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January/February 1991 $3·50

CB Action

AUSTRALIA'S ONLY CB MAGAZINE

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CB Action

Managing Editor:
Len Shaw VK3NLS

Production Manager:
Paula Parker

Editorial Office:
603-611 Lt. Lonsdale St.,
Melbourne 3000
Postal — GPO Box 628E,
Melbourne 3001
Phone: (03) 601 4222
Fax: (03) 670 9096

CONTRIBUTORS

Russell Bryant
P.O. Box R16,
Roselands, NSW 2196

David Flynn
P.O. Box E160,
St. James, NSW 2000

Rod Fewster
P.O. Box 29,
Kallangur, Q 4503

Greg Towells
P.O. Box 514,
Toukley, NSW 2263

Rob Williams
P.O. Box 108,
Minto,
NSW 2566

Ken Reynolds
1290 Nepean Highway,
Cheltenham, Vic 3192

Bob Bell
P.O. Box 301,
Chester Hill,
NSW 2162

Patrick McDonald
P.O. Box 357,
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ON CHANNEL

So we come to the end of another year...a good one for the magazine and, judging by our increasing sales, readers also.

The year has been one which has seen many changes to the contents of CB Action.

When the magazine started way back in the mid-70s it was strictly 27MHz CB only and it stayed that way for many years, later widening its scope to cover UHF CB. Times, however, change and we have changed in response to the trends indicated in our regular 'reader surveys'. As a result of these, the magazine now places a great deal of importance on scanning and shortwave listening and we have greatly expanded these areas during the past year.

It has, however, not been totally at the cost of CB editorial although the level of content has decreased as have the manufacturers of rigs, antennas and accessories. We still carry reviews on new rigs and equipment along with general articles on 27MHz and UHF but if we still relied on just this aspect of the hobby it would be a very slim magazine indeed.

SO WHAT'S NEW..?

DX International has proved to be very popular with our 27MHz DXers as also has the DX forecast chart. We have also introduced a section for computer owners and this is slanted directly at the radio communications area of computer operation. Again, this new section is very popular and rates highly in reader surveys.

Our most recent recruit is Bob Bell, arguably one the best informed people in Australia when it comes to airband communications and utility traffic. He joins a very experienced line-up of other knowledgeable contributors — Russell Bryant (Scanning), Patrick McDonald (Computers), Rob Williams (Shortwave), Rod 'Furious' Fewster (Spectrum Anarchy), Ken Reynolds (Rig Reviews and General articles) and of course David Flynn, a longtime crew member, who supplies more material than we can usually handle. My personal thanks to all of them for it is them who make the magazine the success that it is...

My thanks also to all our advertisers, some of whom who have been with us since issue one away back when. Without them we wouldn't be in business, while we also like to think that without the magazine they wouldn't be able to reach the very specialised market which makes up most of their business...the readers of CBA. One thing to please keep in mind...in these tight economic times our advertisers deserve your support more than ever and we hope that whatever piece of communications equipment you're buying, you're buying it from them.

Having said that, I now wish you a remarkably Mary Chrissmas with the hope that Mary stuffs things into your stockings like never before...250 channel CBs, 5 kW linears, 10 element beams, 5000 memory scanners, shortwave rigs on which you can listen to Outer Mongolia every night and, above all else, CBA wishes you one helluva good New Year.

See you in 1991.

CB Action

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Frank Hall Media
4th Floor, 102 James Street,
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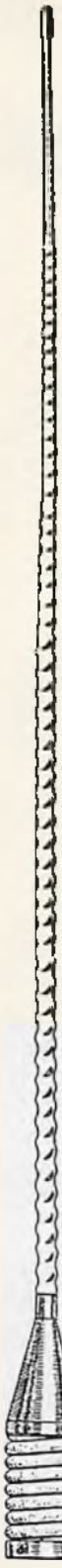

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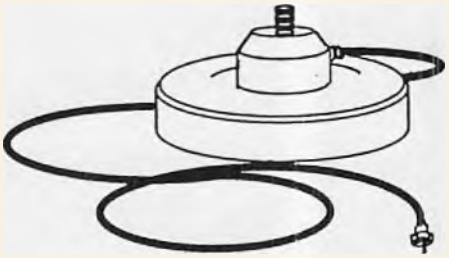

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Codes, callsigns and frequencies all spell out . . .

MILITARY ACTION

By Bob Lopaka

In this final chapter of the 20th century, no army, navy or airforce can afford to exist without state-of-the-art communications equipment and highly- trained personnel to man the signalling equipment. The high frequency demand for military messages of all types, both secure and non-secure, being transmitted over a myriad of frequencies across the radio spectrum, creates a mecca for and gives rise to a special breed of cat...the military monitoring enthusiast!

Military monitors constantly tune the military bands 30 to 50 MHz, 225 to 399.975 MHz, 136 to 138 MHz, 140 to 143 MHz and portions of 68 to 88 MHz, 400 to 512 MHz, and countless microwave frequencies above 1.5 GHz for any copyable signals of a military nature. In addition, military monitoring enthusiasts wade through the massive HF spectrum in search of their prey. I am one such creature. I spend many hours each week devoting an envelope of my available monitoring time to military pursuits.

Military communications captured my attention initially when I first saw a fighter aircraft, and observed the speeds it could achieve, and then started to imagine the awesome things the aircraft was capable of. I wanted to listen in to military pilots talking with their bases, and to Air Traffic Control. I wanted to overhear their communications as they went about practicing aerial warfare!

When I saw naval frigates, destroyers, patrol boats and submarines on the harbor I wanted very much to monitor their radio communications. And as for army signalling and its interception, my local army monitoring and interception of US-Honduran military "exercises" during the flare-up of 1983-84 frequently caused my two HF receivers to overheat through constant use.

Although I couldn't hear it at the time, for I had no decent low band receiver, many other Australians were monitoring Honduran VHF-FM signals "skipping" in, even during the winter and spring months notorious for killing off DX! All I owned with low band was the Tandy Realistic patrolman portable radio which was analogue tuned and very "deaf" on those bands. Who would have imagined that I could have actually monitored grassroots tactical field communications as they were happening from Latin American battlefields?

Anyway...enough motivational hype...in this feature I will provide you with the frequency tools to enable you to monitor the modern military, and add great enjoyment to your leisure hours spent listening to your radios.

MILITARY AVIATION SPELLS FASCINATION

This is the band that spells "total fascination" for me. For many years I knew where the fighter jets and transport aircraft of the Royal Australian Air Force were to be located on the radio bands, but there isn't a readily available receiver for me to buy which included military UHF. So I couldn't get down to the nitty gritty and start to monitor these special aviation frequencies.

Tunable receivers mostly missed out on 225 to 39.975 MHz, except for handheld scanners like the PRO-30 which boasted parts of the band, namely 380 MHz onwards. But these units did not enable listening in AM mode. And all the military traffic on these bands was in AM. Finally though, better and wider coverage scanners were produced by companies such as Ace Communications and Radio Shack (Tandy Electronics) which not only featured the band but had selectable modes to go with it. I was finally airborne with the crews of the Hercs, Caribou, F-111C, Mirage and Macchi aircraft I had so desperately wanted to listen to!

This is part one of a two part article in which Bob Lopaka spells out where to listen for military communications and how to understand what they're saying when they use codewords.

WHAT CAN YOU HEAR ON THESE MILITARY FREQUENCIES?

A big mix really...air traffic contro from civil aircraft channels linked up to certain military frequencies, as is also the case with selected flight informa tion service channels. There are also tactical exercises on discrete squadron frequencies, embracing air-to-air com bat practice (dog fighting), low-level je route flying training at 300 feet AGL and below, practice bombing runs by day and night, and air-to-ground simu lated and actual gunnery.

There are also Caribou and Hercules parachute drops of men and machin ery, and distress communications, re membering that the flying of high speed military aircraft exacts a high attrition rate. This is even borne in mind by RAAF service hierarchy when they are planning equipment purchases they actually allow for losing a few of their multi-million dollar toys as time passes!

You will also be able to monitor air field operations, perimeter and building security patrols, and in times of natural disaster or emergency, you will hear military aircrews coming to the aid of stricken communities. Times such as these include bad flooding, or during the aftermath of a cyclone or earthquake.

Usable range of military UHF is 100 to 150 miles depending on the altitude of the aircraft. Many military airfields categorize their standard radio frequencies into presets called studs, with each allocated a number. "Stud 4" may be, for example only a RAAF control tower frequency. You will hear the approach controller say: "Call the tower stud 4", meaning dial up preset channel 4 and call the tower on that.

Squadron company frequencies consist of UHF channels assigned discreetly to individual squadrons to allow the passing of vital operational messages while airborne.

Although this is the criteria for use sometimes, when the crew of the aircraft is far, far away from home base and well out of earshot of the "brass" some pretty spicy conversation come to life on company UHF!

Military aircraft approaching for landing are always provided with check wheels reminders to lessen the chance of an accidental wheels-up landing which could take a savage toll on the very expensive aircraft. Pilots respon

This is the Boeing 767 "Star Wars" aircraft with bulbous upper fuselage. Photographed in Seattle in early November, this is the first picture of this aircraft to appear in the Aust. media.

o this reminder with an electronic beep ıenerated by a button connected to an ıscillator on the flight deck. The tone vhen generated by the crew pushing he activation button is broadcast ıcross the operational radio frequency ınd means wheels down and locked.

While monitoring FA.18s, F-111Cs, 'C-9s, and MB-326H Macchis, you will ıear the hollow conversation caused ›y helmet-mask mike configurations. When first monitored, the mikes sound hroaty and strange.

MILITARY DISTRESS

Distress situations are far more fre-ıuent among private pilots flying light ıircraft at general aviation fields. But vhen things do go wrong in high speed ighters like the FA.18 Hornet or F-111C, service pilots don't always have he luxury of being able to talk a great ıeal about their problem. As it hap-›ens, they are usually more concerned vith exiting the aircraft using an ejector ıeat, and ensuring the ensuing crash of he aircraft doesn't kill or injure inno-:ent people below.

If they get the chance, fighter pilots vill call distress on their working fre-ıuency and/or the military distress :hannel 243.0, which is the exact dou-›ling of the civil distress frequency 121.5 MHz.

The call will be similar to: Mayday, Mayday, Maple-Hawkeye three-zero-›ne, I'm on fire...ejecting...over water, three miles east of Port Macquarie, at ›ight thousand, over. In this described scenario, the callsign depicts an FA.18 Hornet in very serious trouble. A slight-y less urgent call is the PAN PAN PAN transmission, notifying of an on-board situation of urgency, but one which is not affecting the immediate safety of the aircraft. An example I could offer up is an engine oil leak, where the aircraft is still flying, and due to the small amount of oil escaping, it is expected that the crew of the aircraft will be able to fly it safely back to the field for a landing.

As do their civilian counterparts, military pilots activate their on-board transponder during an emergency (if able to do so) by selecting the code 7-7- 0-0 and squawking ident. It means: I'm in distress, send assistance immediately. The code will automatically show up on radar control screens as a "flowering paint", very unlike the normal subdued radar paint of an aircraft squawking ident. With a 7-7-0-0, on some radar screens, the letter "M" for mayday appears, leaving absolutely no doubt as to the situation surrounding the aircraft.

MILITARY AVIATION USE HF (SHORTWAVE) COMMUNICATIONS

The HF frequency spectrum is used to communicate with aircraft travelling remote oceanic or transcontinental routes, unable because of range from the ground station to communicate on UHF or VHF frequencies.

HF or high frequency can span thousands of miles, if operating frequencies are chosen wisely for time of day and season. HF radio propagation is inconsistent, due to solar storms and flares, achieving its long distance coverage by a phenomenon known simply as "skip". This is ionospheric reflection or bouncing of the signals.

3 and 5 MHz frequencies are used mainly during local nights, while 8, 11, 13 and 17 MHz frequencies are used during the day.

Communications with ground stations are in upper sideband mode, and monitors hoping to overhear military aviation communications on the HF bands have to realise they not only need a shortwave receiver, but also a receiver with a USB clarifier to resolve the signals successfully.

(Continued over)

A FEW UHF AVIATION FREQUENCIES TO KEEP YOU BUSY

Amberley 363.8, 243.0, 270.6, 335.8, 257.8, 284.6, 259.8, 279.5, 381.4, 316.2. **Canberra Fairbairn** 335.6, 306.3, 257.8, 243.0.
Darwin 285.4, 338.2, 363.8, 243.0, 305.4, 261.4, 257.8, 264.6, 259.8, 236.1, 340.2, 317.7, 316.2. **East Sale** 281.6, 243.0, 340.2, 270.6, 257.8, 264.3, 259.3, 316.2.
Edinburgh 306.3, 243.0, 270.6, 257.8, 264.6, 306.3, 259.8, 264.0, 269.2, 316.3. **Gingin** 261.4, 294.5, 243.0, 257.3, 267.0, 259.3.
Laverton 258.2, 285.4, 243.0, 267.2, 259.8. **Nowra** 370.1, 243.0, 253.9, 257.6, 340.2, 282.8, 267.2, 280.4, 264.3, 273.2.
Pearce 261.4, 335.8, 294.5, 243.0, 257.8, 264.6, 259.8, 360.7, 355.0, 316.1. **Pt. Cook** 258.2, 285.4, 243.0, 305.4, 269.8, 264.3, 259.3, 258.2, 316.1.
Richmond 269.0, 306.0, 328.5, 363.8, 261.7, 289.4, 257.3, 243.0, 264.6, 259.8, 316.3.
Williamstown 261.4, 243.0, 293.4, 254.7, 317.8, 338.5, 271.3, 259.3, 257.8, 264.3, 269.0, 306.0, 316.1. **Avalon** 314.6, 344.4, 243.0 (and low band 43.975).
Evans Head 287.5, 280.0, 243.0 (also 27.88 marine).

MILITARY ACTION

MILITARY AVIATION UHF COMPANY FREQUENCIES

Fairbairn-322.5, 348.4, 349.1. Richmond-261.4, 261.5, 261.7, 300.4, 316.9, 322.5. Various bases-262.2, 267.5, 272.1. Williamstown-256.5, 301.1, 311.6.

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Abnormal-Space and missile test. Acrobat-Andrews. Afkai-Tactical, 89th military air wing.
Agar-EC-135N aircraft. Airevac-air evacuation.
Air force 1-president of US. Air force 2-vice-president.
Alfa-advisors Venezuela. American Eagle-commando escort unit.
Aria-EC-135N. Army 1-army helicopter with president on board.
Army 2-army helicopter with vice-president. Cape-Cape Canaveral.
Charlie-cooperation Uruguay. Copter-helicopter.
Crown-White House. Delta-advisory group.
Denali-MAC Elmendorf. Discard-MAC Travis.
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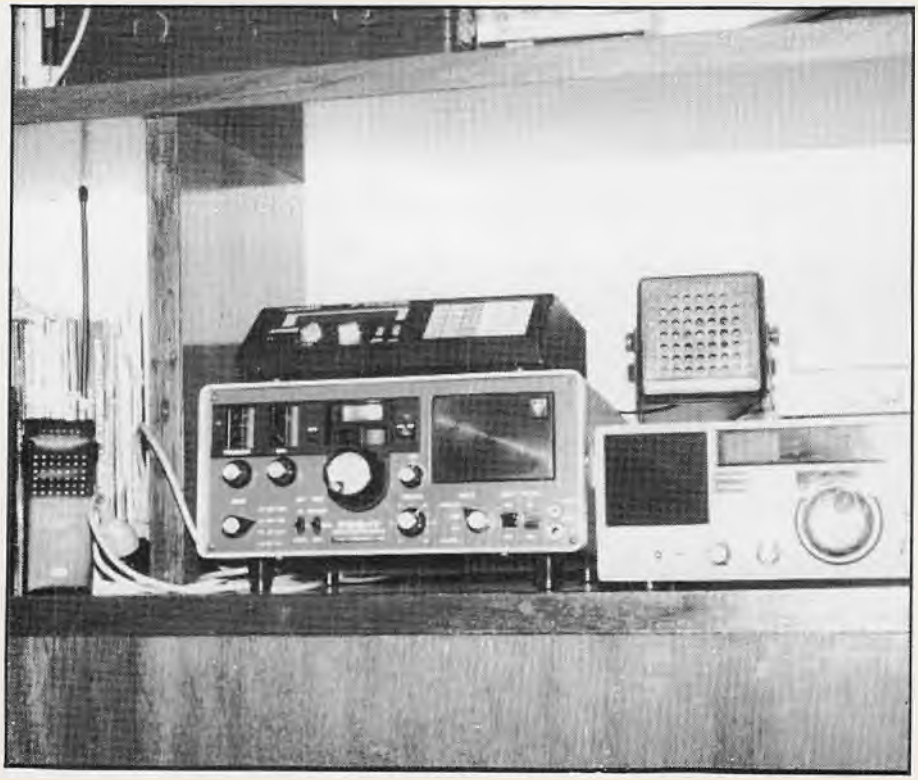
Edgy-AWACS aircraft. Electric-national emergency airborne command post.
Executive 1-commercial flight carrying president. Executive 1-F-commercial flight, president's family.
Executive 2-commercial flight vice-president. Executive 2-F-commercial flight vice-president's family.
Fast charger-joint command. Fertile-SAGE/NORAD.
Fireside 1-TAC Langley. Fireside 3-9th air force Shaw.
Fireside 4-mountain home. Fireside 5-12th air force Bergstrom.
Fivespot-commando escort unit. Fletcher-commando escort unit.
Flynest-nuclear and chemical warfare disaster team. Format-21st air force McGuire.
Furious-MAC Panama. Gold Coin-McDill strike command.
Golden-any aircraft wishing to call TAC.
Golf-advisor Guatemala.
Goliath-NORAD. Gull-53rd weather recon.
Hilda-MAC command. Hotel-advisor Haiti.
Jolly-search and rescue helicopters. Kilo Echo-advisor El Salvador.
Lark-55th weather recon. Letterman-hickam (weather).
Mike-cooperation Paraguay. Nighthawk-marine corps helicopter president on board.
Mac-military airlift command. Mainsail-aircraft wishing to contact GCCS.
Marine 1-marine corps helicopter president on board. Marine 2-marine corps helicopter vice-president on board.
Medevac-evacuation helicopter medical facilities. Mike Mike-advisor Honduras.
Minuteman-national guard Andrews.
Oscar-advisor Colombia.
Papa-advisor Bolivia/Dominican Rep. Pedro-rescue.
Phantom-MAC European control.
Queen-rescue Eglin.
Raymond 1-TAC Langley. Raymond 6-TAC George.
Raymond 7-27th and 35th tactical fighter wing. Raymond 9-TAC Dyess.
Raymond 10-TAC Hurlburt. Raymond 11-TAC Eglin.
Raymond 12-TAC England (air base in USA). Raymond 13-TAC homestead.
Raymond 14-TAC 49th tactical fighter wing Holloman. Raymond 15-TAC 31st tactical fighter wing Homestead.
Raymond 16-TAC 1st tactical fighter wing Langley. Raymond 17-TAC 347th tactical fighter wing Moody.
Raymond 19-TAC 56th tactical fighter wing McDill. Raymond 21-TAC 345th tactical fighter wing Myrtle Beach.
Raymond 22-TAC 57th and 474th tactical fighter wing Nellis. Raymond 23-TAC Pope.
Raymond 24-TAC 552nd AWACS Tinker. Raymond 25-TAC 4th tactical fighter wing Seymour Johnson.
Raymond 26-TAC 363rd tactical fighter wing Shaw. Raymond 27-TAC 336th and 662nd tactical fighter wing mountain home.
Raymond 28-TAC Bergstrom. Ringmaster-NORAD Cheyenne Mountain.
Sam-special VIP flight. Sam 01-special mission foreign head of state on board.
Sam 26000-Air Force 2 without vice president on board. Sam 27000-Air Force 1 without president on board.
Sam 31682-vice-presidential aircraft without him on board. Sam 86971-US secretary of state.
Sam 86972-US national security advisor. Save-resue.
Sentry-AWACS aircraft tinker. Sierra advisor Ecuador.
Sierra Alpha-advisor Costa Rica
Skybird-any aircraft wishing to contact SAC.
Skyking-general callsign, nuclear and support forces. Spar-89th military airlift wing VIP aircraft.
Swan-54th weather recon Anderson
Teal-815th weather recon Keesler.
Tonight-MAC Pacific control. US air force-international flight over foreign country.

USAF HF/SSB FREQUENCIES

2371, 2374, 3032, 3060, 3067, 3081, 3144, 3503, 4449, 4457, 4464.5, 4467.5, 4495, 4504.5, 4507.5, 4582, 4585, 4599.5, 4602.5, 4627, 4630, 4721, 4725, 4742, 4746, 4747, 4760, 4809, 4812, 4872, 5020, 5026, 5197, 5297, 5303, 5328, 5479, 5688, 5700, 5703, 5710, 5745, 5805, 5827, 6100, 6683, 6708, 6714, 6715, 6716, 6727, 6730, 6738, 6750, 6753, 6756, 6761, 6769, 6800, 6826, 6890, 6895, 6940, 7330, 7430, 7460, 7635, 7853, 7918.5, 8101, 8731, 8964, 8967, 8989, 8993, 9011, 9014, 9018, 9023, 9027, 9057, 9129, 9220, 9723, 10344, 10452, 10510, 10780, 10802, 10935, 11118, 11141, 11169, 11176, 11179, 11182, 11214, 11220, 11226, 11236, 11243, 11246, 11267, 11408, 11440, 11441, 11494, 12129, 13201 (used by "Air Force 1" Presidential Aircraft), 13204, 13211, 13214, 13215, 13218, 13241, 13244, 13247, 13547, 13907, 13937, 13950, 14650, 14894, 14905, 14955, 15015, 15031, 15035, 15041, 15091, 15734, 15962, 16246, 17248, 17975, 18002, 18019, 18027, 18049, 18059, 18594, 20390, 20631, 20855, 20873, 20885, 20890, 23206, 23277, 23337, 26620, 27870

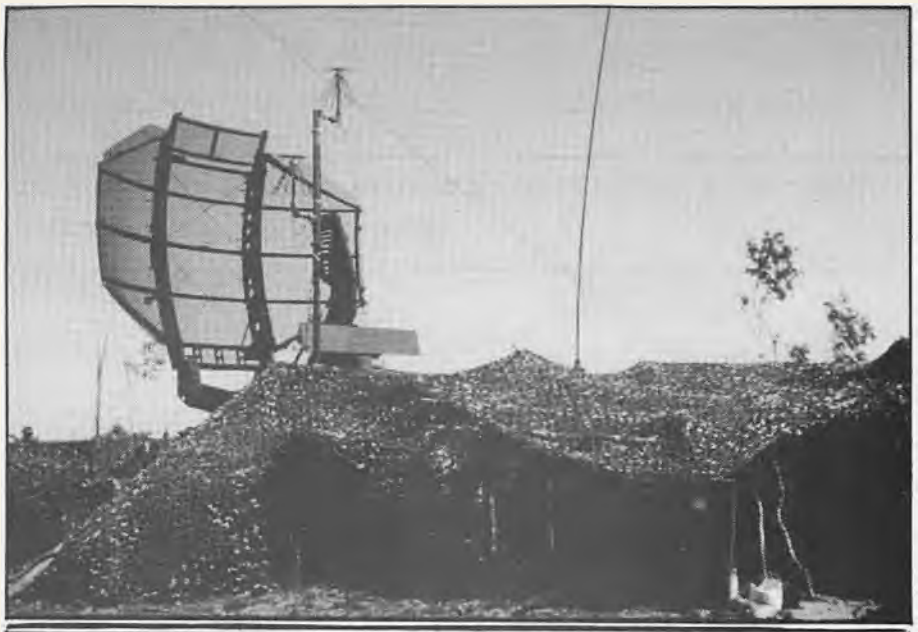


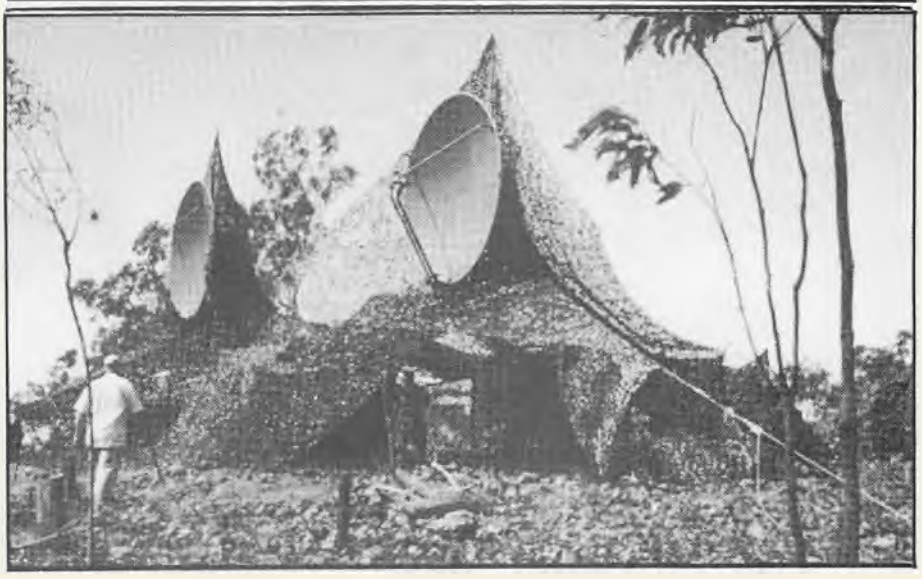
This is the type of equipment you need to monitor the modern military. UHF, VHF and HF radios are necessary if you are to cover the main activity.

op: Camouflaged microwave antenna at ush camp.

entre: Deep jungle 'radar' emplacement assist in warning of approach by enemy ircraft.

ower: More microwave communications quipment at 'secret' army bush camp.





ISAF COMMUNICATION CONROL ZONES AND STATIONS

-Clark Base, 2-Anderson Base, 3-okota Base, 4-Hickam Base, 5-lmendork Base, 6-McClellan Base, 7-cott Base, 8-Albrook Base, 9-McDill ase, 10-Thule Base, 11-Croughton ase, 12-Lajes Base, 13-Ascension ase, 14-Incirlik

IAAF CALLSIGNS

.RDU, tester, delta, lambda, omega, sigia, theta.

AC-111, envoy. **BLACKHAW**, albatross, ruiser, diver, wheeler, blackhawk.

OEING 707, windsor. **CARIBOU**, lackduck, vanguard, dingo, emu, enfield, on, steel, wallaby, boomer, bushranger, w ard, wombat.

T-4, central, camel, spad, charlie, garrett, riffin, gypsy, king, merlin, roller. **F-111**, uck, dash, fang, lion, oggy, puma, ramp, ot, buckshot, cannon, carbine, colt, pisl, falcon, cutlass, sabre, scimitar.

ERCULES, stallion, charger, chieftain, averick, shadow, thunder, tornado, trojan.

ORNET FA-18, baron, apache, cobra, ougar, lancer, raider, ranger, zulu, classic, lackbird, buzzard, condor, magpie, sparw, despot, amber, black, blue, brown, old, green, orange, purple, red, white, yelw, firebird, maple, hawkeye, hipshot, omburg, hoodoo, hornet, hunter, hydrant.

S.748, consort, torch, sable, saffron, arlett, silver. **IROQUOIS**, iroquois, hiptail, barra, lancer, manta, stinger.

IACCHI, airways, alladin, bearcat, corsair, ustang, spitfire, charlie, tango, valiant, ampire, vengeance, viper, vixen, voodoo, rtex, vulcan, stingray, talon, tiger, toxin, ident, tripod. **MUSEUM AIRCRAFT**, eritage.

IYSTERE FALCON, regent. **P3 ORION**, riker, shepherd, sea lion, mariner.

C-9, chieftain, kestrel, mentor, roulettes.

QUIRREL, eagle, hawk, shrike, wedge, opper searcher, oxford, top end, python, okka.

VINJEEL, stacker, dagger, dirk.

In the next issue Bob Lopaka looks at the other forms of military communications, codewords, terminology and naval frequencies.

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(OPPOSITE CHELTENHAM POLICE STATION) Melway Ref. 86 J1

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PB-900

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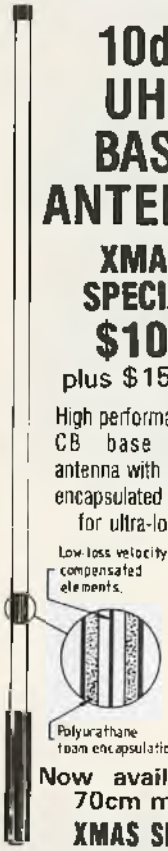

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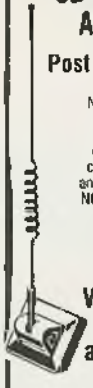

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- ★ Illuminated LCD display
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NEW SWR POWER METER

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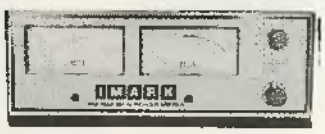

A top quality VSWR power meter covering from 3MHz to over 1,000MHz in two ranges. A must for the serious UHF enthusiast. Australian made. 'Eats' the imported competition.

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3 Power Levels
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Kits are now more than 90% pre-assembled — all you need to do is attach the matching network. All amounting hardware is stainless steel for reliable, corrosion free operation

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10 metre amateur transceiver
A few early model units left

$550 plus P&P $12.50

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Specialised directional array with unique directional properties. Polar pattern is virtually free of side-lobes and has very high back to front ratio. Ideal for repeater operation for stations who usually access multiple repeaters on a single channel. Wide frequency range from 460MHz to 490MHz. Ideal high performance UHF scanner antenna. Offers good gain and directivity from 420MHz to 550MHz. Works well on 800/900MHz too. Variable feed impedance and frequency range. Short mounting mast supplied. Complete kit with detailed instructions

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AOR AR-1000 SCANNER

8MHz to 600MHz
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1000 channel memory AM/FM/FM wide. Great performance

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Three sizes: 60cm — $32
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Conversion features:
400 channels. 30 channel per second scan rate. 30kHz channel spacing in Cellular Phone Band. Improved squelch control. Conversion includes overlay.

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NOTE:—
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I enclose Cheque/Money Order
Please debit my Credit Card VISA ☐ BANKCARD ☐
MASTERCARD ☐ Please send goods COD ☐
ALL Orders must include phone number for confirmation.

Phone ( ) .....

Signature .....

Expiry Date.....

Name.....

Address.....

.....P/code .....

RUSSELL BRYANT'S

SCANNING ACTION

All frequencies are in FM unless otherwise stated, all times are in local time, unless indicated differently.*

SCANNING THE USN FLEET SATELLITE COMMUNICATIONS SYSTEM.

It's true, satellites are causing the demise of HF, as the primary world wide communications mode. It is also true, that most satellites operate in bands outside the range of the scanner hobbyist...most not all that is !

There are dozens of birds using frequencies that can be received on the average scanner. Defence, weather and amateur sats can all be monitored by scanner enthusiasts in Australia. While it requires a fax decoder to 'receive' weather pictures from the satellite, military and amateur transmissions can be picked up using a scanner and, preferably, an external antenna.

While we will only be dealing with a particular military sat, it is necessary to understand some of terms and phrases employed by satellite users and monitors.

LEARNING SATELLITE SPEAK

The terminology associated with satellites is somewhat unique. Basically a communications satellite is an outer space radio repeater, or transponder. Instead of using repeater input and output frequencies, satellites utilise up and down links. Information is carried to the transponder on the uplink frequency, where it is returned to earth on a different frequency known as the downlink.

Communications satellites revolve around the earth relaying information from country to country, ship to shore, aircraft to aircraft and so on. Their revolutions are known as an orbit, of which there are three standard types. The orbit most commonly used, is Geo-Stationary, which is used by communications, television and defence sats. Located approximately 32,000 kilometres above the equator, Geo-Stationary satellites orbit the earth at the same speed at which the earth revolves in space. Thus it appears the sat is stationary above the earth, or Geo-Stationary.

Another widely used orbit is Polar, whereby the satellite tracks via the earth's polar caps. It is customary for reconnaissance sats, spacecraft and space stations to use a polar orbit.

Named after a Soviet satellite system, the third orbit is called Molniya. Somewhat unusual, Molniya is highly elliptical with the bird passing within several hundred kilometres of the earth's surface at the lowest point and reaching 65,000 kilometres into space at the highest.

The United States Navy Fleet Satellite Communications System has a Geo- Stationary orbit. There are seven of the satellites sitting just above the equator, each servicing a given area of the world. The one most often monitored here in Australia is the Pacific Area FLTSATCOM, which is located at 172 degrees east.

YOU'LL NEED ONE OF THESE SCANNERS

Frequencies used by FLTSATCOM are within the range of scanners covering the UHF aircraft band and having user selectable receive modes. The PRO 2004/2005/2006, Yaesu FRG 9600/965, Icom ICR 9000/7000, AOR 1000/2001/2002/3000, Fairmate HP 100 and Yupiteru MVT 5000/6000 are all capable of monitoring the FLTSATCOM.

Little is known of the USN FLTSATCOM, either here or in America, the following data is from my own files, obviously some of it is not correct, it is difficult to verify and is therefore given at face value. If any reader can add to, alter or correct any of the information contained herein, please feel free to contact me at the address at the end of the column.

FREQUENCY ALLOCATIONS

The frequencies used by FLTSATCOM are;
261.450, 261.475, 261.500, 261.525, 261.550, 261.575, 261.600 261.625, 261.650, 261.675, 261.700, 261.725, 261.750, 261.775 261.800, 261.825, 261.850, 261.875, 261.900, 261.925, 261.950

The satellite is available to all US defence organisations as well as Coast Guard units and CIA personnel. Transmissions are in narrow band FM with 25 kHz spacing. Ground stations are located at Travis Airforce Base Arizona, McGuire AFB New Jersey, Ramstein AFB Germany and Kadena AFB Japan, in addition to other unknown military establishments throughout the world and including Australia.

The variety of transmissions monitored include two-way type operations, phone patch as well as data modes. While most of the conversations are in the clear, (not scrambled), it is expected that due to the sensitive nature and status of the organisations using the FLTSATCOM, that encryption will be encountered.

DIGITAL SCRAMBLING USED

It appears that digital scrambling similar to Motorola's DVP is used together with TDM or Time Division Multiplex. TDM scrambling is easier to 'crack' than DVP, however, it is still effective against the casual listener. Time Division Multiplex, divides the analogue information into segments before modulating the carrier. Instead of the information being transmitted in normal fashion, for example 1, 2, 3, 4, 5, 6, the message goes out like this, 6, 1, 3, 2, 5, 4, and until the radio on the other end reassembles it in order the signal sounds unintelligent.

TYPICAL CALLSIGNS ARE...

Typical callsigns monitored on FLTSATCOM are;
NAVAL TACTICAL IDENTIFIERS=The navy uses three digit alpha-numeric callsigns such as A2B and Y6L.
ATLANTIS=Control station located in Clark Air Force Base Philippines. CLARK=Clark Air Force Base. DULUTH=USS Duluth, callsign CWN. Amphibious transport dock (LPD) Hull number '6'. OIL PAN=Army transport unit, located Pusan South Korea. VALDEZ=USS Valdez, callsign CUK Frigate (F) Hull number '1096'

Military operators employ a number of phrases and words unique to themselves. Some of the terms used are, L&C=loud and clear, LIMA CHARLIE=loud and clear, IN THE PLAIN=non encrypted transmission, GO GREEN=activate scrambling, IN THE RED=clear speech, SITREP=situation report and finally INDIVIDUAL (followed by a name)=a person.

Monitoring the FLTSATCOM is not possible in all areas, an external antenna is almost a must, in some locations a pre-amp or active antenna is certainly a bonus, however a discone also works well dependent on your location. Remember any additional information will be welcome and included in future columns.

MAILBAG

**A reader from Croydon VIC,* whom I shall call Scanfan, wrote to me with an incident he heard while monitoring the phone bands (which of course is highly illegal). I am not prepared to relate the story here, however he has given me an idea. If you have heard any funny or interesting items via the scanner (other than telephone calls) drop me a line detailing the story and I'll feature it in a special section within my column.

POLICE FREQS..?

Two readers have discovered that they can receive police frequencies on the 490 MHz band. Adam from Frankston VIC and John in Ingleburn NSW wonder what the frequencies are used for...? Unfortunately you have not discovered anything new, what you have found is an image of the actual frequency. In Adam's case the image is 490.075, the real channel is 468.675. John has the City police on 490.100, and image of 468.400. If you take the IF or intermediate frequency of your scanner (10.7 MHz for Adam and 10.85 MHz for John), double it, deduct that figure from the higher frequency, you then have the actual frequency. For Realistic, Regency and Saiko scanners the IF is 10.7 MHz. For Cobra and current model Bearcats the IF is 10.85 MHz and for the early Electra Bearcats the IF is 10.8 MHz. Hope that solves the mystery police transmissions on 490 MHz.

AMBULANCE CODES ?

David in Rockingham WA monitors the following in his area, police 79.090 metro enquiries, 79.105 Harvey, 79.135 Bunbury, 79.120 and 79.150 Fremantle, 79.180 Special Ops Metro, 79.195 Brookton/Donnybrook area, 79.210 Perth and Midland, 79.240 Mundaring, 79.270 Warwick, 79.285 Mandurah, 79.300 Victoria Park, 79.330 Car to Car. David also keeps an ear on the St.John Ambulance on 79.600 Metro South and 79.630 Metro North, with 80.010 for ambulance to hospital comms. David asks if someone has a list of Ambulance codes could they send them in, he has only a few and would like to know the rest.

McDONALDS UPDATE

Tony Santos from Melbourne, author of the article Monitoring the VHF Low Bands, (Nov/Dec '90 issue), wrote to me with an update on frequencies used at the McDonalds Drive-In windows. It appears there may be other frequency allocations in use by the McDonalds' group, these alternatives are to prevent interference from nearby stores. They are 30.840/154.570 and 33.140/151.895. If you happen to live nearby, or visit McDonalds on a regular basis, check out these channels and let me know if they are active.

BATEMANS BAY FREQS

Some of the local frequencies used in Batemans Bay NSW (provided by Bob) are 73.160 Forestry Commission, 158.635 Telecom, 80.820 Eurobodalla Shire, 72.740 Illawarra Electricity, 467.275 Fisheries Inspectors, 83.910 Goulburn Police, 468.250 police in Batemans Bay, Moruya and Narooma.

CHANGED FREQS FOR St JOHN AMBULANCE

The Victorian Division of the St.John Ambulance has had a frequency change, out are the old 469.525 and 469.800 allocations, in are two repeater based frequencies 470.400 and 470.150 repeater outputs. The callsign is now VM3SJ. The new system will eventually be expanded to a 10 channel one with the equipment being supplied by Motorola. The best time to listen, according to Peter in Bullen VIC who supplied the info, is during the weekends.

AND THE WINNER IS...

Duncan, a 13 year old airband monitor from Willetton WA, is the winner of the Australian Airband Guide from Airband Communications. He provided some of the VHF AM air frequencies for his area...Perth Approach 118.7 and 123.7, Perth Tower 120.5, Perth Ground 121.7, Perth Clearance 133.0, Perth ATIS 123.8, Jandakot Tower 118.1 and 119.4, Jandakot Ground 119.9, Skywest Company 128.8. He also supplies Ansett ground staff FM channel as being 463.675 MHz.

CUSTOM DEPT FREQS ?

A Melbourne reader in a previous Scanning Action requested a list of the Bureau of Customs frequencies for Victoria. Once again many replied and here are the allocations 489.475, 489.550, 489.575, 489.600, 489.625, 489.650, 489.675, 489.700, 489.725.

(Continued over)

RUSSELL BRYANT'S

SCANNING ACTION

HELP WANTED

In a past issue J.Henry of Sydney wrote requesting help in identifying a number of 'GOVERNMENT' frequency users. Here are a some of the frequencies that readers have been able to track down...78.850 Corrective Services, 173.790 Pipeline Authority, 463.175 Newmans School Greystanes, 463.650 Royal Hospital for Women, State Recreation areas at Lane Cove and Georges River, 463.900 Electricity Commission of NSW, 487.250 Federal Airports Commission, 493.025 Department of Housing and Construction and finally 508.275 - the now defunct Egg Corporation. Thanks to Dave in Fairfield, Colin in Sadliers Crossing QLD, and Alex in Bondi, unfortunately Alex I can't give J.Henry your phone number as he didn't supply an address.

APPLE ISLE FREQS

An unidentified Tasmanian enthusiast checks in with a host of frequencies for the Apple Isle. The Army can be monitored on 40.150, 78.19 and 78.94 MHz. Tas Police have 76.085, 76.115, 76.145, 76.175, 76.205, 76.235 and 76.640 allocated to them while Department of Main Roads' cars can be heard on 76.615, 77.180 and 77.540. In Devonport the Able Tasman uses 169.900 for its comms. There are plenty more in the list, I will include them in future columns.

95% CORRECT

David from Melbourne VIC supplied Scanning Action with a comprehensive list of frequencies and callsigns for the Roads Corporation of Victoria. He says the information is about 95% correct, here it is, Channel 1 — 462.400 Seymour, Woods Point, Wedderburn, Portland and Horsham. Channel 2 — 462.425 Geelong, Stawell and Cann River. Channel 3 — 462.600 Ballarat, Elmore and Nowa Nowa. Channel 4 — 462.650 Dandenong, Bendigo, Kerang and Genoa. Channel 5 — 462.675 not allocated. Channel 6 461.650 Wodonga and Morwell. Channel 7 461.700 Wangaratta. Channel 8 — 462.625 Melbourne. Channel 9 — 462.225 Healesville. Channel 79 — 467.200 Westgate Bridge. VHF channel 1 — 80.010/74.585 Benalla. Any updates corrections and alterations will be gratefully accepted.

SOUTH OF THE BORDER

While in Victoria, regular contributor to these pages, John from Shepparton, has another helping of frequencies from south of the border, 493.650 Shepparton Shire Council by day, the local Search and Rescue at night. GTV 9 492.550, Southern Cross Comms TV 8 162.550, Alpine Search and Rescue 467.625 and lastly VKC Melbourne on 168.280.

SES AND AIRBAND FREQS

John in Oxley QLD monitors the State Emergency Services and airband frequencies. The SES use 468.600, 468.625, 468.650, 467.250 and the country disaster channel 466.775 MHz. His AM airband frequencies include Archerfield ATIS 120.900, Archerfield approach/departures 118.100 and 123.600, Archerfield Ground 119.900, Brisbane ATIS 125.500, Brisbane approach/departure 125.600 and Brisbane Tower 120.500.

FREQS. FROM ALBANY

Some of the regular frequencies that Alan of Albany WA has programmed into his scanner are Ambulance 79.600, Police 79.135 Albany, SES 163.270 channel A, 163.390 channel B, 164.440 channel C, Telecom 159.460, CALM Rangers 80.820.

THUNDERDOME ANYONE ?

A Victorian reader requests help in obtaining the frequencies used at the Calder Park Thunderdome. He welcomes all frequencies for cars, pit crews and officials.

MORE HELP WANTED

Tony from Turner ACT would like to know the frequencies used by the various Motor Transport Departments or Roads and Traffic Authorities throughout Australia.

MANUAL NEEDED

Chris in Morphett Vale VIC owns a JIL SX100 scanner, however he doesn't have the manual for it. If another reader has a spare copy or even a photocopy of the manual for the SX 100 let me know I will pass your details onto Chris.

BOOKS

About five years ago ESG produced its first frequency guide, it targeted South Australian services (home base for ESG) and proved extremely popular with enthusiasts, not just in that state but Australia wide.

Today, ESG publishes not only a VHF/UHF guide for each state and territory in three different formats, but also a nationwide HF register, aircraft register and their latest release, the Australian Emergency Services Register for 1990.

The AESR contains over 15,000 entries in its 330 pages, all aimed at providing the emergency services monitor with a concise up to date listing of HF, VHF and UHF frequencies employed by rescue and emergency organisations.

A quick glance at the index shows that not only the traditional groups, such as police, fire and ambulance, but Red Cross, SES, Hospitals, RFDS, Mines Rescue, Port and Harbour Authorities, Prisons and Aviation, to mention but a few, are included with entries for each service displayed state by state.

The introduction pages give a brief insight into the workings of each entrant in relation to their duties at emergency or rescue situations. An explanation of DoTaC callsign allocation policy is also provided at the conclusion of the introduction.

If the emergency services are your prime area of monitoring or you would just like to have ready access to frequencies used by rescue services then check out the Australian Emergency Services Register, it may be what you are looking for...it's available from Captain Communications, 26-28 Parkes Street, Parramatta, telephone (02) 633 4333 o from ESG, GPO Box 1200, Adelaide 5001. Price is $49 plus $5.50 post and pack.

NEW GEAR

A few issues back I mentioned a book dedicated to th airband enthusiast. The Australian Airband Guide from Airband Communications contains all the air frequencies a monitor needs to know. Judging by the response the suppliers have had (the book has nearly sold out of its first print run) aircraft listeners make up a large percentage of scanner users.

Few radios cater exclusively to the needs of the airband monitor and most use a hand held or mobile scanner to pursu their pastime. AV-COMM PTY LTD have changed all that. A importers of two new airband only receivers, they are set to capture a chunk of the market. The R-535 is a synthesized, high performance receiver providing access to the VHF and military UHF bands. Frequency coverage for VHF is 108-143 MHz AM and for UHF 220-400 MHz AM, sensitivity is on average .5 microvolt or better on both bands. The LCD displays all frequency information and has a soft green backlight.

Operation of the R-535 can be manual, multi channel scanning or searching between two preset frequency limits. Scanning of the 60 memory channels takes around five seconds. Designed for installation in a car or aircraft, the R-535 is a neat compact receiver that out performs the averag scanner on the airbands. The performance is in fact so good that one Asian aviation authority has employed them within their communications setup.

The second receiver, designated R-537S, has an analogue readout and frequencies are selected by dialling up the desired channel. In addition to the manual tune, the R-537S has provision for two crystals which can be cut to your specific requirements. Sensitivity for the tunable band 118-136 MHz is around one microvolt while the sensitivity for the crystals is slightly better.

Prices for both units have not yet been set, however, the R-535 is expected to be around $449 and the R-537S $199. Enquiries should be directed to AV-COMM PTY LTD, PO Box 386, Northbridge, NSW 2063 or by FAX to (02) 9497095.

Look for an in-depth review in a future CBA.

Anyone who has purchased a handheld scanner will be familiar with the antenna that is normally supplied with the unit. Specifications vary, however, all are basically rubber duckie style and tuned somewhere around the VHF highband. For UHF frequencies a wire is co-axially mounted within the VHF helical. The whole lot is then attached to a BNC connector.

All rubber duckies used on portable scanners are a compromise when it comes to optimum performance on specific frequency bands. A whip tuned to each band is required for the best possible results and the cost obviously prohibits most owners from purchasing the half dozen or so antennas needed to obtain good frequency coverage.

On page 76 of the 1991 Tandy Catalogue are two items that solve the rubber duckie compromise. Realistic are offering two telescoping whips for 'walkie talkies and scanners'. Both whips are capable of receiving frequencies within the range 25 MHz-1300 MHz. Catalogue number 20-006 has a centre loading for extra gain, while 20-008 is a straight telescoping aerial.

Both are rugged, heavy duty whips and, irrespective of which whip you choose, both will provide improved reception over the supplied helical antenna. The 20-006 with the coil loading is priced at $19.95 with the 20-008 at $17.95 and are available for all Tandy stores and dealers.

Tandy has generously supplied Scanning Action with one each of the telescoping whips to give away to readers of the column. Rather that give it to the best letter received over the next few months, I decided to put all the letters I have on file to date into a hat and draw out two winners. The recipients are — Dean in Mt.Gambier SA and Philip of Melbourne VIC whose addresses are also obviously on file. Their antennas will be in the mail in a short time.

PROPAGATION

Scanning Action (July/August '90) carried a piece on the VAEIS or Video Audio Entertainment and Information Services, an operation that broadcasts ethnic news and music to clubs, hotels and non-domestic premises.

Due to the availability of equipment (scanners) capable of receiving VAEIS broadcasts, plus the interest in some of these services by persons other than the intended audience, DoTaC has decided to encrypt VAEIS transmissions.

If you are a monitor of these unusual broadcasting like services make the most of them now, the future in scanning them is limited.

This year changes to the VHF mid and high bands may have scanner users scurrying to update data bases or the like. The Department of Transport and Communications will be implementing new band plan arrangements. Frequency allocations in the bands 70-85 MHz and 157-174 MHz were normally 15/30 kHz apart. From now on, allocations will be either 12.5/25 kHz between channels which brings Australia into line with many of its trading partners. Temporary arrangements will exist for current spectrum users until equipment capable of accepting the 12.5/25 kHz can be purchased.

Older scanners may have difficulty with programming the new frequencies, check yours out now.

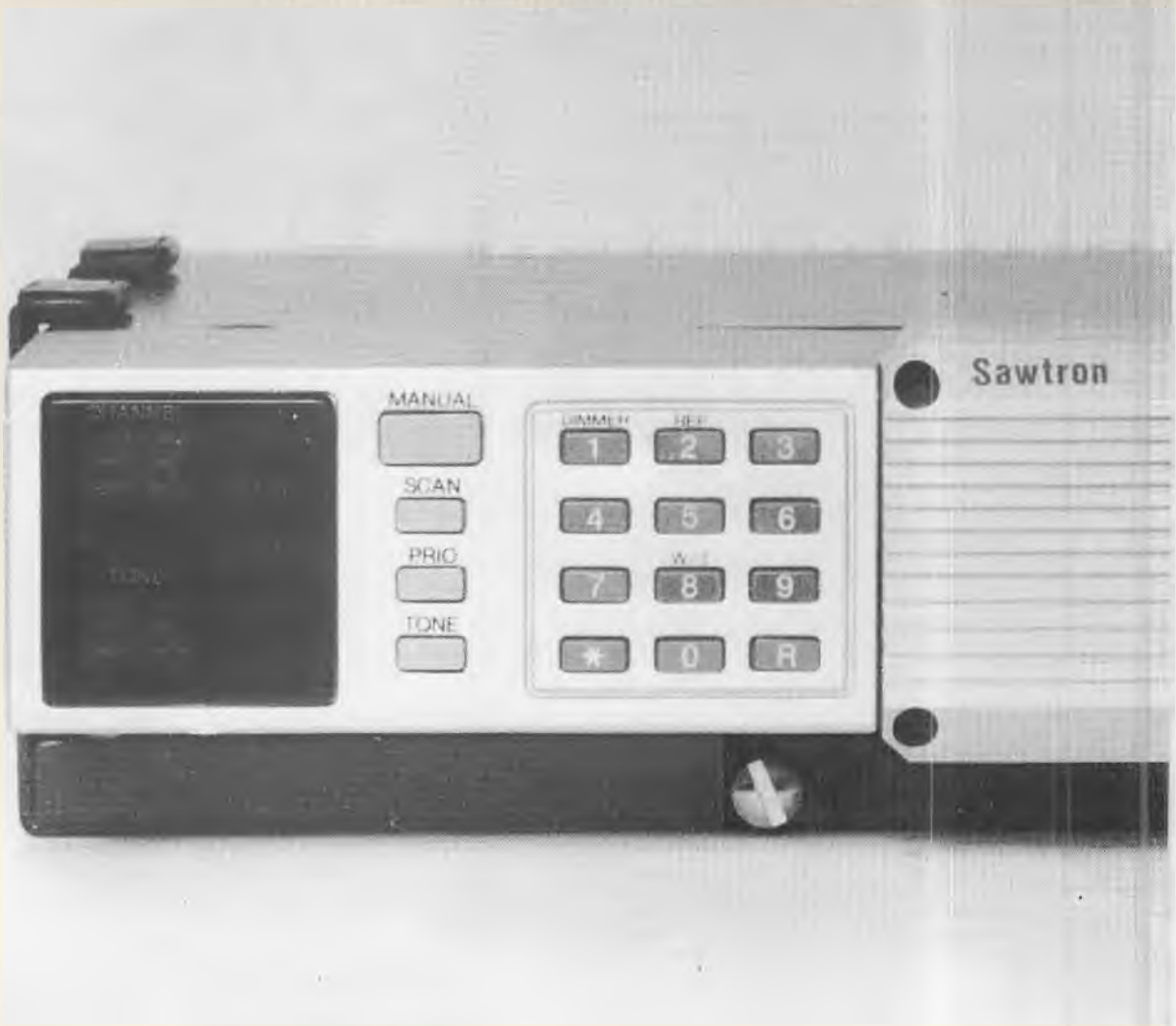
Remember if you have any funny stories, frequencies or questions to share with your fellow readers, simply drop me a line at the address below.

If you require a personal reply, a stamped self addressed envelope please.

SCANNING ACTION
PO BOX R 16
ROSELANDS NSW 2196

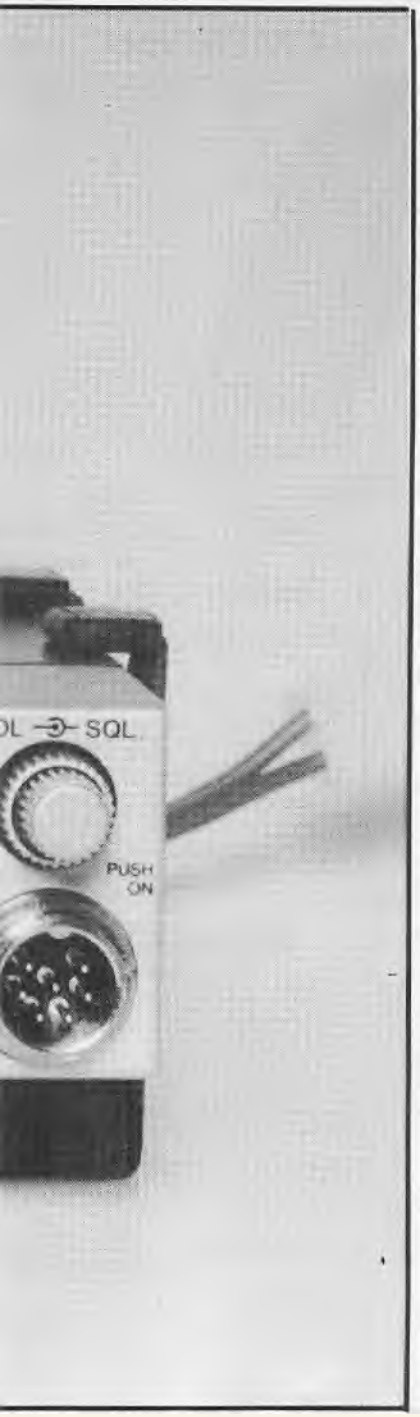
The 999 — UHF's Winning number . . .?

SAWTRON 999 UHF MOBILI



The Sawtron 999 UHF mobile is acclaimed as the best UHF CB on the market — but David Flynn wonders if the Sawtron 999 isn't just too clever for its own good . .

The Sawtron 999 is a transceiver with a pedigree. Australian UHFers began their acquaintance with the brand in 1979 when the Sawtron 880 became the second 477 MHz rig on the market — a calculated counterpoint to the first generation Philips FM320.
The 880 was crafted from a die-cast chassis that lent as much in weight as it did to the 'solid' look and feel of the rig, compared with the plastic case of the lightweight FM320. The Philips was a busy, almost cluttered rig with a collection of features new to 477 MHz, but it was also criticised for severe failings in sensitivity and adjacent channel rejection; Sawtron delivered a spartan no frills transceiver with all the build quality, high-spec performance and attention to detail that you would expect given its origins as a commercial two way unit.
Philips, credited as the fathers of the UHF CBRS, launched and re-launched the FM320 with fanfare and freebee dinners, press kits and media releases. Imark, a relatively new entrant into the field, played their cards close to the chest. While rumours, sketches and specs were circulated for some 18 months before the 880 was shipped, it was still a tightly-controlled operatio



— so much so that the CBA test rig bore the serial number of '2'! The runners in this two-horse race were diametric opposites in every way.

In late 1983, Imark released the Sawtron 990, a leaner and cleaner rig that was smoothly updated to suit the 80s. A 990 served admirably in my own mobile for many years and even after the demise of the line, I refused to budge. The 990 was slim, looked good and — important when mobile — dead easy to use. No complicated controls, just a rig that did the job at hand and did it in fine style. It didn't have scanning, priority channels, memories or the like, however I was prepared to make do without.

Then along came temptation from all directions — editors, friends, industry contacts — and it was high time I looked over the much-vaunted 999.

Sawtron's UHF CB radios bear great family resemblances. It almost goes without saying that they are well-built, considered the best 477 MHz rigs on the market. They all possess a smooth styling, which despite their firmly Japanese origins (from Kyodo, a company small by Japanese standards, but quite well-placed in the world markets) have had a sleekly functional European feel, until the 999 came on the scene.

There are a string of trademarks — solid and often innovative mounting brackets, an ability to remote-mount the radio 'head' from the rest of the transceiver, a front-firing speaker, hefty rear heatsink, and a steadfast refusal to adorn any unit with the ubiquitous S/RF meter.

If you still can't be sure it's a Sawtron, look at the price tag. This level of engineering doesn't come cheap. In 1979 the 880 retailed at $399 — sounds a bargain today, but that was a time when AM rigs cost $40 and sideband $150, while an issue of CBA cost but a dollar. CB prices had by 1983 returned to the real world, at around $100 for AM mobiles and $250 for SSB, and a princely $550 for the Sawtron 990 (CBA was still a great buy at $1.99). Today you'll look to $800 or so for the 999 and CBA is still a steal at a lowly $3.50.

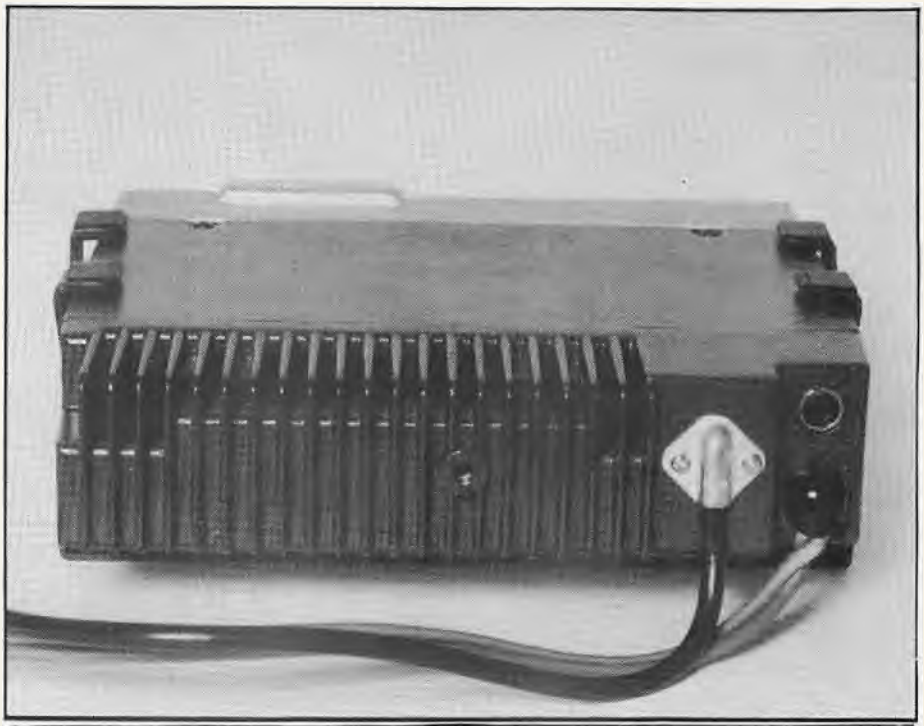
So who'd buy such a radio at such a price? The UHFer who must have the best of everything, of course. But it is the business and rural users that can appreciate what the Sawtron 999 represents, as they are the mainstay of 477 MHz and the reason why the band continues to grow.

APPEARANCES

There are three main components to the front panel. The display panel includes a pair of red LED readouts which, although quite bright, are rather small (6 mm x 3 mm) for my liking. The 990 has a channel readout that is larger and in green, a colour far more legible and less likely to 'wash out' under direct light. The 999's upper display is for the channel number, while its bunkmate shows the selected selcall code (more of which later). Five additional indicators are toggled for transmit and receive ('busy'), scan, priority and repeater/duplex mode. Next to the displays are four keys assigned to manual channel entry (sensibly the larger and top-most of the buttons), scan, priority and tone. Do not confuse this last key with the usual high/low audio tone, as it is used to set the CTCSS tone or the selcall number to be paged.

That clutch of calculator-like keys, decked out in a disagreeable combination of red and blue, is referred to by the 999's handbook as the 'data input keypad' and is used to select channel number, selcall code, priority channel, repeater operation, display dimmer and a few other tricks.

(Continued on Page 21)



999 uses flying leads instead of fixed connector sockets on the rear panel which makes installation easier than with most CB rigs.

AR1000

FROM HF TO MICROWAVE WITH 1000 MEMORY CHANNELS
8MHz-13GHz, AM-FM (N)-FM (W)

FEATURES:

- ★ Ultra Wide Frequency Coverage. AR1000 covers two wide bands 8-600MHz and 805-1300MHz without having a gap in the band.
- ★ Multiple programmable search limits: 10 different search bands can be programmable to find unknown active frequencies very easily.
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- ★ Permanent memory back up: EEPROM (Electrically Erasable Programmable Read Only Memory) maintains the programmed frequencies and function modes without having memory back-up battery which protects you from the disaster of losing 1,000 preprogrammed channels' information even at the time of battery failure.

SPECIFICATION

Frequency Coverage	8-600MHz/805-1300MHz
Sensitivity	N.FM 0.45uV @ 12dB SINAD W.FM 1.0uV @ 12dB SINAD AM 1.0uV @ 10dB S/N
Scanning Speed	Minimum 20 channels/second
Audio output	130mW into 8ohms 10% THD
Size	70(W) x 170(H) x 39 (D) mm
Weight	370 grams without antenna

Only $545

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EMTRON ACE

FEATURES:

- 40 Channel UHF CB
- Repeater ...
- RF Output 2W high 0.4W low 3W with 10.8V battery
- Illuminated channel selection switch for night operation
- Small in size
- Big in performance
- Full range of accessories

GENERAL SPECS

Freq range 476.425 - 477.400 MHz UHF-CB
Freq control: Digital PLL synthesizer
Type of emission 16F3
Antenna impedance 50 ohms
Power supply 8.4V ±15%
Operating temperature -10 to +60 C

THE FABULOUS ACE STILL THE BEST IN QUALITY AND PRICE

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DESIGNED SPECIALLY FOR AUSTRALIA With features and specs better than most commercial grade transceivers. EMTRON ACE covers the UHF CB band both simplex and duplex. It comes complete with nickel cadmium battery pack, belt clip wrist strap, flexible antenna — all standard at no extra cost

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OPTIONS:

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PROFESSIONAL RECEIVER

The AR3000 now extends your listening horizons further than anyone believed was possible. Covering the entire frequency spectrum from 1000KHz to 2036MHz without any gaps in the range. The AR3000 brings the general coverage receiver to a new level of performance and utility.

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POWER SUPPLIES

EMTRON EPS 30 20 amp-35amp peak	$499
ELECTROPHONE PSA 1210 10 amp-11 amp peak	$185
ELECTROPHONE PSA 126 6 amp-7 amp peak	$129
ELECTROPHONE PSA 123 3 amp - 4 amp peak	$80

ICOM SCANNERS

DC to Daylight

ICOM R1 h.held	$725
ICOM R100 Mobile	$1050
ICOM R7000E Mobile	$2665
ICOM R9000 Base	POA

NOTE: Prices may vary due to overseas currency fluctuations.

ACCESSORIES

CO-AX CABLE RG58 $1 pm
RG213 $3 pm

★ METERS

REVEX W560 1.6-500 MHz	$299
EMTRON EP2000 1.6.30 MHz	$118
EMTRON EP 1 26-29 MHz	$59
CO-AX SEAL	$5
FREQUENCY REGISTERS	$20
CO-AX SUITABLE 2 POSITIONS	$29

★ GME/ELECTROPHONE

TX 475 UHF HANDHELD	$699
GX 558 VHF MARINE INCL SEAPHONE	$450
MARINE ANTENNAS FOR 27 MHz AND VHF	

ANTENNAS FOR SCANNING

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Fax: (07) 394 4316

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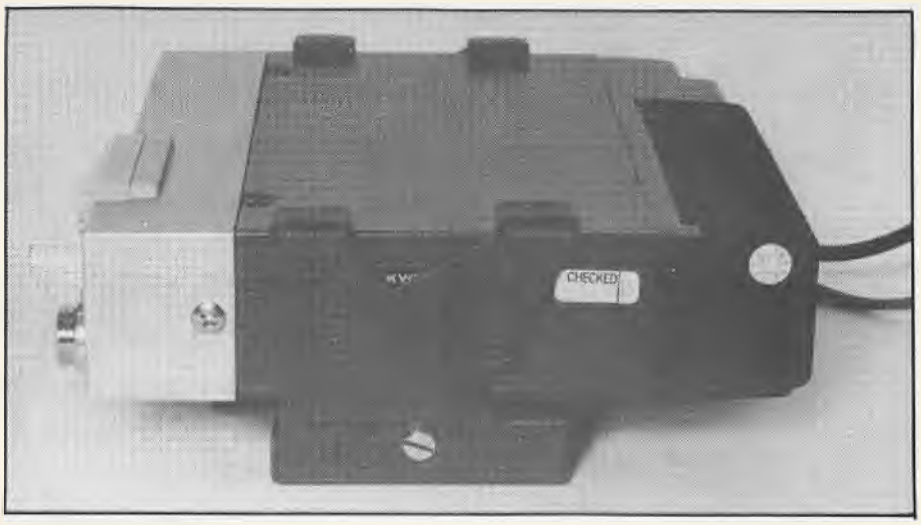
336 Albany Highway
Victoria Park, WA 6100
Ph: (09) 470 1118
Fax (09) 472 3795

SAWTRON 999 UHF MOBILE



The mounting bracket is indicative of the 999's high standards. The system firmly clamps the rig into place without it being necessary to bolt it to the bracket. It is released by pressing a spring-loaded button in the bracket centre.

INSTALLATION

It's easy enough to install the Sawtron 999 in almost any vehicle, even without having to resort to remote mounting of the control head. The rig conforms to the standard DIN measurements for car audio equipment, provided you can afford a bit of overhang to accommodate the 999's panel speaker. Here is a perfect example of what mounting brackets can and should be, if the radio demands it. The mounting system consists of two sections, one fixed to the mounting surface and the other to hold the radio itself. Together they clamp the 999 into place without bolting the radio itself to the bracket, and the unit can be released by pressing a spring-loaded button in the bracket centre. Kyodo has thoughtfully coated in plastic all parts of the bracket that grip the transceiver, so the Sawtron remains unscathed by the process.

Installation is also made easier by the 999's preference for flying leads instead of fixed connector sockets on the rear panel. You may have come across this before as either a hassle in your own installation, or a solution provided by the 990 or Electrophone TX472D. But, you know the problem — it is hard enough getting the radio in, let alone hooking up the power and antenna cables. To get around this, some manufacturers hardwire a length of cable into the back of the radio and then fit it with the appropriate in-line socket.

Once ensconced in my vehicle, the Sawtron looked there to stay. It was a neat fit in the centre console, although the charcoal colour of the 999's commercial cousin the Kyodo KG-107 would have better suited my car's interior.

As I said earlier, I have always thought the 999 to be too cluttered with controls to be practical for mobile use — that there were just too many tiny buttons and keys to get in the way. It does take some getting used to, and after a while you get the hang of using the 999 to do what you want it to, although the small size of some keys would make it a bother for those with massive digits. In many ways the 999 is rather more like a scanner than a conventional UHF CB radio, and in order to get the most from this rig (and thus get your money's worth) you should start at page one of the manual and work your way through, step by step.

FEATURES

Looking at the features themselves, like all other 477 MHz rigs the 999 has the full 40 channels including a choice of simplex or duplex (repeater) operation on channels 1-8. For all but the earliest 999s, there are two ways to engage the repeater mode. The original method used an arcane combination of keys in a manner which made little sense to anyone but a computer programmer. First you selected the appropriate simplex channel. Then, to toggle into duplex, you keyed in R,2,*,1 and were rewarded with a LED readout of H1. To go back to simplex you entered R,2,*,0 and up came a display of H0. The handbook called this a 'simple operation'! Imark have since altered the 999 programming to a far superior arrangement. Channels 1 to 40 remain in simplex mode, but you can now dial up channels 41-48, which are in fact duplex 1/31 to 8/38, and 51-58, which reverses the duplex channeling. You can listen on the input and transmit on the output — handy if a repeater has ceased working and everyone is still in rpt mode.

Beyond this, the 999 throws in a handful of useful functions starting with a scan of the entire band for busy signals. There is also a user-programmable 'priority' channel, which is checked for activity every two seconds, plus a display dimmer and high/low tone settings for the received audio. To this is added a memory which can store and scan up to 40 channels, with priority watch on your favourite frequency.

But, the Achilles Heel of the Sawtron 999 is the process of driving the radio. 'Programming' is the term used by the handbook, and they've hit the nail dead centre. Apart from a few basic operations — dialling up a channel, activating the priority watch or scan functions — the 999 can be excruciatingly difficult to use. There is no doubting the technical superiority of the 999 over its competition. It could even be considered to be over-engineered for a UHF CB radio, but being bred from a line of land mobile transceivers tends to do this. It is a dream to behold and to work on, and you can rest assured that the 999 is not a radio that will let you down.

OPTIONS

Official dealer options include plug-in modules for standard five-tone selective calling and the Digiscram digital scrambling unit, plus the remote-mounting kit. Unofficial options extend to re-programming the unit to receive the nearby UHF police allocation. Like the KG-107, the 999 has quite a wide bandwidth and can easily be configured to operate on UHF CBRS and appropriately licenced business frequencies, complete with CTCSS — in effect giving the operator two or three radios in one, and all with full commercial specs.

There is ample audio from the two watt speaker. The volume and squelch controls are mounted concentrically and, although operating the squelch is a tight fit, this is the one control you tend to set and forget.

Rather than leave you locked into a single selcall code, the 999 allows you to select any one of a hundred different combinations dialled up from the front panel, from '00' to '99'. With this you could have dozens of vehicles with their own codes, and your Sawtron 999 could call any of them — great for a supervisor/fleet situation where car-to-car chat is discouraged. Call and reset controls are mounted atop the 999 mike for mobile convenience.

You'll also note that the mike plug is a right-angle connector as opposed to the usual straight-in approach. If you intend to mount the 999 overhead, this is a bonus. Any other way and it is a right pain. But, overhead radio installation is preferred in the cabs of tractors, harvesters and the like, and thereby lies the reason for Sawtron's decision.

In summary, while the Sawtron 999 demands more input from the user than any other UHF CB radio, it also gives you more in return. If your heart is set on a Sawtron, then you'll find plenty of company among satisfied owners — the 999 comes second to nothing.

DX LOGBOOK

WITH ROB WILLIAMS

Welcome to DX Logbook, Rob William's informative shortwave DX column with the latest DX news and tips. If you have any ideas as to what you want to see in this column or would like to share an opinion with other DXers then this is where you can do it. Each edition Rob reports current news and events that will assist your DXing.....read on to see what is happening in the shortwave world. All times are in UTC (same as GMT) and all frequencies are in kHz.....

NEW RECEIVERS

Media Network has reported the release of a new shortwave receiver from the Japan Radio Company, bearing the model number NRD-535. Early specifications indicate it will have synchronous detection and be able to tune from 100 kHz to 30 MHz in 1 Hz steps. Continuing with current trends the receiver will have a RS-232 port to allow you to interface it with your computer. While JRC receivers have a high reputation I'm afraid to see what the price will be here in Australia when it finally hits our shelves sometime during 1991.

A report in 'DX Post', the magazine of the Southern Cross DX Club, is that the Drake company plans to release the R-8, a new communications receiver to compete against the NRD-535 and Kenwood's R-5000. The radio will have 100 memories, ECSS tuning, five bandwidth positions, variable AGC control, tuneable notch filter, passband tuning, keypad frequency selection combined with a traditional large main tuning knob, and the almost compulsory computer interface. With all these impressive features it could well provide stiff competition to the other manufacturers. Drake was well known many years ago for its SPR-4 and SSR-1 receivers. The SPR-4 was considered its best, and is still used by many old time DXers.

And while on the subject of new radios, Tandy's 1990/91 catalogue has just been released. Tandy now has two new shortwave receivers to complement the DX- 440, which is identical to the Sangean-sourced ATS-803. These portable SW sets are the DX-370 and DX-350, which are also known as the Sangean ATS-800 and the SG-700L (reviewed in this issue).

TANDY CORRECTION

In our last issue we made mention of Tandy's warranty period. Intertan Australia (Tandy) has contacted us to point out that 'it is their policy to cover all transport costs from store to head office and return'. So, if your rigs fails during the warranty period, you take it to the nearest Tandy store (any store that is, not necessarily the one from which you purchased it) and the store covers all costs. If the rig fails after the 90-day warranty period, the same applies in terms of transport costs and all you pay is the repair bill.

Either way, the customer is not faced with transport costs, despite what it says in the manuals/handbooks which, Intertan said, were maybe in need of updating to clarify the situation and any potential misunderstandings.

MAJOR CHANGES FOR DX PROGRAM

It seems that 'Sweden Calling DXers' has finally been laid to rest. Over the last few months internal changes to host broadcaster Radio Sweden has meant that, from the end of November, this popular program has ceased in at least the format we knew it. The new-style SCDX will concentrate on Nordic media developments. It now appears that DX tips will only be broadcast once or twice a month, with the printed edition of the bulletin ceasing after nearly 43 years.

RADIO AUSTRALIA UPDATE

The Darwin site of Radio Australia is to get two new 250 kW transmitters, both of which should be operational within two years. RA also reports the arrival of its new matrix switch at Shepparton, although a contact tells me the switch arrived in several hundred pieces and looked more like a Mecano kit than a matrix switch! Telecom staff has been recruited from surrounding ABC sites to assist local staff in erecting the switch. I have one of our ace reporters on site and will give more details as they come to hand. Extensive testing will be done before cutover to the new switch, however one drawback will be its limited connections to the antennas at Shepparton. The switch only has facilities to connect seven transmitters (6 x 100 and 1 x 50 kW) and 22 antennae. Shepparton has a total of 34 antennae and will need to retire some of these. Also, two of the three 50 kW transmitters will be mothballed resulting in restrictions placed on RA.

November 1990 saw the commencement of the D-90 transmission period with a few new surprises. In past years RA has provided extra broadcasts for cricket matches during our summer months, however with the 50 kW transmitters being removed from service it can no longer do this. Cricket broadcasts will now be slotted into regular RA sports programs, causing programming headaches in the sports department. Another drawback with the loss of the 50 kW transmitters is that RA will not be able to provide adequate broadcasts in the 26 MHz band, which is beyond the tuning capabilities of Darwin's present Harris transmitters. The additional Middle East broadcasts have met with a very good response, and have now been slotted into the regular broadcast schedule. RA hopes to continue the service while the crisis lasts, even though funding by the Department of Foreign Affairs could dry up.

More on the changes to RA following the government review into our international shortwave broadcaster.....the recommendation to relocate RA to the ABC's proposed 'Southbank' site in Melbourne appears to have fallen through. Construction and development company AV Jennings has pulled out of negotiations to purchase RA's Burwood site, due to failure to rezone the area to its liking. Also, as proposed in the review, RA will close its Japanese service at the end of the year and investigate other ways of broadcasting to Japanese listeners. One possibility is to arrange for local broadcasters to transmit a packaged program made by RA.

'WORLD BY 2000' PROJECT

Those who love chasing QSLs and awards now have a new contest to enter. Back in 1985, HCJB formed a partnership with several other gospel broadcasters to set a goal of broadcasting to all points of the world in all major languages by the year 2000. 'The World By 2000' project was born, and the consortium has just launched 'The World By 2000 Confirmed Station Award'. To qualify for this award all you need to do is verify at least one of the project broadcasters — HCJB, FEBC, TWR and ELWA — in each of the five geographical areas of Europe, the Americas, Africa, Asia and the Pacific. Verifications must include at least one report from FEBC, TWR and HCJB, but you can't use TWR verifications from each of the five zones. There is a special endorsement if you are good enough to log all 10 stations. The verifications can be past or current, so you can use your old QSLs from ELWA, which went off the air last July due to the civil war in Monrovia. To receive the award you need to send a list of the five or 10 stations you are counting together with a photocopy of each of the verifications, and one IRC. All this should then be sent to HCJB, BOB 691 Quito, Equador. Not a bad contest — I'm almost there, so go to it.

RELIGIOUS BROADCAST NEWS

High Adventure Ministries, owners of US station KVOH, plan to establish a new shortwave transmitter on the Pacific island of Guam. However there have been some political problems in trying to obtain a 50-year lease on crown land, so

o overcome this they are looking at private land. All the tudio equipment, antenna and transmitter have arrived and re awaiting site selection before it can all be put together. he antenna will be directed to Asia and mainland China and ill initially broadcast in Mandarin and Cantonese. Later on hey will add Japanese and Korean. Their transmitter will use 00 kW into a curtain array and in about a year they plan to ut up a second antenna and transmitter directed to South ast Asia. In common with their other transmitters they will rovide satellite link facilities in the event of a need to link all ites together.

RCI's NEW SKED FOR SUMMER

Effective until 31/3, Radio Canada International broadcasts n English on weekdays at 1900-1929 on 17820, 15260, 3670, and 1930-1959 on 17875, 15325, 11945; and veekends from 1900-1959 on 17875, 15325, 11945, and etween 2130- 2159 on 17820, 15150, 13670 and 11880 o Africa. Programs to South East Asia are on 11705 via the ransmitters of NHK at 2200-2229. The DX program can be eard at 2230 Sunday (Monday in Australia) on 11945 and 5325.

RED CROSS FREQUENCIES

If war does break out in the Middle East we could see the Red Cross playing an important role in providing medical and elief aid to refugees caught up in the crisis. Up until the end f February RCBS has the following schedule: to Australasia n English at 0740 to 0757 on 9560, 13685, 17670 and 21695; to the Far East between 1040 and 1057 on 13635, 15570, 17830, 21770 and via Beijing between 1310 and 1327 on 9620; to South and South-East Asia between 1310 nd 1327 on 13635, 15570, 17830, 21695 and via Beijing n 11695 all on the 31/12, 3/1, 28/1, 31/1, 25/2 and 28/2. Keep an ear on 7210 as this is the frequency assigned to the Red Cross back in 1948 for use in times of major crisis and war.

RPH STATIONS ON THE MOVE

As a result of the sale of FM frequencies to AM roadcasters, Brisbane's 4RPH has moved to 1296 and hanged its callsign to 4WM. Plans are also underway for PH (Radio for the Print Handicapped) stations in Perth and delaide to shift to FM sometime early in 1991. There also eems some confusion as to what is to happen with 1PPP own in Canberra, as I've heard rumors of it moving to FM, et the station official I spoke to claimed that it is staying put. t is known that it will have to move from its current frequency ssignment, but to where, and when, maybe someone one ut there could fill in the missing facts.

RFDS ERROR

Due to an editorial problem beyond my control, the popular chool Of The Air frequency of 8150 for Broken Hill was left ut of my article in the September/October edition. Thanks to Venlock Burton for pointing out the mistake.

ENGLISH 'CASTS FROM RN

Radio Norway has recently released its new schedule ffective until 30/3 with the English transmissions to this egion on Saturdays and Sundays at 1200 to South Asia and ustralia on 25730 and 21695. Another transmission to New ealand is aired at 1900 on 15220.

BELGIAN BROADCASTS TO AUSTRALIA

BRT can now be heard in Australia from 0730-0800 on 1695. A latter transmission to South East Asia is aired on undays at 1230-1300 on 21810 while there is a broadcast n the same frequency to South East Asia between 1400-430 Mondays to Saturdays.

MAILBAG

J. Elliot from Victoria (not THE J. Elliot — Ed.) asks for ome more articles with frequencies of major events, before ney occur. He also asks if there is a database file containing ll the frequencies mentioned in these pages. To answer the rst question, if I get enough advance warning on something I ndeavor to put it in the mag, either in the column or via a pecial article. However as CBA is only published every two onths we generally don't get enough of an early warning om the organisers of these events in time to put such info in ere. Writing a column on shortwave, where things are onstantly changing, is very hard. If readers out there know of nportant events that are coming up and they send in the

(Continued Page 27)

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DX LOGBOOK

WITH ROB WILLIAMS

nformation to me I'll do my best to print it for others. Sometimes editorial problems prevent material being printed n time, too. On the other question of a database, this is lready in hand. Readers of my column will know about the Omega project, which will be available on computer bulletin oards around the world. DXers will be able to run Omega and ut in all the frequencies they find through monitoring and vhich appear in CBA. Remember that Bob Bell is now andling utes in his HF UTILITIES column, while I look after hortwave, so between the two of us there are ample requencies to monitor.

VOA's SUMMER SKED

Powerhouse broadcaster VOA has published the following sked effective until 30/3 for English language programs to Oceania and South East Asia. To East Asia/South East Asia nd the Pacific at 1000-1100 on 5985, 11720 and 15425; 1100-1200 on 5985, 6110, 9760, 11720, 15155 and 5425; 1200-1230 on 6110, 9760, 11715, 15155 and 5425; 1230-1330 on 6110, 9760, 11715, 15155 and 5425; 1330-1400 on 6110, 9760, 15155 and 15425; 1400-1500 on 6110, 7125, 9760, 15160 and 15425; 1900-2000 on 9525, 11870 and 15180; 2100-2200 on 11870, 5185 and 17735; 2200-2230 on 7120, 9770, 11760, 1870, 15185, 15290, 15305, 17735 and 17820; 2230-000 on 7120, 9770, 11760, 11870, 15185, 15290, 15305, 7735 and 17820; 0000-0030 on 7120, 9770, 11760, 5185, 15290, 17735 and 17820; 0030-0100 on 7120, 770, 11760, 15185, 15290, 17735 and 17820. Broadcasts o South Asia are at 0100-0300 on 7115, 7205, 11705, 5160, 15250, 17740 and 21550; 1400-1500 on 7125, 645, 15205 and 15395; 1500-1530 on 7125, 9645, 9700 nd 15395; 1530-1600 on 7125, 9645, 9700 and 15395; nd from 1600- 1800 on 7125, 9645, 9700 and 15395.

DoTaC PLANS FOR WARC '92

As previously mentioned, DoTaC has begun planning for his most important conference to be held in Spain in 1992. The department has convened an Australian Preparatory Group (APG) from government agencies, industry and nterested groups to work towards preparing a policy to go to he government on Australia's position at the conference. WARC '92 will consider reallocating much needed frequency space for certain bands including shortwave broadcasting. Similar groups around the world are also considering their positions and the APG is communicating with these groups in New Zealand and the Asia-Pacific area, Canada, USA and Europe. I'll have more on this as the deadline draws closer.

RADIO FREQUENCIES FOR SALE

A report titled 'Management Of The Radio Frequency Spectrum: An Economic Analysis', published by the Bureau of Transport and Communications Economics, advocates the ight to have frequencies traded through auctions and over-he- counter sales. It is claimed that existing practices are utdated and are not flexible enough for today's business sers. New Zealand has already moved to this method and m sure Australian users will keep a keen eye on what appens over there. Copies of the report are available from AGPS offices.

BUY YOUR VERY OWN SHORTWAVE STATION

According to a report over Media Network, two ommercial shortwave stations in the US are up for sale. They re WRNO and KUSW, and both can be yours if the price is ight. Why not buy them for yourself as a Christmas present?

And with that last item another edition is put to rest. If you vould like to share your thoughts and tips then drop me a etter to PO Box 108, Minto, NSW 2566. If you have a roblem and would like an answer, then a SASE is required otherwise it will be answered through this column. I also ccept electronic mail through the computer BBS network to Fidonet 3:713/605. Until next time, good DXing.

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Recommendations from satisfied customers sell more antennas than all our advertising and we want to get the SNIPER on the air all over Australia so people will start spreading the word.

We want you to buy one so YOU'LL start spreading the word, so for a limited time we'll send you a SNIPER right to your door by Express Courier for only $75.

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ANTENNA FEEDLINES & TUNING UNITS

A great number of CBers and novice amateurs who have come up through CB ranks, believe that antennas must be vertical and that the only way an antenna can be fed is with coaxial cable. True, vertical antennas have their advantages (and their disadvantages) and so does coaxial cable, but there are other types of feedlines and antennas which can be made very cheaply and will work just as well as the commercially built products.

Before discussing these subjects in detail, let's look more closely at a simple antenna and some of its characteristics.

One of the simplest antennas to start with is the familiar half wave dipole. This can be made from wire or aluminium tubing. As its name suggests, the half wave dipole is half a wavelength long at the frequency (or wavelength) being used. Thus for 27MHz, the length will be half of 11 metres or approximately five and a half metres long. For the 15-metre band it will be seven and a half metres long and for 80 metres, approximately 40 metres long.

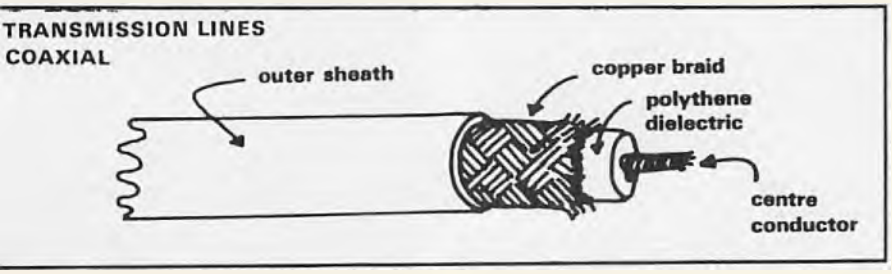
Assuming that the antenna is fed with a signal from a transmitter, the dipole resonates (having been cut to the proper length previously). In this condition, standing waves are set up along the length of the antenna as the current alternates at the particular radio frequency being used.

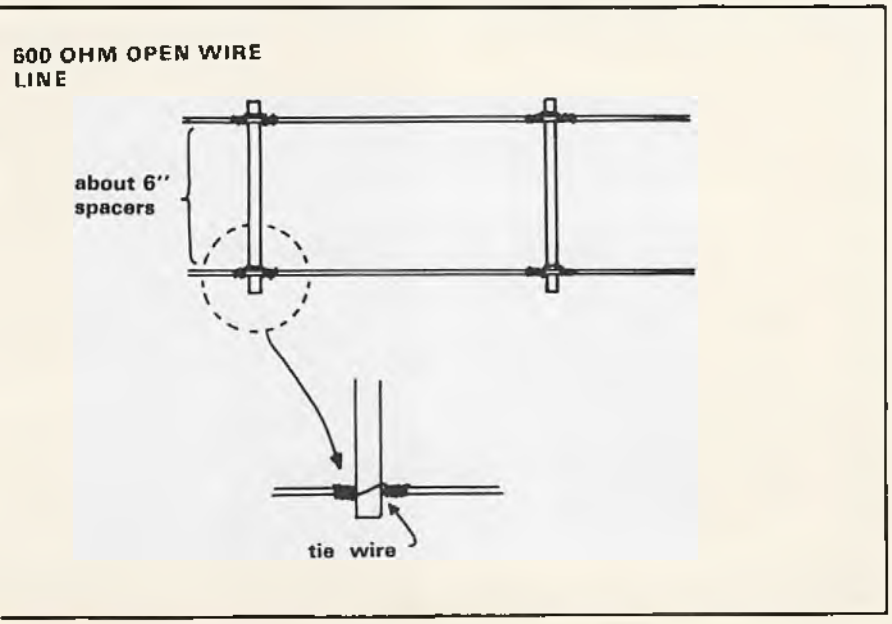
It might seem surprising to many readers that, if the voltage along the dipole were measured while power is being radiated, it would be found that it is not uniform. At the centre of the dipole the RF voltage is low, typically only a few volts, but moving toward the ends the voltage rises and can reach thousands of volts right at the tips of the dipole.

Measuring the current flowing in the dipole is a little more difficult, but if it is done a similar thing would be noticed. The difference is that where the voltage was the highest in the dipole, the current is the lowest and in towards the centre of the radiator, (a low voltage point) the Rf current is maximum.

The question that is bound to be asked by someone is, "If the current and voltage is not uniform along the dipole, then why does it not flow along the radiator until everything is equal?"

If we were dealing with simple DC (direct current), this would happen but it must be remembered that the power coming from a transmitter is not DC but is alternating at a frequency equal to that of the transmitter (such AC power is termed "RF" or Radio Frequency power). Consequently, the simple laws which govern DC circuits do not apply at these frequencies.





IMPEDANCE — WHAT IS IT?

At this point it might be as well to go over some basic knowledge regarding impedance. Impedance is a term that all CBers and novices will have encountered when antennas and feedlines are discussed, but it is a concept which is often difficult to grasp fully.

Without confusing the issue with "inductive reactance" and "capacitive reactance" you should all be aware that impedance is measured in ohms. That is, like resistance to a DC current, impedance is an "opposition" to an AC or RF current. Being measured in ohms, any particular value of impedance can be regarded as a certain ratio of voltage to current (remember R-E?).

(Continued Page 30)

ANTENNA FEEDLINES & TUNING UNITS

When the RF voltage is high and the RF current is low, the impedance of that particular point in the circuit is also high. Similarly, when the RF voltage is low and the RF current is high, the impedance can be regarded as low.

Getting back to our antenna, the centre of the dipole has low voltage and high current and therefore is a point of low impedance. The ends of the dipole have high voltage and low current and therefore are points of high impedance.

Between the centre and the ends there will be different ratios of voltage and current and as you move it from the centre towards the ends, the impedance of the radiator will increase from a few tens of ohms to some thousands of ohms.

In designing and constructing antennas, the different distributions of voltage and current should always be taken into account. For example, the ends of a dipole must be well insulated if it is to be suspended from a mast or tree. Using high power (particularly on 80 metres) the voltage developed can be sufficient to track across low quality insulators causing the antenna to go off resonance and a loss of power.

Also, it is important not to leave any sharp strands of wire sticking off the ends of a dipole. If the voltage developed is sufficient, an electrical discharge can form on the sharp ends of the wire as the RF streams off into the atmosphere.

The centre part of the dipole carries considerable current and, to prevent losses due to the ohmic resistance of the conductor, the material used for the antenna should be capable of handling these currents. Fortunately, the power levels authorised for CB and novice work should pose no problem, but even so, don't try to make do with an antenna made from steel fencing wire if copper wire is available.

LOW SWR IS ESSENTIAL

To get the best results, an antenna should be fed with a feedline where the impedance of the feedline matches that of the antenna. Where this does not happen, a mis-match occurs and some of the RF energy is reflected back along the feedline to the transmitter.

Such a condition increases the Standing Wave Ratio (SWR) on the feedline and contributes to losses in the antenna system. If the impedance of the feedline were say 50 ohms and the impedance of the feed point of the antenna is 100 ohms, the SWR is 100:50 or 2:1. If the feedpoint impedance is reduced to 75 ohms, the SWR would drop to 75:50, or 1.5:1.

In the case of a yagi, where the feedpoint impedance of the driven element is reduced due to the presence of a director and a reflector, the centre impedance can be as low as 20 ohms. If direct feed were attempted with 50 ohm feeder, the SWR would be 50:20, or 2.5:1.

Feedlines can usually be classified into two main groupings, coaxial and open wire types. The coaxial type is familiar to everyone, with the two conductors, one a stranded inner wire, and the other, usually a woven braid which surrounds the inner conductor. Between the two conductors is an insulating material or dielectric, which is often polyethylene.

The characteristic impedance of the cable is determined by the thickness of the inner conductor, the thickness of the dielectric and the composition of the dielectric. Typical impedances for coaxial cable are 52 and 75 ohm although these are by no means the only values that can be obtained.

The open wire type of feedline is not often used in CB applications, but has found favour with amateurs and commercial broadcasters where long runs of feedlines are involved.

This type of feedline consists of two parallel conductors separated by a uniform distance (usually half an inch up to around six inches). Again the impedance varies depending on the diameter of the two conductors and the distance between them. In normal cases the impedance is around 300 ohms to 600 ohms.

An example of this type of feeder is the familiar 300 ohm TV ribbon. The two wires are kept a uniform distance apart by a flat strip of polyethylene. An improvement, which lowers the attenuation or feedline losses, is to modify the dielectric from a solid strip of polyethylene to one consisting of a number of small spacers.

This has the effect of increasing the amount of air between the wires (air having less dielectric loss than polyethylene) and reducing losses caused by the feedline.

The differences in losses between coaxial cable and open wire line are quite appreciable, and anyone whose antenna is located a long distance away from his transmitter would be well advised to examine the problem before investing in a long run of cable. Whereas good quality RG-58U has a loss of something like 3 dB per 30 metres and RG-213 (the thicker coax about 10mm in diameter), a loss of about 1 dB per 30 metres, the loss for a length of 600 ohm open wire line is only a few dB per kilometre at HF frequencies.

This is why large commercial radio stations, such as those run by the Overseas Telecommunication Commission, rely on open wire line very extensively. Having to feed perhaps 15 or 20 large rhombics, some up to a kilometre from the transmitter, transmission line losses, if coax were used, would be prohibitive not to mention the cost of the lines themselves.

THINGS TO KNOW ABOUT OPEN WIRE FEEDLINES

Of course there is a catch to this, or rather a whole series of catches. For one thing, open wire lines cannot be run next to antenna masts or down brick chimneys or buried underground like coax can. Whereas the field in a coax line is completely confined to the region between the outer surface of the inner conductor and the inner surface of the outer braid, the field in an open wire transmission line lies between the two wires. Run it too close to an earthed object and the RF signal will simply leak away.

Another disadvantage is that most transmitters and receivers are designed to work into an unbalanced 50 to 70 ohm feedline.

Simply coupling your open wire line to the transmitter will produce a mismatch which will result in a poor transfer of the signal.

This second problem can be overcome by using what is known as antenna tuning unit or A.T.U. (sometimes called an antenna coupler). The purpose of this device is to match the 50 ohm unbalanced output of the transmitter (or receiver) into the balanced open wire transmission line which might have an impedance of 300 to 600 ohms.

These antenna couplers are really very simple and the sort of project which is well within the capability of the advanced CBer or new novice. Basically they consist of a tuned circuit into which the power is fed from the transmitter. From another point, the RF power is tapped off and fed into the transmission line.

Figure one shows an elementary tuned circuit consisting of a coil and a variable capacitor. RF energy from the transmitter can be fed into the tuned circuit by using a loop of wire attached to the end of a short length of coax which plugs into the back of the rig.

This loop of wire, sometimes consisting of two or three turns of wire acts like the primary winding of a transformer and produces a field which is picked up by the larger coil in the tuned circuit. Thus, even though there is no direct connection between the tuned circuit and the transmitter, the energy is transferred quite efficiently.

If one side of the tuning capacitor is earthed, then one end of the coil will be earthed also and the RF voltage at this point will be very low. Moving up the coil, the RF voltage will build up (just like our simple dipole antenna). At the same time the current flowing in the coil will decrease as we move up from the earthy or "cold" end of the coil.

By now you can probably see how he tuned circuit can be used to achieve match between two different impedances. If we go up the coil, we will find point somewhere, where the impedance — right ratio of voltage and current — of the coil matches that of our eedline. Once you know where it is, it s a simple matter to clip on your feeder nd you are in business.

Again there is a drawback (isn't here always?) We have a feeder with WO wires but there is only one point n the coil which has the right impedance. Where do we connect the other ire?

This problem is overcome by building up a more elaborate tuning unit, one hich really consists of two tuned circuits arranged "back to back".

This time we use a larger coil with a umber of tappings along it every few urns and what is known as a split stator capacitor. This split stator capacitor s really two variable capacitors in one, ith two sets of fixed plates and two ets of moving plates. As the rotor shaft) is turned, one set of moving lates goes into mesh while the other et of moving plates comes out of esh.

The rotor and moving plates are arthed and the ends of the coil are ttached to one set of fixed plates ach. If the centre of the coil is now arthed, you can see that we have the quivalent of two tuned circuits. Instead of one end of the coil being high npedance and having a high RF voltge, both ends of the coil now are high npedance. The low impedance point ow has shifted from being at one end f the coil to being in the centre.

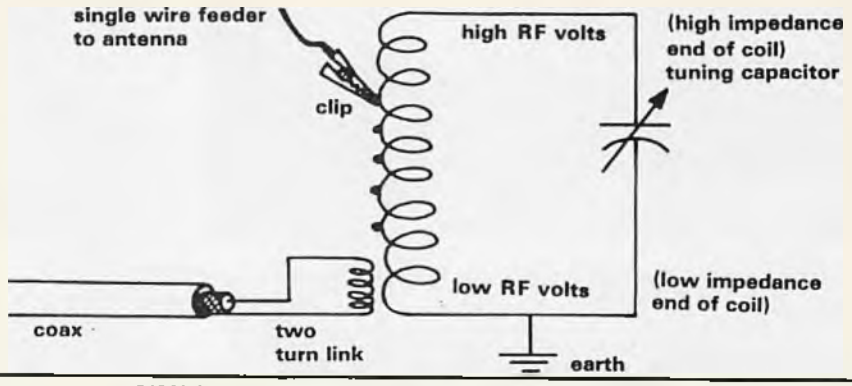
Our tuning unit will now have two oints on the coil where the impedance f the circuit is equal to the impedance f the transmission line. To get the est match, the feeders only have to be ttached to these points.

That looks after the matching of the ning unit to the transmission line, but on't overlook the fact that the short ngth of coax from the transmitter to ie tuning unit must also be properly atched. Compared with open wire eders, coax is low impedance, and ie two or three turn link transferring ie power from the transmitter must be oupled to the low impedance part of ie coil.

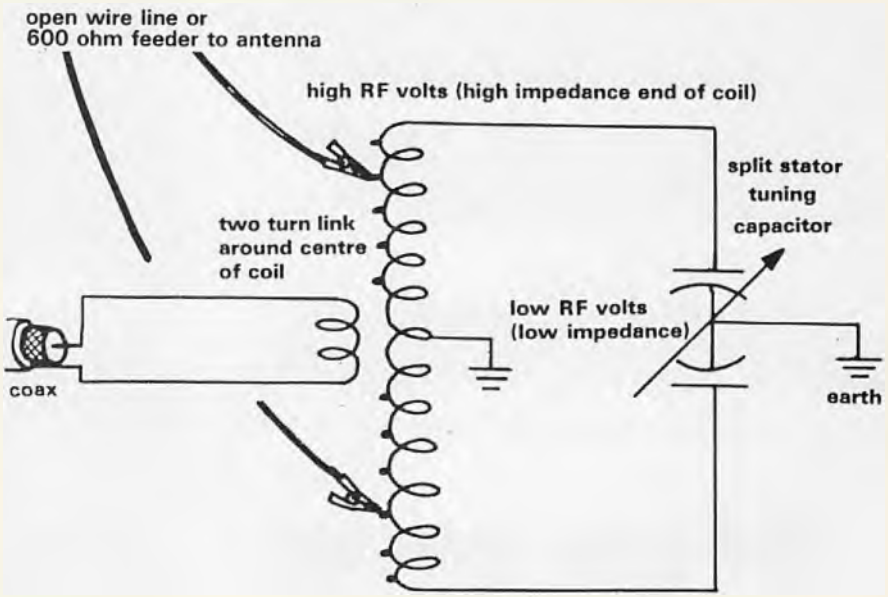
This is the reason why the link is ound round the centre of the coil hen a split stator tuning condenser is sed, or wound round the earthed end f the coil if a simple one feeder system being used.

Some CBers use antenna tuning nits which have a coaxial input socket nd a similar coaxial output socket instead of a single wire or twin wire output suitable for feeding open wire line. hese units I regard with some suspion since it is only possible to reduce ie SWR on the short length of coax etween the transceiver and the tuning nit with these devices.

FIGURE ONE **SIMPLE ANTENNA TUNING UNITS**



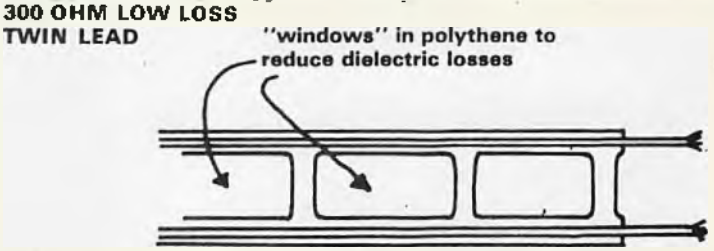
SIMPLE COUPLER FOR A SINGLE WIRE FED ANTENNA OR RANDOM LENGTH OF WIRE



ANTENNA TUNING UNIT SUITABLE FOR TWIN FEEDERS OR OPEN WIRE LINE

Note: Because this circuit is essentially two tuned circuits arranged "back to back", both ends of the coil are high impedance points and have a high RF voltage. The low impedance link from the coaxial feeder must be moved to the low impedance portion of the main coil, that is, the centre.

300 OHM LOW LOSS TWIN LEAD



Admittedly, lowering the SWR on this section of the transmission line makes the rig much happier as it can be made to "see" a proper 50 ohm load but all the adjusting in the world of the tuning unit will not improve matters if the antenna is not properly matched to the transmission line at the antenna feed point.

Under these circumstances, particularly if you are using one of these coaxial line antenna tuning units and are not having much success, it is better to take the ATU out of the line and to adjust the matching at the antenna feed point until a 1:1 SWR is obtained.

Remember coax is coax and balanced open wire line is something quite different. What you can do with one type of feedline, you cannot necessarily do with the other.

BAND SPREAD

FROM DC TO DAYLIGHT

WITH GREG TOWELLS

I'll get in early and wish all Bandspread readers a great 1991. I hope your silly season proves to be happy and productive, hopefully much DX will be worked and your scanner happens across some new, previously unknown frequency. Also that ALL of your antennas stay put during the summer round of storms leaving you ready to face a new year of brand new radios, new frequencies and happenings.

Don't forget, if something is happening in your area, or if you want to read about something, please drop me a line to the address at the end of this column.

RADIO INSPECTORS OR REVENUE COLLECTORS ?

Have heard around the traps that the Sydney radio inspectors have and are continuing somewhat of a blitz on unlicensed operators in the western suburbs. Quite a few operators have been caught up in the roundup from all reports so one would hope that this might be a forerunner to a clean up on the offensive rabble that populate everything from call and emergency channels on 27 MHz to repeaters on UHF CB.

But no, hopes are dashed, as this exercise appears to be simply a revenue raiser. Why..?? It seems that the inspectors (or maybe collectors ?) are merely roaming around and checking out cars and homes equipped with antenna systems and demanding of owners of the radios their licenses...if none forthcoming, then taking the necessary revenue raising action. Maybe it is too much to expect for them to do anything much more difficult than to look for antennas. Granted, all operators of all transmitters must be licensed and possibly blind luck might enable them to wipe off the odd cretin from the bands, but why not tackle the real problems of the spectrum ?

BRAIN DEAD OR JUST DOPEY ?

While we are onto problems of the spectrum, who are the cluster of unfortunates operating out of the west of Sydney that seem to be carrying out 'Operation Ratbag' on various channels on 27MHz. This pathetic group of brain- dead noddies delight in flying raids in force on a pre-selected channel on which a reasonable conversation has been in progress for sometime and totally destroying it with foul language, sound effects and sundry other crap.

This goes on until the group previously on channel gives up for the night. Their mission accomplished, the kindergarten dropouts assemble back on their usual channel to laugh about their pitiful actions and plot the next attack...and their usual channel...almost always channel 44 — 27.445MHz or sometimes channel 42. Now that's somewhat illegal so, while the RIs appear slow to move against foulmouths in general, I wonder if they can come up with a good reason for not policing 'out of band foulmouths' along with 'out of band DXers'.

OVER TO THE RIs FOR ACTION

This is a BIG hint to the above mentioned RI's. I'm certain that THESE operators are unlicensed, operating illegally, probably using amateur rigs and using foul language...now surely THAT is enough for a major series of busts...! I await the result, if any, with interest.

ANTENNA GIVES EXCELLENT SCANNER PERFORMANCE

I picked up a new antenna for handheld scanner use recently. Called the Diamond RH-77, it is a high quality unit, originally designed for the amateur dual band VHF/UHF handheld transceivers used on 2 metres and 70 cm.

The RH-77 offers higher gain than the standard quarter wave antenna normally supplied with these dual banders and performs like a rocket...in short, it's an outstanding antenna. OK then, if it's so good on 2 metres and 70 cm, then what about on a handheld scanner ?

Right then, onto the scanner with the RH-77, and how does it go ?

In a word, fantastic ! The lower VHF band is improved marginally, but on VHF high and UHF, the improvement in reception is nothing short of marvellous. Previously unheard stations are increased to full quieting while noisy stations become totally noise free.

The main drawback that I see to the Diamond antenna is only the length of the unit, being double the length of the standard scanner antenna. However, the RH-77 is slimline and nicely flexible and should not present any problems in regular use, especially considering the resultant vast improvement in scanner performance.

If you doubt my experience, try dropping in to any of the Andrews Communications stores in Sydney or Melbourne with your scanner and test out the improvement for yourself. The VK2 division of the WIA has a recorded message service with a mailbox facility, which can be reached on (02) 552-5188. The service includes WIA broadcast news highlights of the previous broadcast and comments can be left on the system at the end of the session (mind you, if you read Amateur Radio Action magazine...on sale at all newsagents...you probably won't need to listen to the broadcast). Thanks to Marc of Ashfield for pointing that out, and one of his other choices of recorded information is (02) 683-5673, the NBL Gridiron Hotline. There you go, Marc, thanks for your letter.

NEWCOMERS AND SHORTWAVE LISTENING

How many readers are newcomers to CB radio and to radio in general ? Since becoming involved in CB radio, have you taken an interest in other radios lying around the house, particularly radio/cassette types with the 'SW' band on them. That's right, SW stands for Short Wave and right at the top end of the Short Wave band is where our own 27MHz CB band is located. So how about having a play with the shortwave segments of that radio when the CB gets a little boring. There is a whole new world of radio broadcasting for your listening pleasure, it just needs you to switch over and have a listen.

Here are a couple of little hints which might get you going into the shortwave listening hobby (and turn you into contributors of HF Link and Utility DX columns in this mag). First, see if your radio with the shortwave band has any connectors on the back of it for an external antenna, maybe a labelled screw, socket or something.If there is, connect a length of wire (as long as possible)to it. If you can't find any connectors on the back of the radio, just connect the wire to the extendable antenna on the top of the radio. Take that wire and string it up as high as you can, preferably outside the house. Try to ensure that the wire is insulated from whatever you string it up to, whether it be a tree, pole or whatever.

Now turn on your radio and marvel at the difference an external antenna (especially when it is setup outside the house) can make to your little radio. The world of broadcasting is literally at your fingertips and you will be able to hear stations from all around the world, especially during hours of darkness.

LISTEN TO SIDEBAND WITHOUT A SIDEBAND RADIO

Another tip. From time to time you may hear sideband signals around 3.5MHz and 7.0MHz...these are the signals of radio amateurs and without a sideband switch, a BFO (Beat Frequency Oscillator) or whatever, you will not be able to understand what is being said. A way around this (if you happen to possess a second SW radio) is to hold the radio close to the first SW radio. By tuning the second SW radio around 0.5MHz lower than the frequency you are listening to the sideband transmissions on, you will hear what sounds like a carrier sweeping across and, with careful tuning of the second radio, you will be able to tune in the sideband signals...there you have it, you are listening to amateur radio without a sideband switch.

Another hint, this time for UHF operators who are just setting up a base station for the first time. Keep in mind that the longer the run of cable on UHF, the greater the signal loss, both on receive and transmit. Try and get most of the run of cable to be in the vertical. It is a waste of time running cable horizontally to a mast because the advantage of any height you may have is being lost in the horizontal distance. If it is at all possible, get your mast and antenna system as close as possible to your radio room and, while you are at it, make sure that you invest in good quality coaxial cable and UHF connectors, also that you waterproof them very well to keep out the elements.

Water in coax makes a very good RF sponge, especially at UHF levels.

I have heard that the new Icom IC-R1 handheld super scanners are proving extremely popular with supply being outstripped by demand in most places. The main problem with these radios, as I see it, is the owner putting down the radio, then LOSING IT. These radios are SO small, it is almost unbelievable what can be fitted into such a tiny package. Maybe the problem could be solved by the fitment of a radio-location type device so that when you put the radio down somewhere in the house, you can locate it again in under a week. No, seriously, it is a delightful radio and, being so small, is very easy to pocket and take anywhere with you.

That's it for this time. Again, if you have anything that everyone should know or you have suggestions for what could be in this column, just drop me a note at P.O. Box 514, Toukley, NSW, 2263. Happy New Year.

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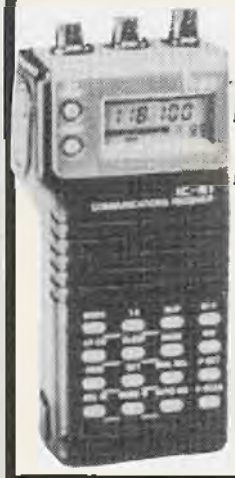

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South Pacific Radio scores a direct hit with the . . .

27MHz SNIPER ANTENNA

A few weeks ago SPR sent me one of its new SNIPER antennas to test...a half-wave vertical with no radials, no tuning coil, not even a set of assembly instructions. All I received was a collection of aluminium tubing of various sizes, a packet of screws, and a note saying: "Try this out and see what you think of it."

The vertical section appeared at first glance to be insulated from the support tube, but it wasn't...a quick lab with a multi-meter showed continuity, so I figured the base section had some kind of tuning network inside it.

There didn't appear to be any way to tune the antenna apart from maybe adjusting the length, but as all the sections were pre-drilled that idea went out the window.

I've since found out that every antenna is pre-tuned at the factory for minimum VSWR and never needs further adjustment. The tuning bizzo is weatherproofed to such a degree that if you stick your finger over the drain-hole you can't even blow air through the tube!

Cable connection is by the usual PL-259/SO-239 plug-and-socket, and the socket is recessed into the support tube to keep rainwater out of the coax.

End result...I didn't need an instruction sheet.

Assembly was a breeze, even for someone like me who has ten thumbs on each hand. All I had to do was align the pre-drilled holes, screw the sections together, shove the antenna in the air, and start talking.

Naturally before taking the ultimate step I did check the VSWR.

The needle barely flickered on both Channel 1 and Channel 40.

I didn't expect any startling performance reports from on-air checks which was just as well because I didn't get any (no-one told me to turn my linear off), but reports from DX contacts indicated that the SNIPER was getting out quite a bit better than my old SPR-27 and there was a definite increase in received signal strength.

When talking to very close stations I could switch between the two antennas without the operators knowing which one I was using, but local stations further away all reported a noticeable increase in signal strength.

I didn't find any difference on close-up receive (there probably was but you'd need instruments better than my ears to detect it), but there was a marked improvement in signal strength from the distant local stations.

I've been using two of South Pacific Radio's SPR-27 base station antennas (one as a permanent home base stick and the other when I went camping) since I did a test report in 1983, although they've been around since about 1977. They have never let me down and none of the other antennas I've tried prompted me to replace them. Until now!

It was a different story when I tested the SNIPER on the first rainy day to come along. The SPR-27 has always done a better job for me than any other antenna on dry days but like all other 'three-quarter-wave' verticals and the obsolete half-wave and five-eighth-wave groundplanes it suffers badly from 'wet-weatheritis'.

Because I'm surrounded by tall trees, the VSWR on my SPR-27 used to climb to over 2:1 every time it rained and stay there until the weather cleared up, and that's high enough to make a lot of modern CB rigs start to back off the output power.

In pouring rain the VSWR on the SNIPER barely changed.

Reports from regular contacts indicated that my transmitted signal was stronger on the SNIPER than on the SPR-27. In every instance, even nearby stations could easily pick which antenna I was using and received signals were also noticeably stronger on the SNIPER than the SPR-27.

One thing which mildly irritated me about my 'mobile' SPR-27 whenever I went bush for a weekend was that I had to tune it practically every time I set up camp. I set the SNIPER up in three different campsites on weekend trips and the VSWR stayed exactly the same from place to place regardless of the surrounding terrain.

Looks like I'll have to get myself another SNIPER and retire both the SPR- 27s.

I've seen ads from various antenna manufacturers claiming 'gain' of up to 3dB for their half-wave verticals, but rather than jump right in and make a fool of myself by saying in print that the SNIPER has more gain than the SPR- 27 I rang South Pacific Radio to find out if this was the case. They told me that the SNIPER out-performs the SPR-27 because it is a more efficient design, not because it has more gain.

They said they'd rather rely on word-of-mouth from satisfied users to sell their antennas than try to make them look good by shonky advertising, and asked me to specifically mention in this test report that they do NOT claim that the SNIPER has gain.

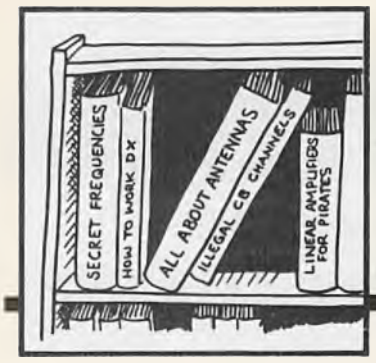
I'd like to point out here that there is nothing to stop South Pacific Radio from advertising the SNIPER as having gain and they don't legally have to tell you that this gain is over a theoretical isotropic source or over a quarter-wave groundplaneor even over the proverbial piece of wet string. However, SPR's owner reckons that such advertising is misleading and makes an antenna look better on paper than it really is. I'm inclined to agree with him.

I'd far rather buy something and find it works better than I thought it would than buy something and find it doesn't work as well as the sneaky (but legal) advertising blurb led me to believe.

The SNIPER sells for $85 including express courier delivery and insurance anywhere in Australia, and that's probably the best 85 bucks you'll ever spend on your station.

In my 1983 test report I gave the SPR-27 10 out of 10 because it was the best all-round CB antenna I'd ever used.

The SNIPER is even better!



BOOK REVIEW

Frequency Spectrum Reference (author: Rodney Letts)

This two volume set covers 0.0001 Hz to 29999.9 kHz and it is probably Australia's most comprehensive HF utility listening guide. The first volume lists users in order of frequency and the second in alphabetical order. Although you can buy and use each book on its own, author Rodney Letts says that most people come back for the companion book to complete the set.

Letts has compiled the Frequency Spectrum Reference as a complete frequency guide for HF 'utility' monitors. It is written for the Australian listener, but also includes overseas services which can be heard here. This takes it one step beyond other frequency registers which list only Australian stations.

Each volume is well bound, with a soft cover and around 350 pages of double- sided listings which total over 15000 entries. Letts has made it easier to work through his guides by including a cross-referenced index at the rear of each volume. A typical 'frequency' listing includes the type of station, its callsign and location. One drawback is that for many services the listing is a general one, such as 'Police NSW' and it does not detail in which part of NSW the frequency is used. On the other hand, duplex maritime channels have both frequencies listed on the one line, compared to other guides which list ship and shore frequencies on their own and pages apart.

Letts' guides cover almost everything you would be likely to hear, apart from shortwave broadcast stations: VLF/LF radio navigation services (Omega, Decca, Loran and aircraft beacons), aircraft, maritime, land mobile, transport, emergency services and more Government and Defence users than I ever imagined. The books are also handy for tracking down interference from computer monitors, metal detectors, TV sets and hundreds of other devices, the spurious signals of which are listed with great accuracy. It seems that if you can hear it on HF, it is in the Frequency Spectrum Reference.

At $64 per volume (plus $4 p&p), it may at first glance seem too expensive. But if you have just spent nearly a thousand dollars on a HF receiver, the books will really help you get the most from your new radio. The Frequency Spectrum Reference is available from Rodney Letts, 446 Boronia Rd, Wantirna South, Vic 3152. Please specify Volume One (frequency order) or Volume Two (alphabetical order).

Australian Airband Guide (author: Bob Bell)

You do not have to be a pilot or even a dedicated airband monitor to appreciate the excellent 'Australian Airband Guide'. This is not just a frequency list, but a complete guide to monitoring and understanding airband traffic on HF, VHF and even UHF military aeradio channels. And there is probably nobody in Australia who knows more about airband monitoring than Bob Bell. Bell is a contributor to 'Australian Aviation' magazine and also now writes CBA's utility column.

The Australian Airband Guide starts with a complete glossary of terminology for aeradio and also aviation terms you are likely to hear on the band. Detailed sections cover the very different roles and practicalities of HF, VHF and UHF airband radio, explanations of air traffic control, flight service, distress procedures and notes on selcall and 'company frequencies', those private channels used by airlines and associated companies.

But the frequencies are what dominates the Guide. They are divided into two chief groups, the main airports and the smaller regional and airstrips. For each of these there are frequency listings for: flight service, surface movement, tower, approach/departure, ATIS (Automatic Terminal Information Service) and any other frequency used. There is also information on the airfield itself, including elevation, runway numbers and notes that may indicate it is used for gliding practice, special hazards or conditions for poor weather and so forth.

In addition to all this there are also RAAF frequencies with squadron numbers and codes, worldwide HF frequencies, selcall codes and a very good explanation of the popular Skycom airband telephone service. To top this off there are even listings for the US Space Shuttle, Soviet Cosmonaut missions and the American Fleetsatcom satellites.

Whether you are a complete novice to scanning and monitoring, a student pilot or an accomplished flyer, you will still get a lot out of the Australian Airband Guide. I have logged almost every channel used at Tullamarine and other local airports, but my very dog-eared copy is still proving to be a mine of information. I recommend the Guide to anyone who wants to get the most from their scanner or HF communications receiver. It costs $24.95 (+ $3 p&h) and is available from Airband Communications, PO Box 301 Chester Hill, NSW 2162.

Guide To Utility Stations (author: Joerg Klingenfuss)

One of the most useful books available to utility DXers has arrived Down Under for CBA to review. This publication stands alongside equivalent SW bibles such as the WRTH as the utility DXers Bible. Serious monitors will have this fine publication in their collection of research books and notes.

The book I'm referring to is Joerg Klingenfuss's **Guide To Utility Stations.** A publication of this magnitude contains more than just frequencies and callsigns. Inside you'll find a wealth of background information has been presented for all levels of DXers to experience. I liken the book to an almanac as it gives you up-to-date knowledge enabling you to get more enjoyment from the hobby.

Fold-out maps depicting MWARAs, RDARAs and Volmet regions are included to assist in understanding how these services operate and where frequencies start and finish.

Joerg has explained the complex rocess he used in compiling the book. his allows the reader to judge the uality of material in it. Modulation ypes (together with details of where ervices can be found) are also xplained in detail. Information on seful international publications which ay be of interest are examined, ointing out their good and bad points. xotic character generation techniques re listed alongside SSB, CW and TTY frequencies giving you instant ccess to the means of identifying nknown stations.

Also included are addresses to ssist you in gaining further ackground publications from such rganisations as the ITU and WMO vho have available many interesting adio-related publications, all of which ake life easier for the DXer.

Intensive monitoring of the bands rom various locations worldwide and he use of computer technology means hat this book is useful for DXers round the globe. Joerg hasn't just topped there, he claims that with this vealth of information available he has ndeavored to transfer the millions of ytes in his computer to printed form a period of 10 days. The 'guts' of he book are laid out in frequency rder followed by callsign, the station ocation and the relevant information bout the station such as schedules nd mode of operation.

A good explanation of ITU egulations on the use of frequency ands is included after the frequency st. This becomes relevant as some requencies have different uses roughout ITU regions. To upplement the frequency listing, a allsign database is included which is ross-referenced to frequencies on vhich the user operates.

dded to all this are schedules of ress agencies on RTTY and weather ix users for those DXers capable of ecoding these signals. Plenty of pace has been spent on explaining vhat is meant by Q (both military and ivil) codes, also Z codes plus elegraph and Telex codes.

This type of material is ideal for ewcomers to the hobby. Having such large amount of useful and current nformation close at hand assists in the uick identification of transmissions.

With any publication of this agnitude the use of abbreviations is andatory to keep it within a easonable size and an acceptable rice. Internationally accepted bbreviations have been included ogether with a list of their meanings.

You may ask how accurate the ook is.....well, in some areas I found oles. It seems that many of Australia's utility stations are inaudible overseas meaning little is known about us. Sadly, some common Australian frequencies are also missing. If you are just chasing Australian utility stations then this book is not for you, but, for international DXers there is a large source of relevant information to make DXing very enjoyable.

As PCs are now playing an important role with DXers, it is about time that editors of books such as this made the material also available on floppy disks. This can result in big savings when compared with the cost of buying a bulky book and sending it by airmail halfway around the world. Maybe Joerg will consider this for a future edition.

In summary, I found the book far more than just a frequency guide, it is a very good reference book which makes it possible for DXers to have information immediately available.

Guide To Facsimile Stations (author: Joerg Klingenfuss)

This publication is designed for those who are already into, or are planning to get involved, with DXing Fax stations. It is a serious attempt by the author to explain how, when, where and why there are Fax transmissions. It is sort of a 'Everything you need to know but where afraid to ask' type of book.

A detailed summary of Fax equipment found on the commercial market is discussed at the start of the book while pictures along with the pro and cons of the demodulators make it much easier for DXers to understand and buy equipment, some of which can be expensive.

With all the options available on Fax receivers it is important that you choose the right equipment if you are to get the maximum return not only on your money but also on your enjoyment. Photopgraphs of equipment also help in giving you a 'feel' for the receiver before you buy. Various techniques and processes involved in Fax transmissions are explained together with a description of 'fax terminology' which makes the hobby easily understood.

Expanding on this is a full technical explanation of satellite transmissions and this enables DXers to move outside HF and into the realm of SHF (Super High Frequency), VHF and UHF DXing.

A comprehensive listing of known Fax frequencies is of course included.

A large portion of the publication is devoted to pictures from various Fax services which enables you to get some idea of what you're likely to see from any given service and also assists in identifying a particular transmission. This is another plus for the book as it helps in overcoming those initial setting- up problems which are usually encountered.

Even though Fax users are moving away from HF to satellite transmissions there is still a high demand for HF equipment, including air, sea and news agency services such as AAP, Reuters, etc. Klingenfuss also lists other publications which may be of help in understanding meteorological charts and maps.

In all, the 10th edition of 'Guide To Fax Stations', with its 398 informative pages, is a must if you are into Fax reception. The 9th Guide to Utility Stations (which also includes the Guide to Radioteletype Stations) is available for DEM 60 while the Guide To Facsimile Stations (printed in June, 1990) sells for DEM 50. Both prices include airmail to your front door. To keep your utility information accurate there is also a supplement service for the Utility Guide; this costs a further DEM 20 and is published in April and August.

Joerg also informs me that other publications available from him include the Air and Meteo Code Manual for all those DXers who listen to aircraft movements around the world...the book sells for DEM 50 airmail.

Then there is the **'Guide To Former Utility Transmissions'** which lists some 8000 frequencies and 4000 callsigns of stations monitoring since the sixties. This is available for DEM 25 airmail to anywhere in the world. For those who chase RTTY Joerg has the **'Radioteletype Code Manual'** which is an in depth look at the various types of RTTY codes in use. Not only codes but also information concerning foreign languages is given. There is even a section on cryptology which I'm sure would make very interesting reading. This book sells for DEM 25, and finally there is a cassette recording of modulation types which sells for DEM 40. This cassette covers CW, Fax, RTTY and other known systems to help you ID what you are tuning into. **The 'Guide' publications are available from Klingenfuss Publications, Hagenloher Str. 14 D-7400 Tuebingen Federal Republic of Germany.**

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GIVE ME SOME INFO!

My column was conspicuous by its absence in the last issue of CB Action.....first time I've missed an issue for about 0 years.....because no-one bothered to write or phone with ny information I could use.

Over the past couple of months I've had a lot of calls and etters, but very few with useful information — most of them vere bleating because I didn't write a column in the last ssue. At the rate the information has been coming in lately here won't be one in the NEXT issue either!

VIVE LA LEGISLATION?

France has passed legislation taking control of Citizens Band Radio from the independent regulatory authority CSA (Conseil Superieur Audiovisuel) and giving it directly to the Government, but the CSA still retains control over radio and television broadcasting and other radiocommunications services. Many French pirate operators are of the opinion that this restructuring is the thin end of the wedge towards the introduction of stiff new penalties for out-of- band and other illegal operations.

TANGO TANTRUMS

Rumor going around the shadier side of the computer world says that staff in a certain Italian government department were overjoyed when they received a floppy disk in the mail which supposedly contained an up-to-date world-wide membership list of Gruppo Alfa Tango but were far from happy when they discovered that the disk contained a lethal virus which trashed the FATs (File Allocation Tables, no information can be retrieved without them) on their hard disk and left an obscene message on the screen. **BEWARE THE SUPER SLEUTHS**

There hasn't been a CB 'bust' in Brisbane for months, but that doesn't mean the RIs have gone into total hibernation. A lot of Bad Buddies thought The Garden Gnome's departure for the USA and the fact that DoTaC didn't replace him would make their lives easier. It did for a while, but all that could change in the very near future. My spies in DoTaC tell me there has been a marked increase in pirate operation on the Amateur Bands over the past few months and that illegal operation on Commercial Bands has reached plague proportions so I guess these 'more serious' transgressors will keep the heat off CB pirates for a while yet, however, Brisbane RIs have taken delivery of some new super-sophisticated RDF gear which reportedly will track a handheld in a submarine to compensate for the reduction in staff and they reckon this new equipment will help them clean up the pirate Amateur and Commercial operators very quickly and give them more time to spend hunting for Bad Buddies.

One of the priority uses for the new gear will be tracking down a few dorks who persistently interfere with Police Channels on Brisbane's northside. It seems these characters are using modified Sawtron 999s, and both the RIs and the Police are keen to have a quiet chat with whoever is doing the modifications before throwing him down the elevator shaft. The RIs are also interested in speaking unkindly to whoever is operating the pirate UHF-CB repeater just north of Brisbane (CTCSS-controlled to keep mere mortals out) on 9/39, and the guy who built same.

NO GO FOR LOCAL RIG?

Electrophone's long-rumored locally-made AM/SSB rig looks like being a non-event. My spies tell me the design was excellent and the prototypes performed to world standards, but the costs of producing the rig in Australia were too high for it to compete against Asian imports. Bit of a shame really. Assuming that the AM/SSB would have been comparable in quality to Electrophone's UHF-CBs and the brilliant GX-558 VHF Marine rig, it would have given the Asian imports a caning.

AN EXPENSIVE IMPORT

A young Brisbane CBer came unstuck rather badly recently when he decided to import a Cobra 2000 base station priced at US$399 plus US$140 for airfreight (the rig weighs over 12 kilos) while the Australian dollar was up around the 85c mark.

He rang and ordered the beastie on a credit card but, by the time the transaction was processed, the poor old Oz dollar had dropped by almost 10 cents. Next he received a call from the airfreight company telling him it would cost $130 for them to clear the rig through Customs on his behalf, plus Customs Duty and Sales Tax.

Because he wasn't able to take time off work to go to the airport and go through all the complicated rigmarole himself he paid up, then they hit him with another 12 bucks to have the rig delivered to his home. He unpacked it and set it up, bent the legs on the two-pin power lead to suit our local power points, and plugged it in. Result? A BLOODY BIG BANG!

It exploded instantly, destroying the power transformer and several expensive components as well as the inbuilt frequency counter (110VAC rigs do NOT like 240VAC at all.....he's lucky it didn't kill him). He's since had it converted to 240VAC and repaired, but the frequency counter is history.

The bottom line is that the guy has a rig which will have cost him around $1400 all up by the time he gets the replacement frequency counter he's ordered. Bet he wishes he'd bought a Washington.

REVIEW

Put the world in your pocket with these new shortwave portables from Sangean.

by Rob Williams

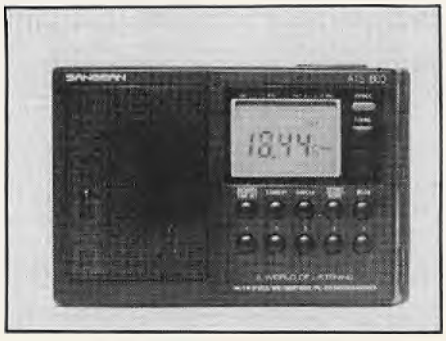
SANGEAN ATS-800 AND SG-700L

Described as a communications receiver, the ATS-800 represents the latest in shortwave radios from the stables of Sangean. Let's look at how this new receiver stands up to the reputation that the manufacturer has established in Australia while also putting Sangean's new shortwave radio, the SG-700L, under close scrutiny.....

With one Large Scale Integration (LSI) chip and seven ICs this radio is compact in size yet offers a big punch. The radio is larger than your palm in size, but is light and would be suitable as a travel radio. When you first see the ATS-800 you can't help but notice the size of the digital display; it really stands out. But the display gives you an immediate indication of what state the radio is in. By using a liquid crystal display, battery drain is reduced to a minimum, enabling longer battery life. Unfortunately frequencies on the shortwave bands are displayed in MHz rather than the accepted use of kHz. So for instance if you are tuned to 3215 kHz the display will show 3.21 MHz in large characters and the five in half-size. Whenever you operate the tuning buttons you hear a short beep from the speaker.

RESTRICTED COVERAGE ONLY

When turned off, local time (in 24-hour format) is displayed and by pressing the display button the alarm clock time is shown. The radio, while small in size, offers reasonable



reception across all shortwave bands. Tuning is only available between 3200 to 7300 and 9500 to 21750 with reception considered average across the entire range. This isn't a large drawback as there are no international broadcast bands between 7300 and 9500. However, some stations which broadcast just below 9500 or just above 21750 are missed as well as broadcasts on 25 MHz, which are active during high sunspot cycles or summer periods. If you are aware of this drawback and accept it then there aren't any problems. The receiver only has AM on the shortwave bands. It also covers the FM and AM band and provides a headphone socket on the side of the radio capable of taking a pair of stereo headphones, and with the headphones jacked-in you switch the radio into its stereo mode.

A FREE BUILT-IN ALARM CLOCK

Like most of the other Sangean radios in this price bracket, the radio comes with a built-in alarm clock and a sleep function. This means you can program the radio to turn itself off after you fall asleep and you can wake up to the radio and you favorite station. The radio also allows you to wake up to a buzzer rather than a radio station if you prefer to. While it has been designed to take to bed with you, there is no built-in light to illuminate the display in the dark.

TWO-WAY POWER AVAILABLE

Power is provided either through four internal AA size batteries or via a AC adaptor which plugs into the side of the radio. Power consumption is quoted at 300 mA, but this will depend on the setting of the volume control. A 'Low Battery' indicator appears in the lower right side of the display whenever the batteries run down. When replacing the batteries you have about three minutes to change them before frequencies in the memories are lost. While this is not a communications receiver in the true sense, I would like to see Sangean include a copy of the circuit for the radio to enable repairs to be carried out through electronic shops without having to refer it back to the shop where you brought it from.

INSTANT FREQUENCY RECALL

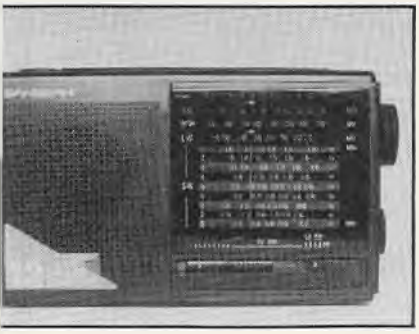
The radio comes with five memory positions which can store up to five frequencies on each of the four bands the radio offers, giving you a total of 20 memories. Very helpful for keeping track of your favorite station.

Frequency selection is done with the familiar up/down buttons, located on the front of the radio next to the display. By operating one of these buttons the display moves up or down 5 kHz at a time. If you keep the button depressed longer it makes a rapid change in 10 kHz steps and if the key is still held the frequency changes in 100 kHz steps. This overcomes the problem found on some receivers where you can't move across the frequency spectrum quickly. It takes some practice to get used to moving up and down, but with time you can master it. Shortwave frequencies are divided up into two bands and, together with FM and AM bands are chosen by a slide switch located on the top of the radio. As you move this switch a beep is heard from the speaker. A seven segment telescopic antenna provides reception of shortwave or FM stations, however, there is no external antenna socket for an external aerial.

AMPLE VOLUME

A big powerful speaker takes up half the front of the radio offering a good tonal quality, but there is no way of controlling the tone. The volume control is a slide switch built on the

de of the radio. Located above this is n electronic locking switch to prevent ccidental bumping of the buttons on ie front of the radio. The built-in low attery alarm, not often found on ortwave radios, is a real plus. A nall battery symbol flashes on and ff on the screen when the batteries ad a flat state. This only occurs hen the radio is switched off and the me is showing. I'm surprised that ore battery-powered radios don't ave this feature. When changing the atteries you have three minutes therwise frequencies stored in the emory will be lost. A flip-out stand n the back of the radio enables it to e supported at (45 degrees?) when tting on your desk. The built-in sleep nction will turn the radio off after 60 inutes. This has no effect on the arm clock setting and is handy if you ften fall asleep while listening to your dio. The recommended retail price r the radio is $199 and it is due in the ops now. For this you get a leather oking carry pouch, a 13-page struction manual, a small set of ersonal lightweight headphones, their Wavebook' and of course the radio.



HE SG-700L

Also from Sangean, is a new ortwave radio called the SG-700L, placing the SG-796. For just under 100 this light portable shortwave dio, described as a 12-band receiver, omes without all the frills of more xpensive shortwave radios. Tuning n this radio relies on the old fashioned ertical bar which moves across the ont of the radio against a background f frequencies, compared with the SG-96 with which frequency tuning was orizontal.

INE SHORTWAVE BANDS TO HOOSE FROM

The shortwave spectrum is divided o into nine non-continuous shortwave ands: 5850 to 6200, 7050 to 7450, 450 to 9900, 11600 to 12000, 3550 to 13850, 15100 to 15600, 7450 to 18000, 2145 to 21950 and 5700 to 26150. Even though there is o digital display, each band is well pread out across the dial. Also ncluded in the radio is longwave reception between 150 kHz and 270 kHz enabling you chase aero beacons.

A small red tuning light indicates whenever you are tuned to a station. The volume control, located below the tuning knob, is a small rotary knob on the right hand side of the radio. In the case of the 796, the on/off switch and volume control were incorporated together as a slide switch. As the radio has nine shortwave bands, mediumwave, longwave and FM there is a need to be able to switch between bands. This is achieved by a smart combination of two slide switches located on the front of the radio. One of these selects FM, MW, LW and SW while the other chooses which of the seven shortwave bands you want. An eight-segment telescopic whip enables you to improve shortwave and FM reception, but there is no provision to connect an external antenna, except by wrapping a piece of wire around the telescopic rod. Four AA size batteries or an external 6 Volt DC power supply (not included), run the radio with a current drain of approx 300 mA. For personal listening, a headphone socket is included on the side of the radio, however, there were no headphones or earphone supplied with the unit.

To turn the radio on or off, a small push-button switch is located on the top of the radio. Half of the front of the receiver is taken up with the tuning display while the other half is made up of a good quality 2.5 inch speaker with an output power of 200mW.

PERFORMANCE

There was some breakthrough of MW stations during longwave reception. MW was good with faint distant broadcasters being received. On shortwave, strong broadcasters were easy but the AGC wasn't able to keep up with signal fluctuations from less powerful stations. On FM there was aircraft breakthrough which, in my case, didn't effect reception of Sydney and Gosford FM stations.

As I've explained at the beginning the radio is a 'no-frills' unit so don't expect too much. The radio is ideal for the beginner who doesn't want to spend too much, but needs to have a radio which can offer wide coverage across the shortwave spectrum. For your money, the radio comes with a short set of operating instructions, which in my case was printed backwards, and the 'Wave Handbook which comes with all their radios.

Thanks to Access Communications and Garry Cratt for the loan of the two review receivers. Access Communications can be contacted at PO Box 231, Northbridge, NSW 2063 or telephone (02) 406 5311.

lere's something new — try your hand at catching ar-away TV and FM radio signals! TV/FM Xpert RICHARD JARY tells you how.....

DX with a difference

Interested in DX but haven't got a am licence? 27 MHz a bit too quiet? ou've logged all those big guns on hortwave? Then move up the dial and y VHF reception!

When most people think of DX their oughts turn to the shortwave bands. ut, hams have discovered that long stance reception is possible well oove 30 MHz, and surprisingly nough it doesn't require any ecialised equipment. So what are we lking about? To put it simply — long stance reception on your existing FM dio or TV set! Unlike shortwave oadcasts, FM and TV transmissions e designed for local coverage. They en't expected to provide wide area overage. And this only adds to the rill — you are picking up something at you shouldn't be able to.

But, why should you try this type of X? Probably for the same reason as ny other type of radio reception — to chieve something more, do some- ing different, and receive stations at are not normally heard in your area. got quite a thrill from being able to elephone FM station 1KCC in Auck- nd, New Zealand, and let them know I as listening in Sydney — they even ent me an on-air cheerio call which I aptured on tape! And being able to atch a sports program on Welling- on's TV1 network certainly provides alternative to the local channels!

V/FM PROPAGATION

What makes all this possible? VHF gnals can travel just like HF, under the ght conditions, and they also have ome special propagation modes all of eir own. And UHF is another story gain. In case you aren't familiar with ropagation modes, here's a brief verview. The earth is surrounded by arious layers that can reflect radio aves. The primary layers are called D, , F1 and F2, named in order of height. he D layer is primarily responsible for osorbing frequencies below around 3 Hz, and is primarily active during the ay, thus inhibiting long-distance ediumwave reception during daylight ours.

The E layer is the next level, at a eight of about 110 km. This is respon- ble for some HF propagation, and at

Test card from Hawaii's KGMB TV network.

times can become heavily ionised and reflect frequencies up as far as those TV channels towards the bottom of the VHF spectrum. Unpredictable or sporadic E also affects the lower end of the TV band, providing reception anywhere from 800 to 2000 km distant.

Sporadic E appears to consist of a highly ionised cloud which can move quite fast, leading to DX reception of many stations at varying distances in a very short period. It can occur anytime during the 11-year sunspot cycle, and can be often be characterised by multipath propagation from different parts of the layer, most noticeable as 'ghosting' on television signals. Sporadic E would probably have been responsible for my first taste of FM DX, when, on my humble car radio, I heard an, unusual station on 93.7 MHz. This turned out to be Adelaide's 5MMM-FM, and through the rest of the afternoon I logged 3RRR Melbourne, 7THE-FM Hobart and even XS-FM from Palmerston North in New Zealand. And these aren't powerhouse stations — 5MMM runs just 4 kw and 7THE only 1 kw.

Another useful form of propagation is the F2 mode, which has a range of up to 4000 km per hop due to the layer's increased height above the earth. F2 skip generally remains active for several hours, and even multiple hop propagation is not uncommon — in one outstanding example of F2, a Perth resident found himself watching BBC1 television direct from the UK! People involved with shortwave will realise that F layer propagation is dependent on sunspot activity, as well as the time of year — so this summer, near the peak of cycle 22, should be ideal.

From my home on the NSW Central Coast I am regularly able to receive television from New Zealand, which comes courtesy of the F2 layer. The best time is from 10am to sunset. New Zealand has a fairly different TV bandplan than Australia, but, NZ channels 1 and 2 occupy pretty much the same space as our own channels 0 and 1. There are several high power transmitters on these lower channels, all beaming from various parts of New Zealand, and like the ABC all programs are networked. So the main problem is

identifying the particular relay station you are receiving.

GONE TROPO!

Yet another VHF skip mode is tropospheric propagation. This can occur throughout the year, and often at the same time as a temperature inversion — a common event during the passage of a cold front, when warm air is

trapped between two layers of colder air. The signal gets caught in this duct which acts like a waveguide, carrying signals for several thousand kilometres without once touching the ground. Tropo ducting can provide paths up to 400 MHz and higher, so it not only affects the higher VHF TV channels but, also UHF TV and radio. This is what causes most DX in the UHF amateur and CB bands. It is most common within 4000 km of the equator, which is roughly anywhere north of Sydney.

There are even more modes to consider, which require more specialised equipment yet still are favored by many FM DX enthusiasts. One is aircraft scatter, using aircraft to reflect signals; reception is possible up to 600 km but this requires a highly directional aerial. Or what about receiving a signal bounced off the tail of a meteor? This works best on the lower channels and during the meteor showers which occur several times each year. It is also possible to bounce signals off the ionised trails which remain after a lightning strike, and from northern Europe's Aurora Borealis. The same effect is observed at the South Pole so it is likely that you could receive Aurora scatter in Tasmania, however the problem may well be finding a transmitting station far enough south to receive.

BEING BITTEN

The simplest way to get involved in TV and FM DX is simply to turn on your radio or TV. You won't necessarily be lucky the first time, but keep trying. If you see or hear something that you don't normally receive, then you are either getting a test transmission from somewhere close or something from further away. The best times are anytime from just before sunrise to just after sunset, though some people in Melbourne have logged Queensland stations approaching midnight.

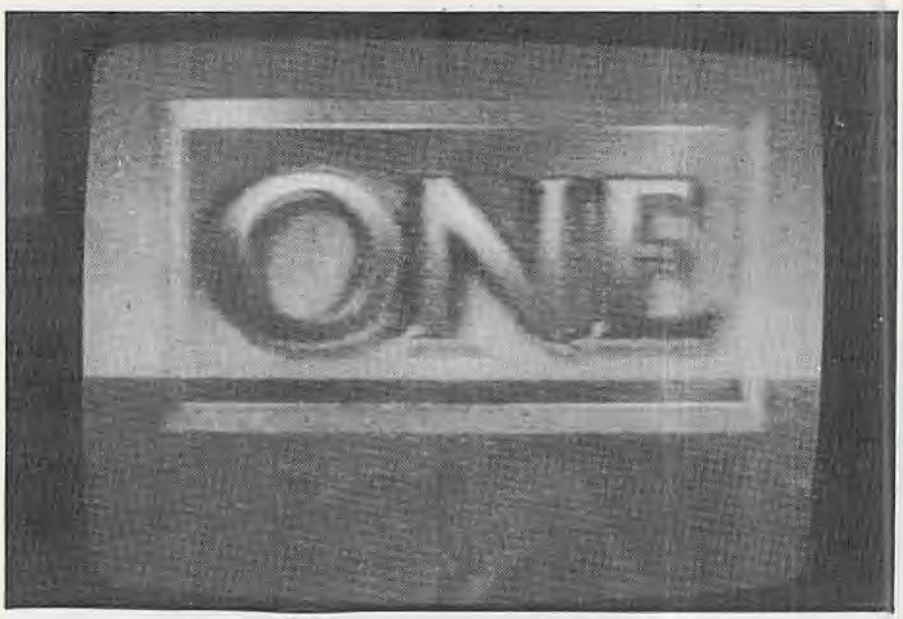
Several times I have had a quick scan through the FM broadcast band and stumbled across a swag of New Zealand stations. One night during an Australian v New Zealand cricket series our Channel 9 ceased coverage to screen the evening news, yet I was able to keep watching the game on New Zealand's TVNZ network.

If you find TV/FM DX to your liking, then you'll want to go further. What are your best chances of catching regular long distance VHF? Like any way to enhance your radio hobby it involves money but not necessarily as much money as buying a high quality shortwave radio. As with shortwave, scanning and CB, the first step towards getting more from your radio is to invest in a decent aerial.

After all, if the signal isn't coming down the wire it doesn't matter how good the receiver is. Some TV aerial manufacturers and specialist TV stores can supply sensitive fringe antennae for either VHF or UHF. One desirable extra for the aerial is an antenna rotator, which allows you to aim toward the signal and hopefully cut out some of the local stations. Another useful item is a masthead amplifier, commonly used by viewers in poor reception areas. These simply boost the signal before it comes down the aerial lead,

however, they can be a disadvantage if you have strong local stations which can overload the amp and inject spurious signals.

When it comes to the radio itself, in some cases you will find selectivity is more important than sensitivity. Selectivity is the ability to tune into a weak signal which is very near in frequency to a strong one, whereas sensitivity simply refers to how weak a signal the radio will pick up. After all, the FM band is becoming more and more crowded in Australia's capital cities, so it is becoming crucial to be able to lock into a distant signal which might be just 200



TV Channel 1, Wellington NZ, is a surprisingly regular catch.

Hz (one FM broadcast 'channel') from our local rock station, as opposed to eing able to hear a signal which hardly noves the S meter.

This is particularly true in a location ke Gosford, where I get all Sydney and ewcastle, as well as the new Central oast FM stations. There is a station very 400 kHz between 101.3 and 06.1 MHz, so selectivity is a must! nfortunately this is often hard to test hen you are buying your receiver, as most shops the local stations are all hat will be available. But, I have been leased with the performance of many ommunications receivers which cover M as well as shortwave, and even ome car radios do a fine job. The aver-ge radio-cassette unit is not so hot — hile I have logged some good signals n mine, of course it comes nowhere ear a decent shortwave/FM receiver.

If you really became serious about atching TV DX then you can splash ut and buy a set that handles the three ternational TV transmission stan-ards — PAL for Australia and New ealand, NTSC for America and ECAM for Europe. One interesting deline might be Teletext DX — TVNZ cludes a full Teletext service and with good signal there is no reason why ou can't read the DX information page n TVNZ-1!

What you will hear and see with all is very much depends on your loca-

Station ID from Ch. 13, Honolulu.

tion. In Sydney and Melbourne, and along the coast in between, reception of New Zealand FM and TV is common during summer months. Melbourne DXers can also tune in to Tasmania, Queensland and South Australia, and I know one listener who has reported hearing FM from Perth. In Brisbane and further north, enthusiasts have logged Papua New Guinea, New Caledonia and Fiji.

Of course, as with any aspect of the hobby, how far you go is up to you. But, I hope this shows you that not only is FM/TV DX possible, it's fairly easy. So while you're saving up for that new shortwave set, turn on the TV or FM stereo and spin through the bands. You may be pleasantly surprised.

RICHARD JARY is a communications hobbyist who specialises in TV and FM DX reception. His popular 'Sundries' column appears in the monthly newsletter of the Australian Radio DX Club (PO Box 227, Box Hill, Vic. 3127).

ONLINE

With PATRICK McDONALD

Thanks fer all them cards 'n letters, boys 'n girls!

It sure is nice to know that so many CB ACTIONers have got computers these days.....or at least WANT to get such a beastie.....to use with their various radios. And it's also great to hear from readers directly. However, since so many of your questions are similar, I thought I would write a bit about these things here in ONLINE and save some of you a few postage stamps.

WHICH COMPUTER?

First and foremost, those poor radio users still without computers want to know WHICH COMPUTER is the best one for use in general DXing, keeping records and logbooks, decoding RTTY or whatever.

Fortunately, in this case, the answer is not simply 'the Commonwealth Computer'! In fact, almost any modern computer will do.....though some will certainly do much more than others. It all depends on whether the application software you want to use is available for that particular machine and its operating system. Some years ago, most radio/computer enthusiasts owned one of the classic Commodore 64s and, to be sure, there are still many of these trusty little boxes around.

Quite a number of simple radio software programs were written for them and some of these remain in use. However, times have changed and newer computers have much, much more capacity than the original C64 or even the updated C128.

These days, IBM-compatible computers using the world standard MS-DOS operating system are far more common and there are lots more programs for this kind of set-up. Although some folks rave about the Apple Macintosh system, there seems to be less radio-related software written for the Mac so far.

My advice, for what it's worth? Well, in the first instance, use whatever computer you have handy. Check to see if there is a local computer club around that can advise on software. However, if you have no computer at all, or are looking to upgrade your equipment, I have no hesitation in recommending an IBM-Compatible machine.

Why so? I hear you ask. Well, there are several good reasons: the IBM compatibles are relatively cheap, completely generic, have tremendous capacity for running programs and storing data easily, and have tons of software written for them. You also have many choices as to which machine to buy; there are literally hundreds of different IBM compatible computers on the market in Australia. Even the simplest 'XT' model, preferably with at least a small hard disk drive, will be great for radio-related work and will not quickly go out of date. I use two such grey boxes myself, both el cheapo XTs, and am happy as a clam.

The next most common query I find in my mailbox concerns modems. Lots of CB ACTION readers are obviously very interested in communicating with other radio nuts via one of the worldwide computer bulletin board (BBS) networks, over their home or business telephone lines. Again, you will have many choices as to which modem to attach to the serial port of your IBM-compatible machine, but even older, non-standard computers can use most modems, as long as they have the appropriate port.

Any computer dealer can tell you what is available for your particular machine. You can start with the advertisers utilizing this great mag!

Also ask the dealer about the communications software you will need. He'll probably offer you a simple 'shareware' comms package that will do the job until you can download something better from your friendly neighborhood BBS. And my recommendation for comms software is always the fabulous TELIX system, easy to install and available on most good Australian BBSs. Probably the most anguished questions that come my way, however, concern computer noise! How can you get that damn machine to quiet down so that the microprocessor and monitor buzz don't drown out every signal that comes your way?

RFI (radio frequency interference) sometimes seems almost to defeat the whole purpose of using a computer! Well, there are several answers, none of them foolproof, but I can assure you, from personal experience, that it is indeed possible for your radio, whatever kind it is, to co-exist with that dear little grey box in some kind of marriage of convenience.

But let's be perfectly honest about this: you will probably never get rid of ALL computer noise.....at least, not until computer manufacturers take themselves in hand and install better shielding in their machines (the same holds true for a great many household appliances, by the way). Nevertheless, it is possible in most cases to minimize the buzzing and growling to a level where it is not a problem.

Tom Kanusha, a well-known US DXer and computer user, has made a few interesting suggestions in a recent note in the worldwide SHORTWAVE echomail conference (carried by a number of Australian bulletin board services) and perhaps I could pass on a few of these hints. First of all, check that all your computer cables are shielded and grounded to the chassis. This means your RS-232 cable and your monitor cable as well. If you are buying a monitor (or when you can afford to buy a replacement for your current one) see if you can find a metal enclosed model. These steps can often reduce RFI quite a lot. Some people recommend spraying plastic computer cases with a metallic paint to better shield against the dread RFI (I haven't tried this myself).

However, if you do, forget about cosmetic considerations and spray the OUTSIDE of the case, for goodness sakes! The mind boggles imagining what would happen to the innards of your hot little 'lectronic beauty when the paint starts flaking off in a few months time!

OK, let's go further. Have a look at your antenna set-up. You should make sure that, whatever kind of antenna you are using, it is located at least 30 metres from the computer itself. Of course, your antenna lead-in must always be shielded COAX cable and you should take care that your antenna line comes nowhere near your computer cables.

In this issue Patrick looks to the which, why, when and what of computers, offers some advice on reducing RFI noise and tells you where to obtain a worthwhile DXers guide to computers . . . it's essential reading if you're into radio communications and/or computers.

Now, with your radio on, try manually lifting and shifting round your various cables. You may be surprised at what a difference the actual position of the cables makes. Finally, onsider adding RFI chokes (available at your friendly local lectronics shop) for all your cables, including those to the nodem. I would be very surprised if the above efforts don't educe your computer RFI considerably.

But one last tip: if you are presently in the process of uying a computer, bring a portable radio along and fire them oth up, side by side. It is often awkward to do this in shops nd you may not get a favorable reaction from the salesman, ut the test is well worth the effort, believe me.

Computers vary a great deal as to microprocessor noise nd you might as well purchase the quietest model possible. fy two monsters vary a great deal noise- wise, for instance. ne can be run with minimal radio noise whereas the other, lder job defies all efforts to do more than partially moderate he wide-band chainsaw effect. Try before you buy — after ll, it's your money Ralph! (Drop us a line if you have any rther noise-limiting tips and we'll pass them along to others ere at ONLINE).

In this context I might now mention a brand new 60-page ublication that has just come out, from George Wood of adio Sweden International — edition four of 'Sweden alling DXers Guide to Computers.' This is the best yet of a ng series of similar booklets by the same author and is well orth the eight IRCs (International Reply Coupons.....get em at the Post Office) needed to get one direct from Radio weden International (S-105 10 Stockholm, SWEDEN). lternatively, you can 'download' the electronic version gratis om your's truly at SWP BBS (address to follow). Topics overed include: recommended computers, radio software ackages available, packet radio, computer control of eceivers, and much more. In fact, Wood's 'Guide' is so seful, I think I'll review this nifty booklet properly in the next NLINE column!

Now let's briefly turn to a couple of new software packages hat might be of interest. All these are in the MS-DOS format r use on IBM compatible computers. OMEGA, mentioned previously in these hallowed pages, is presently well-advanced in its testing by a team of Sydney radio software maniacs, led by the inimitable Rick Jones and should be available for general release in January. Designed as an interactive online database for BBS use, it will also function as a stand-alone frequency database and logbook program. I am presently playing with an Alpha version, and can promise you it beats heck out of sliced bread!

However, let's wait for the next issue, when I hope to review the finished product in more detail (I can put you in touch with Rick if you would like to assist in the testing phase).

PAKET4 has just appeared on my doorstep this week. This shareware program is designed for packet radio use by licensed amateurs. An upgrade of an earlier, excellent program, PAKET is all you could desire if you are a licensed ham with a computer and want to get stuck into a BBS-of-the-airwaves. Check SWP BBS for this one, which includes full documentation.

Finally, as the big bottom-of-the-page number looms up at me all too quickly, I have to skite a bit about the success of the OZ-SW national BBS echomail conference concerning Australian radio listening topics. Pioneered by above-mentioned Rick Jones of MONITOR WORLD BBS and supported by Richard Jary and myself, this national electronic confab is now carried by more than a dozen computer bulletin boards in four states. If you got that modem I recommended, you can dial up your nearest BBS (for the cost of a local call) and read messages from all over Australia concerning Aussie radio topics.

Naturally,these BBSs should also carry the worldwide SHORTWAVE conference, linked to the US and Europe. So, if you haven't got a modem stuck in your serial report yet, do it! You're missing a lot of low-cost international communication about the world of radio and computers.

I hope to hear from you in the next couple of months, gang, preferably at SHORTWAVE POSSUMS BBS on (02) 651-3055 (24 hours) or via snail mail at PO Box 357, ROUND CORNER, NSW 2158.

Happy listening and BFN!

Make the most of summer by

TUNING INTO THE HIGH SEAS ON HF

ROB WILLIAMS continues his series on HF utility monitoring, with everything you need to listen to boats, yachts and ships this summer. . .

Monitoring the maritime radio services can be very rewarding. With the large number of craft of all shapes and sizes using our rivers, harbors and coastal waters there are many opportunities to tune in any time of the day or night. And when you've had enough of Australian waters you can extend your HF ute horizons by tuning into distant oceans and countries using these international allocations.

Maritime communications can be divided into three groups — inshore, coastal and high seas — each using different parts of the frequency spectrum. Inshore radio includes pleasure craft such as yachts and power boats. Boat owners make use of rivers and lakes located around Australia to enjoy their hobby, and communicate on the 27 MHz and VHF marine bands.

Coastal boats include those large enough to venture into open waters — usually for commercial fishing, sailing and larger power boats. They favor the VHF maritime bands, which are reliable up to 50 kilometres out to sea. Ocean-going ships, be they cargo or passenger carriers, rely on the extended range of HF radio and even satellite communications through the Inmarsat network.

Even though satcoms are fitted to some 8000 ships worldwide, most traffic is still carried on HF radio. Tens of thousands of ships visit Australian ports each year and you'll still find the familiar long-wire aerials mounted high on the masts, ready to go into action at any time. Let's look at each area of HF radio to see how boat owners communicate, and on what frequencies. Note that all frequencies have been listed in kHz, which is easily converted to MHz by moving the decimal point three places to the left. Most maritime HF transmissions are in SSB and all times are in UTC/GMT, unless otherwise indicated.

INSHORE MARINE RADIO

For hobby craft working the inland and sheltered waterways, low powered and low cost 27 MHz radios are the easiest means of having peace of mind. Many volunteer coastal patrols, boating and fishing clubs scattered around Australia successfully use 27 MHz to keep in contact. There are 10 special marine channels allocated just above the 27 MHz CB band.

Channel	Frequency	Use
68	27680	commercial organisations
72	27720	professional fishing
82	27820	professional fishing
86	27860	alternative calling/working channel
88	27880	distress and calling channel
90	27900	recreational clubs
91	27910	recreational clubs
94	27940	recreational clubs
96	27960	intership communications
98	27980	rescue organisations

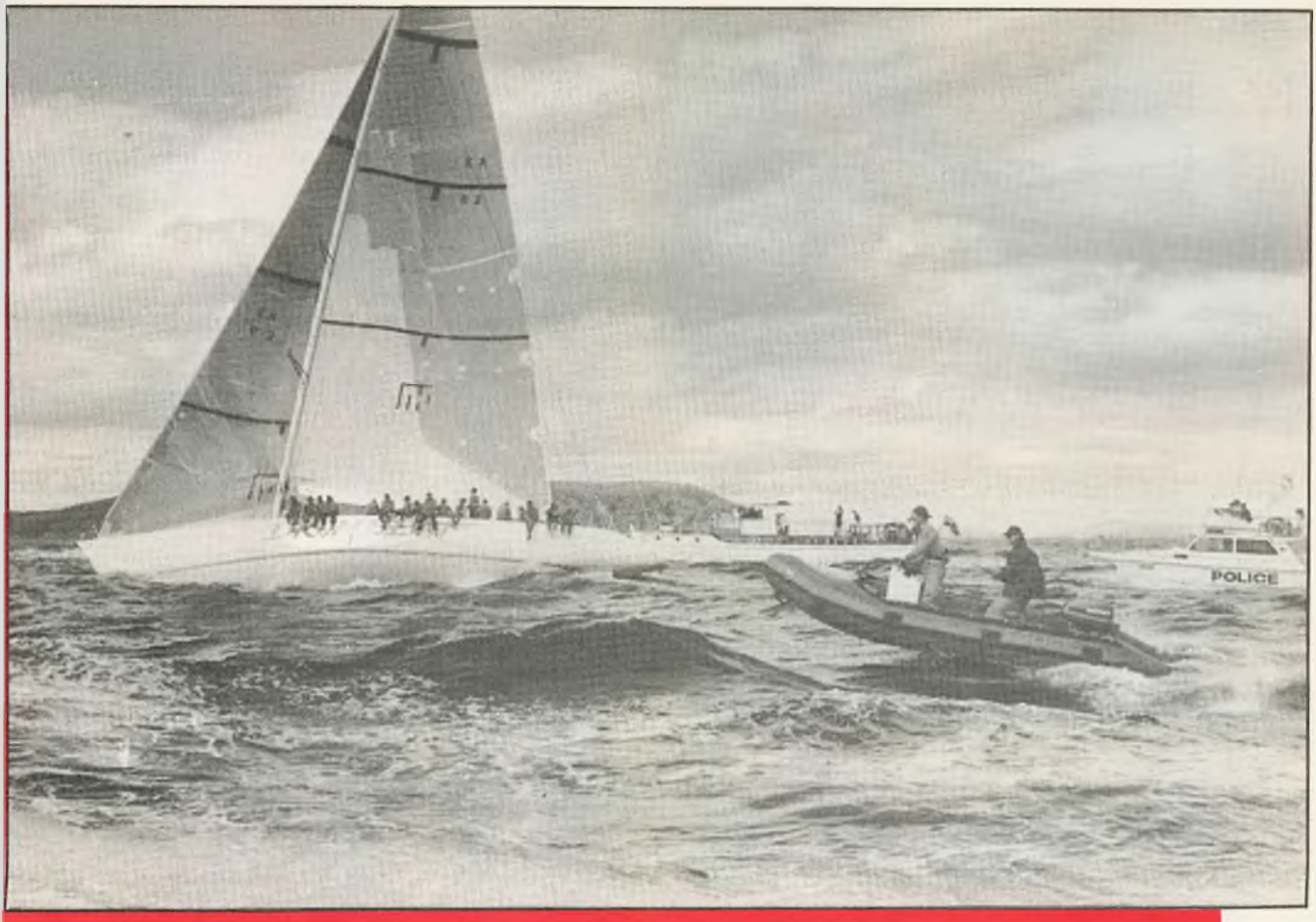
HIGH SEAS COMMUNICATIONS

By international convention, a wide range of HF fre quencies have been set aside for the exclusive use c ships. DoTaC has chosen certain common HF channel from within those bands for various users. They are a follows:
2182 — international distress and calling; 4125, 6215. — supplementary distress, safety and calling; 4143.6 – calling and working by small craft; 2201 ship-to-shore 4134.3/4428.7 (tx/rx) — also known as channel 424 this duplex pair is used by stations of the coastal radi service (CRS) for traffic lists and weather/navigation re ports; 6206.2/6512.6 (tx/rx) — ch 603, used by CRS t carry traffic lists; 2436, 2638 — commercial services 2112, 4535, 2164 and 4620 — fishing fleets and nor commercial services use these frequencies for the safet of vessels and persons and for private correspondence 2524 — used by pleasure craft for safety of vessels an persons; 1715, 1725, 1775, 2008, 2032 and 2436 – private correspondence by business and pleasure craf and for professional fishing services; 4483 — ocea yacht racing; 4485, 4063/4357.4, 6510.9/6204.5, an 7722.5/8062.5 are all used for private correspondenc by professional fishing services; 4186.2, 6279.3 8372.4, 12558.6, 16744.8, 22246.0, 25073.0 25075.0, 4186.6, 6279.9, 8373.2, 12559.8, 16746.4 22244.0, 25073.0, 25075.0, 22286.0, 22294.0 22302.0, 25093.0, 25098.0, 25103.0, 4181.8, 6272.7 8363.6, 12545.4, 16727.2, 22232.2, 12546.6 16728.8, 22234.0, 4193.0, 6289.5, 8386.5, 12579.5 167773.0, 4213.0, 6319.5, 8426.5, 12639.5, 16781.0 16853.0, 4199.0, 6298.5, 8398.5, 12597.5, 16797.0 4203.0, 6304,5, 8406.5, 4195.0, 6292.5, 8390.5 12585.5 are all allocated for use by public correspo dence stations.

One of the largest users of maritime communications OTC. It has an extensive weather forecasting service f coastal and high seas shipping, and its main revenu comes from the 'Radphone' HF marine telephone servic For more detail on OTC's involvement in the HF maritim bands, refer to my article on that topic in the July 198 edition of CBA.

The HF marine bands are at 4, 6, 8, 12, 16 and 22 MH and they include hundreds of channels, far too many detail here. These channels are divided into duplex paired frequencies, for telephone coversations. One fr quency is used for transmit and the other for receive. Th first digit of the channel number indicates which MHz ban it is in. OTC's CRS stations use channels from most of th bands to provide good reception at any time of the da and year, even during sunspot cycle peaks. For your infc mation, here is a complete list of OTC Radphone channe — but remember that it is strictly illegal to listen to tel phone conversations.

Only nine of the 13 CRS stations provide a Radphon service — VIB Brisbane, VIS Sydney, VIM Melbourne, V Hobart, VIT Townsville, VIP Perth, VID Darwin, VIA Ad laide and VIR Rockhampton.

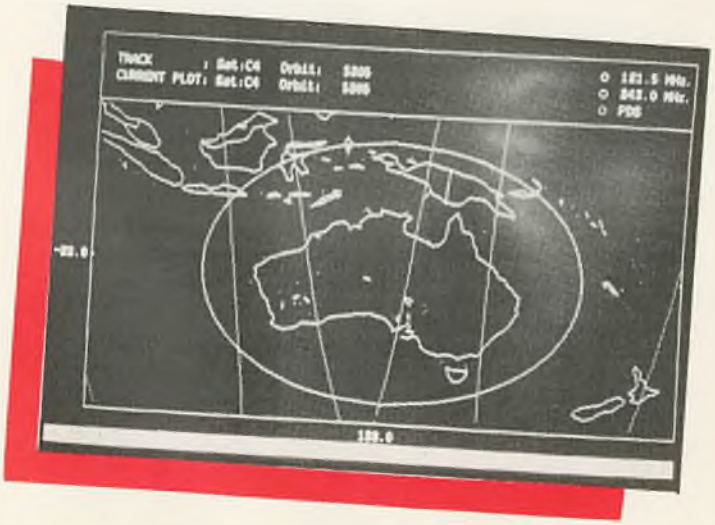


Ch	Coast tx	Ship tx	CRS stations
04	4366.7	4072.3	VIB, VIH VIM, VIP, VIT
05	4369.8	4075.5	VIS
12	4391.5	4097.1	VIA, VIB, VIT
15	4400.8	4106.4	VIB, VID, VIP
17	4407	4112.6	VIM, VIR, VIS
19	4413.2	4118.8	VIA, VID, VIT
02	8722	8198.1	VIS
06	8734.4	8210.5	VIP
11	8749.9	8226	VIB, VID, VIM, VIP
15	8762.3	8238.4	VID, VIP
17	8768.5	8244.6	VIA, VIT
22	8784	8260.1	VIT
29	8805.7	8281.8	VIS
203	13107	12336.2	VIS, VIT
226	13178.3	12407.5	VIM, VIP
227	13181.4	12410.6	VIA, VID
229	13187.6	12416.8	VIB, VID, VIP
231	13193.8	12423	VIS, VIT
602	17236	16463.1	VIS
604	17242.2	16469.3	VIP
610	17260.8	16487.9	VIS
622	17298	16525.1	VIS
203	22602.2	22006.2	VIS
212	22630.1	22034.1	VIP
223	22664.2	22068.2	VIS

MARINE SAFETY — A VITAL ELEMENT

The Safety Of Life At Sea policy (SOLAS) requires vessels over 300 tons on international voyages to carry prescribed radio equipment to provide regular ports during their journey, and must also monitor the HF distress and safety frequencies. Even ships which aren't SOLAS-equipped are generally covered by local laws which require them to carry some form of radio (in most cases, a 27MHz marine transceiver). Such vessels are commonly referred to as 'non-SOLAS' ships. Communications can be between ships at sea, ship-to-shore and vice versa. 'Base stations' are generally OTC CRS facilities, limited coastal stations or fishing and yachting clubs.

Search and rescue (SAR) operations are carried out through the Sea Safety Centre, a government organisation staffed by a team of marine SAR experts who can also call on help from other maritime organisations. The Federal August budget brought a surprise announcement that the SSC, currently located in Canberra, will be moved to New-



castle in 1991. The SSC is also responsible for issuing radio navigation warnings for broadcast by CRS. They have dedicated lines to CRS stations, State police, maritime authorities and offices of the Department of Defence, and also to aviation authorities via the Aeronautical Fixed Telecommunications Network (AFTN).

Position reports are generally relayed via the nearest CRS station, who then pass the message on to the SSC. This service is known as 'Ausrep' or the Australian Ship Reporting System. The object of Ausrep is to instigate SAR operations if no position report or distress message has been received, and provide a reporting procedure for ships en route.

Craft on voyages exceeding 200 nm and fitted with approved safety equipment can participate in Ausrep. Their captain lodges a sailing plan at the start of each trip, provides daily position reports at set times during the journey and upon reaching the destination sends the SSC a final report to notify of their safe arrival.

Other reports heard on the HF maritime bands include 'Auscoast', for ships along Australian coastal routes, and 'Navarea X' for ocean-bound vessels. There are also warnings for military weapons practice and safety messages relating to dangers to ships in a particular area. A parallel system operated by the US coast Guard is AMVER, the Automated Mutual Assistance Vessel Rescue service. This computer database is an internationally recognised reporting procedure through which over 100 coastal stations in 25 countries provide an invaluable service to shipping movements around the globe.

The frequencies used by maritime organisations around the world have been in use since the early days of radio communications. Several years ago we saw the move from AM to SSB, followed by increasing acceptance of satellite navigation and location-fixing, emergency position indicating radio beacons (EPIRBs), VHF, UHF and even SHF communications. so plans have been made to clean up and modify the global maritime allocation, updating and improving the SOLAS system.

The International Telecommunications Union, a specialised agency of the UN, held a conference during 1987 to discuss changes in mobile and maritime communications. It was here that 107 countries agreed to introduce the Global Maritime Safety System (GMDSS). This service will ensure that all vessels at sea can obtain up-to-date information concerning weather and navigation via the most efficient means of communications, whether by HF or satellite.

Local implementation of GMDSS will by 1992 lead to a reduction of the present CRS network from the present 13 stations to just four — Sydney, Perth, Darwin and Townsville (the future of VIM Melbourne is still undecided). Digital Selective Calling (DSC) will be introduced on the MF, HF and VHF bands, enabling direct communications with any one ship or a group of vessels by dialling their unique selcall number. The use of Morse Code is also planned to cease as this system starts. Now, here's the new bandplan.

For distress and safety channels, craft will still use 2182 kHz and ch 421 (4125 kHz); however ch 606 will be renamed as ch 6215; 833 becomes 8291; 1221 will be 12290; and 1621 is renamed to ch 16420.

Duplex pairs for general calling will now be as follows (coast tx/ship tx): ch 821, 8779/8255; ch 1221, 13137/12290; ch 1621, 17302/16420; and ch 2221, 22756/22060.

For regular working and maritime safety information craft will still be heard on 2201, but ch 424 will become 4426/4134 and ch 603, 6507/6206.

The new Radphone channel allocations will be as follows —

Ch	Coast	Ship	CRS stations
404	4366	4074	VIB, VIH, VIM, VIP, VIT
405	4369	4077	VIS
412	4390	4098	VIA, VIB, VIT
415	4399	4107	VIB, VID, VIP
417	4405	4113	VIM, VIR, VIS
419	4411	4119	VIA, VID, VIT
802	8722	8198	VIS
806	8734	8210	VIP
811	8749	8225	VIB, VID, VIM, VIP
815	8761	8237	VID, VIP
817	8767	8243	VIA, VIT
822	8782	8258	VIT
829	8803	8279	VIA, VIS
1203	13083	12236	VIS, VIT
1226	13152	12305	VIM, VIP
1227	13155	12308	VIA, VID
1229	13161	12314	VIB, VID, VIP
1231	13167	12320	VIS, VIT
1602	17245	16363	VIS
1604	17251	16369	VIP
1610	17269	16387	VIS
1622	17305	16423	VIS
2203	22702	22006	VIS
2212	22729	22033	VIP
2223	22762	22066	VIS

Other frequencies used for OTC's high seas weather forecasts, fleetcoms and yachtcoms will also change as follows:

Present	Future
4143.6	4146
6218.6	6224
6221.6	6227
8291.1	8294
8294.2	8297
12429.2	12353
12432.3	12356
16587.1	16528
16590.2	16531
22124	22159
22127.1	22162

COASTAL MARITIME STATIONS

Dotted along our coastline are several small coastal stations run by clubs and volunteer rescue organisations. Most of these operate on either 27 MHz or the VHF marine band. But, there is one station you should listen out for, as it uses the HF, 27 MHz and VHF bands, and can be easily heard up and down the east coast of Australia. This is Penta Comstat, callsign VM2PC (better known as simply 2PC). Located on the NSW central coast, its mountain-top site at Holgate makes Penta an excellent communication link for yacht races and recreational boats which are members of the Penta Base Club. Weather forecasts, boating information and other details can be heard during the several skeds listed below.

2PC daily skeds (all times EST): 0910, 1210, 1410, 1610 and 2010 on 2524 with local waters forecast; 0725, 1055, 1410 and 1625 on 2524, 4483, and 8291. with coastal forecasts; 0735 and 1635 on 4483 an

291.1, interstate weather forecasts; 0800 and 1700 on 291.1, 12429.2 and 16593.3, position report skeds.

A high seas forecast and Navarea X navigation warning s broadcast at 0035 UTC on 4483, 8291.1, 12429.2 nd 16593.3; and at 0935 UTC on 2524, 4143.6, 221.6 and 8291.1. Gale and storm warnings are trans-itted at 1410 on 4483, 8291.1 and 12429.2. During our ummer months you will hear many competitors in many acht races giving position reports to Penta Comstat in the te afternoon.

N THE NAVY!

The Royal Australian Navy still makes use of HF and has major naval communications station located at Canberra. ve logged it on 8161, 8294 and 4081 and have also eard reports on 4286, 5450, 12128, 14480, 15063, 8445 and 23080. During search and rescue operations ff the east coast of Australia you can follow events by tening to 5718 as military aircraft involved in the search ake regular reports to their base. Channel allocations for eneral Navy traffic are as follows:

Channel 1 Alpha 1 is 2768; alpha 2, 4081; alpha 3, 294; alpha 4, 8294; alpha 5, 12436; and alpha 6 is 6572. Callsigns for RAN bases are VHA Hobart; VHB, HK and VHC are all Belconnen, Canberra); VHD, Garden land in Sydney; VHE Brisbane; VHG and VHO, Fremantle; HH, Port Melbourne; VHL, VHR, VHT and VHM are Dar-in; VHN, Nowra; VHJ, Western Port of Flinders; VHX airns; and VHY, Coburn Sound in WA. One I've recently dded to my log signed as 'Exmouth Control', but gave no allsign.

You can also hear Sydney Water Police VKG on 2524 nd even the 27 MHz marine band, when they are beyond nge of their UHF police radio system. Drill rigs in Bass trait and off WA's northwest shelf are also said to be still sing HF, and have been reported on 6780. Even though ey are fitted with satellite and VHF equipment I'm sure ey still carry HF radio.

HE KIWI CONNECTION

For readers in New Zealand, or those who like listening our friends across the pond, here are the latest sched-es for their maritime traffic. All times are in NZ local, hich is two hours ahead of EST. Many of these broad-asts can also be heard on 4419.4 kHz.

2423 — Awarua Radio, ZLB; * messages on hand, 220 and 1620; * navigation warnings at 0003, 0403, 803, 1203, 1603 and 2003; * meteorological warnings nd coastal weather forecasts at 0503, 0848, 1103, 703 and 2303; * weather reports from coastal stations 0725, 1325 and 1925; * Chatham Islands — New ealand area bulletin at 0940 and 2140.

2153 — Wellington Radio, ZLW; * messages on hand, 235 and 1635; * nav warnings at 0006, 0406, 0806, 206, 1606 and 2006; * met warnings and coast weather recasts at 0518, 0903, 1118, 1718 and 2318; * weath-reports from coast stations at 0735, 1335 and 1935; * natham Islands — New Zealand area bulletin at 1003, 203.

2207 — Auckland Radio, ZLD; * messages on hand at 240 and 1640; * nav warnings at 0009, 0409, 0809, 209, 1609 and 2009; * met warnings and coast weather recasts at 0533, 0918, 1133, 1733 and 2333; * weath-reports from coast stations at 0740, 1340 and 1940; * eather forecast for area from New Zealand to Fiji, be-veen 160 degrees East and 170 degrees West, at 2218.

2104 — Chatham Radio, ZLC; * messages on hand at 645 and 1845; * nav warnings at 0012, 0412, 0812, 212, 1612 and 2012; * Chatham Islands — New Zea-nd bulletin at 0950 and 2150; * Chatham Islands fore-ast at 1550.

N THE SEAS OVERSEAS

International marine traffic is another source of enter-ainment and with a bit of experience you will be able to ack down several of the better known coastal stations in the USA and Asia-Pacific region. You may even be able to hear marine traffic from Europe, although as most maritime communications are on the low HF channels, propagation over such a distance is not favorable.

During the Falklands War there were many occasions of Australian DXers listening to the British Navy throughout the conflict. The easiest UK coastal station to log is Portshead Radio which like OTC has several regular broadcasts — try them on 4372.9, 8765.4, 13172.1, 17236 or 22611.5. Another station I've heard is at Berne, Switzerland on 8785 with a traffic list at 0633 UTC; on 8722 I've noted Taipei Radio's traffic list at 1500; and Singapore Radio on 12386 at 1027.

The US is perhaps the world's biggest user of maritime radio. It has a naval presence spread across the world and also many high powered coastal radio stations and the famous US Coast Guard. Three AT&T coastal stations to chase are KMI, WOO and WOM. Try 4391.5 and 13169 for WOM, Florida; and 4357.4 or 8729 for KMI, San Francisco. From WOO New Jersey, you'll hear traffic lists for telephone calls broadcast every two hours starting at 0000 on 8749 and 4388.4; and weather forecasts for the North Atlantic on 4388.4 and 8749 at 1200 and 2200.

Other catches are 4428 and 13113.2 for NMN, Portsmouth; 6506.4 for NRV Guam; 8765.4 and 8828 for Coast Guard station NMO Honolulu; 8765.4, NMC San

Francisco; 13113.2 for NRV Coast Guard, Guam; and 13172.5 and 13178.3 for WLO. The USCG Communications Area Master Station Pacific has routine broadcasts at 0430 and 1030 on 4428.7, 8765.4 and 13113.2; plus 1630 and 2230 on 8765.4, 13113.2 and 17307.3. Even further afield, try for VAI Vancouver, Canada on 8738.

FUTURE DEVELOPMENTS

The newly-developed international Global Maritime Safety System will allow maritime users to make use of the latest high technology, with satellites and advanced digital communications playing an ever larger role in safety and day-to-day contact with ships and shore. 24-hour communications are already available through the Inmarsat network of six high altitude satellites which blanket the earth.

Two-way text communications from a computer-like terminal give ships access to distress and emergency services provided by OTC as well as navigation warnings and accurate position reporting. The small omni-directional antenna located on the vessel itself weighs just two kilos, and the ultra modern electronics in the satcom transceiver have only a small current drain. As the antenna isn't required to be directly aimed at the satellite, anyone is able to operate the equipment with very little training — it's just like using a computer or a telex machine.

With all this information and frequencies you have more than enough ammunition to get out there and discover some high quality DXing! (My thanks to Lawrence Hester and Glyn Cooper for assistance with material used in this article).

GET THE LATEST ON

HF UTILITIES

from BOB BELL

During my recent visit to Knoxville, Tennessee for the Monitoring Times Convention I learned that Americans are generally very surprised when they discover the high level of domestic HF radio communications to be found here in Australia.

Did you know, for example, that all US air traffic is forbidden to use HF/SSB radio while overflying any part of continental USA, unless they are involved in an emergency situation and their VHF is unserviceable? Certain other aspects of Australian HF usage totally captivated and in fact besotted our stateside monitoring counterparts. The RFDS was one. The Royal Flying Doctor Service was the singular most intriguing Australian HF communications service among ute monitors attending the convention. Our domestic aviation HF network and the RFDS would not be permissible under current American regulations, and as such we had much explaining to do about our system.

Australian utility monitors are fortunate as we certainly have a varied selection of HF/SSB activity to log. Whereas US monitors have mainly military networks to tune, we can boast of HF usage by the various state-operated railways (in several cases), the SES, VRA and CFA, Forestry Departments, Bass Strait oil rigs, the police and of course the RFDS, plus all the usual HF monitoring diversions such as aero, maritime, military, and even amateur radio!

We flew non-stop to Los Angeles on Qantas' brand new B747-400 Longreach, VH- OJD, and later enjoyed a tour of the Boeing factory at Seattle. Our host was Mr Dwayne E. Broderson, Chief Design Engineer of Avionics for the 747 and 767. Dwayne supplied us with volumes of information regarding the not-too-far-off move by world commercial airline aviation to using L-band satellites for all primary air/ground radio communications and company communications functions. Boeing is already carrying out exhaustive flight-testing of suitable equipment. What Dwayne told us has far reaching and major significance to HF aeronautical band monitors, as it means the end of our ability to monitor oceanic and other aircraft on HF as these bands will effectively become redundant in favor of L-band satellite communications through Inmarsat — unless we we obtain compatible satellite receiving equipment, which is presently not available commercially for the hobbyist monitoring purposes we are discussing. And even when a company starts producing cheap L-band receivers for utility listener usage, you still have the dishes and LNA's to think about, and in anyone's language, that is going to spell BIG BUCKS!

We spent many hours on the flight deck of VH-OJD enroute to Los Angeles, and noticed the aircraft was fitted with single VHF and dual HF rigs from Collins' 700 series. VHF antennae on the 400-series Jumbos are essentially unchanged from the 300-series, a blade-style antenna mounted on the top of the fuselage. But the older style horizontally-polarised HF whips which used to be seen running back from the tip of each wing have been replaced with an antenna set into the leading edge of the tail-fin.

Back on terra firma, and we've had a solid response from many readers to CBA's first HF UTILITIES column, with lots of log contributions which I'll be presenting after the body of the column.

To begin, John Chandler of Cherrybrook NSW supplies a list of action-packed ute stations to which he regular listens: 4069.2 — ship working; 4112.6 — ship calling; 4413.4 — ship calling; 4419.4 — ship working; 5015 — US Army Engineer Corps; 5320 — US. Coast Guard; 5616 — North Atlantic Track (NAT) aeronautical air/ground; 5692 — US Coast Guard; 6673 — NOAA Hurricane Hunters; 6697 — US Navy; 6723 — US Navy; 6753 — Royal Canadian Air Force; 8291 — ship working; 8778 — US Navy; 8805.7 — ship working; 8808.8 — ship working; 8864 — North Atlantic Track (NAT) aeronautical air/ground; 8972 — US Navy; 10493 — FEMA Emergency frequency; 11200 — Royal Air Force (RAF) weather (wx) broadcasts; 11233 — Royal Canadian Air Force; 12429.2 ship working; 13113.2 — US Coast Guard wx broadcasts; 13354 — NOAA Hurricane Hunters.

I've been handed a preview of details relating to changes to be made worldwide to HF Maritime frequency allocations, which become effective early in 1991 and coincides with the planned introduction during 1992 of the new Global Maritime Distress and Safety System. This will improve the safety-of-life-at-sea (SOLAS) and tighten up the procedures for commercial shipping and small vessels. It's too bad that old-hand ship-board radio officers are being 'retired' and won't be around to use the new allocations!

From July 1 1991, the International Telecommunications Union.(ITU) has announced that Australia's OTC will be required to operate on these new frequencies:

Distress and safety

ch.	coast	ship
—	2182	2182
421	4125	4125
606	6215	6215
833	8291	8291
1221	12290	12290
1691	16420	16420

General Calling

ch.	coast	ship
—	2182	2182
421	4125	4125
606	6215	6215
821	8779	8255
1221	13137	12290
1621	17302	16420
2221	22756	22060

Working and Maritime safety

ch	coast	ship
—	2201	2201
424	4426	4134
603	6507	6906

Radphone Frequencies by area

Adelaide

ch	coast	ship
412	4390	4098
419	4411	4119
817	8767	8243
829	8803	8279
1227	13155	12308

Brisbane

ch	coast	ship
40	4366	4074
412	4390	4098
415	4399	4107
811	8749	8225
1229	13161	12314

Darwin

ch	coast	ship
415	4399	4107
419	4411	4119
811	8479	8225
815	8761	8237
1227	13155	12308
1229	13161	12314

Hobart

ch.	coast	ship
404	4366	4074

Rockhampton

ch.	coast	ship
417	4405	4113

Melbourne

ch	coast	ship
404	4366	4074
417	4405	4113
811	8749	8225
1226	13152	12305

Perth

ch	coast	ship
404	4366	4074
415	4399	4107
806	8734	8210
811	8749	8225
815	8761	8237
1226	13152	12305
1229	13161	12314
1604	17251	16369
2212	22729	22033

Sydney

ch	coast	ship
405	4369	4077
417	4405	4113
802	8722	8198
829	8803	8279
1203	13083	12236
1231	13167	12320
1602	17245	16363
1610	17269	16387
1622	17305	16423
2203	22702	22006
2223	22762	22066

Townsville

ch.	coast	ship
404	4366	4074
412	4390	4098
419	4411	4119
817	8767	8243
822	8782	8258
1203	13083	12236
1231	13167	12320

Additional Channels

coast	ship
4146	4146
6224	6224
6227	6227
8294	8294
8297	8297
12353	12353
12356	12356
16528	16528
16531	16531
22159	22159
22162	22162

Now that you're acquainted with these latest velopments to maritime radio in Australian waters, let's aste no time, and launch straight into our UTILITY OGSHEET!

5100 Canberra AXM32 1300z Sending satellite wx eather) pix FAX (Bromley)

5574 San Francisco AERO 0648z Working 'Express 77', elta 54' and 'Evergreen 8155' USB ('Sunset')

6218 Mississippi WRI 0815z Wkg vessel 'Mississippi Lady' GB (Jones)

6637 New Zealand 188 AERO 1038z Wkg AirNZ Flight spatch re:EPR or EGT (engine!) faults; operator decided uation was minor annoyance, and could be fixed on arrival Christchurch USB (Palmer)

6738 Incirlik Turkey MIL 1510z USAF base wkg aircraft 'c) callsign 'Werewolf 23' in Persian Gulf area USB romley)

7660 Dubbo Police VKG 0943z Discussing propagation and nditions for HF wkg, no callsign back to Dubbo, but first mes being dropped regularly USB (Bell)

8291 Sydney maritime 0110z High seas wx and traffic (tfc) warships 'Tobruk' and 'Parramatta' USB ('Sunset')

8765.1 Honolulu Hawaii National WX service Wx for waiian Islands and details of tropical disturbance at 14N 2W USB (Bell)

8777.8 Pearl Harbour Hi. 0630z ID as Hotel-1-Bravo, wkg ctor-3-India and Bravo-9-Quebec. H1B tx from Barbers int Naval Airstrip USB ('Sunset')

8825 Shannon (Shanwick AERO) 0726z Wkg 'Mac 4464' AF C-141 Starlifter a/c at posn. 44N 15W USB (Henry)

8828 Auckland AERO Volmet 0651z Aviation terminal wx nditions for AKL, Christchurch, Wellington, Nadi, La ntouta, Pago, Tahiti USB (Bromley)

8867 Qantas 44 AERO 0636z Wkg Sydney Radio, B.747- registered VH-EAA at FL 430. Sydney Radio (female) gave correct VHF freq of 128.9 instead of correct 129.8 for Gulna sn. USB (Bell)

8867 Air Van 164 AERO 1031z Wkg Sydney Radio at posn. eldi, B.727 registered VH-TBN, FL 310 USB (Bell)

8930 Stockholm AERO LDOC 0650z Wkg 'MAC Alpha 87' with phone patch request for London number. Patch nn.on 20770 USB ('Sunset')

8942 Manila AERO 2000z Wkg Japan Air 712 and ngapore 681 USB (Henry)

8967 Auckland RNZAF 0703z Wkg 'Kiwi 928' with phone tch to 30 Sqd. Maintenance, major probs No.3 engine, oil k involving spill valve USB (Henry)

8991 Maritime (Pacific) 1041z Jap. fishermen wkg each ner, very strong sigs, suspect in vicinity Nth. Qld near wnsville USB (Lopaka)

8993 McMurdo USAF/USN 0736z Scrambled tx, this is a S Navy 'X-Ray Delta' freq. also used by McDill and Travis AF bases. Time division-type encryption USB (Collins)

9027 Auckland RNZAF 0016z Wkg 'Kiwi 921' with req. for c to slow down so press and officials can be allowed to be in sn. at Whenuapai Base USB (Henry)

9224 Barrigada Guam USCG 0846z US Coast Guard stn. RV with tfc. for unidentified vessel RTTY (Lopaka)

10344 Radio Moscow (feeder) 1053z Feeder service to known area, fem announcer, Russian lang. and then music SB (O'Dell)

10512 Unknown QTH US Navy 0615z Parallel EETSATCOM freq. 'Atlantis' wkg 'Korneez' USB (Name thheld)

11161 Unknown QTH Unidentified 1037z Not decoded, rong sigs Fax (Reakes)

11176 Phillipines Clark USAF Base 0650z 'MAC Foxtrot 36' phone patch request Upper Heyford USB (Henry)

11198 Sydney Air Force RAAF 0624z Air Force Sydney kg 'Hudson 824' phone patch request USB (Henry)

11384 Honolulu AERO 0655z Wkg 'Coast Guard 1603' at sn. 42N 50W at FL 240 USB (Bell)

11641 Unknown QTH Unidentified 1039z Not decoded but d strong sigs. Fax (Reakes)

13214 MAC 2145 AERO 0550z Wkg McGuire USAF base th details No.4 engine being shut down due constant-eed-drive (CSD) problem USB ('Sunset')

13282 Hong Kong AERO VOLMET 2015z Aviation terminal broadcast USB (Bell)

13312 Unknown QTH Rockwell Flight Test 0250z Wkg a/c Whiskey' USB (Santos)

**13342 Stockholm AERO LDOC 0610z Wkg 'Mike Golf Mike' and phone patch to Philadelphia USA re:arrival fuel fig. USB (Santos)

**14295 Space Shuttle 'Columbia' 0510z Wkg Houston. Ham station re-broadcast of Shuttle audio, exc. quality USB (Dodwell)

**14350 Unknown QTH US Customs 0925z 'Swordfish 47' wkg 'Shark Zero-3' and 'Oceanside' with details of the target vessel track/speed USB (Collins)

**14391 Unknown QTH Unidentified spy station 1250z Pips, then CW calling 'VA4' sent in 'cut number' form. (Monitored often, at same time on many separate dates) CW (Reakes)

**16590.2 Unknown QTH Unidentified 0635z Yacht positioned Vanderlin Island (in Sir Edward Pellow group) in the Gulf of Carpentaria with phone patch to Townsville discussing personal plans for travel to Indonesia USB (Santos)

**18030 Unknown QTH Unidentified (USAF?) 0612z Number groups repeated twice '53367, 34500, 41611, 67376' spoken with American accent USB (Henry)

**20185 Space Shuttle 'Columbia' (Z time not logged) Wkg Houston during Orbit 65 over South Africa USB (Name withheld)

Well, how was that? You did good, people... keep it up, those were what I consider to be 'quality' loggings. I will continue to be very respectful of contributors like 'Sunset' and 'Name withheld' who do wish to participate and share their loggings but definitely don't wish to be identified!

If you would like to contribute to HF UTILITIES, write to me at PO Box 301, Chester Hill, NSW 2162. Loggings should be in acscending frequency order, that is lowest to highest, with details of frequency, location, station callsign, UTC time, details of traffic heard and the mode of transmission. Please indicate how you want to be credited (if indeed you do wish to be credited for the loggings), and include a stamped self-addressed envelope if you would like a personal reply. For more loggings, catch my monthly column in 'Australian Aviation' magazine. So tune in, and take the plunge into serious utility monitoring.

Russell Bryant checks out the . . .

1991 TANDY SCANNERS

In keeping with its policy of updating or replacing its scanning receivers every 18 months or so, Tandy has released three new models and upgraded the very popular PRO 2005 for 1991.....

The new PRO 2023 is up there with the best and, according to Russell, outperformed only by the 2006.

PRO 2006

To all intents and purposes the PRO 2006 resembles the PRO 2005, both externally and, to a degree, also internally. The difference is the speed at which the PRO 2006 scans and searches for frequencies. Tandy calls the accelerated scanning rate HYPERSCAN. The 2006 moves along at 26 channels per second fast scan and 13 channels slow scan — a vast improvement over the 16/8 channels common to the PRO 2004 and 2005.

Other now well known features of the 2000 series scanners retained in the PRO 2006 are extended frequency coverage 25-520 the 760-1300 MHz, user selectable, wide FM, narrow FM and AM receive modes, superior image rejection due to improved IF filters (around 600 MHz), 400-channel memory capacity, divided into 10 banks of 40 and sound squelch and variable step rates.

With each successive PRO 2000 series scanner, the sensitivity has noticeably improved. The PRO 2004 was considered by some to be relatively deaf, or lacking the ability to draw in signals especially when located some distance from the base, as in country and non-urban areas. The PRO 2005 remedied the problem and the new PRO 2006 is a major leap ahead. I decided to test the old against the new.

Top panel of the PRO 36 contains antenna socket, ear plug, volume and squelch controls.

The test was simple, employ only the aerial supplied, program identical frequencies into the memories and wait. The PRO 2006 on VHF mid and high bands as well VHF AM airband outperformed the 2004 every time. On UHF the 2004 and 2006 were virtually identical and when it came to 800 MHz signals the PRO 2004 wasn't even in the race.

While the PRO 2006 is an improvement over its predecessors the price remains the same as the PRO 2005, retailing for $749.95 and it is arguably the cheapest way to get into super scanning. While on the subject of the 2005/2006, mobile mounting brackets are now available for both units on special order from Tandy for $49.95.

PRO 2023

This mid-range scanner allows you to stay on top of the action, with access to any frequency within the

HF midband 68-88, VHF AM airband
8-136, VHF highband 144-174 and
HF 406-512 MHz. Sixteen of your
vorite frequencies can be
ogrammed into its memory and to
lp prevent the loss of memory
annels a non-volatile back-up
stem is employed.

As always Tandy rates the
nsitivity of its scanners very
nservatively. The handbook quotes
ures varying from .5 microvolt on
HF midband to 2 microvolts on
band. On air the PRO 2023 was up
are with the best, outperformed only
the 2006. Constructed by Uniden
Tandy, the PRO 2023 is similar to
e Bearcat 175 XL.

The PRO 2023 would make an
cellent second set for the shack or
a first time scanner. It is simple to
e, compact (measuring 6.5x24x18
ns) with all the features found on
ore expensive units. Tandy lists the
O 2023 at $299.95.

RO 2025

The PRO 2025 is Tandy's re-
nergence into the mobile scanner
arket. This 16 channel synthesized
obile has a departure from the
rmal band allocations. Tandy has
ted for the VHF low band 29-54
Hz in preference to midband VHF,
herwise the frequency range is VHF
ghband 138-174 MHz and UHF 406-
2 MHz.

The two-segment LED displays only
e channel number, to check the
quency, one press of the REVIEW
tton reveals the entered frequency
git by digit. The compact size of the
25 (45 x 140 x 175mm) lends itself
mounting in the often cramped
aces of today's small cars. The
ority channel feature automatically
ks onto your favorite channel the
oment it becomes active.

The 2025 comes complete with
ounting bracket and DC power cord,
you have to do is supply the car.
ven the fact that the VHF lowband is
under utilised resource in Australia,
e PRO 2025 is still ideal for mobile
rk. Recommended retail is
29.95.

RO 36

Like the 2006, the PRO 36 is more
upgrade of a previous model.
placing the PRO 33, the 36 has the
ded feature of the AM VHF airband.
equencies from 108-136 can now
programmed into any of its 20
emories.

The PRO 36 provides access to
nergency service transmissions
ile on the go. To help preserve
ttery power when operating mobile,
e PRO 36 has a Battery Saving
cuit built in. If no activity is heard
ter a predetermined time, the radio
uts off until a transmission is

The low cost ($229.95) PRO 2025 is ideal for mobile operation.

Features of the PRO 36 include low battery indicator, two-way direct search, back-lighted LCD, two second delay plus all the usual bands such as VHF mid and high, plus UHF.

detected at which stage the PRO 36 reactivates itself.

Styling of the PRO 36 is in keeping with the PRO 34 and the PRO 33. A BNC socket makes the connection of an external antenna simple while operation of the PRO 36 is identical to all other PRO handhelds with the exception of the PRO 38. Other features include low battery indicator, two-way direct search, back lighted LCD, two-second delay plus all the usual bands such as VHF mid and high bands and UHF.

The PRO 36 is priced at $379.95 from all Tandy stores and dealers.

If you haven't already obtained your copy of the Tandy catalogue for 1991, zip down to your local store and check out the new scanners and accessories for 1991 while you are there.

New PRO 2006 resembles the 2005 but introduces the accelerated scanning technique 'hyperscan' — 26 channels per second on fast scan and 13 on slow.

PART FIVE

SPECIFICATIONS What do they mean?

By Ken Reynolds

(Powerband Communications)

I have carried over the series on specifications for one more issue in order to reply to a few letters inquiring further about some of the points raised during this series of articles.

The first question comes from a New Zealand reader who asks: "Why is single sideband better for working skip ? I know SSB has a bit more power and I hear plenty of sideband skip, but I never hear any on AM...why not ?"

This is an interesting question and one deserving an answer. You only think you don't hear any 'skip' on the AM channels. When a radio signal is launched into space from your antenna — whether it be SSB or AM — the exact same laws of physics act on the signals in the very same way. That is, if the prevailing ionospheric conditions are conducive for the 'skip' phenomenon to exist, it makes no difference to nature whether you use SSB, AM, FM, FSK or even PCM, all the signals on the same frequency will take part in the long range propagation effect.

It is not that AM signals are any less subject to 'skip' conditions, it is more the way the signals are processed that produces the problem. For example, if you could clear all the stations from a nominated channel and leave only a single AM station transmitting at its normal power level, under the right conditions the signal can 'skip' right round the world so that an independent listener might actually hear the direct signal and an echo delayed by the length of time it takes for the signal to propagate the entire distance around the globe. A sideband signal would of course achieve the same result but would probably do it better because of its higher effective power content.

It is only when a second AM station simultaneously transmits on the same channel that the whole argument comes unstuck.

If both AM stations were exactly on the same frequency — to the very Hertz (cycle per second) — it would be possible to hear both sets of modulation just like on SSB when more than one station is transmitting at the same time. AM rigs, however, are usually not too slick at being exactly on frequency and so the rot sets in and the listener hears a 'howling' sound emanating from the speaker instead of the desired modulation. Add to this a few more AM stations, also a bit off frequency, and pretty soon all you can hear is a cacophany of tweeting, howling and squealing. This effect is known as Heterodyning, a term we encountered in Specs Part Three back in the 1990, September/October issue of CBA.

For the reason SSB signals do not suffer from the heterodyne problem we go back to Specs Part Two where we looked at the construction of a single sideband signal. If we bring together a few facts from both CBA issues it is possible to see why AM signals come a poor second to SSB in the race for long distance 'skip'.

If you remember, both AM and SSB signals begin life in much the same way. Two or more RF signals are generated and then mixed (heterodyned) together to produce new frequencies that are far enough apart in frequency so that the desired signal can be isolated easily and the remaining frequencies are filtered out and discarded. To achieve this, the original frequencies are usually Megahertz away from each other and so the resultant mixing products are also separated by Megahertz.

When we modulate the RF carrier wave to produce Amplitude Modulation — or FM, FSK or PCM for that matter — we produce a total signal in which the sidebands carry the modulation information separately from th carrier wave but still all tied in togethe It is this superfluous RF carrier wav that is the cause of our concern.

In the SSB mode, after generatir the composite signal we stripped awa the RF carrier and one sideband (upp or lower) leaving only the desired sing sideband. So when we listen to a SS signal on an AM receiver all we hear little bursts of fuzzy noise which th simpler processing in an AM receiver unable to reconstruct properly. A SS receiver on the other hand re-inser the missing RF carrier wave during th signal processing to achieve proper d modulation of the transmitted signal

What happens with AM signals this. While the signals from various st tions on the same channel travel ind pendently from each other, the m ment they enter a superheterodyr receiver they become part of the he erodyne process. In other words th are subjected — along with the inte nally generated signals — to the F mixing processes where all the existir frequencies are combined with ea other to produce many new freque cies (heterodynes), most of which a undesirable. As the signals combi the resulting new frequencies, as y will remember, are equal to the su and the difference of all the individu frequencies that exist together in t circuitry.

When two RF carrier waves that a a little different in frequency from ea other enter the circuitry together - e.g. 1000Hz apart — as they mix t gether they will produce a sum sigr and a difference signal like any oth mixed frequencies. If they are 27MH signals the sum will be around 54MH while the difference signal will be a or kilohertz signal smack in the middle the audio frequency range which tran lates directly as a 1000 cycle to

ard through the receiver's loud-eaker.

Add to this another handful of sta-ns on the same channel and the re-lt is quite an audio frequency mess here all trace of the original modula-n impressed on any of the signals is ll beyond resolution. This is the ef-ct encountered in your local area un-r normal propagation conditions and usually means that the very strongest gnal can win out by sheer brute force.

Imagine what happens when skip nditions are in operation. Chances e that you are hearing the terodyning of hundreds of stations at might be thousands of kilometres ay combined with the local dirge as ll.

Because the RF carrier wave has en removed in the single sideband neration process, this desperate sit-tion never occurs and no matter how any stations might occupy the same annel, the receiver only reinjects the e RF carrier wave for all the signals d thus avoids the problem almost en-ly. The carrier insertion frequency is ntrolled by the Clarifier which allows e operator to fine tune the recovered dio signal for the most suitable und.

All RF signals of similar frequency n 'skip' as well as each other it's just at sometimes you can't hear the lldust for the bulldust.

HY IS IT SO ?

Peter from Middle Park in Melbourne has checked the specs of his two UHF rigs and reckons they appear very similar from both manufacturers and he wants to know why he frequently hears a Taxi service on all 40 channels on one rig but never hears it on the other. He also suffers a similar problem with his scanner. The interference always occurs at the same time on the CB and the scanner but he hears different signals.

This is a bit of a curly one to cover in brief but the effect is generally related to the way in which a receiver a handles a signal that is so strong it overloads (over powers) the out of band rejection circuitry.

Specifications are very handy to get an idea of the performance of a system, in this case three receivers. The most important parameters are supplied as a matter of course in each case but there are various conditions the manufacturer prefers to leave untouched or doesn't foresee. The rigs are designed to cope with most reasonable conditions encountered during normal operating situations...with the exception of a few extreme cases that Peter seems to be experiencing.

Sometimes these interfering signals are so strong that they just burst right through and appear over the top of everything else while at other times they are the result of heterodynes and the mixing effect.

Again...?

For example, a very strong signal might get straight into the demodulation stage of a receiver and sort of shortcut a few processes to appear directly in the loudspeaker. Some signals can at times drive the audio amplifier so hard that they cause a type of demodulation to occur almost at the speaker itself. This is typical of the effect experienced by your neighbors when your CB signal comes roaring through their TV, stereo, clock radio or VCR.

Peter's problems are more likely mixing problems where a quite strong signal outside the citizens band — probably the Taxi service base station — sneaks around the built-in safeguards in his receivers and becomes part of the mixing process. Once the rogue signal gets into the system the receiver is unable to discriminate between the right and wrong mixed signals and it will process them all in the best way it can. This new signal may allow the receiver to now tune-in other out-of-band signals that are strong enough to be within the range of the quite broad 'front end' filtering of his UHF rigs. Many scanners are perfect targets for overload signals because by necessity they have quite wide filtering characteristics to accommodate their huge tuning ranges.

The one rig that does not suffer from the interference problem probably has better safeguards to prevent the incursion of strong out-of-band RF fields or it may use different internal oscillator arrangement that makes it less prone to this type of problem.

NOTE: Skip conditions are virtually the same from Sydney as they are for all other East Coast areas — likewise Perth predictions can be taken as similar to those for other West Coast areas.

```
DATE          JANUARY  1991                                  ADDRESS NO. 8303

SYDNEY-JAPAN                 7825
27.0 FMMMMMMF%%%%FF%%..       %%F
   MHZ !     !     !     !     !
      00    06    12    18    24

SYDNEY-C&E.COAST USA        15712
27.0 %.              ..    ..%%%%
   MHZ !     !     !     !     !
      00    06    12    18    24

SYDNEY-NORTH AFRICA         17109
27.0         %........
   MHZ !     !     !     !     !
      00    06    12    18    24

SYDNEY-ENGLAND LR           23031
27.0             ...
   MHZ !     !     !     !     !
      00    06    12    18    24

PERTH-CENTRAL EUROPE        13575
27.0         %%%%%%....
   MHZ !     !     !     !     !
      00    06    12    18    24

PERTH-WEST INDIES           18005
27.0  ....
   MHZ !     !     !     !     !
      00    06    12    18    24

PERTH-NEW ZEALAND            3255
27.0 ....                       .
   MHZ !     !     !     !     !
      00    06    12    18    24

PERTH-WEST AFRICA LR        26220
27.0 ...%.     ........       ...
   MHZ !     !     !     !     !
      00    06    12    18    24

ADELAIDE-P.N.G.              2960
27.0 .%%%%%%%.........        ...
   MHZ !     !     !     !     !
      00    06    12    18    24

SYDNEY-MIDDLE EAST          12903
27.0    %%%%%..........
   MHZ !     !     !     !     !
      00    06    12    18    24

SYDNEY-WEST COAST USA       11951
27.0 MMM% .               . %MMMMM
   MHZ !     !     !     !     !
      00    06    12    18    24

SYDNEY-PAPUA NEW GUINEA      2740
27.0 .%%%%%%..........        ...
   MHZ !     !     !     !     !
      00    06    12    18    24

SYDNEY-WEST AFRICA LR       23596
27.0 %%%%.      ..%%%%%.. ..%%%%
   MHZ !     !     !     !     !
      00    06    12    18    24

PERTH-SOUTH AFRICA           8315
27.0        ...
   MHZ !     !     !     !     !
      00    06    12    18    24

PERTH-SOUTH AMERICA         14569
27.0
   MHZ !     !     !     !     !
      00    06    12    18    24

PERTH-ENGLAND SR            14480
27.0          %%%%%.....
   MHZ !     !     !     !     !
      00    06    12    18    24

MELBOURNE-P.N.G.             3157
27.0 .%%%%%%%.........       ....
   MHZ !     !     !     !     !
      00    06    12    18    24

BRISBANE-NEW ZEALAND         2506
27.0 .....                   ....
   MHZ !     !     !     !     !
      00    06    12    18    24

SYDNEY-CENTRAL EUROPE       16090
27.0          %%.....%.
   MHZ !     !     !     !     !
      00    06    12    18    24

SYDNEY-WEST INDIES          14950
27.0 %%%....           ..   ..%%%
   MHZ !     !     !     !     !
      00    06    12    18    24

SYDNEY-ENGLAND SR           16993
27.0           .%.....%%.
   MHZ !     !     !     !     !
      00    06    12    18    24

PERTH-JAPAN                  7923
27.0 %%FFMMMMMF%%%%F%%..      .%%
   MHZ !     !     !     !     !
      00    06    12    18    24

PERTH-C&E.COAST USA         18614
27.0 ..                ...    ...
   MHZ !     !     !     !     !
      00    06    12    18    24

PERTH-NORTH AFRICA          13941
27.0          %%......
   MHZ !     !     !     !     !
      00    06    12    18    24

PERTH-WEST AFRICA SR        13804
27.0    ..    ...
   MHZ !     !     !     !     !
      00    06    12    18    24

BRISBANE-P.N.G.              2090
27.0    ..%...         ..
   MHZ !     !     !     !     !
      00    06    12    18    24

ADELAIDE-NEW ZEALAND         3214
27.0 ............            ....
   MHZ !     !     !     !     !
      00    06    12    18    24

SYDNEY-SOUTH AFRICA         11036
27.0      .........
   MHZ !     !     !     !     !
      00    06    12    18    24

SYDNEY-SOUTH AMERICA        13180
27.0 .......      .         .....
   MHZ !     !     !     !     !
      00    06    12    18    24

SYDNEY-WEST AFRICA SR       16428
27.0  ..
   MHZ !     !     !     !     !
      00    06    12    18    24

PERTH-MIDDLE EAST           10077
27.0    %%FMM%%%%%%.....
   MHZ !     !     !     !     !
      00    06    12    18    24

PERTH-WEST COAST USA        14743
27.0 ..%%.                    ...
   MHZ !     !     !     !     !
      00    06    12    18    24

PERTH-PAPUA NEW GUINEA       4073
27.0     .
   MHZ !     !     !     !     !
      00    06    12    18    24

PERTH-ENGLAND LR            25544
27.0
   MHZ !     !     !     !     !
      00    06    12    18    24

HOBART-PAPUA NEW GUINEA      3711
27.0 %%%%%%%%......%..      ....%
   MHZ !     !     !     !     !
      00    06    12    18    24

DARWIN-NEW ZEALAND           5321
27.0 .........   ..           ...
   MHZ !     !     !     !     !
      00    06    12    18    24
```

These GRAFEX style predictions present in pictorial form the expected HF propagation nditions between Australia and a number of important DX areas. For each circuit, the East" terminal refers to the eastern half of Australia. The horizontal axis of each graph presents the hours of the day in Greenwich Mean Time from 0000 hours to 2300, ading left to right. The vertical axis represents increasing frequency.

A GRAFEX symbol represents the predicted propagation conditions for a particular equency at a particular time. The meaning of each symbol used is given in the key on the xt page. The letter "F" designates the best conditions for HF communications.

Grafex prediction charts supplied courtesy of the Ionospheric Prediction ervice, 162-166 Goulburn Street, Darlinghurst, NSW.IPS offers pre-recorded lephone information. To access the service, please phone (02) 269 8614.

LEGEND TO GRAFEX SYMBOLS

- . Propagation is possible but probably on less than 50% of the days of the month.
- % Propagation is possible on between 50% and 90% of the days of the month.
- 'F' Propagation is possible by the First F modes on at least 90% of the days of the month.
- 'E' Propagation is possible by the E modes on at least 90% of the days of the month.
- 'M' Propagation is possible by both the First and Second F modes on 90% of the days of the month.
- 'S' Propagation is possible by the Second F mode on 90% of the days of the month.
- 'A' High absorption — above the ALF but probably too close to it for good HF communication.
- 'X' Complex mixture of modes including the Second E mode.

```
DATE          FEBRUARY  1991                                 ADDRESS NO. 8303

SYDNEY-AUCKLAND              2157
27.0 .......                 ....
   MHZ !     !     !     !     !
      00    06    12    18    24

SYDNEY-LONDON LR            23031
27.0             ..           .
   MHZ !     !     !     !     !
      00    06    12    18    24

SYDNEY-SAN FRANCISCO        11951
27.0 MMMSSM%..             %MMMMM
   MHZ !     !     !     !     !
      00    06    12    18    24

SYDNEY-HONOLULU              8167
27.0 %%%%M%%%%.....         .%%%%
   MHZ !     !     !     !     !
      00    06    12    18    24

TOKYO-SYDNEY                 7825
27.0 MMMMMMMMMMMFFFFFF%%.     MMM
   MHZ !     !     !     !     !
      00    06    12    18    24

SYDNEY-NEW YORK SR          15988
27.0 F%               %.   .%%FFF
   MHZ !     !     !     !     !
      00    06    12    18    24

BERLIN-PERTH SR             13575
27.0        %FF%%%%%....
   MHZ !     !     !     !     !
      00    06    12    18    24

NORTH AFRICA-SYDNEY         17109
27.0        %%%%%..  .
   MHZ !     !     !     !     !
      00    06    12    18    24

NORTH AFRICA-PERTH          13941
27.0        %%%%%%%..
   MHZ !     !     !     !     !
      00    06    12    18    24

SYDNEY-MACQUARIE ISLAND      2373
27.0    .
   MHZ !     !     !     !     !
      00    06    12    18    24

JOHANNESBURG-SYDNEY         11036
27.0       .....%%..
   MHZ !     !     !     !     !
      00    06    12    18    24

CAIRO-SYDNEY                14411
27.0 .    .%%%%%%..           ...
   MHZ !     !     !     !     !
      00    06    12    18    24

JOHANNESBURG-PERTH           8315
27.0       ..........
   MHZ !     !     !     !     !
      00    06    12    18    24

LONDON-PERTH SR             14480
27.0         %F%%%%%....
   MHZ !     !     !     !     !
      00    06    12    18    24

SYDNEY-BOLIVIA              13180
27.0 .......%.              .....
   MHZ !     !     !     !     !
      00    06    12    18    24

SYDNEY-WASHINGTON DC SR     15712
27.0 F%.              %.   .%%FFF
   MHZ !     !     !     !     !
      00    06    12    18    24

PERTH-WASHINGTON DC SR      18614
27.0 %%                ....   .%%
   MHZ !     !     !     !     !
      00    06    12    18    24

SYDNEY-KINGSTON             14950
27.0 %%%%%%%.          ..  .%%%%%
   MHZ !     !     !     !     !
      00    06    12    18    24

PORT MORESBY-SYDNEY          2740
27.0 %%FF%%%%%%.......       .%%%
   MHZ !     !     !     !     !
      00    06    12    18    24

SYDNEY-MONTREAL SR          26029
27.0 F%                ..  .%%FFF
   MHZ !     !     !     !     !
      00    06    12    18    24

PERTH-SAN FRANCISCO         14743
27.0 %%%%%.                   .%%
   MHZ !     !     !     !     !
      00    06    12    18    24

TEHRAN-SYDNEY               12903
27.0    %%%%%%%%%......
   MHZ !     !     !     !     !
      00    06    12    18    24

PERTH-LONDON LR             25544
27.0             ..
   MHZ !     !     !     !     !
      00    06    12    18    24

BERLIN-SYDNEY SR            16090
27.0        %%%%%......
   MHZ !     !     !     !     !
      00    06    12    18    24

WEST AFRICA-SYDNEY SR       16428
27.0 ...      ......           ..
   MHZ !     !     !     !     !
      00    06    12    18    24

WEST AFRICA-PERTH SR        13804
27.0 ....   ..%%%..
   MHZ !     !     !     !     !
      00    06    12    18    24

TEHRAN-PERTH                10077
27.0    FMMMMMM%%%%%....
   MHZ !     !     !     !     !
      00    06    12    18    24

LONDON-SYDNEY SR            16993
27.0          %%%%.......
   MHZ !     !     !     !     !
      00    06    12    18    24

SYDNEY-RIO DE JANEIRO       13518
27.0 .......  ..             ....
   MHZ !     !     !     !     !
      00    06    12    18    24

MONTREAL-SYDNEY LR          23995
27.0                           ..
   MHZ !     !     !     !     !
      00    06    12    18    24

MOSCOW-SYDNEY SR            14494
27.0      %FF%%%%.....
   MHZ !     !     !     !     !
      00    06    12    18    24

PERTH-TOKYO                  7923
27.0 MMMMMMMMMMMMMFFFFF%..    ..M
   MHZ !     !     !     !     !
      00    06    12    18    24

PERTH-BOLIVIA               14569
27.0  .  ....  ...
   MHZ !     !     !     !     !
      00    06    12    18    24

SYDNEY-WEST AFRICA LR       23596
27.0 FFFF%.  .%%%%%%%..   %FFFF
   MHZ !     !     !     !     !
      00    06    12    18    24

PERTH-WEST AFRICA LR        26220
27.0 %%%%%.  .%%.... .       ..%
   MHZ !     !     !     !     !
      00    06    12    18    24

PERTH-KINGSTON              18005
27.0 ........                  ..
   MHZ !     !     !     !     !
      00    06    12    18    24
```

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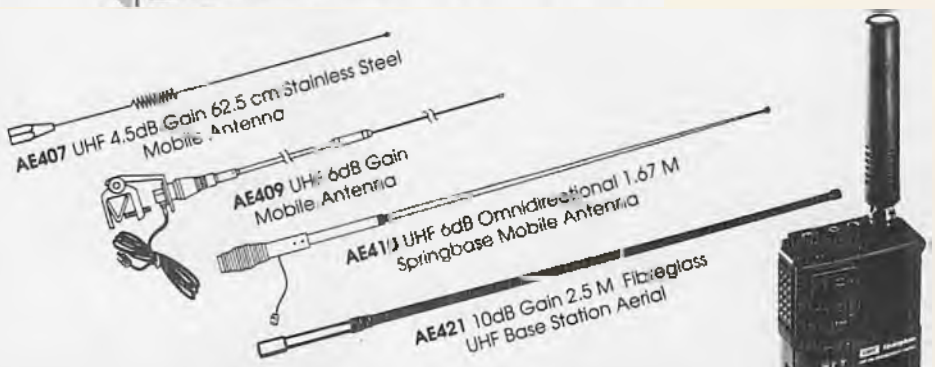
  —**Group Scanning**
  —**Open Channel Scanning**
- Memory Protection Circuit
- Hi Intensity L.E.D. Display with Dimmer Control
- Sel-Call Option



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REGULATED POWER SUPPLIES

240V AC TO 13.8V DC
PSA123 3 AMP
PSA126 6 AMP
PSA1210 10 AMP
PSA1225 25 AMP

REGULATED VOLTAGE REDUCERS

24V DC to 13.8V DC

VR1-3 3 AMP	VR5-30 30 AMP
VR2-5 5 AMP	VR7-280 20 AMP
VR3-10 10 AMP	VR8-410 30 AMP
VR4-20 20 AMP	Single & Multi Circuit

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DX INTERNATIONAL

WHAT'S BEING HEARD ON THE DX CHANNELS — JACK-67-W-07

By the time this magazine hits the stands Christmas will nearly be with once again with the new year just around the corner. During 1990 we tnessed many important changes in our world. A few months back one ould have laughed at the thought of a united Germany, and one would have ver entertained the thought of Iraq invading neighboring Kuwait.

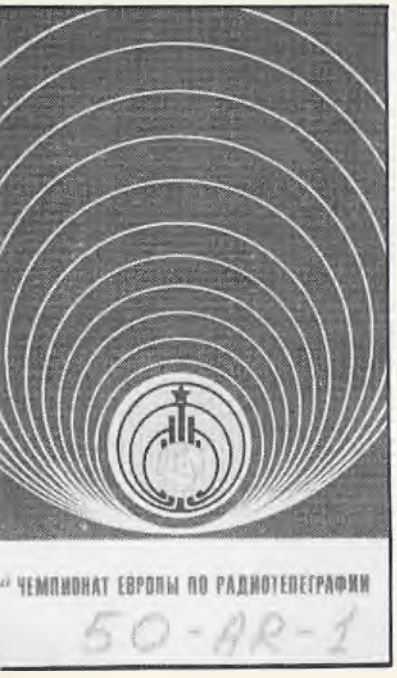
All these events have affected our hob- of radio and DXing as from 4 October, 90, East Germany ceased to be a DXCC untry and the majority of 11 metre band well as amateur band activity from Ku- it has now disappeared for the time ng.

More and more activity from the coun- s of eastern Europe has also been not- on the band, and as political and social orms take place in the USSR we are w hearing an abundance of stations on 11-metre band. Previously these were are catch for the DXer but were quite mmon on the 10-metre amateur band. Conditions on the band have been ex- lent recently with only the odd day or o of poor openings putting a damper on ngs. Now is the time to get cracking and ase those new countries before sunspot cle 22 begins its decline.

FRICAN & INDIAN CEAN REGIONS

The band to this part of the world has en opening favorably in recent weeks h excellent signals to match. The best e to look for this region is from mid- ernoon via the shortpath.

n, the 50-AR-01 is one of the most pular DXers from the USSR. He uses a ge seven element beam from his ation just north of Moscow.



Madagascar appeared briefly on the band by way of Charlie who was signing as the 188-AT-101. Charlie was heard at 0003z with a fair five by three report.

Quite a number of European stations were heard at 0649z chasing a station in Uganda signing as 174-WR-01 with a poor four by one signal in eastern Australia. Then I noted 164-VC from Togo in West Africa at 0659z with a barely readable signal, but he had no shortage of European stations calling him.

Tanzania is still about and at 0729z I logged 95-CD-56 operated by Silvio on the band. Silvio was a fair five by two report here and again the Europeans were in hot pursuit.

The Republic of Namibia has been appearing when the band is open to South Africa and at 0516z I noted Kevin who signs as the 74-AT-102 with a good five by five signal report.

The Canary Islands has been present by way of both the longpath and shortpath openings and at 0230z on the longpath I heard the 34-AT-140. He was a five by six at the time and was calling for Asian stations only.

There are a number of stations from South Africa about and at 0511z I logged Peter who signs as the 44-AT-123. Peter was a good five by eight, peaking nine, and was closely followed by 44-AT-169 — also in South Africa.

ReUnion Island is still about and at 0518z I noted Eric the 168-ICA-01 on the band. Eric was a strong five by nine plus 20DB and was closely followed by Jean-Paul who signs as 173-AT-106. Jean-Paul was five by eight at 0536z. Beware when QSLing to this region as their reputations for replying to cards is not that good.

MIDDLE EAST & ARABIA

The band openings to this region are not the same, now our friends in Kuwait are no longer about.

Qater is still about the band and at 0310z I heard Kahlid on the band signing as 115-NE-102. Kahlid was a good five by nine plus 20DB and was busy working Australian stations.

The United Arab Emirates has been making the odd appearance on the band by way of the 94-SK-102. He was heard at 0411z with a poor four by two report.

At 0853z I picked up quite a faint signal from Saudi Arabia signing as the 48-AT-103. He was busy working the Europeans at the time and advised that his QSL Manager was 1-AT-467 in Italy.

Israel was represented on the band at 0739z by way of Matti who was signing as the 97-AT-101. Matti was five by two at the time and was looking for stations in the Pacific Islands.

Ali, the 1-PW-207 from Lebanon, was logged at 0613z with a good five by three report and had no shortage of takers to his calls.

Plenty of activity from Turkey has been observed with an impressive signal coming from 116-AS operated by Murat from Izmir in south west Turkey. Murat was a good five by nine steady at 0709z and was keen to work into the Pacific region. Also from Turkey 116-AT-102 operated by Zafer and at 0931z was a good five by seven from his city of Samzun on the Black Sea.

At 1000z I heard a pile up of Europeans calling a station in Algeria (callsign unknown). There were so many calling I failed to hear any trace of the Algerian station.

EUROPE

Eastern Europe and the USSR has taken out the "Flavor of the Month" award. More and more stations are appearing on the band from these countries, adding a new thrill to the DX chase on the band.

One of the most popular stations out of the USSR would be Ken who signs as the 50-AR-01 from his home just north of Moscow. Ken was an impressive five by nine at 0846z and had a pile up on his hands at the time.

Apparently some stations in the Soviet Union have formed their own DX club on 11 meters and use a country number followed by the letters "SU" (which mean Soviet Union). AT 0817z I logged Igor who signs as 50-SU-001 on the band and Igor was a good five by five. He was closely followed by Jack who is the 50-SU-478 and at 0856z Jack was a good five by eight signal.

Alex, the 50-AT-103, has been most active on the band and at 0710z was five by six. Later in the evening I heard 50-AT-101 operated by Anatol from Magnitogorsk. Anatol was a reasonable five by three at the time and he too was working a large pile up of stations — mostly from Europe.

Vladimir, the 50-AT-105, was noticed on the band at 0911z and was a good five by seven with the signal holding well for nearly one hour with minimum fading.

An interesting one to look for is the 316-AT-101 operated by Varcia in Uzbekistan in the USSR. Varcia was logged working a huge pile up at 1128z and was a just readable four by two. QSL cards go via 1-AT-343 in Italy.

Another one worth searching for is the 312-SR-103 operated by Alex in Kazakhistan in the USSR. Alex, who is also the 308-AT-102, was a very poor four by one at 1245z and was having quite a problem controlling the pile up of western Europeans calling him. Those in the Pacific region had no chance at all of breaking through.

At 1225z I heard a good five by five signal coming from Anatol, who signs as the 317-AT-101 in White Russia. Anatol, with his impeccable English, had no trouble at all controlling the large pile up of Europeans and was working them at a very steady pace at the time. Again, those

DX INTERNATIONAL
(Continued)

in the Pacific region had litle hope of getting through as he was giving the Europeans consistent five nine plus reports.

Increased activity has been noted from Poland with Andreas, who signs as the "AQF", being popular on the band. At 1108z Andreas was a fair five by two report from his home in Lukow which is south east of Warsaw.

Also from Poland, I logged QS-100 operated by Wojtek and at 1216z Wojtek was a steady five by five report from his home in Ostroleka which is north of Warsaw. At 1235z I heard a station signing as the NP-05 from norther Poland he was a good five by seven peaking nine.

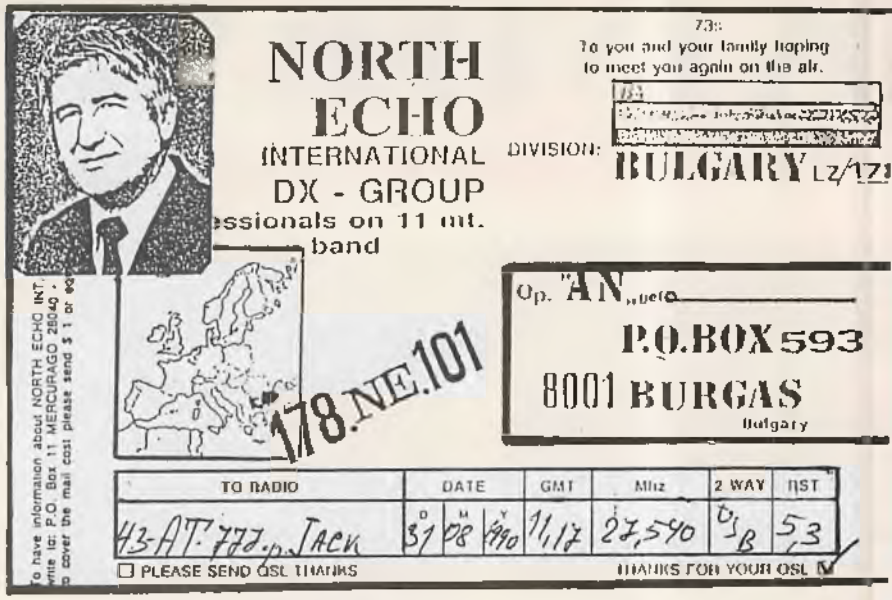
Czechoslovakia has also been observed on the band by way of Igor who signs as CL-BB-14. Igor was heard at 1038z with a fair five by two report.

Hungary is still about and at 1118z I logged old regular DXer, George, who signs as the 109-AT-108. George was a good clear five by six and was busy looking about for a new country.

A variety of stations from Yugoslavia have been about for the taking and at 0945z I heard Zivko the 1-KL-001 on the band with a good five by nine signal report.

Monaco has been about with Alain, who signs as the 107-AT-102, being most active. At 1000z Alain was a good five by seven report peaking at nine.

Corsica was noted on the band at 1247z by way of Dominique who is the



Bulgaria is still one of the most wanted countries on the 11 metre band but An, who signs as the 178-NE-101, presents a fair chance for most of us to have a crack at a rare one.

104-AT-112. Dominique was a very steady five by eight and was looking for stations in the Pacific region.

Kefalonia Island in Greece was heard at 0900z by way of Leonardis, who operates as the 18-AT-134. Leonardis was a good five by nine and his signal held well for some time before fading out.

Jersey Island was also heard by way of John who was signing as the 167-WR-01. John was busy chasing other WR members for contest points and at 0923z was a good five by five signal.

A rather poor signal from Andorra was noticed at 1255z by way of a station signing as 51-AT-104. The band was not too good and he soon faded out.

Luxembourg still proves to be quite popular with DXers. A few Australian stations have been chasing Chris, the 54-AT-106. At 1116z Chris was a good five by nine and had quite a few callers from this part of the world.

Cyprus was heard on the band at 0515z by way of John who signs as the 110-AT-177. John was a good five by five at the time and was busy working Australia and the Pacific region.

The majority of East German stations are being absorbed in to the 13-AT Division as the 42-AT Division is defunct from 4 October. For those of you who worked East Germany prior to 4 October, it still counts as a DXCC country. After 4 October it just counts as Germany (13-at).

CENTRAL/SOUTH AMERICA & THE CARIBBEAN

Outstanding propagation conditions to this area means quite a few new countries can be worked.

Uruguay has been quite noticeable on the band with some very good signals. At 0551z I logged 12-AT-171 operated by Gustavo in Paysandu in western Uruguay. Gustavo was five by six and eager to work Australia and the Pacific region.

Increased activity from French Guyana has been noticeable recently with LA-09, operated by Jean, the most popular. A 0105z Jean was give by eight peaking nine.

A good signal from Curacao in the Netherlands Antilles belongs to Rafael who signs as the 7-AT-103. At 2143z Rafael was a good five by six peaking nine a times.

Central American DX signals have been strong in past weeks with signals well into the red on the meter. One big signal I came across belonged to Ernesto, who signs as the 53-AT-103 from San Salvador the capital of El Salvador. Ernesto was five by eight at 0128z.

Nicaragua is still about. At 2210z I logged a good five by seven signal from station signing as 126-SR-101 operating from the capital of Managua. You may need a little basic Spanish to be sure of a good contact.

There are some big signals out of Costa Rica and at 0513z I noticed Marco the 69-AT-108 pushing my signal meter up to 30DB over nine. I do not know what Marco is using but he is seldom under strength nine.

ASIA & THE PACIFIC REGION

Sakhalin Island seems to be getting quite a bit of airing lately. Regular station 303-SR-02, operated by Ken, was logged at 0706z with a five by nine report. Ken was closley followed by Ron, also on Sakhalin Island. Ron, who signs as 26-FT-01 was logged at 0758z and was five by seven at the time.

Thailand can still be secured on the band. At 0746z I heard Charty, who signs as SK-03, with a good five by nine signal. Charty was on study leave in the village of Songkhla in southern Thailand on the Gulf of Thailand. At 0909z I heard another Thailand station and it was 153-SR-01 who was five by five at the time.

Pakistan was noted briefly on the band at 1148z by way of 114-AT-105, name unknown. The signal was barely audible but a number of Europeans quickly caught the scent and kept the chase going.

At 0515z I noticed a good five by nine signal from TW-231 operated by James in Taiwan. James was enjoying himself practising his English with stations in Australia and the Pacific. Also from Taiwan is San

ho signs as the TW-200, and at 1235z
was a reasonable five by five report.
am was followed by a station signing as
55-EG-001, also in Taiwan, who was
/e by seven.
The Republic of Vanuatu has been
lout for those who need it. At 0532z I
gged ING-777 operated by Colen from
rt Villa. Colen was a very strong five by
ne plus 10DB and had a pile up of Austra-
n DXers wishing a contact.
A big signal from Seward on the Pacific
ast of Alaska belongs to Rich, who
gns as the 33-AT-101. At 0140z Rich
as five by nine plus 20DB and the signal
ld quite well.
Nauru Island has been about occasions
way of Jack, the 271-NI-01. Jack was
e by six at 0230z and plans to put up a
e element beam to enhance the signal
d cut out some of the noise from Asia.

XPEDITION NEWS

Roberto, the 83-AT-101 from Tanza-
, launched an operation into Zambia and
as heard on 12 September with a barely
rdable signal. If you were lucky, cards
to 1-AT-502 in Sicily.
Some say they worked it, others say
ey didn't hear it at all. That was the
pedition to Kirghizistan in the USSR
ning as 309-AT-0. It was supposed to
/e appeared on 19 and 20 September.
The Gambia was supposed to have
en activated during September and was
have signed 118-AT-0 but it failed to
pear. No excuse has been given as yet.
East Germany was activated on numer-
s occasions by West German stations in
days leading up to reunification. At
45z on 22 September I logged 13-AT-
7/46-At operated by Joey. He was five
six at the time and QSL cards go to his
ne address. AT 1117z I noticed 13-
-248/46-AT operated by Udo. Udo
s five by nine and QSL cards go to his
ne address.
Still on the East German bandwagon
ne Thomas, who signed as 46-YB-0,
d at 1056z on 23 September Thomas
s a good five by five peaking seven at
es. QSL cards go to 13-AT-135 with
rn postage and progressive number.
The planned DXpedition to Bulgaria and
mania, signing as 178-AT-0 and 233-
-0 respectively, failed to appear as
nned for 25 September and 3 and 4
tober respectively. The operation was
celled due to financial problems which
s a pity as many needed these two.
The Club Station in Luxembourg was
posed to have appeared as 54-AT-
) on 6 October, I failed to hear any trace
this scheduled operation. If you were
y enough then cards go to 54-AT-111
h the usual trimmings.
Sakhalin Island appeared by way of a
pedition on 6 October and signed as
3-OP-0. Operated by Bob, his signal
s a good five by six at 0520z and held
I for some time. QSL cards, with pro-
ssive numbers go to 19-AT-102 with
usual trimmings to ensure a quick
y.
A DXpedition to the Soviet Ukraine was
eduled for early October and was to
as 304-SR-0. I failed to hear this one
if you were lucky then QSL cards go to
R-220 in Italy.
One pile up pursued a station signing as
RN-0, which was supposedly in Mon-
a. However, after some quick conferral
a couple of Europe's leading DXers, it
decided that this one was a slim. For
record, it was heard on 6 October at

ABOVE: If you haven't worked Kuwait yet I wouldn't hold my breath, likewise if you're still hoping for a QSL card from that part of the world. One can but hope that Mohamed, the 1-KA-06 is still alive and well.

BELOW: This is a special card from a unified Germany, now known as the Federal State of Germany...the card comes from Andrea who signs as the 13-AT-227.

1022z with a good steady five by five signal report.
Israel was activated by Yusef signing as 4YZ-M-0 and was noted on the band at 0815z with a poor four by one signal on 11 October QSL route unknown.
Poland appeared on the band by way of 161-VC-0 and was heard at 1100z on 15 October. Signals were good and he peaked five by nine at times. QSL route via 1-AT-876 (AT members only).
Prominent DXers from Ecuador plan to scale the 6,310-metre high Mount Chimborazo in Equador on 2 and 3 November an establish a station to sign as 61-SK-0 at 5,000 metres. QSL route not know to date.
Sable Island should have appeared on 7 to 9 November. QSL route for 277-AT-0 wil be announced on air.
A much sought after DXpedition to Crete should also have appeared from 9 to 11 November and will be signing as 99-AT-QSV9. QSL route is via 18-AT-104, with the usual trimmings.
Monaco was scheduled to appear in the period 19 to 21 October and should have signed as 107-AT-0. If you were lucky then cards go via 14-AT-375 or 1-AT-316 with the usual formalities.
Have a safe and pleasant festive season. Thanks to all who kept me informed during 1990. See you next year.

AUSTRALIAN UHF CB REPEATER LIST

ACT

Canberra	2/32
Canberra	8/38

New South Wales

Albury	6/36
Armidale	4/34
Barraba	6/36
Bathurst	8/38
Bega	6/36
Belbora	1/31
Binya	3/33
Blue Mountains	2/32
Bombala	8/38
Booral	7/37
Bowral	6/36
Braidwood	3/33
Brewarrina	1/31
Brindabella Ranges	7/37
Broken Hill	4/34
Broken Hill	7/37
Buladelah	7/37
Casino	6/36
Cobar	8/38
Coffs Harbour	6/36
Cootah	6/36
Cooma	4/34
Coonabarabran	4/34
Corowa	2/32
Corowa	5/35
Corwa	7/37
Deepwater	5/35
Deniliquin	1/31
Dungog	3/33
Eden	2/32
Glen Innes	7/37
Gralton	8/38
Grenfell	1/31
Gundagai	7/37
Gunnedah	2/32
Guyra	1/31
Warden	1/31
Hay	4/34
Inverell	2/32
Jindabyne	1/31
Junee	5/35
Lismore	2/32
Manilla	3/33
Murrirundi	3/33
Muswellbrook	4/34
Narrabri	2/32
Narranderra	8/38
Narromine	5/35
Narromine	6/36
Newcastle	1/31
Newcastle	2/32
Newcastle	5/35
Newcastle	6/36
Nundle	7/37
Orange	3/33
Port Macquarie	2/32
Sydney (south)	1/31
Sydney (west)	3/33
Sydney (outer-west)	4/34
Sydney (north)	7/37
Tamworth	4/34
Tenterfield	3/33
Tumbarumba	3/33
Tumut	6/36
Tweeds Heads	4/34
Wagga Wagga	1/31
Wagga Wagga	5/35
Walbundrie	2/32
Walcha	2/32
Walcha	6/36
Walcha	8/38
Warrumbungles	1/31
Wingham	1/31
Wilcannia	1/31
Wollongong	8/38

Northern Territory

Bushy Park	1/31
Darwin	1/31
Erlunda Station	3/33
Katherine	2/32
Maryvale Station	4/34
Mt Swan	2/32

Queensland

Alpha	2/32
Atherton	8/38
Ayrens	8/38
Ayr	3/33
Barcaldine Downs	1/31
Balhurst Heads	1/31
Baulnina Downs	4/34
Bilnela	7/37
Blackall	8/38
Blackwater	6/36
Brisbane	1/31
Brisbane	5/35
Brisbane	7/37
Bundaberg	4/34
Bundaberg	7/37
Cairns	3/33
Chinchilla	8/38
Clermont	6/36
Clermont	7/37
Crows Nest	6/36
Dimbulah	8/36
Dirranbandi	8/38
Double Island Point	3/33
Edward River	3/33
Emerald	8/38
Gladstone	6/36
Gold Coast	3/33
Goondiwindi	4/34
Double Island Point	3/33
Gympie	2/32
Gympie	5/35
Gympie	7/37
Hervey Bay	8/38
Hughenden	1/31
Ingham	2/32
Inglewood	1/31
Innisfail	1/31
Ipswich	4/34
Jericho	4/34
Kilcoy	3/33
Lakeland Downs	2/32
Longreach	3/33
Mackay	3/33
Mackay	6/36
Marlborough	2/32
Maryborough	6/36
Maxwelton	2/32
Miles	6/36
Monto	3/33
Moranbah	4/34
Moura	1/31
Mt Isa	1/31
Mundubbera	6/36
Murgon	7/37
Quilpie	2/32
Rockhampton	1/31
Rockhampton	4/34
Roma	1/31
Springsure	3/33
Sunshine Coast	6/36
Sunshine Coast	8/38
Tambo	6/36
Tarcom	2/32
Thargomindah	6/36
Toowoomba	2/32
Toowoomba	4/34
Townsville	1/31
Townsville	4/34
Wavell Heights	2/32
Warwick	1/31
Wide Bay	1/31
Yaraka	7/37

South Australia

Adelaide	1/31
Adelaide	3/33
Adelaide	5/35
Angaston	4/34
Bhirman	3/33
Carretown	1/31
Ceduna	1/31
Clare	7/37
Cleve	2/32
Coonalpyn	6/36
Coppouduba Hill	1/31
Hawker	7/37
Kangaroo Island	4/34
Manum	8/38
Mt Bryan	8/38
Mt Gambier	5/35
Mt Gambier	7/37
Myponga	2/32
Naracoorte	4/34
Orroroo	2/32
Port Lincoln	8/38
Port Pirie	4/34
Renmark	6/36
Snowtown	6/36
Tarcoola	6/36
Wilkatana	8/38
Yorketown	7/37

Tasmania

Burnie	8/38
Central Highlands	7/37
Devonport	1/31
East Coast	6/36
Flinders Island	1/31
Hobart	1/31
Hobart	5/35
Launceston	2/32
Launceston	6/36
Midlands	4/34
North East Coast	3/33
North West Coast	4/34
North West Coast	6/36
West Coast	2/32

Victoria

Alexandra	1/31
Ballarat	2/32
Ballarat	5/35
Ballarat	7/37
Bairnsdale	3/33
Beech Forest	4/34
Bendigo	6/36
Cavendish	4/34
Currajung	6/36
Echuca	3/33
Euroa	3/33
Falls Creek	6/36
Foster	4/34
Geelong	6/36
Halls Gap	5/35
Hamilton	8/38
Harcourt	4/34
Hawkesdale	3/33
Horsham	2/32
Kerang	4/34
Lavington	2/32
Mansfield	1/31
Melbourne (north)	3/33
Melbourne (metro)	5/35
Melbourne (metro)	7/37
Melbourne (south)	3/33
Mildura	2/32
Moe	8/38
Mornington Pen.	7/37
Mortlake	8/38
Mt Cann	6/36
Mt Concord	3/33
Mt Delegate	8/38
Mt Terrible	8/38
Myrtleford	1/31
Penshurst	7/37
Shepparton	1/31
St Arnaud	1/31
Swifts Creek	7/37
Talangatta	6/36
Wangarrata	7/37
Waubra	

West Australia

Albany	3/33
Augusta	7/33
Bencubbin	2/33
Boyup Brook	4/34
Bunbury	2/33
Carnamah	2/33
Carnarvon	2/33
Coolgardie	7/33
Darkin	6/33
Denmark	1/33
Esperance	4/33
Kalgoorlie	2/33
Kambalda	1/33
Kalanning	1/33
Kellerberrin	1/33
Kulin	4/33
Lancelin	4/33
Mandurah	7/33
Manjimup	6/33
Margaret River	6/33
Meekatharra	1/33
Merredin	2/33
Mia Mia	1/33
Mt Manypeaks	6/33
Mt Barker	5/33
Mt Barrow	7/33
Mt Saddleback	1/33
Mt Solus	4/33
Nannup	2/33
Perth	1/33
Perth	3/33
Perth	5/33
Perth	8/33
Ravensthorpe	8/33
Stirling Ranges	7/33
Wickham	1/33
Wongan Hills	8/33
Wyalkatchem	6/33
York	7/33

Note: This list includes repeater licenced but not yet operationa It is compiled from variou sources, and relies upon reade input to remain accurate. Co rections and up/dates may b sent to: CBA Repeater Listing PO Box E160, St James NSW 2000.

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