

practical Wireless

APRIL 1994 £1.90

PW Explores The Challenging World Of Amateur Radio Low Power QRP Communications



G4SLU Builds The Yeovil 3.5 And 14MHz HF Transceiver

Peter Barville G3XJS Reviews The Poky-toky OVER-A 144MHz Ultra-QRP Transceiver



**Milliwattling On 1.8MHz
The Yeovil QRP Convention 10 Years On**

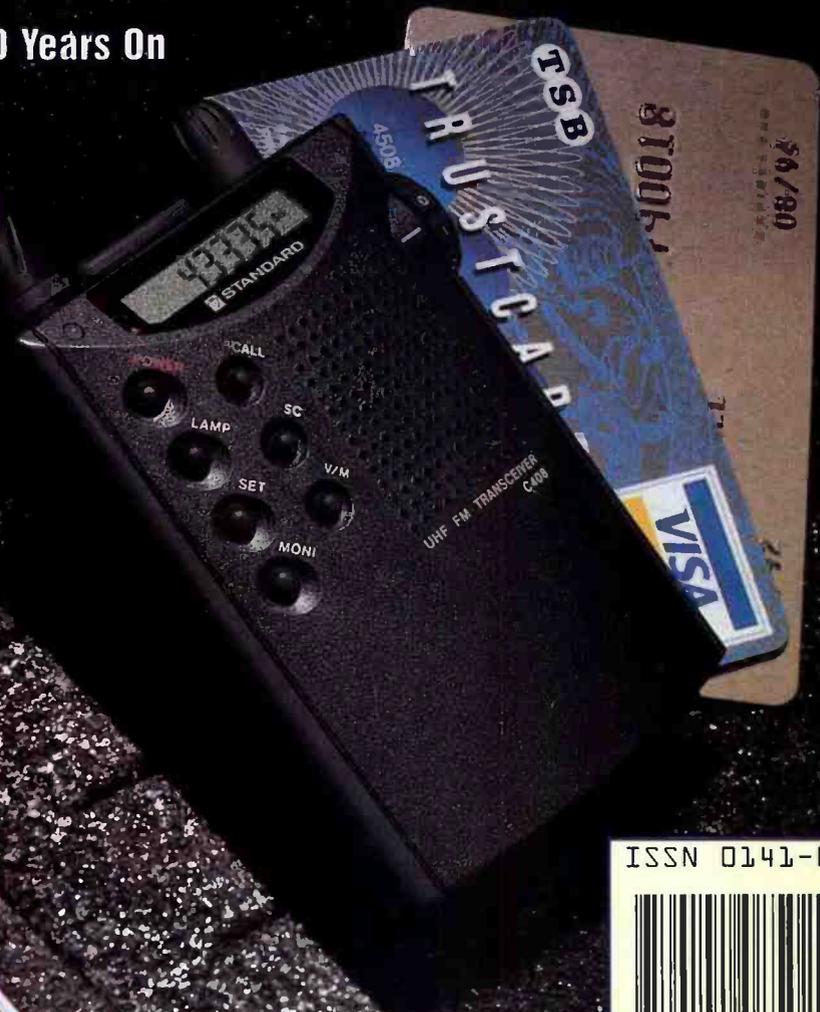
Product Reviews

Richard Newton GORSN Pays Credit To The New Standard C408 Miniature UHF Transceiver

And Ed Taylor G3SQX Tries The W9GR DSP11 Audio Filter

Build Part 2 Of The PW Jubilee 14MHz SSB Mobile Transceiver

Plus Bits & Bytes - Valve & Vintage - Focal Point And Much More!

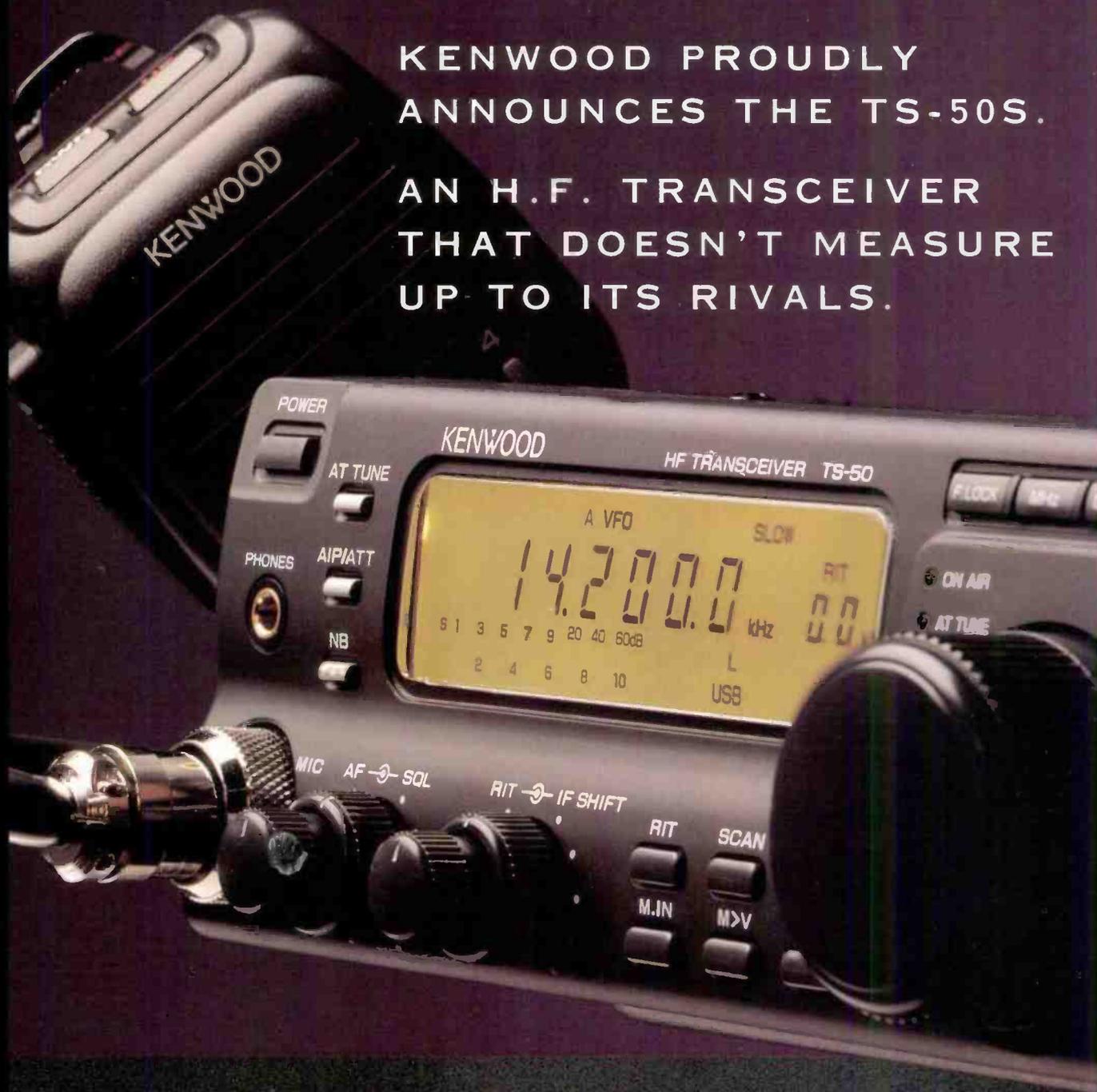


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APRIL 1994 (ON SALE MARCH 10)
VOL. 70 NO. 4
ISSUE 1045

NEXT ISSUE (MAY)
ON SALE APRIL 14

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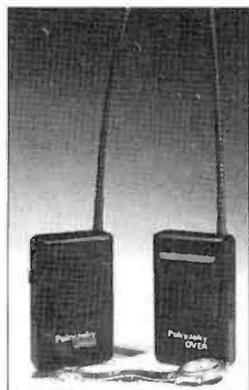


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COMING NEXT MONTH

Practical Wireless takes a look at computing in amateur radio.

DON'T MISS IT!

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P335
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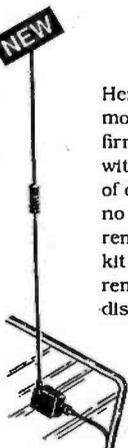
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30kHz-30MHz



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for FM Beams



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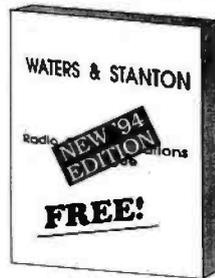
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Practical Wireless, April 1994

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DJ-580E
2M/70cms

Wide-Band Rx
42 Memories
Full Duplex

£449

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DR-130E 2m Mobile



£359

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20 Memories
CTCSS Encoder
Time Out Feature
Channel or Freq. Display
Compact size
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2m/70cm

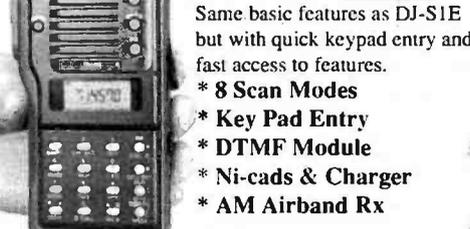
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- * 70 memories
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- * Very Compact
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- * Illuminated Display

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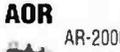
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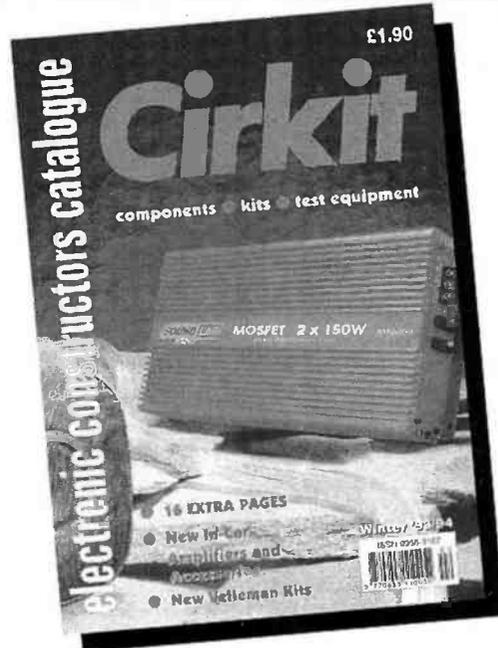
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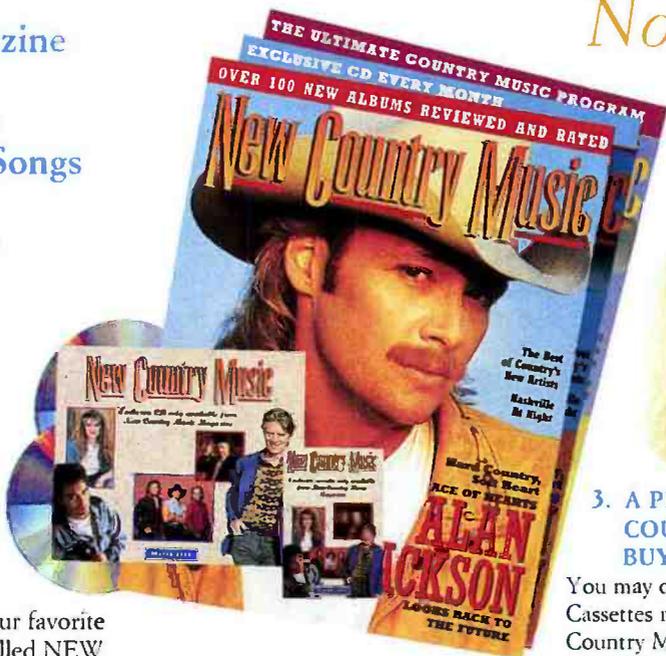
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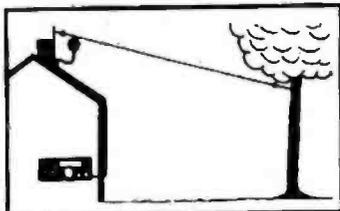
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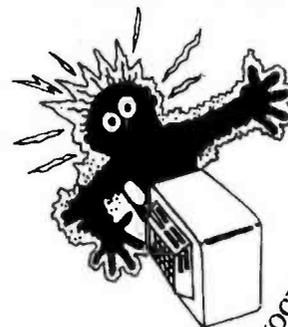
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Model	Brand	Type	£ inc. Vat
PX FT1000	Yaesu	HF Transceiver	£2695.00
SE FT107M	Yaesu	HF Transceiver	£476.00
PX FT767GX (X2)	Yaesu	HF Transceiver	£825.00
PX FT757GX2	Yaesu	HF Transceiver	£795.00
PX FT767GX	Yaesu	HF Transceiver	£1295.00
PX HL2K	Tokyo	2Kw Linear	£1235.00
PX HT180 (X2)	Tokyo	80MTR TX/RX SSB	£289.00
PX IC725	Icom	HF Transceiver	£825.00
PX IC761	Icom	HF Transceiver	£1295.00
PX TS140	Kenwood	HF Transceiver	£599.00
PX FT747	Yaesu	HF Transceiver	£625.00
PX FT101Z	Yaesu	HF Transceiver, Valve PA	£375.00
PX FT101Z	Yaesu	HF Transceiver, Valve PA	£395.00
PX FTONE	Yaesu	HF Transceiver	£795.00
PX TS440SAT	Kenwood	HF Transceiver	£795.00
PX KWM4380	Collins	HF Transceiver	£1495.00
PX FT767GX	Yaesu	HF Transceiver + 2m	£1375.00
AX ARG05Y	Tentac	HF Transceiver	£476.00
AX FT747GX (X2)	Yaesu	HF Transceiver	£725.00
AX IC725	Icom	HF Transceiver	£650.00
AX IC751A	Icom	HF Transceiver	£975.00
AX IC761	Icom	HF Transceiver	£1200.00
AX TS430S	Kenwood	HF Transceiver	£595.00
AX TS50S	Kenwood	HF Transceiver	£725.00
AX TS690S	Kenwood	HF6M Transceiver	£1199.00
AX TS700	Kenwood	HF Transceiver	£299.99
AX TS430S	Kenwood	HF Transceiver	£650.00
AX FT101ZD	Yaesu	HF Transceiver	£449.00
CX FT757GX	Yaesu	HF Transceiver	£705.00
LX TS140	Kenwood	HF Transceiver	£699.00
LX TS820S	Kenwood	HF Transceiver	£395.00
BX FT1012MK3	Yaesu	HF Transceiver	£369.00
BX FT102	Yaesu	HF Transceiver	£489.00
RX FT747GX	Yaesu	HF Transceiver	£625.00
RX FT767GX	Yaesu	HF Transceiver with 2m & 6m	£1650.00
RX FT767GX	Yaesu	HF Transceiver	£1295.00
RX FTONE	Yaesu	HF Transceiver	£995.00

VHF EQUIPMENT

Model	Brand	Type	£ inc. Vat
PX DJ120	Alinco	2M Transceiver	£129.00
PX FT690R2/A	Yaesu	FT690R A Version	£350.00
PX FT76	Yaesu	70CM Handheld	£235.00
PX TH46E	Kenwood	70CM Transceiver	£169.00
PX TH78E	Kenwood	2M/70CM Transceiver	£359.00
AX C5608D	Standard	Transceiver	£500.00
AX C844	Comunique	Handheld	£50.00
AX FT225RD	Yaesu	2M Transceiver	£599.00
AX FT290R	Yaesu	2M Transceiver	£275.00
PX TS790E	Kenwood	2m/70cm Base station	£1295.00
AX FT290R2	Yaesu	2M Transceiver portable	£414.80
AX FT480R	Yaesu	2M Transceiver multimode	£295.00
AX IC2GE	Icom	2M Handheld	£160.00
AX KT22	Kenpro	2M Handheld	£119.00
AX KT400	Kenpro	2M Handheld	£119.00
AX KT44E	Kenpro	70CM Handheld	£129.00
AX MX2		Handheld	£80.00
AX TH28E	Kenwood	2M Handheld Transceiver	£235.00
AX TR2100M	TriO	Transceiver	£126.00
AX TR751E	Kenwood	2M Transceiver	£549.00
AX TR9130 (X2)	TriO	Transceiver	£350.00
AX FT225RD	Yaesu	2M Transceiver	£525.00
AX FT26	Yaesu	2M Handheld	£195.00



AX TH78E (X2)	Kenwood	Dualband Handheld	£385.00
AX DJ500E	Alinco	Handheld	£189.00
AX FT208R	Yaesu	2M Handheld	£115.00
CX FT290	Yaesu	2M Transceiver Multimode	£299.00
CX FT470	Yaesu	2M/70CM Transceiver	£399.00
CX FT73R	Yaesu	UHF Transceiver	£159.00
CX TH205E	Kenwood	2M VHF Transceiver	£175.00
LX FT2400	Yaesu	2M Transceiver	£310.00
LX FT736R	Yaesu	Transceiver	£1199.00
LX FT811	Yaesu	UHF Handheld	£220.00
BX FT290R2	Yaesu	2M Transceiver Multimode	£389.00
BX FT470R (X2)	Yaesu	Dualband handy TXA	£325.00
BX FT690R2	Yaesu	6M Transceiver	£350.99
BX TH77E	Kenwood	Dualband Handheld 2M/70CM	£299.00

BX FT811	Yaesu	70CM Transceiver Handheld	£165.00
RX 204		Transmitter	£135.00
RX IC4SRE	Icom	70CM Transceiver	£330.00
RX C500	Standard	2M/70CM Handheld	£150.00
RX FT290/1 (X2)	Yaesu	2M Transceiver	£249.00
RX FT290R	Yaesu	2M Mobile	£225.00
RX FT290R2	Yaesu	2M Transceiver	£350.00
RX FT727	Yaesu	2/70 Transceiver	£295.00
RX FT76	Yaesu	70CM Handheld Transceiver	£249.00
RX FT790R	Yaesu	70CM Portable multimode	£165.00
RX IC24ET	Icom	2M/70CM Transceiver	£350.00

RECEIVERS AND SCANNERS

Model	Brand	Type	£ inc. Vat
PX AR3000	ADR	Scanner	£599.00
PX D707	Diamond	Pre-amp Ant	£69.99
PX FRG6800	Yaesu	Receiver	£425.00
PX ICR7000	Icom	Receiver	£885.00
PX MVT6000	Yupiter	Scanner	£220.00
PX PRO2005	Realistic	Scanner	£229.00
PX PRO80	Sony	Handheld Scanner	£169.00
PX PRO9200	Realistic	Scanner	£108.99
AX ICF2001D	Sony	Receiver	£169.00
AX 800XLT	Bearcat	Scanner	£159.00
AX FRG7000	Yaesu	HF Receiver	£250.00
AX HP200E	Fairmate	Scanner	£199.00
AX ICR1	Icom	Scanner	£285.00
AX ICR70	Icom	HF Receiver	£450.00
AX ICR71	Icom	Receiver	£626.00
LX MVT800	Yupiter	Mobile Scanner	£265.00
LX R5000	Kenwood	HF Receiver	£895.00
AX MVT8000	Yupiter	Scanner	£289.00
AX MX7000	Regency	Scanner	



AX R532	Signal	Airband Receiver	£100.00
AX SW77	Sony	Receiver	£299.00
AX ICR1	Icom	Scanner	£275.00
AX BJ200	Black Jag	Scanner	£85.00
CX D2935		Receiver	£152.75
CX ICF2001D	Sony	Receiver	£188.00
CX ICR71	Icom	HF Receiver	£564.00
CX R100	Icom	VHF Receiver	£395.00
LX AR1500E	AOR	Scanner	£240.00
LX FRG7	Yaesu	HF Receiver	£185.00
BX VT125MK2	Yupiter	Scanner	£139.00
RX 200XLT	Bearcat	Scanner	£185.00
RX AR2002 (X3)	AOR	VHF Receiver Scanner	£299.00
RX FR400	Yaesu	HF Receiver Amateur	£150.00
RX FRG9600	Yaesu	Scanning Receiver	£299.00
RX HX850	Regency	Scanner	£79.99

DATA EQUIPMENT

Model	Brand	Type	£ inc. Vat
PX COM-FAX	ICS	Com-Fax Cartridge, handbook	£39.00
PX HANDIPAK		TNC	£149.00
PX MM1000 (X2)	M/M	ASC11 to morse	£40.00
PX PK232/BBC	ICS	E-PROM overlay, cable	£19.00
PX THERM (X2)	ICS	Software (BBC)	£19.00
AX AR21		Modem	£115.00
AX PK232MBX	ICS	Modem 7 mode Data Terminal	£249.00
AX PP1		Phone patch	£139.00
AX ST5		Decoder	£29.00
LX ICR100	Icom	Scanner with SSB	£450.00
LX PK64		TNC	£65.00
BX PK232MBX	ICS	7 Mode TNC	£269.00

ACCESSORIES

PX 12/25A	Bnos	25A Power supply	£189.00
PX BC15A	Kenwood	Desk charger	£59.00
PX F50-L/U	Bnos	Filter	£19.95
PX FMUT747	Yaesu	FM unit for FT747	£35.00
PX FMUTONE	Yaesu	FM unit	£35.00
PX FP700	Yaesu	PSU	£159.00
PX FP707	Yaesu	PSU	£139.00
PX FRB757	Yaesu	Relay	£10.00
PX FS500V (X2)	Yaesu	Power meter	£79.00
PX FS740V	Yaesu	Power meter	£79.00
PX HC2000	Tokyo	2KW HF ATU	£300.00
PX HL100B/10	Tokyo	10M Band amplifier	£155.00



PX KR2000	Kenpro	Rotator	£345.00
PX LA2080H	Daiwa	Linear amplifier 2m	£119.00
PX LPM50/10/100	Bnos	6M 10-100W amp	£199.00
PX MMB20	Yaesu	Mount FT757/FT890	£19.95
PX MMK1296 (X2)	M/M	1296MHz Converter 2MIF	£59.00
PX OSCAR 2	Oscar	CB Transceiver	£38.00
PX SPC3000	Yaesu	HF ATU	£285.00
PX FL7000	Yaesu	HF Linear 500W	£1495.00
PX LPM144, 10100	Bnos	2M Linear 10-100 Warts	£195.00
AX AL84	Ameritron	HF Amplifier	£399.00
AX AT50	Icom	Antenna tuner	£229.00
AX CWR501E		Decoder	£150.00
AX EP2500	Alinco	PSU	£89.99
AX FC757AT (X3)	Yaesu	Tuner hf automatic	£250.00
AX HL62V	Tokyo	Amplifier	£129.99
AX HS15	Icom	Microphone	£50.00
AX LPM144/10/100	Bnos	2M Amplifier	£125.00
AX M75		Pre-amp	£55.00
AX MC85		Microphone	£85.00
AX MD188	Yaesu	Microphone	£64.99
AX MFJ722		MFJ filter	£69.00
AX MMT28/144	M/M	Transverter	£79.00
AX PC1 (X2)		Converter	£110.00
AX PS31	Icom	Power supply	£145.00
AX PS55	Icom	Power supply	£150.00
AX R&N	R&N	Transverter	£128.00
AX RAMA250FC		SWR Power meter	£66.00
AX RS3050		Power supply	£99.99
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AX SW100B		Meter	£40.00
AX YO100	Yaesu	Monitor scope	£99.99
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AX FV101DM	Yaesu	VFO	£150.00
AX FC902	Yaesu	HF Antenna tuner	£200.00
AX OPT02300	Optio	Counter	£99.99
AX SG2305GS		Antenna tuner	£299.99
AX T-200	Toy	Dummy load	£49.00
AX DLA80H	Oaiwa	2M Amplifier	£285.00
CX ARA60	Dressler	Active AE	£135.00
CX FL2010	Yaesu	2M Linear amp	£51.70
CX SB1000		HF Linear	£423.00
LX 12/25	Bnos	12V/25A PSU	£160.00
LX FP757HD	Yaesu	PSU	£240.00
LX G-1000S30X	Yaesu	Antenna rotator	£346.00
LX TB3MK2	Jaybeam	HF 3 Element beam	£350.00
BX FR7700	Yaesu	RX Antenna tuner	£59.00
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RX 12/6A	Bnos	12V 6A PSU	£50.00
RX 144/28	Yaesu	Converter	£85.00
RX BC72	Icom	Charger	£75.00
RX FL2025	Yaesu	2M Linear FT290R2	£110.00
RX FL2025	Yaesu	2M Linear	£85.00
RX FL2100Z	Yaesu	HF Linear	£750.00
RX FL400	Yaesu	HF Transmitter amateur	£150.00
RX FRA7700	Yaesu	Active antenna	£45.00
RX FTV107R2	Yaesu	Transverter	£135.00
RX FV101	Yaesu	Ext VFO	£105.00
RX LF30A	TriO	Low pass filter	£28.00
RX MMB49	Yaesu	Bracket	£16.00
RX NC15	Yaesu	Base charger	£50.00
RX TC350X		Antenna	£69.99

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 BX SMC BIRMINGHAM TEL: 021 327 1497/6313
 CX SMC CHESTERFIELD TEL: 0246 453340
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EDITOR'S keylines

I regard writing Keylines as a monthly privilege. As such, I always try to introduce a fresh topic or comment. However, this time I'm going to break my own rule because of what seems to have become a real nuisance here in the UK - Subscription Services Ltd.

Have you ever tempted fate and suffered the consequences? Well, last month I did just that in Keylines and I'm hoping that I'm still (legally speaking) G3XFD!

If you read the March editorial, you may well remember my comments about the problems many radio amateurs seem to be having with Subscriptions Services Ltd., who handle the Amateur Radio Licence system. It was shortly after writing that editorial when my troubles began.

My licence renewal for G3XFD is due at the end of January and various members of the PW and SWM team reminded me that I'd better not

forget to renew the licence. They need not have worried, because I'm responsible for three callsigns - G3XFD, G3SWM and GORSC (Clayesmore School Radio Society) - I take care to make sure everything is in order. Can't have the Editor of PW as a pirate can we?

I duly sent off my cheque for £15 about two weeks before the licence was due for renewal. I always prefer to pay by cheque, as I've had problems with direct debits with the predecessors of SSL.

Approximately three weeks later, I received a very polite letter and a cheque for £15 from SSL in Bristol. The letter duly informed me that "According to their records, I had paid twice for my licence". Literally in the same post came the licence validation document.

It's very pleasant to receive money through the post. It's not often money comes in to me, as it's usually going the other way! However, as much as I could do with an extra helping of pocket money (I'm saving up for the Dayton Hamvention trip). I was

concerned that when they realised their mistake, my licence would be void.

I telephoned SSL in Bristol and informed them of my problem. I assured them that it was difficult to get money out of me once, let alone twice! However, to be sure that the problem could be highlighted, I also contacted the Radiocommunications Agency in London.

The RA asked me to send the cheque from SSL and a copy of the letter direct to them to sort out the problems with the sub-contractors (they're actually part of the Post Office).

A helpful lady in the RA's Waterloo Bridge House office in London then spoke to me on the telephone and intimated that SSL had told her the difficulty was caused by troubles with my direct debit instructions. In answer to that I told her that it would cause difficulties, especially as I had NOT filled in a direct debit form!

I was then told to "disregard the letter that's on the way to you" regarding the direct debit. It was

fortunate, I had not used the direct debit system, but I wonder if someone else had their account debited for £15 before they realised the mistake?

So, it was back to 'Square one' for the RA's lady, as she had been told (wrongly) the reason behind my licence fee refund. At the time of writing this column I've heard nothing more but as far as I know (I've got the Validation Document to prove it) I'm still legally G3XFD.

In my letter to the RA I made a very strong point. Something has got to be done about SSL. Surely, the inefficiency highlighted by my problems and that of very many other amateurs must be costing the Government money?

And, even if they don't seem to worry about much else - Government Departments usually worry if the money side of their operations are not running smoothly. At the moment, the Amateur Radio Licence is cheap compared to other licenses. But if the RA loses money because of SSL's inefficient operations I'm left wondering if the 'customers' (us of course) will end up by paying more.

To round off this month's comment, I must pay a compliment to the RA's staff in London. They are, and have been most helpful every time we have had to complain about SSL. I'm just thankful that there's someone 'out there' to listen and help us!

Rob Mannion G3XFD

COMPETITION CORNER

Wordsearch

Wordsearch rules:

Twelve different words have been hidden in the letter grid. They have been printed across (forwards or backwards), up and down, diagonally, but they are always in a straight line without odd letters between. You can use the letters in the grid more than once for different words. Once you have found all 12 words, mark them on the grid and send it, along with your name and address (photocopies accepted with the corner flash) to our editorial address, marked 'Competition Corner' Wordsearch April 1994.

Name

Address

.....

.....

Send your entry (photocopies acceptable with corner flash) to: Competition Corner, Wordsearch Competition, April 1994, PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. Editor's decision on the winner is final and no correspondence will be entered into.

S	S	C	W	S	D	J	U	B	I	L	E	E	Q	B
D	C	W	L	I	L	F	A	O	P	Y	J	W	J	V
B	F	D	O	G	W	E	D	Y	S	E	I	Q	L	U
B	I	U	R	L	W	X	N	S	K	R	R	S	K	A
L	I	T	Z	O	G	O	E	B	E	O	T	M	G	S
R	A	E	A	O	Y	N	S	L	A	N	T	Y	V	S
Y	F	C	F	A	I	Z	E	Z	E	R	K	C	T	F
P	P	M	I	L	T	S	T	M	R	H	G	T	P	P
O	S	S	Y	T	S	Y	E	Z	S	I	A	A	H	B
S	J	E	Y	Y	C	S	P	B	L	W	X	X	I	E
A	K	K	R	K	A	A	H	O	I	I	S	I	H	N
F	N	D	F	B	O	Q	R	L	W	U	V	K	K	Q
B	F	B	R	J	D	P	L	P	L	E	Q	O	T	V
A	H	W	W	G	C	I	Q	I	Y	D	R	K	E	U
P	V	P	A	K	M	X	Z	X	M	R	F	U	D	Y

Words To Find

Bargain	Low	Practical
Basement	Milliwatts	Toky
Jubilee	Poky	Wireless
Keylines	Power	Yeovil

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The Star Letter will receive a voucher worth £10 to spend on items from our Book or other services offered by *Practical Wireless*. All other letters will receive a £5 voucher.

A Reply From The RSGB

Dear Sir

I should like to respond to recent correspondence in *Practical Wireless* from G3BIK and G0GPF concerning the Radio Amateur's Examination in order to outline the RSGB's viewpoint.

It is a fundamental premise of the Society that any person wishing to use the airwaves as a licenced UK radio amateur should be properly trained to operate their equipment in a safe and well disciplined manner. To this end, it is natural that some technical competence and practical skill must be associated with achieving the required standard for licensing.

In wishing to carry out its responsibility to maintain essential entry standards, the RSGB currently works in close co-operation with the City & Guilds who are contracted by the Radio Communications Agency to run the RAE/NRAE examinations.

The RSGB holds the view that improvements are always there to be made as situations and needs change. Although the RSGB does not rule out the possibility of running examinations for radio amateurs, as is the case in many other countries, notably the

USA where the National Society has this responsibility, it is not the main consideration of the Society at present.

In his letter G0GPF raised the question of the Morse Examination which is operated through a volunteer based scheme set up by the RSGB in 1986. This scheme has operated extremely successfully, providing a wider choice of venue at more frequent times and at a lower cost than previously. In fact, the RSGB won the contract to carry out Morse Tests for these very reasons.

Since April 1993, the RSGB Morse Test Service has been extended to encompass the Novice Morse Test and because of the popularity and success of the QSO format used in this test, the 12w.p.m. test was later rationalised.

This was agreed with the RA after the review of the first year of the Novice Morse Test. Since the introduction of the 12w.p.m. QSO format examination, the pass rate has been consistently higher than that of the old style test.

In his letter G0GPF also raised the subject of the Novice Licence. As he states, the RSGB did send out a question-

naire to all of its members prior to the full discussions with the RA. The initial enthusiasm (80% of those who responded said they liked the concept of the Novice Licence) for this new type of licence has been maintained, with over a thousand Novices a year obtaining their licences. Certainly the Novice route for attracting beginners into amateur radio has proved very successful even though it is still early days.

As to the future, the RSGB will continue to work with the UK licensing authority, the RA and the City & Guilds to improve the examination process. Currently the RSGB is carrying out a major review of training methods and the examinations leading to the radio amateurs qualification. It is exploring many avenues including the need for a 'hands on' practical element as well as looking at a competence based assessment and awards system. To broaden the debate, the RSGB's Training and Education Committee will shortly be inviting input from anyone interested in this subject.

Peter Kirby G0TWW
General Manager
RSGB

Similar Experience

Dear Sir

I was sorry to read Mr Jones's letter in February *PW* recounting his attempt to pass the RAE. I too had a similar experience.

I bought the course published by The Rapid Results College in early 1992 and bought other books from *PW* and the RSGB throughout that year.

I sat the examination in December 1992 and was shocked when I turned over the paper to discover that many of the questions were on topics not covered by the postal course, or in any of the textbooks. I was luckier than Mr Jones because I have other technical qualifications and I passed the examination.

I believe that the problem is communication (or lack of it) with the City & Guilds of London Institute. The RSGB and The Rapid Results College books were, in my estimation, about four years out of date, and the CGLI is ever (quite rightly) altering the syllabus of the RAE to take account of new technology.

One answer is to take one of the many college courses, which I assume, are governed by the CGLI and will be up-to-date. They may seem to be expensive, but they have a good pass rate and the cost of retaking even one of the parts of the RAE is both time consuming and more expensive. Postal courses and textbooks should, in my opinion, be treated with care.

T. M. Pirrie G7OCV
Warwickshire

Editor's comment: We have received many letters in the office regarding Mr Jones's letter published in the February *PW*. The majority urge him to 'try again' and not lose heart. Hopefully, he will be encouraged by the support of other readers.

No 'B' For Birmingham

Dear Sir

Oh! Mr Editor, we're all in such a stew, There is no B for Birmingham, and we don't know what to do We thought we'd use the spare one - line 6 column 3 But then, Oh Calamity!, found that valve had lost its E!

Editor's reply: We don't normally publish anonymous letters, but this one

regarding the problems with the February *PW* word-search had to be the exception! Here's our reply:

Sorry for causing such a to do, Our mistakes we try to keep down to just a few, This time it was down to our department of art, Who failed to fully play their part!

Citizens' Band Radio

Dear Sir

I'm writing about Mr Howlett's (G1HBE) letter in the January issue of *Practical Wireless*. He seems to be under the impression that CB is only for people who want to clown around and play stupid games.

I'll grant him, yes, there are some people who only want to play music and swear at other CB users, but also there are a lot of sensible people who enjoy communicating with local stations and also, as with DXers, occasionally get the chance to talk a bit further a field.

Basically, what I am trying to say is that CB is not just used by immature idiots as Mr Howlett portrays, but also by responsible and friendly people.

Neil Lindsay (aged 15)
Lancaster

Failure Of The RAE

Dear Sir

I am writing to your reply to W. Jones (February *PW*) concerning the failure of the RAE. When the NRAE was launched at the National Exhibition Centre, I went along to see what it was all about.

For many years I thought the full RAE was too hard for a CB operator with no electronics knowledge. The RSGB gave me the name of a local Novice Instructor, who gave me the help and support I needed to pass my exam first time.

The RAE is not impossible, it just takes determination and lots of effort. George Benbow's book is only a study aid for the exam, so some points may need deeper explaining.

I feel sure that given a good 'Elmer', lots of study and taking the exam when you are ready, a pass will be assured.

So, to all of you thinking of becoming radio amateurs, good luck!

Many thanks to my own 'Elmers', Dave G0MJY and Phil G4SPZ for all their help. If W. Jones would like to study for the RAE, I may be able to find him an 'Elmer' too.

G. R. Coultas
Worcestershire

Europe For QRP Weekend

Dear Sir

In October, I participated in the 'Europe for QRP' weekend and, as usual, communications were marred by non-QRP stations. I have never believed that the maximum power levels permitted, and the higher powers illegally used by some, are really necessary.

Consider this: If a 1kW output signal is received at S-9 and the operator then reduces his power to a mere 4W, the signal would still be received at an adequate S-5.

I therefore propose

that on at least one 24-hour period each year (not necessarily 'International QRP Day') the international QRP frequencies $\pm 10\text{kHz}$ be reserved for QRP only (max. 5W output), other stations being requested by adequate publicity to respect this arrangement. This would demonstrate what really can be done with low power and skill. It might tempt some of the QRO brigade to turn down their wicks and join in, and be surprised!
W. Farrar G3ESP
Pontefract

Amateur Radio In Sudan

Dear Sir

I have been a radio enthusiast, on and off for many years, and within the last few years have returned to the fold so to speak. In October of last year I was very fortunate to hear an Amateur radio station in Sudan, Khartoum to be precise. His name is Ali and his callsign ST2/G4OJW. He was QRP at 15W using an IC-735 into a dipole

I was very grateful to receive a response to the card and letter I sent to Ali and in return he asked me to make known in the UK the following information. In his letter Ali states that for many decades there has been no legally licensed operators in the Sudan and after recent demonstrations that he gave his authorities, they are now prepared to issue formal licences. The first licensed station is a club with the callsign of **STOK** and all QSL cards should be sent to the following address: **PO Box 617, Khartoum, Sudan.**

However, your readers may like to be aware that IRCs are not easy to exchange, though not impossible and any QSL exchanges should be supported by an SAE preferably \$1US or two IRCs. **STOK** can be heard usually between 0800-1200Z in c.w. on 18.069, 2100Z or 24.895-905MHz and 28MHz when open every day except Friday. The club station uses 100W to a dipole and for the record I heard Ali on 14.06146MHz at 1957Z on October 8 1994.

I hope this information is useful to your readers and wish you continued success in what is probably the best communications magazine on sale.

John Ireland (G-20603), Buckinghamshire

★ ★ STAR LETTER ★ ★

Above 30MHz

Dear Sir

Why do the RSGB and the popular publications enforce the h.f. bands so much. And, if there is any mention of 'above 30MHz' it is more often than not 50MHz which is covered.

I fully understand that 144 and 432MHz do get a mention in the odd article or even your recent 'VHF Special'. But is this really enough to probably the most popular part of the spectrum for new and not so new comers to the hobby, how many 2E1s are there compared with 2E0s?

The other thing which confuses me is why Special Event stations don't normally cover 430MHz - working h.f. and 144MHz metres only?

My other main gripe is the attitude shown by some class A operators towards class Bs and Novices. Is this attitude the best way to get new blood into the hobby?

At the end of the day, Amateur Radio is just a hobby, whatever band of frequencies people choose to transmit on.

Bob Taylor G1WEX
West Midlands

Editor's reply: Bob Taylor has raised some interesting points regarding the 'world above 30MHz'. Do YOU think v.h.f. and above is neglected in PW? Let's hear your opinion!

Looking For Amateur Radio In London

Dear Sir

I was in London in September 1993 and I was looking for any amateur radio store or club. I asked the taxi drivers, I went through the *Yellow Pages* and even asked the hotel at which I was staying (Royal Garden Hotel). It was useless, but suddenly I remembered *Practical Wireless* and I bought a copy!

Many, many thanks to *Practical Wireless*, because without *PW* I could buy nothing, and thanks to Paul G7MNI for his help (Icom Hamstore in Hendon, London).

Hassan Bin Ali Al-Is'HAQ A71AC
State of Qatar

Editor's comment: Thank you for the compliment Hassan. Hopefully next time you can come when the Picketts Lock or Leicester Show are on.

Trader's Service

Dear Sir

On reading J. Fairgreaves' letter about traders giving bad and poor service and cheque clearance, I must mention Martin Lynch's good service regarding cashing cheques.

When I ordered my MVT-7000 I forgot to sign my cheque. The Yupiteru was sent to me along with the unsigned cheque and a request to sign it and return. How's that for service and trust!

Bill Buchan
Inverness
Scotland

Getting Started

Dear Sir

In the recent past you published a series of articles - 'Getting Started The Practical Way' concerning an introduction to amateur radio written by Rev. George Dobbs G3RJV.

I understand that these articles were to be compiled and published in book form. If this were to be the case, these most helpful notes for the Novice or youngster would make an invaluable addition to the *PW* range of radio books.

I look forward to their appearance and would like to place an order for one of the first copies.

Thank you in anticipation.
J. D. Bottomley
G3TQQ
Halifax

Editor's reply: Thank you for the comments Mr Bottomley. We would be interested in hearing what other readers think of the suggestion regarding G3RJV's series.

Send in your news, photographs and product information to Donna Vincent at the editorial offices in Broadstone.

NEWS 1994

Overwhelming Demand

South Midlands Communications Ltd. have informed *Practical Wireless* that due to the overwhelming demand for the Yaesu FTC703 and FTC740 they have managed to get hold of further stocks.

The FTC703 is a 3W, 6 channel hand-held transceiver without crystals and the FT740 a 40W, 12 channel mobile transceiver again without crystals. Both models were primarily designed for the 73-80MHz range and therefore may require minor component changes for use on 70MHz. Complete details on any changes are supplied with each set. The FTC703 is available for £49 including VAT plus £5 carriage and the FT740 for £99 including VAT plus £7.50 carriage.

Both transceivers, subject to availability, can be bought from the South Midlands Communications stand at the London Amateur Radio Show on March 12 & 13 or direct from School Close, Chandlers Ford Industrial Estate, Eastleigh, Hants SO5 3BY. Tel: (0703) 255111.

Repeater Group Trap Misusers

The group which runs the GB3SN 145.725MHz repeater in Four Marks, Hampshire, has installed a new method of 'capturing' those who persistently exceed the two minute 'time-out' period, or make regular use of the repeater without contributing to its upkeep.

They have installed an advanced voice-recognition system which is capable of recognising different users' voices and extracting the callsign from the spoken words. The more it has heard a voice the better it can recognise it, even after a few words. The system is fully maintained by the repeater's battery back-up system and stores the usage data on a disk.

The disk is regularly transferred to a computer system which analyses the usage and pro-

vides a fully detailed report of the repeater's use and automated invoices for those who often exceed the two minute talk period. Pilot invoices, at 10p per timeout, were distributed to a few 'lucky' individuals at the Group's AGM. The recipients were shocked by the accuracy, some of them clocking up over £5 of 'fines' in one month.

Colin Lansley G0LOX, the Group's Membership Officer, said, "All repeater users should support their local group, that way we will have a network that covers the country. However, we cannot allow those who misuse the facilities to get away with it." The system will be fully operational from April 1.

Further details from **GB3SN, PO Box 6, Alton, Hants.**

Radio Kits Catalogue

Northamptonshire based C. M. Howes Communications have recently published a new edition of their *Radio Kits Catalogue*. The 12-page catalogue containing more kits and metalwork packages than before is said to be the biggest edition of the *Radio Kits Catalogue* ever produced.

The *Radio Kits Catalogue* is illustrated with plenty of photographs of kits and completed projects giving a good idea of how smart home-built equipment can look. There is also an article on starting out in amateur radio to help those who are thinking about taking up the hobby.

If you would like to obtain a copy of the *Radio Kits Catalogue* just send an A5 or A4 sized s.s.a.e. (25p stamp UK/overseas customers are asked to send a couple of IRCs) to **C. M. Howes Communications, Eydon, Daventry, Northants NN11 3PT. Please note the new post code, the post office have changed it, C. M. Howes haven't moved!**



Apologies To Kanga

Practical Wireless would like to apologise to Kanga Products for the errors that crept into 'Kits And Bits' in the January 1994 issue.

Dick Pascoe would like to point out to *PW* readers that Kanga's telephone number is **(0303) 891106** not (0303) 276171. He would also like to emphasise that the kits he produces are Kanga Kits not G3ROO kits.

For more information on the full range of Kanga Kits contact Dick Pascoe, Kanga Products, Seaview House, Crete Road East, Folkestone, Kent CT18 7EG.

New All Band Icom

The latest offering from the Icom stables is the IC-736 h.f. 50MHz all band transceiver which will be available in early March. Icom claim that the IC-736 is not just an IC-737A with the capability of covering 50MHz.

Features of the IC-736 include an all-in-one design with antenna tuner and a.c. power supply, 100W output for h.f and 50MHz, newly developed DDS circuit for 1Hz resolution and a quick split function with programmable offset.

The price of the IC-736 will be around the £1800 mark. **For more information contact Icom (UK) Limited, Sea Street, Herne Bay, Kent CT6 8LD. Tel: (0227) 741741 or any Icom approved dealer.**

New Dealer

Trio-Kenwood UK Limited have recently announced the appointment of a new official Kenwood Amateur Radio Dealer. Castle Electronics, who are based in Kingswinford, near Birmingham are an already established specialist service and repair organisation for the amateur market.

Castle Electronics have opened a new showroom at their premises to enable them to sell Kenwood Amateur Radio products. It is hoped that under the direction of John Taylor G6VJC and Geoff Wainhouse G4AQU the appointment of Castle Electronics will strengthen Kenwood's representation in the West Midlands.

More information on the Kenwood range of products is available from either **Trio-Kenwood UK Limited, Kenwood House, Dwight Road, Watford, Hertfordshire WD1 8EB. Tel: (0923) 816444 or from Castle Electronics, Unit 3 Baird House, Dudley Innovation Centre, Pensnett Trading Estate, Kingwinford, West Midlands DY6 8XZ.**

Repeater Group Become Landowners

The UK (FM) Southern Repeater Holding Group who run the GB3SN 145.725MHz repeater at Four Marks have become, it is believed, the first group to own their own site.

After several months of negotiations the small piece of land and the equipment huts have been purchased from Hampshire County Council, who have not used the site for some time. The site is large enough that should the Group's use of the adjacent water tower for antenna support ever become threatened they could erect their own mast.

Greg Wood G0KVT, the Chairman of the Group, said, "This puts us in a secure position for the future".

Membership details from **GB3SN, PO Box 6, Alton, Hampshire.**

All India Radio

The All India Amateur Radio Convention, Hamvention '94 is being held in Bangalore, India on April 9 and 10 1994. The Hamvention is sponsored by the National Institute of Amateur Radio and the Institution of Engineers (Karnataka State Centre) Bangalore.

The theme of the convention is 'Ham Radio - A Global Fraternity' and will focus on various aspects of the hobby. There will also be an exhibition of instruments relating to amateur radio, HAMPEX-94 (a stamp exhibition on subjects related to radio) and a Ham-Esperanto meeting. Delegates from India and abroad are invited to participate.

Registration forms and a free brochure are available by writing to **Nagesh Upadhyaya VU2NUD, General Convener, PO Box 1129, Bangalore 560 011, India.**

New MFJ Model

Since 1992 the Mississippi based MFJ Enterprises Inc. have sold thousands of their MFJ-249 hand-held digital s.w.r. analysers around the world. Waters & Stanton Electronics have notified PW of a new MFJ SWR analyser that has been added to the range.

The MFJ-259 is an h.f./v.h.f. s.w.r. analyser, which has all the features of its predecessor the MFJ-249 plus an r.f. resistance meter. The 259 allows you measure r.f. feed-point resistance up to 500Ω at a minimum SWR using the side-by-side r.f. Resistance and s.w.r. meters.

Waters & Stanton Electronics, 22 Main Road, Hockley, Essex SS5 4QS. Tel: (0702) 206835 are selling the MFJ-259 for £249.

Eddystone Administration

The Eddystone Users Group administration work has been carried out by Kathy Moore for the past four years. Unfortunately due to pressure of work Kathy is no longer able to continue with this task.

However, Chris Pettit the Managing Director of Eddystone Radio has arranged that as from April all administration will be carried out by a group of volunteers at the Eddystone Works in Birmingham. All subscriptions and queries should, as from April, be sent to **The Eddystone User Group, Eddystone Radio Limited, Alvechurch Road, West Heath, Birmingham B31 3PP.** All cheques and money orders should be in Sterling and made out to Eddystone User Group as before. Subscription fees remain at £10 for 1994/1995.

FEAST With GB2NCM

The Norfolk Amateur Radio Club, using the callsign GB2NCM (Norwich Castle Museum) will be taking part in the Norwich Science Festival of Engineering, Art, Science and Technology (FEAST). The festival is taking place during the week of 18 - 26 March 1994 and is just one event being held during a national week of science, engineering and technology called SET7.

The contribution to FEAST by GB2NCM will be the organisation of a workshop on building a receiver and helping children of all ages discover the world of amateur radio. GB2NCM will be operating on 144MHz and all h.f. frequencies. They will also be issuing special QSL cards enabling one adult and one child free admission to the Norwich Castle Museum.

Trio Of Transceivers From Kenwood

Trio-Kenwood have added a trio of new transceivers to their range. The first of these is the TM-255 144MHz all-mode mobile transceiver.

The TM-255 covers f.m., s.s.b. and c.w., gives 40W of r.f. output power and has a detachable front panel. Kenwood say that the built-in dual tuning knobs, through type main tuning knob and click style sub-tuning knob are designed to aid the ease of mobile operation.

Other features include a built-in 9600baud packet connector, Advanced Intercept Point, i.f. shift and noise blanker. The TM-255 is available for £899.95 either direct from Trio-Kenwood UK or from any of their authorised dealers. There is also a 430MHz version, the TM-455 available for £999.95.

The second new offering is the TS-60S 50MHz multi-mode transceiver which is designed to cover s.s.b., f.m. and c.w. delivering 90W of r.f. power. It also covers a.m. giving 25W of r.f.

The design of the TS-60S employs MRF492 transistors arranged in a push-pull configuration as well as a cooling fan and heat sink to give a more stable output. The TS-60S is available for £999.95.

The TM-251 is a 144MHz f.m. mobile transceiver featuring a digital recording function, DTSS complete

with pager and sub and cross band operation facilities.

The TM-251 has 40 multi-function memories plus one call channel, enabling the independent storage of transmit and receive frequencies, CTCSS tone and DTSS codes. It is also possible to increase the number of memory channels to 200 by adding an optional memory expansion unit.

Other features that are supplied as standard are a 1200/9600 baud packet terminal, wireless cloning function, memory channel number display and CTCSS encoder.

The TM-251 will cost you £389.95 or £429.95 for the TM-451 430MHz version.

For more information on any of the new Kenwood transceivers contact Trio-Kenwood UK Limited, Kenwood House, Dwight Road, Watford, Herts WD1 8EB. Tel: (0923) 816444 or any of the Trio-Kenwood authorised dealers.



Suredata Supplies Badger

Suredata the Amstrad repair and second user sales company who are based in Middlesex are agents for the Badger range of PCs, manufactured by T&A Peripherals.

John Serlin G3TLU proprietor of Suredata would like to remind potential customers that he can supply a brochure showing the Badger range complete with a variety of options. John will be happy to quote for any combination, to suit individual requirements, as well as for individual base units or for parts of systems for customers who want to upgrade existing systems.

A 486DX33 Base Unit complete with keyboard, 2Mb RAM, 1.44Mb floppy drive, two serial ports, one parallel port, one games port, IDE controller and 256K VGA card will cost you £610 including VAT and delivery. Systems are also available including an extra 2Mb RAM, VLBUS mouse, MS DOS 6.2 and either a mono or colour SVGA monitor. The price for the complete 486DX33 is £1099 for mono or £1199 for colour including VAT and delivery.

Suredata offer a three month return to base warranty on all second user equipment and a 12 month return to base warranty on new equipment. **For more information on the complete Badger range contact Suredata, Unit 5 Stanley House (opposite Dorothy Avenue), Stanley Avenue, Wembley, Middlesex HA0 4JB. Tel: 081-902 5218.**



NOVICE matter

This month I want to apologise to all of you who are waiting for a reply to your letters. Harmonic number three made an unscheduled early appearance at Christmas and has made letter writing a bit difficult, although I'm getting back into routine now.

I hope to have caught up with all the correspondence by the end of January/beginning of February. Thank you for all your recently received letters, don't worry if you don't see anything about your topic in print for a while after you have written to me, it's all to do with magazine deadlines.

I wrote this copy before the end of January and you'll be reading it in early March. But I will get around to mentioning all the input just as soon as I can.

Flashcards

I've had two letters from **Eileen 2W1BPS** over the last few weeks. In the first she enclosed a 'flashcard' her husband **Wyn GW8AWT** gets his Novice students to make as a



Fig. 1: Eileen 2W1BPS hard at work using the G3RJV 'Sudden' 3.5MHz receiver.

useful reminder to carry with them.

The card is about the size of a credit card. It has the alphabet in Morse and phonetics on one side and the resistor colour codes on the other side, along with their multipliers.

For example:

0	black	10^0
1	brown	10^1
2	red	10^2
and so on.		

I must admit that when I was taught Morse (more years ago than I care to admit!) I also used 'flashcards' to help with

the learning process. So I can vouch for the fact that this sort of thing really works.

I could go on trying to describe this little learning aid, probably unsuccessfully! So, if you would like a copy of this 'flashcard', just send a stamped self-addressed envelope and I'll send you one that you can colour in with the appropriate resistor colours then attach to a piece of card.

The college where Wyn teaches the Novice course is in Llandovery. They obviously do the job well as you can see Eileen in the photograph (**Fig. 1**) operating her station.

Wyn points out that Eileen is a grandmother (with a teenage grand-daughter), so age is no barrier to successfully becoming a Novice. Eileen is operating the G3RJV 'Sudden' receiver on 3.5MHz.

More Space

The next letter this month comes from **Sonia Jones 2E1BQR** who starts her letter by asking for more space on Novice matters (Mr Editor please note, beg, beg!!). I'll try and include as much as I can about the hobby as well as hints and tips to passing the RAE.

Sonia would like to see Novices allocated up to 10W. That way, she says, Novices wouldn't get complaints from other amateurs about them sitting on the repeaters. They also wouldn't get fed up trying to work simplex on the 430MHz band and getting nowhere. She's sure this is the reason Novice licence holders get disillusioned and give the hobby up.

Antenna Design

Perhaps, we'll have to look into ways of improving a station over the next couple of months. If you have a favourite antenna design that you find works well, or can recommend a type of cable that has really low losses, drop me a line and let me know.

I'm especially looking for home-made antennas as **Duncan Walters** took me to task for only mentioning commercial versions. Unfortunately, my favourite antenna booklet is out of print at the moment. If you can beg, borrow or steal a copy of *Out of Thin Air* then do so, as it contains loads of really good and easy-to-build antenna ideas.

I still have very fond memories of my Slim Jim antenna, built for the 144MHz band. This was used, propped up on the window sill of my first flat-ground floor and at sea level! It worked very well when I was first licensed.

Duncan points out that several antenna books from the RSGB or ARRL may be available from your local library. Building your own antennas can be a good way of experimenting without it costing huge sums of money.

Many of the bits and pieces you'll need for antenna building can be bought at radio rallies up and down the country

over the spring and summer months, an ideal time of year to be messing about with antennas. But please don't go climbing around on roofs unless you know what you're doing. I don't think this column has got enough readers yet to go losing them in accidents!

Success On Air

Jon Cope 2E1CHH has written to tell others of the activity he found on the 50MHz band back in December. On the 12th at 1700UTC he heard WA1EKV using 50.420MHz u.s.b. and that signal rated an S3, unfortunately he couldn't make contact. He had more luck on the 22nd from 1800-2000, when he

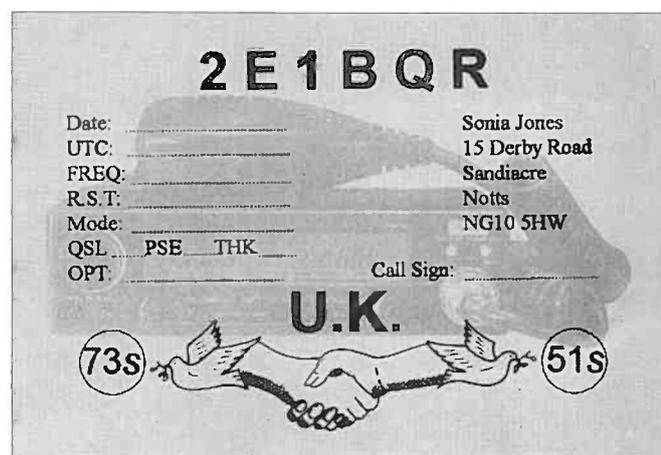


Fig. 2: QSL card from Sonia 2E1BQR.

made contact with EH1DVY, EH7AH and EH7AJ all at good signal strength.

Jon uses a 5-element beam fed from a 28 to 50MHz transverter via 20m of coaxial cable. He's surprised that his 500mW works as well as it does. Let's hope that now all the festivities are over and things are settled again that 50MHz will pick up.

If you've worked any good stations recently, that's something else I'd like to hear about. It encourages others to keep trying and shows just what can be done with limited power.

Free FAX And SSTV Software!

You can have free FAX and SSTV software, well very nearly - just the cost of three first class stamps. Have I caught your attention yet? Seriously though, I am able to offer

copies of the very successful JVFAX software for IBM PCs or compatibles.

The program is written by Eberhard Backshoff from Mettmann Germany. Mike G4WNC & I have permission to freely distribute the program on his behalf.

Perhaps the first thing I ought to do is specify the computing requirements so you can see if your computer is suitable. The program is designed to run on any fully IBM compatible PC or clone running DOS versions 3.0 or higher.

However, the best results are to be obtained when using computers with a 386 or faster processor. If you only have access to an older/slower machine you can adjust the program to cope with this.

The latest version (6.0) of JVFAX is very sophisticated and gives access to amateur and commercial FAX plus a wide range of amateur SSTV signals. Once you've got the program, all you need is a very simple interface to start receiving and transmitting!

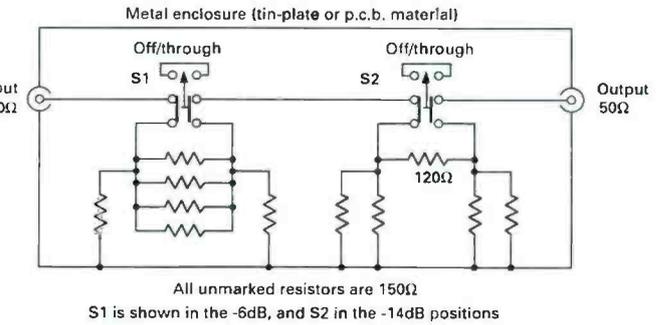
I'll give more details on how you can use JVFAX next month. But for now you just need to send me three first class stamps, a return address label and a formatted 3.5in 720K or 1.44Mb disk to the address at the head of this column. Don't worry about sending disk mailers, I've a good stock of suitable padded envelopes sat waiting for your disks.

Dodgy S-Meters

Following on from my natter on dodgy S-meters back in the November issue, Wyn Mainwaring GW8AWT wrote with a useful tip.

Wyn's advice is to fit a 6dB pad. The idea is that if you fit a switchable 6dB attenuator in the antenna lead of your receiver you can use this to check the accuracy of your meter at any frequency.

To check your meter do this you just tune to a steady signal that gives a reading on the point you want to check, then switch in the attenuator and



see if the reading drops by one whole point. If the reading is wrong, you can always add a thin strip of masking tape to the face of the meter and add your own calibrated S-points.

If you fancy trying some DIY, Wyn has supplied a simple circuit, Fig. 3, for a combined 6 and 14dB attenuator. The beauty with this design is that you can switch in both attenuators to give a useful 20dB that can be great for controlling very strong signals. Happy building.

Fig. 3: Simple S-meter checker circuit.

That's it for another month as space has caught up with me again. Don't forget to keep sending me your questions along with any helpful hits you'd like to pass on. Cheerio for now.

C.M.HOWES COMMUNICATIONS

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The above items are also available with assembled PCB modules, and as basic electronics kits without the hardware.

	Kit	Assembled PCB
AP3 Automatic Speech Processor	£16.80	£24.90
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CTU30 ATU covers all HF bands + 6M for receiving or 30W TX	£39.90	£46.90
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ST2 Morse Side-tone or practice oscillator	£9.80	£15.90
XM1 Crystal Calibrator for frequency checking	£16.90	£22.90

	Kit	Assembled PCB
CTX 40 or 80M Band versions very popular QRP TX	£15.50	£22.90
MTX20 20M 10W CW TX - work the World!	£29.90	£39.90
AT160 Dual Band 80 & 160M AM/DSB/CW .5 to 10W PEP	£39.90	£62.90
HTX10 10 & 15M SSB/CW Exciter (matching PA etc. available)	£49.90	£79.90

AA2 150kHz to 30MHz ACTIVE ANTENNA

The HOWES AA2 is the active antenna for general coverage HF reception. Broad-band performance that does not tail off at the higher frequencies. The neat compact answer for those with limited space, holiday use, mobile operation etc. Two selectable gain settings, local or coax powering (12 to 14V). Good strong signal performance, IP3 + 38dBm. Easy to build, and much liked by customers!

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Covers 25 to 1300MHz. Broad-band performance in a neat, compact package. Just over 16 inches long - the answer to space/visibility problems for home or portable use. A low noise microwave IC gives good performance with a low parts count, making construction straightforward. Excellent performance in a small space!

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Optimised for the VHF air-band, 118 to 137MHz. Excellent long range reception with omnidirectional coverage using an end-fed half-wave antenna element with low noise pre-amplifier, band-pass filter and switchable 10dB attenuator. Fits standard 1.5 inch plastic water pipe for easy weather-proof installation, or use it "naked" in the loft. Should transform your air-band reception if you are still using a general purpose antenna!

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73 from Dave G4KQH, Technical Manager.

Antrim

Carrickfergus ARG. Tuesdays, 7pm. Downshire Secondary School, Downshire Road, Carrickfergus. **GIQJOF** on (0960) 351807.

Avon

North Bristol ARC. Fridays, 7pm. Self Help Enterprise, 7 Braemar Crescent, Northville, Bristol. RAE & Morse tuition available for members. March 11 - Relax & Chat, 18th - Setting Up A Packet Station, 25th - How To Use A Wave Meter, April 8 - Committee Meeting. **Tony G4ROX** on (0272) 513573.

Shirehampton ARC. March 11 - Chat Night, 18th - VHF Test Equipment by G4DPJ, 25th - Chat night. Fridays. Ron Ford on (0272) 770504.

Bedfordshire

Shefford & DARS. Thursdays, 8pm. Church Hall, Ampthill Road, Shefford, Bedfordshire. March 17 - Members Activity Night, 24th - Junk Sale, 31st - Members Activity Night. **Paul G1GSN** on (0462) 700618.

Berkshire

Maidenhead & DARC. The Red Cross Hall, The Crescent, Maidenhead, 7.45pm. March 15 - AGM. **Neil G8XYN** on (0628) 25952.

Newbury & DARS. 4th Wednesdays, 7.30pm. Bucklebury Memorial Hall, March 23 - Talk By Rob Mannion Editor Of *Practical Wireless*. **Norman** on (0635) 863310.

Buckinghamshire

Aylesbury Vale RS. 1st & 3rd Wednesdays, 8pm. Village Hall at Hardwick. March 16 - AGM, April 6 - Surplus Equipment Sale. **Martyn G4XZJ** on (0296) 81097.

Central Region

Dollar Academy ARC. Most afternoons, after 3.30pm. Geoff Collier GM0LOD, Tait House, Academy Place, Dollar FK14 4JF on (0259) 742126.

Stirling & DARS. Thursdays 7.30pm. Clubrooms, Banded Industrial Estate, Throsk, Nr. Stirling. March 31 - Video Presentation Dn DXpedition. **Brain Mulleady GM0KWL, QTHR** on (0324) 636235.

Cheshire

Mid-Cheshire ARS. Wednesdays, Morse & RAE classes held, Cotebrook Village Hall, Cotebrook, Nr. Northwich, Cheshire. March 16 - Cairo Night, 23rd - Quiz Night, 30th - Video Night, April 6 - On Air/Construction, 13th - Rally Planning Night. **Mike Baguley G7LQD** on (0606) 331210.

Stockport RS. 2nd & 4th Wednesdays, 7.45pm. Room 14, Dialstone Centre, Lisburne Lane, Offerton, Stockport, Cheshire. March 11 - Multi Media by G0HJQ, 18th - Computer Set-Up Procedures by G0HAL, 23rd - Surplus Equipment Sale, 25th - Amort/Pactor Demonstration by G3KAF, April 14 - A Beginners View Of TCP/IP by G0UDC. **Jim France G3KAF** on 061-439 4952.

Cornwall

Poldhu ARC. Tuesdays and Fridays, Wednesdays HF Net, 7.30pm. April 3 - Committee Meeting, 12th - Monthly Meeting. (0326) 290638.

Cumbria

Eden Valley RS. Odd months, 7.30pm. BBC Club, Penrith. March 31 - AGM. **John Pape G0NYQ, 2 Mill Hill, Appleby-in-Westmoreland** on (07683) 52106/52148.

Derbyshire

Buxton Radio Amateurs. Lee Wood Hotel, Buxton, 8pm. March 22 - Why Is CW Better Than Phone? **Derek Carson G4IHO** on (0298) 25506.

Derby & DARS. Wednesdays, 7.30pm. 119 Green Lane, Derby. March 16 - The Crich Tramway Museum by Bob Hall, 23rd - AGM, 30th - Designing Receivers by John Wilson, Lowe Electronics. April 6 - Surplus Sale. **Hayley Winfield G7PXA** on (0773) 856904.

Devon

Exeter ARS. 2nd Mondays, 8pm. The Moose International Centre, Blackboy Road, Exeter. March 14 - Construction Competition, April 11 - Quiz Night. **Ray Donno** on (0392) 78710.

Plymouth RC. Tuesdays, 6.30pm RAE class, 7.30pm Morse class, 8pm club activities. (As from June for the summer, meetings will be fortnightly). The Basement, The Royal Fleet Club, Devonport. March 12 - Dinner Dance, 15th - Business Meeting/Natter Night, 17th - Visit To Brixham Coastguard Ops Room, 22nd - Talk by Lifeboat Crew Member, 23rd - Visit To Crownhill Police Station Comms Room, 27th - British Summer Time Begins, 29th - Talk On The Pressures Of The CW Exam, April 1 - Easter Weekend, 5th - Night On The Air. **F. P. Russell G7LUL, 63 Fleet Street, Keyham, Plymouth PL2 2BU** on (0752) 563222.

Torbay ARS. Fridays, 7.30pm. ECC Social Club, Highweek, Newton Abbot. March 18 - Talk by Peter Thornhill. **W. Hipwell G3HTX** on (0803) 526762.

CLUB news

Dorset

Bournemouth RS. 1st & 3rd Fridays, 8pm. Kinson Community Centre, Pelhams Park, Millhams Lane, Kinson, Bournemouth. March 12 - Picketts Lock Visit, 17th - An Evening With Jack Loader, 27th - 7th Annual Sale At Pelhams. **Ian G2BDV** on (0202) 886887.

Fight Refuelling ARS. Sundays, 8pm. Flight Refuelling HQ, Merley, Wimborne, Dorset. March 13 - DX Packet Cluster by G00FE, 20th - Island Chasing by G4WVZ, 27th - Guest Speaker, April 3 - Falconet Video by G4FDS, 10th - DF And The Wild Life by G4NWJ. **John Hart** on (0425) 653404.

Poole RAS. 2nd Fridays, 7pm. Lady Russell-Coates House, Lower Constitution Hill Site, Bournemouth & Poole College of FE. March 11 - Final Steps In A Simple Transceiver by G1TEX. **Vernon Cotton G3BCI** on (0202) 760231.

South Dorset RS. 1st Tuesdays, 7.30pm. Wessex Lounge of Weymouth Football Club, March 1 - Bring, Buy & Barter. **Mike Lenzi G7HNY** on (0305) 773860.

Down

Bangor & DARS. 1st Fridays, 8pm. Bangor Technical College, Room A13. April 8 - Presentation Dn Workshop Practice by Crawford G10EZO & Harry G14JTF at Winston Hotel, Queen's Parade. **Keith G10SSA** on (0247) 883315.

Dfnyed

Aberystwyth & DARS. 2nd Thursdays, 8pm. Scout Hut, Plasrug Avenue, Aberystwyth. March 10 - Natter Night & Skywatching Video, 12th - Bring & Buy Sale at Aberaeron Youth Club, 31st - GWOARA On The Air, April 14 - RAYNET AGM/Construction from Les GW3SON. **Kathy GW0SFO** on (0545) 580675.

East Sussex

Crowborough & DARS. Thursdays, 8pm. Plough & Horses, Crowborough. March 24 - The Biggest Aspidistra In The World, BBC Overseas Broadcasting by Les G3FET. **Michael Smith G6UUD** on (0892) 661807.

Southdown ARS. 1st Mondays, 7.30pm. Main Hall of the Chaseley Home for Disabled Ex-Servicemen, South Cliff, Eastbourne. Wednesdays (Morse) & Fridays (Novice & RAE), 7.30pm at the clubrooms, Hailsham Leisure Centre, Vicarage Road, Hailsham. April 11 - Bring Your Own Thing. **Bob Fox G7LHX** on (0323) 484282 or **G7LHX** on GB7HAS.

Essex

Braintree & DARS. 1st & 3rd Mondays, 8pm. The Clubhouse, Braintree Hockey Club, Church Street, Bocking. March 14 - Club Net, 21st - Waters & Stanton Come To The Club, 28th - Club Net, April 4 - Construction Contest. **J. F. Button G1WQQ c/o G4JXG, 88 Coldnailhurst Avenue, Braintree, Essex CM7 5PY** or Publicity Secretary on (0376) 327431.

Colchester RA. Colchester Institute, Sheepen Road, Colchester. March 10 - Contests And Why by Alan G0EGX & Dave G10GY, 12th - Morse Test, Bookings In Advance to RSGB, 24th - Travel In China by Adrian G4HPU. **Trevor Bradbeer G0URJ** on (0206) 764034.

Venge ARS. Thursdays, 8pm. Barnstaple Community Centre, Long Riding, Basildon, Essex. March 31 - Easter Buffet, April 7 - Junk Sale, 14th - Steam Trains by Bob G7JXJ. **Doris** on (0268) 552606.

Grampian Region

Aberdeen ARS. Fridays, 8pm. Queen Mother House, Aberdeen. March 11 - Measurements And Test Equipment, 18th - Wet String Listening Competition, 25th - Building The Yearling Part 2, April 1 - Junk Sale.

Greater London

Acton, Brentford & Chiswick ARC. 3rd Tuesdays, 7.30pm. Chiswick Town Hall, Heathfield Terrace, London W4. March 15 - General Awards/Discussion. **Colm Mulveny G0JRY** on 081-749 9572.

Clifton ARS. Kidbrooke House Community Centre, Room 9, 90 Mycenae Road, Blackheath SE3 7SE. March 11 - Tony & Sue's Visit To Tonga, 25th - QRP Evening. **Keith Lewis** on 081-859 7630.

Cray Valley RS. 1st & 3rd Thursdays, 8pm. Progress Hall, Admiral Seymour Road, Eltham SE9. March 17 - RSGB Video, April 7 - Test Equipment Talk by G0FDZ. **Bob Treacher** on 081-850 1386.

Crystal Palace & DRC. 3rd Saturdays, 7.30pm. All Saints Parish Rooms, Beulah Hill, London SE19 (opposite junc. Grange Road). March 19 - Computers In Amateur Radio by Tony Swainsbury.

Wilf Taylor G3DSC on 081-699 5732 or **Bob Burns G300U** on (0737) 552170.

Edgware & DRS. Watling Community Centre, 145 Orange Hill Road, Burnt Oak, 8pm. March 10 - AMTOR by Hank Kay G0FAB, 24th - Morse Training Evening, April 14 - Computer PCs by John Copley G4RMD. **Rod Bishop G0SQL** on 081-204 1868.

Loughton & DARS. Room 12 of Loughton Hall, 7.45pm. March 18 - Voice Procedure On Aeronautical Airwaves by Tony Mothew G0LWM. **John Ray G8DZH** on 081-508 3434.

Silverthorn RC. Fridays, 7.30pm. The Chingford Community & Adult Education Centre, Friday Hill House, Simmons Lane, Chingford, London E4 6JH.

March 11/18th - Night On The Air/Social, 25th - Junk Sale. **Andrew Mowbray G0LWS** on 081-529 4489 between 5.30 & 6.30pm weekdays only.

Southgate ARC. 2nd & 4th Thursdays, 8pm. Winchmore Hill Cricket Club Pavilion, Firs Lane, Winchmore Hill, London N21. March 10 - Normal Club Meeting, 11th - Show Set Up Day, 12th/13th - London Amateur Radio & Computer Show, April 14 - The Grand Surplus Sale. **Brian Shelton G0MEE** on 081-360 2453.

Greater Manchester

Rochdale & DARS. Mondays, 8pm. The Cemetery Hotel, 470 Bury Road, Rochdale, Lancs. March 21 - Lego Bricks PC by G3RIK. **Brian** on 061-653 8316 or **John** on (0706) 376204.

Tameside ARS. Wednesdays, 7.30pm. ATC Camp, Moorcroft Street, Droylsden, Tameside. **A. N. Laughlan G1YCM, 8 Kempton Close, Droylsden, Tameside, Manchester M35 7LJ.**

Gwynedd

Dragon ARC. 1st & 3rd Mondays, 7.30pm. Four Crosses Hotel, Menai Bridge. March 21 - Videos On Electricity Distribution by Norman Grice GW0MKP, April 4 - Surplus Equipment Sale. **Tony Rees GW0FMQ** on (0248) 600963.

Porthmadog & DARS. 3rd Thursdays, 8pm. Harbour Cafe, Ffestiniog Railway, Porthmadog. March 17 - Ffestiniog Railway Signals by Alan GW0SAY. **Pat Vernalis** (0766) 770546.

Hampshire

Itchen Valley RC. 2nd & 4th Fridays, 7.30pm. Scout Hut, Brickfield Lane, Chandlers Ford. March 11 - Open Meeting & Natter Night, 25th - Club Annual Junk Sale. **Les Kennard G3ABA** on (0703) 732997.

The Three Counties ARC. Every other Wednesday, 8pm. Railway Hotel, Liphook Hampshire. March 16 - Antennas & Feeders by Nigel Gerdes G7CAW, 30th - SAREX by Doug Loughmiller, April 13 - Aeronautical Communications by Duncan Tribble G10EQ. **Tom Milne** on (0428) 606298.

Hereford & Worcester

Bromsgrove ARS. 2nd & 4th Tuesdays, 8pm. Lickey End Social Club, Alcester Road, Burcot, Bromsgrove. March 22 - On The Air Night-Invitation to Scouts/Novices. **Mr B. Taylor G0TFG** on (0527) 542266.

Bromsgrove & DARC. 2nd Fridays. Avoncroft Arts Centre, South Bromsgrove, Worcester. March 11 - AGM, April 8 - Annual Constructors Competition. **Joe Poole G3MRC** on (0562) 710010.

Hertfordshire

Hoddesdon RC. Alternate Thursdays, 8pm. Conservative Club, Rye Road, Hoddesdon, Herts. March 17 - Visit To Martin Lynch's Shop, 18th - Club Annual Dinner at The Chequer's Inn, Ware, 31st - Fast Scan ATV by Adrian G0QJY, April 14 - Inter Club Dart Match. **John G7DCI** on (0920) 466639.

Stevenage & DARS. Tuesdays, 7.30pm. Stevenage Day Centre, Chells Way, Stevenage. March 15 - Quiz Night, 22nd - Video Evening, 29th - Radio Experiences. **Neil Ravilious 2E1ASZ** on (0438) 350882.

Humberside

Goole R & ES. Fridays, 7.30pm. West Park Pavilion, West Park, Goole, last Fridays at the 'Old George Inn', Market Place, Goole. March 11 - Junk Sale, 18th - Contest Planning, 25th - Social Evening, April 1 - Night On The Air, 8th - ARDF The Easy Way by G6YYN. **Steve Price G8VHL** on (0405) 769130.

Isle Of Wight

Isle of Wight RS. Unity Hall, Mill Square, Wootton, Isle of Wight PO33 4HS. March 14 - NRAE (0983) 872620.

Kent

Bromley & DARS. 3rd Tuesdays, 7.30pm. The Victory Social Club, Kechill Gardens, Hayes, Kent. March 15 - Miniature Antenna Demonstration by Ian Daniels & Jim Burr. **Alan G7GBH** on 081-777 0420

Dover RC. Wednesdays. Duke Of York's School, Guston, Nr. Dover. March 16 - Natter Night/Committee Meeting, 23rd - Construction Contest. **Mike Bowers G7NOR** on (0304) 825030.

Hilderstone RS. Fridays 7.30pm. Hilderstone College, St. Peter's Road, Broadstairs, Kent CT10 2AQ. March 11 - Equipment Sale, 18th - Practical Evening, 25th - Quiz. (0843) 869812.

Medway AR & TS. Fridays. Tunbury Hall, Catkin Close, Tunbury Avenue, Walderslade, Chatham, Kent. Visitors & new members welcome. March 18 - Morse For Better Or Worse by Smudge G3GJW. Mrs Gloria Ackerley G70VI, 40 Linwood Avenue, Strood, Rochester, Kent ME2 3TR. Tel: (0634) 710023.

Lancashire

Fylde ARS. 2nd & 4th Tuesdays, 7.45pm. Blackpool South Shore Lawn Tennis Club, Midgeland Road, South Shore, Blackpool. March 22 - Informal, April 12 - Equipment Sale. Eric Fielding G4IHF on (0253) 726685.

Thornton Cleveleys RAS. Mondays, 8pm. 1st Norbreck Scout HQ, All Hallows Road, Blispham, Blackpool. March 14 - Final Norbreck Rally Planning, April 5 - Meeting On The Air. Trevor Simpkins G7PDS, 25 Onslow Road, Layton, Blackpool, Lancashire.

Lincolnshire

Grantham RC. 1st & 3rd Tuesdays, 8pm. Kontak Sports & Social Club, Barrowby Road, Grantham. March 15 - Sine Waves-Decibels And Falling Off Logs by Mike G3PJR, April 5 - QSL Card Night. John Kirton G8WVJ on (0476) 65743.

Merseyside

Liverpool & DARS. Tuesdays, 8pm. Churchill Club, Church Road, Wavertree, Liverpool. March 15 - History of Computers, 22nd The Mark 123 Spy Set by G3XSN, 29th - Surplus Sale, April 5 - Oliver Lodge Centenary Arrangements. Ian Mant G4WVX on 051-722 1178.

Sefton ARC. Liverpool Prison Officers Social Club. G4KIN on 051-531 0991.

Wirral ARS. Irby Cricket Club, Mill Hill Road, Irby, Wirral, 8pm. March 16 - Possible Lecture by Mr G Robbins, April 6 - The Thesis Affair. Paul Robinson G0JZP on 051-648 5892.

Norfolk

Dereham ARC. 2nd Thursdays, 8pm. St. Johns Ambulance Hall, Yaxham Road, Dereham. March 10 - Fax Machines How They Work G0FVG, April 14 - Discussion On Your Own Antennas. Mark Taylor G0LJG on (0362) 691099.

Fakenham ARC. 1st Tuesdays, 7.30pm. Trinity Church Room, Hempton. April 5 - 75 Glorious Years Of The RAF by Paddy G0MQU. Dave G4DCJ on (0485) 528633.

Norfolk ARC. Wednesdays, 7.30pm. University Arms, South Park Avenue, Norwich. March 13 - Club Coach To Picketts Lock, 16th - First HF NFD Briefing, 23rd - The Making Of Anglia At War by Richard Kennan, 30th - AGM, April 6 - Committee Meeting, 13th - Basic Digital Electronics by Mike G4EOL. Dale Simkin on (0603) 37393.

Nottinghamshire

Mansfield ARS. 2nd Mondays, 7.30pm. Polish Catholic Club, off Windmill Lane, Woodhouse Road, Mansfield. March 14 - Junk Sale, April 11 - The Novice Licence - A New Dimension by Gerald G0NRA. Mary G0NZA on (0623) 755288.

Nottingham ARC. Thursdays, 7.30pm. Sherwood Community Centre, Mansfield Road, Nottingham. March 10th - Tuning The Club's HF Rig & Amplifier by Trevor G0IXR, 24th - Construction/Activity Night, 31st - Annual Construction Exhibition And Competition Night, April 7 - AGM, 14th - Forum/Night On The Air. Simon G0IEG on (0602) 501733.

Oxfordshire

Oxford & DARS. 2nd & 4th Wednesdays, 7.45pm. North Oxford Grove House Club. Terry Hastings G0CFN on (0865) 863526.

Shropshire

Salop ARS. Thursdays, 8pm. Oak Hotel, Shrewsbury. March 10 - Construction Project Discussions by Terry G8DIQ & Paul G7LRB, 24th - Construction Projects Final Part by Terry & Paul, 31st - Packet By Don Goddard G3UQH, April 14 - Talk by Specialist Antenna Systems. Sheila Blumfield G0SST on (0743) 361935.

Somerset

Wincanton ARC. 1st & 3rd Mondays (except Bank Holidays - 2nd & 4th), 7.30pm. The Community Lounge, King Arthur's Community School, Wincanton, Somerset. March 21 - Open Evening. Dave G3ZXX on (0963) 34360 or Andy G1FPW on (0747) 51381.

South Yorkshire

Sheffield ARC. Mondays 7.30pm. Firth Park Pavilion, Firth Park Road, Sheffield. March 21 - Operation Of Club's HF & Construction Night, 22nd - Ten Pin Bowling, April 5 - RAYNET, 11th - Talk On Crashed Planes On The Sheffield Moors. (0742) 446282.

Staffordshire

Bloxwich RS. 2nd & 4th Mondays, 7.30pm. All meetings are non-smoking. March 14 - Construction Project, 28th - Easter Social, April 11 - VHF/UHF Locator Systems. Rob Briggs G0TDF on (0902) 722830.

Suffolk

Ipswich RC. March 16 - Navigation, 23rd - Social In Bar, 30th - CW Evening, April 6 - Trinity House by Colin G0STW, 13th -

Please send in all of your 'Club News' items to Donna Vincent at the editorial offices in Broadstone.

Social In Bar. Mrs S. Elden
G8HYE, 124 Larchcroft Road,
Ipswich IP1 6PQ.

Sudbury & DRA. 1st Tuesdays, 8pm. Wells Hall Old School, Great Conrad, Sudbury, Suffolk. 3rd Tuesdays, 8pm. Five Bells Public House, Bures Road, Great Conrad, Sudbury. March 15 - Natter & Noggin, April 1 - Sudbury Fun Run, 5th - Equipment Exchange & Junk Sale. Tony Harman G8LTY on (0787) 313212 or G8LTY @ G87NNA.

Surrey

Dorking & DRS. The Friends Meeting House, South Street, Dorking, 7.45pm. March 22 - Digital Communications by Neil Lasher G6HIU. John Greenwell G3AEZ on (0306) 631236.

Horsham ARC. Guide Hall, Denne Road, Horsham, West Sussex, 8pm. April 7 - Wartime Coolham Airfield by Dick Sherwin G3VIN. Peter Stevens G8SUI on 0737) 842150.

Surrey REC. 'Terra Nova' The Waldrons, Waddon, Croydon, Surrey. March 21 - Natter Night. Berni G8TB on 081-660 7517.

Sutton & Cheam RS. 3rd Thursdays, 7.30pm. Sutton United Football Club, The Borough Sports Ground, Gander Green Lane, Sutton, Surrey. Natter Nights - 1st Thursdays. March 17 - The 7th Cavalry, The Pogo Stick And Guide To Personal Communications by Brian Cannon G8DIU, 19th - Annual Dinner at Sutton United Football Club, April 7 - Natter Night. John Puttock G0BWV, 53 Alexandra Avenue, Sutton SM1 2PA.

Wimbledon & DARS. 2nd & last Fridays. St. Andrews Church Hall, Herbert Road, Wimbledon SW19. March 25 - Top Band DF, April 8 - Book Sale. George Cripps G3DWW on 081-540 2180.

Tayside

Dundee ARC. Tuesdays, 7pm. College of Further Education, Graham Street, Dundee. March 15 - Lecture, 22nd - Construction Night, 29th - Lecture. George Miller GM4FSB, 30 Albert Crescent, Newport-on-Tay, Fife DD6 8DT.

Warwickshire

Coventry ARS. Fridays, 8pm. Baden Powell House, 121 St. Nicholas Street, Radford, Coventry. March 11 - Club Project Starts, 18th - On The Air Night/Morse Code Tuition, 25th - Cheese & Wine Supper, April 1 - On The Air Night/Morse Code Tuition. David G1ORG on (0203) 311468.

Stratford-Upon-Avon & DRS. 2nd & 4th Mondays, 7.30pm. Home Guard Club, Main Road, Tiddington, Stratford-Upon-Avon, Warwickshire. March 14 - Something In The Sky by Ken Shaldon G4NIJ, 28th - AGM. Alan Beasley G0CKJ on (0608) 82495.

West Midlands

Aldridge & Barr Beacon ARC. 1st & 3rd Mondays, 7.30pm. Aldridge Central Community Centre, Middlemore Lane, Aldridge, Wasall WS9 8AN. Charles Baker G0NOL on (0922) 36162.

West Yorkshire

Denby Dale & DARS. Pie Hall, Denby Dale, Nr. Huddersfield, 8pm. March 16 - Video Editing by M. Williams G0ISX, April 6 - Talks On The Duties Of An RLO & The Dangers Of Drink Driving by Derek RSGB RLO West Yorks. Ivan Lee, Clayton Lodge, Sunnyside, Edgerton, Huddersfield HD3 3AD.

Halifax & DARS. 1st & 3rd Tuesdays, 7.30pm. March 15 - Receiver Construction by George Dobbs G3RJV. David Moss G0DLM on (0422) 202306.

Keighley ARS. The Ingrow Cricket Club, Ingrow, Keighley, 8pm. March 10 - Local Life Between The Wars by Ian Dewhurst, 17th - Packet On The Air by G0KRS/G7KRC, 24th - Junk Sale, 31st - Natter Night, April 7 - Natter Night, 14th - Computer Logging by G0MDO. Kathy Conlon G0RLO on (0274) 496222.

Spen Valley ARS. Thursdays, 8pm. Old Bank Working Men's Club, Mirfield. Alternate Thursdays - 'Noggin & Natter Nights'. March 17 - AGM, April 7 - Contest Operating by John G4RCG. Tony Galvin G0IKD on (0532) 534437.

Wakefield & DRS. Tuesdays, 8pm. First Floor Rooms, Ossett Community Centre, Prospect Road, Ossett. March 10 - Committee Meeting, 15th - Monthly Meeting, 19th - Annual Dinner, 22nd - HF Night On The Air. Roy Harvey (G0TBY), 12 Hillcrest, Altofts, Normanton, Yorks WF5 2NT.

Wiltshire

Salisbury R & ES. Tuesdays, 7.30pm. 3rd Salisbury Sea Scout Hut, St Marks Avenue, Salisbury. March 15 - Bring & Buy, 22nd - Contest, 29th - HF Operating, April 5 - Microwave Part 1 by Martin G8FA, 12th - Marconi Day Planning. David Kennedy G7GWF on (0722) 330971.

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The PW Jubilee 14MHz SSB Mobile Transceiver Part 2

The Rev. George Dobbs G3RJV continues to describe the construction of the PW Jubilee s.s.b. mobile transceiver for h.f. This month, George takes a look at the switching arrangements and explains the techniques involved. He also provides more of the main circuitry for the project and explains what each section does in the project.

One of the prototype PW Jubilee 14MHz transceivers designed and built by G3RJV.



On the PW Jubilee, the basic board has a simple transmit/receive switching arrangement. The circuit for this is shown in **Fig. 2.1**.

A small relay, RL2 is grounded by the p.t.t. (press to talk) switch and this switches a 12V transmit (12V TX) and 12V receive (12V RX) line.

The i.c., IC8, provides a permanent 9V line for the oscillators. Other i.c.s, and IC4 and IC5 provide stabilised voltages for appropriate parts of the receive and transmit circuits.

This simple system is replaced by a key operated change-over arrangement for c.w. operation. Simplicity is the key to reliability!

Frequency Stability

Frequency stability is an important factor for any modern piece of amateur radio equipment. It's perhaps even more important with equipment that's likely to be used in a portable or mobile environment.

The circuit of the v.f.o. I've adopted for the PW Jubilee, is shown in **Fig. 2.2**.

Frequency control is controlled by C86, this should allow full coverage of the band. Receiver offset is achieved by the use of varactor diodes, for simplicity and maximum stability for mobile/portable use.

The v.f.o. is provided with a stabilised supply via

IC11. This is done so that the 2N3819 f.e.t., Tr5, has the minimum of voltage variation.

Control of receiver incremental tuning (r.i.t.) is provided for by the arrangement of D17 and 18. This circuitry allows for manual or fixed offset via diode D16.

The Mixers

The diagram, **Fig. 2.3**, shows the circuit of the receiver mixer board. Centred around IC9, an SL6440, the mixer is quite straightforward in action.

In **Fig. 2.3**, D10, 11 and 12 form a voltage dropping network to provide the correct supply level

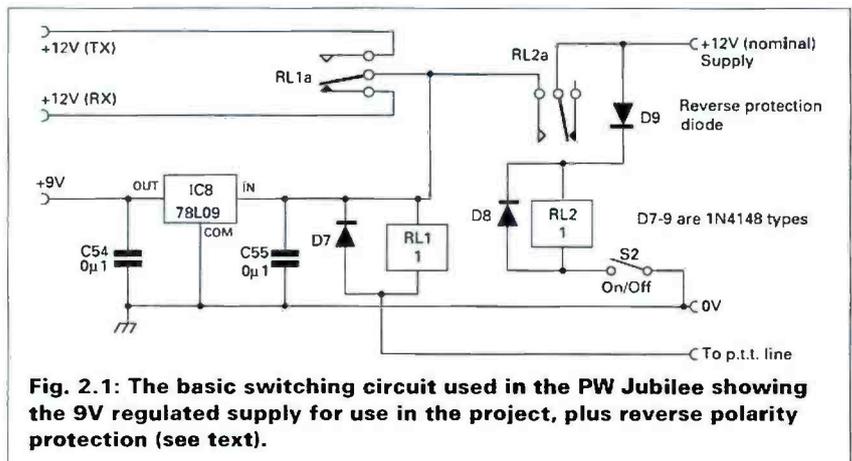


Fig. 2.1: The basic switching circuit used in the PW Jubilee showing the 9V regulated supply for use in the project, plus reverse polarity protection (see text).

for pin 4 on IC9. The dots on T2 and 3, mark the beginning of the windings and are included for reference purposes.

The transmitter mixer and driver stage is shown in **Fig. 2.4**. Again, the mixer function is provided by an SL6440, IC10.

As in the receiver mixer circuitry, IC10 is provided with a supply via 1N4148 diodes. The supply, via D13, 14 and 15 utilises the voltage drop over the diodes to provide the correct supply level.

The 47k Ω variable resistor, R32, is a front panel mounted 'drive' control. The transmitter driver f.e.t. Tr4, a MFE201 provides the necessary amplification of the 14MHz signal for the separate power amplifier stage.

Power Amplifier

I have designed the Jubilee with the idea of using a widely available kit power amplifier stage. The output level from the transmitter mixer board will enable you to make your own, or use one of several kits from suppliers I'll include in the main shopping list.

Next time, I hope to provide you with the final constructional details, the p.c.b. layouts and associated overlays. There will also be a comprehensive shopping and suppliers list.

Fig. 2.2.

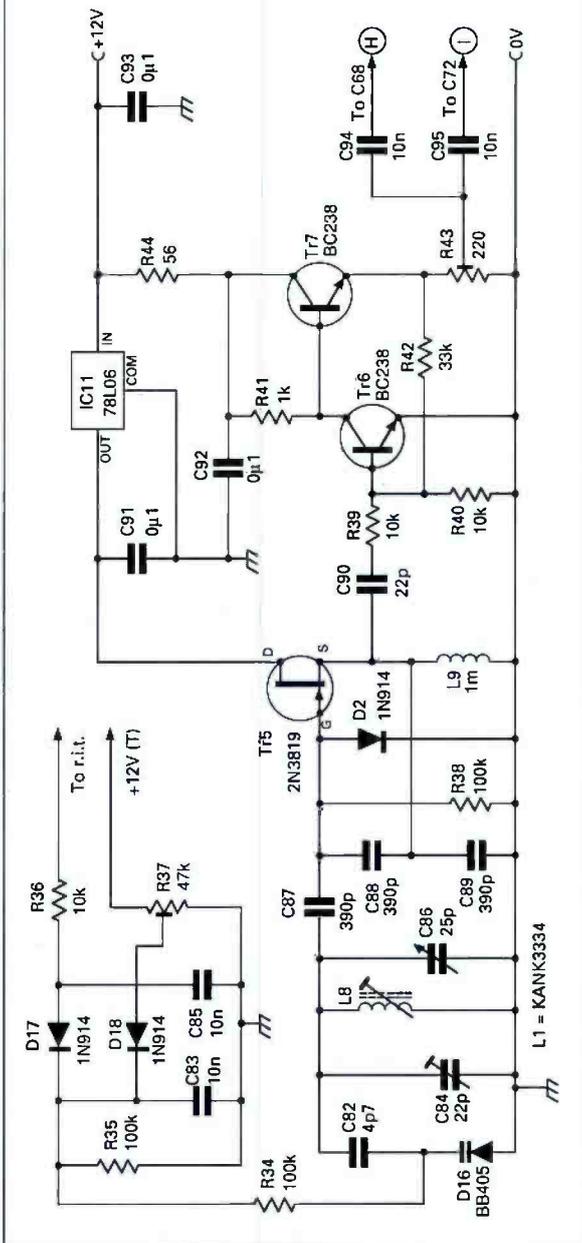


Fig. 2.3.

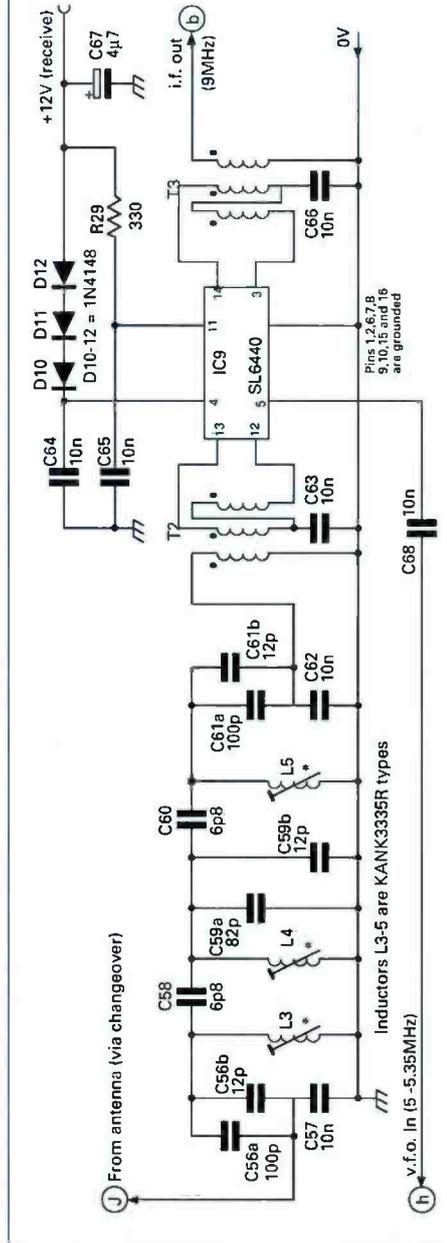


Fig. 2.2: The circuit of the v.f.o. employed by G3RJV for use in the Jubilee employing varactor diodes for frequency control. The v.f.o. has its own regulated power supply for stability, provided by IC11 (see text).

Fig. 2.3: The receiver mixer circuitry for the transceiver. The identification letters refer to the interconnections to the other p.c.b. used on the Jubilee. The small dots marked on the windings of the toroidal transformers indicate the beginning of each winding.

Fig. 2.4: Circuit of transmitter mixer board for the Jubilee project. The dots on T4 indicate the output level of this board is designed to provide enough r.f. drive to enable it to use a variety of ready-made p.a. circuit boards, including that produced by Cirkit Distribution Ltd.

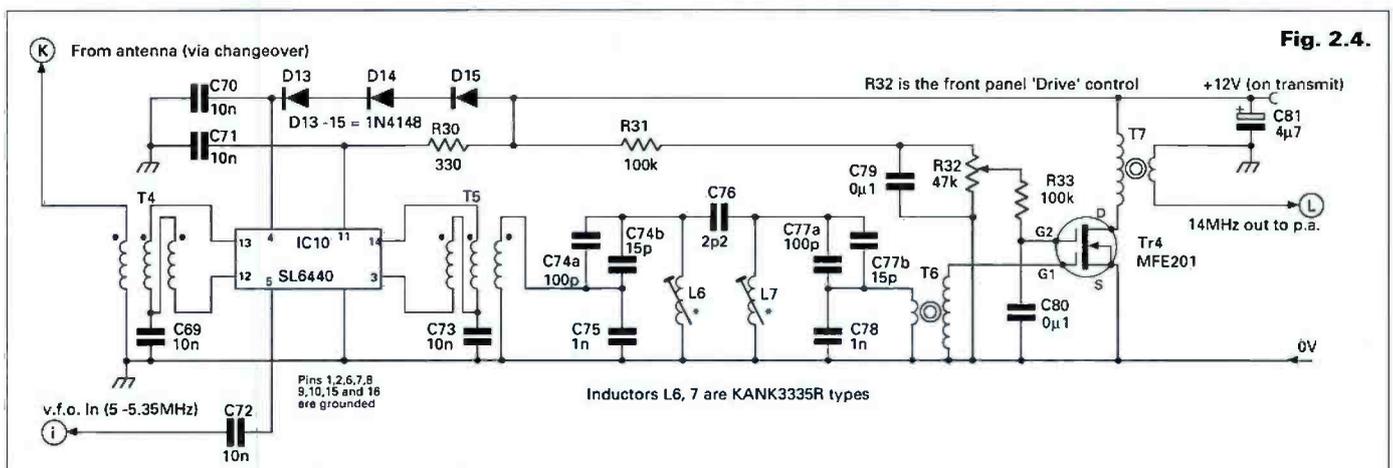


Fig. 2.4.

The Standard C408 Hand-Held UHF Transceiver

Richard Newton GORSN aims to take the full 'credit' for reviewing the latest hand-held transceiver to appear from the Standard 'stables'.

Regular readers may remember that in my previous reviews I have remarked on how small hand-held transceivers are getting. Well they've finally done it - *PW* has given me a talking credit card to review!

The Standard C408 u.h.f. f.m. hand-held is a miniature transceiver. The radio is supplied with a user manual and a helical antenna, (the NiCad battery pack and the charger are optional extras).

The user manual supplied with the review C408 consisted of twelve photocopied A4 sheets. However, I understand that this is a temporary, stop-gap measure.

Although the manual was informative to a degree, the diagrams were scarce. However, the illustrations provided were good quality.

The manual will get you on the air. But the information that was sadly lacking was the technical data and a list of specifications.

Smart Grey

The radio is finished in a smart charcoal grey plastics case. The top panel of the unit is home to the helical antenna. It's not a BNC fitting and to be honest, I don't think that one would have fitted!

The antenna fitting is, in actual fact, an SMA type. I understand this is a standard fitting used on mobile telephones, and seems to be similar to a miniature TNC fitting. A patch lead ready made to connect the SMA to an SO239 is available from Lee Electronics for around £12.50.

Also on the top panel is a rotary control. This tunes through the v.f.o. and memory channels and also provides access to the user menu. More about that later.

The top panel also houses the standard speaker/microphone jack sockets. These are protected by a strong rubber cover.

As the transceiver faces you, the **Press To Talk** button can be found on the left side panel. And on the right side panel is the rotary volume control.

The volume control protrudes slightly to the front of the unit, this is how the user gains access to it. My immediate worry was that this control would be easily moved accidentally when placed in a pocket.

However, my fears were unfounded. In practice it's not difficult to use and is so designed that accidental use is highly unlikely.

The front panel of the radio is slightly

curved. The l.c.d. display therefore is situated at a very slight upward angle. The slight curve makes the display very easy to read when the unit is standing on a desk or similar surface.

The curved design, coupled with the very effective green back light and the large numerals in the display, suggests some thought went into the design of this radio. I found this to be a useful and helpful touch.

Seven Buttons

Also on the front panel are seven buttons. These controls are well labeled and considering the size of the unit, easy to use although I did find it a bit 'fingers and thumbs' on occasions.

The control buttons are positive to the touch. They're also well recessed to minimise accidental operation.

The button control functions are: Power on/off, Lamp on/off, Gaining and access to the user function menu. Also included are Squelch defeat or Monitor, Recalling the Call frequency, Scan and Switching between v.f.o. and Memory.

On the rear panel there is provision for a belt clip, although one was not supplied with the review radio. There's also the battery compartment housing the two AA cells which power the transceiver.

The battery compartment cover is the only part of the case that gave me cause for concern. In my opinion it seems a bit flimsy.

In use, the battery compartment cover is only held on by one small hard plastics clip. I was left wondering how long it would be before this became loose or broke completely.

There are no facilities provided to connect the C408 to an external power supply. The transceiver delivers about 230mW r.f. output when the batteries are in good order.

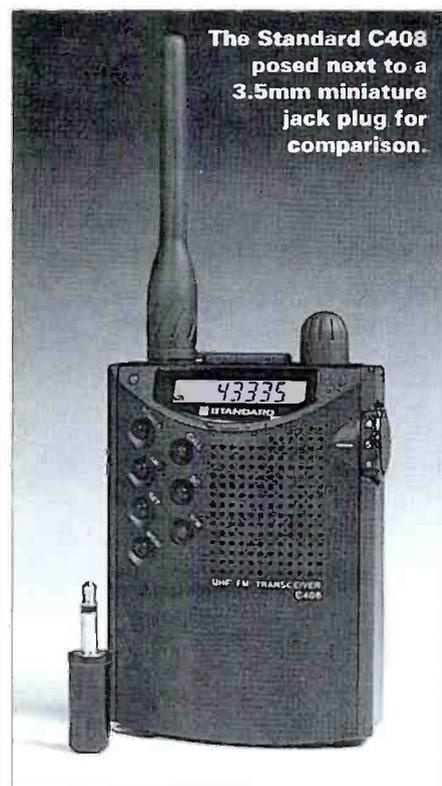
Credit Card

To give you some idea of the size of this radio I laid it down on my desk and placed a normal sized credit card on it. The credit card covered the radio! All you could see was the antenna.

I was afraid to take the transceiver out in high winds in case it blew away! Anyway, enough of this I'd better tell you what it does!

I think I will start with the hardest thing to describe, the User Menu or Set mode. This enables the user to set certain parameters, it also sets the repeater shift and facilitates the

The Standard C408 posed next to a 3.5mm miniature jack plug for comparison.



programming of the unit's 20 memories.

Other things you can set up are functions such as Key lock and disabling the Transmit. The Automatic squelch can be set to high or low sensitivity. The lamp can be set to remain on all the time.

The monitor or squelch defeat can be set to latch on or just work while you depress the **MONI** key. There's also a facility where you can monitor the v.f.o. frequency and the last used memory at the same time.

The usual battery save and auto-off functions are present. Reverse frequency monitoring is also possible but a little cumbersome. The offset shift can be set to any frequency between zero and 39.9875MHz, as long as the frequency can be obtained using the unit's set channel steps.

Channel Steps

The channel steps available on the C408 are 5, 10, 12.5, 20, 25 and 50kHz. The transceiver also has auto-repeater shift, but this is set to the American repeater frequencies and can't be used in the UK.

Selecting a repeater offset is not too difficult. But it requires you to move in and out of the user menu.

What I did find to be very tiresome was the

following. If I tuned to (for example) to 433.375MHz and then selected the offset, and received no reply when I called, through, and therefore retuned to 433.350MHz, I had to reselect the repeater offset.

I had to reselect the offsets - everytime! The obvious way around this problem is to put all your favourite repeater frequencies in memories.

The unit will deliver a 1750kHz tone for repeater access. This is achieved by depressing the Call key whilst transmitting.

The v.f.o. of the C408 will cover the entire 430MHz band and a little bit more each side. However, transmission is only possible on the amateur band.

The C408 has four scan features. It will scan over a 1MHz range, between two programmed limits. It will also scan the memories or scan only selected memories.

The scan can be set to pause on a busy frequency for about five seconds or until the carrier drops.

If the user menu seems daunting to you - don't worry! You don't have to use it to enjoy this radio, unless you're programming memories which I found quite straight forward after a little practice.

Charger Unit

With the review transceiver I was also provided with the 'stand-in' charger unit and NiCad battery pack. However, as I mentioned before, these are optional extras.

The charger seems well made and worked well, but the one thing that did annoy me was that it had a two-pin plug. I do wish manufacturers would put the correct plugs on equipment that's to be sold in the UK.

The prongs on the charger's two-pin plug were very thin. Because of this, they didn't fit properly into the shaver adaptor that I had bought. Another optional extra!

Eventually I had to secure the two-pin plug to the adaptor with Blu-Tack to prevent it from falling out! This was far from acceptable, I can only hope the problem is a stop-gap measure like the instruction manual.

Power Level

The Standard C408 is a very nice little transceiver. It's unfortunate however, that the output power level could not have been pushed up to 500mW. Although I do appreciate that this perhaps would cause problems with the battery life and the design of such a small unit.

However, I live on the outskirts of Bournemouth and I was unable to access the local repeater GB3SZ. This repeater is sited in Bournemouth town centre.

I did on the other hand have some simplex contacts. Several of these were with other people about three miles away and I was given good reports. The QSOs were over an unobstructed, line of sight path.

As you imagine from the output level of this transceiver, it's not really an ideal choice for a main set. Despite this comment, I must say that I think that the receive sensitivity is fantastic! Using only its own helical antenna the C408 sat, inside my bungalow on the outskirts of Bournemouth and received the GB3SD repeater some 20 miles away in Weymouth.

Specifications

General

Frequency range	430.000 439.995MHz
Modulation	F3 (f.m.)
Voltage range	2.2 - 3.5V(two NiCads or AA cells)
Rated voltage	3.0V
Current consumption	230mA (approx) in transmit 30mA (on receive) 8mA (with battery save option) 0.5mA (auto powered down)

Microphone impedance	600Ω
Loudspeaker impedance	8Ω
Dimensions	58 x 80 x 25mm (HWD)
Weight	130g (inc. batteries and antenna)

Transmitter

Output power	230mW (approx)
Spurious emissions	-60dB or better
Maximum deviation	±5kHz
Built-in microphone	electret condenser type

Receiver

Type	double superheterodyne
IF frequencies	23.05MHz (first) 450kHz (second)
Sensitivity	-10dB (0.3μV)
Signal/Noise ratio	>30dB (at 0.5μV input)
Squelch sensitivity	-14dB
Audio output	100mW (8Ω and 10% distortion)

We apologise for the fact that we haven't been able to carry out the *PW* Workshop tests on this transceiver. G1TEX

Summing Up

In summing up, the C408 struck me as a very well made, versatile and novel radio. Something perhaps for family holidays if there are two licencees in the household. It's the ideal radio for keeping in touch with friends at a rally or similar event.

Then I talked to a good friend of mine Bob G6DZM, who is very involved with RAYNET. He came up with another possible application.

The RAYNET organisation obtain permits to operate cross-band repeaters. This technique is where a dual band transceiver is modified so it transmits on one band whatever it receives on the other band.

For example, the main dual bander is set to, let's say, 145.400 and 433.450MHz. Whatever the radio receives on 433.450MHz is immediately transmitted on 145.400MHz and vice versa.

The C408 has obvious advantages with the RAYNET cross-banding. A member could go out into the field with their very small, light and easy to carry C408. They would then transmit on 430MHz with low power, therefore minimising the chance of interfering with other stations, but enjoying the communication advantages of 144MHz.

There's one problem though - the price. The Standard C408 and helical antenna without anything else is expected to retail at about £229. The NiCad pack is going

to be around £15 and the charger about £35.

The C408 is a wonderful little radio, but that much money for a low power, single band basic transceiver without NiCad pack or charger? I would have liked to see the whole package for under £200.

Well, despite my comment, I found the Standard C408 to be a reliable and well built radio. Its performance on transmit was what you would expect of such low power on u.h.f., but the performance on receive was breathtaking. I'm sure that if the Standard C408 is ever realistically priced it will sell like the proverbial hot cakes.

My thanks for the loan of the review transceiver go to Lee Electronics of 400 Edgware Road, London W2. Tel: 071-723 5521, which they can supply for £229. The charger unit is available for £35 and the NiCad pack costs £15. ■



The small size of the Standard C408 can be judged by the battery pack, containing four AA size cells.

The Yeovil Club - Half a Century Coming Up!

There are anniversaries galore in the air for Yeovil Amateur Radio Club says Mike Glasson G7OWG. Mike, official historian for the club reminds us that the 10th QRP Convention will be taking place on May 8 1994, that Club members claim they made the first transistor contact just over 40 years ago on February 21 1954, and the club will be 50 years old in 1996.

The very start of the Club was an advert placed in the local press by Bill Kirkland G8FP (now a silent key) in September, 1946. Three weeks later, on Thursday 17th October, the first meeting was held at the Wellington Inn, Yeovil.

Ten members attended; they formed the committee and established the name. Since then, the club has had nine headquarters, being guests of such worthy organisations as the British Legion, the Ministry of Defence and currently the British Red Cross Society.

Callsign Issued

In April 1947 a callsign was issued - G3CMH (first held by G3BEC on behalf of the club) - and the acquisition of a class B licence - G8YEO - celebrated the first 30 years of the club's life.

The appropriate callsign of G8YEO was coming up for issue and the opportunity was seized to help put the club on the map.

Thousands of stations have been contacted since 1947, among the most notable being contact with K2ZXM/MM, Captain Kurt Carlsen, Master of the ill-fated ship the *Flying Enterprise*.

In 1989 Yeovil was delighted to welcome Joy VK2EBX and her husband Dan from Yeoval in New South Wales. At the time Joy was the only amateur in the town of about 500 inhabitants, presumably named by emigrants from Somerset.

The Club likes to show the flag at local events such as Air Days at Royal Naval Air Station Yeovilton, the Yeovil Festival of Transport and the Royal Bath & West Agricultural Show; each with a special event callsign.

Fig. 1: Peter G3CQR operating the special event station GB3LOW during the Yeovil QRP Convention.



The QRP Convention

The Club also organises the annual QRP Convention (callsign GB2LOW) the tenth airing of which is to be mounted in May.

The Club and several individual members belong to G-QRP Club; Rob G3MYM and then chairman Tim Healey G4WMV, (now a silent key) conceived the idea for a forum where amateurs could expound the science and technology of low power, long distance radio communication.

Implemented by Tim Healey the Convention has gone from strength to strength. Those who have attended include QRP notables George Burt GM3OXX Chris Page G4BUE Bob Hudson G4JFN and PW's own Rob Mannion G3XFD.

The Convention programme includes lectures, on-air stations, displays of equipment and a Constructors' Challenge. In this event a problem is set - last year it was to measure two frequencies in the 3.5MHz band.

Much ingenuity and skill goes into the devices. And the spectators derive much amusement from the weird and wonderful contraptions on display. This year the emphasis is on the number 10. The task will be to construct the most sensitive receiver using ten components.

Transistor Transmitter

The transmitter used to test the QRP Challenge receivers will be equivalent to the one used on February 21 1954. This was when club members made what was, almost without doubt, the first long distance radio contact with a transistor transmitter.

The original, which unfortunately has not survived the passage of time, used a point contact transistor. Experiments were being performed with an audio frequency device to see if it would oscillate at radio frequencies.

The transistor worked successfully at r.f., and the circuit was then matched to an aerial (no antennas in those days!) and calls made. The power input was 30mW, representing an output of some 5mW.

In due course contact was established



A typical busy scene at the Yeovil QRP Convention, which will be celebrating its 10th anniversary with the 1994 event.

with J. A. Shaw G3CAZ in Haslemere. And, what is believed to be the first amateur radio transistor sky wave QSO was made on 3.5MHz.

The achievement was recognized in the book *World At Their Fingertips*. American amateurs made their own first known similar contact 18 months later in August 1955.

The test transmitter for the Yeovil Challenge has to be described as an 'equivalent' because a point contact transistor is not available today to replicate the original design.

Class Success

Each year since 1976, Rob G3MYM has run an RAE class. It is timed for the December exam and has met with with outstanding success.

This year George G3ICO has become a registered Novice instructor. Morse instruction is not forgotten, and Eric G3GC has directed many a class B licensee onto the road to an A licence with his immaculate sending.

Construction continues with the 'Yeovil' 3.5 and 14MHz transceiver designed by Tim Walford G3PCJ. This project is a stable companion to his 'Tiny Tim' published recently in *PW*.

Founders Still Active

Two founder members Don G3NOF and Dennis G3OMH are still active in the Club. They're keenly looking forward to the 50th anniversary in 1996. Don's name and callsign will already be familiar to readers of *PW*'s 'HF Bands Report' pages.

Those members mentioned are just a very few of the people who deserve credit. The very existence of the Club depends on the efforts of all its members, and we're fortunate in having an enthusiastic and knowledgeable membership.

The Convention in May will be preceded by a radio 'Fun-Run'. For further details of this and the Convention contact Peter G3CQR - QTHR.

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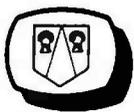
BOOKS

The Society publishes a wide range of books on amateur radio at discount prices to members.



CONTESTS

Many RSGB contests are organised each year as a fun way to test your operating skills.



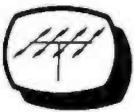
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A wide range of operating awards are available to help you set operating goals and reward your achievements.



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There is a special booklet and expert help available to members seeking help with planning matters. The Society has an outstanding record of gaining permission for members where previously it had been refused.



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The New Classic

AR3030 General Coverage Receiver
* Collins mechanical filter inside



When the AR3030 was first placed onto the drawing board about 15 months ago, the R&D team at AOR had the dream of producing a high quality DDS (Direct Digital Synthesizer) receiver with excellent filtering characteristics offered by the legendary *Collins mechanical filters. This dream has now come true, a feat rarely achieved by any manufacturer whether large or small. As a listener you too can join enjoy the experience of this very special marriage of high technology and classical styling.

Most receivers employ ceramic filters, such filters offer good performance and reasonable cost. However the "best" kind of filter is the mechanical resonator filter, pioneered and still manufactured by the *Collins Division of Rockwell International. In contrast to ceramic filters, *Collins mechanical I.F. filters are more expensive and rarely used in any but the very top of the range and professional equipment.

Our aim here at AOR has been to produce a general coverage receiver using the *Collins 6kHz AM mechanical filter fitted as standard yet at an affordable price for most shortwave listeners around the World. We believe that only the very best receiver design deserves the *Collins mechanical filter, and feel our R&D team have succeeded with this goal. It is very easy to appreciate the true effectiveness of the *Collins AM mechanical filter on today's crowded medium and shortwave bands especially in Europe after dark. We also believe DDS is the best method available today to produce the cleanest signals, absolutely essential for high performance receive capability especially on crowded bands containing many strong signals. There are two other filters fitted as standard, these being 2.4kHz for SSB/FAX/CW and narrow AM/S.A.M & 1.5kHz for NFM. Additional filter options include a *Collins 7 resonator mechanical 500Hz filter for narrow CW operation and a *Collins 8 resonator mechanical 2.5kHz filter for even better selectivity on SSB.

Our "Collins inside" logo and use of name has been fully approved by Collins Rockwell and we are proud of that fact. Our pride will be lifted even higher should other manufacturers be brave enough to follow our example in the near future.

The AR3030 boasts a wide frequency coverage from 30kHz to 30MHz and all mode reception 'as standard': AM, S.A.M (synchronous), NFM, USB, LSB, CW & FAX. Tuning is via a silky smooth rotary tuning knob with a minimum step of 5Hz (selectable for faster / slower tuning), there are two VFOs and dial lock to prevent accidental loss of frequency while listening. We are so confident with the performance of the DDS that the same chip is planned for use in our new generation wide-band receiver which will tune in ultra smooth 1Hz increments.



The AR3030 has a number of unique facilities to offer. In particular the BFO (Beat Frequency Oscillator) is switchable on USB/LSB/CW and FAX modes. During 'normal' operation the AR3030 uses true carrier re-insertion techniques for SSB reception, this ensures ease of use and good audio quality. However should adjacent interference be encountered, the BFO may be switched On so that the main rotary tuning control can be used to tune away from interference and the BFO used to recover readable audio thus provide a simple but effective manual form of passband tuning.

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Poky-toky OVER

Keen QRP operator Peter Barville G3XJS tries out a single channel low power v.h.f. transceiver - the 'Poky-toky OVER'.

The Poky-toky OVER is really a pair of transceivers and these single channel (144.550MHz) rigs are just about the ultimate in simplicity. Apart from the p.t.t., there is only a three position slide switch, which selects **Off, Low Volume, or High Volume**.

No other controls are provided, or needed. As you'll be able to see from the specifications, the transceivers are extremely small and light, and yet the case appears to be quite sturdy, and fits well in the hand.

The range obtainable will obviously depend on terrain, buildings etc., but I found the Poky-toky's 10mW power output to be reliable over a distance of about 250 to 300m. This should be more than adequate for conducting TVI tests, antenna erection parties and communication at rallies etc., where a limited range is called for.

Small And Light

Two antennas are provided with each unit - a thin helical whip, and a flexible wire antenna. The transceivers are small (and light) enough to be put into a shirt pocket.

The clip at the end of the wire antenna is designed to be attached to a jacket, or coat collar. Unusually, the antenna connector is a 3.5mm jack socket and I wonder whether these will prove reliable over a long period of time.

The earphone connector, mounted adjacent to the antenna socket, is also a two-pole 3.5mm jack. I do not recommend plugging an earpiece into the antenna socket and didn't experiment to discover what the result would be!

Power is supplied from a single 9V PP3 battery and care must also be taken when inserting the battery. There are no symbols marked on the casing to indicate which way round the battery should go. In fact, the

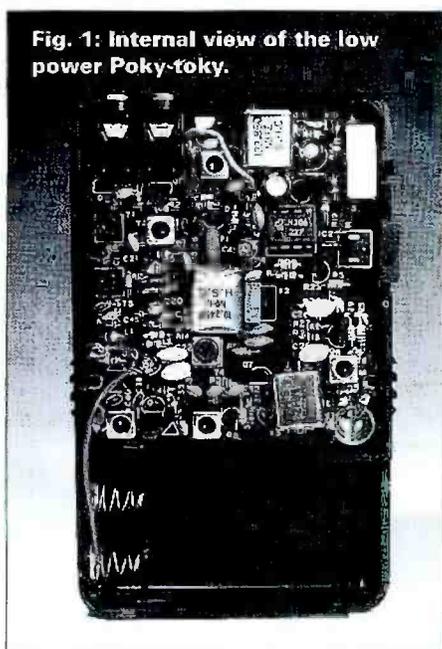


Fig. 1: Internal view of the low power Poky-toky.

positive terminal does have a red connecting lead soldered to it, but you must still correctly identify the battery terminals.

I don't know whether reverse polarity protection is incorporated in the rig. The battery compartment cover is very tight when a battery is installed - but I'd rather that, than a cover which could fall off too easily. I measured the current drain to be about 18mA with the receiver squelch closed (no signal present), and 46mA on transmit.

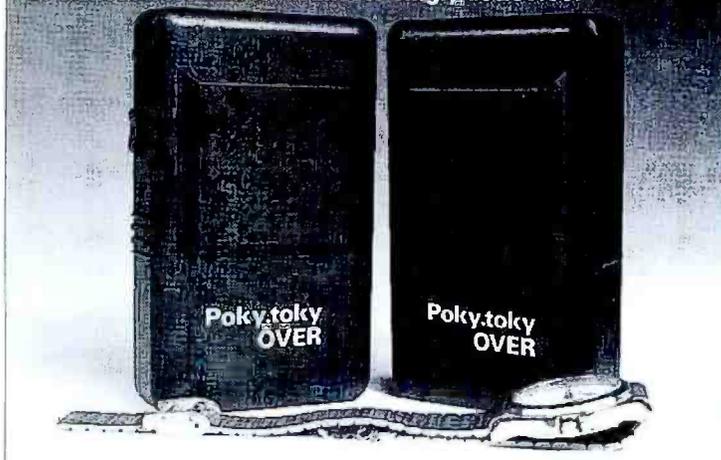
With the volume set at **Low**, the audio from the internal speaker seemed about right for normal applications, and very healthy indeed at the **High** setting. The audio quality was surprisingly good between units and also sounded very acceptable when checked on the main station rig.

One Channel

There's one disadvantage of the Poky-toky having only one available channel. It's that, if you are using a pair at the local rally (or boot sale) to tip off a colleague about the best bargains, anyone else using a Poky-Toky will also hear your good news!

But there is another, potentially more serious, drawback. Recent changes to the 144MHz band-plan mean that packet radio operators may now use 144.550MHz for Mail

The Poky-toky OVER is in fact supplied as a matched pair of transceivers and is available singly at £39.95.



Box access, etc.

Local activity levels will determine whether this is likely to present a problem when using your Poky-toky. The wire ended crystals are soldered into the circuit board, but it should be possible to obtain, and install, alternative frequencies if you wish. Crystal specifications are available from South Midlands Communications.

Excellent Value

At £59.95 a pair, these transceivers represent excellent value for money and they offer a very good 'no frills' performance.

I suspect they may be a little susceptible to strong out-of-band transmissions, or other nearby 144MHz transmitters, but should otherwise provide excellent short range personal communication and a lot of fun.

My thanks go to South Midlands Communications Limited, S.M. House, School Close, Chandlers Ford Industrial Estate, Eastleigh, Hampshire SO5 3BY. Tel: (0703) 255111, FAX: (0703) 263507 for the loan of the Poky-toky OVER.

Specifications

Receiving system	double super-heterodyne (squelch circuit installed)
Receiving/Transmitting frequency	144.550MHz (✓)
Frequency control	crystal controlled (✓)
Operation mode	f.m. (✓)
Operating temperature	-20C to +50C
Power source	one 9V 6F22 or 6LR61 type alkaline battery
Dimensions	63 x 104 x 21 mm
Weight	90g (without battery)

What the (✓) means!

When we have a rig in for review in *PW*, we check the rig on our test equipment to see how well it measures up to the manufacturer's quoted specification. The specification figures we feel are important to you, the reader, we check out and highlight with our *PW* (✓).

We use a (✓) sign after a measurement figure, to mean that the reviewed rig matched (within measurement limits) the quoted specification. We use a (✓+) sign to mean the rig bettered the specification by a good margin. The ultimate accolade is a (✓++) sign, meaning the margin was excellent. (G1TEX)

Milliwatts On 1.8MHz

Leighton Smart GWOLBI shares his experiences of a communications experiment on 1.8MHz using milliwatt power levels.

There are currently nine h.f. bands allocated to radio amateurs in the UK, with each band having its unique characteristics as far as propagation and DX capabilities, etc. are concerned. However, of all the nine bands, the 1.8MHz band ('Top Band') is accepted generally to be perhaps the most difficult band to work, both in terms of high static levels and the obvious need for rather long antennas. Many amateurs are restricted to postage stamp gardens!

Having a keen interest in 1.8MHz, I have been active on the band for around 18 months, operating exclusively QRP, with powers of 5W and less. I have been rather surprised on occasions as to what is achievable with low power on the band.

Being primarily a 'night-time' band, the signals begin appearing as the 'D' region starts to become depleted around early evening, with a slow increase in signal strengths until around 22-2300 hours local time. This results in some signals of reasonable strength being received.

The cooler months of the year are best suited to operation on the 1.8MHz band. The summer months often see an increase in the noise levels which are usually far in excess of anything experienced during wintertime.

However, having operated on the band during both summer and winter and having first hand experience on 1.8MHz QRP operation, my thoughts turned to the possibility of milliwatt operation on the band. Could reliable communication take place on less than say, 500mW? If so, what distances could be covered?

After some considerable thought, I decided my chances of being heard would be increased if I publicised my plans in the form of an experiment. As a member of the ISWL, I appealed to its members through the League journal to assist me in this experiment by listening on 1.980MHz c.w. between 2130 and 2230UTC for five evenings, beginning on the Monday evening.

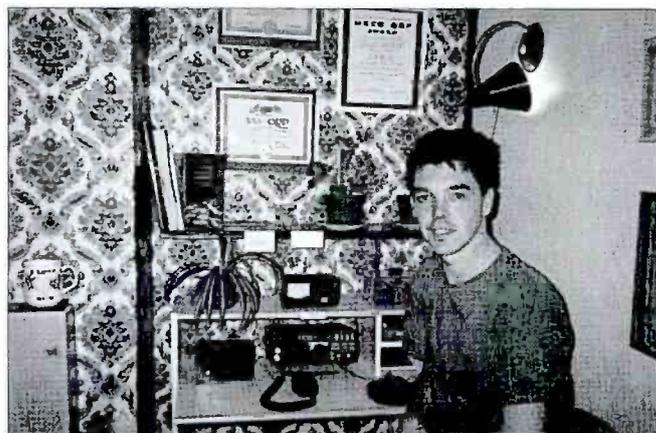
I also asked for replies if possible, or, in the case of s.w.l. stations, to send reception reports informing me of the strength of readability of my milliwatt signals, etc., in the hope that at least **someone** would hear me!

Frequency Chosen

The frequency 1.980MHz was chosen because it seemed relatively free of QRM for the most part and was more suitable than anywhere in the 1.830 - 1.840MHz DX slot, where my signals would be buried beneath all the QRM!

My station comprises a Yaesu FT-747GX, modified to run a maximum of five watts on all bands. The antenna is a modest affair,

Leighton GWOLBI pictured at his QRP station.



around 53m long, that is just 9m a.g.l end fed and tuned against earth and a tuned counterpoise. So, with my key at the ready, I began calling CQ TEST TX DE GWOPGT QRP K with considerable doubts as to what would be the result!

The first evening saw just one contact with **John G0PGT** in Weymouth. The power output used was 500mW and the distance in the region of 90 miles. This initial contact gave me cause for encouragement and I was pleased to receive a 449 report from John.

The following evening session yielded two contacts; the first with **Sid G13LFH**, near Belfast, receiving a 549 report with just 100mW output; secondly came **Ray G13PDN**, near Ballyclare, from whom I received a 569 with 500mW. Following a QSY to s.s.b. he also gave me a 53 report when I was running 300mW p.e.p.! Both stations were approximately 225 miles from my QTH.

The third evening gave no contacts, but s.w.l. reports were received from s.w.l. stations **Dennis Coggins G-17148** in Cheshire, who reported 449 with 200mW and **Bill Hobson G-5748** Scunthorpe, who gave 549, again at 200mW. Both contacts were 110 and 170 miles respectively. It was very nice to hear from s.w.l. operators who could read c.w.!

The fourth session provided a very pleasant surprise indeed. Only one air contact was made, and one s.w.l. report was received. The s.w.l. report was from **Evelyn May G-17197**, Cheshire, around 100 miles at 100mW the report was 549, quite a respectable signal for the power involved.

The on air contact was with **Ken SM6CTQ**, while I was running 500mW output, receiving a 339 report. This contact took place over a 800 mile path, a distance I did not honestly expect to cover with such low power.

The final evening proved less spectacular, but nevertheless, two QSOs resulted. The first QSO was with **G13LFH** again, at 225 miles, although this time I was given a respectable 579 for 500mW. The second was **Neil G4DBN**, near York, at around 175 miles with a 569 report for my 500mW.

With the experiment over, it was a pleasure to be able to run QRO again, although my QRO equals five watts full power!

Conditions Restrictive

In conclusion the experiment took place under conditions which could only be described as restrictive. The power levels used were no more than 500mW and I utilised a far from ideal antenna system.

However, given the circumstances, reliable communication did take place over considerable signal paths. Good copy was obtained with powers of 500, 300 and 100mW which was very enlightening as far as I was concerned.

The greatest distance covered was around 800 miles, and although these distances are regularly covered on the higher frequency bands, the fact that this was achieved on 'Top Band' was something of an achievement as far as I was personally concerned. Remember, my antenna for this band is not exactly ideal!

I think that I may conclude that milliwatts can be reasonably effective in providing reliable radio communication on 1.8MHz. Of course, there are other factors which come into play, such as seasonal variations, prevailing propagation conditions, QRN, QRM, etc., but the experiment has served a purpose in demonstrating the effectiveness of very low power levels on this band.

I had doubted that I would be heard outside Wales, but I was pleasantly surprised by the results I obtained. The SM6 contact in particular was quite an eye opener, in fact, I have worked Ken since then on a number of occasions with good copy on both five and 500mW, thus proving that the contact was not just a one-off QSO. The possibility of a regular contact with these power levels on 1.8MHz is becoming more and more apparent.

Finally, there are perhaps many conclusions which could be drawn from the results. You can, of course, draw your own, but I hope that this article will be of interest to others and in particular the 1.8MHz enthusiasts.

PW

Nesting Dipoles

John Wood G3EAY shows you how to make your own nest of dipole antennas. And what's more, they're portable.

The single most important part of almost any amateur radio station must be a good antenna system. No matter how sensitive the receiver, or how powerful the transmitter, if the signals don't get in and out efficiently, the overall performance will degrade.

At your home location, arranging an efficient set of antennas isn't too much of a problem. However, I was going to spend some time in Alicante, Spain and I didn't want to lose out on my amateur radio.

My station in Alicante was to consist of a Yaesu FT-7 with about 10W of r.f. output. So, the antenna I used would make or break the set-up. It also had to be cheap to make and easy to erect.

The antenna I settled on, after deciding that I would only use 14, 21 and 28MHz was a series of dipoles. To reduce weight, I didn't want to carry an a.t.u. with me, so the system had to be pre-tuned and matched.

By looking at the drawing, Fig. 1, you'll see just how cheap and simple the end result was. The spreaders were made from 25mm white plastics water pipe. The insulators were the white plastics joiners used with chipboard furniture.

The antenna centre piece was an offcut from a 50mm diameter waste water pipe. You'll find the centre section layout detailed in Fig. 2.

I used pvc covered multi-strand copper wire for the elements, and nylon monofilament for the support strands. The finished system is light, strong and easily rolls up to fit into a suitcase.

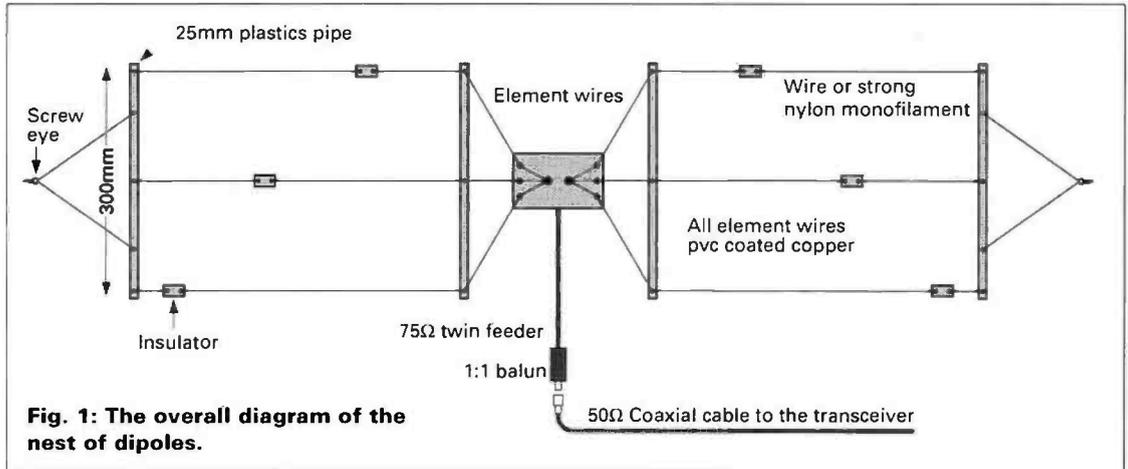


Fig. 1: The overall diagram of the nest of dipoles.

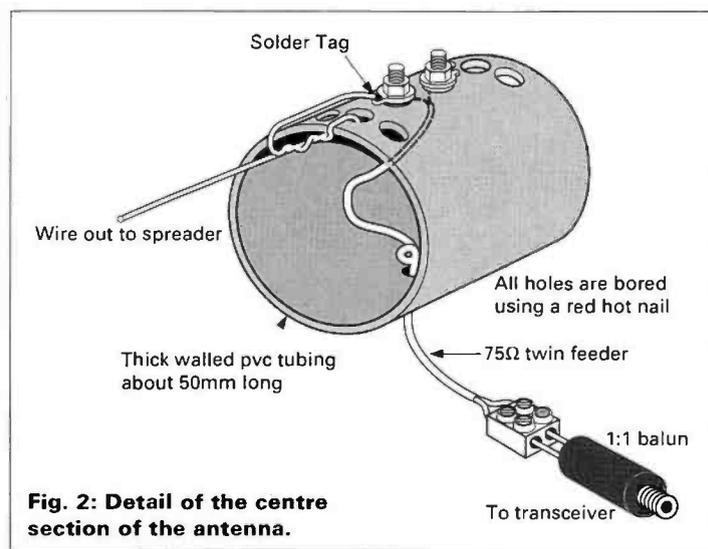


Fig. 2: Detail of the centre section of the antenna.

Cut two lengths for each antenna, to the lengths shown in Table 1. Allow some extra wire in each element to fold back and secure, by soldering. I bored all the holes with the aid of a hot nail that I held in a pair of lock jaw pliers.

The 75Ω feeder may be almost any convenient length, although it should be as short as possible for maximum efficiency. The 1:1

balun at the junction of the coaxial cable and the 75Ω feeder could be left out if you wanted to. If you do this however, the antenna may not perform as well as expected in some directions.

That's how I built the antenna I used so successfully in Alicante and I have a log of contacts from all areas of the globe with whom I was able to have good two-way conversations. So it must have worked well! In fact, I worked WA6NHO who was the captain of a C150 Galaxy aircraft one hour into his homeward bound flight from a mission to Panama! Good DX

PW

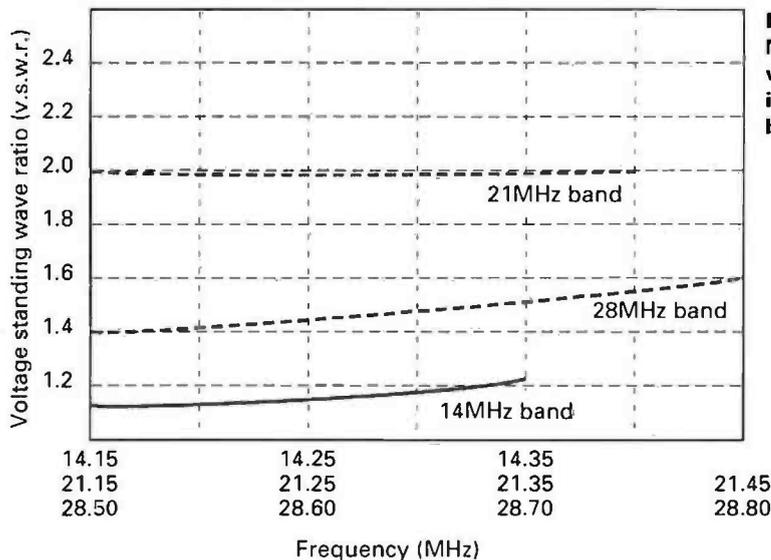


Fig. 3: Measured v.s.w.r. levels in all three bands.

Table 1: Element lengths

Band	Length
28MHz	1.84m
21MHz	3.25m
14MHz	4.84m

RADIO DIARY

*Practical Wireless and Short Wave Magazine in attendance.

***March 12/13:** The London Amateur Radio & Computer Show will be held at the Picketts Lock Centre, Picketts Lock Lane, Edmonton, London N9. Large trade presence, free parking, lectures and disabled facilities. Bring & Buy, special interest groups, talk-in on S22. (0923) 893929.

March 13: Wythall Radio Club will be holding their annual Radio Rally at Wythall Park, Silver Street, Wythall (near Birmingham on the A435, just 2 miles from Junction 3 on the M42). Doors open 10.30am to 4.00pm. There will be the usual traders in three halls and a marquee. Bar and refreshment facilities available and a Bring & Buy stall will be run by the club. Talk-in on S22. Admission only £1.00. Chris G0EYO on 021-430 7267.

***March 20:** Norbreck Amateur Radio, Computing & Electronics Exhibition, Norbreck Castle Hotel, Queens Promenade, Blackpool, Lancashire. Extended free car parking with free shuttle service, Novice licence details and demonstrations. Bring & Buy, competitions, refreshments, talk-in on S22. Doors open 11am (disabled entry with ramp from 10.45am) close 5pm. Admission £1.50, over-65s £1.00, under-14s free. Peter Denton G6CGF on 051-630 5790.

March 20: Tiverton South West Radio Club are holding their 1994 Mid Devon Rally at the Pannier Market, Tiverton. Doors open at 10am. Easy access, only minutes from junction 27 on the M5. Excellent free parking, two halls of trade stands, Bring & Buy stall and mobile snack bar. Further displays and full refreshment facilities in the club room bar which is open throughout the day. Talk-in on S22. G4TSW. Mid Devon Rally, PO Box 3, Tiverton, Devon.

March 27: Bournemouth Radio Society are holding their 7th Annual Sale at Kinson Community Centre, Pelhams Park, Milhams Road, Kinson, Bournemouth. Doors open at 10am. Talk-in from G1BRS on S22. Amateur Radio and Computer Traders, clubs and specialised groups. Admission £1 including free raffle ticket. Ian G2BDV QTHR on (0202) 886887.

March 27: Pontefract & DARS are holding their 14th Annual Components Fair & Spring Rally at the Carleton Community Centre, Carleton, Pontefract. Doors open at 11am, 10.30 for disabled. Bring & Buy, traders, bookstall, licensed bar and refreshments, Morse tests, tombola, traders, car boot spaces available, admission by prize programme, 3 prizes plus special draw for the ladies. G0NQE, QTHR on (0977) 677006.

April 3: Launceston Amateur Radio Club will be holding its 8th amateur radio rally at Launceston College. Doors open at 10.30am, well known traders, ample parking, RSGB Morse tests on demand (bring two passport photographs). Roy G0IKC on (0409) 221624 or Rodney & Joy on (0566) 775167.

April 4: Centre of England Easter Radio, Satellite, Computer & Electronics Show is being held at the Sports Connexion Centre, Leamington Road, Ryton on Dunsmore, Coventry A45/A423. Doors open at 10.30am, admission £1.50, senior citizens, £1.00. Held in two large halls, over 80 traders, Bring & Buy, talk-in on S22, bar and hot food all day, ample parking. Frank Martin G4UMF on (0952) 598173.

April 16: The Spring All Micro Show/Radio Rally and Electronics Fair is being held at Bingley Hall, Staffordshire Showground, Weston Road, Stafford (A518 Stafford-Utttoxeter Road) AA signposted from Junction 14 on M6. Doors open 10am, adults £2 on day (advance tickets £1.50), children under 14 free. As usual we are supporting local charity stalls, free parking, licensed bar from 11am, refreshments, meals and a cafeteria. (0473) 272002

April 17: Bury Radio Society will be holding a rally at the Castle Leisure Centre, Bolton St. Bury. Doors open at 11am, 10.30am for disabled visitors. Bring & Buy, talk-in on S22, refreshments and bar available. Laurence on 061-762 9308 evenings.

April 17: The Cambridgeshire Repeater Rally Group will be held at the Philips Telecom - Catering Centre, St. Andrews Road, Chesterton, Cambridge. Doors open at 10.30am. There will be a Bring & Buy, trade stands and an auction. Darren Salter on (0223) 358985 extension 3265.

May 1: The BATC Rally, Sports Connexion, Coventry will be among the largest indoor radio events of 1994 - around 320 trading tables, flea market, outside TV displays etc. Mike Wooding G6IQM.

May 2: Dartmoor Radio Rally will be held at Yelverton Memorial Village Hall, Meavy Lane, Yelverton, Devon. Trade stands, Bring & Buy, refreshments etc. Parking, access for disabled, doors open 10.30, talk-in on S22. Ron on (0822) 852586.

May 2: Mid-Cheshire ARS Rally will be held at Civic Hall, Winsford, Cheshire. Doors open at 11am, (10.30am for disabled visitors). £1 entry and ample free car parking, full catering and bar plus Bring & Buy. Dave G4XUV on (0606) 77787.

May 8: Midland Amateur Radio Society/Drayton Mobile Radio Rally is being held at Drayton Manor Park, Tamworth, Staffs (A4091). Doors open at 10.30am, usual traders, flea market, car boot and club stands. Peter G6DRN on 021-443 1189.

May 8: The 10th Yeovil QRP Convention will be held at the Preston Centre, Yeovil, Somerset. Doors open 9am - 5pm, free car parking. Traders, QRP kits and components plus club Bring & Buy and QRP club stand. Natter area and refreshments. Peter G3CQR, QTHR on (0935) 813054.

May 22: The 37th Northern Mobile Rally will take place at the Flower Show Hall on the Great Yorkshire Show Ground, Harrogate, North Yorkshire. Mike G0MCK. (0423) 507653 evenings or G0MCK @ GB7CYM.

May 29: The 18th Annual East Suffolk Wireless Revival will be held at The Maidenhall Sports Centre, Stoke Park Drive, Ipswich, Suffolk. Attractions include vintage radio display, Novice stall, RAIBC, BYLARA, RAYNET. Non-radio stalls and refreshments. Talk-in on S22. Bob Baal on (0394) 271257.

May 29: The Plymouth Radio and Electronics Fair will be held at Plymstock Comprehensive School, Plymstock. Doors open 10.30am. Over 25 stalls selling electronic and computer and radio components, many second-hand bargains for the enthusiast. Free parking, Bring & Buy stand, club station on air, bookstall, hot and cold buffet and a grand raffle. Admission £1 on the door. (0752) 364152.

June 12: The Royal Navy Amateur Radio Society is holding its annual rally on the sports field HMS Collingwood, Fareham, Hants between 10am and 5pm on Sunday. This site, with its easy road access and good car parking, is a splendid successor to the previous venue. Trade stands, Bring & Buy, flea market, local repeater and radio clubs and also a large arts and crafts exhibition. A full range of entertainment for all the family along with refreshments. Talk in on 144 and 432MHz to guide visitors from the nearby M27 (leave at junction 11 and follow the A27 towards Fareham). Clive Kidd G3YTO on (0705) 3327621 daytime or (0329) 234143 evenings.

June 19: Denby Dale & DARS Annual Mobile Rally will be held at Shelley High School. Phil G4FSQ on (0484) 644827.

June 26: The 37th Longleat Amateur Radio Rally is being held at Longleat House, Warminster, Wiltshire. Shaun O'Sullivan G8VPG on (0272) 860422 (office hours) or (0225) 873098.

July 2/3: HAMfest-UK. A new event for Amateur radio, s.w.i. and computer enthusiasts will be held at The County Showground, Weston Road, Stafford off junction 14 M6. Large trade presence, free parking, lectures, Bring & Buy, special interest groups, Morse testing and flea market. (0923) 893929.

July 3: The 5th York Radio Rally will be held in the Tattersall Building, York Racecourse, Knavesmire, York. Doors open 10.30am, admission £1. Ample free parking, amateur radio, electronics and computers, arts and craft, Morse tests, licensed bar and cafe, talk-in on S22. Dave Moreland G7FGA on (0904) 790079.

July 9: The Cornish Radio Amateur Club are holding their annual rally at Penair School, Truro. Ted Kier G1DTS on (0872) 222605.

July 24: Colchester Radio Amateurs will be holding their 26th Radio & Computer Rally (including car boot sale) at St Helena School, Colchester. G3FLJ on (0206) 851189.

July 31: The Rugby Amateur Transmitting Society will be held at the BP Truckstop on the A5, 3 miles east of Rugby and just 2.5 miles north-west from Junction 18 of the M1 motorway. Doors open at 10am, admission is £1 per car and facilities include a good cafeteria and toilets. Talk-in on S22 by GB6CBS. Peter on (0455) 552449.

August 14: The Derby and District Amateur Radio Society will be holding its annual radio rally at the usual venue, Littleover Community School, Pastures Hill, Littleover, Derby. The venue for the Rally is on the A5250, just north of its junction with the A38, on the southern outskirts of Derby. There will be the usual attractions, including the famous monster junk sale. Martin Shardlow G3SZJ, QTHR on (0332) 556875 or packet G3SZJ @ GB7LTN

August 21: The West Manchester Radio Clubs 'Red Rose Rally' will be held at the usual venue of the Bolton Sports & Exhibition Centre, Silverwell St., Bolton (town centre). All the usual trade stands (over 75), societies, Bring & Buy etc. all at pavement level, with facilities for the disabled. Refreshments available all day plus bar. Doors open 10.30am for disabled, 11.00am for general public. Admission £1.00, children free. Dave G1100 on (0204) 24104 evenings only.

August 24: King's Lynn Amateur Radio Club are holding their 5th Great Eastern Rally at the Cattle Market, Hardwick Narrows, King's Lynn (off A10/A47 roundabout). Doors open at 10am (9.45am for disabled). Attractions include a spacious indoor area with major international exhibitors, outdoor car boot area, Bring & Buy, Talk-in on S22, easy access for disabled, all one level, free parking, refreshments available. Entry £1. G0BMS on (0553) 765614.

August 29: Scarborough Amateur Radio Rally will hold their radio electronics and computer rally at the Spa, South Foreshore, Scarborough. Doors open at 11am. Many traders, Bring & Buy, refreshments and bar. Ross Neilson on (0723) 514767.

IF YOU'RE TRAVELLING LONG DISTANCES TO RALLIES. IT COULD BE WORTH 'PHONING THE CONTACT NUMBER TO CHECK ALL IS WELL, BEFORE SETTING OFF.

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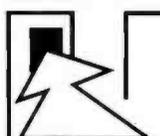
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The Yeovil 3.5 and 14MHz Transceiver Kit

Clive Hardy G4SLU is a keen home-brewer and QRP enthusiast. Recently, Clive's had the opportunity to build an interesting kit transceiver designed by G3PCJ, the designer of the PW Tiny TIM.

I've no doubt that regular *PW* readers will remember the single band Tiny TIM s.s.b. transceiver kit designed by Tim Walford G3PCJ. (It appeared in the July to October 1993 issues of *PW*). The Yeovil transceiver shares several features with the Tiny TIM.

The Yeovil covers the whole of both the 3.5 and 14MHz amateur bands. It has a power output of 10 to 12W p.e.p. from a 13.8V d.c. supply.

The receiver is a single conversion 9MHz i.f. superhet. It uses a six-pole 2.2kHz wide i.f. filter and a single free running v.f.o. covering 5 to 5.5MHz.

Two Bands

Coverage of the two amateur bands is achieved by subtracting the v.f.o. frequency from the signal for 14MHz coverage and by adding it for 3.5MHz. Switching double tuned r.f. filters at the receiver input selects the wanted band and suppresses the unwanted band.

On transmit, s.s.b. generation is done by reversing the signal flow through the receiver filter blocks. In the receiver the signal switching is done by electronic transmission gates.

There's no i.f. amplification in the Yeovil as such. The NE612 mixers provide 15dB gain and an audio pre-amplifier helps lift the overall sensitivity.

The c.w. filtering is achieved by altering the pass-band of the audio pre-amplifier. For transmission, s.s.b. is applied to four stages of r.f. amplification at signal frequency.

There are two low level stages with i.c.s followed by a f.e.t. driver. The final power amplifier stage uses IRF510 m.o.s.f.e.t.s in a push-pull configuration.

The speech amplifier is a conventional low noise op-amp with a high input impedance to cater for most types of microphone. For c.w. transmission the carrier is generated by feeding a 720Hz tone from a free running oscillator into the speech amp.

Two Boards

The Yeovil is built on two 160 by 100mm boards. The receiver can be built as a stand alone unit if required.

A 50-page construction manual has been produced by the designer. It contains circuit diagrams, building information and notes on



The Yeovil kit transceiver as built by Clive Hardy G4SLU.

the theory as well as the construction notes for each section of the radio.

Advice, based on experience, is given on how to run the construction as a club project. The manual is essential reading for any would-be Yeovil constructor. The text is typewritten with some handwritten amendments and the schematics are hand-drawn.

Basically speaking there are four parts to the kit. These are the receiver, the transmitter, the hardware, and the construction manual.

Each element of the kit is available separately, the manual is free when you buy the complete kit. The hardware kit contains a piece of p.c.b. material for use as a front panel, plus a meter, knobs, and various switches.

You can of course put the transceiver into a box. This is what I have done with the Yeovil I built.

The three major parts of the kit are supplied in clear polythene bags with a list of contents. All the components for each part are in the one bag, so you have to be able to identify them from their markings.

The p.c.b.s are double sided and pre-drilled. The variations in the depth of the counter sinking on the p.c.b.s indicated that it had been done by hand. Undrilled boards are available from G3PCJ if requested.

So, I ordered the parts I needed for the external casing (so they would be waiting when I was ready for them) and then set about the construction. I built the receiver first and I'm pretty sure most other builders will do the same.

Guide Schematics

To guide you as to the positioning of parts on the boards, the manual has three schematics of the component layout. One is a simple block

diagram, the others show individual components with either their values or part numbers. Another lists all the receiver components by part number and value in the suggested order of construction.

Essential items of test equipment when building the receiver are a multimeter and a 13.8V d.c. supply. A frequency counter to check the operation of the v.f.o. and a crystal oscillator are also useful.

There are 11 sections of the receiver put into three blocks. The first block consists of a voltage regulator, audio output, c.w. filter relay, audio pre-amplifier, and automatic gain control (a.g.c.).

The first block alone took several hours to build. Selecting the location of some components reminded me of a *PW* 'Spot The Difference' competition. You know they're in the picture somewhere, but can you find them! However, as the board filled up the number of spaces decreased and the problem diminished.

I found that one or two of the holes hadn't been drilled right through the board. I also discovered some of the countersinks were a little too shallow. Both problems were solved with hand twisted drill bits.

There are a number of test points on the board with no means of accessing them from the top side. To help, I fitted Veropins in the ready-drilled holes.

Fortunately, at the end of each stage everything worked correctly. Various leads were temporarily connected just for the test procedures as I worked through the assembly.

Box And Fittings

The next task was to prepare the box and fittings. I used a S2:42 box from Maplin which is 200mm wide, 250mm deep, and 75mm

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73 Martin G4HKS



Mr Jan Hasegawa, the Yaesu President, on a recent visit to my new super store in London.

Yaesu Musen

FT1000

Awarded the best of everything, the Yaesu FT1000 is their flagship, why not make it yours too? I know it retails at three & a half grand, but I can do wonders to the price and give you options on paying the balance. If you want to make a serious investment on the very best transceiver in the world, then come and see me!

FT990

If you don't feel the necessity on having the FT1000, then why not choose the FT990? It's built along side its big brother and still offers most of the main features - including "digital" filtering that no other radio has! The price has already been slashed by Yaesu U.K. and I'm offering even better tempters to relieve you of your cash!



FT890

"The worlds smallest 100w H.F. transceiver with auto-atu", is true, (the TS-50S has a tuner the same size as the radio), but if you want

a compact H.F. station with features only found on bigger machines, then take a closer look at the FT890. The auto-atu actually fits inside the radio, making it a truly portable H.F. system.

FT840

Launched at the Leicester show last year, this NEW H.F. transceiver costs less than many receivers available on the market and offers stunning performance. The RadCom team loved it and so do I - you can have one from only £13.50 a week!



FRG100

Now the price is back to what it was twelve months ago, this excellent 50KHz-30MHz receiver is an absolute winner. Yaesu have improved the AM filtering and for the price of a dual-band handie you can have one today!



FT736R

The only VHF/UHF base station to offer EVERYTHING in one box, the FT736R has proved to be the DXers choice for 2/6/70 or 23cm. Yaesu tell me they have a permanent waiting list for this one, despite it being several years old. For complete flexibility on all the upper bands, including a built in PSU, full satellite operation and much more, if you want one today, give me a call!

FT260R mk11

Once again, Yaesu have the market to themselves, the FT290/690/790R series are the only multimodes operating on 2, 6 or 70cm offering full portability if required. Clip on the optional linear amplifier and you turn it into a full blown base/mobile installation!

FT5200

The only DualBand mobile 2/70 FM transceiver with a "quick release" front panel, the new LOWER price for this model makes it a must! Full



duplex, optional CTCSS and remote cable kit make this the most versatile of all the "funny mode" talk boxes!

FT2200/7200

The latest in a long line of FM transceivers, these two are the most compact and easy to use yet. A full 35 watts on seventy, or 50 watts on two, these two new "super models" are the ones to go for.

FT530R

Think you've seen a good deal elsewhere? Think again! When Yaesu introduced their new DualBand handie to replace the FT470R, customers couldn't believe the build quality and features contained in such a neat package. No, it's not the smallest, but then unless you're a ballerina with dainty little fingers, who cares? Unlike all the competitors, the FT530R has



CTCSS fitted and comes supplied with NiCads & Charger. The price? You won't believe it!

FT11R/41R

I know you probably think the Japanese have gone bonkers building VHF portables, but you've just got to see what Yaesu have done with these two. No larger than a packet of cigarettes, the NEW FT11/41R handies are full-feature machines with all the "trick" facilities built in. The volume & squelch are controlled by up & down buttons, leaving the top panels with only one knob - the channel change knob. See one today!



Trio-Kenwood

TS950SDX

The only H.F. base station to feature proper digital signal processing, 150 watts, all mode, general coverage, dual receive and lots more. If you listen to 14.295 and hear Eddy, G0BBD, he'll tell you how good it is. You will be able to HEAR how good it is on transmit yourself!



TS850S

Recently reviewed in PW, the TS850 set the standard for sub E2K radios and judging by how many we get through every month, you obviously appreciate the machine as well! Rather like a popular car, you either know someone with one, had one and wish you never sold it, or haven't yet got round to investing in the best HF base station since Trio launched their TS530 all those years ago. I'm



here and I'm ready to take your money!!

TS450/690S

For those of you that like things a little more compact in H.F. operation but don't want to lose the bigger radio features, try the TS450 or TS690 for size. You can specify auto ATU with either, (Yes the TS690 will give you 100w on H.F. 50w on 6 metres & contain an auto atul) and the price won't bust the bank.

TS50S

Apparently there are people out there that still think the ever so small TS50S is an April Fools play from last year! To put the record straight, the radio really is the size of a 2m multimode, does produce a clean 100w output, does possess a multimode receiver with general coverage and is just about the most amazing piece of kit I've ever seen out of Japan. Don't continue being a mushroom sitting in the dark, ask about one today.

R5000

Still the favourite shortwave receiver and built to Kenwood's high quality of construction. You can add an internal VHF option to cover 108-174 MHz for a minimal cost and additional filters throughout the modes.



TR751E/851E

Take it from me, these two 25 watt multimodes for 2 & 70 are still unmatched by any other manufacture. No frills no gimmicks, just good RF performance. (they must be, "mutek" hasn't touched them since they were introduced!). These two winners continue to sell despite any recession.

TS790E

For those of you that like TS850 style looks but want it on VHF, then take a look at the new TS790E. Comes fitted with 45 watts on 2 & 70, you can add a

10w 23cm module and have a triple band base all in one box! I used one at home for a while, until Chris, G1FMH sold my own machine to a customer.

TM241E/441E

Simple to use high power 2 or 70 FM mobiles. No more to say. We love 'em. Get your money out and lets haggle.

TH78E

The TH78E still has the most features per pound offered on a dual bander. It's the smallest shape with the most buttons on it. I haven't counted them all, but the first person who does and tells me face to face, gets a free case for it worth £16!

TH22/42E

The latest in slim-line single band FM handies. If you're fed up with the bits you'll never use, but just want a good 2 or 70 radio then look no further. They are sensibly priced too!

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100 watts on HF + 100 watts on SIX!

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No other radio offers you so much - for so less. Have Icom got it right? I should say so! Call now for the best advice and price!

Icom IC737

If you're not enthused about the NEW IC736, or simply don't want 6M or possibly a power supply, then take a special look at the IC737. It's been a favourite of mine since its introduction last year. Voted one of Peter Hart's favourite rigs, his comment "amongst the best receivers I've ever tested" is absolutely true. They're in stock at a special price to suit you.

Icom IC728/9

Sub £1K will bring you a neat 100w HF station called an IC728. If you want 6m then add £300 or so pounds and buy the fabulous IC729. Both have digital synthesizers giving unparalleled "smoothness" and real VFO like tuning.

IC275H/475H

Still the trend setters amongst the "BIG BOYS" on VHF, 100w on either 2m or 70cm is the way to go. When I first took the pair home I thought there was something wrong with the receivers - they're that quiet! Throw out your old FT225RD, even with muTek, believe me, it doesn't compare.

ICW21E/ET

The alternative Icom Dual Bander is available with or without keypad. They are great value and still offer all the extended receive features that is so important today. Why I don't know, but there it is. What ever happened to AM on 2 and tuning "low to high"?

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Alinco

Alinco DJ580

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Alinco DJ180/480

Probably the strongest and most versatile 2 or 70 handie available. One of the few to come with a proper "stand-in" charger at the all in price.

Yupiteru

MVT7100

An all mode all band, (150KHz-1.3GHz) receiver, that you can hold in your hand? If you turned up with one of these 10 years ago, you would have probably been classed an Alien. There's a joke there somewhere but my brain is running a bit slow. Something to do with my mates in the Midlands perhaps? If you haven't played with an MVT7100 by now, then you're probably still watching a black & white T.V. whilst operating the 80m net on Wednesday afternoons.

AOR

NEW AR3030

The AR3030, is the very first in a range of ShortWave receivers from AOR. Using the famous "Collins" filters, the performance over the entire range (50KHz-30MHz) is uncompromised. We should have stocks by March, so get your order in now!



AR1500EX

We have literally sold hundreds of these little pocket scanners. All mode and general coverage right up to 1300MHz, the little AR1500EX is a delight to use.

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MFJ 1278	£339.95
Universal M400	£399.95
M900	£529.00
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M8000	£1279.00
Momentum MCL 1200	£229.00
ERA Microreader	£189.00

"Advice given was excellent - the delivery as promised. All this in Christmas week! - Wonderful!"

"The best advice was pushing me on to the FT990 - it's a cracker - many thanks and it works like a dream come true."

"The standard of service on the repairs was excellent and I will use your company again."

"Helpful, polite and efficient, I am very satisfied with your service."

"Very pleasant and happy atmosphere + helpful. Not found very often nowadays."

"Good attentive service and quick despatch, was received 10.30 next morning."

"I've been SWLing for 39 years and never have I had better service from Chris Taylor in all those years, I will be back."

"Of my many world wide QSOs - the name "Martin Lynch" crops up many times, with nothing but highest praise."

"All equipment supplied is of excellent quality and value. I look forward to continued good relationship."

This is just a small selection of authentic comments from my satisfied and loyal customers.

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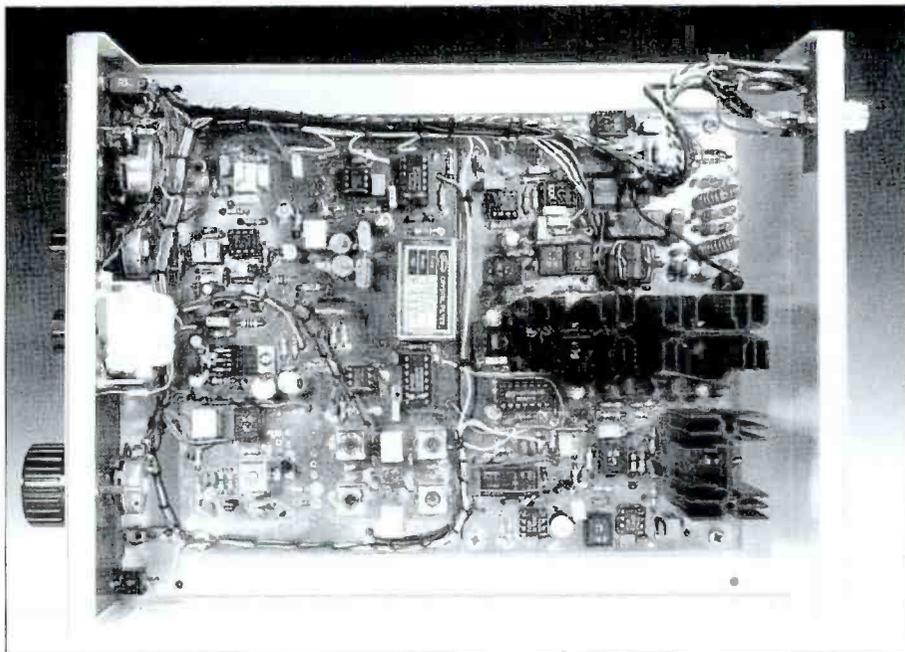


Fig. 1: An inside view of the completed Yeovil 3.5 and 14MHz s.s.b./c.w. transceiver built by G4SLU from the kit designed and supplied by Tim Walford G3PCJ.

high, giving a reasonable clearance around the boards.

Both boards and an internal front panel are mounted on two 218mm threaded rails fitted to the base of the box. The boards are attached to the rails on stand-offs with the rails being held in place by screws through the base of the box. Both boards were fitted to the rails at this stage.

The boards are fitted to the rails because several of the transmitter sections need to be linked to parts of the receiver board for proper testing to be done during the building. This is a lot easier with boards fixed in place.

A counter-sunk screw through the front panel and hidden by the main tuning knob, holds the inner front panel in place. The fixing nuts for the potentiometers and switches are soldered to the rear of the inner front panel.

The potentiometers and switches are secured in position with a locking nuts. I used a bracket from a scrap CB radio to hold the meter in place.

When wiring the front panel connections to the receiver board I discovered there were no S-meter connections. For some reason the half dozen components in that circuit are on the transmit board.

Receiver Board

I then started the receiver board and this took me several hours. When finished, with an antenna connected signals could be heard, and it seemed quite easy to tune the front end from off-air signals.

Slight improvements were obtained by using my main transceiver transmitting into a dummy load as a signal generator. The receiver a.g.c. worked, as did the a.g.c. defeat.

In the Yeovil transceiver, there's considerable damping in the S-meter operation. The damping provides very steady meter readings.

Coverage of the v.f.o. was easily adjusted, however when switching the r.i.t. on, all signals were lost. Switching the Yeovil off and back on with the r.i.t. switched on brought back the signals.

I decided the problem with the r.i.t. was switching spikes causing erroneous operation of one or more gates of the 4066 i.c.s. A 10nF capacitor across the r.i.t. switch contacts cured that problem.

Other 100nF capacitors were also fitted across the supply rails of the 4066s close to the i.c.s. I also fitted 10nF capacitors across the other front panel switch contacts, except the s.s.b./c.w. switch, as capacitors fitted there would affect its operation.

Audio Output

I think that the audio output from the Yeovil could be a little greater. I often had the volume set at maximum and weak stations were difficult to hear.

In theory the gain of the audio amplifier can be altered by changing the feedback resistor R116. My efforts to increase the gain of the audio amplifier by changing the feedback resistor caused it to 'take off'.

I eventually altered R116 from 1k Ω to 560 Ω , so doubling the gain. To keep everything under control I also fitted a 120k Ω resistor between the wiper of the a.f. gain control and ground.

With hindsight, I would advise leaving the circuit as originally designed and using the best quality loudspeaker available. I fitted a very small 500mW internal speaker. Its performance is adequate when the ambient noise level is low.

By the way, there aren't any protection diodes to guard against reverse polarity connection. When I made my mistake, everything survived except the two audio i.c.s. However with the i.c.s replaced the receiver seemed to be performing as before, so I set about building the transmitter.

The Transmitter

Before starting to build the transmitter in earnest, I wound the four inductors for the output filters and the two ferrite transformers.

The single windings of the inductors are on T50-2 toroids and are quite straightforward.

The two transformers wound on FT50-61 toroids require double windings, and one transformer is wound on two toroids. Winding that transformer is a test of patience and skill.

The windings, 20 turns in total, almost fill the cores. I found it impossible to neatly wind the primary next to the secondary as I couldn't tell which winding was which in the middle of the cores. The solution is to use different coloured wire for each of the two windings.

After winding the coils, I built the rest of the transmitter in the recommended sequence. There are 11 sections of the transmitter divided between two blocks.

The first transmitter block consists of the changeover controls, changeover relays and tone oscillator. There's also the sidetone, speech amplifier and the meter drive fitted earlier.

The second block consists of the matching bridge, low pass filters, preamplifiers, driver, and power amplifier. In total, nearly seven hours were spent building the transmitter board.

As with the receiver, all the stages of the transmitter produced the right results when tested. Apart from winding the transformers, one other difficulty was encountered.

The f.e.t.s in the meter drive and sidetone gate were shown back-to-front on the schematic diagram supplied with my kit. Although in practice it doesn't really matter, as the gate is on the centre pin.

The manual states that bad wiring layout of the transmitter could cause feedback problems. If this occurs, the suggested cure is a liberal sprinkling of 10nF capacitors across the points where wires attach to the boards.

Whether it has something to do with the wiring layout or not I don't know, but on 14MHz with the a.f. gain set at maximum a gremlin appeared. I found that transmitted audio could be heard quite loudly from the loudspeaker and the side tone was much louder. I soon found that backing off the audio gain a little was the answer, and I was ready to start setting up.

Setting Up

Setting up requires a multimeter able to measure around 3A, a 50 Ω dummy load, and an r.f. power measuring device. A non-metallic trim tool is also required.

I used an OA90 diode to rectify the r.f. across the dummy load and a multimeter set on the 25V d.c. range to measure the voltage.

Because the transmitted signals pass through the receiver front end, it's necessary to tune those circuits for maximum output. This has the effect of tuning the receiver for maximum sensitivity and produced an improvement over my earlier tuning efforts.

The resultant tuning is fairly sharp with power and sensitivity dropping slightly at the band edges. Optimum performance could be centred on a favoured part of each band.

Aligning the transmitter went more or less according to plan. Matching the output levels on both bands involves some careful adjustment of a potentiometer and variable capacitor.

There's provision in the design of the Yeovil for a front panel drive control. This allows the user to set the power output to whatever level is required. Setting the power levels as close as

possible on both bands resulted in the Yeovil easily producing the expected 10W p.e.p.

When aligning the transmitter, I found the switching transient problem appeared again and caused some frustration as the tune switch was the main offender. On transmit the fault prevented any r.f. reaching the antenna.

The switching problem was finally eliminated by fitting a 1N1418 diode across the coil of the relay RL401, operated by the Tune switch, to reduce the back e.m.f. from the relay coil.

The tune function on the Yeovil switches in a Wheatstone bridge. This allows only around 25% of the r.f. power to reach the antenna.

The actual power level reaching the antenna is dependent on the impedance it presents. But the Wheatstone bridge has the advantage of always presenting a reasonable load to the output devices whatever the match of the antenna.

When the meter reading is at a minimum, the antenna system is matched to the transmitter. When transmitting normally the meter gives an indication of r.f. output. So, after tuning up, I was then ready to go on air.

As always, the first contact was pre-arranged, with critical reports being requested. Pat G3WLK, provided that first contact on 3.5MHz.

Pat reported the audio quality from the Yeovil to be very good. Similar reports came from John G0SKR, who joined the QSO. A standard low impedance microphone from my Trio TS-120V was used.

As the TS-120V microphone was already fitted with a four pin plug, the equivalent socket was fitted to the Yeovil, rather than the 5 pin DIN socket supplied.

The Front Plate

To finish off the Yeovil's box, I drew the front plate using a computer and printed it onto coloured paper. The paper was then stuck to card using artwork spray and the front coated with clear sticky-backed plastics.

The holes on the front plate were then cut with a sharp craft knife. Finally, the plate was fixed in place with artwork spray.

The internal loudspeaker was fixed to a board attached to the inner rear panel. The sound is radiated via the ventilation holes.

Lacing cord holds the wiring in place. On the front panel are the three tuning controls and a.f. gain control, plus switches for mode, band, r.i.t., and tune.

Also on the front panel is the main d.c. power switch, the microphone, key, and external loudspeaker sockets, and the meter. The fine tune makes tuning in s.s.b. signals much easier.

On the rear panel is the d.c. power socket, fuse, and antenna socket. I used a BNC socket because I think it's tidier and easier to use than an SO239 type. It's also easier to make a tidy job of fitting the plugs to the coaxial cable.

Stability Excellent

Using the radio it is apparent that the stability of the v.f.o. is excellent. With an external loudspeaker the audio quality from received signals is good and sensitivity is more than sufficient for a low power radio. Strong signal

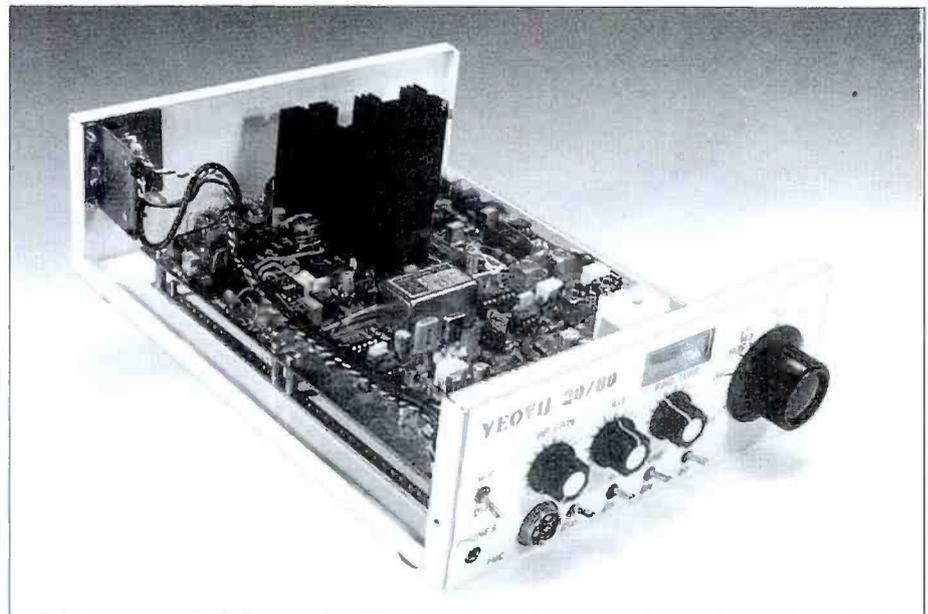


Fig. 2: Side view of the completed Yeovil transceiver kit, producing a professional-looking unit.

handling is also good.

As the Yeovil is supplied as an unboxed kit, the final finish of the radio requires some thought from the constructor. With this in mind, there are a couple of suggestions for the front panel layout in the manual.

Being inclined to the construction rather than the operating side of amateur radio, I enjoyed building the Yeovil transceiver. It's ideal as the club project it was designed for, where help is at hand, or for constructors with the ability to work around the occasional lack of information.

I think that screen printed p.c.b.s would be very helpful with the Yeovil kit. And I also think the manual needs clearer instructions in places.

Summing Up

In summing up, I think that the Yeovil project provides the builder with a good transceiver.

But I feel the kit needs a little more development.

Other than in the area of the final audio stage, the Yeovil performs well and it's straightforward to operate, but not quite so easy to build. However, despite my criticisms, during the weeks of using the Yeovil I developed a liking for the transceiver.

During the last two months of 1993 I managed a respectable number of entries in my log book on both bands using the Yeovil, all on s.s.b. And I'm sure anyone who builds one, will have plenty of fun with their Yeovil.

My thanks for the opportunity to build the kit go to Tim Walford G3PCJ of Walford Electronics at Upton Bridge Farm, Long Sutton, Langport, Somerset TA10 9NJ. Tel/FAX: (0458) 241224, who can supply the Yeovil kit for £150 including P&P (further details direct from G3PCJ).

PW

Tim Walford G3PCJ comments on G4SLU's review:

"I welcome and would like to thank PW for the opportunity to comment on the experiences of Clive Hardy in building the Yeovil. Although I have not seen it myself, I understand he has made a very fine rig. I appreciate his comments about the manual and would add that when it was written nearly two years ago, I couldn't justify a computer! He is the first person to pick up the error in the parts layout diagram concerning the orientation of f.e.t.s, despite over 50 of these kits having gone out all over the world. A thorough reviewer! As luck would have it, these f.e.t.s. are symmetrical electrically.

Specifically because the project is rather more advanced, the whole of the instructions are available to prospective builders for £5, so they can see what is involved.

I suspect that most of the electrical difficulties that he experienced, stemmed from his mechanical layout and the use of a small loudspeaker, inevitably they produce less sound for a given input hence his need for increased electrical output. In any rig, particularly a multi-band transceiver, ground loops can be troublesome and the manual does emphasise the importance of good electrical layout.

His suggestion of screen printing to ease finding the holes for parts was thought about carefully and discarded since it does add materially to costs. An important point in all my designs is to get the monetary value into the electronics and not spend customers' hard earned money on things they can do themselves with a little patience. This is why the rig is available in a least cost open style of construction for a price of £155 post paid complete with all the essential hardware required. I don't think that there are any other dual band s.s.b./c.w. rigs with all the features mentioned at anywhere near that price, or which can have 7MHz and a digital readout for a small amount extra.

Tim Walford G3PCJ

The W9GR DSP Audio Filter

Keen contest operator Ed Taylor G3SQX takes a look at an audio filter, which could be a most useful accessory on the crowded amateur bands.

Boffins have worked out a new way to achieve filtering in radio equipment using digital techniques. Based on sampling principles similar to those used in compact disks, digital filters can achieve results impossible with conventional components.

Recently, PW provided me with the chance to try one of the new digital filter units available from the USA. So, as keen as ever, I got busy and put it through its paces.

The theory behind Digital Signal Processing (d.s.p.) has existed for years. But practical uses are quite new.

With d.s.p., a signal is converted into a stream of bits resembling those inside a computer. These are then modified mathematically, creating an 'improved' version of the original speech or Morse signals.

Recently, d.s.p. chips have recently become fast enough to make input and output appear simultaneous. The transformed digital signal is reconverted to analogue form. In brief, this is the principle of the W9GR d.s.p. filter.

Compact Case

The W9GR filter is not very large. It comes in a nice looking compact case, together with a small explanatory booklet.

Setting-up and operation are straightforward, requiring a 12V supply. In operation, the filter is interposed between the extension speaker output and loudspeaker (or headphones).

There are eleven filtering options, and these are selected by a front panel knob. They include: four s.s.b., four c.w., plus h.f. packet, RTTY and slow-scan TV. For this review, I assessed the W9GR filter on c.w. and s.s.b.

The s.s.b. selections on the W9GR filter comprises of two main categories. These are 'de-noising' and notch.

A 'de-noiser' compares audio from one instant to the next. If there is correlation (repetitiveness) the signal is assumed to be speech. Otherwise, it's considered as noise, and eliminated.

The Optimised De-noiser brings a noisy

signal into audibility, increasing intelligibility. Although some distortion is introduced, an unreadable station can be raised above the noise level, a worthwhile achievement.

The **Automatic Notch Filter** eliminates highly correlated signals (such as heterodynes), and allows speech (which changes quite rapidly) to pass through. This option removes several heterodynes simultaneously (quite a boon) and operates instantaneously, with no noticeable effect on wanted signals.

The two options I've just mentioned, work well. Although I think that the advertised claim that the filter "can make an s.s.b. signal with band noise sound just like a local f.m. signal" is an exaggeration!

The **Weak Signal Notch Filter**, handling low level heterodynes, and the **Combination Denoiser and Notch Filter** were not as helpful as the booklet suggests.

Overall, the s.s.b. filters were useful, although the rather harsh audio resembled processed speech. There was also background white noise (similar to that heard when tuning f.m. without squelch) reducing when a signal appeared. I operated the filter only when needed, rather than leaving it continuously in circuit.

Bandpass Filtering

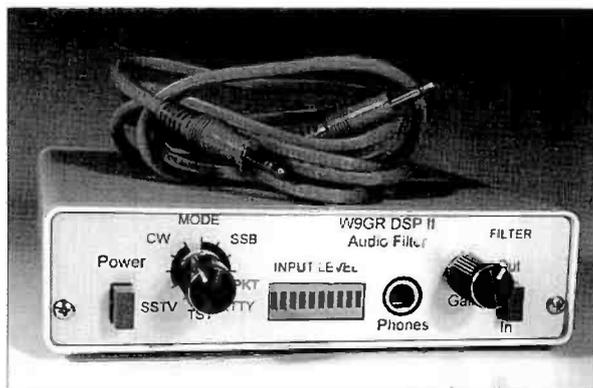
The four c.w. options on the W9GR provide bandpass filtering. Three are centred on 800Hz, with bandwidths of 200, 100 and 30Hz. The other is at 400Hz, 100Hz bandwidth option.

I found it was difficult getting used to the c.w. option filters. The quantisation noise was quite high, although it reduced when stations were tuned. Signal strengths were masked, everything apparently emerging from the noise.

The filter produced a low volume whining, which eventually became annoying. However, that being said, the selectivity is remarkable.

The 30Hz position separates stations which seem to be on the same frequency, with little ringing. In contrast to conventional filters, strong, out-of-bandwidth signals are eliminated, which can be disconcerting!

Transmit sidetone (when



monitored through the filter) may become inaudible if outside the passband - a difficult problem to solve. Users would perhaps become accustomed to operating the filter only in difficult conditions, as with the s.s.b. options.

Controlled From Filter

Audio volume is controlled from the filter. The radio's output is adjusted to keep the l.e.d. bars (input level) lit to specified levels.

On bands with varying signals, keeping to the specified levels requires frequent adjustment. Maybe the input in a future version could be stabilised with a VOGAD automatic level control?

When switching options, the filter sometimes cycled through programs without locking on. This might happen for several minutes and I could only resolve it by selecting another option, then switching back.

With audio filters, strong signals can 'take over' the a.g.c., reducing the receiver's gain. Although the filter may eliminate these signals, the de-sensitising could make wanted stations inaudible.

Summing Up

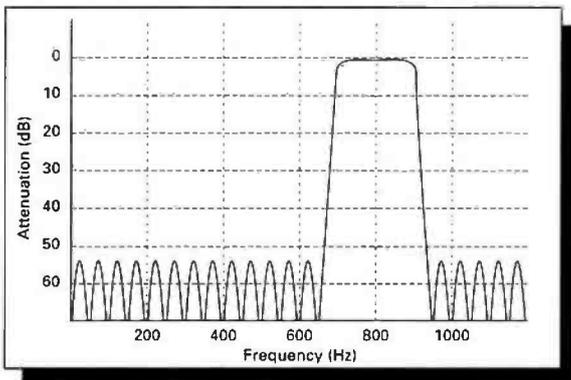
In summing up my opinion, I thought the filter was useful. It has good features, and one or two surprises.

Many amateurs could not justify buying a W9GR filter, which involves parting with a large chunk of cash. It faces competition from other highly-specified d.s.p. filters (plus some excellent conventional filters).

I think that buyers will mainly be dedicated DXers. They'll be wanting to extract the last decibel from a band, using the filter when necessary. Finally, I must thank KN4QS, G3RCQ, G4TKH and G3VBL, whose comments were useful in my evaluation.

My thanks also go to Waters and Stanton Electronics of 22 Main Road, Hockley, Essex SS5 4QS. Tel: (0702) 206835/204965, FAX: (0702) 205843, who can supply the W9GR Filter for £299.95, plus £4.50 P&P. PW

Fig.1: In effect the W9GR unit is a comb filter. Three of the c.w. bandwidths options are centred on 800Hz (see text).



Manufacturer's Specification

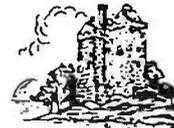
SSB Filters:	Optimised denoiser Optimised automatic notch Weak signal notch Combination denoiser and notch
CW Filters:	Centre 800Hz - bandwidths 200Hz 100Hz 30Hz Centre 400Hz - bandwidth 100Hz
Other filters:	HF packet; RTTY; SSTV
Notch and out-of-band rejection:	> 40 dB Passband ripple: < 3 dB
Power requirement:	nominal 12v, at 250 mA
Audio output	2 watts (into 8 ohms)
Size:	40 mm x 140 mm x 165 mm Weight: 580 gms

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EF40	5.00	PCL82	2.00	5Y3GT	2.50	6J7	4.00	2050A GE	10.00
EF41	3.50	PCL83	3.00	5Z3	4.00	6JB6A GE	17.50	5751	6.00
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EL84 Mull	6.00	PV81	1.50	6B7	4.00	6S7	3.00	7668	12.00
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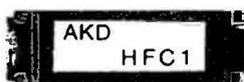
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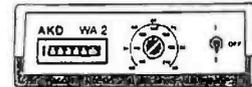
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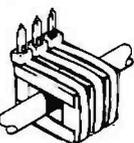
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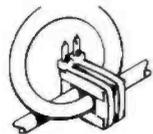


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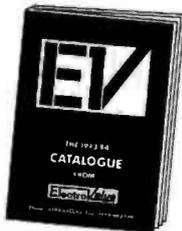
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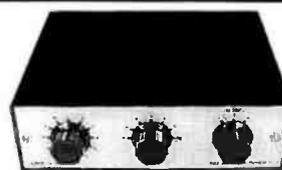
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Care and Maintenance of Nets

John Worthington GW3COI explains how he tried to keep his local 3.5MHz net alive and kicking and offers some possible solutions for you to do the same.

To the casual listener, it may seem that most nets are cast into the concrete of time and that their regular appearance could not be seriously affected by anything short of World War III. This, however, is not the case (said he ponderously, as befits one who has spent most of his life in one net or another).

Have you ever wondered what the world of committees would do without your average net man? Have you never heard the old saying 'Old netters never die, they only QSB?'

Well, no one lives forever is said with some truth and that even applies to netters, although I admit, it is difficult to believe when you hear the same low droning daily. Yes, even those who natter with the regularity of WWV's pips are mortal and this article is really on how to go about keeping your net alive and if not kicking, at least complaining.

Virtually In Charge

Many years have passed since I was virtually in charge of an 3.5MHz net of rather unwieldy proportions. In fact, what with the growing number of regulars, plus breakers, I even contemplated seeking a 'shrink' about the pressure.

Fortunately, a few became silent keys (a daft expression in their case as none of them ever liked c.w.) and I was able to say a few words in reasonable comfort. However, numbers continued to fall and although not alarmed, I began to ponder on the probable cause.

Was I being too harsh on those who spoke too long? Had I been raising the subject of my many prejudices too often? Perhaps it was the over liberal use of my speech compressor which resulted in a quality that would remove hardened Araldite from a man's beard?

Anyway, my mind was concentrated to a point when it was borne on me that eventually the net as such had disappeared entirely, in that there were only two of us left. Something had to be done to re-establish the net so that it would throb with its old vigour.

Don't go away with the idea that I'm



going over the top about the vigour, etc. It really did seem to have a life about it and I suppose my ancient home-brew power pack with the loose laminations probably helped.

Considered Recruiting

At first I considered wandering up and down the 3.5MHz band recruiting the stray CQers. But I soon discovered that there are very few of these and what there were, were generally undesirable.

I am rather a professional snob and can't abide signals of poor quality and low strength. It seemed to me that virtually all the worthwhile stations were those already belonging to nets and possibly the only way that I could attract new members would be to 'poach' a few by offering incentives. So, I drafted an advert that read:

NET MEMBERS WANTED
 New injection of blood required for decimated group of regular natters. Applicants who are equipped with reasonably efficient rigs and aerials are invited to apply for the position of full time pundit with one of the oldest established 3.5MHz sideband nets of hypochondriacs. Nagging medical conditions an advantage. Send CV with s.a.e. to GW3COI, QTHR.

As a result of the advert I received two replies. One was from a bingo card firm and the other was a final demand from the electricity board.

From this, it is therefore obvious that net members are a shrinking population and that every effort must be made to encourage new breakers possibly by using the following methods:

- Courteously welcoming them with good reports.
- Enlisting their help to recruit others.
- Always saying 'Roger, fine business you're romping in here'.
- Addressing them by name frequently such as 'Yes Sid; FB Sid; all points noted there Sid; Go Ahead Sid; It's Sid's turn - K Sid's, etc.
- Discovering their birthday date and sending a card with a nice present.
- Never grumbling about QRM.

.....in fact, to a coin a phrase, 'This is GW3COI standing by for any possible reply....'

PW

Once again Ron Ham welcomes readers to the *PW* 'vintage wireless shop'. This month, amongst other things, Ron chats about the wartime developments which brought us the 'all dry' portable, including firm favourites such as the *Sky Queen* and the *Lady Margaret* receivers.

In order to assist the younger collectors of vintage radio, I will emphasise last month's theme that 'wireless is wireless' - whoever it was made for!

The above statement will allow me to mix civilian and military sets in the same column, especially this year. This is because so much attention is being focused everywhere on the Allied invasion of Europe in 1944 and the wide spectrum of equipment used in the campaign.

Look At Wireless

Let's take a look at wireless. Briefly speaking, a 'message' carrying signal is sent by transmitting apparatus and picked up, some distance away, by a receiver without the two stations being connected by wires.

Whereas the telegraph and telephone are fixed systems, communications without being 'tied' together means freedom to transmit and/or receive signals from almost any mobile or fixed location. The facilities offered by 'wireless' communications was good news for the armed forces where mobility is an important part of their work.

However, there's a basic rule (putting it simply): The transmitted signal is alternating current. So, before the 'message' can be understood by the listener, it must be converted to direct current. This happens inside the receiver with some form of semiconducting or thermionic diode.

Signal rectification has progressed from the coherer in use from the early days. We've passed through the eras of the 'cats-whisker' and crystal and specific valves, to the variety of tiny diodes in use today.

The Westector

Another, perhaps lesser known, device is the Westector. This was developed in the 1930s by the American Westinghouse company

for signal detection.

Among other electrical devices, the Westinghouse Co. were famous for their metal rectifiers and their WX 6 Westector is included in their advert in the September 1939 issue of *Television And Short-Wave World*.

September 1939 was the month that the Second World War began. And I wonder if it was foreseen then, that this little rectifier would soon be used by the fighting forces,

Used By Infantry

One of the portable transmitter receivers, used by the infantry during Second World War, was the WS 38. Many D-Day veterans will remember this set because of its compactness and the fact that both the send and receive frequency, 6-9MHz, could be selected on one dial, centre Fig. 1.

The 38 set is currently sought after, by both wireless and military collectors. Last month, I referred to the army valves type AR8, ARP12, and APT4 used in their dry battery portables.

The 38 set has four ARP12s, one ATP4, right Fig. 2, and a Westector. The latter suited the 38 because, with no filament, it makes no demands on the l.t. battery.

Also, the size of the Westector permitted it to be wired in with other small components close to its working position. Here the Westector is fitted inside the i.f. transformer at the top left of Fig. 2.

For a closer look, I removed the transformer cover, top right Fig. 3, which is held in position by a screw on the side, see top left Fig. 2.

If the original screw is lost, DO NOT replace it with a longer one. As you can see by its thread, centre transformer top right Fig. 3, it may 'puncture' a component or a coil winding.

The Westector is immediately left of the thread. It has a short glass tube with large polarised, black and red, end-caps.

The single 3-gang tuning capacitor and its associated ceramic trimmers are at the top left of Fig.

Valve &

3. The majority of the coils, with adjustable cores, centre Fig. 4, are below the tuning capacitor.

The r.f. alignment of the 38 set is critical. The failure of any one or more of the fixed capacitors surrounding the 'gang' or the coils would send the tuning haywire. Do not attempt to correct the alignment by adjusting the trimmers or the cores until you are sure that the associated capacitors are of the correct value.

Two of the wire-wound resistances in the filament circuit can be seen across the two left-hand valve holders at the top of Fig. 4.

The four valve holders visible, left to right, carry the ARP12s. The base for the ATP4 is almost hidden by a choke at the top right.

Fig. 3: Photograph of one side of the 38 set, clearly showing the upper and lower chassis assembly of the transmitter-receiver.

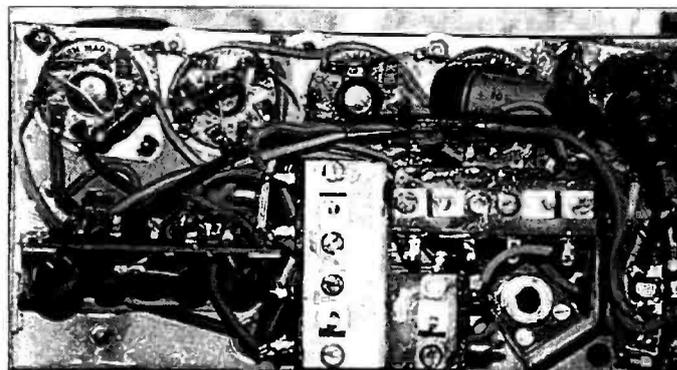


Fig. 4: Under-chassis view of the 38 set. Note that the valve holders are Mazda octal types (see text).

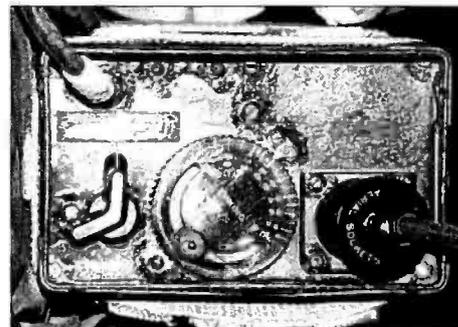


Fig. 1: The 38 set, viewed from above (see text).

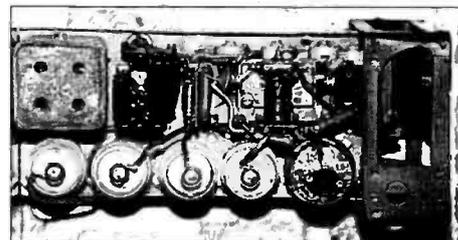
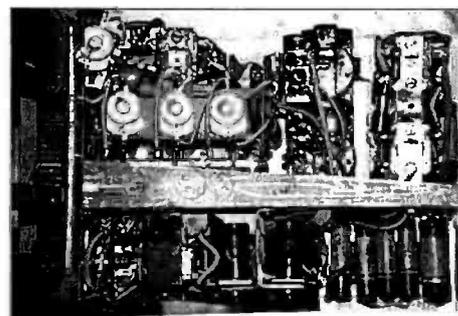


Fig. 2: The valve line up in the 38 set. The ATP4 valve is on the right.



Vintage

By Ron Ham

The multi-way cable is at the top left Fig. 1. It carries the high and low tension and the microphone and headset feeds, between the signals satchel junction box and the set.

The multi-way cable enters at the top right hand corner of Fig. 4. Examine this area carefully for perished insulation, because, a short circuit in this cable is almost sure to blow all the valve filaments.

You'll see my point about possible short circuits if you take a close look at the junction box end of the cable in Fig. 5. Note the perished rubber and bare conductors near the cord-grip.

Portable Sets

A great deal was learned during the Second World War about portable sets using directly heated valves and dry batteries. As a result, by 1946, the radio industry were redeveloping their domestic market.

A demand existed for portable sets which could be used for leisure. They could also be used as the main set in many rural houses without electricity.

In conjunction with the 90 or 120V high tension batteries, most pre-war portables and household battery receivers, used a 2V 'wet' accumulator for the low-tension. Between 1946 and 1950, the charging of accumulators was still a daily chore even in town wireless shops.

As late as 1954, when I took over an old established village wireless shop, up to 60 accumulators were still being charged each week! We gradually phased this service out by offering our customers one of the 'new' all-dry sets.

The all-dry receivers included models like the Ever Ready Models C and K. Later, the Ever Ready *Sky Queen*, Fig. 6 and the *Vidor Lady Margaret* arrived.

I was reminded of this by Les Borthwick (Hawick, Scotland) who has a *Sky Queen* in his collection, P. Atterbury (London) who has a Cossor 469, and wireless book publishers, Peter and Valerie

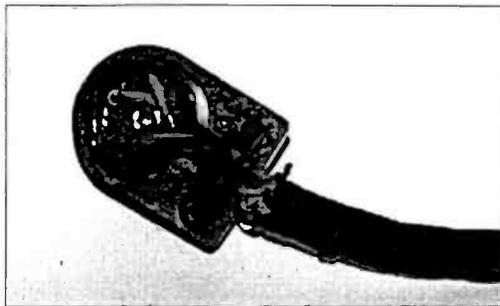


Fig. 5: The multi-way connector plug used with the 38 set. Note the frayed condition of the cable (see text).

Wallage (Ashford) who still have the *Sky Queen* they received as a wedding gift.

Valve Filaments

The current required to 'heat' valve filaments always was a problem for the set makers. They wanted to produce a portable radio that was relatively small, worked well and looked good.

To achieve their aims, the set manufacturers co-operated with the battery and valve manufacturers. And between them they came up with an interesting range of sets.

During the Second World War, the Canadian 58 set and the clandestine MCR1 communications receiver used miniature glass valves with 1.4V, 50mA filaments. These were the IR5, IT4, IS5 series.

The 1.4V filament valves appeared again after the war, in several makes, including the Cossor 469. The latter used, IR5 for the frequency changer, IT4 for the first i.f. amplifier, IS5 second i.f. amplifier and detector and a 3S4 for audio output.

From memory, I recall that the Ever Ready models C and K used types DK91, DF91, DAF91. It also used a DL91 (or DL92?) in the same positions.

However, before using a similar valve of a different make, check your valve manual. This is because the base connections and electrode voltages and currents may vary.

For example, the output valves 3S4 and DL91 have three filament

connections. This is so that they can be wired for 1.4V at 100mA or 2.8V at 50mA.

The Cossor and the two Ever Ready receivers used a combined power source. This was a 90V h.t. and 1.5V l.t. dry battery known as the B103.

During the mid-1950s the 96 series of valves came on the market. They did the same job as the 91s, but only required half (25mA) the filament current.

The 96 series of valves were used in many portables like the *Sky Queen* and the *Lady Margaret*. The line up was DK96, DF96, DAF96 & DL96.

The DL96 also had a tapped filament. This was provided so that it could be used at 1.4V at 50mA/A and 2.8V at 25mA/A. A new style battery, the B136, Fig. 6, was made for the *Sky Queen*.

Both the 91 and the 96 series of valves were also used in a variety of mains/battery portables where the filament wiring is totally different to that of a battery set. With this type of set, you should never mix the 91 or 96 range of valves.

I provide the warning because of the differing filament currents. You should also be aware of the full main voltage on the chassis and around the on/off switch, mains dropping resistance and rectifiers. No doubt we'll be discussing this range of sets in later issues.



Fig. 6: The Ever Ready *Sky Queen* portable valved receiver, which utilised 90V h.t. valves and a 1.5V filament supply, with its associated battery (see text).

Can You Help?

Now it's time to ask 'Can you help?' I'll start off with a request for a complete and unmodified (if possible), BC312 or BC342 communications receiver, for the Rev. Adrian Heath, 'Valley View', 227 Windrush, Highworth, Swindon, Wiltshire SN6 7EB.

Help is also needed in the form of a copy of the official REME circuit diagram and maintenance instructions for the complete (Canadian) WS 19 MKIII station, for K. G. Barnes, C/O Oil Cyprus Calibration Centre, Akrotiri, BFPO 57. He would also like photocopies of a series of modifications, published by *PW* during the 1960s, on converting the set for amateur use. Mr Barnes will refund all expenses.

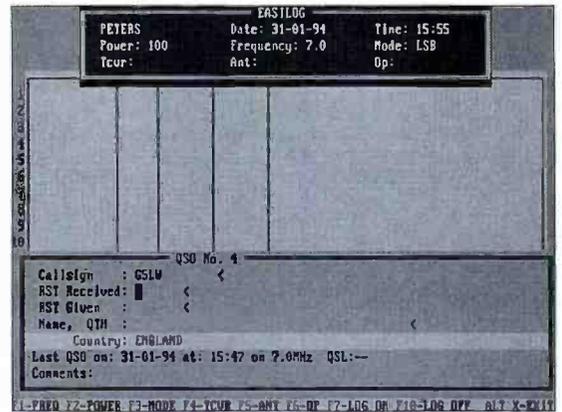
That's the lot for now. It's time to close up the *PW* 'wireless shop', but don't forget I'm open for business via your letters to 'Faraday', Greyfriars, Storrington, West Sussex RH20 2HE.

The Computer in Your Shack

BITS & BYTES

This month Peter Hunter GOGSZ takes a look at a logbook program designed for use on an IBM PC or clone, as well as CD-ROM for the Amiga.

Fig. 1: A screen grab of the EASILOG logbook in action.



The first thing I want to do this month is thank all those who responded to my request for a c.w. decode program. Your response has been overwhelming.

I have sent copies off to those who originally requested such a program, and replies to those who sent me discs. (If I've forgotten you, I'm sorry, please let me know).

To the rest of the multitude who wrote, phoned or packeted information to me, I give you a wholehearted thank you. I'll be looking closely at the various programs sent in, and reviewing the 'best of the bunch' next month.

So, do you need a program that will decode c.w. direct from your radio, display the dits and dahs directly onto your computer screen as ordinary text and maybe even allow you to reply (if you're licensed to do so of course) using the keyboard? If so, make sure you get a copy of the May 1994 issue of *Practical Wireless*.

Good Logbook

For those of you looking for a good logbook program, without spending a lot of money, then EASILOG could be what you're looking for. The EASILOG program has been upgraded recently, to version 3.1 and will do just about everything you'd want from a standard electronic logbook, plus much more.

You can see from Fig. 1 that EASILOG is designed for ease of use. All you have to do is type in the appropriate information as required and the program does the rest.

Searching for previous callsigns is very easy and fast, as is adding calls, updating the QSL sent/received list, and printing QSL labels and/or log files. The EASILOG 3.1 will run on virtually any IBM compatible PC.

The manual states its minimum requirements as: An

IBM PC or clone, with 512K RAM, one 360K floppy drive, any type of monitor and DOS 2.x or higher. Which covers just about anything that may be in use today. In other words it will run comfortably on a Amstrad PC1512 single drive mono.

With just 512K of RAM the logbook will hold a maximum number in the region of 28 000 QSOs. With 640K or above you can run to the programs maximum capacity of 30 000 QSOs.

When you enter a new QSO into EASILOG the entry is automatically saved to the disc, so it can't be lost! (says who? Hi!). And (for hard disk users) if you follow the instructions in the manual for making a batch file to run EASILOG, then the whole log will be backed up onto floppy on exiting the program.

Although EASILOG 3.1 doesn't compare with the 'big boys' for frills, it is without any doubt a very powerful log program with all the facilities you need for log-keeping on your computer. For the price it's got to be the best value for money that I have seen so far.

Don Ward G0MDD, the program's creator is always willing to listen to users comments, and to implement changes if suitable or viable. So I must say, well done Don, I look forward to seeing, and reporting on, future upgrades of EASILOG.

Unfortunately, I didn't get this latest copy in time for a full review in this issue, but there should be enough information here for you to decide whether to buy the program or not.

If you want a copy of EASILOG V3.1, just send £5 (that's quite correct, just £5), inclusive of VAT and postage, to: **Don Ward G0MDD, 9 Little Lane, East Morton, Keighley, West Yorkshire BD20 5UQ.**

The Amiga

Another CD-ROM has landed on my desk, this time for the Amiga. It's called the

AMINET CDROM. Whilst this is not a 'Ham radio' disk it does contain many programs that will be of use to radio amateurs using an Amiga computer.

The Aminet CD was produced in June 1993. It contains literally thousands of programs for the Amiga, in its more than 600 megabytes of storage space.

The range of subjects covered are: Business, Communications, Programming, Disk tools, Games, Graphics, Music, Utilities and much more. The Aminet CD is lacking a 'front end' (menuing system), so finding files is a bit of a long job. Imagine having to look through hundreds of directories every time you want to find one file!

However, the disk has listings in the form of text files for each and every directory. This means you could print these out and make your own catalogue.

Cataloging would certainly make finding a program much easier. This is not necessarily a bad point, as most CDs that are produced as a 'download' from a large BBS follow this pattern, which is how they manage to keep the cost so low.

If you don't have a CD-ROM drive on your Amiga, have no fear. The Aminet CDROM is formatted to the standard ISO-9660 format. This means that if you have access to, or have a friend that has access to, a PC with a CD drive, then this disk can be accessed from the PC.

There are programs

around for the Amiga that will read from and write to MS-DOS (PC) formatted disks. One of these programs is called CROSSDOS (supplied with WB3 on A1200 etc.).

Programs can therefore be copied from the CD onto PC formatted floppy disks, the floppy can then be placed in the Amiga drive and all files copied to either a hard disk or an Amiga formatted floppy. All the programs and files are compressed, so file names don't cause any problems. The files/programs can then be uncompressed and used in the normal way on the Amiga. I know this method is a bit long winded, but it does give you cheap access to a lot of programs even if you don't have a CD drive with your Amiga.

The Aminet CDROM costs just £18 plus VAT and postage. It is available from: **Public Domain and Shareware Library, Winscombe House, Beacon Road, Crowborough, Sussex TN6 1UL. Tel: (0892) 663298. Please note this is not an expensive phone call, the (0892) is the code for Crowborough.**

Space has beaten me again, so keep the letters coming. 73 de Peter Hunter GOGSZ, 2 Mayes Close, Bowthorpe, Norwich NR5 9AR. Tel/Fax: (0603) 748338. Packet = GOGSZ @ GB7LDI.#35.GBR.EU.

E N D

This month, Paul Essery GW3KFE takes a look at low power (QRP) operating.

Report

H F BANDS

Low-power operating gets an airing this month. And, regular contributor G3BDQ believes that given a good antenna, the receiver is the key to success.

The G3BDQ approach is 'logical. If you can't hear 'em, you certainly can't work 'em! The chaps who write in regularly these days, all use the best they can for reception.

Sadly, many low-power operators allow themselves to become obsessed by getting every last ounce of power up to the antenna. To get, say, 1dB worth of extra oomph 'up the spout' is a bit pointless compared with the greater improvement given by a better antenna.

One deciBel (dB) - was originally defined as the smallest change in power which can be detected by a quick change-over test. It's also about a 30% change in power level.

Telephony, whether a.m. or s.s.b., is such a totally inefficient mode that almost all low-power buffs use c.w.

Finally, and most important of all, there's the operator at the other end. If he or she can't wrinkle your signal out of the mud, you just don't get a contact. All praise to the characters at the other end!

Lloyd Colvin

Sadly, I've heard that Lloyd Colvin W6KG, died in the American Hospital, Istanbul at 0746 local time on December 14. He was aged 78, and died after a massive stroke.

Lloyd and his wife Iris W6QL were chief operators of the Yasme Foundation. They became a legend in their own lifetimes.

For 30 years or more they've headed to various rare spots. They seldom left anywhere with less than 10,000 contacts in the book and they activated over 100 countries.

My sympathies go out to Iris W6QL, and the family in their sad loss. (Stop Press: I

hope Iris and family escaped the earthquake damage - misfortunes never come singly).

Your Letters

Time for your letters now. And, I'll make a start with Leighton Smart GW0LBI, in Trelewis.

From Leighton's letter, it sounds as though the 'GW Christmas Party on the Air' was a right rave-up. It started off at 1930 and continuing to 0130. The long wait for next year's party has begun!!

Leighton uses an FT-747 rig at a maximum of 5W. Recently, he has spent much time on the earthing system, adding some 20m of fencing, a quarter-wave counterpoise and other refinements to the existing system.

The improved earthing at GW0LBI has enabled good contacts at the 1W level on sideband with stations which were previously scratchy at 5W. Also GW0LBI changed his microphone to one bought for £3 which provided improved reports.

Leighton's contacts on 1.8MHz s.s.b. included: GM3YXM(58), EI2FN(59), GM3OXU(58) all at 1W. On the key with 2W, GD0LQE, G4TLS (both were two-way QRP), LA5HFA, SM3GSK, and a new country by way of ZB2EO. On 3.5MHz, PA3GDT, S57BZ, DL9GB, and DK4AK.

Up on 7MHz using sideband, Leighton worked with GM3OXU. He also worked and GB2SM, the Science Museum amateur radio station in London. Leighton's key on 7MHz accounted for PA3CCF, F5NR, UB5JBB, and US7ID.

In Leighton's 10MHz log, I note he again used c.w. and the calls of HA7PL and ES7FU; both were running low power. A try on 14MHz c.w. showed OE6WTD, UT5UIA, EA2CKH, and IK2WOF, while OH2YL was raised on 21MHz.

In Hastings, John Heys G3BDQ decided to have a 'One Watt Week' just for the hell of it. The week between Boxing Day and New Year's Day yielded some 150 c.w. contacts at this output power level, using the normal 'BDQ wire antennas' only.

In G3BDQ's 10MHz log I found OY2H, UX0IB, while on 14MHz John recorded WB2YQH, W1QJR, VE2KN, W8WNA, WV1C, VP5P, EV0A, 4Z4SZ, A71AN, VK6WT, ZC4ZZ, VU2BK, and TA3D(QRP both ways). On 21MHz I noticed W1FMR, W3TS, VE2KN, NN9K, and, of course, 1.8/3.5/7MHz.

Altogether, during his 'One Watt Week' John had 150 contacts. He worked 45 countries, and five continents all on the single watt of output - nothing was even heard of South America during this particular week.

Perhaps the reports from G3BDQ might do something to silence those who bleat about others 'running excess power'. Especially whenever they hear a decent signal or notice others working DX they can't even hear!

I'm now turning to Ted G2HKU on the Isle of Sheppey. There the prime news is that Ted is heading for The Royal Military Hospital for what's usually described as 'an MOT test and full service'!

On the low-power side Ted uses an IC-721S, but on 3.5MHz raised G5RV, GM3GKJ (he was using a 19 Set!). He also worked GM0PHG, DK2VJ, ON40A, SM5STF and PA3AFD. But the Omni-V was needed to bring UA9DE down.

On to 7MHz with the Omni and Ted worked G5RV again and UI8AA. Working ZD8XR needed all 70W from the Omni on 14MHz, while VE1BJK, K21H, and 3B8CF featured on 18MHz from the low-power rig. Again however, Ted needed the full power output to fish out KL7H/W6 and 9X5DX.

The analysis of conditions by Don G3NOF in Yeovil notes that the h.f. bands were really only useable in daylight. Although he reports that 14MHz occasionally lingered to 1900 for the East Coast Ws.

On 3.5MHz, Don reported that VKs were quite often around 1900UTC, while from around 2300 the Americans were strong, along with 5T5JC, 9K2MU, T15KD, WB3KBZ/VP9; but the only one actually worked was K1DH.

The 7MHz band drew a blank for G3NOF, but on 14MHz the usual VK and ZL signals were heard by long path around 0800. He found that 1500-1800 was good for Africa and Asia. ET3SID, XF4CI, 4S7DA, 5H3JB and 5X1F were pick of the crop.

On 18MHz Don found that the band was good on the long path, with JA/VK/ZL around 0900. There were also a few short path openings around 1100. An occasional African station was noted in the afternoon.

Up on 21MHz, Don raised BZ4DJW, VR2B (otherwise Martti, OH2BH), and 9X5DX. However, 24MHz was very 'iffy'; with the odd VK6 by short path around 1100 and occasional afternoon African openings.

As for 28MHz, Don didn't work any DX, and only the odd Africans were heard. Don of course uses full power s.s.b. and has beams on a high tower for 14, 18, 21, 24 and 28MHz.

Your Reports

That's it again for this month. Your reports please by the middle of the month, as usual to: 287 Heol-y-Coleg, Vaynor, Newtown, Powys SY16 1RA.

E N D

In this month's look at amateur radio in orbit, Pat Gowen G3IOR provides details on yet more coming amateur satellites.

Scene

SATELLITE

Welcome to the world of amateur radio in orbit. This time I've got some interesting news on student satellites.

I've heard from K8OCL and ZS6AKV who write that the Students for the Exploration and Development of Space SATellite 'SEDSAT' of Huntsville, Alabama are designing and building 'SEDSAT-1'.

The student spacecraft will be flown later this year with NASA's 'SEDS' (Small Expendable Deployer System). It will be launched as a secondary payload on a Delta-II 7925 launch vehicle with a Global Positioning main payload. It's scheduled for insertion at 38-42° inclination, dependent on the residual fuel remaining in the Delta-II second stage.

The depletion burn of the second stage will be used to raise the orbital inclination. The altitude at the commencement of the mission will be an elliptical 185 X 740km.

Tethered Satellite

The SEDSAT idea is similar to the Italian Shuttle experiment, when they tried to wind a tethered satellite out from ATLANTIS. Due to a problem with the last minute change of the reel, that attempt wasn't successful.

With SEDSAT-1, the satellite will take the place of what otherwise would have been 22kg dead weight deployed by SEDS soon after perigee. The DELTA-II will reel out a 42 kilometre long 0.5mm diameter line at some 20 metres per second.

Towards the end of the deployment, a braking force will be applied to the tether. This will cause the satellite to swing upward toward the vertical.

After about six months, when the satellite is close to apogee, the tether will be cut. This action will impart



Fig. 1: Richard Dowling's photograph of a solar sail deployment test (see text).

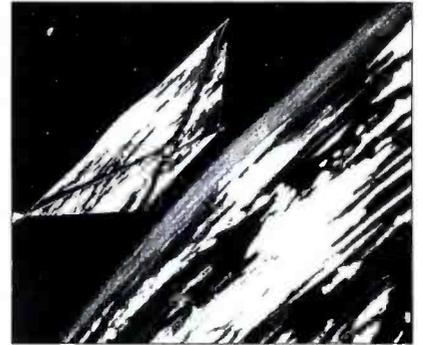


Fig. 2: Tom Hames' impression of how a solar sail would look in orbit (see text).

by gravity gradient forces a momentum transfer from Delta-II to SEDSAT-1, enough to raise the perigee by over 480 kilometres. It should result in a final slightly elliptical orbital altitude of 680 x 792 kilometres.

Student Payloads

The satellite Student Experiment Package (SEP) will carry two student payloads. They'll comprise of the tether dynamics, a three axis accelerometer system and an impact system.

The payloads will allow anyone to gain an understanding of the problem of orbital debris, by recording both the impact magnitude and direction of anything that might hit SEDSAT-1 in orbit.

Information about the on-board systems and the performance of the sub-systems will be available. The information is planned to be displayed in a graphical presentation system that will help students understand how a satellite operates in orbit.

Also carried will be AMSAT's 5W output omnidirectional antenna Mode 'A' and 'J' linear and digital transponders. The planned life of these is five years.

The SEDSAT-1 will carry advanced and highly efficient thin-film AlGaAs solar cells to complement sealed Nickel-metal hydride (NiMH) rechargeable batteries. These offer greatly improved power performance over conventional solar panels and Nickel-Cadmium (NiCad) cells.

Spacecraft Transponders

The SEDSAT-1 spacecraft will have a Mode 'A' transponder with a 300bps BBS at the l.f. end and a digitaizer at the h.f. end of the downlink passband. The 145MHz f.m. uplinks will be downlinked as s.s.b. signals on 29MHz.

The Mode 'J' digital transponder for digital communications and telemetry will use two 9600bps data channels. These will allow free access to the unique SCC-100 space computer.

The unique computer resource will allow students around the world to write programs. It's going to be a computer that's unavailable to most students at any price!

The spacecraft computer is linked to the SEDS Earth Atmosphere and Space Imaging System (SEASIS) experiment. It will allow all users to participate in and contribute to earth observations studies. Digital images, initially of the tether, as well as telemetry will be transmitted on 435MHz.

Solar Sail

Another exiting project that's been on the books for the past 15 years is the Solar Sail. It's a plan for the World Space Foundation and AMSAT to collaborate in building one each Japanese, American and European spacecraft to race to the Moon.

The individual spacecraft would be taken by ARIANE to geo-transfer orbit. They will then be pushed as a group into a circular 40,000

km altitude orbit.

Once there, the spacecraft will separate, then their individual controllers will unfurl their 2.5µm thick aluminised Kapton 4,000 square metre area sails, Fig. 1.

Using Solar radiation and typical sailing boat manoeuvres such as tacking, reaching and turning (in three dimensions) they then set out for our natural satellite. The race winner is the first to send back a TV picture of the far side of the moon.

As the spacecraft will also have interplanetary capability, when the Moon is reached the fleet may continue out to Mars and beyond. An artist's impression of a solar sail in orbit is shown by Fig. 2.

The missions will carry a colour c.c.d. camera like that on WEBERSAT-OSCAR-18. Beacon transmitters are proposed for 145.825MHz, whilst the communication links with the spacecraft will use Mode 'S', 1.2GHz uplinks and 2.4GHz downlinks.

Like the microsats, Manchester encoding with HDLC formatting will be used for the uplink data stream. While the spacecraft transmitters will use binary phase shift keying AX.25 level 2 packet data protocol.

There's lots more AMSAT spacecraft to go up soon, such as the Finnish 'HUTSAT', the Israeli TECHSAT and the Chilean CE-1 amateur satellites. The information on these will have to come later, as sadly I've run out of space again!

E N D

Panorama

PACKET

This month Roger Cooke G3LDI, looks into the world of packet radio, both on the amateur and professional sides of the mode.

The changes in mail forwarding on HFNET that I mentioned in the February issue took place very smoothly indeed. Forwarding was transferred from Manos SV1IW, to Tony SV1GH.

Tony, taking advice from Manos, already has plans for improvements to his h.f. station. I'll publish a picture of his station shortly. My other forwarding partner, Jim 4X1RU, has been replaced by Corinne 4X1KT, and she's located at Kiryat Yam.

Forwarding is running quite smoothly. Although there have been a few minor headaches, one of which caused a problem for a few days.

Both new stations allowed more than one BBS connection at a time. They also allowed any user that tried, to have access too. This caused the mail to back up for several days until it was sorted.

Since correcting operations, the forwarding goes on without a problem. The h.f. link to the USA is also being maintained, despite poorer h.f. propagation. Any mail not sent within 24 hours, is re-routed via the Satgate.

New Gateway

All AEA multi-mode data controllers (PK-232MBX, PK-900, DSP-1232, DSP-2232) now include new Gateway firmware as a standard feature. There will be no price increase.

The following features and enhancements are included.

- 1) Gateway functions like <The-Net> or NET/ROM.
- 2) Cross-mode Gateway operation for dual-port controllers (PK-900, DSP-2232). Gateway

from packet/Amtor, packet/PACTOR, and packet/packet.

- 3) Lower case AMTDR operation, like AMT-3, G4BMK.
- 4) SIAM identifies PACTOR signals.
- 5) Automatic detection, switching between AMTOR, PACTOR.

There is a long list of other features. The use of the Gateway will eliminate the need for digipeating and allow any unit to be used as a packet node. Upgrade E-PROMS for existing users of these products are available from ICS Electronics Ltd., at £39.95 inc. VAT plus £3.50 post and packing (UK only).

There is a list of about 12 changed, or added, parameters for the PK-232, all of which help to add to the versatility of this multi-mode TNC.

Packet Commercial

Amateur packet has been around since the early 1980s and the commercial world has been watching development by amateurs (as usual!) with an eye for a commercial outlet. It wasn't until 1991 that the DTI granted the first licences for packet radio modem services in the UK.

To date, four commercial packet licences have been granted. These have gone to Cognito, Hutchinson, Paknet and Ram Mobile Data.

All four now have some form of network running, and today Cognito covers around 80% of the UK with over 1000 terminals on-line. Cognito has two products.

The Messenger packet radio-based terminal, is a

two-way radio pager unit with keyboard and screen. This unit has a flip-up antenna, whereas the RTU unit is basically just a modem. The Messenger retails for about £500 and rates for use of the network are negotiable, depending on use.

Ram Mobile Data has the other true packet radio modem service. This service also covers about 80% of the UK. The RAM company specialises in the credit card authorisation business so next time you use your credit card (I nearly said dreadit card!) and the sales assistant passes it through the Verfone terminal, you can be almost certain that the data is being passed by packet radio.

Obviously there is a lot of commercial interest and following on from that, lots of money involved. So, support for your local Packet User Group is vital in order for the amateur network to maintain what is an extremely efficient service and is the envy of the commercial world.

Working ZL

I was interested in working ZL on 1.8MHz last autumn and so I put up a dipole at 30m with the ends drooping in the classic inverted V configuration. The frequency used for the tests every day was 1.843MHz.

After a couple of days, I noticed an S8/9 carrier was always there just off to one side. I mentioned this and found that no-one else could hear it. After trying multiple combinations of kit, I found that the KAM was causing the fault.

On looking at the circuit I found two crystal oscillators, one at 4.4336MHz and another at 7.3728MHz. I found no

correlation between these no matter how I mixed them.

However a letter to Kantronics produced the answer. Pin 64 of the micro, the E clock, requires 1.8432MHz. So, if you have a carrier on 1.843MHz, and you have a KAM, you know what to blame!

Mistake

In the February issue, I made a mistake and gave the Components Manager of BARTG as Ken G0PCB. In fact, Ken is G0PCA and his XYL is G0PCB. Ken receives his messages at his wife's call. I also gave the wrong BBS address, so the correct addressing for Ken is now: G0PCB @ GB7EZB.

Baycom Program

I received a letter from Paul G0LJB @ GB7IOM, who has just started on packet. He is using the Baycom program and interface, and had quite a few problems in getting it to work.

Paul is using a '286 PC/AT and an IC290 transceiver. He has it working now, but feels that the manual is not too well translated or put together. Perhaps some Baycom users could drop Paul a line and then share experiences.

Every little helps when first starting on packet, and I had a request from John, G1HOK for some tutorial and advice. I shall be tackling this in next months column.

Space has won yet again! News views and pictures please to G3LDI QTHR, @GB7LDI. Tel: (0508) 570278. NOTE the slight change in number. Happy packeting!

E N D

Round-up

BROADCAST

Peter Shore takes his monthly look at the broadcast bands and also has some interesting news on Digital Audio Broadcasting in the UK.

I'll start this month with a letter from Mr E. S. Walden-Vincent in Great Yarmouth on the Norfolk coast who wrote to me about picking up North American short wave stations. He reports that he has picked up WWCR during the afternoon on 15.685MHz, with good reception.

Mr Walden-Vincent says that he uses a Grundig Satellit 3400 and as he wrote that letter in late January, was getting WWCR with SIO333. He goes on to say that he often picks up American broadcasters and other stations such as New York Volmet on 13.271 u.s.b., Monitor Radio International on 11.707; WYFR on 21.615 and US amateur operators on 18.147 and 24.965MHz. "My radio may not be the most up-to-date receiver, but I can receive nearly everything that is going", he concludes.

Thanks for your letter Mr Walden-Vincent and I am glad that you enjoy Broadcast Round-up each month. Let me know if you hear anything else of interest and that goes of course for everyone who tunes into the broadcast bands.

Down South

From down in South America, HCJB in Quito has sent me programme details for the Spring. These details remind me that the 1994 HCJB QSL series features the people of Ecuador in bright colour. It's available simply for a correct reception report.

The program *Musica del Ecuador* is aired from HCJB each Friday when Jorge Zambrano offers listeners the chance to absorb the music of the Andes and learn about the traditions and fascinating places of Ecuador. It's broadcast to Europe at 0800 and 1930UTC.

The US religious broadcaster World Harvest Radio has opened a new transmitting facility on Hawaii in the Pacific. The transmitter, which has been heard in Europe, is on the air at 0000-0200 on 17.555; 0200-0600 on 17.51; 0600-1600 on 9.93; 1600-1800 on 7.425; 1800-2000 on

13.625; 2000-2200 on 13.72 and 2200-2400 on 17.51MHz.

Reception reports should be sent to **WHRI, PO Box 12, South Bend, Indiana 46624, USA.**

In Europe

Here in Europe there has been much to-ing and fro-ing at Radios Free Europe and Liberty. The station heard during December, that it relays on f.m. in Slovakia would be stopped at the end of January, although RFE complained that this broke the agreement the station had with the Czech and Slovak authorities signed before the two countries split.

William Marsh, RFE and Liberty's President, then announced his intention to quit the organisation. The internal wrangling over whether the organisation should move from its Munich headquarters to Prague continued. Meanwhile, RFE intended to launch a service to the Balkans on January 17.

The Balkan broadcasts, in Serbo-Croatian, should have been on the air from 1630 to 1800 on 15.37, 11.815, 7.115 and 5.985MHz and at 2200 to 2300 on 5.985, 7.115, 7.145 and 9.695MHz. However, the transmissions had not materialised by the time this column went to press. Keep checking your dial.

Spanish Foreign Radio has English to Africa at 1900 for an hour on 11.775MHz and to Europe at 2100 on 6.125MHz. There is also a transmission for two hours to the Americas at 0000 on 9.54MHz.

Vatican Radio's broadcasts to Europe may be ended on short wave by the end of the year, when the station will be relying entirely on satellite relays to reach the continent. Short wave will continue for broadcasts targeted outside Europe.

In addition, the Vatican's medium wave transmissions on 527 and 1611kHz have been discontinued. However, it is intended that at some point in the future, transmissions on 1611kHz should recommence beamed



towards the Balkans and the Middle East.

Radio Vlaanderen International (formerly the Belgium Radio & TV's International service) is now on Astra. Tune in to the FilmNet transponder at 10.92075GHz and the audio subcarrier at 7.38MHz. The station has asked for reactions from satellite listeners to **PO Box 26, B-1000 Brussels, Belgium.**

Radio Sweden in English to Europe is on the air at 1715-1745 on 6.065MHz and 1179kHz, at 1830 on 15.145, 9.655 and 6.065MHz and 1179kHz, at 2130 on 9.655 and 6.065MHz and 1179kHz and at 2230 on 6.065MHz and 1179kHz.

All broadcasts are also carried on the Astra satellite, except for the 2130 programme that is on Astra only at weekends. George Wood's *MediaScan* programme is heard every other Tuesday on Radio Sweden's English service.

More New Schedules

Radio Vilnius adopted a new schedule in late January. English is now transmitted at 2000 and 2230UTC on 9.40, 9.675 and 9.71MHz, as well as the medium wave channels on 666 and 1557kHz. There is also a broadcast at 0000 on 7.15MHz, but at weekends this transmission will be in Lithuanian.

Radio Moldova International, beaming from the former Soviet Republic, has programmes in Spanish and French transmitted from transmitters in Romania. The station is on the air at 1200 in Spanish on 15.25MHz; from 1400-1425 in French on 11.775, between 2000 and 2025 in

French on 7.235 and in Spanish at 2100 on 7.245MHz. The station does not transmit on Sundays.

As Deutsche Welle plans to announce a Ukrainian language service later this year, Radio France Internationale has announced the end of its Albanian service during January. The ten minute news broadcasts have apparently been stopped because of financial difficulties, but the station hopes to restart Albanian using an f.m. transmitter in Tirana.

Finally The Future

Finally, news about the future of radio - well, one type of radio, anyway. Britain's Department of Trade and Industry, which through its specialised department the RadioCommunications Agency, governs frequency usage, announced in January that frequencies have been allocated for Digital Audio Broadcasting in the UK.

The old TV frequency range of 216.5 to 225MHz has been chosen. This means that broadcasters could now start transmitting DAB to the UK population. The problem is that receivers are not yet available!

However, it is likely that the first sets will come on to the market in mid-1995, but at prices of around £700. If DAB takes off like the CD, equipment prices will fall to lower levels within a couple of years. Watch this space for details!

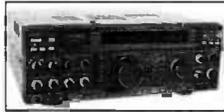
E N D

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	CD 120	1.8-200MHz 200W SUR/PWR	\$117.95 (B)
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	CD 270D	140/5.25MHz 200W SWR/PWR	\$91.50 (B)
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	CS 201G2	2 way aerial SW 'N' skts	\$27.50 (A)
	CS401	4 way aerial SW 50239	\$79.00 (B)
Comet	CF 30MR	HF Lowpass filter	\$38.95 (A)
	CF 50MR	6m Lowpass filter	\$38.95 (A)
	CF BPF2	2m Band pass filter	\$31.65 (A)
Toyo	T 25	3kW Dummy load	\$14.50 (A)
	T 100	100watt dummy load	\$50.00 (B)
AKD	WA3	HF Wavemeter	\$50.83 (B)

Carriage in brackets
(A) = \$2.00 (B) = 5.00 (C) = \$7.50 (D) = \$12.50



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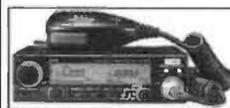
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PW/1

Antenna Work

Previously I've described measurements that are useful for understanding antennas. Measurements have included, finding resonance with a dip meter and measuring impedance using a receiver noise bridge.

Up to now, I've not discussed the measurement of s.w.r., even so this is the measurement that will be the most familiar to you. Every shack I've visited has a suitably marked meter for the measurement of s.w.r.

While the measurements of s.w.r., resonance and impedance are important when designing or checking an antenna, alone they don't indicate how well an antenna is performing. In some cases a measurement can be downright misleading.

For example, if the coaxial cable feeding the antenna becomes very lossy (perhaps due to moisture inside the cable), then the s.w.r. might appear to be very low. But the radiated signal from the antenna would also be low.

Due to cable losses, the r.f. energy from the rig is translated into heat in the coaxial cable. On the other hand the field strength meter (f.s.m.) makes a direct measurement of the energy radiated from the antenna.

Determining Performance

In this session I'll discuss the measurement of field strength and how this is useful in determining antenna performance. This aspect of s.w.r. and antenna performance is one I'll discuss more fully in a later Antenna Workshop.

A field strength meter may be used to:

- 1) Make comparative measurements of various antennas to assess gain
- 2) Plot a polar diagram to record antenna directivity.
- 3) Enable a transmitter antenna to be tuned for maximum efficiency or gain.

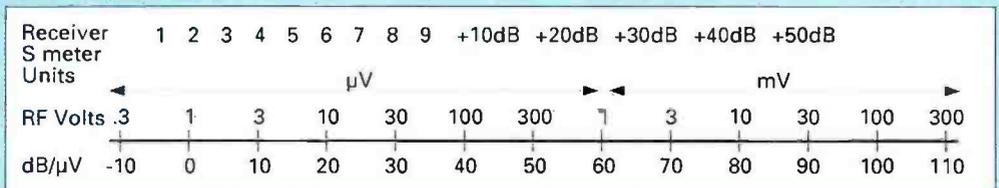


Fig. 1: The S-meter units are defined above. Signal levels are spaced 6dB per division from 1-9. Though few receivers are as accurate as the definition.

- 4) Align a v.h.f. radio or TV antenna to obtain the greatest signal strength from a transmitter.

The sensitivity and maximum reading that your f.s.m. needs will depend on circumstances. If you're setting up the station antenna you may be able to adjust the transmitter power to give a convenient field strength level. If you are checking a v.h.f. or u.h.f. antenna directivity using the local repeater then you do not have any control over the signal strength.

Field strength of an r.f. wave in free space, is measured in μV (or mV) per metre (micro or millivolts per metre). In general the larger the antenna, the greater will be the signal captured from free space. It's more practical to define the signal strength by the magnitude of the signal arriving at the f.s.m. terminals.

This value arriving at the terminals, is stated as μV in 50Ω (the input impedance of the f.s.m. or receiver). However, this definition has now been replaced by dB referred to 1μV (dBμ). The scale, Fig. 1, shows

the defined relationship between these signal level definitions and S-meter readings.

A communications receiver with a good signal level S-meter, can be used as an f.s.m. Ideally it should have, good sensitivity and overload capability and a true logarithmic S-meter response (see later). In practice a receiver requires the r.f. gain be turned to maximum for the S-meter to function correctly.

Under these circumstances a receiver is very sensitive and would only be useful for measuring relatively weak signal strengths. In addition the receiver would be susceptible to interference from other stations, almost certainly affecting the readings.

The many problems of a practical receiver, may be overcome by using a switched attenuator, connected in the feeder between the pickup antenna and the receiver's antenna socket.

A further advantage of a switched attenuator, is that S-meter calibration is unimportant. The S-meter reading is used only as a

reference level indicator, and the relative levels are then indicated by the switch settings on the attenuator.

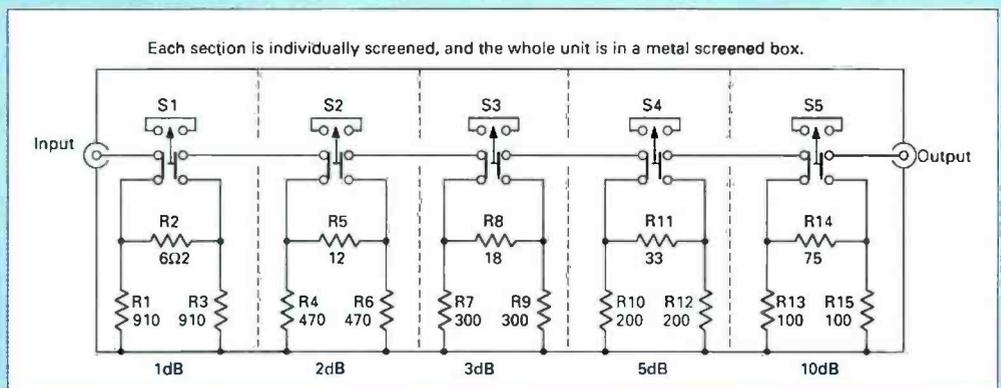
Low Power Attenuator

The switched attenuator described below is designed specially for performing gain measurements using a receiver or an uncalibrated field strength meter. It comprises five pi-network attenuators (Fig. 2) to give a maximum of 21dB attenuation in 1dB steps.

The design described uses small DPDT slide switches. When the attenuator is used for gain measurements these switches are in constant use so the you may use DPDT toggle switches with a long-life wiping action.

The attenuator can be built into a die-cast box with screens between the switched sections, or a complete enclosure can be constructed from double-sided p.c.b. material. The layout should be similar to that shown. Interconnecting wires should be kept as short as possible.

Fig. 2: The circuit of a simple attenuator suitable for use in antenna gain tests as described in this article. Screening is of extreme importance if the readings are to be believed.



Workshop

This month Peter Dodd G3LDO deals with ways of measuring field strength.

Absolute Gain

This method of finding an antenna's absolute gain, is by measuring its comparative gain. In use we compare our antenna against a reference antenna of known gain.

Because of the effects of ground any change in the position of any of the antennas used in the test will probably affect the recorded gain. This difficulty is overcome by making several gain measurements with the

antennas in different positions, and taking the average of all these measurements.

The measuring equipment is set up as illustrated in Fig. 3. This test arrangement operates with the receiver connected to the antenna under test (a.u.t.). The test range is flooded with a weak r.f. field provided by an r.f. source.

The r.f. source is connected to an antenna, located a few wavelengths from the a.u.t. It can be a low power transmitter

or signal generator, whose output should be monitored to ensure the level remains constant during the test.

The receiver section of the test system uses an attenuator combined with a receiver, or transceiver, with an S-meter. A sensitive f.s.m. could also be used. I'll describe various types of f.s.m. in the next Antenna Workshop.

The main advantage of using the receiver's S-meter method is that, accuracy of measurement is not restricted by the inaccuracy of the S-meter. In this application the S-meter is used only as a reference level indicator.

The accuracy of the measurements depends mainly on the accuracy and resolution of the attenuator. In practice this method should give accuracies in the order of $\pm 1\text{dBd}$.

Remember that the gain figure produced by this method is gain relative to a reference dipole at the same height as the a.u.t. Both the a.u.t. and the source antenna should be well matched to their feeder cables.

The S-meter on a receiver will only give the correct indication if the r.f. gain control is at maximum, so it's important that the source has a variable output. This enables the range of test parameters to fall within the capabilities of the receiver test set-up.

That's all I have time and space to deal with now. I look forward to carrying on from here in a future session of Antenna Workshop. PW

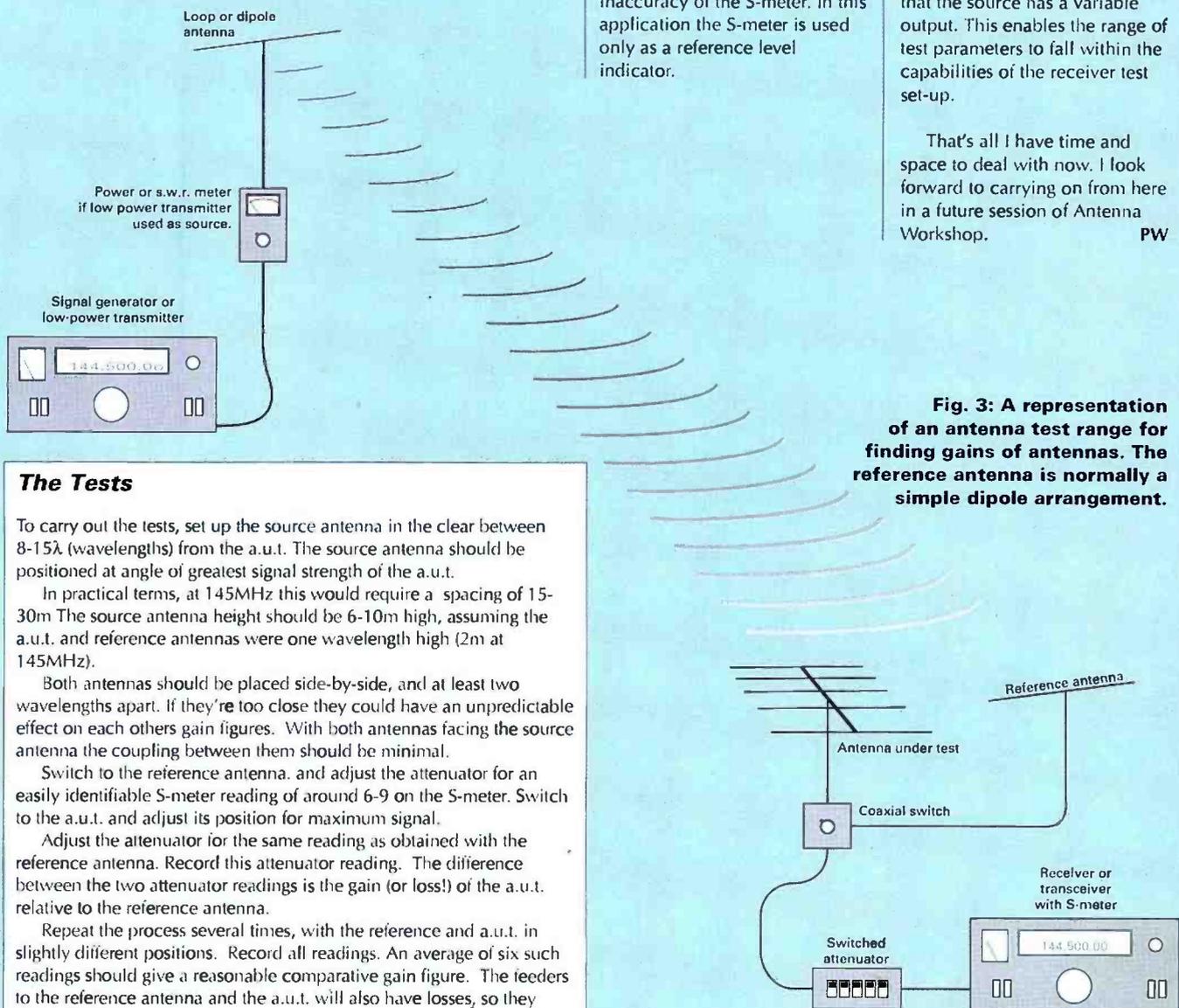


Fig. 3: A representation of an antenna test range for finding gains of antennas. The reference antenna is normally a simple dipole arrangement.

The Tests

To carry out the tests, set up the source antenna in the clear between $8-15\lambda$ (wavelengths) from the a.u.t. The source antenna should be positioned at angle of greatest signal strength of the a.u.t.

In practical terms, at 145MHz this would require a spacing of 15-30m. The source antenna height should be 6-10m high, assuming the a.u.t. and reference antennas were one wavelength high (2m at 145MHz).

Both antennas should be placed side-by-side, and at least two wavelengths apart. If they're too close they could have an unpredictable effect on each others gain figures. With both antennas facing the source antenna the coupling between them should be minimal.

Switch to the reference antenna, and adjust the attenuator for an easily identifiable S-meter reading of around 6-9 on the S-meter. Switch to the a.u.t. and adjust its position for maximum signal.

Adjust the attenuator for the same reading as obtained with the reference antenna. Record this attenuator reading. The difference between the two attenuator readings is the gain (or loss!) of the a.u.t. relative to the reference antenna.

Repeat the process several times, with the reference and a.u.t. in slightly different positions. Record all readings. An average of six such readings should give a reasonable comparative gain figure. The feeders to the reference antenna and the a.u.t. will also have losses, so they should be the same length.

Report

David Butler G4ASR reports that propagation on all frequencies above 50MHz were abysmal during January. Tropo was non-existent and there was only one brief aurora recorded, on January 11. The mid-winter Sp-E failed to materialise on the 50MHz band and even the meteors were slower!

I'll start off with meteor scatter this month. And, as far as I'm concerned the Quadrantids meteor shower was a bit of a wash-out this year. Although reflections were numerous they were very short.

Even using c.w. at a speed of 2500 l.p.m. didn't significantly help. At that speed, (500 w.p.m.), a burst of 0.25 second duration will produce approximately 10 received characters. That's almost two complete sets of call signs. However m.s. operation is never that simple!

I heard very little on the s.s.b. random frequencies on the 144MHz band. A contact was made on c.w. with LA4XGA (JP33) between 1100 to 1200UTC on January 3. During the 1 hour schedule 12 bursts and over 60 pings were received. The longest burst was about 3 seconds long at S4.

Collin Morris G0CUZ (I082) reports that the 1994 Quadrantids won't go down in the meteor scatter history books. In his opinion the shower is on a downward trend. It's not giving reflections like those experienced in the mid-1980s.

Actually, I think Collin's opinion rings true. A meteor shower stream doesn't have an even distribution.

For a number of years many suitably sized meteors may be encountered. However, in the last few years the earth has possibly been passing through less

chunkier sized rocks. (Actually the meteors are only about the size of grains of sand!)

Collin noticed the first indications of the shower late in the morning of January 3. He monitors the Irish TV carrier on 53.750MHz and reflections were well up on normal.

Conditions on the 144MHz band were poor and remained that way for most of the day. But, around 2100UTC reflections improved to small shower standards.

According to G0CUZ the shower peaked at 0100UTC on January 4. (Reports from LA7DFA and S57EA also confirm this.). Even so reflections remained rather short with very few long bursts.

By the evening of January 4 the shower had completely disappeared. Between 2100UTC and 0230UTC on January 3/4 Collin made c.w. contacts with HA7UL, S51AT and YZ7UN.

Contacts on s.s.b. were also made by Collin with I1JTQ, I3LGP, SP9COO and 9A2PT. His best contact was with US5WU (K020) giving him a new DXCC country and locator.

Meteor Showers

The period between January 4 (Quadrantids) to the latter part of April is devoid of any usable meteor showers. The next good shower will be the April Lyrids and is reported

by some astronomers to be good this year. Now where have I heard that before?

The Lyrids are calculated to peak at 0945UTC on Friday April 22. Although the predicted peak can be taken with a pinch of salt (highly suspect to our

non-UK readers) calculations of path efficiencies are accurate. This is because the characteristics of the shower (Right Ascension and Declination) are easily defined.

From the basic information, it's simply a matter of performing calculations on a home PC. To show the best time versus direction and when the shower rises or sets. In the case of the April Lyrids the shower radiant is below the horizon between 1400 to 1830UTC.

In practice the shower is not at the required elevation for about three hours either side of these times. Therefore, it's not really worthwhile making long distance schedules between 1100 to 2130UTC.

The best times to beam in a particular direction are 2200 to 0200UTC (N/S), 0030 to 0330UTC (NE/SW), 0500 to 0900UTC (NW/SE) and 0600 to 1100UTC (N/S).

The shower is not particularly good in the east/west direction. This data is calculated for my QTH (I081MX) located 52N 3W but will generally be correct for most of the UK.

Calculations of peak times and path efficiencies are okay if you want to get the best results out of any particular shower. Generally speaking though, if you point your antenna towards any centre of activity, south-eastern Europe (I, S5, T9, HG, OK) or Scandinavia (OH, SM) you'll normally find enough meteoric and amateur activity to keep you happy!

Changes At Conference

Changes were made at the IARU Region 1 Conference regarding frequencies for meteor scatter operation. Two new segments for s.s.b. random operation have been introduced.

The new segments are 144.195 to 144.205MHz and 144.395 to 144.405MHz. Previously, the

recommended allocation was 144.400 to 144.426MHz.

Although 144.200MHz has been used for many years its usage was actually dropped from the Region 1 Band Plan in 1981! No specific calling frequencies have been indicated.

The aim is to get operators to spread activity throughout the 10kHz wide sub-bands. Obviously the situation will be dynamic.

During non-shower periods I would normally expect s.s.b. stations to make calls on 144.200 or 144.400MHz (on c.w. it's 144.100MHz). During good shower periods stations should spread out ± 5 kHz of these frequencies.

In August, when the earth encounters the Perseids shower, it is hoped that stations will move even further out! The IARU Region 1 'letter' system although successful for c.w. useage has been discontinued for s.s.b. operation.

Moonbounce Reports

Onto moonbounce now. I'm still receiving reports about the use by VE3ONT of the 42m radio telescope on the 144, 430 and 1296MHz bands in the recent ARRL e.m.e. contest.

Geoff Findon G3TQF hastily set up a pair of 21-element F9FT Yagis for the 430MHz band. They were horizontally polarised and spaced about 2m apart. A low noise amplifier using an NE41137 was mounted at the end of the coaxial phasing harness.

Including the changeover relay a noise figure of about 1dB was measured. He managed to hear VE3ONT from 1100 to 1230UTC on October 9, but signals were much weaker than expected.

The VE3ONT signals were only peaking S1 and Geoff suspects he may have had a fault in his receive system. He also heard them on November 7 on the

Fig. 1: The QSL card issued by OZ3SDL.

DANISH AMATEUR RADIO STATION

OZ3SDL
(G3SDL/FOCWN)

Dave Court
Egebakken 18
DK-3520 Farum
DENMARK

LOC JO65ET

PSE QSL TNX QSL

73's Dave

TO RADIO		CONFIRMING 2-WAY QSO					
DAY	MONTH	YEAR	UTC	MHZ	RST	MODE	
G4ASR	22	6	92	17.51	50/70	59	SSB

UK6MG 330 SMIRK 5580 DXCC 160 m 6m50CC 6m50cc

1.3GHz band.

A 2m dish with dual dipole EIA feed was used. This was connected to an I.n.a. with an MGF1402 GaAs f.e.t. giving a claimed noise figure of 0.9dB. An 80W power amplifier consisting of a pair of 8533s was also used.

The dish was manually adjusted in azimuth and elevation using a magnetic compass and plumb line. At 0800UTC weak c.w. signals were heard approximately 3dB above the noise floor.

Geoff called them several times on c.w., but their signals were broken up and too fast for his 12w.p.m. capability. Unfortunately at 0900UTC the moon dipped behind a large and very wet tree and VE30NT promptly disappeared!

One of the Canadian operators VE2ASO reports that the group are considering operation on the 50MHz and 10GHz bands during the ARRL contest later this year.

The 50MHz Band

Now I'll turn to news of activity to come on the 50MHz band. From January 1 C31HK (JN02) was been allowed to operate from 50.000 to 52.000MHz.

Previously he could only transmit above 50.200MHz.

The Ukrainian station of UU8JJ will be active this summer from various locations in the Crimea. He'll be using an FT-690 and a Yagi antenna.

Per-Einar Dahlen LA7DFA will be QRV from Jan Mayen (IQ50) between June to October. He will use the callsign JX7DFA. On the 50MHz band he will be using a Yaesu FT-767.

Per-Einar will also be active on the 144MHz band with 1kW output into 2 x 15-element Yagis. This will make it possible for Per to work e.m.e., m.s., Au and Au-E.

In 1993, using 11dB less power (about 80W), he was heard on the 144MHz band by several stations over 2000km away. My QTH is 2125km away from JX so he should be able to make m.s. contacts with many stations in the UK.

For your information, a station running 1kW and a pair of Yagis should be able to work well equipped m.s. stations up to 2300km away without too much difficulty.

Dave Court G3SDL intends to operate from a number of European locations on the 50MHz band during 1994. On June 4 (to coincide with the UK Six

Metre Group contest) he will operate from the island of Mon (JO64).

Between July 31 to August 6 he expects to operate from the island of Bornholm (JO75). He's hopeful that some activity will also take place from the southern tip in locator JO74.

Dave will use the callsign OZ3SDL from both of these Danish islands. The card in Fig. 2 gives his QSL information.

Between June 29 to July 12 he will be active from Cyprus as 5B4/G3SDL. He will operate from locator KM65, a square not normally activated. An automatic beacon will run on 50.093MHz.

The 50MHz expedition of the year will no doubt be that organised by the committee of the UK Six Metre Group (UKSMG). The group were very honoured to receive official communication from the office of HM King Hussein of Jordan (JY1).

The official note stated that permission had been granted by the Royal Jordanian Radio Amateurs Society (RJARS) to operate a 50MHz station in Jordan. Thanks for this are due to Robin Bellerby G3ZYE of the Anglo-Jordanian Friendship Society.

The UKSMG plan to operate from Amman "around the clock" during the last week of May and all of June. The group have agreed to provide training sessions for members of the RJARS.

The group will also leave behind an antenna, transverter and beacon. Committed operators include G0JHC, G3K0X, G3W0S, G4CCZ, G4JCD and DL7AV. Each will go out for a two week session, so they can also have an opportunity to work Jordan.

A JY equipment fund has been set up in order to purchase equipment and offset some of the operator expenses. The UKSMG are requesting donations of £10 (\$15) from individuals.

In exchange for a donation you will receive a full colour photo QSL sent direct to your home, provided of course you work them! A list of all operators that have contributed will be displayed alongside the donated equipment.

Send your donations, stating clearly your callsign, name and address to: **Byron Fletcher G6HCV, 2 Slade Gardens, Codsall, Wolverhampton, Staffs WV8 1BJ.** Cheques should be made payable to **The UK Six Metre Group.** Cash can be



sent in your local currency if you wish.

The Microwave Bands

In a recent edition I described e.m.e. tests carried out by WA7CJO on the microwave bands. He runs 350W output on the 10GHz band and was heard by G0API and G4JNT using only a 1.6m dish.

Another station to hear 10GHz e.m.e. signals from WA7CJO was **Lyle Patison VK2ALU**. His system consists of a 1.8m dish front-fed with a small feedhorn.

The receiver is located in front of the dish to keep losses to a minimum. The first stage consists of a G3W0G h.e.m.t. low noise amplifier. This feeds a second stage WB5LUA I.n.a. and then into a W0G002 down-converter.

The 144MHz i.f. is then connected to an Icom IC-202. On November 21 Lyle heard WA7CJO for 15 minutes.

Signals were marginal, peaking less than 1dB above the noise floor. However, even though signals were weak both callsigns being sent were copied.

It's amazing how much selectivity a pair of ears have! A sighting telescope was used to obtain a coarse fix on the moon.

The dish was then accurately pointed towards the moon using what is now the accepted method for e.m.e. on the 10GHz band. It simply means peaking up the dish for maximum received lunar noise.

The normal practice is to split off some of the receiver i.f. signal and amplify this in a wideband gain-block. The output is then fed to a power meter. Small changes in thermal noise are then noticed fairly easily.

Contests Coming

A number of contests are coming, and I'll deal first with those on the 50MHz band. The UKSMG have

Fig. 2: The antenna array for the 144 and 430MHz bands at the QTH of DG4GAN.

organised a series of winter cumulative contests.

Although you may have missed the first contest in February, you might still be able to win. This is because the contest only requires you to enter the best two scores out of three sessions.

The second cumulative will be held on Sunday March 13 between 1000 to 1300UTC. The final event runs on Sunday April 10 at the same time. You don't have to be a member of the UKSMG to enter the contests.

If there's Sp-E about you might work some OK stations in the Czech Republic 50MHz contests. These are held every 3rd Sunday in the month between 0800 to 1200UTC.

Similarly, you might hear some Scandinavian activity on the 4th Tuesday in every month. Their 50MHz contests run between 1800 to 2200UTC. During the summer time they are held 1 hour later.

Moving up in frequency to the 70MHz band, I have details of two contests. The final session in a series of RSGB cumulative contests will be held on Sunday March 13 between 1000-1200UTC.

The RSGB are also holding a 70MHz fixed station contest on Sunday March 27. The duration has been cut by two hours and will be run from 0900 to 1300UTC.

And now, up to the microwave bands. On Sunday April 10 the RSGB are running fixed station contests on the 1.3 and 2.3GHz bands. The events are held between 1700 to 2100UTC.

That's all I have for you this month. Please send your reports to me at Yew Tree Cottage, Lower Maescoed, Herefordshire HR2 0HP or via packet radio @ GB7MAD or the DX Cluster system.

E N D

Andy Emmerson G8PTH begins his bi-monthly look at the ATV scene with the question what got you into amateur TV.

The World of ATV

FOCAL POINT

Can you remember what got you into amateur television? I doubt if one day you woke up and said to yourself, I think it's time I had a new interest - I know, I think I'll try amateur television.

For me, television was a matter of wonderment when I was young. Our family first had television back in 1956 when television was still a miracle.

It was certainly a miracle how my father managed to afford it, since TV receivers were genuinely expensive in those days, probably £1,000 in today's money. Fortunately you could rent them too, which is what millions of people did.

In those days the technology was awe-inspiring, what with huge image orthicon cameras, fat cables snaking across the studios and rack upon rack of valves, switches and dials. Every *Boy's Book of Engineering Marvels* had pictures of this sort of kit. I guess it made a subliminal impression on me in the same way as any youngster who was allowed to look inside a steam engine cab, then wanted to be an engine driver when he grew up.

Years later I was in Foyles bookshop in London, looking around the technical shelves. I then came upon a copy of *CQ-TV*, the magazine of the British Amateur Television Club. The hapless owner is probably still wondering where that issue got to, but his loss was my gain!

Inside that copy of *CQ-TV* was a report of the CAT-70 convention and there were lots of pictures of private individuals playing with real big stuff, that same old studio equipment that's now pensioned off. Hey, this was obviously the game for me!

So, I joined BATC and the rest is history and I'm still fooling around with big, heavy TV technology. Amateur television has of course changed since those early days and the only people who still use that old gear are nuts like me who

Fig. 1: Here's a proper ATV shack! Note the long cables and plenty of technical-looking gear, how a shack ought to look! Picture shows Dick G4RRX in Norwich transmitting to ON5NY on 30 June 1993.

Photograph by Paul Godfrey G8JBD in Lowestoft.



collect and restore it for its own sake.

In the ATV shack you can get away with much smaller (and far more sophisticated) equipment, with the potential to produce pictures of fabulous technical quality. Whether this promise is fulfilled is another matter, but that wasn't the point I was trying to make.

Using modern technology you can have a camera, vision mixer, preview monitor and transmitter all on one desk, which is great. But there are still people who enjoy creating virtually the same facilities and results at lower cost, using a mixture of second-hand and home-brew gear and this I think is the true spirit of amateur television.

I don't know exactly what equipment Dick G4RRX has in his shack but the photo (Fig. 1) I have this time certainly looks as if it's a good old mixture. I hope he takes this as a compliment!

Down To News

Enough of ATV philosophy, down to some news.

Eamonn Phelan EI9GO writes from Waterford in Eire, saying that he's trying to get the local club to put up an ATV repeater. The Response from the Radio Division of the Department of Communications has been positive, indicating that they will consider applications for experimental TV repeaters in the bands 1240-1300, 5650-5680 and 10000-10500MHz.

It's worth remembering that ATV in Ireland has a different status to Britain, in that amateurs there are considered experimenters rather than amateurs. You may think that's a pretty subtle distinction and it is.

However, there is a logic to this and it allows the authorities to grant on occasion, extra facilities that normal amateur status would not warrant. That's how it was described to me.

Talking of microwave television on the amateur bands, I recently had a conversation with Bill G8CMK in St. Leonards-on-Sea.

The conversation started with his news that the existing GB3VI (amplitude modulation) repeater serving Hastings is no longer supported by the official repeater group there and will have to be established elsewhere and relicensed (I have heard nothing about this officially).

Bill continued and told me that Keith G8HGM was seeking to start a new East Sussex f.m. TV repeater group. The repeater is likely to be sited possibly in Heathfield (a good location as that's where the BBC/ITV broadcast transmitter is).

Bill then expressed his own view, that with the amateur microwave spectrum becoming more crowded, television operators might have to give up f.m. operation on the grounds that it occupies too much bandwidth. In the space of one f.m. TV channel you could get two 8MHz-broad a.m. TV channels, he says.

The view on f.m. is an interesting point and can be argued all day and all night. I have no doubt that an a.m. TV signal would occupy less bandwidth but the problem of building linear power amplifiers at these frequencies forces most people to take the easy route and use Class C amplification with f.m. We'll have to see if any reliable and more important, easily

reproducible, designs for Class A power amplifiers are promulgated.

Music Status

Another interesting thought that has been put to me, regards the status of music on amateur television transmissions. (I have suppressed the call sign in case he has thought better of it since!).

In the olden days (when G3s were mere strips of lads) you were allowed to transmit one gramophone record a day for test purposes. My informant suggests this facility was withdrawn only for reasons of copyright.

But what if we wish to play 'test card music' to accompany beacon transmission on ATV repeaters? We need to use broad-spectrum quasi-random analogue audio tone sequences to test the frequency transmission characteristics of our wideband audio amplifiers? If the so-called copyright-free music was used, the sort you can buy to accompany home-made camcorder movies, nobody would object on copyright grounds.

At the same time, because most of this music is pretty mediocre, you could reasonably argue that it was not being transmitted for entertainment purposes. What do you think? Is it worth proceeding with or arguing for?

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

E N D

ARCADE

The PW Shopping Arcade

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- 2: We **cannot** give advice on modifications either to our designs, to commercial radio, TV or electronic equipment.
- 3: All letters asking for advice **must** be accompanied by a stamped self-addressed envelope (or envelope plus IRCs for overseas readers).
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Practical Wireless, April 1994

BOOK REVIEWS

Rob Mannion G3XFD takes a look at a selection of books that would make welcome additions to your shack bookshelf.

Amateur Radio For Beginners.

By Victor Brand G3JNB.

Published by the RSGB.

Well known radio amateur Victor Brand G3JNB,

describes in a very practical fashion, just how you can discover the amateur radio hobby. Victor tells you about the hobby, how to build your first radio and introduces you to listening and how to understand what you hear!

£3.50 plus P&P from the *PW* Book Service.



Revision Questions For The Novice RAE.

Esde Tyler GOAEC.

Published by the RSGB.

Esde Taylor GOAEC writes

the Novice pages in the RSGB's *Radio Communications* magazine and has much experience in helping students through the Novice RAE. This book, although primarily aimed at providing revision for the NRAE, also gives the newcomer a thorough look at what's involved in studying for and becoming a Novice Radio Amateur, as it's packed with useful information.

£5 plus P&P from the *PW* Book Service.



Practical Wire Antennas.

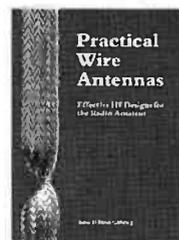
John D. Heyes G3BDQ.

Published by the RSGB.

John Heyes G3BDQ's book is filled with

practical wire antenna ideas and most operators should find at least one they could use. Theory is kept to the minimum, although the author ensures there's enough information for you to learn about your new antenna. A useful, helpful and very practical guide.

£8.50 plus P&P from the *PW* Book Service.



HF Antennas For All Locations.

Les Moxon G6XN.

Published by the RSGB.

This is the second edition

of Les Moxon's book, which can really be considered as a handbook on h.f. antennas. Although it's aimed at providing ideas for h.f. antennas, the accompanying theory of propagation, feeding antennas and the many other topics covered will also provide the reader with a useful reference guide.

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David J. Smith
Extensively revised & updated (October 1992). Air band radio listening enables you to listen-in on the conversations

between aircraft and those on the ground who control them, and is an increasingly popular and fascinating hobby. A new chapter on military air band has been added. The author, an air traffic controller, explains more about this listening hobby. 190 pages. £7.99

THE COMPLETE SHORT WAVE LISTENER'S HANDBOOK 3RD EDITION

Hank Bennett, Harry Helms & David Hardy
This book is a comprehensive guide to the basics of short wave listening. Everything you need to get started as an s.w.l. is explained in a clear and easily understood manner. Receivers, antennas, frequencies, propagation, Q-codes, etc. are all covered. 294 pages. £14.95.

DIAL SEARCH 1992/94

George Wilcox
The listener's check list and guide to European radio broadcasting. Covers m.w., l.w., v.h.f. & s.w., including two special fold-out maps. Also includes a full list of British stations, a select list of European stations, broadcasts in English and 'Making the Most of Your Portable'. 46 pages. £4.25

FLIGHT ROUTINGS 1993

Compiled by T.T. & S.J. Williams
This guide was produced with the sole aim of assisting airband listeners to quickly find details of a flight, once they have identified an aircraft's callsign. Identifies the flights of airlines, schedule, charter, cargo and mail, to and from the UK and Eire and overflights between Europe and America. 122 pages. 0/P

FERRELL'S CONFIDENTIAL FREQUENCY LIST 8th Edition

Compiled by Geoff Halligey
Spirally bound, this easy-to-use reference book covers 1.6 - 28MHz in great depth, all modes and utility services, with new reverse frequency listing showing every known frequency against each callsign, who's using what frequency and mode, what's that callsign? These are some of the answers this book will help you find. 544 pages. £17.95

GUIDE TO FACSIMILE STATIONS

13th Edition
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GUIDE TO UTILITY STATIONS

12th Edition
Joerg Kligenfuss
This book covers the complete short wave range from 3 to 30MHz together with the adjacent frequency bands from 0 to 150kHz and from 1.6 to 3MHz. It includes details on all types of utility stations including FAX and RTTY. There are 19549 entries in the frequency list and 3590 in the alphabetical callsign list plus press services and meteorological stations. Included are RTTY & FAX press and meteor schedules. There are 11800 changes since the 10th edition. 534 pages. £24.00

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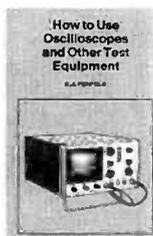
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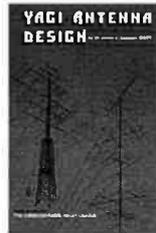
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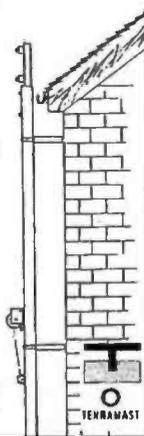
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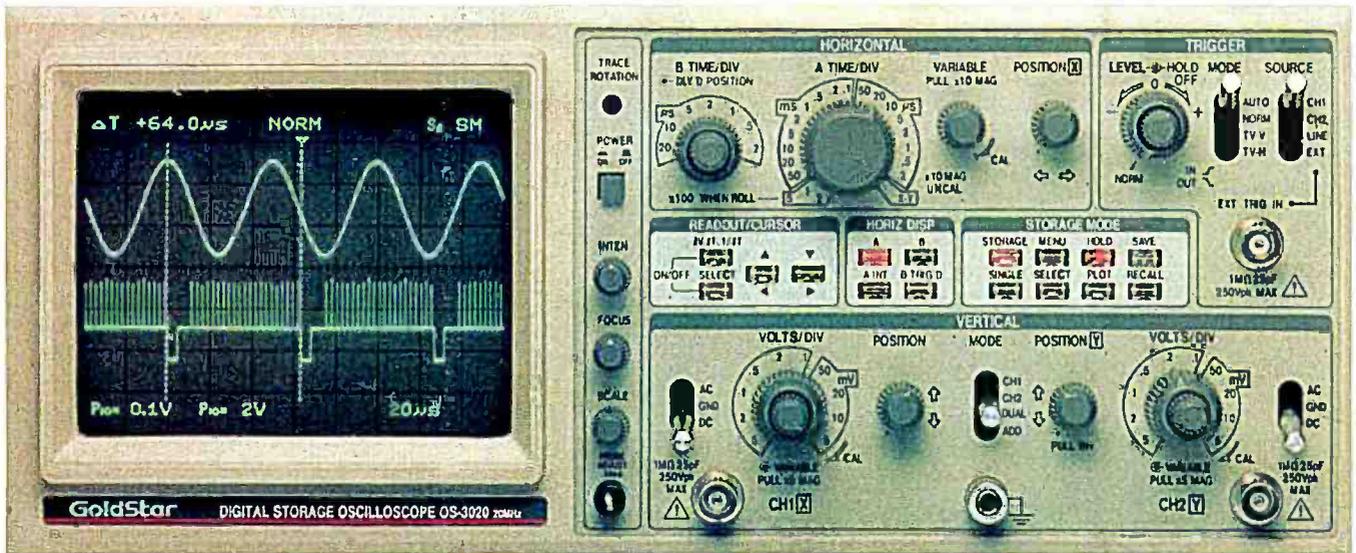
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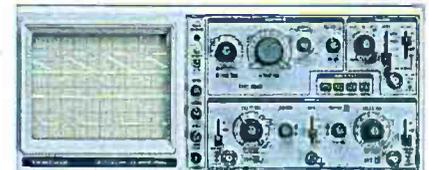
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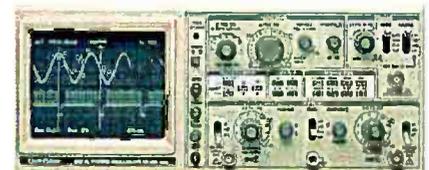
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