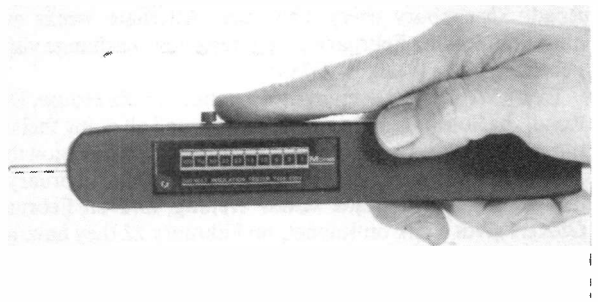
Hornsea seems to foregather at The Mill, Atwick Road, Hornsea, N. Humberside on a weekly basis, on Wednesday evenings. Unfortunately, we don't have the February data, for which we must refer you to the Hon. Sec. — *see* Panel.

Over to **Ipswich** where they gather in the "Rose and Crown" on the second and last Wednesday of each month, and often on other Wednesdays too. The venue is at 77 Norwich Road, which is the junction between Bramford Road and the A45 to Norwich.

Over the water to EI now, and here we have **I.R.T.S.**, combining the functions of a local club and a national society; so if there is anything you need to know about amateur radio club activity in Eire then contact the Hon. Sec. — *see* Panel for his details.

More sailing, this time to **Jersey** in the Channel Isles, where the locals have the AGM on February 8, at the Communicare Centre, St. Brelade, starting at 2015 sharp.

Lincoln now, and this means the City Engineers' Club, Central Depot, Waterside South, Lincoln; February 1, 15, and 29 are all CW/RAE nights; February 8 is a talk with slides on astrophotography by Don, G4GZA, and on 22nd they have an activity night with the club station on the air.



Shown here is the *Osborne Electronics* Model 4100, a new 500-volt, low-cost, hand-held, self-contained insulation tester which, the maker says, offers radical improvements over existing test units. The Model 4100 has many interesting features, and for further information contact the manufacturer, *Osborne Electronics*, Ryde, Isle of Wight. Tel: 0983-63622. Telex: 86363.

At **Midland** the club have their own place at 294A Broad Street, Birmingham. February 21 is the main meeting and the subject "A Fireman's Life". However, there are construction sessions on Monday evenings, and on Wednesdays there is Morse and nattering. We believe there is usually someone around on *any* weekday evening! Look for the Repertory Theatre, and 294A is opposite.

Mid-Sussex seems to have first and third Thursdays, at Marle Place Adult Education Centre, Leylands Road, Burgess Hill, but unfortunately we don't have the February programme data for which we must refer you to the Hon. Sec. — *see* Panel.

February 24 is down for a talk on RTTY by G3ZCG, and the AGM of the **Mid-Warwickshire** club is on 28th. The practical situation is that you can find them on the second and fourth Tuesday at 61 Emscote Road, Warwick.

Nene Valley have Jack Hum, G5UM, on February 1, talking about "VHF, then and now". February 8 is a natter evening. Either February 15 or 22 will be the date for G4BAO to do his talk on Six Metres, and on 29th they have the Heard Island DX-pedition video. They don't mention the venue, but luckily our card index says the lectures and natters are at the "Dolben Arms", Finedon, while the transmitting sessions are from the 1st St. Mary's Scout Hall, Finedon.

North Wakefield are at the Carr Gate Working Men's Club on February 2 for a talk on repeaters by G4EZV; and again on February 16 when they have a video of satellite communication.

Next we are to note a change of venue for the **Plymouth** crowd; they have moved to Hyde Park Junior School, Hyde Park Road, Mutley, Plymouth. We believe they are to be found on alternate Mondays, but our information is a little out of date, so a reference to the Hon. Sec. is in order — *see* Panel.

R.A.I.B.C.'s members are those who are interested in amateur radio but are blind or disabled; and of course there are able-bodied supporters and representatives necessary to make it all go with a swing. To help, or to become a member, contact the Hon. Sec. — *see* Panel for her address.

Now **Reigate**, which means the Constitutional and Conservative Centre, Warwick Road, Redhill, on the third Tuesday of each month. For the February programme we must refer you the Hon. Sec. — *see* Panel for the needful.

Turning now to the **Royal Navy**, we reckon that all those who have connections with salt water, either past or present, RN or MN or even foreign navies, all have a slot available for them in this club — and a good club it is too. Details from the Hon. Sec.

At **Salop** they have a place at the Albert Hotel, Smithfield Road, Shrewsbury every Thursday. Alternate weeks are for nattering, leaving February 2 for a telephone exchange visit, and February 16 for a talk by G3VRI.

Every Wednesday evening at Whitchurch Folk House, Dundry Road, the **South Bristol** gang are to be found all doing their thing; they don't say just what it is, but we do get the impression that the club is very definitely increasing its membership. February 1 is a bring-and-buy plus trade stands evening, and on February 15 G8XIH gives a talk on Raynet; on February 22 they have a QRP night with G4MCQ and on 29th it is a video night with G4EIA.

The first Monday in the month is the date for the meetings of the **Southdown** club; the venue is the Chaseley Home for Disabled Ex-Servicemen, Southcliff, Eastbourne. We don't have any more details, but we can say they always have something of interest set up for their meetings.

The Dover area is catered for by **South East Kent YMCA** who have their place at Dover YMCA, Godwynehurst, Leyburne Road, Dover, where they are to be found on Wednesday evenings for their club meetings with Mondays for RAE and Tuesdays for Morse.

South Manchester still lives at Sale Moor Community Centre, Norris Road, Sale, where they are to be found on Friday evenings. February 3 is a talk on fault finding, and a radio clinic. February 10 is an "audio-visual spectacular" by G6MOQ to which members will bring wives and YLs. February 17 and 24 were still to be settled when they wrote, but on February 25 they have a night Top Band D/F contest for the keen (or nutty!).

Yet another move of Hq. comes up for mention from **Stourbridge** — these chaps seem to have wanderlust! This time they have moved to the Robin Woods Centre, in School Street, off Enville Street — this is the Bridgnorth turning off the Ring Road. Contact the Hon. Sec. for programme details.

From Stourbridge to **Stratford-on-Avon** where the locals nowadays have their Hq. at the Control Tower, Bearley Radio Station, which is about three miles north of Stratford-on-Avon. February 13 is a session on power supplies, and on 27th they have a surplus sale.

February 6 for **Surrey** looks like being an evening of short talks at the time of writing, but what happens on 20th is unknown; we can say that both will be at *TS Terra Nova,* 34 The Waldrons, South Croydon.

We don't quite grasp what has happened to **Sutton and Cheam,** but their newsletter has completely omitted any reference to February's meetings! January and March — but no February. Therefore, we must refer you to the Hon. Sec. — his name and address appear in the Panel.

Nice to hear that the **Swale** group are still making progress; they are still to be found at Nina's Restaurant, 43 High Street, Sittingbourne, on Monday evenings.

February 14 is a junk sale for **Thanet,** at Grosvenor Club, Grosvenor Place, Margate; and on 28th, they will be entertaining the folk from R.A.F. Manston to hear them talk about Air-Sea Rescue.

A new club to mention now; this one is at **Todmorden** in Lancashire; the Hq. is at the Queens Hotel, Todmorden, and the date the first Monday in each month. The talk on February 6 will be on the important topic of safety in the shack. Already the club has about forty members and they are keenly looking for more!

The **Vale of White Horse** club is now based on the Lansdown Club, Milton Trading Estate, Milton, Abingdon; on February 7 G3UMF will be talking about fast-scan TV transmission.

Over now to **West Kent;** the formal meetings on February 10 and 24 are respectively for a talk on airline communications systems, and a surplus sale respectively. Informals are at the Drill Hall in Victoria Road, on February 14 and 28 (the letter says February 18 but we think that's wrong!). The Hq. for the main meetings is the Adult Education Centre, Monson Road — both venues being in Tunbridge Wells.

Club nights at **Wirral** are the second and fourth Wednesday of each month at Irby Cricket Club; the former is a technical film night, and on 22nd they have a visit by a local trader. In between they have their 'D & W' nights — drink and waffle! — the dates for which are February 1 at the "Basset Hound", Thingwall, and the other one on February 15 at "The Wheatsheaf", Ness.

The Oddfellows Club, New Street, Worcester, is Hq. to the **Worcester** club; on February 6 they have a talk on calculations for amateur radio by G4JSZ. On February 20 they have the informal at the "Old Pheasant" in New Street, starting time for both being 8 p.m.

Down at **Yeovil** the lads have every Thursday evening booked at the Recreation Centre, Chilton Grove, Yeovil. February 2 is a talk on radio noise, by G3MYM, and on 9th he takes over again for a talk on how to make radio equipment. February 16 is G3MYM again for a talk on how bipolar transistors work, and on 23rd they let him off the hook while they have a natter night — but what would they do without him!

As always, the **York** crowd will be heading on Friday evenings for the United Services Club, 61 Micklegate, York; as they say, they don't know what 1984 will bring them, but they will enjoy it whatever it is!

Finally, **308;** the club name was derived from the room number in which the members did their RAE classes; now they gather every Tuesday evening in the Coach House behind St. Mark's Church, Surbiton — and they add that the pink-painted Coach House is not a pub!

Finale

That's it for another time; the deadline dates are in the box for the next few months, and the dates are for *arrival,* addressed to your "Club Secretary", SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts. AL6 9EQ.

Mendascope

As many readers may already be aware, Scopex Instruments Ltd., who made a widely-used range of test gear, have been forced to call in a receiver. However, the person who was responsible for the design of all Scopex analogue instruments is now one of the directors of a new firm, **Mendascope,** which is therefore in a position to offer a unique service on Scopex equipment, including collection and free estimates. The address of **Mendascope Ltd.** is Otter House, Weston Underwood, Olney, Bucks. MK46 5JS. Tel: Bedford (0234) 712445.

Corrections

In "Data Processing the Log Book — on a Microcomputer" in last month's issue errors appeared in Program 2, which should be amended as follows:

Line 130 should read Z$ = " "

i.e. 25 space characters are enclosed within the quotes.

Lines 240, 260, 280 each contain two double-quotes — these enclose one space character; *i.e.* " " or "one space".

Line 240 should start T$ = not T$ –

Line 280 has a missing + sign. It should include

. . . X$(I) = B$ + M$ + " " + C$

Also, "83" which appears in all dates throughout the article should be "82".

Some readers may wonder where to find the £ sign on their keyboards: on PET and Commodore 64 machines it is the 'hash' key.

In "Maidenhead Squares", also in the January issue, "39°S" in the 4th line from the bottom of the first column on p. 569 should have been "30°S".

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Selling: Liner-2 2m. SSB transceiver, PA-3 pre-amp. fitted, with mains PSU, £85 or near offer. — Ring Edwards, Eastbourne 27396.

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For Sale: Trio TR-9130 2m. all-mode transceiver, 5 watts or 25 watts output, (date of purchase 4/11/83, cost £433), as new, will sell for £360. Daiwa CN-620A power/SWR meter, 1.8-150 MHz, £40. Colinear GPV-5 vertical antenna, £22. Will sell as one lot, or separately. Unforeseen circumstances force sale. — Ring Stan, G1CGX, Naphill 3626 after 6 p.m. (Bucks.).

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Printed by K&SC Printers Ltd., Tunbridge Wells for the Proprietors and Publishers, The Short Wave Magazine Ltd., 34 High Street, Welwyn, Herts. AL6 9EQ. The *Short Wave Magazine* is obtainable through the following: Continental Publishers & Distributors Ltd., William Dawson & Son Ltd.; AUSTRALIA AND NEW ZEALAND — Gordon & Gotch Ltd.; AMERICA — International News Company, 131 Varick Street; NEW YORK. Registered for transmission to Canada by Magazine Post. *February 1984.*