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AUTHOR'S MSS

Articles submitted for Editorial consideration must be typed double-spaced with wide margins on 
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prepared in accordance with our normal setting convention — see any issue. Payment is made at a 
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185
This new HF transceiver from ICOM is compact enough to make mobile or portable use a possibility. The IC-735 covers all Amateur frequencies from 1.8MHz to 30MHz including the three new bands 10, 18 and 24MHz. Modes include SSB, CW, AM and FM, all circuits are solid-state and output is approximately 100 watts.

Tuning ranges from 100kHz to 30MHz, made continuous by using a high-side IF and a CPU control system. RTTY operation is also possible. Dynamic range is 105dB with a 70.451 MHz first IF circuit. The direct feed mixer rejects spurious response and gives higher sensitivity and wider dynamic range. Pass-band tuning and a sharp IF notch filter provide clear reception even under duress.

Preamp is 10dB and attenuator 20dB.

The new IC-735 from ICOM is easy to operate and versatile, it has various scanning functions, comprehensive LCD and 12 memories. Computer remote control is possible via the RS-232C jack. Options include: the AT-150 automatic antenna tuner and shown here the PS-55 AC power supply and SM-8 desk mic.

Please contact Thanet Electronics or your local ICOM dealer for even more information on this latest HF transceiver – the IC-735.

A new exciting set is the ICOM IC-3200E FM Dual-band transceiver (144-430/440 MHz). This is the smallest transceiver available.

The IC-3200E employs a function key for low-priority operations to simplify the front panel. LCD display is easy to read in bright places, showing frequency, VFO A/B, memory channel, duplex mode and S/RF meter information.

Other features include a 10 channel memory able to store operating frequencies. Simplex or Duplex. A memory lock-out function allows the memory scan to skip programmed channels when not required. The IC-3200E has a built-in duplexer and can operate on one antenna for both VHF and UHF. Options include: IC-PS45 DC power supply, HS-15 mobile mic, SM6 and SM8 desk mics, SP-10 external speaker and UT-23 speech synthesizer. A great future is predicted for the IC-3200E.
IC-02E, IC-04E Handheld
The direct entry microprocessor controlled IC-02E is a 2 meter handheld, features include:
scanning, 10 memories, duplex offset storage in memory and odd offsets also stored in memory.
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frequencies, memory channel, signal strength, transmit output and scanning functions.

The IC-02E has an LCD readout indicating frequency, memory channel, signal strength,
transmitter output and scanning functions. The HS-10 Headset also available, with
earphone and boom microphone, which operates with either of the following: HS 10-SB Switch box
with pre-amplifier giving biased toggle on, off and continuous transmit. HS 10-SA Voice operated
switch box, with pre-amplifier, mic gain, vox gain and delay. The IC-2E and 4E continue to be
available.

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12-30MHz £99. The most versatile filter available. £343.50 Ex stock.
With effect from the next issue, cover price of S.W.M. will be £1.35 and the annual subscription £16 (i.e. now we pay all the postage). It is of course a large increase, but when one realises that the cover price was 40p as long ago as eight years then the new price is still reasonable, considering the massive percentage price rise of most other products and commodities during that period.

Be that as it may, the major factor in making this decision has been the reduction in advertising revenue we have experienced over the last year or two. The appearance of new magazines in the radio field means that there are now more journals — the old and the new — pursuing the same total (actually, rather smaller because of the recession) of possible advertising, with the inevitable result that the shares for all become smaller. Herein lies our difficulty: we cannot afford to lose that revenue!

The only way we can make up the loss is through increasing the cover price; it's as simple as that.

We feel quite sure of two things: firstly, that all readers will at least understand our problem and, secondly, that the Magazine is worth every penny of the new price. However, this second point is, of course, up to readers — not us — to decide. In other words, whether or not Short Wave Magazine continues to appear month after month lies in the hands of you, the readers.

For our part, we intend to continue to produce a journal with only high-quality editorial content, covering as many aspects of amateur radio as possible. In that regard, next month sees the start of a new bi-monthly series with the self-explanatory title “Amateur Radio Computing”, written alternately by those two experts in this field, Paul Newman, G4INP, and Rev. Richard Butcher, G4NWH. Also starting in the August issue is a new bi-monthly feature by Rev. George Dobbs, G3RJV, in addition to his “Kitchen Table Technology” series. And with other plans in the pipeline, there's plenty to look forward to ahead.

More Piracy

At the beginning of June, ITN news programmes on the ITV network included coverage of a Mr. Tom McLean's temporary occupation of a lump of North Atlantic rock known as Rockall, ostensibly to confirm Great Britain's claim to it. The bulletin on June 5 included film of an English radio amateur talking to McLean, who was using the phoney callsign GR1TM. This was a blatant piece of spectrum abuse since McLean is not a licensed radio amateur so has no right to use any amateur band. Furthermore, our licences clearly state that we can only communicate with other properly licensed radio amateurs, so anyone who contacted this pirate was clearly in breach of Clause 1(b) of their licence. As if this were not enough, the ITN transmission also included footage of Mrs. McLean in a light aircraft talking to her husband via a small handheld transceiver.

The RSGB was rightly extremely concerned about this overt flouting of the regulations governing our use of the amateur bands. A complaint to ITN brought the supercilious response that the Society's attitude was "rather churlish" since McLean "was a hero". We think this whole caper was a silly season publicity stunt and it would be interesting to know who paid for it. It has been suggested to us that McLean illegally used the amateur bands in a previous Atlantic escapade, but that no action was taken by the appropriate authority. Therefore this time the D.T.I. must be seen to act swiftly and decisively against all those who have broken the rules if it wishes the amateur radio fraternity to take it seriously.
THINGS livened up somewhat in the past month with some welcome tropo, several sporadic E openings from north Africa to the Balkans, and a new world record for 2m. E-M-E.

Moonbounce

On May 26, a new world record distance for 144 MHz E-M-E was established between Clive Penna, G3POI, (JOOIAH) and ZL2BGJ (RE781Q). This calculates as 18,821 kms. from centre-to-centre of their respective squares. This is only 1,184 kms. short of the maximum possible distance which could be achieved by someone in Spain. ZL2BGJ is in the North Island so Clive could stretch the DX if he can find another operator in the South Island.

Clive uses a 160-ele. collinear array but the New Zealand station was using four Yagis and a Henry 2002 amplifier. Congratulations to both operators.

From Devon, Dave Sellars, G3PBV, has now heard 15 stations off the Moon, including eight from the U.S.A.. On May 25, after the thunder and static rain stopped, he logged DL8DAT, F6BSJ, XBR8Q, K0ZK and UA1ZCL. On the evening of the 26th, Dave copied SM2GFG, F6BSJ, F6CJG and UA1ZCL. At 2354 he called K1WHS who was 439 and Dave replied with G3PBV with "O" reports and finally G3PB. At which point K1WHS’s signals faded as he called QRZ? again. With his huge array, K1WHS reckons to be able to work single Yagi stations running 200-300w, so G3PBV, with four 9-ele. Yagis should make it.

Contests

The results of the Barking R and ES Club’s March 31 144 MHz contest show 13 entries in the high power section and 15 in the low power part. Winner of the former was G4NVO with 9,968 pts. from 173 QSOs, with G4NVA/P second, 9,700/168, and G8SRC/P third, 8,650/177. GW8BO/P, 8,232/160, won the low power section with G6ZZZ/P, 7,440/158, runner-up and G4WET/P third, 6,278/137. 650 different calls appeared in the logs. RF and weather conditions were not good, many folk reporting severe gales.

From GB2RS, some recent contest results beginning with the March 144 and 432 MHz events. 2m. Multi-op;—

1. G4RNL/P 2,962 pts. 370 QSOs
2. G4CLA/P 2,889 ,, 294 ,, 315 ,, 3. GW8TFI/P 2,856 ,, 315 ,, 70cm. Multi-op;—

1. G4NVA/P 785 pts. 128 QSOs
2. GJ4ICD 737 ,, 66 ,, In the two-band Multi-op. section the Warrington ARC were first, the Parallel Lines Contest Group came second and the Sheppey Western Contest Group, third. GJ4ICD was first and G4NVA/P, second, in the two-band Single-op. part. This contest was on the March 2/3 weekend.

The 432 MHz CW event on March 31 was won by the Wirral & DARC, GW4MGR/P with 376 pts. from 45 contacts. The Sheppey Outcasts Contest Group, G4BVY/P, were runners-up, 277/39. There were 19 entries.

The next leg of the microwave Cumulative contests is on July 14, 0900 to 2000 GMT. 10 GHz is one band but the other remains a mystery due to an error in the April RadCom wherein the rules were published. The main event this month is VHF NFD on the 6/7 weekend from 1400-1400 GMT. Full rules appeared in April’s RadCom. The 432 MHz Low Power contest is on July 27, 1700-2300 and the 144 MHz follow-up is on the 28th, 0900-1700. Both are Fixed, and All-other affairs with radial ring scoring. Exchanges must include the administrative county the final score being ‘ring’ points multiplied by the total of counties and countries worked. Max. Tx output on 432 MHz is 10w and 144 MHz, 25w p.e.p.

It has been suggested that details of various European contests are given in VHFB. This is a good idea but we must rely on correct information being supplied. It is impractical for our scribe to contact all European societies for such details but if any readers do get authentic information about such events, please pass them on.

DX Notes

David Hardy, G8ROU, has sent details of the Derbyshire Hills Contest Group’s proposed Perseids expedition which are;— Aug. 3-15, GB4ZAP, North Ronaldoay in the Orkeny Is. (YT48F). QRGs;— 70.22, 144.22, 432.22 and 1,296.22 MHz for tropo. 2m. MS QRGs;— 144.144 and 144.444 MHz for CW and SSB respectively. Only a limited number of skeds will be arranged in the usual notes about the station. He has been involved in the hobby since 1964 and was first licensed as GJB0RH in 1978, the present call being obtained in 1979. He likes to build equipment, main present interest being 23cm., for which he has just put up a 100-ele. Quad Loop Yagi array, and 70cms. E-M-E. He likes contests and has held the Thorogood VHF Trophy for six consecutive years. Geoff has many "firsts" from Jersey to his credit and his ambition is to work 100 squares on 23cm.

Ted King, G3DCC, from Sidcup in Kent, has become member no. 38 of the 70cm. VHF Century Club and his certificate was issued on June 4. He was first licensed in 1947 and operated on HF and 2m. till 1952. He returned to the fold in 1982 with the call G6KYM and obtained 2m. VHFFC certificate no. 356. He got back his old call after re-taking the Morse test. His station comprises an Icom IC-490 and 40w amplifier, the antenna being a 48-ele. Multibeam. He often goes out -/Portable from high spots. Any reader wanting details of the QTHCC and VHFFC awards should send an s.a.e. to the Welwyn QTH. For the benefit of new readers, some comments about the tables. To enter the Squares table, just state the number of main squares, like ZL, AE, etc. you have worked since 1/1/75; they need not be confirmed. For the Annual VHF/UHF Table, the counties are the 78 administrative ones as listed in RadCom every January, plus the 26 in the Irish Republic. The countries are the DXCC ones plus Shetland (GM) and Sicily (IT9). Both tables are for operation from one fixed station. For the Squares Table, if you move QTH not more than 50 kms. from the location when you started, the scores can be carried on, but if you move from York to London, for example, you must start again.

Awards and Tables

The Ludbreg Radio Club, YU2EZA, (IG341) submitted a few more QSLs and were awarded their “225” sticker for 144 MHz QTH Century Club certificate no. 51 on May 13. Over the years, they have used different combinations of equipment and the current station comprises a Yaesu FT-221R with muTek board, and 3SK9 mast-head preamp. The PA is a pair of 4CX250B valves running 250w output to a single 16-ele. FB9 (Tonna) Yagi 35m. a.g.l.

Geoff Brown, GJ4ICD, holder of 144 MHz QTHCC award no. 53, has supplied the usual notes about the station. He has been involved in the hobby since 1964 and
little, if any, two-way communication is planned. W9ORE may be QRV during 10-12 passes but whether any will be over the U.K. and Europe was undecided at the time of editing.

And now to the band reports and henceforth, the RSGB county abbreviations which appear in each January RadCom will be used, e.g. BDS for Borders, ESX for Essex. Most are fairly obvious, but GNM, GNS and GNW for Mid, South and West Glamorgan respectively might cause a bit of head-scratching.

**The Microwaves**

John Quarmony, G3XDY, (SFK) is now QRV on 13cm. using the G8LMW transverter system at about 300mw. The antenna is a 44-ele. loop Yagi at 46ft. with 20m.; of FHF4 cable. In early May he had QSOs with G4BVY (NOR), G3LQR and G8HPU (SFK) and in the May 4/5 contest G3ZQU (SFK) and G4FRE/P and GA0LE/P (KN7). May 30 brought DC4BK (JO43) at 534 kms. and P0ACRA (JO22). Best night was June 1 which brought in SM6ESG (GR72h) at R57, with John at RST 419, the QRB just over 900 kms.

On June 2 in the morning, G3XDY contacted PA0GUS/P (JO23) and that evening John got PA0FRE (CLO3j), DC9XO (JO42) at 515 kms. with R59 reports exchanged, DC4BK again and PA0JMY (JO22).

On 23cm. John added FC1AKW/P (JO00) for a new square in the May UHF contest. On June 1, worked GIHGG (TWR), PA0GUS/P, OZ1QZ (JO56), SM6ESG, LA8AK (DS80b) and SM6HYG (FS58h). The next day, DJ9BV (EN40), PA3B4F (JO23), DC8AH (JO42), DC4BK and DD8BD (DM3d).

Haydn Barker, G6XVV, (YSS) should be QRV on 23cm. about now with a Microwave Modules transverter and home made antenna. John Stow, G4MCU, (ESX) got three new squares on 23cm. thanks to PE1HNR (DM) at 2242 on May 31; SM6HYG (FS) at 2304 on June 1 and DJ9BV (EN40), PA3B4F (JO23), DC8AH (JO42), DC4BK and DD8BD (DM3d).

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**Centimetres**

Welcome to first-time reporter Paul Brochett, G1LSB, from Herne Bay in
resulted in four new squares. He used a Yaesu FT-790R at one watt through the UHF Compendium so has 250w available. The first ever OZ being heard at 2049 on the night of June 1 and 2. New squares were LA1ZE (J028), LA9DL (FT) and SM6AFH (GQ). LA8AK provided a new square.

Richard Mason’s G6HKS, (NOR) letter missed last month’s deadline and dealt with contest activity on May 4/5 which resulted in four new squares. He used a Yaesu FT-790R at one watt through LDF4-50 cable to a 21-ele. F9FT Yagi at 30ft. G6XXV now has 70w on the band from an IC-402 and amplifier, so Haydn should do well now that he has finished his A-level exams. Neil Montanana, G8RWG, (SRT) is another reader who has recently got going on the band with 10w and 19-ele. Tonna Yagi.

### Two Metres

The most exciting feature this month has been Sporadic E and at least seven openings have been reported between May 25 and June 9. The following is a general summary compiled from your letters and QSOs on the band and on 20m. VHF net, starting with May 25, when there was a brief opening from the 13 area to Finland around 1005. At about 1035, the SM4/5/7 stations had QSOs with YU5s and there were reports of FAI propagation between EA3 and HG. On May 29, at 0918, EA7ERS (WX) worked GW8VHI and was heard by GW6VZV calling “CQ Fs.”

The first major opening was on June 2. Eddi Ramm, DK3UZ, (EN) worked CT4KQ (WA), EA2LU (ZC) and Fs in BD and CE. Between 1200 and 1600, stations in north Germany worked into EA and IT9. GM4CXM (XP) worked down to IT9, too. David Whitaker (YSN) heard YU7AR but reports earlier paths from his area to EA3, EA6, SV and YO2.

It was utter bedlam in the London area. At G3FPK, I7WIN (LA) was loud for quite a time around 1620. SV1OE (LX) and HG1Y1/MM (HD) were also heard. Other stations heard/worked from the southeast were I7QHE, I7HCB, I6CXO and I6MQS (GD), I6VY and a UB5 or two around 1630. From the southwest, G3PBV records the start around 1500 with IT9 heard briefly. Subsequently, I0FHG (FC), IWOAKA (GB), IC8EGJ (HA), YU2RS (ID), YU2FM worked and YU1UN and YU1NDL heard. Between 1800 and 1833, stations further west were heard working HG8CL and YU2EZA.

From the Midlands, G4TIF reports an incomplete QSO with YO5YJ (LH). G6SV (OZ3BS) worked EA6ET (BZ), later HG8ET and HG8CE (KG). On May 13, 1648. On June 3, between 1646 and 1719, the YU2 area was worked from London but the most interesting contact was made by Ray Baker, G4SFY, (NOR) at 2206 with UA3LBC (WS). Remember, Moscow time is three hours ahead of GMT. Ray got 599 and sent 579.

The next major event was on June 5 which seems to have started around 1230 when the GWS were working into 18. Very soon afterwards, stations all over the southeast of England were working from 9H1, through IT9, IO, SV, LZ, YO and YU at least, up to about 1500. SV2JL (LA35b) was one of the more consistent signals around 1300 from London and widely worked. Paul Pasquet, G4ARR, (HPH) made 20 QSOs including SV1OE, SV4LD (LZ), SWP2K (LA) and SV2JL (LA) on SSB. On CW, LZ1KKA and LZZXU were worked. John Hunter, G3IMV, (BKS)
found 9H1E/A (HW), SV1DH (LY) and L2ZUU (ND) for three new squares.

From Devon, G3PBV records the start around 1218 with I0CUT (GB) and I8TUS (IZ) worked, followed by 5 Is in FC and FD squares. From 1300 to 1343, the Es was marginal with Dave with a few YUs and YO2heard in odd bursts. At G3FPK, there were many MS bursts in this opening.

Now to June 6 when a good, if short, opening to the south occurred from about 1440. GW4LOX reported working an EH9 (YV) and EA7AYD (YX) at 1450. In the London area, CN8EO (IM64PB) was quiet strong but disappeared completely at 1451 when your scribe called him, not to be heard again. The Gibraltar beacon, ZB2VHF, (XX64g) on 144.145 MHz was heard in odd bursts. At G3FPK, there were three MS bursts in this opening.

On the tropo. scene, in the May 4/5 contest, G1EZF worked 30 continents, best DX DJ4GC/P (EL). G4SEU added G1AWP (NLD) and G0/NAS E (YSN) on the 4th. G4SFY found conditions not too good, Ray's best DX being BJ3B square. Paul Baker, GW6VZW, (GWT) worked Fs in IN78, IN09 and IN19, J000 and ONs in JO10 and JO11. The long-awaited tropo. lift began on May 6 when a good, if short, opening to the south occurred from about 1440. GW4LOX reported working an EH9 (YV) and EA7AYD (YX) at 1450. In the London area, CN8EO (IM64PB) was quiet strong but disappeared completely at 1451 when your scribe called him, not to be heard again. The Gibraltar beacon, ZB2VHF, (XX64g) on 144.145 MHz was not heard at G3FPK.

Some late news is that on the 9th, LA1K (FX) worked SV1OE (IX) a QRB of about 3,000 kms. It was mentioned that the LA was also copying SP stations at the same time suggesting double-hop Es? Also on the 9th, the Z3/4 area stations worked into UB5, UC2, UD6 and UG6s.

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The long-awaited tropo. lift began on May 30 and lasted about a week, producing a great deal of activity to Scandinavia and northern Germany, mainly. The continental Field Day over the June 1/2 weekend made the band very busy as well with,, "hordes of PA and ON stations from portable sites " as described by David Whitaker. On the 30th, Mark Page, G1EFC, (BKS) got six new German squares and the early morning of June 2 brought OZ1ICTZ (EP) and SM7AED (GQ). LA3VHF (DS77j) on 144.880 MHz was strong at midnight on the 3rd and still audible at 0500.

Our three lady CW operators, Mini Page, G4UKM, (BKS), Sue Frost, G4WGY, (LDN) and June Charles, G4YIR, (ESX) have all written to update their ladder totals. Mini stayed with Sue over the Bank Holiday and both ended up with tongue-ache, it seems. An odd observation now from Dave Whitaker who, on May 26 at 1532, received GM4LER (ZU65) at S9+ off the back of his beam, no other GMs being audible. The Angus beacon was only S2. G1EZF complained about telephone and computer QRM which turns Mike off the band except for good openings. Kev Archer, G4CMZ, (DYS) with his home made half-watt CW rig has now expanded the VFO coverage to 50 kHz. His best DX is 85 miles. G4DCV lists completed MS QSOs with EA2LU on May 10, OH3S1 (KP30) on the 12th, and LA8KV (JP52) on the 18th. Paul worked HB9RZU (JN37) on SSB tropo. on the 18th. On June 9 at 2330, G4DHF's "CQ" was answered by GM3JJI (WS) at RS39 + auroral. LA0DT/MM (BT) was also heard. Best reception was only by beaming at the stations. In the same period, GM3XQ (SLD) worked UA1ZCL (RC) probably via auroral Es, so was Dave getting this too? That evening, 1855-1920, there was Es to Finland, too. G4SFY informs that club station YU2EZA will be QRV daily on the 20m. VHF net till Aug. 15 looking for MS skeds. G4SFY worked G4DEZ/A (AL) and G4ANT (AM) on May 19 via aircraft scatter.

Four Metres

G4SEU (WKS) did not positively identify GM4OBD/P (YR) on May 6 as advertised by "the RSGB news," according to Jerry. He did work G4WND/P (TW) on May 6, though. On May 30 G0BCT who was running 2W of CW, was worked at 2238 for an all-time new county — Wiltshire. John Jennings, G4VOZ, (LEC) gave G4EPA (NHM) his second QSO on May 1. By the 10th, Crick was running 25W to an outdoor dipole. On May 6, John worked G3TSJ (MCH) but could not raise G4WND/P. EI9Q was heard at RST329 on the 23rd. Dave Lewis, GW4HBK, (GWT) heard EI9Q on the 14th and 25th, worked G0BCT on the 26th and G4ISM (NHM) on June 3.

Six Metres

G3PBV reports ZB2VHF quite strong on May 30 at 2230-2300 and lots of Euro TV at the end of May, beginning of June period. G4WNB writes that many stations are monitoring 28.885 MHz looking for crossband QSOs, including CT1WW, DJ2RE, HB9QQ, OZ9VQ and SM6FU. A 6/10m. MS QSO with OZ9VQ on May 25 was not completed, but 20 mins. later, the OZ was S9 via E-layer. Beacons ZB2VHF and 5B4CY (QU14g) were heard on May 25 and June 2 respectively.

Finale

Yet more 2m. Es on June 11 with 9H1 and IT9 working from southeast G around 0930, a couple of URs2 at lunch time, the main opening starting at 1456 to HG, YO, YU, then swinging round to UB5 and SP. That's it for now. All your news, opinions and claims by the dates in the box to:- 'VHF Bands,' SHORT WAVE MAGAZINE, 34 High Street, WELWYN, Herts., AL6 9EQ. 73 de G3FPK.
A Tone Filter for RTTY Transmission

A Simple Circuit to Clean-Up Computer Generated AFSK Tones

P. C. COLE, G3JFS

COMPUTER generated AFSK tones for RTTY use are square wave signals, rich in harmonics, which must be filtered to produce sine waves before they can be applied to the audio circuits of a transmitter. The easiest way to do this is to pass the tones through a suitable low pass filter, and the purpose of this article is to describe a unit which was designed for use with a BBC microcomputer/KW-2000A combination.

Filter Requirements

Despite the need to produce a reasonably good sine wave from a square wave input the filter specification is not at all severe when it is realised that:

(a) a square wave such as the TTL signal output from the computer consists (in theory anyway) of a fundamental sine wave and odd harmonics only, so that there is no need for very high attenuation at the second harmonic of the tone frequencies;

(b) when using standard 1275/1445 Hz AFSK tones the harmonics from the third upwards will be attenuated in both the audio chain and the sideband filter of a properly designed transmitter.

These considerations reduce the demands on the filter circuit, particularly in regard to the sharpness of cut-off, and bench tests showed that a single pi-section m-derived filter with its frequency of maximum attenuation centred on the third harmonic of the mark and space tones would give more than enough filtering for this particular application.

Fig. 1 shows the basic circuit and a simplified response curve of the LC filter section used for the initial measurements. This filter had the following characteristics:
Fig. 2 shows the circuit of the low pass filter unit as built. TTL level signals from the computer user port are fed to the base of TR1, which is a BC108 transistor connected as an emitter follower so as to minimise the loading on the computer output circuits. R1, C2 form a single section RC low pass filter which, although only capable of a 6dB/octave reduction in signal, does give a useful improvement in the stop band attenuation. The +5 volt supply

Table of Values

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<tr>
<th>Component</th>
<th>Value</th>
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<tbody>
<tr>
<td>R1</td>
<td>10K</td>
</tr>
<tr>
<td>R2</td>
<td>33K</td>
</tr>
<tr>
<td>R3</td>
<td>68K</td>
</tr>
<tr>
<td>R4, R6</td>
<td>1K</td>
</tr>
<tr>
<td>R5</td>
<td>1K2</td>
</tr>
<tr>
<td>VR1</td>
<td>10K preset</td>
</tr>
<tr>
<td>VR2</td>
<td>500R preset</td>
</tr>
<tr>
<td>C1</td>
<td>0.1 µF</td>
</tr>
<tr>
<td>C2</td>
<td>0.01 µF poly (but see text)</td>
</tr>
<tr>
<td>C3</td>
<td>0.1 µF disc ceramic</td>
</tr>
<tr>
<td>C4</td>
<td>2.2 µF tantalum bead</td>
</tr>
<tr>
<td>C5</td>
<td>0.1 µF</td>
</tr>
<tr>
<td>C6/C7</td>
<td>C6 + C7 are nominally</td>
</tr>
<tr>
<td>R5, R6</td>
<td>select values to tune notch frequency</td>
</tr>
<tr>
<td>TR1</td>
<td>BC108, or similar small signal silicon npn transistor</td>
</tr>
<tr>
<td>L1</td>
<td>150mH ferrite pot cored inductor</td>
</tr>
</tbody>
</table>

Note: all resistors are 1/4-watt types

The Circuit

Passband ripple: 1.0dB.
Cut-off frequency 1.9 kHz.
Notch frequency 4.025 kHz.
Notch depth: >50dB.
Rejection of second harmonic: >50dB.
Rejection of other harmonics: >35dB.

Fig. 3 shows the overall response of the tone filter unit. With the rejection notch tuned to 4.020 kHz, 3rd harmonic signals are reduced by 50dBs and higher order harmonics by more than 42dBs resulting in a very clean sine wave output.
for TR1 comes from the computer and VR1 serves to set the emitter to half of the supply voltage. Partially filtered signals from the emitter follower then pass through the LC low pass section to VR2 which is used to set the sine wave output level up to a maximum of about 500mV.

The filter design is the result of some calculation and a certain amount of juggling to allow available components to be used. However with such a simple circuit there is considerable latitude in component values so long as L1 and C6 + C7 resonate at the proper frequency for maximum rejection of the third harmonics of the mark and space tones. The other filter components — shunt capacitors and the load resistors — can then be changed if necessary to modify the overall response.

**Construction**

Layout is not at all critical and so the components for the prototype were assembled on a piece of matrix board and mounted in a small diecast metal box, which also contained the few additional parts needed to interface the computer and terminal unit. For convenience C2, C6 and C7 are mounted on circuit board pins so that they can be changed easily during the alignment procedure.

The only component likely to be a problem is L1 which in the original was a small ferrite pot cored coil about ¾-inch diameter by ½-inch high of unknown characteristics picked up from a junk stall at some long forgotten rally because “it might come in useful one day”! Several mail order component dealers have ready wound ferrite cored inductors up to about 1 Henry in their lists, or alternatively it is very easy to wind one's own using standard pot cores which are also available from the larger stockists. Although perhaps a bit expensive, adjustable type ferrite pot cores are very convenient and a suitable coil can be made by winding 612 turns of 0.2mm. diameter wire onto an RS Components RM4/400 pot core. This gives an inductance of 150mH with a claimed adjuster range of 20%.

**Test and Alignment**

This can be carried out easily by using the following procedure:

1. Apply power to the unit and adjust VR1 to set the BC108 emitter to half of the supply voltage. Because of the wide spread of current gain in the BC108 (hFE = 110 — 800), in an extreme case, it might be necessary to change R2 or R3 to get this setting correct.

2. With a sine wave input do a quick response check to see that the unit is working. Adjust L1 and/or select values of C6 and C7 so that the notch in the frequency response is at about 4020 Hz — choose the notch frequency that gives equal attenuation to the third harmonics of the mark and space tone frequencies (4335/3825 Hz).

3. Check that the output level is the same at the mark and space frequencies. If it is not change the value of C2 until this is achieved. (A 1 dB difference, due to the filter passband ripple, was noticeable as a slight flicker on the forward power meter when transmitting RY’s. By correct choice of C2 the flicker was completely removed.)

4. If a scope is available apply square wave signals to the filter input and check that the resultant output waveforms are sinusoidal with no noticeable distortion.

5. Carry out on-the-air tests.

**Results**

Fig. 3 is a plot of the overall frequency response of the filter unit, from which it may be seen that all frequencies from the third harmonics upwards are reduced by more than 40dB. The transmitted signal appears clean when monitored on an oscilloscope and there have been no adverse comments from stations asked to give critical reports on the quality of the signals. One cannot ask for more from so simple a circuit.

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**"Practically Yours"**

with GLEN ROSS, G8MWR

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**Audio Generator**

The first unit in the series is a wide range generator covering from 20 to 20000 Hz in a single range and which provides sine, square and triangle waveforms with adjustable amplitude. These outputs can be switched to a single socket or can be provided on three outputs so that they can be used at the same time if required. The duty cycle can be varied over a wide range and by this means it is possible to generate a sawtooth, ramp or pulse waveform from the basic generator. It is also possible to use the unit over a much greater range if the timing capacitor value is changed, the actual limits being from .001 Hz to 1 MHz. The waveforms produced are
Table of Values

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
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<tbody>
<tr>
<td>R1</td>
<td>820Ω</td>
</tr>
<tr>
<td>R2</td>
<td>22kΩ</td>
</tr>
<tr>
<td>R3</td>
<td>4M7</td>
</tr>
<tr>
<td>R4, R5</td>
<td>2k7</td>
</tr>
<tr>
<td>R6, R8</td>
<td>12kΩ</td>
</tr>
<tr>
<td>R7, R12</td>
<td>47kΩ</td>
</tr>
</tbody>
</table>
| R9, R10, R11 | 10kΩ |}

Note: all resistors are 1/4-watt types.

Wave Shape

VR2 controls the duty cycle of the generator and hence the precise shape of the generated signal and this should also be mounted on the front panel. Only when this control has been used will its full potential to generate exactly the required shape be appreciated. VR3 and VR4 are PCB mounted presets and are used to minimise sinewave distortion; ideally they should be set up using a wave analyser, a piece of gear which is not normally available to the average amateur. Excellent results can be obtained by use of an oscilloscope to display the waveform while adjusting the two presets. If neither of these instruments is available then it is best to dispense with the presets, take pin 12 to ground through a 82K resistor and make no connection to pin 1. This will usually produce distortion of less than 2% which is adequate for most purposes.

Output Buffering

The three outputs are available on pins 2, 3 and 9; these are then set to around the same level by the use of the series resistors and are then switch-selected and fed to the output level control, VR5, and then to a 741 which is used as an output buffer; VR5 is of course panel mounted. If the outputs are required to be separately available then the select or switch is dispensed with and the outputs from the chip are taken to individual level controls, buffers and panel sockets. For the small additional cost this is probably the best arrangement although it must be mentioned here that the duty cycle control will change the shape of all three waveforms.

Power Requirements

The unit will operate from a minimum of ten volts to a maximum of thirty at a current consumption of only a few milliamps, the exact amount depending on the configuration you have used. It could be run from an external supply but the cost of low current components is so low that it is probably better to build a supply into the unit.

Construction

There is little to comment on as far as construction is concerned. The unit could be built on a PCB but Veroboard is equally convenient. A small metal box could be used to house the completed oscillator, the only important consideration being to give adequate space on the front panel for an uncluttered control layout. The circuit diagram shows a single range, single output unit but the drawing of a completed unit shows all the available options built in.

Comments

If you would like to comment on these designs or put forward any ideas for future designs please write to me at 81 Ringwood Highway, Coventry, or contact me via Prestel on 203616941.
A rather unusual small communications receiver came into my possession some time ago via an auction sale. The front panel measures 12" x 9" and carries a rather plain dial with external slow-motion drive of the Muirhead type. Alongside it is a built-in 5" loudspeaker with extruded metal grill. When I received the set it had but two controls other than tuning — wave band switch and AF gain — others having been crudely removed with wires left dangling. An engraved strip beneath the tuner and L.S indicated that two of the missing items were the BFO on/off switch and a socket for "hand-set", but there were two other holes not identified. A discoloured patch at the bottom centre of the panel, flanked by two small tapped holes, suggests that here was once a model identification plate. The panel is finished in the usual Marconi grey (an official description) and the set is generally to that company's pattern. The chassis is rather unusual, being a very thick die-casting measuring again 12" x 9" x 2½" deep. Eight valves are employed, viz. KTW61 RF amplifier, X65 frequency changer, two KTW61 IF amplifiers, DH63 detector/AGC/AF amplifier, D63 noise limiter, KT63 AF output and KTW61 BFO. There is no internal power supply, a large 5-pin McMurdo socket being fitted for an input lead. The three wave bands cover 170kHz-460kHz, 460kHz-1.35MHz, and 1.35MHz-3.8MHz, the latter having the greater area of dial space ideally disposed for the 160m. and 80m. ham bands.

A closer inspection of the set, after a large accumulation of dust and deceased fauna had been dispensed with, revealed that much other modification work had been carried out in addition to the butchery on the front panel mentioned above. Immediately noticeable was the fact that the DH63 had been replaced by an EBC33 (similar but not a direct equivalent) with a lead soldered directly to its top cap, which did not bode particularly well for the standard of workmanship. The volume control had been renewed and left with its spindle uncut to length, and of which more anon.

The valve heater wiring had been altered considerably, this probably having been due to an original series/parallel arrangement for 12 or 24V. There had also been some additions to the AGC circuitry near its diode.

For the initial test I disturbed none of the modifications, but merely connected up HT and LT supplies (200V and 6.3V respectively). Not a sound was to be heard, not even when I applied the classic finger-on-AF-amp-top-cap test. It transpired that during the fitting of the new volume control the lower end

![Diagram of the DETECTOR/AGC/NOISE LIMITER/AF AMP/OUTPUT CIRCUITRY](image)
had been taken directly to earth, resulting in an excessive amount of bias being applied to the grid and cutting it off.

The circuitry around a double-diode-triode valve's cathode is sometimes complex, with, as in this case, more than one bias resistor being employed. (See Fig. 1). The reason for this is the need to apply different levels of bias to the three component sections of the valve. The AGC diode is likely to receive the maximum bias in order to "delay" its action, i.e. to ensure that it does not attempt to reduce still further the signals from weak stations. Only when signal strengths greater than the designed level of delay are received does the AGC begin to operate. When the delay voltage is required to be higher than two or three volts it may become inconvenient to obtain it by a straight-forward cathode resistor as this would have to be of a very large value, the current through it being only small. Instead, as in the diagram, it is arranged that the heavier cathode current of the output valve should flow through part of the chain of resistors to bring about a fairly large voltage drop. Now, the triode section of the DDT will not require anything like as much bias as the AGC diode and so it is returned to a point above earth on the cathode resistor chain, restricting the actual grid bias to a low value. In the case of this particular set, it is only 0.9V, although the cathode voltage is 20.5V. The signal diode in any receiver normally requires no bias at all; if any were to be applied it would result in a similar effect as the delay voltage on the AGC diode, i.e. only signals strong enough to produce a higher voltage than the bias would be reproduced. The effect may of course be deliberately introduced as "squelch" or for "silent tuning". These facilities were in common usage in domestic Rx's as long ago as the early 1930s.

Restoring the lower end of the volume control to its correct place on the bias chain did not, however, improve matters to the extent that was expected, the results still being feeble. This was due to the use of the incorrect EBC33, the triode section of which has different characteristics to that of the DH63. Once the correct valve had been fitted the performance was vastly improved. The (120kHz) IF transformers appeared not to have been interfered with, but the RF and oscillator coils obviously had, and a slight amount of re-alignment was needed to realise the full potential, but this proved to be a simple job. The sensitivity of the 1.35/3.8MHz band was sufficient to pull in a large number of commercial and amateur SSB stations, so restoration of the BFO facility was the next item on the programme.

Of the three wires left hanging through the front panel two were solely concerned with switching the BFO HT supply, and thus were taken to a simple on/off tumbler switch installed in the appropriate hole. The third wire presented a problem. It went to G1 of the frequency-changer via a 20K resistor, and the most likely reason for its presence appeared to be that it was intended to bleed off some HT onto a manual RF gain control, although none existed. Support for this theory came from a careful examination of the cathode circuitry on the RF and IF amplifier valves; the various bias resistors were not taken to nearby chassis points, but to a common lead which wound around the chassis to a point just by the BFO switch. There it had been earthed to a tag on the middle band oscillator coil — obviously not an original piece of work. The snag was that where one would expect to find the RF gain control was this hole labelled "handset". Had this Rx formed part of a small transmitter/receiver set-up in which depression of a press-to-talk switch also activated a desensitising circuit? This of course, is only speculation as far as I am concerned; I can but hope that someone who reads this may be able to put me wise. In the event I fitted a 2K-ohm pot, in the hole and connected it up as a conventional RF gain control with the 20K resistor feeding its top end. This has given very smooth and effective control over the gain and makes it possible to resolve SSB signals of widely different strengths (e.g. whilst listening to an 80m. net) without difficulty. The BFO itself, although preset, also causes no problems. I set it up on a commercial station (Shannon Airadio) after giving the set ample time to warm up, and it has not needed to be touched again as yet.

Sensitivity of this little receiver is good — almost embarrassingly so when compared to larger and more modern sets! For practical comparisons I tend to use MSF Rugby, which apart from its intended function, can be relied upon here to give a constant signal strength. For those who like figures, the lowest inputs which will give good clean output at the loudspeaker are:

- 190kHz-60µV;
- 400kHz-60µV;
- 600kHz-20µV;
- 1.3MHz-40µV;
- 1.6MHz-10µV;
- 3MHz-5µV.

Although the noise limiter is permanently in circuit, it does not appear to introduce any distortion, unlike some examples.

An unassuming Rx of strictly functional appearance, this, but one giving very pleasing results and obviously capable, with its coverage of the standard IF band, of being used in a double superhet role; I hope that I may be able to acquire a suitable vintage pre-selector for this purpose. The alternative, to construct one, appeals to me greatly, but unfortunately the time element is a great deterrent!

As mentioned earlier, should anyone be able to offer any information or advice of any nature regarding this receiver, I shall be most grateful to receive it.
HELLO again! This time we have a starter entry which offers an interesting problem for solution. W. J. Prior (Lochcarron) has a plot which is just big enough for him to hang up his home-brew five-band trap aerial in an east-west direction, so that it 'fires' north-south. This is hardly the preferred direction; but to make matters worse, a look at the atlas agrees that SWL Prior lives between the Applecross and Torridon mountains; and we are aware by reference to the atlas again that he is based on old rock structure which isn't very conducive to good grounds.

Clearly, then, a vertical aerial will not be at its best as it will be all but impossible to get a decent ground system down. Perhaps the best solution is to build a beam aerial for the 10-15-20 metre bands and put in on the best mast that can be arranged. We would suggest the trial of the VK2ABQ design, which is easily homemade and takes up very little space in terms of 'wing-span.' As for the mast, one wouldn't want too high a mast, lest the main lobe fail to lift over the mountains. In fact, if one were faced with just one preferred direction for such an aerial, one would choose it to shoot in a westerly direction, for morning VK/ZL/Pacific activity, plus the Ws through the day from about noon onwards. Incidentally, the secret of keeping a VK2ABQ-type beam in the air is to be sure the legs of the thing are gilded to each other all the way round, using pre-stretched Terylene braided line as bought from a boat chandler. The VK2ABQ design must be resonated in to the band using a GDO or whatever and one must expect the adjustments on each band to interact; the dimensions will depend on the amount of supporting metalwork. Also, the recommendation to use coat buttons as the end insulators does seem to have some bearing on the success of the beam; it seems to like having the ends of the driven element and parasite within a fraction of each other.

The Mail

Still with SWL Prior, he uses an FRG-7700/FRT-7700 combination and an MBA decoder hitched to his five-band dipole. Out of his list of call signs we managed to pick out some 133 prefixes, but to your J. C. the most noticeable thing was just how hard SWL Prior has to work at it from his location. For example, he has no GM signals recorded, and very few G's. A couple of JA and a sprinkling of East Coast U.S.A., nothing from Oceania, one South American and one Asian, out of a total of some 328 RTTY calls logged over a period of eight months. The implication is that a very good aerial system indeed is necessary, or that the activity should be altered to operate portable from the hilltops or the sea coast. Our sympathies!

Next we have a letter from T. Ross (Edinburgh) who has a Heath HW-101 plus home-brew ATU, CBM 64 computer with GW3RRI RTTY program, and four aerials, the T2FD as a sloper, an end-fed wire, G5RV of the half-size variety and, finally, a sloper version of the half-wave dipole for 14 MHz; operation is essentially on 3.5 and 14 MHz, but of course the aerials chosen give coverage of all bands 3.5-28 MHz. It is interesting to notice the T2FD reference, as this aerial was first written up properly in this country in Short Wave Magazine by, as we recall G2NU, N. P. Spooner, during 1953. It enjoyed a brief spell of popularity and then faded out, chiefly we suspect because few people used it with understanding. It is not a folded dipole in its operation, but should be regarded as more in the nature of a 'rhombic squashed flat into folded dipole shape' — the point being that the dipole family require that standing waves be set up on them (not on the feeder, of course, just on the flat-top), while the rhombic family, being terminated at their far end in a correct match, carry no standing waves on the aerial and rely on the travelling wave going to the far end and being lost on arrival at the termination resistor as heat. In the rhombic, removal of the standing waves removes the backward pattern and the aerial becomes a quite superb unidirectional beam; but we question its use in the T2FD aerial as it isn't directive. The great advantage is that the SWR stays well within bounds even if the thing isn't radiating. Years ago the writer made one up for TV Band 1, and plotted its feedpoint impedance on a Smith chart in the lab, across 3.5 and 7 MHz. It couldn't have radiated significantly, but it had an acceptable SWR! There are so many grey areas in this subject of aerials, as G6XN shows in his valuable book 'HF Antennas for All Locations.' Anyway, Tom enters the lists at 232.

J. Routledge (Hartlepoo) has been neglecting RTTY in favour of SSB — possibly to tickle the score over the 1000 mark? We certainly wouldn't blame him — that used to be the pinnacle to be reached before "retiring to let the rest have a go" a couple of decades ago.

Our next letter is from J. Singleton (Withernsea) who has been an SWL since he received his first receiver as a tenth birthday present; there has almost always been a log about, and for seven years at sea a large chunk of the baggage space was taken up by a receiver. John is at the moment looking for a RTTY tape for the Spectrum — he should be in contact with SARUG by way of G4INP (see our 'Clubs' feature this month). John is still somewhat of an eighty-metre exponent.

I. Thomson (Rye) has been 'noticed' by the other two Rye contributors, and by the sound of things Ian would do well to get to know them — they have the answers to the queries on prefixes he has presented already! T77C is pretty well-known but T26FE sounds a little odd; M4DR making asked with a 4X4 station to try for a contact through a repeater on 144.775 MHz sounds a bit odd too — one would have thought the repeater would have been up at the other end of the band for one thing, and for another the call signs itself doesn't ring true... anyone any ideas?

Just nearby in Rye is N. E. Jennings who is now mending nicely and has the additional pleasure of having celebrated his 76th birthday and Golden Wedding too just recently — and playing with micros and SWL will keep him amused for years yet! Apart from his list, Norman indicates that he and "SWL" reader Pete Lincoln get lots of enquiries as to where the RTTY is to be found — try around 14080-14100 kHz for a good starter.

W. G. Shipston is our third Rye contributor; he has roared up over the 1000 mark, using the Datong AD270 active aerial.

Conditions

H. M. Graham (Chesham) reports that things are still pretty lean. Maurice noted several European openings on Ten, while Fifteen was largely north-south propagation; 14 MHz seems to have been the best with all continents bar Africa. Forty was a 'Nil' but on Eighty some new WAB areas were found; on Top Band the
furthest was Manchester, around noon — there was no late-night listening done. Maurice noted an odd one on April 26, in the shape of LY4L, a prefix that hails from UP-land. The QSL address given was via UA4LM, but the station didn’t say where it was.

It’s a long while since we heard from A. Vest (Durham); but Arthur is now retired and has more spare time. He has started with a CW list — good! — and will be putting in a Phone list in due course. To rake up the 200 from scratch would be, in answer to Arthur’s question, the work of a reasonable contest weekend, or a hardworking normal one, given reasonable receiver, aerials, and some previous experience in SWL reception — not to mention a good logging system. And, that refers to prefixes, not just lists of stations.

That query from E. M. Gauci last time round brought in a reply from Stan Herbert, G3ATU (Sunderland). Stan says that the G8QVA/S was in fact “Old Fred, G8QV/EAS”, now back at home in Ely.

Lo and behold, our next one is E. M. Gauci (Siema, Malta) with another big list, from which we have deducted 5BA/NF6 — probably a typing error, and ZB31D which was either piratical or a mis-hearing.

J. Heath (St. Ives, Hunts) has at last long been able to get some listening time in, both at HF and on 144 MHz. John has a very questionable one too, his offering rejoicing in “2Q4KS”.

Lightning

For the past few minutes your scribe has been totally stopped from writing the column because of the arrival of a thunderstorm with its attendant problem of one scared dog which insists on sitting on J. C.’s lap as the safest place to be — but at least I’ve had time to put together a thought or two on lightning protection. Firstly, it should be possible to earth everything down on the aerial side, and that implies an earth connection to the ATU itself. In the second place, the mains plug should be pulled out and placed at least three feet from any known mains wiring of the house. Thirdly, it must be realised that a direct strike is a full-scale disaster; what one is trying to cope with is the close-by bolt, and the tendency for aerials that aren’t earthed to pick up static electricity if they haven’t a path to get rid of it. Thus, all the low-impedence ‘holes’ in the J. C. ATU have a 1M resistor permanently wired across them to earth. As the earth radials of the vertical are trenched in the ground the coax outer from this provides the DC ground path for the ATU. The long-wire aerial is permanently connected to earth by the turns of the coil and so can’t build up static, while the transmitter cable is pulled out and replaced by a dummy load resistor being plugged into the hole from which the transmitter feeder has just been removed. That takes care of the aerials and involves just one operation of plugging in a dummy load. The transceiver and linear are on a common lead, by way of a distribution board, so one mains plug is pulled out to completely isolate the rig. That’s the shack dealt with. For the rest, go round the house and pull out the domestic radio, TV and other stuff from the mains sockets. Unplug the aerial from the TV and radio, as it is likely that both are going to be ‘hot’; and finally make sure all items are three feet or more from any known mains wiring. Then sit it out! Now back to business. . . .

ANNUAL HPX LADDER

Starting date January 1, 1985

<table>
<thead>
<tr>
<th>SWL</th>
<th>PREFIXES</th>
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</thead>
<tbody>
<tr>
<td>S. Wilson (St. Andrews, Fife)</td>
<td>450</td>
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<tr>
<td>J. Singleton (Withernsea)</td>
<td>447</td>
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<tr>
<td>I. Thompson (Rye)</td>
<td>437</td>
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Minimum of 200 Prefixes to have been heard from January 1, 1985 for an entry to be made. At score 500, transfer to the All Time List is automatic. In accordance with HPX Rules, see p. 19 March issue.

HPX LADDER

(All Time Post War)

<table>
<thead>
<tr>
<th>SWL</th>
<th>PREFIXES</th>
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<tr>
<td>PHONE ONLY</td>
<td></td>
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<tr>
<td>B. Hughes (Harvington)</td>
<td>2949</td>
</tr>
<tr>
<td>Mrs. R. Smith (Nuneaton)</td>
<td>2474</td>
</tr>
<tr>
<td>E. E. Robinson (Felixstowe)</td>
<td>2412</td>
</tr>
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<td>E. M. Gauci (Siema, Malta)</td>
<td>2305</td>
</tr>
<tr>
<td>H. M. Graham (Chesham)</td>
<td>1805</td>
</tr>
<tr>
<td>Mrs. T. Parry (Blackpool)</td>
<td>1649</td>
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<tr>
<td>M. Rodgers (Harwood)</td>
<td>1307</td>
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<tr>
<td>S. Baker (Cwmbarn)</td>
<td>1388</td>
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<tr>
<td>N. E. Jennings (Rye)</td>
<td>1375</td>
</tr>
<tr>
<td>N. Askey (Cowen)</td>
<td>1362</td>
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<tr>
<td>P. Oliver (Paigey)</td>
<td>1357</td>
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<tr>
<td>N. Henbrey (Northham)</td>
<td>1327</td>
</tr>
<tr>
<td>R. Fox (Northampton)</td>
<td>1305</td>
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<tr>
<td>P. A. Cardwell (Sheffield)</td>
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<td>F. Dunn (Chester)</td>
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<tr>
<td>G. A. Carmichael (Lincoln)</td>
<td>1077</td>
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<td>G. Shipston (Rye)</td>
<td>1021</td>
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<tr>
<td>M. Ribton (Gillingham)</td>
<td>985</td>
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<tr>
<td>J. Routledge (Hardiipo)</td>
<td>950</td>
</tr>
<tr>
<td>P. Lincoln (Aldershot)</td>
<td>886</td>
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| CW ONLY |
| J. Goodrick (L.O.W.) | 1763 |
| F. Dunn (Chester) | 1569 |
| R. Fox (Northampton) | 1463 |
| A. Vast (Durham) | 249 |

| RTTY ONLY |
| N. E. Jennings (Rye) | 622 |
| P. Lincoln (Aldershot) | 494 |
| J. Routledge (Hardiipo) | 332 |
| N. Henbrey (Northham) | 293 |
| R. Fox (Northampton) | 233 |

Minimum score for an entry to be made is 500 for Phone, 200 for CW or RTTY. Listings to be in accordance with HPX Rules — see p. 19 March issue.

C. Burrells (Stevenage) seems to have regained his activity, at least as far as HPX goes, and he now goes into the All-Time. As he says, up to the time of writing there hasn’t been any nicer weather. . . there was, a week or so ago, but J. C. missed it while having a cup of tea!

R. Fox (Northampton) has now solved his RTTY problems by obtaining a TDT 91000E at a reasonable price, but this led to others: firstly the monitor developed TVI on transmit, secondly the power supply objected to the increased load, and thirdly the Icom IC-251E PSU also resigned duty; each a separate incident over a period of two weeks — at least it gave some incentive to work on the Morse! Arising from all this, Roy now has a Scarab TU plus interface, plus a program for the 48K Spectrum to go to a reasonable price to a good home. Roy is at 72 Artizan Road, Northampton.

During a recent few days holiday, G. Caselton (Orpington) put his entire collection of old logbooks on to the database of his computer, as well as making up an entry for 1985 by a different listing; and, praise be, his dot-matrix printer has been fed recently his entire collection of old logbooks on to the database of his computer, as well as making up an entry for 1985 by a different listing; and, praise be, his dot-matrix printer has been fed recently his entire collection of old logbooks on to the database of his computer, as well as making up an entry for 1985 by a different listing; and, praise be, his dot-matrix printer has been fed recently his entire collection of old logbooks on to the database of his computer, as well as making up an entry for 1985 by a different listing; and, praise be, his dot-matrix printer has been fed recently...
becomes longer and slimmer, while containing the same quantity of ‘gas’.

P. Oliver (Paisley) went to the Scottish Convention a week before he wrote on May 13, and seems to have had a great time. Between times, Pete found the time to add 93 more to bring him up to 1357.

Now to E. W. Robinson (Felisstowre) who got himself a bumper crop of which the pick was definitely BY1PK, heard twice around luncheon time on 14 MHz, driven by operator Sheng.

B. Patchell (Sheffield) wonders whether everyone is as studious as he is about what he records as a hearing in his log; without asking for QSLS, which can take a long time, we couldn’t check this one directly. However, we can, from long experience, usually spot the ‘wrong’ uns — and, anyway, we have to accept that each SWL has his own ideas on what constitutes a ‘hearing.’ For example, your J. C. doesn’t reckon to log a station until he is (a) sure he hearing to the right end of the QSO, and (b) has listened to all the overs of at least one complete contact. If a report is to be sent, then we listen to several contacts, and make comparisons.

On a different tack, Brian has discovered the great advantage of a decent filing system in addition to the log itself for keeping down the number of duplicates claimed. This indeed is one place where the Spectrum computer can be very useful indeed.

N. Askew (Coventry) comments on the VE3KFI/49X noted by E. M. Gaucci, and says the chap was in fact VE3KFE/SU on Golan Heights, and ‘scrambling’ his SU suffix while handling phone -patches so as to avoid the unwanted attentions of Italian and YU stations calling him.

Now to Mrs. R. Smith (Nuneaton); Ruth notes how much the improvement in one’s score can be affected by the time of day one listens, one’s position on the Ladder, and above all, how much time one can put in at the rig — she sounds as though all of these factors are annoying!

The letter from N. Henbrey (Northiam) indicates that Norman has other things on his mind now that the warmer (?) weather is with us; nowadays he umpires the cricket matches around the area and his wife does the scoring. However, Norman has managed to get a little time in at the receiver as his score indicates on Phone, although the RTTY seems to have been left alone.

White Rose SWL Contest

D. Whitaker (Harrogate) writes in with the results of this shindig, held last January; it was ‘blessed’ with some atrocious conditions, which ironically enough made a steady improvement after the contest was over. D. Piccirillo, BR5-52868, won the CW section by a handsome margin with a score of 75632 points, more than double that of the runner-up, Alex Elkovavm, L2ZA-256. On the Phone side, A. Miller came up top with a score of 51168 points, ahead of runner-up Norman Henbrey, BR528198, who made 24492 points. Congratulations to all; and in particular to D. Piccirillo for being overall winner even though he stuck to CW, and to A. Miller for his persistence. Arthur has always managed to be ‘there or thereabouts’ meaning in the top three, and this year his first place on Phone was a worthy reward. For myself I would couple with that Norman Henbrey, who has been in the lists with credit for far more years than I like to think about.

On a different line, there were some problems with the Rules, possibly mis- interpreted by foreign journals, so David would appreciate comments from competitors and others as to next year’s Rules. Contact him direct: D. A. Whitaker, Hillcourt, 57 Green Lane, Harrogate, N. Yorks, HG2 9LN.

Both G. Carmichael (Lincoln), and Mrs T. Carmichael have had a thin time of it in terms of prefixes; Gordon has found the medium wave band in terms of DX so goes up just two in the Ladder, while his wife seems to have been totally QRT visiting a hospitalised relative. We hope all is soon well.

D. Pye (London W2) is looking forward to visits from K7RHD and XYL KA7UBC, who first started his interest in amateur radio. On a different tack, Don seems to feel somewhat ‘conned’ in his purchase of a Commodore Plus 4. The ‘built-in’ programs all require a disk drive for data storage, and other programs are distinctly thin on the ground. As Don says, it is not surprising the box was discounted £100! True enough, but that is always the penalty of dealing in discounts. It is simple arithmetic that the costs of providing good service are such that to discount successfully you must do as little service as possible. That’s fine for a young electronic engineer, but hard luck on a non-technical chap, who never goes looking for anything if he can help it, especially for luxury hobby items.

Young S. Baker (Cwmbren) bows out with the current list, as there won’t be any receiving gear henceforth, says father GW6VZW. We hope to hear again when they have sorted out their receiving station position.

B. F. Hughes (Harvington) is finding it hard at the top, but he took note of our detail on the half-size G5RV aerial and intends to put one up before long, plus a better mast too.

The mind of M. Ribton (Gillingham) runs on aerials; and to give point to his question he draws a sketch of his position. The receiver sits in a front bedroom, and an earth connection would have to be on the other side, fully thirty feet away. Mike proposes an alternative, which can be summed up as a 67’ top along the back garden to his mast fed from the inner of a piece of coax going through the house; the outer of the coax being taken to another 67’ length also run out to the mast. Let’s consider this as a 3.5 MHz half-wave dipole — so arranged that it would almost certainly produce near-complete cancellation of pick-up on the wires. On all the higher bands, this problem will to some degree remain, but the ‘killer’ is to consider the coax cable as a physical capacitor sitting across the receiver input. Say thirty feet of it, at roughly 30pF to the foot, or about 900pF between the aerial and earth terminals of the receiver, to decouple off any signal that might reach there! No, the answer must be in this case to leave up the top section, generate the best possible earth by burying lots of copper, and then either (a) bring the ATU to the lead-in and then connect aerial and earth, feeding back to the shack in coaxial cable, or (b) bring aerial and earth back through the house to an ATU in the shack. Neither is very ‘sanitary’ but either will give better results than the coax-feed and no ATU proposition. The biggest problem is the amount of electrical noise that can be picked up in the house en route to the rig if the ATU is at that end, closely followed by the ‘how to’ of remote tuning the ATU. Another possible proposition is to use the coax-fed half-GSRV, letting the twin-feeder bit hang straight down, bury the coaxial until you get to the house, and then feed unobtrusively up and in like the TV aerial feeder. A colleague used to do this, but his method was to use 50-ohm balanced instead of coaxial, wire a balun at the shack ATU end, which for him seemed to work better. Some experimenting seems to be called for.

P. Lincoln (Aldershot) has decided with regret that this year he cannot justify the cost of the U.S. and DX Call Books, so while he can still look up calls for people they will be from last year’s issue. He is on (0252 317870. Peter has a RTTY program for his Sharp computer up and running, to read or send RTTY or ASCII at 45, 50, 75 and 110 baud rates. He also has a machine code program for the HPX List using the same computer. If anyone would like details, contact him direct.

Next we come back to M. Ribton and the problem of using the mains earth for RF. The problem has to be that most appliances tend to leak to RF through stray or other capacities. In addition, should an appliance ‘go down’ to earth, a mighty current could flow if the fuse holds. Now, under these conditions, the worst case would be that of the earth potential at the shack mains earth point, roaring instantly up to nearly the voltage of the live wire of the mains. That wouldn’t be very nice for Master, and it would probably result in the high voltage eating at least the front-end of the receiver. If you must use the mains earth, then don’t pick it up on a socket; take a separate, and double-beefy, earth lead to where the mains earth goes to earth, and then make off below (i.e. nearer the ground than the mains earth connection). If anyone has any other views on this or other subjects, Mike would like to receive a letter and will reply — he is at 9 Paget Street, Gillingham, Kent.
Finally, we have L. H. Marquardt (Hereford) who uses a vertical dipole almost entirely on 14 MHz, feeding a DX-302; he also has a portable receiver and ¼-wave whip. His latest three letters bring his total up to 160 prefixes and so by next time with any luck he should have his name on the Ladder. We wonder if Luciano is a member of the Hereford club — like most clubs they can always use more members and have chaps there who could probably be a great help to him in progressing along the path to a licence.

BOOK REVIEW

“AMATEUR RADIO OPERATING MANUAL”

Third Edition

THE third edition of the Amateur Radio Operating Manual has been published and, rather than compare it with its predecessors reviewed in the December, 1979 and April, 1982 issues, this appraisal will start from scratch for the benefit of relative newcomers to the hobby.

The first chapter, The Amateur Service, deals with the international and national legal aspects of amateur radio, such as call sign blocks and the designation and classification of emissions. Chapter 2, Setting Up a Station, is full of sound advice about the need for, and acquisition and assembly of, equipment, stressing the importance of considering the station as a whole. Since most newcomers do not have a very clear idea of which facets of the hobby they will concentrate upon, a flexible, low cost approach is suggested.

Operating Practices and Procedures are covered in the next section which is essential reading for all newly-licensed amateurs, particularly those who have graduated from the CB band. It is all too easy to pick up bad operating habits such as speaking too close to the microphone, incorrectly setting speech processors, using silly phrases like, “That’s a Roger,” and “Affirmative” when “Yes” would suffice, and the use of the royal “we.” This chapter includes extracts from the international Q-code, the RST Code, common CW abbreviations and popular phrases in English, German, French and Spanish.

The fourth chapter has 49 pages and is entitled DX. It is a very comprehensive piece including copious information on the characteristics of all bands from 160 metres through 23 centimetres whereon DX can be worked, how to work DX stations, predicting propagation conditions, and awards. The European QTH Locator and Maidenhead World Locator systems are fully explained and all the current band plans and beacon are listed. Several pages are devoted to VHF meteor scatter mode covering the arranging of schedules, operating procedures and a list of thirteen showers.

Whether one loves or loathes them, contests are an established part of the hobby and chapter five is devoted to them. The major, annual HF clashes are tabulated. Most of this section consists of common sense advice on how to do well in contests, covering equipment preparation, maintenance and operation, organisation and strategy, antennas, log keeping, check sheets and performance analysis. Mobile, Portable and Repeaters is the title of the next chapter which includes lists of the U.K. 145, 433 and 1,297 MHz repeaters complete with a map of where they are. Chapter 7, Amateur Satellites, covers the remaining Soviet RS orbiters, the two UoSAT ones, UO-9 and UO-11, and the first Phase 3 elliptical orbit spacecraft AO-10. All the information about ground station requirements, tracking, band plans and actual operation are adequately dealt with.

The following two chapters deal briefly with RTTY and SSTV but neither data systems nor packet radio gets a mention. The final, tenth chapter is entitled Special Event Stations, and is a welcome inclusion. These stations are usually the general public’s first introduction to amateur radio so first impressions should be favourable. This section offers sensible advice on this public relations aspect of the hobby.

In this edition there are eight appendices the first of which consists of a series of continental and regional maps including a Maidenhead one of Europe, the “CQ” and ITU Zone maps and ones showing all the countries. The second appendix has 28 pages devoted to International Call Sign Series holders listed alphabetically and supplemented with maps showing the call areas of many countries. The lastest U.S.S.R. callsign system occupies two pages. Appendix 3 is a callsign list wherein all the ITU callsign blocks are given, together with the appropriate amateur prefixes, continent, “CQ” and ITU zone numbers and the antenna azimuth from London.

In the fourth appendix, the current A.R.R.L. DXCC countries are listed and there are seven columns for the reader to use to tick off those worked on the bands of his or her choice. Deleted countries are not listed. The next appendix is Worldwide Legal Time. No. 6 lists all the amateur frequency allocations in Regions 1, 2 and 3 from 1.8 MHz through 250 GHz. There are two pages of W.A.R.C. 1979 footnotes in minute typeface. Standard Frequency Stations in Argentina, Australia, Canada, France, Italy, Japan, the U.K., U.S.A. and U.S.S.R. are listed in Appendix 7 together with their operating schedules. The final appendix gives guidance on phone contacts in French, German, Italian and Spanish and the book is concluded by a short, one-page index.

The Amateur Radio Operating Manual is published by the Radio Society of Great Britain and edited by R. J. Ekersley, G4FTJ, who lists 43 individual contributors and other groups. The format is 204 pages in soft cover, size 245 x 183mm. This manual remains one of the most informative volumes available, particularly for newcomers to amateur radio, and it is highly recommended. It is in stock at £6.10 and orders should be addressed to “S.W.M.” Publications Department at 34 High Street, Welwyn, Herts., AL6 9EQ. The price is inclusive of postage and packing.

N.A.S.F.

Finis
160-Metres for the Yaesu FT-707 Transceiver, Part 1
A Conversion Project for both Early and Later Models of this Popular Piece of Equipment
IAN KEYSER, G3ROO

For some considerable time I have been considering the possibility of modifying the FT-707 for 160m. operation, but have fought shy due to the lack of space in the rig. Recently, however, interest has been rekindled and a more concerted effort put into finding a solution.

In the past it has always been my intention when modifying a set not to exclude any facility that might be of use and this has been the stumbling block on several occasions. This time a choice had to be made as I wished to include two things, an attenuator for use on 40m. at night and the new premix oscillator needed on 160 metres. The marker circuit, I decided, would have to go — after all it had been used on very few occasions and it was a simple matter to use the redundant components and build it into the ATU; also this gave me a suitable switch on the front panel for the attenuator circuit.

There is another slight drawback that has to be accepted when doing this modification. The variations in gain between bands on the FT-707 is very slight indeed but to carry out this modification we have to make the RF tuned circuits on 28 MHz cover down to 25 MHz, and this has the effect of reducing the overall gain of the front end on the 10 and 12 metre bands. The effect is not as marked in practice as it sounds on paper as it is still possible to hear solar noise on 10m. with only a dipole.

Those of you who have already done my FM modification (S.W.M., April and May, 1984) should have little problem in completing this modification; however I repeat the warning that for those of you who doubt your ability, do not attempt it without the aid of another amateur who has sufficient experience.

The Attenuator

We will cover this first, but for those who do not wish to remove the 'mark' facility, or those of you with the later RF PCB with insufficient room to include the attenuator, the 160m. oscillator should be built on a piece of Veroboard and "fiddled" into some convenient corner of the set.

The attenuator is switched using a miniature relay which is obtainable from MS Components. Using a small modelmaker's drill and grinding heads, islands can be ground into the unused copper ground plane alongside T1001 and the relay mounted there; it is then a simple matter to add the attenuator circuit (Fig. 1) into the track from J1002 pin 1 and C1005. On my printed circuit the combination of T1001 and C1003 (forming a trap) is not connected as shown in the circuit diagram, but connected to the cathode of D1002. The wire connected to pin 7 of J3003 is removed from the insert. The insert can be removed from plastic case by using a small screwdriver to push down the barb on the insert at the same time pulling on the wire. When the insert is

Fig. 1  Input Attenuator circuit

![Diagram of Input Attenuator circuit](image)

Fig. 2  RF Transformer connections

![Diagram of RF Transformer connections](image)

- Caparator now external
- Different tapping point
- L1
replaced check that the barb has not been pushed flat, otherwise the insert will not catch in the plastic insert and will be lost. This wire is routed back through the cableform until there is sufficient length to reach the relay; when the 'mark' button is depressed supply is available on this wire and is used to energise the relay.

The 160m. Modification
Having completed the conversion of my FT-707 with the original front end design, it was decided necessary to find someone with a rig with the new style front end and convert that before calling the project complete. Just at that time a call happened to come from Ian, G4MWD, asking about converting his later-version FT-707 to 160m! After a fairly lengthy assessment, the only difference seemed to be that the RF stage input had two tuned circuits and that the high pass filter on the input to the receiver had a slightly higher cut-off frequency than the original on 1.7 MHz.

Addition of the new oscillator would create little problem and could be built on a small PCB if the marker circuit was to be retained. Alteration of the coils would be the next job and as these are all the same units as used in the Rx RF amplifier output on the original board, conversion of the coils would be carried out in the same manner to be described for T1025 and T1026. The high pass filter on the receiver poses little problem as it will only decrease signals by less than 10dB, and when one considers the sensitivity of the set and the general noise level on the band it is hardly worth worrying about. If you do wish to change the values of the filter these are given in Fig. 14.

With Ian having completed his modification without too many problems I decided that it was only fair that I purchased a later version PCB and did the same to my set. A phone call to South Midlands Communications Ltd. and, with the assistance of a very helpful young lady (and Access), one was in the post the following day.

To commence the conversion release the front panel by removing the countersunk screws but take care not to release the VFO mounting screws; careful investigation will identify these screws and this unit must come away with the front panel. Ease the panel away from the set a couple of centimetres, that is all that is required, and locate the wavechange switch. Examination will reveal four terminals connected together on the rear wafer and to the left of these a grey/white wire, this is the 12m. RF terminal.
The corresponding red/white wire on the front wafer is the supply for the 12m. premix oscillator. If the wavechange knob and retaining nut are now removed the switch assembly can be rotated revealing two spare pins, one on each wafer. These pins are the unused position on the wavechange switch between 10m. and 80m. and is used for 160 metres.

Our first job is to change the switch wiring to enable the 10m. RF and premix filter circuit transformers to be used on 12m. This is done by removing the grey/white wire from the 12m. pin and connecting it to the spare pin on the rear wafer; now, using a short piece of wire, connect the 12m. pin to the four pins that are joined together alongside it. Not only has this changed the coils used on 12m. but has made the old 12m. coils redundant and wired the diode switches onto the 160m. position on the bandswitch. These coils can now be changed for ones suitable for 160 metres.

Next take a 12-inch length of clear plastic covered wire (about the only colour not used in the FT-707) and connect it to the spare terminal on the front wafer of the wavechange switch and then refit the switch taking care not to overtighten the fixing nut. This new wire will be the supply for the new premix oscillator required for 160m. which will be covered later.
Table of Values

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1</td>
<td>270R</td>
</tr>
<tr>
<td>R2</td>
<td>52R</td>
</tr>
<tr>
<td>R3, R4, R7, R8, R9, R10</td>
<td>22K</td>
</tr>
<tr>
<td>R5, R11</td>
<td>100R</td>
</tr>
<tr>
<td>R6</td>
<td>22R</td>
</tr>
<tr>
<td>R3145</td>
<td>22K</td>
</tr>
<tr>
<td>R3146</td>
<td>10K</td>
</tr>
<tr>
<td>R3148</td>
<td>1K</td>
</tr>
<tr>
<td>C1, C2, C3, C9</td>
<td>180pF poly</td>
</tr>
<tr>
<td>C4, C5, C6</td>
<td>1500pF ceramic</td>
</tr>
<tr>
<td>C7</td>
<td>220pF poly</td>
</tr>
<tr>
<td>C1021</td>
<td>100pF poly</td>
</tr>
<tr>
<td>C1028, C1035, C3136</td>
<td>0.01µF d/c</td>
</tr>
<tr>
<td>C1068, (C1066), (C1030)</td>
<td>47pF poly</td>
</tr>
<tr>
<td>C1111, (C1151)</td>
<td>1000pF d/c</td>
</tr>
<tr>
<td>C1175, C1176, (C1152), (C1153)</td>
<td>68pF poly</td>
</tr>
<tr>
<td>C3132</td>
<td>0.047µF d/c</td>
</tr>
<tr>
<td>C3135</td>
<td>270pF poly d/c</td>
</tr>
<tr>
<td>C40807, C40809</td>
<td>2000pF d/c</td>
</tr>
<tr>
<td>C40808</td>
<td>1000pF d/c</td>
</tr>
<tr>
<td>L1</td>
<td>113KN2K241 (Cirkit)</td>
</tr>
<tr>
<td>L1024</td>
<td>100µH, RFC</td>
</tr>
<tr>
<td>T1010, T1025, T1026, (T1016), (T1017), (T1032), (T1033)</td>
<td>119ANAS871HM (Cirkit)</td>
</tr>
<tr>
<td>T1044, T1045, (T1051), (T1052)</td>
<td>119LC30099N (Cirkit)</td>
</tr>
<tr>
<td>L2, L3</td>
<td>26 turns, 22 swg, spaced on T68-2 toroid</td>
</tr>
<tr>
<td>L4801, L4806</td>
<td>8.2µH</td>
</tr>
<tr>
<td>L4803, L4804</td>
<td>3.3µH</td>
</tr>
<tr>
<td>L4802, L4805</td>
<td>10µH</td>
</tr>
<tr>
<td>D1</td>
<td>1S1555 or similar switching diode</td>
</tr>
<tr>
<td>Q3034</td>
<td>BC109 or similar npn</td>
</tr>
<tr>
<td>Xtal (15.9875)</td>
<td>FT-101 spare part 7180013, HC18/U 210147</td>
</tr>
<tr>
<td>RL1</td>
<td>6V 1-p/2-w min. relay</td>
</tr>
<tr>
<td>RL2</td>
<td>2-p/2-w min. relay</td>
</tr>
<tr>
<td>Notes: All resistors are 1/4-watt. Capacitors and relays can be obtained from M.S. Components, Zephyr House, Waring Street, West Norwood, London SE27 9LH (tel: 01-670 4466). Cirkit’s address is 200 North Service Road, Brentwood, Essex (tel: 0277-211490).</td>
<td></td>
</tr>
</tbody>
</table>

Having completed that part of the operation it is now desirable to reassemble the set and test that everything is functioning as expected.

The New Coils

Before we start, the component numbers in brackets refer to the new style front end and with two tuned circuits between the aerial input and the RF amplifier, the other numbers refer to the older boards with only one input tuned circuit.

RF Input, Early Version

This is the most fiddly part of the operation and one that I was not looking forward to but, in the end, it was quite painless. There are no coils on the market that can be just ‘plugged in' without modification but luckily there are a limited number of appropriate transformers and chokes available that are suitable for modification.
We will cover each coil in turn starting with the RF input coil T1010 (the input coils for the new PCB will be covered later). This along with T1025 and T1026 (T1016, T1017, T1032 and T1033) have to resonate on 160m. For this position we use modified 'adjustable RF chokes' which have a nominal inductance of 45µH. For T1010 we have to add a low impedance input winding and for this we need some very fine enamelled wire of about 40 s.w.g.; only a short length is required and this can be found in IF transformers salvaged from an old trannie radio. Carefully remove the outer can by bending the four lugs on the base, the top ferrite cup will come away with the can leaving the exposed bobbin. Wind four turns of the fine wire onto the bobbin and connect the ends to pins 3 and 6 (see Fig. 2). Remove the original T1010 and replace with the new one, connect a 180pF capacitor on the underside of the PCB between pins 1 and 3, change C1028 to 0.01µF, and cut the PCB track between pins 3 and 6 (see Fig. 4).

RF Input, Later Version, and RF Output Both Models

T1025 and T1026 (T1016, T1017, T1032 and T1033 in the new style PCB) are all modified the same way. Remove the covers and locate pin 3, carefully break the fine wire using a watchmaker’s screwdriver. Unwind 26 turns and form a tap onto pin 2; it is not necessary to clean the wire as a hot iron will ‘solder through’ the insulation. Wind back on 23 turns and finish on pin 3 (ensure that you rewind them in the same direction as they were before they were removed). Check with a meter on the ohms range that the insulation has soldered through. Replace the original T1025 and T1026 (T1032, and T1033) and change C1068 to 47pF. On the new style board replace (T1016) and (T1017) with the two remaining modified coils, change (C1030) and (C1066) to 47pF, (C1021) to 100pF and (L1024) to 100µH. In all cases solder 180pF capacitors between pins 1 and 3.

The next part of the operation is to change the premix tuned circuits to cover the range 10.7875 to 10.9875 MHz; suitable coils for this application are 10.7 MHz IF transformers type 119LC30099N, available from Cirkit. Remove the bobbins from the cans and remove the fine wires from pins 4 and 6, this disconnects the secondary winding. Carefully smash the small capacitors in the base of the coils and replace the cans. Use these transformers in place of T1044 (T1051) and T1045 (T1052). Replace C1175 (C1152) and C1176 (C1153) with 68pF and C1111 (C1151) with 100pF and place links on the PCB between pins 3 and 6 on each coil, taking care that they do not touch the groundplane.

to be continued

ROO-Extra

More pictures of G3ROO’s mobile microphones project, which appeared in last months issue.
Conditions

By far and large, considering the position we occupy in the solar cycle time scale, not bad at all. Some one-hop and short skip on Ten, and even the odd long-distance contact were reported, implying things were quite tolerable on other bands, with Twenty often open until quite late — well, after this old-timer was safely tucked - up, anyway. So — let’s look a little closer.

Events

Pitcairn Is. are getting positively crowded with ham licensees; first it was VR6TC, then Kari VR6KY, as residents, and now we hear that G3OKQ is there for five months helping with repairs to the jetty and licensed as VR6JR.

Also noted in the DX News Sheet is the business of Mt. Athos. Seems that the monks have rebelled a bit — they have written to the civil authority indicating that they will never again permit amateur radio on the Mount.

The station recently around and signing 3A2TO was a very definite dug. Although it sent out some QSLs claiming legality, it gave data which proved otherwise, and the Monaco Amateur Radio Society have raised the matter, we understand, with ARRL.

The G3KQL/TT8 station is raising a few eyebrows. It puts a pretty weak signal into Europe and claims WIA for the military transmission’s for which the station is based in the U.S.A. with that not enough the pond pump has been having hysteries and now lies on the bench, just alongside the monitor TV which also has decided to go into a faint! However, on SSB the early Sunday sessions with PA0PN continue, and on CW LQSLG and 7S6SSA were also worked.

G40BK (Chorley) wrote early, just before NFD, and his reason for absence over the past few months is now clear — Phil’s long period of saving-up is over and the garden now sports a tribander at the top of a tower. This is good for Ten of course, and Top Band activity has been lower. Nonetheless, CW accounted for LA7JB and 7Z2KZA, while SSB contact was made with OH0MM/OJ0. This last one should be a new one: it is a long time since one recalls Marker Reef being on Top Band.

Another early reporter was G3BDQ (Hastings) who was going to be having a holiday in The Smoke at deadline time. John was all-CW, and his contacts were out to AA1K, K1ZM, W2GVX, W2ADB, VE1ZZ, PY1BVY, UP2BP/UH, OL9CQW, UA0CBO, and the Swedish stations 7S6SSA and 7S6SSA.

G4AKY (Newport, Essex) has just returned from a Welsh holiday; in April there was a contact with A92E about which Dave is rather doubtful, plus in May UA9FNR, U18JS, GV2DX, GV2WMR, GV2VED, 7S6SSA, UA9CBO, TF3KG and JY9WR (QSL via G4ATS) for a new country. There was also an interesting daylight one with QG2FRO, flying a balloon or kite aerial which was rather surprised to reach out to G4AKY, on SSB. Part of the ragchew was devoted to happy memories of G3APA/GC3APA — Ted it will be recalled used to be on from Sark on Top Band, although the writer’s memories of him go back to thirty years ago when he was in Coventry. An operator to be really missed.

Ten Metres

First we have a new reporter in GW4ZWO (Abergele) who has fifteen watts of input to a verticle dipole at 10 ft. a.g.l. On SSB there were contacts with OK2BTI, H.A2EOO, DL8ANZ, SP6DVP, DK7NL, LA9V, SM6NJK, SM5MGW, DF2UU, SM5POS, DL85CC, DF3VW, DL3SI, DF3XZ, Y25XH, and 140W8; FM gave DL2GBT, and DF9RT, while CW was used to work SP6C6P and a half-contact with DL1RX which sank in the QRM. All this was on May 1, and on 2nd SSB accounted for DK7RT, IK2DRC and I2KAJ; CW was used for DJ10J. May 3 saw the band open again, and this time the CW knocked off DF2UU, EA3FDO, while LZ1BK and YU3JR were heard. On SSB, OK2BTI, DF2UU, EA9NW, EA3EQS, plus some HG stations heard but lost in deep QSB. Just goes to show that there is business to be transacted on the band if you go and look for it!

GW4BLY (Newport, Gwent) reckons the band conditions, considering how far down the side of the cycle we are, were very good indeed, particularly around mid-month. Without his linear, a running barefoot, Steve used his SSB to work CE3AUO, CT1, CT3BM, EA, EA6MR, EA9YV, EL1AH, EL2AK, HA, HG, LUIFOW, LUI7DDE, OK, PY5E6, RB7GA, TK/G3KFT, TR8JLD, TR8SA, T26FE, UA3, UA46, UL8AWE, Y39, OE3HGB/YK, ZDJL, and 7Q7LW.

Turning now to G6QO (Hoveton), David was quite active, but really had not operated on nineteen days of the month. On Ten he offers IY3YR, YU3CK, UB44DLW, HG8QW, RP2BD1, UQ6GJN, RQ2GDO, EA3FHT, and EA3BDE.

G4H2Z (Knutsford) stuck to Ten and SSB with his TS-820 and Quad; Tony found it a most interesting month, with some Sopor-E and some real DX too. On the latter front were such contacts as LZ, YU, HA, OK, I, UB4, UP2, OH, DL, SP, EA, UQ2, UA1, UB5, SM, OZ, LA plus EI2AW in Limerick, and SO1MN; SO is stated to be the prefix for foreigners living in Poland, and SO1MN had retired to live in that country. Turning to the more DX’ signals raised, we note EL2AK, 7Q7LW, OE3HGB/YK, UA64ARE, R49FCB, UA9CRR, the last two being in Zone 17, .
which, G4HZW felt, indicated the chance of a Stateside opening later — but this in fact didn’t materialise.

G4VF (Ivybridge, Devon) found the band so interesting that he stuck totally there. Friends had reported the CX, PY, 8P6 stations around, but Peter’s own crop was a few EAs. ISTYTV, EI1SM, OK2BFI, UP1BXY, IK3FHP, a QRP p IZIL on one watt, YU2NA, IF1Y on three watts of QRP, EI8EVE, DL9HBZ, DF8TK, CT1IR, CN8MC, CT1KN, IM0UXZ (Santa Monica, S.W. of Sardinia) IS0CDS, YU2RMZ, IK0EUP, all on Sideband; CW got out to YU2VC, YU2CAO, HA1VE, UA6TLT, and GM3ZRC. Peter notes how the improved conditions brought out the intruders — mostly Italian and other EU stations, plus of course the increased CW activity involved in trying to shift them.

**Award?**

Peter, G4VF concludes his letter by saying that he is a keen ‘squares’ hunter on two metres, and he wonders whether a similar scheme would be of interest on Ten as a way of spreading activity out and around during the next years of sunspotlessness. Any views — from contributors or others — will be welcome on this idea. However, back to the ten-metre clip.

G4ZZG (Warrington) is another new contributor who noted our comments back in April about intruders reading about ten-metre activity or its absence. Charles does not, he says, report any exotic DX, but he has noticed and dealt with the Spor-E and short-skip openings he has come across. The machinery is a TS-120v into an ex-CB vertical minus loading coil, and fitted on the chimney with three 120V into an ex-CB vertical minus loading coil, and fitted on the chimney with three

Charles is no newcomer to this game, 28.2 is that he heard, several times, sending "CDXN" deadlines for the next three months:

**August issue — July 4th**

**September issue — August 8th**

**October issue — September 5th**

Be sure to note these dates

Now we turn to a couple of letters from G3EKP (Blackburn) who used to be active on 70 MHz. Last month he started on the new bands with a dipole for 10 MHz, and worked lots of things, a sample being K3DY, OE3JPH, VE3UT, VK5LU, VK2QM, NP2AB (Virgin Is.), VK3BXN, EA3BPQ, HB9CWJ, VK3DQ, three times, LU9CV and lots of Europeans. In the middle of the month an 18 MHz dipole went up, to produce SM6LQG/MM off Newfoundland in a gale, LU6EF/D, DJ2FR, F6CTK, LA5RX, Y26FL, and LU1DOW — so, as G3EKP says, there is activity there. The second letter indicates that G3EKP had next had the idea of feeding his 18 MHz dipole through the station ATU with 24 MHz RF; this turned that G3EKP had next had the idea of moving Y22TO and J28EI. On 24 MHz things were poor, but Y22TO was worked and G4PGW heard in the morning, while a tea-time session for an hour gave O6EWK, and SM6LQG/MM logged and J28EI worked.

**New Bands**

Let’s start with G4UZN (Leeds), who notes that we didn’t use his report last time . . . so what’s at the top of the left-hand column on p. 149 then — scotch mist? Not very often that one of the gang misses, so Tony quite made my day! Turning to his doings on the air, we see, on 10 MHz, KP4PS, QA4SS, VE7YC, WP2MDY, V2A, W5ZJ, in New Mexico, 4X4WF and 5B4OG. It was all heard activity on 18 MHz, with EU of course, plus LU1DOW, LU1DZ, DL2GC/YV5, ZS6BMS, and 9J2BO. As for 24 MHz, it has been the scene of many European openings, plus LU1DOW and 9J2BO. Tony notes that the Ws have this band from June 22 so with any luck there should be a notable rise in activity.

G2HKU found time, in between weeding and mending things to look at 10 MHz and to work G6ZY/EA6, SM5KX and N4SU.

During the Activity Weekend, G4FLK came on and sampled all three bands. On June 1, between 0600-0800z, he heard DL1MO, DJ6CP, OZ1HRQ, DJ8QR, Y26DM and LAlAE, plus a QSO with DL1NAW/P. 18 MHz yielded lots of G6HL, a thing signing 74BXN (!), J28EI, VK3XA, HB9QQ and a contact with VK3MR. 24 MHz was — or, dormant. Next morning the tack was repeated and on 10 MHz contacts were made with OK4HBE/MM, VK3XB and Y22TO, while logging OE9SLH, OZ1KYL, N4FNG, DL6NB, VK2AKE, W7RK, F3NB, G6CJ, and others. 18 MHz produced loggings of ZS6AYM, HB9AMZ, LU1DOW, DL6NB, SM6CYZ, OZ1EOU, DL7UX, in between working Y22TO and J28EI. On 24 MHz things were poor, but Y22TO was worked and G4PGW heard in the morning, while a tea-time session for an hour gave O6EWK, and SM6LQG/MM logged and J28EI worked.

First the Ipswich Radio Club Golden Jubilee Award; the Award requires you to get 50 points, 25 of these must be for contacts with Suffolk and Ipswich Radio Club. Contacts with a G station count one point, a station in Suffolk counts two
points, a member of Ipswich club counts three, and the club stations G11RC, G4IRC, and GB2IRC count five—these calls will be on the air in several special-event appearances through the year. Any mode, and band, but no repeater contacts; certificates may be endorsed for a single band or mode. Applications for the award, must be certified by your local club chairman or secretary, or by a representative of RSGB, to be sent (along with six IRCs, £1 or a couple of dollars) to Alan Owen, G4HMF, 102 Constable Road, Ipswich IP4 2XA, before March 31, 1986; and of course all QSOs have been in 1985. The certificate you will receive is a quite handsome effort, signed by the club's President and the Mayor of Ipswich, while Arrow Electronics are sponsoring the award.

We have a letter from G4HPU of the WAB organisation. At the last AGM (at Drayton Manor Rally) it was stated that £250 had gone to RAIBC and a £100 to Victoria, Australia. 412 Brunswick Manager, Wireless Institute of Australia, and to be sent QSO, no more than 30 of these to be in any his/her certificate number as part of the already qualified as in VK75A, or (b) work someone who has Award; to get yours you either (a) work VK3WI direct. Additionally there is an commemorative station signing VK75A on the air of his/her anniversary. Aussie radio amateurs may encouraged to only do so if they can send out the WAB organisation. At the last AGM (at new prefix, awards account.

Make your cheques to Worked All Britain and packing, from G4KSQ who is QTHR. which nowadays cost £4, plus £1 for post open to anyone who buys the WAB book, received. Membership in the WAB setup is with six IRCs, £1 or a couple of dollars) to represent a curator himself - G3KPO - popped in key dating to 1918. The very next day the curator at the Wireless Museum in the Isle of Wight — his two watts was driven with a keyer, with a reward by way of contacts a fine signal. GW4BLS reckons he has had enough of VHF for the moment; thus he is on 7 MHz with a "dipole so low it gives long-path via moonbounce." The knack is clearly there on, though as on CW the following are offered: W2BA, LU3ESH, CM5HL, KU1H, PS7OS, VE1BEI, KV8Q, N1DG, VE30BM, A15P/TF, PP2MD, UP2NK/UF, or a collection of small fry. Another CW man is G2HKU who found KD8QW, UA9XBB, W4ZMQ, G3VTT/W4, TV8QY, and KA8HOK/V9P. Turning to G3BDQ, John also stuck to the keyer, with a reward by way of contacts with UA9XHT, UA9CI, UA0ABL, OH0MM/OJ0, P29PR who came back to a CQ one evening, VK2APK, VK2PA, JA1AAE, JA5BJC, and ZS6DN. Yet another all-CW report comes from G40BK, who found HJ1LR, K1MM, UP3BI/UF, T10RCT, HB0/DK11I, CT3ET, and UL7FEC. The usual routine for Forty at GW4BLS is to have a session between about 6.45-7.30 local time, and SSB in this timeslot accounted for G6ANU, CE3DPP, CE0ZIJ (Easter Is.) CP6CSJ, HK11OE, HK31HPN (the four-letter suffix is an indication of novice status), HK51SX, HC6FS/5, OA4AWS, OA4FT, T12C, several VKs, XE1VIC, YV5HQA, ZL4IG, and 8R1RPN.

Fifteen

Obviously, if Ten were going to show signs, 21 MHz would do it better! G6QQ stuck to his key, and worked RL8PYL, A92EM, NM5M, 5Z4MX, ZS1CT, NP4CC, J28EI, LU4FDM, LU2DSL, 4Z4NUT, and 4X6NM, all in the WPX contest.

G3NOF next; Don says that in the first half of the month the band was open most afternoons to Africa, but later these openings became fewer. After several weeks of absence a few East Coast Ws were noted in the evenings, also Indians and South Americans. Other than YC5NOF, in the DK9KE net, nothing was heard of Asia, Australasia or the Pacific, until May 28 when Don was called by G3OKQ/MM 700 miles from Piccain, at 2158 — and unusual opening. SSB contacts were made with DL7F/TV9, G3OKQ/MM, G5CW/EA8, G14FUM/ZS1, J28AG, J28AB, JA2DV/MM off Greece, OE1EIB/MM4, PY2CIL, PY7ZQ, S79CW, ST5LR, TA1A, TI2KD, TL8CK, TR8DR, TR8LD, TR8SA, TU2UK, VP2MDG, VP2MO, W2JT/V2A, XT2BR, YC5NOF, ZD7CW, ZD8JP, ZP5CDB, ZS1SL, ZS3GB, ZS5DT, (ex-912DT), ZS6CDZ, 3B8CA, 3B8FP, 5H3YL, 7P8AE, 7P8CM, and 9Y4NW.

GW4BLS found some DX mixed up with the VHF-type propagation, but agrees that the path to the States was absent most of the time. SSB contacts were made with CE2BIC, EC91R, FM4DN, FT8X8B, J28DN, LU5DIT, PY5EG, PZ1DR, S79CW, TL8CK (this one was raised twice, once at 0650z at S9+), TR8DR, TU2UK, TU2LM, WB8YUC/V5P, VE3JGC/V9P, ZD8LJ, ZS3BI, ZS4RT, and 7P8CM.

On 21 MHz, G40BK records one SSB contact, with OE1EIB/MM, plus CW contacts with UA9s, UA0s, UL7CH, UM8MM, U18BB, PYs, LUs, IS0S5U, NP4CC, HH2ZW, CE3DNP, UH8EA, TRIG, HZ1HZ, 5Z4MX, and OH0MM/OJ0.

A mixed crop at G3BDQ included CW to JA3YBF, 5Z4MX, NP4CC, UH8EEAA, EA5YU/EA8, 4X6IF, plus Phone to VQ9YR (Diego Garcia), 7P8CM, and VU2GI.
Now Twenty

Let G2HKU have first shout this time; Ted used his Morse key to get at VE3NOC, K4QO, LU9CV, ZP5LOY, PY1QN, K4BAI, VP2E/NL7G, UA0BAJ, FM4CW, G3VTT/W1, G4BUE/W1, G3VTT/W4, and OA4Z.

CW all the way again with G3BDQ, who mentions his contacts with HL1EJ, DV1TV (Manila), V2A, T12LK, VP2E/NL7G, (Anguilla), JY9XR, FG5XC, AP2AM, TF3XXU/8 on a lighthouse near Keflavik, UV2RRM, UV2SKP, A15P/8F, operated by W3HKN, DK6NV/SV9, JE2UYV/MM near Muscat, KL7Y, KL7MF, KH6XX, lots of VE7s, W7s, PYs, lots of JAs, 7S2SSA, 7S5SSA and 7S7SSA, plus OG1AA who turned out to be OH1AA in a disguise. There was one SSB contact, with SP0BEM, an exhibition station.

Sorting through the log from G4OBK, we find Phil using SSB to get out to GU0/ON4TJ, 7S2SSA, A4XRS, E09IJT, OD5YU, UI1AG, CT3EU, 7X5VUK, UJ8SC, plus CW to UW3HY/1 (Franz Josef Land), H18DDC, OH0MM/OJ0, A92EN, TI2L2K, all W call areas, NP4CC, PA0JLS/PJ, TRIG, J28EI, HL1CG, LG5LG, 6Y6A, HP11XKR, HH2WW, 8J7ITU, JAs, UI8LB, UAs and UAs, HB0/DA1WA, KH6s, VK4XS, FG5DL/FS, VE3DNP, YV5FCY, UH8EAA, 7S3SSA, and V2A.

Twenty was the star turn, awers GW4BLE, with the Pacific over the short path from 0600 onwards on most days — GW4BLE’s worst direction, with a barrier of 400 metres of rock a mile away! This is where a linear does come in handy! SSB contacts were made with A35TA, A4XRS, AH6FF, AH6FL, AH6FG, BY1QH, E0V0AG, F08LV, F08MN, JT1KAA, KH5’s NH6AT, T32AF, V85GA, VK2, VK3, VK6, VK0DJ and VK0ML (both these two on Mawson Base, Antarctica), YB6NH, YJ8RG, and ZD8LJ. One of the FO8s said he was using a “single element beam” — dipole tied between a couple of palm trees.

Now to G3NOF, who reports short-skip quite noticeable, and only a few weak VK/ZL signals heard on the long path. Don was not on before 0700z but he has word that there were earlier openings to the Pacific. The band wasn’t much good in the day but came back to life in the evenings, the Statesiders peaking around 2300z. Little was heard of Africa or Asia. It added up to Phone contacts with EE9ITU, FM5DD, FW8AF, G3OKO/MM in the Pacific, HH7PV, H80/DA1WA, a couple of IBs, JW0EQ, J6LKN, KH6SB, KL7LF, KL7TQ, KP4BZ, LG5LG, SJ9W/L, both Morukulien and operated by G4JBH, UF6FL, UZ9AYA, W2JT/V2A, 4U0ITU, 7S1SSA, 7S3SSA, 7S5SSSA, and 8P6AW.

Last man in is G6QQ; David used his CW to work W4BW, VE2WQ, UA9OBP, VE1BRP, and JE7JZC, plus Phone to KA9ONO and KE5KK.

Ending

That’s the lot for this time. Deadlines are as shown in the box, and are for the arrival of your letters addressed as always to your conductor, “CDXN”, SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts. AL6 9EQ. By now.

**Fig. 2** JLD Transmitter PCB Layour (Corrected)

**CORRECTION:** In Part 1 of the "J.L.D." Transceiver (May issue) there were some errors in Fig. 2 on page 120. A corrected transmitter PCB layout is given above, with changes encircled. Also, in Part 2, C8 (Fig. 1, page 161) should be 10nF.
HF Antennas for Restricted Sites, Part 2

A Practical Approach to an Everlasting Problem

A. P. ASHTON, G3XAP

In Part 1 we discussed the method of inductively loading an antenna in order to reduce its physical size yet maintain resonance, and it will have been noted that some care was required in producing suitable loading coils in order to maintain a reasonable level of antenna efficiency. A somewhat simpler method of fitting an antenna into the available space is to 'bend' the device rather than shorten it, and this is a common method.

Antenna Bending

Where only slight reductions in span are required, the simple approach of erecting an antenna in the 'inverted-V' configuration is a common example of this technique. For example, the W3DZZ type of trapped dipole requires a span of around 110ft. if it is to be erected in a horizontal format, but if we erect it as an inverted-V with its centre at a height of 40ft., and its ends only 5ft. from the ground, the span required is reduced to around 85-90ft. A half-wave dipole for 3.5 MHz, which requires a span of at least 140ft. could be similarly erected in a span of less than 120ft. and either example could make the difference between being able to accommodate the antenna or not. However, most amateurs who have site restrictions are concerned with considerably larger reductions in span than those mentioned, and the bending obviously needs to be more marked.

Before moving on to this more severe bending it is worth going back to 'square one' and consider the current distribution on a half-wave antenna and the significance of the current at a given point. Fig. 1 shows the current and voltage distribution and also indicates the area of maximum radiation, this being the 'business' section of the antenna from which most of the transmitter's energy is radiated during transmission and most signal pick-up occurs during periods of reception. This region of maximum radiation is best left alone since bending in this area will lead to:

(i) Larger distortions in the radiation pattern,
(ii) Larger changes in the feed impedance,
(iii) Larger changes in resonant frequency, and
(iv) Larger reductions in antenna bandwidth

than will be experienced if we bend the outer sections of the antenna; it is also important that we do not make any bend at an angle greater than 90°.

Having laid down these simple rules, let us take the example of the W3DZZ device mentioned above and consider the ways in which it may be accommodated in restricted sites. Fig. 2 shows various methods of erecting the antenna, 2(a) and 2(b) being the horizontal and inverted-V configurations discussed above. Fig. 2(c) represents an even greater reduction in required span, but it will be noted that the two outer support points will need to be located at least 25ft. from the ground, and preferably 30ft., which detracts from the inverted-V's advantage of requiring only one high support point. Assuming a centre support point at 40ft. and the two end supports at 25ft., the total span required for the

![Figures](attachment:Antenna-Bending-Figures.png)
W3DZZ will be reduced to around 57ft. Fig. 2(d) is a method of erecting the device without the need to have the end supports elevated, and assuming a centre support of 30ft. high and with the ends 10ft. from the ground, the span is further reduced to around 50ft. Note, however, that when the end supports of a W3DZZ dipole mounted in this manner are as close as 10ft. to the ground, the centre support must be lowered also or the slope of the antenna becomes so steep that performance will be seriously degraded.

It is good practice to ensure that the angle between the two halves of the dipole is never less than 90°, and for the W3DZZ erected as in Fig. 2(b), this means that the difference in height between the centre support and the end supports should not be more than about 38ft. and for one mounted as in Fig. 2(d), the difference should not exceed 23ft. If the dipole is erected as in Fig. 2(d), it will be noted that the device may be seriously detuned and that the feed impedance may be very significantly altered since there is obviously a very high degree of coupling between the sections of the antenna between the traps and the outer sections, which run directly underneath them. It may also prove impracticable to have these outer sections running across the site in close proximity to the ground and it is suggested that a better alternative may be to run the ends away as depicted in Fig. 2(e).

Even the 50ft. span required for the devices shown in 2(d) and 2(e) may be too much for some sites and a method similar to that in Fig. 2(f) may need to be considered. The actual span required may be reduced to 40ft. or even 30ft., but it must be realised that there is a greater length of wire to be 'folded' into the available area as the span is reduced. The actual layout is open to the ingenuity of the reader, but provided that the guidelines outlined above regarding symmetry and not having angles less than 90° are followed, a surprisingly effective device can result.

At this point it may be worth considering the fact that although we are discussing methods of reducing the area necessary to erect a given antenna under separate headings, there is no reason why two methods should not be used together. The first part of this series discussed inductive loading, and there is no reason why the W3DZZ dipole should not be both individually loaded and bent. Fig. 3 shows one way of combining the two methods, but it must be realised that this will probably convert the antenna into a strictly two band (3.5/7 MHz) device, since the loading effect of the coils when subjected to energy at 14, 21 or 28 MHz will almost certainly move the antenna's resonances away from these frequencies. Since there is an infinite number of inductances and positions in the antenna where they may be inserted, it is possible that a resonance may occur in one or more of these bands, but this will be entirely by accident. In order to maintain the antenna's symmetry, the two loading coils should be as nearly identical as possible, and they must be inserted in identical positions in the two halves of the antenna. A further pair of loading coils could be inserted in the outer sections of the antenna, thus further reducing its overall length, but as the number and size of coils used in an antenna are increased, losses will also increase, whilst the antenna's bandwidth will decrease. However, there is much room here for the reader to experiment and it is hoped that the ideas given will enable an antenna to be fitted into the available area.

Perhaps the most important point to consider when bending an antenna to fit it into a small site is that the high current portion of the device should be in the clear and preferably at the highest point of the antenna. With the dipole type of antenna just discussed this is fairly easy to arrange, but when end-fed wires are used as multiband antennas, the current antinodes will change position on the wire as we change from one frequency band to another. End fed wires will be discussed in a later part of this series and this aspect will be considered in some detail.

Vertical Antennas and Inverted-L's

In many cases of restricted area, the restriction applies only in the horizontal plane and it is still possible to think in terms of vertical antennas. However, as the height of a vertical antenna is increased guying becomes necessary and we need to think in terms
of horizontal space once again. When considering the lower frequency bands (i.e. 3.5 and 7 MHz) we can meet severe problems with verticals which are electrically quarter-wave devices since we will need to provide a radial or ground system against which the antenna can operate. Hence what would appear to be a simple way to overcome our space restrictions becomes less simple as we begin to consider all of the requirements for efficient operation of a vertical antenna.

The author makes no apology for stating yet again that unless we are prepared to provide an effective ground system for a vertical antenna, we will finish up with a device that performs very poorly and will give rise to much frustration and disappointment. It is a fact that the vast majority of cases of ineffective operation of vertical antennas are a direct result of shortcomings in the ground system rather than shortcomings in the vertical antenna itself.

By considering the use of vertical dipole rather than a base fed quarter-wave vertical we can obviate the need for any ground system at all, but this obviously applies more in the case of 14, 21 and 28 MHz, where such a device would be of manageable proportions, than on 3.5 or 7 MHz where vertical dipoles would be respectively 132 and 66ft. in height! However, by applying the principles of inductive loading and bending, such antennas may not be completely out of the question.

Looking firstly at quarter-wave verticals, it is possible to erect them either as single band devices for 14, 21 or 28 MHz, or to construct trapped devices for any two or all three of these bands and yet have a maximum length of about 16ft. This enables them to be erected without guys and they can be fastened to a chimney stack or the gable end of a house and therefore in the clear. They can also be mounted at ground level although, as we are concerned with restricted sites, it is likely that this method of mounting will lead to severe screening by surrounding structures.

A vertical antenna mounted on a chimney stack can have its radials laid on the roof of the building and will, therefore, slope away from the base of the antenna. This is an advantage in that it has the effect of raising the feed impedance from the 30-ohms or so encountered with radials which are horizontal, to between 40 and 60-ohms, thus providing us with a better match for our 50-ohm coaxial feeder. Fig. 4(a) shows a suggested layout for a three band trapped vertical antenna and uses 4 radials for each band. It has been assumed that the house is semi-detached and that the radials cannot, therefore, be positioned symmetrically around the antenna — the slight distortion to the radiation pattern that will result from this layout should not be significant. Note that some radials may need to be bent and run along the guttering if the distance from the apex of the roof to the eaves is less than about 17ft. — again this practice will not detract seriously from the antenna’s performance. Note also that the radials are grouped in 4 ‘bundles’ of three — i.e. one 14 MHz radial, one 21 MHz radial and one 28 MHz radial are taped together to form a single ‘bundle’ — again this does not appear to affect the performance.

If the antenna is mounted on the gable end as depicted in Fig. 4(b), it is likely that the antenna feedpoint will be well below the apex of the roof and the radials should be run as shown — under no circumstances should any part of any radial be at a height which is above the antenna’s feedpoint. Note that Fig. 4(b) shows three sets of radials — this number can be increased if desired. A trapped vertical dipole could also be mounted as shown in Fig. 4(b) but it must be realised that the ends of the radials in the case of the quarter-wave vertical, and the end of the dipole in the case of the vertical dipole, will have a very high RF potential when operating on 14 MHz and care must be taken to insulate them effectively in order to prevent injury — especially to young children.

Having seen that it is relatively easy to deal with verticals, for 14, 21 and 28 MHz, we must now consider how we can erect efficient vertical antennas for 3.5 and 7 MHz within the confines of a restricted site. The first point to consider is that quarter-wave radials are now becoming rather long and it may prove impossible to accommodate them — especially the 60-plus feet required for 3.5 MHz. Whether our vertical is to be ground mounted or positioned on a building as discussed above, it is recommended that at least one full sized radial should be installed. This radial
will almost certainly need to be bent if the antenna is on a restricted site and it may even have to follow the entire perimeter of the plot and 'overlap' itself at its extreme end.

Fig. 5 shows a two band vertical for 3.5 and 7 MHz in a small plot measuring only 15ft. by 15ft., and it will be seen that the 3.5 MHz radial runs around the entire perimeter and has a few feet of overlap at its very end; it will also be seen that the 7 MHz radial runs alongside the 3.5 MHz radial. This illustration is purely to demonstrate the principle and it is clear that if the 3.5 MHz radial is taken from the antenna directly to one corner of the plot no overlap would, in fact, be required. If the small plot were covered with concrete there is little else that could be done in the way of improving the ground system, except that if a small hole can be made in the concrete at the base of the antenna, a long ground stake could be driven down as deep into the soil as possible in order to establish a "DC" ground, but extreme caution must be exercised on some older properties since it would appear to be easier to hit water supply pipes or drains than it is to miss them! (Murphy's Law). If the plot consists of soil or grass it is recommended that as large a number as possible of ground spikes should be driven in all over the plot, stout wires being run from these to the antenna's radial(s) and to each other — Fig. 6 shows a suggested layout. Such a layout will provide a reasonably low DC resistance and the effort involved will be more than repaid by enhanced antenna performance. The wires can run an inch or so below the ground, being laid in slots cut open with a spade, and after they have been brazed onto the ground spikes, the spikes can be driven down until their tops are also just below the ground, and in this way we finish up with a completely invisible ground system.

If a vertical for 3.5 or 7 MHz (or both) is mounted off the ground, the provision of a ground system is not quite so easy because although one full sized radial can be installed relatively easily by bending it to fit the necessary route, it will not be so easy to provide a series of ground spikes all tied to the antenna's ground terminal. It is suggested that in this situation, as many full sized radials as possible are run across the roof of the house, along guttering, down drain pipes, etc., and that a stout wire be run from the antenna feed point (i.e. ground connection) directly down to one earth spike and that other spikes are installed and 'tied together' as in Fig. 6.

Regarding the vertical antenna itself for 3.5 and/or 7 MHz, it is likely that full sized quarter-wave devices will not be possible in a restricted site (partly due to the need for guys) and that some form of bent or loaded device will be necessary. If a centre loaded vertical is decided on, the inductances given in Part 1 of this series will be applicable, and by reducing the antenna to 25% of its full size, we will have a device only 16.5 ft. long for 3.5 MHz, this being quite a manageable length even in very restricted locations. By switching inductances in and out of circuit, it is possible to use the same antenna for more than one band, and Fig. 7(a) shows such an antenna for the 3.5 and 7 MHz bands which has been evaluated by the author. Fig. 7(b) shows the detail of how the plastic box containing the coils plus a two-pole change-over relay are fastened to the central area of the antenna, and it will be noted that flying leads from the relay are connected to the upper and lower sections of the antenna — which was constructed from 1 1/4-inch OD, 18 s.w.g. aluminum tubing. Fig. 7(c) shows how the coils and antenna are connected to the relay, and it is suggested that the coil for the band which is likely to be used most often is the one which is in circuit when the relay coil is not energised — this will help to prolong the life of the relay and lead to less heat generation. Having trimmed the coils in order to resonate the antenna on 3.5 and 7 MHz, the box is closed and waterproofed. It will be seen from Fig. 7(b) that the wire carrying DC from the shack to the relay coil is passed down the inside of the lower section of the antenna — this is to ensure that it has as little effect on the radiation of the antenna as possible; running the wire alongside and parallel to the antenna is not recommended.

A vertical antenna of this type will not perform as well as a low, horizontal antenna if local and semi-local contacts are required on 3.5 and 7 MHz, but many contacts were made with it and it is considered that in cases where it is impossible to get a decent length of horizontal wire installed, it is well worth a try.

As was discussed with dipoles, an alternative to inductive loading is to bend the antenna into the available area and this is also possible with vertical antennas, resulting in an 'inverted-L' configuration. Fig. 8 shows a trapped inverted-L, the antenna basically consisting of "one half of a W3DZZ dipole". Length A will be approximately 32 ft., and the trap is a 7 MHz parallel resonant device. Length A is adjusted to resonate the antenna on 7 MHz, and then length B is adjusted to resonate the entire antenna on 3.5 MHz and, as with the W3DZZ trapped dipole, resonances will be found in or near to each of the 14, 21 and 28 MHz bands. The vertical section of the antenna can be as long or as short as circumstances permit and it will be found that the antenna will probably outperform the two band inductively loaded 7/3.5 MHz vertical discussed above for local and semi-local contacts on 3.5 and 7 MHz, since the rather short vertical section of the device means that there will be horizontal sections of the antenna carrying a fairly high current and hence radiating horizontally polarised, high angle energy. Like the W3DZZ, it may be found that SWRs get a little high on one or more of the 14, 21 and 28 MHz bands, and some form of antenna matching unit at the transmitter end of the feeder is probably mandatory for these bands. The antenna need not necessarily be in the exact configuration shown in Fig. 8 and can be bent considerably to fit the available area. It is also possible to employ inductive loading in addition to the bending, but, as with the W3DZZ device, this will probably mean the loss of the 14, 21 and 28 MHz bands and be strictly a 3.5/7 MHz two band antenna. Fig. 9 shows such a device on a typical suburban site and suggests a layout that enables the device to be accommodated.

All of the discussion and examples so far have assumed that there is some ground space available, but there are numerous amateurs living in flats or apartments who literally have only the building in which they live on/in which to attach antennas. Indoor antennas and 'invisible' antennas will be discussed later in this series, but it may be desired to attach some form of antenna to the outside of the building. A vertical antenna lends itself to this situation since it can be attached to a building by brackets and lie against the wall as shown in Fig. 10. This presupposes, of course, that it is possible to reach out of the window in order to attach the antenna carrying a fairly high current and hence radiating horizontally polarised, high angle energy. Like the W3DZZ, it may be found that SWRs get a little high on one or more of the 14, 21 and 28 MHz bands, and some form of antenna matching unit at the transmitter end of the feeder is probably mandatory for these bands. The antenna need not necessarily be in the exact configuration shown in Fig. 8 and can be bent considerably to fit the available area. It is also possible to employ inductive loading in addition to the bending, but, as with the W3DZZ device, this will probably mean the loss of the 14, 21 and 28 MHz bands and be strictly a 3.5/7 MHz two band antenna. Fig. 9 shows such a device on a typical suburban site and suggests a layout that enables the device to be accommodated.

![Fig. 9 Loaded trapped inverted L bent into a suburban site](image-url)
efficient device for 14, 21 or 28 MHz without encroaching on other occupant's territory. Radials for such a system will pose difficulties and it is suggested that a single quarter-wave of wire be simply suspended from the base of the antenna — this can be wound up and loosely tied to the antenna when the device is not in use. Such antenna siting is very much of a compromise situation and it can be found that in wet weather its performance may suffer badly since bricks can absorb very large quantities of water, and the whole wall against which the device is mounted will tend to act as a reflector, decreasing the antenna's feed impedance by an alarming amount. Similar effects can be caused by internal wiring or plumbing in the building which can be paralleled to, and in close proximity to, the vertical antenna; this can also lead to large amounts of RF getting into the building's wiring — with predictable results!

It is suggested that the flat dweller seeks permission to install his antenna on the roof of the block — it is surprising what can be achieved by asking, so don't automatically assume that permission will be refused. The author knows of one such case where the amateur concerned approached the council who owned the block, asked for permission to install antennas on the roof and at the time undertook to take out adequate insurance cover in case of damage or injury. Permission was granted, the only proviso being that the borough engineer's department was required to inspect the installation in order to satisfy the council that the system was secure and posed no threat to anyone's safety. The amateur now has a 5-band trapped vertical on the roof, with radials for each band running across the roof, and the coaxial feeder running down the wall past three flats to his own which is located on the fourth floor from the top. Clips to fasten the coax to the wall were fitted by cooperation from the other flats dwellers who allowed their windows to be used for access for the very few minutes required to fit the clips.

The only warning to be given to any amateur who has received help in this way is not to repay the kindness by causing unnecessary interference to televisions or video recorders! In the case just quoted, severe interference occurs to one video installation when the 14 MHz band is used, so the amateur concerned does not use 14 MHz at times when the owner of this equipment is likely to be using it — he considers this to be a very small price to pay for what is a superb antenna installation!

"G9BF CALLING"

SORRY no recent news from Britain's best gnarled up station, fans, but G9BF was forced to a-/A location for a year by the rotten D.H.S.S. Some rubbish about not paying out any more dole money and benefits as not enough stamps on card due to long stay in VK. So had to take job to earn bread. The-/A digs useless for serious AR but before QSY did press on with 20m. E-M-E idea.

As reported in Nov. 83 S.W.M., bespoke PL-172 Tx worked FB with dipole antenna but rhombic essential for more gain and big ERP for Moonbounce. Buttonholed local Scout troop leader in pub and he agreed FB idea to use his lot to put up antenna, but what would be in it for them? I said, "What about bob-a-job then?" and he says, "You'll be lucky, mate. It'll be a quid a throw; inflation you see." After prolonged haggling compromised with G9BF offering to rewire their hut and fix old valve-type record player. This very good deal as all stuff in stock!

Local club owed me a favour so borrowed a few Field Day poles and guys to supplement own ones; not enough trees in the field in the right place. Marked out spots for poles in field with old motor tyres. Next weekend, posse of Cubs and Brownies descended on QTH in a couple of minibuses with two Scouts and a couple of YL Guides. Explained task. Utter chaos ensued, Brownies being right St. Trinians' types. Terrorised innocent little Cubs, chasing them all over the field. Caught some tying the poor things to trees with guy ropes.

Antenna poles and wire eventually erected by OICs and G9BF. Bit of a bodge-up but it pointed more-or-less at the universal window. Realised Cs and Bs nowhere to be seen. Found them in one of the sheds swigging G9BF's special home-brew ale. Head Brownie called Samantha, and a right little horror, said the ginger beer was the best they'd tasted. Threw them some stale sausage rolls and bags of crisps before they piled into their minibuses and departed singing bawdy songs. Really, the youth of today....

Reckoned rhombic legs about 800 feet long so should be bags of gain. Ran open wire feeder to huge ATU made by Dad from bits and bobs, and then bought for a song in Lisle Street just after WW2. Used old valve GDO to tune up system then bunged it into the old faithful R-1155 Rx. Terrific sigs. from W and VE, all end-stop with 5-meter hard over. Fired up Tx and put out CQ call on the key for a couple of minutes. Bedlam! Great pile-up like I was a VR6. Made a few QSOs with VE4, W5, etc. all reporting "LOUDEST EVER SIG FROM EUROPE OM," and complaints about bent S-meter needles and de-sensed Rx's.

Next problem to find out when Moon would be on end of rhombic. Enlisted aid of clever-Dick spotty youth in village with old ZX-81 and Moontrack program who came up with dates and times. Trouble was, these were when band was wide open so weak E-M-E sigs would be swamped. Decided test would have to wait till band dead during the small hours but before this, the enforced QSY to the-/A QTH came. Now G9BF QRV again, 20m. open round the clock, so will have to wait. Have had FB QSOs with Ivan the Terrible, UV5AC, and am working on him to put up rhombic for proper E-M-E tests when condx. right.

Just had visit from some twit from local council about G9BF vertical antenna; says it needs planning permission 'cos more than 4m. high or something. Told him to naff off as don't need planning permission to grow big trees so why all the hassle over thin tube? Said I'd grow ivy up it if he didn't like the look of it. Nothing but aggro these days. 73 es CUAGN SN OMs de G9BF.
CLUBS ROUNDUP

By "Club Secretary"

To state the obvious, it is absolutely vital that we should have a name and address, plus if possible a telephone number for the Secretaries Panel. That panel is compiled from a data file of names and addresses which is our reference whenever someone writes in and asks about a local club. So — if you want new members, keep the entry on your club up to date!

On phone numbers, it is important to be sure that the telephone number is given in the recommended form of Exchange Name (STD Code) Number.

The Mail

Abergavenny & Nevill Hall are first in the pile; find them on Thursdays at 7.30 p.m. at Pen-y-Fal Hospital, Abergavenny, in the room above Male Ward 2.

Acton, Brentford & Chiswick have their date on July 16, for a discussion on antennas; even at Chiswick Town Hall, High Road, Chiswick, London W4.

New One

To us, at least. This one is called Alyn and Deeside and is to be found at Shotton Social Club, Shotton Lane, Shotton, Deeside, Clwyd, the starting time being at 8 p.m. July 8 is a D/F Hunt and July 22 is a talk on contest arrangements, to be followed by a chat by G3VQT on the uses of computers in amateur radio. To fill up the intervening Monday evenings they have in formals.

Now to Antrim; for all the details on this one we must refer you to the Hon. Sec. — see Panel for his details.

Still in GI, and this time Bangor where the venue is the Royal Hotel in Bangor, on the first Friday of each month.

Basingstoke make special mention of their RAE class, on which full details can be obtained from the Hon. Sec; and he will no doubt have the details on all the club’s activities, plus the when —where of their venue.

The Bishops Stortford crew has its main meeting on the third Monday in the month at the British Legion Club in Windhill — this is the road running from the town centre traffic lights to Much Hadham and Ware. Informals on the first Thursday in the month at the “Nag’s Head” on the A120 Dunmow Road in the saloon bar.

The first and third meetings each month at Bolton are formals with a speaker or video, or whatever, the others being informals. Find this group any Wednesday evening at the Horwich Leisure Centre.

B.A.R.T.G. looks after the interests of all the folk who have an interest in RTTY, packet radio, AMTOR and similar modes of transmission, whether mechanical or electronic. Details from the Hon. Sec. — see Panel.

The Braintree arrangements seem to have changed since last we heard; July 3 is the only meeting in the month, for a talk by G4PAY on Egypt. The Hq. is now at St. Peter’s Church Hall, St. Peter’s Road, off Bocking End, Braintree, starting at 8 p.m.

Change of Date

The letter from Brighton indicates that although they continue to foregather at the Seven Furlong Bar on Brighton Racecourse, they now do so on the first and third Wednesday. More details on ‘what gives’ from the Hon. Sec. — see Panel.

Bristol City RSGB have their place at the Queens Building, Bristol University, where on July 29 they will have the pleasure of listening to Ron Broadbent, G3AAJ, spelling out in detail about AMSAT and Oscar-10.

Although they get together every Tuesday evening, Bury mention July 2 as a surplus equipment sale; normally the ‘main’ meeting is on the second one of the month. The place is Mosses Community Centre, Cecil Street, Bury.

Next Cambridgeshire Repeater Group; they look after the repeaters in the area, and also have some interesting meetings. For details contact the Hon. Sec. — see Panel.

Cheltenham comes next, and they are at Charlton Kings Library, in the Stanton Room, on July 19; and in addition they are to man a stand at Bournside School Fete on July 13. More details from the Hon. Sec. — see Panel.

Turning to Cheshunt we find they have an RAE course set up once again for East Herts College, Turnford. In addition there will be a Morse class. Find out by going to a meeting — every Wednesday evening at Church Room, Church Lane, Wormley, Herts., except on 24th when they will have their /P evening on Baas Hill Common, Broxbourne.

The Chester chaps meet at Chester Rugby Union Football Club, Hare Lane, Vicars Cross, Chester, each Tuesday; the July programme is complicated by the GB4CSB operation, to celebrate 75 years of Scouting in Chester — July 5th to 7th, from Eaton Hall, Chester, the home of His Grace the Duke of Westminster. There will of course be a special QSL. All the details from the Hon. Sec. — see Panel for his statistics.

Special Event stations bulk largely in the Chichester thinking too; July 9-13 and 16-20 will be the dates for their GB2CH1 from the Chichester 910 festivities, at Guildhall, Priory Park. July 14 is the Sussex Rally, of course at Brighton, so July 2’s meeting in the Long Room will be devoted to the details; July 18 is a relaxing evening in the Green Room, and these are at Fernleigh Centre, 40 North Street, Chichester.

Deadlines for “Clubs” for the next three months—

August issue — June 28th
September issue — July 26th
October issue — August 30th
November issue — September 27th

Please be sure to note these dates!

Down to Cornwall, and Cornish where they gather on the first Thursday of each month, at the Church Hall, Treleigh, on the Old Redruth By-Pass.

At Coventry they are at Baden Powell House, 121 St. Nicholas Street, Radford, Coventry, every Friday evening. July 5 is a treasure hunt followed by a barbecue, and all the remaining sessions are ‘open’.

On to Crawley where the main thing this time in the newsletter is the tale of G4ZPP’s cheap QSL cards — quite hilarious. Try the fourth Wednesday at the United Reformed Church Hall, Ifield, or contact the Hon. Sec. — see Panel.

Turning now to Crystal Palace on July 20, you have a good marker to help you find the place — the IBA mast! Hq. is in the All Saints Parish Rooms, Upper Norwood, at the junction of Beulah Hill and Church Road, and opposite the mast. The subject will be op. amps, and the speakers G3OOU and G8OTG.

As far as Dartford Heath D/F club’s events are concerned we are somewhat confused. The dates are July 2 for an evening hunt, July 28 for the Sunday hunt, and July 23rd for the pre-hunt meeting at the “Horse and Groom.” But where are the hunts?

We must head north now to Denby Dale and the famous Pie — they get together in the Pie Hall. Details from the Hon. Sec. at the address in the Panel.
Now to Derby where we still get a feeling of surprise at not seeing G2CVV's name on their letter. Find them on any Wednesday evening at 119 Green Lane, Derby, where they have the whole Top Floor.

Every Friday evening the locals at Devizes head for the Devizes Football Club Social Club; the first in each month is formal with a speaker, the third is usually some sort of joint social event with other clubs, and the rest are purely social affairs.

At Droitwich we have it that the club meets on the second and fourth Monday in each month at the Scout Hq. Union Lane, Droitwich, next to the railway station.

The East Lanes business is conducted at the Conservative Club, Cliff Street, Rishton, on the first Tuesday and last Tuesday — the former is a formal and the latter a matter session.

Now Edgware and here the venue is 145 Orange Hill Road, Burnt Oak, Edgware, on second and fourth Thursday evenings. On July 11 they have a talk on first aid for electric shock, and July 25 is an informal.

For all the details on the Exeter activity at the Community Centre, St. Davids Hill, we must refer you to the Hon. Sec. — see Panel for the needful.

Fareham is synonymous with Portchester Community Centre, Westlands Grove. July 3 is a talk on AMTOR, and on the 10th they are on-the-air. On July 17 there is a talk on VHF/UHF Linears, and on 25th the topic will be two-metre rhombic aerials.

July 10 is the date for G5RV to give his talk on HF Aerials to Farnborough at 7.30 p.m. in the Railway Enthusiasts Club, Access Road, off Hawley Lane. The other date is July 24 when the subject will be RTTY by G8WMW.

Membership of Fylde includes membership of the Kite Club at Blackpool Airport, where they have their meetings. The actual club meetings are on first and third Tuesday evenings; the former is a formal and the latter a natter session.

Another New One!

This one is known as Hilderstone; they are to be found at Hilderstone Adult Education Centre, St. Peter's, Broadstairs, Kent. where they have a booking every Friday evening. More details from the Hon. Sec. — see Panel.

Next Holyhead where they foregather on alternate Sunday evenings at 7.30, the venue being the "Forsters Arms", Kingsland Road, Holyhead, Anglesey. More details from the Hon. Sec. (see Panel) or, we understand, from the local papers which carry details a few days before each event.
 Names and Addresses of Club Secretaries reporting in this issue:

for reasons of space, see last month’s issue for those names not appearing here.

ALYN & DEESIDE: G. C. Cook, GW4RKK, 20 Eccleston Road, Kinnerton, Chester CH4 9DY.

BOLTON: P. Ingham, G6HDD, 49 Highfield Road, Farnworth, Bolton BL4 0AH. (Farnworth (0204) 79158).

BRAINTREE: D. Willcoombe, 355 Cressing Road, Braintree, Essex.


BRISTOL CITY RSGB: C. R. Hollister, G4SQQ, 34 Battersea Way, Henbury, Bristol BS10 7SU. (0722 506651).


CHELTENHAM: T. Kirby, G4XVE, 29 Tivoli Road, Cheltenham, Glos. GL50 2TZ. (0242 26723).

FAREHAM: B. Davey, G4ITG, 31 Somerwell Drive, Fareham, Hants PO16 7QJ. (Fareham 234904).

HILDERSTON: Ms. A. Penfold, GOBEX, Staple Farmhouse, Staple, Canterbury, Kent CT3 1JX. (0304 812723).

HORNSEA: N. A. Bedford, G4HNP, 39 Hamilton Road, Bridlington, Yorkshire YO15 3HP.

KIDDERMINSTER: A. F. Hartland, G5WOX, 22 Granville Crescent, Offmore Farm, Kidderminster. (Kidderminster 61584).

NEWBURY: M. J. Fereday, G3VOW, Spindleswood, Slattery Lane, Newbury, Berks. RG16 9HQ.

NORTH WAKEFIELD: S. Thompson, G4RCH, 2 Alden Close, Morley, Leeds. LS27 0SG.

PRESTON: G. Farnshaw, G3ZNG, 12 Withy Parade, Fulwood, Preston.

READING: C. Young, G4CC, 18 Wincroft Road, Caversham, Reading, Berks. RG4 7HH.

SKELMERSDALE: C. Crowhurst, G4ZPY, 41 Mill Dam Lane, Burscough, Ormskirk, Lancs. L40 7FG. (0704 894299).

SOUTH ESSEX: A. Smith, G4FMK, 8 The Parkway, Canvey Island, Essex, SS8 0AA. (0268 663865).

WEST KENT: Mrs. J. Green, G4UPI, 13 Culverden Down, Tunbridge Wells, Kent TN14 9SB. (Tunbridge Wells 28275).

WILLENHALL: J. Phillips, G4UPP, 16 Burham Avenue, Oxley, Wolverhampton WV10 6DX. (0902 782076).

WIRRAL: C. Cawthorne, G4KPY, 40 Westbourne Road, West Kirby, Wirral L48 4DH.

WORTHING: R. Jones, G4SWH, P.Q. Box 599, Worthing, Sussex BN14 7TT. (Worthing 208752).

the month at Newbury Technical College. On July 8 they have an illustrated talk “From Berkshire to Box 88” and on August 13 they move to the “Spotted Dog” for an informal gathering.

Moved

This means North Wakefield which now has a place at the “White Horse” pub on Thorpe Lane, off Bradford Road, East Aylesbury, which is about a half-mile from their old place. Look for them on any Thursday evening.

Now to Preston and hence the Lonsdale Club, Fulwood. On July 4 they have a sort-out for VHF NFD, while on July 18 and August 1 they have informal natters while the majority are on holiday.

R.A.I.B.C. is the one to get any invalid or blind amateur or SWL to join — it is their club. Of course, it follows that they need supporters and representatives from the fitter among us. Details from the retiring Hon. Sec. — and will someone QSP the name and address of the new Hon. Sec. which doesn’t seem to have reached us yet?

R.A.O.T.A. is the Old-Timers club. The qualification is 25 years in the hobby; details from the Hon. Sec. at the address in the Panel.

‘The White Horse’, Emmer Green, Reading is the home of the Reading group. On July 2 they have an extra meeting to finalise the VHF NFD affairs, and on July 9 they have a talk on receiver front-end parameters and their measurement. On July 23 they make final arrangements for the special station they are putting on at the Shire Hall on July 27/28.

July 16 is a night of RSGB slides for Reigate at the Constituional and Conservative Club in Warwick Road, Redhill.

If you have a Sinclair computer, you should be a member of the R.A.O.T.A. is the Old-Timers club. The qualification is 25 years in the hobby; details from the Hon. Sec. at the address in the Panel.

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If you have a Sinclair computer, you should be a member of the Sinclair Amateur Radio User Group (SARUG to us!). Details of the club, and its excellent newsletter and offers to members, from the Hon. Sec. — see Panel.

At Scarborough the right-thinking people head for the Cricket Club — details on the July programme as far as amateur radio is concerned from the Hon. Sec. — see Panel. (Doubtless he will also have the cricket fixture list!).

Beacon Park Golf Club is the home of the Skelmersdale group; the members are to be found there every Thursday evening. We understand that talks and natter nights are alternated in the programme.

At South Bristol we can find the locals at the Whitchurch Folk House, East Dundry Road, Whitchurch, Bristol, each week. July 3 is a talk on QRP construction, and July 10 is a “Work a G1 on CW Night” with Sue, G4XED. July 17 is a DX-TV receiver activity evening, and on 24th they have a G1s on HF night, under GOALG. July 31 is then left, for a talk on amateur television.

Southdown are still having their main meeting on the first Monday of each month at Chaseley Home for Disabled Ex-Servicemen, Southciffe, Eastbourne; but nowadays they also are to be found on Tuesdays and Fridays at the Clubrooms, Wealden District Council Offices, Vicarage Field, Hailsham, every week. S.E. Kent (YMCA) is the formal name for the Dover area club, as the base is at the Dover YMCA, Godwynhurst, Leybourne Road, Dover. Meetings appear to be every Wednesday.

The South Essex group meet at the Paddocks Community Centre, Canvey Island, every Wednesday evening. All the latest details from the Hon. Sec. — see Panel. On a different tack they have sent us the first notification for their mobile rally on March 16, 1986, at the same spot.

Fridays and Mondays are the evenings when the South Manchester gang get together, at Sale Moor Community Centre, Norris Road, Sale. More details from the Hon. Sec.

Stourbridge meetings are normally on the first and third Monday of each month, at the Robin Woods Centre, School Street, off Enville Street, Stourbridge. Again, the latest details from the Hon. Sec. at the address in the Panel.

The group now known at Stroud used to be called ‘South Cotswold.’ They are now to be found at Nelson School, Stratford Lodge, Stroud, on July 10 and 24; at the time of their letter no details from the Hon. Sec. — see Panel. On a different tack they have sent us the first notification for their mobile rally on March 16, 1986, at the same spot.

On we go to Surrey where on July 1 they have a talk on amateur television by G8MNY; in fact they have first and third Mondays booked on the first floor mess deck at TS Terra Nova, 34 The Waldrons, South Croydon.

Sutton & Cheam are to be found at Downs Lawn Tennis Club, Holland Avenue, Cheam; On July 1 they have a natter evening in the Downs club bar, and on July 19 they have G2MI talking about the early days of radio.

The Thornton Cleveleys letterhead shows a nice picture of an old windmill, but no other indication of their current Hq. July 1’s meeting is deleted, in favour of a visit on July 3 to the local Police Hq, at Hutton. July 8 is an NFD discussion, and on 10th they visit the Red Rose Radio Station, Preston. July 15 is informal with the
This time it is Willenhall and they have moved to the “Cross Keys” pub, Prouds Lane, Willenhall, where they are to be found every Wednesday evening.

We have a gentle rhubarb from Wirral about a dilatory Club Secretary. But the main thing is that we eventually got the news; they are at Haswell Church Hall, on July 3 for a surplus sale, and 17th for a problem night.

There is another club on the Wirral and this one we call Wirral (West Kirby) even though it seems nowadays to live at Irby Cricket Club; here they meet for the formals on the second and fourth Wednesday of each month, with the intervening weeks occupied by informal in different pubs around the area.

Wolverhampton’s Hq. is at Wolverhampton Electricity Sports and Social Club, Chapel Ash, every Tuesday. July 2 is a visit to Wolverhampton Central Telephone Exchange; July 9 a discussion on CB, chaired by G8YFA. July 16 is a demonstration of RTTY and AMTOR by G1DIL, and on 23rd they have the club on the air. July 30 is a committee meeting to which as usual all members are invited to attend.

Both informals and club nights nowadays are at the Oddfellows Hall, New Street, for Worcester; July 1 for Droitwich Rally planning and July 15 for the informal.

We have a long listing from Workshop and from it we see they have meetings on the 9th July for a talk on Converting BC sets to Top Band, and 23rd for a slide show. In between, they have trips to Scarborough Rally and a barbecue in Culumber Park. However, for the club Hq. address we have to refer you to the Hon. Sec. — see Panel.

No mistaking the Worthing details; look for them every Wednesday evening at Lancing Parish Hall, South Street, Lancing, West Sussex.

Down to Yeovil now, and this means the Recreation Centre, Chilton Grove, Yeovil on Thursdays. July 11 is a visit by the RSGB RR, and on 18th G3MYM talks about ‘take-off angles at sunspot minimum’. July 25 is a natter night, and on August 1 G3MYM talks about SSB.

At York their GB3YCS station was as ever preceded by the stone-throwing contest ritual for aerials! Find these cheerful optimists at the United Services Club, 61 Micklegate, York, on any Friday evening.

The bottom of the biggest clubs' listing for quite a while at last! Deadlines for the arrival of your letters are in the 'box', addressed as always to your “Club Secretary”, SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts. AL6 9EQ. Keep 'em rolling in — we love reading all about the various things you all get up to. Cheerio for now!

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Finale

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Special Events Stations

From Wivenhoe, near Colchester, Eddystone Radio Ltd. will be activating their company callsign, G6SL, on July 7, using one of the firm's new Orion 5000 transceivers, with operation on 3.655 or 3.720 MHz from 10.00 till 11.00 GMT. A special QSL card will be available to all amateurs who make contact with the Eddystone operator.

Pembrokeshire RAYNET Group will operate GB2DFB on 20-21 July from Haverfordwest (Withybush) Airfield, during the Dyfed Fire Engine Rally. Operation will be on HF, and contacts with other Fire and emergency services will be particularly welcome. More details from GW4ODN, on 06462-3991.
All 9 hf Bands from a 2m multimode!

Transversers once had a reputation for being a second best approach to getting on to any band. With careful system design this need not be so. People have favorably compared the receive performance of the TVHF 230c when coupled to a modern vhf transceiver to that of prestige hf transceivers costing well into four figures. Even with a budget 2m rig, the performance will be better in most respects than the sort of hf transceivers available second-hand at the same price! On transmit, the signal generated is very clean, and the 10W pep output is enough to work the world with a decent antenna. Of course, if you want to be a really big signal, then this power is just right for driving a variety of power amplifiers! (If you have a valve vhf amplifier, then an hf linear becomes a very simple thing to build - a pair of 4CX360's would burn as big a hole in 2om as 144MHz!!)

Chris Bartram G4DGU
Dept. S.W., Bradworthy, Holsworthy, Devon EX22 7TU (0409 24 543

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**RADIO AMATEUR PREFIX-COUNTRY-ZONE LIST**
published by GEOFF WATTS
Editor of "DX News-Sheet" 1962-62

The List you have always needed, the list that gives you everything, and all on one line! For each country:
- a. Its DXCC "status"
- b. the "CO" Zone No.
- c. the special prefixes
- d. the ITU call sign block allocation
- e. the continent
- f. the "CO" Zone No.
- g. the ITU call sign block allocation
- h. the normal prefix
- i. the country's ITU allocation
- j. its DXCC "status"
- k. the ITU callsign block allocation
- l. the continent
- m. the "CO" Zone No.
- n. the ITU call sign block allocation
- o. the continent
- p. the "CO" Zone No.
- q. the ITU call sign block allocation
- r. the continent
- s. the "CO" Zone No.
- t. the ITU call sign block allocation
- u. the continent
- v. the "CO" Zone No.
- w. the ITU call sign block allocation
- x. the continent
- y. the "CO" Zone No.
- z. the ITU call sign block allocation
- {a. its DXCC "status"
- b. the "CO" Zone No.
- c. the special prefixes
- d. the ITU call sign block allocation
- e. the continent
- f. the "CO" Zone No.
- g. the ITU call sign block allocation
- h. the normal prefix
- i. the country's ITU allocation
- j. its DXCC "status"
- k. the ITU callsign block allocation
- l. the continent
- m. the "CO" Zone No.
- n. the ITU call sign block allocation
- o. the continent
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- q. the ITU call sign block allocation
- r. the continent
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- t. the ITU call sign block allocation
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- v. the "CO" Zone No.
- w. the ITU call sign block allocation
- x. the continent
- y. the "CO" Zone No.
- z. the ITU call sign block allocation
- {...}

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**THE UNIDEN CR-2021 PORTABLE COMMUNICATION RECEIVER**
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