PRACTICAL WIRELESS

PW

THE RADIO MAGAZINE

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A SEMI BREAK-IN MORSE PROJECT

144MHz ANTENNA

Reviews

AEA ISO-LOOP HF ANTENNA

DEWSBURY SUPA-TUTA

Plus

LEICESTER SHOW PULL OUT PLAN & GUIDE

Cover subject

ONE MAN AND HIS WAGON - Radio Personality G4YXV

NOVEMBER 1990
£1.60

ISSN 0141-0857

NEWSDESK '90 · RADIO DIARY · DISCOUNT VOUCHER AND LOTS MORE INSIDE THIS ISSUE

THE NEW

FT-1000 FOR DYNAMIC DX

YAESU

The FT-1000 is a new top of the range all mode h.f. transceiver that is the result of more than 25,000 hours of intensive research by Yaesu's top design engineers. They have adopted a completely new approach to the application of digital and RF technology. The extensive use of surface mounted components has allowed *six* microprocessors and *five* Direct Digital Synthesisers to be integrated with a simple to use operator interface to give a highly reliable full featured transceiver that has been optimised for serious h.f. applications. Please write or call SMC or your local authorised Yaesu dealer for the full specifications of this dynamic new transceiver and discover how you can open up the bands.

YAESU

UK Sole Distributor

South Midlands Communications Ltd

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Tel: (0703) 255111

Prices and specifications are subject to change without notice

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ICOM

NEW MODELS

Designed for the serious operator on the 144,430 and 1200MHz bands, Icom's IC-970E has up-to-date technology for DX, digital and satellite communications.

The IC-970E is supplied as an all-mode dual-bander for 144 and 430MHz bands. Optional units expand its capabilities to 1200MHz or wideband receiving from 50-905MHz.

Communication via satellites has never been easier, the IC-970E automatically tracks uplink and downlink frequencies as the tuning control is rotated, there are also ten specific memory channels for satellite frequencies.

The dual-band watch allows you to receive both MAIN and SUB band audio simultaneously, multiple scanning systems on the MAIN and SUB bands plus 99 memories, an easy to read central display and Icom's DDS system makes this one of the most comprehensive multi-band transceivers available.

For more details on the IC-970E and any other Icom radio contact your local authorised dealer or call Icom.

Icom (UK) Ltd.

Dept. PW, Sea Street, Herne Bay, Kent CT6 8LD. Tel: 0227 363859. 24 Hour. As from 1st September our showroom opening times will be Mon–Fri 09.00–13.00 and 14.00–17.30.

Count on us!

S AT LEICESTER

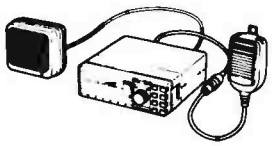
The IC-901 is a 2M/70cm. Dual-Band FM modular mobile featuring the versatility of upgrading to a multiband system with the addition of optional band units.

Band stacking is available for 28,50 and 1200MHz and 144MHz SSB/CW operation. By adding the wideband receive unit other interesting stations can be heard.

When the front panel and main body are combined the IC-901 operates as Dual-Band transceiver. By using the fibre optic cable the main body and optional band units can be easily boot mounted for complete security, leaving only the remote head to control the transceiver;s functions on view. This system is ideal for the security conscious amateur and motorist where dash-board space is limited.

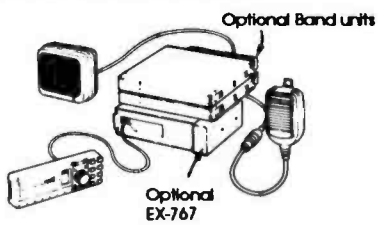
MULTIPLE INSTALLATION CONFIGURATIONS

- **Basic 1-body style**



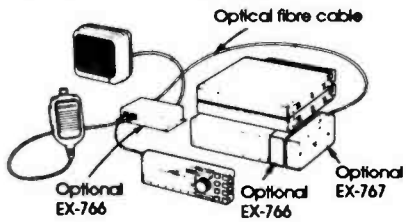
- **Basic separate style**

- **With optional band units**



Optional band units allow you 28, 50 and 1200 MHz FM operation and 144 MHz SSB and CW operation.

- **Separate installation using an optical fibre cable**



By connecting optional interface units and an optical fiber cable, all band units can be installed in the boot of your vehicle

Helpline: Telephone us free of charge on **0800 521145** Mon-Fri 0900-13.00 and 14.00-17.30. This service is strictly for obtaining information about or ordering Icom equipment. We regret this cannot be used by dealers or for repair enquiries and parts orders, thank you.
Datapost: Despatch on same day whenever possible.
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SMC South Midlands Co

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WHY NOT COME AND SEE US ON STAND

S8 AT LEICESTER FOR SOME SHOW SPECIALS

Either the amazing FT747GX

Light in weight and low in price, the FT747GX, is a high performance HF rig with a great receiver and full power transmitter. With a refreshingly simple control panel the FT747GX is ideal for hopping around the bands chasing those exotic DX stations. Full 100W PEP and factory installed filters for CW & AM give improved performance on today's crowded bands.
All this housed in a high impact metallised plastic case, must surely be too good to miss especially at such an attractive price.

FT747GX

NOW ONLY **£549** inc VAT

OTHER OPTIONS INCLUDE

MMB42A MOBILE BRACKET ..	£65.00
D3000568 FM UNIT	£39.99
D3000561 TCXO UNIT	£46.00
FP757HD P.S.U.	£258.75
FC700 A.T.U.	£149.00

WITH CW & AM FILTERS FITTED AS STANDARD

or the incredible FT736R

With Yaesu's new FT-736R VHF/UHF base station, you can discover some of the best DX happening in ham radio. Via moonbounce, Tropo. Aurora. Meteor scatter. Or satellites. You see, the FT-736R is the most complete, feature-packed rig ever designed for the serious VHF/UHF operator. For starters, the FT-736R comes factory-equipped for SSB, CW and FM operation on 2 meters and 70cm, with two additional slots for optional 50MHz or 1.2GHz modules. Crossband full duplex capability is built into every FT-736R for satellite work. And the satellite tracking function (normal and reverse modes) keeps you on target through a transponder. The FT-736R delivers 25 watts RF output on 2 meters and 70cm and 10 watts on 6 meters and 1.2GHz. Store frequency, mode and repeater shift in each of the 100 memories. For serious VHF/UHF work, use the RF speech processor, IF shift, IF notch filter, *CW Narrow Optional and FM wide/narrow IF filters, VOX, Noise blanker, three-position AGC selection, Preamp switch for activating your tower-mount preamplifier. Even an offset display for measuring observed Doppler shift on DX links. And to custom design your FT-376R station, choose from these popular optional accessories: lambic keyer module, FTS-8 CTCSS encode/decode unit, FVS-1 moice synthesizer, FMP-1 AQS digital message display unit, 1.2GHz ATV module. MD-1B8 desk microphone, E-736 DC cable, and CAT (Computer Aided Transceiver) system software.

*CW narrow optional

for only £1199 inc VAT

Can be easily modified for 9600 and 1200 baud PSK packet operation.

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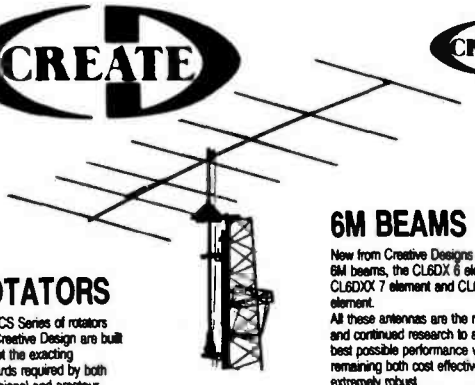


6M BEAMS

New from Creative Designs are a range of 6M beams, the CL6DX 6 element, CL6DXX 7 element and CL6DXZ 8 element.
All these antennas are the result of long and continued research to achieve the best possible performance whilst remaining both cost effective and extremely robust.

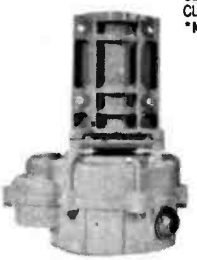
CL6DX 5 ele 13dB* £115.00 P&P £8
CL6DXX 7 ele 14.3dB* £168.99 P&P £14
CL6DXZ 8 ele 14.5dB* £225.00 P&P £14
*Manufacturers figures

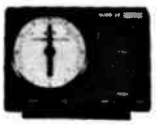
ROTATORS

The RCS Series of rotators from Creative Design are built to meet the exacting standards required by both professional and amateur users. A range of methods is available designed to cater for medium to large shed antennas. All the rotators are manufactured with high quality components allowing continued and reliable operation.

RCS-1 ..... £219.00
RCSA-3 ..... £425.00
RCSB-3 ..... £675.00
CK-46 Rotary bearing £34.95

Carriage on:
Rotators £7.50
CK-46 ..... £3.50





COMET & HOKUSHIN ANTENNAS

New from Hokuskin, an exciting range of high performance antennas, the WX1 has been a best seller for some time now, available are its bigger brothers the WX2 and WX4. Both are multi section 2m/70cm colinears and the mechanical construction the best we have seen yet. On the mobile front a new mini dual band mobile, the HS-727SS, very similar to the Comet CHL21J, and tests with our network analyser confirm its compatibility with our existing range of gutter and mag mounts. Also available a low profile hatchback mount and cable, the SS-B1, two new dual band antennas, the very slim VM-720SKR and the compact HS-727VMS. Both are suitable replacements for the 70N2M. For the HF enthusiasts a compact 10m HB9CV dual driven element antenna that is extremely light and very cleverly constructed.

WX2	WX4	HS-727SS	28HS-2HB
VHF/UHF Base	VHF/UHF Base	VHF/UHF Mobile	10m 2 ele HB9CV
144/432MHz	144/432MHz	144/432 mini	Dual driven element
6/8dB gain	7.8/10.8dB gain	1/4 5/8 wave	6dBi gain
200W max	200W max	100W max	500W PEP max
£75.00	£99.00	£16.95	£65.00

MOBILE ANTENNAS

2QW	2m 1/2 wave	£4.95
2NE	2m 5/8 wave lolding	£13.25
78B	2m 7/8 wave	£15.00
78F	2m 7/8 wave lolding	£21.50
88F	2m 8/8 wave	£24.10
258	70cm 2 x 5/8	£29.37
358	70cm 3 x 5/8	£33.73
268E	70cm 2 section colinear	£32.80

DUAL BAND MOBILE

CHL21J	Mini dual band mobile	£14.95
CHL23J	Small dual band mobile	£16.90
CA2X4KG	2m 2 x 5/8 70cm 4 x 5/8	£39.95
CA2X4MB	2m 4.5dB 70cm 7.4dB	£37.75
HS-727SS	Dual band mini antenna NEW	£16.95
HS-727VMS	2m 1/2 70cm 2 x 5/8 NEW	£25.95
VM-720SKR	2m 1/2 70cm 2 x 5/8 NEW	£24.95

DUAL BAND BASE ANTENNAS

WX1	2m/70cm colinear	£54.99
WX2	2m/70cm colinear	£75.00
WX4	2m/70cm colinear, high gain	£99.00
CA2X4WX	2m/70cm colinear	£79.00
CA2X4MAX	2m/70cm colinear, high gain	£99.95
CF416MN	Duplexer 1.3-500/400-540MHz	£25.50
HS790DN	Duplexer Mess 1.6-150/410-460MHz	£25.50

ANTENNA MOUNTS

GCCA	Gutter mount and cable	£14.25
HDTMCA	S/S trunk mount and cable	£19.50
SOMM	Mag mount and cable	£12.75
TBR	S/S hatch back mount NEW	£11.25
RS17	Mini hatch back mount NEW	£12.50
RS16	Mini gutter mount NEW	£12.50
SS-B1	Mini back mount & cable NEW	£26.50
CK-3LX	Cable assembly for RS16, 17, TBR	£19.95

CARRIAGE BASE ANTENNA £7.50, MOBILE ANTENNAS £4.00, CABLES AND MOUNTS £3.50

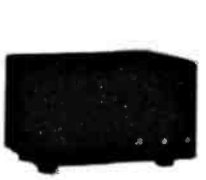
ROTATORS

Superb engineering standards combined with pin sharp setting accuracy means new technology from Yaesu create Kenpro Hygain.

ROTATORS		
AR200XL	OFFSET TYPE 3 WIRE	£49.50
G-250	BELL TYPE TWIST/SWITCH CONTROL	£78.00
G-400	BELL TYPE METER CONTROLLER	£139.00
G-400RC	BELL TYPE ROUND CONTROLLER	£169.00
G-600RC	BELL TYPE ROUND CONTROLLER	£219.00
T2X	BELL TYPE METER CONTROLLER	£499.00
G-800SDX	BELL TYPE 450 DEG VAR. SPD	£325.00
G-1000SDX	BELL TYPE 450 DEG VAR. SPEED	£368.00
G-2000RC	BELL TYPE ROUND CONTROLLER	£445.00
G-500	ELEVATION METER CONTROLLER	£149.95
G-5400B	AZIMUTH/ELEV DUAL CONTROL	£375.00
G-5600B	AZIMUTH/ELEV DUAL CONTROL	£435.00
RC5-3	BELL TYPE PRESET	£275.00
RC5-1	BELL TYPE ROUND CONTROLLER	£219.00
RC5A-3	BELL TYPE VAR. SPEED AND PRESET	£425.00
RC5B-3	BELL TYPE VAR. SPEED AND PRESET	£675.00
ROTATOR HARDWARE		
AR200AB	ALIGNMENT BEARING AR200XL	£17.50
KS505	ROTARY BEARING 1½" MAST	£19.95
GS-065	ROTARY BEARING 2" MAST	£29.95
GC-038	LOWER MAST CLAMP G-400, 600 etc	£16.95
9523	CHANNEL MASTER BEARING	£19.95
CK46	ROTARY BEARING 1.5–2.5 MAST	£34.95
MC1	LOWER MAST CLAMP RC5 SERIES	£25.00
ROTATOR CONTROL CABLE		
RC5W	5 WAY G-400RC, 800, 1000SDX PER MTR	£0.48
RC6W	6 WAY G-250, 400, 600, RC KR500 PER MTR.	£0.66
RC8W	8 WAY HAMIV, T2X 2000RC RC SERIES PER MTR	£0.72

CARRIAGE:
ROTATORS £7.50, ROTATOR HARDWARE £3.50, ROTATOR CABLE £3.50 UP TO OVER 20 MTS, OVER 20 MTS £5.00.

SWR/PWR METERS



YS60

FS710V

FS710V	50-150MHz	15/150W	PEP £107.80
FS300H	1.8-60MHz	20/200/1000W	£53.40
FS210	1.8-150MHz	20/200W	Auto SWR £65.50
FS301M	2-30MHz	20/200W	£42.25
FS301MH	2-30MHz	200/2000W	£42.25
FS711H	2-30MHz	20/200W	Head/Display £43.65
FS711V	50-150MHz	20/200W	Head/Display £43.65
FS711U	430-440MHz	5/20W	Head/Display £43.65
FS711C	26-30MHz	10/100W	Head/Display £24.55
FS500V	50-150MHz	20/200W	£81.95
W720S	130-440MHz	20/200W	Head/Display £52.75
SWR50B	3-5-150MHz		£36.75
FS20DL	3-150MHz	1/10W	£43.65
FS20D	3-150MHz	5/20W	£43.65
SWR3E	3.5-150MHz	20/200/1000W	£28.75
JD110	1.5-150MHz	10/100W	£16.50
T435	144/430MHz	20/200W	£65.00
YMIX	3.5-150MHz	Rel. Power/SWR Twin meter	£31.50
OSCAR-171B	3.5-150MHz	Rel. Power/SWR Twin meter	£26.85
SP425	140-524MHz	5/15/150W	£119.95
YS60	1.6-60MHz	20/200/2000W	£93.15
YS500	140-525MHz	4/20/200W	£81.65

Carriage on all power meters £4.00

MORSE KEYS

MORSE KEYS			p.p.
HK702	STRAIGHT KEY	£42.75	£1.75
HK703	STRAIGHT KEY	£49.69	£1.75
HK704	STRAIGHT KEY	£26.35	£1.75
HK705	STRAIGHT KEY	£26.25	£1.75
HK706	STRAIGHT KEY	£28.95	£1.75
HK707	STRAIGHT KEY	£25.49	£1.75
HK708	STRAIGHT KEY	£26.45	£1.75
HK710	STRAIGHT KEY	£41.75	£1.75
HK711	STRAIGHT KEY KNEE MOUNTING	£41.75	£1.75
BK100	MECHANICAL BUG	£41.45	£2.00
MK701	SINGLE LEVER PADDLE	£38.35	£1.75
MK702	SINGLE LEVER PADDLE	£41.50	£1.75
MK703	SQUEEZE KEY	£37.00	£1.75
MK704	SQUEEZE KEY	£24.99	£1.75
MK705	SQUEEZE KEY	£32.78	£1.75
MK706	SQUEEZE KEY	£35.00	£1.75
HK802	DELUXE BRASS KEY	£99.95	£2.50
HK803	DELUXE BRASS KEY	£89.95	£2.50
HK804	DELUXE BRASS KEY	£95.00	£2.50
MORSE EQUIPMENT			
KP100	SQUEEZE KEYER	£109.25	£2.50
DEWSKEYSTD	STAR MASTER KEYER	£54.69	£2.50
DEWSKEY M	STAR MASTERKEY MEMORY	£94.99	£2.75
D70	MORSE TUTOR	£63.40	£2.50
DATA TERMINAL			
PK232/FAX	MULTIMODE DATA TERMINAL	£289.95	£3.50
PK232/MAIL	MULTIMODE DATA TERMINAL C/W Mail Drop	£319.95	£3.50

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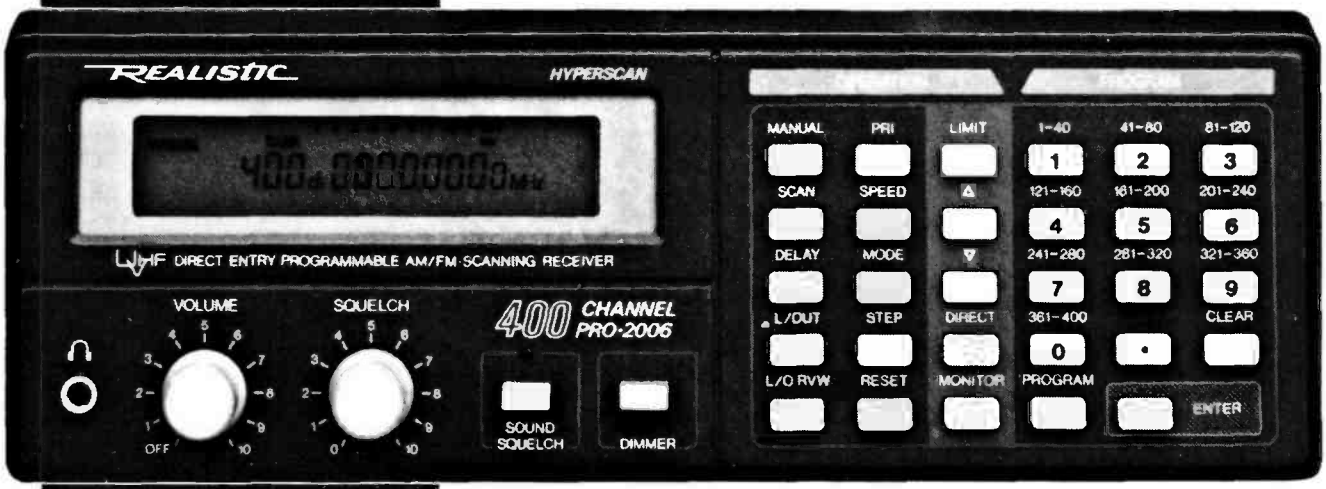
For full addresses see display advert

REALISTIC



PRO SCANNERS

Covers: 25 - 520 MHz And 760 - 1300 MHz

400-Channel With Hyper Scan

£349.95

20-9145

Realistic PRO-2006. Features ten 40-channel memory bands, a 10-channel monitor bank for temporary storage, plus search and favourite channel priority functions. Hyper scan doubles the scanning speed - 13 or 26 channels per second. Backlit LCD display with dimmer. AM, FM-narrow and FM-wide modes. Jacks: tape out, 3.5mm headphone, external speaker, external DC power and BNC aerial input. Memory backup requires 9v battery. Measures: 76 x 222 x 209mm. Mains operation (or 12 VDC cord, extra).

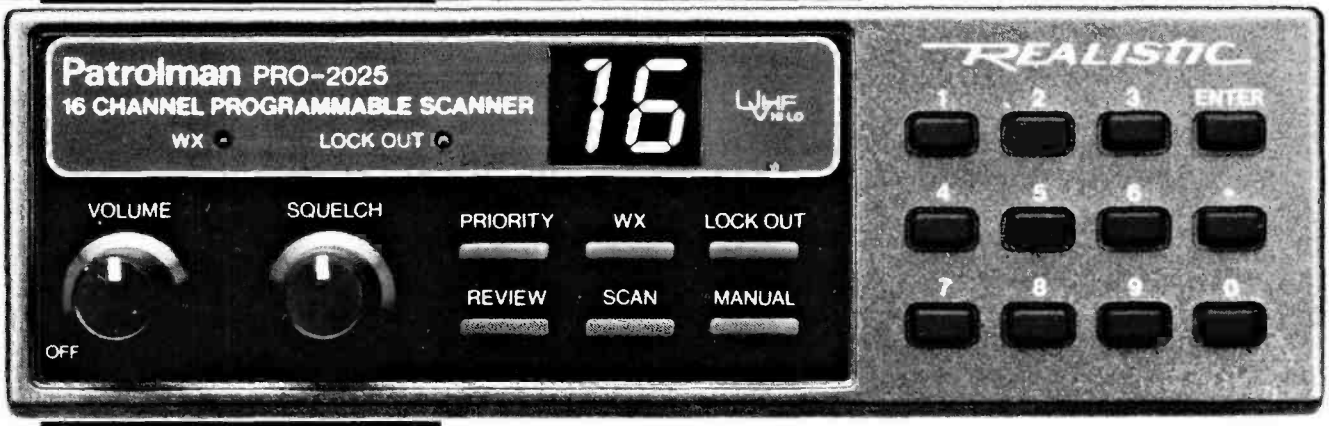
16-Channel Mobile Scanner

£99.95

20-9146

Realistic PRO-2025. This scanner gives you direct access to different frequencies. You can select up to 16 channels to scan and you can change your selection at any time. Features automatic two-second scan delay, memory backup, priority channel and lockout function that lets your scanner skip over specified channels. Squelch and volume controls. Jacks: power, external speaker and aerial. 12 VDC neg. gnd. only. Measures: 45 x 140 x 175mm.

Covers: 66-88, 136-174 MHz And 406-512 MHz



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ICOM

IC-R100

IC-R100 Mobile/Base Receiver now with SSB! WHY SETTLE FOR ANYTHING LESS

For the enthusiast who prefers a more permanent installation the IC-R100 is ideal giving full frequency coverage of 500kHz-1800MHz and AM/FM. FM wide modes of operation. The IC-R100 boasts 100 memory channels to store your favourite stations and has features similar to the little pocket receiver. 48 monthly payments of £16.77.

ONLY FROM US — WITH SSB **NOW ONLY** **£499**

THE AMAZING IC-R1 SCAN RECEIVER NOW AT A NEW AMAZING PRICE

£379

FREQUENCY RANGE 100kHz to 1300MHz NO GAPS A.M. or F.M. ALSO AVAILABLE ON EASY TERMS

48 payments of £12.86 per month

Other Scanners Available — JUPITER II FAIRMATE UNIDEN

ICOM IC-725 or 726 HF

Transceivers for both mobile or base — the 726 HAS 6 meters inc.

PHONE FOR OUR PRICE YOU MIGHT BE AMAZED

THE NEW ICR72 RECEIVER 100KC to 30MHz SSB AM CW

Powered by either internal batteries or external supply
Superb selectivity and sensitivity

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ICR-7000HF Receiver 500kHz — 2GHz

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NO DEPOSIT **£989. with HF fitted**

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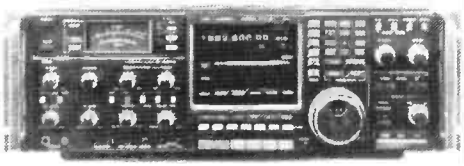

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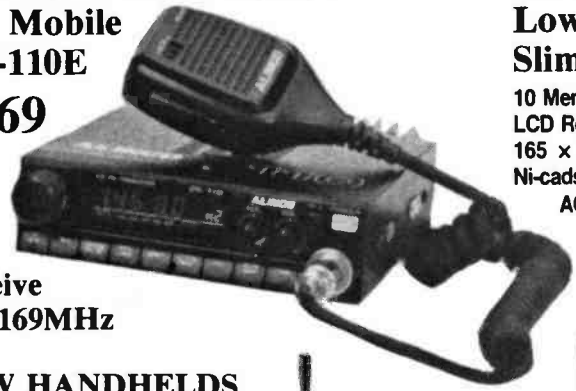

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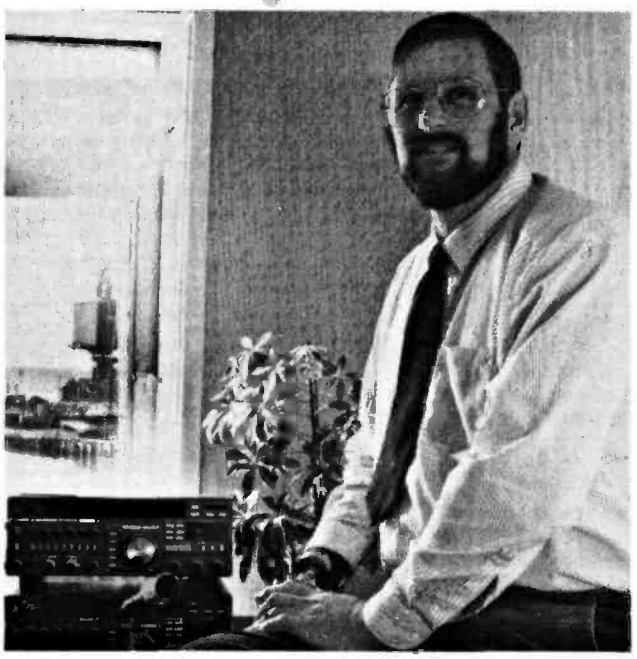
Keylines



Rob Mannion G3XFD

In recent years I've suffered the all-too-common problem that comes the way of people who like their food - an expanding waist. My waistline unfortunately reflects all the delicious 'goodies' that my wife - an excellent cook - prepares. I'm one of those people who'll always enjoy a big, well prepared meal and not worry (at the time) about the consequences.

Unfortunately, the 1990 *PW* issues have been 'overfeeding' the binders designed specifically for the 'normal' size magazine. We had hoped that all 12 issues would fit into the binders. However, we were pleased to be able to produce 'bumper' size issues to provide you with much good reading. But, as a direct result of the larger magazines, we now have to face the fact that readers will have to 'carry over' one or two issues from this year's volume, into the 1991 binder.

Although I apologise to those of you who will be annoyed with us for making *PW* so big, in another sense I'm pleased that despite the severe recession that's affecting the UK as a whole - we've been able to pack so much in.

Sorry for the 'tight squeeze', but I know many of you appreciate our efforts to pack as much as we can into a very small space every month.

Tight Specifications

Thinking about the binders being 'out of spec' for the larger sized issues, has reminded me of a recent meeting I attended at the Potter's Bar Headquarters of the RSGB. Those attending the meeting had been invited to discuss suitable kits and specifications applicable to the forthcoming Novice Licence.

I was delighted to attend the meeting, and it was a pleasure to see many of the 'faces behind the names' so to speak. We were given a 'potted' history of the Novice Licence before the subject of the specialised training courses were explained.

The emphasis for the Novice course is 'hands on' all the time and I was particularly interested to see some of the novel techniques that will be used during the course. This aspect of the Novice training sessions will, I feel sure, breathe much new life into our hobby.

But, I must stress that I came away from the meeting with the feeling that the proposed specifications for kits aimed at the Novice are too tight. I don't propose to mention the various figures that were discussed because I'm hoping that they can be relaxed considerably.

I was also surprised that the meeting arranged by the RSGB had not been arranged much earlier. It seemed rather 'late in the day' to arrange such an important liaison event to discuss kits and their specifications only some six months before the proposed introduction of the new licence.

Main Worry

My main concern and worry is not that the specifications can't be met, they surely can be - but at what cost? Surely - for the sake of the hobby - we must endeavour to keep prices down as low as possible!

Within a few days of the meeting at RSGB headquarters, I had heard from several people who are directly involved in the manufacturing and selling of kits. One respected (and very professional in approach) manufacturer stated categorically that yes, he could make a kit to the suggested specifications but one filter alone could cost more than one of his present - high quality - kits.

Ideally the RSGB will eventually mark the agreed (somewhat relaxed I hope!) specifications with some sort of amateur radio 'Kite Mark'.

Orderly House

We would all like to keep our own house in order and the RSGB, anxious of course to save the members money, would like to see this small section of the amateur radio market regulating itself.

In my mind this is an excellent proposal **PROVIDED** that the specification burden on the industry is not too great. We'll soon see the results, for you can be sure the specifications will be reflected in the price.

All the manufacturers present at the meeting stated that they would prefer to abide by a standard that would allow self-regulation in the industry.

Such self-regulation removes unwieldy bureaucracy. I feel that the kit manufacturers co-operation, must be backed by a specification that is commercially viable. This is essential for an industry that is (with due respect) dominated by small businessmen working to very tight profit margins. Let's help them by loosening the specification 'belt' at least.

It must be obvious to anyone reading 'Keylines' this month, that I place a great deal of importance on the Novice Licence. The value of the 'new blood' that will - hopefully - be attracted to the radio hobby by the bold, new initiative will help to carry the hobby into the new century.

Without the 'invisible' army of instructors however, the scheme would undoubtedly never be launched - let alone float!

The instructors will be gladly giving up their time and expertise to encourage the newcomers. In many cases, the instructors will be paying out a great deal - in time and money - to make the necessary teaching aids.

Every instructor will be a volunteer. They'll be backing Amateur Radio, the RSGB and last - but certainly not least - the radio enthusiasts of the future. Surely then the instructor should at least be given the necessary Novice Licence course book?

Of course I realise that the RSGB has to pay 'up front' for the manuals and this has had to come out of membership money. But surely the teacher should not have to pay for his apple?

I have discussed this problem at length with David Evans G3OUF, Chief Executive and General Secretary of the RSGB. In my mind the answer lies not in the soil - but in sponsorship. Members of the RSGB - myself included - must seek a sponsor willing to help pay for this vital initiative.

Individual sponsors for instructors might come forward, but the project needs further sponsorship in a very big way. This would allow the RSGB to give their essential support, by freely providing each instructor with the necessary training manual and teaching aids.

I'm on the look-out for further sponsors to help take our hobby into its second century...are you?

We apologise that 'What is Propagation' has been held-over this month.

73 DE G3XFD

Receiving You...

★★★★★STAR LETTER★★★★★

Dear Sir

A bit of a word from a lonely s.w.l. in Sri Lanka. Sir, first of all I wish to introduce myself to you. I am Asantha Cooray, 16 years old, student in one of the leading schools in Colombo, capital of Sri Lanka.

I thought of writing to you some months ago, but didn't have a chance, but finally I got my mind to write to you and raise some points.

I have been reading *PW* for the past two years, since I started short wave listening and DXing, at the British Council Library. As I wasn't able to subscribe for the magazine due to several reasons, I go to the library to have a look at it, and see what is on.

As a s.w.l., I found the magazine was quite useful. I really liked your latest format, which made *PW* easy to read. One of my favourites is the 'HF Bands' and also 'Broadcast Round-up' helped a lot.

Now to the main point, as a s.w.l.I used to send QSL cards, and still do, to radio amateurs, but what I expected first seems not to be happening. For the past year I have sent out about eighty cards, but receiving QSLs doesn't come up to the same number.

I don't know why amateurs are not sending QSLs to s.w.l.s who send QSLs to them. Many seem to be not in need of s.w.l. QSLs, which is equally the same as an amateur transmitter QSL.

Due to this reason, I have learned that many s.w.l.s have stopped sending cards. So as a s.w.l. I request you Sir, as an amateur, to think about this, and from myself I request that all your readers don't stop QSLing to s.w.l.s and not to ignore their QSLs.

Even inside Sri Lanka, there were about three s.w.l. who used to send out cards, but now according to the Radio Society of Sri Lanka I am the only s.w.l. who is still doing so. I am also happy to let you know that I am the youngest member of the RSSL.

There are several reasons that many young people are not involved in this. One is that many don't know that there is something called Amateur Radio. Even amateurs themselves work in such a secret way that it seems that they don't want others to join in.

As in your country nothing has been done to promote the hobby, and another factor is the high price of equipment. Many enthusiasts use home-brewed equipment. I used to use a self-made oscillator and ran my portable radio to s.s.b., but later on I got hold of my uncle's Sony ICF-7600DS.

Finally before I say good bye to you sir, I wish to make a request. If there are any of your readers out there who would like to help me in some way, such as by sending old magazines, books, etc, I would really appreciate it. And most of all I wish to ask, is there any chance that you can send me *PW* freely or can a heartfull reader subscribe for me?

Goodbye.

Asantha Cooray, Colombo 10, Sri Lanka.

Editor's Comment: Asantha's letter, his manner and attitude impressed the *PW* team. The letter also raised a valid point regarding QSL cards. I know of course that this is not a new problem for either the licensed radio amateur or s.w.l., because I had the same problem in getting cards back 30 years ago. I can only suggest that we licensed operators help to encourage new and established listeners to enjoy their hobby by replying to their cards - **especially when they have International Reply Coupons attached.** We hope that Asantha will also enjoy the six-month *PW* subscription he's won as his special prize. **G3XFD**.

Send your letters to the Editorial Offices in Poole, the address is on our contents page. Writer of the Star Letter each month will receive a voucher worth £10 to spend on items from our PCB or Book Services, or on *PW* back numbers, binders, reprints or computer program cassettes. And there's a £5 voucher for every other letter published.

Letters must be original, and not duplicated to any other magazines. We reserve the right to edit or shorten any letter. Brief letters may be filed via our Prestel Mailbox number 202671191. The views expressed in letters are not necessarily those of *Practical Wireless*.

Dear Sir

I thought that the letter from 17 year old Stuart Hipkin made some very telling points on why the hobby is not attracting young people to it.

The RSGB seems totally unable to appreciate what actually appeals to creative youngsters and his reaction to the Novice licence proposals highlights what is wrong with the proposals as they stand.

How about a campaign to get us back to the roots of the hobby with simple construction projects for c.w. and a.m. and pressure in the right quarters for recognition that a.m. users have a right to the frequencies available, in the same way as classic cars have a right to use the highways.

How about a 'Basic Equipment Constructors Club' for instance, or 'AM Revival Club', backed up with articles on both transistors and valve construction projects, and with suggested frequencies and bands for enthusiasts and of course aimed at newcomers to the hobby particularly.

Although 1.8MHz is the easy band to get going on, 70MHz is the band with virtually no occupancy and needs reviving.

Information on existing a.m. nets and enthusiasts for the more simple things in amateur radio could also be collated and included.

Although I have been a member of the RSGB for many years I do not hold it in very high regard, and I certainly hold it responsible for the situation which is now agonising over the lack of recruitment to the hobby.

What do you think? I would be happy to help in any way I am able.

Peter Simpkins G3MCL
Winchester
Hants

Editor's comment:

G3MCL has a good argument regarding the use of a.m., especially as regards to 70MHz. We have some projects under way for v.h.f. but in the meantime if you have an a.m. net under way in your area - tell us about it! If you have a proven circuit for a simple a.m. transmitter for 50 or 70MHz - why not share it with us in the new 'What A Good Idea' circuits feature in *PW*?

Dear Sir

Although the condescending attitude of certain Class A licensees toward Class B licensees is already well documented in the amateur radio press, I should like to draw attention to what I regard as an equally unwarranted, but normally unmentioned, example of elitism/snobbery within our hobby.

Views such as those expressed by Stuart Hipkin ('Receiving You' - September 1990), and many others, regrettably continue to prevail. So many, it would seem, are of the opinion that the only Radio Amateur truly worth his salt is the one who is committed to home construction.

I should at this stage point out that I would be the last to deny that home construction is an extremely laudable facet of our hobby, providing excitement and much satisfaction to its enthusiasts. However, I do not believe that those interested in it have any right to believe that it is they - and only they - who have a 'divine right' to the r.f. spectrum, or at least a moral priority to it.

To take my own case, one of the many interests in life is learning foreign languages, and I find that my access to the h.f. bands is invaluable in providing opportunities - without having to leave my own home - for using and practising those languages, albeit via the medium of a 'Black Box'!

What gives anyone the right to judge occupancy of part of the spectrum for these purposes any less worthy than for the testing and use of home-brew equipment?

The essence of what I am saying is that there can surely be a multitude of legitimate reasons for desiring access to amateur bands. In the final analysis, I believe that provided a licensee operates his station in a responsible manner, courteously and in accordance with the terms of his licence, the only ultimate justification required for access to the spectrum is that the licensee concerned desires access to it.

Amateur radio, as we all know, is a wonderful hobby. Let's all enjoy it,

Receiving You...

irrespective of the underlying causes of our individual interests. In-fighting never strengthened anything!

Many thanks for an excellent magazine. I've placed a regular order with my newsagent so as never to miss a copy.

Chris Hilton G4UPZ
Oakham
Leicestershire

Editor's Comment: G4UPZ's letter reminds me of a quote in a world-famous book (still in print and selling very well) where a very respected teacher and counsellor said to his 'club members' (who were arguing who should eventually sit next to the 'chairman') that "There are many rooms in my father's mansion". We should bear the message in mind! In other words - there's room for all of us - whatever our own special interests in our many-faceted hobby!

Dear Sir

It's well known that the price of electronic equipment has fallen dramatically over the past few years. there is perhaps no better example than that of the digital watch.

In April 1975 *PW* announced that a British supplier had broken the then magical price barrier of £60. Scale that up in proportion to the increase in the cost of *PW* then and now and we have a price in real terms of £318 for telling the time electronically.

In 1966 it was stated that the frequency synthesiser was the preserve of the professional, typically used by broadcasting companies as a v.f.o. style transmitter input drive with Xtal accuracy. Employing 90 valves it produced every frequency from 1kHz to 30MHz in 1kHz steps. A wealthy radio amateur, we were told, could buy one for £1500, equivalent now to £18750.

A worthwhile parallel has been the drop in price of ex Ministry of Defence gear. July's *PW* carried an ad for receivers covering 1-20MHz which are presumably the type R209. In 1964 the asking price was £23-50 which equates with £376 now, quite a bit more than today's asking price of £60. The earliest reference to the R209 that I have seen dates from 1974, when Philips announced it as a civilian model FO509. Can any reader state what it cost then? Neither Philips nor the Vintage Wireless Co. has been able to help.

I have compiled for my own use what may be a unique listing of all ex Ministry of Defence equipment advertised in *PW* during the fifties, sixties and seventies by which time supplies had dwindled considerably. If any reader would like to dip into this index I will do what I can to help on receipt of a s.a.e., but copyright prohibits any photocopying.

Hilary Humphries
Newmarket, Suffolk

Dear Sir

The only thing more boring than one of the "all your equipment should be home-brew" is one barely out of his nappy.

An amateur radio licence enables one to operate under section one of the wireless telegraphy act. In other words, to behave in a reasonable manner whilst operating.

Home-brew or not home-brew is left to choice. Perhaps the writer of the letter in September's *PW* should gain a few years experience before sitting in judgement.

M. Charlton G0MDF
Hulthwaite
Notts

Competition Corner

When you've read the Dewsbury Electronics Supa-Tuta review on page 29 - you have an excellent opportunity to win one of these marvellous Morse training aids for yourself. For a change - and just to be a little sneaky - we've hidden the competition throughout the editorial pages of *PW*!

The competition takes the form of Morse characters spelling out a message. There'll be no more than one Morse character on each of the pages used in the competition and the characters will be in letter order.

To enter the competition find all the characters and then decode the message. Send your decoded letters together with the page number you found them and your name and address on a plain postcard to: **Supa-Tuta Competition, Practical Wireless, Enefco House, The Quay, Poole, Dorset BH15 1PP to reach us no later than Monday November 19.**

The first correct entry drawn out of a 'hat' will receive a Supa-Tuta, kindly donated by Dewsbury Electronics. The four runners-up will receive 1 year subscriptions to *PW*. The winner and runners-up will be notified by post and the results will appear in the January 1991 issue, on sale December 13. Best of luck and Da-Di-Dah!

Newsdesk '90

Howes AA4 Active Antenna

The Howes AA4 Active Antenna is designed for users of scanning receivers who require a compact antenna giving a wide frequency coverage.

The frequency range is 25 to 1300MHz. The antenna is only 409mm long by 30.5mm wide and incorporates a low noise microwave integrated circuit amplifier. The i.c. noise figure is less than 3dB rising to about 3.2dB at 1300MHz. Gain is more than 15dB over the entire range. A 10dB switched attenuator is provided on the receiver interface board. This interface board takes a 12 to 14V d.c. power input and feeds the power up the coaxial cable to the antenna.

The Howes AA4 cost £18.80 in kit form, or £24.90 as built and tested p.c.b. modules. Post and packing charge is £1.00 when ordered by mail from C. M. Howes Communications. Kits are also available from the many Howes Kit stockists around the country and at most radio rallies.

An information sheet on the AA4 and a copy of the Howes Kit Catalogue is available by sending an s.a.e. to the address below. Telephone sales and technical advice is available by phoning the number below during normal office hours.

C. M. Howes Communications, Eydon, Daventry, Northants NN11 6PT
Tel: (0327) 60178

Gulf Link

BBC World Service's new *Gulf Link* programme is standing by ready to take calls from British people with friends and family members in Iraq and Kuwait. The number to call is 071-257 2373 and the line is open from 9am to 6pm. People can also send their messages by FAX to 071-836 5195. The first edition of *Gulf Link* presented by Chris Loosemore went on air on Friday September 7 at 1645UTC and focused on the work of the Gulf Support Centre in London. The programmes, including personal messages, started the following Monday and are broadcast every weekday at the same time, with a repeat the following morning at 0445UTC. *Gulf Link* follows the pattern established during the Falklands conflict by the *Calling the Falklands* programme. It is produced by the same World Service department Topical Tapes.

STOP PRESS: Due to demand, extra programmes are now scheduled for weekends.

Marco Trading

The Marco Trading 1991 Electronic Components and Equipment Catalogue arrived in the offices recently. Once again this catalogue includes many new and exciting lines and is available at £1.50 post paid.

Further details from:
Marco Trading
The Maltings
High Street
Wem
Shrewsbury SY4 5EN.
Tel: (0939) 32763

Maplin 1991 Catalogue

The Maplin 1991 Buyers Guide to Electronic Components is now available at WH Smith, Maplin shops or direct by mail order, at £2.45 a copy.

With over 600 action and bargain packed pages featuring new product lines such as Kodak films and Olympus cameras, Pro-Sound car/radio/cassette/speakers, satellite receivers, 'watch as you build' cassette-based learning courses. Meanwhile extended product ranges include batteries, books, cables, protection devices tools and projects are laid out as before.

Doug Simmons
Maplin Electronics
PO Box 3
Rayleigh
Essex SS6 8LR
Tel: (0702) 554155

Do-It-Yourself

The latest Maplin project is the digital speech record and playback module. A novel and versatile project which can store speech digitally and then play it back at the push of a button. The project is based around the UM5100 digital voice recorder and playback i.c.

Digital recording has the advantage over tape recording as there is no mechanical wear and tear. Applications include voice message pads, security systems and telecommunications. The onboard 32K SRAM memory will store between 5 and 20 seconds of speech (depending on sampling rate).

The module can be further expanded with an EPROM programmer module, which will allow non-volatile storage of speech in EPROM. An additional playback-only module is available, which does not incorporate the record circuitry and is intended for use with speech stored in EPROM. Just the thing for a contest call! Available from Maplin shops or by mail order.

For further information, please contact:
Doug Simmons
Marketing Director, Maplin Electronics plc
Tel: (0702) 554155

Fax and Weather Satellites

Previously, FAX on a Spectrum has meant using the very poor, low resolution screen display, showing only a small part of a chart and with no grey shading for pictures.

Now, by simply using the system just introduced by Technical Software with a standard, Epson-compatible dot matrix printer, you can produce full resolution charts, press photos and weather satellite pictures on any 48K or 128K Spectrum computer. The pictures are reproduced with excellent grey shading, giving near photographic results.

The software is very easy to use with the screen displaying all the current settings and operational status. It is supplied either on tape or Spectrum +3 disk but may be copied to other formats if required.

The price is £40.00 for the SIA-2 interface adapter board and the software on tape or £42.00 if on +3 disk. To receive FAX, the Spectrum FAX interface is £40.00 and for weather satellites, the APT-1 weather satellite decoding module is £59.00. Full instructions are supplied.

Technical Software
Fron
Upper Llandwrog
Caernarfon
Gwynedd LL54 7RF
Tel: (0286) 881886

New Soldering Iron

Just introduced by Greenwood/Oryx is a new addition to its range of Skylab soldering products. Developed to meet the stringent COSH regulations to limit fume emissions during soldering, the Skylab fume extract soldering iron has been designed to extract fumes directly from the area of the tip itself - virtually eliminating the possibility of harmful gases escaping into the atmosphere.

Featuring a light-weight ergonomic design, the iron uses the same advanced tip configuration as the standard Skylab soldering iron which actually incorporates the heating element within the tip.

The extraction pipe is unobtrusively integrated into the tool itself and can be adjusted or replaced in seconds if required.

Easily replaceable extension plastics piping is attached to the electric cable for connection to standard fume extract systems.

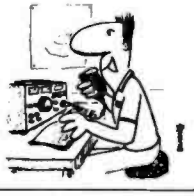
The new iron can be driven by either the DD or GD skylab soldering stations. For further details, contact:

Alan Cooke-Sanderson
Greenwood Electronics
Portman Road
Reading
Berkshire RG3 1NE
Tel: (0734) 595843

G4TJB QSL Cards

Cartoon DIY cards each featuring a different aspect of amateur radio are now available from 'G4TJB QSL Cards'. These are on sale at £3.50 matt and £4.50 gloss per pack of 100.

'G4TJB QSL Cards'
24 Portishead Rd
Worle
Weston-Super-Mare
Avon BS22 0UX
Tel: (0934) 512757



Newsdesk '90

Powerful and Portable

Weighing less than 10kg and with at least 4 hours of operation from built-in rechargeable batteries, Bruel & Kjaer's NEW Real-time Frequency Analyser Type 2143 is the ideal analyser for acoustical and vibration measurements in the field and in the laboratory.

Type 2143 operates in real-time with bandwidths down to $^1/_{24}$ octave and is able to read 1000 spectra per second into non-volatile memory, thus making it both an excellent analyser and a powerful data-gathering device. The memory capacity in the standard unit is sufficient for 512$^1/_3$ octave spectra.

The built-in PC/MS-DOS compatible disk-drive makes it easy to store the measured data and can be used to transfer data to other equipment. Type 2143 is operated by means of user-interactive menus, while a system of on-screen help pages enables even a novice user to realise the full potential of the analyser in the field. Type 2143 has further control and data-processing possibilities via the IEEE-488 and RS 232C interfaces.

In sort, Real-time Frequency Analyser Type 2143 is the logical choice when portability, powerful measurement, signal analysis and data collection are required.

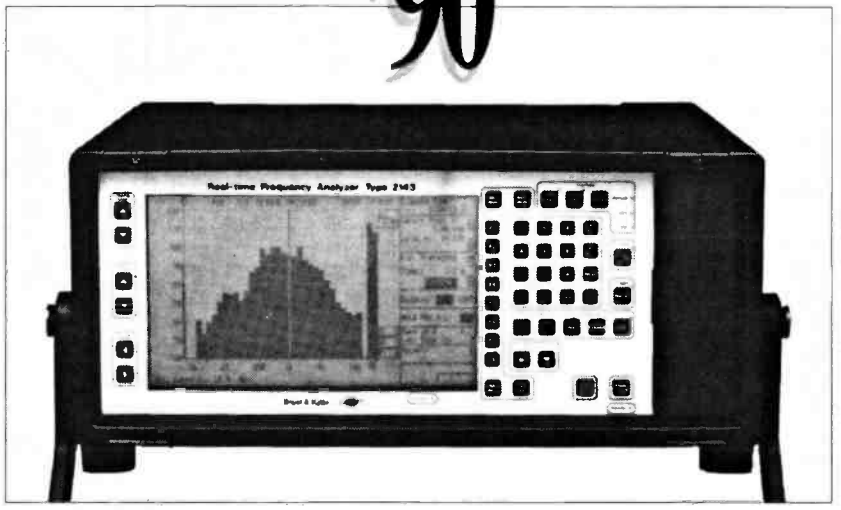
Price £12212 excluding VAT but including post and packaging.

Bruel & Kjaer (UK) Ltd
Harrow Weald Lodge
92 Uxbridge Road
Harrow
Middlesex HA3 6BZ
Tel: 081-954 2366

Periphex inc

Manufacturing both amateur and commercial battery packs for hand-held radios, 'Periphex inc' also sell premium battery packs for the radio controlled model industry, camcorder batteries and individual cells. For more details, contact them at:

149 Palmer Rd
Southbury, CT 06488
Tel: (203) 264-3985
Fax: (203) 262-6943



Undercarpet Telephone Cable

Announced by CableMaster is a new undercarpet telephone cable which meets BT specification CW1316. A low-profile 6-core product, it is designed to lay flat on wooden, concrete or tiled floors - thus reducing installation costs and enabling the extension of essential communications services with minimal disruption.

The cable has excellent cut-through and abrasion resistance and is unaffected by moisture, steam or carpet-cleaning fluids.

Each conductor is of 1/0.5mm plain annealed copper wire insulated with radiation cross-linked pvc to a radial thickness of 0.15mm.

Conductors are laid up in parallel with a radiation cross-linked pvc outer sheath. Max conductor resistance is 90.4Ω/km at 20°C and capacitance between adjacent cores at audio frequencies is 50 to 80pF/m.

For further details, contact:

CableMaster
Edinburgh Way
Harlow
Essex CM20 2DF
Tel: (0279) 639639.

A New Emporium

Martin Lynch started in amateur radio some twenty years ago as a short wave listener from his father's garden shed in Ealing, West London. His primary interest was listening on the v.h.f. amateur bands, eventually getting his first callsign G8JNW. Working through his apprenticeship with Racal BBC in Wembley, he built a lot of his own equipment and passed the Morse test acquiring the callsign G4HKS in 1978. From 16 years old, Martin was well known in the area for buying and selling used amateur radio equipment - in those days AR88D's, 1155's and Creed 7B's.

In September of this year, Martin opened his own retail showroom, specialising in new and used amateur radio equipment, together with computers, hi-fi and video.

The location was very important. The showroom is situated in Northfields Avenue, the same road that 'Amateur Radio Exchange' was in originally. Parking is easy and it is centrally positioned. There are bus stops and Northfields Tube is literally a hundreds yards away.

The showroom area is large with lots of display benches, all wired up for instant demonstration of equipment. The company called 'Martin Lynch' will bring back the flavour of 'exchange' as it used to be in years gone by. Goods can either be sold on behalf of a customer (i.e. on a commision basis) or exchanged/bought outright for cash. The company will also specialise in modifications of equipment to further enhance operation.

The usual array of accessories is on display and what the shop does not hold in stock can normally be obtained within 24 hours.

Martin Lynch welcomes any calls, whether it be for advice on new or used equipment, or just an informal chat between old faces seen in the not too distant past!

Opening times are Tuesday to Saturday 10am to 6pm, closed all day Sunday and Monday. The address is:

286 Northfield Avenue
Ealing, London W5 4UB.
Tel: 081-566 1120. Fax: 081-566 1207

Services

Queries
We will always try to help readers having difficulties with a *Practical Wireless* project, but please note the following simple rules:
1: We cannot give advice on modifications to our designs, nor on commercial radio, TV or electronic equipment.
2: We cannot deal with technical queries over the telephone.
3: All letters asking for advice must be accompanied by a stamped, self-addressed envelope (or envelope plus IRCs for overseas readers).
4: Make sure you describe the query adequately.
5: Only one query per letter please.

Back Numbers & Binders
Limited stocks of many issues of *PW* for the past years are available at £1.65 each including post and packing.
Binders, each holding one volume of *PW*, are available price £4.50 each (£1 P&P for one, £2 for two or more).
Send all orders to the Post Sales Department.

Subscriptions
Subscriptions are available both for the UK and overseas. Please see current issues for the latest prices.

Constructional Projects
Each constructional project is given a rating to guide readers as to its complexity.
Beginner: A project that can be tackled by a beginner who is able to identify components and handle a soldering iron fairly competently.
Intermediate: A fair degree of experience in building electronic or radio projects is assumed, but only basic test equipment is needed to complete any tests and adjustments.
Advanced: A project likely to appeal to an experienced constructor and often requiring access to workshop facilities and test equipment for construction, testing and alignment. Definitely not recommended for a beginner to tackle on their own.
Components for our projects are usually available from advertisers. For more difficult items a source will be suggested in the article. Kits for many of our recent projects are available from CPL Electronics and FJP KITS, both of who advertise in the magazine.
The printed circuit boards are available, mail order, from the Post Sales Department.

Mail Order
All *PW* services are available Mail Order, either by post or using the 24hr Mail Order Hotline (0202) 665524. Payment should be by cheque (overseas orders must be drawn on a London Clearing Bank), Access, Mastercard or Visa please.

Wireless Line
This is an information service for the radio enthusiast, updated each Friday. Calls cost 44p per minute peak time and 33p per minute off-peak. The number to ring is: (0898) 654632.

Newsdesk '90

Two New Kits

In the latest edition of their catalogue, Lake Electronics announce the introduction of two new kits to their QRP range.

The DTR7 is a single band transceiver with 2 watts output on 7MHz. Featuring a stable v.f.o., sensitive receiver, sidetone, r.i.t. and a passive audio filter. The kit comes complete with not only all components but with the hardware!

Compact and lightweight - an ideal rig for portable work.

The PM20 power meter combines a 50Ω dummy load with a sensitive wattmeter reading from 25 milliwatts to 20 watts, over the range 10kHz to 150MHz.

The DTR7 kit is priced at £84.50 and the PM20 kit at £19.50. Both prices include postage.

For a free copy of the catalogue, send an s.a.e. to:

Lake Electronics
7 Middleton Close
Nuthall
Nottingham NG16 1BX

Label Service

Able-Label can now offer radio amateurs and short wave listeners a special self-adhesive label service. 500 printed black on white costs £5.75 and 500 printed black on gold costs £6.25 (both prices include CQ design if required). They offer 12 different label designs and you can get further details from:

Steepleprint Ltd
Earls Barton
Northampton NN6 0LS
Tel: (0604) 810781

A Measure of Quality

Now freely available from Alpha Electronics is a new brochure relating to their BS5750 Test Equipment Repair and Re-Calibration services. Alpha repair and maintain all types of instrumentation, both electrical and electronic, oscilloscopes up to 150MHz bandwidth both real-time and storage, all types of analogue and digital multimeters, as well as specialist electrical test sets. The brochure gives useful details of Alpha's location and facilities, including a local pick up and delivery service in many areas.

For further information, please contact:

Fred Hutchinson
Quiswood Ltd
Tel: (0756) 799737

New Standard C5608D

With the new standard C5608D it is possible to programme all functions from the l.c.d., keypad, hand microphone, as well as the main unit. Some of its facilities include 20 memories, two scan modes, programmable wide band receive and a.m. for airband listening. It incorporates (when programmed) cell phones between 800-1000MHz.

Being two separate bands in one box, it has two speaker outputs, it is possible to transmit on one whilst tuning the receive section on the other band and is usable as a full duplex repeater (for approved users, i.e. RAYNET, etc). The first sample in the country will be on demonstration on the **Lee Electronics stand at the Leicester Exhibition.** The proposed introductory price is £650.00.

The 1990-91 Tandy Catalogue

The latest Tandy 1990-91 Electronic Catalogue is now available free-of-charge. Produced annually by InterTAN UK Limited, the Walsall based electronics and computer retailer better known by its trading name Tandy. The full colour 140-page catalogue contains a complete guide through their product range and features details on all Tandy stores and dealers.

Anyone wishing to obtain a copy should visit their local store or dealer.

Newsdesk '90

Summitek Portabeam

The Summitek DL-146 portabeam 3-element delta loop antenna was developed during extensive field testing by Stephen Peterson of Summitek, Salt Lake City, Utah. He wanted an antenna with good gain, good portability and easy field assembly during adverse conditions. What resulted was a version of the proven delta loop with about 8dBd gain, equivalent to a 4-5 element Yagi-Uda parasitic array. The antenna's three elements and male BNC equipped feed line all store inside the antenna's 864mm boom. Throw the stored antenna in the car boot or stuff it in your backpack, it's virtually indestructible when stored.

While the antenna was developed for emergency field use it has proven extremely valuable for field day and other portable applications.

Each DL-146 is handmade and tested. Quality brass, aluminium, pvc, coaxial cable and connectors are used in its constructiion. Should an accident befall the antenna, spare parts can be ordered (or obtained locally) or the antenna returned for repair. Each antenna comes with its own v.s.w.r. graph made prior to shipping and dimensions for replacement parts. Complete assembly instructions are included. The antenna weighs about 19 ounces, a little over one pound.

The Portabeam DL-146 comes with a 100mm pvc handle for hand use. A porta-mast is available for field use, however, the threaded mounting 'T' enables you to easily design accessory masts and mounting brackets to suit your specific requirements using readily available pvc pipe and connectors.

The DL-146 can be used with either vertical or horizontal polarisation. While we do not recommend that you use the antenna for permanent outside use, it will make a fine indoor or attic mounted beam.

In addition to the complete system, a kit version containing a drilled boom and sized fittings may be made available if there is sufficient interest.

Further details from:

Steve Peterson
Summitek
PO Box 520011
Salt Lake City, UT 84152
24 hour answering/
ordering 801-277 4205

Coping with Cancer

An additional stand and a variation to the norm, this year is to promote the 'Coping with Cancer' group in Leicester in honour of the late G4CPY Neville, who had always taken charge of the 'talk-in' station at the Granby Halls. The 'Coping with Cancer' group exists to help people cope with the practical and emotional problems following a diagnosis of cancer, this service is for the sufferer and their families.

The group uses their own personal experiences of cancer, giving caring support - sharing can lessen the fear which is often more of a problem than the illness itself.

The group aims to provide a service which will improve the overall care of cancer patients in the community, especially those who are unaware of the many organisations and benefits available to them, medical advice is not given, but close co-operation with the professionals is achieved, accepting referrals and passing on information.

Help is at hand at all times, both for the sufferer and their family, by contacting Leicester 621112 or calling *at **Spencer Chambers, 4 Market Place, Leicester LE1 5GF.***

Most of the items being offered for sale on the 'Coping with Cancer' stand will be soft goods made by the members of the group. Items include soft toys, cushion covers, dried flower arrangements, patch-work quilts, etc.

New Unitel Catalogue

Unitel has produced a comprehensive brochure on its range of fuses and fuseholders from several established manufacturers.

The range of fuses from Beswick, Littlefuse and Siba cover T, F and FF types, glass and ceramic, in both 20mm x 5mm and $1\frac{1}{4} \times \frac{1}{4}$ in dimensions. Details are also provided on axial lead fuses from Littlefuse.

The fully illustrated brochure highlights an extensive selection of fuesholders from Bulgin, Littlefuse and Schurter in varying styles. Information is also provided on fuseclips and fuseblocks.

Copies of the brochure are available free-of-charge.

For further details, contact:

Alan Coulling
Unitel
Tel: (0438) 312393

STANDARD NEW!

C5608D Dual Bander

HI! Standard have produced this wonderful new dual band, 144/432 MHz, 50-Watt hi tech design, and it takes me two days to sus out where the on/off switch is! I have to be honest, I now have the handbook, and it's almost English too, so I might attempt to take it off the repeater channel!!

No, seriously, it is one of the most sophisticated pieces of equipment I have played with for some time, it has everything that the now renowned C528 has plus a few extras. I have managed to get some info (not issued by the manufacturer) which, from the keypad will give you receive between 800 MHz and 1000 MHz, plus, again, keypad programming, listen AM for airband! Haven't had time to try these out yet, only got sample two days ago. I don't think I have to remind you that we are the sole authorised importer for all Standard products, including their commercial and marine products, so I won't.

We will be at the Leicester Show, so come over and see us. PS. I still drink Campari and lemonade... hint, hint!

Norman

FEATURES

- ★ Handmic with bright LCD frequency readout.
- ★ All functions on keypad microphone.
- ★ DTMF (when optional CDT5608 fitted) programmable two tone only is possible.
- ★ CTCSS (when optional CTN5608 fitted) keyboard programmable
- ★ Memory scan
- ★ 1 MHz band scan
- ★ Single band operation
- ★ Key lock
- ★ Multifunction keypad
- ★ Pageing alert
- ★ Programmable offset
- ★ Dual displays
- ★ Separate volume and squelch controls on both bands
- ★ Cross band repeater for authorised users (ie Raynet)
- ★ Keyboard expandable frequency ranges
- ★ Cellphone receive capability
- ★ Possible to receive AM
- ★ Extension mic lead. Lets you remote the set. 2 mtr or 4 mtr length
- ★ Twin mic lead, to run hand and boom mic together

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Radio Personality - G4YXV

Feature

Amateur radio - although a specialist hobby itself - has many facets. This month's Radio Personality - Geoff Pagoda G4YXV - has carved his own niche operating from remote areas within the UK.

One look at Geoff Pagoda's antenna-festooned Land Rover on *PW*'s front cover tells you that he's a keen v.h.f. portable operations man. Another - equally brief look inside the vehicle will also leave you in no doubt that here is a man dedicated to his hobby.

Perhaps 'Radio Personality' should have been entitled 'One Man and His Wagon' for this month! Geoff , like many other amateur radio operators now coming onto the bands, had his interest aroused in radio communications when he was introduced to CB radio.

"I thought it was all a joke at first," he said, "but it soon took hold of me". Geoff, whose Polish father was killed during the latter stages of the war, was born in Germany but was brought up by his mother and British stepfather in the north-east of England. "Even after 22 years away from South Shields I've still got the Geordie accent," he says.

Geoff's job as a service engineer looking after everything from 'Juke Boxes' to gaming machines kept him on the road for 22 years travelling within a 40 mile radius of Bedford. "Twenty two years is enough of service-van driving and I applied for a bench-job which I'm now enjoying" he tells us.

Anyone who sees Geoff's ex-military 'T' registered Land Rover cannot fail to see how keen he is - but how did he become involved so deeply in portable work - especially with a Land Rover!

"It all started with the 'Worked All Britain' crowd where I made many friends and worked some interesting places and people," Geoff explained. In particular Geoff mentions that through his friend G1GSB his interest in WAB 'Square Bashing' grew.

Eventually it became obvious that the sort of site and locations he was setting out to activate for WAB - needed a rugged, especially equipped vehicle. The re-registered Land Rover turned out to be just the job.

"I didn't know anything about Land Rovers when I started but I learned. It's also very lucky that I'm only five-foot three inches tall. I can sleep in the back of the wagon then," he joked.

In fact he wasn't joking because he'd just returned from helping to run a special event station GB50BOB at the old RAF 'Battle of Britain' commemoration, at former RAF Hawkinge where he had to sleep in the vehicle for a week.

Now you can see for yourself...an Amateur Radio 'Aladdin's cave'.

Roving Rover

Geoff's unique 'Roving Rover' has taken him to some rare and exotic locations throughout the UK. The sturdy vehicle has been seen in delightful spots in the Highlands and Islands and enabled the many keen 'square bashers' to work otherwise 'silent' areas.

For a long time, 144MHz was Geoff's main area of interest but now he's getting very keen on the 50MHz scene, and has had a great deal of pleasure working on the band.

Geoff's busy life demands much and his hobby even more. His dedication to his three hobbies of amateur radio, 'Square Bashing' for WAB and photography has provided much enjoyment and, perhaps inevitably, left him a bachelor. "No, I can't afford marriage," he says with a chuckle, "my other hobbies are too expensive!"

Specially Equipped

The Land Rover, despite being an ex-army model - still required a great deal of work to enable Geoff to use it 'off the beaten track'. "When I'd got all the equipment, antennas and the 2.5kVA Honda petrol-engined generator on board - one end of the Land Rover was much lower than the other!" said Geoff - indicating the degree of slope the vehicle attained!

However, once it had been fitted with strengthened springs the sturdy Land Rover could take his portable station literally anywhere he liked from the Scottish Highlands to Land's End. As a result Geoff has been able to activate over 200 areas for the WAB 'square bashers' during his various expeditions.

When combined with his interest in photography, Geoff's determination and enthusiasm make a formidable mobile public relations team for our under-publicised hobby. You just never know where the 'One Man and his Wagon' team will turn up next. But wherever it is, onlookers will never be in doubt that Geoff Pagoda is a keen radio amateur and an ambassador for the hobby. **PW**

Construction

2-Element Extended Collinear Antenna For The 144MHz Band

This antenna described by Fred Judd G2BCX gives a useful amount of gain over a 144MHz band vertical dipole, allowing better reception as well as transmission.

Vertical collinear antennas consisting of a number of half-wave elements, one above the other, are always operated with the currents in the elements in phase. But, because of the nature of the mutual impedance between the elements, the radiation resistance increases as the spacing between the elements is decreased. For this reason the power gain does NOT increase in direct proportion to the number of elements in the array.

Power gain is greatest when the spacing between elements is *increased* to between 0.3-0.5λ at the frequency of operation (the optimum is 0.41λ). However, when more than two elements are employed the use of widely spaced half-wave elements makes construction somewhat difficult and necessitates a system of feeding r.f. separately to each element.

Close spacing elements may be more convenient allowing a collinear consisting of two or more elements to be fed from a single coaxial cable. This configuration limits the overall power gain i.e. the directivity gain relative to a single dipole, to 1.9dBd for a two element, 3.2dBd for 3-element and 4.3dBd for 4-element system.

An Extended 2 Element Collinear

However, it is possible to construct a vertical collinear for v.h.f. operation consisting of two elements and obtain an omni-directional directivity gain a little greater than obtainable from a 3-element close spaced system. This is achieved by making each element 0.64 of a wavelength long as illustrated in **Fig. 1**. The currents in each half-wave portion of the two elements will be in-phase. The array is fed via a short, open ended stub, 0.15λ long using a 50Ω, preferably low loss, coaxial feeder (MUR63) direct from the transmitter.

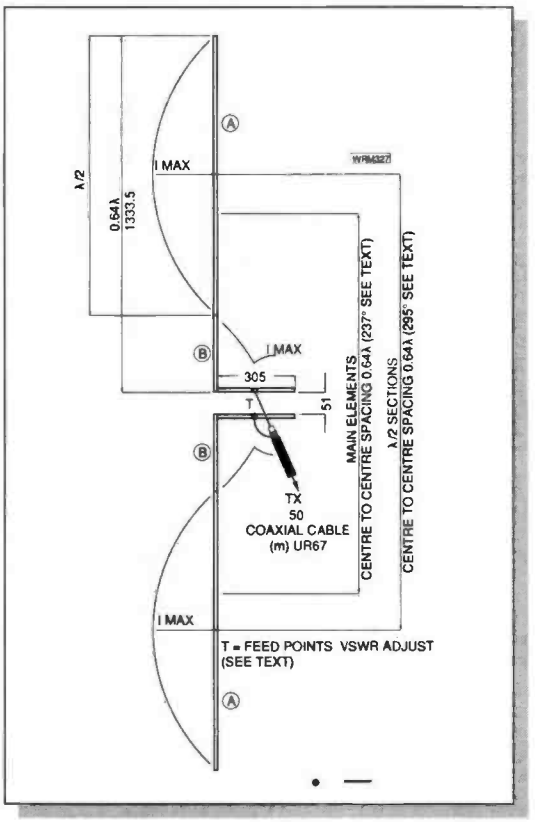

Fig.1: Configuration, general dimensions, current distribution, etc. 2-element extended collinear antenna.

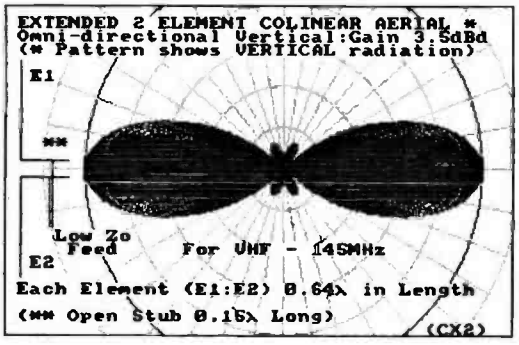

Fig.2: Vertical radiation pattern of the extended collinear antenna. The antenna provides omni-directional coverage in the horizontal plane (see Fig. 7).

It is the inner ends of each element (B and B as in **Fig. 1**) plus the gap between (where the open stub joins) that provide the wider spacing between the half-wave sections (A and A in **Fig. 1**). That allows the currents in each of these sections to be in-phase. Taking the velocity factor into account this configuration allows a wide, effective spacing (nearly 0.4 wavelength) between the half-wave portions of each element thus providing a directivity gain of 3.5dBd (5.65dB isotropic). The short sections at the centre (B and B) do, however, carry currents in phase, opposition to those in the half-wave sections and produce four, very small, side lobes. The radiation from these is low enough as to be of little or no consequence. The full, computer produced vertical angle radiation pattern is shown in **Fig. 2**.

Construction

The element lengths and the length of the short open stub section are given in **Fig. 1**. The major part of the construction is illustrated in **Fig. 3**. This includes details of essential materials concerning the

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2 x 1.5m lengths of 19mm (3/4in) aluminium tube
2 x 305mm lengths of 12mm (1/2in) aluminium tubing
1 x 787mm of 21mm(7/8in) square aluminium tubing.
2 x 500mm (approx) of 21mm (7/8in) square aluminium tubing.
2 x 70mm length of 21mm (7/8in) aluminium tubing
2 x 28.5mm length of 21mm (7/8in) aluminium tubing.
1 piece 3mm (1/8in) thick aluminium plate.
One 100mm piece of turned insulating material, Delrin, Nylon 66, even wooden dowelling should be adequate. Various nuts, screws, washers, etc. as required. Watertight connecting box.

NOTE: This special watertight connection box is available from B & H Aerials, 49 Blackwell, Darlington DL3 8QT. Price £2.50 including VAT, post and packing. Order: Coaxial Connection Housing (v.h.f. Insulator) and state for extended 2-element collinear by G2BCX as in *Practical Wireless*.

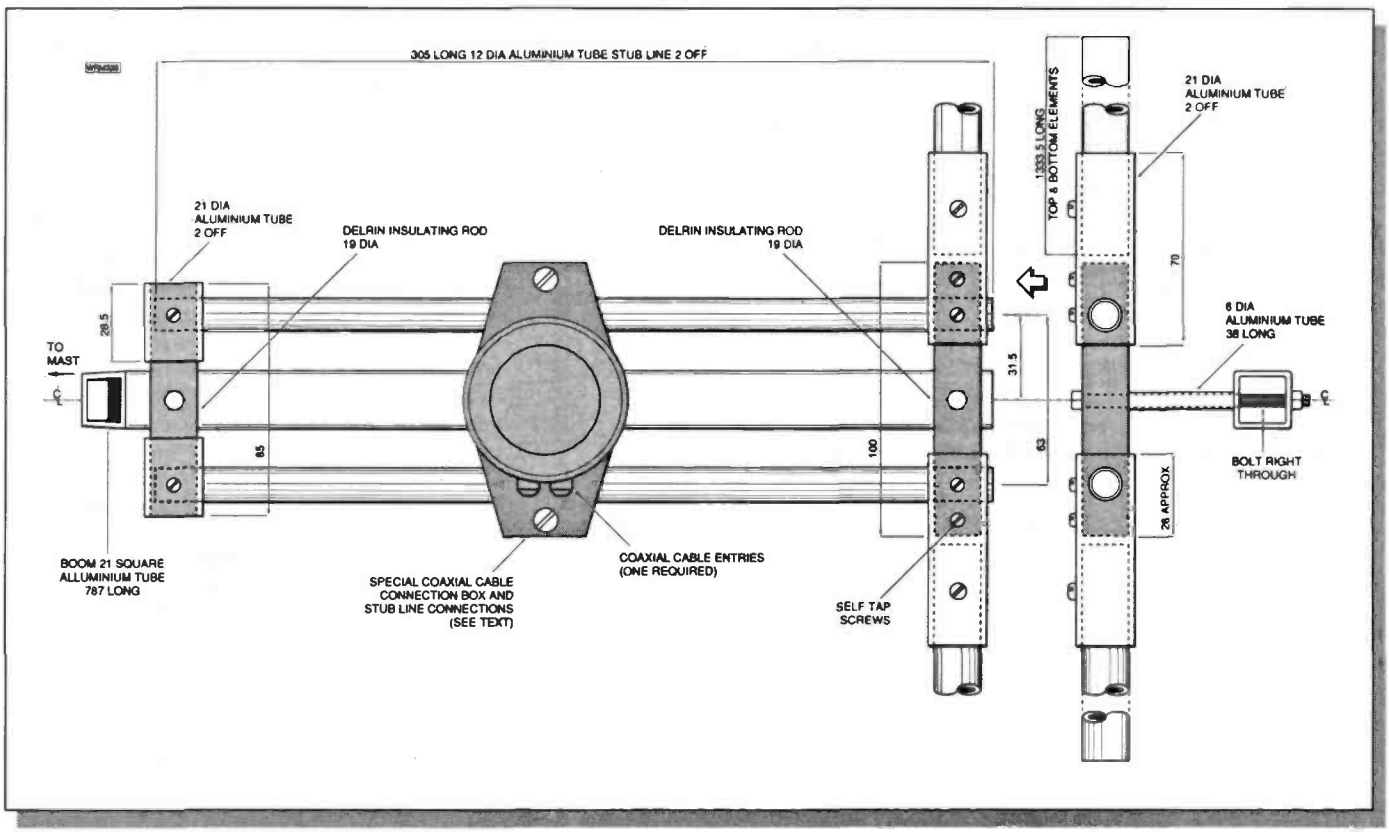

Fig.3: Constructional details, dimensions and materials for the assembly of the twin stub line with the driven elements and the position of the cable connection housing (see text regarding availability of this unit).

main elements, supports, stub lines and the coaxial cable connection box.

The main elements and the stub lines are secured to the boom with bolts right through the respective Delrin insulating sections. Spacers are fitted, as shown, to keep the stub lines and inner ends of the main elements away from the boom by about 38mm.

The cable connection housing box is fitted before the outer ends of the stub lines are secured to the insulating section at the rear (as in **Fig. 3**). This box actually bridges tne two lines and is held to them by half-round clips supplied ready-fitted to the box itself. Each stub line slides under a clip. The coaxial cable connections to the half-round clips on the stub lines are made via two terminals inside the box.

When, as described later, final adjustment has been made for minimum v.s.w.r. each clip must be secured to its respective stub line with a short, self-taping screw. This ensures positive electrical connection and prevents any movement of the clips and the box.

Note also how the ends of each stub line, as in **Fig. 3**, are fitted to the main elements so that they make good contact. A hole, just large enough to admit the end of a stub line, is drilled in the element but NOT right through. The other ends of the stub lines are secured in a similar manner **Fig. 3** (right). This part of the assembly is shown close-up in the photo **Fig. 4**.

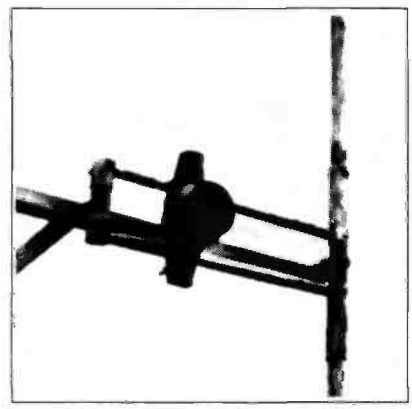

Fig.4

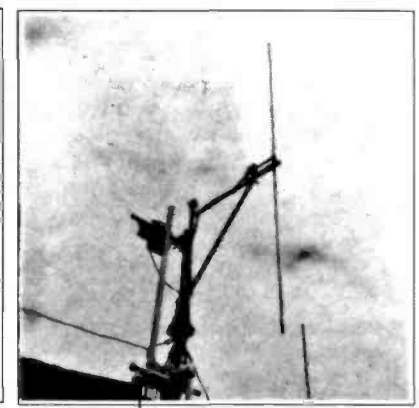

Fig.5

Fig.4: Closer view of the cable connection housing and the stub lines. Shows how these and the driven elements are mounted on the boom.

Fig.5: View of the completed prototype antenna mounted on a rotator for test purposes only, as explained in text.

Changing the Method of Assembly

Whilst different methods of assembly may be devised it is important NOT to alter the lengths of either the main elements and stub line lengths, or the diameters of the aluminium tube specified for these.

Final Adjustment

When assembly is complete, the full length of coaxial cable required to reach the final location of the antenna should be connected. The antenna should be set up *horizontally* in the open as high as possible above ground, say at the top of a pair of steps, or suspended from a rope clothes line but so that the cable connections can be reached for v.s.w.r.

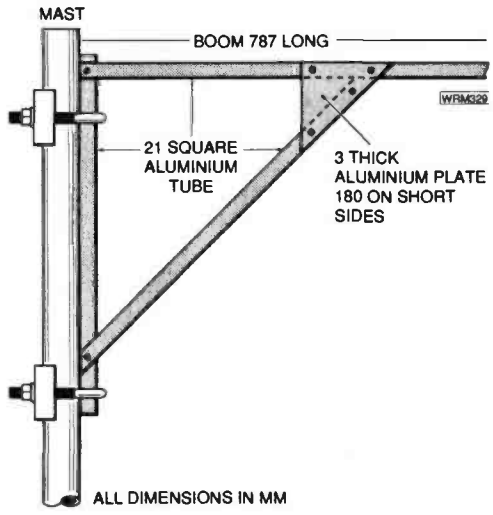

Fig.6: Suggested arrangement for supporting the boom and antenna and attachment to a metal or wood mast.

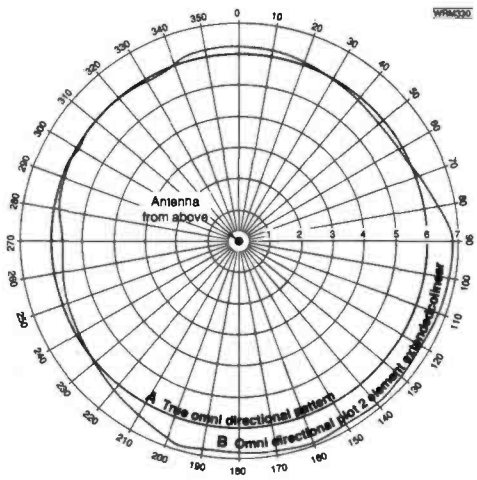

Fig.7: Plot A. Perfect circular omni-directional radiation pattern. Plot B. From the vertical extended collinear. Slight deviation due to other nearby vertical 2m antennas, proximity of metal mast and other conductors. The 3/8ths wavelength offset provided by the boom is about optimum and should not be less.

adjustment.

Set the cable connection box so the clips are about halfway along the stub and make an initial check for v.s.w.r.. It is only necessary to move the box and therefore the clips a little either way to bring the v.s.w.r. to as near to 1:1 as possible at band centre frequency (145MHz). Next, check the v.s.w.r. at each end of the band. It should rise only, if at all, by a very small amount.

If possible a further check on v.s.w.r. should only be made with the antenna as high as possible and vertical. The complete and tested antenna is shown in the photo **Fig. 5**. If all is satisfactory, the cover for the cable connection box can be fixed and to make sure no water can enter, run a little Evostick around the joint between this and the box and at any other point where water could enter, especially at the coaxial cable entry.

Attachment to a Mast

The antenna may be mounted on a wood or metal mast as suggested in **Fig. 6** (see also photo **Fig. 5**). The length of the boom is sufficient to prevent undue interaction between the antenna and mast and/or any metal guy lines supporting the mast. The coaxial cable is routed from the connecting box, along the boom and then down the mast for the same reason. With this mounting, the omni-directional (radiation in the horizontal plane) pattern displacement, derived from actual measurement made by rotating the antenna whilst receiving a steady signal, is minimal as shown in **Fig. 7**.

The prototype collinear is at present mounted on the same mast and at the same height, as a 12-element (2m) ZL Special. There is virtually no interaction between the two particularly when the beam is horizontal. Note that the collinear mounting boom provides a clearance, from the mast, of about 3/8 of a wavelength.

Performance

At a height of about 12m above ground (the author's QTH is about 4m a.s.l.) the extended collinear provides a very good local performance, that is over the whole of Norfolk and a long way South into Suffolk under what might be called normal conditions. During tropo lift good signal reports have been obtained from numerous European countries, France, Holland, Germany, etc., and from more distance locations around the UK.

Finally, it should be mentioned that the author makes no claim for original design except for dimensions, construction and the matching method for 2m operation of an antenna that was originally known as the Double Extended Zepp and used in the early days of amateur radio, in horizontal mode, for the h.f. bands. Few probably know that the so called 5/8 wavelength vertical used with a ground plane, or car roof mounted for 2m mobile operation, was derived from this antenna.

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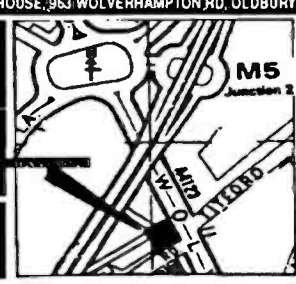

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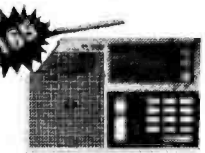


Dewsbury Supa-Tuta

We all need help when attempting to learn Morse code, so a new tutor is always welcome. Mike Richards G4WNC looks at the Supa-Tuta from Dewsbury Electronics.

Learning Morse code is never easy and tutors such as the Supa-Tuta from Dewsbury Electronics are a great help to many of us. Another interesting point about the Supa-Tuta is that it is entirely British made. A first look reveals an impressive array of useful features that should prove very useful to the learner. So let's take a closer look at the Supa-Tuta.

Presentation

I was most impressed with the appearance of the Supa-Tuta. Instead of the usual plain metal or plastics box, it employed a metal and plastics front panel with wooden side cheeks. Although this may sound like a fairly minor enhancement, it certainly looked attractive.

In addition to the tutor itself, there was a fourteen-page A4 manual that was bound by a simple and durable plastics strip.

The manual contained a good range of useful information about the workings of Morse code that should prove interesting for the beginner. As the Supa-Tuta used pre-programmed letter patterns, a large part of the manual was taken up with listings of these. This is, of course, very useful for checking the accuracy of your decoding and is a distinct advantage over simple random number tutors.

For the newcomer, there was a very useful step by step guide to getting started on the beginners courses. This single page was particularly valuable because of the unusual operating procedure of the Supa-Tuta.

Getting Started

Powering-up the Supa-Tuta required an external power source capable of delivering 9V - 14V d.c. at 250mA. For receive practice there were no other connections required as the Supa-Tuta had an internal speaker. However, there were several options available via sockets on the rear panel. Although the internal speaker was very convenient, family relationships are usually improved somewhat if headphones are used! This was facilitated via a standard 6.3mm jack socket on the rear panel. The output characteristics of this were designed for standard low impedance headphones.

The internal side tone oscillator could be used for sending practice by plugging a standard key into a 6.3mm jack socket on the rear panel.

For those who may want to use the Supa-Tuta in a classroom situation, it can be fitted with a relay output. This can then be used to key a more powerful oscillator. All in all the Supa-Tuta had a comprehensive range of facilities.

Operation

When it comes to operating the Supa-Tuta the first thing you notice is that all functions are controlled by a sixteen button alpha-numeric keypad. This was rather unconventional, but very practical. All the various facilities were selected by pressing the appropriate alphabetic key followed by a number then the space key.

One of the most important adjustments for the beginner is the speed. The Supa-Tuta had a range of 2 to 99 words per minute that should suit everyone from the raw beginner to the expert.

On the audio side both the pitch and volume could be altered, via the keypad. The range of pitch adjustment was 500 to 1250Hz and covered the 'standard' frequencies of 800Hz and 1kHz.

The volume control range was split into eight steps from off to full volume and proved to be adequate.

One useful trick for the learner is to practice with a fast character speed but with the inter-character pause expanded. This technique gives the learner some extra thinking time whilst still preserving the correct 'sound' of the character. The Supa-Tuta handles this with a programmable inter-character pause of up to 50 dots. As the normal spacing is 3 dots, you can see that this gives a very wide range of control.

The character generation system employed both stored and random message generation. The stored message technique requires a large range of patterns to avoid the problems that could occur if the operator starts to learn the sequences. The Supa-Tuta overcame this problem with a vast range of learning patterns.

The starting point was the beginner's course which was divided into ten lessons. The first lesson

REVIEW

simply repeated a single six letter group and made a good starting point. Each subsequent lesson added another group of characters with the latter lessons incorporating punctuation and accented characters. The concept of gradually building up to a complicated message is a well proven learning technique.

Once the beginner's course has been mastered you could move onto a set of ten training courses designed to further develop your decoding ability.

These courses operated in sequences containing twenty groups of characters. The first two lessons contained letters only and started with five letter groups building up to fifteen letter groups.

This was followed by some number groups of five and ten numbers per group.

The next lesson introduced accented characters in a similar format.

Mixed numbers and letters were included in the next three lessons that built up from five character groups to twenty character groups.

The final lesson in the main training course comprised random groups of mixed numbers and letters with a random group length. This was probably the most difficult test as there was no room for guess work!

Just in case this was not enough there were an additional ten messages that could be used. These were mixed letters and numbers arranged in five character groups containing 500 characters each

The final lesson had a very practical bent as it contained real words and abbreviations. Once the lesson was started it selected words randomly from the library of 69 words and 51 abbreviations. Although it was obviously impossible to list the actual sequences, the library of words was printed in the manual to aid checking.

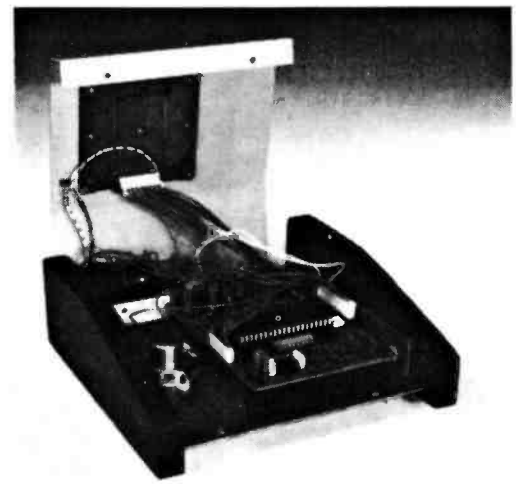
Acid Test

Although I enjoy Morse operation I don't very often get the chance to operate, so my Morse is a little rusty. This, of course, put me in a good position to evaluate the Supa-Tuta.

I quickly became accustomed to the operating technique and found it to be quite fast. The volume and pitch adjustment ranges were very useful and well chosen.

I am a firm believer that the best way to learn Morse is to start with a fairly high speed but with the letter spacing increased. The reason for this is that the correct rhythm of the Morse is maintained despite the slow overall sending speed. The adjustment range of the Supa-Tuta was wide enough to suit just about every taste.

I started with the beginner's course and had slight doubts about the effectiveness of repeated groups. These proved to be totally unfounded - the



repeated groups actually gave me some confidence that I was making progress! My Morse capabilities like many are not too bad on plain text, but when I reached the accented letters and punctuation I was struggling. Despite the difficulties I encountered, I thought the course was very comprehensive.

The ten training courses and subsequent messages and words made a logical learning progression. The use of stored character patterns was a real boon and I found it very useful for spotting common errors.

Summary

The Supa-Tuta certainly proved to be a very effective learning aid. The provision of external keying opens up the possibility of using it for group tuition. I can imagine that it could be used by a perhaps a radio club or college tutor to provide a well structured learning programme.

The ability to check your decoded Morse was a particularly useful extra that was great for catching those tricky common mistakes.

The only criticism I have is the use of an external power source - internal battery power would have been an additional plus.

As you have no doubt gathered, I was impressed with the Supa-Tuta. The combination of good looks, fine performance and British construction must make this a winner.

The Supa-Tuta costs £69.95 and can be obtained from **Dewsbury Electronics, 176 Lower High Street, Stourbridge, West Midlands DY8 1TG.**

My thanks to Dewsbury for the loan of the review model. **PW**

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Dayton Hamvention '91

SPECIAL FEATURE

Roger Hall G4TNT invites you to join us on our special trip to Dayton '91 - letting PW take the strain!

Regular readers of *Practical Wireless* will no doubt have read George Dobbs G3RJV's account of his trip to Dayton this year. We're sure that many of you will have thought about going in 1991. That's why we've put together a very special package deal for *PW* readers.

The full details are on page 34 and 35, but before you look at them, perhaps you should read about my experiences as an **independent** traveller to this year's show and see why it's easier to let *PW* 'take the strain'!

I went to Dayton to see if it was feasible for us to have a stand there, to chat to a few of the American dealers who have expressed an interest in advertising in *PW* and to meet some of the staff from the American magazines.

As we are a small independent company, Concorde was out and I had to shop around for the lowest air fare that I could find. After days of 'phoning around the bucket shops I eventually realised that the prices quoted in their advertisements were never available on the days that I wanted to travel.

I finally settled for flying into Chicago for about £350. This may seem a bit out of the way, but as Dayton is not an international airport it is not normally possible to get a direct flight.

The Journey

I set off from Heathrow airport on the Thursday morning and arrived in Chicago some 10 hours later. Chicago's O'Hare airport is not very well laid out. It took me some time to find the courtesy bus that I needed to take to pick up the hire car that I had booked from England.

After an hour or so of wandering around I found the bus and was taken to the rental company depot. Here, a very go-ahead young man at the reception desk tried to persuade me to take out various levels of insurance. The insurance costs would have more than doubled the cost of hiring the car.

Despite his dire warnings as to the possible consequences, I declined his offers and set off armed with the totally inadequate little map that seems standard issue from all American car hire companies.

Different Driving

Driving on the right-hand side of the road is not as difficult as you may imagine (but please don't practice on the M1 before you go), especially as most Americans are very considerate drivers. The biggest problem for me was sitting on the wrong side of the car!

On the Right Road

After circling the airport a few times, I eventually found the road with the right number but according to my map it should have been running north-south whereas all the signs read east or west.

I decided to take a chance and drove up the next slip road onto the freeway. That this was a mistake, became evident some hours later when I realised that none of the exit signs coincided with the towns on my planned route.

Heading For Canada

I turned off and managed to find a convenience store that sold Rand-McNally maps - definitely the ones to go for. When I explained to the cashier that I had been trying to drive from Chicago airport to Dayton, she laughed and said that it was a good job that I had stopped when I did because I was heading for Canada!

I was soon back on the right road, going the right way

and looking forward to seeing Dayton and about nine hours later I did! You cannot imagine the frustration of a 55 miles per hour speed limit on long straight multi-carriageway roads that disappear over the horizon.

My day had started when I got up at 5 o'clock Thursday morning, and it ended when I settled into bed at the hotel at 6 o'clock Friday morning, English time.

Lucky Choice

I was extremely lucky with my choice of hotel. The decision for me to go to Dayton was not taken until a few weeks before the show and I had booked into the only hotel that had a vacancy. Unfortunately it was some 40 miles outside town, as Dayton gets very full at Hamvention time.

The weekend before I was due to leave I had been talking to Terry Edwards of Radio Shack at the RSGB show in Birmingham. He told me that he had booked in at the Radisson Inn, which although expensive was right in the middle of things, but now found he couldn't go.

He was going to cancel his room the following Monday and suggested that I use his reservation. I accepted and as it turned out, this was an incredible piece of luck as the Radisson is where everyone from *Ham Radio*, *CQ* and *Popular Communications* stay every year.

I had a great time in the Hotel. There are two eating places just opposite the Radisson - and you'll get good value for any meal bought. There's 'Big Boys' - which specialises in outsize burgers - and 'Roy Roger's Family Eaterie' which, contrary to local stories, does not specialise in 'Triggerburgers'.

Alternative Activities

If you read George Dobb's article there's no need to tell you about the show itself, other than to say it really is the biggest and the best. It also boasts plenty of alternative activities such as jewellery making, pottery and so on.

Courtesy buses take visitors to and from the hotels, the enormous shopping malls and local places of interest. These include places such as the Wright Brothers Museum, as Dayton was their home town. There is also a great deal to do in the evening with much socialising!

I went to the hotel where the ATV enthusiasts were having a meeting. I met up with Andy Emmerson - ATV contributor to 'Backscatter' in *PW* - and we watched an interesting video that had been shot from a camera mounted on a model 'plane. The 'plane was in the car park and we had a play with that and with a kite equipped in the same fashion.

Heading Homewards

Monday came around all too soon and at 8am I set off for home. This time I didn't get lost and at 3pm I was at the airport check-in desk.

My flight was not until 7pm, but I always like to check in early so that I can book my favourite seat and get rid of my luggage. I also usually book in before returning the hire car as this means that I can then have a few hours sightseeing without having to worry about looking after my belongings.

Cancelled Flight

This time it was just as well that I had not returned the car as the girl at the desk casually informed me that they had cancelled my flight! There was no explanation as to why, only the suggestion that I should return at the same time on Tuesday.

It seems that the big red sticker on the front of my 'bucket shop' ticket - which I had not bothered to read - absolved them from all responsibility for delayed or cancelled flights!

Wilting Plastic

Feeling a little 'down', I did what most Americans seem to do when they feel low - and went straight to the shops. I drove out to the Woodfield shopping mall, which has more than 500 shops and is one of the biggest in America.

I then booked into a local hotel and spent the rest of the day spending money until my credit card started to wilt.

On Tuesday I went back to the airport, checked in a suitcase that was noticeably heavier than it had been the day before and sighed with relief that this flight had not been cancelled.

I also met a very nice American cop as I'd parked in an area where a large sign had advised me not to park. While I was at the desk the car was in view, and I noticed this cop walking towards it with a large book of tickets in his hand.

Leaving the desk I rushed out and explained to him that I was just checking in and would be finished in a few minutes. Instead of the ' Never mind that. You can't park here' reaction that I had expected, he asked which airline I was using. When I told him that it was TWA he said "American eh? OK take as long as it takes".

Tourist Tips

I met him again as I was leaving the airport and I thanked him for letting me park. We chatted for a while and when he discovered that I had been bumped off a flight the previous day and now had the rest of the day to kill, he spent about half an hour telling me all about Chicago.

The policeman told me the best route into town, avoiding all the traffic, the best sightseeing places and even where to park. He also told me about the areas where it is not safe for a tourist even to drive through.

As a result of that conversation I had a very enjoyable day in Chicago. I saw all the usual sights and some that I would never have found without his help. I also found some beautiful sandy beaches with palm trees, which rather surprised me as Chicago is at least 1000 miles from the sea!

I had forgotten about Lake Michigan, a lake so big that it could easily be mistaken for a sea. The one bad feature of that day were the terrible driving standards in the city centre.

It seems that big city drivers are the same the world

over and drivers of yellow cabs are far worse than their London counterparts. I certainly annoyed a few of them when I did a U-turn on Michigan Avenue, the main thoroughfare, but years of driving in central London have taught me that cabbies don't really mean what they say about your parents.

Confused Customs

I arrived back in England on Wednesday morning, Tuesday night having mysteriously disappeared somewhere over that Atlantic due to the time difference. It took me a long time to clear Customs because I had bought so much that the officer had some trouble working out the duty payable.

It's a great temptation to spend money in America as everything is so cheap. Petrol's only about 60p a gallon and everything else is considerably less expensive than in the UK.

Clothing, cameras, electrical goods and so on cost about the same in dollars as we pay in pounds, with some things costing even less!

Heathrow Hassle

I had just one more mishap, this time on my way out of the airport. I couldn't find my car park ticket. Anyone who has parked at the long term car park at Heathrow will know how big it is.

There are hundreds upon hundreds of rows of cars and dozens of bus stops. Although I had carefully noted the number of the row where I parked and the letter of the nearest bus stop, I had written them on the car park ticket.

The problem was simply resolved by emptying the entire contents of my luggage onto the airport floor and searching until I found the ticket. It was the final straw that made me determined to be a little more organised next time!

Flying PW

It's not easy, and not cheap as an independent traveller. That's why we've arranged a special *PW* trip to Dayton in 1991. The show will be held 26, 27 and 28 April next year and we have organised a complete package that will get you there without the trials and tribulations that can beset the independent traveller.

We leave from London on the Thursday before the show and after a 'plane change in America, we fly into Dayton on Thursday afternoon. Luxury coaches will take us directly to the Radisson Inn where we will be staying until Monday morning.

Throughout the show courtesy buses will be available from the hotel and from the show area. These will take you to almost anywhere you would want to go in Dayton, including to and from the Radisson. The package also includes your admission tickets for all three days of the show.

We leave Dayton on the Monday morning and fly back to London, arriving either late Monday night or early Tuesday morning.

Big Saving

The normal price for a return flight to Dayton is approximately £550 as it involves a change and because it's not one of the usual holiday destinations.

The Radisson Inn is an up-market American hotel that usually charges $80-$90 a night and the tickets to the show will cost about $15 each. On top of this we will be providing coaches to and from Dayton airport.

However, the total cost for our trip, including admission to the show, is just £499 per person. This price is based on two people sharing a twin-bedded room but does not include meals. The offer is strictly on a first come, first served basis, as there are only a limited number of places available.

Seat Reservations

If you don't want to miss this holiday of a lifetime, just fill in the coupon and send it in as soon as possible. A £50, non-refundable deposit will be payable to secure a place, but you need only return the coupon if you just want to register your interest without commitment.

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CB CORNER

There is a very welcome wind of change blowing through the dusty corridors of powers in the offices that regulate wireless communications in this country. The establishment of the Radiocomunications Agency (RA) within the DTI has borne immediate fruit in the plans for the proposed novice licence. Something that should tempt quite a few CBers to take the plunge and become licensed amateurs. The debate has just begun, and doubtless there will be strong opinions on both sides. Particularly about allowing access to the cherished segments of the airwaves, and the comparative freedom to use complex and costly equipment by relatively untrained, but not necessarily in radio terms, inexperienced operators.

I have nothing new to add, other than to say that the arguments, both for and against, have been trotted out with monotonous regularity at every change in the system and the laws from the year dot. Despite the doom and gloom merchants, anarchy still hasn't broken out on the airwaves. Possibly the reason for this is that most users of personal communications systems are sensible folk who seem to be able to live together more or less harmoniously.

The general relaxation of attitudes by the establishment is good news but RA officials have confirmed that there will be no let-up in tracking down the small number of idiots who persist in using powerful linear amplifiers or 'burners' to boost their infantile, and mainly incoherent rambling waffle. I find this surprising. It seems incredible that disgustingly 'dirty' burners are readily available. The problems they cause, from t.v.i. to interfering with vital services, still goes on. The yellow Post Office vans with their distinctive directional antenna systems, filled also with the dreaded 'buzbies', were a familiar sight in the early days. Due to their endeavours numerous 'cowboys' were brought to book. Either the authorities are using more discreet methods or they have scaled down their activities. This must be the case as I cannot recall seeing, or hearing of any significant prosecutions recently.

Tale Of Two Events

I know I have prattled on about the usefulness of CB for marshalling public events, but a couple of weeks ago I witnessed two genuine human tragedies that owe their wholly successful and speedy outcome to CB radio. Perhaps on the scale of world tragedies these were comparatively small-beer. Though in the mind of the small lost two-year-old child, the end of the world must have seemed very close. However the child was delivered into the safe keeping of one of the marshalls who quickly made a call to their base station. An immediate announcement was made over the p.a. system and within minutes mother and child were tearfully and joyfully reunited. The event in question was held in a large and very crowded farmer's field and sooner or later there is no doubt that the reunion would have taken place, but CB radio cut the worrying time to an absolute minimum.

Case Number Two

The second example occurred the following week and could quite easily have had a more serious outcome. The threat of rain at an event lead to a sudden and unexpected exodus. Cars were 'gridlocked' as drivers made for all available exits at once. Tempers were becoming very frayed, as one bold middle-aged driver took it upon himself to try and control the flow of traffic from competing exits opening onto the one small track leading onto the main road. Angry motorists simply ignored his well intentioned efforts.

Then the inevitable happened. He keeled over, clearly in the throes of a stroke or heart attack. A nearby marshal summoned help on her CB, which lead to an ambulance being called immediately, at the same time an appeal for medical aid went out over the p.a. system. Fortunately a trained ambulance officer, caught up in the jam, was able to resuscitate the victim and so limit the severity of the attack. Happily for the victim it turned out well. The prompt attention he received on site saved his life. Had it, due to poor communications, been unavailable he would most probably have died before the ambulance arrived.

The Verdict

Citizens band radio has had a rough ride over the years and frankly some of the adverse publicity earned in this time has been justly deserved. These two incidents though, illustrate the other side of the coin. It still has a valuable role to play and there are quite a few people around who literally owe their lives to this simple and accessible communications system.

Errors & Updates

Earth Tuner
October 1990 page 21/22.

Godfrey Baillie-Searle GD4EIP advised us that the following description of how to use the earth tuner may be in order.

The Earth Tuner In Use

The earth from the transceiver is connected to the input post of the earth tuner and the existing earth wire or any length of wire is connected to the output post.

The capacitor C1 and resistor R1 are both set to about mid-range, and using a low power output from the transceiver, tune the inductance control S1 for a maximum deflection on the meter M1. Then at this setting and using R1 to keep the reading on M1 below full scale, adjust capacitor C1 for a peak reading on the meter. At this point the chosen earth wire is working with peak efficiency.

Instruments For Weather Observation
October 1990 page 40 in the '8-page Weather Special'.

In column 1 on page 40 under the section labelled 'The March Of Time', a slip on the editorial keyboard changed one word which altered the sense of the paragraph. The paragraph in question starts "Sporadic-E can occur at any time.....". This should have read "Tropospheric propagation can occur at any time...".

A similar twitch removed a sentence in the paragraph 'The Barograph Explained'. After the first sentence add "It may be compared to a pen recorder used to record measurements of an electrical nature", then continue reading.

We apologise to both Ron Ham, the author of the instrumentation article, and to our readers for these errors.

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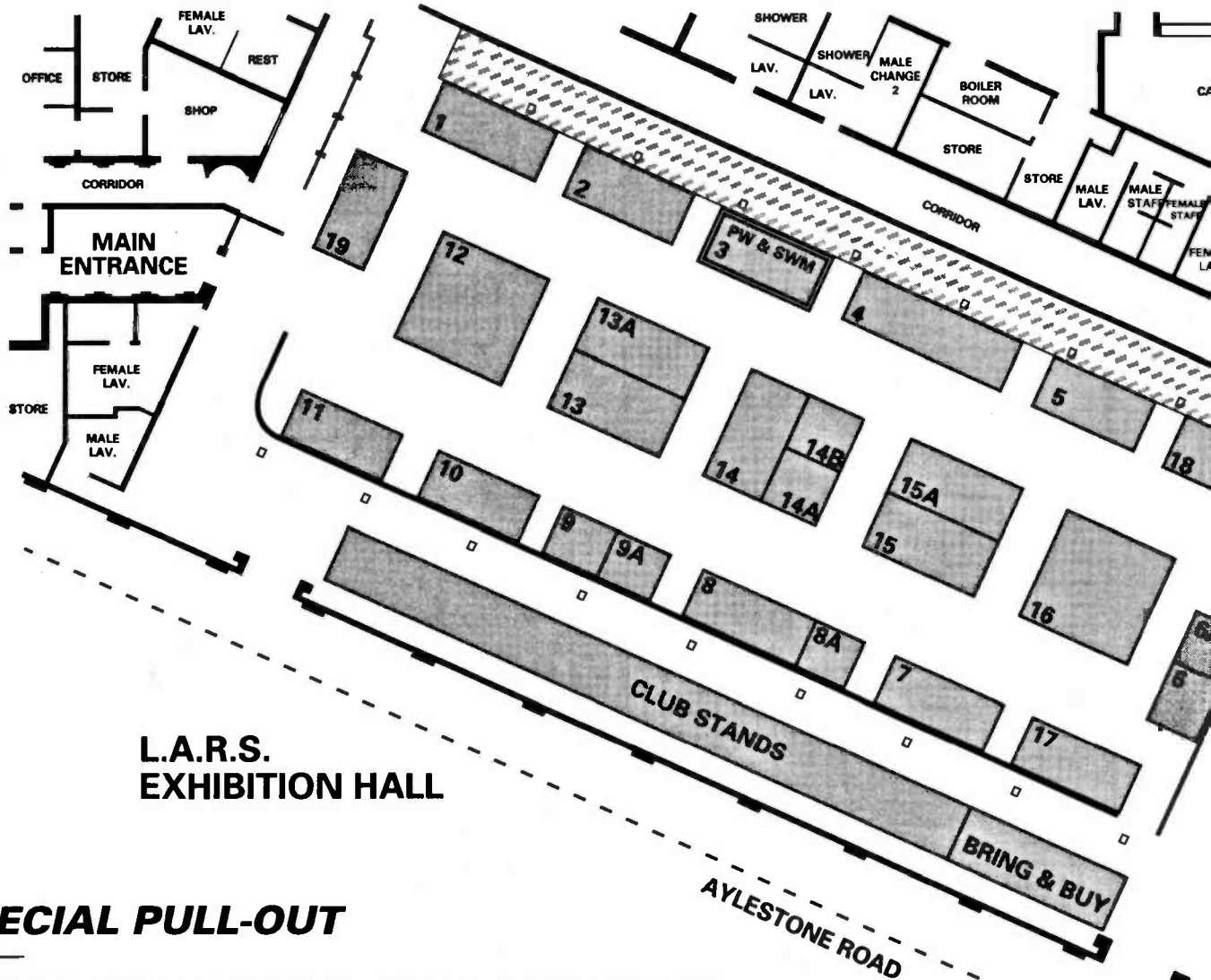

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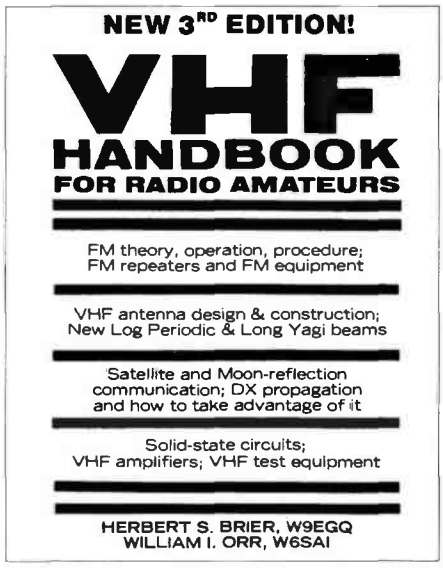
Book Review

PW BOOK REVIEW



VHF HANDBOOK FOR RADIO AMATEURS
Herbert Brier W9EGQ and William Orr W6SAI
335 pages, £7.95
Available from *PW* Book Service, 85p post and packing

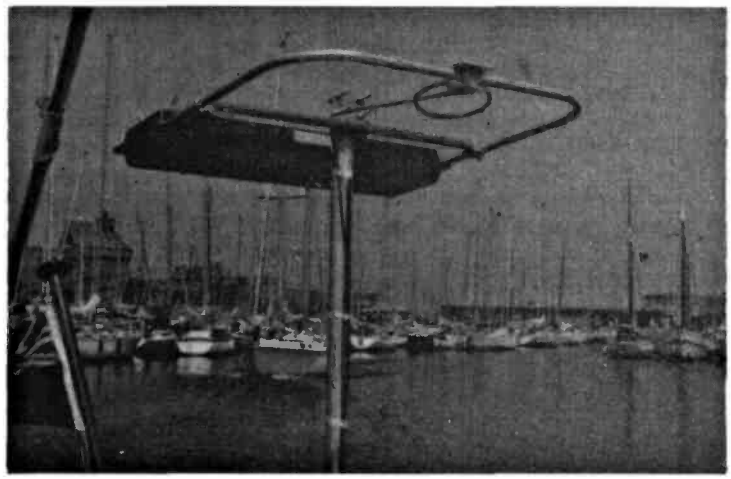
The 3rd edition *VHF Handbook for Radio Amateurs* is a difficult book to classify. It is a splendid history of v.h.f. and u.h.f. transmission history, and I was surprised to find out just how long ago it all started. There are also chapters on propagation, amateur satellites, moonbounce and v.h.f. components and noise.

This 335-page, A5 sized, book also manages to pack in many practical ideas. It is a source of information on building your own antenna systems, filters both bandpass and bandstop, test equipment, not forgetting transceivers and converters. Diagrams of antennas may be found covering the three major bands of 50, 144 and 430MHz. Complete with dimensions and hints to overcome most of the problems that beset the hobbyist when producing antennas.

At £7.95 it represents excellent value for money for both the novice searching for initial information and for the initiated searching for ideas to improve his or her present setup.

REVIEW

Space for antennas is at a premium for many radio amateurs. The problem can be greatest for anyone living in a flat or apartment. The AEA IsoLoop antenna is one approach to solving the problem. Rob Mannion G3XFD tried one and was surprised at the results.



AEA IsoLoop Antenna

The AEA IsoLoop HF Antenna 14/30, although new to the UK market, has been available in the USA for some time. The antenna was being advertised in all the American magazines that we receive in the *PW* office.

To be honest, at first I was not impressed with the appearance of the antenna. I was also extremely sceptical about the claimed performance of the unit. How could such a small loop such as this hope to be an alternative to a full size antenna? It didn't even look anything like antennas should!

Arrival Surprise

When the unit to be reviewed arrived I was in for a surprise. It was even smaller than I thought it would be after assembly. The assembly instructions supplied with the IsoLoop make the job very easy and I had little difficulty in mounting the loop into the main tuning housing.

I've already mentioned the instructions were clear, but I did find that one mounting bracket differed from the example shown in the supplied diagram. I soon got over this problem and had the assembled unit ready to mount.

As with all recently introduced equipment the buyer must be on the look-out for production line modifications. I'd already discovered one (the change in the design of a mounting bracket) but such changes can be of benefit at times as they can mean less assembly work.

Once I had assembled the IsoLoop the next job was to buy a suitable length of four core shielded cable, to connect the antenna to the remote controlled tuning unit. The remotely-controlled tuning facility is the real 'secret' of the IsoLoop as without it operation would be rather difficult to say the least.

With the unit on test I had to buy the cable and make up the supplied DIN plugs to each end. I understand from ICS Electronics, the UK agents, that AEA now supply a reasonable length of suitable cable with plugs already fitted.

When the IsoLoop was ready to attach to the 5m wooden pole (the only mast I had available) I carefully attached the antenna before erecting it in the garden.

Care In Cable Dressing

The main loop-tuning stepper motor is mounted inside a plastics housing. The housing can be removed by 'popper' type plastics re-usable rivets. The DIN plug of the remote control cable is applied to a DIN socket underneath the housing and AEA provide clear instructions that care is needed 'dressing' both the 50Ω feeder cable and the control cable for best results.

I must admit that (knowing our climate) I was surprised that un-protected DIN plugs and sockets were being used in an environment that would expose them to the 'elements' (forgive the dreadful pun!). If the antenna was to be erected for any length of time outside I would certainly wrap and seal all the external connections with self-amalgamating tape and silicone grease.

On The Air

As I had not been impressed with the antenna at first sight, I started the 'on air' tests with some foreboding but these thoughts soon disappeared as the DX appeared on my rig. For the tests I used my KW2000B transceiver for 14 and 21MHz and also a converted multi-mode CB rig on 28MHz.

On 14MHz I found that the IsoLoop tuned up very easily, once I had got used to the remote-tuning control. Tuning across the band I quickly 'got the hang' of the loop tuning by listening for the signal peaks as the stepper-motor slowly turned the variable capacitor and resonated the antenna.

I was unprepared for the very noticeable 'peak' obtained as the loop tuning control was in use. Until the antenna is 'peaked' at the operating frequency it appears to be very 'dead'.

To help the operator obtain the best results, the stepper motor speed can be adjusted and I found this facility most useful. The very low background noise level is very deceiving and the remote tuning facility proved to be very sensitive. It just goes to show how much we've become used to the various forms of 'hash' and interference heard on the h.f. bands!

Although the IsoLoop is rated for a maximum of 150W I found that even when driving my KW2000B to 75W on c.w. I obtained consistently

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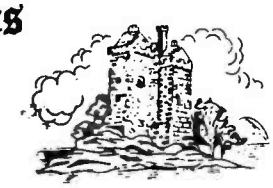

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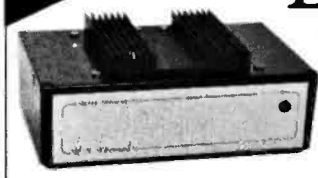

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good reception reports. In the ten days or so I had the antenna in operation, propagation conditions on 14MHz led to many 'short' skip and DX QSOs.

Splatter Attenuated

'Splatter' from poorly set-up and badly operated s.s.b. transmitters has been a problem on 14MHz for many years. I've no doubt that many readers have tuned a long way up or down the band to locate the source of this annoying (and unnecessary) interference. The high *Q* of the series radiating *LC* combination of the antenna helps to overcome this nuisance. Any transmission more than 15kHz above or below your operating frequency will be drastically attenuated.

The best DX I worked on 14MHz was into Soviet Central Asia, into South America and the Pacific. There was much interest shown by stations in the USA when they heard what antenna was being used.

There were only a few occasions when my received transmissions were awarded less than S9. Mostly, I was able to give similar reports but it was interesting to note that almost invariably the other station was using much higher power than me!

As I didn't have access to a rotator all my tests were with the antenna mounted horizontally, utilising the omni-directional characteristics of the IsoLoop. The antenna can also be used mounted in a vertical plane. When mounted in this fashion the directional properties can be used to null out interference and allow the operator to use the main lobe from the antenna to best effect.

Ten and Fifteen

On 21MHz I worked down into Asia and could hear many JAs. I didn't work any Japanese stations though, because of the 'pile-ups' that ensued and I was competing against kilowatts into beam antennas.

It seems that every American station wants to work JA! Despite not being able to work into JA, I was most impressed with the antenna's ability to effectively reduce background noise and allow the relatively weak DX stations to be heard.

On 28MHz (undoubtedly my favourite band nowadays) the antenna came into its own. I worked a great deal of DX with the KW2000B and found that the antenna would still give me S9 reports from Californian and other west coast USA stations - even when it was mounted just one metre above the ground.

I then decided to 'have a go' with my newly-converted multi-mode CB transceiver on 28MHz. This rig can just about manage 15W p.e.p. and using the IsoLoop I was soon in QSO with a Hawian station.

Much to my surprise and pleasure I also heard and worked several a.m. stations operating from the American mid-west. Propagation conditions on 28MHz at the time enabled me to hear both sides of UK - USA QSOs and I discovered that the high *Q* filter effect of the antenna - greatly reduced 'hash' interference from my word-processor, which I placed close-by for an 'acid test' knowing it would make an ideal source of 'hash'.

British Climate

Although I was most impressed with the results from the IsoLoop, I had one or two reservations regarding the control and the electrical hardware of the antenna. I was also particularly concerned that the externally mounted DIN type plug and socket used for the remote control facility, would cause problems when exposed to the vagaries of the British climate.

I contacted ICS Electronics who supply the antenna to discuss the various points. I discovered that the newly-imported models come complete with ready-made-up control cables. They also informed me that the manufacturers are considering mounting the DIN socket inside the flat, box-like, plastics housing containing the stepper motor and variable capacitor.

The other points discussed with the importers, concerned the remote tuning switch operating the stepper motor. I suggested that as the operator would be using the tuning control a great deal, that for comfortable operation, the centrally 'biased off' toggle switch for the stepper-tuning be replaced by a Morse-keyer type paddle.

Added to their on-going developments in the weather-proofing areas mentioned, the manufacturers are also working on a model to cover 7MHz which I am in no doubt will prove to be popular with the keen 'forty' operator.

One big advantage for the radio amateur with planning and space problems, is that the IsoLoop doesn't look anything like the usual antenna and it could be used in situations where antenna erection could otherwise be difficult!

Conclusions

Well, I'm convinced that the IsoLoop antenna is a viable alternative for anyone who cannot erect a full size dipole or multi-band vertical. I tried the antenna inside our house and it still worked very well, particularly on 28MHz QRP operation.

For the amateur or s.w.l. living in an apartment or a flat with no chance of an outside antenna - it could be an ideal solution for the h.f. bands above 14MHz. Boat and caravan operation is also easy, especially as the remote control unit is 12V d.c. powered.

Owners of high-sided, coach-built motor-caravans who want to work mobile, could solve their often difficult problem of where to place the antenna by using an IsoLoop. The antenna could be mounted just above a roof-rack.

To sum up, I must admit that the IsoLoop's performance took me by surprise. I enjoyed using it and await the arrival of the 7MHz version with interest. The antenna is available for £299.95 including VAT from **ICS Electronics Ltd., Unit V, Rudford Industrial Estate, Ford, Arundel, West Sussex,** who kindly loaned me the review antenna.

PW

REVIEW

Specifications

Frequency Coverage:	14 to 30MHz
Nominal Impedance:	50Ω
Power Rating:	150W
VSWR:	Less than 1.4:1 (no nearby objects)
Temperature Range:	0° to 50°C (operating*), -50° to 60°C (storage).
Dimensions:	900 x 900 x 90mm (maximum)
Maximum Mast Outside Diameter:	32mm
Weight:	5.44 kg
Coaxial Connector:	u.h.f. type SO-2399
Gain:	Approximately that of a dipole

* Because the IsoLoop is such an extremely high-*Q* antenna, its performance will be degraded by accumulations of snow. Also, freezing weather preceded by heavy moisture may result in temporary failure of the remote tuning mechanism.

Feature

Lower Frequencies in Smaller Gardens – PART 1

Don't give into your small garden is the message from Paul Essery GW3KFE. Paul aims to encourage anyone in a situation where it seems h.f. operations would be hopeless, with some practical ideas.

Since I retired, I've lived in a small house with a garden some 8 x 6m at the back and 5 x 6m out at the front, in a valley with hills rising to 330m or higher in every direction but for a small gap to the north-east.

The front of the house faces north-west. It didn't seem too promising for operation on any band. However, the presence of GB3PW some 6km to the SW at a height of some 560m a.s.l. was enough to at least put me in contact with the locals.

To cover 14, 21 and 28MHz I initially used an indoor beam in the loft, then a vertical followed by a two-element outdoor tri-band beam at approximately 8m above the ground.

By careful siting, it was found possible to arrange that when 'parked' and out-of-use none of the beam elements extended beyond the confines of the plot. However, when working DX it would usually overhang the adjoining gardens.

Griping Authority

When the authorities griped about the beam, I replied that when they removed all the illegal CB antennas, I'd be pleased to take my beam down and backed it up by commenting that the beam was a 'temporary' one anyway, moved more often than at 90-day intervals.The authorities didn't respond, CB antennas are still there, so the beam is still up!

By the ploy of advising everyone that I was very active and then staying in s.w.l. mode for several months, and - above all - having a TVI-proof TV set actually sitting next to the linear as part of the station, I was eventually 'up and running' on four bands namely 144, 28, 21 and 14MHz. Later I added 432MHz. In that time I had one TVI complainant and that was soon cured.

Mountainous Problems

That left me with a problem, namely the lower bands, 1.8, 3.5 and 7MHz. Some experimentation seemed to be called for. First, because of the mountains and the fact that even the locals on the Sunday morning net suffered marked fading, it was fairly evident all communication, even in daylight, on 3.5 and 1.8MHz was based essentially on sky waves.

Secondly it was noted that my house was wired up in accordance with the questionable PME (Protective Multiple Earthing) technique, and whatever I did would allow for this problem.

Thirdly, the underlying rock structure wasn't exactly encouraging. Fourthly, I got hold of some wire. The stage was now set for a series of 'suck it and see' experiments.

Earthing Precautions

My first test was to use the available mains earth, but taking some precautions. These were very simply, to ensure the station was always switched off by removal and physical separation of the power plug at the mains socket.

Up 'aloft' I had a half-wave of thin (28s.w.g.) wire which left the a.t.u., went out and up to the eaves (say 5m) from whence it sloped down the garden to the back fence which it reached at about eye-level.

The wire now continued at this level around three sides of the garden, ending up quite close to where it started! By using a half-wave of wire I hoped to keep the current in the earth down to a lower level.

The low height of the current portion, would I thought, cause most of the r.f. to go up and hence out of the valley. I then stuck with this configuration until I had a 'feel' for how it behaved. The feed was by way of my home-brew a.t.u., so that at least the transmitter would 'see' the 50Ω it yearned for.

Thicker Wire

Around this time I had painters and builders around, so since they couldn't see the thin wire before the ladder had hit it, I had a renewal job to do. This time the wire - a bit thicker stuff - went up as before, then across the back of the house until it turned down the garden at which point it was about 3m high.

The wire now went down the garden, reaching the fence at approximately 2m above the ground as before, where it turned and ran about half-way across to end in an insulator. Clearly the new configuration wasn't much better and worse, it was going to look like a much lower impedance at the feedpoint.

Radio Motto

As always though, 'suck it and see' is the radio amateur's motto. Practically, the thing seemed to be performing more or less unchanged, no improvement for sure, but not noticeably worse either.

Stage three came next, when a reel of tinned copper wire of about 24s.w.g. was acquired in a 'junk sale', (the local 'wags' claimed it was to repair my car!). Each side of my garden is defined by a wire-link fence, with horizontal and vertical strands of about 12 gauge galvanised wire at 150mm intervals. This fence is held vertical by steel angle posts sunk well in the ground to act as guy anchors. The end of the plot is closed by a timber fence.

From the earth terminal I ran a length of the tinned copper wire out of the house, spiralled it round the topmost strand of the fence at a rate of about one turn every 150mm or so. I then ran the wire across the end of the garden, returning it towards the house again. It was finally wrapped round the top strand of fencing on the other side.

Measured Improvement

Where it went past the back gate, the wire was dropped right to the floor, clamped to the gatepost with drawing pins, and on the other side, back up to about 150mm above ground level. Nothing was soldered, nothing else was altered and in fact the wire ran where circumstances dictated.

This extra 'earthing' alone had given me around a 10dB measured improvement. I might add that it tends to confirm my belief that at these low frequencies, radial wires above ground are more effective than they would be when buried.

Mainly Low Angles

Now, it is stated in most of the textbooks that a ground-mounted quarter-wave Marconi-type antenna will radiate mainly at low angles. 'Tain't necessarily so!' There are in fact two functions associated with the earth side of such a Marconi antenna.

The first is, that of getting the return currents back to the feedpoint. This task is nicely covered by using many radials, since the earth return currents are highest under the antenna.

However, the second requirement really involves being able to maintain a decent earth plane out to many wavelengths from the (vertical) antenna. Anyone who has used a vertical on the seashore or from a lighthouse will know what happens, the level of the DX from out to sea is quite frightening!

One light-keeper, GW3VVZ for example, in his time at Nash Point lighthouse would hear Ws on 1.8MHz from twilight onwards. So, in sum then, the ground radials, whether above or below the ground, serve merely to reduce the losses in soil heating. It is the quality of the ground out to approximately 100 wavelengths or more from the antenna, that determines whether or not the low angle radiation observable over sea will be attainable at the chosen site.

Mirror Simulation

For an experimental demonstration of this, try a small scrap of mirror and pin (the pin simulates the vertical antenna, with the pin's mirror reflection simulating the vertical's ground image). As you get your eye near the horizontal, you'll lose sight of most of the pin's image in the mirror.

Repeat this test on a much larger mirror and you can get right to horizontal before you lose sight of the image. Remove the mirror altogether and sit the pin over a piece of cloth, and you'll lose sight of the image.

The mirror 'image' equates to the vertical's image in the ground, without which it wouldn't work. Adding wire in the ground equates to silvering the mirror at the frequencies I'm using.

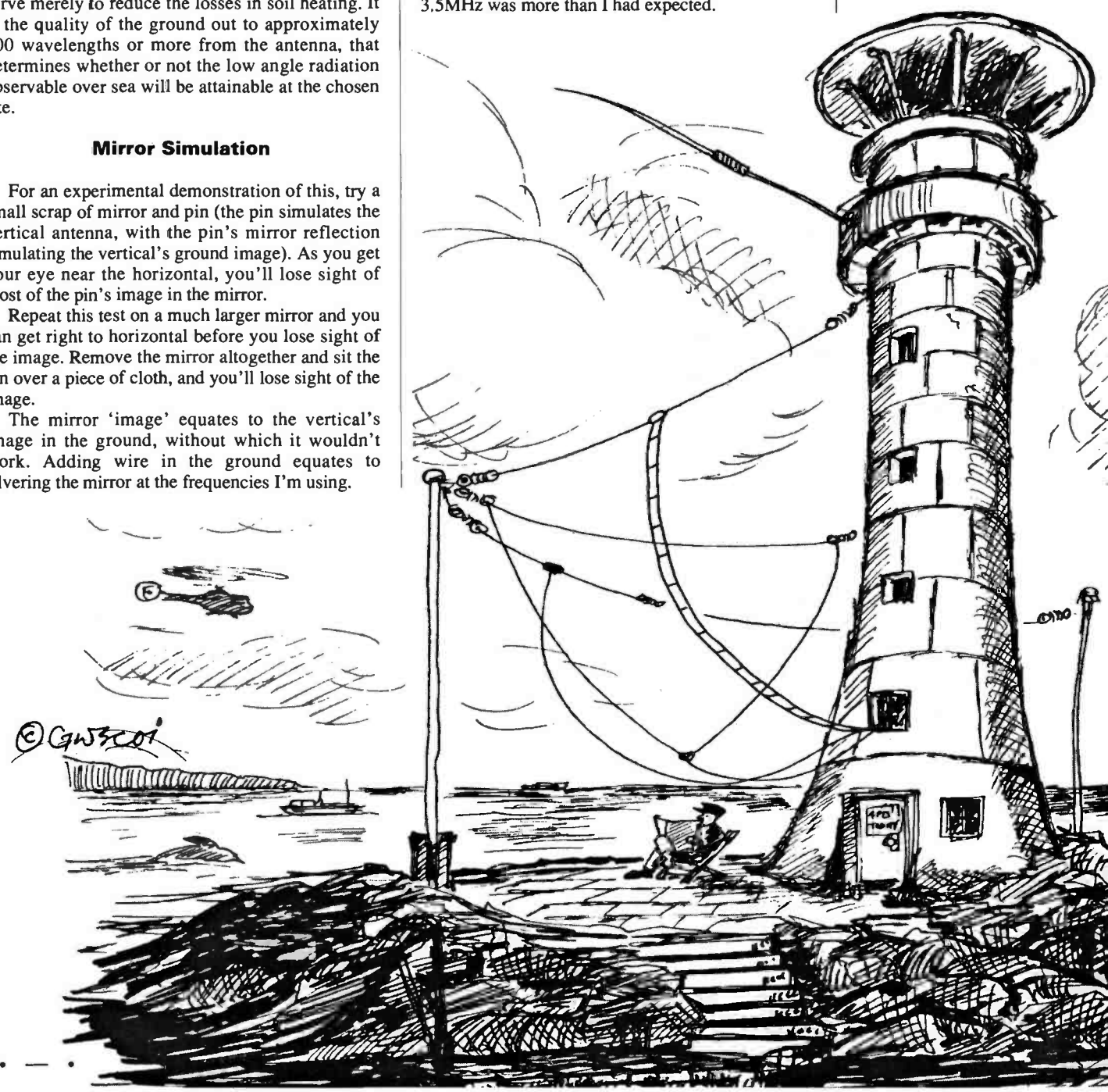
High Hills

However, back to practice! I've already mentioned that this QTH is surrounded by high hills. My house is approximately 100m a.s.l. and the hills are all over the 300m mark, save for a very narrow gap around NE - a singularly useless direction!

So, it was reasoned that I had to accept the need to radiate my best signal upwards to at least some degree to get over the hills. Measurement indicated that 2.5° to as much as 7.5° was needed to clear the hills. Since most of the radiation would be at higher angles, there really didn't seem to be too much risk of much r.f colliding with the hills!

So, after all the experimentation, matters rested for several months and I was encouraged by the results. But I improved the ground system, by adding extra wire radials, both above and just under the ground.

Each extra radial added to the effectiveness of the system. Certainly I hadn't got a DX-inhaler, but even to be called by an 0Z9 one Sunday noon on 3.5MHz was more than I had expected.



Invisible Antenna

What was more important, the system was now almost invisible. With a bit of fiddling the a.t.u. could be persuaded to load the 'thing' on 1.8MHz and 7MHz - although that achievement was a credit mark for the a.t.u. rather than the antenna!

What next ? The roof of the house was about 8m high. How about taking the wire almost up to the roof-top, then leading the surplus back down as inconspicuously as possible? Inevitably there would be some cancellation in some directions, but would it matter? The only way to find out was to try it.

String Over The Roof!

Basically speaking there are several techniques available to get over a roof. You could use a strong and trusty right arm plus a child's ball, a bow and arrow, a radio-controlled model helicopter or even climb up. All these methods are possible, whether they will succeed is another matter altogether!

It has to be admitted that my throwing powers aren't what they used to be - due to the onset of 'old age'! Instead, my friendly neighbour Steve decided to have a go.

Under the watchful eyes of the children who'd loaned us their favourite ball, we started the job. At the first attempt the ball soared up to the roof-top, was caught by the prevailing wind and blew along the ridge. The string then snagged on a slate. A quick yank from below and - you've guessed it - the string broke. Break off operations, jump in car, go purchase the youngsters a new ball!

Next, with the help of a long ladder and a couple of bamboo canes, GW0JAI at the top and me at the bottom footing the ladder, we recovered the ball. Progress - I had at least got back to the starting line!

We soon perfected the technique and it wasn't all that difficult. The only snag was that although this time the ball went over OK, the wind took it into the next-door garden - fortunately they were away and I had no trouble completing my 'vertical'!

Measurements

As Shakespeare would have expressed it - to load, or not to load, that is the question. The first tests were to establish some sort of relationship with what had previously happened.

Make no mistake, the keeping of a 'lab notebook' and writing up each and every test carried out is absolutely invaluable when playing with antennas. Because 'conditions' change continually, you need more accurate 'controls' on any experiment.

To that end, I record - and I have done so for thirty-odd years - the exact configuration of the antenna, TX and a.t.u. settings and field-strength meter readings taken at various carefully defined positions. The field-strength meter itself is checked and calibrated to produce a specified reading on the meter for a specified input drive.

With care and precautions such as these, I can reproduce fairly accurately, a configuration that was taken down years ago. It's not possible for me to measure the system 'gain' - but neither can most professionals to judge by the claims one sees in the ads! . . . **To be continued.**

In Part 2 Paul looks at Calibration, Testing, Results, Radials and Loading.

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SA 450N	Toyo Coaxial Switch 2 way 2.5kW 1-500MHz 'N'	£26.00	£2.00
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K 20	Koyo 15/50W 2m	£24.60	£2.00
K 100	Koyo 2KW 1.8-60MHz	£79.96	£2.00
K 200	Koyo 200W 1.8-60MHz	£61.55	£2.00
K 400	Koyo 200W 140-525MHz	£63.65	£2.00
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FT73R	70cm Mini H/H	£229.00	–
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QRP CONTEST RESULTS

This month Neill Taylor G4HLX describes and presents the full PW QRP contest results

The 1990 *PW* QRP contest attracted entries from 115 groups and individuals - a significant increase over 1989. For the first time in the eight-year history of this event, the winner is an English station! The Mansfield Contest Group G0MCG/P, operating from Harboro Rocks in Derbyshire, become the contest's first non-Welsh champions.

In second place, leading the Welsh stations, is GW4VEQ/P, Tony and Tom Jones, as The Cymru Contest Group on their Anglesey site. At the same time they take the title as the leading station using a single antenna.

The leading Scottish station and winner of the Tennamast trophy, is again GM4CAA/P, the Civil Aviation Authority Radio Society (Prestwick), located on Lowther Hill in Strathclyde. Amongst the EI and GI entries, the leader is GI0EJN/P, Fred Sweeney and Paul Knocker, who climbed Slieve Donardo, the highest point in Northern Ireland. Of the 43 single operator entries, which included some noble one-man back-packing stations scaling various mountains, the leader is Roger Dyke GW4NVA/P operating from a popular spot near Wrexham.

The summary results tables shown here give details of other leading stations - congratulations to all certificate winners. The results list of all 115 stations was published in 'Newsdesk' in the October issue of *PW* (page 19). Entrants who submitted an s.a.e. with their logs will shortly receive the full detailed results list. Anyone else requiring a copy should send an s.a.e. to the *PW* offices. The detailed results table will also be distributed via the packet radio network shortly after this issue is published - look for it on your local BBS by using the command L< G4HLX.

High Activity but Poor Conditions

Many entrants remarked on the increased activity in this year's event, but offset by the most mediocre of propagation conditions in the contest's eight-year history. "Conditions were very poor," says GM0ICF/P and "generally we found the band to be flat," at G8PGM. The remark by G6ARC/P: "nothing special in the way of DX to report," seems to have been an understatement - searching through the logs for some sort of exciting event yielded nothing. Nevertheless, many operators were delighted with what they could achieve with only 3 watts in such flat conditions. G0EHV, for example, who says "no real DX was heard at all. However, 3 watts of power to the South Coast from Tyne and Wear must be good going".

Peter G0JEW operates G7APD/P while Andy G0AMD tackles an all too common problem.

The distribution of the active stations gave rise to some comment, for example from G0MCG/P: "what was pleasing was the number of GM stations that were around to work", while at G6HH/P, near Hastings and thus just a short hop across the Channel, they found "absolutely minimal operation on the continent". G0JLF/P (in IO80) complains of "a complete absence of contacts in IO91 square. Where were they all?". Well John, there were at least the nine entrants in that square active, plus the contest adjudicator himself and many others "giving away points", so perhaps this shows how easy it is to miss a square as a multiplier.

One common observation of activity; many stations found it very slow going towards the end of the contest. GW6TEO/P probably has the answer: "Where did everyone go to after 1500 hours? No contacts for 40 minutes! Was everyone watching Ireland play in the World Cup?"

Weather

For many, the tradition of a hot sunny day for the *PW* contest continued. At G6HH/P "the weather was exceptional and allowed operation at a picnic table all day". In some areas however, this didn't last. G6ESJ/P says "the fine sunny morning was wasted on us as we raced to get set up in time. Later the weather, like our performance, deteriorated and the afternoon was spent in drizzle." The consequences of wet weather for portable stations are various. At G1GVA/P "in the afternoon it rained. I had to keep the car window open to pan the antenna so the last three pages of the logs got a bit damp." Mountain summit conditions can be rather more severe, at GI0EJN/P the high winds took their toll on the 8-element quad, which lost its reflector - "we brewed some more tea and carried on regardless, the tent was cosy and neither of us fancied the struggle with the wind to get it down and up again."

Perhaps the most severe effect was at GM3NHQ/P, at 1245 metres a.s.l. on Cairngorm. He only stayed for half an hour because "it was a bit cold due to the snow lying nearby!"

Signal Quality

One disappointment this year was a number of remarks about stations apparently radiating poor quality signals. Although no seriously broad signals were heard by the adjudicator (just a few which sounded rather 'odd'). It seems that in some areas there were problems, which is an unwelcome change for this contest, having had relatively few such problems in the past. In the articles about the QRP contest, the importance of having a receiver which has good strong signal handling capability has always been emphasised, and the inevitability of problems when stations operate at close range has been highlighted. Equally, the correct adjustment of the transmitter and especially, any speech processor in use, has always been underlined. Some operators seem to think that a low power rig can't cause any problems, whereas in fact there is just as much scope for over-driving and producing a broad signal as when a high power is in use. And, as has so often been said, even a QRP signal can be very very strong, especially when it comes from a superb location and is backed up by an array of large Yagi antennas.

The comments received this year were mainly of a general nature and of those who did implicate individual stations, no more than one complaint was received against any particular station. However, for next year's contest we will be looking for a way of encouraging genuine reports of poor signal quality and penalising the offenders - a 'get tough' policy to nip this unwelcome development in the bud!

Leading multi-operator stations

Pos	Name	Call	Score	QSO	Sqs	Loc	Ae	a.s.l.m	TX/RX
1	Mansfield Contest Group	G0MCG/P	15040	376	40	IO93EC	4x14P	380	IC-275E
2	Cymru Contest Group	GW4VEQ/P	13904	316	44	IO73XC	6Q	1080	TR-751E
3	Guildford & District RS	GW5RS/P	7337	253	29	IO81NV	4x19Y +2x17Y	425	IC2-51E
4	R. Thornley & S. Maher	G1NUS/P	7221	249	29	IO93CF	2x9Y	400	FT-290R
5	Oldham Radio Club CG	G1ORC/P	6748	241	28	IO93BJ	2x9Y	635	IC-251E
6	The TOAD DX Group	GW1MOU/P	6578	253	26	IO82KW	16Z	405	FT-290R
7	Rugby Amateur Transmitting Society	G7APD/P	6554	226	29	IO92LJ	4x17Y	210	FT-225
8	Civil Aviation Authority RS (Prestwick)	GM4CAA/P	6300	225	28	IO85DI	17Y	725	FT-290R
9	Truckers Contest Group	GW1HGV/P	5373	199	27	IO81KW	9/9S	800	TR-751E
10	The Windbreakers CG	GW4VIX/P	4975	199	25	IO81LR	2x15Y	425	IC-275

Certificate Winners

Leading single operator stations

Pos	Name	Call	Score	QSO	Sqs	Loc	Ant	a.s.l.m	TX/RX
11	Roger Dyke	GW4NVA/P	4876	212	23	IO83JA	17Y	560	FT-225RD
19	David Wright	G0MTV/P	3725	149	25	IO94MJ	18Y	425	TS-780
22	Jon Page	G1POS/P	3427	149	23	IO92CA	8Q	300	FT-480R
23	Peter Thompson	G8DDY/P	3322	151	22	IO90JO	2x19Y	235	FT-221R
24	Dave Hewitt	GW8ZRE/M	3278	149	22	IO83JA	HB9CV	560	TR-751E
32	Gary Hawkins	GW1YOA/P	2907	171	17	IO81LS	17Y	580	FT-290R
34	Tony Crake	G1GVA/P	2793	133	21	IO91GI	13Y	290	TR-751E
41	Dr. John E. Tindle	G3JXN	2106	117	18	IO91UM	9Y	60	TS-790
43	Steve Williamson	G3WGU/P	2079	99	21	IO83OW	10Y	510	FT-290R
47	Tim Raven	G4ARI	1820	91	20	IO92IQ	10Y	200	F-850

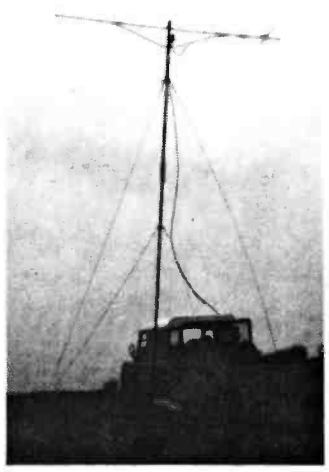
Overall Winners	Mansfield Contest Group	G0MCG/P
Runners-up, Leading Welsh station and Leading single-antenna stn.	Cymru Contest Group (Tony & Tom Jones)	GW4VEQ/P
3rd Place	Guildford & District Radio Soc.	GW5RS/P
Leading single operator	Roger Dyke	GW4NVA/P
Runner-up single op.	David Wright	G0MTV/P
3rd placed single op.	Jon Page	G1POS/P
Leading Scottish Station	Civil Aviation Authority RS	GM4CAA/P
Leading Irish Station	Fred Sweeney & Paul Knocker	GI0EJN/P
Leading fixed station	Sutton & Cheam Radio Society	G3OLX

Operating Practice

On the brighter side, QRP contest entrants continue to maintain a high standard of operating. G0EHV, who has "worked many contests in the past", notes that "operating standards seemed very high". At GI0EJN/P, "we felt that operating standards and courtesy shown were generally excellent both by the portable stations and the many fixed stations who gave points to so many." Of course there's always the odd one - G6HH/P says "standard of operation by all but one wally was good."

A few specific operating procedures are worth sharpening up, however. At G0JLF/P, "it was surprising how many stations called us at least twice after working us. Obviously checklogs were not being used as effectively as they should." Elsewhere they were in use, but with insufficient care: G6ARC/P kept finding that "some stations thought they had already worked us", there was GW4ARC/P and possibly other ?-ARC stations active. "So perhaps some thought needs to go into check-logging" concludes G6ARC/P.

G1JHZ/P was concerned about congestion: "When will people learn that there is life outside the band 144.250 - 144.350MHz? Such crowding just caused huge amounts of QRM." There's also the long-standing meaningless signal report phenomenon. While some stations seem hell-bent on giving every contact RS59, no matter how much difficulty they are having in copying, GI4SJB/P remarks on the other extreme: "How the station that gave me RS20 as a report heard enough to know who he was talking to beats me."



GW6TEO/P apparently on the brink!

Mishaps

As usual, there was no shortage of groups for whom things went less than smoothly. Site problems beset GM6FPX/P; "the farmer giving me permission had forgotten he'd already said yes to another group. I got there to find antennas already erected." The site at G1JDP/P turned out to be less than perfect, too. They found themselves with a problem one doesn't expect after climbing to 520 metres - "passing within 6 metres of our station was a vintage car rally. What a noise, with ignition systems red hot after the long climb! For two hours they passed". A more conventional problem at GW4VEQ/P, "a transistor blew in the rig at 1606 and that was the end of that." A less common, but important, piece of equipment failed at G1JHZ/P - the digital watch! "I did not ask other stations for the time as I felt this would create more difficulty", so he estimated the time aided by the odd contact with a friend who gave him time checks, and by listening to BBC broadcasts.

There was "one costly mishap" at the winning station, G0MCG/P. "The generator, which was borrowed for the first time, blew the mains power supply in the IC-251E. We tested the mains and found that it had 120V between earth and neutral! Fortunately we could run the IC-251E on 12V so some hasty changes enabled us to continue."

However, the greatest misfortune must surely have been that of Peter PE1MHO, visiting Scotland and operating as GM/PE1MHO/P. He earns the distinction of achieving the lowest ever score by an entrant in the contest - just ONE point! He explains: "Our DXcapade turned into an absolute fiasco. Due to a misunderstanding with the ferry operator, I was unable to get to the Isle of Mull, so my wife and I went out to the Ardnamurchan Peninsula, the most westerly part of the UK mainland - I wish I'd never thought of it! All those miles just to reach the spot, all that being eaten alive by midges, and for what? ONE QSO! Just to add insult to injury the gearbox in my car (not yet two months old) seized up. I had to pay £144 towing costs. This has resulted in a ban on future DXcapades from my XYL. She says next year I'll have to do it here in Holland".

One compensation for Peter - despite everything, he gets the certificate for being the leading station in IO66 square!

A Great Day

"A great day, a great contest", says G6HH/P, with similar sentiments from many others. G6ESJ/P notes that "it is a great first contest for beginners with its relaxed (I must be joking) atmosphere". One such beginner was GW7BOY: "My first venture into any competitive radio event and to be honest I was shocked at the amount of activity during the day. I worked stations in areas which I have always considered closed to me."

This latter point continues to delight those active in the contest - EI2SDR/P says "we were amazed at the reports we were receiving from distant squares and at the strengths of the signals we heard." G1JHZ/P, too, was "pleasantly surprised by how well my modest station performed".

As usual, most stations conclude by saying that they are looking forward to next year's contest and are starting to plan the improvements they will make. So with thanks to all who participated this year, let's start thinking about the ninth *Practical Wireless* 144MHz QRP Contest, the date for which is provisionally Sunday 16 June 1991. **PW**

Leading Stations using a single antenna

Pos.	Name Callsign
2	Cymru Contest Group GW4VEQ/P
6	The TOAD DX Group GW1MOU/P
8	Civil Aviation Authority RS GM4CAA/P
9	Truckers Contest Group GW1HGV/P
11	Roger Dyke GW4NVA/P
12	Neil Underwood & Martyn Wright G4LDR/P
13	Chippenham Moonrakers G7DIP/P
14	Stroud Amateur Radio Society G4RSR/P
15	Laugh-a-minute Contest Group G4ILI/P
16	St. Helens & District ARG G1STH/P

Leading stations in each locator square

Square	Name	Call	No. entrants in square
IO63	John O'Sullivan	EI6ARB/P	3
IO66	Dragonslayers DXcapade	GM/PE1MHO/P	1
IO70	Bideford Bay Radio Club	G0JKD/P	3
IO71	Pembroke Puffins Contest Group	GW6TEO/P	1
IO72	Ian B. Eldred	GW0MKQ/P	1
IO73	Cymru Contest Group	GW4VEQ/P	1
IO74	Fred Sweeney & Paul Knocker	GI0EJN/	3
IO75	Wigtownshire Amateur Radio Club	GM4RIV/P	3
IO76	Stirling & District ARS	GM0GMD/P	1
IO80	Neil Underwood & Martyn Wright	G4LDR/P	6
IO81	Guildford & District Radio Society	GW5RS/P	10
IO82	The TOAD DX Group	GW1MOU/P	5
IO83	Roger Dyke	GW4NVA/P	13
IO84	John Baker & Don Birch	G0MTQ/P	3
IO85	Civil Aviation Authority Radio Soc	GM4CAA/P	2
IO86	George McKay & others	GM0ARH/P	2
IO87	Tom Harrison	GM3NHQ/P	1
IO90	Peter Thompson	G8DDY/P	2
IO91	Laugh-a-minute Contest Group	G4ILI/P	9
IO92	Rugby Amateur Transmitting Society	G7APD/P	12
IO93	Mansfield Contest Group	G0MCG/P	12
IO94	David Wright	G0MTV/P	5
JO00	Hastings Electronics & Radio Club	G6HH/P	1
JO01	South Essex Amateur Radio Society	G4RSE/P	5
JO02	Chippenham Moonrakers	G7DIP/P	7
JO03	Spilsby Radio Club	G7BPR/P	1
JO11	Frank L. Laanen	PE1EWR	1
JO32	Dragonslayers QRP Group	PA3FGI	1

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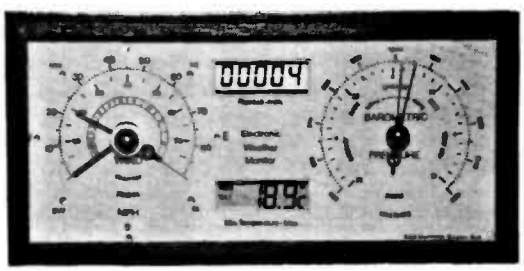

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PACKET P

Roger Cooke G3LDI answers the questions often asked by someone who is new to the packet radio scene.

Nodes have always been a source of mystery to some users. In order to explain their operation, Nick Martin G6NHK has written a very comprehensive guide, essentially for the newcomer, but quite a useful reference for all concerned. It is presented here in its entirety.

This guide is mainly intended for those new to packet. I will attempt to unravel the jargon and explain in as simply as possible how nodes work, and how to get the best from them. If you're reading this via packet you obviously know what a TNC is and how to connect it to a radio and some sort of terminal, so we won't be starting from absolute basics! There are several types of packet node which you will encounter - TheNet, NET/ROM, BPQ, TCP/IP and KA nodes, but for now we will be referring to the TheNet and NET/ROM types, which are used extensively by GB3 and GB7 nodes.

What is a Node?

The set up of a node is very similar to the that which you are using at your station, except that a node's TNC contains different software, and there usually isn't a terminal permanently connected. The main task of a node is to help establish connections, and the software contained inside the TNC is specially written to do that. We shall see later that this software is very powerful, and much of what the node does is transparent to the users. The software has been designed so that the node can send information about itself to other nodes and receive similar data from other nodes with the minimum of interference to users.

How it all works

To avoid creating extra traffic when conversing with other nodes, a node uses a special abbreviated language called 'Level 4' (most ordinary users on packet use Level 2). Since node TNC's are basically simple computers, node-to-node 'chatter' need not be in plain language. So on a normal 'Level 2' terminal this data will appear as hieroglyphics! A node needs to know the callsigns of other nearby nodes, so each node sends out a 'Nodes Broadcast' at regular intervals (usually every hour). This broadcast contains: (1) the callsign & alias of the node sending the broadcast, (2) information about neighbour nodes which it can 'hear' including the 'route quality' (see later), (3) information about nodes even further away, which neighbouring nodes have 'heard'.

On receiving these broadcasts, the node can build two 'tables', which are called the 'Routes Table' and the 'Nodes Table'. These tables can be accessed by users, and used as a guide when they wish to connect to other stations (or other nodes). A connection needn't involve just one node, connections can be made (or attempted!) by using several nodes. Those who have only had experience with voice repeaters may find it difficult to grasp this concept - it can be likened to a frog crossing a pond, the frog cannot jump the whole pond at one go, but by jumping from one lily-pad to another it can eventually cross the pond. When you connect to a node it is like landing on a lily-pad, you can then 'jump' to the next pad (node), and so on. The ROUTES TABLE is accessed by sending the command 'ROUTES' (or R). The node will reply with a list similar to the one shown in **Fig. 1.**

The '>' symbol is relevant because (unlike normal stations), nodes do not disconnect from one another when a user's connection is terminated. Even if there are no other communications going on involving the two nodes, they continue to periodically ask each other "Are you still receiving me ?" for about 15 to 30 minutes after the last users have disconnected (all in 'Level 4' code of course!). This is done to save time on air and reduce congestion, well-used links do not have to be re-established every few minutes.

Fig. 1

```
      0    GB7XX-2   100  5
>     0    GB3YY      50  4  !
```

- '!' Indicates that these parameters have been locked in by the Sysop (person in charge of the node).
- The number of entries in this node's node table.
- The route quality of this neighbour as a figure, 255 is superb, and 0 the worst.
- This is the callsign of the neighbouring node.
- Type of path. '0' is a radio link, '1' is a wired connection possibly to another frequency.
- '>' indicates that the path is in use, though you could use it as well.

Route Quality

The route quality of adjacent nodes is usually 'locked in' by the Sysop, because when the node 'hears' a nodes-broadcast from another node it has no way of telling how strong the radio signal was. The received broadcast could be from another node just 25km away, or alternatively it could be from a node 150km away and heard under quiet or 'lift' conditions. Usually the Sysop will 'lock in' all of the immediate neighbour nodes with their corresponding route qualities, and allow 'rogue' nodes to enter the routes table with a default low quality (usually 10 or 20). He might also decide to 'lock out' a node (locked with zero quality) if the path is 'one-way' (i.e. can be heard but not able to be contacted). This is important as route qualities are not only for the benefit of the user, they are used by the nodes themselves when deciding on the best path for a connection. As an example, let's consider just three nodes, which for sake of simplicity we will call A, B and C. A cannot 'hear' C (and vice-versa), but good radio paths exist between A-B and B-C. B will tell C that it can also 'hear' A, but what route quality will C assign to the path via B to A.

A > route quality = 100 < B > route quality = 100 < C

This is where the computing power of the software takes over. There is an established formula which the node uses to calculate the effective 'route quality' of the path A-C. This is given by:

$$\text{Route quality (A - C)} = \frac{(X \times Y) + 128}{256}$$

ANORAMA

Where X = the path quality existing between node B and node C and Y = the quality of the route A-B as broadcast by B.

If you feel that the maths is getting a bit 'heavy', don't worry, this is as complex as it gets! And if you can't understand the formula, then remember that some sort of 'attenuation factor' has to be applied, otherwise nodes could claim to be able to connect to any other node in the world, since (eventually) the info about all the nodes would pass unhindered across the network!

To the user, the 'NODES TABLE' is a list of nodes to which a usable path exists, and it can be listed by sending a 'NODES' (or N) command. This may not be a 'one-hop' path, depending on the inter-node path qualities inbetween. An entry on a nodes table could be five or more 'hops' away. The nodes table includes both the callsign and the alias of each node, and connect requests can be made to callsign or alias. The user doesn't really have to concern him(or her) self with the actual path the connection takes - the node itself only knows the immediate neighbour(s) which claim to have paths to the required node. One can, however, ask the node about these neighbours.

For example, a 'NODES' command issued to our node GB7XX sends back a list which includes the list as shown and described in **Fig. 2.**

XX2:GB7XX > Routes to YY2:GB7YY

>	100	6	0	GB7QQ
	50	4	0	GB7ZZ

GB7ZZ — Neighbour's callsign.

0 — Port type . '0' - radio, '1' - hard wired.

4 — Obsolescence count'. Set to default value when node-broadcast is heard from the node. Each unsuccessful connect reduces this by one.

50 — Route quality to neighbour.

> — The '>' character indicates an path in use.

Fig. 2

Route Quality to Neighbour

The character '>' indicates path is in use. As stated before, the node doesn't know the exact route to each entry on the nodes table (there isn't enough memory to store it), and we do not need to concern ourselves with it either. The obsolescence count ensures that the optimum path is chosen if two or more neighbours with equal route qualities all claim to have paths to our required destination. TheNet, NET/ROM and BPQ nodes use 'automatic adaptive routing' which simply means that they can quickly adapt to varying radio conditions. Indeed, the path taken by our connection could change whilst we are connected, as the system is constantly monitoring and adapting to network conditions. If a path should fail while it is in use and the node has an alternative, it will attempt to restore the connection using the alternative. This system is also quick to adapt itself should a node suddenly go 'off air' due to a failure somewhere. Most of the other commands available on TheNet and NET/ROM are fairly self-explanatory. The 'USERS' command lists the connections currently existing (or in the process of being made). The command is useful if you're thinking about trying a 'DX' connection - this might not be too successful if another user is flooding the node by downloading text from a BBS! The 'CQ' command enables users to connect to a node (either direct or via multi-hop), and then send out a CQ beacon. The Syntax is 'CQ ....<up to 80 characters of text>'. Those replying to your CQ would connect to your callsign AS IT APPEARED ON THEIR SCREEN. There is a command 'I' (which is INFO on TheNet and IDENT on NET/ROM), which will cause the node to send info about itself which has been entered by the Sysop. There is also a 'PARAM' command - this causes the node to send out a list of numbers which correspond to certain parameters set in the node.They cannot be changed by anyone other than the Sysop, so we won't go into details of their meaning. How does a user know what type of node that he/she has connected to?

A little detective work is required here, since TheNet, NET/ROM, and BPQ nodes all behave in a very similar manner. You can tell a lot from the response of the node to your initial connect request. If the symbol after the callsign/alias is a '>' you are almost certainly connected to a TheNet node. However, both NET/ROM and BPQ nodes respond with a '}', so a little more work is required. Fortunately, BPQ nodes are easily identifiable, as their response to a 'U' command will include the G8BPQ callsign and software revision number.

KA nodes don't follow this form as they don't work the same way as other nodes, but they will at least list the NET/ROM type nodes that they have heard. So an automatic, 'multi-hop' link will not use KA nodes. KA nodes always identify themselves as KA when you connect to them. TCP/IP is a complex system of file and message transfer which 'rides on the back' of NET/ROM type nodes, and later versions of TCP/IP (or NOS) emulate some (but not all) of the functions of NET/ROM.

Digipeating

This mode is not encouraged through NET/ROM, TheNet and BPQ nodes! In fact, the 'digi' facility on most of these nodes is disabled, so users would be most unwise to try a multi-node digi! Where the 'digi' is enabled, it is really there so that 'Mail For:' beacons of BBS's can be relayed over a wider area. With all this sophisticated software at your disposal, why should you want to 'digi' anyway ?

BPQ

BPQ nodes use software written by John Wiseman G8BPQ. This software enables stations to emulate the workings of TheNet and NET/ROM using an IBM PC/XT/AT computer with TNC's or internal TNC cards. BPQ nodes usually work in conjunction with a 'GB7' BBS or private mailbox. Most BPQ type nodes will operate on more than one frequency, and the software is configured in such a way as to make it easy for users to choose which frequency to make outgoing connections. For this reason there is a 'PORTS' command, and this causes the node to list port numbers and frequencies. The 'ROUTES' command on BPQ will result in a slightly different response -

> * GB7XX 100 5! where the '*' will be replaced by a port number. Connections to other nodes do not normally need a port number, but connections to other stations do. So, on a BPQ node, to connect to G9XXX on Port 3 you would send-

'CONNECT 3 G9XXX' (or C 3 G9XXX).

If you omit the port number the BPQ node will list its ports and ask you to repeat the connect request using a port number.

That's it for another month. News, views and comments to G3LDI, QTHR, @ GB7LDI or Tel: (0508) 70278.

Specifications

Frequency range:	144.00 - 145.995MHz
Type of Emission:	F3 (f.m.)
Antenna Impedance:	50Ω unbalanced
Power Supply:	5.5 - 12V d.c. (rated voltage 8.4)
Current consumption:	130mA at maximum audio output on receive.
Standby mode:	18mA
Transmitting (high power):	550mA
Transmitting (low Power):	220mA
Operating temperature:	-10 to 60°C
Dimensions:	60 x 40 x 170mm
Weight:	Approximately 490g including batteries and antenna
Receiver Section	
Type of Receiver:	Double Superheterodyne
Intermediate Frequency: 1st	10.695MHz
2nd	455kHz
Sensitivity	Better than 26dB Signal to Noise with 1μV input
Selectivity:	-60dB (±15kHz)
Bandpass Width :	±7.5kHz (-6dB)
Spurious sensitivity:	Less than -60dB
Audio output power:	More than 300mW into 8Ω impedance, 10% distortion.
Transmitter Section	
Transmitter output power:	High 1.5W
	Low 150mW
Type of Modulation:	Reactance modulation
Maximum deviation:	±5kHz
Spurious emission:	Less than -60dB
Microphone:	Built-in Electret condenser type
Price:	**£129.00 + £5.00 carr**

KENPRO KT-22E

REVIEW

Rob Mannion G3XFD rediscovers the joys of 'pedestrian portable' operation with the aid of a Kenpro KT-22E hand-held 144MHz f.m. transceiver.

The first station I worked on 144MHz with the Kenpro KT-22E laughed when he heard that I was only now discovering the joys of stroke 'P' operation (in this case I mean pedestrian) on the band. He enjoyed pointing out that nowadays many operators start on 144MHz with a hand-held transceiver before graduating to a 'main station' type rig. Of course, I had to do it the wrong way round but I did get there in the end!

To say that I'd never operated a hand-held rig on 144MHz is not strictly true, but the last time that I enjoyed using a hand-held transceiver was in the days of a.m. on the band. Some readers may well remember the successful circuit for an easy-to-build a.m. transceiver design, published by G. Packer (then GW3UUS but now G3UUS) in *Short Wave Magazine*.

Along with many others, I built this little rig and enjoyed using it from hill-top sites. The transceiver - despite its 'swooshbox' (super-regenerative) receiver - added a new dimension to my 144MHz work. It even managed a cross-channel QSO from an inland Hampshire hillside!

I don't know if imported hand-held receivers for 144MHz were available then, but I did notice one or two adventurous types using what we called 'funny mode'. You would always notice when you worked one of these 'different' types because their received audio would be low (due to inefficient 'slope detection') on an a.m. receiver.

Life turns full circles at times and now f.m. rules while a.m. is the odd man out! Another big difference is that the modern hand-held f.m. transceiver has an on-board synthesiser, bringing big savings by eliminating crystal-control.

Using The Rig

The Kenpro KT-22E is not new on the market but it deserves a mention as it's certainly in the 'bargain basement' price range. As such, the transceiver could prove to be the first equipment owned by a newly-licensed amateur.

When the review model arrived I found that it came complete with a two-pin (plug adaptor required) battery charger, the NiCad batteries, a reasonable handbook, carrying strap and 'rubber duck' type of antenna.

Operating the transceiver is simplicity itself. The 'thumbwheel' type selector switch for the synthesiser was easy to use despite my larger than usual hand. The instruction manual clearly explained how to interpret the digits on the switch and front panel into the operating frequency.

The transceiver is very simple to operate and the recessed switches controlling power output, simplex, duplex and repeater frequency shift are easy to use. The audio quality on transmit and receive was remarkably good - even when compared to the middle-price range transceiver fitted in my car.

Good Reports

Other operators commented on the audio quality and how well the little rig was accessing the various repeaters. It was a new experience to access the local repeater while sat in my favourite armchair.

However, the transceiver came into its own whenever I took our Labrador for a walk on the local hills. She quickly learned that when the rig came - we'd be having a longer walk while I chatted to friends old and new. I also found that the transceiver's audio output was sufficient for windy locations and that in many cases I could safely reduce the output power to the low setting.

One of my favourite locations in the Dorset hills is not far from a multiple-user p.m.r. repeater station. This station has many transmitters operating on a wide range of frequencies and can easily cause cross-modulation. I was most impressed at the way the KT-22E reacted in this situation, with not a sign of cross-modulation to be heard when I was within 250 metres of the p.m.r. site.

Opinions

In my opinion this little transceiver is a 'bargain buy' and returns excellent value for relatively little money. I enjoyed using it very much and could have ended this review with the reviewers cliche 'I liked it so much I bought it'.

This time however, I can't use the phrase as the review model had been sold while it was on loan! So, unfortunately the transceiver had to go back to **ARE Communications, at 6 Royal Parade, Hanger Lane, Ealing, London** who had kindly loaned it for review. I'd very much like one of these rigs...but I'll just have to wait my turn - although I think it will be worth it in the end! **PW**

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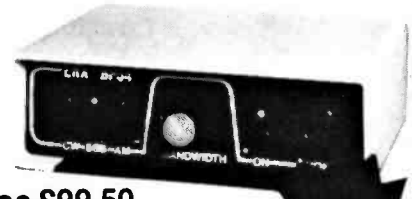

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I have been using my Yaesu FT-290 on c.w. for some time and recently it has been joined by a Belcom 120S retuned to the 28MHz band. Both of these excellent rigs have what I consider a failing. I have, due to the lack of a suitable break-in facility, coupled with the inability to adjust the sidetone level when using headphones, on many occasions forgotten to operate the p.t.t. switch before using the key.

I decided that a control box to provide these functions and remedy this situation was the answer. To be effective the box in question had simply to plug into, and fit either rig when required. The results of these deliberations are shown in the diagram **Fig. 1**.

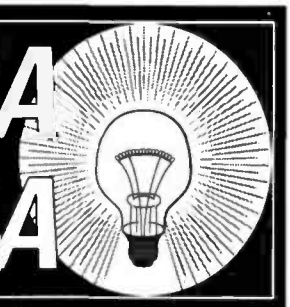
All the components are non-critical and the average 'junk-box' should provide most if not all of them. Even if all components are purchased the cost should not exceed £5 or so. The original was housed in a tobacco tin, though there are many small cheap plastics boxes available from the various suppliers who advertise *PW*

Setting Up

This should present few problems as the timing delay is adjusted by setting R4, so that the relay drops out soon after your over has ceased but not in between words at your operating speed. Then set R5 and the set's volume control to give a comfortable level of both sidetone and received audio. Layout diagram **Fig. 2** shows a suggested layout in use. The leads should be taped together and marked to avoid confusion.

Happy keying
Ken Fisher G0LKX

WHAT A GOOD IDEA



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We've always been proud of our authors and their work. Many readers are also 'budding' authors and now you can join in - and win £25 - by sending circuits and projects to 'What A Good Idea'. It's the ideal solution to the advice often offered by friends who suggest that 'You should publish that'!

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More details on page 22 of PW October 1990.

Fig. 1

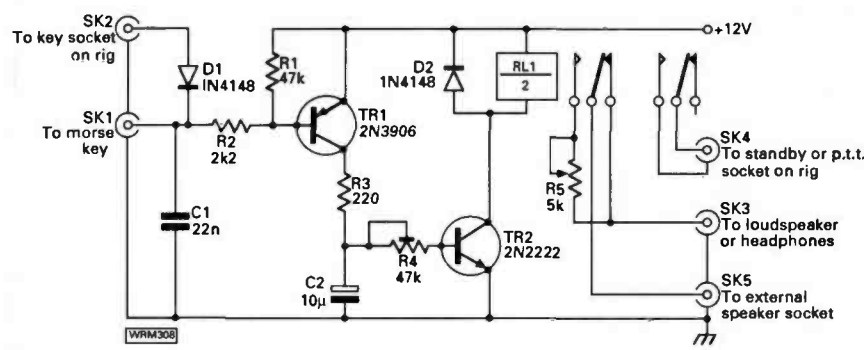
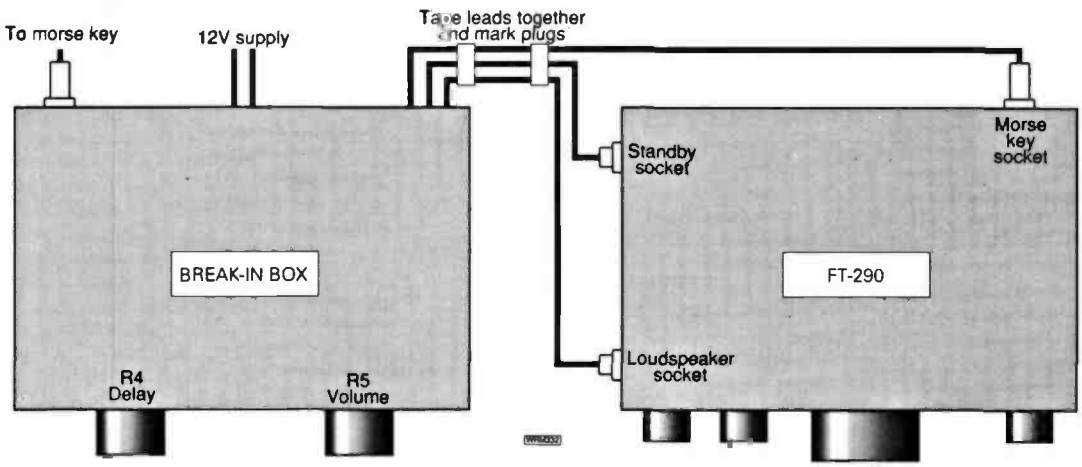


Fig. 2



Back-Scatter

HF Bands

Reports to
Paul Essery GW3KFE
287 Heol-y-Coleg, Vaynor, Newtown, Powys SY16 1RA

The weather since last time has, one is sure, driven most southern amateurs out of their shacks; on the other hand, some of us were prevented from sleeping by the night-time heat and tried the shack instead. It's an ill wind.....!

Events

The main one has to have been the action of Iraq in Kuwait. Many of the Kuwaiti licensed amateurs were in fact members of the ruling Al-Sabah family, notably of course Prince Yousuf Sauf Al-Sabah 9K2CS, who led the 7O1AA operation. *DXNS* quotes unconfirmed reports from Kuwait that he and others of the family died in the invasion. We hope this is not so.

Iris and **Lloyd Colvin W6QL** and **W6KG** are on their travels again. First stop is a month as 5H0KG, in the shack of 5H3TW; other proposed stops include Mozambique and Madagascar, albeit they do not at the time of writing - last week of August - have licensing nailed down in either place. Don't forget that Iris often operates in the DX nets, as an exercise in completing 100 countries from every stop. Incidentally they were awarded the the title of 'Amateur Radio Ambassadors of the Decade 1980-1990' by the ARRL Board.

You reckon your club can put on a 'Biggie' for a contest? How does it compare with the forthcoming Finnish effort as PJ9W (s.s.b.) and PJ9A on c.w. for which some 55 operators and 40 support personnel are all headed for Curacao?

Y90ANT is at the Georg Forster research station, which counts for DXCC purposes as Antarctica.

Thought

One of the most useful things the technical fraternity could do for h.f. radio of all sorts is to devise a more satisfactory method of combating static, particularly when using a.g.c. This is one area in our hobby where digital methods in the receiver have some promise.

More Snakes

Last time we mentioned the letter from K6EIL on this. Immediately the copy had gone (Sodde's Law again!) in came a letter from DA4MU, enclosing a photocopy of another article by the same author; in this version, the far end of the coaxial cable is shorted and of course sealed, and the braid is left open-circuit at the home end. Either way (April '88 *QST*, or July '90 *Monitoring Times*) the idea seems to have merit for noisy bands or locations.

Conditions

Dominated by summer static, alas. As this is being written I am just recovering from a couple of flares - and the audible signs of a thunderstorm to add a smidgeon of extra flavour! Interestingly enough there is a very sizeable proportion of amateurs who consider the sunspot cycle this time to have totally failed to live up to its promise. One reason possibly could be the higher level of QRM due to greater numbers and higher power; many of the OTs won't use the attenuator and so suffer desense problems. However, one begins to wonder whether man-made atmospheric pollution rising into the ionosphere and changing its nature to a less ionisable nature might have some bearing on the problem.

Reports

Let's make a start with Top Band; just one reporter, namely **G2HKU** (Sheppey) who comments that he managed his regular s.s.b. QSO with ON7BW - with difficulty! It seems that ON7BW can hear Ted OK on his Beverage antenna, but that G2HKU's reception is made very difficult by the static. One wonders whether a frame for receiving, plus a pre-amp might be the answer.

I have been on the band a couple of times but frankly the noise level noted on each occasion was enough to try the power of a saint. Thus, nothing much was raised apart from the odd local.

The 3.5MHz Band

G0KRT (Welling) sticks to QRP c.w. at the one watt level; up aloft he has some 25m of wire, worked against a quarter-wave counterpoise. Two-way QRP contacts were made with G0MLB, G3BWV, G3IVF, G3NSA and G4RGN, while other stations raised included G0BFU, G0MOU, G3GZN, G3KVT, G3MCK and G3WQ. Interestingly, notes that before he had his ticket he used to Howes d.c. receiver on the band, and used regularly to hear the W and VE stations on s.s.b., either late at night or just before dawn using just a simple 10m wire antenna.

Turning to **GM3JDR** (Aukengill) Don managed a c.w. QSO on the band with 7Q7CW.

3.5MHz c.w. for **ON7PQ** (Kortrijk) meant DF2UU/TF and J49G.

Again, the columnar rig has been activated on 3.5MHz s.s.b., but only on Sunday mornings for the club net; and between the QRN and the QRM from tuner-uppers it was hard going. If ONLY the rig instruction books would tell people just what frequency they radiate on when tuning-up, and warn them to avoid generating QRM from this cause life would be so much easier - much of this nuisance is done by people who just don't realise what they are inflicting on others.

The 7MHz Band

Another band well coated with noise - but the addicts still manage to find DX to turn we ordinary mortals green with envy!

For **G0JBA** (Sittingbourne) the s.s.b. signal gave him CT4NH, GS0AYR/P, LZ1KVZ, OH1AF, UB5ILA, UL7LBI, YU4JHI, and lots of G, GW and GM signals.

The letter from G2HKU has a few comments about the 'north of Watford' types - we'll deal with him later! - but as far as the band was concerned Ted mentions UA9CM, PT7ASQ and OJ0/N7BG.

Even GM3JDR seems to have been inhibited from his usual level of activity, but Don does note c.w. with DL8CSM/ZS1, UJ8JKV, LU5DG and 7Q7CW.

For **GW0HWK** (Wrexham) the band has yielded entries in the log for HJ3MCM, UA6HSW, TM1BRE (Brehat Is), GM0ENN/P, EI2GY, DF9KG, FD1DIH/P, IV4CIH, UL2LEG, G0AFG, G0MZO and G0DMZ.

As always, c.w. at ON7PQ; Pat mentions TI9CF, BY5TS, DF2UU/TF, 6W6/DL7FT, ZD8Z, K3JXO/LU, 5H3TW, 7O8AA and 7Q7CW.

Contests

For those who like 'em, warning to prepare; for those who don't, notice of the weekend reserved for domestic chores!

October 27-28 is the date for the CQ WW SSB DX contest, while November 3-5 is the ARRL CW Sweepstakes; leaving November 10/11 for the OK DX Contest - a bit too near home for comfort, this one! November 17/19 is the ARRL SSB Sweepstakes, and November 24/25 the CQ WW CW DX.

10, 18 and 24MHz Bands

No, not a riddle, our newest bands - though to be sure a large proportion can't even recall the time when we didn't have them. Come to think of it, I wonder how many are still around who can recall clearly that wonderful first few hours on 21MHz?

Anyway, to the meat. G2HKU found, on 10MHz, SM0CCE, ZM2AGY, W2BA, ZM4HB, DL7CY, N4EJK, SM5AUK/6; on 18MHz 4S7WP, KB2IIQ, K4II and W2BA; and on 24MHz, no mention.

For **G3NOF** there wasn't a lot on 18MHz, although Don did raise RA3GI and 4U1ITU; while on 24MHz the only offering was PJ6/KV4AO.

Now to **G4ZZG** (Mansfield), who notes that his postcode ends with the magic '0DX' and reckons the postcode is true at that! This, alas was after he had twice waited through four earlier QSOs with 9M2FS only to have the chap go QRT before Charles managed to get in. On the other hand, 18MHz did stump up with OJ0/K5VT, TA7/KU0V, FG5ED, PY1BVY, JA5IU, JA7AB, WB4TBG plus Europeans and UD6DKW, UM8MBA, RV0YF. Incidentally Charles was a happy lad when he posted his letter to the column, as he had just received his ZS8MI QSL that morning.

Now to GW0HWK; on 18MHz Mike found VO1BD, KC1NO, VE2HRP, W3PLM, RW9FW, KD3SM, W5FT, HL1UA, A92BE and a gaggle of Europeans to fill up the logs. As for 24MHz, GW0HWK mentions TA0B, TA2/VE3NSK, A92BE, JA6BSM, K1ZFE, 4X6ZS, and of course again the EUs.

Turning to ON7PQ, Pat tried all these bands, and his log includes 7Q7CW on 10MHz, plus 7Q7CW, 9V1YB, TA1/KU0J, EA9EO, 8R1/W1CDC, and PA0GAM/ST2; while on 24MHz the yield was 7Q7CW plus EA9EO.

It was nice to have a chat about old times with **G3VWC** (Bath), who nowadays commutes to the 'Great Wen' by HS125 train daily. He still found time though to raise JA1ITX, JA1UQP, JA4AO, JA7DJO, W4TG, W4EIN, AB4CA, W5VBT, W6FAY, K7ZR, VE4LY, VE7SR, 4S7WP and JW/DK2OY.

A new reporter is **John Bell G3JON**, from Sheffield, who says that reading the piece each month at least makes him realise what he's missed! On the other hand, John did manage to latch on to JA4AO, VK5VN, VK4CEK, VK3AHJ and 8P6FV. The G3JON antenna incidentally is the Windom design from the April *PW* 1990 issue; although cut precisely to the dimensions quoted in the article, G3JON gets different results, but, as he says, it works very well on 18MHz. Incidentally, John's operating time is usually around the 2200-2359 clock-time.

Now we turn to 9H1IP, (M'Scala, Malta) who managed on 18MHz to locate OM1IAI, HB0/DK8ID, XE1VIC, A45ZQ, C6AFR, CM3EF, YO3APJ, ZL2UW, NH6C (Hawaii), VK3CTT, TR8CJ, 5B4ES and RB5WA/RB9P, with the nicest surprise being WZ6C/ST4 back to a CQ call! Gotaways included V63AY and 3X1AU. Turning to 24MHz, conditions kept the count low, but T77T, A92BE, Z21CS, A22JP, K8LF/4, OA8BT, ZL3DX, KF3T and WB3JRU, the last five all coming in one session on July 27, between 0256 and 0340UTC. Since then it has been a matter of keeping fingers crossed for conditions to lift a bit.

Geoff Watts

Geoff has had to raise the price of his various lists, for UK customers to £1.25 for the double-sided, or £1.50 for the single-sided version, (the latter is handy for mounting up on to card, or under glass on the operating surface). The lists include **1.** the *CQ and ITU Zones Guide*; DXCC countries in each zone, arranged by prefix and including all the other prefixes and special prefixes for that country. **2.** *The USSR Oblast Guide*, in numerical and in prefix order. 7 maps, USSR Awards, CQ-M Contest, R-150-SCountries List, Victory-40 Stations, CQ & ITU Zones, deleted oblasts future USSR prefixes, and 250 USSR QSL Bureau addresses. **3.** the *DXCC Countries Guide* lists the DXCC countries alphabetically, present and past prefixes back to 1945, IOTA references for all islands on the IOTA list and a six-band DXCC/IOTA QSL log. **4.** is our dear old friend the *Radio Amateur Prefix-Country-Zone List*, arranged by prefix. Everything for each country on one line, normal prefix, special prefix, ITU callsign block, continent, DXCC status, CQ and ITU Zone number, and obsolete prefixes used in the past ten

years. Each list is 14 or 15 pages long and only obtainable from Geoff Watts, 62 Belmore Road, Norwich NR7 0PU. Note, overseas prices are held for the moment.

The 14MHz Band

Space closes in apace. G2HKU mentions UA4/N7KZN, PJ9Y, and PY5BVL.

G3NOF (Yeovil) noted little from the Pacific, but did have s.s.b. contacts with ED5PIH (Homegas Is), JU750BV (JT1BV), KL7XD, TI9US, U3V/UZ9SWR, VKs, YB8RB, YB0DD, YK1AA, ZK1XY, 7Q7LA, 9M2ZZ and 9M8FH.

It was all-c.w. on 14MHz for GM3JDR, who connected with 4K3ODX, 4K3/UA3CYA, 4K3PA, 4K3MI, 4K3PWB, 4K2PGO, UA0HAE/UA0K (Wrangel), G4MYG/ST2, VU2SU, KP2/JP1DMX, TR8JLD, HK3AHM/1, VS6WV, JW/DK2OY, TE2T and 'scads' of JAs.

Now GW0HWK; his crop included ZF2NT, V29OA, HK0TCN, 9M2CW, 7X2DBN, 6W1PZ, PT2BRA, A92FB, PP8WHL, N4LAW, J39BO, JU750BG, plus US, Russian and EU stations.

The c.w. from ON7PQ came to terms with TI9CF, RZ1OA/A for IOTA EU-66, HB9IQP/5B4, VE2DWC/CI0GI, JW/PA3DCO, PJ9Y, OJ0/N7BG, V2/AA6OG, JU9G, DF2UU/TF, V63IK, 6W6/DL7FT, C56/DL7FT and OA4ZV.

G0JBA (Sittingbourne) brings up the tail with a collection on s.s.b. including IK0GDH/IH9, UZ6LY and W2, W3 and W4 call areas.

The 28MHz Band

G0JBA stuck to s.s.b., and raised DL8SDN, EA5DLD, ED9ICM (IOTA AF36), FD1CMT for a 30-minute contact at 0030UTC, HA8BI/5, HB0/ON4KST, LY3BAQ, LY3BE, RB5EKW, TK/IK4GRO, UB5WJ, Y23RO/A, 7O8AA and 9H1EL.

Turning to ON7PQ, Pat notes 7O8AA, YI1BGD, TR8JLD, 5H3TW, VS6BG, 7Q7CW, YK1AO, FH5EJ and C56/DL7FT.

GW0HWK mentions F6EZV, IK0OEF, EA3FST, G0NOR and FR5DX.

Just one s.s.b. contact is noted by GM3JDR, who worked YC2NFA.

The G4ZZG log includes c.w. to 6W6/DL7FT, I2DMK/IY1TYH, and, in response to a CQ on a 'dead' band, JQ3QYL.

G3NOF noted lots of short-skip on the band, and strange conditions; Don had QSOs with FR5ZN and 7O8AA.

G2HKU seems to have found the decent openings, as he managed LU3EW, CX4SB and ZP6XDW.

The 21MHz Band

Probably the best of a job lot! **G2HKU** notes BV2DA, UMBMK, YN1CC, VP2EXX, PY2ZEB, VP5VPX, and HC5AI.

This is obviously G3NOF's favoured band. Don made it across to BV2FB, BY4AA, BY5QW, C56/DL7FT, CT0BI, DF2UU/OY, DU8USK, ED5ICE, EK9QRP, FO0IGS, FR5DX, GM/DL1SCQ (IOTA EU 12), H44RW, JAs, JW/PA3DCO, HK6DOS, HL1KII, HL9KL, HP6AW, HR1RMG, HV3SJ, HZ1AB, KJ8M/P/C0H(IOTA NA 67), P29BT, P29NMD, R3D/RA9SB, SV9/DL8YEF, U9W/KA6ZYF, UW9W/W6/G3MHV, UA0QBK, UL0ACI, UL0GE, UL0LYA, UL0OB, UM8MGO, VP9CB, YBs, YF0CHA, ZB2AZ, ZK1XY, 4K4/EK9JG, 5B4ZL, 5Z4BI, 8P6AD, 9M2SH, 9V1YC and 9Y4IBN.

The s.s.b. of GM3JDR went to YB2OK, UA0BCJ, UA0X/RB4ES, XX9KA, but the c.w. was more popular, with UA0FZ, UA0IBB, UA0LWC, 7K1FFG, VU2TTC, HL1CG, HL1IXP, 4K3PWB, XX9KA, UJ5K, 8J90XPO, F6GCP/BV, BZ4RA, BZ1OK, BY5RA, VP2VI, JA9AIX/JD, HL3EIE, HL4CHH, JT1KAA, JUG750BR, KH6IJ, and HK1HHX.

GW0HWK; HL2KAT, JA7SN, YC3JVB, 4K4/EK9JG, JA1XLL/7, A61AD, 4X4SO, GX3XRO, 6W6/DL7FT, C56/DL7FT, S01A, 6Y5DA, ZL4JO, 5Z4BP, 9H1EL, A41KY, G4OUK/MM (Indian Ocean), RL0PYL, GD0BCR/MM (off S Turkey), UL0OB, UL0GE/A, BZ4RDX, ZC4MK, lots of Americans and the odd EU.

ON7PQ also has a long list: 9M2FB, 4K4/UA6WCG (IOTA AS-63), SV9/KM8M, H44RW, TI9CF, VE2DWU/CI0GI, VK9NS, J49G, 7O8AA, 4K4/EK9JG, ED5ICE (EU69), 8J0BSJ, 9V1YB, A22AA, 3B9FR, WA6EMV/KH6, 3V8/C31WW, JU750BR, V73AZ, 7Q7CW, TR8BY, Y90ANT, SV5/SM0CMH, and YU4OO/4U.

Finally, G0JBA, who found BY5QW, ED9ICM (Chafarinas Is), KH2/JP1UEE, N4CVR and K4LHE.

Late Flash

Too late for total inclusion was the letter from **G3BDQ**; but I couldn't help but note why the JU750 stations were on.... 750 years on from Genghis Khan - blimey!

Deadlines

Addressed as above, and to arrive by November 5 and then November 30 to take the Christmas posting rush into account. Please try not to be late!

Back-Scatter

VHF Up

Reports to
David Butler G4ASR
Yew Tree Cottage
Lower Maescoed, Herefordshire HR2 0HP

Solar Data for August 1990

The end of July finished with an aurora and magnetic storm on the 28-29th. There was a major flare on July 30, lasting for 3 hours but nothing came of it. The restructuring of the solar surface now seems to be complete. There was very little solar activity during the period but the spot count increased reaching 234 by August 12. A major flare occurred at 1415UTC on August 13. Spot counts continued to climb and by August 18 had reached 394, the highest daily count since September 1989 and just short of the highest level recorded this cycle, 16 May 1989, when it peaked at 401. The latter part of August saw some very disturbed conditions giving rise to auroral activity. The geomagnetic A index was up to sub storm levels of 35 on August 22, 42 on August 23 and 48 on August 26. A number of flares were reported throughout this period with a type X3/2B occurring on August 27. August 28 was the only quiet day, with a geomagnetic A index of 6 units.

The latest predictions for Solar Cycle 22 places the maximum as July 1989. If this is correct it means that it is the shortest cycle rise ever recorded - 34 months. It will take a massive rise in solar activity to change this and so far there is no sign that this will occur.

The 50MHz Band

Although Sporadic-E was still prevalent during August, the addition of the Perseids meteor shower at the beginning of the month and some good auroras during the latter part of the month allowed much inter-European activity. It was a pity however that so many operators still operate within the DX window, 50.110-50.130MHz, when working European stations. It was made even worse during August by some stations attempting meteor scatter QSOs on 50.110MHz. I don't believe that it is a simple case of operators not having a copy of the band plan to hand but if this is the case, you can always send me an A4 s.a.e. to obtain the latest IARU Region 1 and UK National plans.

Don't forget that the months of October and November are the most likely for an opening to VK. If conditions are right the band will be open around 0730-0930UTC. There are a number of ways to ensure working into Australia. You can take careful note of the state of the sun, observing when the noisy side is facing us and when the quiet side is within view. As a very rough guide you wait for the quiet side to face our way, add a few days for the geomagnetic activity to reduce to a low level and bingo, an opening to VK. A more practical approach is to wait for someone else to work into VK in the morning and then find out on the grapevine in the evening that an event occurred. Assuming that the sun does not throw a wobbler, the band will be in exactly the same state the next morning and you can then work the pile up. In 1989 this is how I and many others accomplished our 6th continent. My records show that if conditions are undisturbed the band can remain open for up to 6 or 7 successive mornings before the noisy side of the sun comes into view again to disrupt the proceedings.

Looking for the county of Gwynedd? **GW1SXN** is now active from Caernarfon with a Trio TR9000, an RN Electronics transverter and 15W to a MET dipole. His first contact on the band was with GD4IOM (IO74) at 1145UTC on August 9.

Another operator new to the band is **Rhys Williams G7DEG** (CBA). Since getting an FT-690, 15W amplifier and 5-element Yagi he has been having great fun working the stations around Europe. In his first fortnight of operation, Rhys worked 13 countries, including OH0BNP (KP00) and 42 locator squares. He asks if there are any awards that he can start collecting for?

144MHz QRB Table
Distances in kilometres

Station	Tropo	Aurora	Meteors	Es
G0CUZ	2943	1758	1996	2943
G0DAZ	2923	1780	2026	2923
G0DKM	2811	1488	——	2203
G0EVT	3080	1640	1808	3080
G0FYD	1315	1624	——	2019
G0ISW	1059	566	——	2057
G0LBK	3060	1755	1876	2350
G1DWQ	1454	1812	——	1836
G1EZF	1730	1757	1920	2375
G1KDF	3023	1421	——	2386
G1LSB	1319	733	1732	2723
G1SWH	3035	1429	——	2372
G3FPK	1835	1686	——	2337
G3LTF	1824	1846	2021	2174
G3SEK	1560	1681	1872	2154
G4ASR	2848	2029	2107	2853
G4DHF	1498	1530	2000	2448
G4JCC	1334	1158	1018	2173
G4MUT	1163	684	1533	2068
G4NBS	1321	1714		1901
G4RGK	1466	1757	1920	2375
G4VXE	2862	1446	1501	2880
G4YTL	1404	1774	2025	2172
G4ZTR	935	1535	——	2130
G6DER	1834	997	1957	2068
G6DZH	2924	711	——	2233
G6HCV	2880	1450	1912	2880
G6HKM	1304	1555	——	2265
G6LEU	2620	910	——	2430
G8HHI	1742	——	——	2058
G8JDX	2667	1368	——	2663
G8LHT	3070	1780	1868	2510
G8MFJ	1209	1210	1329	2168
G8PYP	1240	1451	1479	2318
GD4XTT	3053	——	——	1700
GI1JUS	3067	1614	1507	2216
GI8YDZ	1216	1809	1901	2562
GJ4ICD	1620	1100	2050	2090
GM4CXM	1428	1750	2100	2023
GM4YXI	3160	1881	2048	2513
GW4VVX	2823	1391	1313	1910
GW6VZW	2830	1473	——	2236
ON1CAK	1420	1166	1948	2725
ON1CDQ	1420	1166	1948	2124

Back-Scatter

QTH Locator Squares Table

Station	50	70	144	430	1296	Total
G3IMV	310	—	440	125	51	926
GJ4ICD	407	—	263	119	59	848
G4ASR	279	43	350	41	3	716
G6HKM	263	—	224	112	48	647
G3JXN	204	22	187	134	88	635
G1KDF	258	—	183	104	37	582
EI5FK	314	—	187	58	—	559
G0DAZ	146	—	221	137	39	543
G6HCV	309	—	233	—	—	542
G3UVR	—	50	257	140	83	530
G4KUX	—	—	372	120	—	492
G4RGK	—	—	284	124	50	458
G3XDY	—	—	206	148	91	445
G1SWH	195	26	158	59	—	438
G1DWQ	264		152			416
G0EVT	142		213	57		412
G4DEZ	55	—	249	49	49	402
G0LBK	—	—	260	89	46	395
G8ATK	103		145	94	52	394
G1LSB	73	—	176	144	—	393
G6DER	—	22	183	110	78	393
ON1CAK	48	—	280	53	11	392
G8LHT	79	19	185	93	14	390
G1EZF	—	—	263	93	—	388
G4XEN	—	—	274	111	—	385
G4MUT	82	22	153	93	31	381
ON1CDQ	43	—	255	56	7	361
G4NBS		35	138	108	67	348
G4RRA	—	—	255	80	—	335
G3CDJ	—	—	186	103	44	333
G8PYP	183	2	112	34		331
G8PNN	7	24	129	99	64	323
G4SSD	—	—	229	93	—	322
G4FRE	—	—	102	146	72	320
G4TIF	—	—	200	110	—	310
G4OHF			307			307
G4ZTR	78	28	120	50	30	306
G1EGC			198	80	23	303
G8HHI			148	110	38	296
G6MGL	—	—	141	89	59	289
DL8FBD	—	—	280	—	—	280
G0FYD	110	1	160	6		277
GM0HBK	111	1	142	15	—	269
GW6VZW	118	—	143	6	—	267
G4PCS	—	—	258	3	—	261
G6MXL	66	22	98	49	23	258
G3BDQ	256					256
G1GEY			168	77	11	256
G3NAQ			175	80		255
G6DZH			158	87		245
G6STI			152	69	24	245
G0NFH	113	25	78	18	9	243
G3FPK			241			241
G4IGD	—	—	238	—	—	238
G0EHV	—	—	160	75	—	235
GW4FRX	—	—	231	—	—	231
GM4CXP	—	—	198	31	—	229
G1SMD	165	—	110	—	—	275
G4DDL	—	—	216	—	—	216
G4MEJ	—	—	213	—	—	213
G8LFB	—	—	209	—	—	209
G8MKD	—	—	150	49	—	199
GJ6TMM	—	—	151	48	—	199
G4YCD	—	—	197	—	—	197
G1TCH	94	—	95	6	—	195
GI1JUS	—	—	192	—	—	192
G8XIR	—	—	123	—	62	185
G7ENF	59		89	24		172
G4FVK	—	—	82	50	22	154
G7ANV			153			153
G4AGQ	—	—	104	42	1	147
G8XTJ	29	—	116	—	—	145
G6MEN	41	2	63	26	4	136
GW4VVX	10	—	117	—	—	127
G1WPF	—	—	97	29	—	126
G0FEH	—	—	101	24	—	125
G0ISW	45	—	59	17	—	121
GW1MVL	—	—	109	7	—	116
G1IMM	—	—	98	17	—	115
GM0GDL	—	—	88	23		111
G7CFK	109	—	—	—	—	109
G1CEI	11	—	77	18	—	106
GI4OWA	—	—	103	—	—	103
G7CLY	—	—	100	2	—	102
G1SWH	—	—	148	53	—	101
GM0JOL			88			88
GM1ZVJ	35		48			83
G4WHZ	—	—	76	—	7	83
G0GTF	76	—	—	—	—	76
G1NVB			73			73
G0HDZ			64			64
G0HEE	—	—	73	—	—	73
GU4HUY	—	—	73	—	—	73
G2DHV	—	—	33	7	2	42
G7AHQ	—	—	34	—	—	34
GW7EVG	—	—	21	—	—	21

No satellite or repeater QSOs
Starting date January 1 1975

The answer to that is Yes and already Rhys has, providing he can get the QSL cards, enough locator squares for one RSGB award. The 50MHz Squares Award requires proof that 25 squares have been worked. A similar award, the 50MHz DX Certificate requires confirmation of contact with 25 countries. Stickers are available for both of these awards in increments of 25. If you really want to find out more about what certificates are available I suggest you invest in the *Amateur Radio Awards* book written by Chris Henderson.

Gordon Emmerson G8PNN (NLD) managed to work a total of 18 squares this summer before deciding to dismantle his 50MHz station. He reports that despite having 50W from a QQV06-40A amplifier and an HB9CV antenna he couldn't compete with stations in southern England. I assume Gordon is referring to the fact that conditions on 50MHz are generally better the further south you are located. He has now decided to stick to 70MHz and above.

Meanwhile **John Hilton GM1ZVJ** (LTH) is still plugging away at the band with his 2W to a 3-element Sandpiper Yagi. On August 1 he worked 10 German stations, IK2NCJ, OE5MSM, OE5WIL and PE1LYO, picking up 4 new squares in the process.

Ela Martyr G6HKM (ESX) reports that the band has had its good and bad days. One good day was July 28 when QSOs were made with a number of DL, I and OE stations. Included in this bunch was OE2CAL who has now been worked by Ela on 4 bands. In the evening of the 28th, 8 GM stations, including GM1YZW and GM3JIJ, both in IO68, were worked via aurora. Conditions during August remained quite good, OH0BNP and SM6FZD (JO57) being worked on the 2nd and FC1EAN/EA3 (definitely dodgy), HB0/HB9QQ (JN47) & F/G6LZO (JN13) being found on the 11th. Two more new countries were notched up on August 12 with G4ODA/TF (IP03) and YO2IS (KN05). A late night Auroral-E opening, on August 21, gave Ela another country, in the form of OY/G4ODA (IP62). In an aurora on August 23, contacts were made with DL8HCZ (JO53), GD3AHV and GM1POA.

At my QTH, activity during August was considerably quieter than previous months. Even so there were still a few juicy morsels to be found. The very rare DXCC country, The Sovereign Military Order of Malta, 1A0KM was worked on s.s.b. via Sp-E on August 1. The same mode provided OH0BNP Aaland Island on August 2 and a late night opening, on August 4 at 2219UTC, found 4U1ITU (JN36) on c.w. Following an abortive m.s. schedule, on August 5, with G4ODA/TF earlier in the day, I was fortunate to catch the group at 2040UTC booming in on s.s.b. via Sp-E. This mode was still prevalent on August 11 allowing many operators, including myself to work HB0/HB9QQ in Liechenstein for a new country. Using meteor scatter I worked HB9STI (JN46) in 8 minutes on August 12. He was using 10W of s.s.b. and a 5-element Tonna Yagi.

John Heys G3BDQ (SXW) found a fair bit of DX amongst the more normal

Annual v.h.f./u.h.f. table
January to December 1990

Station	50MHz		70MHz		144MHz		430MHz		1296MHz		Points
	Counties	Countries	Counties	Countries	Counties	Countries	Counties	Countries	Counties	Countries	
G6HKM	52	35	—	—	63	22	34	13	27	10	256
G1SWH	42	31	32	6	77	14	38	8	—	—	248
G4ASR	18	35	48	8	48	31	—	—	—	—	188
G0IMG	44	29	40	4	49	12	32	4			214
G0NFH	40	20	21	3	48	9	11	2	2	2	158
G0FYD	20	24	1	1	75	20	11	4			156
GD4XTT	31	18	—	—	73	17	10	4	—	—	153
G6MXL	5	17	17	3	34	9	17	5	13	4	124
G8PYP	19	23	1	1	42	13	21	6	—	—	126
G0EVT	21	23	—	—	36	14	5	1	—	—	100
GW4HBK	2	12	39	7			29	4			93
G4ZTR	—	—	—	—	59	19	—	—	—	—	78
GW1MVL	2	2	—	—	43	10	11	2	—	—	70
G7CLY	—	—	—	—	60	9	—	—	—	—	69
G4SEU	—	—	62	6	—	—	—	—	—	—	68
GW7EVG	—	—	—	—	29	6	—	—	—	—	35
G7CFK	18	12	—	—	—	—	—	—	—	—	30
GM1ZVJ	1	9	—	—	2	1	—	—	—	—	13

European stations. On July 31 he got SV1AB, SV1DH and YO2IS. It was the turn of the Faroe Islands on August 1 with OY6FRA and OY7ML being worked around 1830UTC. A number of OEs were worked on the 2nd along with OH0BNP and SV1DH. An unusually early opening to Africa occurred at 0826UTC on August 5 with Mal Z23JO being worked on the key 529 bothways. The band was open at this time via Sp-E to France and Italy. A new country, LX1JX was worked at 1730UTC, presumably via a long meteor burst but very welcome all the same. Szigy YO2IS was heard again, at 1050UTC on August 13. The aurora on the 23rd, around 1500UTC, found GD3AHV and GM4UPL whilst later in the day, contacts were made via Sp-E with IK1LGV, I2FHW, I2JSB, IK3QIF and IK5ME bringing John's total of Italian squares up to 28.

Jim Smith G1DWQ (DOR) mentions that August was an interesting month with tropo, aurora, t.e.p. and some good late season Sp-E. The month started tremendously with OH0BNP, OY6FRA and 1A0KM being worked between 1530-1830UTC on the 1st. There were openings via Sp-E on August 2 & 4 allowing many contacts to be made with stations in DL, OE, OH and SM. Kosie V51E was heard between 1630-1700UTC on August 8 peaking 55. On the 11th Jim caught a good Sp-E opening between 1330-1930UTC, working strings of DL, I & OE stations, the prize being HB0/HB9QQ at 1706UTC for country 59. I2ADN/8 was worked on August 12 from JM79 and from JM88 on the 16th. Jim heard a number of DL stations, between 1500-1600UTC, in the aurora on August 23 and some DL, F and I stations via Sp-E from 1600-2030UTC. Another aurora, on August 26 between 1500-1830UTC, was a weaker event but later from 1915-1945UTC a number of SM stations were heard via auroral-Es. Sp-E was prevalent on August 26 from 1000UTC, the band being open to 9H, I and SM.

The 70MHz Band

Thanks to a few portable stations operating from rare locators, the band was made that more interesting during August.

Dave Lewis GW4HBK (GWT) managed to work EI2VPX/P (IO61) on August 4, G4ZFQ (IO90) on August 7 and

Annual c.w. ladder

Station	Band (MHz)				Points
	50	70	144	430	
GD0ELY	12	-	144	—	156
G4OUT	-	39	99	—	138
G4ASR	34	4	97	—	136
G0FYD	31	—	62	1	94
G0DJA	17	-	10	—	27
GW4VVX	3	-	9	—	12

Number of different stations worked since January 1 1990

G4VIX/P (IN79) on August 11, all stations via tropo. Dave also made some good QSOs with Charles EI9FK/P contacting him in IO53 on August 11 and IO44 on August 12. These two contacts were made via meteor scatter as was a QSO with GM1SMI/P (OKE) on August 13. Later on the 13th, GM3WOJ was heard calling CQ MS but no contact resulted.

I took time off the other bands to work EI2VPX/P & G4ZTR/P via tropo and EI9FK/P (IO44) & GM1SMI/P (IO89) via meteor scatter. The Irish station was worked in one long burst whereas the Orkney Island contact required 12 bursts and 28 minutes to complete.

The 144MHz Band

A number of operators have commented on the reduced number of Sp-E openings this year. It is very difficult to generalise by using the number of stations worked as data, but my records show that in 1988 I made 173 QSOs in 11 countries, in 1989 I made 79 QSOs in 9 countries and this year I only managed 35 QSOs in 4 countries. Contacts during this 3 year period were predominantly to the south-east of the UK, with 97 QSOs being made with Italy, 78 QSOs with Yugoslavia and 38 with Hungary.

During August there was much activity on the band via tropo, aurora, Sporadic-E and meteor scatter. The latter two modes will not be so prevalent in the next few weeks but you should be able to work some good DX during the autumnal tropo season and via aurora.

Gary Nicholas GW7EVG (CWD) reckons that tropo conditions have improved recently. Contacts made during July included GM3ZME/P, GM6SPS/P and GM9OCC. On August 7 he managed to get his 3W signal across to EI2VPX/P (IO61). Gary was also pleased to work GW1PXM/

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Back-Scatter

P (DFD) over a very obstructed path. On August 19 he worked G7IAC/P (NLD) for both a new county and locator square.

John Hill G7CLY (HBS) managed to catch EI2VPX/P, GB2XS (HLD) and GM0LVI (TYS) all on tropo at the beginning of the month. On August 12 at 1010UTC, he heard G4PIQ/TF (IP03) via meteor scatter.

G6HKM picked up an unexpected square on July 26 when she worked GW0KZG/MM sailing through IO60. An aurora, on July 28, coincided with the 144MHz QRP contest, allowing Ela to work a number of stations including GI4KIS and GM1YZW. The early part of the Sp-E opening on August 1 was missed but even so s.s.b. contacts were made with EA7ALL (IM87), EA7BVD (IM77), EA7ERK (IM77), EA7GIF (IM87), EA7RO (IM76), EA7ZM (IM76) and Mark ZB0T for a new country. Tropo conditions were good across the North Sea on August 26 allowing several OZ stations to be worked.

Keith Killigrew G6DZH (HWR) reports that Sp-E and tropo conditions have been very poor this summer. Contacts via Sp-E have included EA7AH, EA7GAA and EB7BQI on June 4 and EA6PS on August 1. During the evening of August 9, EA1TA (IN53) was worked via tropo. An aurora on August 21 found GM6OWX/P in IO88, the last UK locator square for Keith. Another event on August 23 gave s.s.b. contacts with DB6DX (JO32) and GM8OEG (IO86).

Dave Law G0LBK (YSS) made the best of the recent good tropo conditions by working HG6VV (JN97) and OK2MMW (JN89) on July 13, OK1DDO (JO60), SP6GZZ (JO81), SP6TRQ/P (JO71) and Y26CI (JO50) on July 22, and OK1IBL (JO60) on August 2. Prior to the peak of the Perseids meteor shower, on August 10-11, Dave worked I2FAK and W5UN on e.m.e. During the shower he only managed to work HG3DXC, IW5AVM and SP2NJI but puts this down to the fact he got married on August 11. Congratulations!

I found this year's Perseids meteor shower to be quite good, especially the amount of random operation on 144.400MHz. Completed scheduled contacts included DJ3VI (JO51), G4YTL/TF (IP03), HG3DXC (JN96), OH2TI (KP20), OK1DXR (JO60), SM5DCX (JO89), YU2CCY (JN85), YU3JY (JN75) and ZB0T (IM76). Random s.s.b. contacts were made with HG2NP (JN97), I3LGP (JN65), I5JUX (JN53), LA6CL, LA9ZV, OH1AF, SM4CSO, SM5CHK (JO78), YU1EV and YU2CBE (JN86). Earlier in the month, on August 4, tropo conditions were good to the south, allowing s.s.b. contacts to be made with EA1DKV and EA1WZ (IN53).

John Lincoln GM0JOL (HLD) mentions that he is still QRV from IO88 square. In recent months, c.w. contacts via meteor scatter have been made with DL1GBF (JN48), DL3RBH (JN68), G0GMB (IO92), SM2CEW (KP15) and SP6GZZ (JO81). John can usually be found on c.w. when auroras are present. During such an event on June 14, QSOs were made with DF5DE (JO40), DK9OY (JO52) and ES2XM (KO39). On July 28 another aurora produced contacts with DL, PA, G, GM, GW0KZG/MM (JO12) and OK1IBL (JO60).

The 430MHz and Microwave Bands

Thankfully the major expedition groups still take 430MHz equipment out with them on their trips to rare squares. With a number of such groups out in August and an improvement in tropo conditions there was much for the dedicated u.h.f. operator to work.

Dave GW4HBK made it across the water to EI2VPX/P on August 7 and to G4ATA/P operating from The Lizard (CNL) on August 14. On the previous day he heard the club station GD4IOM but was unable to attract their attention.

Paul Brockett G1LSB (LCN) has been doing particularly well in the recent 430MHz tropo openings. On July 15 he worked DG9BAX (JO43), LA1BM (JO29), LA1YCA (JO38), LA5KO (JO48), OZ1KLU (JO46) and OZ7LX (JO55). A choice DX station OK5A/P (JO70) was contacted on July 21. Paul found conditions very good to Scandinavia on August 2, coinciding with their monthly activity period. Contacts were made with DL3LAB (JO44), LA1YCA/P (JO38), LA3DV (JO48), LA3EQ (JO28), LA3VW (JO48), LA8AK (JO38), LA9DI (JO59), LA9RAA (JO28), OZ1JPT (JO64), OZ1KLU (JO46), OZ2OE (JO45), OZ6HY (JO45), OZ7IS (JO65), SM4DHN/4 (JP70), SM4JHK/4 (JO69), SM4KRK (JO79), SM4KYN (JO79), SK6AB (JO57), SM6CEN/M (JO57), SM6JEH (JO68), SM6OEQ (JO58) and SM7LAD (JO65). Not bad for an evening's work.

G6HKM was also QRV on August 2, working 7 LAs, 3 OZs, 2 SMs and many PA stations. Four contacts were over 1000km. On 1296MHz, Ela worked her furthest DX ever, contacting SM4KYN (JO79) at 1193km. Ela reports that this was the best evening on the band since August 1988. The 1296MHz Trophy contest on August 12 produced 26 QSOs, the best without a doubt being GD4XUM/P.

Having dispensed with 50MHz, Gordon G8PNN was able to concentrate on 430MHz. He also found conditions excellent on August 2, s.s.b. contacts being made with DL2NO (JO43), DL3LAB, LA1YCA/P, LA9RAA, OZ2OE, OZ6CE (JO55), OZ6HY, SM6CEN/M, SM6OEQ, SM7ECM and SM7LAD (JO65).

VHF News

Negotiations by the RSGB have resulted in a number of improvements in licence conditions likely to come into force later this year. One of the major enhancements is that c.w. power is to be permitted at the same level as s.s.b. With 400W of r.f. at the antenna, modes such as e.m.e. will be within reach of many more operators in the UK without having to apply for a special research permit. Other weak signal modes such as aurora, field aligned irregularities (f.a.i.) and meteor scatter will also take on new dimensions. Another change affecting v.h.f. operators is that, following my paper regarding relaxations to certain licence conditions, mobile operation and vertical polarisation will be allowed on 50MHz. It is hoped that this move will encourage the use of 50MHz for local f.m. nets, relieving some of the congestion on 70MHz. It is worth noting that there is absolutely NO provision for speech repeaters on 50MHz. Please don't start bolting the whips on your car yet or running QRO c.w. Wait until these improvements have been announced officially in the Gazette.

DX Information via Packet Radio

I think most of you have some idea about packet radio and how it functions even if you may have some misconceptions about the mode in general. This column is not the forum to discuss the politics of its usage but a recent development in this area has meant many operators have found an additional source of information for successful DXing on the h.f. and v.h.f. bands.

I refer of course to DX Clusters. Very simply, these clusters allow many operators, typically 100 or so on each unit to be connected, via packet radio, to a specialised data base. Users can access these facilities via the 50, 70, 144MHz or 430MHz bands, depending on local arrangements and each cluster can be connected together using the existing network. So, potentially the cluster network could have hundreds of like minded DXers connected together via packet radio. Once logged into the cluster, the user can make use of its many facilities. The primary function is for DX spotting. A user, having found a station worthy of note can announce it to all concerned. A typical message might read "50.121MHz VK8ZLX 59 PG66 LISTENING UP". All you do then is turn on the 50MHz rig and work the DX! The message, having been inputted into the system can then be manipulated by the data base facility. So, having got home late from work you can ask the system to list what DX you have missed on any particular band. **Fig.1** shows the 50MHz data received on my local cluster GB7DXC, at 1145UTC on August 12. It shows frequency, callsign, date, time, signal strength, locator and callsign of the station inputting the information. The facilities available are too numerous to mention in detail but the following areas may whet your appetite - WWV data, Solar information, MUF, Bearings, Sunrise and Sunset calculations, QSL details, mailbox facilities etc. At the beginning of August there were four clusters operational in the UK, GB7DXC in Gloucestershire, GB7DXI in Berkshire, GB7WDX in Devon and GB7YDX in Yorkshire. Why don't you try it? It's what packet radio has been waiting for!

```
50128  G4ODA/TF   12-Aug-1990  1142Z  54  IP03  (G7BPX)
50128  G4ODA/TF   12-Aug-1990  0927Z  59  IP03  (G3COJ)
50110  LU8YYO     11-Aug-1990  1810Z  59  FF50  (G4CCZ)
50185  HB0/HB9QQ  11-Aug-1990  1732Z  59  JN47  (G4ASR)
```

Fig. 1.

DX peditions

The latest letter to arrive from **Bo OZ1DJJ** indicates that he will be operating as OX3LX from Prins Christian Sund (GP80) between October 10-20 and will be QRV at most times during the day or night.

Neville Bethune G3RFS has sent details of his trip, with Nick G3KOX, to Sao Miguel in the Azores (CU2). Between July 10-20 nearly 1000 QSOs were made on 50MHz, of which half were with the UK. 120 contacts were made into USA and Canada with all W call areas being worked. Contacts were also made with LU8YYO and V51E. ZC4MK was heard but no QSO resulted. A total of 35 countries in 4 continents were worked using a Kenwood TS-680S, Tokyo amplifier and 4-element Yagi.

John Hotchin G4ATA has also provided details of his recent expedition to The Lizard, Cornwall (IN79) between August 10-17. Despite clashing with the Windbreakers Contest Group expedition to the same location a large number of QSOs were made. On 50MHz 14 countries and 36 locator squares were worked with the best DX being SV1OE. 144MHz results were very good, 42 squares in 17 countries being worked, the best DX being YU2CV. There was less activity on 430MHz but even so 14 squares were worked in 4 countries, the furthest contact being with ON5NY.

One reason for attempting this expedition was to raise money for charity via sponsorship. I am pleased to report that by the end of August, John had managed to raise over £800 for a worthy cause.

Finally, **John Lemay G4ZTR** has sent details of the Windbreakers expedition to The Lizard between August 10-15. The group consisting of G4VIX, G4ZTR and G6CMS made 110 QSOs on 50MHz, 35 of them via meteor scatter. Using 50W and a 5-element Yagi on 70MHz, 27 contacts were made, including EI2VPX/P and GM1SMI/P.

Beacon and Repeater News

The University of Saskatchewan, Canada, is planning a 50MHz auroral beacon of enormous proportions. The beacon will run between 1-2kW c.w. centred on 49.990MHz using 4 distinct carriers 1kHz apart. The antenna will consist of twelve 6-element Cushcraft Boomers, each with an 11m boom length. This "monster" is to be located 180km north-east of Thompson, Manitoba (VE4) and should make an excellent propagation indicator, perhaps for the entire northern hemisphere.

The Guildford 430MHz repeater GB3GF, has been closed down as its site is no longer available. Contact G4EML for further details.

The Bath Television repeater GB3UT, on channel RT1 is off the air for maintenance. Further details can be obtained from G8CPF.

Another TV repeater GB3TG, the 10GHz unit in Milton Keynes is also off the air for a rebuild. More information from G4NJU.

Back-Scatter

Meteor Showers

The following data, concerning meteor showers occurring in the next few weeks, will help you determine in which direction to beam at specific times and when the shower is below the horizon.

The Orionids meteor shower will be encountered between October 17-26, peaking on Monday 22nd. Between 0000 to 0300UTC beam north-east or south-west, 0300 to 0700UTC beam east or west, 0700 to 0900UTC beam south-east or north-west. The radiant is too low for effective working between 1100 to 2200UTC. This shower is broad with several sub-peaks and predicting when its maximum activity occurs is very difficult.

The Taurids shower lasts from October 11 to December 5, with maximum activity occurring on Sunday November 4, the same day as the 144MHz c.w. contest. Between 2100 to 2300UTC beam north-east or south-west, 2300 to 0300UTC beam east or west, 0300 to 0500UTC beam south-east or north-west. The shower radiant is low between 0700 to 1900UTC.

QRZ Contest!

The UK 6 Metre Group are holding a 50MHz contest to coincide with the SMIRK QSO Party on November 17-18. Non members of the 6 Metre Group can participate. If you require a full set of rules and contest stationery, send me an A4 size s.a.e.

If you fancy your chances at winning a c.w. contest or maybe just wish to enter the c.w. ladder then note that the RSGB 70MHz c.w. contest is being held between 0800-1200UTC on October 21 and the final legs of the 144MHz c.w. cumulatives will be run on October 26 and November 11 between 2030-2300 local time. If you want to try your hand at a longer event, the Marconi Memorial 24 hour c.w. contest is being held on November 3-4. This contest also has a 6 hour section, between 0800-1400UTC on November 4.

Operators of the u.h.f. and s.h.f. bands have not been left out. 430MHz cumulative contests will be run on October 17 and November 2 between 2030-2300 local time. Operators of the 1.3 & 2.3GHz bands are well catered for with cumulative contests arranged for October 9, October 25 and November 10. Timing is the same as the 430MHz cumulatives.

SAT 13 OCTOBER			SUN 14 OCTOBER		
UTC	AZ	EL	UTC	AZ	EL
0100	71	5	0200	77	3
0200	83	14	0300	89	11
0300	94	22	0400	101	20
1300	264	20	1300	252	22
1400	276	11	1400	264	14
1500	287	3	1500	275	5

SAT 3 NOVEMBER			SUN 4 NOVEMBER		
UTC	AZ	EL	UTC	AZ	EL
0600	282	16	0700	284	19
0700	293	8	0800	295	11
0800	304	1	0900	306	4
1700	59	5	1800	56	6
1800	69	12	1900	67	14
1900	80	21	2000	77	22

Fig.2.

The Scandinavian activity contests will be run on the following dates. Microwave activity on November 1, 144MHz on November 5 and 430MHz activity on November 6.

The ARRL e.m.e. contest is scheduled for the weekends of October 13-14 and November 3-4. This is an ideal opportunity for the less well equipped station to hear or work some new countries or continents even if you don't have elevation facilities. **Fig.2** gives details of moonrise and moonset times when the moon passes through the vertical beamwidth of your Yagi. Simply point the antenna in the correct direction and listen carefully for the c.w. from the mega e.m.e. stations. The calculations are based on central England but should be quite accurate for most of the UK especially if using a single Yagi. Let me know what you hear.

Deadlines

Please send your letters to reach me no later than the end of October. The target date for the following issue is November 30. I can also receive messages via packet radio at my mailbox GB7TCM.

Back-Scatter

Amateur Satellites

Reports to
Pat Gowen G3IOR
17 Heath Crescent
Hellesdon, Norwich, Norfolk NR6 6DX

This month we have cut the usual station operational details hopefully to include in following issues, in favour of covering the news and main content of the recent colloquium and other important educational aspects of amateur radio satellites.

AMSAT-UK Satellite Colloquium

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The 1990 AMSAT-UK Satellite colloquium held at the University of Surrey from 26-29 July 1990 was a sell-out and a great success, with over two hundred visitors attending from 29 countries around the world. It opened on Thursday July 26 at 0900 for registration and coffee, followed by the welcome by Dr. Arthur Gee G2UK, Chairman of AMSAT-UK.

C. Van Dijk PA0QC, Chairman of Region 1 IARU, started off with a talk entitled 'Recent IARU Events and Decisions towards WARC'92, the Torremelinos Conference', followed by Ron Broadbent G3AAJ, Secretary of AMSAT-UK, speaking on 'Survey of Users present and future' and a talk on SUPARCO and the the new BADR-1 Pakistan Satellite. After coffee break a discussion was held on the identification of future amateur space related objects and on matters of policy by AMSAT-NA, DL, UK, etc., producing a formal statement of requirements for IARU delegates to take to WARC.

After lunch, Dr. Karl Meinzer DJ4ZC, President of AMSAT-DL, spoke on 'What do You want on the Next Phase III Satellite, and are you willing to pay for it?' until tea, when Doug Loughmiller KO5I, President of AMSAT-NA, delivered 'Future satellite projects by AMSAT-NA'. Following Doug came Hans Groenendaal ZS6AKV and Dr. Martin Sweeting G3YJO on the topic 'Satellites in Education: Is There a future Role - Which way for Amateur Radio?' Dick Ensign N8IWJ then gave a talk 'Webersat and Microsat, The Educational Aspects', followed by a paper by Ross Forbes WB6GFJ entitled ' Project Oscar Group, Future plans' read by Ron Broadbent. At 1700 there was an open forum discussion and decision making session, followed by presentations and dinner in the hall restaurant. The day finished with a tour of the UoSAT Mission Control station.

Friday July 27 commenced with reception and registration, and a welcome by both UoSAT Director Dr. Martin Sweeting G3YJO and Dr. Arthur Gee G2UK. Z. Wahl G0NJC then spoke on 'Basic Orbits and Satellite Prediction', and G3AAJ with a satellite tracking and data software demonstration. After coffee Dr. Bob McGwier described 'Microsat Packet Operations' and 'Operating via UoSATs, an overview' then came Dr. F. Yamashita of the JARL, addressing 'FO-20 operations'. After lunch Peter Guezlow DB2OS spoke on 'RS-14 & RUDAK-2 Operations', then David Silvester G2BFO on 'Mode L & S on AO-13', followed by afternoon tea and Freddy Guchteneire ON6UG on 'A Dedicated Satellite Tracking System'. After this came Phil Bridges G6DLJ of Siskin Electronics on 'Packet Radio Equipment', Dr. Marty Davidoff K2UBC on 'An Efficient Method of Calculating Average Daily Access Times' and Dr. Arthur Gee on 'My RS Satellite Operations'. Question Time and Presentations followed by the AMSAT-UK AGM before dinner. After dinner was a video and slide display and a talk for beginners entitled 'The Guide to Oscar Satellites' by Richard Limebear G3RWL. A tour of the UoSAT Mission Control followed this, and lastly a social session at the bar and club in Wates House.

Fig. 1.

Saturday July 28 opened at 0830 with registration and coffee and a welcome by Dr. Jeff Ward G0/K8KA of the UoSAT Project. Geoff Perry, OBE, of the famous Kettering satellite tracking gave his talk entitled 'I haven't got a callsign, but ...!' followed by G3YJO on 'The UoSAT Spacecraft on Ariane'. Following Martin came Bob McGwier N4HY and Lyle Johnson WA7GXD on 'The Microsat', then G0/K8KA on 'PACSAT Communication Protocols'. Lawrence Howell GM4DMA described the satellite operations in the North Pole 90 expedition, and after lunch Karl Meinzer DJ4ZC gave an overview of Phase III-D and reported on the July 26 meeting. James Miller G3RUH followed with an address on the 9600 baud modem and UoSAT-OSCAR-15, then to the rostrum came Doug Loughmiller KO5I, President of AMSAT-NA to tell of the Shuttle Amateur Radio Experiments. Following afternoon

tea, A. de Silva Curiel G7GLY described Doppler tracking of UoSAT-1 decay, then Ray Soifer W2RS speaking about the orbital estimation for low-earth-orbiting satellites. Clive Underwood G1WTW then covered thermal design and analysis of the UoSAT spacecraft, after which came G7DSY M. Allery and E. Milton on u.h.f. antenna design for LEOs followed by a discussion period before the colloquium buffet dinner. The day ended with UoSAT Mission Control tours, a Fun Junk Sale, presentations, a series of three minute speeches, and the Grand Raffle Draw.

Sunday, the final day, opened with Leonid Labutin UA3CR talking on the new Soviet RS satellites and the Moscow Adventure Club, after which Dr. F. Yamashita of the JARL covered the FO-20 spacecraft and Lyle Johnson WA7GXD talked on TAPR DSP and Digital Radio Projects. After coffee your author Pat Gowen G3IOR and Ray Soifer W2RS came on to describe 144 and 432MHz e.m.e. operation on 'OSCAR-0' and to show a video of the G3HUL home-brew moonbounce station and on-the-air action. After lunch came P. Pidoux F6BVP on the French ARSENE amateur satellite project, Hans Groenendaal ZS6AKV on AMSAT-SA Balloon Projects, and Dr. Felix Cabello on 'Space Education in La Laguna University'.

Marty Davidoff K2UBC covered satellite archaeology after tea, then came Michael Meerman PA3BHF on 'Data Format on UoSAT spacecraft', G1WTW on 'Radiation Effects on UoSAT Spacecraft', after which came the presentations. Dr's Martin Sweeting and Arthur Gee closed the meeting with farewells at 1700, looking forward to another excellent series of presentations again next July.

Not the least of the joys were the meetings of many kindred spirits. **Fig.1.**, snapped by DJ1KM, shows (left to right) your author G3IOR with Junior de Castro PY2BJO, provider of 'DOVE' and Leo Labutin UA3CR, provider of previous 'RS' and the future RM-1 amateur spacecraft. In the background is Freddy Guchteneire ON6UG, adjusting his portable dish for the on-site operating Mode B and S OSCAR-13 station.

The entirety of two issues of *Practical Wireless* would be insufficient to relay half the colloquiums information packed content, but here follows just a few of the many topics of general interest that were covered.

RM-1 Satellite

From **Leonid Labutin UA3CR**, came the decoding formula for the analogue mode telemetry that you may soon be hearing from the new AMSAT-U-Orbita/AMSAT-DL combined satellite, which was last said to be planned for launch on October 26.

Channel	Parameter	Formula	Unit
0	Output Power	N = 0.05N	Watts
1	PA Temperature	N = °C	° Celsius
2	24v Power Line	N = V	Volts
3	16v Power Line	N = V	Volts
4	9v Power Line	N = V	Volts
5	24v Power Supply	N = V	Volts
6	Internal Temp	N = °C	° Celsius
7	Eng. Parameter	N = *	----

Fig. 2.

Hexbox	Contents	Var. C	Var. B	Var. A	Units
0	RX E/F Audio(W)	0	+0.0246	0	V p-p
1	RX E/F Audio(N)	0	+0.0246	0	DOVE.
2	Mixer bias V	0	+0.0102	0	Volts
3	Osc bias V	0	+0.0102	0	TELEMETRY.
4	RX A Audio(W)	0	+0.0246	0	V(p-p)
5	RX A Audio(N)	0	+0.0246	0	DECODE
6	RX A Disc	+10.427	-0.09274	0	kHz
7	RX A S meter	0	+1.0	0	Fr.Counts
8	RX E/F Disc	+9.6234	-0.09911	0	kHz
9	RX E/f S meter	0	+1.0	0	Counts
A	+5V bus	0	+0.0305	0	Volts
B	+5V RX current	0	+0.0001	0	Amps
C	+2.5V VREF	0	+0.0108	0	Volts
D	8.5V bus	0	+0.0391	0	Volts
E	IR detector	0	+1.0	0	Counts
F	LO Monitor I:	0	+0.000037	0	Amps
10	+10v bus	0	+0.05075	0	Volts
11	GaAs.f.e.t. bias I:	0	+0.000026	0	Amps
12	Ground Ref:	0	+0.01	0	Volts
13	+Z array volts	0	+0.1023	0	Volts
14	RX Temp	+101.05	-0.6051	0	Deg C
15	+X(RX) Temp	+101.05	-0.6051	0	Deg C
16	Bat 1 volts	+1.7932	-0.0034084	0	Volts
17	Bat 2 volts	+1.7978	-0.0035316	0	Volts
18	Bat 3 volts	+1.8046	-0.0035723	0	"
19	Bat 4 volts	+1.7782	-0.0034590	0	"
1A	Bat 5 volts	+1.8410	-0.0038355	0	"
1B	Bat 6 volts	+1.8381	-0.0038450	0	"
1C	Bat 7 volts	+1.8568	-0.0037757	0	"
1D	Bat 8 volts	+1.7868	-0.0034068	0	"
1E	Array volts	+7.205	+0.0720000	0	"
1F	+5V bus	+1.932	+0.0312	0	"
20	+8.5V bus	+5.265	+0.0173	0	"
21	+10V bus	+7.469	+0.021765	0	"
22	BCR Set point	-8.762	+1.1590	0	Counts
23	BCR load current	-0.0871	+0.00698	0	Amps
24	+8.5v bus amps	-0.0092	+0.001899	0	"
25	+5v bus current	+0.00502	+0.00431	0	"
26	-X array current	-0.01075	+0.00215	0	"
27	+X array current	-0.01349	+0.00270	0	"
28	-Y array current	-0.01196	+0.00239	0	"
29	+Y array current	-0.01141	+0.00228	0	"
2A	-Z array current	-0.01653	+0.00245	0	"
2B	+Z array current	-0.01137	+0.00228	0	"
2C	Ext power amps	-0.02000	+0.00250	0	"
2D	BCR Input amps	+0.06122	+0.00317	0	"
2E	BCR Output amps	-0.01724	+0.00345	0	"
2F	Bat 1 Temp	+101.05	-0.6051	0	Deg C
30	Bat 2 Temp	+101.05	-0.6051	0	"
31	Baseplate Temp	+101.05	-0.6051	0	"
32	FM TX1 r.f. out	+0.0256	-0.000884	+0.0000836	W
33	FM TX2 r.f. out	-0.0027	+0.001257	+0.0000730	W
34	PSK TX HPATemp	+101.05	-0.6051	0	Deg C
35	+Y array temp	+101.05	-0.6051	0	"
36	RC PSK HPATemp	+101.05	-0.6051	0	"
37	RC PSK BPTemp	+101.05	-0.6051	0	"
38	+Z array Temp	+101.05	-0.6051	0	"
39	S Band HPATemp	+101.05	-0.6051	0	"
3A	S Band Tx out	-0.0451	+0.00403	0	Watts

Richard Limebear G3RWL explains that apparently the term 'RSM' in respect of the type of modulation given in our earlier data from UA3CR stands for 'Rectangular Spectrum Modulation', but no other information about this is available at this time. The 70cm uplink receiver link antenna will utilise right hand circular polarisation, whilst the two metre will use a plane polarisation dipole. Only one transponder will be commanded on at any one time and that will mainly be the RUDAK analogue transponder.

FO-20

In answer to pleas made on behalf of keen 'JA' mode enthusiasts such as Dave Rowan G4CUO, **Dr. F. Yamashita**, the representative from JARL, said that arrangements would be made to provide more analogue mode operation, particularly at times of important DX possibilities such as when the apogee point provides optimum paths to remote activated areas. He also promised that the FO-20 operating schedule would in the future be published well ahead, and that JARL will soon issue an operating achievement award for Mode JA operations.

The latest news on FO-20 is that it is now in full sun until probably May next year, and the satellite and battery has been already noted as heating up by G4CUO, who is closely observing the telemetered values. This has caused the JARL controllers to introduce unexpected 'off' rest periods to the programmed schedule.

ARSENE

F6BVP gave the colloquium a comprehensive presentation on the long awaited 'ARSENE' satellite, of which we published the basic and original details several years ago. 'ARSENE', an acronym for 'Ariane Radioamateur Satellite pour l'ENseignement de l'Espace' will be mounted within the rocket separation collar on the September 1992 Ariane flight carrying the Telecom-2-B payload, which is intended for a final equatorial orbit with an apogee of 36000km and perigee of 20000km, 17.5 hour period.

Footprints covering the UK for this type of orbit are unusual compared to those that satellite users have hitherto been accustomed to, with the longest pass some 31 hours in duration, with gaps of 48 hours between passes occurring from time to time.

A solid fuel rocket motor will be used to raise the low perigee following launch into 'GTO' (Geostationary Transfer Orbit). The spin-stabilised satellite will carry three deployable solar panels and will be positioned as to be earth-pointing, using nitrogen gas jets for attitude control. The lifetime of the spacecraft is expected to be in the order of five years.

The hexagonal body structure will measure 900mm in diameter and 880mm high, weighing some 140kg with fuel prior to the kick motor firing.

The amateur radio communications payload will have a 70cm uplink with downlinks on 145 and 2445MHz, but the two Modes B and S will not operate simultaneously as with AMSAT-OSCAR-13. Mode B operation will be f.s.k. packet

Back-Scatter

Radio with three distinct 70cm uplink channels and a single multi-output 2 metre downlink. The S mode will be a linear transponder.

AMSAT-F also gave information of a proposal to launch a separate satellite on an Ariane flight in April 1991. If the proposal is realised, AMSAT-UK will make a significant donation to the project, which is hoped to carry a popular Mode 'A' 2m to 10m transponder. AMSAT Israel also gave details of their plan to build and launch a store-and-forward amateur radio satellite, which, like those developed by other Universities, would also carry scientific experiments. The future Italian microsat was in there too, and **Hans Groenendaal ZS6AKV** produced a novel proposal for a broadcast transponder and trans-ionospheric channel sounder for the Phase-III-D satellite for bulletins, technical material dissemination and educational use that will be described in a later issue.

PHASE-3D

Design requirements for the Phase-3D satellite were discussed, resolving the plan to improve up and down links by better than 10dB above the current AO-13 levels by using more power, more antenna gain, and specialised scanning a.l.c. 'anti-alligator' measures, so bringing simple low power v.h.f./u.h.f. mobile and hand-held cross continental satellite QSOs to all. The preliminary specification has a 250W p.e.p. transmitter in a 3 metre diameter toroidal structure weighing 400kg. AMSAT-DL would like it to carry 'X' band (10GHz) and other microwave equipment, plus experiments, educational features and the 'normal' communications payloads.

Sadly, that's all we have space for on this topic for this month but further content and aspects of this mass of satellite related information will be given in future issues. It will certainly give enthusiasts the incentive to book early and hear the experts first hand in next July's event.

AMSAT-NA Space Symposium

Following the highly successful AMSAT-UK colloquium the AMSAT-NA Space Symposium and Annual Meeting will be held October 10, 11 and 12 at the Johnson Space Centre (JSC) in Houston, Texas. Coming as it does during a year in which two Shuttle missions are scheduled to carry licensed amateurs, this should be an exciting site for the meeting. With the added attraction of the centre's extensive museum and fascinating tours available, attendance could easily break all records. The AMSAT-NA Space Symposium, to be held in the JSC Visitors' Centre Auditorium, is intended to feature talks on the latest in technology in both the manned and unmanned aspects of the Amateur Space Programme, including talks on MICROSAT utilisation. The session Sunday morning at the Ramada Kings Inn will feature presentations aimed at beginner satellite users and those wishing to try their hand with the RS birds, AO-13 and the new range of microsats.

DOVE Decoding

In response to many queries of packeteers who have come across their first satellite in the form of the highly popular 'DOVE' on 145.825MHz, and stated their desire to 'decode' the various parameters sent down to their packet radio terminal screens, **John Branegan GM4IHJ** has supplied the means of bringing the information to meaningful figures of interest. First, he provides the frame content, see **Fig. 2.**

DOVE Decoding Examples

The above shows the format of the Dove Telemetry Frame Decode File, with its 59 boxes labelled 00 hexadecimal to 3A hexadecimal. A typical transmission of telemetry sends a 57 or 59 element frame in two halves, e.g:

DOVE-1>TLM

00:59 01:5A 02:8E 03:35 04:5C 05:59 06:6E 07:4A 08:70 09:6A 0A:45 0B:EF 0C:E8 0D:DC 0E:10 0F:23 10:DC 11:A0 12:02 13:EE 14:BF 15:B5 16:76 17:76 18:78 19:77 1A:76 1B:07 1C:7D 1D:79 1E:DE 1F:68 20:D1

DOVE -1>TLM

21:C8 22:6E 23:30 24:2A 25:24 26:70 27:01 28:4D 29:01 2A:03 2B:02 2C:01 2D:7A 2E:5F 2F:AA 30:D8 31:AB 32:10 33:B8 34:AB 35:A7 36:AC 37:AF 38:C8

John gives two examples as to how to decode elements of this telemetry, first by:

Example 1

Step 1. Chose which item you want the data for. e.g. to get r.f. E/F Audio(W), read box 00.

Step 2. Read the appropriate box = 59 hex.

Step 3. Translate to ordinary numbers = 5 x 16 + 9 = 89.

Step 4. Using the values of the A,B and C variables appropriate to box 00, e.g. from Frame box 00 values are: A is zero, B is .0246, and C is zero.

Step 5. Substitute these values into the decode formula :

RF R/F Audio(W) = A x N x N + B x N + C, e.g. 0 x 89 x 89 + .0246 x 89 + 0 = 2.1894 volts peak to peak.

Example 2

Chose boxes 32 and 33 to compare f.m. transmitters, which boxes show 10 and B8. This is translated as 16 and 184.

The formula for box 32 A x N x N + B x N + C which gives .0000836 x 16 x 16 - .000884 X 16 + .0256 = .03286 watts, so TX is nearly zero, thus it is off. The formula for box 33 A x N x N + B x N + C, giving .000073 x 184 x 184 + .001257 x 184 + (-.0027) = 2.70076 watts, so TX2 is the operational transmitter.

John adds: "Please note that some descriptions of DOVE telemetry have reported box 3A as S Band HPA Temp and box 39 as S Band TX out. As yet there is no confirmation as to the correct order of these two boxes. In addition, Dove seems not to transmit these two boxes, although S Band equipment is definitely fitted and operating on some but not all orbits. Software is available from AMSAT- NA, which does all the mathematics for you, but, if you only want to watch one or two special parameters, you can easily make direct translation tables. The most interesting parameters for the experimenter are block 26 to 2B which change very rapidly as the satellite spins in the sun." GM4IHJ will be giving out future bulletins with details of experiments using this telemetry.

UoSAT-3 Operating Manual

Recognising that the new packet radio satellites pose a tremendous challenge to radio amateurs both in terms of their technical 'quantum leap' and their apparent need for expensive equipment, GM4IHJ and GM4JJJ have recently published the draft of the *UoSAT-3 Operating Manual*, of which 25 copies of the final version will be available by mid-September, the make up costs of which come to UK £3-50 per copy including post and packing. The thirty plus page booklet attempts to simplify all the technicalities, and provides instructions for making up very simple and cheap UoSAT-3 station equipment. (e.g. GM4IHJ's present UoSAT-3 9600 baud receiver cost just £5-20 UK, which I shall try to describe as part of his developed hardware in next month's column). Both Geoff Ward G0/K8KA of the UoS and I have studied the coming manual, and we are very impressed with the content, format and quality, it being clear, easy to follow with lots of diagrams and pictures. Being fully comprehensive in all aspects for newcomer and experimenter alike.

John asks that enthusiasts should NOT send money now, but write to John Branegan at 8 Whitehills, Saline, Fife, Scotland KY12 9UJ, expressing their interest. He will respond to tell you if and when a copy is available. If this helpful guidance approach is taken up, a future booklet on DOVE may follow a month later.

WO-18 SPACE SCIENCE STUDIES

Chris Williams WA3PSD, also finds that curious Hams often wonder if science can be fun, and suggests that if you combine space science with OSCARs you get an unusual mix of exhilaration and excitement by observing a phenomenon that would be missed in normal daily life. This is what the students at Weber State University (WSU) discovered when they recently noticed that WO-18 was going to pass through a total solar eclipse as its orbit took it over Finland and Siberia. Ground controllers took advantage of this fact and quickly started to prepare to take pictures of this event using WO-18's c.c.d. camera. It was their hope to snap a picture of the earth as WO-18 passed through the penumbra and umbra. Also, the Whole Orbit Data (WOD) telemetry mode was programmed so that solar panel array currents could be recorded and examined later. The very difficult task of planning the telemetry capture and picture taking during this event was quite taxing, however, it paid off as the WOD data revealed that WO-18 did indeed pass through the solar eclipse at the exact predicted time. The c.c.d. camera was programmed to take eleven pictures, one every 13 seconds. The first picture was to be snapped at 02:42:35UTC on July 22. As WO-18 came back over WSU on the next pass, an immediate dump of the telemetry showed that the their predictions had been perfect. The WOD showed a marked decrease in solar array current, but alas, no pictures were taken which accurately showed what the earth looked like during an eclipse. Although that is what WSU engineers wanted so see the most, this time it was not to happen. Not to be discouraged, in future solar eclipses, WSU engineers plan to do this again until they do snap a picture of the earth during an eclipse.

In another interesting scientific observation, the microscopic particle impact detector on WO-18 recorded a significant number of collisions during a recent meteor shower. During one day the impact detector noted eleven hits during one orbit when normally, the impact detector only records two collisions a day. Once again, WSU engineers will be planning WOD operations during future meteor showers as they continue to study this.

Chris reports that significant progress has been made in further refining picture taking strategies. WSU engineers now have a far better understanding of how to use the information from photo cells to determine when WO-18's c.c.d. camera is looking down at the earth. Also, new software algorithms are being developed to decide when to take pictures.

WA3PSD announces that WSU will be sending out a beautiful QSL card to all those amateurs who have either captured telemetry or a picture from WO-18. Just send your hard copy of telemetry or data to WSU/CAST, Eng.Tech.Bldg., Rm 236, 3850 Harrison Blvd., Ogden, UT 84408-1805, USA. It MUST be a REAL picture (White pieces of paper or totally darkened pictures will not count!). Please include an s.a.s.e or s.a.e plus 3 IRCs to expedite the return of your QSL card. For more information about the availability of WeberWare 1.0 which will process the image data from WO-18 contact, AMSAT HQ or AMSAT-UK.

Whether you've just started, or are an 'old hand', Pat needs your feedback and news. Write to him at: 17 Heath Crescent, Hellesdon, Norwich, Norfolk NR6 6DX.

Back-Scatter

Propagation

Reports to
Ron Ham
Faraday
Greyfriars, Storrington, West Sussex RH20 4HE

Solar

While **Ron Livesey** (Edinburgh) was projecting the sun's image he located 5 active areas on July 8, 10 and 14; 6 on the 16th; 7 on the 7th and 22nd; 8 on the 5th and 24th and 10 on days 3, 23, 26 and 28.

"The mean solar flux for July 1990 was 177 s.f.u," wrote **Neil Clarke G0CAS** (Ferrybridge) and his computer print-out, **Fig. 1**, clearly shows the peaks of activity at the beginning and end of the month and the trough in the middle.

Doug Smillie (Wishaw) noted a short radio-blackout on the 7MHz band at midday on the 13th. **Ern Warick** (Plymouth) heard fluctuations in the background noise of his 28MHz receiver on July 25, 27, 28, 30, August 2, 5, 12, 16, 17, 18 and 22. Those early August events were most likely due to activity among the 22 sunspots counted by **Ted Waring** (Bristol) on August 3 and/or the large sunspot group observed and drawn by **Patrick Moore**, with special apparatus, at his observatory in Selsey around 0900 on the 3rd and 5th, **Figs. 2 and 3**. Also, I bet that the aurora, 'dead' bands and background noise, reported between August 22 and 24, was due to the group that Patrick saw at 1100 on the 21st, **Fig. 4**. For example, **Fred Pallant G3RNM** (Storrington), a regular 28MHz watcher, remarked about the 22nd as, "the quietest day I have known for a long time" and on the 23rd and 24th he heard nothing until about 1400 and then only the South African beacons came up.

Cmdr Henry Hatfield (Sevenoaks) recorded individual busts of solar noise with his 136MHz radio telescope on July 24 and 26 and August 21, 22 and 26 and more continuous noise on days 23, 24 and 25. Did any of you see Henry operating his spectrohelioscope and radio telescopes in ITV's *Equinox* programme between 1900 and 2000 on August 26? However, while observing with this instrument, Henry located 1 sunspot group, 12 filaments, 12 quiescent prominences and a small 'hot spot' at 1120 on July 24; 3gps, 16fs and 10qps at 1020 on August 12; 3gps, 12fs and 10qps at 1142 on the 17th; 5gps only seen, because of cloud at 1115 on the 20th; 3gps, 13fs and 10qps at 1130 on the 21st; 4gps, 19fs and 10qps at 1045 on the 22nd and 2gps, 15fs and 12qps at 1057 on the 28th.

Auroral

"Aurora at 0100 - Fairly conspicuous rays through Ursa Major. No colour. Lasted for an hour," wrote Patrick Moore on July 29. I was not a bit surprised when I saw Patrick's super drawing of the central meridian sunspot group which he observed at 0610 on the 25th, **Fig 5**. Do keep in mind that radiations from a group like that can produce an aurora at any time while it is visible from earth.

Ron Livesey, the auroral co-ordinator for the British Astronomical Association, received reports of 'auroral glow' from an observer in North Dakota for the overnight period on the 1st, 2nd and 17th and 'rayed arc' on the 7th. 27 observers located in Canada, southern-England, Northern Ireland and Scotland told Ron about the massive aurora on the night of 28/29 and auroral disturbance to terrestrial radio signals for the same period was identified by **Tony Hopwood** (Worcester) and Doug Smillie. Tony observed the same effect on days 12 and 13. Ern Warwick tells me that the German Beacon DK0WCY on 10.144MHz gave weak auroral indications between 1210 and 1900 on the 29th and strong at 1900 on August 23 and 0830 and 2100 on the 24th.

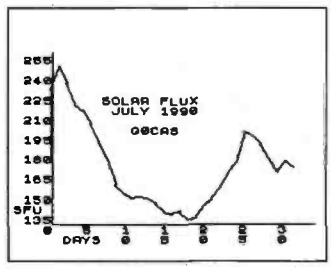


Fig. 1

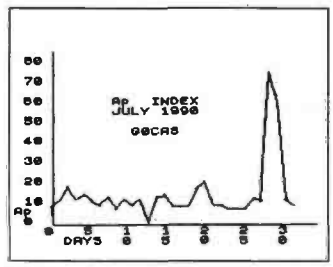


Fig. 6

Magnetic

Neil Clarke's graph shows that the Ap index for July, **Fig. 6**, "was quiet to unsettled till the 28th when it became stormy with an index of 76 and 61 on the 29th." The various magnetometers operated by Tony Hopwood, **Garry Hunt** (Bristol), Ron Livesey and Doug Smillie between them recorded disturbance on days 3, 5, 9, 11, 13, 14, 17, 18, 19, 20, 21, 24, 26, 27 and 29 and an "active storm" on the 28th.

Sporadic-E

Barry Bowman (Prestwich) received pictures from Spain on Ch. E2 (48.25MHz) and identified their broadcast stations on 87.6 and 87.8MHz around 1800 on July 31. **John Woodcock** (Basingstoke) received strong Arabic sound during the afternoon of July 27 and test-cards from Italy, Norway, Portugal, Spain and the USSR on August 2 and Norway again on the 4th. In Great Sutton, **Bob Brooks,** often received pictures in Band I (48-68MHz) from Finland, Germany, Iceland, Italy, Scandinavia, Spain and the USSR during a series of openings between August 1 and 6.

Another Sporadic-E disturbance lasted until the late evening on August 2 and in that time I received strong pictures in Band I from Hungary, Italy, Norway, Spain and the USSR, at least a dozen Italian or Spanish broadcast stations in Band II (87.5-106MHz) and about 40 Eastern-European f.m. broadcasters between 66 and 73MHz.

Simon Hamer (New Radnor) received television pictures from Greece and Morocco on August 1 and Iceland, Switzerland, and Yugoslavia on the 2nd. In Arbroath, **David Glenday** received pictures from Austria, Italy and Spain in Band I and heard Spanish f.m. stations in Band II on the 1st and logged pictures from Italy on Ch. Ib (62.25MHz) at 0640 and Italian and Spanish f.m. stations during the evening of the 2nd. I found 9 East Europeans between 66 and 70MHz and weak to reasonable pictures on Chs. E2 and 4 (62.25MHz) around 2030 on August 23 and 40 broadcasters (66-73MHz), plus fluctuating television pictures and sound on Chs. R1 (49.75MHz), R2 (59.25MHz), R3 (77.25MHz) and R4 (85.25MHz) between 0750 and 0830 on September 2.

Propagation Beacons

First, my thanks to **Mark Appleby G4XII** (Scarborough), **Chris van den Berg** (The Hague), Henry Hatfield, **John Levesley G0HJL** (Bransgore), **Greg Lovelock G3III** (Shipston-on-Stour), **Ted Owen** (Maldon), Fred Pallant, Ted Waring and Ern Warwick for their detailed 28MHz beacon logs from which I compiled this months chart of the beacons they heard, **Fig. 7**. Ern Warwick copied signals from KK4UC and PT2AA on 28.220MHz, LU2FFV on 28.292MHz and PB0AAQ on 28.225MHz on the days indicated in **Fig. 7.** In addition he received signals, almost daily, throughout this period from IK6BAK on 24.915MHz and PY2AMI on 18.100 and 24.931MHz; JA2IGY, LU4AA, ZS6DN/B, 4U1UN/B and 4X6TU/B on 14.100MHz and DK0WCY on 10.144MHz.

Tropospheric

The slightly rounded atmospheric pressure readings for the period July 26 to August 25, **Fig. 8**, were taken at noon and midnight from the barograph installed at my home in Sussex, some 60m a.s.l.

A change from the very hot weather and high atmospheric pressure was apparant on August 8 and true to form co-channel interference appeared on some u.h.f. channels during the evening of the 8th and while I was parked at Bosham, Sussex on the 9th, I received strong negative pictures from France on Chs. L5 and 9 in Band III (175-230MHz) and 21 and 26 in the u.h.f. band on my Plustron TVR5D with its own rod antenna. **Andrew Jackson** (Wirral) received pictures in Band III from Ireland on August 1 and France on the 7th and 8th and when Simon Hamer checked Band II on the 4th he logged BBC Radios Guernsey and Jersey, Melody Radio (London), Radio Harmony (Coventry) and several stations in Ireland. David Glenday had a good u.h.f. television haul each day from July 31 to August 4 when he identified pictures, most often in colour, from Belgium, Denmark, France, Germany and Holland.

934MHz

"Since changing my feeder lines to the more flexible '10 FDB' there has ben a marked improvement in TX and RX. The s.w.r. has also improved and the cable

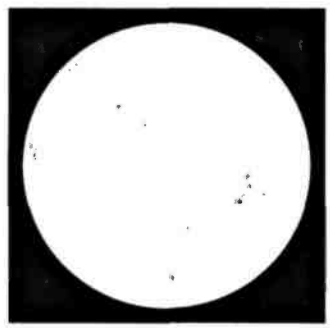


Fig. 2

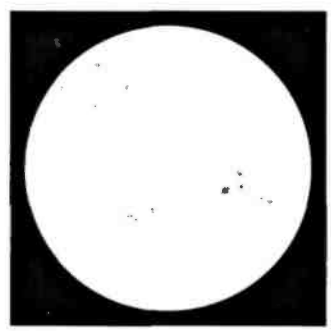


Fig. 3

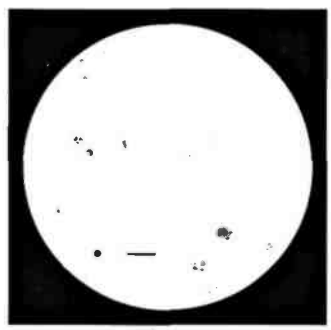


Fig. 4

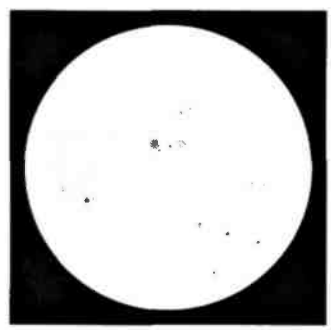


Fig. 5

losses a mere 0.105dB per metre. A recommended mod to all on the band," wrote **Les Jenkins GB-37** from Godalming.

While the good conditions prevailed during late July and Early August, **Terry Wyatt UK-845** (Walton on Thames) worked BB-15/M (Brighton) at 65km, UK-432 (Canvey Island), UK-717 (South Banfleet), UK-888 and UK-1400 (Southend), UK-968 (Hadleigh), UK-1381 (Leigh on Sea) and UK-1555 (Hockley) all around 80km, UK-879 (Huntingdon) at 112km, JD-25 (Littleborough) at 175km, UK-1375 (Boston) at 200km. Although Terry heard, but could not raise WL-34 in Torguay (240km) he did hear UK-369 in Cowley make contact. John Levesley UK-627) heard or worked stations in the Channel Islands, around 165km, on July 28 and 29 and August 1, 3, 4, 5, 6, 10 and 11, a few on Butser Hill (80km) on July 29 and one in Brixham (128km) on August 1.

Tea on Hot Days

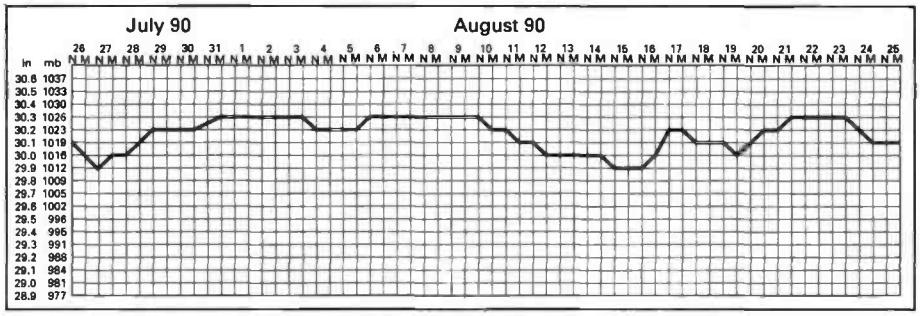
I had the pleasure on a very hot August 1 of meeting and showing members of the Wednesday CW Club, from the Ashford area, around the Vintage Wireless Exhibition at the Amberley Chalk Pits museum. The group, lead by **Geoff Voller G3JUL** (centre front row) were guests of the museum's curator **Mike Wall** (far right back row) and where better to start the day and record the event, **Fig. 9,** than outside the tea shop. We had our priorities right, wireless second, hi. Joan and I also had the pleasure of drinking tea in the September sunshine with **Dick and Peggy Ganderton** from our associate journal *Short Wave Magazine* on the 1st and **Geoff and Barbara Arnold** from *Radio Bygones*, **Myles Eckersley** the son of the late **Capt. Peter Eckersley** the first Chief Engineer of the BBC, Henry and Sue Hatfield and **Irene Marwood** and **David Marcuse** the widow and son of the late **Gerald Marcuse** on the 2nd. The museum had a special display that week-end dedicated to Gerald who pioneered Empire Broadcasting in 1927.

Fig. 9

Fig. 7

Beacon	July 26	27	28	29	30	31	August 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
DF0AAB										X			X		X	X	X	X	X	X	X	X		X			X		X	X	X
DF0THD							X	X		X				X	X	X	X	X		X		X		X			X		X		
DL0IGI	X	X	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			X	X	X	X	X		
EA3JA	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	
HG5GEW	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X			X					X		
IY4M	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X		X	X	X	X			X		X
KK4UC													X																		
LA5TEN			X				X	X	X	X	X	X	X	X	X	X		X	X	X	X			X		X					
LU1UG		X																	X		X										
LU2FFV																								—	•	—	—			X	
NX20							X					X																		X	
OK0EG	X		X			X	X	X		X	X	X			X	X	X	X	X		X	X							X		
OH2TEN		X	X		X	X	X	X	X	X	X		X	X	X	X	X	X		X	X	X	X	X		X		X			
PB0AAQ									X																						
PI7BQC							X								X														X		
PI7ETE							X								X														X		
PT2AA																											X				
PT8AA																					X						X				
PY2AMI	X	X			X		X	X	X	X	X	X			X		X	X	X		X		X		X	X	X	X			X
SK5TEN		X	X			X	X	X	X	X	X		X	X	X	X	X	X		X		X		X		X					
VK2RSY			X				X			X										X	X						X	X			
VK3MEY			X																												
VK5WI			X				X				X							X	X		X		X		X		X	X			X
VK6RWA			X				X			X	X			X									X				X				X
WA4DJS						X	X				X	X	X					X													X
W3VD						X	X					X	X			X															X
ZD8HF	X	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X			X
ZS1LA	X	X			X		X	X	X	X	X	X	X		X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ZS5VHF	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X
ZS6PW	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X
Z21ANB	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
4N3ZHK	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			X	X			
5B4CY	X		X		X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X		X
5Z4ERR						X				X		X	X	X	X	X	X		X	X	X	X		X	X		X	X		X	X

Fig. 8



Ron's page relies on feedback from you! Write to him direct or via the office. Alternatively, we'll be pleased to pass on comments received by telephone.

Back-Scatter

Broadcast Round-up

Reports to
Peter Shore, via the *PW* Editorial Office

During the past weeks there has been little news to displace the Gulf crisis from the leading story in news bulletins on the world's most significant international radio broadcasters. Radio Kuwait is still unheard - it has been replaced on many of its pre-invasion regular frequencies by Iraqi radio.

As is usually the case when crisis flares up overseas, international radio comes to the fore, and is noted by Joe Public, too. Television news bulletins on both the BBC and ITN in this country have shown BBC World Service in English and Arabic at work, and made use of material gathered by BBC Monitoring at its country mansion base on the outskirts of Reading. Pictures of Sony ICF-7600D receivers being used by Arabs and Western expatriates in the Middle East to tune in to London or Washington for reliable information have been flashed around the world. But radio has proved in many cases more reliable than certain satellite television services. CNN in Atlanta relayed Iraqi television news bulletins live when Saddam Hussein was quoted at length, pouring out rhetoric and threat to the West. But CNN became somewhat confused, placing a caption on the Iraqi TV news reader suggesting that he was President Saddam. It took several hours before this was corrected. At least that cannot happen on radio!

BBC World Service started a special programme called *Gulf Link* heard at 1645 daily to keep Westerners in the Middle East and particularly those in Baghdad and Kuwait City, informed about developments and news from home. Meanwhile, Arabic language broadcasts from London are still being intermittently jammed by Iraq although additional frequencies have been brought in to use, and programme hours extended by an hour and a half daily.

The Deputy Managing Director of BBC World Service, David Witherow, said "Jamming the BBC is always the last resort of those who wish to suppress the truth - and in a way it is a tribute to the role of the

Back-Scatter

World Service at times of crisis". Evidence of the way in which World Service is a unique lifeline to the outside world for those trapped came from a letter faxed from the Manager of Thai Airways in the Gulf to Bush House:

"From questioning those Thais who escaped from Kuwait by crossing the border near A1 Kafaji in Saudi Arabia, I discovered that a group of them trying to flee lost heart - in the middle of the desert and were going to return. Suddenly they heard the news on the BBC that somehow some Thais had managed to get out via Al Kafaji already, which encouraged them to continue their journey and they succeeded in reaching the Saudi border".

Radio Australia has been allocated 11.5 million Australian dollars for upgrading transmitters. Australia is endeavouring to focus its resources on the Pacific region, and is still investigating potential relays in Thailand or other Asian countries.

European Stations
All times UTC (=GMT)

The 1900 European service from the Voice of Greece is now heard on 9.695MHz, replacing 9.395, with Greek, English at 1920, French at 1930 and German at 1950. The parallel frequency is 11.645MHz.

Radio Norway International increased its English language programmes to include Saturday on September 2, something the station had wanted for a good many years. The Norwegian Foreign Office finally agreed the additional budget in the Spring of this year. The current schedule is now:

1200 on 25.73 & 21.735MHz
1300 on 9.59 & 9.585MHz
1600 on 15.22 & 25.73MHz
1700 on 9.655MHz
1800 on 17.755MHz
1900 on 25.73, 21.705, 15.235 & 15.22MHz
2100 on 15.165MHz
2200 on 17.73 & 15.195MHz
0100 on 11.925MHz
0200 on 11.735 & 9.615MHz

English programmes from Soviet Republic stations include:

Radio Tashkent with English at 1200 until 1230 and 1330 until 1400 on: 17.74, 11.785, 9.715 and 7.325MHz.

Radio Vilnius has English at 2130 for half an hour on 9.675, 6.10 and the two regular m.f. channels of 666kHz and 1.557MHz. The transmission at 2200 can be heard on 15.485, 15.445, 15.18, 13.645 and 11.79MHz.

Radio Kiev has an English service for Europe at 2000 on 7.28 (this replaces 9.865MHz). At 2300, the North American service is transmitted on 17.69, 17.665, 15.18, 12.06, 12.005 and 11.77MHz.

Radio Minsk has German language transmissions on Wednesday, Saturday and Sunday at 1730 on 11.96, 11.78, 9.60 and 7.33MHz.

Middle Eastern and African Stations

Reports from The Congo suggest that a new 100kW short wave transmitter has been installed by Radio Diffusion-Television Congolaise and that 300kW senders are due to be installed in the next few months. Try 15.19 and 6.115MHz.

Radio Baghdad is beaming programmes in English to Western military personnel in Saudi Arabia, noted at 1630 on 11.86MHz. The broadcast claimed that transmissions on this frequency would be heard at 1000+1200, 1600+1800 and 2000+2200. The European English service continues at 2000 on 13.66MHz through until 2200, but this is not in parallel with the special military service.

Use of transmitters of Radio Kuwait has now settled down, with 13.62MHz in use since the end of August. Strangely enough, one of the regular Kuwait channels of 15.505MHz has been unheard since the closure of Radio Kuwait some days after the invasion.

A clandestine station has been heard on 9.73 and most recently 9.72MHz during most of the day (from at least 0500 until 2200) in Arabic, with the name Holy Mecca Radio. It appears to be directed against the Saudi government and people.

Israel has changed a frequency for its evening transmissions to Europe, moving from 17.575 to a new 17.59MHz. French at 2100 and English at 2130 are affected by this alteration.

The current schedule from Kol Israel suggests that there is now a relay of the Israeli television news programme at 1900 until 1955 on 15.64MHz. Checks made so far indicate that Russian is transmitted on this channel at 1900, although it may be that this service will be introduced during the current schedule period, which runs in the case of Israel until November 4.

Roy Merrall in Dunstable has written with details of Radio RSA's new schedule from September 2.

0400-0500 on 11.90 and 7.27MHz with *Good Morning.*
1100-1200 on 17.835, 11.90, 11.805, 9.555
1500-1700 on 15.27, 7.23
1700-1800 on 17.79, 15.27, 7.23

The programme *Africa South* is heard on weekdays after the 1100 and 1700 news casts, and the request programme *Yours and Mine* is broadcast each day except Saturdays at 1600.

Asian and Pacific Stations

Radio Japan is using the facilities of Africa Number One in Gabon to relay increased Arabic language programmes from 0930 until 1000 on 21.53MHz.

Roy Merrall reports his findings about Radio New Zealand International, detailing his use of 9.855 with variable results at 0700 with SIO of 433 to 454, particularly on Wednesdays for the *Countdown* pop album chart programme, heard to the 0800 news and close down at 0815. Also on Saturdays from 0700 with *Saturday Scrapbook*, but transmissions continue until 1000 with *Beyond Our Ken* or *Round the Horne*. Roy suggest that a typical SIO of 433 down to 332 over the period.

15.485MHz has been barely audible, but has improved recently from sign on at 1753 through to close at 2200.

North, Central and South American Stations

Radio Canada International is using the facilities of Radio Austria for its special programmes for the Gulf region. At 0330, Arabic is heard on 11.73, whilst an hour later at 0430, 15.275MHz is in use.

Meanwhile a special programme for relatives to send messages to Canadians held in Iraq and Kuwait has been introduced. Broadcast at 0400, the frequencies are the same as the special Arabic service.

Last month's column included details of s.s.b. tests from HCJB in Quito. News now of German language programmes from the station which include regular transmissions using s.s.b. senders. The new schedule is:

0430 on 25.95, 21.46 & 11.835MHz
0600 on 25.95, 21.46, 15.27, 11.835 & 9.61MHz
1830 on 25.95, 21.48, 17.79 &15.27MHz

The s.s.b. frequencies are 25.95 and 21.46MHz

Voice of America Arabic programming has been increased, but to counteract Iraqi jamming, new frequencies have been introduced. At 0530 a new service is heard on 6.16, 7.16, 7.255, 9.74, 15.16 and 17.705MHz.

VoA Europe is being relayed on h.f. frequencies to the Gulf at 0300 on 6.095, 15.16, 15.225, 17.81 and 17.865 and at 0800 on 11.74, 15.16, 15.195, 21.535 and 21.615MHz.

Have you heard anything interesting? Phone the editorial answerphone and leave the details for everyone to read about it.

Back-Scatter

ATV

Reports to
Andy Emmerson G8PTH
71 Falcutt Way
Northampton NN28PH

The time for our quarterly activity column has flown round again and once again we have news about amateur television from all round the world.

Celtic Nations Linkup

Our first port of call this time is the principality of Wales. A most enthusiastic letter from **Derek GW3FDZ** in Dyffryn Ardudwy. Derek's interest in ATV goes back quite a way: 'twas he who carried out the first contact between GW and GD with John Lawrence back in 1958. Of course everyone knows that 405 lines travelled better than 625 (no letters please!) but it was a major achievement in those days.

Another major achievement has been the recent revival of ATV in Eire, and one of Derek's regular ATV contacts now is **Craig EI3FW** who provides P5 pictures. It looks as if all Derek's contacts are fated to be across water, since his location between Barmouth and Harlech only permits him to cover the coastal area between Cardigan in the south and the northern end of Cardigan Bay. But the path across to Ireland is fine! If anyone finds themselves on the west coast of Wales, then a phone call in the evening on 03417-343 will have Derek on the air in no time.

Derek also speaks enthusiastically of an ingenious in-line masthead pre-amp from RN Electronics, details on Brentwood (0277) 214406. This is r.f. switched and will withstand up to 300W, which is handy as Derek uses a 100W linear. The pre-amp provides a gain of 14dB on receive.

Kent Television Group Progress

A letter from **Chris G4AYT** confirms that things are bubbling on the north Kent coast. He writes: "The Kent Television Group was set up at the second meeting of local amateurs interested in television on August 23 1990. The aim of the group in particular is to establish a 23cm amateur television repeater with a primary coverage area of north Kent, as well as to encourage activity on 23cm ATV.

"The group's executive committee consists of G4AYT, G4BBH, G6GHP, G8GHH and G8SUY. Members of the group are asked to pay an initial subscription of £10 as expenses are expected to be high in the

first year. Further details of progress can be obtained from G8SUY, while subscriptions should be sent to G4AYT."

Chris adds that conditions have been very good on 23cm during the summer. "A regular signal here in Whitstable has been that of the North Norfolk repeater, GB3TN in full colour with sound. Indeed this repeater is an excellent indicator of propagation to the north from Kent. On August 1 G0KZN running a couple of watts in Lincolnshire was an excellent colour signal here in Whitstable. Many Dutch stations have been seen, including the following at P5 during August: PE1DWA, PI6ATE, PA6ROT and PE1KTO. The last of these, PE1KTO, was listening on 145.790MHz and could not be contacted as none of my three 144MHz rigs can get on that channel! Activity in the area has been low on 70cm, despite some good conditions, PE1DWA and PA3CHH having been seen P5."

70cm Is Still Alive

That's the feedback from several areas. Even though many operators' main sphere of activity is now 24cm, most of them can still transmit a signal on "good old seventy", so don't be afraid to ask if you are new on this band. Another word to the wise: I hear that private mobile radio (p.m.r.) is starting to occupy the frequencies directly above 440MHz in many areas now. There are dark rumours that a few TV amateurs transmit colour on seventy and their signals spill out above 440MHz. I cannot believe anyone would be so foolish or thoughtless, but rest assured that if there are any complaints of interference from business users, the Radio Investigation Service will be forced to look into them. Let's avoid this.

New Zealand News

Our regular correspondent **Mike Sheffield ZL1ABS** advises that he has now received his 23cm transmitter kit from the Sussex Repeater Group. He had travelled all the way from New Zealand to the BATC's convention at Harlaxton to buy one but there were no Worthing people there! Still, he had a nice letter of apology from them and no doubt everyone who didn't attend this year will come to Harlaxton next year and make it an even greater success.

Recently Mike and **Wayne ZL1USK** gave a talk to the Auckland VHF Group entitled "What's New in ATV". They brought along some project from the NZ *Break-IN* magazine plus the teletext video generator from the BATC's *ATV Compendium*. Mike had put two pages of video data into an EPROM promoting the AK group's ATV and voice repeaters. The meeting welcomed seeing this transmitted from the ATV repeater/beacon when the trustees approve it. On the r.f. front Mike displayed the Worthing transmitter kit (not yet built up) and a new 70cm a.m. transmitter design with subcarrier sound for portable work. While coffee was served the Severnside Repeater Group's promo tape was seen. To round it all off a live off-air demo from **Ken ZL1TVQ** was a success and Mike hopes they have raised the awareness of ATV in the v.h.f. Group. Well done! I don't get to hear of similar ingenuity here ... I wonder why not?

Radiovideograph Club Success

The sixth meeting of the members and friends of the Polish Radiovideograph Club took place over the weekend May 19/20th in Debrzno near Pila (writes **Stanislaw Pazur**). The venue was recommended by local club SP1KOS. For the first time in the history of the club the president of the national radio club PRV, SP5HS, was there. The guest of honour was Juergen Y23NE. Around 150 people attended the meeting and a special event station SP0RVG worked on the amateur bands. A special brochure was produced for the meeting entitled *ATV in Amateur Radio Sport*.

SP1FMH opened the meeting. In the chairman's report Mr Cwojdzinski SP2JPG summed up the major events of the last year. Krzysztof Slomczynski SP5HS, president of PRV, discussed the present complicated situation in PRV and plans for the future. The second part of the meeting is always very popular. There were some technical lectures about ATV with demonstrations (by SP2JPG) and packet radio (by Henryk SP5DED and Bartosz SP3CAI). Mr Cwojdzinski presented the interesting DF4PN mini-ATV transmitter. Members' constructions and commercial gear for packet radio were also shown.

During the meeting the following officers were elected: Chairman - Wojciech Cwojdzinski SP2JPG, Vice Chairman - Henryk Ignasiak SP5DED (packet radio technique), Vice Chairman - Bartosz Pastuszak SP3CAI, Secretary - Kazimierz Slomski SP2ERD, Intercontest Manager - Krzysztof Ulatowski SP2UUU and Committee Member - Jerzy Smietanski SP9AUV.

There was a flea market as usual and the participants exchanged some interesting computer programs. The packet radio group plan to establish the gateway 3599kHz/144.650MHz in Warsaw for mailbox and BBS. There are 16 stations with permission to transmit packet radio.

This year is a very special one for PRC members in Poland, being the tenth anniversary of the first QSOs in SSTV and RTTY. The first two-way SSTV contact was between SP3ZHC and OZ3WP on March 3, 1980. Station SP3ZHC was working the special event callsign SP0PIR. In RTTY SP3CAI was first on December 23 1980. As part of the celebrations the Club will organise a SSTV and RTTY contest on October 21 this year from 0600 to 1800UTC. Cups and diplomas will be awarded to the winners. (Thanks for all this useful info, Stan. It's good to know there is so much activity coming along.)

That's it for this time. Once again most of our news has been mainly foreign: is there really nothing going on in England and Scotland?!? Write and deluge me with YOUR news!

Radio Diary

October 14: Computercations will be held again this year at Hillhead campsite on the Dartmouth road in Brixham, south Devon. **Bill Trezise. Tel: (0803) 522216**.

October 20: The G-QRP Club Mini Convention will be held in St Aiden's Church Hall, Manchester Road, Rochdale from 10am to 5pm. There will be a large social area, full lecture programme, equipment display, refreshments, Bring & Buy, Component/Kit Stands, Test Bench and lots more. Admission £1. **Rev George Dobbs G3RJV, QTHR**.

***October 20/21**: The 4th North Wales Radio Rally will be held at the Aberconwy Centre in Llandudno. Rally open as at 11am on both days and the entrance fee is £1 with OAPs 50p and children under 14 free. **Mr B Mee. Tel: (0745) 591704**..

***October 26/27**: The Leicester Amateur Radio Show will again be held in the Granby Halls, Leicester.

***November 18**: The Bridgend Annual Amateur Radio Rally will be held in the Leisure Centre, as last year but in 1990 they are taking over the whole of the building! **Don Chennell GW4DUY. Tel: (0656) 863084**.

December 9: The Leeds & District ARS have their Christmas Rally in The Civic Hall, Dawsons Corner, Pudsey (junction of the Leeds Outer Ring Rd and Bradford Road A647). Talk in on S22. All usual facilities. Admission is by program only, 50p. Doors open 10.45. **Geoff on Leeds (0532) 585801.**

***Practical Wireless and Short Wave Magazine in attendance.**

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Have Yaesu FT-790RII with NiCads, charger and 3-element collinear. Unit is little used and in mint condition. Would exchange for an h.f. linear or triband antenna with rotator or perhaps anything interesting for h.f./c.w. **Tel:** Arthur G0DKJ on Halifax (0422) 368021

Have G2DAF type h.f. linear amplifier complete with 2x 813 valves and one spare, plus power supply unit for 1.8kV. (The p.s.u. weighs 50kg and the amplifier 15kg). Would exchange for a BBC 'B' computer with DFS. **Tel:** G. Wilson G3APV (09467) 28449

Have Redifon R408 communication receiver covering 13kHz-28MHz without break, plus Trio TX599 custom special, both in good condition and with manuals. Would exchange for a 144MHz multimode transceiver. **Tel:** Tom Burke (0472) 602335

Have Realistic PRO2004 scanner complete with discone antenna, mast and coaxial cable. Would exchange for 144MHz transceiver or w.h.y. **Tel:** Tony Hall G0MQG (0603) 611764

Have Eddystone 770R Mk 2 v.h.f. receiver covering the range 19-160MHz in six bands. Having a very large tuning dial it requires much space on the bench. Would exchange for a mains powered airband receiver or a Halicrafter. **Tel:** F Walker (0221) 241088

Have late '20s' 4 valve portable receiver with built-in frame antenna and speaker. The unit works well and would exchange for an h.f. (w.h.y.) receiver. **Tel:** Mann (0223) 860150

Have AOR 2002 receiver with discone antenna and 1.3MHz frequency counter. All complete with p.s.u.s and leads. **Tel:** K Faulkner 061-748 9604

Have Realistic PRO2004 scanner would exchange for a good h.f. receiver. **Tel:** John (0865) 774602 after 5p.m.

Have ERA Microreader MkII and would exchange for h.f. mobile transceiver system (w.h.y.) **Tel:** B. Greer (0283) 63667

Have Black Star 1.3GHz frequency counter in 'as-new' condition. Would exchange for scanner or 144MHz transceiver or w.h.y. **Tel:** Godfrey Whiteway (0443) 772387

Have Polaris 12x52 binoculars as new in leather case. Murphy l.w./m.w./f.m. bands clock radio, plus cassette player as new with Shure 444 microphone. Would exchange for a KW202 receiver or similar (w.h.y.) **Tel:** George. King's Lynn (0553) 763428

Have new boxed compact disc player, with remote control, repeat, shuffle etc. Has never been played. Would exchange for a Grundig Satellit or similar digital h.f. receiver with b.f.o. Must be mint condition. **Tel:** Alex Kevan (0671) 3562

Have Sony PRO80 in mint condition with box, etc. Would exchange for either a hand-held or base station scanner w.h.y. **Tel:** Steve Grosvenor 021-422 3298

Have Korg Trident professional synthesiser and Roland Cube 60W amplifier complete with a five octave full size keyboard. A progressive disability forces disposal. Would exchange for a good 144MHz mobile preferably with 45W output (Kenwood Yaesu or w.h.y.) **Tel:** John Evans G7CEC (0706) 874044

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