Ham RADIO News

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The Journal of Amateur Radio Society of India (Member of IARU)

" AMATEUR RADIO - A NATIONAL RESOURCE"

THE AMATEUR'S DILEMMA

!!! M I L L E N I U M O F F E R !!!

Ham Radio is a hobby. To enjoy this space Age Hobby you don't need to make a big hole in your pocket. We are making this simple offer so that you can enjoy Ham Radio without any financial burden to you or to your elders.

Now, to register as a Delegate for HamRadio2000 you need Rs.300/-. Are you thinking twice, whether to invest Rs.300/- to be there in Hyderabad for the Millenium Ham Meet? Think no further. Here is a very simple, straight forward and most reasonable solution. Use your good contacts with friends & relatives and get a Full Page Black & White Ad (costing only Rs.1500/-) for the HamRadio2000 Souvenir. You will immediately receive 20% (i.e. Rs.300/-) from HamRadio2000 for your contribution to this Mega Event.

Well, still worried about your travel & hotel expenses? Very simple! Get a couple of more advertisements or a sponsor for one of the items listed in the Advertisement Tariff. On all the advertisement / sponsorship revenue generated by you we will give 20% straight. No questions asked. Hurry-up and send your payments, alongwith the Delegate Registration Form, immediately, so that you can receive your funds from us well before the HamRadio2000 - Millenium Ham Meet begins.

A few of our local boys here have already worked-out plans how to fund their dream Ham Equipment! Now, what's stopping you!! Doesn't it sound like an Earn-While-You-Learn or Earn-While-You-Surf programme? Yes! It does!! But, we prefer to call it as **Earn-While-You-Enjoy-HamRadio** programme!!!!

The Challenge: For those of you who are more enterprising and like to enjoy a sport in everything in life, here is a challenge. We are offering 1st, 2nd & 3rd prizes alongwith an ACTIVE CONTRIBUTOR AWARD to the first three highest contributions we receive by 30th November, 2000. This is besides the 20% everybody gets for whatever contributions they make. Points calculation for these three positions are given below.

While for every Rs.100 (Rupee One Hundred) contributed to HamRadio2000 you will earn 10 points, here is how you can earn bonus points.

a) Contributions received before 15th Oct 2K will be awarded 5% bonus points.
b) Contributions from 16th to 31st Oct 2K will be awarded 3% bonus points.
c) Contributions from 1st to 15th Nov 2K will be awarded 1% bonus points.

Accordingly, the first three positions will receive an additional 5%, 3% & 1% amount on their total ad / sponsor revenue contribution to HamRadio2000. Starting from 16th Oct 2K every Monday we will post, on our website, the first ten (10) positions of the Cumulative Points earned, till the previous day, to inform about your close contenders.

| For Further Details Please Log Onto: www.hamradio2000.com |

EDITORIAL

In the last issue of our publication, we had sought members' opinion on the need for asking additional call sign blocks from W.P.C. in Asia, Europe and even Africa. Till the time of writing, I have not received a single letter on this- or any other subject. The question I am tempted to ask is, Does any one read the Ham Radio News? And if the answer if negative, the next question will be: Should we continue to publish it?

Some progress has been achieved on our proposals for amendment to Indian Wireless Telegraph (Amateur Service) Rules, 1978. The W.P.C. Wing now intends to seek opinion of active amateur clubs and knowledgable individuals, by circulating ARSI proposals. It is very important that all those who receive these papers, must send a reply. It should not appear that Indian amateurs are not interested in any improvements in the existing Rules.

Can we now expect member's response to the various problems faced by Indian radio amateurs. A "FEEDBACK" column is proposed to be started, but first, let there be some feed-back, hopefully, before the next issue becomes due.

The triennial Conference of IARU Region 3 was held at Darwin, Northern Territory, Australia, during the last week of August, 2000. Your Society was represented by its President. The attendance was relatively low, conspicous by the absence of Bangladesh, Indonesia, Pakistan, Philippines and Sri Lanka. A report on the proceedings appear elsewhere in this issue.

We sought and obtained informal permission to prepare a list of those amateurs whose licences have not been renewed for ten or more years. The first instalment of this list, consisting of some Grade I amateurs, is being published in this issue. Members are requested to give widest publicity to the list so that who wish to renew their licences can do so at the earliest. (Even though the licences have been cancelled, we have been assured that the Society's recommendation concerning its members, will be taken into account for renewing them.)

We wish all, a very happy Diwali and an equally happy New Year!

Sahruddin- VU2SDN
President.

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'SUCCESS IS GETTING WHAT YOU WANT, HAPPINESS IN WANTING WHAT YOU GET'

MEMBERSHIP FEES 2000-2001

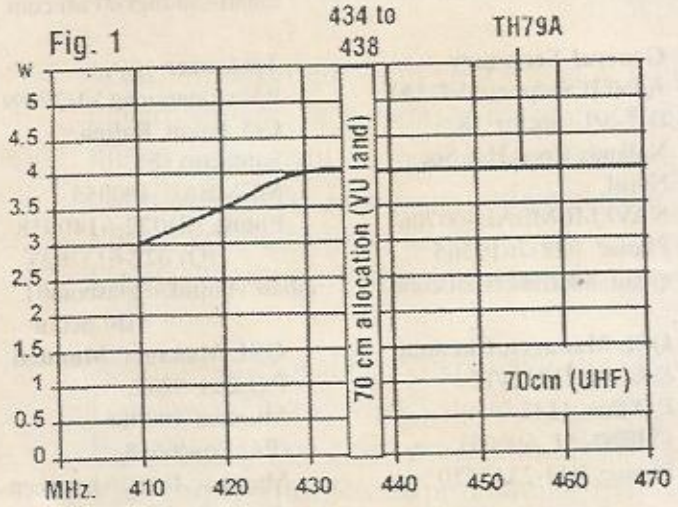
A good number of members have not paid their fees for this year. Reminders have been sent individually with no response. Kindly pay up your fees with the penalty and let the Society run with its own funds.

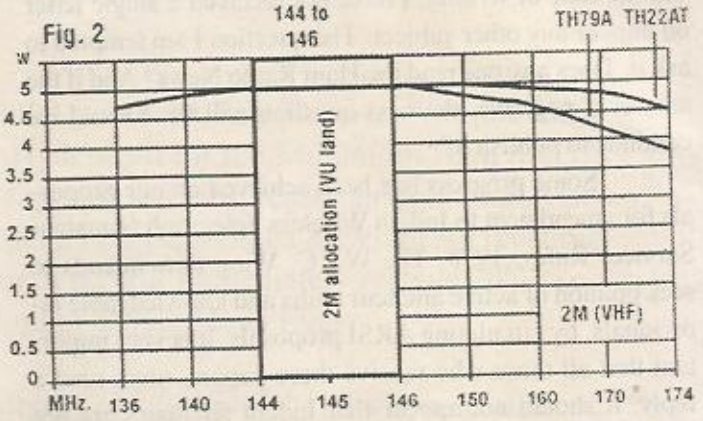
CONTENTS

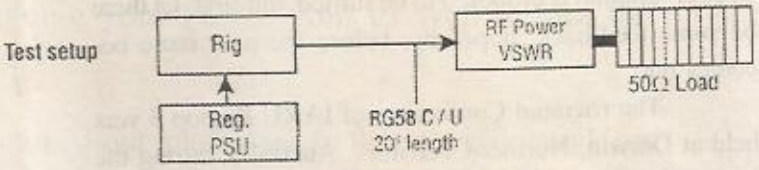
RF FREQUENCY AND OUTPUT POWER

By N.S. Harishankar VU3NSH
W.EXP.794/98, TVM DPL / 004 / 98

When it is seen that the RF power module data of M67798LA, its output power, total efficiency Vs. Frequency characteristics; the output power depends with input frequency. i.e., the module is mentioned like "144-148 MHz, 9.6V, 8W FM- portable radio." The chart shows that an input voltage (Vcc) 9.6 V, RF input 20 mW with a 50ohms load, the frequency response is at 140 MHz- 11W, 145 - 12W, 150 - 11W, 160- 10W and in 170- 8W. Therefore the output level from TXvers is experimented. For that selected TH79A and TH22AT.







Test Setup

* RF Power / VSWR Meter- SX 600 Diamond - 200W- 500 MHz
* Termination - 50Ω - DL- 30A Diamond - 100W inte. 500 MHz
* Rig 1 TH79A (Dual Band) 2m / 70 cm
  Rig 2 TH22AT (Monoband) 2m
* RG58 C / U - 50Ω cable 20" length

My test setup is a VSWR/ power meter and 50 ohms dummy load. Starting from VHF lower frequency to higher level (See fig.2), it is varying. The input DC voltage is constant, both VHF output modules are same and the output modes are high. Hey, what's going on!! The input DC is constant, 2m RF output from different rigs are different above 146 MHz!? Lets remember that while pumping an RF power through LPF (Low Pass filter) its output depends upon the LPF character.

Fig. 1 and Fig.2 are graphs illustrating these phenomena. In fig.1 (UHF Band) at 410 MHz, the output is 3W and in 430 to 470 MHz it gives 4W output. In fig.2, VHF (Band), at 136 MHz, the output is a 4.7 W and in 140 MHz to 146 MHz, it is giving 5W output; but in TH79A, the output at 160 MHz it is giving 4.6W and in 174 MHz, 3.8W; but in 22 AT at 160 MHz 4.9W and in 174 MHz. 4.5W. The output power from rig is varying upon bandwidth of the output IC / Transistor and L.P.F. (Low Pass Filter)at output stage. So this will confirm that the output from a rig at different frequencies is not fixed one. Generally, an RF power from output stage depends upon DC input voltage, output load, input frequency and power.

Test Mode

RF output IC	- PF0310-01-VHF (TH22AT) 5W
	- PF0310-01-VHF(TH79A) 5W
	- AU57-UHF (TH79A) 4W
DC input	- 12.5V / 2A from Reg. PSU
RF Power	- High Power
Type of test	- Cold (Nonradiating)

This a broad band RF frequency nonradiating test. Conducting this test without a proper licence is an offence. VU land Amateur VHF band is 144-146 MHz and in UHF, 434-438 MHz. AWTS Licensees can test only in the allotted frequency.

REPORT ON THE ELEVENTH I.A.R.U. REGION 3 CONFERENCE

The Conference of I.A.R.U. Region 3 members was held in Darwin, Australia, from 28.08.2000 to 01.09.2000. In all, 13 member societies were represented by delegates and observers. In addition, officials from I.A.R.U. Secretariat, Directors of Region 1 and 2, Beacon and Intruder Watch Co-ordinators, and other observers were present. In all, 75 people participated in the conference.

A notable occasion for India was the presence of Intruder Watch Co-ordinator for Region 3, Mr.B.L.Manohar (Arasu), VU2UR.

In the Delegate's Meeting on Sunday, 27.08.2000, three Committees were formed- Credentials and Election Committee, Finance Committee and Editorial Committee. I was nominated in the first Committee which oversees the credentials of Delegates and takes care of election procedures.

After the opening ceremonies and obituary references, the delegates were divided into three Groups, to deal with

- Working Group 1 : Policy Matters
- Working Group 2 : Technical & Operational matters, and
- Working Group 3 : Matters connected with ITU Conferences.

To help single member delegations- like ARSI (India), MARTS (Malaysia), RSGB (U.K.) and RAST (Thailand)- participate in Working Group 2 and 3, the meetings were timed separately. Some delegates who were in a position to contribute substantially to the agenda of these two working groups were similarly able to attend both the Group's meetings.

The recommendations of the Working Groups were placed before the Plenary for acceptance. Most of these were ratified. Two recommendations of Working Group 2 were modified on my suggestion- one of them (opposed by ARRL, NZART and WIA) after a vote by show of hands.

These recommendations become part of I.A.R.U. Policy Document. After acceptance by the Administrative Council, they are processed in the I.T.U. Meetings through established procedures. The major points of interest were

- Amendment of Article 25 of International Radio Regulations, dealing with Amateur service and providing for knowledge of Morse and the need for demonstrating "operating skills", as related to it. It was felt that the words "operating skills" (which sound a bit derogatory) be replaced by the words "methods of communication."
- Harmonising of 7MHz amateur band so that 300 kHz is made available to Regions 1 and 3 (in line with Region 2 allocation), either from 7.0 to 7.3 or from 6.9 to 7.2 MHz.
- Harmonisation of licensing qualification to provide for a world-wide reciprocal licensing privilege.

Two other topics which were widely debated and finally accepted, related to growth of Internet. On one hand, some kind of marriage between internet via amateur radio was called for (enabling access to internet via amateur radio), stress being laid on the fact that internet is not a replacement of amateur radio. The other aspect related to the traditional methods of advertising amateur radio as "talk to the world through amateur radio." With internet providing similar access- even though without speech communication- it is now necessary to promote amateur radio for its social content, like emergency service, field days, ARDF, self-training and self-reliance.

For the first time, the Conference organized a Workshop for I.A.R.U. Liaison Officers. The talks by I.A.R.U. President, Larry Price, Chairman, I.A.R.U. Region 3, Fred Johnson and Director Sangat Singh, were informative and dealt with National Regulatory Authorities as well as I.A.R.U., and promoting ham radio nationally.

On the last day of Conference, two elections took place, first to elect five directors for Region 3, where 9V1UV, Selvadurai from Singapore and VK2BPN, Peter Naish from Australia were elected for the first time, in addition to the three existing Directors from Japan, Korea and New Zealand, but 9M2SS, Sangat Singh from Malaysia lost by 2 votes. The second election (before which I resigned from the Credentials and Election Committee, being an interested party) was to choose the venue for the next Conference, there being two contestants: India and Taiwan. Taiwan won, perhaps because it was their third attempt while it was our first attempt.

The good news is that ARSI's nominee, VU2UR, Arasu, was elected unopposed as Intruder Watch Co-ordinator for Region 3, for a period of three years.

All in all, the conference was a big success.

Sahruddin, VU2SDN.

CLUB NEWS

ADUR AMATEUR RADIO CLUB

HAM XPO 2000

The Adur Amateur Radio Club will be conducting HAM XPO 2000 on Sunday 3rd December 2000 at Adur. There will be an exhibition of Ham radio materials, books, junk materials for sale. There will be demonstration of amateur radio station technical talks on the subject. A souvenir will be released on the occasion. Delegate fee of Rs.50 may be sent to L.V.Sharma, Mukalethu Matom, Adur Kerala 691 523. Phone 0473 / 428 358, 420 133.

LIST OF LICENCES NOT RENEWED FOR TEN YEARS

For the benefit of Indian Radio Amateurs, the Society has listed the various call signs with the corresponding licence numbers of those amateurs.

- who have become silent keys,
- who have left India for indefinite period (mostly foreigners),
- who are no longer interested in amateur radio, or
- who have just forgotten to renew their licences.

Since the information listed below has been obtained on purely informal basis, any discrepancies found in the list may kindly be brought to the notice of the A.R.S.I. President (AND NOT TO THE W.P.C. WING). On the other hand, those who wish to renew their licences, may also contact the President to ascertain if their licences can be renewed at this late stage. Apart from paying the late fees etc., they may also have to forego their original call signs.

This is the first list covering licence numbers upto 2000. Further lists will follow in subsequent issues.

LIST OF CANCELLED VU2 --- CALLSIGNS WITH LICENCE NUMBERS.

CALL	L. NO.	CALL	L.NO.	CALL	L.NO
AAA	913, 1490	AAC	1200	AAK	1809
AAL	890	ABC	1068	ABI	1602
ABO	1040	ABQ	1517	ABR	1260
ABV	1002	ACD	1175	ACJ	1079
ACR	1207	ACS	1276	AE	152
AFP	1930	AFS	1362	AG	228
AGI	1535	AGS	1357	AGT	1396
AGV	998	AH	170, 1203	AI	279
AIK	993	AIM	1698	AJI	1045
AJR	1688	AJT	1129	AKA	1759
AKD	1157	AKE	1177	AKI	1950
AKM	1205	AKR	1780	AKS	1696
AL	1137	AM	069	AMI	1300
AMN	972	AMY	1338	AN	173
ANI	1006	ANL	1750	ANO	1836
ANR	1173	APD	1025	APM	1676
AQ	002	ARS	213	ART	910
ASF	1752	ASP	1422	ASS	1320
AUS	1718	AV	19, 108	AVC	1209
AVI	1225	AVR	909	AW	053
AX	106	AZ	023		
BA	001	BAB	1577	BAI	1082
BAN	1939	BAR	1786	BAS	1882
BBC	1211	BBN	1149	BC	079
BCH	941	BCJ	1378	BCN	1785
BCT	1241	BDP	1049	BE	211
BEE	1504	BEO	785	BG	163
BGD	1987	BGN	1507	BH	21, 1196
BIJ	1556	BHG	883	BIT	1168
BJ	115	BKR	1875	BLB	1478
BLN	1830	BN	894	BNR	1975
BOB	1170	BOS	1468	BP	240
BPL	1256	BPR	1907	BQ	132
BR	116	BS	761	BSL	1764
BSR	1892	BT	127	BTR	970
BV	648	BW	758	BY	006
BZ	094				
CAN	939	CB	201	CCR	1146
CDG	1605	CDN	1932	CDS	1873
CG	024	CH	43, 759	CHO	1856
CI	365	CIL	842	CJA	1220
CKN	1334	CL	036	CMA	1787
CMC	943, 1329	CN	060	CPJ	1872
CQ	041	CR	966	CRC	1502
CRG	1186	CRM	1725	CRS	999
CS	051	CSC	1568	CTA	931
CTB	1448	CTP	1670	CTS	996
CU	732, 982	CUA	1862	CV	149
CW	066	CX	030		
DAR	881	DC	366	DCD	1221
DD	305	DDG	1136	DF	091
DG	306	DG	817	DI	198
DJ	370	DJS	1712	DK	1905
DLV	1562	DN	1330	DNG	1986
DON	1904	DOT	1317	DP	802
DPT	891	DQ	640	DQP	1278
DRB	1546	DRR	1439	DSG	1356
DSN	1088	DU	995	DUA	1813
DUE	1345	DV	154	DVS	878
DVV	1567	DYA	1460		
EB	971	EBK	1462	EC	113
ECG	1379	ECJ	1392	ED	194
EE	796	EG	029	EI	968
EIV	1375	EK	155	EL	912
EO	916	EP	963	ER	873
ERS	1432	ES	1044	ET	067
ETA	944	EZ	206		
FB	295	FBS	1898	FBT	1549
FD	988	FET	1059	FG	677
FGA	851	FJ	1004	FL	681
FLS	1182	FM	165	FMB	1595
FQ	1080	FS	825	FT	1081
FUN	1741	FV	055	FX	025
FZ	118				

CALL	L. NO.	CALL	L.NO.	CALL	L.NO
GA	007	GAA	1315	GAJ	1834
GB	772	GBL	1156	GCT	1280
GDP	1288	GDR	1571	GF	663
GG	870	GH	705	GIN	1512
GJ	089	GKK	1115	GL	033
GLS	1859	GMC	734	GN	294
GND	1014	GNI	1744	GOD	1385
GPN	1869	GR 844, 1015		GRF	1919
GRH	1587	GRI	1601	GRR	1114
GRU	1874	GS	077	GSC	1954
GSP	1339	GTH	1650	GW 326, 1464	
GV	135	GZE	1236		
HA	082	HAL	903	HB	1062
HC	952	HH	846	HJ	794
HKJ	905	HKR	1731	HL	845
HLU	823	HM	126	HMB	1767
HMI	1223	HN	609	HNI	1673
HNJ	827	HO	770	HOK	1908
HOS	1204	HP	078	HPR	1952
HR	779	HRA	1210	HS	204
HSK	1505	HSL	1381	HT	652
HW	1064				
IAD	1447	IB	245	ICK	1302
ID	282	IE	778	IK	635
IKM	973	IM	683	IP	789
IRA 889, 1306		IS	826	IT	715
IV	739	IXP	831		
JAG	1903	JAM	1056	JAP	880
JAR	1525	JAY	1282	JDG	1541
JER	1691	JG	095	JGP	1162
JIK	1404	JJ	300	JJK	1858
JLR	1900	JMD	1236	JNC	1852
JNT	932	JOB	812	JP	638
JPH	1218	JPN	1457	JQ	763
JR	017	JRC	1369	JRD	1456
JRL	1553	JRR	1913	JSA	1206
JSB	1909	JSN	1383	JSR	1917
JT	660	JU	072	JUD	1475
JV	682	JVG	1414	JX	978
JXO	1710	JY	236		
KA	299	KAS	1393	KAT	1708
KC	362	KD	011	KE	377
KED	1501	KG	215	KHA	1143
KK	097	KKA	1212	KKB	882
KKK	1459	KKN	1515	KKR	1596
KKV	956	KMR	1228	KMS	977
KN	214	KNB	1597	KNR	951
KNS	1503	KP	020	KPS	1348
KR	879	KRA	1430	KRB	1387

CALL	L. NO.	CALL	L.NO.	CALL	L.NO
KRC	1252	KRK	1576	KRV	1959
KSA	1274	KSB	1232	KSC	1824
KSN	1139	KSS	1762	KUM	936
KUR	1066	KVI	1283	KVN	1531
KVP	1612	KVS	1063	KX	397
KXS	1615				
LA	342	LAN	1569	LAP	1318
LC	283	LD	375	LEO	1092
LFM	1933	LG	888	LHO	1399
LIL	1328	LIP	1599	LL	004
LPL	1561	LQ	1017	LQA	1229
LS	611	LSB	1441	LUV	1303
LW	709	LXM	1972	LXV	1412
MA	979	MAA	1279	MAN	1295
MAO	1702	MAS	1443	MAV	1782
MAW	1695	MAX	1060	MC	180
MCN	1018	MCR	919	MCS	990
MCT	1849	ME	241	MEJ	1350
MFC	1894	MG	314	MGK	1783
MGN	1548	MGP	1668	MH	804
MHT	1123	MJ	249	MK	133
MM	234	MD	1343	MMM	1179
MMR	1101	MNK	1699	MNR	1312
MNU	1337	MO	788	MPU	1657
MQ	104	MQF	1039	MRO	1332
MRS	1766	MRV	1440	MSG	1557
MSK	653	MSN	1000	MSS	989
MTA	1050	MUM	1373	MUS	1309
MV	744	MVN	1427	MVP	1213
MVR	1070	MVS	1051	MW	276
MX	093	MZ	703		
NAC	1979	NAE	1639	NAF	1690
NAR	1131	NAT	1359	NBN	829
NC	863	ND	034	NE	347
NEW	805	NFC	1435	NGT	1400
NH	307	NI	798	NIN	1560
NJ	1046	NJF	1465	NJG	1171
NJK	1022	NK	175	NKA	1217
NKG	1150	NL	615	NM	776
NMR	1194	NMS	1697	NN	1074
NPN	1474	NPR	1956	NQ	997
NRN	1382	NRS	1169	NSL	1534
NSN	1254	NSR	1694	NT	627
NTB	940	NUT	1341	NV	781
NVR	1778	NX	848	NY	337
OA	670	OC	616	OF	1255
OI	984	OK	352	OLK	726
OMR	856	ON	339	OSA	1661
OT	667	OUA	1136	OUM	1319

CALL	L. NO.	CALL	L.NO.	CALL	L.NO
OY	1032	OZ	820		
PA	815	PAD	1765	PAM	1583
PAO	1647	PAR	1926	PAV	1703
PBK	1485	PBS	1988	PBU	1910
PC	013	PD	868	PEC	945
PEG	1095	PF	840	PG	695
PH	262	PHI	1791	PHM	1388
PI	209	PIE	1799	PJA	920
PJK	803	PKG	1191	PKI	1370
PKS	1543	PL	1132	PLN	1668
PM	1053	PMV	1593	PNJ	1310
PNM	1272	PNP	1591	PNR	1351
PO	224	PPK	958	PRA	1163
PSE	1923	PSG	1450	PSK	1484
PSM	1367	PSR	1876	PSU	1250
PSV	1307	PU	341	PUR	1384
PVN	1269				
QA	289	QBC	1993	QC	690
QE	1138	QF	782	QG	783
QH	1486	QJ	388	QK	382
QL	747	QO	386	QQ	293
QS	387	QU	806	QV	791
QW	384	QWS	1041	QY	807
QZ	750				
RAF	947	RAL	1665	RAN	923
RAO	1257	RAS	1124	RAW	1346
RBB	1937	RBC	1322	RCA	1023
RCB	1037	RCS	1227	REC	1685
REG	849	REN	1832	REP	969
RES	724	RFB	1626	RGM	1701
RGP	1286	RH	274	RHA	1772
RJ	233	RJL	1097	RJU	1837
RJV	1144	RK	2273	RKA	1155
RKK	1365	RKM	918	RKN	954
RKP	1473	RL	212	RLL	1291
RLV	1164	RMK	1880	RMP	1818
RMR	1730	RN	054	RNI	1086
RNN	1788	ROB	1800	ROM	1261
ROW	1103	RP	254	RPK	1125
RRR	1267	RSA	1308	RSH	1522
RSN	1402	RSR	1087	RV	830
RVB	985	RVC	1851	RVI	967
RVN	1663	RW	285	RWB	1790
SAC	1598	SAG	861,1296	SAK	901
SAN	1506	SAS	1477	SAT	1692
SB	102	SBR	1967	SBS	1184
SC	809	SCM	866,1201	SCN	1284
SCS	1140	SD	169	SDD	1609
SG	751	SGP	874	SH	210

CALL	L. NO.	CALL	L.NO.	CALL	L.NO
SHA	1891	SHP	1942	SJI	1582
SJM	1812	SJN	1544	SK	867
SKL	1423	SKS	1178,1572	SLN	1054
SM	1721	SMG	1513	SMJ	1542
SNG	1013	SNL	1911	SNM	1491
SPA	929	SPG	1126	SPR	1190
SQ	217	SRD	1305	SRE	865
SRI	1121	SRJ	1418	SRK	1943
SRN	1416	SRP	1492	SRS	938
SRW	1524	SSD	1957	SSI	1579
SSK	1586	SSS	1495	SST	1366,1660
SSV	1245	STS	1110	SUE	830
SUN	1224	SUQ	1817	SVC	1240
SVH	1580	SVV	1323	SXE	1135
SY	230	SZ	701		
TA	197	TAG	1686	TAP	1111
TAT	1352	TB	304	TC	1011
TCN	1922	TCS	1672	TD	057
TED	042	TF	740	THU	1644
TJ	793, 948	TKR	1020	TKS	1244,1622
TL	231	TLB	1711	TMB	1733
TNJ	1805	TOM	1529	T	271
TPS	1570	TR	887	TRI	1819
TRG	950	TRK	1165	TRR	1944
TRS	974	TRV	1578	TVA	885
TVN	1215	TY	834	TYL	1833
TZ	376, 1055				
UB	277	UF	836	UFO	1566
UH	1253	UHF	1887	UIN	1105
UJ	899	UL	895	UM	871
UMA	922	UMK	1906	UN	795
UO	935	UP	614	UPT	1682
UQ	828	US	075	USE	1454
USN	1386	UW	897	UX	898
VAE	792	VBI	1333	VC	242
VD	688	VDD	1026	VE	373
VEH	992	VG	657	VIJ	1666
VIM	1645	VJA	1216	VJB	1181
VJK	1048	VJN	1342	VJP	1371
VJU	1442	VKA	1481	VKN	1160
VL	632	VLS	1807	VM	123
VMG	872	VNB	1089	VNG	1479
VPD	1208	VQ	270	VR	303
VRJ	1659	VRS	937	VS	810
VSA	1899	VSM	1854	VSR	1275
VSS	1742	VW	649	VYA	1901
VYL	1895	VYN	1122	VZ	617
WA	822	WBC	1540	WD	628
WE	1005	WGR	918	WHO	1552

CALL	L. NO.	CALL	L.NO.	CALL	L.NO
WJD	964	WK	757	WL	1230
WTR	1458	WV	736		
XC	775	XG	784	XI	841
XM	655	XN	1047	XQK	1499
XR	725	XS	814		
YA	777	YAK	1090	YC	818
YD	801	YE	926	YF	927
YG	928	YII	1798	YM	768
YMA	1653	YO	1001	YOU	1623
YR	766	YS 819, 837		YSG	1829
YSN	1226	YT	858	YU	808
YUS	1187				
ZA	975	ZAL	1565	ZB	689
ZD	1009	ZG	762	ZJ	847
ZJD	869	ZL 1010, 1281		ZP	748
ZQ	959	ZT	824	ZU	1024
ZVA	925	ZX	760	ZY	619
ZZ	771				

CONTESTS

PEARL CITY CONTEST FOR CW & SSB

1. Object:

1.1 To promote & celebrate Ham Radio 2000 - Millennium Ham Meet of Indian Hams (scheduled for 22 - 24th December, 2000 at Hyderabad, India) and to expand relation between amateurs of India and the world by establishing as many contacts as possible with amateur stations world wide.

1.2. Indian amateurs work as many amateur stations in as many DXCC countries of the world as possible on 160, 80, 40, 20, 15, and 10 meter bands.

1.3. Foreign amateurs work as many Indian stations in as many of the 27 contiguous states and provinces as possible.

2. Dates & Contest Period:

2.1. **CW:** First full weekend in November **(Nov 4-5, 2000).**

2.2.**SSB:** Second full weekend in November **(Nov 11-12, 2000).**

2.3. **Contest Period:** 48 hours each mode (separate contests). Starts 0000 Indian Standard Time (IST) Saturday; ends 2400 Indian Standard Time (IST) Sunday.

3. Entry Categories:

3.1. **Single Operator:** One person performs all transmitting, receiving, spotting and logging functions as well as equipment and antenna adjustments. Only one transmitted signal is allowed at any given time.

3.2. **Multi Operator:** More than one person performs transmitting, receiving, spotting and logging functions etc. However, only one transmitter and one call-sign (according to the licensed location of the station) is permitted. Group of hams or Club Stations can take part in this category.

4. Eligibility:

4.1. All licensed amateur radio operators worldwide. All operators must observe the amateur radio regulations of their country at all times.

5. Contest Call:

5.1. For **CW** - CQ VU TEST; For **SSB** - CQ Pearl City Contest.

6. Contest Exchange:

6.1. **RS(T) and Serial number** of QSO starting from 001. Example for CW: 599001or 557001 etc. Example for SSB: 59001 or 55001 etc.

7. Scoring QSO Points:

7.1. VU stations count **25 (twenty five) points** for contacting a Maritime Mobile or Aeronautical Station. **10 (ten) points** per DX QSO and **5 (five) points** per VU QSO.

7.2. DX stations count **10 (ten) points** per VU QSO.

7.3. QSO with Contest Special Call Station will earn **100 (hundred) points** for both VU and DX stations. While the CW Side of the bands are used during CW Contest, during the SSB Contest, the Special Call Station will be on 7.070MHz or 21.170MHz or 28.170MHz (+/- QRM) according to the band openings.

8. General Rules:

8.1. Cross - mode / Cross - band contacts are not permitted and are subject to disqualification. However, no band change limits apply.

8.2. The same station may be worked only once per band per day. You can contact the same station next day also for QSO credit.

8.3. Aeronautical and Maritime Mobile stations may be worked by VU stations for QSO credit only.

8.4. To qualify for Contest Award, a minimum of **250 (two hundred & fifty) points** must be scored. VU hams **MUST** be Registered Delegates, for Ham Radio 2000 - Millennium Ham Meet, to be considered for the Contest Awards.

9. Log Submission:

9.1. Log Sheets (**original** and one duplicate copy) for the CW & SSB Contests must be sent ONLY to: Pearl City Contest, Secunderabad, India. Please keep at least one copy of your log with you for reference.

9.2. Log Sheets must be sent by Courier or Speed / Registered Post ONLY.

9.3. Entries for CW Contest MUST reach us by **20th November, 2000.**

9.4. Entries for **SSB** Contest MUST reach us by **30th November, 2000.**

9.5. The Organizers are NOT responsible for any non-delivery or postal delay.

9.6. Electronic Entries **(For DX Hams ONLY)** for the CW/SSB Contests can also be E-mailed to: *vu2kc@hamradio2000.com* with a CC to: *ljrao@yahoo.com*

before the last dates mentioned in 9.3. & 9.4.

9.7. Any submission, which is created electronically, must include a summary sheet and log file in Excel '97 and Word '97 file formats.

9.8. Paper copies of electronic logs are also acceptable, when accompanied by Electronic Entries, as substitutes for electronic data files.

10. Log Sheets:

10.1. All Log Sheets must show QSO entries in Chronological Order of Date & Time (IST or UTC) of QSO along with Call Sign of the Station worked and points for QSO.

10.2. Serial Order of the QSO number should match the Chronological Order of Date & Time in the Log Sheets.

10.3. Include a separate cover sheet indicating in BLOCK LETTERS: Category- Mode-Name-Call Sign-License Number-Mailing Address-Summary of Scores.

10.4. Logs must have duplicate contacts (made on the same band & the same day) clearly shown with zero (0) points.

10.5. Incomplete Log Entries will not be considered for calculation of points.

11.Disqualification:

11.1 A contestant will be disqualified for violation of amateur radio regulations in his own country and the rules governing the Contest as well as own license conditions.

11.2 Wrong operating practices cause disqualification of the contestant.

11.3. An entrant whose log is deemed by the Contest Committee to contain a large number of discrepancies or indicate a persistence of incorrect QSOs or show duplicate contacts up to 25 % will be subject to disqualification.

11.4. Action and decisions of the Contest Committee are official and final.

12. Contest Organizers:

12.1. All correspondence regarding this Contest for more details or clarifications should be made to:

Pearl City Contest, Ham Radio 2000, 303,
Sree Raghav Apartments, Sarojini Devi Road,
Near Sangeet Cinema, Post Bag No:15,
Secunderabad- 500 003, Andhra Pradesh.
INDIA

Phone: 091-40-621 0993, 771 3941
Fax: 091-40-771 3941, 763 1067
Email: vu2k@hamradio2000.com, ljrao@yahoo.com
Web Site: www.hamradio2000.com

"World-Wide Grid Locator System"

-B.L.Manohar "Arasu" VU2UR

On many of the QSL cards you have received from DX stations, you would have noticed some six character "alpha-numeric-alpha" combination like "JN 08 PM" etc... often given for "QRA Locator/ WW Locator/ Loc/ GL/ WW Loc/ Locator/ Grid Locator/ QTH Loc/ Grid Loc/ G. Loc/ Grid." Those six characters are simply giving information about the approximate location of QTH of the operator, instead of giving the laborious geodetic co-ordinates like 18° 40' 20" N and 15° 35' 30" East etc... It is very advantageous to give grid locator for your QTH information, during the very short propagation openings that come up while working satellites, meteor scatter, sporadic E opening etc... This system of giving alpha-numeric characters for locating your QTH is called the "Maidenhead Grid Locator System."

The grid locator concept is to find a terrestrial habitat inside a system of rectangles within rectangles, finally microscoping or zooming to an adequate least count of 5 minutes longitude and 2.5 minutes latitude in the smallest rectangle.

The whole of the earth's surface is divided into 'fields', 'squares' and 'sub-squares.' Each of these in turn, are formed by rectangles of size 20° Longitude x 10° Latitude; 2° Longitude x 1° Latitude; and lastly 5 minute x 2.5 minute of longitude and latitude respectively. In other words, there are in all 18x18=324 'fields'. Each of these fields consists of 10x10= 'squares' and each of these 'squares' consists of 24x24=576 "sub-squares." Fields and sub-squares are denoted by alphabet combinations from AA to RR and AA to XX respectively to cover 324 'fields' and 576 'sub-squares.' The 'squares' are designated by numerals from 00 to 99, to cover 100 squares.

Thus, (1) a 'field' which is a small rectangle is defined by its length (unit of 20° Longitude) and breadth (by unit of 10° Latitude) each by an alphabet.

(2) A smaller rectangle called a 'square' within the above small rectangle defined as a 'field', and is denoted by a numeral each for Longitude and Latitude of 2° and 1° respectively.

(3) The smallest rectangle called a 'sub-square' within the above 'square' is denoted by an alphabet each (from A to X) for Longitudes and Latitudes of 5 and 2.5 minutes respectively.

A typical locator of a town reads, say, "MK82SW". Here, the characters M, 8, S give Longitude to the least count of 5 minutes, and K, 2, W the Latitude to a least count of 2.5 minutes. In other words, you look on to the 'field' bound by "M and K"; then search for the 'square' bound by "M8 and K2" within that 'field', and finally, zoom to 'sub-square' bound by "M8S and K2W" which is the

rectangle of 5'Longitude x 2.5' Latitude, wherein is the QTH of the station you worked.

Before jumping at conversion exercises, please observe these conventions:

a) The block 180° W to 160° W is given the 'field' character 'A, 160° W to 140° W as 'B' etc... and 160° E to 180° E as 'R' for Longitude. Similarly, the block 90° S to 80° S is 'A', 80° S to 70° S is 'B' etc... and 80° N to 90° N as 'R' for Latitudes.

b) For an exact multiple of the unit (i.e., 20° or 2° or 5' Longitudes) towards West, use the previous alphabet (of Table LG-1) and for East Longitudes the succeeding alphabet.

c) All West Longitudes and South Latitudes are to be considered 'negative'

For helping you in finding the six grid locator characters after knowing the Longitude and Latitude of your QTH, you can use the following six tables, three each for Longitude and Latitude respectively.

Example A: QTH is at 156° 35'W and 35° 48' S. Grid locator is to be formed.

1. Draw six boxes as shown: | | | | | | |

2. 156° W is between 14° and 160° W, so from Table LG-1, you get alphabet "B". Write this is the 1st box from the left as shown: | B | – | – | – | – | – |

3. For 156° W, you have accounted for 140° W only so far. The balance of 16° 35'W is to be accounted now. From Table LG-2, this value of 16° gets you the numeral "1". Now, the boxes look like: with box 3 filled:

B	–	1	–	–	–

4. Now, for the balance of 35'W, refer Table LG-3, and as it is an exact multiple of 5', pick up alphabet 'Q' and not 'R' for box 5. Thus, the box is now:

B	–	1	–	Q	–

5. Coming to Latitude conversion to Grid Locator, from Table LT-1, you get alphabet 'M' for values between 30 to 40° N. This alphabet 'M' goes to Box 2.

B	M	1	–	Q	–

6. Balance of 5° 48'N. Referring to Table LT-2, for 5° you get numeral '5'. So this goes to box 4.

B	M	1	5	Q	–

7. The balance is still 48° N. Referring to Table LT-3, you get alphabet 'T'. Thus, the boxes now look with final configuration with 'T' in box 6 :

156° 35'W, 35° 48'S = | B | M | 1 | 5 | Q | T |

Example B: Grid locator is MK82SW and Geodetic Coordination are required.

1. Refer the characters M8S from Table LG-1 to LG-3 respectively and the details arrived at are:

M	60° E
8	16°
S	90'
Rounding Off :	2.5' (half of Least Count)
Total Comes to :	77° 32.5' E.

2. Refer K, 2, W which are the portion for Latitude, from Tables LT-1 to LT-3 respectively and you get:

K	10° N
2	2°
W	55'
Rounding Off :	1.25' (half of Least Count)

Total Comes to 12° 56.25'N MK82SW=77° 32.5'E, 12° 56.25'N.

A simple BASIC computer program was written in 1990, to cover only the East Longitudes and North Latitudes for arriving at the QTH locator for various locations in the Indian sub-continent. This program is listed, and test cases of Geodetic Coordinates for the various State Capital cities are given as input. These coordinates were picked up from Oxford School Atlas-English Version. The result output is listed for your reference. The input data has Latitude first and Longitudes later. Thus, you will have to feed data in the same format with 'comma' as separator. Else, the output will be erroneous.

I am sure, the above explanations and examples give you confidence to find the Grid Locator for your QTH. You can use detailed road map of India published by Survey of India, and arrive at the coordinates from there. A certain amount of "scaling-off" may be necessary. If you can get hold of a GPS hand held version, things become very easy.

If you still need help, contact your local amateur radio club members for help. You may use "Internet" facility and contact "sm3cer@contesting.com", giving your Geodetic Coordinates, through E-mail, and Om Jan will answer you.

As said earlier, grid locator is an important detail of exchange in VHF/UHF Contest, TOEC-Contest, Sporadic E QSOs, meteor scatter QSOs, Satellite QSOs etc... So, work it out and mention it on your QSL card too.

Good luck and 73

(Ref: SM3CER' web site; article by N5JTY Edmund T.Tyson in QST January 1989)

NOTICE OF THE ANNUAL GENERAL MEETING 1999-2000

The Annual General Meeting for the year 1999-2000 will be held on the 23rd December 2000 at 1830 hours at the Hotel Deccan Continental Secunderabad.

The agenda will be as follows:

1. To read and pass the minutes of the last AGM held at Mumbai on 19th March 2000.
2. To present and pass if deemed fit the Balance Sheet of the society as on 31st March 2000.
3. To present the report of the President/Secretary on the working of the society.
4. To appoint the Editor for the Ham Radio News.
5. To appoint Managers for the QSL Buros at Chennai and Mumbai.
6. To appoint an Auditor for the year 2000-2001 and fix the remuneration.
7. Any other point that may be brought up with the permission of the Chair.
8. Vote of thanks.

P.S. Members wanting to raise points may kindly intimate them to the undersigned by 15th December 2000.

Date: 25th October 2000

Adolf B.Shepherd, VU2AF
Hon.General Secretary

LETTER TO THE EDITOR

From: V.S.Battu. A-0632
A/1, Vishram Society, Gokhale Road,
Dahanukarwadi, Kandiwali (W).
MUMBAI-400 067.
Tel: +91 22 8059862

Reg: QST (returnable)

Sir.

Thank you Adolf for giving me the March and April, 2000 issue of the QST. They are now being returned to you.

I am an avid reader of HRN. Editorial, Silent Keys, HAM profile are my favourites. I am sure that pioneering work and host of homebrew projects may have evolved over the years. It is a pity that a beginner like myself has information on these pioneers only when they are silent keys or somebody writes in a HAM profile. A need for a book on the History of HAM in India, with Who's Who and accomplishments in this hobby is desperately needed.

Unless old timers like yourself and others of your generation are willing to share their experiences, none of the next generation HAM's like myself may ever get a chance to acquaint with the stalwarts in this hobby. And please this is not a complaint but a humble request. You will agree that with Internet and the filth and vulgarity that is pursued by the present generation, this hobby may soon end up in oblivion.

I am not sure how I can help this society, but below mentioned are some of my capabilities and would like to offer my services if desired (free of cost)

CAD design software for PCB layout (PTH or double sided).
SPICE for circuit simulation and analysis.
DTP package ALDUS PageMaker 5.
I look forward to hear from you. Soliciting an early reply.
Thank you.

Sincerely Yours.

V.S.BATTU.

HOME BREW
7MHz SSB TRANSCEIVER

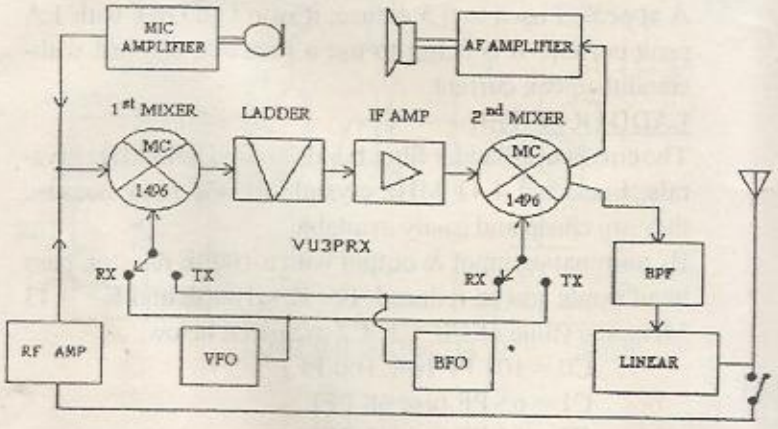
The transceiver described here is remarkably simple based on popular communication building block MC1496. It is fairly simple to build because most of the functions are performed by MC1496.

The emphasis during the design of the project was on repeatability, minimum number of switching and ability to modify for multi band operation.

In the beginning I would like to say that none of these circuit ideas are totally original and are taken from various books and magazines.

The circuit uses easily available components. Most of the coils are wound on low cost balun core. The circuit uses a ladder filter. Filter is build around four numbers of 4.43 MHz crystals. I used ladder filter because it is cheap and getting reasonably good reports.

The circuit uses two numbers of MC1496. First MC1496 functions as receiver mixer cum balanced modulator. Second MC1496 works as product detector cum transmit mixer. The block diagram of the transceiver is given below.



Presently the circuit is only for 7 MHz SSB operation. It can be modified for other bands by suitably changing VFO, transmit band pass filter and receiver band pass filter. I had avoided CW and AM provision for simplicity. CW and AM can be implemented by making some carrier to leak through balanced modulator. This can be done by offsetting balanced modulator by applying some external voltage to pin 4 of MC1496.

Before you start heating your soldering iron, here is some advice for beginners.

1. Avoid dry soldering- Many of the problems with unsuccessful project are dry soldering. Dry soldering is due to dirt in soldering surface Clean legs of the component and pcb surface before soldering. Use good quality soldering plaster and lead.
2. Before placing components- confirms the value of resistance, legs of transistors; pin configuration of IC, etc.
3. Assemble stage by stage- Never put all the components in the board expecting it will work perfectly when you switch on. It is highly recommended to follow some divide and conquer method. Divide your project into small modules that can be easily assembled and tested. Test each module thoroughly before going for next stage.

MC1496 DBM

A mixer is a nonlinear element that combines two signals. A mixer has three ports: F1 receives low level signal: F2 is high level signal (local oscillator) and F3 is the resultant mixer product.

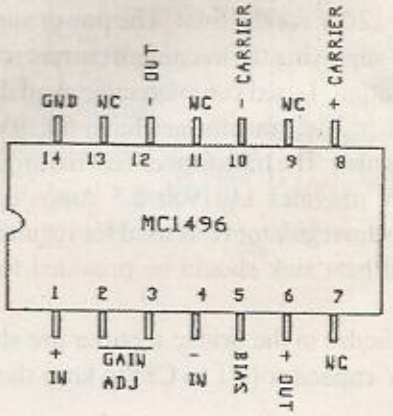
The output of the mixer contains number of different frequencies that obey the relationship F3=mF1+ nF2. Where m and n are integers 0, 1, 2, 3.....

There are three types of mixers: single-ended, single balanced and double balanced. Double Balanced Mixer (DBM) suppresses F1 and F2 components of the output signal leaving only the sum and difference frequencies. Double Balanced Mixer provides superior suppression of the local oscillator and RF signals in the output leaving only the sum and difference frequencies. This is known as port to port isolation.

MC1496 is an active double balanced mixer made from bipolar silicon transistors formed into Gilbert transconductance cell.

The transceiver is designed around two numbers of MC1496. The first MC1496 performs the function of Receiver mixer and balanced modulator. Second MC1496 works as Product detector cum Transmit mixer.

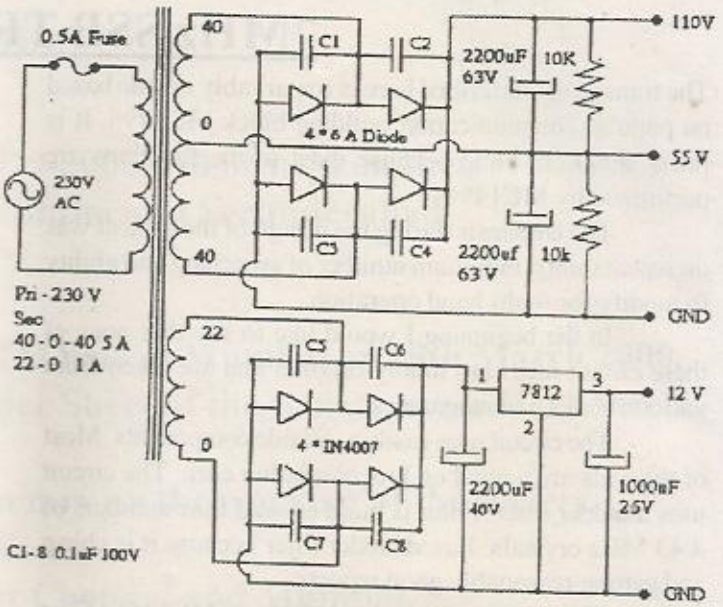
MC1496 is available is 14-pin DIP package. Brief descriptions of various pins are given below.



Pin 1 and pin 4 are balanced low-level inputs. Pin 8 and pin 10 are balanced high-level inputs. Pin 6 and pin 12 are outputs. Pin 5 is bias usually connected to Vcc through a resistor (normally 10k). Pin 2 and pin 3 determines gain of the mixer. The gain will be maximum when pin 2 and pin 3 are shorted. Gain can be adjusted by connecting some resistance between pin 2 and pin 3. Pin 7, pin 9, and pin 11 and pin 13 are not used.

DC Voltage measured at various pins of MC1496 given below. There may be slight variation in these voltages due to accuracy of measuring equipment or components used.

PIN	VOLTAGE	PIN	VOLTAGE
1	3.58V	8	6.51V
2	2.96V	9	NC
3	2.91V	10	6.51V
4	3.58V	11	NC
5	1.25V	12	11.8V
6	11.81V	13	NC
7	NC	14	0V [GND]



TEST EQUIPMENT'S

Assembling will be easy if you use proper test equipments. Average hobbyists can't go for sophisticated test equipments. In this project I had used multimeter and RF voltmeter for measurement. Using RF probe you can use multimeter as RF voltmeter. RF probe is essential test equipment for ham shack. It can be used as an FSM also.

To work as RF voltmeter put multimeter in volt range. For FSM I used multimeter in 0.25 ma range and connect a long wire to the probe. If you won't have a multimeter a vu meter can be used.

WINDING COILS

Most of the coils used are wound on balun core. They can work up to VHF range, normally used in TV boosters. A single balun core can handle up to 10 Watts. Band pass coils and coils used in IF amplifiers are wound on IFT former. Wind both primary and secondary in the same direction. If the start end of the primary is cold end, the start end of the secondary should also be a cold end.

POWER SUPPLY

The transceiver requires 12 volt for most of the circuitry and 120 V for the final. The power supply should be capable of supplying the maximum current required with good stabilization. I used commercially available 40-0-40 5A transformer. The transformer have 6V, 9V, 12V, and 22V windings also. The transformer cost me around Rs:370. Power supply provides 110 Volt 2.5 Amps or 55 Volt 5 Amps. Three-pin regulator IC is used for regulating 12-volt supply. Good heat sink should be provided for regulator IC.

All diodes in the bridge rectifier are shunted with 0.1 uF 100 V capacitor (C1 to C8) to keep the diode protected from high voltage transients on the AC line as well as reduce inter-carrier hum modulation of RF that may be picked up by the mains. Always use fuse in 120 V supply line. This can avoid hand full of burned IRF. It also protects the power supply itself. My final consumes around 1 A at peak. I used to 0.5 A fuse; it won't go QRT with 1 A peak current. It is better to use a fuse that can just withstand the peak current.

LADDER FILTER

The circuit uses ladder filter builds around 4.43 MHz crystals. I selected 4.43 MHz crystals for the filter because they are cheap and easily available.

By terminating input & output with a 1000E resistor, pass band ripple can be reduced. For R = 1000E and F = 4.43 MHz, the value of C0, C1, C2 are given below.

C0 = 101 PF (use 100 PF)
C1 = 65 PF (use 68 PF)
C2 = 14 PF (use 15 PF)

Ladder filter is assembled on a small PCB. The metal enclosures of all crystals are connected to ground through thick copper wire. For ladder filter you need four crystals and one crystal for carrier oscillator. Collect all crystals of same make and with same serial number.

AF AMPLIFIER

The receiver audio amplifier uses popular low noise IC LM386. Operational amplifier IC 741 is used as preamplifier. Both LM386 and 741 are available in 8 pin DIP.

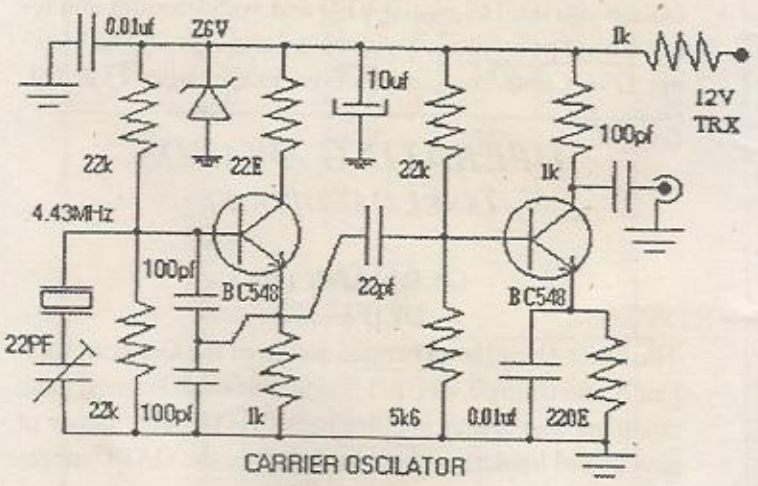
LM386 is designed for operation with power supplies in the 4 V to 15 V range. Quiescent current is about 4 ma. It's input impedance is 50 K. Output automatically centers on a quiescent half supply voltage value. It provides 250 mw to 8 E speaker, which will be sufficient for

comfortable listening level. The gain can be adjusted between 26 dB and 46 dB depending on the circuit at pin 1 and 8. here LM386 is configured for 26 dB gain.

IC 741 is a very popular Op.Amp. Many makes of IC 741 such as LM 741, AM 741, CA 741, CA 741, UA 741, uA 741 are available in market. Op Amps have two input terminals. For IC 741 pin 2 is inverting input, pin 3 is non-inverting input. Supply voltage can be in the range of 5 V to 18 V. Input impedance is 200 K. Here Op Amp is configured as inverting amplifier. Its gain can be adjusted by changing the value of resistance between pin 2 and pin 6.

CARRIER OSCILLATOR

Carrier oscillator is a crystal controlled oscillator using two numbers of BC548. The circuit does not use any coils or turned circuits. First BC548 is used as oscillator second BC548 is used as buffer. The carrier oscillator frequency is offset by 1.5 KHz above ladder filter (IF) frequency. The carrier oscillator frequency can be varied slightly by adjusting the trimmer in series with the crystal. The metallic enclosure of the crystal should be grounded for increased frequency stability.



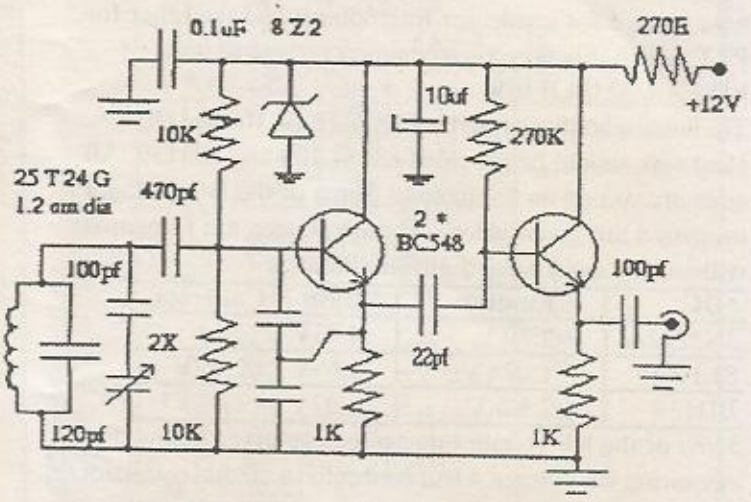
CARRIER OSCILATOR

IF AMPLIFIER

IF amplifier consists of two-stage collector turned amplifiers using BC548. It provides useful gain for both transmit and receive modes. The coil used are of same type, wound on ordinary IFT core. Primary is 15 turns. Secondary is 4 turns. Any thin copper wire such as 36 SWG can be used. The IF amplifier can be turned by connecting carrier oscillator at input and RF Volt meter at output. Adjust both coils for maximum deflection in RF Volt meter.

FRONT END

BF494 is used in receiver front end. The circuit provides enough gain. I had not used any turned circuit at collector



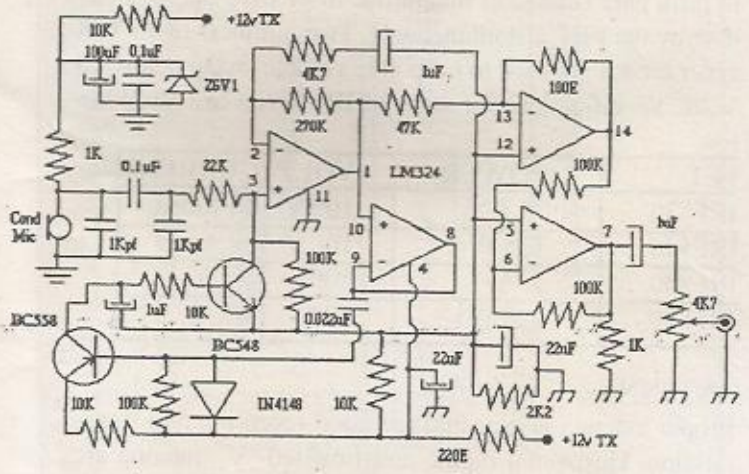
of BF494 to make it compatible for multi band operation. No AGC is provided to keep the things simple. AGC voltage can be taken from pin 12 or pin 6 of MC1496 and applied to base of BF494 through a 100K resistor.

VFO

Variable frequency oscillator uses two numbers of BC548. For 40 meter band VFO oscillates form 2.567 MHz to 2.667 MHz which on mixing with 4.43 MHz generates 7.0 MHz to 7.1 MHz. If you have a frequency meter it is easy to calibrate the VFO, otherwise connect a 2J gang condenser in parallel with VFO coil and adjust it to receive ham stations. VFO is fixed inside a small aluminum box.

MIC AMPLIFIER

Microphone amplifier consists of LM324 and two transistors. LM324 is available in 14 pin DIP. I brought it for Rs.6/-. It contains four identical operational amplifiers. Transistors BC548 and BC558 are used as compressor.



I used 2-wire shield wire for connecting microphone. One wire is used for condenser microphone and the other for PTT switch. Shield serves common ground to both.

LINEAR AMPLIFIER

The linear amplifier consists of 2N2222, SL100 and BD139. Heat sink should be provided for SL100 and BD139. All coils are wound on balun core. Some of the DC voltages measured are given below. These voltages are measured without any input using digital multimeter.

*DC	Emitter	Base	Collector
2N2222A	2.79 V	4.43V	9.54 V
SL100B	1.078 V	1.69V	12.05 V
BD139	7.5 mV	0.67V	12.01 V

Some of the RF voltages measured are given below. For measuring RF voltage, I had connected a crystal oscillator to input of the linear. These voltages are measured using digital multimeter and RF probe.

*RF	Emitter	Base	Collector
2N2222A	0.44 V	2.3V	0.82 V
SL100B	0.76 V	0.78V	4.87 V
BD139	0.55 V	1.3V	23.0 V

POWER AMPLIFIER

In my prototype I used IRF840 in the final. Most of the power FET are designed for high voltage operation. At lower operating voltages they saturate quickly limiting the output power. I had given 120 V for IRF840 it takes 1 Amp at peak. Gate voltage is fixed at 1V. Heavy head sink is essential for IRF. My heat sink measures 30 cm * 6.5 cm. Use a mica insulator and heat sink compound for fixing IRF. You can directly replace IRF840 with many of the power FET like IRF830, IRF530, IRF540 etc... When using a different IRF, supply voltage should be changed to less than half the maximum drain voltage (Vds). A zener diode rated slightly higher than the twice the supply voltage connected across drain and source can prevent drain source breakdown. Peak to peak gate voltage of magnitude more than 20 Volts can destroy the FET instantaneously. Two numbers of 15 Volt zener diodes are used to keep gate voltage swing below 20 Volts. Specifications for some of IRF series are given below.

FET	POWER	VOLT	CURRENT
IRF530	75 W	100 V	14 Amps
IRF540	125 W	100 V	27 A
IRF830	75 W	500 V	4.5 A
IRF840	125 W	500 V	8 A

ANTENNA

Proper antenna is essential for good reception and transmission. Horizontal dipole and Inverted 'V' antenna are popular among hams. I am using horizontal dipole antenna. Horizontal dipole is considered to be a fundamental antenna. Inverted 'V' is a variation of dipole with its center position raised. For inverted 'V' the angle at the center between the two halves should be between 90 degree to 120 degree for better results. Impedance of horizontal dipole is 70 ohms and a coaxial cable with impedance of 73 ohms like RG59 can be used. The impedance of inverted 'V' is around 50 ohms and a coaxial cable with impedance of 50 ohms like RG58 or RG8 can be used. The length of the dipole is half the wavelength. Any thick copper wire can be used. Cut the wire at the center and connect suitable coaxial cable at the center. For 7.05 MHz the length can be calculated as follows.

* Horizontal Dipole
  Length= 468 / F (in MHz)
  =468 / 7.05= 66.38 feet
* Inverted 'V'
  Length= 464 / F (in MHz)
  =464 / 7.05= 65.81 feet

CONCLUSION

The circuit is for 40 meter band. It can be modified for other bands by making suitable changes in the receiver band pass filter, transmit band pass filter and VFO. I had used 4.43 MHz ladder filter. If you want to use 9 MHz crystal filter or any other filter you need to change IF amplifier frequency, carrier oscillator and VFO. For multi band operation you need to switch VFO and both transmit and receive band pass filters. So go ahead and enjoy home brewing. *(For Complete Circuit diagram see pages 15 & 16)*

OPERATING AWARDS

(ARRL HANDBOOK)

GERMANY (DL)

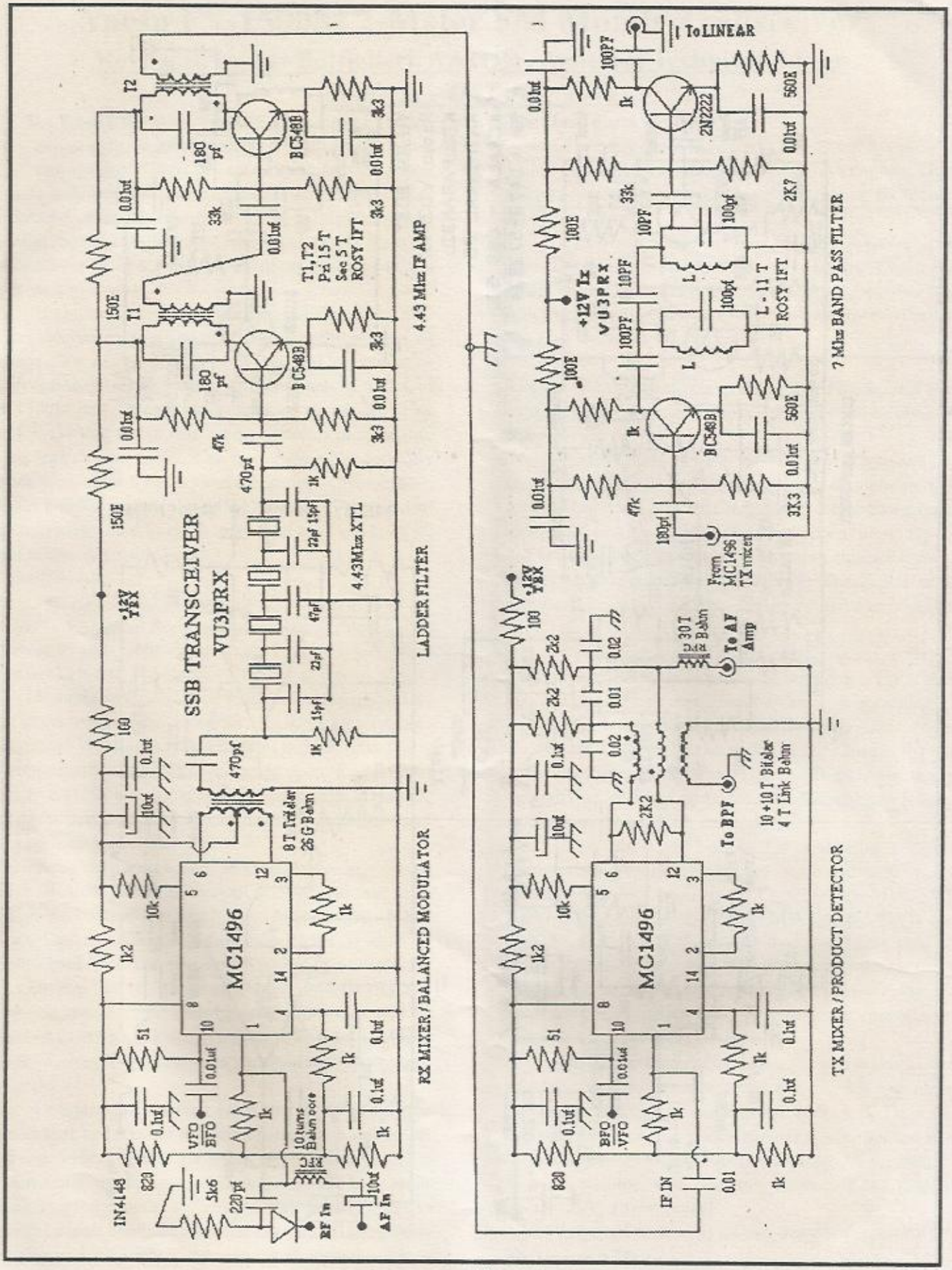
DLD Award

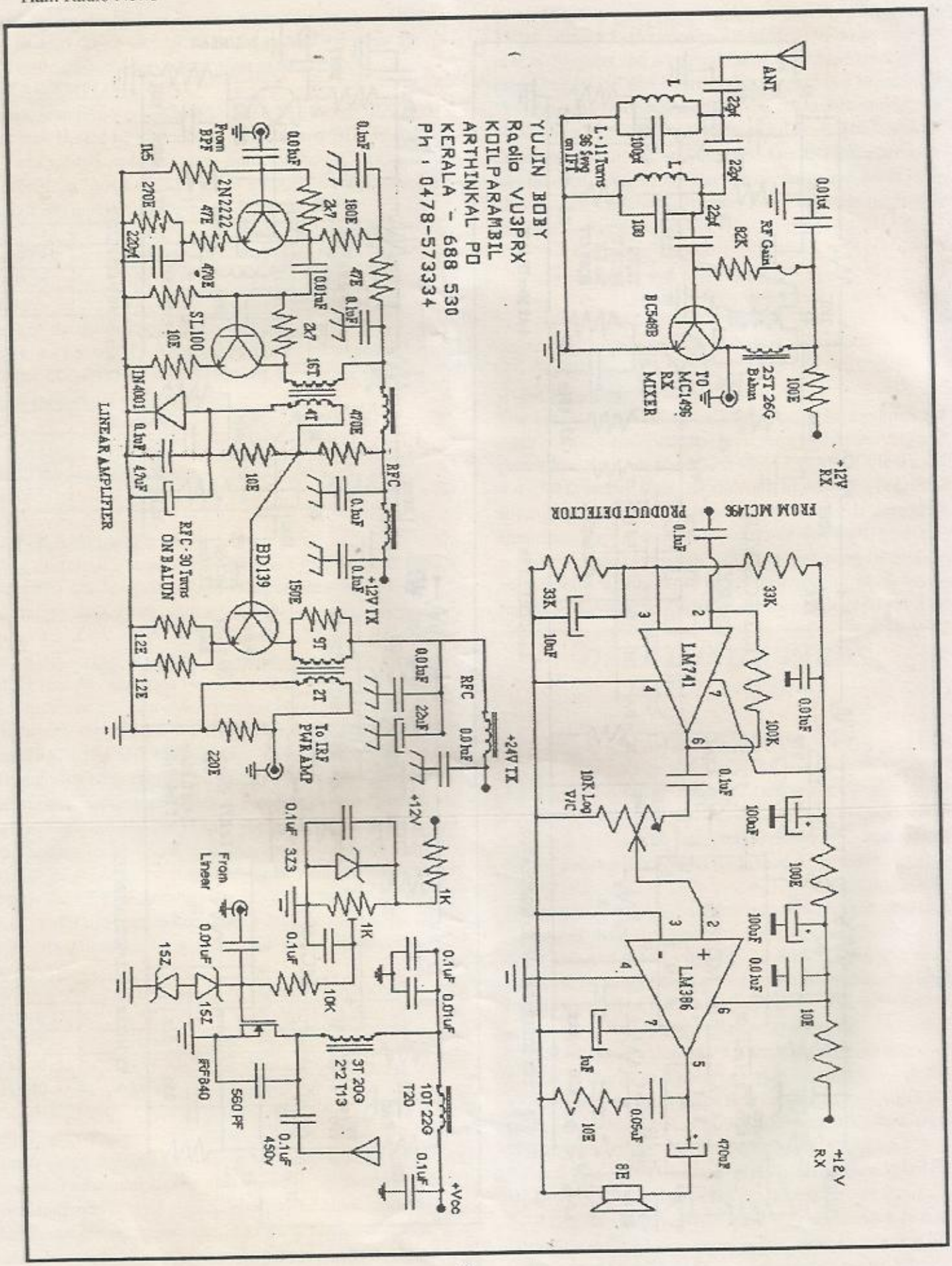
The DLD Award is an official award of the German Amateur Radio Club (DARC). It is available to all licensed radio amateurs and shortwave listeners (SWL). The names of new award holders will be published in the DARC magazine *CQ-DL*.

All members of DARC, its associate club VFDB, and club stations of both organizations are issued a *District Location Code* (DOK). To qualify for DLD, applicants must submit QSL cards from licensed radio amateurs showing a certain number of DOKs worked or- for SWLs-heard.

DLD Award Classes and Modes

* DLD is issued separately for each amateur band.
* DLD is issued in different classes on each band as follows: DLD 100, DLD 200, DLD 300, DLD 400, DLD 500 (with lapel badge), DLD 600, DLD 700, DLD 800, DLD 900 and DLD 1000 (with engraved badge of honor).
* For SWLs, the awards are known as DLD-SWL 100, DLD-SWL 200 and so on up to DLD-SWL 1000.
* All DLD Awards may be issued for mixed modes, or may be endorsed for single mode operation, providing that this is supported by QSL cards. *(continued on page-20)*


SSB TRANSCEIVER
VU3PRX
RX MIXER / BALANCED MODULATOR
LADDER FILTER
4.43 Mhz IF AMP
7 Mhz BAND PASS FILTER
TX MIXER / PRODUCT DETECTOR
MC1496
BC548B
2N2222
4.43Mhz XTL
T1, T2
Pri 15 T
Sec 5 T
ROSY IFT
L - 11 T
ROSY IFT
+12V Tx
VU3PRX
+12V
RX
To LINEAR
To BPF
To AF
Amp
From
MC1496
TX mixer
10+10 T Bifilar
4 T Link Balun
8 T Trifilar
26 G Balun
10 turns
Balun core
IF IN
RF In
AF In
VFO
BFO


YUJIN BOBY
Radio VU3PRX
KOILPARAMBIL
ARTHINKAL PO
KERALA - 688 530
Ph : 0478-573334
ANT
L
RF Gain
82K
BC548B
25T 26G
Bahan
100E
+12V RX
TO MC1496 RX MIXER
FROM MC1496
PRODUCT DETECTOR
LM741
LM386
10K Log
VOL
100uF
0.01uF
0.1uF
33K
10uF
10E
47uF
8E
LINEAR AMPLIFIER
From RFF
2N2222
SL100
IN4001
BD139
RFC - 30 Turns ON BALUN
+12V TX
+24V TX
To IRF PWR AMP
From Linear
1K
10K
0.1uF 323
15Z
3T 20G 2*2 T13
10T 22G T20
560 PF
0.1uF 450V
+Vcc

Yaesu FT-1500M 2-Meter FM Mobile Transceiver

Reviewed by Joe Bottiglieri, AA1GW, Assistant Technical Editor

Courtesy - QST July 2000

The Yaesu FT-1500 is a single band 2-meter FM transceiver with an ample selection of the most important features. While it's not quite as fully equipped as Yaesu's alternative 2-meter mobiles-their feature-packed FT-3000M and their well appointed FT-2600M transceivers-what the FT-1500M might lack in bells and whistles it makes up for in its remarkably compact dimensions and apparent ruggedness.

If you are particularly hard on your mobile transceivers mechanically- if you tend to drop or throw them, or perhaps even run them over with your car occasionally, you'll definitely want to make sure you include a look at the '1500M on your next radio shopping excursion. (This is not to say that we've verified the mechanical durability of this transceiver- ARRL Lab testing does not currently include a regiment of impact and mechanical stress testing. If looks and feel count for anything though, I'm confident that this radio would be up to just about any such tests we could reasonably subject it to.)

A Small Wonder

The FT-1500M is undisputedly the smallest 50 W 2-meter FM Amateur Radio transceiver available today. It is however, somewhat larger than the FT-90R-Yaesu's dualband VHF/HF FM mobile.

Notable features include 130 memories with 6-character alphanumeric label capability, expanded receive coverage from 137 through 174 MHz (AM aircraft reception is not supported): 1200/9600 bps packet operation; S meter squelch; CTCSS encode, decode and tone scan; automatic repeater offset; a variety of scan modes, a time-out timer and automatic power shut off.

Yaesu has also tossed in their exclusive "Smart Search" feature. Once activated, this system will scan through the band and automatically load any active frequency that it encounters into a dedicated 31-channel memory bank. You can then sort through these manually and memorize any that are of interest into the regular memory positions. The Smart Search memories will be erased when you exit the search though, so you'll want to transfer desired frequencies into the regular memories immediately.

Conspicuously absent from the '1500M are two features that had seemed to become staples on nearly every Yaesu VHF or VHF/UHF transceiver released over the last few years: digital code squelch (DCS) and their automatic range transponder system (ARTS). While these can be useful capabilities, they are not currently finding wide use. The vast majority of operators will probably never miss them.

The Hard Facts

The body of the transceiver consists of two die-cast aluminum covers that mate together clamshell-style. There are no separate front or rear panel assemblies, these two enclosure sections wrap completely around the internal electronics. The aluminum's thickness appears to be about 3/16-inch.

Bottom Line

The FT-1500M is the smallest 2-meter FM mobile transceiver on the market today. Yaesu has squeezed in all of the most important features and has even managed to provide nearly total remote control from the microphone.

The smallish liquid crystal display is recessed into the front panel and presents frequency or alphanumeric information as 1/4-inch tall characters on a blue background. Icons representing activated features appear along the top and left edges of the display- a 10 segment signal/RF power output meter occupies the bottom edge. The display background illumination intensity can be adjusted to 10 different levels or shut off completely.

Display legibility is good from nearly any angle, but bright lighting can cause problems with glare. For mobile applications, choose your mounting location accordingly.

Two largely knobs are positioned to either side of the display window. The knob on the left controls the volume. The right knob-labeled **DIAL**- is used for tuning through frequencies or memories, or for selecting and changing settings when in the set mode.

Five rubberized buttons for controlling the most common operations are positioned "keyboard-style" across the front edge of the top cover. These include **MHz/SET, REV/ DW, LOW/A/N, D/MR/ MW** and the **PWR** buttons. These keys and the two knobs are the only controls on the chassis of the radio. The majority of the more advanced operations- the squelch level, the repeater shift, the tuning steps and various CTCSS settings, for example- are controlled through a set-mode menu.

On the back side of the enclosure you'll find a chassis mounted SO-239 antenna connector, a 1/8 inch external speaker jack and a 6-pin mini DIN data jack. De power is connected through a 9-inch cable that's terminated with the conventional T-type Molex connector. A separate 9-foot power cable, with a mating connector and fuses in both leads, is also supplied.

A small internal speaker is mounted inside the top cover.

Microphone Magic

The MH-48 hand microphone supplied with the FT-

1500M features a backlit 16-button DTMF keypad, side-mounted **LAMP** and **LOCK** switches, top-mounted **UP** and **DWN** buttons that mimic the operation of the front panel **DIAL** control and, of course, the **PTT** button.

Four additional keys- **P1, P2, P3** and **P4**- are located just below the 16-button keypad. In their factory-default configurations, **P1** opens the squelch, **P2** activates a "Smart Search," **P3** initiates a CTCSS tone search and **P4** switches the receiver to a preprogrammed band of 10 standard NOAA Weather Broadcast channels. You can reprogram the buttons to provide instant access to any one of these four operations or choose form one of six others- CTCSS tone activation, tone burst, duplex direction, dc voltage indication, display brightness or memory channel skip settings for scanning.

When the radio is in the receive mode, pressing the **number** buttons on the DTMF keypad allows you to enter frequency digits directly. When you enter the 6th digit in the string (or press the #key if the desired trailing digits are all 0), the radio will instantly tune to the entered frequency- no additional "enter" button stroke is required. Punch in a memory number followed by the *key and the radio will tune to that memory channel.

DTMF keypad entries with the **PTT** button pressed will result in transmitted DTMF tones for repeater control and autopatch applications. There are also 9 autodial memories that can hold up to 16 digits each. The speed of the transmitted string and a start delay setting can be varied with a menu setting.

The MH-48 is very similar to the MH-38B microphones that have been packed with the last few Yaesu transceivers we've looked at, but this one has a few more tricks up its sleeve.

When the radio is in the receive mode, the DTMF **A, B, C** and **D** buttons will perform the same functions as the keys mounted on the body of the transceiver. This allows control of every operation the radio-with exception of the volume level and power on/off- from the microphone.

Nearly all of the buttons on the microphone (and on the radio itself) sound a unique note when pressed. After you become used to their sounds, this confirms that you've pressed the desired key without having to divert your attention to the legends on the buttons or the information on the radio's display. This would certainly be a useful feature for the vision impaired. Unfortunately, a voice synthesizer option is not available.

Table 1

Yaesu FT-1500, serial number 0E030077

Manufacturer's Claimed Specifications	*Measured in the ARRL Lab*
Frequency coverage: Receive, 137-174; transmit, 144-148 MHz.	Receive and transmit, as specified.
Power requirement: Receive, 0.7 A; transmit, 8 A (high power).	Receive, 0.52 A; transmit, 8.0 A. Tested at 13.8 V.
Modes of operation: FM.	As specified.
Receiver	*Receiver Dynamic Testing*
FM sensitivity, 12 dB SINAD: < 0.2 uV.	For 12 dB SINAD, 0.17 uV.
FM adjacent channel rejection: Not specified.	20 kHz channel spacing: 77 dB.
FM two-tone, third-offer IMD dynamic range: Not specified	20 kHz channel spacing: 71 dB; 10 MHz channel spacing: 100 dB.
FM two-tone, second-order IMD dynamic range: Not specified.	82 dB.
S-meter sensitivity: Not specified.	Maximum indication: 5.1 uV.
Squelch sensitivity: Not specified.	At threshold: 0.06 uV.
Receiver audio output: 3.5 W at 10% THD into 4 Ω	3.4 W at 10% THD into 4 Ω.
Spurious and image rejection: Not specified.	First IF rejection, 102 dB; image rejection, 85 dB.
Transmitter	*Transmitter Dynamic Testing*
Power output (H/L3/L2/L1): 50 / 25 / 10 / 5 W.	50 / 24 / 9.5 / 3.8 W.
Spurious-signal and harmonic suppression: > 60 dB	68 dB. Meets FCC requirements for spectral purity.
Transmit-receive turn-around time (PTT release to 50% audio output): Not specified.	S9 signal, 105 ms.
Receive-transmit turn-around time (tx delay): Not specified.	16 ms.
Bit-error rate (BER), 9600-baud: Not specified.	Receiver: BER at 12-dB SINAD, 2.5×10^{-5}; BER at 16 dB SINAD, 4.4×10^{-5}; BER at -50 dBm; 1.4×10^{-4}; transmitter: BER at 12-dB SINAD, 9.3×10^{-5}; BER at 12-dB SINAD + 30 dB, 3.0×10^{-4}.

Size (hwd): 1.4x5.0x5.0 inches; weight, 2.2 pounds.

Note: Unless otherwise noted, all dynamic range measurements are taken at the ARRL Lab standard spacing of 20 kHz.

Hittin' the Road

While many FT-1500Ms will likely end up finding applications in portable and fixed stations operations, this radio's small size and extensive microphone control capabilities should make it a very popular choice for permanent mobile installations.

The included mobile mounting bracket is unique. It consists of a 3 x 2 3/4- inch plate with a pivoting rod system that allows you to adjust the angle of the chassis. You can mount the bracket to the top or the bottom of the transceiver- whichever suits your situation best.

Workin' It

Yaesu provides a small 44-page *Operating Manual* and a folded sheet of paper with detailed schematic and block diagrams. The step-by-step instructions given in the manual are easy to follow. I didn't run into any difficulties programming or varying the settings on even the most advanced features.

The operations that you use most-selecting the memory, home or VFO mode; adjusting the RF power output level; writing VFO information to a memory; toggling to the input frequency of a repeater; for example- are directly controlled through the keys located on the top of the front panel. Their primary assignments are activated with a quick press. Pressing hand holding a key for a second or two brings up its secondary assignment. There's no function button to fumble with.

The duplication of these top panel keys on the microphone's **A, B, C** and **D** buttons is particularly handy for mobile operation. It would have been nice to have them specifically labeled with their functions, but it probably won't take long to commit their assignments to memory.

The radio makes extensive use of a set mode menu for controlling the more advanced operations. There are a total of 35 selections. All are clearly identified with alphanumeric titles up to 6 characters long and are arranged alphabetically. It certainly makes it much easier to locate the desired selection. Good going Yaesu!

I used the FT-1500M in both mobile and fixed station operation and was generally very pleased with the control configuration and performance.

Transmit audio reports gathered from my usual test group of local audiophiles positioned the FT-1500M's transmit sound quality squarely in the "communications grade" category. While the gang agreed that it didn't sound objectionable, all preferred the fuller range of audio frequencies rendered by my trusty old shack transceiver.

The receive audio-although plenty loud-does suffer the usual consequence of being reproduced through a comparatively small speaker. The "1500M's" receive audio clarity benefits greatly from the use of a larger external speaker. With an external speaker connected, the 3 1/2 W audio output is more than sufficient in even the noisiest environments.

What's Cookin?

The FT-1500M- as is the case with nearly all of the current single band FM mobile transceivers- does not enjoy the luxury of an internal cooling fan. Part of the design philosophy of its die-cast aluminum enclosure is to allow the entire surface area of the radio to act as a heat sink.

Extended periods of relatively high duty cycle operation at full power output can bring the temperature of any transceiver's heat sink (the whole radio in this case) to a pretty significant level.

I spent an evening rage chewing with a couple of the locals. With the RF power output set to the 50 W level, after about a half-hour of exchanging our usual fastpaced witty banter, I noticed that the temperature of the transceiver had raised to a considerable level. Shortly afterward, protective circuitry in the radio recognized the dire implications of such a temperature increase and automatically switched the RF power output to the low setting.

I don't find this particularly alarming, but let me provide a couple of suggestions (incidentally, these are valid for any transceiver). 1) Resist the temptation to mount any transceiver in a location that restricts air movement around the enclosure. (This warning is found in every transceiver's owners manual-save some H-Ts, perhaps.) With a chassis size as small as this, it's difficult to resist mounting it in the small storage compartments prevalent in most modern car interiors. Just don't. 2) Use the minimum amount of REF power output necessary for effective communications. (Now where have we seen this "suggestion" before?)

A particularly nice feature provided on the FT-1500M is the ability to assign one of four RF power output levels-5, 10, 25 or 50 W- to any programmed memory. Repeaters that are located close to your usual stomping grounds can be programmed in with lower power settings. Those further away can be allocated higher settings. Make use of this feature.

Table Scraps

The 10 MHz offset IMD number, typically a good measure of a transceiver's ability to reject interference from nearby VHF commercial communications just to either side of our 2-meter band, came in at 100 dB. This level is well above the running average of the numbers posted by the single band VHF mobile transceivers we've recently reviewed.

The receiver sensitivity, the IF rejection and the image rejection measurements, while not chart topping, all compare favorably with similar units.

Bit Error Rate (*BER*) testing for 9600 baud operation produced results that point to poor performance. It should be noted that we've seen similar problems with the majority of the 9600-baud capable FM-only transceivers that we've tested over the last 5 years. If 9600-baud operation is important to you, please refer to *"9600-Ready" Radios: Ready or Not?* by Jon Bloom, KE3Z, in the May

1995 issue of *QST*.

Wrappin' It Up

The FT-1500M possesses all of the features that are required for the vast majority of the 2-meter FM operation that I typically participate in. Its small dimensions should offer a wider variety of mounting options to those looking to install radio equipment in modern vehicles, and its rugged construction and simple operation makes it an attractive choice for public service and portable applications.

(Continued from Page 14)

Conditions of Issue

* All modes permitted by the applicant's license may be used.
* The DLD Award will be issued initially when the applicant submits evidence of confirmed contacts with 100 different DOKs on a single band.

For each additional 100 DOKs on the same band, the applicant may apply for the next class of DLD. Applicants may skip awards if they wish. That is, it is not necessary to apply for a separate award for each 100 DOKs worked.

* A DOK will only count if the station worked or heard is located in the Federal Republic of Germany at the time of the contact. Stations have only one DOK each and must only give out the DOK under which they are registered with DARC QSL Bureau. Special Event DOKs will be published in CQ-DL.
* There will be a charge for the issue of the DLD Awards. Detail of charges will be published form time to time in *CQ-DL* and payment should be included with the application, or sent to the DARC bank by bank transfer.

Deutscher Amateur-Radio-Club e.V.
DLD-Diplome, Postfach 11 55
D-3507 Bauntal 1
Federal Republic of Germany

Postal Giro Account 2571 55-302 Hannover
Sort Code (BLZ) 260 100 30

Applications for DLD

All valid DOKs are listed in the official DOK List which is obtainable from DARC publications and is used as the application form. It is recommended that you use a separate list for each band. You may order that DOK List by sending an address label and $7 US or 5 IRCs per list to DARC at the address mentioned above.

A computer generated list will be accepted providing it uses the same format as the application form issued by DARC. All applications must be verified by the applicant's local club or by an official Award manager before forwarding the DARC-HQ. The DLD Award will be issue once the relevant fee is received.

DIG Award Program

All DIG awards and trophies may be applied for by licensed radio amateurs and SWLs around the world. The awards are available either without endorsement for contacts on all bands and modes (mixed), or for contacts on CW only or VHF only. Applicants must be in possession of the QSL cards, but need not send them. It is sufficient to sent a GCR list (General Certification Rule) signed by two witnesses. Please enclose a return address label.

DIG Award Manager Addresses:

DF8BQ, Dieter Weckmann, Alte Reihe 28, 27313 Dorverden, Germany
DH 1PAL, Werner Theis, Tilsiter Str 16, 53879 Euskirchen, Germany.
DJ80T, Eberhard Warnecke, PO Box 10 12 44, 42512 Velbert, Germany.
DJ8VC, Alfons Nichoff, Ernst-Hase-Weg 6, 48282 Emsdetten, Germany.
DK7ZT, Bernd Muller, Weitershauser Str 11, 35041 Marburg, Germany.
DL1YCA, Dieter Petring, Bruderstr 52, 32584 Lohne, Germany
DL6YBY, Uwe Lusmoller, PO Box 150, 45713 Hallern, Germany.
DL8JS, Walter Hymmen, PO Box 1925, 32219 Bunde, Germany.
DL9HC, Wolfgang Landgraf, Weidenstr 18, 68526 Ladenburg, Germany.
DL9XW, Hans-Peter Gunther, PO Box 1406, 48504 Nordhorn, Germany.

DIG Membership List

The DIG membership list will be published during the first quarter of each year and may be obtained from the DIG secretary, DJ80T. A return mail label and 4 IRCs for surface mail (or 8 IRCs for air mail) are required for all countries. *(to be continued....)*

IMPORT OF YAESU EQUIPMENT

The Society has started processing the import of the Yaesu equipment for those who have already booked.

However the ambiguity of the rate of import duty still persists. As already published, the rate of 9.2% is not so. The customs are believed to charging upto 27% import duty on Ham equipment. The Finance Ministry is being approached for a clarification in the matter. But be prepared for the high rate of duty. Members will be intimated on the progress from time to time.

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