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around the world



Triband Rigs Reviewed

Kenwood TM-742E
Mobile and
Icom
IC-41E
Handheld

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any future
for kids?**



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GRP 'pen' transmitter**

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SPECIAL EVENT

'BIRMINGHAM

Last year we claimed to have one of the best Ham Radio Showrooms in the country... this year we know we have succeeded.

Come and see for yourself between 10am and 4pm. There will also be some very special discounts on offer, the date to remember is...

Saturday 18th September

Special events on the day include...

- Wide selection of second hand radios
- Extra 10% discount on all gear
- 2m/70cm repeater checks
- Video presentations on Amateur Radio
- Advice on the Radio Amateur's laws
- Guidance on the Novice course
- Local Radio Club representative
- Radio Station CEPT demonstration including MTY, FACIO and PACKET
- Shortwave listening & weather chart reception
- Operating desks c/w rigs by all the major manufacturers
- Scanner displays
- Mobile radio aerials and accessories
- Portable radios of all kinds
- Loads of Radio books
- Doto sheets to mull over,

- All the everything for Audio Recording, including software & equipment
- IC7000 Mobile, Triplex and DMR radios will also be on display
- HAMSTORES sell AEA, AND, Alinco, AOR, Boreany, Comet, Gaisler, Duro, De Groot, Dextat, Icom, JRC, Kenwood, Loew, Madsen, MRL, RSGB books, Teys, Yesu, Yaesu, you and all the accessories you could need for your shack
- Low, Single, Unidirectional, cable & coax cable for most radio purchases
- Great 10m and 30m are all looking forward to greeting you at the BH!
- (Sounds like a golf tournament to me!)



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10



TORRES

ENT DAY AT HAMSTORE!

See how far we have developed and help us celebrate our second year in Birmingham with a glass

of Buck's Fizz and some nibbles, Who knows, you might even get your teeth into a **NEW RADIO!**



See you on the 18th!

Only an hours drive from Sheffield, Manchester, Nottingham, Leicester, Luton, Oxford, Bristol, Cardiff and all points west!

HOW TO FIND OUR BIRMINGHAM STORE...
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963 Wolverhampton Road,
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B69 4RJ. Tel: 021 552 0073
Fax: 021 552 0051.



Also at...
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11 Watford Way, Hendon
London, NW4 3JJ - Tel: 081
262 0073 Fax: 081 262 6873

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Unit 7, Home Bay West
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Home Bay, Kent CT6 8LD
Tel: 0222 741553
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Saturdays 09.30-16.00
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Ex-PMR bargains in the flea market

The many trade stand marquees housed both 'big names' and small traders alike, and in the 'flea market' area all manner of equipment was on show, from synthesised ex-PMR rigs at £15 each, to PCBs for popular magazine construction projects. A notable exception from the variety of stands present was the RSGB, who were there last year, what happened to you this time? Maybe they were saving up for Friedrichshafen. Talking about that, you could even win a trip over there at the Elvaston Rally!

As usual, entertainments in the centre arena were held throughout the day, and an all-day 'bungee jump' was available for radio amateurs who felt they'd like to 'take the plunge'. For the family, as well as the traditional fairground there were hi-tech activities such as the 'Laser Quest' where young and old could battle it out, and for the more sedate a craft marquee with 25 stands offered non-radio exhibits and goodies for sale. All manner of food and drink was available, from pork roasts, fresh fruit cocktails, crepes, strawberries and cream, right down to fish and chips and ice cream. An on-site mobile police station and plenty of private security staff helped keep the day happy, and we're told *not one* complaint was received at the large organiser's marquee, in the half hour or so the HRT team were present there this was certainly the case! Here, the organisers also provided a shaded reception and meeting area where you could sit and rest your weary feet if you wished, meet the organisers, or even make any comments in the visitor's book.

This event must, by now, have gained the reputation of being the biggest and best UK rally. You're not even charged for admission, just a nominal car parking charge if you use their adjoining car park. Next year's event takes place on Sunday 12th June, see you there?

GB0TOV

The Central Lancs ARC say they've had to shorten the operating period of their special event station GB0TOV, operating from Carr

House in Much Hoole, near Preston (as reported last month in HRT), to 19th to 21st November 1993. Further details from J. Proctor G0FQN, 168 St. David's Road, Leyland, Lancs PR5 2UX.

New Amateur Radio videos

A series of four 'getting started' videos on amateur radio are now available from Nevada. In an agreement with the US producers, CQ Communications in New York, we're told Nevada have achieved exclusive distribution rights over here for the PAL versions of these. Entitled 'Getting Started in Ham Radio', 'Getting Started in Packet Radio', 'Getting

Started in Amateur Satellites', and 'Getting Started in DXing', they are admittedly oriented primarily for US amateurs, but would certainly act as an introduction for the newly-licensed amateur, or one seeking to expand their horizons, into getting going on the bands. Priced at £19.95 each, they are available from Nevada at 189 London Road, North End, Portsmouth, Hants, PO2 9AE, Tel. 0705 662145. We have review copies of these here already, watch out in next month's HRT!

CIS Callbook, also on disk

The CIS firm of Octavia have now prepared the 4th edition of their CIS Call Directory, containing direct QSL addresses for Russia and former Russian Republics. For the first time, all of the addresses are printed in both Russian and English. The 323 page softbound book contains the direct mailing addresses of over 30,000 Russian amateurs, plus thousands of additional addresses of hams in the Ukraine, Belarus, Azerbaijan, Georgia, Armenia, Turkmenistan, Uzbekistan, Tajikistan, Kazakhstan, Kirghizstan, Moldova, Estonia, Lithuania and Latvia. Many amateur's hometelephone numbers are also listed in the directory. The directory also contains a complete list of over 500 Russian regional QSL bureau addresses. UK amateurs can obtain a copy from Giuseppe Iannuzzi I8IYW, P. O. Box 5083, 80144, Naples, Italy, for US\$10 plus \$6 shipping charges. Octavia are interested in obtaining a UK distributor, interested parties may contact their owner Valery Kharchenko RA6YR direct at P. O. Box 40, 352700,

Maikop, Russia.

Octavia also have a shareware version of their callbook available on PC disk. This is in the form of a self-extracting file of just under 1Mb, extracting to around 2Mb, and comes complete with comprehensive pop-up search routines etc. This should by now be available from UK shareware sources for just a nominal disk copying fee, with registration costing US\$15. If you'd like a copy and have difficulty obtaining one, contact Chris Lorek G4HCL on 0703 262105 6.30-8.30pm weekdays who'll be pleased to oblige.

The C.I.S. Call Directory
in Russian & English

• 323 страниц адресного справочника QSL, включая Украину и республику Беларусь
 • 40 страниц адресов и номеров телефонов
 • 400 иллюстраций

КОЛЛЕБУК

1993

ОСТЭВИА

Icom IC-Δ1E Review

Chris Lorek G4HCL tests the world's first triband FM portable

We've had 2m/70cm dualband FM portables for a while now. But in a truly pioneering move, Icom have now brought out a *triband* FM portable, covering 2m, 70cm, and 23cm. There have been around a dozen or so 23cm FM repeaters operational in the UK for some time, in some countries there are considerably more, so 23cm is certainly a logical 'next step' up!

Fully Featured

As you may see, the IC-Δ1E (pronounced 'IC delta 1E') is a 'full-feature' handheld, having plenty of operating 'bells and whistles'. These includes 25 memory channels, plus a further call channel,

per band, plus all the usual scanning modes such as timed and carrier halted scan, priority check, all band scan and so on. DTMF 'paging' is fitted as standard, where you can 'page' other similarly-equipped amateurs over the air or indeed just keep your rig silent until called by your friend. With three bands available, you also can do wonderful things such as 'cross band double duplex', i.e., have a 'three way' duplex conversation if you wish—novell

Three in one

In use you can simultaneously receive on all three bands, using the single aerial connector, with transmit PTT control on any one of the three bands you've chosen as the 'main' band by pressing the appropriate 'band' button on the front panel. A comprehensive LCD gives you simultaneous information on what's happening



on each band, even with three independent bargraph S-meter displays! There are three sets of concentric rotary controls on the top panel, the inner of each controls click-step tuning, and the outer controls the volume, for each band.



But where's the rotary squelch control? The answer is that it's taken care of, within the set's 'brain'. By pressing the small 'S' button next to the PTT, the bargraph S-meter panel on each band turns into a 'squelch level' display, and using the click-step tuning knob you can adjust the squelch to either off, or to either a 'low', 'mid', or 'high' level setting, for each band. A novel feature is that you can also program the squelch level you wish into the memory channels on a channel-by-channel basis, along with the operating frequency etc.

On the top panel, a combined speaker/mic jack socket provides receiver audio from the 'speakers' selected bands, which you can of course individually program, and a further jack socket provides audio from the 'unselected' bands - which could be quite handy when monitoring at home. The front panel keypad controls most of the rest of the set's functions, and in case you get stuck (as I did several times at first!) a small fold-out operating guide is supplied to act as a 'memory jogger' when out and about.

Power

The set's transmitter, using the supplied 7.2V 1200mAh nicad pack, gives around 2W out on 2m, 1.5W on 70cm and 1W on 23cm, with the power output on 2m and 70cm increasing to 5W if you use a 13.5V supply (a DC socket is fitted on the set's top panel, or you can purchase an optional BP-103 12V nicad). On 2m and 70cm, one of

three 'low power' levels can be selected, these being 3.5W, 1.5W, and 500mW, and on 23cm a single low power level of 200mW is used.

As well as a variable ratio 'battery saver', where the set's receiver cycles on and off on a channel with no activity, one or two of the operating bands can be totally 'powered down' if you don't need them during a given spell of operating, all of which keeps your nicads going that bit longer. An 'auto power off' mode can, if you wish, switch the set off after either 30 mins or 60 mins of no button-pushing activity, i.e., if you've left it switched on accidentally. As well as this, 'timed' power on and power off modes in conjunction with the set's internal digital clock let you choose the hours the set operates on!

In use

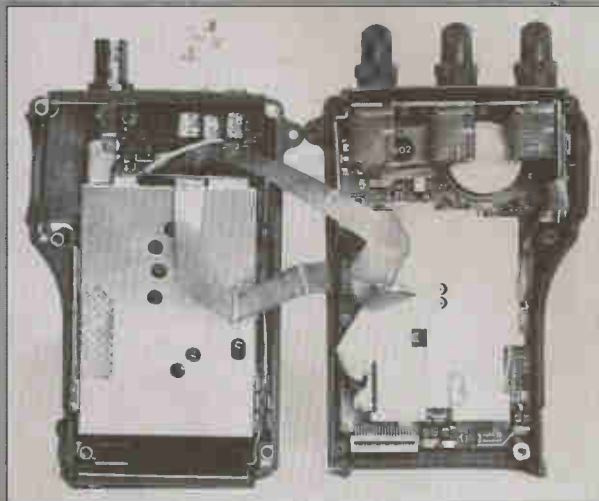
Well, just after the rig was delivered (just before my trip to Friedrichshafen - what luck!), I opened the box with great trepidation. "This'll show them in Europe" I thought! When I took the set out and held it in my hand, my immediate thought was "it's a bit big, isn't it?". So I showed it to the HRT Editor, the immediate comment being "it's a bit big, isn't it?". Having said that, comparing the difference in size between a state-of-the-art single band handheld and a dual band handheld, then adding the 'difference' to the dual bander, did 'tie up' with the IC-ΔTE, so maybe I was just expecting a bit too much! The set's 'vital statistics' with the supplied BP-102 nicad are 58mm



(W) x 49mm (D) x 145mm (H), weighing 635g.

I went the plug-in nicad wall charger (this being fitted with the correct UK three-pin plug), and I gave the set an overnight charge while I read through the 48 page instruction book. Out and about the next day, the set performed very well, especially when considering that the set-top aerial *must* have been at least some compromise between the three bands. My semi-local repeaters on 2m and 70cm were coming in well, and I could access them with greater ease than I'd have expected with the power output of the set.

Unfortunately I didn't have any luck with my (again) semi-local 23cm repeater. But this I often put down to the traditional (dated?) insistence by the 'powers' that all UK 23cm repeaters must be horizontally polarized - making



pioneering work that *could* have been carried out on urban mobile/portable propagation on this band that bit more difficult. 23cm is a great band for communication in built-up areas. I've used it a fair bit portable and mobile in the past, and it has great potential given sensible repeater parameters, of which I understand there are now moves to change.

With the review period taking in the Friedrichshafen show, it was natural that I took the set over with me for my visit, which, combined with the travel there and back plus a period of use 'at home' did indeed give it a good 'air test'. Throughout the review period it operated well, and although I did get initial comments about the size from other amateurs before they realized it was a tribander, I found it quite easy to carry around both in my hand and clipped onto my belt. It let me have plenty of QSOS, although I wished that it had CTCSS encode/decode fitted as standard (yes I know, I should have asked for one with the review set!). This is a plug-in option at £75, or £39 for encode-only, and would have been handy for use in that busy location for communicating to the CTCSS-equipped 70cm handheld-carrying HRT Editor! Likewise for UK use, where CTCSS is now becoming common as a much better way of accessing repeaters using a relatively low power portable rig.

About the only 'niggle' I had was when trying to wire up an external speaker/mic or packet TNC. Although the manual was very comprehensive and came with block and circuit diagrams, there was no information whatsoever on the speaker/mic stereo jack plug connections used - a call to the Icom (UK) service department however provided this information. Maybe they just want you to buy *their* ready-wired accessories and not use your own.

Technicalities

Inside, the set is made up of three separate RF units, combined of course with a common control section. The receiver sections are all double conversion superhets, with high 1st IFs of 30.85MHz (2m), 35.8MHz (70cm) and 72.2MHz (23cm) for good image rejection. On transmit, the usual synthesizer/VCO/modular PA approach is used, together with separate low pass filters for a 'clean' signal, all feeding a three-band combiner common to the receive path.

In the lab tests, the transmitter was indeed very 'clean', and each receiver gave a good technical performance.



The 23cm 'S meter' seemed fairly 'mean', although the receiver sensitivity was indeed quite good. I did occasionally find that some combinations of receive frequency (i.e., 145.000 and 1297.000) caused a mid-strength 'carrier' to appear on one frequency, although this didn't cause me any problems at all in 'real' on-air use. The 23cm side was slightly off frequency but was within typical constraints for 23cm FM gear, indeed the set has an adjustable RX and TX/TX 'shift' control for this

very purpose, which allows you to 'fine tune' the frequency to match your frequency to that of your QSO partner.

The current consumption on receive was a little on the high side, this no doubt being due to the simultaneous three-band operation, the figures in the accompanying table being measured with the battery saver 'off'. However the supplied 1200mAh 7.2V battery should give quite a reasonable operating period overall.

Conclusions

The IC-21E isn't cheap at £759, although it is certainly less costly than a 2m/70cm rig plus a 23cm portable! If you're interested in occasionally getting away from the 'crowd' on 2m and 70cm, whilst still being able to join in the action when you're out and about, the IC-21E is certainly worth considering. There are already several areas of 23cm FM activity, and if future 23cm repeaters with vertical polarisation plus maybe wider TX/RX splits (making repeaters easier to get going) start coming into operation in the UK, this could certainly be the extra band to get onto.

My thanks go to Icom UK (Sea Street, Herne Bay, Kent, CT6 8LD, Tel. 0227 741741), for the loan of the review handheld.



LABORATORY RESULTS:

All measurements taken using fully charged nicad as supplied, high power TX, otherwise stated.

RECEIVER:

Current Consumption

Standby, squelch closed;	183mA
Receive, mid volume;	252mA
Receive, max volume;	305mA

S-Meter Linearity

	145MHz	435MHz	1297MHz
S1	Sq open	Sq open	Sq open
S3	0.32µV pd (-9.9dB)	0.27µV pd (-8.5dB)	0.96µV pd (-9.8dB)
S5	0.47µV pd (-6.5dB)	0.34µV pd (-6.2dB)	1.35µV pd (-6.9dB)
S7	0.71µV pd (-3.0dB)	0.46µV pd (-3.2dB)	1.95µV pd (-3.7dB)
S9	1.00µV pd (0dB ref)	0.72µV pd (0dB ref)	2.97µV pd (0dB ref)
S9++	1.75µV pd (+4.9dB)	1.01µV pd (+2.9dB)	4.48µV pd (+3.6dB)

Blocking:

Increase over 12dB SINAD level of interfering signal modulated with 400Hz at 1.5kHz deviation to cause 6dB degradation in 12dB SINAD on-channel signal;

	145MHz	435MHz	1297MHz
+100kHz;	83.3dB	74.4dB	63.5dB
+1MHz;	92.6dB	91.9dB	71.6dB
+10MHz;	96.7dB	96.8dB	86.9dB

Squelch Sensitivity;

	145MHz	435MHz	1297MHz
Threshold;	0.13µV pd (12dB SINAD)	0.12µV pd (12dB SINAD)	0.17µV pd (12dB SINAD)
Maximum;	0.30µV pd (22dB SINAD)	0.21µV pd (18dB SINAD)	0.28µV pd (17dB SINAD)

TRANSMITTER

TX Power and Current Consumption;

Freq.	Power	7.2V Supply	13.2V Supply
145MHz	High	2.12W/1.08A	4.87W/1.44A
	Low 3	2.12W/1.08A	3.19W/1.21A
	Low 2	1.29W/890mA	1.31W/890mA
435MHz	Low 1	480mW/670mA	480mW/690mA
	High	1.45W/1.20A	5.50W/2.08A
	Low 3	1.42W/1.18A	5.50W/2.06A
1297MHz	Low 2	1.42W/1.18A	2.70W/1.08A
	Low 1	750mW/780mA	820mW/730mA
	High	1.01W/1.04A	1.07W/1.04A
	Low	150mW/660mA	50mW/580mA

Harmonics;

	145MHz	435MHz	1297MHz
2nd Harmonic;	-82dBc	<-85dBc	-
3rd Harmonic;	<-85dBc	<-85dBc	-
4th Harmonic;	<-85dBc	<-85dBc	-
5th Harmonic;	<-85dBc	-	-
6th Harmonic;	<-85dBc	-	-
7th Harmonic;	<-85dBc	-	-

Adjacent Channel Selectivity;

Measured as increase in level of interfering signal, modulated with 400Hz at 1.5kHz deviation, above 12dB SINAD ref. level to cause 6dB degradation in 12dB on channel signal;

	145MHz	435MHz	1297MHz
+12.5kHz;	4.0dB	29.8dB	26.8dB
-12.5kHz;	34.9dB	30.2dB	26.2dB
+25kHz;	72.8dB	65.3dB	55.1dB
-25kHz;	72.2dB	67.0dB	55.9dB

Intermodulation Rejection;

Increase over 12dB SINAD level of two interfering signals giving identical 12dB SINAD on-channel 3rd order intermodulation product;

	145MHz	435MHz	1297MHz
25/50kHz spacing;	66.1dB	56.2dB	62.0dB
50/100kHz spacing;	66.1dB	56.2dB	62.0dB

Maximum Audio Output;

Measured at 1kHz on the onset of clipping (10% distortion), 8 ohm load, 520mW RMS

Image Rejection;

Increase in level of signal at first IF image frequency, over level of on-channel signal, to give identical 12dB SINAD signal;

145MHz	435MHz	1297MHz
72.7dB	72.5dB	53.3dB

Sensitivity;

Input level required to give 12dB SINAD;

144MHz;	0.14µV pd
145MHz;	0.14µV pd
146MHz;	0.13µV pd
430MHz;	0.14µV pd
435MHz;	0.14µV pd
440MHz;	0.14µV pd
1240MHz;	0.16µV pd
1275MHz;	0.17µV pd
1297MHz;	0.17µV pd

Peak Deviation;

145MHz	435MHz	1297MHz
5.93kHz	5.73kHz	4.90kHz

Frequency Accuracy;

145MHz	435MHz	1297MHz
-86Hz	-205Hz	-1.17kHz

Toneburst Deviation;

145MHz	435MHz	1297MHz
3.69kHz	3.30kHz	4.90kHz

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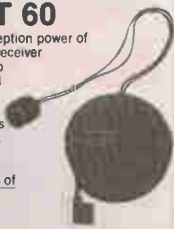
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Netset PRO-46. Covers 66-88, 108-136.975 (AM), 137-174, 406-512 and 806-956 MHz. LCD display with backlight, search, priority, lockout, scan-delay, memory backup circuit. Belt clip. Requires 4 "AA" batteries or Adaptor. 20-9305



NEW 50 Channel Scanner £149.99

Netset PRO-44. Covers 66-88, 108-136.975 (AM), 137-174 and 380-512 MHz. LCD display with backlight, search, lockout, scan-delay and keyboard lock. Memory backup circuit for changing batteries. Belt clip. Requires 6 "AA" batteries or AC/DC Adaptor. 20-9304



NEW 200 Channel Scanner £219.99

Realistic PRO-39. Covers 66-88, 108-136.975 (AM), 137-174, 380-512 and 806-960 MHz. Hyperscan search and scan, 10 channel monitor back, priority, lockout, scan-delay, LCD display with backlight. Memory backup circuit. Belt clip. Requires 6 "AA" batteries or AC/DC Adaptor. 20-9303

Pro 2006 £299

Pro 43 £249

SCANNERS

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Channels of operation: Any 200 channels in any band combinations (20 channels, 10 banks) and 10 monitor channels.

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*subject to status



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TS-850S	1649 95	D
TS-450S	1499 95	D
TS-140S	899 95	D
TS-50S	PEP VLE	D



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HK706	Straight Key 0.5kg adjustable tension and contacts	33 95
HK705	Straight Key 0.5kg similar 706 with cranked arm	31 95
HK704	Swing arm straight key bearing less solid brass construction	99 95
HK703	Swing arm deluxe telegraph key with w base plate	91 50
HK702	Swing arm deluxe telegraph key with w base plate	97 00
HK701	Swing arm deluxe telegraph key with w base plate	47 95
HK700	Swing arm deluxe telegraph key with w base plate	43 50
HK699	Swing arm deluxe telegraph key with w base plate	29 50
HK698	Swing arm deluxe telegraph key with w base plate	39 95

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HL1009 10	10M Linear 10W in 100W out PEP Suitable for 21 24 28MHz	210 00
HL1008 20	20M Linear 10W in 100W out PEP	210 00
HL1009 80	80M Linear 10W in 100W out PEP	210 00
HL65V	6M Linear 10W in 50-60W out Rx Preamp	149 00
HL166V	6M Linear 3 10W in Auto select 80 160W out Rx preamp	299 00
HL375X	2M Linear 0.5-5W in 20-35W out variable gain preamp	109 00
HL6275X	2M Linear 5 10 25W in 50W out preamp	195 00
HL110V	2M Linear 2 10W in 100W out Rx preamp	226 00
HL36U	70cm Linear 6 10W in 25 30W GaAs FET preamp	155 00
HL63U	70cm Linear 10 25W in 50W out GaAs FET preamp	259 00
HL160U	2M Linear 3 10 25W in p auto select 100W out Rx preamp	349 00
HL130U	70cm Linear 3 10 25W in p auto select 120W out Rx preamp	459 00

TRANSVERTERS

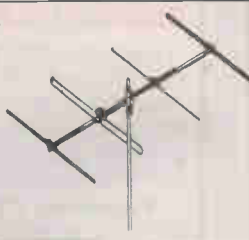
HX240	2M to HF 86 40 20 15 12M 2.5 10W Drive 30-40W o p	289 00
HX640	6M to HF Specs as above	229 00
HX650	10M to 6M Transverter High performance MGF 102 preamp built in	289 00

BASE STATION ANTENNAS

	£	Carriage
GP62	62	C
CA3102B	102	C
GPV1	102	C
WX1 N	102	C
WX2 N	102	C
WX3 N	102	C
WX4 N	102	C
WX5 N	102	C
WX6 N	102	C
WX7 N	102	C
WX8 N	102	C
WX9 N	102	C
WX10 N	102	C
WX11 N	102	C
WX12 N	102	C
WX13 N	102	C
WX14 N	102	C
WX15 N	102	C
WX16 N	102	C
WX17 N	102	C
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WX96 N	102	C
WX97 N	102	C
WX98 N	102	C
WX99 N	102	C
WX100 N	102	C

JB ANTENNAS

	£	Carriage
Yagi 8 element	20	C
Yagi 10 element	33	C
Yagi 12 element	40	C
Yagi 14 element	47	C
Yagi 16 element	54	C
Yagi 18 element	61	C
Yagi 20 element	68	C
Yagi 22 element	75	C
Yagi 24 element	82	C
Yagi 26 element	89	C
Yagi 28 element	96	C
Yagi 30 element	103	C
Yagi 32 element	110	C
Yagi 34 element	117	C
Yagi 36 element	124	C
Yagi 38 element	131	C
Yagi 40 element	138	C
Yagi 42 element	145	C
Yagi 44 element	152	C
Yagi 46 element	159	C
Yagi 48 element	166	C
Yagi 50 element	173	C
Yagi 52 element	180	C
Yagi 54 element	187	C
Yagi 56 element	194	C
Yagi 58 element	201	C
Yagi 60 element	208	C
Yagi 62 element	215	C
Yagi 64 element	222	C
Yagi 66 element	229	C
Yagi 68 element	236	C
Yagi 70 element	243	C
Yagi 72 element	250	C
Yagi 74 element	257	C
Yagi 76 element	264	C
Yagi 78 element	271	C
Yagi 80 element	278	C
Yagi 82 element	285	C
Yagi 84 element	292	C
Yagi 86 element	299	C
Yagi 88 element	306	C
Yagi 90 element	313	C
Yagi 92 element	320	C
Yagi 94 element	327	C
Yagi 96 element	334	C
Yagi 98 element	341	C
Yagi 100 element	348	C
Yagi 102 element	355	C
Yagi 104 element	362	C
Yagi 106 element	369	C
Yagi 108 element	376	C
Yagi 110 element	383	C
Yagi 112 element	390	C
Yagi 114 element	397	C
Yagi 116 element	404	C
Yagi 118 element	411	C
Yagi 120 element	418	C
Yagi 122 element	425	C
Yagi 124 element	432	C
Yagi 126 element	439	C
Yagi 128 element	446	C
Yagi 130 element	453	C
Yagi 132 element	460	C
Yagi 134 element	467	C
Yagi 136 element	474	C
Yagi 138 element	481	C
Yagi 140 element	488	C
Yagi 142 element	495	C
Yagi 144 element	502	C
Yagi 146 element	509	C
Yagi 148 element	516	C
Yagi 150 element	523	C
Yagi 152 element	530	C
Yagi 154 element	537	C
Yagi 156 element	544	C
Yagi 158 element	551	C
Yagi 160 element	558	C
Yagi 162 element	565	C
Yagi 164 element	572	C
Yagi 166 element	579	C
Yagi 168 element	586	C
Yagi 170 element	593	C
Yagi 172 element	600	C
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Yagi 178 element	621	C
Yagi 180 element	628	C
Yagi 182 element	635	C
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Yagi 194 element	677	C
Yagi 196 element	684	C
Yagi 198 element	691	C
Yagi 200 element	698	C
Yagi 202 element	705	C
Yagi 204 element	712	C
Yagi 206 element	719	C
Yagi 208 element	726	C
Yagi 210 element	733	C
Yagi 212 element	740	C
Yagi 214 element	747	C
Yagi 216 element	754	C
Yagi 218 element	761	C
Yagi 220 element	768	C
Yagi 222 element	775	C
Yagi 224 element	782	C
Yagi 226 element	789	C
Yagi 228 element	796	C
Yagi 230 element	803	C
Yagi 232 element	810	C
Yagi 234 element	817	C
Yagi 236 element	824	C
Yagi 238 element	831	C
Yagi 240 element	838	C
Yagi 242 element	845	C
Yagi 244 element	852	C
Yagi 246 element	859	C
Yagi 248 element	866	C
Yagi 250 element	873	C
Yagi 252 element	880	C
Yagi 254 element	887	C
Yagi 256 element	894	C
Yagi 258 element	901	C
Yagi 260 element	908	C
Yagi 262 element	915	C
Yagi 264 element	922	C
Yagi 266 element	929	C
Yagi 268 element	936	C
Yagi 270 element	943	C
Yagi 272 element	950	C
Yagi 274 element	957	C
Yagi 276 element	964	C
Yagi 278 element	971	C
Yagi 280 element	978	C
Yagi 282 element	985	C
Yagi 284 element	992	C
Yagi 286 element	999	C
Yagi 288 element	1006	C
Yagi 290 element	1013	C
Yagi 292 element	1020	C
Yagi 294 element	1027	C
Yagi 296 element	1034	C
Yagi 298 element	1041	C
Yagi 300 element	1048	C



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SAGRA 600



TEMPO 2002A

TOKYO HY-POWER

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HL1K	160 10M HF Linear 1KW PEP RF input	995 95	D
HL1K 6	6M Version HL1K 10W drive	939 00	E
SAGRA 600	2M Linear 600W max output 25W Drive	210 00	C

HENRY RADIO

2002A	2M 3CX800A7 25W in 800W + Output PEP	1550 00	E
2004A	70cm 3CX800A7 25W in 700W + Output PEP	1650 00	E
2006A	6M Version of the 2002A Available to order	1495 00	E
3002A	2M 8877 50W in 1600W + Output PEP	2895 00	POA
3004A	70cm 8938 70W in approx 1800W out	3200 00	POA
	19 rack mounted	3900 00	POA
3KREMIER HF	160-10 2 x 3CX1200 100W in 2KW Output PEP	2995 00	POA
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*No charge over Relay on this Model

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VAESU	£	Carriage
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CD-120 1.8-27MHz	115.00	B
CD-160H 1.6-60MHz	104.50	B
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CN101L 1.8-150MHz	69.95	B
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DLIWA PRODUCTS



	£	Carriage
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PS120M1A PSU 3-15V Variable 9 12A	79.95	D
PS14011A PSU 13.8V 12 14A	69.00	D
PS304 PSU 1-15V Variable 24A 30A	129.95	D
RS40X PSU 1-15V Variable 32A 40A	189.00	D
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DLA80H 2m 70cm 0.5-25W input auto select 80W 2m 60W 70cm out	385.00	C

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	£inc VAT Carr.	
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G-400RC Yaesu Bell type Round meter 360 degrees	239.00	D
RCS-1 Create Bell type Round meter 360 deg. varn speed	255.00	C
RCS-3 Create Bell type 360 deg. varn speed + preset	319.00	C
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G-1000SDX Yaesu Bell type 450 deg variable spd 43-90 sec/rev	435.00	C
G-2700SDX Yaesu H/D 450 deg varn speed 50-120 sec	819.00	E
G-400 Yaesu Bell type Meter control +/- 180 degrees	199.00	C
G-500A Yaesu Elevation Meter calib +/- 90 degrees	245.00	C
G-5400B Yaesu Azimuth & Elevation Dual Controller	469.00	C
G-5600B Yaesu Azimuth & Elevation Dual Controller	539.00	D



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GS-055 Rotary Bearing Takes 2" mast	38.50	B
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	2m	70cm	£	Carriage
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FT530	£529.00	C
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KW2/E	£449.00	C
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FT747GX

Yaesu FT-747GX - 100W - 160-10M SSB/CW base or mobile transceiver with 100kHz-30MHz receiver and opt. FM transmit receive Dual VFOs 20 multi function memory Scanning with lockout Main tuning knob or scanning mk up/down frequency entry RT narrow CW filter AM filter attenuator blinker squelch CAT system bus for PC control 12V DC @ 20A 3Ah x 9.2" x 9.6" 7lbs

£875

FT890

Yaesu FT-890 - 100W - 160 10M all mode transceiver with 100kHz-30MHz receiver Two independent A/B VFOs for each band (20 touch hold freq. modes, channel offsets and repeater shifts. 32 memories store all data for both VFOs. Blinker all mode squelch. RF speech processor. built-in alphanumeric key. Optional internal auto antenna tuner. 13.5VDC @ 20A 9.4" x 3.9" x 9.6" 12.3lbs

£1375

FT1000

Yaesu FT-1000 - 100W - all modes 160-10M HF transceiver with 100kHz-30MHz receiver 99 tunable/scannable memories and built-in antenna tuner w/ memory. Dual VFOs digital IF shift/note filters, speech processor. Special provisions for CW RTTY. Packet Digital Voice. Carried option. Built-in AC ps 123W x 44W x 11.8d 30lbs

£3695

FT900

Yaesu FT-900 - 100W - all modes 160-10M HF transceiver with 100kHz-30MHz receiver. 99 tunable/scannable memories and built-in antenna tuner w/ memory. Dual VFOs digital IF shift/note filters, speech processor. Special provisions for CW RTTY. Packet Digital Voice. Carried option. Built-in AC ps 123W x 44W x 11.8d 30lbs

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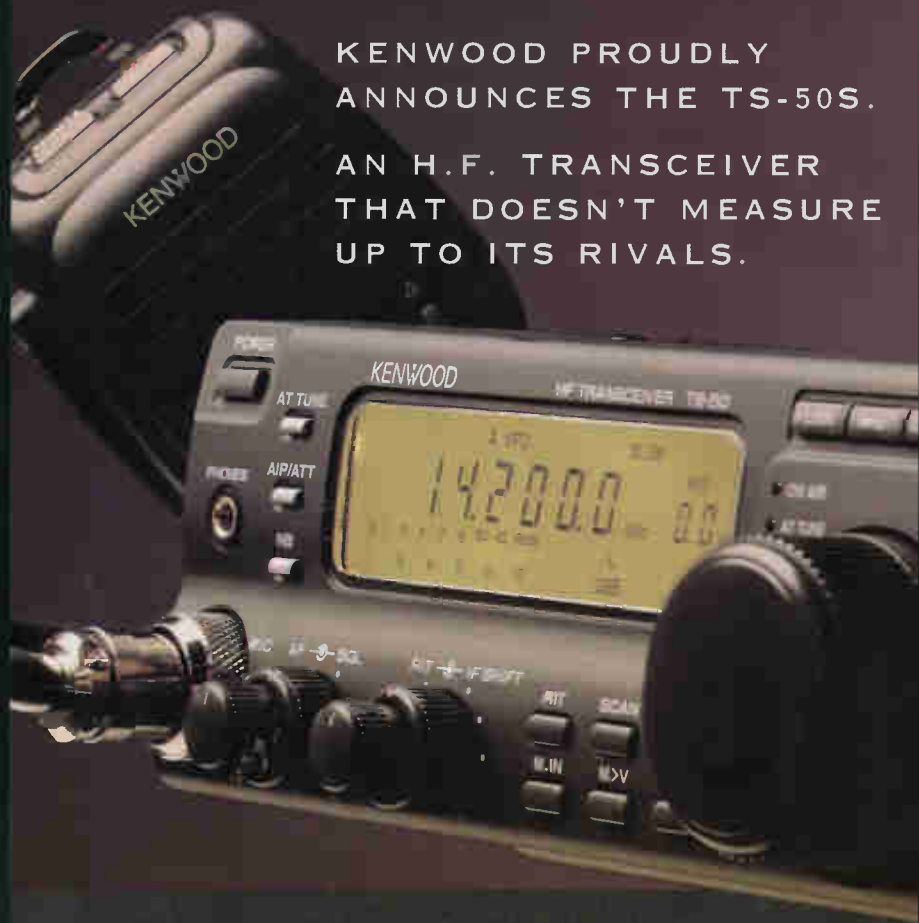
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After all, the Kenwood TS-50S may be the world's smallest H.F. transceiver. But you don't need the world's biggest bank account to own one.

KENWOOD

I've always been a proponent of 'safe mobile operating', where ease of use of the set's controls coupled with minimum eye-travel distance between the road ahead and the need for controlling or viewing the set, is very important. From controlled professional tests, this has been shown to be far, far more important than the use of so-called 'mobile safety mics'.

But not all rigs let you place them on top of your dashboard so that you can easily see what frequency you're on. Also, this isn't always the best place for controlling the set on the move with your hand, trying to reach over the steering wheel! With this in mind, I was very excited at Kenwood's latest transceiver, the TM-742E. This set gives you the option of placing the 'main body' anywhere convenient, with the set's slim display in a different position (e.g., above the dashboard or on your



Kenwood TM-742E Review

*Chris Lorek G4HCL goes three-way triband with
Kenwood's 'three way split' rig*

sun visor), with the similarly slim control panel in a different position again (e.g., on the front of the dashboard, where you can reach it easily when needed). I say 'when needed', as a remote control microphone comes as standard with the set, which besides the usual Up/Down and PTT buttons, allows any four other functions to be programmed on its push-buttons (in-

cluding a tone-based frequency readout of what the set's operating on – see later). Superb!

Bands

The TM-742E comes 'as standard' as a dual-band 2m/70cm FM rig (the virtually identical TM-942 rig being a tribander having 23cm fitted also). If

2m and 70cm isn't enough for you, an optional band module may be internally fitted to the TM-742E to make it into a three-band FM rig. You can choose from 10m (£219.95), 6m (£219.95) or 23cm (£299.95) units, and I was pleased to also receive the 10m unit on loan for this review, together with two sets of optional cables for remote mounting.

The transmitter offers a 50W maximum output on 2m with 35W maximum on 70cm (50W with the 10m and 6m options, 10W on 23cm), each band having switchable 'mid' and 'low' power levels of 10W and 5W respectively.

Controls

Independent volume and squelch controls are used for each band, so there's no 'fumbling around' needed in switching bands on the front panel for control purposes. Kenwood's ABC – 'Automatic Band Change' facility also allows you to let the set switch transmit control automatically to the last band the squelch raised on, useful when you're on the move with a multibander rig!

For those times when you can't or don't want to look at the set, or for those who are visually handicapped,



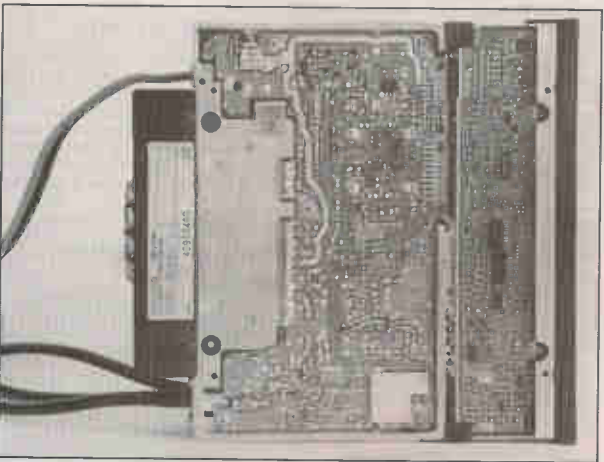
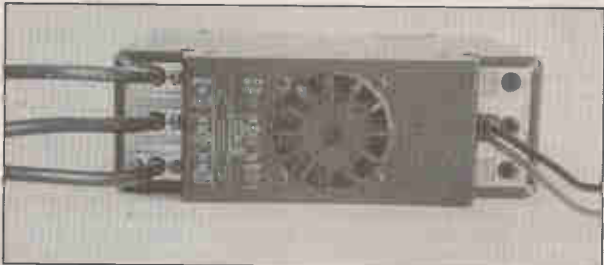
the set has a very useful 'beep tone' function which, after initial programming, a press of one of the four microphone buttons (e.g., the PF button) gives a readout of the channel frequency in a series of single tones, each tone frequency ascending with the 'digit' of the frequency 'readout'! These are arranged as musical C-G for 0-4 and A-B for 5-9 (a total audio tone range of 523Hz up to 1318Hz for 0-9). Add an optional DTMF microphone and you can also use this for virtually complete remote control of the set, the DTMF buttons controlling the set's front panel functions.

The front panel knobs, and even the indicators, are similarly used very cleverly to control various functions of the set. Pressing the volume knob for any band transfers PTT control to that band, and pressing the dual-colour LED next to each 'band knob' transfers other controls to that band, i.e., tuning etc. This LED changes from red to green indicate that band is currently the 'control' band, and flashes when that band is in 'scan' mode, separate 'control' and 'PTT' icons on the display unit are shown also to let you know what's happening.

As well as a manually adjustable 'squelch', a 'microprocessor controlled' squelch setting can be used on a band-by-band basis, the manual squelch control then not being needed! As well as this, an 'S-meter' squelch may be selected, again on a band-by-band basis, instead of the usual FM 'noise squelch', when the strength of received signal can instead be used to determine the squelch opening point. This could be useful on, say, 10m and 6m. Also on 10m and 6m, an internal receiver attenuator can be switched in if needed to prevent any problems from local 'monster signals' in the same or adjacent bands, and on 10m the transmit bandwidth can be set to either 'wide' or 'narrow', the transmit peak deviation being changed to suit the station you're communicating with.

Memories

100 memory channels are available on each band, arranged into five groups of 20 channels each for scanning convenience, the groups can also be 'linked' together if required. A variety of scanning modes are available, such as memory scan, group scan, band scan, programmed band scan, even a mode where the set starts to fill up empty memory channels in the 'top' group with signals it finds in VFO scan mode. Together with the usual manually-activated 1750Hz tone for 'normal' European repeater access, CTCSS encode is



fitted, with CTCSS decode as a plug-in option. With this fitted, in scan mode the set can be programmed to stop only on channels with the correct CTCSS tone present. The set may be used as a cross-band repeater if you wish, subject to licensing conditions (for example, all UK amateurs are allowed limited range 'remote control' of their station where this facility could be useful), again controlled by CTCSS if you wish.

When I'm calling you

The set has DTMF selective calling and 'paging' facilities fitted as standard, these using the same common format between manufacturers. Briefly, this allows you to keep the rig's receiver silent until the correct set of DTMF digits is received, whereupon it'll 'wake up', and even play pretty tunes at you if you like when called, together with display-

ing the ID of the calling station. Where allowed, the set can also transpond an on-air 'acknowledgement' to verify it's received a paging call. The set even has a digital clock built in, plus various timers and the like, e.g., auto power-off timer, TX time-out timer, elapsed time from receiving a call, although it doesn't (yet) make you a cup of tea.

On the Move

Well I switched on, read (some of) the instruction book, and started programming up lots of memory channels with my favourite frequencies. I usually choose channels 0-23 for R0-R7 and S8-S23, plus similar on 70cm, but the 100 available channels on each band let me arrange these nicely into 'banks' for scanning purposes. Locally used repeater and simplex channels in one bank, nationally used channels in a couple of other 'linked' banks for when I was travelling out and about. Then into the car it went. I placed the set body itself beneath the car seat, the control unit on the right hand side of my steering wheel for easy access, and the display unit on top of the dashboard itself. This required two optional cable units (only one set is needed for 'remote head' operation, i.e., the controls and display next to each other, either side by side or one above the other), and the 'longer' of the two also provided cables for up to three extension speakers, extension microphone lead and DC lead, as well as the remote 'control' lead.

The majority of my 'on the move' use was with the remote control microphone. With the buttons programmed to their 'default' settings, this gave 1750Hz toneburst, 'VFO' switching and VFO scan initiation, 'Memory Recall' switching and memory scan initiation, and cyclic band switching with the 'PF' (Private Function) button. With the 'head-up' display, I could easily see what was happening, and the only time I usually needed to touch the control panel was to alter the volume and squelch setting, this being very easy by 'touch alone' with the separate controls.

Problems, problems!

After about 300 miles of use on the move (I listen and tune around a lot first, before starting to transmit with a review rig!), I found I was getting indifferent results on 70cm (I found the rig was around two and a quarter kHz off frequency on transmit and receive), and I wasn't having any luck whatsoever in getting 2m QSOs, even though signals were coming through quite well on that band. The rig's (supposed) RF power indicator was working as it

should, and a check with my 2m handportable in the car showed I was transmitting on the right channels. But an in-line RF power meter showed no output, moral - don't trust what the rig says! A spell of home-fault-finding followed at the weekend, which showed the 2m RF driver thick-film (the one feeding the PA block) to be internally faulty, this giving virtually no output.

I must give Kenwood (UK) their due, a replacement set was sent to me the very next working day, the faulty one being picked up. The only problem was, the replacement one had a fault too! A heavy DC power lead inside the set hadn't been soldered onto its connector, and the set started to develop a 'mind of its own' for some time before finally failing to even switch on. Out came the soldering iron.

Anyway, after having sorted the faults, the set then did work fine. I had many pleasant chats, with good audio reports on 2m and 70cm, although my local 70cm repeater occasionally gave me an 'L' indicating 'low frequency'. The set, in constant receive-only use as well as on transmit, did get quite warm, particularly the display unit which used (hot) internal bulbs for illumination.

Laboratory Tests

The receiver on each band was quite sensitive, and apart from the asymmetry of the 12.5kHz adjacent channel rejection on 70cm (caused by the set being off frequency on this band, the first sample being worse at 2.23kHz low on 70cm) it had a very good strong signal handling performance all round.

A further check on 29MHz gave an adjacent channel selectivity of 78.7dB at 20kHz, and 23.6dB at 10kHz, and switching to 'narrow' reduced the TX deviation down to 2.24kHz peak.

On transmit, there was ample power on all bands, and the small rear panel fan which switched in on transmit kept the set reasonably cool for average length transmission, this was quite good for the high power levels given. The transmit harmonics were very well suppressed. All round, apart from the 70cm off-frequency problem, a very good technical performance.

Conclusions

The TM-742E, when it worked, I liked. It had plenty of functions to keep even a 'features oriented person' such as myself quite happy, without going overboard with overcomplicated controls and push buttons. The facility of remote mounting the controls and displays with optional cable units I found very useful and very conducive to promoting road safety.

A worrying aspect however was the problems I had with both tested sets. This could be due to 'teething problems' in the production run of a new set type, but it does show the review samples were indeed 'genuine off the shelf' models rather than being 'specially selected' for the reviewer!

The TM742E 2m/70cm transceiver (less remote cables) is currently priced at £829.95, and my thanks go to Kenwood (UK) for the loan of the review equipment plus their speedy and helpful response to my queries.



LABORATORY RESULTS:

All measurements taken using 13.2V regulated DC supply with supplied DC lead, high power TX, otherwise stated.

RECEIVER;

Sensitivity;

Input level required to give 12dB SINAD;

28.0MHz;	0.12µV pd
29.0MHz;	0.12µV pd
29.7MHz;	0.13µV pd
144MHz;	0.13µV pd
145MHz;	0.13µV pd
146MHz;	0.13µV pd
430MHz;	0.15µV pd
435MHz;	0.15µV pd
440MHz;	0.15µV pd

Image Rejection;

Increase in level of signal at first IF image frequency, over level of on-channel signal, to give identical 12dB SINAD signal;

29MHz	145MHz	435MHz
>100dB	75.5dB	74.5dB

Harmonics;

	29MHz	145MHz	435MHz
2nd Harmonic;	<-80dBc	-78dBc	-69dBc
3rd Harmonic;	<-80dBc	<-80dBc	-74dBc
4th Harmonic;	<-80dBc	<-80dBc	<-80dBc
5th Harmonic;	<-80dBc	<-80dBc	-
6th Harmonic;	<-80dBc	<-80dBc	-
7th Harmonic;	<-80dBc	<-80dBc	-

TRANSMITTER

TX Power and Current Consumption;

Freq.	Power	10.8V Supply	13.2V Supply	15.6V Supply
29MHz	High	23.5W/5.20A	48.5W/9.50A	50.3W/9.55A
	Med	11.6W/6.90A	11.6W/5.15A	11.8W/5.30A
	Low	6.12W/4.05A	6.22W/4.20A	6.12W/4.25A
145MHz	High	28.8W/6.80A	49.9W/8.30A	50.5W/8.35A
	Med	10.7W/3.95A	10.8W/3.95A	10.8W/4.00A
	Low	4.44W/2.65A	4.44W/2.80A	4.44W/2.65A
435MHz	High	24.5W/6.95A	36.5W/8.15A	38.5W/8.20A
	Med	11.7W/4.80A	11.8W/4.90A	11.9W/4.85A
	Low	5.15W/3.55A	5.20W/3.65A	5.15W/3.80A

S-Meter Linearity

Signal level in µV pd required, with dB relative to S9 indication

	29MHz	145MHz	435MHz
S1	1.70 (-12.0dB)	0.14 (-17.0dB)	0.18 (-17.2dB)
S3	2.61 (-8.3dB)	0.22 (-13.4dB)	0.28 (-13.4dB)
S5	3.72 (-5.2dB)	0.38 (-8.5dB)	0.48 (-8.6dB)
S7	5.54 (-1.7dB)	0.65 (-3.9dB)	0.79 (-4.3dB)
S9	6.74 (0dB ref)	1.01 (0dB ref)	1.31 (0dB ref)
S9+	8.22 (+1.7dB)	1.71 (+4.6dB)	2.54 (+5.8dB)
S9++	9.70 (+3.2dB)	3.67 (+11.2dB)	5.06 (+11.8dB)

Squelch Sensitivity;

	29MHz	145MHz	435MHz
Threshold;	<0.06µV pd (<2dB SINAD)	<0.06µV pd (<2dB SINAD)	<0.06µV pd (<2dB SINAD)
Maximum;	0.17µV pd (20dB SINAD)	0.16µV pd (21dB SINAD)	0.18µV pd (16dB SINAD)

Adjacent Channel Selectivity;

Measured as increase in level of interfering signal, modulated with 400Hz at 1.5kHz deviation, above 12dB SINAD ref. level to cause 6dB degradation in 12dB on-channel signal;

	29MHz	145MHz	435MHz
+12.5kHz;	66.8dB	64.4dB	63.3dB
-12.5kHz;	62.4dB	47.0dB	21.6dB
+25kHz;	81.5dB	77.9dB	69.2dB
-25kHz;	80.7dB	77.1dB	66.3dB

Intermodulation Rejection;

Increase over 12dB SINAD level of two interfering signals giving identical 12dB SINAD on-channel 3rd order intermodulation product;

	29MHz	145MHz	435MHz
25/50kHz spacing;	68.8dB	72.3dB	67.4dB
50/100kHz spacing;	68.6dB	72.1dB	66.7dB

Blocking;

Increase over 12dB SINAD level of interfering signal modulated with 400Hz at 1.5kHz deviation to cause 6dB degradation in 12dB SINAD on-channel signal;

	29MHz	145MHz	435MHz
+100kHz;	92.0dB	89.3dB	82.0dB
+1MHz;	98.2dB	95.2dB	94.0dB
+10MHz;	97.0dB	96.6dB	96.2dB

Maximum Audio Output;

Measured at 1kHz on the onset of clipping, 8 ohm load;

29MHz	145MHz	435MHz
2.59W RMS	2.87W RMS	3.00W RMS

Toneburst Deviation;

29MHz	145MHz	435MHz
4.35kHz	4.18kHz	4.14kHz

Peak Deviation;

29MHz	145MHz	435MHz
5.19kHz	4.97kHz	4.64kHz

Frequency Accuracy;

29MHz	145MHz	435MHz
-101Hz	-312Hz	-1.63kHz

QRP CORNER

Dick Pascoe G0BPS recovers from tower planting to build an amplifier for the QRP 'Pen Transmitter'



G-QRP Club members at Dayton this year

Things are coming along at the home-stead, the tower is up waiting for the aerial and also waiting for the concrete to set-fully for the base. Digging a 1.5m deep hole in thick clay is not my idea of fun, but needs must! I am trying to get it all ready for the QRP contest on June 20th, I hope I saw you all there.

I have heard some disconcerting news about another part of 2m. Peter PE1MHO, an avid VHF operator especially on 6m, reminds me that the RSGB is looking to extend the band's data section to include 144.5875MHz to 144.7375MHz. This of course assumes 12.5kHz channel spacing, and totally ignores the QRP FM centre of activity on 144.585MHz. This QRP frequency may not be used to any huge amount, but it is an internationally agreed point

of reference for low power operating. I understand that a few other national societies have the same idea.

It all comes down to the old adage; *Use it or Lose it*, this can equally apply to any other frequency that we claim. The 10m frequency is a good example, here the VHF operators jumped in and we had to move.

Some readers will not have realised that there is any activity on QRP FM within the band, but some very exciting contacts may be had using the mode. The ubiquitous FT290 comes into its own here, I think that a large majority of new licensees in the past started with this great little radio. I suppose that this is shown in how well they keep their second hand price.

New QRP Rig

There have been a selection of



The new Tokyo Hy-Power HT-750

handhelds on the market for some time now that suit the QRP man, the Mizuho (JIM) handhelds being just one type as reviewed some months ago in HRT, 'hammock contacts' being made daily by Ty GM0LNQ with this rig!

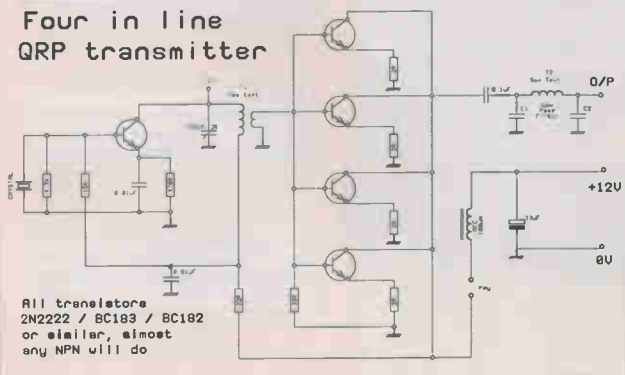
I have just heard a whisper of another handheld to come onto the market. It is not available in the UK yet, but no doubt will be very soon.

The name of Tokyo Hy-Power will be familiar to most readers for their compact single band radios and their amplifiers, I had a six metre transceiver of theirs for some time, it was very good! They have come out with what appears to be a very nice unit the HT750. Claimed to be the "World's First Handy SSB/CW Tribander", it covers the bands of 7MHz, 21MHz and 50MHz.

The 40m section covers 7-7.3MHz, the 15m band covers 21-21.5MHz and the 6m band appears to cover 50-50.5MHz, with power levels of 3W on the 40 & 15m bands and 2W on 6m. The 500kHz band supplied will be great for most operators, I am not sure if this can be expanded by the addition of a further crystal perhaps, we will look more closely when one becomes available.

Running from any voltage from 8.5 to 15V makes this unit very versatile. The size is also fair, at 66mm (W) x 188mm (H) x 47mm (D), this is about 25mm taller than my FT470, 12mm wider and almost double the thickness. Quite a chunky radio but remember,

Four in line QRP transmitter



three band in one set.

This radio would seem to be ideal for novice readers and many more who perhaps like me enjoy the delights of the caravan for a long weekend or the summer break.

I say 'appears' in the above paragraph, I read the information from a faxed copy of their handbook which was not totally clear, I think that the band edges given are accurate. The price of this unit is quoted as 69,800 Yen which converts to about £410 at time of writing. (Any UK price would have to include shipping and Customs charges as well.)

While mentioning caravanning and holidays, at the recent Maidstone Rally I had the opportunity to have a good look at the new TS-50 from Kenwood. This would appear to be the caravanner's dream, a very compact radio that can be switched down to 10W out on SSB, ideal for the QRP man and the power conserving caravanner. I am not sure about the power reduction facilities for CW, but at the very worst

the usual negative voltage up the ALC line should do the trick. I hope to have a much closer look at one of these soon, I know that Rev George Dobbs G3RJV tried one out and was very impressed with it.

High Power for the Pen Transmitter

In last month's column I described a miniature transmitter that was designed to be hidden inside a pen. That single transistor circuit does work, but obviously the output power was minimal, in the region of a few dozens of milliwatts.

By using a similar design and the same devices, we can increase that output power a fair amount by simply paralleling some more transistors. The circuit comes from abroad again, this time from N4DKD, who calls it the 'Four in a row' transmitter. The RF choke in the DC supply line may be of any value between 50 to 100µH, and the tuning capacitor may be of any small type, even a trimmer capacitor will suffice.

Alternatively you may wish to pre-tune the final for best power out with cleanest signal.

The 2Ω resistors in the emitters are to ensure that each transistor draws equal current. Remember that if you cannot find any 2Ω types, parallel some low values up to get down to this level. The 2Ω value is not critical, the closer the better as long as all four are identical.

Most fundamental crystals will fire up, and component values are given for 30, 40 and 80m. Other bands will work, experimentation is the name of the game, but whatever you do, a low pass filter must be used for the band in use. The values given will only work on that band.

At point X on the circuit diagram, the oscillator's output may be tapped and used as an injection signal for a simple DC receiver, so we could end up with a very simple, almost high powered transceiver. More details of the receiver later.

This transmitter is an ideal way to get into QRP operating using the main station receiver, try it, you may be surprised at what you can work!

That's it for this month, news and views to me via HRT editorial or via GB7ZAA or direct to me at Seaview House, Crete Road East, Folkestone. 72 de Dick.

Band	T1 Primary	T1 Secondary	T2 turns	C1 & C2
30m	20	4	14	330pF x 2
40m	28	4	16	470pF x 2
80m	50	12	24	680pF x 2

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Friedrichshafen Show Report

The HRT Editorial team joined around 20,000 amateurs in visiting Europe's largest amateur radio show

We showed you in HRT how to get to Friedrichshafen and back for around £25, including a return British Airways flight to Zurich, but the HRT Editorial team who did just that were surprised to find they'd chosen the exact same flight, train, and boat to Friedrichshafen as a small collection of other licensed 'independent travellers' from the UK! Add to this hundreds more UK amateurs, plus of course the many thousands of amateurs from other countries, and you have a truly international gathering.

Where is it?

If you'd like some background information on the event and where it is, take a look at the September 92 issue of HRT. Briefly, it's acknowledged as Europe's largest amateur radio show, and the three-day event takes place each year at the Messe exhibition centre at Friedrichshafen in southern Germany. This year, around 20,000 visitors from

around the world centred on five large halls, plus the outdoor display area, together housing 280 firms from 19 countries, plus 20 national radio society stands (including the RSGB, who manned their very own stand there for most of the event). The usual huge 'flea market' had many and varied goodies to tempt visitors, ranging from ex-PMR rigs and secondhand amateur gear, right up to surplus test equipment including professional spectrum analyzers. A number of stands manned by amateurs from the CIS republics as well as other countries were selling both electronic and 'bygone souvenir' goods, from vacuum variable capacitors to traditional memorabilia.

As well as the tempting offers on the trade stands, a very comprehensive lecture and meeting program also took place. Thirty two in all, these covered all aspects of amateur radio from HF DXing, VHF contesting, 'live' 80m ARDF hunt, Packet Radio, and, significantly, a number covering various EMC matters.

New Products

This year, several Japanese and European companies chose the venue to launch their new products. Icom launched the IC-Δ1E, and the personnel on their stand were rather surprised to see the HRT Tech Ed walking around the event with the very same rig clipped to his belt! Yaesu displayed the new FT-2200 'full feature' 2m paging mobile (review coming up!), together with the FT-216 and FT-716 2m and 70cm 'designer' portables, these having similar operating features to the FT215/FT715. Kenwood displayed the new TM-742 tribander, and the TS-50S HF transceiver (reviewed in HRT), and Alinco their new 50W 2m DR-130 mobile transceiver (again, review sample already arranged). Stabo-Ricofunk from Hildesheim, Germany, caused a small sensation with their European version of the tiny, credit-card sized, 70cm 100mW transceiver from Standard. The HRT Editor has been using a Japanese

Five large halls plus an outdoor area formed the venue



Bargain hunters from around the world converged in the halls



version since November last year (i.e., no 1750Hz toneburst or 'normal' European repeater shift), and it'll be interesting to see if this will become available in the UK eventually. Maybe we should do a review of the Japanese one? Boger-Funk of Aulendorf, Germany, displayed the new Tokyo Hy-Power HT-750 40m/15m/6m SSB handheld transceiver on their stand, see this month's *QRP Corner* for details.

On the data side, German manufacturers SCS revealed their plug-in PC card Pactor controller (it was so new they told us their UK distributor didn't know about it yet!). Also from Germany, Symek showed their two-channel packet radio controller which used a 68032 16-bit processor with a 1.6Mb maximum data rate. From the US, DRSI had a working demonstration between two of their new DPK-9600 9600 baud TNCs (review coming up soon!). Also from the US, Kantronics had their new KAM Plus on display (they'd sold all the stock of these they took to their stand by the Sunday), and HAL introduced their PC-Clover system, which should soon have a UK distributor.

Evening entertainment

This year, the annual Friedrichshafen Seehasenfest (festival of the 'lake hare') also took place that weekend, and many visitors, including the HRT team, chose to also enjoy the many and varied items of entertainment this lakeside festival offered. From the huge Saturday night firework dis-

play after the international 'Hamfest' in the lakeside Graf-Zeppelin hall that evening, to the lakeside beer gardens, funfair, bands, processions, and the many, many beer gardens with associated grilled and barbecued food stalls alongside. All to the tunes of traditional

foot-stomping live music. Rumour has it that one afternoon on returning to her hotel after a long day at the rally, the HRT Editor asked reception for a wake-up call at 9 o'clock, in the evening, to ensure she didn't miss a thing (including the equally traditional dancing on the tables!)

Stabo-Ricofunk with the tiny Standard 70cm handheld



Roundup

The entire event, organised by the Messe Friedrichshafen in association with the DARC, was in our opinion extremely well run, and our thanks go to the ladies in the press centre who looked after us very well, even to the extent of serving us real English teal. Being a tourist area, there are plenty of hotels and guest houses available, but you'll need to book early to be sure of getting the place you want. You can also, if you wish, camp or caravan within the Messe grounds itself, either under cover or outdoors, this year the charge for three days was a very modest DM15 (£6), four days for DM25 (£10) or DM35 (£14) for a full week there if you'd like a 'mini-holiday'.

Next year's show takes place over the weekend of 24th-26th June, with the Seehasenfest the weekend following. If you're interested in visiting the show and need some booking or on-site camping/caravanning details, you can phone the Messe Organisation office direct on INT+ 49 7541 7080, and for hotel or guest house accommodation the Friedrichshafen tourist office is on INT+ 49 7541 21729.

Part of the vast flea market



Fancy a spectrum analyzer? These were on sale in the flea-market



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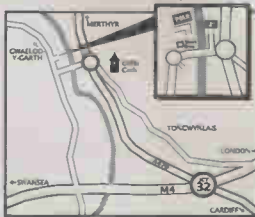
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The **ABF125** will provide useful additional selectivity (in many situations) to any receiver's 'front end' by reducing the multitude of unwanted strong signals from reaching and saturating the receiver's first mixer stage... this results in less interference and improved reception.

Of course 'stub filters' can provide a degree of rejection to unwanted signals but tend to be bulky being suitable for base station applications and usually have to be hand-made. The **ABF125** on the other hand is ready made and very compact measuring only 75.5mm and weighing a mere 52g yet offers excellent out of band attenuation typically of 25dB from 0.3 ~ 75 MHz and 20dB from 190 ~ 400 MHz. This makes the **ABF125** suitable for connection to both external aerials and for connection directly under the whip aerial of a hand-held receiver. A BNC socket (female) is fitted to the top of the **ABF125** and a BNC plug (male) to the other making connection to an aerial easy and straightforward.

The **ABF125** is not an amplifier so will not 'boost' signals, however the additional selectivity offered can significantly improve reception in many situations by removing unwanted strong signals which may overload the receiver and reduce it's effectiveness. When any connection is fitted to the aerial signal path some reduction of signal is resulted (attenuation) however the **ABF125** in band attenuation level is very small due to the excellent in band V.S.W.R. of 2:1 resulting in a loss of only about 4dB. **Note: Remember to remove the ABF125 from the aerial when monitoring signals other than VHF Airband or signal strength will be dramatically reduced. Suggested Retail Price £24.50 inc VAT.** (UK Carriage £1.50)

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SCANNERS

From the Editor's Desk

INTERNATIONAL

'Are scanners to be banned?' is a question I often hear. *Bunkum*. There's a lot of ignorance around. Indeed one police officer, who I witnessed taking to a member of the public carrying a scanner, wasn't sure whether the person was even allowed to use one and whether he should try to confiscate it or not! The 'bad press' on scanners given by some misguided (and often also just as ignorant!) members of the press sparked this off a while ago, however 'sense' is being restored. Many scanners nowadays are virtually full-blown communication receivers, which of course have been

around for donkeys years, and these are now, as they have in the past, been introducing a lot of 'new blood' into the fascinating hobby of radio communications.

The RSGB, who aren't normally associated with getting things wrong, also 'jumped on the bandwagon' recently by broadcasting (via their nationwide radio news broadcast service GBERS) that the ARRL had reported that scanners had been banned in the USA. Maybe they should have 'double checked' first, I'd have been pleased to tell them (as I did later) that only scanners that covered the US cellular bands, or could be readily modified to do so, were prohibited from future manufacture or importation to the USA. Manufacturers of scanners for that market have been aware of

this for a long time, just take a look at the reviews in the last two month's issues of *Scanners*, the Netset and Bearcat scanners 'miss' these frequencies (which for interest's sake are 824.0-849.0MHz and 867.0-894.0MHz). Of course, there's plenty 'full coverage' scanners there already, and the law doesn't cover manually tunable receivers either, so people will still be 'listening in' anyway. Indeed, US citizens are allowed by law to listen to other things such as their local police, drugs squad, FBI officers, ambulances, cordless intercoms, you name it, they can listen to it. Yet, I suppose it might give the cellphone users over there a false sense of security. Until the scanner owners start buying 900MHz downconverters to add to their scanners!

Book Review

A new book for 'utility listeners', reviewed by Chris Lorek

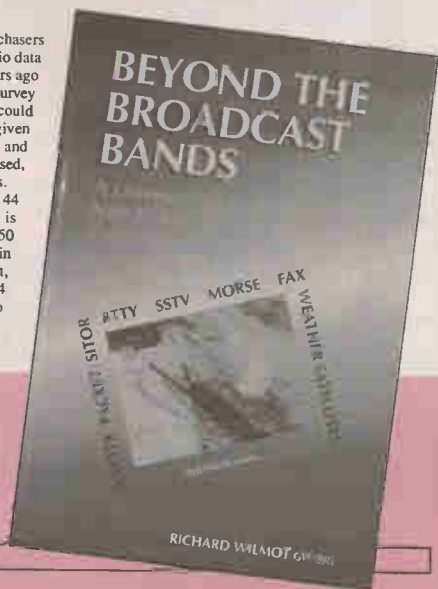
If you've ever been intrigued at all those 'warbling' noises on the HF (0-30MHz) spectrum covered by your receiver, or even 'higher up' on the weather satellite or VHF/UHF amateur bands, and wanted to know what they were, this book goes some way to helping to explain what you're hearing. Possibly more importantly, it also lets you know how to go about decoding the various forms of teleprinter, fax, and other forms of data transmissions you could encounter on the airwaves.

'Beyond the Broadcast Bands' is aimed primarily at newcomers to data modes on radio, and is written purely for listeners rather than being specifically aimed at licensed amateurs who often use these modes for transmission as well as reception.

A reasonable introductory description is given of the various modes such as Morse, RTTY, ASCII, SITOR, Packet Radio, SSTV, FAX, Weather Satellites and so on, plus a section on improving the performance of your data reception station by dealing with noise. A generalised introduction to decoding equipment which you can link to your computer is also given. The author seems to suffer from the unfortunate misapprehension that most UK magazine readers don't use IBM PCs or clones

(currently 90% of UK purchasers of ready-made hobby radio data terminals do, and two years ago a national radio magazine survey put this at 80%), which could cause the information given here to be rather limited, and maybe even incorrectly biased, for the majority of readers.

The book is A5, 144 pages, softbound, and is priced at £12.95 plus £1.50 p/p. It's available from Siskin Electronics (2 South St, Hythe, Southampton, SO4 6EB. Tel. 0703 207587) to whom my thanks go to for the provision of the review sample.



HRT

CONTENTS

HAM RADIO TODAY

VOLUME II NO.8 SEPT 1993

REGULAR COLUMNS

QRP CORNER	24
Dick Pascoe G0BPS with news of a new QRP handheld, and an amplifier for the QRP 'Pen Transmitter'	
FROM MY NOTEBOOK	38
Geoff Arnold G3GSR looks at the bits that keep our equipment together	
SATELLITE RENDEZVOUS	40
Richard Limebear G3RWL with this month's AMSAT-UK updates on the satellites	
PACKET RADIO ROUNDUP	42
G4HCL looks at network developments, new packet software, and a 'packet companion' book	
VHF/JHF MESSAGE	44
Geoff Brown GJ4ICD finds things have certainly livened up on 6m recently	
HF HAPPENINGS	46
Don Field G3XTT looks back on 25 years of HF operating	
FREE READERS ADS	53
Helpline, For Sale, Exchange and Wanted. Published free	

REVIEWS

ICOM IC-Δ1E REVIEWED	13
Chris Lorek tests the world's first triband FM portable	
KENWOOD TM-74ZE REVIEWED	20
G4HCL goes three-way triband with Kenwood's 'three way split' mobile transceiver	

FEATURES

FRIEDRICHSHAFEN SHOW REPORT	26
HRT visits Europe's largest amateur radio show	
SCANNERS INTERNATIONAL	29
New book for 'utility listeners', plus the latest scanner Buyer's Guide	
DAYTON HAMVENTON 1993	36
Don Field G3XTT reports on the world's largest rally	

Elvaston Castle Rally report



PROJECT

A 50W AMPLIFIER FOR 6M (PART 2)	33
Geoffrey Pike G10GDP with the final part, construction and tuning.	

NEWS AND VIEWS

CQ de GB1YA EDITORIAL	5
Is there any commercial future for kit manufacturers?	
LETTERS	6
HRT readers have their say	
RADIO TODAY	8
Elvaston Castle Rally report, RSGB Open Day, and more RIS prosecutions!	
CLUB NEWS	49
Dynamic go-ahead clubs and voluntarily-run RAE course contact details. Is your club listed? If not, why not!	
NATIONAL SOCIETIES AND ORGANISATIONS	50
Contact details for the RSGB, Radio Communications Agency, SSL, ISWL, and many more national organisations	
HRT SUBSCRIPTION OFFER	55
Make sure you get your HRT each month right through your letter box	
CLASSIFIED ADVERTISEMENTS	56
Your local dealers, component and kit suppliers, and RAE courses	



Below left; RSGB Open Day balloon race

Right; Icom IC-Δ1E reviewed



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Buyers Guide

It's been exactly six months since our last 'Buyers Guide', and as well as several new models appearing, many European prices have changed quite a bit following recent developments in the international exchange rates. Here's our latest list of the scanners available in the European new and secondhand market today. These are listed with their frequency coverage, modes of operation, number of memory channels available, typical last new selling price in the UK (including nicads and charger for handheld scanners), and which issue the set was reviewed in (SI indicates Scanners International. HRT indicates Ham Radio Today, back numbers and photocopies available from the address given in the main magazine). All frequencies are given in MHz, with 'H' signifying a Handheld scanner, 'B' signifying a Base/Mobile scanner.

Mode of operation indicates those which may be selected on any entered frequency. Note that some scanners have AM limited to Airband coverage only, where this is the case this is clearly shown. All scanners have a 'Search' facility apart from those where this is also clearly shown.

Scanner distributors and dealers are shown in the magazine's advertising pages, and these dealers will be pleased to offer full details including the latest prices of the scanners they stock.

Make	Type	Freq Coverage	Modes	Mem Ch.	Typ. Price	Review
Alinco DJ-X1D	H	500kHz-1.3GHz	AM/FM/WFM	100	£329	SI Dec 92
AR 800E	H	75-105A 118-174 406-495 830-950	M/FM	20	£169	HRT Sep 88
AR 900	H	108-174 220-280 300-380 406-470 830-950	AM/FM	100	£199	HRT Aug 89
AR-950	B	60-88 108-136 137-174 220-290 291-380 406-470 830-950	AM/FM	100	£254	
AR 1000 MkII	H	0.5-600 805-1300	AM/FM/WFM	1000	£249	SI No.3
AR 1500	H	0.5-1300	AM/FM/SSB	1000	£349	SI Aug 92
AR 2000	H	0.5-1300	AM/FM/WFM	1000	£309	
AR-2002	B	25-550 800-1300	AM/FM/WFM	20	£399	HRT Oct 86
AR-2500	B	0.5-1500 WFM/SSB	AM/FM/	1984	£399	
AR-2800	B	0.5-600 800-1300	AM/FM/WFM/SSB	1000	£425	SI Jan 92
AR-3000A	B	0.1-2036	AM/FM/WFM/CW/SSB	400	£949	SI May 92
Bearcat BC50XLT	H	66-88 136-174 406-512	FM	10 No search	£100	HRT Apr 88

Bearcat BC55XLT	H	29-54 136-174 406-512	FM	10 No search	£99	
Bearcat BC70XLT	H	66-88 118-174 406-512	FM AM Air	20	£199	HRT Jul 88
Bearcat BC100XLT	H6	6-88 118-174 406-512	FM AM Air	100	£200	HRT Apr 87
Bearcat BC142XLT	H	68-88 136-174 406-512	FM	16 No search	£110	
Bearcat BC175XL	B	66-88 118-174 406-512	FM AM Air	16	£169	
Bearcat BC200XLT	H	66-88 118-174 406-512 806-956	FM AM Air	200	£250	SI No.1
Bearcat BC700A		29-54 108-137 137-174 406-512 806-956	FM/ AM Air	50	£250	SI Aug 93
Bearcat BC760XLT	B	66-88 108-174 350-512 806-956	FM AM Air	100	£194	
Bearcat BC800XLT	B	29-54 118-174 406-512 840-912	FM AM Air	40	£149	
Bearcat BC855XLT	B	68-88 118-174 406-512 806-956	FM AM Air	50	£195	
Bearcat UB0950XLT	B	29-54 118-174 406-512 806-956	FM AM Air	100	£235	SI No.1
Black Jaguar MkIII	H	28-30 50-88 115-178 200-280 360-520	AM/FM	16	£239	HRT Jun 88
Fairmate HP-100	H	15-550 805-1300	AM/FM/ WFM	1000	£249	HRT Apr 90
Fairmate HP-200	H	0.5-600 805-1300	AM/FM/ WFM	1000	£299	
Fairmate HP-2000	H	0.1-1300	AM/FM/ WFM	1000	£269	
Icom IC-R1	H	0.1-1300	AM/FM/ WFM	100	£395	SI No.2
Icom IC-R100	B	0.1-1800	AM/FM/ WFM (SSB opt.)	100	£629	SI No.2 (No.3)
Icom IC-R7000	B	25-1300	AM/FM/ WFM/SSB	99	£925	HRT Feb 89

Icom IC-R9000	B	0.1-2000	AM/FM/ WFM/SSB/ CW/FSK	1000	£4080		
JIL SX-200N	B	28-88 108-180 380-514	AM/FM	16	£325		
JIL SX-400N	B	26-520	AM/FM/ WFM	20	£649		
Jupiter MVT6000	B	25-550 800-1300	AM/FM/ WFM	1000	£369		
Kenwood RZ-1	B	0.5-905	AM/FM/ WFM	100	£465	HRT May 88	
Netset PRO-44	H	68-88 108-137 137-174 380-512	FM/ AM Air	50	£150	SI Jul 93	
Netset PRO-46	H	68-88 108-137 137-174 406-512 806-956	FM/ AM Air	100	£200	SI Jul 93	
Nevada MS1000	B	0.5-600 805-1300	AM/FM/ WFM	1000	£279		
Realistic PRO-34	H	68-88 108-136 136-174 380-512 806-960	FM/ AM Air	200	£249		
Realistic PRO-35	H	68-88 108-174 406-512	FM AM Air	100	£180	SI Feb 92	
Realistic PRO-37	H	68-88 107-174- 380-512 860-960	FM AM Air	200	£200		
Realistic PRO-38	H	68-88 136-174 406-512	FM	10 No search	£79		
Realistic PRO-39	H	68-88 108-137 137-174 806-956	FM/ AM Air	200	£220		
Realistic PRO-43	H	68-88 118-174 220-512 806-1000	AM/FM	200	£250	SI Feb 93	
Realistic PRO-2005	B	25-520 760-1300	AM/FM	400	£329	SI No.1	
Realistic PRO-2006	B	25-520 760-1300	AM/FM	400	£330	SI Jun 91	
Realistic PRO-2022	B	68-88 108-136 136-174 380-512 806-960	FM AM Air	200	£200		
Realistic PRO-2024	B	68-88 108-136 136-174 380-512	FM AM Air	60	£100		
Realistic PRO-2025	B	68-88 136-174 406-512	FM	16	No search	£99	SI Oct 91
Realistic PRO-9200	B	68-88 108-137 137-174 406-512	FM AM Air	16	£130	SI Apr 92	
Regency HXR50E	H	60-89 118-136 140-174 406-495	AM/FM	20	£179		
Regency HX-2000	H	60-89 118-174 406-512	AM/FM	20	£99	HRT Jan 87	
Revco RS-3000	B	26-32 60-90 118-180 380-512	AM/FM	50	£225		
Shinwa SR001	B	25-1000	AM/FM/ WFM	200	£299	SI May 91	
Signal R535	B	108-143 220-380	AM	60	£199		
Signal R550	B	118-137	AM	40	£129		
Sony AIR7	H	0.1-2.2 76-136	AM/FM/ WFM	30	£229	HRT Sept 87	
Sony ICF PRO80	H	0.15-108 115-223	AM/FM/ SSB	40	£299	HRT Dec 87	
Son ICF 2001D	B	0.15-30 76-108 116-136	AM/FM/ SSB	32	£279	SI No.1	
Standard AX700	B	50-905	AM/FM/ WFM	100	£545		
WIN108	H	108-143	AM	20	£113		
Yaesu FRG9600	B	60-950	AM/FM/ WFM/SSB	100	£520	HRT Jul 87	
Yupiteru VT125	H	108-142	AM	30	£189	SI Aug 91	
Yupiteru VT150	H	142-170	FM	30	£169		
Yupiteru VT225	H	108-142.1 149.5-160 222-391	AM/FM	100	£269	SI Jul 92	
Yupiteru MVT5000	H	26-550 800-1300	AM/FM	100	£239	HRT Nov 89	
Yupiteru MVT6000	B	25-550 800-1300	AM/FM	100	£199		
Yupiteru MVT7000	H	1-1300	AM/FM WFM	200	£369	SI Sep 91	
Yupiteru MVT7100	H	1-1300	AM/FM LSB/USB WFM	1000	£449	SI Apr 93	
Yupiteru MVT8000	B	8-1300	AM/FM/ WFM	200	£389		

A 50W Amplifier for 6m

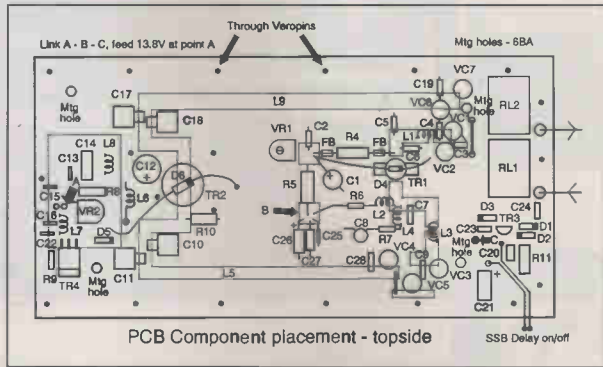
Geoffrey Pike G10GDP concludes his 50MHz linear amplifier description and details the construction and tuning

In the amplifier circuit, capacitors C5 and C6 are only included as a measure to aid stability, and form no necessary part of impedance matching. The output network L3, VC3, C9, and VC5 form an identical matching network to that matching the input to the device, but in this case takes an output impedance of $6.2 - j4; 5R$ to $50R$. Capacitors C25, C26 and C27 provide local decoupling for the supply line. C7 provides suppression against VHF parasitic oscillations. Network L4, R7, C8 provides a low impedance path for any low frequency parasitics. To aid the board layout and make it more convenient, L1 and L3 are wound coils of 166nH and 88nH respectively.

Output stage

This consists of a flange mounted, multiple emitter device MRF492. This is rated at 70W output with a minimum gain of 11dB at 50MHz. The input impedance of this device at 50MHz 70W level is $0.7 - j 1.17R$. This is getting too low for matching to $50R$ in one stage, so the transformation is made in two steps, using two L, C, C, networks with a Q of 5 each, giving also giving better bandwidth.

Capacitors C10 and C11 are mica wrapped types, these must be used



because of the high circulating RF currents. The inductor L5 is etched onto the upper surface rather than using a conventional air wound coil, the inductance is $57 + 16nH$, and becomes a line length of 10cm and 2.75cm. The measured inductance of this board mounted 3mm above the heatsink or ground plane was 5.8nH/cm.

The output network consisting of C17, C18, C19, L9, VC6, and VC7 forms the low output impedance of $0.58 - j1.0R$ to $50R$, tuning being accomplished with VC6 and VC7.

Construction

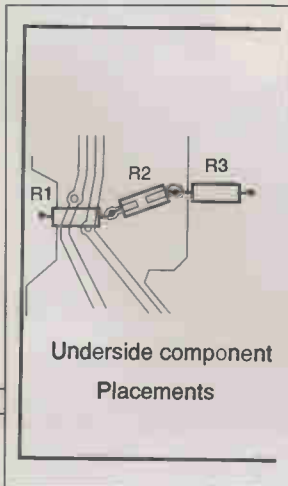
A 200mm x 100mm double sided fibreglass board is used, as this is a commonly available size. The construction of the board is best achieved using a masking system and spray painting the board in the areas in which the copper is to be retained, the track areas on the bottom of the board are best made with a Dalo etch resist pen or similar.

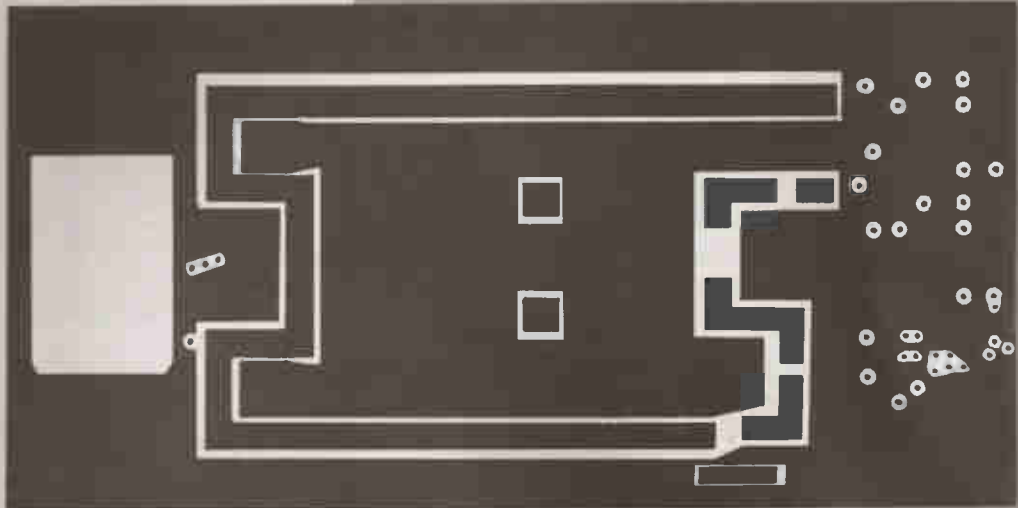
At various points on the board, Veropins are inserted to link the top earth plane to the bottom, also any points not requiring an earth connection on the top foil should be opened up just to the depth of the upper layer using a

2.5mm drill. The locating holes for the upper and lower PCB layouts are also the mounting centres for TR1 and TR2. TR1 is opened up to 10mm in diameter, and TR2 is 13mm, then using a file and a saw, the flange for TR2 can be cut. Try to make the cutout for the flange as neat as possible, this will allow the Veropins to pass unobstructed to the bottom earth plane. At this stage do not fit either TR1 or TR2.

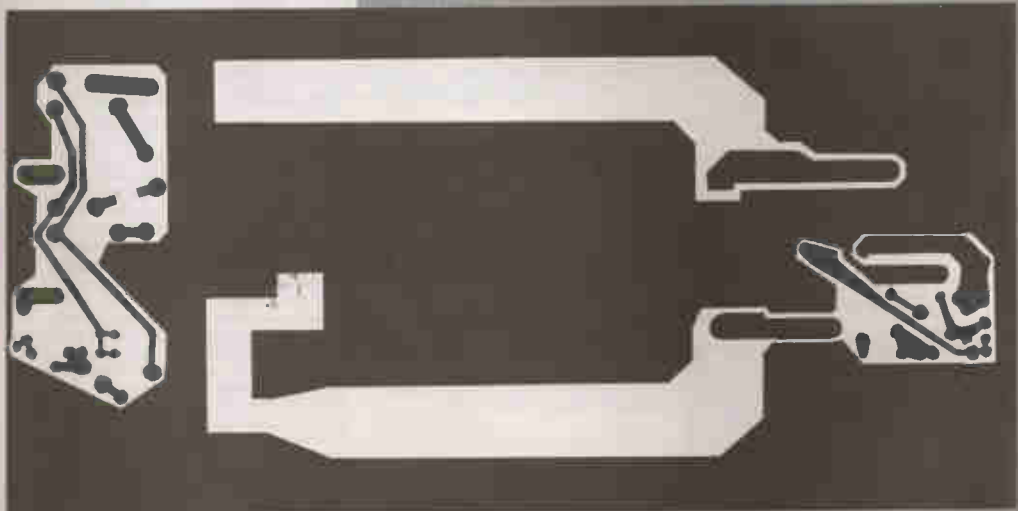
Mount all other components, checking for earth connections on the top foil as necessary. A wire link is needed between points A, B, and C. After testing, these links can be removed to the underside of the board. When all of the components are fitted, offer the board up to the heatsink and mark the positions of the four 6 BA studs, and the positions of TR1 and TR2. The base and collector leads of TR1 and TR2 are bent upwards at 90 degrees. The emitters are clamped to the upper foil using 1mm thick brass plates, and secured with 8 BA bolts. These measures will allow, if necessary, easy removal of TR1 and TR2 in the unlikely event of failure.

Before final assembly, make certain that you put some heatsink compound on the mounting area of TR1 and TR2. When fitting C10, C11, C17, and C18,





Topside PCB layout - full size



Underside PCB layout - full size

ensure that a good flow of solder is achieved and that C10 and C18 do not earth out L5 and L9. The base bias transistor TR4 should be mounted with a mica washer, brushed with some heatsink compound. The diode D6 should be in good thermal contact with TR2, and should also have a smear of heatsink compound on it, this also ap-

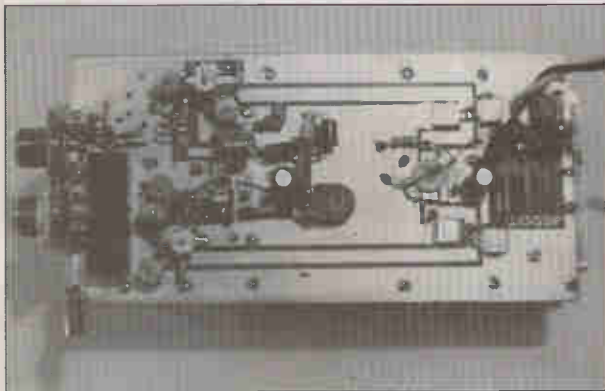
plies to D4 in conjunction with TR1.

When all the components are fitted, check for polarities of all diodes and capacitors. Also ensure that there is enough clearance between the bottom of the PCB board and the heatsink. Check that the SG-232 1F sockets are resoldered directly to the top of the board, using 6 BA bolts and 6 BA nuts bent at right

angles and soldered to the PCB.

Tuning up

Tuning does not take long, but a good SW load is needed and a power meter, an ammeter to measure up to 1.5A is also required. It is best to have a current limiting PSU, but failing this, a



low ohmage 10-20W resistor in series will prevent most mishaps.

The quiescent current in TR1 is set at 25-30mA, while TR2 is about 80-100mA. To check the bias for TR2 is working correctly, it is best to disconnect L6 temporarily and measure the voltage at this point, check that it is adjustable over the 0.5-0.8V range. When it is re-connected, the quiescent current in TR2 can be monitored, and should decrease

when D6 is heated up by placing your finger on it.

Set the variable capacitors to the following; VC1 50%, VC2 90%, VC3 100%, VC4 100%, VC5 70%, VC6 10%, and VC7 90%. With a drive source of about 250-500mW, the driver TR1 will produce about 5-6W, this may be tested separately if desired. When connected to TR2 the system will provide over 90W.

The drive level should be adjusted for 50W output. Final setting of all trimmers is done at full output. With a current limit resistor fitted, the output may be in the region of only 20 W, however this will allow approximate tuning of all trimmers, the resistor must then be removed for full output. At 90 W output the total current drain is in the order of 11- 12 A, but will depend on SWR and variations in the MRF492s. The driver TR1 will draw about 0.8-1.0A when delivering 6 W, it is not very efficient, ensure the collector current does not exceed 1 A, as this indicates incorrect setting of VC3 and VC5. It may be found that the low pass filter is directional, so just mark the sockets 'TX' and 'ANT' for future reference. This concludes the project, have fun on 6m!

The first part of this project was featured in the August 1993 issue of HRT, back copies are available at £2.20 inc p/p from; HRT Back Issues, Argus Subscription Services, Queensway House, 2 Queensway, Redhill, Surrey RH1 1QS, Tel. 0737 768611. Readers may contact the author for any queries on this project, with an SAE for reply, sent c/o the HRT Editor at the main HRT address (not the back numbers division).



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Two vintage receivers on sale in the flea market



Bringing home a tower from the flea market!

Dayton Hamvention 1993

*Don Field G3XTT reports from the
World's 'largest' rally*



One of the inside halls - quite a crush.

Take a mid-western town of roughly 175,000 population. Bring in 35,000 amateurs from around the world, enough to fill every hotel room within 60 miles, make use of every hire car, keep every restaurant busy. Lay on a flea market (car boot sale) of 35 acres, and an indoor trade show which fills the equivalent of several halls at the NEC. Add in a whole series of seminars and presentations on a wide range of topics. Ensure that a wide variety of clubs and specialist interest groups run hospitality suites in various hotels around the town until the early hours of the morning. And all this is just a flavour of the Dayton Hamvention, the biggest amateur radio event in the world. Even though it does take over the whole town the people of Dayton love it - the Hamvention pumps some \$2m into the local economy by way of hotels, taxis, restaurants, car hire, etc. Incidentally, although Dayton is rather off the beaten track, it was the home of the Wright brothers, and houses an excellent aviation museum as well as being home to the massive Wright-Patterson Air Force base. It is also one of the few American towns with trolley buses!

Amateurs really do make a big effort to get to Dayton. I saw many car licence plates from as far away as California - two or three days drive - and spoke with VE7ZZZ who was pre-

paring for the long drive back to Vancouver. He had brought his truck in order to take back plenty of hardware for his big contest station in the wilds of British Columbia (located on the site of a disused logging camp). In fact, there were amateurs there from all over the world, including a record contingent from the UK, at least 60 according to my calculations. Incidentally, getting there from the UK needn't be too difficult. Although it wasn't the route I took Delta Airlines fly direct from Gatwick to Cincinnati, which is just an hour's drive from Dayton (and car hire in the US is much cheaper than here).

To be honest, although I was well aware of the statistics about the Dayton Hamvention, it still hadn't prepared me for the reality, which is really quite breathtaking. In the two and a half days over which the Hamvention runs it is quite impossible to get around all the stands or to attend all the forums. Regular HRT readers will not be at all surprised that I concentrated mainly on things HF, attending parts of the antenna forum, the contests forum and the DX forum, though naturally I made an effort to have a good look at a number of the trade stands and at the flea market. I was also pleased to see three British stands in the main halls.

The new TS50 transceiver was generating a lot of interest, and there were some new handportables around,

but I didn't pay much attention to these. However, I was very interested to see the new equipment for the data modes, both Pactor and Clover. Pactor software and hardware is already available in the UK, and users of most multimode TNCs can upgrade. Clover is a whole new concept, designed specifically to cope with the vagaries of HF propagation - fading, interference, multipath propagation, etc, and employs advanced signal processing techniques and an error correcting protocol to maximise throughput, even at very low power levels. Clover doesn't come cheap. The Hal Communications Corp. PC-Clover card with software retails for \$995, which presumably means it will be close to £1000 when it reaches these shores. However, it is certainly an indication of things to come and, no doubt, once the sales volume starts to increase prices will begin to fall. A rather different piece of hardware to catch my eye was the TH11DX antenna by Hy-Gain. This is a 5-band HF Yagi (20/17/15/12/10), weighing 44kg on a 7.3m boom, with its longest element some 11.3m. I would love one, but it's somewhat bigger than my TH5DX, the little brother of the range.

Inevitably there were lots of computers around, and plenty of software to make them useful. I was very sur-



The HA5BUS bus, with a queue of visitors

prised that at least 80% of the software on sale was on CD-ROM; presumably CD-ROM drives are now widespread though, at \$175 a time, not much cheaper than over here. I was very taken with Kenwood's *Ham Windows* series of software. This consists of a series of modules running under MS Windows and includes functions such as rig control, packet interface, logging, maps and country data, plus a rather neat one called 'Sunspot Breaker'. This one asks your computer to scan the amateur bands and store data about the signal strengths of stations it 'hears'. It then presents this data in graphical form so that you can see immediately which bands are open! All you then need to do is click on a particular band with the mouse and your rig will QSY there ready for use. Of course, several of the log programs now available not only control your radio, but will also interface to the latest antenna rotors to swing the aerial ready for use according to the call sign you type in. Elsewhere I found the hardware available to control your radio over a phone line or VHF link. So there really is no excuse now for having

The flea market area



a poor signal because you can't get planning permission for a tower. Site it remotely and control the whole thing from the comfort of your living room!

While on the subject of computers, there are now several DVP (Digital Voice Processor) cards available for the PC. These allow you not only to send pre-recorded messages to the rig (CQ calls, etc) but to record snatches of incoming audio (beware, your hard disc can fill up very quickly). These are a boon, especially for contest operators, but think how nice it would be in several years' time, to look back through your computer log and not only see the log details of who you worked, but also hear the actual QSO replayed through your PC speaker!

If it's bargains you want, then the flea market at Dayton is the place to find them. A friend of mine bought an MLA-2500 HF linear amplifier for \$450, for example, while I saw 75 ohm coax available at \$6 (about £4) for 30m. Of course, you can never get round the flea market in the time available, but not to worry. It was possible to catch a suntan (at least, on the Friday) while watching the Kenwood hot air balloon take off (and, yes, there was a 2m airborne station aboard). There was also the HA5BUS to see - this is a bus which has been modified especially for amateur radio. This left Hungary over a year ago and has been right round the world, with amateur radio operations from such rare spots as Iran and Bangladesh, as regular readers of my HF column will know. There were several other stations operating around the flea market area. One that particularly took my fancy was a fellow using a very unusual HF aerial, looking more like an oversize spider web. He said he had designed it, didn't really know how it worked, but as it did he had decided to market it. True! American entrepreneurialism at work! Farther afield, away from the Convention proper, it was also possible to take a tour of the nearby Voice of America relay station.

If you don't want to buy anything at Dayton, then you can always hope to win a raffle prize. There are dozens of prizes, including top of the range trans-

ceivers from each of the major manufacturers, so who knows what you could come away with?

I won't list all the forums from which you could choose, but just to give you a flavour, they ranged from Amateur TV, through QRP homebrewing and a VHF/UHF forum, to Bicycle Hams of America, and Amateur Radio and the Law. Surely a case of something to suit all tastes. Most were well attended. I dropped in on the HF Contests and DX Forums and these were packed out, with perhaps 600 people in the audience.

After hours there are numerous hospitality suites around town. The HF crowd meets at Stouffers Hotel (where I was staying), and there were hospitality suites on four different floors, each organised by a different DX club from various parts of the US. On Friday evening the thing to do was to attend the DX Dinner - about 500 of us did - which ended with a slide show on Ethiopia and Eritrea by Carl and Martha Henson, WB4ZNH and WN4FVU, and then to tour the hospitality suites until the early hours until you dropped, either from tiredness or from over-imbibing! On the Saturday it was the same idea, starting with the first Annual Dayton Contest Dinner, presided over by top contester K1AR, with an after dinner speech by Joe Rudi NK7U, a famous (if you're an American!) ex-baseball pro, who has now built himself a top flight contest station on the West Coast.

Even on the way home the mood continued. I found myself on the flight out of Dayton sitting next to an amateur from Florida whose great interest is in restoring antique military radios. He had spent most of the weekend scouring the flea markets for parts he needed, so his perception of the Hamvention was rather different to mine, but we had both found more than enough to satisfy us.

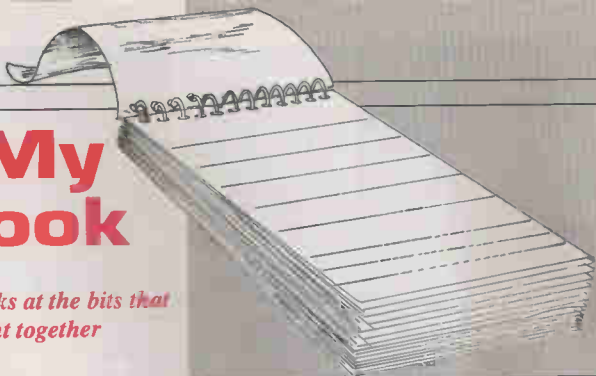
Next year's Dayton Hamvention is from 29th April to 1st May. Book it in your diaries now!

Some rather nice vacuum variables and roller coasters for that HF linear you have always meant to build.



From My Notebook

Geoff Arnold G3GSR looks at the bits that keep our equipment together



When I mentioned to someone that I was planning to talk about screws, nuts and bolts this month, the reaction was along the lines of "Whatever for? You just use what's to hand!". If your first reaction is similar, I hope that by the end of this article you will at least feel that it's worth knowing what various terms and descriptions mean when they crop up in catalogues, books and so on.

One of the perennial questions of newcomers to engineering is "What's the difference between a bolt and a screw". The sort of screw I'm talking about here is often called a machine-screw, to distinguish it from a woodscrew, the type used to fix things to wood. Many years ago, I was taught that a screw became a bolt when it had a nut on it. Although I was never entirely happy with this definition, it seemed no more crazy than some of the other terms used. Engineering handbooks obviously think such basic matters are not worthy of a mention, but a look at present-day fastener catalogues would lead you to conclude that 'bolt' is now used simply to describe a large screw! Is there an expert among the readers of HRT who can enlighten us?

Heads

Screws come with heads of many different shapes (see Fig. 1), with some strange names, and the situation is made even more confused by the fact that some heads are known by different names in different parts of the world, and by users in different trades. A prime example is the 'semi-counter-sunk', which is also known as 'raised head', 'raised countersunk', 'dress head', 'oval countersunk' and 'American countersunk'!

Some screws or bolts have heads intended to be held or turned by gripping with a tool such as a spanner or

wrench; these heads are generally either square or hexagonal in shape. Others have heads with some sort of a recess (see Fig. 2) into which a tool will fit. Except for some special recesses, of which more later, such a tool is known generally as a screwdriver, although purists prefer the term 'turn-screw' as being more accurately descriptive. In an ideal design, you wouldn't need to push or 'drive' the screw at all - the screwdriver tip would stay firmly in the recess under minimal pressure and all you have to do is to turn it.

Although it is not the ideal shape, the straight slot is still the most common shape for the recess, accommodating the standard flat-bladed screwdriver. The more snugly the tip of the screwdriver blade fits the slot, the less risk there is of it slipping out of the slot, perhaps injuring the operator and damaging the finish of the workpiece in the process.

One of the first attempts to design a screw recess which would prevent the screwdriver slipping out was the Philips head, with its recess in the form of a cross. This is still in widespread use

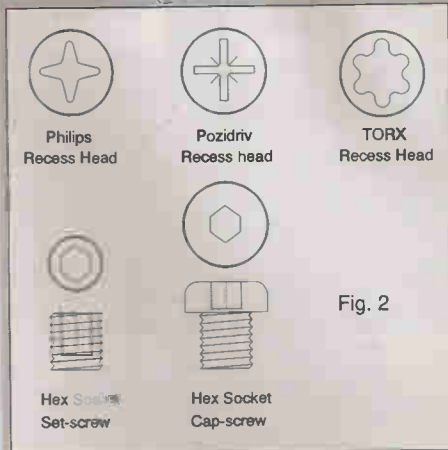


Fig. 2

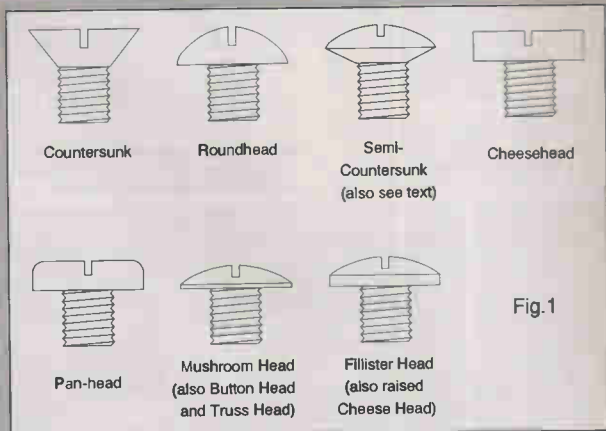


Fig. 1

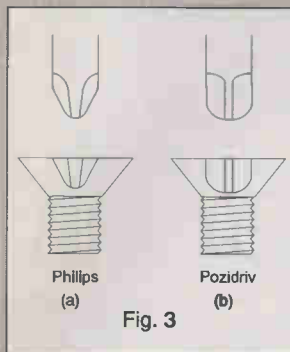


Fig. 3

today, especially in the smaller sizes in electronic equipment, although it can suffer from a problem of the screwdriver slipping out of the recess when turned hard. This is because the inside faces of the recess, where the screwdriver exerts its turning force, are not parallel (Fig. 3(a)). The inclined faces of the recess and the screwdriver tip act like cams, trying to push the screwdriver out of the recess, and in fact the effect is known as 'cam-out'. The problem is not too bad if the correct size screwdriver is used to match the screw, and if its tip is in good condition. When the screwdriver tip becomes worn, there is little you can do other than buy a new one, for they can't easily be trimmed with a file like the flat-bladed type.

To overcome the cam-out problem, the Pozidriv™ recessed-head was developed. At first glance, this looks the same as a Philips head, but closer examination, especially of a large screw, reveals that the driving faces of the recess are parallel, so 'cam-out' is eliminated (Fig. 3(b)). Also, there are tiny cuts between the arms of the main cross, which give a slight 'springiness' to the recess so that it actually grips the screwdriver point, holding the screw on the driver even when held point-downwards.

A later development of the Pozidriv is called the Supadriv™, a slightly modified design which gives better retention of the screwdriver point in the recess in the situation (all too frequent) where the driver is at a slight angle to the screw. Pozidriv screwdrivers are suitable for use with Supadriv screws. A range of three different-sized drivers (Nos. 1 - 3) will handle all the Pozidriv and Supadriv screws you are likely to encounter in radio applications.

Socket Screws

A screw recess frequently encoun-

tered in radio and electronic equipment is the hexagonal socket, which mates with a special tool called a hexagon wrench or Allen key. The most common use is in the tiny headless screws which secure control knobs on the shafts of variable resistors and capacitors, and of rotary switches. In this application they are usually known as grub-screws, presumably because of their resemblance to tiny grubs, but in general engineering practice they are called set-screws, because they set something at a particular angle on a shaft.

It is worth considering changing slot-headed grub-screws for the hexagon-socket variety on any cherished piece of equipment, especially one where control knobs have to be taken off for access in servicing. It will save that frustrating situation of a knob that can't be removed because of a jammed grub-screw with half its slotted head

button (domed) and countersunk heads.

Hexagon wrenches are known by the size 'across flats' (A/F) of the hexagon. There are two ranges, Imperial and metric. The Imperial ones fit the old BA-size grub-screws; a 1/16in A/F for the 4BA size used in small control knobs and a 3/32in A/F for the 2BA used in larger knobs, for example. Hexagon sizes are different for cap-screws and countersunk screws, so it is a good idea to have a kit of wrenches if you're planning to get involved in much equipment servicing and repair.

Other specially-shaped recesses and tools have been developed for small machine-screws and set-screws. This is the American counterpart of the hexagon socket screw and Allen key; a screw with a star-shaped recess mating with either 4- or 6-pointed Bristol wrenches (also widely known - apparently wrongly - as Bristol wrenches). These are found in US military radio

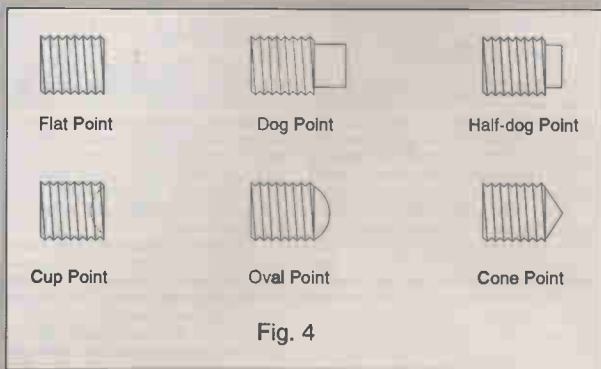


Fig. 4

broken off.

Set-screws or grub-screws come with a variety of different shaped points, and it can be vital to replace a broken or missing one with the correct type (see Fig. 4). Remember that the point of the screw is bearing on a cylindrical shaft with a comparatively small diameter, rather than a flat surface, and particularly for rotary switches may have to transmit a considerable turning force without slipping. Sometimes, the shaft will have a dimple or hole drilled in it, to retain the point of the grub-screw and prevent the control knob slipping. The dimple or hole must be very accurately positioned if the knob is to line up with any markings on the equipment panel.

Occasionally, particularly in electro-mechanical assemblies, you will come across screws with hexagon sockets in cylindrical heads, these are called socket cap-screws. There are also versions with

and electronic equipment of the World War II era and after, such as the famous BC-221 frequency meter. In more recent years, the TORX (R) screw system, which uses a 6-pointed recess which might best be described as a star with blunt points, has found favour.

Until Next Month

I still want to talk about more types of specialised fixings you're likely to run into in radio equipment and around the shack, but I seem to have run out of space for this month, so they will have to be held over for the next time. I'll see you then.

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FT5200



TM732E

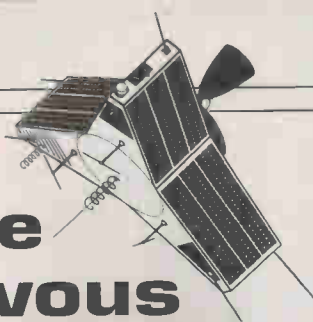


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Satellite Rendezvous



Richard Limebear G3RWL gives the latest AMSAT-UK updates on the satellites

It was nice to see folks at the NEC exhibition recently, the HRT Tech Ed (as usual - Ed!) even caught me on film chatting to current and prospective AMSAT-UK members.

Oscar 13 Mode S

At the time of writing, the transmitter section of the AO-13 Mode-L transponder appears to have stopped working. Therefore, while investigations proceed, the Mode-J/L session should be considered as having been deleted from schedules. I recently spoke to G3RUH about the problem, he is not confident that the mode-L operations will ever resume. The best guess seems to be that a switching transistor has popped in the supply to the mode-L amplifier (the exciter is still working). Even if someone could get up there to change the transistor we couldn't afford the price of the power cord from the ground to the soldering iron.

Remember that continuous up-to-date information about AO-13 operations is always available on the beacons.

Russian Satellites

RUDAK is currently transmitting PY2BJO's Peace Message in Russian (female voice) in addition to the English voice. The FM repeater and 1200 Baud AFSK AX.25 Telemetry are also still in operation, although as this is written a French voice will be loaded next month, so this should be in operation when you read this.

It's reported that RS-12 is in Mode-K which means its uplink is in the 15m band and the downlink is in the 10m band, and that the DL2MDE 'digital-microphone' was in operation recently transmitting a message of 'greetings' to the STS-55 astronauts, this repeating once every 3 minutes. Mir has also

been heard using a downlink of 145.850MHz rather than the usual frequency of 145.550MHz

MicroSats

LO-19's CW beacon is on again, you can copy it on a downlink frequency of 437.125MHz and it's quite strong; it is in operation on Wednesdays only. The beacon output power is about 800mW and it transmits eight telemetry channels and then its identification, the other PSK transmitter is on a downlink frequency of 437.150MHz and is used for BBS operations.

Recently, new spacecraft software arrived in Argentina, so LO-19 could soon be used with the same (directory broadcast) software as used for the other digital satellites (except FO-20). If you want a QSL card from AMSAT-Argentina, please send your telemetry reports to: AMSAT Argentina, P. O. Box 9 Suc. 1, 1401-Capital Federal.

WO-18 is still producing pictures from the on-board camera. The spectrometer software has also been uploaded at last. The spectrometer seems to be working well, and either it or the camera can now be selected on command. Software for decoding & analysis of the spectrometer data has reportedly been uploaded onto AO-16 and LO-19. Work is progressing on the improvements and updates to WeberWare, new code for the spacecraft which will allow doubling of video fields is also under consideration. If completed, this would improve the quality of the photos, although it will take longer to collect 100% of the data.

Arsene

After a nominal launch from the Kourou spaceport early on the 12th of

May, a new satellite joined the family of satellites serving amateur radio. After some initial difficulties in establishing command after launch, the ground command station turned the Mode-S transmitter on late on Thursday 13th May and started the flow of telemetry.

According to the telemetry, ARSENE is working perfectly. The problem is that nobody has heard anything on VHF downlink frequency of 145.975MHz. The control station put ARSENE in a mode with the same telemetry sent on both downlinks in order to allow a careful search for a small signal on 2m.

The apogee-kick-motor was successful in taking ARSENE out of its geostationary-transfer-orbit and raising it from its dangerously low perigee of 205km to 17,666km. This firing occurred on 17th May and put ARSENE into the desired orbit. Initially, the firing was planned to occur earlier but, because of the VHF downlink problems, the firing was delayed so that ground controllers could study the problem in detail. There are two theories that ground controllers have come up with about what has happened to the VHF transmitter, one being possible damage to the Local Oscillator crystal, the other being that, during launch, the coaxial cable or a connector between the power amplifier and the VHF aerial became damaged.

Controllers asked all amateurs to scan between 140-150MHz whenever ARSENE was above your horizon. If you hear a telemetry signal coming down between 140-150MHz we would very much like to hear from you. Telemetry signals are at 128Hz with 2048Hz Manchester encoded PSK at 128 bauds. Due to publication timescales however, check the AMSAT-UK nets for the latest information.

RACE would like to thank all radio amateurs for the numerous messages of sympathy received concerning the launch of this new satellite.

ARSENE being launched into orbit



ARSENE's final orbit is much as expected and the characteristics of this orbit are that a ground-station will see the satellite continuously for about 20 hours and then not see it until it reappears about two days later (successive apogees shift eastwards by almost 100 deg per day). Because of its high altitude, contacts are possible from Britain to most parts of the world (except New Zealand, Eastern parts of Australia, and some of the Pacific area).

The satellite was available for Mode S use effective from June 1, 1993. The 16kHz uplink passband is centred at 435.100MHz with a corresponding downlink passband centred at 2446.540MHz. Polarization of all spacecraft aërials is linear but circular polarization is recommended for ground stations and a 2m diameter dish with a low-noise preamp should be sufficient to receive ARSENE's 0.8W S-Band output. The recommended uplink power is 1kW EIRP.

RS-15

I mentioned RS-15 last month and it's now confirmed that the launch was postponed, perhaps until January or February 1994. What we do know is that it will be part of a larger satellite, in a nearly circular orbit at 67 degrees inclination, 2,300km mean height. The linear transponder complex will be similar to other RS satellites with 2m up, 10m down, 40kHz wide passband, beacons at each end of this passband, 64 channels of info, and a 2KByte memory. The Uplink will be 145.857-145.897MHz, the 5W downlink being 29.357-29.397MHz, with commandable 400mW or 1.2W beacons on 29.398MHz and 29.353MHz, neither of which is likely to be a ROBOT.

2m on Phase-3D?

The Americans have been making a lot of fuss about there being no 2m transmitter available for the Phase-3D satellite; apparently many USA folks have said "no mode-B, no donations

etc."! The position is that no individual or group has yet stepped forward, either from North America, or elsewhere, with a firm commitment to take on the task of designing, fabricating and testing a 2m transmitter capable of flying on Phase-3D. Locations for additional transmitter and receiver modules, including a place for a 2m downlink transmitter, still remain both in the spacecraft structure as well as in the IF matrix.

Flight hardware is needed in 600 days, so, unless a suitable group or individual can be identified within the next few weeks, there will not be a 2m downlink in Phase-3D. It's pretty hard to have a downlink, if you don't have a transmitter.

Amsat-UK news

The annual AMSAT-UK Colloquium will have just taken place as this appears in print. If you haven't been before, the Colloquium is a Satellite Get-together and we welcome anyone giving us their experiences, tips, technical advice and new ideas. This is a "fun by learning" weekend in the south of England countryside. This

year should have been one of the best because of the new UoSAT Unit having been completed, and we expect all attendees this year to be able to visit the Command Station during their stay at Surrey.

The latest score on the new version of the *Guide To Oscar Operating* is that it is sitting on my computer waiting to see what happens with Arsene. Once I know how Arsene is going to ultimately operate (i.e., will they fix or abandon the 2m part) then I'll put the final touches in and the Guide will be sent for publication. More news to follow in future columns.

If there's anyone out there, not necessarily a member of Amsat-UK, who wants a few copies of *Oscar News* (1990-92), send Ron G3AAJ a big SAE, he will fill the SAE to the level of postage on the envelope.

Trakbox kits are in stock again, same price as in previous Oscar News.

For further information about Amsat-UK contact; AMSAT-UK, c/o Ron Broadbent, G3AAJ, 94 Herongate Rd., London, E12 5EQ. Big SAE gets membership info. SWL's are welcome. All new joiners get the USAT-P tracking program on 5-1/4 disk.

Oscar 13 Transponder Schedules

Aug 02 - Aug 30

Mode-B : MA 0 to MA 40 |
 Mode-S : MA 40 to MA 50 | < S transponder, B is off
 Mode-LS : MA 50 to MA 55 | < S beacon plus L transponder
 Mode-JL : MA 55 to MA 70 | Alon/Alat 150/0
 Mode-B : MA 70 to MA 256 |
 Omnis : MA 170 to MA 10 | Move to attitude 180/0 Aug 30
 Please don't uplink to B during MA 40-50, it interferes with mode S.

Aug 30 - Oct 18

Mode-B : MA 0 to MA 120 |
 Mode-S : MA 120 to MA 130 | < S transponder, B is off
 Mode-LS : MA 130 to MA 135 | < S beacon plus L transponder
 Mode-JL : MA 135 to MA 150 | Alon/Alat 180/0
 Mode-B : MA 150 to MA 256 |
 Omnis : MA 230 to MA 40 | Move to attitude 210/0 Oct 18
 Please don't uplink to B during MA 120-130, it interferes with mode S.

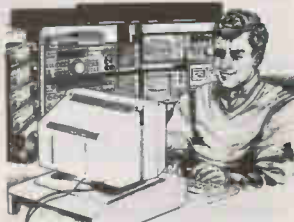
Note that these schedules are provisional, continuous up-to-date information about AO-13 operations is always available on the beacons, 145.812MHz, 435.658MHz and 2400.646MHz in CW, RTTY and 400 bps PSK.

KEPLERS

SAAT:	OSCAR 10	UoSat 2	Mir	RS10/11	AO-13	PACSAT	DO-17	WO-18
EPOC:	93145.79721491	93141.597343450	93146.96296056	93144.82485291	93145.59505686	93145.26079164	93145.25242197	93145.08163788
INCL:	27.0866	97.8133	51.6223	82.2546	57.8486	98.6210	98.6220	98.6206
RAAN:	23.8203	169.1743	326.0686	0.0012646	314.7648	230.6503	230.8485	230.7026
ECCN:	0.6012365	0.90313149	0.90009509	0.0012646	0.7240291	0.0010699	0.0010643	0.0011257
ARGP:	84.2480	81.4755	11.6798	28.8470	315.8218	251.1433	249.7075	251.1816
MA:	337.2706	278.7940	348.4229	331.3354	5.1212	106.8589	110.2863	108.1826
MM:	2.95881052	14.68987257	15.59109833	13.72317255	2.09725274	14.29831581	14.29966899	14.29947021
DCV:	96.08	4.14E-06	7.92E-05	8.8E-07	-1.72E-06	9.7E-07	9.3E-07	6.8E-07
REVN:	4683	49281	41882	29644	639	17416	17417	17415
SAT:	LO-19	FO-20	INFORMTR-1	Cosmos 2123	UO-22	KITSAT-A	ARSENE	
EPOC:	93145.78464579	93145.05606133	93146.79278989	93141.90575830	93136.23131487	93142.715108723	93145.00000000	
INCL:	98.6212	99.0382	82.8443	901.8077	98.4745	66.0787	1.0550	
RAAN:	231.5715	2.0542	68.6660	301.6072	214.8206	18.6936	130.8800	
ECCN:	0.0011497	0.0541199	0.0037107	0.0030142	0.0008314	0.0006198	0.2939750	
ARGP:	248.0844	148.9721	80.7684	115.7847	30.6346	199.5106	137.2680	
MA:	1113116	214.4563	278.7648	244.6425	329.5242	160.5677	335.5380	
MM:	14.30036498	12.83219311	13.74518627	13.74022323	14.36823958	14.28277980	14.2273540	
DCV:	7.2E-07	-1.2E-07	8.5E-07	4.6E-07	1.43E-06	1E-08	0.0000E+00	
REVN:	17428	15378	11650	11491	9636	3649	24	

Packet Radio

—Roundup—



Chris Lorek G4HCL looks at network developments, new packet software, and a 'packet companion' book

I've recently been 'tearing my hair out' in trying to reliably run my local node system, this 'crashing' almost every day after having installed the packet software into a nice new 386 machine which *should* have improved things tremendously. Eventually the whole lot went out, and was put back into the trusty 'old' linked XT and 286, together handling the 10 port node and cluster system, the 386 is now just used as an activity monitor. You can't win them all!

Sunpac

The Southern Users Network Packet Group have also had an active time lately. They've been drumming up new members at their stands at several rallies in their area, with many useful 'handouts' which have been very professionally prepared, plus software disks and packet guides for sale including multi-colour network link maps. Their aims are to act as a support and development group for the packet network in the central south coast area, and to coordinate links with other areas. They have funded the GB7SW node located at Coombe Bissett in Dorset (co-sited with the GB7SW voice re-

peater), and have recently taken over the running of the GB7HP on Portsdown Hill in Hampshire, and current plans include more 'backbone' links using 70cm and 23cm, plus close liaison with the two DX PacketClusters in the area to improve inter-cluster linking. This active group hold network planning meetings every month with plenty of SysOps in attendance, and hope to hold a special 'meet the SysOps' event in the winter months where users can meet and chat to the people who actually run the systems in use. You can get further details on SUNPAC from their Secretary John G8OQN @ GB7HJP or via a message on the DX Cluster system.



The SUNPAC stand at last year's Longleat rally



Your Packet Companion

There are plenty of books available to get you started on packet, most of these assume you already have a 'commitment' to get on the mode. But what if you just want to find out what packet can offer, without going 'all out' in getting yourself kitted out with the latest gear? The recently published *Packet Companion* sets out to do just that, and gives an enthusiastically written introduction to the mode and what it can do in real terms, without getting you bogged down with all the technicalities right from the word 'go'!

It's written in a very 'light' style that lends itself to being read more like a novel than a 'heavy' reference book, and covers a wide range of aspects such as; What is Packet Radio; Assembling a station; Eavesdropping on packet; Getting 'Packet Active' including one-to-one QSOs, accessing a BBS, and DX PacketClusters; Packet in space including Mir, Space Shuttle, and PacSat use; and rounds off with a collection of the different aspects of packet such as TCP/IP, Rose, and Digital Signal



Processing plus various appendices and a 'Packet-Speak glossary' to reveal what all those funny-sounding words actually mean! I really enjoyed reading through the book, which I did cover-to-cover. Although it's aimed at US readers, with some items like 'if you have a rig for sale, you can advertise this on the BBS network' which aren't applicable in the UK, I feel the book contains a very substantial amount of information in its 170 pages. It costs \$8.00 in the US, and is available in the UK for £5.75 plus p/p from Poole Logic, 49 Kingston Rd, Poole, Dorset, Tel. 0202 683093.

New KAGold and PKGold Software

You may have heard of the benefits of operating your TNC or multimode controller in 'Host Mode', where your computer's processor 'talks' directly to the TNC's processor, allowing a great deal more flexibility. This

Typical multi-window screen display for KAGold

```
G3VCR de GB7SMC 20-Jun-1993 17412 Type H or ? for help >
06/20/93 18:45:54 G4SMC>G8AYC-3: [RR,6]:
06/20/93 18:45:55 G3VCR>G4SMC: (rr,3):
06/20/93 18:45:57 G4VJP->>G0ISB-15: [RR,0]:
 * Net view: VHF * Sunday, 20 June 1993 6:45:59 PM
Packet: CPORD - <Alt-N> QTH: <Alt-Q>
State: Connected Pending: 0 Tries: 0
Session TNC Memory: 3315 Port: VHF
G4HCL de GB7SMC 20-Jun 17382 >
sh/dx 6
50110.0 Y71AU 20-Jun-1993 17352 <G0JHC>
50110.0 QW3OM 20-Jun-1993 17222 <G7GUB>
50121.6 H6VQ 20-Jun-1993 10502 JM19 <G7GUB>
50110.0 9H5EE 20-Jun-1993 10442 Jm75wv John. <G9IKD>
50153.0 179/F1PH1/P 20-Jun-1993 10212 JN680D <G7GUB>
G4HCL de GB7SMC 20-Jun 17392 >
sh/cwq
Operation: 2, params: \PACKKLU\CONNECTS\GB7DX1.COM
G4HCL de GB7SMC 20-Jun 17392 >
DX de G4M2Z: 44169.0 VU2JK 1736Z
DX de G0JHC: 50101.0 YU1EU 1737Z
Logging in user: G3VCR

1Help 2Net Vu 3PrvQSD 4Next 5TxtOps 6Xfer 7Connct 8Path 9Search 0Cmd
```

Pop-up KAGold 'Help' screens give you a hand

```
Packet Parameters Sunday, 20 June 1993 6:49:44 PM
Select these Packet Parameter groups, read more, and return to this
section using the backup [Alt-F1] key combination.
A KANODE Setup . . . . . Setting up your KANODE
B PBBS Parameters . . . . . Setting up the PBBS
C HF . . . . . HF Baud Rate, and other topics
O Identification . . . . . Callsigns, Text Messages, etc.
Packet Monitoring . . . . . What to monitor
Timing . . . . . Timers of all sorts
H Asynch . . . . . Baud, parity, etc.
O Link . . . . . Connmode, Facsim, etc.
Special Characters . . . . . Dumb Terminal issues, unimportant.
I EntryMode . . . . . Entry Mode for Quick Connects
M See the section: [Editing Parameters] for more information on how to
change or view parameters.
O
S
N
P

1Help 2Net Vu 3PrvQSD 4Next 5TxtOps 6Xfer 7Connct 8Path 9Search 0Cmd
```

typically lets you operate different streams and even different modes simultaneously, and possibly even allow 'gateway' access between them, together with 'off air' monitoring of other packet activity while you're connected. Interflex Systems have produced KAGold (for the Kantronics TNCs including the KAM and KAM Plus) and PKGold (for the PK-88 and PK-232) to do exactly this written for use on PC and clone computers, software versions also being available for the PK-900 and DSP1232/2232.

It gives the usual multiple window connections, off-air monitor while connected, and simultaneous different-mode operation for multimode TNCs, very much aimed as a competitor to programs such as the Kantronics Hostmaster. There's really too much in the program to do it justice in a few paragraphs here, but as well as the 'do-everything' software with its multiple windows and pop-up 'help' menus and the like, the demo version uniquely gives a short audio/visual introduction to the sounds you'll hear on-air of RTTY,

FEC and ARQ AMTOR, CW, and HF Packet, using your computer's speaker.

If you'd like to 'test drive' a working program (this being limited to 30 minutes maximum use each time you run it), you can get one free by sending a formatted PC disk (any format) and stamped addressed envelope/mailer for its return, to Siskin Electronics, 2 South Street, Hythe, Southampton SO4 6EB, remembering to state which type of TNC you have. The software itself is priced at £69.95 for the single-port version, £79.95 for the KAM, and £109.95 for the PK-900 and DSP versions.

CTRL-Z, End of Message

I was pleased to receive the latest copy of *Digicom*, the journal of MAXPAK, the Midlands AX25 packet group. The June/July issue features the usual news including details of two new packet products, plus a comprehensive overview of GB7BBS written by Andy GDIL. Maxpak offer several TNC kits for sale as well as a BBC computer terminal software EPROM, and you can get details on the group from their Publicity Officer Andy GDIL @ GB7BBS, or their Membership Secretary/Equipment Sales Manager Richard JINZZ @ GB7MAX, or Tel. 0384 373682 (20.00-21.00 only please).

That's all there's room for this month. I'm shortly off on my £25 trip to the Friedrichshafen event, so maybe elsewhere in this issue you'll see a report of what happened there. My thanks for all your messages, please do let me know what you or your local packet group are doing, all packet messages I receive get a speedy reply, BBS forwarding systems willing! Until next month, 73 from Chris G4HCL @ GB7XJZ, or by post via the HRT address.

NEXT MONTH

Is this packet talk all gobbledegook to you?

Read HRT next month for a 'beginner's special'

VHF/UHF Message

Geoff Brown GJ4ICD finds things have certainly livened up on 6m recently

Firstly, I forgot about a good report from Steve G4JCC in late April; Steve heard 5R8 from Madagascar calling CQ on 50MHz for about five seconds on the 27th April, this was of course when the UK had good 'ES' to SV and Southern Italy, and extended the T.E.P. from the Mediterranean.

50MHz alive and kicking

Early May started to bring the usual openings via 'ES'. On the 7th many reports were received about the CT/EA opening into central England, however the best was on the 9th, starting at around 0800z with EH9IB (Melilla, counts as Africa) blasting into the UK plus France and Germany. By 0900z the band became full of activity; G8VR (Kent) was heard working EH7DZI (IM66) and quite a rare square for those who collect them, other stations reported were EH7AH (IM67), CN8HB (IM63), CN8ST (IM64), CT4KQ, CT1QP, and CN8CC, but interestingly enough the

CN6VHF and ZB2VHF beacons were not heard. At 0956z I heard CT3FT (IM13) (Madeira) working EA3s, and I called him on 28.885 to let him know he was being heard in GJ.

Eventually at 1028z Cedric CT3FT was into GJ at around 57, and within the next ten minutes he became S9+. He said I was his first G of the 'ES' season, and a new country for him. Cedric's path became extended and he went on to work other UK stations including G3VYF (Essex), G4JCC (Hants) and G4IGO (Somerset). Although many became excited that CT3 was on the band, if you look at a map you will soon find that CT3 is about the same distance as 9H1, which, during the peak 'ES' month of June, is audible nearly every day!

But the best came at around 1100z when, on checking the band to the south-west, the FY7 beacon (50.039MHz in French Guiana, South America) was heard for about ten minutes at strength 2-3. G4IGO was also heard a short while earlier via some form of scatter mode

while beaming in this direction (E reflections out in the Atlantic?), was this a T.E.P. extension or just multi-hop 'ES'? On 10m, stations in the Caribbean were audible and it was certainly quite fantastic to hear this beacon after a few years of zero propagation to that area.

On the 10th there was a reported 'K' index of 7, so something had become very disturbed up yonder, but 'ES' was still around in the form of Italy into the central UK, (funny really isn't it that after major disturbances we get these blasts of 'ES'?). The daily trend continued with more and more 'ES' and then came the big one.

C31HK

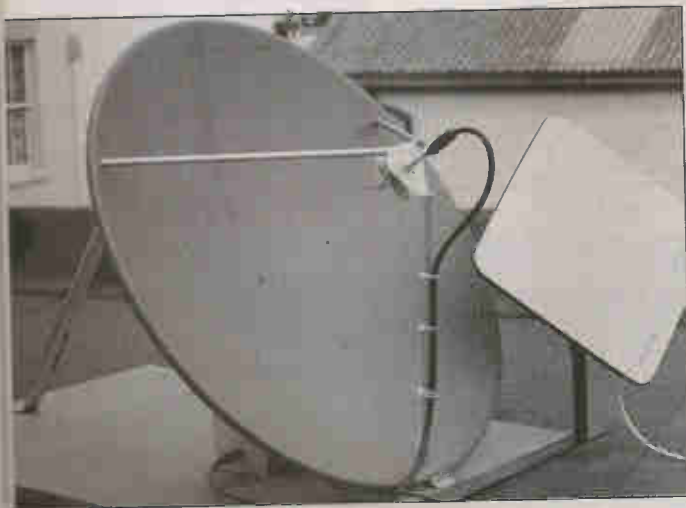
On the 12th I had organised a sked with Fred C31HK on 50.220MHz, but somehow in the relaying of information the frequency became 50.200MHz, so I wasted my time as we were both on the wrong frequency! But, one hour and a bit of 'ES' later, and Neil G0JHC (Lancs) made it with Fred to become the First G station to work C31 legally. Six others in IO83 square followed, well done to all. That morning the band was buzzing with action, stations in 9H, EA3, IT9, 9A were S9+ all over the Country.

In the afternoon things really heated up, at 1300z SV10H, SV1AB were heard with good pile-ups into the UK, at 1345z the 5B4CY beacon on Cyprus (50.499MHz) was S9+ and stayed like it for the next five hours. Others reported were EH7s, S57AN, and many Italian stations. Around 1500z Ralph 4X11F (Israel) reported signals from GJ on 28.885MHz, so I had to work him! Then a few minutes later and OD5SIX (50.078MHz) was heard at S2/3 in GJ (remember this beacon - built in Jersey) what a surprise!

144MHz opens up

At 1545z the M.U.F. had risen so high that 144MHz opened between France and Greece and CN8ST to HB9, 4X11F was S9+ on SSB (on 50MHz) and then T.E.P. enhanced by the 'ES' brought 7Q7JL from Malawi at S9+++ and ZS6s were heard. HB9QQ worked stations on 144MHz in Greece, at 1700z things were still alive and kicking, as, 4X11F

The Meteo-Sat dish described last month





Dave OZ3SDL also G3SDL operating /P in Portugal

was still S9+ on six and so was the 5B4 beacon. More countries became alerted to what was happening and joined in the fun, OM3PC, OKs, DLs, EH7s, Fs and others took advantage of this early season Sporadic 'E' event. Reports came in stating things were still alive at 1900z, what a day, and certainly the best 'ES' in May for many years!

The 13th didn't bring bad luck, just more firsts, with G4UPS working UC2AA for the first ever contact with the UK. Later that day CT3FT was into the UK for over three hours at S9+, along with CN8ST and ZB0T, but yet again no beacons were heard from CN or ZB so we presume that they are not operational. At 1630z V51VHF and ZD8VHF were both S9+ for about 40 mins with the 'ES' enhanced T.E.P.

The next day could have brought a real cracker, as JX3DA heard G3SYC in Yorkshire but had to go QRT for work, typical! For the next few days there was good propagation between the UK and Poland, Finland, Estonia and Sweden, but where had UC2AA got to when the band was open in his direction?

On the 17th there was T.E.P. into the Med' area, and this then coupled up with 'E's' to bring 5R8DG (Madagascar) into Holland for the first time ever. Another test with Fred C31HK this time brought fruitful results, on the 19th he was 54 via tropo into GJ for about one minute, but could be heard most of the

test very weakly and notched up his second country on the band. Tropo tests are really worth trying on 6m, you can often be surprised at the results.

Another new one heard during May was UB5BW, he was heard by Mike G3MY and others in the north of England. Yet another new one showed up into the UK on the 27th, this was EV9A (KO43) in Byelorussia. On May 31st things got going again with a massive opening between northern SM (J81) and CT3FT plus EA8/DJ3OS (not legal!), but later EH8ACW/IL28 appeared on the band and he is legal. It was also reported via CN8ST that EA stations worked into HK1 (Columbia) and the W4 area via multi-hop 'ES'.

Dave G0DJA reports a quite month on 6m due to having no spare time (I know the feeling Dave), however he did bag EH7, I, OH, DL, and SMs via 'ES' on the 29th and 30th. Our friend Ela G6HKM (Essex) pulled off some nice new ones during May, these included: C31HK, CT3FT, EV8A, and lots of new squares in Poland and Italy.

Into June now and things were really hotting up on 50MHz, Paul G4CCZ (Surrey) and Chris G3WOS both reported the OD5SIX beacon on 50.078MHz at S4 on June 1st in the early evening, plus many reports that EA8ACW in the Canaries was blasting the UK. Other new ones on the band were YO4BZC in KN45 near the Black

Sea and Fred C31HK in Andorra. During the openings on this day there were a substantial amount of thunderstorms around, of which some people say may be the cause for Sporadic 'E' openings.

Operating News

If you were lucky enough to work Dave OZ3SDL/G3SDL during June when he was in EA6 and operating from JM08 and JM09 as EA4BG/6, then his QSL info is; Dave Court, Egebakken 18, DK - 3520, Farum, Denmark.

A new 50MHz beacon has appeared, this is EA8SIX on 50.075 and it is located in IL29. This should prove very useful for those openings to South America (joke!)

Watch out during August for prefix 3V. A group will be operating HF including 50MHz as part of the package, this is very rare so don't miss it!

The higher bands

Great news has just been received that a European amateur has claimed and been awarded DXCC on 144MHz. ARRL confirm that Arne SM7BAE has picked up the award which is Number 3, the other two being claimed by Dave W5UN (#1) and KB8RQ (#2). Congratulations to all.

As mentioned earlier, the 12th was a good day on the VHF bands. The M.U.F. soared over 144MHz which is very early for mid-May, Ela G6HKM reports that during the big 'ES' of May 12th she picked up her first SV, working SV3KH at a distance of 2269km, IK7LUXY (JN90) was also worked during the event. On the 25th Ela had a pipeline to GM and worked GM0HTT (Orkney), GM0ILB (IP90), GM4GUF (IO85) and GM1TUD (IO87), with the Lerwick 144MHz beacon coming in at S9.

Loss of another great amateur

It is with sad regret that we have lost Geoff G3ENY. Geoff was a very keen operator on all VHF bands for many years, his VHF/UHF activities had spanned many solar cycles, Geoff was also a staunch watcher of solar activity and solar figures over many years which helped us all to learn a little about propagation. HRT passes its condolences to his family and friends.

Well that's another month gone by, and at last some action on 50MHz for a change after a quiet six months or so! Thanks to all contributors, and please send any reports to; Geoff Brown GJ4JCD, TV Shop, Belmont Rd, St Helier, Jersey, C.I. or Phone/Fax 0534 77067. Next Month; QSLing on VHF.



G3XTT in 1972. Heathkit DX-1000 transmitter, AR77 receiver, and Heathkit 2m transceiver (plus assorted junk!)

HF Happenings

Don Field G3XTT looks back over 25 years of HF operating

I'm starting to put this column together in early June, shortly after National Field Day (NFD). My local club, the Reading and District Amateur Radio Club was the only group in the country to enter each section. G3WGV and I operated in the Open Section, with a team of willing helpers who erected our two towers and several masts to support a TH5 triband Yagi, a Cushcraft 2-element Yagi for 40m, and various wire antennas for the lower bands. Our 'B' station entered the Restricted Section, where entrants are limited to a single wire antenna no more than 10.66m high. We also had a 'C' station in the Low Power category, where several of our Novice licensees were able to get a first taste of contest operating, though I have to say it was very much like being thrown in the deep end. Anyway, they coped well and, I feel sure, learned something from the experience. As so often in this contest, the gods of propagation had a surprise in store. In this case it was a solar disturbance which knocked out the high bands and made it very much a low bands contest. This is one of the things which makes contest operating so much fun. Whatever grand plans you might make beforehand, you have to be on the ball during the contest itself, adjusting your factors to make the best of the propagation you find on the day. And, of course, coping with whatever other unanticipated factors come into play; in our case a computer failure which

necessitated reverting to paper logging for about two hours while a fresh computer was brought to the site and loaded with the necessary software.

The weekend before NFD I was able to get in some useful practice by operating in the CQ WPX (Worked pre-

G3XTT get serious - a J-beam TB-3 tribander, installed in 1981.



fixes) CW Contest. For once I was confined to a vertical aerial for the higher bands, my TH5 having been taken down in readiness for NFD. I have a Cushcraft R5, which I installed on the chimney, a fairly typical installation for those of you with limited space. Nevertheless, in the course of some very casual operating (I had to make a 150 mile round trip to relatives, lay a carpet and do a host of other household jobs during the same weekend) I was able to work quite a number of interesting stations. I thought it worth listing some of them here, not to blow my own trumpet, but to show that big aerials really are not essential to work DX, especially on CW (Morse) and especially during a contest when contacts are short and sharp. 10m propagation was relatively poor East/West, though I did work 9V1YC in Singapore, but the rest of my contacts were mostly to the south, including FH/DK5WL (Mayotte), 7Z2AB (Saudi Arabia, also worked on 15 and 20), ZX0F (Fernando do Noronha, also worked 15 and 20), 5U7M (Niger), DL1VJ/T5 (Somalia) and 5T5CJ (Mauritania). I also had a very good run into Europe on the Sunday afternoon when Sporadic E conditions led to very strong signals from Germany and from Scandinavia. Calling CQ, I was able to work 56 stations in 35 minutes, a rate of almost 100/hour. Again, not bad without a beam. 15m propagation in the contest was really quite good, with Japanese stations workable both morning and evening, and at good signal strengths. My DX contacts included 9K2ZZ (Kuwait), 5Z4TT (Kenya), P40J (Aruba), FY5FP (French Guiana), KG6DX (Guam), HT1T (Nicaragua) and HV35J (Vatican City). 20m brought me contacts with 9Y4H (Trinidad), BT1BJ (China), 5U7M (Niger), JU5DX (Mongolia), ZF2NE/8 (Cayman Islands) and FM5CW (Martinique).

The 9M0S Spratly Island expedition also finally appeared just before the WPX contest weekend. I was able to put them in the log on 17 and 40m, and I know other UK stations managed contacts on 12, 15, 20 and 30m. I heard them on 80m, but I don't know whether any UK amateurs managed a contact.

The other operation worthy of note was E35X from Eritrea, put on by a group of Norwegian amateurs very soon after the Eritrean people voted overwhelmingly for independence and the country formally separated from Ethiopia. As I write this I have yet to work this station (which is still active), but Eritrea is bound to be added to the DXCC country list in the near future. Mind you, I anticipate that there will be regular activity from there over the coming months, so there is probably no panic to get a contact in the log.

Celebrations

In September I celebrate 25 years as a licensed amateur. I hope, therefore, that readers will allow me a little nostalgia. Although the Class B licence was in existence in 1968 it was still very much a licence for experimenters, as very little off-the-shelf VHF equipment was available. Indeed, when the Class B licence was first introduced, it didn't include 2m, but only the UHF and microwave bands. So, having cut my teeth on HF band listening, both amateur and broadcast, I was determined to go for the Class A licence at the outset.

There was some Japanese HF gear available in '68, though anyone who wanted the best still bought American, the Drake B-line and the Collins S-line dominated the top end of the market. In the UK, KW Electronics manufactured a range of HF equipment including the popular KW-2000 transceiver. All this equipment used valves; transistor technology was in its infancy and unable to give the performance which the more discerning amateurs were looking for. And, although SSB was on the increase, there was still a lot of AM (amplitude modulation) to be heard on the HF bands. As an impecunious schoolboy I certainly couldn't afford SSB equipment, so I built myself a receiver from a Japanese kit (a Lafayette KT-340, made under licence for Lafayette by an up and coming Japanese manufacturer by the name of Trio). My transmitter was a Codar AT5, a British-made 10 watt AM and CW transmitter for 80 and 160m, which I replaced about a year later with a Heathkit DX-100U, a 150 watt AM and CW transmitter covering all the HF bands. This latter was a massive piece of kit as any of you who are familiar with the workings of AM will appreciate. Not only did it need a modulation transformer but, because AM requires a carrier to be transmitted continuously, the mains transformer was far bigger than in a modern SSB transceiver. It wasn't until 1973, when I left university



Gary VE3XN operates my station in the 1983 WPX contest.

and started work, that I blew one of my early pay cheques on a secondhand Yaesu FT-101 Mk1 transceiver. Its receiver overloaded horribly, especially on 40m, but it *did* get me onto SSB for the first time.

What was around on the bands back then? There were far fewer DXpeditions than now, although some of today's well-known DXpeditioners such as OH2BH were beginning to get their feet wet (I recall Martti operating from the Gambia and from Lebanon around that time). However, Portugal had still to disband its empire so CR6 (Angola) and CR7 (Mozambique) stations were common, and there was still plenty of activity by British ex-pats operating from all corners of the Commonwealth. While countries like China, Burma and Albania were closed to amateur radio, other countries which were later to become well-known trouble spots were still at peace and amateur radio activity was quite common. Cambodia, Iran and Afghanistan are three examples. Only a handful of countries were licensed to operate on 160m; after several years of fairly serious DXing on the band my country

total was still only around 20. The *Worked All Britain* award came into being around this time and has gained in popularity ever since. I still find myself in demand for having one of the very early book numbers, and well recall running the 40m WAB net on 40m during my university holidays, with the net following me around the band as my DX-100U drifted about!

Yet in many ways HF operating hasn't changed much. Although there have been great improvements in equipment, success on HF still owes much to operating skill and to aerials, and there has been little progress in either of these areas. There have always been skilled operators and, in the UK at least, it has if anything become more difficult to erect decent HF aerials as planning rules have become stricter. Certainly the sheer number of HF operators has increased, with much higher participation in contests, bigger pile-ups when major expeditions take place, and generally a higher level of activity on the bands. However, to compensate, at least in part, we gained three more HF bands as a result of the WARC (World Administrative Radio Conference) in 1979, and these are increasingly taking more of the strain.

For my own part, my interest in HF has continued, despite occasional lapses to chase DX on 6, 4, 2 and even 70cm, and I have gradually improved my station as finances and space have permitted. I have also greatly enjoyed the opportunity to join with others in mounting DXpeditions or contest operations. It has often been said that amateur radio attracts those who prefer to avoid people and to sit in a small room full of throbbing equipment (and, yes, Tony Hancock's *The Radio Ham* was popular around the time I was licensed), but over the years I have found probably more pleasure in the social side of the hobby than in actually getting on the air, and it is especially pleasant to meet and put faces to those disembodied voices as I travel around the world for pleasure or on business.

Of course, my 25 years in this hobby (plus about two years' of SWLing before that) is very modest compared with many, but I plan still to be working the DX in another 25 years as there are so many aspects in terms of bands, modes, aerial experiments, etc. still to try. I included a photograph of my original 1968 station in the October 1991 HF Happenings, but this month's photos give a flavour of how my station has evolved since then.

Finally, congratulations to Chris, G4BUE, who recently completed 5-band Worked All Zones exclusively on CW, the first UK amateur to achieve this. Well done.

G3XTT at his rig in 1992



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Club News

Acton, Brentford & Chiswick RC meet at 7.30pm on the third Tuesday of each month at the Chiswick Town Hall, Turnham Green, Chiswick, London W4. New members welcome. Club diary;

Aug 7th Communication receivers, discussion.

Further details from Colm Mulvany G6JRY, Tel. 081 749 9972.

Aylesbury Vale RS meet on Wednesday evenings in the Village Hall in Hardwick, located off the A413 between Aylesbury and Buckingham. Club events;

Sep 1st Visit to RAF Croughton.

Sep 15th Foreign QSOs, by Liz G0ETU.

For more details and meeting times, contact Martin G4XZJ, Tel. 0296 81097 or Roger G3MEH, Tel. 042482 6651

Basingstoke ARC meet on the first Monday of each month, 7.30pm, at the Forest Ring Community Centre, Sycamore Way, Winklebury, Basingstoke, Hants. Planned club diary;

Oct 4th AGM.

For further details Tel. 0256 25517

Barnsley and District ARC was formed in 1913, and meets every Monday night in the radio shack at the rear of the Darton Hotel, Station Road, Darton, Barnsley, S. Yorks, S75 5AA. Anyone interested in radio or the Novice licence is most welcome to attend. Forthcoming club events/talks;

Aug 9th On the air night with GB4AXR.

Aug 16th Ex-military equipment, by Eric G3MWN.

Aug 23rd On the air with GB4AXR.

Aug 30th Real homebrewed beer, by Roy G4YDI.

For further details contact the Club PRO Mr. J. Caleton-Scott, G4LRS at above address.

South Birmingham RS meet at West Health Community Association, Hamstead House, Fairfax Road, West Heath, Birmingham 31. Planned club diary;

Aug 4th MAXPAK packet demo, G1DKI.

Nov 3rd AGM.

For further details tel. 021 474 3784

Bristol (South) ARC meet every Wednesday at the Whitchurch Folkhouse Association, Bridge Farm House, East Dundry Road, Whitchurch, Bristol. Club diary of events/talks;

Aug 4th 70cm activity evening.

Aug 11th Computer shareware evening.

Aug 25th Magazine exchange.

Sep 5th Bristol rally, Brunel train shed.

For more information and meeting times, telephone Whitchurch 832222 on a Wednesday evening.

City of Bristol Group meet on the last Monday in the month, 7.00pm for 7.30pm, at The Small Lecture Theatre, Queens Building, University of Bristol. Club diary of events/talks;

Sep 27th History and use of oscilloscopes.

Further details can be obtained from Dave Coxon G0GHH, Tel. 0275 855123

Bromley and District ARC meet on the third Tuesday of each month, 7.30pm for 8.00pm at the Victory Social Club, Kewhill Gardens, Hayes, Kent. Club events/talks;

Aug 17th BBO/calibration/operating evening.

Sep 21st Introduction to electronics, Graham Chamberlain.

Further details from Alan G0TLK, Tel. 081 777 0420

Bromsgrove ARC meet on the second and fourth Tuesday of the month at Lickey End Working Men's Club, Burcot, Bromsgrove. Club diary of events/talks;

Aug 10th Safety in the shack.

Aug 24th HF night on the air.

Sep 14th Technical topics.

Sep 28th RTTY night on the air.

Further details from Barry Taylor G0TPG, Tel. 0527 542266

Bromsgrove and District ARC meet every Friday night for on-air, construction, and natter nights at Avoncroft Museum of Buildings and Arts Centre. Main meeting

2nd Friday of each month at 8.00pm at Wasely Country Park. Technical advice and Morse tuition is available from experienced members. Planned club talks/events;

Sep 4th SSB Field Day - Avoncroft.

For further details contact Joe Poole G3MRC, Wasely Country Park, Gannow Green Lane, Rubery B45 9AT, Tel. 0562 710010

Buxton ARC meet at the Lea Wood Hotel, Buxton, at 8.00pm on the second and fourth Tuesdays each month. Club diary of events/talks;

Aug 10th Aerial topics.

Aug 24th Video night.

Sep 14th Amateur radio licence discussion.

Sep 28th Talk by Clive G4FZH.

For further information contact Derek Carson G4IHO, Tel. 0298 25506

Chapel Green ARS meet at the Chapel Green Project, 230 Lane End, Chapelton, Sheffield, every Thursday from 6.30pm. They tell us that they are running a course on 'How to use Packet Radio' on Wednesdays from 6.30pm - 8.30pm, run by Tony 2E1AGR. Also a Novice course will start in September 1993.

For further details contact Club Secretary Roy Saunders, 2E1BJD at the above address, or Tel. 0742 846720

Charnwood AR Contest Club meet every first and third Sunday in the month at The Albion, on the canal bank, Loughborough. The club are grouping together interested amateurs to form an AM operators' clan in the area and elsewhere, hoping to experiment in long range propagation. If you are interested please contact Mike G0LBP, 25 Rivington Drive, Loughborough, Leics LE11 0EJ. Club diary;

Aug 15th Aerial discussions.

Aug 29th Club field day.

Sep 4/5th NFD contest.

Sep 19th VHF night on the air.

Further details from Phil G4RYW, 21 Alan Moss Road, Loughborough, Leics LE11 0LX, Tel. 0509 232927

Mid Cheshire ARS meet each Wednesday, 8.00pm, at the Cotebrook Village Hall, Cotebrook, Cheshire. They run Morse and RAE classes. Planned club events/talks;

Aug 4th Equipment night.

Aug 25th On air night.

Further details from M. Baguley G7QLD, 21 Sovereign Close, Northwich CW9 7XN, Tel. 0606 331210

Chichester and District ARC at 7.30pm on the first and third Tuesday each month at St. Pancras Hall, St. Pancras, Chichester. Planned club events/talks;

Aug 3rd Aerial and feeder fundamentals, by G3JUS.

Aug 17th Simple amateur band aerials, by G3DX.

Further details from D. Clear G0KNU, 1 Milestone Cottages, Fishbourne, Chichester, West Sussex, PO18 8AU. Tel. Chichester 573541

Cray Valley RS meet on the first and third Thursday of each month, 8.00pm at the Progress Hall, Admiral Seymour Road, Eitham SE9, club net 3.720MHz 8.00pm every Monday. Planned club diary;

Sep 2nd Military radio, by G7KQO.

Sep 16th Ballooning with Richard Branson, by G4SOT of loom.

Oct 7th Surplus equipment sale.

For further details contact Bob Trencher BRS 32525, Tel. 081 850 1386

Crowborough & District ARS meet at The Plough and Horses, Crowborough at 8.00pm. Planned club diary;

Aug 28th No meeting.

Sep 23rd PDSL software or logging with computers.

For further details contact club Secretary Michael Smith G6UJO, Tel. 0892 661807

Crystal Palace and District RC meet on the third Saturday of each month, 8.00pm, at the All Saints Parish Rooms, Beulah Hill, London SE19 (opposite junction with Grange Road). Regular club net each Wednesday at 8.00pm on 144.7125MHz. Planned club diary;

Aug 21st Active HF/VHF radio station, and informal evening.

Oct 16th Quiz night.

Further details can be obtained from Will Taylor G3DSC, Tel. 081 699 5732 or Bob Burns G3OOU, Tel. 0737 552170

Dereham ARC meet at the St. Johns Ambulance Hall, Yaxham Road, Dereham, at 8.00pm. Planned club talks/events;

Aug 12th BBQ and informal.

Sep 9th Equipment review.

For further details contact Mark Taylor G0LGJ, Tel. 0362 691099 or G0LGJ @



CQ de G8IYA

Editorial

Is there any commercial future for amateur radio kit manufacturers?



As I write this, the summer rally season is in full swing. In wandering around the stands, as well as seeing the 'black box' dealers with their ever-so-nice shiny rigs, it's good to see plenty of 'component' and 'surplus gear' stands, where you can often get real bargains if you know what you're looking for. Another thing that's evident is the growing popularity of UK-manufactured kits, with several such traders having stands and doing a good trade. All this helps 'new blood' get started in the hobby.

Problems?

But if you remember reading my Editorial a few months ago in HRT, you'll remember that I warned of the forthcoming necessity for EMC certification of all commercially available amateur radio equipment to be sold in Europe.

'OK' you say, the big equipment manufacturers will have to start testing their sets to make sure they comply with the EMC requirements. They'll have to cut their profit margin' you'll probably also think. Well that's unlikely in the real, competitive, world. Someone, somewhere has to pay for this, and where several manufacturers, Icom, Kenwood and Yaesu for example, are in competition for your hard-earned money, you'll be sure they want to keep the price of their bit of gear competitive to try to make you buy *their* gear in preference to some from another

manufacturer.

A typical cost of EMC certifying a small HF receiver in a test laboratory is around £4000. So, if they sell 1000 of them, that's £4 on the cost of each one to cover the EMC testing costs. To this is added the manufacturer's time, effort, and extra components etc. in each set to make sure it has a chance of complying with the specification, say a few pounds more per set. Well, this isn't too much in comparison with, say, a selling cost of around £1000 for the set itself, is it?

What about kits?

But kits also need EMC certification. Most of these don't cost megapounds, a typical example would be a direct conversion receiver kit, selling at around £30, maybe with the kit put together by the proverbial 'chap running his business from his garage'. Amateur radio kits are a specialized, and by that I mean *limited*, market. This market is often solely within the country the small kit supplier lives in, simply because he isn't 'geared up' for export sales and advertising. His sales are often through his attendance at rallies with his small trestle-table stand, together with the occasional 'small ad' in magazines. If, say, the manufacturer sells 100 of one particular model over its lifetime, then a £4000 testing fee equates to £40 per kit. This then puts the total price of the above example up to £70. Would he still be able to sell 100 of them at that price? Would he manage to find £4000 to put 'up front' before even starting to advertise any models of that kit in the first place.

Now, how about a Morse practice oscillator kit? That has to meet the EMC requirements as well. What about an add-on digital frequency readout? Or an automatic CW keyer? Where does it end?

Different avenues

Fortunately, all is not lost, as there are a couple of avenues open to EMC certification of equipment solely for amateur radio use. One is 'Self Certi-

fication', where the manufacturer does his own tests, with his own test equipment. This test equipment includes a spectrum analyzer, a signal generator, an electrostatic discharge gun, a radio test site with watts of RF power fed to a nearby aerial to see if the set under test is 'immune' from it, DC transient testing gear, and so on.

The other route is a 'Technical Construction File' certified by a 'Competent Body'. Here the manufacturer puts together a formal document of all the circuits, layouts, build standard, photos of the completed kit, measures taken to reduce EMC, and the results of the tests he's carried out (similar to the above for 'self certification'). He then takes this to a 'competent body' for certification, who'll look over it and may point out any further action or tests needed which the manufacturer should do. He then, naturally, gets charged by the competent body for the appraisal and eventual certification, typically two or three hundred pounds a time.

Large commercial organisations may already have this test gear 'in house', especially if they also produce equipment for the professional radio communications market. The kit supplier however may be able to 'knock up' his own test gear, a home-made spectrum analyzer for example, 25W 2m and 70cm FM transmitters for the 'RF field immunity' tests, it's also been suggested that a modified piezo gas lighter could be used to generate a suitable electrostatic discharge to feed to the exposed connectors etc. of the set under test.

But to the kit manufacturer, this still means more time spent on each kit, more costs, and the need to find more money 'up front' for each and every new kit. Which still means more cost to the kit builder, i.e., *you*. And if the eventual cost is too high, you won't buy it, so the kit supplier goes out of business.

Could this be the 'death' of the small kit supplier in the UK? Several of these have now formed themselves into an Amateur Radio Kit Manufacturers Association, and they hope to lobby the 'powers that be' in the EC to get the EMC requirements for amateur radio kits changed. I'll keep you posted on how they get on. One thing's for certain though, they may appreciate a letter or two of support from you to 'add weight', you know who the suppliers are.

'Ere mister, how much is this Morse practice oscillator kit so I can use it on my Novice course? Just £80 to you, young sir, £9.95 for the kit and £70.05 for the EMC tests. Mind you, that's the price if you get together with some others and buy 50 of them, so I can spread the cost of the EMC tests.

Essex Valley RS meet at the BBC Club, Penrith, 7.30pm, every other month. Club diary.

Sep 30th Video night.
For further details contact John Pape G0NYO, Tel. 07683 521065/51248

Edgware and District RS meet, at 8.00pm, at the Watling Community Centre, 145 Orange Hill Road, Burnt Oak. They have Morse practice sessions, and run club nets on Mondays and the last Sunday of each month. Visitors always welcome. Planned club talks/events;

Aug 26th SSB field day briefing
Further details can be obtained from Rod Bishop G0SQL, 99 St Pauls Avenue, Kenton, Harrow, Middx, Tel. 081 204 1868

Exeter ARS meet on the second Monday each month, 8.00pm, at the Community Centre, St Davids Hill, Exeter. Planned club events/talks;

Aug 9th Barbecue.
Sep 13th Club visit.
Further details from B. L. Bolt, Tel. 0392 214204

Fakenham ARC meet on the first Tuesday of every month at the Trinity Church Room, Hempton, 7.30 for 8.00pm. All are welcome. Diary of events/talks;
Aug 16th GB2FSW, Fakenham Splash Week begins.
For further details contact Dave Jarrett, Tel. 0485 528633

Halifax and District ARS meet at 7.30pm on the first and third Tuesdays each month. The first Tuesdays are informal 'Noggin and Natter' nights, other planned club events/talks;

Sep 21st AGM.
Further details can be obtained from Mr. D. Moss G0DLM, Beechwood Lodge, Lightcliffe, Halifax HX3 8NU, Tel. 0422 202306

Haslings Electronics and RC meet every third Wednesday of each month for their main meeting, at the St. Leonards Sea Anglers Club, Grand Parade, St. Leonards. They run RAE and Novice courses. Planned club events/talks;

Aug 18th Annual 'bring your things' competition.
Sep 15th Concorde, by Keith Ellis.
For further details contact Reg Kemp G3YFF, Tel. 0424 83454

Hoddesdon Radio Club meet alternate Thursdays at the Conservative Club, Rye Road, Hoddesdon from 8.00pm. Visitors very welcome. Club diary of talks/events;

Aug 19th Tolmers Park.
Sep 11th Hoddesdon Carnival.
Sep 16th First aid in the shack, by Nurse Jane Churchill.
For more information contact Roy GAUNL, Tel. 081 804 5643 afternoons, or Peter Fairhurst G0KLU, Tel. 0992 33036 evenings.

Hordean and District ARC meet on the first Thursday of each month at Hordean Community School, Barton Cross (off Catherine Lane), Hordean, Hants. Club diary;

Sep 2nd Raynet, by Dick G0MNL.
Oct 7th AGM.
Further details can be obtained from Stuart Swain, Tel. 0705 472846

Horsham ARC meet on the first Thursday each month, 8.00pm, at The Guide Hall, Denine Road, Horsham, W. Sussex. Planned club talks;

Aug 5th Automated TV transmission, by Robin G3OGP.
Sep 2nd The night sky, by G3PYC.
Further details from Peter Stevens G8SUI, Tel. 073784 2150

Isle of Man ARS meet every Monday, 8.30pm, in The Royal Naval Association HQ, Regent Street, Douglas (opposite the main post office). They also meet every Thursday, 9.00pm, in The Manx Legion, Douglas Street, Peel (opposite Lloyds Bank). They have a monthly main meeting on the first Monday each month at the Royal Naval Association HQ. Planned club event; Aug 28th Special event station GD3FLH from Point of Ayre. For further details contact club Secretary June Wigley G07DPG, 20 Fairy Hill Close, Ballalessa, Port Erin, IoM, Tel. 0624 834257

Keighley ARS meet at the Cricket Club, Ingrow, near Keighley every Thursday at 8.00pm. Most club meetings are 'Natter nights', other events/talks include;

Aug 12th Naylor Bros. car restorations visit.
Aug 19th Ideas for club events in 1994.
Aug 26th Treasure hunt.
Sep 2nd Packet on the air G0X0RS Gx7KRC.
Sep 9th Foxhunt.

Sep 16th Quiz vs. Northern Heights, pie and peas.
Sep 30th More packet G3TOA.
Further details from Kathy Conlon G1GH on 0274 496222

Kettering ARS meet every Tuesday at 7.30pm at The Electricity Sports and Social Club, Eskdale St. Kettering. Club diary of events/talks;

Sep 14th Water distribution, radio comm., and control by Anglian Water.
Further details from Len G0ROV (was G7EHM), Tel. 0536 514544

Leiston ARS meet at 8.00pm, on the first Tuesday of each month at Sizewell Visitors Centre, Sizewell Power Station. Planned club diary;

Aug 31st Felixstowe quiz.
Sep 7th Talk by Andy Nunn G8AXO.
Further details from Bob Simmons G0HSI, Tel. 0986 874800

Liverpool and District ARS meet at 8.00pm every Tuesday evening at The Churchill Club, Church Rd, Wavertree, Liverpool. Planned club events/talks;

Aug 10th Gx3AHD on the air.
Aug 17th Quiz.
Aug 24th Medical Electronics.
Aug 31st Surplus sale.
For further details contact Ian Mant G4WXX, Tel. 051 722 1178

Loughton and District ARS meet 7.45pm, in Room 12, Loughton Hall, Rectory Lane, Loughton, Essex. Planned club events/talks;

Sep 3rd CW operation from Lancaster bombers in WWII, G4P5Y.
Sep 17th Testing printed circuit boards, John G8DZH.
Further details can be obtained from Ray Pedley G0LWF, Tel. 081 500 2811

Maidenhead and District ARC meet, 7.30pm, at The Red Cross Hall, The Crescent, Maidenhead. Planned club events/talks;

Aug 5th BBO, at Max G7DXK's OTH.
For further details contact Neil G8XYN, Tel. 0628 25952

Manchester and District ARS meet at 7.00pm on a Tuesday evening in the Smpson Memorial Hall, Moston Lane, Moston, Manchester M10 9NB. Free RAE courses and Morse tuition available;

For further details call on a Tuesday evening, or contact course tutor Barrie Langford G3JCA, Tel. 061 681 5406

Mansfield ARC meet on the second Monday every month, 7.30pm, at The Polish Catholic Club, 37 Mansfield Lane, Woodhouse Road, Mansfield. Planned club diary of events/talks;

Aug 9th Foxhunt and BBO
Sep 13th Evening on the air
For further details contact Roy G3JZA, Tel. 0623 755288

The Midland ARS at the Regent Palace, of Caroline Street, Hockley, Birmingham, say they will be holding RAE and Morse classes this autumn starting on September 15th at 7.30pm. The courses are aimed at beginners and will run until May of 1994. For further information contact John Grate G0LAI, 194 Brays Road, Sheldon, Birmingham B26 2PP, Tel. 021 526 7632

Norfolk ARS meet every Wednesday, at The Norfolk Dumping, The Livestock Market, Harbord Road, 7.30 for 8.00pm start. They now have a new Committee who are: Chairman, Steve Snelling G0KWP, Secretary, Dale Simkin Tel. 0603 37393, and Treasurer, Richard Duval G0JAG. Club diary of events/talks;

Aug 11th Red Radio, bring your oldest piece of working equipment.
Aug 18th Antenna workshop, bring any HF aerials if possible.
Aug 25th Scheme for al. Arnold G3PTB.
Further details can be obtained from Sheila Snelling G0KPW, Tel. 0603 618810.

Nottingham ARC meet every Thursday, 7.30pm, in the Sherwood Community Centre, Mansfield Road, Nottingham. Visitors interested in amateur radio, whether as a transmitting amateur or SWL, are most welcome. Forthcoming events/talks include;

Aug 12th Visit from Castle Electronics.
Aug 19th Foxhunt No. 5/activity.
Aug 26th Construction/activity.
Sep 9th Talk by G6ABU.
Sep 16th Foxhunt No. 6/activity.
Sep 30th Monolithic Microwave ICs, by Paul Beastall.
For further details visit to club address above.

South Notts ARC meet every Friday, 7.00pm, at Highbank Community Centre, Farnborough Road, Clifton Estate, Nottingham, and have regular construction nights



at Fairham Community College, they plan to start RAE, NRAE, and Morse courses there this September. Other planned club events/talks:
 Aug 6th Mobile HF - aerals and mobile FSTV, Barry GOLCU.
 Aug 14/15th Club field day/S and BBQ.
 Aug 20th Visit to Notts Traffic Flow Management Centre.
 Aug 22nd Fox hunt.
 Aug 27th Junk sale.
 Sep 4/5th SSB field days.
 Sep 10th Talk on SNARC sponsored NRAE, RAE, and Morse courses by G4RHF, GOLXU, and GONVS.

For further details contact Julian GOLXX, Tel. 0602 211 066, or Roy G'ENK, Tel. 0602 841940.

Reading and District ARC meet on the second and fourth Thursdays 8.00am, at The Woodley Pavilion, Woodford Park, Woodley, Reading, RG9 6AA. The club tell us they have obtained recognition from the City and Council for their meeting place to be a examination centre for the RAE and NRAE and shortly for the ARRL exams for the US licence as well. They also run RAE and NRAE courses. Diary of events/talks:

Aug 12th HF SSB contest and members discussion night.
 Sep 10th Club meeting only.
 Sep 23rd Auction night only.
 Further details contact Brian Shelton G0MEE, Tel. 011 360 2453, 50 Pitceol Ave, Reading, Tel. 0734 212349.

Southampton ARC are currently recruiting and are actively looking for new members to join their club. They are offering evening membership, Novices, SWL, old timers and young people. The club meets at 7.30pm on the 1st Monday of each month at the school, Green Lane, Southampton. You can get further details from Tony G1UWL at P. O. Box 249, Southampton, SO8 7SU. If you are interested you will be made most welcome.

Southgate ARC meet on the second and last Thursdays of each month at the Woodchase Club, District Club Pavilion, Firs Lane, Winchmore Hill, London N21. They tell us they have Novice courses run by club members with many years of experience in the hobby of amateur radio. The training involves soldering, practical exercises, and the opportunity to use test equipment and various items of radio while under supervision. For further details contact Brian Shelton G0MEE, Tel. 081 360 2453.

Stotport ARS meet on the second and fourth Wednesdays each month, for details of their meeting place contact Club Secretary Jim G3KAF, Tel. 061 439 4952. Planned club events/talks:

Aug 11th What your mother never told you about multi-track recording, by Howard Gregory.
 Aug 25th Non-packet data systems, by Bill Green.
 Sep 8th Pulsars - time keepers of the universe, G0DMU.
 Sep 22nd Surplus equipment sale.

Stourbridge & District ARS meet on the first and third Mondays each month at The Robn Woods Centre, Scotts Road, Stourbridge. There are no meetings during August. Planned club diary:

Sep 6th On air
 Sep 20th Transformers, by Bob G4VPE.
 For further details contact James French G7HEZ, Tel. 0384 374354

Stratford upon Avon & District RS meet at the Home Guard Club, Main Road, Tredington, Stratford upon Avon, at 7.30pm. Club events/talks include:

Sep 13th Open evening
 Sep 27th Evening with Gerald Marcuse, son of Gerald, founder of Empire Broadcasting
 Oct 11th Badger Boards and Kits, with John Badger G4YZO
 Oct 27th BATC, with Mike Wooding G6ICM
 Details from A. Beasley G0CXX, Tel. 060 882 495.

Surrey Radio Contact Club meet on the first Monday of each month at TS Terra Nova, The Walkons, Waddon, Croydon, Surrey. Planned club talks/events:

Sep 6th Fibre optics.
 Oct 4th Surplus sale.
 For further details contact Bernard Wynn G8TB, Tel. 081 660 7517

Sutton and Cheam RS meet on the third Thursdays each month, 7.30pm for 8.00pm at Sutton United Football Club, The Borough Sports Ground, Gander Green Lane, Sutton, Surrey. Natter nights are on the first Thursdays of each month, plus club meetings on Monday at 20.30 on 70.3875MHz, and Tuesday at 10.30 on 3.760MHz. Club events/talks:
 Aug 18th RF hazards, Fred G1HCM.

Sep 4/5th SSB field day.
 Sep 12th BARTG rally at Sandown Park.
 For further details, Tel. 081 644 9945

Trowbridge and District ARC meet at Southwick Village Hall, Southwick, Trowbridge, Wiltshire for a main meeting every 1st Wednesday of the month, and a natter night every 3rd Wednesday. Planned club events/talks:

Aug 4th Family picnic.
 Sep 1st Raynet, talk by G4TIX.
 For further information contact Ian G0GRI, Tel. 0225 864698 evenings.

Vange ARS meet on Thursdays, 8.00pm, at Barstable Community Centre, Long Riding, Basildon, Essex. Planned club diary:

Aug 5th Junk sale.
 Aug 12th Round table discussion on CW.
 Aug 19th Loading and setting up the FT-101, Roy G3ASH.
 Aug 26th Rally update.
 Further details from Davis, Tel. 0268 552606

White Rose ARS meet every Wednesday at 8.00pm, and every Sunday at 12 noon, at Moortown RUFC, Far Moss, Alwoodley, Leeds LS17 7NT. They have told us they will be running a Novice Course beginning in September. Betty Cappelluto G0PVB has asked us to let readers know that she now has no connection with the club, and so future enquiries should go to the new Club Secretary Murray Glynn G3AAS, 39 Moor Allerton Drive, Leeds LS17 6RY, Tel. 0532 665287.

Widness and Runcorn ARC meet at 8.00pm every other Tuesday evening at the Halton Scout Hut, Castle Road, Halton Castle, Runcorn, Cheshire. The club is currently running RAE and Novice courses. Further details from Dave Wilson G7OBW, Tel. 0270 761808

Winchester ARC meet on the third Friday of the month, 7.30pm, at the British Red Cross Centre, Durngate House, Winchester (adjacent to North Walls Police Station). Club diary:

Aug 20th Social evening with a focus.
 Sep 17th Junk sale.
 For further details contact Peter Simpkins G3MCL, Tel. 0962 865814

Wirral ARS meet every first and third Wednesdays, 7.45pm, at Ivy Farm, Arrowe Park Road, Birkenhead, Wirral L49 5LW. Informal meetings take place every Tuesday night at 7.30pm, new members and visitors most welcome. They run an RAE course, apply to Course Director Norman Kendrick G3CSG, Tel. 051 677 6368. Club events/talks:

Aug 11th Club visit.
 Aug 25th BBQ at Heswall shore, 8.00pm.
 Further details from Alec Seed G3FOO, 31 Withert Avenue, Bebbington, Wirral L63 5NE.

Wrexham ARS meet at Maesgwyn Road Community Centre, Wrexham (behind the Wrexham Maelor Hospital Maternity Unit). Forthcoming events/talks:

Aug 17th Field evening.
 For further details and meeting times contact D. Ian Wight G1WMLV, Tel. 0978 845858

Yeovil ARC meet every Thursday, at the Red Cross Centre, Grove Avenue, Yeovil, Somerset. Club events/talks:

Aug 5th Operating and controlling nets, by G0NMM.
 Aug 12th Activities for amateur radio clubs, by G3MYM.
 Aug 19th Discussion, airing your problems, by G3ICO.
 Sep 2nd Getting on the air for peanuts, G3ICC.
 Sep 9th 2m DF event.
 Sep 16th Power supply project.
 Sep 23rd WW2 clandestine radio, G3CQR.
 Further details can be obtained from Cedric White, Tel. 0258 73845

National and International

British Amateur Radio Teledata Group (BARTG) have a quarterly magazine, hold two contests and a rally each year. The membership officer is Peter Adams, G6LZB, Tel. 0923 220774 for details of joining the BARTG, for other information the group's Secretary is Ian Brothwell G4EAN, 56 Arnot Hill Road, Amdid, Nottingham NG5 6LO, Tel. 0602 262360, or via packet G4EAN @ GB7BAD.

G-QRP Club publish a quarterly magazine devoted to low power communication, and hold regular get-togethers. Their secretary is Rev. G. Dobbs, St. Alden's Vicarage, 498 Manchester Road, Rochdale, Lancs. OL11 3HE, Tel. 0706 31812. **International Short Wave League** who as well as running an International QSL bureau for amateurs and SWLs, have a monthly newsletter and regular get-togethers at their rally stands plus several on-air nets on HF and VHF. See their

feature in the June 92 issue of HRT. For more details send an A4 sized SAE to: ISWL HQ, 10 Clyde Crescent, Wharton, Winsford, Cheshire, CW7 3LA
The Irish Radio Transmitters Society send out regular newsletters giving details of local activities. The contact man is Dave Moore EA4BZ, 12 Castle Ave, Carrigrohilly, Co Cork. Tel: (Eire) 021 883555

Radiocommunications Agency are the radio licensing authority for the UK. They have a large number of free publications including the large booklet 'How to Become a Radio Amateur', and can offer advice on general aspects of licensing. They are based at Waterloo Bridge House, Waterloo Road, London SE1 8UA. The general enquiries point and switchboard service Tel: 071 215 2150 is open between 8.30am and 5.30pm Monday to Friday.

Radio Society of Great Britain are based at Lambda House, Cranbourne Road, Putters Bar, Herts. EN6 3JE. Tel: 0707 659015. They have a unique blend of full-time staff at Putters Bar coupled with many volunteer officials around the country. See their 'open day' feature

Subscription Services Ltd. handle the issuing of amateur licenses in the UK, on behalf of the Radiocommunications Agency. They can help regarding enquiries concerning individual licences rather than general licensing matters (which the RA handle, see above). Contact details: The Radio Licensing Centre, SSL, P. O. Box 884, Bristol BS9 5LF, Tel: (manned 8.30am - 10.00pm, 7 days a week) 0272 258333.

To include your club, or rally, in this feature, make sure you send us your events details early. We only list active clubs, i.e., those who send us their diary of planned talks/events, so if they're not listed here they've obviously not yet dynamited! Is your club listed - if not then either give your Secretary a boost or get some activities going! Dates to be included in the issue published on the 1st October must reach us by the 16th August, addressed to: The Editor, Ham Radio Today (Club News), ASP, Argus House, Boundary Way, Hemel Hempstead, Herts HP2 7ST, or you can fax your club's details direct to the Editor's desk on 0703 263429.

Rallies

August 8th

Derby and District ARS Mobile Rally, further details from Martin Shardlow G3SZU, Tel: 0332 556875

Flight Refuelling ARS Hamfest '93, at the Flight Refuelling Sportsground, near Wimbourne. Starts 10.00am, talk-in on S22. Features trade stands, bring and buy, car boot sale, craft exhibitors, and field events, overnight camping facilities available for Sat. PM. Further details from Richard Hogan G4VCO, Tel: 0202 691021

Wirral Amateur Radio and Computing Rally, at the Masonic Hall, Manor Rd, Wallasey, doors open 11am. Further information from D. Clifford, Tel: 051 639 5922, or D. Roberts, Tel: 061 476 3076

August 22nd

West Manchester RC Summer Rally, further details from G1100, Tel: 0204 2411104 evenings

August 29th

Castle Hall Computer, Electronics, and Radio Rally, Castle Hall Exhibition Centre, Slabybridge, Cheshire. Free radio club stands available, bring and buy, over 200 trade stands available. Talk-in on S22, bar and food facilities, opens 11.00am (10.30am for disabled visitors). For further details Tel: 061 681 0569
Coleraine & District ARG Radio Expo, will be at the Lodge Hotel, Coleraine (this is a new location), 12 noon, featuring amateur radio equipment displays, home computer technology, and limited indoor flea market. Food and refreshments available, admission £1, talk-in on S22. Further details from hotel reception, Tel: 0265 44848/44867, or Raymond G14MFM, Tel: 02665 58230, or Jimmy G14ORI, Tel: 0265 52393

Galashiels Club Open Day at the Focus Centre, Livingstone Place, Galashiels, featuring trade stands, bring and buy, club stands, raffle, refreshments available. Details from J. Campbell GMOAMB, Tel: 0835 22686.

2nd Gloucester Radio Rally and Car Boot Sale, will be at NAAS Lane, Quedgley, Gloucester, signposted from junctions 11 - 12 of M5 motorway. S22 talk-in plus new bring and buy stall run by Stroud Radio Club. Further details from Mike, Tel: 0452 503786

Torbay ARS Mobile Rally, further details from G3HTX, Tel: 0803 526762

August 30th

Huntingdonshire Amateur Radio Society Annual Bank Holiday Monday Rally, St. Germain Street, Huntingdon, admission £1 per person, car parking free, pitch price £5 per car, £9 for transit van, or car and trailer. Hot and cold refreshments available, 10.00am start with talk-in on S22. Further details from David Leech G7DIU, Tel: 0480 431333



September 5th

Bristol Radio Rally, Computer and Electronics Fayre, at the Great Train Shed, Temple Meads Railway Station, Bristol. Further details from Muriel Baker G4YZR, Tel: 0275 834282

Milton Keynes and DARS 7th Annual Radio Boot Sale, at Cranfield Airfield, Cranfield, off Junction 13/14 of M1. Further details from Ray G1LRU on 0908 660798, Dave on 0908 501310, or Tony G6WXM on 0908 316435.

Yange ARS Annual Rally, at the Landon Community Centre, Landon High Road/ Ashton Road, Landon, Basildon, Essex. Talk-in S22, venue is a short walk from BR Landon station on Fenchurch St./Sheeburness lane. Doors open 10.30am, admission 75p, trade stands, bring and buy, raffle, refreshments, good car parking. Further details from Mike Musgrave G4NVT, Tel: 0268 543025

September 11th

Scottish AR Convention, Cardonal College, Glasgow, further details from Tom Hughes G3MEDZ, Tel: 041 882 5753

September 12th

BARTO Rally, Sandown Exhibition Centre. Organised by the British Amateur Radio Teledata Group, who tell us the rally is of general interest to all radio amateurs, most aspects are catered for but with an emphasis on data communication. Opens 10.30am, entrance adults £1.50, OAPs £1.00, accompanied children under 14 free. Trade stands, bring and buy, on-site catering, licensed bar. Further details from Peter Nicol, Tel: 021 453 2676

Lincoln SWC Hamfest, at the Lincolnshire Showground and Exhibition centre, 4m north of Lincoln on the A15 Lincoln/Scunthorpe Rd, Talk-in by G5FZ on S22. Opens 10.30am, usual trade stands, large bring and buy, refreshments inside and outside, licensed bar, attractions for all the family. Admission £1.00 by lucky programme, free parking, caravans welcome by arrangement. Further details from Denis G1XZG, Tel: 0522 684214

September 18th

Wight Wireless Rally at the Wireless Museum, Arreton Manor, near Newport. Isle of Wight. 10.00am to 6.00pm, talk-in on S22, free entry and parking. Also free entry for trade stands, bring and buy, and car boot sale. Under cover if wet, with cafeteria. Further details from Douglas G3KPO, Tel: 0983 567665

September 19th

Peterborough RS East of England Rally, at the east of England Showground, Curlew Road, Peterborough. Admission £1.00, accompanied children free. The showground will have the rally on a non-profit basis, to help traders fall trade taxes. See G5JZG website and annual rally in general. Further details from Mike G5CZJ, Tel: 01753 229999

September 26th

The Three Counties Rally, Mansel. Further details from Eddy Cotton G4PQZ, Tel: 0985 773181

9th North Waterfield RC Rally, further details from John G4RCG, Tel: 0924 362144

October 3rd

Great Lumley Radio Rally, further details from Barry G1JDP, Tel: 091 388 5936

October 8th to 10th

RSGB International HF Convention, The Beaumont Conference Centre, Old Windsor, Berks. Talks, traders and special goods, overseas visitors reception. Further details from G4BWP, Tel: 0638 552080

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R.A.S. (Nottingham)

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HELPLINES

Partially sighted person requires tutor to study for RAE in Wolverhampton area. Jonathan Rose, Tel. 0902 305259 after 7.00pm.

Help wanted, I am seeking an operators/workshop manual for the Kenwood TH46A. I am also searching for crystal data for a Daiwa search nine 2m receiver, all costs will be reimbursed. Mike Evans (Hull), Tel. 0482 834306 after 6.30pm.

Free Ex-PMR circuits, layouts etc. available for most Pye rigs, for large SAE (state which rig), donation (e.g. £1) towards my local Novice course appreciated but not necessary. Chris Lorek, P. O. Box 73, Eastleigh, SO5 5WG, Tel. 0703 262105 6.30-8.30pm.

Paperwork for Motorola CD100 UHF PMR rig, any help would be appreciated. J. Barber G7HUI (Carlisle), Tel. 0228 26436

Manual needed urgently for Kenwood TS 520SE, not supplied when rig was bought secondhand, I will pay for manual and postage. Mike Bowden (Swansea), Tel. 0792 579242

Computer and BBS fan wishes to break into the world of packet radio, please help. What equipment, radio, software, for IBM and qualifications if any are needed. All help gratefully received. Michael Madden, 30 Park Road, South Moor, Stanley, Co. Durham DH9 7BN

Manual or EHT PSU diagram needed for Telegroup D80/84 scope (PO 16A), has anyone got EHT transformer for this, part number 120-0771-01-RNL, or spare printed circuit PC148 iss. 2. Tony Howard, 88 Church Road, Blethley, Milton Keynes MK6 6BY, Tel. 0908 373114

Circuit diagram please for Securitor type 235 mobile transceiver, and/or ex-marine receiver model 'Sailor' type 46T by S.P. Radio, Denmark. E. Chidten G3BIK (Morpeth, Northumberland), Tel. 0670 513994

Service manuals wanted for Telegraph signal generators TSG 10 and TSG 20. J. Frost, 36 York Gardens Braintree, Essex CM7 6NF

FOR SALE

Icom IC-730HF transceiver, 150W PEP, speech compressor, CW

modulator, hand mic, as new, £450. G. Maskott G0DKO (Rochester, Kent), Tel. 0634 408119

2m Cavities suitable for repeater group use, 3 cavities (notch and bandpass types) plus hexalator for single aerial working. £25 each unit or £85 the lot, buyer collects or plus p/p. Chris GAHCL, Tel. 0703 262105 6.30-8.30pm, Fax. 0703 263429.

Yaesu FT-102 HF transceiver, VGC, transmit audio has been described as BBC quality, boxed with manuals, £550 ono. Also AOR2002 scanner, 25 to 550MHz, 800 to 1300MHz, VGC, complete, with box, manuals, and Revcoche, £275 ono. Nick Major G0HFL (Sleaford, Lincs), Tel. 0529 414216

Yaesu FT-711RH 70cm mobile, complete with bracket etc., hardly used, excellent condition, £225. G. Butcher (Dorking, Surrey), Tel. 0306 887057

2m receiver, full coverage, £20. Sangean ATS 803AS/5V receiver, £50, or exchange for PC computer software, or 70cm handheld, or WHY? Call/write to: Shaun Imms, 61 Bradburne Way, Netchells, Birmingham B7 4PA

Swan 350 HF band transceiver, 80 to 10m, £200 or offers. Also computer components - 286 motherboard, video disk controller, PSU, keyboard, 1Mb RAM 9in monitor, any offers? Possibly deliver September. T. Hughes GM4DSO (Kirkcubright, Galloway), Tel. 0557 31727

Racal RA17L with manual, 500kHz to 30MHz, £150. Racal MA1105/B bargraph indicator for TTY, £30. Wanted - Marconi Atlanta receiver. G. Rigby GM8MPG (Aberdeen), Tel. 0224 589947

Save £100 on a perfect condition Yupiter VT7100 all mode scanner. All original accessories, manual, receipt and guarantee, £350. Saving up for a HF transceiver. Rob Adams (Stokeport), Tel. 0625 878876

Alnico DR112EM 2m FM mobile transceiver, complete, 25W, plus Diamond mobile whip M285, both new, unused, and boxed, £200. R. Magee (Creigiau, Mid Glam.), Tel. 0222 892425

FT-890 HF transceiver, excellent condition, never used on transmit (no mic), with manual, leads, box, plus specially imported keypad

for direct entry of frequency, little used, £1050. HF SWR meter, £35. 2-way coax switch, £15. Both boxed and little used. Nick Hobbs G71YG (Uxbridge, Middx), Tel. 0895 236397

VS-2 voice synthesizer unit for Kenwood TS-450, 690S, 850S, 950SDX, brand new in box, never fitted, cost £39 sell for £30. Stewart Green (Coerphilly, Mid Glam.), Tel. 0222 881866 anytime. AMU aerial matching unit, VSWR 2:1 max, 1.5 to 60MHz, 400W PEP, ideal for long wire or vertical whips including mobile, £95. J. Powell (Kinver, W.Mids), Tel. 0384 872921

Icom 3201E dual band mobile transceiver, 2m/70cm, excellent condition with box and instructions, 8 element X beam, Yagi, rotator, control box, ribbon, 12ft pole, and brackets, £325. Martyn Hodggets (Rowley Regis), Tel. 021 561 1128

Lowe HF 150, brand new, boxed, with keypad, whip aerial, handbook, mains unit, best offer over £250, buyer collects. T. Mason (Wolverhampton), Tel. 0902 752706

Ideal for packet radio etc., Sanyo MBC-775 colour luggable IBM-XT compatible, twin drives, full manuals including all circuit diagrams, sell for £90 in GWO, or deal for scanner up to 1300MHz, WHY? B. Nicholson (Bedford), Tel. 0234 782268 anytime please.

R&N 6m transverter, 25W output. Sale or exchange for a TNC of reasonable manufacture. R. Brodberry (Bristol), Tel. 0272 211471 daytime, or 0272 400177 evenings.

Eddystone 730/4, 0.48MHz to 30MHz, 5 bands, 15 valve, £95. 770/R, 19MHz to 165MHz, 6 bands, AM, FM, WFM, 20 valves, £95. Cash. Prefer buyer collects as very heavy. EC10, battery boxes, new, £10 plus post. Some EB37 scale glasses. Peter Lepino (Great Bookham, Surrey), Tel. 0374 128170 anytime, or Fax. 0372 454381

AKD HF converter for FRG-9600 scanner, covers 0MHz to 60MHz, £50. Ronnie Lees (Aldrincham, Cheshire), Tel. 061 928 0470

Aerial Hi-Gain TH3JR, 10, 15, 20m, £225. Rotator KR600RC with controller, £75. Scarab RTTY modem with software, Amstrad 464, 664, 6128 computers, £40. Daiwa electronic key DK210, £40. L. Evans G0SJQ (Wesley,

Herefordshire), Tel. 0544 318875

Desk table top aerial model 1300, unwanted present, cost £49 as advertised, £35 ovno. Ranger 28 meters, £320. Realistic scanner 2006, 3 months old, hyperscan, cost £235, £200 ovno. J. Freeman (Derbyshire), Tel. 0283 221870

Icom IC7000E, £575. Icom R71E, £525. Both with remote control and in mint condition. Icom IC1R1 handheld scanner, mint condition, £265, may exchange with Standard 528 dual band handheld, or Kenwood R5000/440 in good condition. M. Timlett (Luton), Tel. 0582 668648

Complete set of RRC course books for radio amateurs exam. Also 'The Radio Amateurs Question and Answer Reference Manual' and 'How To Pass The RAE', £45. Using these books I obtained two credits. P. Hannaway G17MSJ (Newtownabbey, N. Ireland), Tel. 0232 837159 after 6pm.

Racal RA1792 HF receiver, top of the range, 150kHz to 30MHz, digital, 100 channel, memories, auto and manual scanning, 6 filters built in test facilities 1983 model, was sold for nine thousand pounds, still in government use, offer under £1200. Panasonic DR28, £95. DX300 digital, similar to FRG-7, £80. R. Rai (Southall, Middx), Tel. 081 813 9193

Tektronix 'scope type 524AD, 2 channel. Also Marconi FM signal generator. Wanted - pair of 10GHz Gunnplexers. Mr. Sturdy (Nuneaton, Warwick), Tel. 0203 382956 afternoons or evenings.

Yaesu FT-902DM transceiver and MD1 base microphone, both in excellent condition, with books etc., £525. John Howard (New Milton, Hants), Tel. 0425 615949

Yaesu FT-101B HF transceiver, base mic, spare valves, owners handbook, and FTV-107R transverter with 2m module, leads, and owners handbook, £480 ovno, or exchange for packet data controller and software etc., for Commodore Amiga A500, buyer collects (Po. Chesham), Tel. 0385 745787

FT-200, 80-10m, 100W, £180 ono. TR-2300 plus 10W amp, 3A PSU, £50. 2m ATU, £10. Viewpoint 2m terminal, £20. 3A PSU, £5. Starmaster keyer, £45. Kentwin paddle, £30. Kenwood VSWR meter plus two coupling heads, £35. Two GBKw traps, £2. Three 2m mobile aeriels, £10. W. Beattie

(Helensburgh, Scotland), Tel. 0436 71418

Communications decoder CD660, mint condition, with instructions and circuit diagram, boxed, purchased from new, £180 post and insurance paid. Realistic PRO-32 handheld scanner, 68 to 512MHz, with spare nicad pack, charger, and manual. Can be used with charger from mains supply, covers airband, £80 post paid. M. Marsden (Ormskirk, Lancs), Tel. 0704 892088

Kenwood TS-830S with CW filter, and MC35 noise cancelling mic., £600. Also Trio TS-9130 2m multimode with aerial, £275. Both as new, viewing available in Essex or Swansea. Alex Williams (Swansea), Tel. 0792 390432

Power supply, 10A, over voltage and short circuit protection, £15. G2DAF transmitter, no PSU, £25. Marconi milliwatts output meter and power meter type TF893A, £12. Iambic keyer variable speed, built-in paddle, complete, £18. Gino G4NNZ (Melton Mowbray, Leics), Tel. 0664 500228

Belcom LS202E SSB, FM, hand held transceiver, speaker mic, battery pack, VGC, little used, £170 ono. J. Ferguson (Inverness), Tel. 0463 241211

Icom IC-490E 70cm multimode, 10W in, VGC, in box, with all manuals, mounting brackets etc., £325 ovno or exchange for 2m multimode (no Yaesu 290s) or 70cm FM mobile and 2m handheld, WHY, anything considered. Robert Taylor (Stourbridge, W. Mids), Tel. 0384 444382 after 6.00pm.

FT-767 70cm module, £170 ono. Howes 20 and 40m receiver, plus filter, £35. Atari ST520FM, 1J Meg, Ham, games, S/Ware, all boxed, with 2 mice and joystick, £180. James Bobbett (Glastonbury, Somerset), Tel. 0458 834917 after 5pm.

IC-3220E, £390. **FT-470**, £275. **AOR1000**, £179. **Diamond SX200**, £50. **Welz SP240**, £25. **Welz SP10X**, £18. **Daiwa PS120M**, £45. **Adonis AM303G**, £25. **Kent Morse key**, £20. **Duplexer 2m/70cm**, £10. **Quality coax switch**, £10. **Yaesu YH-55** headphones, £10. **Nevada TC50DX**, £45. **Yaesu YH-2** headphones, £10. **Tokyo HL-35V**, £50. **Cappo SP-100**, £70. **FT-736R** 6m unit (faulty), £90. **Heatherline headset**, £15. **Dual band 2m/70cm mobile aerial**, £10. Two new 6 inch, 8 ohm speakers, £5. **Dave Kay** (Hoddesden, Lancs), Tel. 0254 771621 after 6pm.

Kenwood TS-440S ATU, filters, £825. **Kenwood AT250** auto ATU, £175. **Kenwood TH27E speaker/mic** extras, £180. **Yaesu FT-290R Mutek'd**, FL2010 linear, £250. **Microcave Modules** 144/

432R 70cm transverter, £80. **Commodore C64**, MP803 printer, 1541 disk drive, lots software, £150.

Kenwood TS-711E with SP430, VGC, £650. **Adrian** (Trowbridge, Wilts), Tel. 0225 763923

Kenwood TS-50 HF mobile transceiver, brand new, 1 week old, genuine reason for sale, cost £1000 sell for £875. **Stuart Green** (Caerphilly, Mid. Glam.), Tel. 0222 881866

Yaesu FT-747GX fitted FM module, £575. **Kenpro KT22EE-E** 2m hand held transceiver, brand new, £100. **Base mic** Altai TW232, brand new, £30. **Zetagi 4-way aerial switch**, £5. All plus postage, no offers. **Wanted** - base station HF vertical aerial. **Tom Foster** (Kettering), Tel. 0536 522007

Receivers: **Watking** - Johnson, Drake, Nems - Clarke, DEL, CEI, GE, BRT-400, SP-600, AR-88, HRO, CR-100/8, old vintage VHF RL-85 receiver. **Wanted** - Manuals on R-1283/GRC RX, Panoramic Indicator IP-805/GRC, HP signal generators 606A, 612A. **Bob Wright**, 247 Sandy Lane, Hindley, Wigan, Lancs WN2 4ER, Tel. 0942 55948

Trio receiver JR310, amateur bands only plus WWW, good condition with circuit and data, £70. **J. Galbraith** (Gateshead, Tyne and Wear), Tel. 091 438 2786

Yupiter MVT5000, complete, excellent condition, £175 ono. Also lcom IC-1R1 with external battery pack BP82, again excellent condition, £280 ono. **Mr. B. Cullen** (Leamington, Warwick), Tel. 0926 452478, or 0374 168199

Optoelectronics frequency counter, 1MHz to 3GHz, 6 months old, boxed, little used, £200. **YU3UJMV** frame store and manuals, £50. 120 meg quantum hard drive and ICD board for Atari ST, £200. **Stage PPEPROM** programmer, needs modules hence, £250. **Supramodem V33bis** and fax groups 1, 2, 3, make me an offer, or swops for HF transceiver or ham gear. **Paul Bulmer** (York), Tel. 0904 671578

Sommerkamp FT-277ZD (FT-101ZD) HF transceiver, 9 bands, 160 to 10m, narrow CW filter, AM board, mains or DC, VGC, £360 ono. **Ron Ellis** (Market Drayton, Shrops), Tel. 0630 658136

Cushcraft AV3 triband vertical aerial, 10, 15, 20m, height 14ft, complete with APR18 radial kit, new and unused, boxed, bought for £150 sell for £95. **Phil Johnson** (Wellingborough), Tel. 0933 278264

Realistic PRO-2004 scanner, good condition, 300 channels, £120 ono. Also **Realistic Patrolman** mobile scanner, hardly used and in good condition, £60 ono. **Discone** aerial, needs wiring, £15.

Peter Allnutt (High Wycombe, Bucks), Tel. 0494 446838 afternoons only as shift worker.

HRT magazines volume 1 No.1 to Nov 91, 98 copies. **Amateur Radio Volume 1** No.1 to Sept 89, 78 copies. £25 ono, buyer collects. **R. Woodman** (West Malling, Kent), Tel. 0732 847307

FDK multi 725X 2m FM transceiver, variable output power (0.5 to 25W), scanning mic, ideal cheap mobile or base, good for packet, RTTY etc., £150. **Ian G0BGH** (Kenley, Surrey), Tel. 081 668 4990

Yaesu FT-290 Mki, muTeK front end, charger, £200. 2m mobile ex-PMR Dymar, 100 channel synthesized, with tone burst and reverse repeater facilities, complete with mic and mounting cradle, £70. **Steve Yeomans** (Farnham, Surrey), Tel. 0252 710304

Yaesu FT-23R 2m handheld with nicad pack, dry cell case, speaker/mic, and charger, in good condition, £170, or exchange for 70cm handheld with accessories. **Jim James G7MWR** (Rotherham), Tel. 0709 851133

HRO-MX, 4 coils, power supply, speaker, GVO very clean, £100. **Av8**, extra case as new, £200. **Hammar** and Q180 general coverage receiver, clock, immaculate for year, £150. **Kenwood RB20FX** Lowe's modification for extra 12 bands, £400. All boxed and good copies. **D. Brightman** (Wilton, Keynes), Tel. 0908 313377

Yaesu FRG-9000 receiver, HF converter, excellent manual, as new, £41. **Jan Massey** (Hay-on-Wye, Hereford), Tel. 0437 821339

Yaesu FT-900M 2m multimode transceiver, case and 30ccs, Microset 2m amp, plus X2 co-linear 2m/70cm aerial, £300 the lot. **Tim Freggatt** (Hyde, Cheshire), Tel. 0457 764735

2m transceivers FT-202R handheld complete with case, stand-in charger, speaker/mic, nicads, manual, crystals for S20, S21, S22, S23, R2, and R6, £50. **FDK multi 700EX** mobile, complete with mount, mic, and manual, £100. **Chris Dervin G4RBZ** (Derby), Tel. 0332 271111 ext. 2086 daytime, or 0332 574915 evenings.

2m mobile Kenwood TM-21E5, 5-45W, original packing and instruction book, one owner, £195. **Solid brass** Morse key, **J. H. Bunnel** New York, 40 years old, never been used, £30. **Morse key**, stainless steel, ex WD, works well, £10. **George Perry** (Manchester), Tel. 061 7233461

Realistic 2006 hyperscan, 3 months old, £200. **Desk type Sky Scan** aerial, cost £45, never used, offers. **J. Tarleton** (Derbyshire), Tel. 0283 221870

TS-430S FM board fitted, AM, SSB filters fitted, mounting bracket, MC60A desk mic, approx 15/20hrs use, used as second radio, excellent condition, £675 plus postage. Also workshop and instruction manuals, would take TS-751E multimode or C5608D in part exchange. **T. Waters** G0GQJ, 42 Tregundy Rd, Perranporth, Cornwall TR6 0EF

Optoelectronics frequency counter 2810, 10Hz to 3GHz, 4 gate time etc., case, aerial, charger, instructions, new, £130. **MFJ-207** HF/SWR analyser, use with 2810 analyser for fine tune, new, £60. **Ameco** preamp model PT-3, 1.8/5-4MHz bandswitch, gain, delay, tune controls, instructions, as new, £75. All plus postage. **T. Waters** G0GQJ, 42 Tregundy Rd, Perranporth, Cornwall TR6 0EF

Tilt over 13m slimline Tennamast, full size 3 element beam (TB3), rotator and cables, all four years old, £425 ono. **Doug Noble** (Glasgow), Tel. 041 637 4026

Yaesu FRG-9600 scanner, VGC, £325. **Sky Scan** discone V1300 aerial, still boxed, £25. **R. Flood** (Aldridge, W. Mids), Tel. 0922 59402

Black Star 'Meteor' 1500 frequency counter (up to 1.5GHz), £165. **Orion PAL** composite PCB (and sound) video, pattern generator (up to 500kHz), £110. **Welz CT300** dummy load (1kW peak), £60. All items as new. **Paul G4XHF** (Crawley), Tel. 0293 515201

Kenwood R5000 communications receiver, excellent top of the range set, boxed with instruction manual, coverage of 150kHz to 30MHz, SSB, AM, FM, RTTY, CW, only £575 ono. **Alex Curry** (Stockton on Tees, Cleveland), Tel. 0642 559651

WANTED

Yaesu FT-7 HF transceiver, **Yaesu CPU2500R** 2m FM transceiver, and **TR3200** 70cm FM transceiver. **Ray Howes** (Weymouth, Dorset), Tel. 0305 773240

Pye M296 ex-PMR, U band or similar UHF equipment. **Mr. Wilkins** (Cymmer, Port Talbot), Tel. 0639 850338

Olympic 212 and **202 A** band, for conversion to 70cm and 2m. **B. Howat** (Southport, Lancs), Tel. 0704 63344

Build manual and circuit Heathkit IP-200 regulated PSU, buy, copy, WHY? **R. Hounslow**, 46 Garrick Road, Abingdon, Northampton NN1 5ND, Tel. 0604 24486

Drake TX-4C transmitter and PSU. **Trevor Waters** (Ammanford, Dyfed), Tel. 0269 596037 evenings.

70cm linear amp, with preamp if possible, for use with my KT-44 hand held. 20W or higher output, willing to travel or pay P&P. Shane Williams (Gloucester), Tel. 0452 730764 after 16.45pm. Eddystone models - receivers EC10 EB35 6/7, 880, 880/2, 960, 1995, plus any 1000 series. Speakers deicast 688, 697, 698, sma 652, general purpose 935, 899, 899F, plinth 966, signal strength meter Edometer ED902, cash waiting! Collection possible. Peter Lepino (Great Bookham, Surrey), Tel. 0374 128170 anytime, or fax. 0372 454381

6m module and 70cm module for Yaesu FTV-107R transverter. J. Bolton (Co. Durham), Tel. 0388 745787 use recording machine if not in please!

25 to 35 amp power supply. Also swap or sell smaller power supplies 4/12A, 8-15A. Mr. J. Ticehurst, 249 Elm Grove, Brighton, Sussex BN2 3EA Kenwood/Trio SP430 external speaker to match TS-430S. Robert Fensome (Luton), Tel. 0582 401881

Yaesu FP-757HD power supply, and FC-757AT ATU, cash buyer, also wanted FT-480R all mode, can collect London SW or West. Mark Grossmith (London), Tel.

081 649 8140 office hours. Realistic PRO-2006 scanner, and Realistic HF base receiver, L. Mantering (Burnley, Lancs), Tel. 0282 838576 anytime.

Galaxy receiver, G3DAF transmitter, R1082 T1083, pre-war TV, 'Radio Times', radio mags, books. Douglas G3KPO (Ryde, IoW), Tel. 0983 567665

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LETTERS

Letter of the month

Dear HRT,

In reply to the letter from John Redmond, February issue. I own a CB shop, and have just passed the Novice RAE and awaiting my call sign. First let me say as a CBer, I could not have had more help from radio hams if I tried, they couldn't do enough for me, and I found them very friendly. With having a shop I deal with CBers and Hams, but what a lot of people forget that their training ground, when going on for the RAE or NRAE, was CB itself. I disagree that it is more like CB, and the Hams are not above themselves. My advice to John Redmond is don't knock it until you've tried it.
Yours awaiting 2E1—
Sonia Jones

Editorial comment;

Many amateurs do forget, sometimes deliberately, that they too were a beginner once. On looking through some 'old' radio magazines, I read a letter from a G3 who was boasting about his time as a pirate on the bands, as if this were accepted as being one of the 'good old boys'. At least CB operators share the joy of licensed two-way hobby radio communication, rather than bringing radio communication into disrepute by having to operate illegally or not at all. CB operators do have more restrictions imposed than hams (dictionary definition of 'ham' - licensed radio amateur) who can do rather more on the bands, but this often acts as a useful introduction to licensed two-way hobby communication, and our publication group is pleased to be the one producing the only remaining magazine devoted to this hobby in the UK (CB Citizens Band, published by Argus Specialist Publications). Welcome to our hobby Sonia, I hope you'll enjoy the extra freedom it gives you.

Dear HRT,

G4XPP in the June issue writes about learning another

language, the problem is which language. I have learned to speak Esperanto and although there are not many speakers, it is very rewarding to have a QSO in a language in which neither party has the advantage. It is also very much easier to learn than any natural language because there are no irregularities.

The ILERA (Internacia Ligo de Esperantistaj Radio Amatoroj) has several hundred members world wide, and arranges nets. I have had contacts with many Esperantists around the world, which would not have been possible in English. We manage much more than "my name is....., my QTH is....., your signal is....., 73".
Gis audos vin, Terry GM4DSO

Editorial comment;

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DE G4HCL ES G8IYA AR K

Dear HRT,

I read your May editorial with interest. I am afraid it is rather typical of 'the system'. We are lucky that candidates can sit both RAE and Novice exams in Birkenhead Tech - but it was not always so. Many years ago we wanted to do an RAE course and were turned down flat. However, as one of our members knew a trade union councillor, he on finding that we could provide our own lecturer said "leave it with me", and lo and behold we found that we could have a room at the Tech. This went on for twenty odd years, when suddenly our man was told that it was to be run internally to save expense, so he emigrated his talents to North Wales for a year or two.

We now have our own HQ locally where we run our own RAE class (the tech still run theirs), our fee includes membership of the society and is cheaper than theirs! We are however limited for space and can accommodate 20 students. This is every Thursday starting in August at Ivy Farm, Arrow Park Rd, Birkenhead (publicity please!).

We have just entered NFD for the 40 odd time post war, the results are not winning standard, but the enthusiasm was, the WX is fabulous.
Alec Seed G3FOO

Hon. Sec. Wirral ARS

Editorial comment;

We've every praise for clubs and the like who get up off their backsides and try to do things for beginners, well done lads!

Dear HRT,

Let me state for the record that "amateur radio retailers are ripping us off and laughing all the way to the bank!" Now I have to back up that statement, but before I do please remember that if you read the adverts in any American amateur radio magazine, you will see that our prices in UK £ are the same as the Americans are in US \$!

To back up my statement, I bought an amateur radio plus matching PSU and had all the filters fitted as well as having it broadbanded TX/RX before it was sent to me. It was bought for £1495.98 in September 1991. On the Monday of 5th April 1993, I contacted the retailer and asked for a quote on part exchange for a larger home base radio, total price of the new radio is quoted at £1495 for the basic rig, and with the additional filters etc. fitted it comes to £1500 exactly, and that's without it's matching PSU.

The retailer offered me less than 50% of the price I had paid him 18 months ago, for a radio that is not only still new on the market today, but it's never been used, partially due to a long drawn out battle to get planning permission as well as my ill health. You can draw your own conclusions from the pitiful offer the retailer made, but listen to his reasons, "we may have to store it for months, we will have to give it a further warranty, there's little call for such large radios in the secondhand market!" Those are just three of the poor man's excuses.

As for me, I am totally convinced that we are being constantly ripped off by the UK retail outlets. You should also know it from the lack of those independent retailers that we used to see at rallies, before their radio supplies were deliberately dried up and they had to close down, only to see their shop taken over by one of the big boys.

John Bolton, G4XPP

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(INCORPORATING 4 STROKE RALLY)

**OLD
WARDEN
AERODROME**

**BIGGLESWADE,
BEDFORDSHIRE**

**SATURDAY
& SUNDAY
11th - 12th
SEPTEMBER
1993**



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the whole family!*

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RADIO TODAY



Peter, GU1DKD (centre).

Peter Rouse GU1DKD

We're very sad to inform readers that Peter Rouse GU1DKD, who had been suffering from Leukaemia for some time, passed away on the 29th June this year. Peter, who was a well-known contributor, was remarkably bright and cheerful throughout his illness, we saw him give real inspiration and hope to fellow sufferers, both in hospital and through his job as News Presenter for Channel TV. He underwent two years of hospital treatment for recurrent bouts of the illness, yet kept his hobby interest alive even from his hospital bed with his radio gear and portable computer, even completing the 4th Edition of his 'Scanners' book, to be published in Spring. Last year during one of our visits, he even pulled out from his hospital bedside locker a complete weather satellite reception review for our 'Scanners' section to surprise us! His name will certainly be kept alive, a fitting tribute to someone who's helped many get started in the hobby of HF/VHF/UHF listening. The world has lost a great 'helper', and we pass our deepest sympathies, which we're sure are shared by our readers, to his wife and children.

More RIS prosecutions

Following a lengthy trial lasting over 22nd-25th June, Hereford Crown Court found Robert George Hitchcock, aged 41 years, of Astwood Bank, Redditch, guilty of five out of six charges of operating in contravention of his amateur licence, four further charges having been earlier dismissed by the judge. Prosecutor Ms Rosemary Cox said in court "He was not transmitting straightforward messages to another amateur, but was rambling on to the world at large in a high pitched, squeaky, silly voice.", adding "He was a pest, a nuisance". Assistant recorder Mr. Martin Coates told him "You set out to challenge those who control the amateur wavebands

and caused persistent annoyance to people who wanted to enjoy their hobby". Robert Hitchcock, who confessed to talking in a high-pitched voice for up to an hour and said he liked to think of himself as a comical character, was fined £500 on each of three counts, plus £1,000 on each of two counts, and was ordered to pay £6,000 towards prosecution costs, a total of £9,500. His equipment, including transceiver and associated equipment, was forfeited. Evidence was provided by the RIS division of the Radiocommunication Agency and radio amateurs, and the case followed complaints of abuse on the 2m band and a subsequent raid on Robert Hitchcock's home by the DTI when evidence was seized.

The RA tell us another successful prosecution occurred when a radio amateur appeared before Caernarfon Magistrates Court on 6th May 1993, charged with use of equipment outside the terms of his licence. The RA inform us that he was found guilty and fined £300, and ordered to pay costs of £100. The case followed complaints from amateurs of unlicensed packet mailbox operation on 70cm, 4m, and 2m. The operator was interviewed by Agency staff on 15th December 1992 and the mailbox was closed down. The packet mailbox is now licensed correctly.

The RA also tell us that last December, their staff monitored and traced unlicensed transmissions on 144MHz in Nuneaton. The operator was interviewed and charged with unlicensed use. The case was heard in Nuneaton Magistrates Court on 27th April 1993, where the defendant pleaded guilty and was fined £140 with £100 costs.

This shows us that the RIS do act on information correctly presented regarding abuse of our bands, and they do something about it.

GB2MSR

During the weekend of 19th-20th June 1993, around 200 Scouts were camped at Ballalough, near Douglas in the Isle of Man, for their annual Scout camp. That well-known name in HRT's 'news' pages, Denys Hall GD4OEL, member of the Amateur Radio Enthusiasts Club and advisor on communications to the Scouts and Guides, set up the special event station GB2MSR (Manx Scout Radio) on the site. A large number of contacts were made around the world over the weekend, the Scouts were able to pass greetings messages to stations in the UK, Canada, and USA. The fine weather allowed the station to be set up outdoors, which enabled a lot of radio interested Scouts to come and take part in the event, as well as introducing a new hobby to Scouts who had never seen it before. The IoM Post Office provided colourful 'stamp cards', which will be used as QSL cards for the event.

Denys Hall GD4OEL with some of the interested visitors to GB2MSR, Manx Scout Radio



RSGB Open Day

On 19th June, the RSGB held another of its popular 'open days', with around 250-300 visitors attending this year including RA personnel Barry Maxwell and Karen Scott (plus the HRT Tech Ed!). The many and varied departments were opened up, and several guided tours gave visitors a real 'insight' into the workings of the society. The fine weekend weather provided a 'mini-rally' theme, with outdoor stands manned by the Welwyn and Hatfield ARC, Cheshunt and District ARC, Verulum ARC, Hoddesdon ARC, and the Southgate ARC, together with an open-air barbecue provided by local scouts in association with the Silver Phoenix VSU. To complete the scene, the RSGB held a balloon race, with a number of prizes of the winners' choice of cash or RSGB book/subscription vouchers, together with 'goodie bag' runner-up prizes.



RSGB President Peter Chadwick and RSGB General Manager Peter Kirby try their luck in the balloon race



A 'mini-rally' theme outdoors

The RSGB communications museum, with 'live' working exhibits, attracted interest from young and old



On-air activity at the headquarters station

Elvaston Castle Rally

Sunday, 13th June, saw the 24th Elvaston Castle rally take place. This year, around 20,000 visitors attended on the day, who were favoured with over 200 trade and club stands, some even having a marquee to themselves, plus a 20m long bring and buy area, and a 'monster' outdoor flea market area with 150 tables. The saying 'you can buy anything electronic' must have been more significant here than most other rallies, for example if you fancied buying a red-top missile (minus warhead and rocket propellant!) to put on your tower, you could take one away from outside the Anchor Surplus marquee! With the sunny (i.e., hot) weather, the same trader was giving away cloth caps for children to help keep the sun off their heads, a very nice gesture - thanks lads! *(continued on page 12)*



The huge Elvaston Rally event

