Constructional
Rediscover Top Band
Build The PW Chatterbox AM Transmitter & Receiver

Reviewed This Month
The Ramsey 50MHz Receiver Kit
The Ideal Novice Project

Plus
Antenna Construction
The PW Natterpole Top Band Vertical Antenna

Come Fly With Us
How You Can Join The Dayton '92 Trip

Focal Point, CB High & Low, Competition Results, And Lots More!
The FT-1000 is a new top of the range all mode h.f. transceiver that is the result of more than 25,000 hours of intensive research by Yaesu's top design engineers. They have adopted a completely new approach to the application of digital and RF technology. The extensive use of surface mounted components has allowed six microprocessors and five Direct Digital Synthesisers to be integrated with a simple to use operator interface to give a highly reliable full featured transceiver that has been optimised for serious h.f. applications. Please write or call SMC or your local authorised Yaesu dealer for the full specifications of this dynamic new transceiver and discover how you can open up the bands.
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Practical Wireless, August 1991
IC-2SE,
SIMPLE OR MULTI-FUNCTION
144 MHz FM TRANSCEIVER

Icom's tradition of building high quality, reliable handhelds continues with the IC-2SE, an incredibly compact handheld designed with features that exceed larger, bulky handhelds. The IC-2SE proves that superior quality comes in all sizes.

Slim and unbelievably compact.
The IC-2SE measures only 49(W) x 103.5(H) x 33(D)* mm with the BP-82 Battery Pack. Hold the IC-2SE in your hand to truly appreciate its miniature size. Weighing just 270 g with the BP-82, the IC-2SE will easily fit anywhere – on belts in shirt pockets, handbags, etc. *1.9(W) x 4(H) x 1.3(D) in. = 9.5 oz.

Simple design for operating convenience.
Even with its tremendous versatility and a wide variety of functions, the IC-2SE is easy to use. All functions are performed by a total of just six switches and three controls. The IC-2SE includes both simple and multi-function modes. The result is two transceivers in one: both an easy-operation and multi-function transceiver. Simple mode ensures totally error-free operations. Multi-function mode allows you a variety of function settings depending on your operating requirements.

Other advanced features:
Reduced size doesn’t have to mean reduced quality. The IC-2SE proves this with a wide variety of advanced functions.
- Tuning control on the top panel for quick QSYing.
- Monitor function that allows checking of the input frequency of a repeater.
- Function display that clearly shows all information required for operations.
- Splash resistant design and durable aluminum die-cast rear panel for dependable outdoor operations.

Options
- BA-11, Bottom Cap. Protective cap for terminals on the base of the IC-2SE.
- Battery packs and case.
  - BP-81 ............. 7.2V, 110mAh
  - BP-82 ............. 7.2V, 300mAh
  - BP-83 ............. 7.2V, 600mAh
  - BP-84 ............. 7.2V, 1000mAh
  - BP-85 ............. 12V, 340mAh
  - BP-86 ............. Case for six R6 (AA) size batteries
- BC-73E, AC Battery Charger.
  Desk top charger for the BP-81, BP-85.
- CP-12, Cigarette lighter cable with noise filter. Allows you to use the IC-2SE through a 12V cigarette lighter socket. Also charges the BP-81 - BP-85.
- FA-140BB, 144MHz flexible antenna.
  Flexible antenna for 144MHz band operation. Some type supplied with the IC-2SE.
- HM-46, Speaker/Microphone.
  Combination speaker and microphone equipped with an earphone jack. Clips to your shirt or lapel.
- HS-51, Headset. Headset with VOX function that allows you hands-free operation.
- Carrying Cases.
  Carrying Case Battery Packs, Battery Case
  LC-53 ............. BP-81
  LC-55 ............. BP-81, BP-83 or BP-86
  LC-56 ............. BP-84 or BP-85
- MB-30, Mounting Bracket.
  Mounts the IC-2SE in a vehicle or on a wall.
- OPC-235, Mini DC Power Cable.
  For use with a 13.8 V DC power supply
THE COMPACT HANDHELD WITH A SPLIT PERSONALITY

5 Watt Output Power.
Utilizing a specially designed ultra-small highly efficient power module, the IC-2SE delivers a full 5 W* of output power. Bring those distant repeaters into range.

At 13.8V DC

48 Memory Channels.
The IC-2SE has 48 fully-programmable memory channels and one call channel. Each memory and call channel stores an operating frequency and other information required for repeater operations.

Convenient Repeater Functions.
The IC-2SE is equipped with programmable offset frequencies for accessing repeaters. All memory channels and a call channel store repeater information for your convenience. The IC-2SE includes a newly designed 1750 Hz tone call transmit function. A 1750 Hz tone call transmits when the PTT switch is pushed twice quickly.

Power Saver for longer operating time.
The power saver ensures lower current flow during standby conditions. Operating times are much longer than with older, more conventional transceivers.

Built-in Clock with timer functions.
The IC-2SE is equipped with an advanced 24-hour system clock with timer function. The transceiver automatically turns on when real time matches a pre-programmed time. This is perfect for scheduling QSO's. Auto power-off timers and other settings can be made in clock mode.

Convenient Scan Functions.
The IC-2SE is equipped with VFO and memory scan.

VFO Scan. VFO Scan repeatedly scans all VFO frequencies, in addition, unnecessary frequencies can be skipped.

Memory Scan. Memory scan repeatedly scans memory channels.

Auto Power Off Timer Function.
If you ever forget to turn the IC-2SE off, don’t worry. It will turn itself off. Power-off time can be selected or deactivated using multi-function mode. Preserve battery pack power for the times when you need it most.

Priority Watch.
Why interrupt calls to check other stations? Priority watch monitors a specified station every five seconds while you operate on a VFO frequency. Continue with your communications and let priority watch do the checking for you.
NEW A QUART IN A PINT POT?
Never I hear you say, well YAESU's engineers have done it again with the NEW Dualband FT5200

- Dualband 2m and 70cms
- 50/5W on 2m and 35/5W on 70cms
- Crossband full duplex operation
- Reversed-mask dual LCD display
- Built-in antenna Diplexer
- Trunk Mount Cable Option
  3m or 6m

NEW FT-990 HF TRANSCEIVER

Based on the remarkable performance and easy operation of the FT-1000, Yaesu's new FT-990, combines the basic technical features of that top-of-the-line model with several recent advances resulting in a spectacular performer at a very reasonable price.

Utilising Direct Digital Synthesisers (DDS) and the extremely quiet receiver circuitry of its big brother, the FT-990 delivers silky smooth tuning, pure local signals and clear reception of even the weakest stations.

So if you're looking for top performance in an HF transceiver, try out the FT-990.

You might just fall in love!

NEW FT-26 & FT-76
2m & 70cms
MINI HANDHELDs
A REAL HANDFUL!

Not shown full size.
**DAIWA PRODUCTS**

SMC are pleased to announce that we are now the official UK Distributor for the complete range of DAIWA products.

**POWER SUPPLIES**
- PS120 Mk2: 3-15V Variable 9A/12A max. £69.95
- PS304: 1-15V Variable 24A/30A max. £129.95
- PS50X: 3-15V Variable 32A/40A max. £189.00

**COAX SWITCHES**
- CS201: 2 Way SO239 DC-600MHz 1kW £13.95
- CS201G2: 2 Way N DC-2GHz 1kW £27.50

**SWR METERS**
- CN101: 1.8-150MHz £59.95
- CN103N: 150-250MHz 20/200W £69.95

**LINEAR AMPLIFIER**
- LA2080H: 2m 1.5-5W in 30-80W out £159.95

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**SMC FOR ALL YOUR ACCESSORIES**

**TOKYO HY-POWER**

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**FREE ACCESSORIES**

- Free Finance on selected items, subject to status. Details available on request.
- Up to £1000 instant credit, a quotation in writing is available on request, subject to status.
- Visa Distributor Warranty, 12 months parts and labour.
- Carriage charged on all items as indicated or by quotation.
- Prices and availability subject to change without prior notice.
- Same day dispatch wherever possible.
The DJ-1FE is a new generation of handheld from ALINCO. Its ergonomic design wins instant appeal whilst its compact size (110 x 53 x 37mm) and tailored shape allows it to sit comfortably in the palm. “Solid yet diminutive”, “comprehensive yet simple to use”, are phrases that best describe it.

And in specification the DJ-1FE is up at the front leaving its competitors gasping! Features include; 40 memories, digit message display, triple power outputs, 5 Watts capability, Auto power off, battery save, illuminated keypad, 5 - 25kHz steps, Tone encoder option, etc.

If you want the full story of why ALINCO is now leading the field in handheld technology send for the colour brochure.

Ham’s Best Friend! If you want the very best antenna for VHF or UHF then choose from the range that is stocked by most amateur radio dealers! Diamond give you more gain and quality £ for £. They are tough, sleek, pre-tuned, and have a space back-up that is second to none. All “X” series models are fibre glass encapsulated and knock down into sections for easy transport. And if after purchasing, you are not convinced that they are great value for money with super low VSWR’s, simply return the antenna to us within 14 days for a full refund. Now that’s the kind of confidence that our competitors don’t have. Nuff said!

Tonning VHF - UHF Aerials Are A

DR-590E
2m & 70cms
£499

Kenwood Specialist Dealer

Best Airband Receiver Ever! VT-125 MKII £169

It’s a fact, the VT-125 mkii is the best and most sensitive airband receiver ever produced. That’s not just our opinion, it is the opinion of the professionals who are buying this in quantities!

• 108-142MHz
• 30 Memories
• 2SKHz steps
• Free ni-cads
• Free mains charger
• Latest Mi-II version!
• Full accessories

Are A

Ham’s Best Friend! If you want the very best antenna for VHF or UHF then choose from the range that is stocked by most amateur radio dealers! Diamond give you more gain and quality £ for £. They are tough, sleek, pre-tuned, and have a space back-up that is second to none. All “X” series models are fibre glass encapsulated and knock down into sections for easy transport. And if after purchasing, you are not convinced that they are great value for money with super low VSWR’s, simply return the antenna to us within 14 days for a full refund. Now that’s the kind of confidence that our competitors don’t have. Nuff said!

Tonning VHF - UHF Aerials Are A

DR-590E
2m & 70cms
£499

KENWOOD SPECIALIST DEALER

TS 850!
£1325 + FREE PSU!

COMING SOON!
New TS 450 & TS 690
Full 12 month warranty
Phone for information and delivery

Phone for latest
DEALS!

TS-140S
Covert HF rig + FREE PSU!
£880

TS-450S
Classic HF rig + FREE PSU!
£1099

TS-690S
HF with 6 meters + FREE PSU
£1299

TL-922
Hards 2W Linear in stock
£1495

TS-790E
2m/70cms (Part Ex welcome)
£1225

TI-777
Dualband hardly + Free High Gain Ant
£395

TR-751E
2m All Mode + FREE PSU
£410
Why wait weeks to sell that well loved but surplus FT101 or whatever. If you have decided you must part -
Make a quick clean break - CALL US.

Come and see London's Best selection of new and used
ICOM, Yaesu, Kenwood, Standard, JRC, AOR and all leading makes.

Opening Hours:
Monday-Friday 8.30-6.00pm Saturday 9.00-3.00pm

NEW Reserved car parking at rear of showroom. ALL EASY TERMS ARE BASED ON AN APR OF 34.4%.

Listen to AOR

In the last decade AOR has gained a reputation for unique, high performance wide band radio receivers world wide.
With the arrival of its new subsidiary AOR (UK) Ltd, UK customers may enjoy a much closer link with the factory.

AR2500 and AR2800 The NEW base - mobile scanning receivers featuring coverage from shortwave to microwaves. ALL
mode operation AM, FM (narrow), FM (wide) and built-in BFO for USB, LSB and CW. Operation is from a nominal 13.8V
DC supply (AC adaptor supplied). SSB is used by many services especially on shortwave (including Amateur band and
oceanic airband) to extend the operational coverage of their transceivers. It's inclusion on these receivers isn't just an added
bonus but a positive asset. The BFO allows selection of either side-band and the fine shift control ensures the very best audio
quality. The choice between the AR2500 and AR2800 is difficult. Although both models look similar on the outside (being housed in a
strong plastic cabinet), their design concept is radically different inside the cabinet. The AR2500 was conceived in the USA where
listeners desire massive memory capacity (Elephant memory) and fast "turbo speed" search and scan. There are 1984 memories (62 banks x
32 ch) and 16 search banks. Even an RS232 port is provided for computer connection. The AR2500 covers 500KHz to 1500MHz with no
gaps. The AR2800's strong point is superior SSB/CW receive performance and versatility. Amateur band CW reception is of a crisp
and clean tone. A conventional memory channel and search bank layout is employed in much the same way as the well proven AR1000.
There are 1000 memories and 10 search banks. The AR2800 covers 500KHz to 600MHz and 800MHz to 1300MHz. R.R.P. AR2500 £419,
AR2800 £395

AR2000 The NEW AR2000 must be the ultimate hand portable
receiver. Frequency coverage of the AR2000 is now continuous 500KHz to 1300MHz (with no gaps). One major change is
the replacement of the 154.825 MHz crystal with a highly-stable 12.8 MHz reference and multiplier chain. The result is
an improved frequency stability with a further reduction in unwanted products. Modes are AM, FM (narrow), FM (wide).

For detailed leaflets and price list please send a
S.S.A.E. (17p). Prices shown include VAT,
carriage extra.

AOR (UK) Ltd.
Room 2, Adam Bede High Tech Centre,
Derby Road, Wirksworth, Derbys. DE4 4BG.
Tel: 0629 - 825926 Fax: 0629 - 825927
A Talking Multimeter. Press a button on the probe and the meter will call out its reading in clear English. The reading is also shown on the units large, easy to read LCD display. Features autoranging, autopolarity, continuity sounder, diode-check and over-range indicators. Measures to 1000 VDC, 750 VAC, 300mA AC/DC, 30 megohms resistance. Requires 4 "AA" batteries.

B Digital Multimeter. Full autorange or manual range control, selectable by a switch. Easy to read LCD display. Ideal for use in the field, lab, shop, bench or home. Fold-out stand allows you to adjust position for better visibility or to hang unit. Features continuity check, autopolarity, diode-check and low battery indicator. Measures to 1000 VDC, 750 VAC, 200 mA AC/DC, 20 megohms resistance. Requires 2 "AA" batteries.
MARTIN'S MIDSUMMER MADNESS!!

stacks of bargains available now

DON'T FORGET I STILL HAVE THE LARGEST STOCKS OF USED EQUIPMENT IN THE COUNTRY AND I HAVE APPARENTLY BECOME THE LARGEST INDEPENDENT RETAILER OF YAESU - AND THAT'S OFFICIAL. WHAT REALLY COUNTS IS CUSTOMER SERVICE - MARTIN LYNCH HAS A TEAM DEDICATED TO SERVING YOU, THE RADIO AMATEUR OR ENTHUSIAST WITH KNOWLEDGE AND BACK-UP YOU WOULD BE HARD PUSHED TO FIND ANYWHERE IN THE U.K. WITH YOUR CONTINUED SUPPORT, WE WILL KEEP ON GROWING. THANKS TO ALL OF YOU WHO HAVE SUPPORTED THE 'TEAM' SO FAR.

73 Martin G4HKS

BUYING OR SELLING...
DIAL 081-566 1120

LONDON'S TONNA ANTENNA STOCKIST
DON'T FORGET TRICITY INSTANT FINANCE

Martin Lynch is a Licenced Credit Broker. Full written details available on request. Typical APR 36.8%.
PHONE 081 566 1120

For fast mail order Tel: 081 566 1120.
Please add £10.50 for 48 hour delivery.
Shop opening hours:
Tuesday-Saturday 10-6pm.
24 hour sales HOT LINE 0860 339 339 (after hours only). FAX order line open 24 hours.

FT990 the baby
FT1000

Total list price over £2000+: ONLY £1849.

FT767GX series II

Total list price almost £2000.
Special offer only £1599!! Saving nearly £400.

FT736R with 2/70cm plus 6 metre card absolutely FREE.

You have seen the adverts for this transceiver for over six months. These are direct from the U.K. official YAESU Importer and I have got a limited number - offered with two matching accessories FREE!

FT990 HF Transceiver with BUILT IN PSU AND AUTO TUNER
PLUS: DVS-2 Digital Voice Storage and MH1B8 Microphone worth over £170

Yaesu's innovative all band, all mode transceiver has been around for a couple of years. Since its introduction, Yaesu Engineers have continuously updated the specification to help keep it the "NUMBER ONE ALL ROUNDER." Continuous Coverage Receive, all modes, AM/FM/USB/LSB/CW, built in Auto tuner, Mains PSU and options for 2m, 6m and 70cm - in ONE NEAT PACKAGE.

So, did LYNCHY get stuck with a few from the last promotion on the FT736R back in MAY? Not likely! Still the best selling QUAD BANDER to date. 25W MULTI-MODE output on 2m & 70cm, fitted satellite module for duplex operation, built in Mains PSU and expandable to 6m and 23cm, all in one box.

FT736R with 2/70cm plus 6 metre card absolutely FREE.

LIST OVER £1600.
Special offer only £1299!! Saving £326!!

LIST OVER £1600.
Special offer only £1299!! Saving £326!!

FT736R with 2/70cm plus 6 metre card absolutely FREE.

After the recent appointment as the only authorised Kenwood Dealer in the EALING area, I can now offer this exciting H.F. Masterpiece from stock. Kenwood have a knack of "Getting it right" - this one is no exception.

BEAT THE IMMINENT PRICE INCREASE - ONLY £1325

Complete re-design and bang up to date, two new TWINS to the Kenwood stable. The TS450S is the latest HF general coverage all mode with optional tuner - The TS990S is identical, but with the additional 6 Metre band fitted as standard.

The demand will be high for these two, so get your name down quick!!

DEPOSITS NOW BEING TAKEN

TM741E with free PG-4K (Worth over £30) ONLY £729.

Back to basics? The Kenwood engineers looked at the competition (and their own previous models), scrubbed out 70% of the controls and buttons and Hey Presto! A superbly engineered, no-nonsense front panel layout that even a newcomer to mobile operation will find easy. But do not underestimate the power within its tiny dimensions - 50W/35W on 2M/70cm, optional 6m, 10m &23cm cards available as a plug-in, remote head, TRIPLE SIMULTANEOUS WATCH, full AM receive on AIRBAND. Extended receive including Cellular, (who needs to watch Satellite Movies on Saturday Night?) - This really is a milestone in engineering!
I'm looking forward to working my first UK Novice amateur radio station. I can still remember the thrill I got when my licence arrived. Unfortunately for me though, it arrived when I was suffering from a very bad dose of 'flu' and I couldn't get on the air for a few, very frustrating days.

In the early 70s, and I've still got the log-book recording the QSOs, I had another thrill when I managed to work QRP 'over the pond' to the USA. It was quite an achievement for me, because my rig was one of the early Heathkit HW7s running at less than 1 W on 21 MHz.

Hearing a station with slow, but impeccable Morse, I answered the CQ call. I ended up having an enjoyable QSO with a 12-year-old girl! My ego was somewhat deflated when I learned that she was only running 3W into a homemade QRP rig using a tree-mounted antenna!

Novice Prize
To show our support for the newly-licensed Novice stations, *PW* is offering a year's subscription to the first five operators to send in photographs of themselves in action. The photograph must show the operator and their allocated callsign. We'd also be interested to know who was at the other end of the QSO when.

We're also very interested to hear about schools radio club activities. Our 'Club News' feature in 'Newsdesk '91' is proving very popular, but how about letting us know what your school is doing up there on the air! I'm very much involved in assisting with radio clubs at my daughters' school, so I would be interested to hear your stories and achievements.

Testing Time
The advent of the Novice Licence has not been without its difficulties. I've no doubt that much of the 'midnight oil' has been burnt to get the system underway.

There's also no doubt that there are still not enough Novice trainers and other essential volunteers. However, there's one problem that's been highlighted by the recent Novice examination (the first), and that's the lack of examination centres.

Both the RSGB and the City & Guilds have expressed their concern at the small number of examination centres offering the Novice Examination. But, despite the fact that I share their concern, I know that this is not a new problem!

In my opinion, the situation has existed since financial pressures were placed on regional colleges and other educational establishments by local and central government. As a result, 'minority' interest subject teaching and examination facilities have suffered. Unfortunately for us, amateur radio falls into the minority interest category.

I've already mentioned my concern, regarding the diminishing RAE course and exam facilities, in a comment below Dave Mason G3ZPR's letter in the July *PW*'s 'Receiving You'. Dave's concern related directly to the RAE, but the problem is, I'm sure, going to apply to the Novice Examination. We must all act now, if we're to overcome this problem.

Although it's only midway through June as I write, we're already receiving advance news of RAE classes. Please keep sending this information to *PW*. Don't forget, if you are running a class, with or without examination facilities at the completion of the course, please DO tell us.

All news on RAE classes will appear in 'Newsdesk '91', and we hope to have an up-to-date list available. Don't forget, even if you are not involved, but still have information on a class that's not receiving the necessary publicity, we'd like you to write and tell us NOW. Unless potential radio amateurs have full support from established radio enthusiasts, studying and preparing for the RAE could seem very difficult, when compared to the difficulty in finding an examination centre!

Back To Earth
It's nice to know that Helen Sharman and her colleagues from the JUNO mission are safely back on earth. Although I'm not directly involved in amateur radio 'in orbit' so to speak, I found the whole episode fascinating.

Although I wasn't able to play a part in the mission, I'm fairly certain that the MIR station was visible to the naked eye here in Dorset, when it passed over the UK on the Tuesday afternoon. In the past I have been able to see relatively low earth-orbiting spacecraft during daylight hours, but this time I'm not sure.

Did anyone else get a visual sighting? It would be interesting to hear if anyone else caught a glimpse of the craft. My possible sighting of the 'shack in the sky' made me feel that little bit closer to a magnificent educational effort. The JUNO mission has undoubtedly shown people both young and older, that science and technology are exciting and can make a wonderful hobby and a possible career.

73 DE Rob Mannion G3XFD

Dear Sir

I have noticed the enthusiasm for the younger lads interested in valves.

I have boxes of ex-equipment valves, ie. 6L6M, 6J7, 6K7, 607, 6V6, 6K8, etc., and even a 2SL6. These valves are mostly G and GT, with many 7, 8, or 9 pin types.

In fact, there must be at least 500 of all types. I even have some of my father's old valves such as types FC2, FC4, FC13C, MHD4, HL13DD and more.

The Octal-based valve line up for standard receivers may be had from me, for the lads at only the cost of the postage from me. I have no doubt that many more people are interested in valve equipment, including me.

Bob Robins G8BSK
St Denys
Southampton
Dear Sir

I am one of your regular readers, and a long standing admirer of PW from my small country - Bulgaria.

I would like to say many, many thanks to all who make PW so interesting, and so useful a radio amateur's magazine. I read many other magazines including: Radio Revista, CQ, DL, Radio Communication, DUBUS and so on, but in my opinion PW is the best magazine. I read it with great pleasure.

The best, interesting and most useful reading for me is Amateur Satellites 'Satellite Scene', written by Pat Gowen. My most heartfelt appreciation goes to Pat, who spares no effort, and time to select and write the information for his articles. I'm also grateful for his highly readable style, and simple language form. Every month 'Satellite Scene' is very enjoyable.

Thanks must also go to all the authors who provide the wonderful constructional projects. Such articles are particularly important to Bulgarian radio amateurs.

To my great regret, I must say that prestige of Bulgarian radio amateurs is not good in the world of amateur radio. At least, it is not so good as I want it to be.

I am not going to deny that this evaluation is undeserved, but you must be told the reasons. In Bulgaria we do not have shops for amateur equipment or electronic components. It's impossible to buy materials for antennas, except for wire antennas.

There is no paper for QSL cards, and it's impossible to buy amateur radio books. The economic situation makes it difficult for our fascinating hobby. I'm sure that I can say that many good, intending radio amateurs will give up due to difficulties.

There are few commercial transceivers in our country. Most amateurs here work with home-constructed equipment. Remarkable stations exist, despite this. For example LZ2US, Marko, has a good EME, with everything from antennas to receivers being home-built. Because of his excellent work, Marko has won many awards.

Because in Bulgaria we haven't the right to buy free currency, commercial equipment may be obtained only from the 'black' market, where it costs much more. A commercial transceiver, such as the FT-747, can cost 21 000 Levs, while a monthly salary in Bulgaria is approximately 250 Levs.

Many Bulgarians lose interest in the hobby because of the problems. In spite of this, I am optimistic and think that in future, conditions will change. Bulgarian radio amateurs will regain their international prestige. They won't be ashamed of their country, and they will be proud of their beautiful climate and new, friendly conditions for radio amateurs.

Christo Mintchev
Staras Zagora
Bulgaria

Editor's comment: The PW team were delighted to receive your letter Christo. I had the great pleasure of meeting some of your countrymen at the Friedrichshafen show in Germany in 1990. We are all very pleased to hear you find the magazine so interesting. Perhaps you could send us an article, with lots of photographs, so we can learn more about amateur radio in Bulgaria. We look forward to hearing more from you and your friends.
Competition Corner

PLEASE NOTE THAT FROM NOW ON WE WILL ACCEPT PHOTOCOPIES FOR COMPETITION ENTRIES.
(PHOTOCOPIES MUST BE ACCOMPANIED BY THE 'FLASH' ABOVE).

PRIZES...PRIZES...PRIZES

First prize winner can choose either a one year PW subscription
or
£20 in vouchers for the book service.

The two runners-up can choose from either a six month PW subscription or £10 in book vouchers.

Circle the 12 differences, fill in the form below and send your entry to PW Publishing
Ltd., August 1991 Spot The Difference Competition, Enefo House, The Quay,
Poole, Dorset BH15 1PP.
Closing Date 23 August 1991.
The Editor’s decision on the winner is final, no correspondence will be entered into.

Name:..............................................................
Address:................................................................
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For subscription or vouchers please:
☐ Subscription
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Services

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

Back Numbers & Binders
Limited stocks of many issues of PW for the past years are available at £1.50 each including post and packing.
Binders, each holding one volume of PW, are available price £4.50 each (£1 P&P for one, £2 for two or more).
Send all orders to the Post Sales Department.

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

Constructional Projects
Each constructional project is given a rating to guide readers as to its complexity.
Beginner: A project that can be tackled by a beginner who is able to identify components and handle a soldering iron fairly competently.
Intermediate: A fair degree of experience in building electronic or radio projects is assumed, but only basic test equipment is needed to complete any tests and adjustments.
Advanced: A project likely to appeal to an experienced constructor and often requiring access to workshop facilities and test equipment for construction, testing and alignment. Definitely not recommended for a beginner to tackle on his own.

Components for our projects are usually available from advertisers. For more difficult items a source will be suggested in the article. Kits for many of our recent projects are available from CPL Electronics who advertise in the magazine.
The printed circuit boards are available, mail order, from the Post Sales Department.

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

Wireless Line
This is an information service for the radio enthusiast, updated each Friday. Calls cost 45p per minute peak time and 34p per minute off-peak. The number to ring is: (0898) 654632.
New Catalogue

West Midlands based T.A.R. Communications now have details of their extended range of antenna and associated hardware products, published in a new 1991 Summer Catalogue edition.

This company’s range of products concentrates on antennas, hardware and literally everything associated with rigging techniques. The free catalogue, complete with discount vouchers, clearly illustrates their particularly extensive range of hardware, rotators and antennas.

Further details of T.A.R. Communications’ business, marine, p.m.r., airband and custom-built antennas services, contact (0384) 390944.

BARTG

Membership of the British Amateur Radio Telegroup for 1991 is £10 for the year. You can join by sending your £10, name and address to: Miss Ann Reynolds G6ZTF
169 Bell Green Road
Coventry CV6 7GW.

BARTG News is now put onto packet using the callsign of GB2ATG and sent to GB8. Some transmissions on 14MHz RTTY continue, this depends on the willingness of the local newsreaders to continue transmissions. The 3.5 and 14 MHz transmissions still continue using RTTY.

Software Sales are now handled by: John Barter GASKA
32 Wallbrook Street
Tiverton
Devon EX16 5JW.

Publication Sales are now handled by: Ted Batts GBLWY
27 Cranmer Court
Richmond Road
Kingston-on-Thames
Surrey KT2 5FY.

Secretary and Publicity Officer is: Ian Brothwell G4EAN
56 Arnot Hill Road
Arnold
Nottingham NG5 6LG.

Help!

Could anyone help Ken Hatton, in locating a static voltmeter?

Ken G@ZW, represents ‘The Not Forgotten’ society, an organisation helping disabled ex-servicemen, and for over 23 years he has been engaged in the design and provision of various electro-mechanical aids for the handicapped.

If anyone could help, please contact Ken at: Hamilton House
Beat Road
Bellingham
Northumberland NE48 2AP.

Radio Amateurs’ Course

A RAE course is to be held at Rhondda College. The full session length is to be from September to May. Classes are to be held each week for two and a half hours per evening, on possibly, but not definitely Monday evenings. Students male or female, young or not-so-young, all welcome. Further information from the course tutor John Howells GW4BUZ on (0443) 432187 or 432542.

Beginners’ Guide

Siskin Electronics, probably best known for their support of packet radio, have a 71-page beginners’ guide to IBM PC computing. Many of you will have ventured into the world of computing via this route, and may be finding that the manuals supplied are a little too vague or difficult.

Follow the easy-to-read chapters in the book by Don Bradbury and learn ‘to drive’ the beast a little better. Normally priced at £3.95, but mention that you are a PW reader and it’s yours for only £2.95.

A Guide To Personal Computing by Don Bradbury, available from Siskin Electronics Ltd.

Try-Before-Buy Software

Venus Electronics are continually updating their shareware catalogue. This 12-page short form catalogue has sections covering business to games, word-processing to flight training. These shareware disks are a wonderful way of building up programs that suit you. It really is try-before-buy!

For a catalogue contact: Venus Electronics
26 Pevensey Way
Frimley
Camberley GU16 5YJ.
Tel: (0252) 637860.
Blue Rose Electronics

Surface mount technology is becoming more popular with radio construction enthusiasts. Blue Rose Electronics, based in Warrington, have published their latest catalogue which is packed with all the necessary details on surface mounting devices, related materials, prices and applications.

In reality, this A4-sized booklet which costs £1.50, should be regarded as a comprehensive combined designer’s handbook and catalogue, dealing with the steadily growing application of the surface mount device. For further details contact Blue Rose Electronics on (0925) 727748.

Morse Class

A new Morse code course will commence in September 1991 at Oldswinford Hospital School, Heath Lane, Stourbridge.

Primarily aimed at the 12-16 p.m. Amateur Radio Morse Test, the course will run until Easter 1992, and will include hints on operating procedures and a weekly on-air net.

For enrolment details, please contact the tutor, Phil Harris G4SPZ on (0293) 400205.

Shropshire Morse Course

Wellington College of Arts & Technology will, for the first time, be running a Morse course. Enrolment dates are Monday 9th and Tuesday 10th September 1991.

The course will run for 10 weeks on a Thursday evening 7 to 9pm. The cost will be £22 and the course objective will be 12 words per minute. For more details, contact the course tutor John Christopher GO1SI at Wellington College of Arts & Technology, Wellington, Telford.

Radio Scouting

The National HQ of the Boy Scouts of America K2BSA, will soon have their own station at Camp Wilson in Dallas County. The site is being sponsored by numerous groups including K2BSA, ARA, AMSAT International, Southwest Dallas ARC, Texas Utilities ARC and the Dallas remote imaging group.

Operations are planned to include h.f., v.h.f., u.h.f., packet, satellite, Amor and ATV.

The station will be the main control station for an amateur radio network of 29 Scout stations worldwide.

Radio Amateurs’ Course

North Trafford College are offering another Radio Amateurs’ Course this year. It starts in September, with the Course Tutor being J.T. Beaumont G3NQD. Theory will be covered on Monday evenings or Wednesday mornings, Morse code on Tuesday evenings or Wednesday afternoons, amateur television on Wednesday mornings and advanced Morse code on a Monday evening. The full day course (Wednesday) should appeal to retired or unemployed people, as a successful student could apply for an ‘A’ licence at the end of the year.

Enrolment dates are September 2nd, 3rd and 4th.

North Trafford College
Tel: (0270) 331271.

Amateur Radio Class

The popular Cambridge class will run on Tuesday evenings, 7 to 9pm, from September 24, until the examination in May 1992. It is being held at Chesterton Community College, Gilbert Road, Cambridge. The enrolment evenings are Tuesday 10th and Wednesday 11th September, 7 to 9pm. The fee for the whole course is £73, and early application is encouraged. The course tutor is Martin Mann G4FFO, telephone (0223) 860150.

Scottish Tourist Board RA Expedition Group

On July 20/21 - GB6ONTS will be on the air for the National Trust for Scotland Diamond Jubilee Celebration Weekend. The event will be held in Pollok House, Pollok Park, Glasgow. This is where Morse was born and where six men discussed forming the organisation 60 years ago.

The Trust was founded as a Charity in 1931 by a Private Act of Parliament. It was founded to promote the permanent preservation, for the benefit of the Nation, of lands and buildings in Scotland of national interest or national beauty.

There’s a special QSL card for every contact.

Contact: John (Paddy) McGill G1NNTH. Tel: (0236) 40049.

Radio Amateurs’ Exam

Havering College of Further & Higher Education, will run a Radio Amateurs Examination preparation class starting on Monday September 9, and a Morse Examination class starting Thursday 12 September.

For more information write to Stuart Woosnam G0KPK or Chris Potarzycki G0SIZ at: Havering College of F & HE Quarries Campus
Tring Gardens
Harold Hill
Romford
Essex RM3 9ES.
Telefon (0402) 381460 Ext. 7131.

Shropshire.

Practical Wireless, August 1991
Come Fly With Us

Last month we brought you the Dayton Show report. This time, Roger Hall G4TNT shares some of the highlights and adventures of the first readers' trip to Dayton. Then he lets you in on our plans for the 1992 trip.

I had dreamed about going to the Dayton Hamvention for many years. In 1990, expansion plans at PW Publishing meant that at last, I had my chance. The trip was marvellous. I met so many people who were interested in PW and Short Wave Magazine, that we decided to have a booth there in 1991. I also thought it would be an excellent idea to share the experience with our readers, and so the Dayton Readers' Trip was born.

Good Idea

It seemed like a good idea at the time, but snags appeared as soon as work started on the project. I was about to discover that there were to be one or two problems on the way.

The Gulf War, and airlines not wanting to give me firm prices, caused a few headaches. More aspirins were needed. I also thought that the RSGB show at the NEC clashed with Dayton. I began to wonder if we would ever get there!

Dayton Departure

I needn't have worried. It was alright on the night! The airline tickets were issued, the rooms organised, and the booth was booked. Suddenly, it was time to go.

I went out a couple of days before the main party to help get the booth ready. Another job was to smooth the way at the Hotel, and arrange buses, etc.

By Thursday evening the booth had been set up, the three day tickets to the show collected and the Hotel was ready for us. I had also managed to get into Cincinnati to find out about coaches for next year. Flying this route will save us having to change planes during the Dayton 1992 trip.

Dayton Arrival

When I arrived at Dayton airport that evening, I found Rob Mannion G3XFD, and about 30 readers standing outside. It had been a long flight, although some of the party had taken just as long to reach Gatwick from their homes. They'd come from as far away as Cornwall and Newcastle!

A quick phone call to our Hotel, the 'Radisson Inn', soon brought the buses to pick us up. It wasn't very long before we were in bed. This was when I first heard about the Gatwick adventures.

The trip was marvellous. I met many of our American and Canadian readers, and had the chance to get the latest news from readers coming to chat about their latest discovery or bargain buy. I didn't manage to attend any of the 50 or so forums.

Airport Adventures

The PW party members had enjoyed the trip and I managed to have a chat to several before they headed off to bed. This was when I first heard about the Gatwick adventures.

The adventures started when one of the party simply vanished, but luckily he reappeared just before the flight was due to leave. Then another member of the party, who'll remain nameless in print, very nearly missed the flight because he upset the security staff.

It was a stage when the Special Branch were called in, and it was only one of life's little coincidences that saved him. It turned out that the Special Branch officer knew Rob years ago, AND that he turned out to be a PW reader!

I don't know what it was, but the Special Branch officer eventually decided to leave the telling-off for Rob to do. So, accompanied by a lot of finger wagging, the party thankfully headed for the aircraft.

Dayton Mall at the other end of town has almost 140 stores and it contains more than 100 shops and 22 eating places. The nearest, the Salem Mall, is just five minutes away by bus, and it contains more than 100 shops and 22 eating places. The Dayton Mall at the other end of town has almost 140 stores, 25 eating places, 8 cinemas and parking for 7000 cars!

Shopping in America is a revelation to most visitors. Almost everything costs the dollar equivalent to the amount we pay in pounds, or less! I bought Ralph Lauren, Yves Saint Laurent shirts (they were on special offer at about £20 each) and a couple of pairs of trousers (Levi Dockers at $18) to accommodate my expanding waistline. The cabin staff were amused, and impressed, when they saw everyone wrapped in blankets embroidered with the logo 'PW RULES OK!'

Early Start

Although the show opened officially at 12pm on the Friday, most of our party went a lot earlier because the flea market opened at 8am! An early start is needed, because as Les GOSKF said, "Even after three days I didn't get to see it all!"

If you've never been to America, it's almost impossible to appreciate how cheaply you can eat. Rob G3XFD, all six foot eight inches of him, with matching giant-sized appetite, ate regularly at the appropriately named 'Big Boys' restaurant. Here, even Rob could have had all he could eat for around $5!

Free Buses

It's easy to get there. Free buses run to and from the Hara Arena, the local malls, hotels and tourist attractions. So, you don't need a car on this trip!

During the day the Hara Arena was always busy, but never crowded. This is surprising when you consider that more than 30 000 people attended each day. On the booth I met many of our American and Canadian readers, and had the chance to get the latest news from readers coming to chat about their latest discovery or bargain buy.

Never Crowded

During the day the Hamvention was always busy, but never crowded. This is surprising when you consider that more than 30 000 people attended each day. On the booth I met many of our American and Canadian readers, and had the chance to get the latest news from readers coming to chat about their latest discovery or bargain buy.

I didn't manage to attend any of the 50 or so forums.
To Dayton '92

That's how I met 'Presto The Clown', who was there to covering Glass Etching, Wheat Weaving, Shrink Art, Alternate Activities

Unfortunately, I also missed all the 'Alternate Activities' which are aimed mainly at visitors' wives and girlfriends. This year, there were 33 talks and craft classes covering Glass Etching, Wheat Weaving, Shrink Art, Counted Cross Stitch and so on. We heard that they were very well attended, so they must have been good if they kept people away from the shopping malls.

The show organisers know that Dayton is a family affair, so they also arrange lots of activities for children. That's how I met 'Presto The Clown', who was there to entertain at a children's party.

We swapped balloon models, I showed him a poodle I'd made, and he showed me his teddy bear and so on. But I had to admit defeat in the end, when he made a motorcycle large enough for a child to sit on!

Parents were also given a chance to rest on Sunday morning. Mum and Dad were able to relax while the children went off on a trip, where they had fun and food before they were returned to suitably refreshed parents.

Ray And Alan Entertain

Most people were happy with eating at 'Big Boys', but one evening there was the chance of a real treat. The surprise came when Ray Withers and Alan Hooker, both well known to PW readers, decided to organise something different.

Alan and Ray took a group of readers to a local restaurant and bought everyone a meal. We provided the drinks, and when I say the party poured itself into the bus back to the Hotel, I've chosen my words carefully!

We learnt a lot at the party. If you ever need any advice on how to make an antenna out of drinking straws, just ask Tony G4IMZ. With only the aid of Elaine's penknife and a torch borrowed from Liz' GOJWN, he constructed some wonderfully intricate beam antennas.

Early Shopping

I'm afraid that there's not enough space to tell you everything about the official and unofficial evening events. But I can tell you about the night we went shopping. We attempted to find a department store packed out with shoppers and their children!

Other party members had found time to visit the huge aircraft museum. It's particularly good and Dayton can never be accused of forgetting that the pioneering aviators, the Wright brothers, came from the city.

Honesty Rewarded

To round off, I must pass on a delightfully true story that Terry Edwards of Radio Shack told me. He was in the main arena listening to Jim Simpson, a friend of his, drawing the winning tickets for the $100 000 worth of prizes given away this year.

Suddenly, Jim broke off in the middle of the draw because he said he'd an important announcement to make. Jim announced that early that day, someone had lost an unmarked envelope containing $1800. Fortunately it had been found, handed in to the office and returned to its grateful owner.

The announcement drew a gasp of admiration and a round of applause from the audience for the honest amateur who had returned the envelope. The draw then restarted, but a few minutes later Jim stopped again, because there was something to add to the story.

Jim announced that the people on the Icom stand were so impressed by the honesty of the person who'd returned the money, that they were presenting one of their top-of-the-range transceivers as a reward. This was greeted by even louder applause from the crowd. This reaction, to me, typified the show. It was full of good people having an excellent time.

Planning Next Year

For the Dayton '92 trip, we're planning to fly straight into Cincinnati. We'll then go by coach for the last 50 miles into Dayton, to avoid changing planes.

We've overcome any possible Hotel problems, but the number of places available for next year is strictly limited. If you're interested, fill in the coupon below and we'll send more details as they become available.

The cost should cost be around £500-£600, but don't send any money now. If you decide to come with us, we'll ask for a deposit nearer the time. We're also hoping to offer options such as extended holidays to enable you to explore America independently. As another alternative, complete holidays in Florida or California can be arranged.

All you have to do is to send the Freepost coupon to me at the address below and I'll look forward to seeing you on the Dayton '92 trip.

I am interested in the Dayton '92 Trip. Please put me on your mailing list and send me further details as they become available.

Name ..................................................
Address ..................................................
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Postcode .............................................
Tel: ...................................................

Send to: Roger Hall, PW Publishing Ltd., FREEPPOST, Enefco House, The Quay, Poole, Dorset BH15 1PP.
MAJOR SERVICING/REPAIR CENTRE FOR ALL AMATEUR, PMR AND COMMERCIAL RADIO EQUIPMENT...

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Castle Electronics are a fully equipped DTI approved radio engineering company based in the West Midlands, who specialise not only in PMR equipment, but in land and marine based HF communications equipment of all types.

Our engineers are widely experienced in not only early but also digital/synthesised radio equipment covering a wide range of makes and models.

A 24 hour emergency call out service is available covering the whole of the UK.
The amateur band between 1.8 and 2MHz is a little odd, in that we rarely hear anyone calling it 1.8MHz. More often it’s referred to by its affectionate nickname ‘Top Band’.

If you talk to any radio amateur who has been licenced for 20 years or more, and mention ‘Top Band’, you’ll see his eyes glaze over! The corners of his mouth will then begin to rise, and you’ll hear endless stories of the Sunday morning nets on a.m.

The local ‘natter’ on Top Band, particularly using a.m. equipment, has a firm place in the folklore of amateur radio. It’s something many of us have grown up with, and now you can join in too!

The Idea

In recent years I have had few excursions on the band, except for the occasional relaxing c.w. QSO. It’s a pleasant band, a place to relax and make friends. Despite this, I must admit to being a little surprised, when PW’s editor asked me if I had thought of designing an amplitude modulated transceiver for 1.8MHz.

Apparently, the idea originated as a request from readers. It seems that, almost unknown to me, groups of radio amateurs had been forming a.m. nets on the band. It sounded like fun, and so the ‘Chatterbox’ project was soon under way.

The Chatterbox

The Chatterbox is designed as a rig for the local 1.8MHz a.m. net, although I will describe how it can be used on c.w. with up to 10W input. But you should bear in mind that the basic design is dedicated to a.m. use.

The Chatterbox is made up of a separate transmitter and receiver. This approach goes back to the old days of 1.8MHz equipment, but I must admit that nostalgia was not the primary aim.

I decided that when building an a.m. receiver for local use, it’s very much easier to have separate units. I also think that many people will only want to build the transmitter, as they’ll already have a suitable receiver.

There’s been a lot of interest in 1.8MHz a.m. operation recently. To get you on ‘Top Band’, the Rev. George Dobbs G3RJV and Ian Keyser G3ROO, have come up with the PW Chatterbox, a complete a.m. station.
Simple Receiver

The receiver portion of the Chatterbox is a simple a.m. only design, capable of matching the performance of the transmitter. If you require a 1.8MHz DX receiver, you'll have to look elsewhere!

To fall in line with these ideas, the prototype transmitter and receiver were built in separate, but linked, boxes. The styling is rather like the famous B2 'Spy' transmitter-receivers, once so popular on the bands.

When I began work on the project, I spoke to Ian Keyser G3ROO, and we were soon working jointly on the idea. There are few problems in getting a solid state, 10W c.w. signal on 1.8MHz. The problem comes when you're looking for the easy production of amplitude modulation.

Ian told me of the excellent a.m. signal put out on the band by Doug G4RGN, on a 1.8MHz net in Kent. Doug very kindly supplied us with his circuit, which is simple, neat and works very well and it forms the basis of the Chatterbox transmitter.

The transmitter is a real joy to use. The p.a. stage is almost ‘bomb-proof’ and is very efficient. You can obtain 10W out for approximately 12W input. I could almost claim that it's a solid state switch working at a frequency of 2MHz!

Familiar Circuit

The circuit of the v.f.o. is shown in Fig. 1.1. It's that familiar favourite, the parallel tuned Colpitts circuit that I, and hundreds of others use whenever a v.f.o. is required for the h.f. bands.

The v.f.o. is capable of high output and has a preset, R7, to control the output. This may require adjustment for optimum results, and the best modulation quality.

Good quality polystyrene capacitors are used for the frequency determining portions of the circuit. The
capacitors involved are C2-5.

The v.f.o. tuning inductor, L1, is close-wound on a 7mm former with a core (Maplin LB17T or similar surplus former). I hold the turns in place with bees wax to add stability. Mechanical stability is important throughout the v.f.o. Although oscillator stability should present few problems at 2MHz, a badly built v.f.o. will drift.

Extra stability is provided by two stages of buffering amplification, coupled with a regulated supply line for the f.e.t. oscillator stage. The v.f.o. should be built in its own screened box. It also requires a slow-motion drive and I used a 6:1 vernier drive and dial in the prototype.

Transmitter Board

The circuit for the main transmitter board is shown in Fig. 1.2. This board contains both the transmit stages and the amplitude modulator.

The modulator forms the top part of the circuit diagram and the transmit driver and power amplifier the lower portion. We'll consider the r.f. portion of this stage first.

The output from the v.f.o. is fed into a single driver stage, which is a 2N3866 bipolar transistor. A homewound r.f. choke, L3, damped by a 1800Ω resistor forms a wideband load.

Power Amplifier

The power amplifier is an IRF510 power f.e.t. with an r.f. load comprising L4. This stage is modulated with the aid of an audio frequency transformer, T1. The output has a low pass filter formed around L5 and C28.

The diode, D6, acts as a d.c. restorer. The f.e.t. requires a turn-on voltage of 3V. This voltage is obtained by rectifying the drive, so that if the drive fails, the p.a. stage turns off so it won't overheat.
The completed Chatterbox transmitter section. The v.f.o. section is to the left, with the variable capacitor for frequency control located in the middle to the right, with the power amplifier and screening panel to the left, with the transformer shown to the bottom left hand corner of the picture. The power amplifier and modulator stages are to the right, with the modulation transformer shown located in the middle of the 'u' shaped combined heatsink and screening panel (see text).

The d.c. restoring action ensures that the drive waveform is positive-going, and the negative half is not wasted, and as the required drive for full output is at least 20V peak-to-peak, it avoids possible damage from excessive negative gate voltage. The output low pass filter also looks rather odd. But it works! As the internal capacitances of the f.e.t. are large, it's necessary to use series capacitance on the input of the filter. The power amplifier stage is capable of delivering 8 to 10W of r.f. output.

The Modulator

The modulator is built around two i.c.s, a 741 preamplifier and a TDA2030 power amplifier. The overall gain is set at the preamplifier stage with a preset control. The circuit closely follows the manufacturers data for the TDA2030. This is a very useful, beefy audio amplifier which works very well and reliably in this application.

The modulation transformer, T1, is a centre-tapped transformer in series with the power f.e.t. The transformer is a home-wound job using a special former, the R.S. Components Ferroxcube 228-264. This is also available from Maplin Electronics as part FT33L.

The cores used are designed for power oscillators and switch mode power supply systems. The component is made up from the two 'E' shaped halves of the ferrite core, and a moulded former.

Take great care when handling the ferrite sections, as they are very brittle. During the testing of the prototype transmitter, two cores were damaged in the post. Broken ferrite sections can be glued together, but it works! As the internal capacitances of the f.e.t. are large, it's necessary to use series capacitance on the input of the filter. The power amplifier stage is capable of delivering 8 to 10W of r.f. output.

Transformer Winding

The transformer is wound on the moulded former, and the E shaped ferrite cheeks are then added to the assembly. The transformer requires 300 turns of wire, centred tapped for the audio input. The transformer can be made by winding on 150 turns, making a tapping and adding a further 150 turns. I tried several methods and wire gauges and decided upon a bifilar winding of 150-150 turns of 0.4/0.5mm (26s.w.g.) enamelled copper wire.

The original prototype had 300 turns, centre tapped and wound with 0.71mm wire, but this can only be achieved with careful winding on a lathe. In practice however, the bifilar winding using the wire suggested above produced the same results without overheating problems.

The easiest method of making the transformer is to buy two small reels of 0.4/0.5m wire, and then use them both in the winding process. The windings are made side by side. To make the job easier, you can mount the reels on a thin rod to act as a spindle, allowing them to turn freely as the wire pays out.

The winding consists of turns made with the two wires side by side. You should treat the wires as one wire. Start the operation carefully, and as neatly as possible, wind on 150 turns.

Distribute the winding as evenly as possible over the whole width of the former. Don't forget to leave about 150mm of wire free at both ends of the winding. The completed job will result in four ends of wire, two starts and two ends. If you've got more than this - something's wrong!

The necessary tapping is made by joining the end of one winding to the beginning of the other. The correct wire for the connection may be sorted out using a test meter. These connections MUST be correct. If they aren't, the transformer won't work. If there's any doubt, carefully check. Don't forget that the order of the windings to complete the transformer is: beginning-to-end to beginning-to-end.

Chatterbox Switching

Shown in the top half of Fig. 1.1, are the switching arrangements for transmit and receiving on the Chatterbox. The press-to-talk switch on the microphone, controls a 12V two-pole change-over relay. One pole of the relay moves the antenna input from receive to transmit. The other pole, places 12V to the v.f.o. and transmitter boards when the p.t.t. switch is pressed.

Unusually, the v.f.o. is switched off during the receive periods. This is not usually advised in normal transmitter practice, because of switch-on drift. In this application however, with a a.m. transmitter on 2MHz, the effects of short term drift is relatively unimportant.

Should the transmitter be required for frequent use on c.w., it would be advisable not to switch the v.f.o. off on receive. It may be better to provide an offset to remove it from the receiver passband.

The switch, S2, is a net switch to locate the transmitter frequency prior to transmitting. It switches the v.f.o. on, which then provides enough r.f. to locate the transmitter frequency. For accurate netting it may be advisable to switch on the receiver b.f.o. The switch, S1 is the main on-off switch.

Building The Boards

Layout of the v.f.o. board is shown in Fig. 1.3, and the layout of the main transmitter board is shown in Fig. 1.4. Following usual practice, the v.f.o. board is single-sided, although the transmitter board is double-sided to aid stability.

Just visible running around the edge of the p.c.b. is Fig. 1.4, is the simple wrap-round heatsink which is used for the p.a. f.e.t. and the audio amplifier chip. The heat-sink is homemade from aluminium and is 70mm high. The best method of making the heatsink is to cut and file the metal to suit the individual p.c.b.

Heat Precautions

The f.e.t. used in the p.a. requires an insulated mounting kit to isolate the device from the heatsink. However, the TDA2030 audio amplifier i.c. doesn't require insulation from the heatsink in this single rail configuration.

At this stage, I recommend that TR5 and IC3 are attached to the heatsink before their leads are soldered to the board. This simple precaution will dissipate the heat involved during the soldering process.
Testing Time

I suggest that you should start by building and testing the v.f.o. first. It's easy to locate the oscillator on a suitable 1.8 MHz receiver, when its in the c.w, or s.s.b. mode.

The core of the tuned circuit should be adjusted for the required band coverage. With the values given, the v.f.o will cover the whole of the 1.8 to 2MHz band, and you should check carefully to see that the v.f.o doesn't stray 'out of bounds'. This is best done with an accurately calibrated receiver, frequency meter or crystal calibrator.

In practice, the ability of the v.f.o. to cover the entire allocation is useful for c.w. Don't forget that the whole band is not used for a.m. operation, and you wouldn't be popular if you used an a.m. signal on the bottom sector of 1.8MHz!

Setting Up

The transmitter is easy to set-up. It may be done by car, or by using a cheap audio oscilloscope to monitor the signal.

If an oscilloscope is available, you should set it up on an high input audio range. The transmitter must be fed into a 50Ω dummy load capable of dissipating 10W.

There should be enough r.f. available, for you to lay the probe close to the dummy load, enabling the 'scope to display the classic trace of an a.m. signal.

The next stage is to adjust the r.f. level using the v.f.o. preset control, and the audio gain preset control on the transmitter board, to obtain the best modulation level consistent with good quality. If a 'scope is not available, connect the transmitter into the dummy load, and monitor the signal on an a.m. receiver. The presets are adjusted for the highest, good quality output.

Microphone Surprise

Surprisingly, I found that a cheap CB-type microphone produced the best quality. If you don't have a microphone handy, the Maplin Electronics Communications Microphone type WFO5F gave very acceptable results.

The transmitter is easy to use, and all you do is point and fire! The only other adjustment is to net onto the required frequency. Then you press the microphone switch and talk. I know there's at least six Chatterbox transmitters already in use, and they're all producing good quality signals on 1.8MHz.

How Much? £27 + p.c.b.s + boxes

How Difficult? Intermediate

Shopping List

**Resistors**
- Carbon Film 0.4W 5%
  - 22Ω  1  R20
  - 33Ω  1  R22
  - 100Ω  1  R5
  - 1kΩ  5  R6, 8, 10, 11, 16
  - 5.6kΩ  1  R19
  - 10kΩ  4  R2, 4, 9, 23
  - 33kΩ  1  R18
  - 100kΩ  6  R1, 3, 13, 14, 15, 17

**Capacitors**
- Carbon Film 1W 5%
  - 180Ω  1  R21

**Variable horizontal mounting**
- 22Ω  1  R7
- 100kΩ  1  R12

**Semiconductors**
- BCI83  1  TR2, 3
- IRF510  1  TR5
- TDA2030  1  IC3
- 1N4001  5  D1, 2, 3, 4, 5
- 1N4148  1  D6
- 2N3819  1  TR1
- 2N3866  1  TR4
- 78L05  1  IC1
- 741  1  IC2

**Miscellaneous**
- Printed circuit boards will be available from the PW PCB service. Two suitable aluminium boxes, (Minford), 1.5mm aluminium sheet for the heatsink, coaxial plugs and sockets as required, interconnecting wire, miniature coaxial wire, 0.2mm and 0.4/0.5mm enamelled copper wire, short lengths of heavy (0.8/1.0mm) copper wire, two single pole switches, suitable microphone with p.t.t. switch, one d.p.c.o. 12V relay.

The finished project...read next month for the receiver part of the 'Chatterbox'

Next month, I'll bring you the full details of the companion Chatterbox receiver. In the meantime, get building and I hope to work you on 'Top Band' a.m. very soon!
I was very pleased to find that home construction is very much alive in the USA. At least, that was the impression I got from my thoroughly enjoyable trip to the Dayton Hamvention.

As I'm very much involved in running a series of school radio clubs, I was on the look-out for constructional projects, ideas and kits. I fully intended to bring some home if there were any that proved suitable for my young club members.

There's something about a kit that really encourages you to have a go. There's no excuse, it's all there, ready to go! All you have to do is to apply the ingredients, such as time, patience, a little expertise in soldering and a large helping of enthusiasm.

Kits On Show

To be quite honest, I'd never heard of the Ramsey kits before I went to the Hamvention. But, after I'd been able to wander around the show, I soon noticed the kits on display at various booths and I was very impressed at what was on offer.

Eventually I found my way to the Ramsey booth, where the New York based company had their full range of kits on show. In fact, I was able to see many of the projects built and working, including the newly-launched Ramsey 144MHz f.m. 3W fully synthesised transceiver.

At first sight, the Ramsey kits, neatly packed in see-through plastics bags, don't look as if they're anything really special. The surprise comes when you open the bag, empty the carefully packed contents and glance through the manual.

I was most impressed with the quality of the components, and the simple but very effective way of presenting the kits. However, in my opinion the secret of the Ramsey kit success must surely be the manual. I can honestly say that the manual impressed me very much indeed.

The manual isn't a glossy, full colour job. It's not large, and it doesn't come packed with photographs. But it is a 'no frills' simple-to-use book, extremely well written, and with all the information you require. In fact, I regard the Ramsey manual as being so well-prepared and so readable, that other manufacturers should take another look at their own kit instructions.

Getting Started

My only regret is that I did not have the room or enough money to bring back more of the Ramsey kits. The variety on offer are ideal for newcomers to the hobby. After building a receiver or transmitter, newcomers will have gained much experience and learned much more about the equipment they're using.

As our front cover photograph illustrates, I consider
Receiver Kit

that the Ramsey kits will prove no obstacle to constructors of any age. The step-by-step approach, with component overlay charts on nearly every page, will guide the constructor to successful completion. Additionally, Ramsey also provide a full technical description of the particular project undertaken, and this is backed up by a block diagram showing what each section does.

Ramsey advise constructors to read the manual thoroughly before starting to build. I took their advice, worked my way through the manual, and ended up being even more impressed!

To simulate a very basic workshop, I worked on our lounge table. The lighting wasn't very good, so I rigged up a table lamp. Good lighting is essential and I recommend an adjustable-position light for this work. Some of the components are very small and have even smaller lettering and numerals for identification.

How It Works

The 50MHz f.m. receiver kit I chose for this review, is based around the Signetics NE602 integrated mixer, product detector and oscillator, and the Motorola MC3359 i.e. with suitable filtering and audio amplification. A block diagram of the receiver is shown in Fig. 1.

The completed receiver is very sensitive, and Ramsey claim a sensitivity of under 1µV. More than adequate audio output is provided by an LM386 i.e. stage, making this kit a very useful project for anyone requiring a basic receiver.

The p.c.b. supplied with the kit was of very good quality. All the major components are easy to identify and Ramsey supply a two-colour p.c.b. overlay (approximately twice full size) to assist in component placing.

Progress Summaries

As I worked my way through the kit, I found the progress summaries very useful. At the end of each particular section, the manual tells you exactly what you've done so far and what the stage of the project does.

I brought back two Ramsey 144MHz f.m. receiver kits and two of the 50MHz versions. Both 144MHz kits were built by my young radio club members (their ages range between 13 and 16), and they found the progress summaries invaluable. In fact, my help wasn't needed, because the summaries told them everything they wanted to know!

Finally, when the kit is completed, the manual tells you about alignment, testing and boxing the project up. There's also a fault-finding and test procedure to accompany the alignment section plus a separate trouble-shooting section. I'm pleased to say that in my case, the fault-finding sections weren't needed.

The Finished Project

When you've finished any kit project, it's a good idea to make the most of your efforts by placing the finished job in a decent box. The smaller Ramsey kits aren't supplied with a box, but I had no problem in buying a suitable aluminium container at a rally. Ramsey offer a suitable enclosure for each kit, but I've found that a home-made box (using copper laminated p.c.b. material) does the job very well. The

Conclusions

I like the Ramsey kits very much indeed. I think the manuals are excellent. Their range of kits is expanding all the time, and the 50MHz f.m. receiver kit featured in this article was only introduced in April 1991. We're planning to review their newly-introduced 144MHz f.m. transceiver kit later this year.

Although we have excellent kits available here in the UK, I consider that the Ramsey v.h.f. range will prove very popular with constructors on this side of the Atlantic. I also feel that the author and designer of the manual, Dan F. Onley K4ZRA, should be congratulated for his excellent work. His manual will surely encourage other people's constructional efforts.

The full range of the amateur radio kits made by Ramsey Electronics Inc., and the cases to hold the completed projects are now available in the UK. The 50 and 144MHz f.m. receiver kits cost £29.95 plus post and packing. The kits are available from: Raycom Communication Systems Ltd., 963 Wolverhampton Road, Oldbury, West Midlands B69 4RJ. Tel 021-552 0073.

finished kit has three identical potentiometers for tuning, audio volume control and squelch, plus an on-off switch. I fitted extensions to the knobs so that the receiver would fit into my home-brewed box. Once the receiver was safely housed, I mounted one of the small epicyclic slow motion vernier-type dials, to provide tuning. This is an approach that works very well, and I thoroughly recommend anyone to try it out on one of the receiver kits.

My school radio club members intend to build six or so of the 144MHz receivers for club use, and I've made the enclosures so that they can be hand-held. The next stage is to organise a fox-hunt and to test the club members' map reading and direction-finding abilities!
The Oscilloscope In Your Workshop

Part 4

To round off his short series on the 'scope in your workshop, Fred Judd G2BCX looks at specialised instruments based on this most useful, and perhaps the most neglected 'tool' in the amateur workshop.

I thought that in this final part, we should have a look at three different types of instruments employing the c.r.t. for special applications. At the top of the list are spectrum monitors, or analysers, which could be regarded as 'scopes incorporating other special circuitry.

Also in this category are large screen v.d.u.s of 220 x 180mm. These should not be confused with computer v.d.u.s. This type is also known as the X-Y display. They are almost complete single-trace 'scopes, requiring only a variable 'ramp' wave for a timebase and provide a black and white display.

The final category is the long persistence display. I've already briefly mentioned that some cathode ray tubes have what is known as a long persistence screen. This type of c.r.t. is sometimes called a 'long afterglow tube'. With this type of c.r.t., the time trace and any deflections produced by signals can remain visible on the screen after the event for many seconds, minutes and (for particular applications) even an hour or so.

Spectrum Monitors

Spectrum monitors are perhaps better known as 'spectrum analysers', and were at one time used almost exclusively in laboratories. However, continued development has resulted in simplification and considerable reduction in cost.

The spectrum monitor is a combination instrument, with its own c.r.t. display. It functions as a tuneable r.f. voltmeter for alignment of transmitters, checking modulation levels, receiver performance (stage gain and other measurements), antenna tuning, analysing different forms of interference and for the detection and measurement of harmonics and spurious signals generated by transmitting and audio equipment.

A low-cost spectrum monitor, the Cushman model CE15, is shown in Fig. 1. This instrument incorporates what might be regarded as a superhet receiver with a 'sweep tuned' local oscillator. The l.o. sweep rate is synchronised with the c.r.t. timebase (ramp generator). Thus the horizontal deflection on the c.r.t. is directly proportional to signal frequency. Vertical deflection does of course depend on input signal amplitude. A simple block diagram of the CE15 circuitry is shown in Fig. 2. This is an arrangement common to most low-cost spectrum monitors.

The frequency range of the acceptable input signals is determined by the tuning range of the local oscillator. In the Cushman CE15 for instance, the l.o. tuning range is 2.1 to 3.1GHz. This l.o. range allows the instrument to accept input frequencies from 1MHz to 1GHz.

Practical Uses

Space permits only a few examples of practical uses. The oscillogram, Fig. 3, which should be of interest to narrow band f.m. users, shows a 150MHz transmitter carrier modulated by a 1kHz sinewave.

Frequency modulation produces a large number of sidebands, even when the signal is modulated with a single frequency. The bright trace indicates the outside

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envelope of the sideband power and which makes it
easy to check for excessive deviation. In this example
deviation has been adjusted for 5kHz peak.

The oscillogram, Fig. 4, shows a strong harmonic
from a rather poorly designed, unmodulated 27MHz
CB transmitter virtually swamping a weak TV signal.
Significant interference can be caused by high order
(8th, 9th, 10th and higher harmonics) from poorly
designed transmitters, as well as from the local
oscillators of receivers.

**Radar Displays**

Former radar screen displays, employing 300mm
diameter long persistence c.r.t.s can be modified for
other uses. The example shown, Fig. 5, and virtually
stripped of its original circuitry, was a Raytheon
marine radar display. This had rotating deflection
coils which allow the use of a rotating timebase with
its start at the centre of the tube.

With new transistor and integrated circuits installed,
I used this modified unit for displaying the radiation
patterns of transmitting antennas. The antennas were
scaled down to operate at a very high frequency.

The display also incorporated a special device for
producing a perfect 'dipole radiation pattern' for use
at any amplitude on the screen. This facility could be
superimposed over the radiation patterns of real (rather
than mathematical) model antennas for comparison
and related 'gain' measurements. The pattern of the
electronic dipole is shown, Fig. 6, on the display screen.

The radiation pattern from a 914MHz model of the
12-element ZL special, designed for 144MHz, is shown
in Fig. 7. I also used a transparent screen over the c.r.t.
on which specific marks could be made with a
'Chinagraph' pencil.

Illuminated transparent Perspex screens, with maps
traced on them, as in Fig. 7, could also be fitted over
the display screen. The full details, techniques and
working examples were originally published in the
*PW* reprint book *Out of Thin Air*, which is available
from the *PW* Book Service.

**Long Persistence**

Extra long persistence but smaller diameter c.r.t.s,
are most suitable for very slow timebase operation.
This is because the image formed, is retained for quite
a long time after the event.

I built a special 'scope to help with Sporadic-E
observation, which was carried out over four years,
conjunction with the Rutherford Appleton Laboratory.

It operated with a timebase that could be made to
run for up to about two minutes maximum with a very
long afterglow 18mm c.r.t. This 'scope was particularly
useful for observing photographically and recording
variations in the amplitude of h.f. band signals reflected
from Es clouds and other phenomenon. Good
photographs could be produced, as the example, Fig.
8, clearly shows.

**Large Screens**

Larger visual display units, again not to be confused
with computer displays (v.d.u.s), have a large c.r.t.
with an average size of 23 x 18mm. They are normally
used in conjunction with a conventional 'scope, as in
Fig. 9.

The 'picture' displayed on the 'scope can be
reproduced on a much larger scale. For this purpose,
X-Y v.d.u.s normally have a white trace. Such
instruments incorporate most of the facilities common
to ordinary 'scopes, such as: timebase amplitude
control, trace shift, brilliance control, d.c. inputs (with
amplifiers), image inversion, Z modulation input, etc.,
and as mentioned before, only requires a timebase
waveform.

Timebase ramps are available as an output from
most modern 'scopes. The amplitude required is from
5 to 10V. Note: Earlier models such as the Marconi
Instruments TF 2212A X-Y v.d.u., which is the type I
use, have a limited frequency Y amplifier frequency
response.
Fig. 7: Radiation pattern from a model of the 12-element ZL Special beam antenna, operating at 914MHz. (The other marks on display were for reference purposes only).

Fig. 8: Use of very long persistence cathode ray tube. The trace duration is 25 seconds and it indicates variations in the amplitude of signals reflected from a Sporadic E cloud.

Fig. 9: How a large screen X-Y display unit is used in conjunction with a conventional oscilloscope. (see text).

Series Summary

Although I appreciate that most of the items mentioned in this final part, are outside the normal applications for a 'scope, they may well be of interest to serious experimenters. However, even a good secondhand instrument can become a valuable and instructive electronic diagnostic 'tool' in any amateur radio shack. It's my wish in summing up the series, that you'll now get much more from the 'scope in your workshop.

Fred Judd G2BCX

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(i) \( a \)  
(ii) \( a \)  
(iii) \( d \)  
(iv) \( c \)  
(v) \( b \)  
(vi) \( a \)  
(vii) \( d \)  
(viii) \( a^* \)

With answer (viii) above there wasn’t a possible answer. However, if you ignored the ‘[ ]’ brackets then (a) was the answer. But if you didn’t ignore them, then the answer would have been \( 10^2 + 4 \times 10^3 \). Our apologies for the confusion!

Algebra Time

It’s time to change the subject now, as we turn to Algebra. What does algebra mean to you? Is it a name that conjures up fear? A lot of people seem to go to pieces as soon as that word appears!

However, they don’t seem to worry about simple formulae like Ohm’s law, which is itself a bit of algebra. So why the difficulty?

Algebra isn’t difficult, but we’ve got to start somewhere. The fear of algebra seems to stem from the use of letters instead of figures. The reason for using letters (or other symbols) is that by their use, a general statement can be made which can be used to solve real problems. This is done by substituting numerical values for the symbols used in the general statement or formula.

As I’ve said, algebra isn’t difficult, but we’ve got to begin somewhere. So, to get to the level where formulae becomes meaningful, we must start by understanding simple algebra.

Simplicity Rules

Taking something really simple, such as:

\[ Y + Y = 2Y \]

If the answer isn’t immediately obvious, then try reading it as ‘one Y plus one Y equals two Ys’. Still not got it? Then how about ‘one transistor plus one transistor equals two transistors’, is that obvious? If we call a transistor ‘Y’ then we get the original \( Y + Y = 2Y \), perhaps you’ve got it now?

That’s why its called a general statement as ‘Y’ (or any other symbol or letter) can be used to represent anything we like.

Algebraically, we can write:

\[ Y + Y = 2Y \]
\[ = 1 \times Y + 1 \times Y = (1 + 1)Y = 2Y \]  

Anything inside parentheses ( ), sometimes called parentheses, is to be multiplied by whatever is immediately outside the brackets. For instance:

\[ 3(Y) + 6(Y) + 1(Y) = 3 \times Y + 6 \times Y + 1 \times Y = 3Y + 6Y + Y \]  

(see index Y is the same as just Y) = 10Y.

Brackets (Parentheses) are also used to separate terms in algebra, so that there is less likelihood of errors. We’ll discover more about this later.

Whenever symbols and/or figures are written exactly next to each other, they’re considered as having to be multiplied together. Sometimes a full stop (‘.’) is used to represent the multiplication (of course the ‘x’ or ‘times’ with which we are more familiar).

More often than not, no sign is used at all. This ONLY applies when terms are MULTIPLIED together. With the widespread use of computers in the office and home, the star ‘*’ symbol is commonly used. This can sometimes clarify an ‘x’ (for multiplication) or an ‘x’, used as a term.

Addition And Subtraction

Additions and subtractions use the familiar + or - signs. Of course, the letter Y (or y) is not the only letter used in algebra! My choice of Y was quite arbitrary as any letter or symbol can be used.

Different symbols are employed to identify different things. We can’t add 3 rabbits to 4 cats, can we?

In algebra, this potentially difficult job could be written as:

\[ 3r + 4c, \text{ or } 3x + 4Y \]  

The rules for adding and subtracting in algebra are:

(i) Write down the addition or subtraction to be made.

(ii) Move the terms about to get everything of ONE TYPE together.

(iii) Add (or subtract) the coefficients of the SAME TYPE terms.

Just to show you, here’s an example of algebraic addition using the rules I’ve mentioned:

(i) Add together 4a, 3b, 6c, 5b, 7a and 11c

\[ 4a + 3b + 6c + 5b + 7a + 11c \]

= 4a + 7a + 3b + 5b + 6c + 11c

= 11a + 8b + 17c (the answer)

Common Symbol

Where any symbol is common to two or more terms, it can be used as a multiplier outside a bracket as in:

\[ 4a + 7a + 3b + 5b + 6c + 11c \]

= \[ a \times (4 + 7) + b \times (3 + 5) + c \times (6 + 11) \]

where coefficients of ‘a’ are grouped together, as are those of ‘b’ and ‘c’. The answer is still \( 11a + 8b + 17c \), but it is a friendly really!

Another way of using brackets for the same example would be:

\[ (4a + 7a) + (3b + 5b) + (6c + 11c) \]

showing ‘a’, ‘b’ and ‘c’ terms more clearly. The answer would still have been the same!

Important Signs

It’s VERY IMPORTANT in algebra that the + and - signs are always written, for if a sign is accidentally omitted then terms could incorrectly be multiplied together instead of being added or subtracted.

Well, that wasn’t so bad was it? You can rest easy for now, as I’m not going to set any questions, but don’t stop practising!
Getting Started - The Practical Way

This month, the Rev. George Dobbs G3RJV starts probing and sniffing around electronic circuits, with the help of the common-garden diode!

We've already looked at meters and multimeters and met the diode. Now I'm going to show you how a diode can become a useful, but simple, accessory using a multimeter. But let's begin with a look at a classic application for the diode in that old favourite, the crystal set.

Receiver Circuit

The circuit, Fig. 1(a), is the classic circuit of a 'crystal set'. It employs a suitable (long!) antenna and earth connected to a tuned circuit consisting of a coil, L1, and a variable capacitor C1, which 'gathers' and tunes the radio signals.

A diode, D1, detects the signal and extracts the required audio (sound) signals which can then be heard on a pair of high impedance headphones. The capacitor across the headphones shunts unwanted radio signals to earth.

Simple Radio

The crystal set got its name because the original receivers, built in the 1920s, used lead-ore (Galena) or other crystalline materials for the detector. It's a very simple circuit and the result is a very basic radio receiver.

No batteries are required. The receiver is powered by the radio signals themselves. However, the audio output is low, even with a good signal strength and it requires a decent antenna.

With only one simple tuned circuit to select the required signal, it also has difficulties in 'sorting out' individual stations. Despite the disadvantages, crystal sets do work, and they're fun. If you have never built one, you must!

The coil, L1, can be approximately 80 turns of enamelled copper wire of about 0.4mm (24-28 s.w.g.), closely wound on a toilet roll former (wait until the roll is finished please!). The tuning capacitor, C1, can be any variable capacitor of around 500pF. If you don't have one, the Maplin FT78K is suitable.

Any ordinary diode will work, but if you wish to be precise and use a germanium diode, the OA91 (Maplin QH72P) will do. The capacitor can be a disc ceramic type. For best results, the headphones must be a high impedance type.

Modern, low impedance 'phones (portable cassette types) will not work very well. The receiver can be laid out like the circuit diagram. You can then build it by soldering the parts onto brass drawing pins, pushed into a piece of soft wood, as in Fig.1(b).

Another Application

The crystal set 'detector' is only one application of the diode. Another variation of the idea can prove useful when you're building and testing radio circuits. It can be used to detect whether a radio frequency signal is present and check its relative strength.

The circuit, Fig. 2(a), shows a diode probe. This is for use with a meter, enabling r.f. (radio frequency) signals to be detected and measured.

The circuit has two diodes. The first, D1, works like the crystal set diode, producing a positive voltage at the cathode (the marked end) when a signal is detected. The second diode, D2, doubles on this action by producing a negative voltage at the anode (the un-marked end) when a signal is detected. Since both positive and negative-going parts of the signal waveform are detected, this probe gives what is called a peak-to-peak reading of the signal.
Probing The Works

Now it's time for us look at the action of the whole circuit. You'll see that one side of the probe is connected to the earth (or ground) of the circuit to be measured.

The part of the circuit to be tested, is connected via a stiff wire probe. The capacitor, C1, couples the signal to the diodes. It also blocks any d.c. voltages present at the testing point. Remember that the capacitor allows an alternating current (the signal is a.c.) to pass, but blocks any d.c.

This characteristic is also used by C2. This action does not affect the d.c. voltages produced by the diodes, but it 'shorts out' any remaining signal from D1 and D2.

Following rectification, the signal will have been changed into a d.c. voltage which can be measured by a multimeter. The positive supply will be at the cathode end of D1, and the negative side at the earth end of the probe.

The probe is connected to the multimeter by means of a screened lead which can be made from coaxial cable. Diode probes are often used near circuits which can radiate r.f. signals. These can be picked up by the meter leads, producing confusing readings.

The illustration, Fig. 2(b), shows a simple way to build a diode probe. It's built by surface mounting the components onto a narrow piece of blank p.c.b. material. The layout is shown with the copper side up. The lines on the board are made by carefully drawing a hacksaw blade across the surface of the copper. This method produces a series of 'pads', as in Fig. 2(b).

It only takes three or four firm strokes of the saw blade to cut through the thin layer of copper, so be careful! The size of the board is not very critical, and mine was 70mm long by 10mm wide. This makes the pads only 5mm thick, just enough for the components.

Inspect the channels for burrs and slivers between the pads before making any connections. Then clean the p.c.b. with soapy water after de-greasing it by a hacksaw blade across the surface of the copper. This method produces a series of 'pads', as in Fig. 2(b).

The soldering connections are clearly shown in Fig. 2(b). It's essential to get D1 and D2 connected the right way round in the circuit. The small bar painted on one end of the diode indicates the cathode end of the component.

I used 1mm (20s.w.g.) tinned copper wire for the probe, but any scrap stiff wire will do the job. The braiding on the screen wire must be exposed by cutting back the plastic sheath. This is then pulled away from the inner conductor and twisted to form a pigtail and soldered carefully to the p.c.b. The next job is to fit plugs suitable for your meter, on the other end of the lead.

The soldering connections are clearly shown in Fig. 2(b). It's essential to get D1 and D2 connected the right way round in the circuit. The small bar painted on one end of the diode indicates the cathode end of the component.

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When I want to make measurements, I use a lead with crocodile clips at either end, connected to the probe earth pad. Finally, due to the way the p.c.b. is made, you should ensure that all the pads at the 'earthly end' of the probe are connected together.

Probing About

Using the probe is easy, as you only have to connect it to your multimeter, set to a voltage range. The range selected will depend upon the signal level in the circuit to be measured.

Unless you're testing transmitter power stages, the range selected will be in the order of a few volts. If the reading is very low, a mA or even µA range can be used to tune or peak low level signal circuits.

An easy way to test the probe, is to apply it to an audio signal. Try connecting the probe across a loudspeaker with the multimeter on a low voltage range. It should produce a reading which will vary with the loudness of the signal.

One interesting version of this circuit, called a 'sniffer', is shown in Fig. 3. It's basically the same circuit, but this version uses a small, surplus tape recorder meter of around 200µA full-scale deflection (f.s.d.).

If you can't find a surplus meter, the Maplin LB80B will do the job. The whole circuit can be built on the terminals at the back of a suitable meter if required.

Relative Strength

The sniffer is only designed to show that r.f. is present and give a relative indication of its strength. A short length of wire, connected to C1, will provide a suitable antenna. There are no ranges or sensitivity adjustments in this circuit. The length and placement of the probe wire is used to get a suitable reading.

In the past, I've used the sniffers for field strength meters when working portable away from home, or when tuning up my mobile whip. An r.f. sniffer is a handy item to have around. If you don't build one now, you may find you'll do so later when the need arises.

Keep building, and I'll see you next time. PW

Shopping List

**Crystal Set:** Variable capacitor 300 to 500pF, (Maplin FT78K).

Diode OA91 (Maplin QH72P), 10nF disc ceramic capacitor (Maplin BX00A), enamelled copper wire, high impedance headphones, brass drawing-pins, connecting wire and solder and wood for base-board (see text).

**RF Probe and Sniffer:** Diodes D1, D2 1N914 type or similar (Maplin QL71N), C1/C2 10nF disc ceramic type. Blank p.c.b. material, screened lead, crocodile clip. For sniffer: surplus meter or Maplin LB80B.
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The PW Robin
Frequency Counter Part 2

Before we continue, there are some corrections to be made from last month. In Fig. 1.3 of the first part of the article, the centre pole of S1b should be shown connected to +5V, not left floating as shown.

In the parts list, this switch should have been described as double pole changeover (d.p.c.o.) not s.p.c.o. There were some supply rail labels missing in the circuit diagrams of Fig. 1.2 and Fig. 1.3. Pin 16 of IC1a-3 should be shown as connected to +5V, as should pin 13 of IC6. The junctions of R25, 23, 21 and 19 should also be shown connected to +5V. Sorry about that!

Building Stage

Let's begin the construction with the main p.c.b., starting by placing all the links on the board. You should use insulated wire links if there is a possibility of a short circuit.

Don't forget to thoroughly check the positioning of these links as many are under i.c.s, and any mistake will be very difficult to correct afterwards. You will also see that many components are soldered to both sides of the p.c.b, so they can provide low impedance earth paths. Sockets are used for all i.c.s except for the prescaler chip, IC5.

The next stage is to fit all the resistors, capacitors and diodes. The choke, RFC1 is made by winding four turns of enamelled copper wire (diameter about 0.3mm) on a ferrite bead.

After fitting RFC1 on the board, the transistors, crystal, trimmer, p.c.b. pins, fuse-holder and fuse are mounted and soldered. Don't overheat the crystal and trimmer as both are easily damaged. Now you can, with the exception of IC3 & 5, fit all the i.c.s into their sockets, making sure they're the right way round!

Display Board

Following the methods I've mentioned, you can now make up the display board. Make sure that the seven segment displays are the right way up. The decimal points must be at the bottom. The resistors R1 and 17, are fitted on the track side of the p.c.b., with insulating sleeves over the end wires.

The display board can then be fitted to the main p.c.b. Line up the display board with the right hand edge of the main board, and at right angles to it. The next stage is to check that the holes for the limiting resistors line up with the 4511 driver i.c.s. You should carefully position the display board, so that the holes are no less than 3mm above the surface of the main board.

When you are satisfied with the alignment, make two small solder joints to hold the two p.c.b.s together. Re-check the alignment, and solder the boards securely together. Fit all the limiting resistors (fitted with insulated sleeving), starting from the bottom.

Testing Time

Now it's time to start testing. Start by temporarily mounting the 5V regulator to a heatsink, attaching it to the main board with the shortest leads possible. You should then check for 5V on each of the i.c.s. Finally, and assuming everything's in order, you should remove power and make the following temporary links:

(a) IC3 pin 7 and IC3 pin 10 to 0V
(b) IC7 pin 15 to IC2 pin 5.

Now you can re-apply the power. The display should now light up and the right hand (units) digit should increment by one every second. If it doesn't, check, with an oscilloscope, that the clock is running or by listening on an h.f. receiver.

The display should continue to increment by one count per second. Leave this connection until you have checked the last three digits for correct counting and display.

Remove power and transfer the link from pin 5 of IC3 to pin 10. Re-apply power and verify that the display counts at approximately one thousand, every four seconds or so.

Allow the system to count, until all digits have been checked out. This takes time, but it does help in testing both the display and counter sections. Any miscounts are usually caused by solder bridges between pins, or by dry joints which cause non-displaying segments.

Setting Up Inputs

To set up the input, you should switch off the power and fit IC3 and IC5. Switch on again and check the d.c. voltage at the collector of TR1. This should be in the range 2.5 - 3.0V. If it's not, you should adjust the value of R5 to correct this reading. Increasing the value of R5 will increase this voltage and vice versa. The

Addenda

Transistor TR1 (BFR34A) may be difficult to source. A BFR90/90A may replace it. Similarly with TR2 (BF241), a BF167/198, or similar, may be substituted. A kit of PW approved electronic components are available for the price of £46 inclusive of post and packing, from:

DJ Electronics
46 Ensbury Park Road, Winton, Bournemouth BH8 2SL
Tel: (0202) 515073

The crystal, switch and BNC sockets are included, but not the case or cabling.
Fig. 2.1: The component side of the PW Robin's display p.c.b. The processor and prescaler circuits are on the lower, double-sided portion of the board.

Fig. 2.2: The track pattern side of the PW Robin frequency counter. See Fig. 2.3 for the position of the links on the component side of the p.c.b.
Fig. 2.3: Component placing on the p.c.b. It's essential that the links shown are made first, as some pass under other components. The links in the 'ground plane' area should use insulated wire.

Fig. 2.4: The display board, track and component overlay. The links should be made first. Resistors R1 and R17 are fitted on the track side of the p.c.b.
values in Table 1 are the values of voltages found in the prototype and may be used as the basis of any fault-finding.

### Counting For Real

The next job is to temporarily wire up the 5V side of $S_1$ and reconnect the power. The display should now show zeros. If it doesn’t display all zeros, check for the presence of the reset and latch pulses.

You can now feed a signal to the h.f. and I.f. inputs in turn. But don’t forget that the displayed frequency may not be correct, as the unit still has to be calibrated.

The next stage is to remove the 5V supply to the I.f./h.f. section and connect up the v.h.f. side of the circuit. Check that the display still shows a frequency, but at a figure of one tenth the previous value displayed.

### Acknowledgements

My thanks go to STS Communications and G4UAW for the help, assistance and use of test equipment to produce the prototype.

### Modifications

If you only want to use the Robin as an I.f./h.f. frequency counter, or if all components associated with the TR1 and IC5, you should then permanently connect pin 5 of IC6 to 5V.

With this variation, $S_1$ needs only to be an s.p.s.t. type, switching the 12V input. This will reduce the cost by about £10, and leave you with a counter capable of counting up to approximately 40-50MHz.

Happy Counting!

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This month, Quaynotes passes on some advice to improve your u.h.f. CB signal, information on PW’s forthcoming 934MHz antenna design and glad tidings to the winner of the rather ‘loopy’ May competition.

operators in York, while others are busy in the West and South Riding of Yorkshire. “Many new stations are ‘popping up’ on the air” Keith says. From Keith’s letter it appears there’s also much activity in the Newcastle area. He also mentions that many of the operators active in the north of England, keep in touch through regional newsletters which in their own way firmly support the 934MHz Club UK.

Thanks for the newsletter Keith, and I look forward to seeing a few more examples. That’s the lot for the ‘high end’, keep the letters coming in and I’m looking forward to seeing the 934MHz antenna design in print!

Scene On Twenty-Seven

Well, I’ve got no doubt whatsoever that ‘High & Low’ readers were interested in the CapCo. ‘Loop’ competition. Altogether, I must have read over 400 entries!

The entries were read by myself, PW editor Rob Mannion and Helen & colleagues at CapCo. There were some really good names, one or two were ‘naughty’ and unfortunately unfashionable (but they were funny all the same!).

Judging the competition was fun. It also made me realise what a difficult job manufacturers have, when it’s time to choose a name for a new product. Despite that, you all entered into the spirit of the competition and enjoyed yourselves at the same time.

The winning entry was from Jack Pellam from Wittering in Cambridgeshire. Jack suggested the name ‘CAP 27 Commander’. and he’ll soon be in command of his own antenna. Well done Jack, and I can assure you that your threat to go ahead and buy a CapCo. Loop anyway, win or not, didn’t sway the judging team in their deliberations!

By the time this edition of ‘High & Low’ appears, the three runners-up will have been informed, but I must also thank

Slow Scan TV Illegal On CB Channels

Although there has been much interest shown in slow scan TV on the ‘CB High & Low’ page recently, we now understand that such operation is definitely illegal within the terms of the CB radio licence. As PW does not wish to seem to encourage unlicensed activities, and has a definite policy to avoid doing so, the topic will not be covered in the future unless there is a change in the licence conditions.

Editor.
Antenna Construction

The Natterpole 1.8MHz Vertical Antenna

After working with George G3RJV on the PW Chatterbox, I found that the 'Top Band Bug' had bitten me well and truly. I was determined to put out a better signal on 1.8MHz.

After trying several wire antennas for 1.8MHz, I decided that there was not a lot to choose between them. So, I decided to tackle the problem from the vertical direction!

Although more difficult to construct than wire antennas, the PW Natterpole's performance is far superior in both groundwave and DX working. If it's properly constructed and maintained it should prove trouble-free for several years in our climate.

I started the design process off, knowing I had the constraint of a 10m square garden. My computer, when fed with the design information for a vertical antenna, produced an azimuth plot showing a truly omni-directional pattern, as I hadn't written details about house, tree and other items into the program.

The elevation plot showed, as expected, the greatest radiation to be at approximately 30°. The effect of this would be, I thought, a good groundwave signal at up to 30km range and then a skip zone of a few hundred kilometres. In other words, the Natterpole is good for local and DX working but I can't talk to the English Midlands from my QTH in Kent!

Natterpole Recipe

I decided that the simple approach was best, and you'll find that the main ingredients are easy to find, borrow or buy. The diagram, Fig. 1, shows the basic circuit of the final version of the Natterpole.

Two scaffold poles are required. If you can't afford two brand new poles (and the alloy tubes aren't cheap), it's a good idea to visit your local scrap metal merchant where you'll probably find a shorter length of steel material for the base of the antenna.

I've tried to make it clear in the diagram, that the antenna is based around two poles and a section of alloy TV antenna mast material. The main radiator is actually insulated from the supporting length with layers of pvc insulating tape. This is done so that the scaffold-pole clamps can grip the vertical sections, without 'shorting' the system out *(see Editorial note in shopping list).*

The Centre Coil

The Natterpole centre coil was wound on a 100mm diameter former that I'd bought at a rally. My coil already had 40 turns of thick wire on it, and I calculated that I needed to wind another ten turns of heavy (2.5mm section will do) pvc insulated wire. I worked out that the final inductance was approximately 150µH.

The finished coil was fixed over the glass fibre centre insulating section of the pole, by two 125mm long lengths of 4BA brass studding and 12 nuts. I made some heavy braiding by stripping old lengths of coaxial cable, to use as straps to connect the coil to the poles and to bond all the joints.

Heavy Currents

There'll be heavy current flowing in the bottom section of the antenna, so you will have to keep the resistance in the system to the lowest possible value. You don't want to waste valuable power heating up the pole!

The prototype Natterpole was temporarily lashed to a gate post with polypropylene rope, and a piece of Perspex to stop it shorting to the fencing. The assembly was mounted on a glass bottle to keep it clear of the ground. Very much 'Heath Robinson' style but perfectly acceptable for the first tests!

Using the fencing around the garden as a ground plane radials, I started my tests. I loop-linked my dip-meter to the antenna and found that it resonated at 1.990MHz.

My computer program showed me that the feed impedance was in the order of 6Ω, which is very low and difficult to match. Very high current will be flowing, and as I've already mentioned, you must use thick wire as possible for all connections.

Matching Solution

One solution to achieve matching, would be to make a 9:1 transformer, but that approach wouldn't allow the antenna to be used over the whole band. Electrically short antennas have a high Q and therefore have a narrow bandwidth. I wanted to tune the system over the whole band and enable a good s.w.r. to be maintained on the 50Ω coaxial feeder cable.

After several attempts I decided to use a series tuned circuit at the bottom of the antenna. At resonance, the series tuned circuit has a low impedance across it, and a match can be found on the inductor to feed the antenna from the transmitter at 50Ω. Using crocodile clips on the base coil, to select a suitable matching point, I found a good point within seconds and achieved a 1:1 ratio.

On your finished antenna, the tuning and matching...
system can be protected by making a housing from a suitable plastics container, such as the types used to hold cooking oil, detergent, etc. You can arrange the bottom of the radiator pole to terminate in the neck of the container (cut the bottom of the container away) which then acts as rain shield.

You'll have to make a water-tight seal at the point where the radiator pole passes through the neck of the container. Bathroom-type, flexible silicone-based sealants are ideal for this job! The bottom of the container can then be held back in place (after you've tuned and tested the system) with pvc tape.

On Air Tests

After extensive testing on the air, with a lot of help from my friend Dick G2ACG, I was satisfied that the Natterpole was working well. Dick only lives about 8km away from me and he was receiving me at S-9 +20 when I was running 1W into the Natterpole.

I then changed over to my 40m 'long wire' which then provided a very slightly weaker signal at Dick's end. Finally, for the local tests I changed over again to my 1.8MHz dipole, which is 15m above the ground.

Changing over to the 1.8MHz dipole made the signal slightly weaker at Dick's QTH, and proved to my satisfaction that the antenna was working as expected. Various other QSOs showed beyond doubt that the antenna was good for local and DX working, but not so good, compared to the dipole, for intermediate operation (the English Midlands from Kent is one example I've mentioned).

Conclusions

I've got to do many more tests on the Natterpole, but I'm thoroughly enjoying working with the antenna. The next project is to see if I can come up with the 'Natterwire' antenna!

Finally, I suggest that when you build your ground post pole section for the Natterpole, that you surround the base with broken bricks, etc., before pouring the concrete in. You can also protect the bottom of the pole from rusting by layering it with strong pvc tape.

Don't forget that the radiating sections must be insulated from the ground support post. I realise that many of you won't follow my own construction methods that closely, but please remember the safety aspect and make sure your version of the antenna is safely mounted. It has been known to get windy in the UK in recent years!

I hope you have as much fun on 'Top Band' as I have, and I look forward to working you on 1.8MHz using your PW Chatterbox transmitter-receiver and the Natterpole antenna.

**Shopping List**

One length of steel scaffold pole (ground post), one 6.1m length of alloy scaffold pole (radiator bottom section) and one 3m length of 30mm diameter alloy TV antenna mast tubing. Coillformers, heavy duty wire, crocodile clips, brass nuts and bolts, insulating tape, Plastic Padding filler-resin mixture (available from car accessory shops) and a short section of glass fibre tube. Safety Note: Take care when mixing the Plastic Padding, because of the vapours given off from the mixture, it's a job best done out of doors and away from naked lights. You'll also need three sections 600pF variable tuning capacitor, with as wide spacing between the fixed and moving vanes as possible.

* Editorial Note: Non-metallic scaffold clamps and swivel joints are available, even if they are difficult to find. Such clamps are made from a nylon-like material and are used when insulating and non metallic materials are needed (for electrical use and where the danger of sparks from metal-to-metal contacts are a danger). Your local scaffolding contractor may be able to help you locate the materials needed.
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PLEASE NOTE: that we at PW may not have built and tested the circuit, but present it on an ‘as-is’ basis. We do take the greatest care in preparation of the article, but cannot be held responsible for the suitability of the original suggestion, or for any damage that may occur to property or equipment in implementing this idea.

Paddling At 50Hz

Fancy a paddle key, but can’t afford one? I was in this situation some time ago, and I decided to do something about it. An old round-pin mains plug, a piece of broken hacksaw blade, coupled with some scrap pieces of plastics material became my paddle key.

The drawing, Fig. 1, should make it a little more plain. The pieces of plastics material are used to dampen the action of the paddle, and they may be changed to suit the action needed.

Take the plug apart, and fix the top half to a suitable base board. Take out each supply pin, drill and then tap suitable holes for the screws. These screws become the dot and dash contacts.

Earth Pivot

The next stage is to make a saw cut through the ‘earth’ pin so that the saw blade is held centrally between the other two pins. Then drill another hole at right angles to the saw-cut, to form the clamp for the blade. Scrape the paint from the saw blade, especially in the areas of the contacts.

Make yourselves a paddle handle from some plastics material and fix it to the blade. To finish off the paddle, pieces of old plastics material are added to the spine of the blade and to the clamped end. By adjusting the amount of material added and the length of the free blade, a suitable action may be created.

P. Wilkinson G0IIT
Alford, Lincoln

Further reading.


Practical Wireless, August 1991
YAPSU-2/11
(Yet another power supply unit 2-11V)

It's not always easy to find a suitable transformer to power low voltage projects. This unit uses any transformer with a secondary voltage of 8-15V. It could also be fed directly from a 12V battery or p.s.u.

I dislike having to buy batteries in large numbers for a personal stereo set. I already had a 12V source and so I set to and designed the circuit presented here. The diode bridge and capacitor C1 are only needed if the system is to be powered from a mains transformer. The working voltage of C1 should complement the transformer used, but it must have a capacitance value of at least 2000µF for adequate smoothing.

Based on a commercial design, but modified to give a range of lower voltages, it uses a portion of the reference voltage of the 723 i.c. This portion, controlled by the setting of R1, is fed to the internal comparator of the i.c. Transistor TRI is a 2N3055 although almost any high power n.p.n. would do.

Resistor R3 gives short circuit protection at about 600mA. As shown, the p.s.u. should provide currents up to 600mA, at voltages between 2 and 11V.

Mas'od bin Haji Latib
Johor, Malaysia

Shopping List
Resistors Metal Film 0.6W
1Ω 1 R3
470Ω 1 R2
2.2kΩ 1 R4
3.3kΩ 1 R5
Rotary Variable
2kΩ 1 R1

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Optional components
For C1 and the diodes see text.

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Over a period of many years I have had the pleasure of meeting and talking to hundreds of radio enthusiasts in both amateur and professional circles. Although they may not realise it, their interests and technical ability often covers a far wider field than their prime subject. There has never been any doubt in my mind that the majority of radio people have to be a rather special ‘Jack of All Trades’ to carry out the work they do.

For instance Chris Pearce (Southampton) has renovated an ex-military wireless truck, Fig. 1, made by Humber about 1948 and powered by a Rolls Royce engine. Chris showed me the selection of afloats, mast and fittings, the complex ignition-interference suppression and the all important camouflage used to hide such a station when it’s static.

Inside the vehicle were a variety of ex-army sets, wet-batteries and associated WT and RT equipment that he has fitted in the rear cabin. Believe me readers, this area is as carefully restored as the exterior and, when on exhibition, each section of the vehicle has its own dedicated spectators. To undertake such a task successfully you would require knowledge and skills of mechanical, electrical and radio engineering.

On May 26, 1 I met Dave Higginson G8JET (Doncaster), Fig. 2, a TV service engineer and industrial photographer. He recently restored, ‘from tuner to tube’, to good working order, a Thorn 2000 colour TV set for demonstration and exhibition by the National Museum of Film, Photography and Television in Bradford. This particular television was the first all solid state colour receiver. Dave is a collector and restorer specialising in the 1920s to 30s period of wireless and allied equipment. He is a member of two specialist groups, the British Vintage Wireless Society and the 405 Alive Club. In addition to his expertise in electronics, Dave couldn’t renovate the complex equipment without the ability to use a wide variety of tools and test-instruments and be able to freely work with blueprints, circuits, wood and metal.

Some of you may remember an old friend of mine, the late Eric Cosh G2DDD (Littlehampton), who was one of the pioneers of the

Fig. 1: Chris Pearce’s Humber Wireless truck.

65, 144, 432 and 1296MHz bands. It sounds unbelievable today, but during Eric’s time, as each of these frequencies were allocated for amateur use, the majority of requirements, from antennas to transmitters, had to be home-brewed. This was because there was little on the market to meet the ever higher frequency bands. Eric had separate fully tooled workshops for wood, metal and radio engineering and, like Dick Ganderton the editor of our sister publication Short Wave Magazine, he was an active model and steam engineer.

There are thousands of people within the radio fraternity like Chris, Dave, Dick and Eric, who have these associated skills and use them for business and pleasure. I bet there are several among the members of your local radio club, so, if any of you want to become a home-constructor, don’t be afraid to ask for their advice, I’m sure it will be willingly given. Furthermore, how many ‘Practical’ magazines can you remember that were started by PW’s first editor, the famous F. J. Camm? Did you know, for example, that his elder brother Sydney, another very practical man, designed the Hawker Hurricane fighter. This famous aircraft, along with the R. J. Mitchell’s Supermarine Spitfire, helped to maintain British air supremacy during the Battle of Britain.

Fig. 2: Dave Higginson G8JET.

Measuring The Navy

Equipment, however good, must be operated in the proper manner by people. During last October I was delighted to have another chat to Mike Matthews G3JFF and Ron New, left and centre respectively in Fig. 3, of the Royal Naval Amateur Radio Society. This reminded me that among my archives I have a copy of the official publication National Service published by H.M.S.O. in 1939. The opening of the foreword, written by the Right Honourable Sir John Anderson, M.P. Lord Privy Seal, says "Men and Women all over the country are today eager to fit themselves voluntarily for National Service. Some have already decided what service they can best give and are fitting themselves by training to give it." A sub-heading on page 30 reads, R.N. Volunteer (Wireless) Reserve and from the subsequent text I quote, "is formed for the purpose of training and providing telegraphists for service in the Royal Navy in emergency... and...". The age limits are 18 to 45, and candidates should be amateur operators or should be interested in wireless telegraphy transmission work in the Morse Code.

Under another heading on page 42, R.A.F. Civilian Wireless Reserve the authorities required "Men who are proficient amateur wireless operators, preferably holders of General Post Office Transmitting and/or Experimental Licences..." and... "Training is normally undertaken by members at their homes and with their own sets, and consists of pre-arranged programmes of transmissions from Royal Air Force W/T Stations and general liaison between stations". I wasn’t surprised when my research revealed that both organisations were mainly the
Astronomy

Last month Clive Brook (Plymouth) showed us how he built his sun projection screen attached to his telescope. However, if you don’t fancy making one, you can see if a screen can be purchased as a separate unit. I thought of this approach while looking at the goodies in a photographic store. I had spotted a solar screen attached to a new, tripod-mounted, refractor telescope. A piece of good quality plain paper can be attached to the screen on which any visible projected sunspots can be pencilled in.

One of the solar projection methods was used by Patrick Moore, at his observatory in Selsey, to observe and draw the two large sunspot groups, Fig. 4, at 0900 on May 9. Readers who already watch Patrick’s television programme The Sky At Night, will already know that items of current astronomical interest can be seen on BBC CEEFAX page 616, but for those who don’t, it’s to be recommended.

Meteor Showers

While thinking of the night sky, the expected peaks of two of the Aquarids meteor showers should occur on July 29 and August 7, plus one of the Capricornids on August 2 and the Perseids on the 13th. For several days around those mentioned, the earth encounters great swarms of meteors on its orbital path around the sun and they really are a beautiful sight to see.

These tiny but solid particles manifest themselves as streaks of sometimes colourful, bright light as they burn up on entering the earth’s atmosphere. However, if the sky is overcast, or the moon too bright for viewing, those with scanning receivers can try setting a channel to 70.31MHz and listening for minute ‘pings’ of speech or music that suddenly jump above the receiver background noise. By this method, you will get some idea of the hourly rate of entry.

The received ‘ping’ signals will be from the Polish broadcast station at Gdansk, and are being deflected by the temporary ionisation created by the decaying meteor trails. During the peaks periods, many TV DXers tune through some of the more distant vision channels in Bands I and III looking for ‘pings’ of picture, so you will not be alone in your efforts. Do let me know how you get on.

Observations

Last month I talked about radio-blackouts being associated with solar activity, since when, our editor, Rob Mannion experienced a big one while he was in Dayton, Ohio, USA on April 25/26. He tells me that the “h.f. broadcast bands were virtually dead” and that he could not find the BBC’s World Service for a couple of days, and then only a weak signal. When you’re used to active bands, it’s hard to imagine a partial or total blackout until it is actually experienced and then you ‘hear’ nature at work. Fred Pallant G3RNM (Storrington) noticed something similar on 28MHz, between 0900 and 1000 on May 17th when he reported, “not a peep from any beacon (except GB3RAL)” and by 1046 only the African beacon ZS5VHF had appeared. Also at 1647 on the 23rd he wrote, “have listened at various times throughout the day - have only heard GB3RAL.” Ern Warwick (Plymouth) noted “fast-fading” on the signals from ZS6DN/B on 14.1MHz on the 23rd and 24th. He heard the German beacon DK0WCY on 10.144MHz giving weak auroral warnings at 1730 on the 25th, 0900 and 1400 on the 26th and 0800 on the 27th. In his general report on 28MHz for May, Ern said the band was “dead” around 0850 on the 5th, 1900 on the 13th, 1100 on the 16th. In addition he noted a “high background noise” (no doubt solar) at 0850 on the 3rd, 1300 on the 16th and 1010 on the 25th and a “fade-out” at 1240 on the 17th.

Gordon Foote (Abingdon) found 28MHz conditions good on the 20th and 21st, when he logged 12 international beacon signals, “but”, says Gordon, “in contrast there followed ‘terrible Thursday’ 23rd May and ‘frightful Friday’ 24th May!” when all he heard was ZS6PW on the 24th. “Two days with no sig!” remarked Ted Owen (Maldon) about the sparse activity on those days.

Solar radio noise is something often discussed in this column because an outburst can mean that a stream of charged particles, ejected by the sun, are heading towards the earth’s orbital path. One of the simple ways of finding out if radio-waves are being emitted when sunspots are present, is to point a 144MHz Yagi (usually mounted horizontally) toward the rising or setting sun. Fig. 5. Next, set your receiver in the a.m. position, which should be tuned off station and listen for definite fluctuations in the background noise. Of course, if your beam can be elevated then the sun can be checked at anytime during the day.

Sporadic-E

I’m preparing this column at the beginning of the 1991 Sporadic-E season. Between now and early September, an event, big or small, can happen at any time during the daylight hours. Such events can produce some interesting conditions, mainly between 28 and 80MHz. So far, Bob Brooks (South Wirral) has received television pictures in Band I (approximately 40-70MHz) from Iceland and Norway around 1440 on May 25, the USSR during the early evening of the 26th, Denmark and Sweden early on the 28th, Spain at 1010 on the 29th and Norway again at 1400 on the 30th. Around 1430 on the 25th, I logged test-cards from the Norwegian regions Bagn and Melhus and at times their signals were so strong that the built-in telescopic rod on my JVC 3060 receiver was sufficient antenna for good results.

Reflections
Satellite Preferences

There are many conflicting opinions regarding the set of six microsats launched last year. Some satellite users state they would have preferred Mode B analogue transponders. Others prefer Mode L and S, even more Mode A, some an ATV transponder, and some others digital transponders. Many would like to see a fixed geostationary OSCAR and others a slowly drifting ‘geostel’. Even more would like a Molniya orbiter, and more prefer the DX semi low earth orbits such as used by RS-1 to RS-8.

Some amateurs foresee the need to utilise the much higher frequency bands on a ‘use or lose’ basis. Meanwhile others wish to continue to use the lower frequencies, as these are readily available to most amateurs in most countries, at low station outlay costs.

The designers and engineers in AMSAT have further considerations, with little apparent interest in ‘old hat’ ideas already well tried and tested. They like to do something new and novel, which is what many would say amateur radio progress is all about. This is most certainly one way of maintaining the amateur hold on coveted frequencies. The results of the considerations were the new breed of microsats called ‘PACSAT’s, i.e. Packet Radio Satellites, using high speed digital data transfer, with downlinks mainly in the amateur space allocation in the 430MHz band.

The PACSats

With the PacSats, amateurs now have a highly reliable way to communicate internationally, and a full-time Bulletin Board Service (BBS). They are also a means to receive bulletin and technical data. The most topical sets of satellite products are the AMSAT News Service bulletins and the Bulletin Board Service (BBS). They are also a means to receive both the AMSAT News Service, which is what many would say. This is because the earth’s magnetic field is not centred on the earth’s geographic centre, but is centred 600 km nearer Singapore than the equator. Therefore, we are moving towards a more stable BBS code. This sort of testing is nominal in software development, however, we are not quite finished with it yet!”

Dove DO-17

Perhaps the biggest complaint regarding the microsats, is coming from educators and enthusiasts who were planning to use the Dove satellite in their work, and have been disappointed. The mass opinion is that Dove, with its wide-ranging interest, relative user simplicity, ease of access and low cost user outlay, should have been completed first, and not left until last as appears to be the case.

Professor Martin Sweeting G3YJO, head of the UoSAT project, points out that it was vital to first prove reliable established software effectiveness of over 250 KBytes on the other satellites such as UoSAT-3, before venturing onto Dove, as it has some mission critical hardware deficiencies. He writes, “It is essential that this process be carried through in a level headed and cautious manner, testing each step and in front of the other, without permitting external pressure to precipitate possibly fatal action”. He is convinced that the AMSAT Software team have followed the correct path by first developing and proving the software on UO-14 and AO-16, and concludes, “The disappointment of waiting fifteen months for Dove to ‘speak’ is understandable, but surely that wait is better than risking total loss of the mission?”

W0-18

The WEBERSAT has a camera, and its controllers began shooting pictures in the dark, with wide iris settings to establish controls for the
upcoming full moon imaging experiments. In doing so, they managed to achieve a good picture of the upper right-hand corner of the moon. The phase was crescent, i.e., little of the moon was lit. Despite this, the brightness of the objects on the object were well above 170, suggesting a full moon may adequately illuminate the Earth for imaging. The specifications for the camera didn’t promise good results. Although the device was not selected to be able to image relatively dim astronomical objects, it apparently can. A following picture of Indonesia was also of excellent quality.

LU-SAT

Marcelino LuyDsu, of the AMSAT Argentina Engineering Group, reports that all the tests have been completed on LU-SAT, and that the BBS is now available for use by radio amateurs on a worldwide basis. The first message to appear was from Dr. Carlos Saul Menem LU1SM, President of the Argentine Republic, who wrote, "To all Radio Amateurs: As the President of the Argentine Republic, I am very pleased to give my regards to all Radio Amateurs: As the President of the Argentine Republic, students, scientists and technicians, all around the world, that access this, the First Argentine Communications Satellite. As a ham radio operator I know very closely the activities of the Earth for imaging. The specifications for the camera didn’t promise good results. Although the device was not selected to be able to image relatively dim astronomical objects, it apparently can. A following picture of Indonesia was also of excellent quality.

MICROSAT Users Directory

From Japan. JA6FTL tells us that fifty-five stations in 12 countries are active on UD-14, listed as the following:

CT1DIA, DB2OS, DD1EG, DF5DP, DL1YDD, DL8NCl, DF5LZ, DD1EG, G3YJO, G4WFQ, G8NBO, GO/K8KRA, GO/MJW, G3RUH, G4AXC, I2KBD, JA6FTL, JR1EDE, JA1IING, JA1OGZ, JA1QHO, KP4WQ, K8YAH, K7PYK, K8IRC, WC8J, WDLQCO, W3QNS, WB6YMH, WDOE, W7KRC, W9FWMW, WBOKSL, WA9FMQ, WD3Q, N4HY, N6K6, N6HBB, N5AHD, N5BF, N5FKV, LURDFY, ON6UG, PE1CHL, PA3DVQ, SM5BVF, SMOTER, SV1IT, SV3KHI, VK2BQD, VK3DTO, VK5AGR, VK7DBX, VK6BMD and VK6V.

On AO-16, JA6FTL shows that 84 stations in 18 countries had become active on AO-16. They are:

DF5DP, DL8NCl, DU1POL, EA2CLS, EA9KET, F9DQK, FDFSLQ, GO/N6LIT, G4WFQ, G3RUH, HB9AQZ, HB9CQK, I2KBD, JA8FIL, JA6FTL, JR1EDE, JA1OGZ, KZ1B, KD9Q1, KC4EBR, KA9LYN, KC4SA, K6OYY, KD2CQ, K8RSP, KB9CML, K6OYY, KD3SI, KE0VZ, KZ1B, KC8WF, K6BQ, N4HY, N6K6, N8DNLX, N8AM, N81TP, N5BF, N6XK, N1IH, WH6AMX, W9F, WASNO, WC8J, WB9ANQ, WB0FMD, WD0ETZ, WA3PSD, W9FWMW, W9SL, WB6LFO, WB1HU, AL7LD, LU1EXC, LU2BDD, LU4AESS, LU4AENQ, LU7ABF, LU7DSU, LU7XAC, LU8EBB, LU8XAL, LU6DWA, LU7AA, OHSZN, ONSPV, ON6UG, SM5BFVSMOTERPY2BJOVS3KH, VE3CDY, VE8DXD, VK2BQK, VK2A1T, VK3DTO, VK5ZTY, VK5AGR, VK5HI, VK5ZK, VK6BMD, VK6VW, VK7ZBX and VS6V.

While this is a tiny minority compared to the many on OSCAR-13, and even more on RS-10 and 12, users are growing.

MICROSAT Ground Station Software

The Store and Forward software loaded on UD-14, AO-16 and LU-19 requires ground station software in order to interpret the data which is in binary rather than ASCII format. A description of the protocol used was presented at the proceedings of the 9th ARRL Networking Conference.

This software is available as shareware on CompuServe in USA, and is now being developed for PCs other than the IBM and IBM clones. For ATARI and MAC users, there is now some software with a PG "lookalike". There's also a TLM Decoder that PE1CHL which has successfully implemented the Broadcast and FTLO Protocol. The ATARI file named NET.PE1CHL ATARI BROADCAST FTLO TCP/IP NET/ ROM MBOX is currently being carried on U0-14 and is some 150k long in an Arc file. The MAC programs are called BCAST2.SIT (PG equivalent) and KISSTIL.SIT (for telemetry). BCAST2 is about 90k and KISSTIL is about 31k long.

AMSAT-UK

The AMSAT-UK organisation holds the latest proven and updated versions of much software, and a request and s.a.s.e. sent to the Secretary, Ron Broadbent G3AAJ, AMSAT-UK, 94 Herongate Road, London E12 5EQ, will provide the availability. Current users, G3WFQ and G3CDK, can provide helpful advice on the AMSAT Nets.

Harold Price NK6K, describes the software to be used by ground stations, "The software is broken into five distinct packages, PFHADD is a program which adds a header to a file, and prepares it for uploading. The header contains information on the source, destination, and contents of the file. It also contains the file name, which is used when the file is later downloaded. A file must have the header added before it can be uploaded. Basically, you create a file using your favourite editor, or get a file from any other source, including "text" or "zip" files, run through PFHADD, and get a "out" file. This file is then sent via PG.

The PG program is used to upload and download files in the connected mode. It can get a directory of all files on the spacecraft, a later version will be able to select files based on the contents of their headers. The PG program has an upload command which will send all files with a tag of "out" in the current directory. It will also automatically continue files which were partially transmitted on a previous pass. It has a download command which will download selected files, and it will automatically continue files which were partially downloaded on a previous pass.

The PHS program removes the header from a file, which has been downloaded or received as a broadcast. It will use the embedded file name to build a file on your disk (if a file with that name does not already exist).

Program Broadcast

Another program is PB (broadcast), and this is a program which is used to capture files which are being broadcast. It can capture up to 10 concurrent broadcast files. Lists of missing segments of files are kept, and files can be gradually accumulated over several passes. It can also request that a file be added to the broadcast queue. A requested file is broadcast for five minutes. A special version of PB is available to 'official bulletin stations' to have messages broadcast for longer periods. These will be things like orbit element files and AMSAT news.

These five programs are preliminary versions, and require some human intervention to direct their activities, such as selecting files to capture and download. Future versions will be totally automated. In addition you'll be able to send and receive ASCII or binary files of arbitrary length (up to 2Mbyte for the first version), and will be able to passively receive bulletin and other broadcast files".

Naturally, there's lots more to tell you about the new packet microsats, but this, plus the other news, will have to wait until next month.
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Practical Wireless, August 1991
Microwave Bands

On the 'top' coast of North Wales (on the map) John Lawrence GW3VQA and John Creswell GW2MEO are busy on 1.2GHz, sending P5 fm. ATV pictures to one another. At present, this is over a cluttered 1.6km path in Prestatyn, but they are working on extending their coverage along the coast.

If you follow the coastline around Britain you eventually come to the north Kent coast, and there you'll find Ron G6GHP and Chris G4AYT playing microwaves at X Band (10GHz). By trying reception at various portable locations of a signal from Chris's Whitstable location with a line of sight, we found that 10GHz TV signals travel an amazing distance. Using just a barefoot Solfan head (without a dish) they have exchanged P5 pictures between Whitstable and Canterbury, a high spot on the Isle of Grain, making a path length of some 34km. This is not quite line-of-sight, and I think it's remarkable! The 1.2GHz allocation is definitely a band with potential, too bad so many people don't try it. Of all the ATV bands, it has got to be the cheapest to get going on, and perhaps someone will knock up an 'Airfix' type kit of parts for the deficient.

Our picture this time, Fig.1, was taken at Ron's QTH in Margate. It shows a signal sent by him, on 10GHz, over a 25km obstructed path to G6GHP at Whitstable, then sent back by Chris on 1.2GHz. The picture is P5, with colour still visible - just like closed circuit, so Ron says! Microwaves appeal to Ron. He started working with microwaves in 1987 and is still using the same Solfan equipment as then. The only difference is that he has improved the modulator circuitry. Of course, the price of Solfan heads has tumbled in four years, and you can now pick them up for a fiver or less. Dirt cheap. Ron is also pleased to acknowledge the help and encouragement he has had from his QSO-partner Chris.

As the winner of BATC Diamond Award for 1988, Ron was a grand winner of the manufacturers of ATV equipment, who are now finding a ready and expanding market for their wares. On looking at one UK manufacturer's catalogue, Tom O'Hara W6ORG told me that "The catalogue and data sheets makes one think everyone is spying on everyone else in England! The building business is obviously a much bigger and more lucrative market than cheap old hams". I'm sorry if that rattled anyone's cage! However, just to reinforce this I would like to tell you that even if that news didn't, perhaps the following will. It really made my blood boil normally you'd say that any video signals on 1.2GHz must be a good thing. But there's a not-so-welcome TV transmission on the 1.2GHz (shaded) band in the form of a private (non-amateur) station on the Kent side of the Thames estuary. This transmission provides local amateurs with a rather boring, and unchanging view of a caravan site. The signal can be picked up in Margate, so it isn't exactly running flea power. However, what's more annoying is that it's bang on 1.310GHz, which is a repeater output channel.

The use of 'amateur' television for this kind of surveillance is totally illegal and what is even more tragic is that the transmitters are allegedly being sold by a local G3 'amateur', who really ought to know better.

One of his installations is allegedly in operation in north-east Kent and has even been allegedly received in the Netherlands! This would be amazing if it wasn't so pathetic. Perhaps the local amateurs could conduct some legitimate high power tests on 1.310GHz. This might induce the caravan site owner to close his QRM machine down or at least change the frequency!

Oxford On The Air

A communication from Jeff G8PX (who says two-letter calls are just as 'real' as three-letter ones!) advises that G6NB and G3UMF have reported improvements in signal strength, since the GB3TV repeater at Dunstable has been overhauled. Jeff can now see GB3TV drawing out the Union Jack, and when he gets his masthead pre-amp finished he hopes to get a viewable picture. Jeff has also added a p.p.l. to his Solent transmitter.

Repeater News

In addition, Jeff remarks that he has heard the Aylesbury Vale Repeater Group are considering a 2.4GHz ATV repeater if there is a sufficient support from everyone else. He is hearing that some good pictures on 7.040MHz. He is also picking up some good pictures on 7.035MHz, and especially on 7.038MHz. He is quite line-of-sight, and I think it's very line-of-sight. Jeff O'Hara W6ORG told me that: "The catalogue and data sheets makes one think everyone is spying on everyone else in England! The building business is obviously a much bigger and more lucrative market than cheap old hams". I'm sorry if that rattled anyone's cage! However, just to reinforce this I would like to tell you that even if that news didn't, perhaps the following will. It really made my blood boil. Normally you'd say that any video signals on 1.2GHz must be a good thing. But there's a not-so-welcome TV transmission on the 1.2GHz (shaded) band in the form of a private (non-amateur) station on the Kent side of the Thames estuary. This transmission provides local amateurs with a rather boring, and unchanging view of a caravan site. The signal can be picked up in Margate, so it isn't exactly running flea power. However, what's more annoying is that it's bang on 1.310GHz, which is a repeater output channel.

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I mentioned in my last column that Costis 5B4TX, is responsible for the distribution of the SV9AIZ BBS program. (PW May 1991) I only got the callsign wrong! It should have been SV7AIZ. Apologies to Spiros, and I offer my wrist for slapping!

The 1991 BARTG rally takes place this year on Sunday September 15 at Sandown Exhibition Centre, Esher, Surrey. Located close to London, it's a 10 minute drive from the M25 (junction 10) and is not far from the M3, M4 and the M40 (now open all the way to Birmingham). Obviously this rally has the emphasis on data communications, but is also of general interest to most amateurs. However, with over 250 tables in a large hall you will be able to see the latest in computers, peripherals for computers, radios, t.n.c.s, software, books and all the rest of the usual expected bits and pieces.

There's free parking, on-site catering, talk-in on S22 and SU22. Admission is £1 for adults, under 14s are free if accompanied by an adult. The event is open from 10.30am until 5pm. Further details are available from Peter Nicol on 021-453 2676.

Rallies always provide a good meeting place, and this one is particularly useful for amateurs with a similar interest. The influence of packet has even persuaded the name to be changed from British Amateur Radio Teleprinter Group, to the British Amateur Radio Teledata Group. The group publish a quarterly magazine which caters for most data modes. If you want more information, write to the secretary, Ian Brothwell G4EAN, 56 Arnot Hill Road, Arnold, Nottingham NG5 6LQ.

The Japan Amateur Radio League (JARL) publishes a monthly newsletter. The March 1991 issue of the newsletter published some guidelines for packet radio users and BBS sysops. The guidelines make interesting reading. I've extracted the main points, but please bear in mind that these are verbatim translations and they reflect the Japanese culture.

**JARL Guidelines**

"Guidelines for packet radio users."

1. Packet radio operators must observe the frequency segments stipulated in the JARL 'Amateur Bandplan'.
2. Packet radio operators must take the responsibility to see that the contents of information dispatched by their stations do not conflict with 'Amateur Radio Operation Standard'. Such information must not deviate from the definition of Amateur Service stipulated in the Radio Law of Japan. Including the possibility of such information spreading widely even if intended for specific station (it may well be transmitted to others through store-and-forward system).
3. Packet radio operators must not only be interested in technical matters, but likewise utilise packet radio for its technical development.
4. Those who use BBS's must avoid transmitting (writing) redundant messages (documents) in order to enhance transmission efficiency. The callsign of the dispatching station (including the name of the person responsible in the case of a club station) must be clearly shown on every document so that the dispatcher can be identified."

"Guidelines for BBS's Sysops"

1. Those who have set up a BBS must take good care of its system and documents (messages?) so that the recording and forwarding functions of the BBS work properly.
2. Those who keep a BBS must at all times bear in mind that any message deviating from the 'Amateur Radio Operation Standard' or Amateur Service should not be accepted. When encountered they must endeavour to avoid transmitting such messages to other stations.
3. The Amateur Radio Operation Standard formulated by JARL is as follows:
   1. Not to diminish the reputation of any individual or organisation by openly disclosing facts against others wishes.
   2. Not to infringe human rights of other people by the use of..."
libellous or insulting words.
3. Not to invade the privacy of others.
4. Not to express assertions or opinions in connection with politics, religions, elections, or any other issue in dispute.
5. Not to disturb social order or obstruct good customs.
6. Not to use indecent or obscene expressions which may offend others.

"JARL intends to review the contents of the current Amateur Bandplan this year and in this regard have already received various options as outlined below. The JARL Board of Directors has asked its Frequency Committee to study them.

1. Formulation of frequency segments for RTTY and packet communication in the 'data' classification on the h.f. bands.
2. Study of appropriate segments of the f.m. classification on the 144MHz band.
3. Extension of period of use, and formulation of frequency for audio contact, with regard to ATV communications in the 430MHz band.
4. Separation of the 'c.w/ DATA' classification in the 50, 144 and 430MHz bands*.

It looks as though the JARL are experiencing similar problems to ourselves, with regard to the actual use or misuse of the BBS system. They are at least trying to discipline their network, by curtailing or limiting the content of bulletins in this way, at least their sysops can't then be accused of being 'censors'.

The h.f. side is also suffering the same lack of band-planning and space, that the rest of the world is having to combat. Let's hope that by 1992 we can get some international agreement on the need for a specific segment of each band, instead of each country adopting their own 'solution' to the problem.

Meeting

The photograph, Fig. 1, shows a recent meeting of the East Anglian Data Group. This group is holding regular sysop meetings in Thetford. It usually has an attendance of 15 to 22, which is not bad for just one area. The main discussion topics are normally routing of private mail, bulletins, the local network problems, nodes and qualities plus topics of BBS interest, etc. I wouldn't really know what magazine is being displayed, perhaps you can make it out?

Do you have a packet group in your area? Would you like a mention in 'Packet Panorama'? If your answer is yes, then let me have names, addresses and your views please, to G3LDI @ GB7LDI or QTHR. For those still using voice communications, you can phone me on (0508) 70278 (there's an answering machine if I'm not available).

73 and happy packeting de Roger G3LDI.

STARTING FRAME

CARRIAGE RETURN: A DTE (Data Terminal Equipment) key or a control character that is used to indicate the end of a line of typed information; it causes the DTE display to begin printing at the left-hand margin.

CCITT: International Telegraph and Telephone Consultative Committee, a part of the International Telecommunication Union.

CHARACTER BITS: The bits that represent an alphanumeric or control character. See ANSI and ASCII in PW April '91.

CHECKSUM: A short form of Check Summation usually an 8-bit value. The Byte values of all the characters in a program, message or in memory added together. There is no account taken of the overflow. Also the sum (in hexoctal) of the bits in the t.n.c. software in ROM. It should be equal to the check sum published in the t.n.c. manual. This is a very simple check of integrity, see CRC below.

CLONE: A device that is an identical copy of, or that duplicates another device. Nowadays this is usually taken to mean a computer that is functionally identical to an IBM PC.

COLLISION: A condition when two or more transmissions occur at the same time and cause interference to the intended receiver(s).

COMMAND MODE: The t.n.c. operating mode where the t.n.c. is waiting for command input from the user.

COMMAND MODE CHARACTER: A control character that causes the t.n.c. to enter the command mode. Many t.n.c.s start with the default of '03' (pressing Control+C together)

CONFIGURATION COMMAND: A t.n.c. command that selects a parameter that is used by the t.n.c. when it performs a task.

CONNECT: To establish a communications link (a connection) between two packet-radio stations. At the t.n.c. level this is normally shortened to 'C'.

CONNECTION: At the link-layer, logical coupling of two packet-radio stations for information transfer and control purposes.

CONNECTION PROTOCOL: A network layer protocol that sets up and maintains a clearly defined path for the transfer of packets between the source and destination during a single data communications session; also called virtual circuit protocol.

CONNECTIONLESS PROTOCOL: A network layer protocol that transfers each packet independently along the best available route; also called datagram protocol.

CONTROL FIELD: An 8-bit pattern in an HDLC frame containing commands or responses, and sequence numbers, indicating the frame type.

COSI-SWITCH: An implementation of the CCITT X.25 virtual circuit networking protocol for the t.n.c.-2 written by Howard Goldstein N2WX.

CRC: Cyclic Redundancy Check, normally a 16-bit value calculated from the contents of a file or message. A mathematical operation in which the results are sent with a transmission block to enable receiving stations to check the integrity of the data.

CSMA: Carrier Sense Multiple Access. A channel access arbitration scheme in which packet-radio stations listen on a channel for the presence of a carrier before transmitting.

CTS (Clear to Send): An RS232-C/EIA232-D serial interface signal. CTS informs the DTE that the DCE (data communications equipment) is able to transmit data. This is in effect the 'go ahead' signal. This is the machine equivalent of good operating practice.
The Pocket Guide To RTTY and FAX Stations.
Bill Laver.
SPA Publishing Ltd.

David J. Smith.

This almost pocket-size (211x138mm) book manages to pack a wealth of information about aircraft and control into 19 chapters and six indices. Not only does it deal with the radio side of the hobby, but it also expands into areas such as navigation, airspace and control, both over land and ocean. It discusses weather and its effect on the control and flight routings. One small snippet found, was that Concorde takes fixed flight paths over the oceans. As flying at that height puts them above most of the weather. There is one section covering a range of radios which may be used to listen to this fascinating area of radio communications. When you’ve chosen your radio, there are lists of frequencies and callsigns to listen out for.

Super value-for-money, for either novice or ‘old-hand’.

Space Radio Handbook.
John Branegan GM4IHJ.
ISBN 1 872309 05 4.
242 Pages, 244 x 183mm, softback. £12.00 (£13.34 incl p&p).

Whether you are a mere beginner, a keen space enthusiast or an experienced satellite user with increasing interest, this new book is for you. It covers every aspect of space radio, from the basic solar physics to both manned and unmanned spacecraft and their various communications systems. Adequate coverage is given to all forms of space related contacts, be it the many types of amateur spacecraft, commercial, navigational or weather satellites. The subjects of aurora, meteor scatter and moonbounce, and even amateur radio astronomy are covered. The many fascinating propagational aspects are fully covered without using the complex jargon so often used amongst experts.

Whilst such a book could have been very complex, John Branegan has written it so that all of the many related subjects are comprehensive and fully understandable to all, with lots of assistive diagrams, charts and tables to help the reader understand the principles and practices. The use of computers and programs are covered, as are tracking methods and antennas, plus a fascinating series of practical experiments that may be performed without the need of complex and expensive equipment. John looks ahead also, covering the future of amateur radio in space.

This book is a regular ‘bible’ for the space radio enthusiast, and a great boon to those who wish to teach or learn of space physics and the practice, and is thoroughly recommended to readers of all ages, who will find it invaluable in explaining the many mysteries that otherwise abound in this topic.

Pat Gowen G3IOR

Compiled by T. T. Williams and S. J. Williams.

If you have an interest in listening into the world of airband radio, then this book is a must as the reference for 1991. Little or no space is wasted in this pocket-sized book. It is filled almost to bursting point with the callsigns and short flight details of almost all aircraft passing over, or within UK airspace. The guide aims at assisting airband listeners to quickly find details of a flight, once they have identified an aircraft’s callsign. There’s a list of 112 airlines from Aberdeen Air to Z.A.S. Airlines. Each airline and flight has its own callsign.

Checking this callSIGN out against the listings will give you the airline, flight times, destination and aircraft type. With one page for your own notes, even the inside back cover has information printed on it. Find out what ‘Watchdog’, ‘Clansman’, ‘Leopard’ or ‘Cygnet’ refer to. This book is an absolute ‘must’ if you listen to the airbands.
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FOR SALE KW201 valved amateur bands receiver. 1.8 to 28MHz in 11 200kHz bands. 2 x conversion, mechanical filter, handbook, £65. Leak Stereo 20, valved amplifier and 1 pre-amplifier, £15. Joe Walker, 3 Constable Road, Ipswich, Suffolk IP42 2UW. Tel: (0473) 221032.

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FOR SALE Trio R-600 h.f. receiver. £190. Tatung TMR7602 h.f. receiver, £70. Both immaculate with manuals. Tel: Simon (0925) 261455 evenings.

FOR SALE Jaybeam 137MHz weather satellite cross dipole antenna - as new. £28. Kantronics KPC4 dual port TNC latest firmware, £200. Andrews LDF4-50 connectors (M/F) new, £16 each. Paul Chamberlain G4XHF, 9 Goffs Close, Crawley, West Sussex. Tel: (0293) 515201.

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WANTED A Mark III Whotsit. Do you need a difficult-to-find spare part for the club station? Why don't you use 'Bargain Basement'. Someone, somewhere, can help you!
Conditions

Conditions have been somewhat "like the curate's egg", difficult at times, brilliant at others.

The 1.8MHz Band

I have the May issue of the G3XTT/G3RBP Top Band Newsletter to hand, and the first thing I see is that V3KQG is also now in the field. All I can say is I doubt there is enough support for two such specialist publications. I hope they can, between them, ensure continuity of regular 1.8MHz news to keep activity rolling on this band.

The general consensus of opinion, seems to be that the season since January on this band has been below par - although I must remark that he has a feeling that the band is getting 579, and was noted as 559 to someone this side; he was giving and taking, although as yet she doesn't have a path.

Another band requiring a good attentuators in the receive system! G3LPS (Blackburn) spent a day receiving on 1.8MHz, but the snag is that the path has been fairly difficult at times in late evening/early morning sessions, and as usual at this time of year mainly in a N-S direction. Eric notes 4FJS on Malmy-Vyotskisy Islands doing out contacts in the WPX context. Eric was number 068, but towards the end 4FJS was dishing out serial numbers in the 3500 mark!

Among the G3Os noted on the key, we can see YL20SM, PY7ZJZ, Z21HYS, PY7ZT, DF/ST9, 1AOKW, 0910Z.

Turning to ON7PG, Pat keyed with 1.8MHz, and is more down to activity than usual.

The 3.5MHz Band

The 3.5MHz band is home to the mythical race of sideband pundits, who can lay the law down on any subject under the sun, and actual knowledge is not regarded as relevant!

Eric G3LPS (Blackburn) spent a little keying time on the band, and raised N24C, W1KM, N2NT, P34A, K1DM, K12M and K5MA in the wee small hours of the 7th in an attempt to make contact with 2330Z.

On this band, GOHGA has about 28m of wire, and a key with which he managed G3ATH, G3BQW, G4J-M, G4QEC, G4ON, G4TT, G5OEH, MORSE, G6HME, IC3KH5, YL3XF, YL3XJ, DLYL2R and 0K1RR.

To turn to ON7PG (Kortrijk) we find that he keyed with 1AOXM, U9ACQ, RASA8 and C0EUA. At the end of this list, I found the terse comment "Summer Time!"

On this band 4GKRT (Welling) uses 2W c.w. out from a Lake rig, and receives with a hows. They are difficult to 25m of wire and a counterpoise. The aim is mainly to make GPR-GPR contacts which, but month were completed with 0GCG, G0FGW, G0FYP, G0JBQ, GOLDJ, GMOMU, GONEZ, G0GNA, G3C6G, G3CCE, G3TGW, G4AL, G4E0H, G4ERL, G4FUF, G4GZD, and G4NDL.

A few QRO stations were worked, notably DK8DP, DLB5L, FE6QG, ON7MO and nine Gs.

The 7MHz Band

Another band requiring a good attentuator in the receive system! GM3JDR (Aukengill) is a mainly c.w. operator, and on 7MHz he found 1A0KM, VKYD, 5JS3M and H4X4F.

Next we turn to G3LPS (Blackburn) who notes the band has been fairly lively at times in late evening/early morning sessions, and as usual at this time of year mainly in a N-S direction. Eric notes 4FJS on Malmy-Vyotskisy Islands doing out contacts in the WPX context. Eric was number 068, but towards the end 4FJS was dishing out serial numbers in the 3500 mark!

Among the G3Os noted on the key, we can see YL20SM, PY7ZJZ, Z21HYS, PY7ZT, DF/ST9, 0910Z.

Turning to ON7PG, Pat keyed with 1.8MHz, and is more down to activity than usual.

People

ZD8OX has a severe fall while in Ascension, but is now back in the USA and under intensive care. Please send all our get well cards to Dave Porter K2PBB, Ascension, but is now back in the USA.

Silent Key

I'm sorry to report that 'Brad' Bradbury BRS 1066, has died at the age of 79. A long-time s.w.l. as his BRS number indicates, and sub-manager of the RSGB QSL Bureau as a result.

故居

The DX Chaser have agreed unanimously to add Penguin to the DXCC list. That makes the current list of possibles up to 323. QSLs may be submitted, but NOT before September 1. I've also heard that the 2V2AS/P and AJ6JS/SY operations from Mt Athos have been accepted, and cards may be submitted forthwith.

The 14MHz Band

Mary GONZA (Kirky-in-Ashfield), seems to have stuck to s.s.b. this time, by way of PT775, XJ3F (Madeira Is), 1A0KM, 5R8AL, 4K4/UAOKW, 4K4/UAOKZ, 4K4/UAOKZ, 4K1A, VK7AAG, ZS6QU and 3C1EA, that leaves 24MHz for FS/JL1RUC, 8N6ARL, YB5QZ, Y29A, ZS1ACY, SV5AZR, EL2SM and 5NHBK.

On 2G0CU who stuck to the key throughout the month, to find on 10MHz, 6W6JX, G4MV/N4A, EAAK9D, T77C, FS/UAQMT and WASQ0B.

Pat ON7PG brings up the rear with the 14MHz, FS/JA1IFP, E94KD, 9Y4KB, 4K1A, G4MVA/5B4, EA9KD, 4S7, on 18MHz c.w. VP2EXX, 0910Z.

Comments

Noting that he still needs Help Is., St Peter/St Paul, ZA and CEGZ, 5GMDR notes that both Heard Island and the Latelfast were audible for days upon end but operating with so wide a split -50kHz that he couldn't possibly 'get at them' with his FT101ZD.

I suppose the answer is probably to have 'get at them' with his FT101ZD.

I haven't heard of anyone receiving a card. Furthermore I hear W4FRU has been returning cards with a note saying he has not received any logs. Letters to Rome Stepanenko and Ed Krizky.

Back-Scatter

HF Bands

Reports to Paul Essery GW3KXE

287 Heol-y-Cogel, Vaynor, Newtown, Powys SY16 1RA

Practical Wireless, August 1991
Practical Wireless, August 1991

[Article text]

Back-Scatter

37082, VK5GZ, HK3LT, VK1PP, RA4X, VK0AL, ZL1TV, G3RGL/E6A, VK5RAS/1, VK5TNT (both the same operator in RSARS activity month), VK5AJ, VK6FV, (Q8TU, PJ1A, ZDLII, LVK4V, CE6DZ, YN5SMQDG, J15USIQGL via UA4AWA), J1CIV (out of H1AAA).

On this band, 2G2HU found his way over to VK4KA, VK4LAG, ZC4ARF, VK5AL, SI1M, LI126C, LK4VFC, VK2VCQ, VK2PP, J49CW, WBY2QG, VK6CGB, G39M, VK7FQ, VP8GEA, 4X1AQD, RW8U/UA4D, 4KJ/KIUA6KBE (Wrangel Is), and SI3M1. Down at the QRP, 4W level, Ted was able to make another QSO with 4T4UA06BE.

The 21MHz Band

Angie G0HGA leads off here, and she starts with some 21WV contacts, VKM3J at midnight UTC, JA3P3X, H44VG, H44XF, H44XS, UIA/G35SWH, TAI/S45VNNL, PJ2/G3PA0VDN, VE1ABB, VE3HK, R7TU7, and the usual crop of Europeans, Russians and Gotaways, all c.w.

Now to Mary G0HGA who found her way over to ISBN9C, U8JY6H, ZC3AAU, UV5AHUV,9AEEF, UG, V29A, AJ1L, KP4, AJ1RK, N1NC, and W20CV, all on s.s.b.

It was c.w. all the way for Pat G07PV. For this band he notes 9K2/HB9CVM, 1A3KM, FS/UA1PP, 9S3V, 3V3A/S, AFX/4V3FX, J9A1JPKP, UV0G, YU40S, H44XF, AE6A/9H2, 7Z1AB, ET2A, ZD8Z, AG8A/W0H0 ZD8SE, 3C1EA and F581AT.

From the border, GM3J0R offers c.w. with 4K1AQD, 4K20IL, 4K2/4MBZ, F0U5V, PY0S, H44XF, AG8A/AH2, 7Z1AB, ET2A, ZD8Z, AG8A/W0H0 ZD8SE, 3C1EA and F581AT.

The 28MHz Band

On 28MHz, G2HKU notes PY2KXI, WA4SNI, JB108, ZC4KS, VP2E0H, WB7D, WB7DCH, YB8CS, ZD8Z, 3S1KS, RI8TJ, 6B2I and 3M6HS.

The 21MHz Band

At the time of writing this column, June 9, there had not been any 144MHz Sp-E openings in the UK. This was possibly due to the very high geomagnetic activity prevailing during the early part of June, which tends to disrupt the formation of the required ionised layer.

However, by the time you read this there should have already been a number of 144MHz Sp-E openings, with the likelihood of this continuing until the first week of August.

Openings on 50MHz via Sp-E were recorded on virtually every day during May, allowing contacts to be made with operators in CN, CT, DL, EA, F, I, IS0, IT5A, LX, OE, DN, OH, DY, OZ, PA, SM, SV, YO, ZB, SB4 and 8H. Star turn of the month was the joint Finnish/ Russian expedition to Malyj Vysotskij Island. Using the callsign 4J1FS, this island was worked from the UK on four consecutive days between May 24-27.

Many stations have probably worked Wolfgang IN3TXW, during Sp-E openings on both 50 and 144MHz. The picture, Fig. 1, shows his 28/50MHz antenna system and indicates that signals are stronger via backscatter than on the direct path. The first 70MHz Sp-E signal was recorded on June 12 at 2230UTC when Martin Vincent G3UVK (I025) worked 2B0WS/1 (MB5) on 70.200MHz. Paul ZBOW then went on to work a number of stations on 144MHz, and later in the opening changed to f.m. to work the crystal controlled p.m.r. brigade.

Among the surprised operators to work 2B0WS was Ken Easty G3LVQ. He normally uses his modified p.m.r. box and vertical antenna, to chat to the locals in Cheltenham and was very pleased with the results so far, as observed by myself. The deadline for the October, November and December issues are due to the height of the v.h.f. bands. An excellent decision if I may say so! He is very pleased with the results so far, especially as he participated in the aurora on May 31, working G40PH on 144MHz, working at 1607UTC, and two auroral reports on his attempt. The event of choice on 144MHz and his final contact was made at 1744UTC, at which time he could hear no auroral signals.

Vince Shirley GOORC, (I025) last reported to this column as G7ENF and has obviously since passed his Morse test. Congratulations! Vince mentions that he doesn't particularly want to operate f.m. but wanted to be able to use c.w. on the v.h.f. bands. An excellent decision if I may say so! He is very pleased with the results so far, especially as he participated in the aurora on May 31, working G40PH on 144MHz for a new country and G40LJS on 144MHz for a new square. Vince reports that the aurora faded out with him at 1745UTC, exactly the same time as observed by himself. A number of minor auroral events were recorded during the first week of June, all leading up to a large scale opening on June 5. All the warnings signals were there, massive bursts of solar noise, short wave fade-outs, magnetometers reacting violently, bulletins on the packet network, WWW
reports, announcements on the DX Clusters, alerts on GOV/VCY, messages on the telephone warning chain, you simply couldn’t fail to know that something big was going to happen. The clincher for me was hearing the 144MHz band fully auroral at 0345UTC on June 5. For the next hour I made c.w. contacts with AI6T/P (J037), OZ, SM and GM. This is very rare and as I had heard nothing the previous night, I guessed it was the precursor to a good opening rather than the aftermath of a previous event.

At the time of writing this, I have received no 50MHz reports and only one report, from Jerry Russell G4SEU (I092), concerning the 70MHz band. Between 1532-1805UTC he worked, on s.s.b., 10 HG’s, 14 OK’s, 4 UB’s and 18 countries, DL, F, G, ON and PA. He heard, on s.s.b., G82LU, G82BE, G82VJ and G82GV and worked G82LV. Between 1630-1900UTC he worked HB9GQ, HB9RDE, HB9SNR, HB9VVT and HB9WES.

On 144MHz, the event faded out with him around 0015UTC.

Exciting Reports

Reports from continental Europe were equally exciting. Johan PE1NMP (J032) running only 10W into a 10-element Yagi first heard signals at 1400UTC, working G84DD, SM5GHT and SM7GHT. By 1500UTC, the opening had spread to southern Europe with stations in HB9, HG, I, LA, OZ and SM, then moved south to encompass PA and DL, fading out around 0015UTC.

Packet Warning

Ian McCabe G0FDF, (I083) was forewarned of the event by packet radio bulletins and the Jim Bacon SP-E hot-line. During the morning, the recorded message gave details of the 2000UTC K index of seven and an O9000UTC K index of eight. Normally, a K index of five or over, in the afternoon, should set the alarm bells ringing, let alone in the early morning! With a Trio 7TS80, 100W and a 16-element Yagi, he worked 10 countries between 1345-1455UTC, the notables being HB0DG (K070) at 1385km, I1TTC, OE3JPC (J088) for a new country, OI1KDF (J080), OI1HA (JN79), DL3YV (JN98), YU2CC (JN86), YU3ES (JN65), YU3EV (JN76) and YU52W1 (JN68). G82BE included H1AZD, HAXT, RB5PA and US8WBG.

John Regnault G4SWX, (J002) resisted the temptation of swamping the beams around to the east to work the stations in southern Europe, and concentrated on a northerly beam heading to work the elusive Finnish and Russian operators. He was rewarded with a number of quality contacts including UA1AFA (K059) at 2070km, UV1AS also in K059, UC2CBZ (K034), ES5RE (K038), OH2AV, OH2AP, OH2TI and OH5LKL.

I commenced operation at 1300UTC, the 50MHz beacon GB3RMK being heard this time. Normally, at 1400UTC, I worked a handful of GM stations but found very little else at this time. At 1440UTC, the SK6SIX beacon at 50.6080MHz suddenly became audible at 55A, and within minutes the 144MHz band opened up into central Europe. For the next five hours, from 1445-1945UTC, it was bedlam, but fortunately I was able to hold my c.w. frequency for the entire session. In total, I made 150 QSOs in 73 locators squares and 18 countries, DL, F, G, I, GB, HB9, HG, I, LA, DE, DK, OZ, PA, SM, SP, UB, Y and YU. The chart, Fig. 2, shows the extent of the opening from my QTH in LG81. I won’t bother detailing all the DX but some of the highlights were 14 YUs, the best being YU1AFA (K059) at 1900km, 10 HG’s, 14 OK’s, 4 SP’s, 2 OZ’s, 7 I’s and 185WBG (KN19) at 1875km. The strength of some of the YU, HG and I stations were unbelievable. Beam headings during this event, found Poland at 40°, Czechoslovakia at 50°, Hungary at 50°, Yugoslavia at 70° and Italy at 80°. In the last 25 minutes of the opening, from 1929-1945UTC, I was working stations in southern France on a beam heading of 90°.

Another operator to catch the early morning opening was Andy Cook G4PQJ, (J001) who found GW3PQF (I090) on 144MHz at 0745UTC. During the previous evening, at 2030UTC, he worked OZ8ER/P in the Scandinavian Activity Contest. Suitably forewarned, Andy was able to prepare for the afternoon session. From 1545-2000UTC he made 190 QSOs including 16 YUs and 15 HG’s. Other DX included ES3RE (K038) on a beam heading of 25° and UB5WBG at 70°. At 1917UTC, Andy was called by Y021S (K059) but the QSO was incomplete. By 1930UTC, activity had started to die down, with only a few stations being worked on a restricted beam heading of 75-80°, moving slowly back to around 50-60° by 2015UTC. Andy stayed up for the later phase, around 2240UTC, but didn’t hear very much. It started off with GM, LA, OZ and SM, then moved south to encompass PA and DL, fading out around 0015UTC.

Excerpts from the DX Clusters included HA2RD, HA4XT, K060, HB9GQ, HB9RDE, HB9SNR, YU3ZV (JN76) and YU3ZW (JN86). (JN99), YU2CCY (JN85), YU3ES (JN65), OK1FF (JN79), GM4CXP (1085), GM4DIJ (1085) and GM4ZG (1085). Between 1630-1900UTC he worked, on s.s.b., G1RKF, G18AYZ, G18VEF, G1WAK, G1ZM (I080), G4FCD, G6CJW, G6HKM, ODNKIP, ON6CA, OT4KHG, O4AVT and ONSN.

Joachim Kraft DL8HCZ, was another station to note the early morning opening, hearing the 144MHz beacon GB3MPI and GB3ER at 0700UTC. Reports that from northern Germany it was possible for many operators to work about 100 stations and 40 squares on 50MHz, and about 150-200 stations and 100 squares on 144MHz.

Reports from continental Europe were equally exciting. Johan PE1NMP (J032) running only 10W into a 10-element Yagi first heard signals at 1400UTC, working G84DD, SM5GHT and SM7GHT. By 1500UTC, the opening had spread to southern Europe with stations in HB9, HG, I, LA, UB and YU being heard but Johan found it very difficult to break the pile ups with his low power. However he did manage to work HB9QD, HB9RDE, HB9SNR, HE7STY, K1HWG and FC1OPA.

Marcel F1DQK, (JN18) first noticed the aurora at 1500UTC, on arriving home from work. He worked DB1RR, ES6RK (I051), GG'TM (I094) and G86X (I092) and heard many other stations including E14DQ, OK2ZSB, OL4VVT, RB6PA and SP5SEF. The event faded out with him around 1945UTC.

Further to the south, Didier FC1MXE (JN05) was also fortunate to catch the event. From his QTH, auroras are quite rare, so he was very pleased to work a number of stations between 1532-1805UTC. Running an IC27I, 80W and a 17-element Yagi he made s.s.b. QSOs with GW4VWX, GW4ZQV, GW6TAD, GW6ER, GICRT, GONF, G80CF, G1AAR, G1AWF, G1FEM, G1Guy, G1SSL, G1TWLS, G1ZCW, G4FCD, G6CJW, G6HKM, ODNKIP, ON6CA, OT4KHG, O4AVT and ONSN.

Robert HB9BZA, (JN38) located in Geneva made most of his contacts between 1600-1900UTC, although he continued to hear signals through to 1940UTC. He made nine contacts with the UK, the stations being located in I072, I082, I083, J001 and J002. Robert reports that he does not detect many auroras, normally only one every two years or so.

Tropo

Conditions via the tropo propagation mode were quite good during May. Many contacts were made from the UK into central Europe on both the 144 and 430MHz bands.
On May 3, Vince G0IRC worked DF9RW/P (JO31) on 144MHz and PE9MAR/P (JO22) on 230MHz but found very little else. He had a good s.s.b. contact with G0MNTW (IO89) on May 14, but the best period for long distance working appeared to be during the evening of May 31 when s.s.b. QSOs were made with DL0WAE (JO42), DL2NY (JO32), DL2BY (JO32) and Y23SB (JO35). The European DX, on May 1, gave many contacts with portable stations in France and Belgium, a contact with FP1PB/P (IN97) providing a new square. Later on in the day, LX F4VAY made a contact with a Yagi in the Netherlands. The last language difficulties meant that the contact could not be completed. Vince reports that he is going to brush up on his French.

Gary Nicholas GW7EVEG, (IO83) found that conditions during the RSBG 144MHz contest, on May 18-19, were quite good. With 3W into an A1 element Yagi he worked E55EP, G4KSO/P, G3DMC, G4MBR, G4MAZUK/P, G4MHit that his father, GW301N, GW2DIN, has just bought him a 25W amplifier and GaAs f.e.t. low noise amplifier, so he is hopeful of some better results and is looking forward to the next one. At my QTH there were a number of days during May, when the tropo conditions were enhanced into central Europe. The best of these days were during the period May 31st to June 1. During the evening of May 31, I worked O1ZKYM, O2ZST, Y23SB and a number of German stations, the best being DC6MH (JO62) in Berlin. The next morning I was even better and between 0730-0900UTC I worked OK1KYYP/J (JN69), OL7BVJ/P (J060) and many German stations as far as JN59, J059 and J051.

**Meter Scatter**

The SM7 Six Metre Group have organised a six hour meter scatter contest between 2000UTC on August 11 to 0400UTC on August 12. The frequency band to be used must be between 50.150-50.300MHz and contacts can only be made on c.w. or s.s.b. The contest exchange will consist of callsigns and country codes. The maximum number of contacts made via m.s. over a distance greater than 500km will count The contacts made via m.s. over a distance greater than 500km will count The contacts made via m.s. over a distance greater than 500km will count. The score is calculated by multiplying the number of QSOs by the number of greater than 500km. The contest is open to all amateur radio society members and will count towards the standard IARU Region 1 m.s. report. The 50MHz band from HQ83.

The recent changes in licence conditions, bringing c.w. powers into line with p.e.p. levels, has enabled a number of stations to experiment with e.m.e. communications without the necessity of applying for a special research permit. Mark Holloway G4VYF (IO83) has recently completed a number of c.w. contacts using only 200W into a pair of 14-element Parabrams. Admittedly, all QSOs have been with stations with large antenna systems, but nevertheless the results are very encouraging and show what can be worked with a good tropo system. As Mark has no elevation facility, all contacts have been made either at moonrise or moonset, with recent QSOs including I2FAK, N1BUG, K2CAT, WS6UN and KB8MM. The contact with WS6UN was completed in one minute and was also Mark's third random QSO with that station. The strength of some of the 'mega' e.m.e. stations can be quite enormous, and at times it can be easier to work W stations than working G's around the UK!

Ian McCabe G0FYD reports that thanks to the tracking information given in a recent issue of P/W, he was able to copy, on May 18, 144MHz signals from SM5RHR and WS6UN. The Delta Aquarids occur between July 12 to August 18, with the best activity being on Sunday July 28. Unfortunately it is below the horizon from 0900 to 2300UTC, but does produce very good results on the east-west path between 0100 to 0400UTC. The biggest event of the year, but not necessarily the best, is the Perseids shower encountered between July 20 to August 23. Most activity will occur during the period August 8-13, the theoretical peak being on Monday 12th. The shower is circumstellar, which means that it does not set and is therefore usable, in particular directions, throughout the 24 hours. Between 1000 to 1400UTC beam north-east or south-west, 1400 to 2200UTC beam east or west, 2200 to 0200UTC beam south-east or north-west. There is no well defined peak for the north-south path, it generally being good at all times except between 0500-0800UTC and 1700-2100UTC.

**Moonbounce**

Further information regarding the scientific expedition to Greenland has been obtained from REF, the French amateur radio society. A member of the scientific team, Laurent Beugnet F6GDX will operate as DX/F6GDX, during July and August, on the 50, 144 and 430MHz bands from HO33. Preferred frequencies will be 50.210MHz for c.w. and 51.150MHz for s.s.b. operation. That's what the press release said anyway! A beacon DX8BNC will be in operation on 50.025MHz, 144.850 and 432.850MHz. The RSBG DX News Sheet however gives conflicting details. It states that Laurent F5JBL will operate as DX91REF on the h.f. bands and that he will run a beacon signing DX91BCN on 50.100MHz. You pay your money and take your choice!

Reg Woolley GW8VHI, plans to operate from JD7I between July 13-14. He will use the callsign DA4IG/P and this year is no exception. Between 20-25, Johannes will operate on 50MHz and 144MHz. His equipment consists of a FT746 transceiver and a main transceiver on 144MHz and the same transceiver on 432MHz into a 160W amplifier into a 15-element Cue Dee antenna.

**Active Squares**

Bo OZ1JJJ, will be active on 50MHz from various squares in Greenland during August. Using the callsign OX3L, he will operate from GD12 between July 8-20, HP15 between August 21-27 and 432MHz from September 12-27. He will be running 50W into a 5-element Yagi whilst in HP15 but is no dipole from the other locations.

Monitor 50.150MHz, 144.260MHz and 432.220MHz, if you want to catch the Island Hoppers DX Group activating the Great Blasket Island between July 8-20, 50.025MHz, 144.850 and 432.850MHz. The Blasket Islands, operating on both 50MHz and 230-1800UTC. After leaving Iceland, Johannes will be QRV from the Faroe Islands, operating on both 50MHz and 144MHz. His equipment consists of an FT746 transceiver, a main transceiver on 144MHz and the same transceiver on 432MHz into a 160W amplifier into a 15-element Cue Dee antenna.

**DXpedition Update**

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QRZ Contest!

According to QZ’s contest editor, K1AR, the annual CW World-Wide v.h.f. WPX contest, scheduled for July, has been cancelled. The magazine was unable to find a volunteer administrator for this event.

Low power contests, no more than 25W p.e.p. output from the transmitter, are being run during the weekend of July 27-28. The 144MHz section will be held between 1500-2300UTC on the 27th and the 430MHz section will be held between 0000-1500UTC on the 28th. Cumulative contests for all bands between 3.4GHz and 24GHz, will be held between 0900-2100UTC on July 14, August 18, September 15 and October 20.

Scandinavian activity contests will be held on the following dates. The 50MHz activity on July 23, 144MHz on August 6, 430MHz on August 13 and microwaves on July 16. All sections are between 1700-2100UTC. You can obtain a full set of rules by sending a stamped addressed envelope.

Deadlines

Please send your letters to reach me by the end of the month. I always write up the column in the first few days of the following month. Don’t forget that I can also receive messages via packet radio at my mailbox GBT/TCM.

Photographs of your shack, antennas or any v.h.f. activity are especially welcome. Other pictorial items such as QSL cards, awards, certificates, etc., are also required. These can all be returned.

World Administrative Radio Conference

Of interest to listeners and broadcasters is that the International Telecommunication Union’s Administrative Council, meeting during June, decided to postpone the World Administrative Radio Conference 1993.

This WARC was to have discussed the implications of the World Radiocommunion Plan, which, in theory, is designed to ensure equitable access to the short wave broadcast bands by all countries. In practice the system is a shambles, failing to offer any guarantee of decent reception in a target area or continuity of frequency from quarter-hour to quarter-hour. Whilst it would have affected large broadcasters such as BBC World Service and Deutsche Welle extremely badly, countries such as Brazil and Senegal, which use short wave for domestic transmissions, would have been unable to maintain their operations successfully.

The WARC to examine the planning system will now take place no earlier than 1995.

The WARC 92, which will cover frequency reallocation across the radio spectrum, will be held in Spain during February. There will be some expansion of the short wave broadcast bands and a decision on an allocation for radio direct broadcasting satellite operations will be taken. More details will appear both in Back-Scatter and in the ‘Band Scan’ sections of Short Wave Magazine in the run up to the Conference.

Interesting Changes

Moscow came up with some interesting changes to its output on June 1, with the closure of Radio Station Peace and Progress. This station opened in 1964, claimed to be the voice of Soviet public opinion, although there were plans to distinguish it from Radio Moscow. As a result there has been some tinking with Radio Moscow’s programme line-up. Arabic, for example, is now continued until 2100GMT, having taken over the hour-long Arabic from Peace and Progress. Other services have been trimmed, Turkish output reduces from thirteen and a half hours to fourteen hours weekly and some Indian language services have been slightly reduced, with some minority languages such as Marathi disappearing altogether.

The Soviets have begun to realise that international broadcasting is an expensive business, particularly when transmitting such an extensive range of languages.

In last month’s column, I reported that Israel Radio was to be cut back on June 1. This date came and went, but the cuts did not occur. It seems that the level of protest from listeners across the world, was sufficient to alter the minds of the hierarchy in Jerusalem, and programmes continue as before. The Voice of America started a daily 30-minute European German service on US Independence Day, July 4. At the time of writing, mid-June, no times and frequencies are available.

The VoA is to relinquish some of its use of the BBC Woolferton transmitting site in 1992 when the BBC restarts full-time operations from the station on four 300kW transmitters. At the same time, the Daventry site will close, with the relatively new transmitters redeployed to other sites in the UK or overseas. Presumably the Radio Canada International relays at present via Daventry will be allocated to other BBC sites in the UK.

Radio RSA has plans to start an Arabic service to supplement its present coverage of Africa. No firm details have been decided yet. Meanwhile the station has spare capacity on its transmitters following the cessation of transmissions outside the African continent last year, and is inviting other international broadcasters to bid for time to serve Africa and neighbouring regions.

The AWR-Latin America operation plans to re-allocate and expand its service to Central and South America. The station has purchased a new transmitting site, from the now defunct Radio Impacto near Cahuita in Costa Rica. The site is 48 hectares with a transmitter building, four senders and two quad antennas. At present, AWR-Latin America transmits from the Central American Adventist University near San Jose, the capital of Costa Rica. One 50kW and one 2kW transmitter are used for transmitting programmes in Spanish and English to Central America, Mexico, the northern Caribbean, Colombia and Venezuela, with special programmes on Saturday in Dutch and Papamia to the southern Caribbean. The new site will allow the installation of new log periodic antennas to cover Central and northern South America. Two medium wave transmitters on the new site are being re-built to operate with 50kW on the h.f. bands. Full operations from the new site will begin during 1992. This comes to the twentieth anniversary of Adventist World Radio, which began operations on 1 October 1971. There will be special programmes and QSL cards to mark the anniversary.

Publications Of Interest

Some publications of interest have arrived in my post bag recently. The 19th edition of the Tropical Bands Survey, published by the Danish Shortwave Clubs International, is a complete survey of all stations operating between 1.8 and 5.90MHz from all parts of the world. Each station has full details of times of operation, how often it has been noted and parallel frequencies. This comprehensive and very useful source is made available by ICs or Dkr 35 for airmail postage from DSWCI, (c/o) Bent Nielsen, Betty Nansens Alle 49, 1 tv., DK-2000 Frederiksberg, Denmark.

Meanwhile Radio Sweden has released the latest edition of Communications in Space - The DXers Guide to the Galaxy. Released in May, it offers a complete guide of what is on which satellite, together with frequencies and how to monitor such things as the Space Shuttle and MIR. This useful booklets is available for £1.00 from ‘Sweden Calling DXers’, Radio Sweden, S-105 10 Stockholm, Sweden.

I’m indebted to regular correspondent Roy Merrall in Dunstable and to newcomer Cari Jensen in Delft, The Netherlands, for some of the information in this month’s tour around the airwaves.

Europe

All times GMT (UTC)

Radio Budapest’s DX programme has been noted on Sunday at 0930 for fifteen minutes on 9.835MHz. Radio Prague’s Interprogramme continues with English noted at 0948 on 4.8 and 7.345MHz. Deutschlandfunk is to launch a new German language course in the autumn. Called Der Weltraum, this is set in a small hotel called ‘Hotel Europa’. The course deals with all important aspects of the language you would need when visiting Germany, or meeting Germans in your own country. The dialogues are written in simple, practical German. There is a new course book to accompany the radio lessons which is available free of charge from DLF - English Service, PO Box 50 64 40, W-5000 Cologne 50, Germany. Mark your order ‘German - Why Not?’.

The Voice of Greece has English news from 0945 on 15.65MHz.

Radio Romania International’s summer English schedule has European broadcasts.

Fig. 1.
Practical Wireless, August 1991

There is a half-hour Concert transmitted daily except Friday and Sunday at 1430 on 9.645, 7.25, 6.248 and 1.53MHz.

Hindi programmes are beamed to Europe daily at 145 for 11.92, 9.95, 9.665 and 7.412MHz.

Russian to Europe puts in good signals on 15.14 at 1615 although there is some SSB/RM from Moscow and Lisbon but the AIR signal, rating up to 433, has frequent identifications "Govorit Delhi". Content includes songs and interviews in Hindi and Russian with male and female announcers.

Trying to untangle a schedule from Radio Korea proves difficult because of its confusing layout, but I hope that this is a true reflection of current times and frequencies:

0000-0100 on 15.575MHz
0500-0600 on 15.575MHz
0600-0700 on 15.575MHz
1200-1300 on 13.785MHz
1800-1900 on 15.575MHz
2300-2400 on 15.575MHz

Frequencies marked # are from RO's sackville relay and those marked + are European beams.

Radio New Zealand can now be heard on 13.785MHz from 1800 until 2200 except Saturday with a fairly strong but watery signal. However it does suffer from sideband splatter from Moscow.

Radio Veritas Asia was noted on 15.135MHz although rarely identifiable before 1500. Short English newscasts noted at 1505, 1524 or 1537. The station has been logged as late as 1600 in English on Sunday.

KFBS Saipan's recent tests on 9.475MHz have now been followed by regular programming to East Africa at 1900-2000 in Shona and Yoruba languages. It can be heard clearly, if weakly, on most nights. Roy Merrall's recent QSL of the original tests is pictured here.

Last month I mentioned that Radio Canada's Ian MacFarland was now working at Radio Japan, presenting the News Round programme on Thursday and Friday at 0700 and 1100. I failed however, to include frequencies for these transmissions, so to make amends:

0700-0800 on 21.756, 17.89, 17.81, 17.765 and 17.325MHz
I

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