October, 1984

edited by
Joe Warden, WBLNO
28 S. Hemstead Rd.
Westerville, OH 43081

the official journal of the MAD RIVER RADIO CLUB

Route #1 Mt. Cory, OH 45868 (419) 477-5378 Treasurer: Ron Harps, KBNZ 8321 Edgewood Rd. Mentor, OH 44060 (216) 255-7205

The pre-Findlay meeting at N8ET was a great success, so much so that the XYL has agreed to do it again next year. Mark your calendars now for the first weekend after labor day and plan to attend.

Contest season is upon us. MRRC will make major efforts in CQWW, SS, and the ARRL DX Test. Put in as much time as you can and send your scores to N8ET.

The 'Whip' for your area has probably been hounding you to run up a big score each of the WW and SS weekends. If you havn't heard from your whip be on the lookout for--

KBNZ....Cleveland, NE Ohio and Western PA

KBND....Columbus and Central Ohio

W8FN....Dayton, Southern Ohio and Kentucky

K8CC....Michigan

N8ET....NW Ohio, Indiana and everywhere else

Don't forget that we have accepted the NCCC challenge in the SS. They are busy recruiting to boost their score. If we can get everyone on for both weekends we will beat the rascals. Note the excerpts from the NCCC Jug elsewhere in this issue. They still aren't too sure who they have taken on!

That's about it from me for this issue. Note the change in Editors. Our own K8CC is now Editor of the National Contest Journal. The package deal requires that you tolerate W8LNO as editor of the Flash. K8CC will continue to maintain the mailing list and membership statistics and the Findlay crew will take care of reproduction and mailing chores. Send your contributions to Joe.

The MRRC Flash is the newsletter of the Mad River Radio Club, an ARRL affiliated club serving contesters in Ohio, Michigan, Pennsylvania, Indiana, Kentucky and West Virginia. The FLASH may be reprinted in whole or in part provided proper credit is given. Mail all inquiries or submissions to W8LNO at the address shown on the masthead. Join the Mad River Net on 3825 Khz at 8:30 Eastern each Monday evening.

FINDLAY MINUTES from N8ET

The Findlay meeting clearly began the evening before the hamfest. Mt.Cory was the scene of lots of hamburger and bean eating washed down with suds provided by 'The Goose', WD8LLD. Lots of topics were discussed with the normal level of resolution.

Participation was fantastic! The master of the house counted 18 bodies on the floor. All rose for the Bob Evans breakfast except for the single casualty who was the victim of the Detroit Drizzles. Those who missed it shouldn't do so twice.

43 MRRC members signed in at the Sunday meeting. It was decided to drop the NOARSFEST meeting and add a meeting in Michigan for 1985, probably at the ARRL convention in Livonia the weekend following Field Day.

Looking towards winter and long skip an alternate net frequency of 1875 Khz was suggested as a backup for 3825.

Sweepstakes scores should be forwarded to your 'Whip' or to N8ET. It was agreed that the club will make a strong effort in the CQWW Test , both modes, this year.

The annual K8MR Christmas party will be held on Saturday, December 29 at Jim's home. It was finally concluded that this is the 8th running of that event. The November issue of the 'Flash' will include a Map which details the 1984 detour.

Goose, WD8LLD, gave an excellent presentation on design of phased vertical arrays. K8CC is still trying to make the feed point currents equal in his model.

NOTES and POINTS

N8ET and KU8E will be at the VP9AD multi-multi operation for WW fone. Bill will hold down 20 meters and Jeff will tough it out on Top Band. Run 'em down on six bands and wish 'em luck!

K8NZ won the main prize at the Findlay fest. Ron's luck of late continued. Report was that the new ICOM radio didn't make it through the first hour of the September Sprint; however, repairs were speedy and the 745 is back in the fray. How for the 40 meter beam.

W8LNO still has five rooms for the Hamvention. They are going fast so place your order today!

Anyone interested in designing a MRRC QSL should get in touch with W8LNO. Joe has the beginnings of a card that could make us all famous thanks to the imagination of K8CC. It needs to be fleshed out.

If you have information on the necessary routing to obtain a QSL from HR1DAP please advise K8CC.

NORTH CAL CHALLENGE

The following is quoted from "The Contest Jug", the newsletter of the NCCC.

The Mad River Radio Club Wants Our Champagne

That's right. Murmurings from the Midwest suggest that our celebrated Sweepstakes challenge has finally been answered. An upstart club (simply mad, aren't they?) has accepted our SS challenge. I can only echo the words of Apple Computer in saying: "We welcome the entry of MRRC in the 1984 Sweepstakes, for it helps legitimize the entire contest." Bring 'em on I say. Let's see if that Mad River is really a river, or simply a dried-up creek.

N6TV rambled on and on about the NCCC KB certificate program. Warden's Unabridged Dictionary defines KB as Stomping Ass for under-achievers. It will be interesting to see if they can come up with enough participants to even make it into the unlimited category.

To improve the quality of the competition, your editor will award a special plaque to the MRRC member who is deemed to have high achievement in the SA endeavor. The award will not necessarily go to the highest scoring station, but to that operator who displays the most fervor in his SA effort. Only dual mode entrants will be eligible. GO MAD RIVER!

It seems to have been concluded that the SS awards program for 1984 will be identical to 1983 except that — Certificates will be awarded for combined mode scores only and NCJ subscriptions will be discretionary depending on the state of the treasury. This observation is based upon the October 15 discussion on 3825Khz and is subject to final resolution by the Big Fish, the awards chairman, and the keeper of the cash.

MEMBER ACHIEVEMENT-1984 ARRL DX TEST Wow!! K8CC walked off with it all. Top single op in the world, top in North America, and most significant, tops in MRRC. Dave will receive two plaques from ARRL, but none from the Club. Dave says he is not ready to do it again. Perhaps he will feel better about it after he has some HR1DAP QSL cards printed and sends replies to all of his MRRC friends.

In spite of the QSL situation, it seems to me that Dave ran up one heck of a big score from a 40' by 60' city lot with only a 40 foot tower from which to hang wires. Congratulations, OM!

WBUA finished first, both modes, for MRRC. Mike was the top Phone operator in the Great Lakes Division and won the Livonia RC plaque for his performance. Congratulations, Mike!

DX TEST COMMENTS continued

In the single band category, K8NZ, finished second in the 20 meter competition on CW. KW8N, operating as WB8JBM, finished third on 10 meter code and KC8JH wrapped up a fourth place finish on 80 meter SSB. AD8C finished third on 40 meter phone. With ten more Q's and 3 more mults Jay would have finished first. All band, single operators WD8IXE and N8DE finished first for Ohio Code and Indiana Fone, respectively.

In the 'multi' catagories, NA8V made a strong fourth place finish in two transmitter phone while the WA8YVR double code effort finished second, beating N5AU and W3GM. That has to be a satisfying victory. K3LR teamed up with K8CC and N8DET to finish second in the multi-single phone class. They blew past some very rugged competition.

The MRRC plaque for 3.5Mhz CW was won by W9NXD/HR2. He didn't seem to be working very hard, but was way ahead of the pack in the final tally.

Without question, some deserving operator has been overlooked in the preparation of this summary. You have the condolences of the Editor.

NEWS CLIP OF THE MONTH

K8MR provided the newspaper clipping of the month, dateline Greenbelt, MD, a very standard city. The article imparts that NASA has observed continental drift and that NA and EU are separating 2/3 inch per year. Jim was relieved to learn that it isn't the shortage of spots on the sun that has ruined radio.

ABOUT THIS ISSUE

This is the transitional issue of the 'Flash'. The first four pages don't look like the last seven due to the W8LNO/K8CC division of responsibility. Please be patient. Eventually the 'Flash' will again resemble the quality production which K8CC has delivered for the past year or so.

Because of the changeover there is some redundancy; however, I have elected to let you read those items twice. Not that they are so important—I just got tired of making changes.

Those of you who have never tried to edit a newsletter for a loosly knit organization such as MRRC may not appreciate fully the job which Dave has done. But, take my word for it and give him a pat on the back when you next get a chance. 73,

Joe W8LNO

MRRC SWEEPSTAKES ELIGIBILITY LIST as of 10/20/84

AA8S	ACSE	AD8C	AD8I K8CC KABETK KR8Y N8BTU N9AG W8UA WB8MZZ	AD8P	AK8X	K3JT	K3LR
K7SV	KBAZ	K8BL		K8DB	K8EM	K8KJQ	K8MR
K8ND	KBNZ	K8SS		KB8LM	KB8WC	KC8JH	KC8MK
KC8XK	KD8NS	KN8Z		KS8S	KU8E	KW8N	KX8R
N4TY	NBABL	N8ATR		N8CXX	N8DE	N8DET	N8DMM
N8ET	NSFCF	N8FJP		NA8W	N18B	NZ4K	W8CAR
W8FN	WBKUZ	W8LNO		W8UPH	W8ZD	WA8BIN	WA8RRR
WA8YVR	WB3KKX	WB8KKI		WB8PHI	WB8VMN	WB8WTS	WD8IVL
MD8IXE	MD8LLD	WD8LXX	WM4T				

Note: This is the complete eligibility list per the ARRL Contest Rules compiled by K8CC as of 10/20/84. The club center is Marion, OH. If you are within 175 air miles of the center, you are eligible to participate if you have attended at least half of the MRRC meetings in the last year, or since you joined the club. If you live within 50 miles of the center, there is no attendance requirement, but please register your interest to compete with K8CC. If you are not on the list and think you should be, get in touch with Dave at (313) 425-8296 as soon as possible. Remember, any new members that join between now and SS will be eligible to participate with MRRC.

1984 MRRC SS AWARDS PROGRAM

During the October 15th Monday Nite Sked on 3825 kHz, it was decided to implement some changes in the MRRC Sweepstakes Awards Program. For 1984, we will again award plaques to the top club entry in single op high power, single op low power, and multi-op categories on both phone and code. In addition, a plaque will be awarded to the club member that contributes the most total points to the club effort.

Last year, certificates were issued to any station making 300 QSOs on either mode. This year, awards will be issued for points contributed to the club, with unique certificates for 100K, 200K or 300K total score. This was done to reduce the work in mailing the awards, and to better recognize the overall effort expended by the membership in SS.

1983 SS AWARDS

No, we didn't forget the 1983 SS Awards. There was some delay in getting the certificates printed, and also some questions with the ARRL on which scores counted for MRRC. Then, the former club president misplaced his copy of QST with the results. In any case, NBCXX and KBCC should have the certificates mailed before the end of October. Hopefully, this will not set a precident like CQ magazine, where the CQWW awards are not seen until well after the next years contest...

ARRL SWEEPSTAKES - THE LAST 11 YEARS complied by Jim Stahl KBMR

I set out to track relative performance between geographical areas in the SS with changing solar condx, especially W5 vs. W6 in regards to who to challenge in the club competition. I can't really draw any conclusions from this data, although my intuition is that the average W5 will have an easier time and the average W6 a harder time during the low sunspot times. The big gun W6 will still do 0K - Reaganomics applied to contesting, I guess. But no more barefoot tribanders at $3\emptyset$ feet in California making $1\emptyset\emptyset\emptyset$ Q's on ten meters, etc.

CW SWEEPSTAKES

year	#1	#2	#1Ø	top ten	top W8-land	entries
1983 1982 1981 1980 1979 1978 1977 1976 1975 1974	189K 179K 184K 176K 187K 18ØK 193K 193K 177K 172K 163K	183K 178K 182K 167K 182K 177K 185K 182K 169K 168K 157K	171K 164K 169K 159K 169K 173K 166K 163K 159K 153K	567757Ø5Ø7 5W3237Ø356 56ØW267377 Ø561731561 W773763235 2631766437 WØ6345551Ø W5W7465Ø47 5W47567644 6767749664	159K - WABYVR 142K - WABYVR 157K - KBNZ 152K - KBNZ 147K - WBUA (WABZDT) 161K - KBNZ 154K - KBMR 146K - WBEDU (KBMR) 125K - WBKIC 141K - WBKIC 121K - KBMFO	943 995* 1087 1102 1203 1490 1349* 1402* 1152 1224 1086

SSB SWEEPSTAKES

year	#1	#2	#1Ø	top ten	top W8-land	entries
1978 1977 1976 1975	296K 361K 327K 309K 351K 333K 318K 285K 261K 253K	257K 287K 313K 284K 318K 306K 286K 282K 246K 246K 249K	236K 256K 269K 243K 257K 273K 232K 225K 218K 209K 177K	W5Ø7Ø5Ø677 W5Ø76677Ø5 WØ75676552 7Ø75767656 W7CØH77726 W76CØØ27Ø7 W7ØØ62Ø56C ØW77255751 7Ø67564555 6Ø6277555Ø 7659Ø42713	189K - K8AZ 199K - K8ND 222K - K8LX (WABZDT) 21ØK - N8II 212K - K8LX (WABZDT) 223K - K8LX (WABZDT) 208K - W8KIC (WB8MZZ) 213K - WA8PLZ (WB8AYC) 184K - WA8YWX 204K - WA8YVR 15ØK - W8RC	1Ø52 995* 1285 1242 1248 151Ø 1349* 14Ø2* 1147 1177 1Ø8Ø

notes:

In top ten listing: W=West Indies, C=VE, H=KH6.

* denotes no CW/SSB breakdown in QST; number is 50% of total entries.

#2 score is shown to isolate runaway winning scores, i.e. West Indies.

SWEEPSTAKES RECORDS FOR MICHIGAN

HI POWER

CI	N.	SSB						
83 WABYVR 78 K8LX 83 K8CC 77 K8LX(WABZDT) 81 K8CC 79 W8UA(WABZDT) 81 K8LX 79 K8LX 71 W8SH(K7NHV) 82 WABYVR	1591ØØ-1Ø75-74 15315Ø-1Ø21-75 152144-1Ø28-74 151694-1Ø39-73 147852-1Ø45-72 147852- 999-74 147852- 999-74 146438-1ØØ3-73 1452ØØ- 968-75 142Ø8Ø- 96Ø-74	78 K8LX(WA8ZDT) 2232ØØ-1488-75 81 K8LX(WA8ZDT) 222592-15Ø4-74 79 K8LX(WA8ZDT) 212528-1436-74 74 WA8YVR 2Ø4Ø92-1379-74 72 WA8ZDT 187738-1272-74 78 K9OK/8(WB9DZS) 186ØØØ-124Ø-75 78 W8FF 18285Ø-1215-75 77 W8RC 1749ØØ-1166-75 75 WA8ZDT 168338-1153-75 83 K8CC 167184-1161-75	74 74 74 75 75 75					

LO POWER

			CM	SS	В
		M8CGN M8CGN	137492- 929-74 131254- 899-73	76 WD8MGQ 76 W8TR(WA8PSD)	154364-1Ø43-74 117718- 829-71
		M8CGN	116060- 829-70	82 WD8MGQ	116476- 787-74
-		KBIF	113734- 779-73	78 WBLAQ	113442- 777-73
	81	NBEA	103660- 730-71	8Ø WBJWN	1Ø7448- 726-74
		WASZAV	102528- 712-72	76 WA8WWM	106642- 751-71
		WABMAM	1Ø212Ø- 69Ø-74	76 KBIDE(K8TR)	106050- 707-75
		WASMAM	101616- 696-73	79 WBJWN	1Ø4932- 7Ø9-74
		WSLAQ	1Ø1388- 714-71	79 WD8MGQ	1Ø1324- 694-73
	76	W8SH(N8SR)	100944- 701-72	79 WBLAQ	89336- 633-71

MULTI-OP

	CW				SSB
77 W8L	JM 1257	2Ø- 898-7Ø	83	WD8CRY	192992-13Ø4-74
8Ø WBL	JM 1100	16- 764-72	81	KBSS	1822Ø8-1248-73
79 W8L	IM 1Ø53	76- 712-74	82	WD8CRY	179376-1212-74
83 K84	10M 1001	76- 677-74	80	WD8CRY	1733Ø8-1171-74
74 WB8	3FUO 97Ø	56- 674-72		WD8CRY	158264-1084-73
75 W8L		54- 681-67		K8SS	150672-1032-73
79 WB8		3Ø- 555-73		WBUM	
82 K83		26- 577-69			144448- 976-74
				WASFRE	125652- 849-74
83 K83		20- 543-70	74	WB8FUO	112140- 801-70
80 K83	M 743	32- 539-69	79	WB8JYX	111296- 752-74

SWEEPSTAKES RECORDS FOR OHIO

HI POWER

	CW		SS	BB
7 8 7 8 7 7	6 WBEDU(KBMR)	161320-1090-74 158508-1071-74 157916-1067-74 156584-1058-74 154216-1041-74 152884-1037-74 151552-1024-74 146730-1005-73 146438-1003-73	78 W8KIC(WB8MZZ) 81 K8ND(WB8MZZ) 76 WA8PLZ(WB8AYC) 77 W8KIC(WB8MZZ) 78 K8AZ 78 K8MR 81 K8MN 79 WB8MZZ 82 K8ND 82 W8JI(WB8MZZ)	21945Ø-1463-75 217412-1469-74 213Ø14-1459-73 2Ø88ØØ-1392-75 2Ø715Ø-138Ø-75 2Ø535Ø-1369-75 2Ø4832-1384-74 2Ø2464-1368-74 1992Ø8-1331-74

LO POWER

CM	SSB
82 K8BL 11ØØ16- 764-72 88 82 KU8E 1Ø9872- 763-72 88 83 KU8E 1Ø952Ø- 74Ø-74 87 78 K8EKG 1Ø8216- 752-72 87 79 W8KRR 1Ø2346- 7Ø1-73 77 81 K8BL 1Ø136Ø- 724-7Ø 77 8Ø W8KRR 1Ø1232- 7Ø3-72 88 8Ø K8EE 1Ø1178- 693-73 88	1 K8EE 118114- 8Ø9-73 2 K8EE 11315Ø- 775-73 Ø WA6EZV/8 1Ø434Ø- 7Ø5-74 3 KCBJH 1ØØØ1Ø- 685-73 Ø KABD 98532- 714-69 5 WB8MZZ 967Ø2- 681-71 8 WD8ALG 94572- 639-74 Ø K8EE 9288Ø- 645-72 2 K8BL 91396- 626-73 7 N8RA 9Ø312- 636-71

MULTI-OP

	CW			SSB
83 WB8JBM 82 WB8JBM 81 WB8JBM 74 WB8JBM 79 K8ND 81 K8ND 78 WB8JBM 8Ø WB8JBM 83 K1LT 78 K8ND	161616-1Ø92-74 154944-1Ø76-72 154322-1Ø57-73 147Ø22-1ØØ7-73 142Ø8Ø- 96Ø-74 141Ø44- 953-74 13838Ø- 935-74 137232- 953-72 134384- 9Ø8-74 131984- 9Ø4-73	82 8ø 81 8ø 79 79 78	WB8JBM WB8JBM K8ND	229252-1549-74 2Ø5128-1386-74 2Ø2464-1368-74 2Ø2464-1368-74 2Ø1918-1383-73 2ØØØ96-1352-74 196544-1328-74 195932-1342-73 192992-13Ø6-74 18315Ø-1221-75

CQWW BAND STRATEGY by Mike Socha W8UA

The following chart outlines a possible band strategy for the CQWW DX Tests, showing possible propagation areas on each band for different times of day. It is based on my experience and reflects what I expect to see this season. However, it should be remembered that extraordinary solar conditions (either good or bad) will affect your band strategy.

OCTOBER 1984-MARCH 1985

ZULU	16Ø	8ø	4Ø	20	15	10
9999 9199 9299 9399 9499 9599 9699 9899 9999 1999 1199 1299 1499 1599 1499 1599 1699 1799 2999 2199 2299	SA *EU, SA EU, AF, SA EU, SA EU, SA SA SA SA SA, PA SA, PA	*EU *EU, SA EU, AF, SA EU, AF, SA EU, AF, SA EU, SA EU, SA SA, *PA SA, PA SA, PA SA, PA SA, PA	EU, AF, SA EU, AF, SA EU, AF, SA EU, AF, SA EU, AF, SA EU, SA, PA EU, SA, PA SA, PA SA, PA SA, PA SA, PA, *JA PA, JA, *AS+ PA, JA, *AS+ EU, AS	*AS, AF, SA	*EU, SA PA, SA PA, SA PA, SA *EU, SA EU, AF, SA EU, AF, SA EU, AF, SA EU, AF, SA AF, SA AF, SA SA, *JA SA, PA, *JA	*PA,SA SA SA,AF *EU,SA,AF *EU,SA,AF SA,AF SA,AF SA,AF SA,AF SA,AF SA,AF SA,AF SA,AF

AF=AFRICA AS=ASIA EU=EUROPE JA=JAPAN PA=PACIFIC SA=SA/CARIBBEAN

* * * CQWW SCORE REPORTING * * *

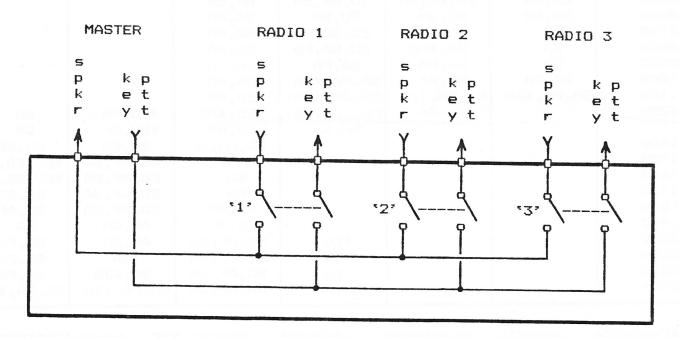
Note that this year MRRC will be submitting our CQWW scores under our own identity, rather than in collaboration with the North Ohio Amateur Radio Society. Our destiny is once again in our own hands, so let's all turn out and make some points for the club. Make sure that under 'Club Competition' on your summary sheet it says MAD RIVER RADIO CLUB.

^{*}Denotes marginal opening, dependent on solar flux level and storm condx. +Denotes Long Path

QUICK & EASY STATION SWITCHING from the NABV/WABYVR station

Contesters never seem to have enough radios, and if they do, it can be a real headache conveniently switching between them for single-op use. Some stations have elaborate switching schemes involving lotsa relays and switches, but for those of us who would prefer not to construct, Radio Shack has come to the rescue.

Radio Shack catalog number 40-125 is an item called a 'Convenient Stereo Speaker Switch Box', designed to switch three pairs of speakers to a single stereo receiver. With a little imagination, it can be used to connect three radios together (see below). For CW use, the RX audio and keyer lines can be brought through the box to the operator's headphones and keyer. On SSB, run the RX audio and footswitch PTT lines through the box and tie all the rigs MIC lines together, or else when using VOX run the MIC and RX audio through the box. In either case, when using multiple radios from a single MIC source, beware of ground loops which can cause hum on your TX audio and drive you nuts trying to locate.



Radio Shack 40-125 Switch Box

The desired radio is selected or de-selected by the appropriate switch. By selecting more than one radio, you can monitor two or more bands simultaneously — this feature should be used with caution, since you will also transmit on those same bands simultaneously.

M	RI	RC	F	RATI	E SI	HEE.	Τ	19	6							SSB CW
							S									S/0 M/S
										IER						M/M
160	80	40	20	15	10	RATE	TOTAL	Z	160	80	40	20	15	10	RATE	TOTAL
								00				100				
								01				1 1 1 1 1	3 - 33			
								02					13		100	
								03		9 944	1000					
								04								
								05								
								06								
							ar terr	07					7.9.70			
								08								
								09				-	9888			
								10			A 10		9 6 8 9			
								11					10.01			
								12								
								13								
								14								
								15 16								
								17			3					
								18					2			
								19								1
								20								
								21								
								22				,		A-101		
								23								
								tot					S = 17	- 181		
			189					dpe								
		112	No. of Concession, Name of Street, or other Persons, Name of Street, Name of Street, Name of Street, Name of St		-			net								
								-	-							
								-								
mme	nts							+		-						
								+								
						İ		_	_							
							t	ime								
							Г	ate								

RECEIVER GUARD 2000 for

NOW AMATEUR RADIO OPERATORS CAN PROTECT THE SOLID STATE FRONT ENDS OF ALL MAINS
RECEIVERS AND MANY TRANSCEIVERS AGAINST RF OVERLOAD AND BURNOUT.

AN AUTOMATICALLY TRIGGERED RF SWITCH, THE RECEIVER GUARD 2000 OFFERS TOTAL PROTECTION AGAINST HIGH POWER RF FIELDS, WHICH CAN CAUSE TREMENDOUS DAMAGE TO THE SOLID STATE COMPONENTS FOUND IN TODAYS RADIOS. THE RECEIVER GUARD 2000 CANNOT BE PLACED IN ANY TRANSMIT LINE, IT MUST ALWAYS BE PLACED IN A LINE WHICH CARRIES RECEIVE SIGNALS ONLY. CERTAIN TRANSCEIVERS OFFER EXTERNAL JACKS WHICH ALLOW THE RECEIVER GUARD 2000 TO BE PLACED IN SERIES WITH THE RECEIVE PATH OF THE RADIO. THE MOST POPULAR OF THESE TRANSCEIVERS ARE:

KENWOOD 930, 830, 430, & 180...KOM 751, 745, 740, 730...DRAKE TR5 & TR7.

**** NOW BEING USED BY ACTIVE AMATEURS FOR THE FOLLOWING ****
PROTECTION FROM NEARBY AMATEURS RUNNING HIGH POWER ****

**** ON BEVERAGE AND LOOP RECEIVING ANTENNAS ****

**** MULTI TRANMITTER CONTEST STATIONS ****

**** FIELD DAY OPERATIONS ****

***** HAS LESS THAN 0.3db INSERTION LOSS *****
***** WILL NOT DEGRADE RECEIVER PERFORMANCE ****

***** PROTECTION ELEMENT REPLACES IN 2 MINUTES *****

***5 YEAR WARRANTY except PROTECTION ELEMENT

°°available at your local dealer or FACTORY DIRECT from:
DESIGN ELECTRONICS OHIO 4925 S. HAMILTON RD. GROVEPORT, OHIO 43125
add \$4 shipping & handling...OHIO CUSTOMERS add 5½% sales tax

MAD RIVER RADIO CLUB 33136 HAMPSHIRE RD. LIVONIA, MI 48154

> DAVE PRUETT TOM PRUETT WB8VMN 33136 HAMPSHIRE RD. LIVONIA, MI

KBCC

48154 D

