



MONITORING TIMES

New Worldwide Aeronautical Frequencies

Since February 18, 1982 the International Civil Aviation Organization (ICAO) has been changing HF (shortwave) frequencies and modes licensed to the aeronautical mobile service.

The new implementation is expected to be completed by February 1, 1983, according to Aeronautical Radio Incorporated (ARINC), prime contractor for the service.

Previously, double sideband (DSB) or single sideband (SSB) was optional; now, all communications must be upper sideband (USB). Additionally, sweeping changes in families of frequencies affect listeners. Most of the following changes have already occurred, with the remainder due within the next few months.

Frequencies available for domestic HF service.

(b) The following frequencies are available for assignment to serve aircraft operating in support of offshore drilling operations in open water areas beyond the range of VHF propagation:

Frequencies available until 0001 G.m.t., Feb. 18, 1982 (carrier) kHz	Frequencies available from 0001 G.m.t., Feb. 18, 1982, until 0001 G.m.t., Feb. 1, 1983 (carrier) kHz	Frequencies available after 0001 G.m.t., Feb. 1, 1983 (carrier) kHz
2973	2973	2878 3019 3434
4654	4654	4672 5483 5508

(c) Alaska: The following frequencies are available for assignment to serve domestic air routes as in the indicated area of Alaska:

(1) Throughout Alaska: The following frequencies are shared with the Federal Aviation Administration and may be assigned where an applicant shows the need for a service not provided by the FAA.

Frequencies available until 0001 G.m.t., Feb. 18, 1982 (carrier) kHz	Frequencies available from 0001 G.m.t., Feb. 18, 1982, until 0001 G.m.t., Feb. 1, 1983 (carrier) kHz	Frequencies available after 0001 G.m.t., Feb. 1, 1983 (carrier) kHz
2861 5631	2861 5631	2866 5631

(2) Alaska Aleutian chain and feeders.

Frequencies available until 0001 G.m.t., Feb. 18, 1982 (carrier) kHz	Frequencies available from 0001 G.m.t., Feb. 18, 1982, until 0001 G.m.t., Feb. 1, 1983 (carrier) kHz	Frequencies available after 0001 G.m.t., Feb. 1, 1983 (carrier) kHz
2924 3448	2924 3448	2911 2956 5496 5980
6568 10057 11295 11319	6568 10057 11295 11319	8855 10068 11363

(3) Central and Southeast Alaska and feeders.

Frequencies available until 0001 G.m.t., Feb. 18, 1982 (carrier) kHz	Frequencies available from 0001 G.m.t., Feb. 18, 1982, until 0001 G.m.t., Feb. 1, 1983 (carrier) kHz	Frequencies available after 0001 G.m.t., Feb. 1, 1983 (carrier) kHz
2875 2924 3481 5547 6568 6617	2875 2924 3481 5547 6568 6617	2875 2911 3470 5484 6580 6604 8876 11357
10041	10041	11357

(4) The following frequencies are available to enroute stations in Alaska without regard to the restrictions contained in § 87.291 (c) or (d). These frequencies may also be used for communications between enroute stations concerning matters directly affecting aircraft with which they are engaged. Enroute stations located at an uncontrolled airport shall not transmit information concerning runway, wind or weather conditions during the operating hours of an aeronautical advisory station (unicom).

Frequencies available until 0001 G.m.t., Feb. 18, 1982 (carrier) kHz	Frequencies available from 0001 G.m.t., Feb. 18, 1982, until 0001 G.m.t., Feb. 1, 1983 (carrier) kHz	Frequencies available after 0001 G.m.t., Feb. 1, 1983 (carrier) kHz
3411 4383.8 4668 4693	3411 4383.8 4668 4693	3449 4383.8 5472 5490

¹ The frequency 4383.8 kHz, maximum power 150 watts PEP, may be used by any station authorized under this part to communicate with any other station authorized in the State of Alaska for emergency communications. No airborne operations will be permitted on this frequency.

EXCLUSIVE!

New RTTY Decoder Copies Encrypted Messages!

A breakthrough in micro-processor design now allows shortwave listeners to listen in on coded messages.

An introduction by Tom Harrington tells our readers how it's done (See Story page 22).

- *****
- M-600 SPECS AT GLANCE
- ASCII: 110, 150, 300, 600, 1200
- Baud
- BAUDOT: 60, 66, 75, 100, 132
- WPM
- MORSE: Up to 60 WPM
- BIT INVERSION: Any combination
- TOR/SITOR: ARQ and FEC
- WEATHER TEXT: Arrows and other symbols
- SELCAL: 3, factory programmed
- FONT: Weather box and standard ASCII
- Plus: Scrolling, page recall, speed readout, unshift on space, self-test, composite video (white on black, 64 character ASCII upper case; 36 or 72 characters per

Frequencies available for international HF service.

High frequencies available to enroute stations serving international flight operations on the Major World Air Route Areas (MWARA's) as defined in the international Radio Regulations and the International Civil Aviation Organization (ICAO) Assignment Plan are as follows:

(a) Central East Pacific (CEP):

Frequencies available until 0001 G.m.t., Feb. 18, 1982 (carrier) kHz	Frequencies available from 0001 G.m.t., Feb. 18, 1982, until 0001 G.m.t., Feb. 1, 1983 (carrier) kHz	Frequencies available after 0001 G.m.t., Feb. 1, 1983 (carrier) kHz
3001 3467	3001 3467	2869 3413 4657
5554	5554	5547 6672
5603 8875 13336 8931 13312 17909	5603 8843 13336 11282 13300 17904	5574 8843 10057 11282 13300 17904

(b) Central West Pacific (CWP):

Frequencies available until 0001 G.m.t., Feb. 18, 1982 (carrier) kHz	Frequencies available from 0001 G.m.t., Feb. 18, 1982, until 0001 G.m.t., Feb. 1, 1983 (carrier) kHz	Frequencies available after 0001 G.m.t., Feb. 1, 1983 (carrier) kHz
2896	2896	2998 3455
4675 5505	4675 5505	4666 5652 5661
6631 8854	6631 8854	6532 6562 8903 10081
11303 13296 17909	11303 13300 17904	11384 13300 17904

(c) North Pacific (NP):

Frequencies available until 0001 G.m.t., Feb. 18, 1982 (carrier) kHz	Frequencies available from 0001 G.m.t., Feb. 18, 1982, until 0001 G.m.t., Feb. 1, 1983 (carrier) kHz	Frequencies available after 0001 G.m.t., Feb. 1, 1983 (carrier) kHz
2910 5589	2910 5589 6655	2932 5628 8655
8938	8938	6661 10048
13264 17909	13300 17904	11330 13300 17904

(d) South Pacific (SP):

Frequencies available until 0001 G.m.t., Feb. 18, 1982 (carrier) kHz	Frequencies available from 0001 G.m.t., Feb. 18, 1982, until 0001 G.m.t., Feb. 1, 1983 (carrier) kHz	Frequencies available after 0001 G.m.t., Feb. 1, 1983 (carrier) kHz
2945	2945	3467
5638	5559 5643	5559 5643
8847	8847	8867 10084
13304 17909	11327 13300 17904	11327 13300 17904

(e) North Atlantic (NAT):

Frequencies available until 0001 G.m.t., Feb. 18, 1982 (carrier) kHz	Frequencies available from 0001 G.m.t., Feb. 18, 1982, until 0001 G.m.t., Feb. 1, 1983 (carrier) kHz	Frequencies available after 0001 G.m.t., Feb. 1, 1983 (carrier) kHz
8847	8847	8867 10084
13304 17909	11327 13300 17904	11327 13300 17904

Continued on page 4

line, 16 or 25 lines), isolated loop user-selectable, printer output with 2K buffer, 60/20 ma. loop supply optional.

For complete data on the most sophisticated demodulator ever available, call Grove Enterprises toll-free now! 1-800-438-8155, or dial 1-704-837-2216.



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A special 10% discount on ALL Grove Enterprises merchandise not presently discounted is available to you. When you place your order, simply tell us you are a subscriber. See our advertisements on pages 9 through 16.

Monitoring Times is pleased to present the first in a series of excellent articles by an accomplished author, John Edwards. While Edwards' topic is very controversial, his unusual insight and professional writing style make for unusual reading fare.

"The Pirates of Long Island--Part I"

By John Edwards

Listening to pirate stations has long been one of the most interesting facets of radio monitoring. What follows is the first installment of a three part series that looks inside the world of bootleg radio operators in New York's Long Island area.

The clock on the radio studio wall reads 1:59 AM as the chief engineer leans over to the transmitter control panel and nonchalantly flicks a switch that warms up the final power amplifier. Then, as the second hand approaches the hour, he starts one of the station's two turntables spinning, locks the transmitter into position and announces a cherry "Good morning!" into the microphone. Radio station WLWK in Hicksville, NY, is on the air.

WLWK is unique. You won't find it carried in the area newspaper's radio listings, nor will you see ads for it on local TV or on busses. As a matter of fact, only a few people know about it. So exclusive is this station that even the Federal Communications Commission does not know of its existence. You see, WLWK was never licensed by the FCC, and running an unlicensed radio station can cost the offender \$10,000 plus \$500 for each day of operation, not to mention the possibility of time in a federal slammer! But to the operators of the dozen or so underground radio stations on Long Island, the benefits of unrestricted broadcasting are worth the risks.

To most people, "underground radio" brings to mind the image of a beleaguered resistance group huddled around a small transmitter, broadcasting messages of hope to a tyrannized people. While this type of underground radio does exist in eastern Europe and elsewhere, a different form of bootleg broadcasting has developed in recent years that's more concerned with opposing established radio stations than any despotic government.

Long Island's "undergrounders," as they call themselves, are a group of people

who say they are fed up with the prepackaged formats offered by regular radio outlets. These pirate broadcasters view their stations as havens in an electromagnetic graveyard, as a place where listeners can request songs, voice their opinions on call-in shows and participate in various forms of experimental broadcasting unencumbered by the usual restrictions imposed on commercial radio. It's also a forum, as most undergrounders willingly admit, to assuage the frustrations of "closet DJs."

The idea of underground radio stations operating in a democratic environment isn't all that new. For years, many of the most listened-to European stations have been pirate operations broadcasting from ships moored in the North Sea, just outside of territorial limits. These broadcasters were among the first to recognize and play recordings of such groups as The Beatles, The Rolling Stones and The Who in the early 1960s, when legitimate continental stations wouldn't touch their music.

Although some ocean-going outlets are still operating today, they now tend to be almost indistinguishable in music programming from their land-based competitors. Success has spawned complacency, and in Europe, advertisers now rule both the waves and airwaves.

The present generation of Island undergrounders, however, bears a close resemblance to the operators of those European pirate stations of two decades ago. Although undergrounders in this country lack the funds to run maritime operations, there is little need to bother. Unlike Europe, where very strict control is maintained over the use of radio frequencies, the FCC is so undermanned that with a little operating savvy, and some self-restraint, an undergrounder can easily evade the Commission's detection efforts. The FCC, for its part, claims that congressional funding cutbacks have severely hamstrung its monitoring staff.

Dave Lewis (whose name, like the others in this article, has been changed to protect his identity) is the owner, chief engineer and program director of underground station WONS). He's been managing the operation out of his modest, colonial-style home in Oceanside (on Long Island's south shore) for about three years. In his mid-20s, Lewis works by day as a computer programmer for a large corporation in a town about 20 miles away; by night, he's an underground radio broadcast executive.

"I originally got the idea of putting the station on the air from a friend who was involved in pirate radio," he explains. "At first, we had a very sporadic operating schedule—perhaps four or five times a year. But then, as calls started coming in from listeners saying how much they liked our broadcasts, we decided to up our schedule to once or twice a month."

Lewis goes to great pains to show that his station is more than just an ego trip for its owner and staff.

"I feel we provide the public with a real service," he says enthusiastically. "Back a few years ago, when new-wave rock was just taking off, undergrounders were the only ones playing the Ramones, Talking Heads and all the rest. Go back a few years earlier, and we were playing disco before all the big stations. Today, we're still digging up new groups, finding bands on obscure record labels friends tell us about. Sure, most of the public may not know of us, or only stumble across our signal accidentally, but word gets around, and people who want our type of progressive music know where to find us."

Even though enforcement is lax, Lewis still must give a lot of thought to ways of avoiding the FCC, for if an undergrounder gets too bold, either by interfering with a legal station or by remaining on the air for an extended period, pressure can be applied by legitimate broadcasters and others to force a reluctant FCC into action.

To prevent this, undergrounders plan their schedules with all of the care and strategy of a commando raid. In the next issue of MONITORING TIMES, we'll look at the way pirate operators outsmart the FCC and how they run their stations.

Pirates Unite

EDITOR'S NOTE: The following controversial editorial does not necessarily reflect the attitude of this publication. It is printed herein to acquaint readers with one philosophy regarding pirate broadcasters...ed.

There is one principle all pirates will agree with: Pirates should have the right to broadcast. Since the air waves belong to the people, why does the FCC attempt to restrict the pirates? It can't be due to harmful interference because any good broadcaster realizes that he must use a frequency which will allow the maximum coverage of the signal without causing harmful interference to other radio services. There are many good pirate broadcasters who provide excellent programming but who must restrict their operating time and change frequencies often to avoid detection by the Federal Communications Commission. Many more good broadcasters have been closed down and burdened with heavy fines even though they were not creating harmful interference to other radio services.

It is time we recognized these pirates as the professional people they are as these broadcasters

provide excellent and sometimes specialized programming to meet the needs of the public.

Instead of calling this fine group of radio enthusiast lawbreakers, let's change the law. A certain portion of the radio spectrum could be allotted to the pirates with restrictions to assure there will be no harmful interference to other radio services. A permit could be granted once the pirate proved his power, equipment and programming meet with the rules and regulations of the FCC.

The FCC has a deaf ear to the public as many of us know from our unanswered letters. Let's take our requests to the federal lawmakers so a law can be drafted to allow pirates to serve the programming needs of the public. I urge you to contact your U.S. House and Senate members so they may know how we feel about pirate radio.

Remember, in the early days of radio it was the amateur who experimentally transmitted programming which later led to television and a host of other electronic spinoffs. Had the early experimenters been restricted from using the air waves, we would not have the electronic advances we enjoy today. The FCC must not be allowed to restrict progress! Write your lawmakers today.

Respectfully,
John H. Demmitt,
Bellefonte, PA

Mind Control By The Media

Your attitudes toward products are carefully calculated and manipulated by clever subliminal suggestion according to several eminent psychologists.

Auditory and visual stimuli are suggested while you stop, read, and watch TV by sophisticated high-tech devices purposely designed to command you to react.

Animorphic imagery, especially those dealing with sex and death, have been shown to induce acceptance of certain advertising products. Death themes are often used in cigarette and alcohol ads since a self-destructive minority buys the vast majority of these products.

The suggestions are always subliminal—below the supraliminal (obvious) messages. They may be hazy, tiny or very large words or shapes woven into the texture of the ad, music, voice or picture. A recent case cited the word "cancer" written on a boxer's glove in a prominent cigarette ad. Experimentally, fantasy-invoking phrases like "Mommy and I are one" have been used subliminally with results.

Occasionally the human voice is modulated with a subcarrier message consisting of a 4 kHz message compressed to 500-1000 Hz.

Grove Enterprises Grows Into New Building

Despite the decline in the American economy, Grove Enterprises has been enjoying unprecedented growth. Increasing sales are accounted to two things, says Bob Grove, President of the progressive North Carolina firm.

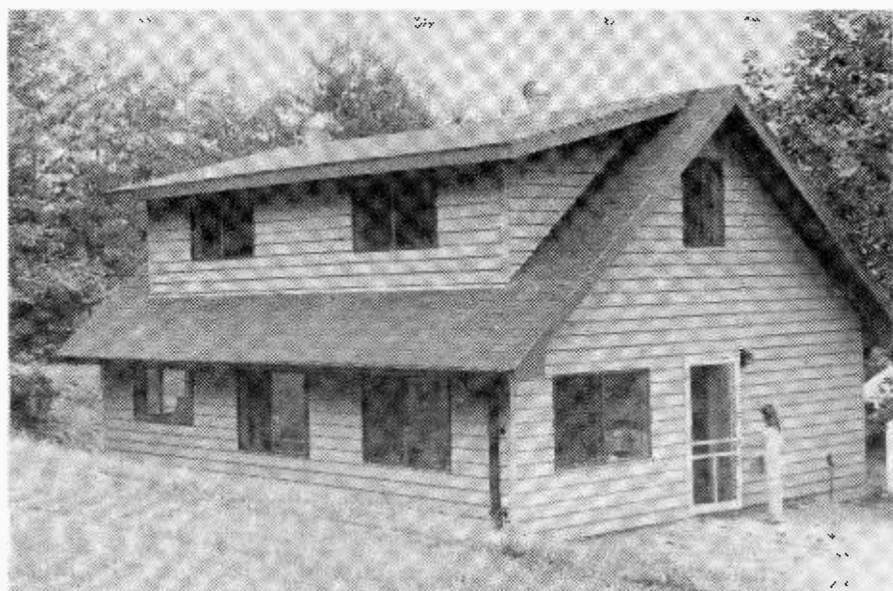
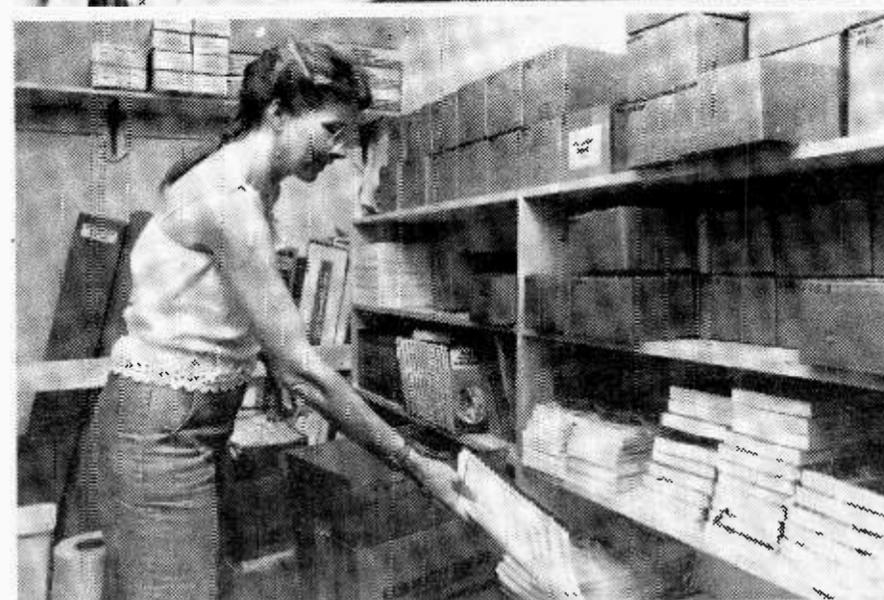
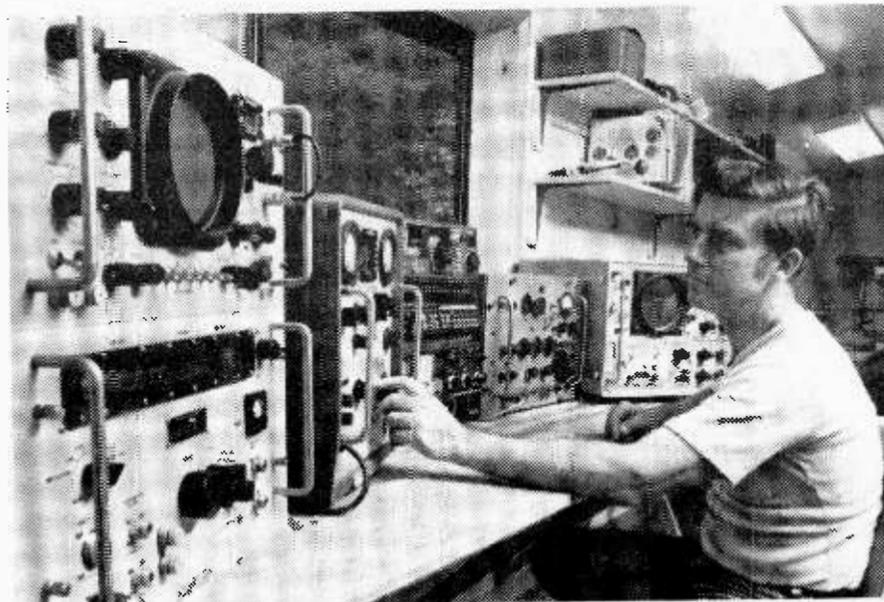
"Our customers are aware of a strict fairness policy," said Grove during a recent interview. "All Grove products are designed with the customer in mind. If it does not work satisfactorily, he is given full credit toward any other merchandise of his choice. He can't lose."

Grove went on to say, "We are a family-oriented company; our employees are friendly and easy to talk to. I personally answer questions and give advice

to our customers. Since I am an active listener, not a cold merchandiser, I know the problems other listeners face. Our products are developed with that in mind."

"Another important factor in our phenomenal success has been the universal acceptance of Monitoring Times which serves a multiple purpose; it alerts the customers to exciting new products to enhance their listening, and provides them with timely, authoritative information of enormous interest."

Apparently the formula works. Several proprietary developments sit poised on the bench on the R & D floor awaiting final approval before introduction to the market.



Solar energy and a rustic setting for the new Grove headquarters.

Bob, Rachel, Mitzi and Angie enjoying the new space.

VHF Aircraft Band Frequency Allocations And Usage (Freqs. MHZ.)

108.1-111.9	ILS localizer/voice (spaced-odd 200 kHz increments)	122.925	Federal/state natural resources
108.2-111.8	VOR (spaced even 200 kHz increments)	122.975	High altitude
112.0-117.9	VOR	123.025	Helicopter air to air
118.0-128.8	ATC near airports (approach, departure, center, tower, ATIS, FSS, clearance)	123.05/.075	Heliport UNICOM
118.0-121.4	Air Traffic Control (ATC), Radar Approach Control (RAPCON)	123.1	Search and rescue
121.5	Emergency (Mayday and ELT's..downswept tone)	123.175-123.575	Flight schools and flight tests
121.6-121.95	Ground control (Runway, gate, utilities info) major airports	123.45	Air to air chatting
121.975-122.675	Flight Service Stations (FSS)	123.6	FSS, small airports with no tower
122.0	FSS Flight watch weather	123.6-128.8	ATC tower to enroute aircraft
122.1	Private aircraft calling FSS	126.2	Military aircraft to FAA towers
122.2/.3/.6	FSS to private aircraft	128.825-132.0	Commercial airlines enroute
122.4/.5/.7	Private aircraft to tower	132.025-135.975	ATC tower to enroute aircraft beyond 30 miles
122.725	Private airfields (not open to public)		
122.75	Air to air		
122.8/.85/.95/123.0	UNICOM aeronautical advisory stations (small fields)		
122.9	MULTICOM (small fields without UNICOM) and air to air		

New Worldwide Aeronautical Frequencies

from page 1

2987	2987	2872
2945	2962	2899
2868	2868	2962
2931	2931	2971
		3016
		3476
5624	5624	4675
5610	5610	5598
5673	5673	5616
5638	5638	5649
		6622
		6628
8945	8945	8825
		8831
8889	8889	8864
8854	8879	8879
8910	8891	8891
		8906
11303	11303	11279
		11309
		11336
13328	13291	13291
13288	13306	13306
17941	17946	17946

(f) Europe (EUR):

Frequencies available until 0001 G.m.t., Feb. 18, 1982 (carrier) kHz	Frequencies available from 0001 G.m.t., Feb. 18, 1982, until 0001 G.m.t., Feb. 1, 1983 (carrier) kHz	Frequencies available after 0001 G.m.t., Feb. 1, 1983 (carrier) kHz
2910	3479	3479
4689	4689	5661
6582	6582	6598
8875	10084	10084
		13288
17941	17941	17961

(g) South America (SAM):

Frequencies available until 0001 G.m.t., Feb. 18, 1982 (carrier) kHz	Frequencies available from 0001 G.m.t., Feb. 18, 1982, until 0001 G.m.t., Feb. 1, 1983 (carrier) kHz	Frequencies available after 0001 G.m.t., Feb. 1, 1983 (carrier) kHz
2889	2889	2944
2910	2910	3479
4696	4696	4669
5582	5582	5526
6666	6666	6649
8847	8847	8855
8826	8826	10024
11327	10096	10096
11343	11360	11360
13320	13297	13297
17925	17907	17907
17917		

(h) South Atlantic (SAT):

Frequencies available until 0001 G.m.t., Feb. 18, 1982 (carrier) kHz	Frequencies available from 0001 G.m.t., Feb. 18, 1982, until 0001 G.m.t., Feb. 1, 1983 (carrier) kHz	Frequencies available after 0001 G.m.t., Feb. 1, 1983 (carrier) kHz
2875	2875	2854
		2935
3432	3432	3452
6680	5565	5565
6610	6610	6535
8882	8882	8861
10049	10049	11291
13344	13357	13315
	13357	13357
17949	17955	17955

(i) Southeast Asia (SEA):

Frequencies available until 0001 G.m.t., Feb. 18, 1982 (carrier) kHz	Frequencies available from 0001 G.m.t., Feb. 18, 1982, until 0001 G.m.t., Feb. 1, 1983 (carrier) kHz	Frequencies available after 0001 G.m.t., Feb. 1, 1983 (carrier) kHz
2987	2987	3470
2868	2868	3485
5645	5645	5649
5624	5624	5655
5673	5673	6556
8840	8840	8942
8882	8882	10066
8868	11396	11396
	13309	13309
13288	13288	13318
17965	17907	17907

(j) East Asia (EA):

Frequencies available until 0001 G.m.t., Feb. 18, 1982 (carrier) kHz	Frequencies available from 0001 G.m.t., Feb. 18, 1982, until 0001 G.m.t., Feb. 1, 1983 (carrier) kHz	Frequencies available after 0001 G.m.t., Feb. 1, 1983 (carrier) kHz
2987	2987	3016
		3485
		3491
		5655
		5670
5673	5673	6571
8931	8931	8897
		10042
	11396	11396
	13297	13297
	13303	13303
	13309	13309
17965	17907	17907

(k) Middle East (MID):

Frequencies available until 0001 G.m.t., Feb. 18, 1982 (carrier) kHz	Frequencies available from 0001 G.m.t., Feb. 18, 1982, until 0001 G.m.t., Feb. 1, 1983 (carrier) kHz	Frequencies available after 0001 G.m.t., Feb. 1, 1983 (carrier) kHz
3404	3404	2944
3446	3446	2992
		3467
		3473
		4669
5603	5603	5667
6624	6624	5658
		6625
		6631
8847	8847	8918
		8951
10009	10009	10018
		11375
13336	13336	13288
		13312
	17961	17961

(l) Africa (AFI):

Frequencies available until 0001 G.m.t., Feb. 18, 1982 (carrier) kHz	Frequencies available from 0001 G.m.t., Feb. 18, 1982, until 0001 G.m.t., Feb. 1, 1983 (carrier) kHz	Frequencies available after 0001 G.m.t., Feb. 1, 1983 (carrier) kHz
2968	2868	2851
3411	3411	2878
		3419
2917	2917	3425
2956	2956	3467
5484	5484	4657
5491	5491	
5498	5498	
5540	5540	
5519	5519	5493
		5652
6638	6638	
5505	5505	5658
5491	5491	6559
5498	5498	
6589	6589	
4682	4682	6574
5498	5498	
5659	5659	
6638	6638	6673
8826	8826	8894
		8894
8924	8924	8903
8959	11300	8894
		11300
13304	13304	11330
13306	13306	13278
		13288
17925	17961	13294
		17961

(m) Indian Ocean (INO):

Frequencies available until 0001 G.m.t., Feb. 18, 1982 (carrier) kHz	Frequencies available from 0001 G.m.t., Feb. 18, 1982, until 0001 G.m.t., Feb. 1, 1983 (carrier) kHz	Frequencies available after 0001 G.m.t., Feb. 1, 1983 (carrier) kHz
3481	3481	3476
5505	5634	5634
8875	8875	8879
13336	13306	13306
17925	17961	17961

(n) North Central Asia (NCA):

Frequencies available until 0001 G.m.t., Feb. 18, 1982 (carrier) kHz	Frequencies available from 0001 G.m.t., Feb. 18, 1982, until 0001 G.m.t., Feb. 1, 1983 (carrier) kHz	Frequencies available after 0001 G.m.t., Feb. 1, 1983 (carrier) kHz
3425	3425	3004
3495	3495	3019
		4678
6533	6533	5646
6589	6589	5664
6603	6603	6592
8861	10096	10096
	13303	13303
		13315
		17958

(o) Caribbean (CAR):

Frequencies available until 0001 G.m.t., Feb. 18, 1982 (carrier) kHz	Frequencies available from 0001 G.m.t., Feb. 18, 1982, until 0001 G.m.t., Feb. 1, 1983 (carrier) kHz	Frequencies available after 0001 G.m.t., Feb. 1, 1983 (carrier) kHz
2952	2952	2887
2966	2966	3455

Frequencies available until 0001 G.m.t., Feb. 18, 1982 (carrier) kHz	Frequencies available from 0001 G.m.t., Feb. 18, 1982, until 0001 G.m.t., Feb. 1, 1983 (carrier) kHz	Frequencies available after 0001 G.m.t., Feb. 1, 1983 (carrier) kHz
5568	5568	5520
5484	5550	5550
6540	6540	6577
6561	6561	6586
6568		
8840	8840	8846
8959	8959	8918
10017	11396	11396
11343	11387	11387
11320	13297	13297
17917		
17925	17907	17907

Long distance operational control.

Long distance operational control communications provide for the exercise of authority over the initiation, continuation, diversion or termination of a flight affecting the safety of the aircraft and the regularity and efficiency of a flight. Assignments are to provide communications between an appropriate aeronautical station and an aircraft station anywhere in the world for exercising control over regularity of flight and safety of aircraft. World-wide frequencies are not to be assigned by administrations for MWARA, RDARA and VOLMET purposes.

available for assignment to flight test stations for test of equipment, emergency and backup use only for communication with aircraft beyond the range of VHF propagation. Type A2H.

A3J, A7J and A9J emissions shall be employed. A3H emission may be used until February 1, 1982.

Frequencies available until 0001 G.m.t., Feb. 18, 1982 (carrier) kHz	Frequencies available from 0001 G.m.t., Feb. 18, 1982, until 0001 G.m.t., Feb. 1, 1983 (carrier) kHz	Frequencies available after 0001 G.m.t., Feb. 1, 1983 (carrier) kHz
		3013
		3494
		5529
6526	6526	5637
		6637
		6640
		8933
		10033
10093	10093	10075
		11342
		11348
13356	13356	13330
		13348
17941	17925	17925
21996	21996	21964

Frequencies available.

(c) The following frequencies are

Frequencies available until 0001 G.m.t., Feb. 18, 1982 (carrier) kHz	Frequencies available from 0001 G.m.t., Feb. 18, 1982, until 0001 G.m.t., Feb. 1, 1983 (carrier) kHz	Frequencies available after 0001 G.m.t., Feb. 1, 1983 (carrier) kHz
		2851
		3004
		3443
2868	2868	
2994	2994	
3474	3474	
4675	4675	
4682	4682	5451
5469	5469	5469
5596	5596	5571
6559	6559	6550
8917	8917	8822
10009	10009	10045
11287	11287	11288
11375	11375	11306
13356	13312	13312
17901		
17965	17965	17964
		21931



Cordless telephones are causing a boom in consumer economics.

Tapping The Cordless Telephones

One of the handiest gadgets to come out of electronic promoters' dream machines, cordless telephones do have one vulnerability: anyone can listen in! Reports of spicy eavesdropping continue to be heard at Monitoring Times.

The Federal Communications Commission has authorized two bands for the operation of these step-saving devices, one just above the standard AM broadcast band (1695, 1725 and 1755 kHz), the other in the VHF low band (49.830, 49.845, 49.860, 49.875 and 49.890 MHz).

The lower frequencies are used by the base unit, transmitted to the remote handset and receivable on any general coverage shortwave receiver.

The higher frequencies are transmitted by the handset and readily heard on a programmable scanner. Some cordless telephone outfits use full duplex (base and handset units) on the 49 MHz band only.

Although the radiated power is quite low (100 milliwatts), metropolitan areas are often rife with these signals. Not only that, but due to skip propagation, signals from the low band cordless handsets may be heard at

great distances under ideal conditions, perhaps hundreds or even thousands of miles away!

Those 49 MHz frequencies are, by the way, the same as used by license-free walkie talkies. It can be expected that as the use of cordless phones increases (and it will—enormously!), there will be more and more reports of interference from co-channel users.

Can you imagine an unethical neighbor dialing up your base unit for his long distance calls? Something to think about.

Regency Merger Falls Through

Monitoring Times has learned that the proposed merger between Regency Electronics, prominent manufacturer of scanning receivers, and the Reading Company, a conglomerate real estate investment corporation, has been abandoned.

A call to the office of Regency's board chairman drew a "no comment" reaction from the spokesperson who said it was simply a matter that the parties couldn't get together and "agreed to disagree". No further reorganization plans are intended at this time.

The IRAC "Public But Secret" Policy

by
HAVANA MOON

(Note: The views expressed are those of Havana Moon and do not necessarily represent the views of "Monitoring Times")

The recent act of assigning the "CONFIDENTIAL" security classification to the Government Master File (GMF) is another example of the near-paranoia that grips our government institutions.

Why, in a free society, should it be forbidden to disseminate information that already is a matter of public record? Perhaps it's time for our elected officials to answer a few questions.

Security classifications, in a general sense, are assigned to official information or material that requires protection against unauthorized disclosure in the interests of national security.

The right of the public to know and to utilize the Freedom of Information Act (FOIA) was made possible in June 1972 by the issuance of Executive Order 11652—certainly an enhancement of the freedoms that are unheard outside of our great country.

E.O. 11652 states in part: "The interests of the United States and its citizens are best served by making information regarding the affairs of Government readily available to the public. (Those that have made use of the FOIA might wonder at the term readily available.) This concept of an informed citizenry is reflected in the Freedom of Information Act and in the current public information policies of the executive branch."

"Within the Federal Government there is some official information and material which, because it bears directly on the effectiveness of our national defense and the conduct of our foreign relations, must be subject to some constraints for the security of our Nation and the safety of our people and our allies. To protect against actions hostile to the United States, of both overt and covert nature, it is essential that such official information and material be given only limited dissemination."

For reasons that are not altogether clear, a "CONFIDENTIAL" classification (the lowest of the three classifications) has been stamped on the GMF, once downgraded and now upgraded by those with "rubber stamp" authority.

Just what is the DoD definition of "CONFIDENTIAL?" The DoD definition is: "National security information or material which requires protection." The test for assigning this classification shall be whether its unauthorized disclosure could be reasonably expected to cause damage to the national security.

It's difficult to comprehend just how a once unclassified, but

now classified, frequency list could be detrimental to the security of the United States. Those foreign counterparts of our National Security Agency and especially the Soviet GRU have long had this information and rate this information as mostly low priority information. Much of this low priority information is - in all probability - inside the infamous Glen Cove Mansion occupied by the Soviets.

While not applicable to the GMF, let's examine the remaining two security classifications. You'll find them most interesting. "TOP SECRET"

This highest of classifications refers to that national security information which requires the highest degree of protection. The test for assignment of the "TOP SECRET" classification shall be whether its unauthorized disclosure could reasonably be expected to cause exceptionally grave damage to the national security. Examples of "exceptionally grave damage" include armed hostilities against the United States or its allies; disruption of foreign relations vitally affecting the national security; the compromise of vital national defense plans or complex cryptologic and communications intelligence systems; the revelation of sensitive intelligence operations; and the disclosure of scientific or technological developments vital to national security. This classification shall be used with the utmost restraint. "SECRET"

This second highest classification refers to that national security information or material which requires a substantial degree of protection. The test for assigning "SECRET" classification shall be whether its unauthorized disclosure could reasonably be expected to cause serious damage to the national security. Examples of "serious damage" include disruption of foreign relations significantly affecting the national security; significant impairment of a program or policy directly related to the national security; significant impairment of a program or policy directly related to the national security; revelation of significant military plans or intelligence operations; and compromise of significant scientific or technological developments relating to national security. This classification shall be sparingly used.

"Restricted" and "For Your Eyes Only" are not recognized security classifications. They are only recognized as valid by James Bond and Maxwell Smart fans! "Restricted" is a valid classification in some foreign countries and was at one time valid in the United States.

Who really has the authority to classify, downgrade and declassify? The list of classification authorities consists of many pages and includes: Director,

Joint Tactical Communications; Director for Communications-Electronics; Director, Defense Communications Agency and the Director, Defense Intelligence Agency.

The list continues with: Director, Defense Investigative Service; Director, National Security Agency; Commandant, National Cryptologic School; Chiefs of Signal Intelligence Operations; Chiefs of National Security Agency Field Elements;

National Security Agency Advisory Officers; and the U.S. Army Security Agency.

Also included are: Director Naval Telecommunications Division/Director Naval Telecommunications Command; Director Signals Exploitation and Security Division. (This ultra-secret group has close ties to NSA, CIA, Naval Security Group Activities and the Office of Naval Intelligence.)

Continued on page 6

Listeners Log

MONTREAL POLICE DEPARTMENT (Contributed by Gilles Thibodeau, Lac-Megantic, Quebec)

Frequencies MHz		
153.650	153.200	153.920
154.040	154.100	154.220
154.320	154.370	154.450
154.740	154.800	154.870
155.400		

US COAST GUARD OPS NATIONWIDE

3123	5692	5696	8980	8984
11201	11198			

RADIO SOFIA, BULGARIA (Contributed by Orrin C. Winton, Bridgeport, CT)

Time (GMT)	kHz
0000-0100	11720
	9700
0400-0500	11860
0730-0800	9560
	11765
	15160
1930-2000	11720
	9700
2130-2200	9700
	11860
	11720
2230-2330	11720
	9700

USAF HF/SSB AIRWAYS AND COMMAND CONTROL STATIONS (Contributed by P.E. Humes, Santa Rosa, CA)

All frequencies kHz/USB			
Albrook AFS, Canal Zone			
18019	15015	11176	8993
6683	5710		
Andrews AFB, Maryland			
13247	9018	6756	4721
Elmendorf AFB, Alaska			
13201	11176	8989	
6738	5703		
Hickam AFB/Honolulu Intl.			
18002	13201	11179	
8964	6738	3144	
Loring AFB, Maine			
15015	13201	9014	4742
MacDill AFB, Florida			
Gander Info	18019	13244	11179
8989	5688		
NY Info	11246	11179	
6750	4746		
Miami/San Juan Info			
8993	6750	13244	11246
Houston Info			
11246	8993		
6750	4746		
McClellan AFB, CA			
18023	15031	11239	
8989	6738	4746	
Scott AFB, IL			
15015	11182	6727	4742
Thule AB, Greenland			
15015	8967	6738	

DADE COUNTY, (MIAMI,) FL. Contributed Bernie Wimmers, Jr.

County Police	
155.985	Headquarters
155.790	CH. D
155.970	TAC
155.730	Northwest
155.190	Central
155.700	Mid-West
156.210	South
156.015	West
155.910	Northeast
155.955	Southwest

County Fire	
453.600	Admin/at scene
453.700	North
453.800	South

City of Miami Police	
453.350	F1 North
453.450	F2 Central
453.300	F3 South
453.500	F4 Information
453.750	F5 TAC 1
453.550	F6 Special Events
453.050	F7 TAC

City of Miami Fire	
453.100	F1 Dispatch
453.150	F2 Tac
453.200	F3 Admin.
453.425	F4 Rescue

Remote Broadcast

161.640	WNWS-AM
161.670	WVCG-AM
166.250	WQDI-AM
170.150	WGBS-AM
450.150	WCKT-TV
450.312	WCIX-TV

State of Florida

Highway Patrol	
45.060	low band
154.665	South
154.695	North
154.920	Car-to-Car
453.625	Turnpike
453.725	Turnpike (service)
155.370	Inter-System
44.760	Game Commission
44.960	Marine Patrol
460.150	Florida Dept. of Justice
460.250	Florida Dept. of Justice
460.350	Florida Dept. of Justice

Homestead AFB

149.565	Command Net
163.485	Security
163.585	Police
173.560	Medical
173.585	Fire & Crash

Press

173.225	Miami Herald
453.000	Miami Herald
452.975	Miami News

NORTHERN MILITARY BASES (Contributed by Ron Tull, Whitehorse, Yukon)

Mode	Stations	Freq. (MHz.)
USB	Elmendorf AFB (Alaska)	13.201 8.989
USB	McClellan AFB (Calif.)	11.239
USB	Edmonton AFB (Canada)	15.031 or .035
USB	Trenton AFB (Canada)	15.031 or .035

The IRAC
from page 5

Further down the list we find: Commander, Naval Electronics Systems Command; Commanders and Directors U.S. Air Force Comint and Sigint Groups and Commanders, Air Force Communications Groups.

Numbers Update

Clarification: "Final" is the common terminator on all 5-digit Spanish number transmissions. "Fin" as well as "adios" have been noted on rare occasions. What, if any, significance to this departure from transmission style is not known. The incidence of occurrence of uncommon terminators is rare. "Fin" is the common terminator for 4-digit transmissions; "Ende" is the common terminator for German number transmissions.

THE TEN PER-CENT FACTOR

The occurrence of "doublets" in randomly generated numbers in groups of five is exactly TEN PERCENT. The average in "Spy-numbers" intercepts in the past has averaged twenty-seven per-cent. Most curious!

NUMBERS AND THE EXILE GROUPS

Several Anti-Castro groups continue to claim that they are engaged in two-way "numbers" communications between their operatives on Cuba and their counterparts inside the United States. No utility monitor has reported any of these transmissions and sources within the exile community are vague for obvious reasons. It's most unlikely that the 5-digit number transmissions are originated by these groups.

TWO(?) TRANSMITTERS

A highly respected source says that on one recent 7 MHz "numbers" transmission that the "random keying" just before the actual start of the "numbers" transmission was not from the same transmitter as the "numbers" transmission. This source was using relatively sophisticated equipment and tuned in this particular transmission while searching for signals of another type. Random keying is commonly heard prior to and immediately after the termination of most transmissions. Draw your own conclusions.

NUMBERS SCHEDULE

The frequency pairs of 3060 and 3090 khz continue to remain dormant. At this time no logical explanation can be offered for this cessation of activity. It is possible that transmission target areas have been changed. This is only speculation.

The above frequency pairs have been replaced by the frequencies of 4044 and 5135 khz. The latter is the repeat frequency with repeat of hourly transmission occurring at fifteen past the hour in the majority of transmissions.

Some few repeats occur at thirty past. The schedule is as follows: 0000, 0100, 0500, 1300, 1400, 1500, 1600, 1700, 1800, 1900, 2000, 2200, 2100, and 2300Z. The repeat frequency for the 0500Z transmission is 3090 khz at thirty past the hour. The 1400, 1900 and 2000Z transmissions are the "taped CW" variety.

It's possible that some of these times and frequencies will change by press time. Activity is most erratic since the frequency change.

SPANISH 4-DIGIT: 0200Z AM YL 5812/4669 khz (simulcast) 0100Z 9072 khz.

GERMAN 5-DIGIT: 0100Z AM YL 8188 khz and 0200Z on 9266 khz.

GERMAN 4-DIGIT: 2330Z USB YL on 9040 khz.

WEDNESDAY ONLY 5-DIGIT SPANISH: 0300Z 3445 khz with repeat at fifteen past the hour on 4443 khz.

THURSDAY ONLY 5-DIGIT SPANISH: 0200Z 4053 khz with repeat at thirty past the hour on 3075 khz.

SATURDAY ONLY 5-DIGIT SPANISH: 0300Z 3085 khz with repeat at thirty past on 3085 khz (an unusual repeat).

AFTER 0500Z: Numerous 6, 7, 8 and 9 mhz frequencies.

CAVEAT:

During the past several months some "numbers" monitors have been solicited for tapes of "numbers" transmissions. The request is usually accompanied by rather vague reasons as to why tapes of these transmissions are needed. In one word: DON'T!

POTPOURRI

For You Crypt Buffs!

THE ADFGX CIPHER

	A	D	F	G	X
A	X	X	X	X	X
D	X	X	X	X	X
F	X	X	X	X	X
G	X	X	X	X	X
X	X	X	X	X	X

X indicates letters of the English Alphabet

First used in 1918 or 1919 by the Germany Army. Transmitted in groups of five. DDFDD ADX-XG XXXADUse your imagination on this one!

PIRATES WALK THE PLANK:

It's a reverse role as the FCC now holds the sabre. Some pirates are running scared and screaming -in some instances - "entrapment." Are renegade CB'ers next?

RADIO MART:

Rumors persist that 1610 khz is now being considered for Radio Marti. One reason given is use of this frequency might lessen "jamming" on standard broadcast frequencies. NO WAY! Fidel will jam medium wave frequencies with high-powered and electronically-dirty transmitters. Why not let the "Commandant" do it his way? The "War of the Ionosphere" is just around the corner.

COMING ATTRACTIONS

The FCC's "Radio Intelligence Division" of days gone by.

Continuous "Numbers" Updates

RDF and the "Numbers" Transmissions

Your very own "Unbreakable" Cipher

An in-depth look at the most guarded secret communications intercepts of WWII (The contents will astound you)

The Japanese "purple" machine

Col. Rudolph Abel (KGB) and his "one-time-pad"

The Psychic Clandestine of the Far North.

"Truth Tables" and "Numbers" Transmissions

"Adios"

HAVANA MOON

Mods For The AEA Reader

Advanced Electronic Applications (AEA) has announced a simple modification procedure to improve low-level audio response on their early model MBA readers.

If you have an AEA MBA-RO Reader with a serial number below 1600, merely write the manufacturer and request the modification procedure.

We would like to thank N. Archibald of Athens, Georgia for bringing this to the attention of our readers.

DXpeditions: How, Where and...

by Terry I. Krueger

Electrical noise, poor antenna locations and crowded living quarters have probably hindered every shortwave hobbyist from hearing certain desired stations.

Fortunately, the DXpedition can provide the answer to the otherwise "impossible" logging. But before attempting such an outing, several steps should be taken in order to get the most of your DXpedition.

CHOOSING A SITE: Obviously, your group will need to select the best possible location. If you are familiar with your state or region, consider national and state parks or wildlife refuges. In the U.S., most national parks will allow small groups to stay overnight. Written permission in advance may be wise in order to prove your intent to park rangers on patrol.

Above all, choose a site that is as isolated as possible from civilization in order to avoid powerline noise, a defective power transformer can emit line noise several miles.

Consider a fairly centralized site for the participants. If a site is selected which is roughly an equal distance for all to attend, more will be willing to participate. Don't forget carpooling either!

A site on a large body of water is ideal for longwave and mediumwave reception. Water,

particularly a salt water shoreline, permits potentially good targets such as transatlantic DX from an east coast U.S. location.

An excursion to the selected site before the DXpedition is a good idea to become familiar with the terrain, facilities and access.

TIME: Early spring or late fall are probably the best time for North American DXpeditions. A typical east coast U.S. DXpedition may begin at 1900 GMT on a Saturday (in order to hear Africans fade in and sign off) and continue through the night till 1400 GMT Sunday (when most Asians fade out).

ATTENDANCE: Potential attendants might be contacted by postcard several months in advance. As the DXpedition date nears, advertise the gathering in the clubs you belong to.

Send a note to popular shortwave programs such as Glenn Hauser's "SW Listeners' Digest" via Radio Canada International or HCJBs "DX Party Line."

SUPPLIES: Your chosen site will determine what equipment the attendants need to bring. Batteries, an auto power converter or, at last resort, generator (it may create interference) is vital.

The type of antennas needed must be planned in advance. An adequate supply of different sized antenna connectors and coaxial

wire should be brought along.

Do not forget ample supplies of food, water and beverages. Flashlights and lanterns are a must, as are reference books, insect repellent, wire cutters and logbooks.

FROM PERSONAL EXPERIENCE: I've participated in many DXpeditions at the Canaveral National Seashore on the east coast of Florida. All of our group's DXpeditions have been quite enjoyable. With every trip to the Seashore, our group discovers something new on the bands.

Generally, it is wise to have about two or three people per auto in case the weather turns sour and a quick shelter is needed. Autos also provide a good place for setting up spare receivers or for napping. Cars with hatchbacks are really useful, so we've found out!

In summary, organization is the key to a successful DXpedition. Try to prevent duplication of equipment and books.

I'd like to thank all of the past Florida DXpedition attendees for their participation, without which this article never could have been written.

You are welcomed to attend the next Florida DXpedition. Just send a self-addressed, stamped envelope to: 84 Winter Park Drive, S., Casselberry, Florida, 32707, U.S.A. and I'll let you know when the next outing is planned!

Product Review ...

The TALKMAN from Standard Communications Corp.

A new personal wireless intercommunications system is an interesting hybrid. Not really a CB walkie-talkie, and not really a cordless telephone, it sports many advantages of each.

The lightweight unit consists of a boom-type head set connected to a belt-clip transceiver. A small wire whip antenna extends from the earpiece. The headset fits comfortably and securely with the windscreen-protected mike close to the lips of the operator.

Operation is the ultimate in simplicity: Switched on, the units are voice activated (VOX) for hands-free communication. Loud and soft volume settings are switch-selectable, as are mike sensitivity positions. Fully squelched between transmissions, the TALKMAN units provide a minimum of listening fatigue.

A conventional 9-volt battery powers the units which idle at a low 13.5 ma. during standby, switching briefly to 70-80 ma. during reception or transmission.

The TALKMAN units operate in the 49 MHz range commonly used for cordless telephones, not in the noisy CB band.

Frequency range:	49.83-49.89 MHz (1 channel)
Dimensions:	4"H x 2-1/2"W x 3/4"D
Weight	9 oz.
Receiver sensitivity	0.5 microvolts (20 dB quieting)
Squelch threshold	0.25 microvolts
Modulation acceptance bandwidth	± 7.5 kHz.
Image rejection	20 dB (minimum)
Frequency stability (0° to 40° C)	± 2 kHz. (Maximum)
Transmitter output power	10,000 microvolts/M @ 3M (maximum allowable by law)
Spurious emissions	20 dB (Minimum suppression)
FM hum and noise	40 dB (Maximum)
Audio distortion	10% (Maximum)

The Standard Talkman is an ideal companion for hiking, camping, antenna installation, bicycle and motorcycle trips, automotive intercar communications, and other applications where simple

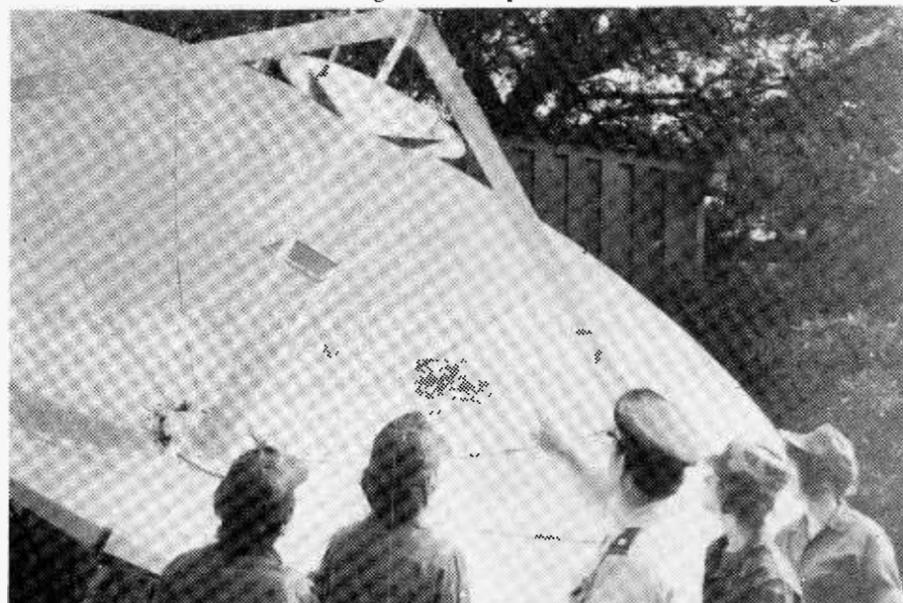


Sensitivity of the receiver is 0.5 microvolts for 20 dB quieting, with a squelch threshold of a mere 0.25 microvolts. Such sensitivity provides extended reliable range...at least a half mile in our field tests. And with a scanner receiver using an external antenna, reception range from the units was increased considerably.

And for you specifications fans, the following list of parameters should be interesting:

toy walkie-talkies simply won't do the job.

(Talkman two-way headset, \$139.95 from Standard Communications Corp., PO Box 92151, Los Angeles, CA 90009)



This satellite dish aimed at WESTAR III on 4160 MHz provides interconnection of US Army Health Services Command personnel nationwide.

Teleconferencing is possible for military medical personnel through the new satellite network.

Army TV Satellite Network

by Rick Sonntag

Education through the ultimate in correspondence courses which travel 45,000 miles instantaneously, is being offered daily by the U.S. Army Health Services Command (HSC), headquartered at Fort Sam Houston, Texas.

HSC is the first military organization to exploit a satellite positioned 22,500 miles in space to meet educational needs of its personnel. The Health Services Command television satellite network is capable of providing timely, accurate and relevant education and training to all Army Medical Department personnel regardless of assignment, job specialty or location.

The satellite TV system has been telecasting since November 1979 from studios at the Television Branch of the Academy of Health Sciences.

The original network has now been expanded to include Fort Hood, Texas; Fort Polk, La.; Fort Sill, Okla.; Fort Leonard Wood, Mo.; and Fort Campbell, Ky.; as well as Fort Sam Houston.

There are two daily network programs, each one hour in length. The first is called "Studio B" and is aimed at "hands on" readiness training for the enlisted

viewer. These programs include such subjects as obtaining vital signs and charting, alcohol and drug abuse requirements for the Skill Qualification Test and how to carry a litter correctly--almost any medical skill subject is presented to help enlisted soldiers become more proficient in their military job.

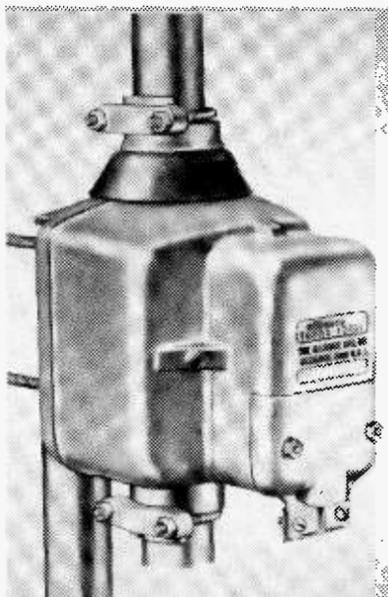
Noncommissioned officer development programs are also included on "Studio B" and occasionally there are programs dedicated to the physician's assistant.

The second program is geared toward professional medical personnel -- primarily physicians and nurses. Produced by Brooke Army Medical Center, it provides the latest information in areas ranging from acute injuries seen in emergency rooms to newer concepts in understanding and management of heart disease.

Through the use of two-way telephone communication during live programming, viewers can ask questions of the instructor. This provides a unique approach to educational television.

The programs utilize the Westar III satellite on a frequency of 4160 MHz. Officials say over 300 persons outside the Army have heard the transmissions.

The ALLIANCE U-100 Tenna-Rotor



A lightweight, low-cost rotator for directional beam antennas.



To those of us who grew up in the advent of TV, the name "Alliance Tenna-Rotor" has become synonymous with "antenna rotator".

While many pretenders have come and gone in the capricious economy, Alliance has remained, confidently offering improved

products as technology evolves.

With the unprecedented growth of hobby radio monitoring, many MT readers have requested recommendations for antenna rotating devices. Here at headquarters, we use an Alliance HD-73 heavy duty rotator for our experimental antenna designs; recently, we were given the opportunity to evaluate a lightweight: the U-100.

The U-100 consists of three parts: The upper rotator, the lower control box and a length of 4-conductor cable (not included).

Designed primarily for virtually any size TV antenna array, the U-100 lends itself exceptionally well to the lighter-weight CB, amateur and monitor market as well.

The rotator motor turns at one RPM, its position determined by the dial setting on the control unit. The familiar "click-click" sound of the resolver is reinforced by a light which shows the position of the antenna as it turns.

Cardinal compass points at 90° quadrants are shown on the front panel, a practical way to indicate direction as it is familiar to most everyone.

Up to 5 square feet of windload area may be accommodated by the U-100 which also features an antenna braking system with storm-windload capability to prevent drive-train damage.

The moisture-sealed motor is factory-lubricated for a lifetime of maintenance-free service.

VIEWPOINT

It was good of you to publish all those Canadian frequencies on Page 5 of the July-August issue. It's nice to see that someone thinks of us Canadians. Good write up on the out of band frequencies for the Bearcat 100.

Thanks again
Dave Dube
Windsor, Ont.

Enclosed is a check for a years' extension of my subscription to the Monitoring Times, also a cartoon that I whipped up showing me enjoying it. I take several Club bulletins and also quit some. I like your paper because of the wide coverage of the various monitoring frequencies, the print that us old folk can read, and interesting information.

Harold Ringgenberg
Cincinnati, OH.

On Memorial Day, May 31, I monitored communications at McGuire AFB, NJ where an air show was taking place. Army jets, C-141's, F-16's, F-106's, and the US Navy Blue Angels were on hand. When the show got underway communications were on UHF exclusively; the following frequencies were in use:

FREQ.	USEAGE
259.3	McGuire Approach/Departure
363.8	McGuire Approach/Departure
236.6	McGuire Tower/Air show control (pri)
255.6	McGuire Tower/Air show control (sec)
391.9	Blue Angels air-to-air
395.9	Blue Angels air-to-air

Their communications were short and to the point: "Smoke on/smoke off," "Clear for next maneuver," "All clear," "Roll...and roll...and roll...and roll," "All clear," etc. The show was much more enjoyable to watch while being able to hear the UHF comms on the scanverter. The scanverter worked beautiful and with the portable whip screwed into the scanner itself, VHF and UHF were received simultaneously with no interaction. I even drew a small crowd around me as I hooked up the CVR and the BC 300 and set the units on the hood of my car. I answered many of their questions most of which were "What is that black box hooked up to your scanner?" I replied, "That black box is going to let me monitor the Blue Angels radio communications." And monitor them I did! Thanks to you for making the CVR-1 a reality!

Richard L. Kramer
Blandon, PA

You have finally done it! You have brought me out of my shell! This is the first time I have written to a publication concerning my own personal interests. Don't change a thing in the format of Monitoring Times! I guess the letter from Mr. Gordon in the Viewpoint column in the July/Aug. issue was the "straw that broke the camel's back". I cannot count

on one hand the magazines I have cancelled or let expire due to special interest groups controlling the magazine and turning it into something greatly different than what the editor and the reader (me) had originally intended. This has happened several times and has always left me with the impression that if I had put in "my two cents" things would have been different. After all editors aren't mind readers, are you???

I have been an amateur radio operator for about six years and I don't really want to read about ham radio in your paper because I can get that information elsewhere, besides that is why I subscribed to your paper in the first place, to get information I can't get anywhere else. When a publication tries to be all things to all people it winds up being nothing to anyone. So I say BRAVO! to your new paper and it's format may it prosper without having to sell out to special interest groups. I have purchased your products for many years, and have enjoyed your government column in the RCMA newsletter likewise, so nothing but the best on the new paper.

Vernon Stilwell
Hardinsburg, Ky.

"My new monitoring hobby is driving my wife crazy. Keep up the good work."

(name withheld)

I read with interest the trend in Washington as you outlined it in the last Monitoring Times. I am wondering how long it will be before books such as the Shortwave Frequency Directory go the way of the Federal Frequency Directory. SFD can't be making the administration very happy either. I continue to hear good things about Monitoring Times.

John Santosuoso
Lakeland, FL.

Concerning your remarks on R. Moscow on top of WWV, you might be interested to know that I received a letter from Maria Montero Triana, head of corr. dept. at R. Habana Cuba telling me that, "We're not sure that you'll catch the Voice of Cuba again on the frequency of 1160 kHz."

I wonder if the U.S. made an agreement with Cuba so they would drop the English broadcasts on the MW?

John Demmitt
Bellefonte, PA

Read in Monitoring Times where the federal government has denied you information for a new edition of the Federal Frequency Directory. I've had the same trouble getting frequency information from law enforcement agencies of the state government, like SBI, Wildlife Commission, and state ABC Board although non-law enforcement agencies have been very free with this information.



These agencies seem unmoved by logic and reasoning like the fact that this information is public information accessible if you have the several hundred dollars to go to D.C. or get the information from the NTIS. Most hobby scannerists don't have the money but criminals do so the policy of nondisclosure really is ineffective.

Hope you finally get new information out of the feds for a new Federal Frequency Directory. It's really opened my ears to the federal traffic and is really a landmark in scanner frequency directories.

Again best of luck in getting new information from the feds.

Bill Britt
Whiteville, NC

Just a short note re Monitoring Times. My last copy took eleven days to reach me from the postmark date.

It is unfortunate after spending 54 cents for postage, but it seems that the postal systems, both yours and mine, seem unable to recognize something as First Class Mail unless it is so marked. I have the same problem with my RCMA Newsletter.

Two other quick comments. I'm sure that you try your best to balance content, but as a scanner fan with little SW interest, I feel that maybe SW is getting just a little too big of a share. Also, would like to see an article on the sounds of Monitoring, to explain some of the bell & whistles we get on VHF-UHF.

Regarding the withdrawal of Frequency Information, you can appreciate how we Canadians have felt for years.

Keep up the great work.

Bob Strong
Windsor, Ontario

Well, you got me! I'm hooked! A sample copy of Monitoring Times arrived today (July-August issue) and I am very impressed.

I've been checking into all available sources of scanning information and you rank way above the rest. I recently purchased a Bearcat BC-100, so the review and out-of-band programming articles were timely, to say the least! Your competition looks slick but doesn't come across with anything close to the amount of real information that you do.

The format and layout of Monitoring Times is good. Short news - type articles mixed with a few features and reviews seem to be the balanced coverage that works well for this subject matter. One suggestion, though - A summary chart would be helpful. How about taking half of a page to list all of the frequency information from the current issue. For example, in the July-August issue, there were frequencies listed for INDIS, Naval Intelligence, SSB Volmet, Coast Guard, The Marine Bands, etc. A summary chart would save a lot of page flipping when readers refer back to past issues.

Jim Dantin
Owensboro, Ky.

The July/August edition of Monitoring Times looks better than anything I have seen in the business. I will throw something in the POT for your next edition.

Fred Simon
Cincinnati, Ohio

I just thought I would write in today, in order to let you know how much I am enjoying reading the MONITORING TIMES.

MONITORING TIMES in my opinion is a very professionally done publication with a nice range of topics for both the beginning and the advanced monitoring enthusiast. As an advanced Utility DXer, I am finding the array of articles quite interesting and useful. Keep up the good work!

A few comments regarding the SHORTWAVE FREQUENCY DIRECTORY:

Continued on page 17

Electronic Equipment Bank

10 Miles West of Washington, D.C.

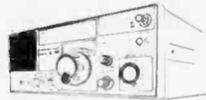
SWL-DX HEADQUARTERS

EEB Has It All!!!

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One loop amp required \$77.50
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Runs on 9V battery supplied FREE.

Now enjoy the rest of the bands. The international shortwave broadcast bands only occupy 11% of the 2.30MHz spectrum. 89% is generally not listened to by the SWLer because the signals are not the spoken word. With a stable CW/SSB receiver you can read many of these signals heard in that 89% of the spectrum previously passed up.

INFO-TECH M 200F

Trimode Converter

The Ultimate in Morse, CW, and Teletype reception. Fill your 'screen' with never ending printed information from around the world. CW-RTTY, ASCII, News services converted to video.



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*optional Sanyo VM-4509 video monitor available \$179.95

AEA-MBA Top of the line self-contained CW-RTTY-ASCII Reader. Bright blue 32 character display. MBA is ideal for SWLs, Hams and for monitoring news or weather broadcasts even while at sea. MBA \$299.95 12VDC Supply \$14.95 BOTH ONLY \$289.95

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Teaching Your Scanner To Do Tricks

Of all the suggestions and recommendations manufacturers receive concerning their scanning products, expanded frequency ranges head the list.

Some programmable scanners like those from Regency are naturals for frequency range expansion--they are already equipped to have their limits defeated by a simple program step to provide the user with a few more precious megahertz of reception.

Other scanners, like those from Radio Shack, are undefeatable. Their microprocessor design did not permit such manipulation.

Electra Bearcat programmables are a mixed bag so far as out-of-band tricks.

Let's take a look at some of the classical techniques reported by users.

UNLEASHING THE REGENCY—The early "Touch" (ACT-T-16K) could be expanded beyond its advertised frequency range by pressing: MA-9-CL before programming a frequency. This signalled the microprocessor to open its limits. Intended primarily as a factory test program, the technique permits wide frequency coverage.

Later models (K-100, K-500, M-100, M-400, D-100, D-300, D-810) utilized a much simpler routine: simply press the decimal key before the frequency entry is made. More recently, many Regency scanners are internally altered to accept out-of-band programming automatically.

While it is theoretically possible for a Regency programmable to accept commands for frequencies vastly divergent from those originally intended, there is still one obstacle: The RF stages lose their tracking after a few megahertz out of bounds, and sensitivity drops off considerably.

On a sample M-100, the algorithm (digital commands to the microprocessor) would actually show the following frequencies to be displayed after the limits were opened: 19.985-60.940 (low band) 118.175-200.060 (high band) 301.712-711.300 (UHF)

While the microprocessor would accept these frequency commands from the keyboard, the receiver would actually continue to function only a few megahertz above and below the advertised frequency range.

It is possible to realign the Regency programmables, however, to receive portions of the spectrum outside of the normal ranges. A discussion of these techniques may be found in an article entitled, "How to Make a Good Scanner Better" by Bob Grove, and published in 73 magazines, October, 1980.

That same article also contains information on AM detection for the Regency.

An additional trick permits Regency K and M models to defeat the limits permanently. On the M-100 and M-400, the user may

simply ground pin 34 of the microprocessor chip (the largest one on the PC board). On the K-100, the connection to pin 9 of IC402 is cut away and pin 9 is connected to a source of +5VDC.

These conversion techniques may be hazardous to your scanner's health, and such field modifications should only be attempted by a technician thoroughly familiar with digital circuitry.

BEATING THE BEARCATS

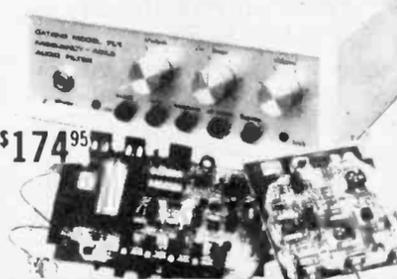
Most out-of-band programming which has been reported by users of Electra programmables turns out to be design oversights rather than intentional software thoughtfulness. Furthermore, such flexibility is quite limited and confined to only one or two models.

The BC-250—There are many scanner buffs who consider the venerable BC-250 the most flexible scanner made to date. Certainly the microprocessor in the earlier versions was easily defeated, allowing considerable frequency coverage. Later editions of the BC-250 switched to a different microprocessor, defeating those who wished to defeat the limits of the Bearcat!

One of the most popular ranges for expanded coverage is the 406-420 MHz federal government band. It has been widely reported that one of the main reasons this portion of the spectrum was not included on early programmables was due to polite pressure from one of those agen-

Continued on page 10

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MODEL FL1

FREQUENCY-AGILE AUDIO FILTER

- Fully automatic search/lock/track operation for notching out unwanted whistles.
- Selectable bandpass or band-reject modes.
- Bandwidth smoothly variable from 280 to 3000 Hz
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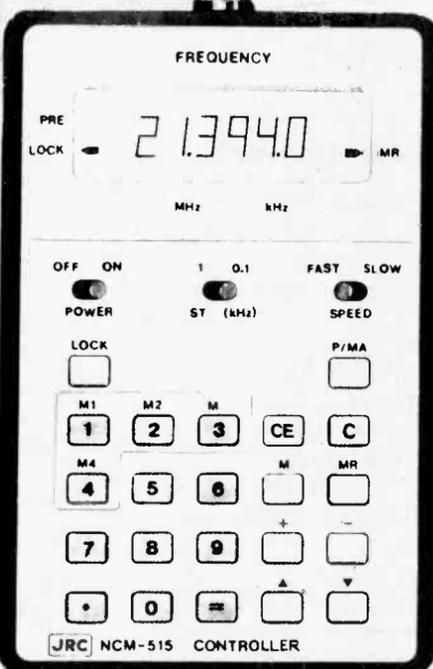
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Teaching Your Scanner

from page 9

cies!

A technique for searching the UHF government band is presented here. Remember, this sequence will work only on the early versions of the BC-250.

1. Enter search limits 420 and 421 MHz.

2. Press STORE and let the search function run for a few seconds.

3. Stop the search and press RECALL to display a birdie frequency. If no birdie is present, it should be possible to open and close the squelch briefly during step 2 in order to capture a signal in the recall memory.

4. Enter a single high band frequency into the limit (such as 150 MHz).

5. Press RECALL to see the UHF frequency displayed.

6. Press DOWN search key to command the circuit to search below 420 MHz in 12.5 kHz steps.

(NOTE: out-of-band searching will not reverse automatically; you must do it manually with the UP and DOWN keys).

As with any search-discovered frequency on the BC-250 the squelch must be opened to hold that frequency. (No search hold feature was provided on the BC-250).

7. To store an out-of-band frequency, press LOCKOUT during its reception.

To transfer an out-of-band

frequency from LOCKOUT to a normal channel:

1. Select a channel into which you wish to transfer the frequency.

2. Step RECALL until the frequency appears.

3. Switch the set off, then on again. This enters the frequency into the normal memory.

A simpler routine for out-of-band reception on the BC-250 has been suggested, but is untested by the author. It is reprinted here for our adventurous readers!

1. Press 421 . Limit . 421 . Limit .

2. Press STORE

3. Open squelch (clockwise), then back again.

4. Press RECALL repeatedly until frequency display is blank.

5. Press 50 . LIMIT (any frequency should work)

6. Press RECALL

7. Manually search up and down.

For low band or high band out-of-band searching, simply substitute 30 or 146 MHz in step 1.

SPLIT-CHANNEL SEARCHING ON THE BC-250

It is possible to receive frequencies separated by only 5 kHz on low and high band, and 12.5 kHz on UHF (older 250's only!)

LOW BAND

1. Enter a low band frequency into store.

2. Press RECALL to display frequency.

3. Enter any two high-band frequencies into limit.

4. Press RECALL to display low band frequency.

5. Press UP or DOWN search key to initiate program.

HIGH BAND

Proceed as above, but swap "high band" for "low band" and vice versa.

UHF BAND

1. Enter 450 MHz and 451 MHz as search limits.

2. Store one or two frequencies within those limits.

3. Enter two new limits of 155 and 156 MHz.

4. Press RECALL repeatedly until a UHF frequency is displayed.

5. Manually search up or down.

Any frequency uncovered while searching using these techniques may be stored and entered using the procedure outlined in steps 7-10 earlier.

BC-220 FREQUENCY LIMIT EXPANSION

Several programming sequences have been reported for opening the limits of the early versions of the BC-220, which used the same microprocessor as in the early BC-250. One of these programs is repeated here.

To Search 136-144 MHz:

1. Turn the set off and on to clear the memory.

2. Manually select any channel.

3. Enter 136.0 Mhz

4. Enter 144.0 and press LIMIT

5. Press SEARCH (reads ERROR)

6. Press LIMIT (reads 136.0 MHz)

7. Press SEARCH

You may restrict this out-of-band search sequence further once steps 1 through 7 have been executed. While the receive is searching, open the squelch at whatever frequency you would like to select as the upper search limit; then:

8. Press 136.0 LIMIT

9. Press SEARCH (reads ERROR)

10. Press LIMIT (reads the frequency at which you stopped searching)

11. Press SEARCH and close squelch again to resume searching.

A number of frequency ranges may be substituted for the examples above, but only in the early versions of the BC-220 with the older microprocessors. But remember, signal sensitivity will decrease rapidly outside of the original tuning ranges.

OUT-OF-BAND PROGRAMMING

THE BC-220FB and BC-250FB

Readers John Mark and Peter Thurlowm brought to our attention an ad in an English publication in which Radio Shack Ltd. suggested programs for extending the frequency ranges of two export Bearcats. Since these products are also available in this country, we are including those instructions for our readers.

- Quite possibly the technique can be adapted to domestic

models merely by substituting appropriate in-band frequencies.

TO search 146-133 and 91-0 MHz with the BC-250FB

Press 146 LIMIT, 146 LIMIT

Press STORE

Open and close squelch

Press MANUAL

Press 174 LIMIT, 174 LIMIT

Press SEARCH, RECALL, SEARCH

BC-250FB will now autosearch 146-133 and 91-0 MHz.

NOTE: Since the oscillator and RF circuitry is incapable of tracking such a wide frequency excursion, only the portions of the spectrum near the original design ranges will be capable of receiving signals.

TO search 144-88 MHz with the BC-220FB

Press 88 ENTER, LIMIT

Press 144 LIMIT, SEARCH, LIMIT

Press Search (BC-250FB will now autosearch 144-88 MHz)

SIMPLE OUT-OF-BAND PROGRAMMING FOR THE BC-300

Reader Rich Kramer who was kind enough to send the out-of-band frequency programming tricks which were discussed in the July/August issue of MT has simplified his scheme even further. Readers are advised to substitute the following routine for searching the 136-144 MHz range on a Bearcat 300 scanner:

Close squelch

Select any channel and enter either a VHF low or VHF aero frequency.

Press 157.6 LIMIT, 165.6 LIMIT

Open Squelch

Press SEARCH

Press ENTER

Close squelch; unit will now search 136-144 MHz

NOTE: These search limits may be restricted if desired merely by entering limits closer to one another in the 157.6 and 165.6 range.

To enter a frequency in the 136-144 MHz range:

Close squelch

Select any channel and enter a VHF low or VHF aero frequency.

Add 21.6 to the desired frequency and set both search limits at that frequency.

Open squelch

Press SEARCH

Press ENTER

Close squelch

Press 1

Press LIMIT

Open and close Squelch; frequency will now be in memory

Thanks, Rich, for your continued efforts to inform our readers!

OUT-OF-BAND PROGRAMMING THE BC-210XL

This program was just received at press time from Steve Jones of Brantford, Ontario and has not been tried in our lab.

For 50-144 MHz (Search and memorize):

Press: MANUAL

Press: 50, LIMIT, 50, LIMIT

Continued on page 11

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Teaching Your Scanner

from page 10

Press: SEARCH, HOLD, MANUAL

Press: 144, LIMIT, 143, LIMIT ("ERROR" now displayed)

Press: SEARCH

Scanner will now search 50-144 MHz, a tedious 17-minute process! Pressing the HOLD button after the scanner reaches 92 MHz will cause the search range to jump to the aircraft band (still FM mode, however).

To memorize an out-of-band frequency, press MANUAL when that frequency is reached.

For 174-212 MHz:

Press: MANUAL

Press: 174, LIMIT, 174, LIMIT

Press: SEARCH, HOLD, MANUAL

Press: 512, LIMIT, 513, LIMIT ("ERROR" now displayed)

Press: Press: SEARCH

Scanner will now search 174-212 MHz. Pressing HOLD after the scanner reaches 174.500 MHz will cause the scanner to jump to 420 MHz.

Memorize a channel as before.

(Thanks, Steve, for your contribution. Any other readers with pet tricks or modifications?)

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Wells-Fargo (Baker Protective Service) Ft. Lauderdale, FL: 461.665

Wells-Fargo (Baker Protective Service) Miami, FL: 471.6125

Goodyear Blimp (Press support): 161.640

Holiday On Ice (Wireless microphones): 171.900 180.100

Time, Inc. (Repeater): 452.975 (Washington, DC) 453.000 (New York City)

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Offshore Radio Telecommunications Service (ORTS): 488-494

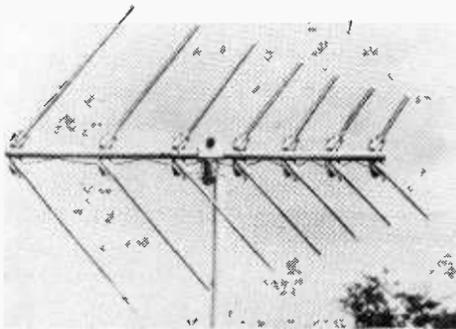
Nascar Officials (Darlington, Ga): 464.500

Wildlife Tracking Transmitters:
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.67/.68/.69

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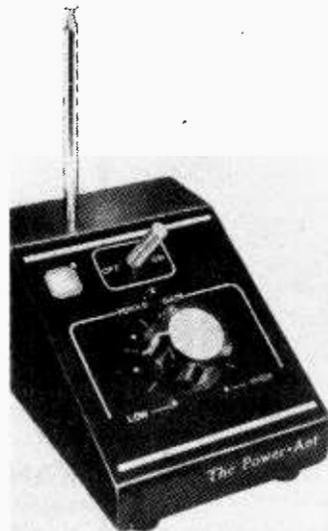
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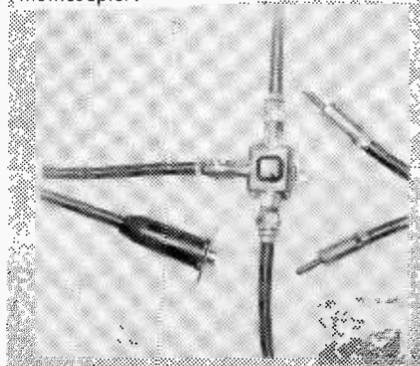
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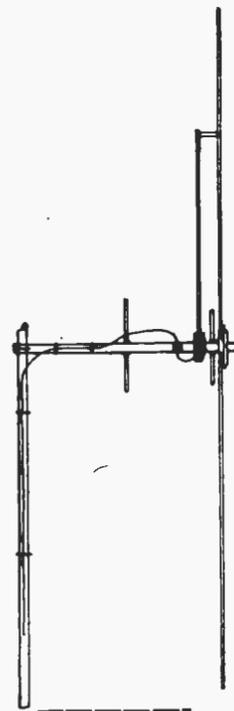


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This low-cost, high-performance, all-direction antenna is designed for 30-54, 108-174, 406-512 and even 806-960 MHz reception!

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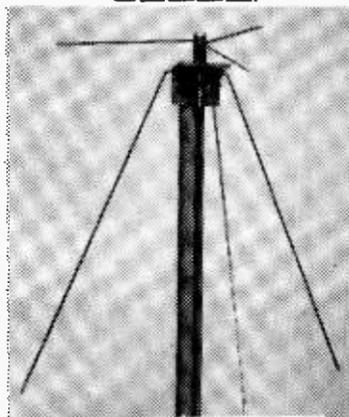


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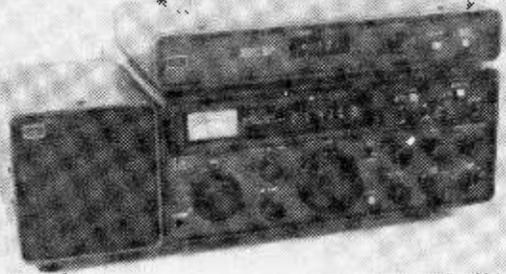


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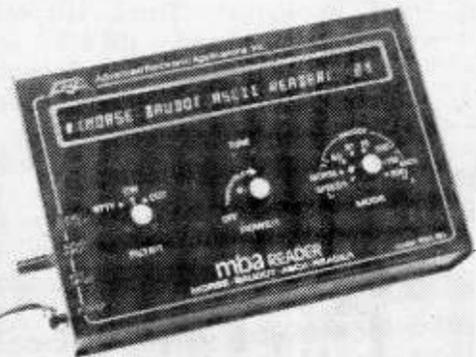
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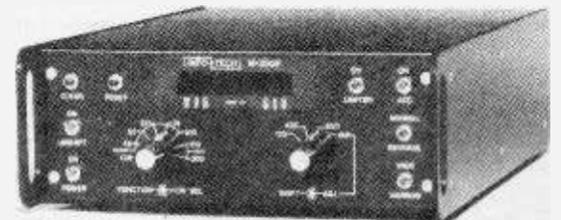
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The Programmable Scanner:

A Little History

The story of communications has always had one prominent direction: upwards in frequency. Even now engineers are developing the new 800 MHz band while satellites overhead transmit in the 2, 4 and 12 GHz ranges and higher.

Hobby receiving equipment has held pace, with scanners occasionally available for the 800 MHz "microwave mobile" band.

The earliest consumer receivers for the VHF and UHF bands were tunable, featuring analog dials rather than digital. Venerable names like Hallicrafters and National, now gone from the hobby market, offered shortwave receivers with extended coverage.

By the 1950's and 60's, VHF and UHF receivers were a breed of their own, with shortwave coverage restricted to the spectrum below 30 MHz. Regency was a prominent pioneer in VHF and UHF tunables, while Radio Shack and Lafayette sported multiband portable radios which included these services.

Because of the instability of tube-type circuitry at these high frequencies, crystal control became quite popular. Only one channel at a time could be monitored and manual switching between desired channels was necessary.

The advent of solid-state electronics brought many changes to the hobby market, including the

first scanner. In 1968 an engineer at Regency, Al Lovell, was toying with the idea that it should be possible for crystals to be switched automatically in sequence, stopping when a signal was detected. The first scanner was born.

Lovell gave the spark of a new industry to the manufacturer of a crystal scanning receiver, the Bearcat, named for his love of antique automobiles.

In the years since that innovation, many companies have come and gone with scanning products. In 1972 a radical new design in scanning technology was announced by Teaberry Company. In that scheme, a forest of frequency dividers and mixers synthesized the oscillator frequency, allowing virtually endless channel selection using only one oscillator crystal.

Unfortunately, a number of problems arose with this circuit, and the Teaberry product never saw the light of day.

It was 3 years later when the first real product emerged from the fledgling industry: the Tenelec "MemoryScan." The release of this product proved to be premature, and the numbers of defective returns to the factory led to the downfall of Tenelec.

Within months of each other in 1975, Electra, Regency and SBE all announced synthesized scanners of their own. Of this bevy of new products, it was the Bearcat BC-101 which dominated the marketplace. Many are still in

Continued on page 14



The M-100, a popular mobile scanner from Regency.



The BC-250 from Electra, possibly the most sophisticated scanner yet produced.

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Programmable Scanner:

from page 13

use, and some "old timers" still think it is one of the best scanners around.

The SBE "Optiscan" sported optically-encoded cards which would provide the frequency information when inserted into the light-detecting slot. SBE also withdrew from the scanner marketplace soon after realizing that the Optiscan had many shortcomings, and concentrated their efforts on a new craze called "CB"!

In the meantime, Tennelec introduced a cleaned-up version of their ill-fated MemoryScan: the MS-2. It was better than the original, but not much.

In 1976 Regency came aboard the programmable-scanner thrust with the WHAMO-10 (ACT-W-10). In that scheme, frequency combs were provided which contained teeth to be broken off to establish patterns which the synthesizer would recognize. It was a novel scheme, but quite dedicated and inflexible.

An accessory item, the DFS-5K digital frequency synthesizer, could be added as an option, permitting the user to dial up the frequency of his choice. Still, only one channel at a time could be dialed up; the rest were determined by frequency combs.

Late in 1976, Tennelec released its last full-blown product into the programmable market: the MCP-1. It featured microprocessor control, digital

frequency readout and search capabilities. But it, too, proved to be premature, and Tennelec went out of business before the birth of the MCP-2.

Even the marketing giant Radio Shack had its problems. The COMP-100 synthesized scanner was similar to the Bearcat 101, requiring a "look-up" book to set the synthesizer switches. Limited distribution prevented widespread acceptance of the product, and it was finally withdrawn.

Two prominent pacesetters were introduced in 1977: The Electra BC-210 and the Regency ACT-T-16K ("Touch"). The Bearcat product featured small mobile size, pushbutton frequency entry and a large display. The Regency scanner sported 16 channels, priority, weather alert and individual channel lockout.

One largely-overlooked product was a rather bizarre flirtation with the scanner market by Panasonic. The RE-1800 had an 8-channel capacity, programmed by a speed control and an up/down lever. It met with little customer acceptance.

Fast on the heels of the COMP-100, Radio Shack announced their PRO-2001, a substantial step forward. It was the mainstay for Radio Shack for several years until the advent of the PRO-2008, both introduced in 1980.

A prominent Japanese auto sound specialist, J.I.L., released two compact, flexible programmables: the SX-100 and SX-200. Unfortunately both were

vulnerable to interference problems from front-end overload, although an improved version is due for release.

Still prominent at this writing are the releases from Regency. ("Touch", Digital Flight Scan, K-100, K-500, M-100, M-400, D-100, D-300, D-810) and Electra (BC-210, BC-250, BC-211, BC-220, BC-300, BC-160, BC-150, BC-350, BC-100)

And even more products loom on the horizon!

Where Are We?

Several basic patents such as "Track Tuning" are owned by Electra, making competitive entries difficult to say the least. But the market is supportive of new ventures. It has been estimated that there are more than six million scanners in 7% of American homes. This represents an annual retail sales impact of a quarter billion dollars! Clearly, the market is inviting to manufacturers, and there are exciting times ahead for the monitoring hobby.

What innovations might we see in the years to come? American engineering is fast-paced, boosted by the rapid-fire technology of the former CB boom. Let's take a look at some ideas and recommendations.

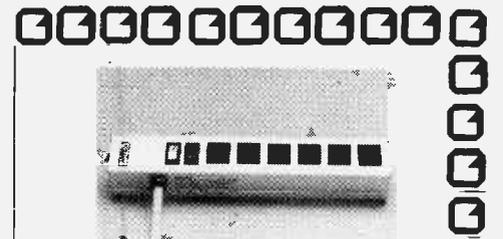
The Ideal Programmable Scanner

Over the years, scanner buffs have pooled their design requests into an imposing "wish list". Some of these features which we may or may not see include:

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2. A variety of detection modes, including AM, wideband FM, narrowband FM, CW and SSB.
3. An S-meter as an aid to antenna orientation and signal comparison.
4. Reduction in "birdies" through more extensive internal circuit shielding. Ability to search past spurs which remain.
5. Reduction in intermodulation, crossmodulation, desensitization and images through better circuit design.
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8. Eminent portability--a true pocket programmable.
9. Programmable search segments to enable skipping of undesired ranges.
10. An effective mobile telephone tone bypass.

11. Built-in descrambler.
12. Panoramic video output for spectrum analyzing.
13. Photocell-controlled display brightness to self-adjust in ambient light conditions.
14. Simple to use with reduction in unnecessary buttons ("dim", "speed", etc.). Clock could display in scan mode or when receiver is shut off; other functions could toggle with one pushbutton.

It is unlikely that all of these features will never appear on one scanner. But it is likely that at least some of them will surface on the market eventually!



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Hams Hear Shuttle--

by M. Elmitt Eastcott
Southern California "Hams" and scanner listeners are fortunate when the Space Shuttle is on a mission. Thanks to the expertise and generosity of the JPL Amateur Radio Club W6VIO (Jet Propulsion Lab., Pasadena), all voice communications between Houston Control Center and the Astronauts are available to us on VHF and UHF.

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JPL then transmits the combined audio (Houston and Columbia) on their La Canada transmitter W6VIO on 224.04 Mhz to the amateur community. Scanner listeners, however, received the audio from repeaters re-transmitting on 145.6, 145.46, 146.75, 446.775 and 447.775 MHz.

Reaction to these transmissions was spectacular. Scanner listeners and amateurs alike poured out calls and letters expressing their appreciation!

The public-spirited hams of southern California are to be congratulated for making this service possible. Hopefully, the coverage will continue with future shuttle missions.



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SALE! '14⁹⁵ (Reg. '16⁹⁵)
WORLD RADIO TV HANDBOOK (BOK-3) by J. M. Frost (1982 edition, 590 pages, 6" x 9"). Widely recognized as the singular reference for broadcast listeners. Shortwave, longwave, FM and TV stations worldwide are all listed. Schedules, frequencies, programs, languages and even printed scores of musical interval signals are included. Beam headings, addresses, band plans, frequency allocations and other articles of interest are presented in an authoritative, easy-to-follow manner. A **MUST** for every shortwave listener.

ORDER TODAY!

Supplies Limited!



THE GIANT BOOK OF ELECTRONICS PROJECTS by the editors of 73 Magazine. (498 pages, 5 1/4" x 8 1/4"). A massive collection of eminently-useful home projects for both beginners and advanced experimenters. More than 100 liberally-illustrated projects include antennas, filters, receivers, transmitters, test equipment, clocks, power supplies and more. **BOK-15, '12⁹⁵**

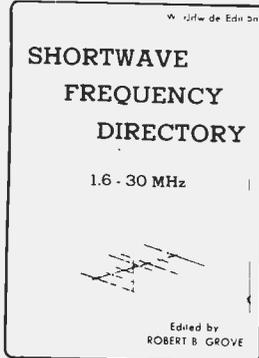


SALE! '3⁹⁵ (Reg. '5⁹⁵) **SOUNDS OF SHORTWAVE (TAP-1)** by Bob Grove (60-minute cassette). Puzzled by those strange sounds on the shortwave bands? This lively, professionally-produced tape identifies them for you!

Learn how to recognize jamming, spy transmissions, slow scan TV, teletype, multiplex, facsimile, telemetry and much more from actual off-the-air recorded examples.

And as an added feature, helpful answers to your questions about antennas, receivers, grounds and other subjects most often asked by listeners. Get the most out of your listening.

Follow the diagnostic tips explained by Grove to test a receiver **BEFORE** you buy so you won't be disappointed!



SHORTWAVE FREQUENCY DIRECTORY
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The most comprehensive 1.6-30 MHz directory by Bob Grove of agencies and frequencies using the HF spectrum to date.

Some 5000 listings including Air Force, Navy, Coast Guard, Army, Foreign military, Energy, Emergency, State Department, Embassies, FCC, Interior, Spies, beacons, clandestine and pirate broadcasters, aircraft and ships, space, RTTY/FAX, smugglers, INTERPOL, Border Patrol, radiotelephone and more.

Over 200 pages, 8 1/2" x 11", spiral bound for radio desk convenience.

Truly an indispensable reference for any shortwave listener.

Listen to comments from delighted users:

"The most exhaustive directory of agencies and frequencies using the HF spectrum ever published. A must for the folks who DX the utilities". (Editors, American Shortwave Listeners Club)

"Worldwide in scope. Data is presented in clean, neat typing, and the offset printing was first rate. There is a very wide assortment of NEW military, governmental, commercial material...quite a collection of data covering virtually all aspects of utility communications. The Shortwave Frequency Directory is destined to be one of those **MUST** use books to have."

(Mike Chabak, utilities Editor, SPEEDX)

"The great virtue of the Shortwave Frequency Directory is gathering so much material together in one handy volume, and presenting it in a form that is so easy to understand and use."

"No one document that I've ever seen gives such a grand overview of what can be heard in the nonbroadcasting parts of the HF band. It's a good for exploring shortwave more deeply."

(Robert Horvitz, Shortwave editor, Radio Communications Monitoring Association.)

WORLD PRESS SERVICES FREQUENCIES, by Thomas Harrington, 3rd Edition). 72 pages, 8 1/2" x 11. An up to date comprehensive manual covering the field of radioteletype news monitoring. Contains three different master lists of

worldwide radio teletype frequencies used for transmitting news services in the English language, plus all needed information on antennas, receivers, terminal units, monitors and how-to-receive hints. Master lists include:

Transmission times, frequency, shift and speed, service (AP, UPI, TASS, REUTERS and other.) location and reception ratings. Highly recommended for all those interested in RTTY monitoring. **BOK-5, '7⁹⁵**

THE COMPLETE SHORTWAVE LISTENER'S HANDBOOK by Hank Bennett and Harry Helms (2nd edition, 306 pages, 6" x 9"). A thorough introduction to the exciting world of shortwave listening.

Learn more about receivers, antennas, frequencies, radio wave propagation, harmonics, logging, reception reports.

Fascinating and informative reading. **BOK-7, '10⁹⁵**.

HOW TO BUILD HIDDEN, LIMITED SPACE ANTENNAS THAT WORK by Robert J. Traister. 308 pages, 6" x 9". A collection of clever and innovative antennas for SWL's, hams and anyone else who finds he has no room for conventional antennas. Special projects for apartment dwellers include suspended verticals, window antennas and attic antennas.

Devise effective antennas from downspouts, window screens, TV antennas and other available surfaces. **BOK-8, '9⁹⁵**.

THE COMPLETE ACTION GUIDE TO SCANNERS AND MONITORS by Louis A. Smith II (256 pages, 6" x 9"). A thorough, easy-to-read handbook on public service monitoring, including systems and accessories. Explains frequency allocations, scramblers, speakers, antennas and more.

Rules and regulations are stressed to help you understand the law. An excellent guide to questions and answers about scanner listening. **BOK-9, '9⁹⁵**.

THE TOP SECRET REGISTRY OF U.S. GOVERNMENT RADIO FREQUENCIES by Tom Kneitel (4th edition, 120 pages, 6" x 9"). An extensive collection of government and military frequencies, many considered highly-sensitive, from 25-600 MHz.

Includes many locations, call signs, code names. Articles on surveillance, monitoring in the 1930's, bugs, scramblers and pictures of federal QSL cards. **BOK-11, '9⁹⁵**.

RTTY FREQUENCY GUIDE by Joerg Klingenfuss (50 pages, 8 1/2" x 11"). Expanded 7th edition -- The ultimate directory for tuning in news agencies, weather broadcasts, military communications, embassies and telegrams worldwide.

Over 2000 RTTY frequencies, 3-30 MHz, identified by location, agency, call sign and schedule. **BOK-12, '11⁹⁵**.



HOME-BREW HF/VHF ANTENNA HANDBOOK by William Hood (210 pages, 6" x 9"). Down-to-earth presentation tells you what you want to know about antennas, dummy loads, SWR meters, dip wave meters, impedance bridges and more.

A handy guide for the home experimenter. **BOK-10, '6⁹⁵**.

HOW TO TUNE THE SECRET SHORTWAVE SPECTRUM by Harry L. Helms (182 pages, 6" x 9"). If your curiosity is aroused by unusual signals, this is the book for you.

Tour the world's secret radio spectrum: pirate and clandestine broadcasters, spy

communications, mysterious beacons, long-delayed echoes, diplomatic and military channels, space communications.

One of our best-selling books. **BOK-6, '7⁹⁵**.

COMMUNICATIONS MONITORING by Bob Grove (117 pages, 5 1/4" x 8 1/4"). Written for the shortwave listener and scanner buff, this fast-selling book describes all facets of radio listening from VLF through UHF.

Paging, telemetry, voice scrambling, bugs, antennas, receivers, accessories, clubs and publications, frequency allocations and more.

And, as a special bonus, a

special home projects section: Antennas, amplifiers, power supplies, receivers, converters, filters and other useful, easy-to-build items. **BOK-2, '6⁹⁵**.

RTTY CALLSIGN DIRECTORY (new publication) (52 pages, 5 1/2" x 8 1/2"). Worldwide collection of some 3000 callsigns to help you identify those elusive RTTY stations encountered on the air.

The list includes callsign block allocations, common abbreviations and ITU identification regulations.

A handy reference guide for every RTTY enthusiast. **BOK-14, '6⁹⁵**.

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FRG 7700 256 Channel Memory Expansion

by Robert Lonn

When I first received the memory option for my FRG-7700 I looked at the schematic to see what Yaesu was doing electronically to accomplish this task. It didn't take me long to discover that the memory chips used by Yaesu were capable of more than 12 channels of memory!

It turned out that 256 combinations were possible, but due to production costs YAESU decided to use a more practical approach: A 12-position switch.

I have designed 3 versions for obtaining these 256 memory channels, but I'll stick to the simplest version which any skilled experimenter should be able to add to his unit.

If you look at your circuit diagram for the memory, observe Q30 thru Q35, bus line A1 and pins 0-7. Follow these lines over to plug P34 of the main circuit diagram. These lines labeled 5 volts thru A7 go to switch S5 (a) and S5 (b). The wipers of these two switches are connected to the 5 volt line.

By selecting any combination of the A0 thru A7 lines you are selecting a binary code to address the UPD5101LC memory chip. 8 address lines will yield 256 different codes.

You will install 8 toggle switches to address these chips and one ON/OFF switch to restore the front panel switch to normal

operation. The procedure is quite simple and should take about two hours to complete.

Remove the memory unit from the back of the radio. Note plug number 34. This is the 13 pin plug with a black wire at one end (pin 1) and a purple wire at the other end (pin 13). The only wire you will have to cut is the white 5 volt line (pin 4). Proceed as follows.

From the list below install 8 SPST toggle switches in any small enclosure; I used a small LMB metal box. You may want to keep the 9th switch (a SPDT switch) separate from the others (see figure 1).

Label the 9th switch "ON/OFF" and the remaining switches as number 1 thru 8. Now solder 8 of the 10 wires of the computer ribbon wire to switches 1 thru 8. One of the remaining two wires goes to the center pin of the ON/OFF switch; the other goes to the terminal which is shorted to the center terminal when the front switch reads "OFF".

Now connect the common terminals of switches 1 thru 9 together with a shorting strap; connect this shorting strap to the remaining terminal on switch 9 (see figure 2).

Cut the white wire at pin 4 of plug P-34 about one inch from the plug. Now solder the wire which goes to switch 9, center pole, to the small one inch wire coming

out of P-34. Solder the other wire coming from switch 9 to the other side of the cut white wire.

Strip off some of the insulation on the colored wires from P-34, pin numbers 5 thru 12. Pin 5 is a gray wire and pin 12 is a brown wire. Solder the remaining 8 wires coming from switches 1 thru 8 to these 8 wires.

Place a small piece of electrical tape or shrink tubing over each soldering connection to prevent shorting of the wires. Any of the eight remaining ribbon wires can be soldered to wires 5 thru 12 on P-34 (see figure 3).

Re-install plug P-34 and secure the memory unit to the back of the radio. Bring the ribbon wire out the top of the unit. Do not tighten down on the top two screws of the memory unit; This will keep pressure off of the ribbon cable.

Normal Operation

For normal operation all switches should be "off"; select memory 1-12 as done previously.

Expanded Memory Operation (see chart)

The front panel switch on the

FRG-7700 must be in the memory 1 position. Turn the ON/OFF switch on the expansion box to "ON". Toggle switch number 1 is on and 2 thru 8 are off. Store memory 1.

Toggle switch 1 off, 2 on, and 3 thru 8 off. Store memory 2.

Toggle switch 1 and 2 ON, 3 thru 8 OFF. Store memory 3.

Toggle switch 1 and 2 OFF, 3 ON, 4 thru 8 OFF. Store memory 4.

Last example: 1 ON, 2 OFF, 3 ON, 4 thru 8 OFF. Store 5. These are binary codes.

Switches 1 thru 8 are read in binary as 1, 2, 4, 8, 16, 32, 64, and 128, so if we took switch number 3 (which is 4), number 5 (which is 16) and number 6 (which is 32) and turned these on we would have memory number $4 + 16 + 32 = 52$.

Make up a chart like the one shown to keep track of which station you have in each memory and the position of the toggle switches. Good Luck with this worthwhile project for expanding the FRG-7700 to 256 memory channels!

Viewpoint... from page 8

The directory is a great deal of Utility data in a neat and easy to read format, all in one handy publication. It compliments the data contained in my copy of the FEDERAL FREQUENCY DIRECTORY. It is another fine publication of Grove Enterprises, Inc. which every Utility DXer should have in his or her library!

Mark Chinsky
Flushing, NY

★★★★★

It was inevitable! Sooner or later, IRAC was bound to classify the entire Government Master File. It is obvious that the successful distribution of the Federal Frequency Directory played an important role in that decision. Also, I am sure NTIA and IRAC, like everyone else, was caught up in the wave of conservatism brought upon by the Reagan administration and the country in general.

I agree that the disclosure of unclassified frequencies reveals classified information. But the government operates in a hypocritical manner, because I know of a discarded unclassified government report which lists the band plans for all land-mobile government communications. Not only does it give the frequency parameters and increments, but it actually lists each individual

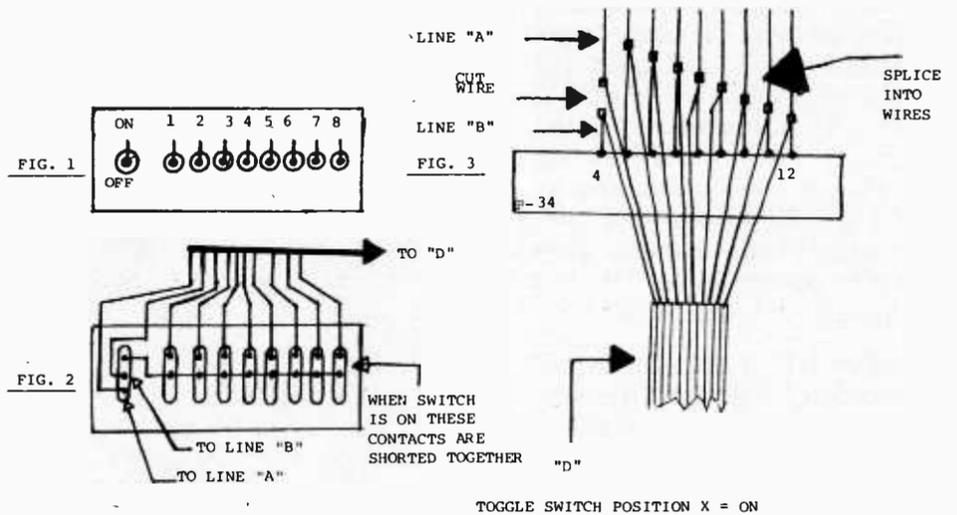
frequency! So apparently it is fine to give the frequency, as long as the user is not identified.

Your article, "Government Withdraws Frequency Information," stated that "casual monitoring is of no concern, but availability of sensitive material to foreign agents is of vital concern." I am sure Russia, or any other "enemy" for that matter, is well aware of any frequency information that it should desire. Furthermore, if Uncle Sam is so concerned about radio transmissions compromising national security, then why did the President and Secretary of State use a "non-secure" phone patch recently? They completely sidestepped the "scrambler phone" (and about ten years of technology!), and decided to use a clear voice channel. Is that the government's justification for denying FOIA requests for frequency information? Just so high-level-politicians don't have to wait five minutes for a "secure" radio link?

Sorry for the sarcasm, but I find the whole situation quite ironic. I will keep listening to federal radio communications. Meanwhile, I will make sure that I tell no one that the now-classified frequency of 162.55 is a National Weather Service frequency.

Wayne Smith

★★★★★



TOGGLE SWITCH POSITION X = ON

MEMORY	STATION	TOGGLE SWITCH POSITION X = ON							
		1	2	4	8	16	32	64	128
1.	BBC 1	X							
2.	VOA		X						
3.	WWV 10 MHZ			X					
4.	HCJB				X				
5.	CANADA					X			
6.	WWV 15 MHZ						X		
7.	WWV 5 MHZ							X	
8.	MOSCOW 1								X
9.	MOSCOW 2	X							
10.	BBC - 2		X						
11.	BBC - 3			X					
12.	BBC - 4				X				
13.	GREECE					X			
14.	FRANCE						X		
15.	MEXICO							X	
16.	JORDAN								X

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QTY	Description	Radio Shack Part No.
1	SPDT Mini Switch	275-625
8	SPST Mini Switch	275-624
1 1/2 ft.	10 Conductor Color Ribbon Cable	276-1976
	CUT OFF connectors	
1	LMB or equivalent Mini Box	270-239
4 inches	Mini Heat Shrink Tubing	
1 pkg	Datak Rub/On Numbers and Letters	

Club Corner

Last month we took a brief look at a number of clubs with memberships available to interested MT readers. This month, let's take a look at some more interesting organizations which offer good reading to their members.

DX ONTARIO Although published in Canada, this monthly volume from the Ontario DX Association is distinctly international in flavor. The July issue features 71 pages of well-written, illustrated articles of interest to shortwave and medium wave broadcast listeners. For a sample, send \$1.50 to ODXA Membership Secretary, Mr. Tony Clift, RR3, Campbellville, Ontario, Canada LOP 1B0.

ASWLC Published by the American Shortwave Listeners Club, SWL is a timely monthly, packed with information about both broadcast and utilities shortwave stations. SWL includes quotes from other sources as well as inside looks into international broadcasting stations. For your sample copy, send \$1 to ASWLC, 16182 Ballad Lane, Huntington Beach, CA 92649.

ACE a little more esteric than most, but definitely fascinating reading fare is this monthly organ of the Association of Clandestine Enthusiasts. Worldwide reports of pirate and clandestine-inspired broadcasts are included, along with photos and illustrations of typical pirate installations and operators. For a sample copy send \$1 to Darren S. Leno, PO box 452, Moorhead, MN 56560.

DX REPORTER After the demise of the oldest DX group in the country, the Newark News Radio Club, several former NNRC members refused to roll up their antennas. The new Association of DX Reporters is the result. Utilities and broadcasting as well as technical articles are beginning to surface in their new publication. Shortwave predominates, although a recent poll of readers may affect the eventual content. For a sample, send \$1.50 to the Association of DX Reporters, 7237 Fairbrook Road, Baltimore, MD 21207.

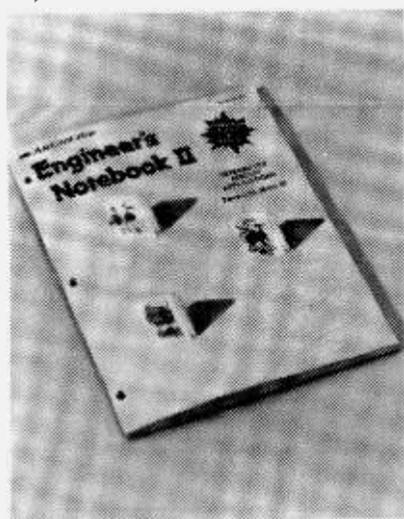
SDDXC The San Diego DX'ers

Club is the brainchild of Larry Brookwell who enjoys flavoring his monthly bulletin with personal insights and reflections. His serialized biography, "The Odyssey of an Aficionado" is about to be released as a book entitled, "Tail Gunner on a Superheterodyne". Anxious readers may learn more by writing for a sample bulletin (and sending \$1): SDDXA, 1826 Cypress Street, San Diego, CA 92154-1154.

SPEEDX One of the best-known and largest clubs, SPEEDX has the most extensive utilities (non-broadcast) section of all the club organs, as well as wide perspective writing on the international broadcasters.

SPEEDX also publishes on an occasional basis a utility guide, and rumor has it that one is imminent, probably in a serialized, unbound format. For your sample of SPEEDX, send \$1 to SPEEDX, PO box E, Elsinore, CA 92330.

RCMA Aimed primarily at scanner monitoring enthusiasts, the Radio Communications Monitoring Association also carries some minor shortwave utilities listings as well. Although RCMA has endured an unusual amount of reorganization recently, the monthly bulletin remains the best in the scanner field. For your sample copy, send \$1 to: RCMA, PO box 4563, Anaheim, CA 92803.



New Books

Engineer's Notebook II, by Forrest M. Mims, III (Radio Shack 276-5002, 8½" x 11", 128 pages)

The name Forrest Mims is well known among hobby elec-

tronics enthusiasts, and author Mims has contributed another excellent volume to the home-brew enthusiast.

Hundreds of simple Radio-Shack parts projects are arranged by categories, including flashers, noise generators, digital logic, counters, inverters, oscillators and amplifiers, alarms, power supplies and regulators, light beam transmitters and receivers, audio boosters and filters....a veritable cornucopia of design ideas for home projects.

POLICE CALL RADIO DIRECTORY by Gene Hughes (available from Radio Shack and other scanner dealers). Regionalized by geographical area, the Police Call directories have become well established among listeners as the standard reference for public safety monitoring.

The 1982 edition includes two new categories: aircraft and a skip locator chart. The aircraft list is a sampling of the most often encountered air to ground VHF channels in each state, while the skip locator permits the listener to target in on a particular out-of-state low-band police or fire frequency depending upon the time of day.

The usual auxiliary lists of railroads and US government stations are included as well as the table of VHF/UHF frequency allocations.

At \$6.95, the Police Call directory is a recommended reference for every listening post. If it is not available locally, write: Police Call, Dept. 1, Lebanon, NJ 08833 and include \$1.50 first class or \$.40 fourth class mail. Don't forget to specify your state, as there are 9 volumes nationwide.

BEGINNERS GUIDE TO PERSONAL COMPUTERS by Forrest M. Mims, III (Radio Shack, \$1.95). Mims is a respected name among writers of hobby electronics subjects, and his guide is a good overview of the personal computer market for the beginner.

Eighty pages of the little guide cover uses, programs, languages, software sources, memories, plotters and printers, and expanded systems.

Yes, Radio Shack is strongly plugged, but the basic information is generic. An easy evening's reading for the person considering a computer.

THE RADIO HOBBYIST'S HANDBOOK by Joseph J. Carr (TAB1346, 5½" x 8½", 383 pages, hardbound, \$19.95). Carr is a well-known author of books on hobby (mostly amateur) radio. His latest contribution is particularly suitable to listening hobbyists who wish to know more about the uses and specifications of receivers, transmitters, test equipment and antennas.

Carr does more than superficially introduce the reader to the equipment; he dissects the equipment so that the reader may more fully understand the principals

behind the operation.

The handbook is well illustrated with diagrams, photographs, sample layouts and other techniques for vivid representation of principles. An excellent addition to the hobbyist's bookshelf.

If you can't find it locally, write TAB Books, Blue Ridge Simmitt, PA 17214.

AMATEUR RADIO, SUPER HOBBY! by Vince Luciani K2VJ. Interested in ham radio? Know anyone who is? Luciani's light-reading treatise takes us through all of the fun and challenges of the ham hobby.

Meet famous hams (Senator Barry Goldwater, General Curtis Lemay and others), read how a young ham hearing an SOS alerted the Coast Guard to a sinking ship. Learn about HANDI-HAMS, handicapped amateur radio enthusiasts who expand their lives through ham radio.

Luciani also introduces us to the many facets of amateur radio: contesting, public service, technical experimentation, building your own equipment and more.

Amateur Radio, Supper Hobby! is timeless. Read it for enjoyment and share Luciani's infectious enthusiasm for one of the world's most rewarding hobbies.

Author Vince Luciani is offering a special discount, including another book "Tornado-Wise!", which tells how these killer storms can be detected and prepared for. An \$18 package for only \$8 postpaid! Get your two books now while supply lasts from Cologne Press, PO box 682, Cologne, NJ 08213.

Interested In Broadcast Band DX'ing?

As a result of our rundown on several clubs in a previous issue of MT, we received a nice note from Ron Musco, Membership Officer of the famous National Radio Club, the oldest major listening club in the United States.

Apparently, large numbers of MT readers were interested in learning more about the NRC. Since their annual convention will be in Louisville, Kentucky on Labor Day (and their 50th Anniversary convention will be held in Hartford, Connecticut next year) we thought it would be appropriate to provide our readers with a little more information about this organization.

The National Radio Club is the world's oldest and largest DX club devoted exclusively to monitoring the AM broadcast band (535-1605 kHz). Their magazine DX NEWS is published 30 times per year to accommodate weekly updates during the winter DX season.

Reprints of previous articles as well as a receiver manual and antenna manual are also available.

For your copy of the NRC Information Booklet and a recent issue of DX NEWS, send \$1.00 to National Radio Club, PO Box 118, Poquonock, CT 06064.

NASA LAUNCH SCHEDULE 1982

EASTERN TEST RANGE: John F. Kennedy Space Center

Spacecraft	Date	Vehicle	Launch Time
RCA C-1	Jan 15	Delta	8:54 PM EST
Westar IV	Feb 25	Delta	7:04 PM EST
Intelsat V, F-4	Mar 04	Atlas-Centaur	7:23 PM EST
STS-3 (OSS-1)	Mar 22	Space Shuttle	11:00 AM EST
Insat 1A	Apr 10	Delta	1:47 AM EST
Westar V	June 08	Delta	8:24 PM EDT
STS-4 (DoD 82-1)	June 27	Space Shuttle	11:00 AM TO 3:24 EDT
Anik D-1	Aug 12	Delta	6:57 PM TO 7:21 PM EDT
Intelsat V, F-5	Sep 09	Atlas-Centaur	
RCA-E	Oct 28	Delta	9:15 PM TO 10:15 PM EDT
STS-5	Nov	Space Shuttle	

Spacecraft	Date	Vehicle	Launch Time
Telesat-E			
Intelsat V, AC-61	Dec 09	Atlas-Centaur	

Spacecraft	Date	Vehicle	Launch Time
WESTERN TEST RANGE: Vandenberg Air Force Base			
Landsat-D	Jul 09	Delta	10:59 AM TO 11:14 AM PDT

Technical Topics

Q. The next-door bank computer ruins my scanner and shortwave reception. Anything I can do? (Steve H.,)

A. Computer RFI is a serious threat which is bound to get worse. Try locating your antenna as distant from the bank, and at right angles to it, as possible. Feed it to your receiver with coax cable. A directional antenna (beam for your scanner, loop for shortwave) might offer an improvement.

If all else fails, tell the head officer at the bank that you are enjoying monitoring the bank transactions on your home computer; it's fascinating to see the balances of their clients' accounts. You may be surprised at how fast they check their radiation levels!

Q. I have several surplus communications receivers and no antenna space. Can I use short whips? (Bill N., San Antonio, TX)

A. Those old tube-type receivers were nice, but not noted for sensitivity. First, try running as long a wire as possible, even if you have to wrap it around the house eaves a wall or two. Stay away from electrical lines and large metallic surfaces. Fifty or one hundred feet is desirable.

You may be better off with an active antenna from MFJ, KRS, Datong, Grove or some other manufacturer.

Q. What is the difference between an antenna tuner and a preselector? (Henry J., Washington, DC)

A. No question arrives at our offices more frequently than this one! Let's set the record straight.

An "antenna tuner" is a misnomer; it doesn't tune the antenna, but matches the receiver input impedance (nominally 50-75 ohms) to the transmission line. It may be thought of as a variable transformer and is not necessarily frequency-selective. It does not amplify.

A preselector may be passive (unamplified) or active (amplified). It is adjusted to favor a certain frequency, rejecting off-frequency signals to avoid overloading the receiver which causes intermodulation (lots of spurious phantom signals) dynamic compression (desensitization), and image interference.

If you have an adequate antenna, you don't need preamplification for shortwave reception. Even a preselector may be unnecessary on more expensive receivers (\$1000 class). At broadcast band and below, however, a good preselector may prove invaluable, even with a long antenna.

On low and medium-priced receivers (\$100-\$500 class), a

passive preselector may show some improvement on shortwave by reducing images and intermod from strong signals, and will definitely help on the lower frequencies.

Q. I can easily pick up the image of my local airport ATIS on 146.45 on my Bearcat, but I can't get it even if parked within 50 feet of the transmitter on my Regency M-400 tuned to 146.25 How come? (Art Kimball, 802 N. Parke St., Tuscola, IL 61953)

A. Since all Regency's to my knowledge have a 10.7 MHz IF, I have no idea; your formula is right ($124.85 + 21.4 = 146.25$). How about it readers? Can you help Art with this one?

Q. Using your new Shortwave Frequency Directory, I have heard many tactical military callsigns that I can't identify. Can you help?

A. Aside from the list of identified ID's in the SWFD, most military callsigns are generated by computer on an expiration basis. Callsigns like "Tango Five Alpha" or "Buzz Saw" are often assigned for a single mission or operation, retired at its conclusion.

Q. What range can I expect to hear on your 225-400 MHz Scanner?

A. Good question! With the new models featuring a built-in preamp and a good outside antenna like a Scanner Beam, I have reports of 200-400 miles line-of-sight from military aircraft in flight.

Much depends upon your antenna and its location, feedline, scanner sensitivity and the power of the transmitter being heard.

Q. Recently, I heard two CB'ers planning an assault on another CB'er; they were apprehended because I alerted the police. Was my notification illegal?

A. Absolutely not; you used excellent judgement. Historically, the unlawful use of the airwaves has been reported to law enforcement officials with impunity; contents of their transmissions have been considered in prosecution (much to the dismay of the defendants!).

Report criminal transmissions to the appropriate law enforcement agencies and also to the FCC whenever possible. Your support will be appreciated and guarded in confidence.

(NOTE TO READERS: PLEASE ENCLOSE A SELF-ADDRESSED ENVELOPE WITH ANY INQUIRIES OR CORRESPONDENCE REQUESTING A PERSONAL REPLY, OTHERWISE ANSWERS WILL BE PRINTED AS SPACE AND TIME PERMIT)

Book Review

"How to Tune the Secret Shortwave Spectrum"

by Harry L. Helms

Review by Kirk Baxter

While perusing recent books in our county library the other day, I noticed "How to Tune the Secret Shortwave Spectrum". I can recommend it to those who tune between the regular SW bands for their listening enjoyment.

Chapter one discusses clandestine broadcasting in different continents of the world, giving a good historical perspective.

Chapter two deals with espionage radio activity and discusses those mysterious number stations.

Chapter three deals with government and military communications including diplomatic communications and the S.A.C.

Chapter four covers space communications and discusses satellites of the U.S. and other countries, along with a list of frequencies. Included is a list of launch support frequencies with some of the frequencies for Cape Radio (Cape Kennedy), a brief description about weather satellites, and Soviet satellite activity.

Chapter five covers 'illegal communications', which Helms has subtitled "funny stuff in the ham bands". These bands provide good cover for spy communications because the large volume of stations offers a good camouflage. Also discussed is how the ham bands have been used by drug smugglers, terrorists, and other unusual groups. In this chapter the 10-1/2 meter band is discussed along with eavesdropping techniques.

Chapter six deals with pirate broadcasting in Europe and

covers such stations as R. Mercur, R. Nordsee International, Voice of Peace, R. Viking, Westside R., and Free R. Broadcasting Corporation, to name a few. For those (like myself) who don't know too much about European pirates, this chapter is a good summary of some of the activity that has been heard.

Chapter seven deals with pirate broadcasting in N.A., with a table listing stations from 1973 to 1979. The history of pirate radio is given (WTIT is listed as one of the first pirates, initially heard in 1973 along with Radio Clandestine). Other stations discussed were Wild Turkey Radio, R. King Kong, WAPL, WHGC, WCPR, WDBX, KVHF, and the Voice of the Voyager.

Chapter eight discusses with unknown and unidentified signals such as beacons, echoes, the Russian woodpecker, and strange RTTY signals (which every RTTYer has heard). Chapter nine deals with receivers and clubs, with tables of the Morse code and addresses of clubs. Chapter ten talks about the FCC and radio in general. Chapter eleven lists recent loggings (Helms began writing the book in early 1979).

The book covers many interesting aspects of SW that are usually ignored, and does not contain the usual chapters about receivers, antennas, headphones, filters, propagation, and paraphernalia used in SWling, which is common for this type of book.

My only complaint is that for a 'new' book, the most current listing is for late 1979; I suppose it takes a long time for editing and publishing.

I would suggest that anyone interested in utility listening or the unusual signals heard in our hobby, take time to read this book.

(See Grove Bookshelf, BOK-6)

No More Government Frequencies ----- An Update

Pursuant to the recent decision of the Department of Commerce National Telecommunication and Information Agency to reclassify the Government Master File as confidential, MT contacted Donald Janske, Associate Administrator of Federal Systems and Spectrum Management.

Janske confirmed that it was his agency that went to the Department of Defense for a recommendation on whether or not to release the GMF to future

petitioners. The thumbs-down recommendation by DOD was the first official statement which prohibits further release of the GMF.

A new executive order is being drafted now and is expected for release immediately.

Under present guidelines, not even the frequencies and locations of the National Weather Service or Voice of America broadcasts are releasable, even though intended for reception by the public.

Listen In On Canadian Coast Guard

---The "Day Of The Ships" Festival---

by Robert Leary

Glancing through the "Stars & Stripes" (military for newspaper) the ad caught my eye: "The Day of the Ships Festival", Cleveland, Ohio. The display list followed: USCG Cutter "Bristol Bay"; US Army Corp of Engineers tug "Stanley"; US Navy destroyer escort "Lawe"; Canadian CG ship "Griffon"; already the possibility of obtaining new frequencies was dancing through my mind.

I happily announced to Michael, my 4 year old son sitting beside me, of all the great things in store for us. He eyed me cautiously. "Dad, don't you think you have enough frequencies already"?! Something tells me that he's getting wise to our "Weekly Excursions". My 7 year old, Robert, being more enthusiastic, was already headed for the car, Bearcat-100 in hand. Although growing fast, he can still nonchalantly walk under tour "guide ropes" and bring back many a treasured frequency. I celebrated when he learned to read; at first he thought it was his birthday!

After loading up all the essentials--scanners, camera, film, note pad, tape recorder, etc--we were on our way. As expected, the lines were long but I still had to get ready for the potential "prizes" that were waiting to be found. Out came my equipment bag for a final inspection of my "tools" of the trade: 35mm camera, flash and film--check! Next a pocket-size tape recorder and lapel remote microphone--check! Next, my inside wrist note pad and pen. Everything checked out--I started to "wire" myself up.

As I was programming my Bearcat-100 I started to get the unusual curious glances from those in front and back of us; then, like clockwork, the questions started: "Hey! are you a policeman?" someone asked from behind. I said "No". Fireman? "No". On down the line they went: "Security guard?" "Military police?" "News reporter?" "Ham radio operator?"

Walking up the gangplank of the USS "LAWE" I casually mentioned to a deck hand my enthusiasm for all types of radio communications... that this was my hobby and how great it would be if my kids could see an actual Navy "radio shack"! I was very polite and this had worked before, but he must have had a bad day. ZILCH!!

Next we started our tour of

the USCGC "Bristol Bay" of the new class of icebreaking tugs. The Bristol Bay was commissioned in 1979 and is homeported in Detroit, Michigan; it has a crew of 17. The tug's primary responsibility is the opening and maintaining of ice-bound shipping lanes in the Great Lakes. The 140 foot ship can break through 20 inches of hard, freshwater ice in the continuous mode.

Our tour guide gladly showed us all radio equipment but no frequencies were in sight. Again we went on our way without any frequencies to show, but the crew on the Bristol Bay really did do a good job of answering questions and they were great in explaining things to kids.

Climbing aboard the US Army Corps tugboat "Stanley" was a real treat; it was like an obstacle course. We were greeted by a very friendly-crew ready to answer a mountain of questions. The "Stanley" is stationed in the "Buffalo District", and their main duties are removal of debris from waterways. They also repair pipelines, and on occasion assist the USCG in removing hazards such as sunken boats. Upon reaching the radio room we finally struck paydirt! A good list of useful frequencies was in plain sight, and the best was yet to come!

As we left the "Stanley" the sight of the Canadian Coast Guard Ship "Griffon" was overwhelming; it is the largest Canadian CG

ship in the central region. The Canadian CG has 20 ships and employs 780 persons in 43 locations. The Griffon has a crew of 39 and was completed in 1970. It operates from the district base at Prescott and during the shipping season it assists in the lower Great Lakes; in the winter the Griffon's icebreaking area extends from Port Colburne (Lake Erie) to Georgian Bay. The Griffon also has been to Baffin Island for arctic resupply and also participates in search and rescue.

We were really given a grand tour by the Canadian crew who went out of their way to explain operations with pride. The tour lasted almost one hour; on reaching the radio room I noticed a very large list of frequencies; the problem was that it wasn't exactly along the "Tour Path". How nice it would be to take a picture of my youngest son Michael sitting near the controls (and frequency list).

The frequency lists are below, but first, a few tips to potential frequency hunters that have

brought me many a prized frequency!

1. Depending on just what is being displayed and where, be careful about flash cameras; a 'flash' and a few raised eyebrows can possibly get you the fastest tour you have ever seen! At least they don't make you walk the plank anymore!

2. Use a small pocket sized tape recorder with a remote mike & switch; you can "talk" frequencies on the tape much faster than trying to write them down and this is not as conspicuous as standing there with a notebook and pen trying to write 90 MPH!

3. Be polite and courteous; don't try to impress anyone with your "expertise". No one likes to be talked down to; "Know it All" attitude and \$.25 will get you a cup of coffee and no more!

4. Don't be afraid to ask questions, and if someone has gone out of his way to help you, return the same courtesy by thanking him. Remember, don't ruin it for the rest of us "frequency hounds". Happy hunting!

OBTAINED FROM THE CANADIAN COAST GUARD VESSEL "GRIFFON" ---JULY -1982

SWITCH	TRANSMIT	RECEIVE	SWITCH	TRANSMIT	RECEIVE
1.	NONE DESIGNATED		51.	2182.0	2182.0 --DISTRESS-CALLING
2.	" " " " " "		52.	2003.0	2003.0 --INTERSHIP-ST. LAWRE.
3.	" " " " " "		53.	1630.0	1630.0 --SHIP/SHORE-PACIFIC
4.	" " " " " "		54.	2638.0	2638.0 --INTERSHIP
5.	NONE DESIGNATED		55.	2015.0	2538.0 --SHIP/SHORE-PACIFIC
6.	" " " " " "		56.	2040.0	2040.0 --INTERSHIP-PACIFIC
7.	" " " " " "		57.	2118.0	2514.0 --SHIP/SHORE
8.	" " " " " "		58.	2158.0	2550.0 --SHIP/SHORE-USA
9.	" " " " " "		59.	2206.0	2582.0 --SHIP/SHORE
10.	" " " " " "		60.	2134.0	2134.0 --INTERSHIP
11.	" " " " " "		61.	2142.0	2538.0 --SHIP/SHORE
12.	NONE DESIGNATED		62.	2142.0	2558.0 --SHIP/SHORE-ARCTIC
13.	2103.5	2103.5 --CGF	63.	2054.0	2054.0 --SHIP/SHORE-PACIFIC
14.	4084.7	4379.1 --CGF-VFZ	64.		2206.0 --CHANNEL-59-RECEIVE
15.	6203.1	6509.5 --CGF-CGK	65.	NONE DESIGNATED	
16.	8201.2	8725.1 --CGF	66.	NONE DESIGNATED	
17.	12395.1	13165.9 --CGF	67.	2237.0	2237.0 --INTERSHIP
18.	16546.8	17319.7 --CGF	68.	NONE DESIGNATED	
19.	22086.8	22682.8 --CGF	69.	2318.0	2318.0 --INTERSHIP-PACIFIC
20.		2670.0 --US WEATHER	70.	4125.0	4125.0 --CCG INTERSHIP
21.	NONE DESIGNATED		71.	2340.0	2458.0 --SHIP/SHORE-PACIFIC
22.		3330.0 --CHU TIME SIGNAL	72.	8284.4	8284.4 --CCG INTERSHIP
23.		7335.0 --CHU TIME SIGNAL	73.	12424.5	12424.5 --CCG INTERSHIP
24.		14670.0 --CHU TIME SIGNAL	74.	6221.6	6221.6 --CCG INTERSHIP
25.		5000.0 --WWW TIME SIGNAL	75.		2598.0 --WEATHER-AIDS
26.		10000.0 --WWW TIME SIGNAL	76.	NONE DESIGNATED	
27.		15000.0 --WWW TIME SIGNAL	77.	2738.0	2738.0 --INTERSHIP
28.	4510.0	4510.0 --(FISHERIES)	78.	8213.6	8737.5 --VAI(CH.-95-PACIFIC)
29.	4462.0	4462.0 --(FISHERIES)	79.	2815.0	2530.0 --SHIP/SHORE
30.	2752.0	2752.0 --(FISHERIES)	80.	4069.2	4363.6 --VFC/VFU/VFF/VAV/VFA
31.	2049.0	2049.0 --OYU	81.	4081.6	4376.0 --VAF/VFU/VFF/VAV/VFA
32.	2056.0	2235.0 --OYU	82.	22009.3	22605.3 --VFF
33.	2056.0	2265.0 --OYS	83.	4090.9	4355.3 --VAI/CHAN-84-PACIFIC
34.	NONE DESIGNATED		84.	4115.7	4410.1 --VCS
35.	NONE DESIGNATED		85.	8269.4	8793.3 --VFF
36.	4100.2	4394.6 --CGK	86.	6206.2	6512.6 --VFF
37.	6203.1	6509.5 --CGK-CGF	87.	6212.4	6518.8 --VCS/VAI
38.	8272.5	8796.4 --CGK	88.	22037.2	22633.2 --VCS
39.	12354.8	13125.6 --CGK	89.	NONE DESIGNATED	
40.	16500.3	17273.2 --CGK	90.	NONE DESIGNATED	
41.	22046.5	22642.5 --CGK	91.	12348.6	13119.4 --VAI
42.	NONE DESIGNATED		92.	12367.2	13138.0 --VCS
43.	NONE DESIGNATED		93.	12330.0	13100.8 --VFF
44.	NONE DESIGNATED		94.	16481.7	17254.6 --VAI
45.	NONE DESIGNATED		95.	8263.2	8787.1 --VCS
46.	6708.0	6708.0 --AIRCRAFT	96.	8229.1	8753.0 --VFF
47.	4616.0	4616.0 --AIRCRAFT	97.	16469.3	17242.2 --VCS
48.	NONE DESIGNATED		98.	16562.3	17335.2 --VFF
49.	2716.0	2716.0 --US COAST GUARD	99.	22058.8	22654.9 --VAI
50.	NONE DESIGNATED		100.	NONE DESIGNATED	

US ARMY CORPS OF ENGINEERS, BUFFALO DISTRICT--TUGBOAT "STANLEY"

FREQ. IN KILOHERTZ

TRANSMITTER NO.1	MODE	TRANSMITTER NO.2	MODE
CHANNEL-1--2003.0	--A3H	CHANNEL-1--2182.0	---A3H
CHANNEL-3--2182.0	--A3H	CHANNEL-2--2350.0	---A3H
CHANNEL-4--2350.0	--A3H	CHANNEL-3--5015.0	---A3J
CHANNEL-5--2604.0	--A3J	CHANNEL-4--5400.0	---A3J
CHANNEL-6--2670.0	--A3H	CHANNEL-5--5437.5	---A3J
CHANNEL-7--5015.0	--A3J		
CHANNEL-8--5400.0	--A3J		
CHANNEL-9--5437.5	--A3J		
CHANNEL-10-6020.0	--A3J		
CHANNEL-2-(DUPLEX)			
TRANSMITT-2118.0			
RECEIVE- 2514.0			

(TRANSMITTER NO.2 USED AS BACK-UP)



Reader Neal Bridges of Welland, Ontario forwarded this picture of Glenn Hauser, noted expert on shortwave international broadcasting stations. Now our readers won't be confused next time we publish a photo of one of the staff at Radio Netherlands! (see March Monitoring Times).

Radio: The Unlimited Classroom

by Jim Miles

Marty poked his head into professor Milbrandt's office.

"Mr. Milbrandt....do you have a couple of minutes to talk.....I've got a problem."

"We'll have to make it snappy young fellow—I have class coming up in about 10 minutes. Come in...have a seat and tell me what's up."

"Well sir," said Marty, "My Dad is really kinda upset with me because I got a low grade in math last semester. It was a "C" but he says I can get "A's" and my problem is that I spend too much time listening to the radio."

"You know, Marty, I never was able to study and concentrate while listening to the stereo or watching T.V....it just doesn't work for me!"

"But sir, it's not a stereo..it's a short wave radio and I can hear stations all over the world...Radio Moscow...you name it."

"Well, now," said the professor, "That's very interesting..and from what I know of your father, being a successful businessman, I rather imagine he's interested in your getting your priorities straight. You need to justify to him that your special interest in short wave radio listening should have a high priority."

"Now, since I'm running

short of time, Marty, why don't you just take a few notes on some ideas I'm going to give you so you can consider them and then get back to me?"

"O.K.," said Marty.

"You should realize a lot of benefits, Marty. if you used your radio as the basis for a home business. Let's say you pick up and maybe record a newscast regarding the mideast situation. Our local newspaper just have some space available for an article that you could write about it. You could add a bit of your own thoughts and impressions and make it quite meaningful."

"Do you suppose I could write it well enough....? Do you think they would pay me for it.....? Do you think.....?"

"Well, your English composition class would help. But in addition it is easier to write about something your interested in. There are some other things you must consider though, Marty. For example, you should stop by our library and review section 605 of the Communications Act. As I recall, this deals with the selling or using for personal gain information heard over the air that is not intended for you to hear. We wouldn't want you to get into even more hot water with your father!"

"You're right about that," Marty agreed.

"Now here are two other considerations. You should think about—then write down the objectives of your new business. Keep your objectives concise, attach numbers to them so you can measure achievement, but above all, write them down!"

If you're going to see your "product" you also need to develop a marketing plan. Let me briefly explain this marketing plan business. You need to discover who might want to print what your going to write. A good source of information is a reference manual call the "Writer's Market." This book lists hundreds of publications that publish articles from people like yourself. Now Marty, do you have to file taxes?"

"Not really..the only reason I file is to get my refund from what Dad withholds from my check, but in a couple of years I'll be out of school and then I'll probably have to pay in."

"It's not an emergency, but in the future you will want to write to the local office of the Internal Revenue Service and ask for their booklet that explains about the operation of a home business. When you own a home you will be able to take many more deduc-

tions, but right now you can depreciate your equipment and deduct your mileage driven for your new business."

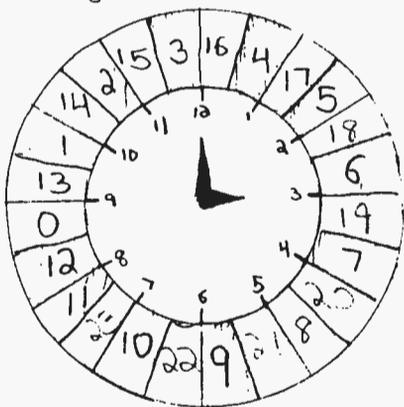
"I don't remember exactly how to do depreciation from accounting class. Maybe I could just review that in my old text."

"Well, your text is going to be out of date in certain respects Marty. The basics will be unchanged but I doubt if it will cover topics like the ACRS, which is Accelerated Cost Recovery System and a part of the Economic Recovery Act of 1981. You might be well advised to request information on the E.R.A. of '81 from the internal revenue office while you're at it."

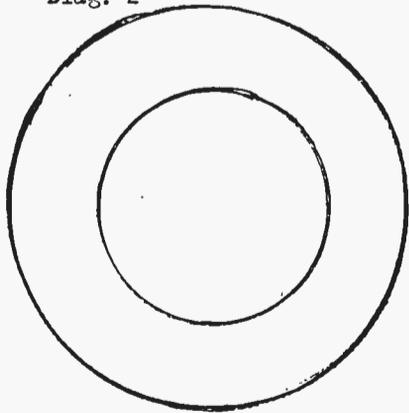
"This sure had given me a lot to think about; maybe Dad could help me think through some of these topics—and he might forgive and forget the "C" I got in math! Can I stop back next week when you have an office hour?"

"Certainly...stop in next week and we'll fill in the blanks and try to get you going. Just one more thing for now; While you're doing this search, see if you can come across an informative publication that can give you information about radio monitoring. Current information about your interests is very important. See you next week."

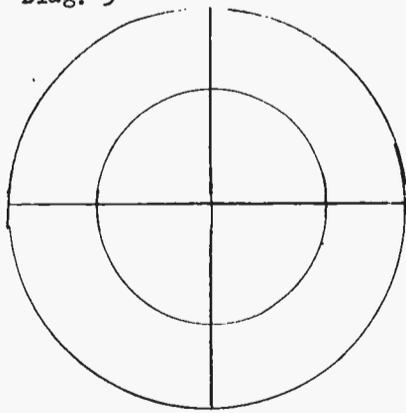
Diag. 1



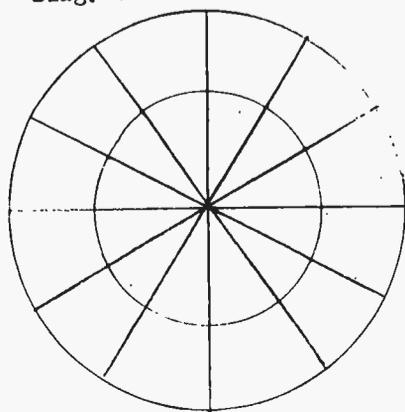
Diag. 2



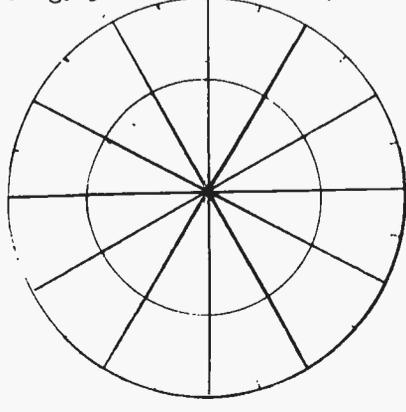
Diag. 3



Diag. 4



Diag. 5



Build This Universal Time Converter

A UTC Conversion Clock Face

by Neal Bridges

A constant problem for the beginning SWL is converting local time to Coordinated Universal Time (UTC); with this easily-built 24 hour clock face, the problem is solved.

On this clock, both local time and UTC can be read. The clock face itself is simply a circle of cardboard that is affixed around the existing face of any 12 hour clock (see diag. 1). The spaces between the hours are marked on the cardboard face and are then divided into two parts. The inner circle has the 1 to 12 outer has the corresponding 13 to 24 UTC hour. The hours from 1 to 12 are darkened slightly to prevent confusion.

Here's how to construct the special clock face. On a piece of thin but sturdy cardboard, draw a circle with a compass. The circle should be the same diameter as the outer diameter of your clock's face. Around this circle, draw another circle with a diameter about 6 cm (15 in.) bigger, (see diag. 2).

Using a ruler, draw a line straight through the diameter of both circles, and then draw another line from left to right through the diameter (see diag. 3). Next, divide each 90 degree section into 3 parts, each with a 30 degree angle (see diag. 4). Now, draw lines dividing each 30 degree angle in two (see diag. 5).

The following instructions are for people in the Eastern Daylight Time Zone. Read it through so that you will understand how to fill in the clock face for any time zone.

In the EDT zone, 0000 UTC corresponds to 8 PM EDT. Put the number 0 in the right hand segment of the two on your cardboard face that correspond to the space between 8 and 9 on the clock face. Right away, it is easy to see that 1200 UTC becomes 8 AM EDT, so the number 12 goes in the left space in the 8 and 9 segment of the clock face.

Fill in the correct numbers for the rest of the UTC hours. Darken slightly the spaces containing the numbers from 1 to 12 (see diag. 1). With a razor blade, or similar tool, cut out the centre of your cardboard face, and cut the whole face from the cardboard. Fasten it around your existing clock face with adhesive or double-stick tape. Be sure to correctly line up the correct numbers and segments. (see diag. 1).

From 8 PM to 8 AM EDT, read UTC time from the shaded segments. From 8 AM to 8 PM, read UTC time from the light segments. Local time is read from the original clock face.

When savings time switches back to standard time, merely rotate the cardboard face one hour.

Simple? And it works!
(Thanks, Neal, for a practical home project for our readers!)

Receiving Non-Standard Radioteletype

by Thomas P. Harrington,
W8OMV

For many years the standard radio teleprinter code has been the Baudot or Murray 5 level code. Recently, the ASCII 7 level code has been used for high speed transmission and is now approved for amateur radio transmission, ASCII is used more in the higher BIT rate transmissions including 110, 150, 300, 600 and 1200 BAUD rates. The accepted BAUD rates for BAUDOT code is 60 WPM (45 BAUD), 66 WPM (50 BAUD), 100 WPM (75 BAUD) and 132 WPM (100 BAUD).

The HF frequencies are very busy with standard BAUDOT radio teleprinter traffic from many sources --worldwide press stations, weather stations, military, AERO weather reports, governments, amateur radio and many others.

Most standard RTTY terminal units (Demodulators or Converters) will decode the standard BAUDOT, ASCII and Morse (CW) Modes; However, there are other radioteletype codes being used that cannot be decoded by these standard converters.

Many services wish to discourage the casual listener so they use bit inversion and other encrypting techniques thwart interception. The new M-600 from Universal may be used to decode many of these services.

The M-600 unit adds several of the most used non-amateur RTTY codes plus the standard codes - a true multi-code converter.

BIT INVERSION

A simple and easy way to afford a RTTY transmission some amount of privacy is done by changing one or more of the five information bits to the opposite sense; i.e., an inverted mark becomes a space. Many stations have been using bit inversion successfully for years. When displayed on a conventional RTTY reader, bit inversion looks like encrypted BAUDOT.

The M-600 terminal unit is capable of analyzing the 32 possible combinations of bits and reinverting them to produce valid characters -- all automatically!

Let's take a look at some other encrypting techniques which may be decoded by the new M-600.

TOR CODES

TOR MEANS "TELEPRINTING OVER RADIO"; the names "SITOR" and "SPECTOR" are trademarked versions of the TOR systems. This code is a seven-bit synchronous code with provisions for error checking by means of a constant ratio of 3 marks to 4 spaces in each character. The normal transmitting speed used by the TOR systems is 100 BAUD rate (132 WPM) using 170 Hz Shift.

ARQ - AUTOMATIC RETRANSMISSION REQUEST

The ARQ mode is the most certain means of error correction. Traffic is exchanged between two

RTTY stations using the same frequency. The station that initiates the communication is the master; the receiving station is the slave.

If an error occurs in the block of three characters, the transmitting station awaits a reply from the receiving station indicating it has received error-free and valid data; then the next set of three characters is sent from the master. If an error is detected, the transmitting station repeats the character group. The request for error-free data can be called for many times.

Although the receiving station must have transmitting facilities, copy can be accomplished with receive-only equipment, the ARQ mode practically guarantees error-free copy.

VARIABLE SHIFT In order to thwart interception by unwitting listeners, many commercial RTTY systems use non-standard shift. The M-600 may be adjusted to receive virtually any shift.

WEATHER SYMBOLS Maritime forecasts often call up special symbols not available on conventional teletype demodulators; these symbols are available on the M-600.

FEC (FORWARD ERROR CORRECTION)

In this mode, one station can transmit to any number of receiving stations; it does not require a reply. There is no repetition of groups of characters that have been sent.

To insure good copy each group of 4 characters is sent twice, with the same 3-space-4-mark ratio in a character-interleaved format.

The receiving station examines the first set of characters and stores them for printout if they are error free. Otherwise, it rejects sets of characters containing errors. The FEC Mode does not have any active error correcting features.

SEL-FEC: -SELECTIVE CALLING-FORWARD ERROR CORRECTION

In this mode, a transmitting station transmits to one or more selected receiving stations. Selective calling directs transmissions to a selected station at the exclusion of others. In order to distinguish SEL-FEC from FEC, the data is sent with the mark/space sense inverted.

Copy of SEL-FEC stations requires only the reverting of the mark-space sense and the correct frequency.

Not all encrypted RTTY transmissions can be decoded by low-cost equipment like the M-600, however. Here are a few real toughies!

BIT TRANSPOSITION

This simple cipher is accomplished by interchanging two or more bits of the regular character code on a regular basis. This code is not readily deciphered on standard RTTY equipment as the bit transposing can change at the will of the

transmitting station.

A combination of bit inversion and bit transposition combined yield a signal that cannot be copied by normal RTTY systems.

FDM: FREQUENCY DIVISION MULTIPLEXING

This mode of transmission consists of several narrow shift radioteletype channels running together and spaced about 170 Hz apart. Highly specialized equipment is required to copy this type of transmission. The FDM signals sound like a buzz saw or buzzing

The new Universal M-600 multimode crypto decoder, available October 1, 1982 from

type of signal.

HIGH SECURITY ENCRYPTION

There are many RTTY signals on the air today that defy decoding by standard RTTY equipment; many of these military. They are no doubt impossible to break; information gained from several reliable sources suggest these systems use high level computer-based systems that code each character on a changing basis.

Grove Enterprises (Order now: \$799.95 plus \$7.50 shipping and insurance -- no discounts).

Adding An External Antenna To The BC-100

by Jim Dantin

Bearcat has received a lot of justifiable criticism in response to their choice of antenna for the new BC-100 handheld programmable scanner.

The rubber duckie does an adequate job for most urban monitoring but just doesn't have the signal capture for long distance work.

Since I desired to use my BC-100 as a "base" as well as portable, I placed a call to Electra's technical department for help. Their solution to my problem was quite simple: "Use an outside antenna for more gain." Good idea--but how? Since the BC-100 doesn't have an external antenna connector, I couldn't see any good way to attach the coax.

The Bearcat engineer suggested a banana plug! Now wait just a minute; a banana plug is used for hooking test leads to a meter, not to an antenna! But I agreed to try it anyhow.

First, I snipped off the existing connector on my antenna coax. Then I stripped the insulation back for about 1/2 inch and carefully cut away the shield braid. Next, the center lead was exposed for about 1/4 inch.

I use RG-8/U cable, so it was necessary for me to drill out the

insulating sleeve which covered the banana plug so that the dielectric covering over the center conductor would fit. The center conductor was soldered to the plug and the insulator tightened back to the plug.

It worked! Stations that were barely audible with the duckie came in loud and clear with the outside antenna, even though the shield was not connected.

With the confidence of success from the first project, I decided to devise a better portable antenna to replace the duckie.

Since the ducky thread size is 10-32, a similar-gauge 5/8" brass screw was soldered to the base of a convenient telescoping whip antenna which was then screwed into the BC-100 antenna hole.

With this new antenna adjusted to quarter-wavelength (18") weather stations 60-90 miles away were copied!

For the purist who has to have a grounded connector for his antenna, two possibilities exist: (1) attach the shielded braid to the adjacent earphone jack, or (2) replace the existing antenna holder with a BNC connector.

Hopefully, Electra will provide this flexibility in future models.

Cracking The SAC

"Go-Code"

by Ken Kimura
Elinhurst, N.Y.

I think I have partly cracked the Strategic Air Command Code. As you probably know, participating stations broadcast their codes using phonetic alphabets on designated Strategic Air Command channels (listed on P. 9 of Bob Grove's Shortwave Frequency Directory).

The number of characters in each "foxtrot" broadcast will be 13, 28, or 35 elements.

When the code is 13 elements long, the day of the month is located at elements number 7 and 8; The message preparation time is given in GMT and is located at subsequent characters 9, 10, 11, 12.

When the code is 28 or 35 elements long, the day of the month is located on element numbers 14 and 15; the time is given on successive elements 16, 17, 18, and 19.

The Clandestines Of Central America

by John Santosuosso

...an exclusive insight by John Santosuosso

Lt. Alan del Cid of the Army of El Salvador knows how elusive it is. He helped dismantle its transmitter last December when the armed forces gained control of the area known as Joyas del Volcancillo near Arambala in Morazan Province. But after only two weeks he was hearing those broadcasts again. Now he says they originate in Nicaragua, an unsubstantiated claim.

The United States Navy knows how elusive it is; in March it sent the Destroyer Caron to the Gulf of Fonseca to jam its signals with salsa music. The station countered with dual transmissions, usually in the vicinity of 6852 and 6952 kiloHertz. The ship-based jammer does not have the capability of jamming both frequencies at the same time.

The elusive station is Radio Venceremos (Radio We Will Conquer), operated by the Farabundo Marti National Liberation Front, an umbrella organization of five leftist guerrilla groups dedicated to the overthrow of the present government of El Salvador.

Even if you occasionally run across this one in the past, it may be worthy of more frequent monitoring as it is an excellent source of information from the guerrillas' point of view on the conflict in El Salvador. Radio Venceremos is regularly quoted by American news media.

A lack of knowledge of Spanish should not deter you from monitoring Radio Venceremos or any other Central American clandestine radio transmissions; listen for key words—names of towns, politicians or military leaders.

A small Spanish dictionary, readily available from most bookstores, can prove helpful in translating enough words to give you some idea of what is being discussed. With a little practice you will be surprised at just how much you will understand.

In some instances the station itself will give you unmistakable clues as to what is going on, such as the obvious sounds of a fire fight during on-the-scene battle reports. You will also be impressed with the professionalism of Radio Venceremos' chief male announcer. He was once one of the best known in the entire capital city of San Salvador before he joined the rebel cause several years ago.

Listen for Radio Venceremos after 0000 GMT; broadcasts may last for several hours. Morning transmissions have been heard after about 1100.

Frequencies vary, but those around 6852, 6952 and 6905 have been favored lately. On rare occasions SSB transmissions have been reported.

Some reception reports are being verified; try El Frente Farabundo Marti Para la Liberacion Nacional, Apartado 2363, Telcor, Los Escombros,

Managua, Nicaragua; or send your report to Apartado 7-907, Mexico, DF, Mexico.

By no means is Radio Venceremos the only El Salvador clandestine. The first was Radio Liberacion which operated on 8243 kiloHertz from December 1980 to February 1981. It was located on Nicaraguan soil and partially financed by the Nicaraguan Sandinistas. However, under American diplomatic pressure, the government of that country finally agreed to shut it down.

Radio Farabundo Marti is another good target. This one is run by the Popular Liberation Front, the largest organization of the Farabundo Marti National Liberation Front. Like the FMLN, the station is named in honor of the founder of the Communist Party El Salvador, killed by the government in the 1930s.

Broadcasts are less frequent and more irregular than those of Radio Venceremos. Listen for Radio Farabundo Marti after 0000 or 0100 GMT on frequencies around 7040, ironically freed for its transmissions by the FCC's closing of anti-Castro La Voz de Alpha 66. In the past it has also transmitted on 6900 and 6940.

Last known of the El Salvador clands is Radio Unidad (Radio Unity). Reports of this one are quire rare, and it is not even certain who operates it, although most likely it is one of the five groups in the FMLN. Supposedly the station operates on 7000 kiloHertz. If you come across this one you have quite a catch!

Political turmoil in Nicaragua is also producing clandestine transmissions. Search between 6110 and 6225 (6220 reported) for La Voz de Sandino or Radio Revolucionario Sandino around 0000 or 0400 sign-on times, but don't be surprised if you encounter very effective jamming some evenings.

Despite its name, this station opposes the Sandinista government of Nicaragua. What makes it such a fascinating one is its association with the legendary Comandante Cero (Commander Zero). This man, whose real name is Eden Pastora, actually touched off the civil war which led to the ouster of the dictatorial Samoza regime by the Sandinistas.

He began the conflict by literally hijacking the Nicaraguan Parliament in August of 1978. Because of his daring, his strongly nationalistic but non-Communist ideology, and his handsome looks he has been extremely popular in Nicaragua.

Nevertheless, he was gradually eased out of the Sandinista leadership, and when he grew more disillusioned with the revolutionary government he denounced his former friends as traitors and murderers.

Today he leads a guerrilla army against them. Despite all of Washington's attempts to

destabilize the Nicaraguan government, Comandante Cero, a genuine national leader, is probably a far greater threat to it, and so the government makes every effort to jam his station's broadcasts.

A somewhat older Nicaraguan cland, which like La Voz de Sandino probably broadcasts from the safety of Honduras, is Radio Quince de Septiembre (Radio September 15).

The station is named in honor of Nicaragua's original independence day and is run by the Nicaraguan Democratic Revolutionary Alliance. Claims have been made that this organization includes elements of former dictator Samoza's national guard. Whether or not this is true, there definitely is a strong pro-Christian slant to programming.

Most recently Radio Quincehas been using 6900 kiloHertz with an 0300 sign on; 5566 is currently in use and operation on 4250 is expected. Morning broadcasts may sometimes be logged, and at times jamming of Radio Quince transmissions has been a problem. If you are fortunate you may run across an occasional English language transmission around 0330.

One other anti-Sandinista clandestine, Radio Swan (not to be confused with the anti-Castro CIA operation) in San Pedro Sula, Honduras, was raided in 1980 and dismantled by the Honduran government. While most Central American conflicts have been in El Salvador and Nicaragua, the Honduran government recently seized a leftist clandestine transmitter in that country. In the past there were occasional reports of guerrilla broadcasts directed to Indian peasants in Guatemala, and some people think it is only a matter of time until the leftist Patriotic Liberation Front takes to the airwaves.

Costa Rica's legally licensed Radio Noticias del Continente (Radio News of the Continent) used 9490 or 9710 kiloHertz to broadcast programs aimed against several Central and South American countries. It is possible that this was also one of transmitters used by the Nicaraguan Sandinistas for their clandestine Radio Sandino broadcasts before they came to power.

The station survived numerous armed attacks and even a bombing until finally shut down by the Costa Rican government in March 1981. One of its tricks was to send secret messages disguised as birthday greetings!

Rumor has it that it is now seeking to obtain a license from the government of Belize.

With the political situation in Central America showing increasing signs of instability, SWLS and DXers should be alert for even more clandestine activity from that part of the world.

COULEURS ET LUMIERE DE FRANCE
 72, rue de Valenciennes
 Bureau de Radio France
 (Lyonville, Nord-Bretagne)
 La Seine et la Tour Eiffel
 10700

QSL

TDF a le plaisir de vous confirmer votre rapport d'écoute
 FREQUENCE: F2
 F: 52,40 MHz
 BANDE: S: 41,25 MHz
 DATE: 22 et 23 octobre 78
 HEURE GMT.

et vous en remercio

Programme
 Radio France Internationale BP 9516 PARIS FRANCE

QSL received from TeleDiffusion de France for 1978 reception of channel F2 audio on 41.25 mega Hertz.

TIRL

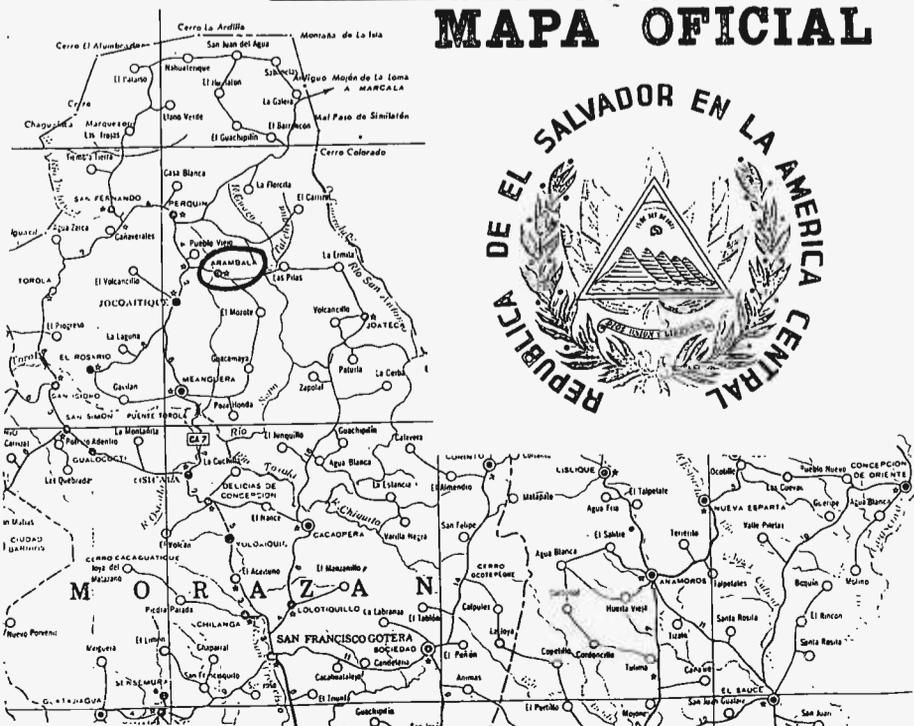
Radio Noticias del Continente

Apartado 172, Pava, Costa Rica.

Confirmando nuestra escucha en:
 9.490 KHZ, el dia 24-9-79...
 de 03:32 a 04:15 Hs. GMT.

Agradecemos vuestro reportaje de recepción.

QSL received from the now defunct "legal clandestine" Radio Noticias del Continente.



Portion of an official Government of El Salvador map showing the area around the town of Aram-

bala in Morazan Province where a Radio Venceremos transmitter was captured in December 1981.

Listen In On The Truckers' Mobile Network

A recent warning from a Regency dealer who specialized in marine transceivers caught our eyes here at Grove Enterprises.

The ad referred to the synthesized model 5500 and cautioned truckers from ordering it for the popular truckers channels.

A call to the dealer revealed that 151.625 and 151.655 MHz are used nationwide for truckers on the move.

We learned earlier that there is also a popular amateur 2-meter channel often used illegally by truckers since inexpensive handie-talkies are so readily available. As we recall, the frequency 145.550 MHz was mentioned. Readers with similar information regarding unusual or illegal channel usage are invited to share the information with other Monitoring Times readers.

Stock Exchange

NOTE: Monitoring Times assumes no responsibility for misrepresented merchandise.

SUBSCRIBER RATES: \$.10 per word, paid in advance. All merchandise must be listening-related.

I will swap lists of frequencies with all Canadians that will see this ad. And with US Citizens that live near the Canadian border from British Columbia to New Brunswick; please write to: Gilles Thibodeau, 3653 Montcalm, Lac-Megantic, Quebec G6B 2H8 Canada.

Bearcat BC-100 hand-held programmable scanner. Excellent condition with antenna, case and charger; \$300. Bearcat BC-210 programmable scanner \$150. FRG7700 digital Yaesu shortwave receiver, excellent condition \$395. QF1A audio filter like new, \$45. Steve Handler, 3330 Old Mill, Northbrook, IL 60062. Phone 312-498-1403 (no collect calls).

J.I.L. SX-200 "Ultimate Scanner", 16 channels, selectable AM/FM, RIT, three level scan delay and squelch, quartz clock, AC/DC power, 26-88 MHz, 108-180 MHz and 380-514 MHz frequency coverage, sensitivity 0.4 to 2 microvolts; \$435 new. Contact Dom Isabella at 806 South 7th Street, Philadelphia, PA 19147 or call 215-592-1900.

Wanted: Books to use, rent, buy or whatever on the subject of monitoring (particularly books for someone just starting) both the private and public sectors. Can you help a beginner out? Ron Graham, Box #53, Essex, MA 01929.

WANTED--Used VHF high band two-way radios. I mainly need portable units but will consider anything. All units must be capable of operating on 151.925. R. Grimes, C.S.A. Enterprises, Pontiac, MO, 65729.

The YAESU FGR-7700 General Coverage Receiver:

by Robert Lonn

With the first anniversary of my FRG-7700 receiver upon me, I decided to re-evaluate my unit. Much to my surprise, performance had not deteriorated, but in many cases had improved! I confirmed these data using some very expensive equipment at my technical lab at Cox Cable TV where I am the System Engineer.

Two areas of much concern to short-wave listeners are adjacent channel rejection (selectivity) and sensitivity. The FRG-7700 does very well in both categories. Sensitivity was measured as 3.2 uV for a 10 DB signal to noise in "AM" mode; selectivity was 12.2 kHz AT -50 DB. This compares to the published specifications of 5 uV and 15 kHz.

The noise floor measured when the radio was new was -129 DBM; it now reads -135 dBMV. You would be hard pressed to hear this difference with the human ear, but any improvement is always welcome!

There are many reasons why this improvement occurs, but component aging is the most widely-accepted. I have experienced no technical problems with my FRG-7700.

The receiver offers all of the conventional features: S-meter, RF gain (which is variable), two position AGC, noise blanker, clock, digital frequency readout,

sleep timer and a programmable ON/OFF feature so you can record your favorite program while you are away! In addition, this radio offers a feature which most radios in the price class do not have: an optional memory storage unit (more on this later).

From the easy-to-read digital display and S-meter (with your choice of two light settings) to the selection of upper or lower sideband, 3 AM width selections and FM for the 10 meter amateur band, the FRG-7700 is easy to use.

The switches and variable controls are the same types used in my Yaesu FT-107M which is a thousand dollar ham transceiver. This is probably why none of these controls has become intermittent or noisy over the last year.

The radio provides a front-panel 12-position memory switch. When the chips are down this single feature tips the scale to make this radio one of the best in its price class, and in many cases will even outperform more expensive units. The ability to store up to 12 different frequencies is a convenience matched only by the digital frequency display.

Other options include a preamplifier, VHF converter, tuner and low-pass filter.

I use an outboard active audio filter in my station; This single item will do more for the elimination of adjacent frequency in-

terference than many so-called "IF filter modifications". If you sacrifice bandwidth, you ultimately give up fidelity. A close friend has the new Yaesu FT-ONE which list for over \$3000.00 and told me he still finds an active audio filter a must for his station.

In conclusion, I feel that while you can pick up a dozen brochures on many different receivers in as many different price ranges, Yaesu has done an excellent job in the design of the FRG-7700. I am very happy with my unit and its memory feature and feel this radio will provide me with many hundreds of hours of high quality short-wave listening.

AFIO And The FOIA

At the suggestion of one of our readers, we decided to find out more about the recently-rescinded privileges formerly guaranteed under the Freedom of Information Act (FOIA).

It was learned that one driving force was the Association of Former Intelligence Officers (AFIO), based in McLean, Virginia.

President John Maury shared some of his thoughts with MT during a telephone conference just before this edition of MT went to press.

According to Maury, the liberal policies of the Carter administration are feeling the backwash of the strongly-conservative Reagan team. As this pendulum swings, AFIO officers were called to testify at both House and Senate intelligence subcommittee hearings.

AFIO recommendations included the following:

- 1) Records should not be available to convicted felons;
- 2) Records should not be available to foreign agents.
- 3) The FOIA reply time is presently too short (10 days);
- 4) Judicial review is undesirable in the hands of unsophisticated recipients.

In addition, AFIO wants complete exemption for CIA, NSA and DIA records.

Asked whether we should expect to see sweeping reforms in the FOIA, Maury replied, "Not during this session of Congress". He went on to suggest that we might see more activity during the next congressional session.

Maury observed that it is impossible to "put back in the bottle" records previously released, but that the government could make it difficult to continue their release. He feels that the Justice Department would not prosecute those individuals who publish information previously released under the provisions of the FOIA.

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