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# Radio-TV EXPERIMENTER

**WHITE'S  
RADIO LOG**

- AM STATIONS
- WORLDWIDE SW
- POLICE/EMERGENCY

JUNE-JULY 75¢

## Science and Electronics

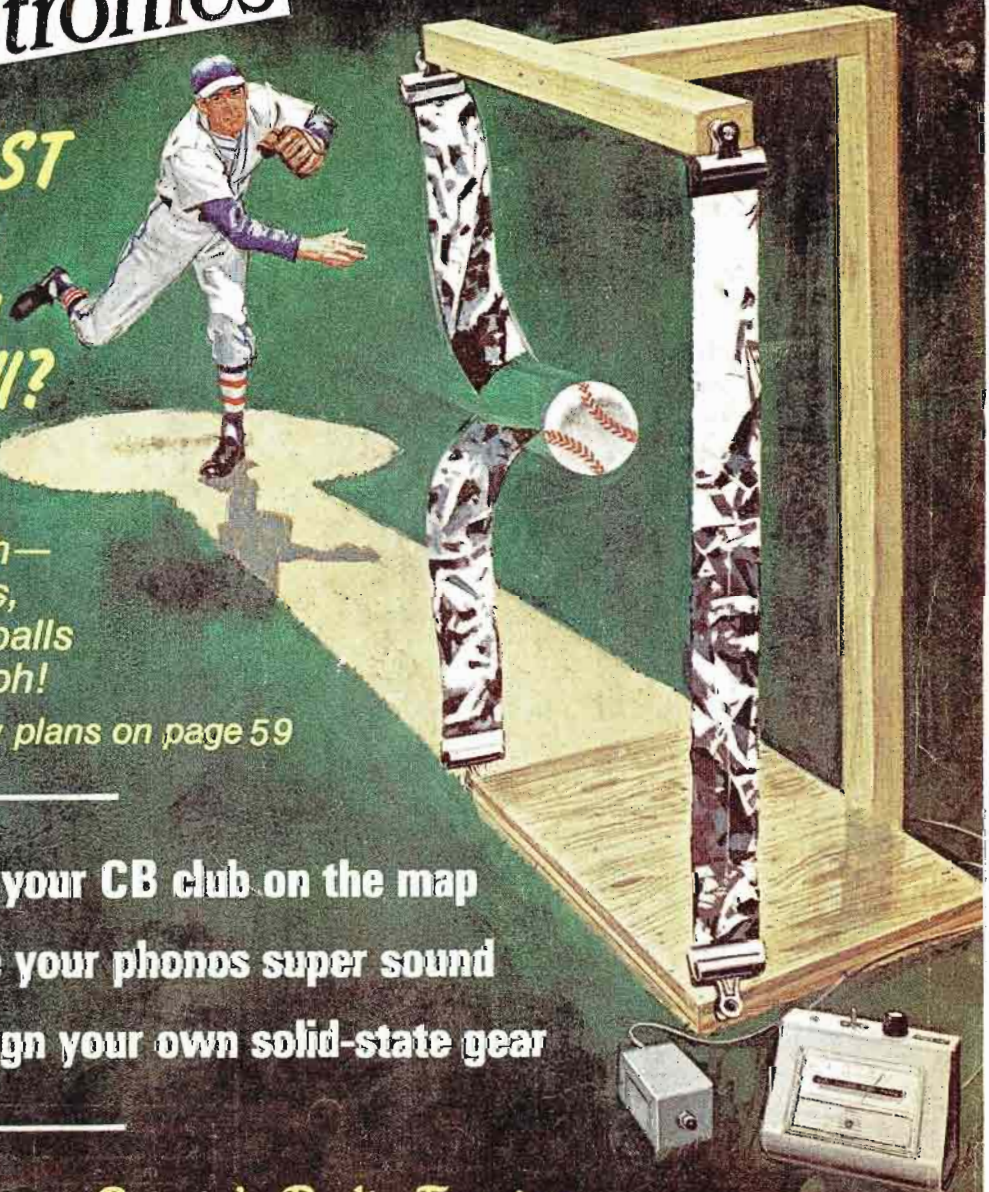
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Easy-to-follow plans on page 59

- How to put your CB club on the map
- How to give your phonos super sound
- How to design your own solid-state gear

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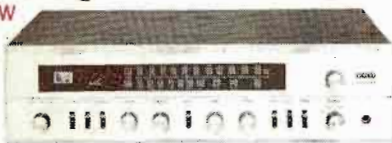
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**NEW**



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June/July 1969

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June/July 1969  
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# WHITE'S RADIO LOG

An up-to-date Directory of North American AM, FM, and TV Stations, including special sections on World-Wide Shortwave Stations and Emergency Stations for Selected Areas

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**NEW**  
Kit GR-48  
**\$3995\***

## Heathkit GR-48 Solid-State AM/FM Table Radio

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**NEW**  
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**NEW**  
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# From The Leader



Now There are 4 Heathkit Color TV's...  
All With 2-Year Picture Tube Warranty

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**GRA-295-4**, Mediterranean cabinet shown... \$119.50\*  
Other cabinets from \$62.95\*

## Deluxe "295" Color TV... Model GR-295

The GR-295 is packed with performance... a top quality American brand 295 sq. in. color tube with improved phosphors and a boosted B + supply deliver brighter, livelier color... Automatic degaussing... Exclusive Heath Magna-Shield... Automatic Color Control & AGC for pure, flutter-free pictures under all conditions... preassembled 3-stage IF... Deluxe VHF tuner with "memory" fine tuning... hi-fi sound output... 300 & 75 ohm VHF antenna inputs... plus exclusive Heath self-servicing features that can save you hundreds of dollars. 131 lbs.

**GRA-295-1**, Walnut cabinet shown... \$62.95\*  
Other cabinets from \$99.95\*

## Deluxe "227" Color TV... Model GR-227

Has same high performance & built-in self-servicing features as "295", except for 227 sq. in. screen. And, like the "295", it can be installed three ways — in one of the beautiful Heath factory assembled cabinets, your own custom cabinet or in a wall. 114 lbs.

**GRA-227-1**, Walnut cabinet shown... \$59.95\*  
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## Deluxe "180" Color TV... Model GR-180

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**GRS-180-5**, table model cabinet and cart... \$39.95\*  
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## Now, Wireless Remote Control For Heathkit Color TV's

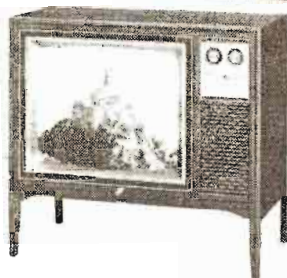
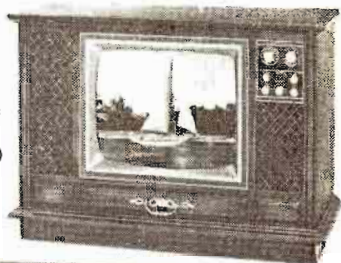
New Wireless Remote Control turns your Heathkit color TV on & off, changes VHF channels, adjusts volume, color and tint — all by sonic control. Installs on any rectangular tube Heathkit Color TV, even if you built it years ago. Circuit board/wiring harness construction.

**Kit GRA-681-6**, 7 lbs., for Heathkit GR-681 Color TV's... \$59.95\*

**Kit GRA-295-6**, 9 lbs., for Heathkit GR-295 & GR-25 TV's... \$69.95\*

**Kit GRA-227-6**, 9 lbs., for Heathkit GR-227 & GR-180 TV's... \$69.95\*

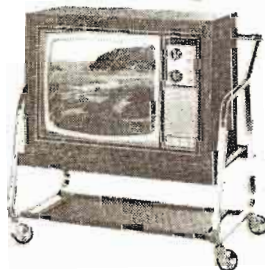
Kit GR-681  
**\$499.95\***  
(less cabinet)



Kit GR-295  
**\$449.95\***  
(less cabinet)



Kit GR-227  
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(less cabinet)



Kit GR-180  
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(less cabinet)



New Wireless  
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# WHITE'S RADIO LOG

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KTRH 740  
KXYZ 1320  
KYOK 1590  
Howell, Mich. WHMI 1350  
Hudson, N.Y. WHUC 1230  
Hugo, Okla. KIHN 1340  
Humacean, P.R. WALO 1240  
Humboldt, Tenn. WIRJ 740  
Huntingdon, Pa. WHUN 1150  
Huntington, Ind. WHLT 1300  
Huntington, N.Y. WGSN 740  
Huntington, W. Va. WKEE 800  
WSAZ 930  
WWHY 1470  
WBHP 1230  
WEUP 1600  
WFXK 1450  
WAAV 1550  
WVOV 1000  
Huntsville, Tex. KSAM 1490  
Huron, S. Dak. KIJJ 1340  
Hutchinson, Kans. KWBW 1450  
KWHK 1260  
Hutchinson, Minn. KDUZ 1260  
Hyde Park, N.Y. WHVW 950  
Idabel, Okla. KBEL 1240  
Idaho Falls, Idaho KID 590  
KTEE 1260  
Immokalee, Fla. WCOF 1490  
Independence, Ia. KUPI 980  
KOUR 1220  
Independence, Kans. KIND 1010  
Independence, Mo. KCCX 1510  
Indiana, Pa. WDAO 1450  
Indianapolis, Ind. WATI 810  
WBRI 1500  
WFBM 1260  
WGEE 1590  
WIBC 1070  
WIFB 1310  
WIRE 1430  
WXLW 950  
Indianola, Iowa KBAB 1490  
Indianola, Miss. WNLA 1380  
Indian Rocks Beach, Fla. WGNP 1520  
Indio, Calif. WGRD 1400  
Inglwood, Calif. KTYM 1480  
Inkster, Mich. WCHB 1440  
International Falls, Minn. KGH5 1230  
WYSE 1560  
Inverness, Fla. KALN 1370  
Iola, Kansas WION 1430  
Ionia, Mich. KCIQ 800  
Iowa City, Iowa WBSU 910  
Iowa Falls, Ia. KIFG 1510  
Irontdale, Ala. WLPH 1480  
Iron Mtn., Mich. WMIO 1450  
Iron River, Mich. WIKB 1230  
Ironton, Ohio WIRD 1230  
Ironwood, Mich. WIRV 590  
Irvine, Ky. WIRV 1550  
Isabella, P.R. WISA 1390  
Ishpeming, Mich. WJPD 1240  
WCKD 970  
Islip, N.Y. WIIX 540  
Ithaca, N.Y. WHCU 870  
WTKO 1470  
Iuka, Miss. WDOM 1200  
Jackson, Ala. WHOD 1290  
Jackson, Ga. WIGA 1540  
Jackson, Ky. WEKG 810  
Jackson, Mich. WIBM 1450  
WKHM 970  
WJCO 1510  
WJDX 620  
WJQS 1400  
WJXN 1450  
WOKJ 1550  
WWUN 1590  
WRBC 1300  
WLSI 930  
WLMJ 1280  
Jackson, Ohio WDXI 1310  
Jackson, Tenn. WJAK 1460  
WJTS 1390  
WYLO 540  
Jackson, Wis. KSGT 1340  
Jackson, Wyo. KGMR 1500  
Jaekensville, Fla. WJAX 930  
WAPE 1000  
WBOB 970  
WVOJ 1320  
WIVY 1050  
WMBR 1460  
WOB5 1360  
WPDQ 960  
WQIC 1000  
WRHC 1400  
WJIL 1550  
WLD5 1180  
Jacksonville, Miss. WJQS 1400  
Jacksonville, N.C. WJNC 1240  
WBBS 1290

Location C.L. kHz

Jacksonville, Tex. WLAS 910  
KEBP 1400  
Jacksonville Beh., Fla. WBIX 1010  
WBX 1010  
Jamestown, Ky. WKY 1060  
Jamestown, N. Dak. KEYJ 1400  
KRJB 600  
Jamestown, N.Y. WJTN 1240  
WKSJ 1310  
Jamestown, Tenn. WCLO 1260  
WDER 1500  
Janesville, Wis. WCLO 1260  
Jasper, Ala. WWWW 1360  
WAF 1240  
Jasper, Ind. WITZ 990  
Jasner, Tex. KTXJ 1350  
Jefferson City, Mo. KLIX 920  
KLW 1240  
Jefferson City, Tenn. WJFC 1480  
WXXV 1430  
Jena, La. KCKW 1480  
Jennings, La. KJEF 1290  
Jerome, Idaho KATJ 1400  
Jerseyville, Ill. WJBM 1480  
Jesup, Ga. WLOP 1370  
John Day, Ore. KJID 1400  
Johnsen City, Tenn. WJCW 910  
WETB 790  
WJES 1570  
Johnston, N. Y. WIZR 930  
Johnstown, Pa. WJCO 950  
WARD 1400  
WCRD 1230  
WJOL 1340  
WJRC 1510  
Joliet, Ill. CJLM 1350  
KBTM 1230  
KCN 1470  
KTCC 920  
WJNO 1590  
Johnsboro, Tenn. KANV 1480  
WMBB 1450  
KQYX 1560  
KFSB 1310  
KOPS 1420  
KUSE 1420  
Joshua Tree, Cal. KMBL 1450  
Junction, Tex. KJCK 1420  
June City, Kans. KINY 800  
Juneau, Alaska KJNO 630  
WJTS 1000  
Jupiter, Fla. KLEI 1180  
Kallua, Hawaii WKB 1400  
Kalamazoo, Mich. WKZZ 320  
WKMI 1360  
WYYY 1470  
KGEZ 600  
KOFI 1180  
Kane, Pa. WKZA 960  
Kankakee, Ill. WKAN 1320  
Kannapolis, N.C. WKBA 1460  
Kans. City, Kans. KCKN 1340  
Kans. City, Mo. KGM 810  
KMBZ 980  
KPRS 1590  
WDAF 610  
WHR 710  
Kaukauna, Wis. WKR 1050  
Kenedy-Karnes City, Texas KAML 990  
Kealakekua, Hawaii KONA 790  
Kearney, Nebr. KGFV 1340  
KERN 1460  
Keene, N.H. WKXN 1290  
WKBK 1220  
KLOG 1490  
Kemper, Wyo. KMER 950  
Kendallville, Ind. WAWK 1140  
Kenedy, Tex. KAML 990  
Kennett, Mo. KBOA 830  
KBN 1540  
KSMK 1340  
Kennewick, Wash. KSMK 1340  
Kennewick-Pasco-Richland, Wash. KEPR 610  
Kenosha, Wis. WLIP 1050  
Kent, O. WKNT 1320  
Keokuk, Iowa KOKX 1340  
KERR 630  
Kerrville, Tex. WKSC 1300  
Ketchikan, Alaska KTKN 930  
Kewanee, Ill. WKEI 1450  
Keyser, W. Va. WKLP 1390  
Key West, Fla. WKWF 1600  
KFKZ 1500  
Kilgore, Tex. KLEN 1050  
Killeen, Tex. KLEN 1050  
Kimball, Nebr. KIMB 1260  
King, N. C. WKTE 1090  
King City, Calif. KRKC 1490  
Kinman, Ariz. KAAA 1230  
WKMT 1270  
WKIN 1320  
WKPT 1550  
WGOO 1190  
WBAZ 1550  
WGHQ 920  
WKNY 1490

Location C.L. kHz

Kingstree, S.C. WDKD 1310  
KEBP 1000  
Kingsville, Tex. KINE 1330  
Kingwood, W. Va. WFSP 1560  
Kinston, N.C. WELS 1010  
WFTC 960  
WJSP 1280  
Kirkland, Wash. KYAC 1460  
KLAB 980  
Kirksville, Mo. KIRX 1450  
Kissimmee, Fla. WYIV 080  
WACY 1220  
Kittanning, Pa. WACB 1380  
Klamath Falls, Oreg. KAGO 1150  
KFLW 1450  
KLAB 980  
Knia 1320  
Knoxville, Iowa KNIA 1320  
Knoxville, Tenn. WBIR 1240  
WIVK 850  
WATE 620  
WJBE 1430  
WKG 1340  
WKXY 900  
WNOX 900  
WROL 1490  
WRSK 1580  
WIOU 1350  
WKOZ 1350  
WLNH 1350  
WEMJ 1450  
LaCrosse, Wis. WKBR 1430  
WBCX 1490  
WKTY 880  
WLDY 1340  
Lafayette, Ga. WLFA 1590  
Lafayette, Ind. WASK 1450  
WAZY 1410  
WBAZ 1420  
KNV 1470  
KVLQ 1330  
KXKW 1520  
Lafayette, Tenn. WEEN 1460  
LaFollette, Tenn. WLAF 1450  
LaGrande, Oreg. KLBW 1450  
LaGrange, Ga. WLWG 1240  
WBRX 820  
LaGrange, Ill. WTAQ 1300  
LaGrange, Tex. KVLG 1570  
Lajunta, Colo. KBZZ 1400  
Lake Charles, La. KLOU 1580  
KPLC 1470  
KAGC 1400  
WBSR 1340  
WRO 960  
Lake City, Fla. WJOT 1260  
Lake Geneva, Wis. WMIR 1550  
Lakeland, Fla. WLAK 1430  
WONN 1290  
WWAB 1380  
Lake Placid, N.Y. WIRD 820  
Lakesport, Cal. WBL 1270  
Lake Providence, La. KLPL 1050  
Lake Tahoe, Calif. KOWL 1490  
Lakeview, Oreg. KQIK 1230  
Lake Wales, Fla. WIPX 1280  
Lakewood, Colo. KLA 1600  
Lakewood Center, Wash. KOOD 1480  
Lake Worth, Fla. WTLZ 1380  
Lamar, Colo. KLMR 890  
Lamesa, Tex. KPET 890  
Lampasas, Tex. KCYL 450  
Lancaster, Calif. KAVL 810  
KBVM 1380  
Lancaster, Ky. WIX1 1280  
Lancaster, N.Y. WBL 1320  
Lancaster, Ohio WHOK 820  
Lancaster, Pa. WGA 1490  
WLAN 1390  
Lancaster, S.C. WLCM 1360  
WAGL 1560  
Lander, Wyo. KOVE 1330  
Lanett, Ala. WRLD 1490  
Langdon, N.D. KNDK 1080  
Lansdale, Pa. WNPV 1440  
Lansford, Pa. WLSH 1410  
Lansing, Mich. WILS 1320  
WJIM 1240  
WITL 1010  
WMPG 1230  
WVLS 1500  
LaPorta, Md. WSMO 1360  
LaPorte, Ind. WLO1 1540  
Laramie, Wyo. KLME 1490  
KQWB 1290  
Laredo, Tex. KGN5 1300  
KVOZ 1490  
KANS 1510  
Larson, Kans. WLPD 1290  
LaSalle, Ill. WSMO 1360  
Las Cruces, N. Mex. KOBE 1450  
KGR 570  
Lester, Wyo. KENO 1460  
KLAV 1230  
KRAM 1140  
KVEG 970  
Las Vegas, N. Mex. KFUN 1280  
PkuV 1570  
WQTV 1570  
WTRA 1480  
WLMD 900  
Laurel, Md. WLMD 900

Location	C.L. kHz	Location	C.L. kHz	Location	C.L. kHz	Location	C.L. kHz
Laurel, Miss.	WAML 1340 WLAU 1600 WNSL 1260	London, Ky.	KNEZ 960 WFTG 1400 KFOX 1280	Mankato, Minn.	KYSM 1230 KTOE 1420	Merced, Calif.	KYOS 1480 KWTF 1430
Laurens, S.C.	WLBG 860	Long Beach, Calif.	KGER 1390	Manning, S.C.	WYMB 1410	Meriden, Conn.	WMNW 1470
Laurinburg, N.C.	WEWO 1080 WLNC 1300	Longmont, Colo.	KLMO 1060	Mansfield, La.	KDXI 1340	Meridian, Miss.	WCOC 910 WDBL 1330 WMGX 1610 WOKK 1410 WQIC 1390
Lawrence, Kans.	KFKU 1250 KLWN 1320	Long Prairie, Minn.	KEYL 1400	Mansfield, Ohio	WMAN 1400 WCLW 1570	Merkle, Tex.	WXMT 2300 KBUZ 1310 KALF 1410
Lawrence, Mass.	WCCM 800	Longview, Tex.	KFRO 1370 KLUE 1400	Maplewood, Minn.	WJSW 1010	Merrill, Wis.	WVMT 2300
Lawrenceville, Ga.	WLAW 1350	Longview, Wash.	KEEO 1400 KBAW 1270	Marquette, Iowa	KMAQ 1320	Mesa, Ariz.	KALF 1410
Lawrenceville, Ill.	WAKO 910	Lookout Mtn., Tenn.	WFL 1070	Marathon, Fla.	WFFG 1300	Metropolis, Ill.	WMOK 420
Lawrenceville, Va.	WLES 580	Loretto, Pa.	WWSF 1400	Marianna, Ark.	WZOT 1460	Metter, Ga.	WMAC 1360
Lawton, Okla.	KSOW 1380 KCCO 1650	Loris, S.C.	WLSC 1570	Marianna, Fla.	WTS 1340 WTOT 980	Mexico, Tex.	KBUS 1300 KXEO 1430
Leadville, Colo.	KBRR 1290	Los Alamos, N.Mex.	KRSN 1490	Marietta, Ga.	WFOM 1230 WBIE 1080	Mexico, Pa.	WJUN 1220
Leaksville, N.C.	WLOE 1430	Los Angeles, Calif.	KABC 790 KFI 640 KHJ 930	Marietta, Ohio	WMOA 1490 WBRJ 910	Miami, Ariz.	KIKO 1340 WGBS 710 WFB 690 WFUN 700 WAME 1260 WLFQ 1220 WQAM 8650 WQEA 1150 WOCN 1450 WINZ 940 KGLC 910
Leavenworth, Kans.	KCLD 1410	Los Banos, Calif.	KGFJ 1230	Marine City, Mich.	WSMA 1590 WMAW 570	Miami Beach, Fla.	WMBM 1460 WKRAT 1390
Lebanon, Ky.	WLBW 1590	Louisburg, N.C.	KFKC 1380	Marionette, Wis.	WMAW 570	Michigan City, Ind.	WITS 1420
Lebanon, Mo.	KLWT 1230	Louisville, Ga.	KLAC 570 KMPC 710 KNX 1070	Marion, Ala.	WJAM 1310	Middlebury, Vt.	WFA 490
Lebanon, Oreg.	KGAL 920	Louisville, Ky.	KPOL 1540 KRKO 1150 KLSB 1330	Marion, Ill.	WGGH 1130	Middleport-Pomeroy, Ohio	WMPO 1300
Lebanon, Pa.	WLBR 1270	Lucedale, Miss.	WYBR 1400	Marion, Ind.	WBAT 1400 WMRI 860	Middlesboro, Ky.	WMJK 560 WAFI 1560
Lebanon, Tenn.	WCOR 900	Lufkin, Tex.	WPEH 1420	Marion, Ky.	WMJL 1010	Middletown, Conn.	WCNX 1130
Leesburg, Fla.	WLBG 790	Lumberton, N.C.	WAVE 970 WAKY 790 WHAS 840 WKLO 1080 WINN 1240 WFJA 900 WLOU 1350 WTMT 620 WLSM 1270	Marion, N.C.	WBRM 1250	Middletown, N.Y.	WALL 1340
Leesburg, Va.	WZST 1410	Lynchburg, Va.	WVLA 590	Marion, Ohio	WMR 1490	Middleton, Ohio	WPIE 1300
Leesville, La.	KLLA 1570	Lynchburg, Va.	WVLL 930 WVLM 1320	Marion, S.C.	WATP 1400	Midland, Mich.	WMDN 490
Lehigh Acres, Fla.	WLEH 1440	Lynchburg, Va.	WVLR 930 WVLL 930	Marion, Va.	WMEV 1010 WOLD 133	Midland, Tex.	KCRS 550 KJRC 1130 KWEL 1440 KARH 1510
Leighton, Pa.	WYNS 1150	Lynchburg, Va.	WVLA 590 WVLL 930	Marked Tree, Ark.	KPCA 1580	Milam, Tex.	WVMS 1490
Leitchfield, Ky.	WMTL 1580	Lynchburg, Va.	WVLA 590 WVLL 930	Marksville, La.	KAPB 370	Miles City, Mont.	KATL 1340
Leland, Miss.	WESY 1580	Lynchburg, Va.	WVLA 590 WVLL 930	Marksville, Mass.	WSRO 470	Milford, Conn.	WPIE 1300
LeMars, Iowa	KLEM 1410	Lynchburg, Va.	WVLA 590 WVLL 930	Marquette, Mich.	WQIB 1320	Milford, Del.	WTRD 930
Lemmon, S.D.	KBJM 1400	Lynchburg, Va.	WVLA 590 WVLL 930	Marshall, Minn.	KMHL 400	Milford, Mass.	WMRH 1490
LeMore, Calif.	KLAL 1320	Lynchburg, Va.	WVLA 590 WVLL 930	Marshall, Mo.	KMMH 1400	Milledgeville, Ga.	WMVG 1450
Lenoir, N.C.	KOAD 1248	Lynchburg, Va.	WVLA 590 WVLL 930	Marshall, N.C.	WMMH 1460 KMHT 450 KDOX 410	Millen, Ga.	WGSR 1570
Lenoir, N.C.	WJRI 1340	Lynchburg, Va.	WVLA 590 WVLL 930	Marshalltown, Iowa	KFJB 1230	Millington, Tenn.	WGMT 1399
Lenoir, Tenn.	WKGX 1080	Lynchburg, Va.	WVLA 590 WVLL 930	Marshallville, Wis.	WDLB 1450	Millinocket, Me.	WMKR 1240
Lenoir City, Tenn.	WBLC 1360	Lynchburg, Va.	WVLA 590 WVLL 930	Marshfield, Wis.	WDLB 1450	Millville, N.J.	WPIE 1300
Lenoirville, Miss.	WVLM 1000	Lynchburg, Va.	WVLA 590 WVLL 930	Martinsville, Ind.	WCBX 1400	Milton, Fla.	WESR 1330
Leonardtown, Md.	WKIK 1370	Lynchburg, Va.	WVLA 590 WVLL 930	Martinsville, Va.	WJSM 1110	Milton, Pa.	WMPA 1340 WARC 1380
Levelland, Tex.	KLVY 1280	Lynchburg, Va.	WVLA 590 WVLL 930	Martinsville, Va.	WJSM 1110 WJSM 1110	Milwaukee, Wis.	WEMT 1250 WBIT 1340 WISN 1130 WMIL 1290 WNVO 860 WOKY 920 WMIJ 620 KASO 1240 WTHE 1520 KMGO 1510 KCRG 1410 WCCO 830 WLOL 1330 WMIN 1400 WDCY 770 KSTP 1200 KLPW 1890 KHRT 320 KJCB 910 KTYN 1420 KBEA 1480 KIRT 1500 KGVV 1290 KGMV 1450 KYL 1340 KYSR 930 KORN 1490 KURA 1450 KWIT 1230 WABT 1480 WGOK 900 WMOO 1350 WMOB 910 WKBQ 710 WLIJ 1360 WMOZ 760 KFLY 1380 WDSL 1520 KTRB 860 KBEE 970 KFIV 1360 KDOJ 1340 WQUA 1230 KVKM 1330 KGC 1340







# WHITES RADIO LOG

Location C.L. kHz

Saginaw, Mich. WKXN 1210  
WSAN 1400  
WLSW 790  
St. Albans, Vt. WWSR 1420  
St. Albans, W. Va. WKLC 1300  
St. Anthony, Ind. KIGO 1400  
St. Augustine, Fla. WFOY 1240  
WETH 1420  
St. Charles, Mo. KIRL 1460  
St. Cloud, Minn. KFAM 1450  
WJON 1240  
St. Genevieve, Mo. KSCM 1240  
St. George, S.C. WOIZ 810  
St. George, Utah KUXU 1430  
St. Helen, Mich. WMIC 1590  
St. Helens, Oreg. KOHI 1600  
St. Ignace, Mich. WIDG 940  
St. Johns, Mich. WRBJ 1530  
St. Johnsbury, Vt. WTWN 1340  
St. Joseph, Mich. WJSM 1400  
St. Joseph-Benton Harbor, Mich. WHFB 1060  
St. Joseph, Mo. KFEQ 680  
KKJO 1550  
KUSN 1270  
St. Louis, Mo. KATZ 1600  
KMOX 1120  
KSD 550  
KSTL 690  
KWK 1360  
KKOK 630  
WEW 770  
WIL 1430  
KXEN 1010  
St. Louis Park, Minn. KRST 950  
St. Maries, Idaho KOFE 1480  
St. Mary's, Pa. WKBI 1400  
St. Paul, Minn. KSTP 1500  
KDWB 630  
WMIN 1400  
WKMT 1370  
WCO 830  
St. Paul, N.C. WBYB 1000  
St. Peter, Minn. KRBI 1310  
St. Petersburg, Fla. WWBA 680  
WSUN 620  
WLCY 1380  
St. Petersburg Beach, Fla. WLZ 1590  
Salsamane, N.Y. WGG 1590  
Salem, Ill. WJBD 1350  
Salem, Ind. WSLM 1220  
Salem, Mass. WESX 1290  
Salem, Mo. KSMO 1340  
Salem, N. J. WJIC 1510  
Salem, O. WSO 600  
Salem, Oreg. KSLM 1900  
KSPJ 1220  
KBZY 1490  
KGAY 1430  
WBLU 1480  
KVRH 1340  
Salina, Kans. KFRM 550  
KISJ 910  
Salinas, Calif. KOON 1460  
KTM 1380  
Salinas, Calif. KCTY 980-1000  
Sahana, P.R. WHOY 1210  
Sahine, Mich. WOIB 1290  
WBOC 960  
KPEP 1420  
WJY 1470  
Salisbury, N.C. WSTP 1490  
WSAT 1269  
Sallisaw, Okla. KRBB 1560  
Salmon, Idaho KSRA 960  
Salt Lake City, Utah KALL 910  
KCPX 1320  
KLUW 570  
KNAK 1280  
KRGO 1550  
KRSP 1050  
KSL 1160  
KSOP 1370  
KSX 630  
KWHO 860  
KTEO 1340  
KGLK 960  
KPEP 1420  
KFR 1260  
KPE 1470  
KATP 1480  
KAP 1260  
KBEY 630  
KBER 1150  
KBUC 1310  
KCUR 1350  
KEDA 1540  
KITE 930

Location C.L. kHz  
KUIKA 1250  
KNAC 630  
KONO 860  
KTTA 550  
W0A1 1200  
San Bernardino, Calif. KCKC 1350  
KFXM 590  
KRN0 1240  
KMEN 1290  
Sandersville, Ga. WSNT 1490  
San Diego, Calif. KCBQ 1170  
KFM 760  
KOGO 609  
KGB 1360  
KSON 1240  
KSD0 1130  
Sandpoint, Idaho KSP 1340  
Sand Spring, Okla. KTOW 1340  
Sandusky, Mich. WMIC 1560  
Sandusky, Ohio WLEC 1450  
San Fernando, Calif. KGIL 1260  
Sanford, Fla. WTRR 1400  
WFR 1300  
Sanford, Me. WSME 1220  
Sanford, N.C. WEYE 1290  
WWGP 1050  
San Francisco, Calif. KFRC 610  
KFBS 740  
KFAX 1100  
KGO 610  
KNBR 680  
KKHI 1550  
KSAY 1010  
KSF0 569  
KSOL 1450  
KYA 1260  
San Gabriel, Cal. KAIL 1430  
San German, P. R. WRS 1060  
Sanitonia, Miss. WSAO 1550  
San Jose, Calif. KLOK 1170  
KLIV 1590  
KEEN 1370  
KKRX 1500  
San Juan, P.R. WAPA 680  
WBMJ 1190  
WBOA 870  
WJAC 740  
WIFA 1140  
WKAQ 580  
WKVM 810  
WQBS 650  
WRAI 1520  
San Luis Obispo, Calif. KATY 1340  
KSLY 1400  
KVEC 920  
KCON 1470  
KOFY 1050  
KTM 1510  
KBAL 1410  
San Marcos, Tex. WFBA 1460  
San Mateo, Calif. KWIZ 1480  
San Rafael, Calif. KDB 1490  
San Saba, Tex. KGUD 990  
San Sebastian, P.R. KIST 1340  
KTMS 1250  
KAC 290  
Santa Clara, Calif. KGNU 1430  
Santa Cruz, Calif. KSC0 1080  
Santa Fe, N.Mex. KTRC 1400  
KAFE 810  
KVSF 1260  
KCOY 1400  
KSMA 1240  
KSEE 1480  
KZON 1690  
Santa Monica, Cal. KDAY 1580  
Santa Paula, Cal. KQIQ 1400  
Santa Rosa, Calif. KSHO 1350  
KYRE 1460  
KJAX 1150  
Santa Rosa, N.Mex. KSYX 1420  
Sapulpa, Okla. KHKE 1550  
Saratoga Lake, N.Y. WNBZ 1240  
Sarasota, Fla. WKXY 930  
WSAF 1220  
WSPB 1450  
WYND 1280  
Saratoga, N.Y. WSPN 900  
Saratoga Springs, N.Y. WKAJ 900  
Sauk Rapids, Minn. WVAA 800  
Sault Ste. Marie, Mich. WSO 1230  
Savannah, Ga. WBYG 1450  
WEAS 900  
WSAV 630  
WSGA 1400  
WTOC 1290  
WSOK 1230  
WORM 1010  
WATS 1060  
Scheffield, Ala. WSHF 1290  
Schenectady, N.Y. WGY 810  
WSNY 1240  
Scotland Neck, N.C. WYAL 1280  
Scott City, Kans. KFLA 1310  
Scottsbluff, Nebr. KNEB 960

Location C.L. kHz  
Scottsboro, Ala. KOLT 1320  
WCRI 1950  
WROS 1330  
KDOT 1440  
Scottsdale, Ariz. WLCK 1250  
Scottsville, Ky. WARM 590  
Searant, Pa. WEIL 1300  
WGBI 910  
WICK 640  
WSCR 1320  
Seaford, Del. WSUX 1280  
Searcy, Ark. KWCB 1300  
Seaside, Ore. KSWB 930  
Seattle, Wash. KAYO 1150  
KVI 570  
KING 1090  
KIRO 710  
KJR 950  
KOL 1300  
KOMO 1000  
KSN 1590  
KTF 1250  
KXA 770  
KBLE 1050  
Sobring, Fla. WJCM 960  
WBS 1340  
KDR0 1340  
Sedalia, Mo. KSSIS 1050  
Sequin, Tex. KWI 1580  
Selinsgrove, Pa. WSEW 1240  
Selma, Ala. WAMA 1340  
WHBB 1490  
WTX 1570  
WBBZ 1090  
WDTM 1130  
Seminole, Tex. KIKZ 1250  
Senatobia, Miss. WSA 1550  
Seneca Falls, N.Y. WFW 1110  
Seneca Township, S.C. WSNW 1150  
Sevierville, Tenn. WSEV 930  
Seward, Alaska KIBH 550  
WASC 1530  
Seymour, Ind. WJGD 1390  
Seymour, Tex. KSEY 1230  
Shakopee, Minn. KSM 1540  
Shalotte, N.C. WVCB 1410  
Shamokin, Pa. WISL 1480  
Shamrock, Tex. KBYP 1560  
Sharon, Pa. WPIC 790  
Shawano, Wis. WTGH 960  
Shawnee, Okla. KGFF 1450  
Sheboygan, Wis. WHBL 1330  
WTS 960  
Sheffield, Ala. WSHF 1290  
Shelby, Mont. KSEN 1150  
Shelby, N.C. W0HS 730  
WADA 1320  
Shelbyville, Ind. WSWL 1590  
Shelbyville, Ky. WCND 940  
Shelbyville, Tenn. WLJI 1580  
Sheldon, Iowa KIWA 550  
Shell Lake, Wis. WCSW 940  
Shelton, Wash. KNAS 1260  
Shenandoah, Iowa KMA 960  
Shenandoah, Pa. WMBT 1540  
Sheridan, Wyo. KWYT 1430  
WY 590  
Sherman, Tex. KRRV 910  
KT0 1500  
Shippensburg, Pa. WSHP 1480  
Show Low, Ariz. KVSL 1390  
KVM 970  
Shreveport, La. KBCL 1220  
KEEL 710  
KKA 1550  
KJOE 1480  
KCIJ 980  
KRM 1340  
KWKH 1130  
KGCX 1480  
Sidney, Nebr. KSD 1340  
Sidney, O. WNR 1080  
Sierra Vista, Ariz. KHFH 1240  
Sikeston, Mo. KSM 1400  
KMP 1520  
Siler City, N.C. WNGA 1570  
Siloam Springs, Ark. KUOA 1290  
Silsbee, Tex. KRAS 1300  
Silver City, N.Mex. KVB 1340  
Silver Springs, Md. WQMR 1050  
Simcoe, Ont. CFRS 1560  
Sinton, Tex. KTOD 1590  
Sioux City, Iowa KSCJ 1360  
KMNS 620  
KTRI 1470  
KSE 1480  
Sioux Falls, S.Dak. KISD 1530  
KELO 1320  
KNWC 1270  
KS00 1140  
KXRB 1100  
Sitka, Alaska KIFW 1230  
KSE 1480  
Skowhegan, Maine WGHM 1500  
Slaton, Tex. KCAS 1050  
Siddell, La. WBG 1560  
Smithfield, N.C. WMPM 1270  
Smithville, Tenn. WJLE 1480  
Smyrna, Ga. WYNX 1550  
Snyder, Tex. KSNY 1450  
Socorro, N.Mex. KSCR 1290

Location C.L. kHz  
Soda Springs, Ida. KBRV 790  
Soldatna, Alaska KSRM 920  
Somerset, Ky. WSCF 1240  
WTLO 1480  
Somerset, Pa. WVSC 990  
Sonora, Calif. KVML 1450  
So. Bend, Ind. WNDU 1490  
WVA 1580  
WSBT 960  
Southbridge, Mass. WESO 970  
So. Boston, Va. WHLF 1400  
Southern Pines, N.C. WEEB 990  
South Charleston, W. Va. WRDS 1410  
South Daytona Beach, Fla. WLE 1590  
So. Gastonia, N.C. WJGS 1420  
So. Haven, Mich. WJOR 940  
South Hill, Va. WJWS 1390  
Southington, Conn. WNTY 970  
So. Knoxville, Tenn. WSKT 1580  
South Lake Tahoe, Cal. KOWL 1490  
KTHL 590  
S. Miami, Fla. WFUN 790  
So. Paris, Me. WKTO 1450  
So. Pittsburg, Tenn. WEPG 910  
So. St. Paul, Minn. KDWB 630  
WKMT 1370  
So. Williamsport, Pa. WMP 1450  
Spanish Fork, Utah KONI 1480  
Sparks, Nev. KBUB 1270  
Sparta, Ill. WHCO 1230  
Sparta, N.C. WCOK 1060  
Sparta, Tenn. WSH 1050  
WKLJ 990  
WCSA 1290  
Spartanburg, S.C. WCO 1400  
WORD 910  
WSPA 950  
WASC 1530  
Spencer, Iowa KICD 1240  
Spencer, W. Va. WVRC 1400  
Spokane, Wash. KGA 1510  
KTO 1440  
KSPD 1230  
KPEG 1300  
KHQ 590  
KJRB 790  
KREM 970  
KXLY 920  
KCF 1360  
KUDY 1280  
Springdale, Ark. KBRS 1340  
KSPR 1590  
Springfield, Ill. WCVS 1450  
WMAV 970  
Springfield, Mass. WTAX 1240  
WHYN 560  
WV 1400  
WSPR 1270  
Springfield, Mo. KGBX 1260  
KICK 1340  
KTTA 1400  
KWTO 580  
Springfield, Ohio WIZE 1340  
KY 1600  
Springfield, Ore. KCON 1120  
Springfield-Eugene, Ore. KEED 1450  
KOB 1050  
Springfield, Tenn. WDBL 1590  
Springfield, Vt. WCFB 1480  
Springhill, La. KBSF 1460  
Spring Lake, N. C. WBS 1450  
Spring Valley, N.Y. KWOW 1300  
Spruce Pine, N.C. WTUE 1470  
Stamford, Conn. WSTC 1400  
Stamford, Tex. KDWT 1400  
Stanford, Ky. WRS 1520  
Stark, Fla. WPXE 1490  
Starkville, Miss. WKOR 980  
WSSO 1230  
State College, Pa. WMAJ 1450  
WRSC 1390  
Statesboro, Ga. WBNB 1240  
Statesville, N.C. WYV 1340  
WDBM 550  
Staunton, Va. WT0N 1240  
WAF 900  
Stephenville, Tex. KSTV 1510  
Sterling, Colo. KGEK 1230  
Sterling, Ill. WSDR 1240  
Stevensville, Ohio WYV 1340  
Stevens Point, Wis. WSP 1010  
Stillwater, Minn. WAVN 1220  
Stillwater, Okla. KSPJ 780  
Stockton, Calif. KJOY 1280  
KSTN 1420  
KRW 1230  
Storm Lake, Iowa KY 990  
Streator, Ill. WIZZ 1250  
Stroudsburg, Pa. WVPO 840  
Stuart, Fla. WSTU 1450  
Stuart, Va. WHEO 1270  
Sturgeon Bay, Wis. WDOR 910  
Sturgis, Mich. WSTR 1230  
Sturgis, S.D. KBHB 810  
Stuttgart, Ark. KWAK 1240

Location	C.L. kHz	Location	C.L. kHz	Location	C.L. kHz	Location	C.L. kHz
Suffolk, Va.	WLPM 1450	Tasley, Va.	WESR 1930	Tooele, Utah	KDYL 990	Tuskegee, Ala.	WABT 580
Sullivan, Ind.	WKVQ 1550	Taunton, Mass.	WPEP 1570	Topeka, Kans.	WIBW 580	Twenty-Nine Palms, Calif.	WDHI 1250
Sullivan, Mo.	KTUI 1560	Tawas City, Mich.	WIOS 1480		KREW 1440		KDHF 1270
Sulphur, La.	KIKS 1310	Taylor, Tex.	KTAE 1260		WREN 1250	Twin Falls, Idaho	KTFF 1270
Sulphur Sprgs., Tex.	KSST 1230	Taylorville, Miss.	WSCO 1286		KTOP 1490		KLIX 1310
Summersville, Ga.	WGTA 950	Taylorville, N. C.	WSTH 860	Toppenish, Wash.	KENE 1490		KEEP 1450
Summersville, S.C.	WAZS 980		WILK 1370	Torrington, Conn.	WTOR 810	Two Rivers, Wis.	KUIC 1590
Sumner, Wash.	KDFL 1560	Taylorville, Ill.	WTIM 1410	Torrington, Wyo.	KGOS 1490	Tyler, Tex.	KZAK 1350
Sumter, S.C.	WFIG 1290	Tazewell, Tenn.	WNTI 1250	Towanda, Pa.	WTTG 1350		KDOK 1490
	WDXY 1240	Tazewell, Va.	WTZE 1470	Towson, Md.	WTOW 1580		KTBB 600
	WSSC 1340	Tell City, Ind.	WTCJ 1230	Trail, B.C.	CJAT 610		KZEY 890
Sunbury, Pa.	WKOK 1070	Tempe, Ariz.	KUPD 1060	Travelers Rest, S.C.		Tylertown, Miss.	WTTY 1290
Sunnyside, Wash.	KREW 1230		KTUF 1580		WBBR 1580	Tyrone, Pa.	WTRN 1340
Sun Valley, Ida.	KSXI 1340	Temple, Tex.	KTEM 1400	Traverse City, Mich.	WTCM 1400	Uhrichsville, O.	WBTC 1540
Superior, Nebr.	KRF5 600	Terre Haute, Ind.	WBOW 1230		WCOW 1310	Ukiah, Calif.	WUIC 1400
Superior, Wis.	WQSM 710		WAAO 1300	Trenton, Mo.	KTNN 800	Ulysses, Kan.	KULY 1420
	WAKX 1320		WTHI 1480	Trenton, N.J.	WAAT 1300	Union, S.C.	WBCU 1460
	WVWJ 1270	Terrell, Tex.	KTER 1570		WBUD 1260	Union City, Tenn.	WENK 1240
	WAXK 1220	Terrytown, Nebr.	KEYR 690		WTIM 920	Uniontown, Pa.	WMBS 580
Susanville, Calif.	KSUE 1240	Texarkana, Ark.	KOSY 790	Trenton, Tenn.	WTNE 1500	Urbana, Ill.	WILL 590
Sutton, W. Va.	W5GB 1490	Texarkana, Tex.	KCMC 740	Trinidad, Lulu,	KCRT 1240		WKID 1580
Swainsboro, Ga.	WJAT 800		KATQ 940	Troy, Ala.	WHAZ 930		WTSF 950
Sweet Home, Ore.	KFIR 1370		KTF5 1400	Troy, N.Y.	WTR 880		WBVM 1550
Sweetwater, Tenn.	KXDX 1240	Texas City, Tex.	KTF5 1400		WTKW 1600		WRUN 1150
Sweetwater, Tex.	WFFB 1340	Thayer, Mo.	KALM 1290		WJRM 1390		WTLB 1310
Sylacauga, Ala.	WMLS 1290	The Dalles, Oreg.	KODL 1440	Troy, N. C.	KTRT 1400	Utah, P.R.	WUPR 1530
	WMSJ 1480		KACI 1300	Truckee, Cal.	KTRM 1400	Uvalde, Tex.	KVUU 1400
Sylvia, N.C.	W5YJ 1490	Thermopolis, Wyo.	KRTR 1490	Trumann, Ark.	KTMN 1530	Valdese, N.C.	W5VM 1490
Sylvania, Ga.	W5YL 1490		KTHE 1240	Truth or Consequences, N. Mex.	KCHS 1400	Valdosta, Ga.	WQAV 950
Sylvester, Ga.	WOGA 1540	Thief River Falls, Minn.	KTRF 1230		WTFN 1550		WGAJ 910
Syracuse, N.Y.	WHEN 820		KTFB 630	Troy, N.C.	KTUC 1400		WJEM 1150
	WFEL 1390	Thibodaux, La.	WSFT 1220	Tucson, Ariz.	KXEW 1600		WVLD 1450
	WNRD 1260	Thomas, Ga.	WTGA 1590		KAIR 1490	Valentine, Nebr.	KVSH 940
	WOLF 1490		WTHN 1500		KCEE 790	Vallejo, Calif.	KNBA 1190
	WSYR 570	Thomasville, Ala.	WJDB 630		KIKX 580	Valley City, N. Dak.	KOVC 1490
Tabor City, N.C.	WTAB 1370	Thomasville, Ga.	WPAX 1240		KCBU 1290	Valparaiso, Fla.	WF5H 1340
Tacoma, Wash.	KMO 1360		WLDR 730		KEW 690	Valparaiso, Ind.	WAKE 1500
	KTAC 650	Thomasville, N.C.	WTGS 790		KHOS 940		WNVI 1680
	KTNF 1370	Thomson, Ga.	WTWA 1240		KHYT 1330	Van Buren, Ark.	KDFD 1580
Taft, Calif.	KTKR 810	Three Rivers, Mich.	WLKM 1510		KTKT 990	Van Cleve, Ky.	WMTG 730
Tahlequah, Okla.	KTLQ 1350		WTHU 1450		KOLD 1450	Vaneburg, Ky.	WKKS 1570
Tahoe Valley, Calif.	KTHO 590	Thurmont, Md.	WIPS 1250		KUAT 1550	Vancouver, Wash.	KISN 910
	WEYY 1580	Ticonderoga, N.Y.	WTIF 1600	Tuecarel, N. Mex.	KTNM 1400		KKEY 1150
Talladega, Ala.	WUZ 1290	Tiffin, Ohio	WTIF 1340	Tulare, Calif.	KCOB 1270		KGAN 1550
Tallahassee, Fla.	WFEN 1410		WVGS 480		KEN 1370	Vandalia, Ill.	WPMB 1500
	WONS 1410	Tillamook, Oreg.	KTIL 1590	Tulia, Tex.	KTUE 1260	Van Wert, Ohio	WERT 1220
	WTAL 1450	Tioga, N.D.	KTGO 1090	Tullahoma, Tenn.	WJIG 740	Venice, Fla.	WAMR 1320
	WTNT 1270	Titusville, Fla.	WRMF 1050	Tulsa, Okla.	KAKC 970	Ventura, Calif.	KVEN 1450
Tallahassee, Ala.	WTLS 1300	Titusville, Pa.	WTIV 1230		KNCW 1300		KUDD 1590
Tallulah, La.	WAE 1250	Tucua, Ga.	WLET 1420		KRMG 740	Vermillion, S.Dak.	KUSD 690
Tampa, Fla.	WALY 1110		WNES 830		KELI 1480		KVRA 1570
	WAE 1250	Toledo, Ohio	WOHD 1470		KVOD 170	Vernal, Utah	KVFL 920
	WYOU 1550		WSPD 1370	Tupelo, Miss.	WELO 580	Vernon, Ala.	WVSA 1380
	WFLA 970		WTOD 1560		WELO 580	Vernon, Tex.	KVWC 1490
	WHBD 1050		WCWA 1230	Turlock, Calif.	WTUP 1490	Vero Beach, Fla.	WAXE 1370
	WINQ 1010		WTIO 1520	Tuscaloosa, Ala.	KCEY 1390		WTTB 1490
	WTMP 1150	Toledo, Oreg.	KTDO 1230		WJRD 1150	Vicksburg, Miss.	WQBC 1420
	WSOL 1300	Tolleson, Ariz.	KRDS 1190		WACT 1420		WVIM 1490
Taos, N. Mex.	KKIT 1340	Tomah, Wis.	WTMB 1460		WNPT 1280	Victoria, Tex.	KNAL 1410
Tarboro, N.C.	WCPS 760	Tomahawk, Wis.	WELF 810		WTUG 790	Victorville, Calif.	KVIC 1340
Tarpon Springs, Fla.	WCWR 1470	Tompkinsville, Ky.	WTKY 1370	Tuscumbia, Ala.	WTBC 1230	Vidalia, Ga.	WVOP 970
					WVNA 1590	Vieques, P.R.	WIVV 1370
					WRCK 1410		

## A THANK YOU NOTE FROM THE EDITORS

**Thank you!** The Editors of **RADIO-TV EXPERIMENTER** would like to thank all readers who offered information on station changes, additions and deletions during the past few months. Though many of the letters overlapped, each aided us considerably in making the task of keeping White's Radio Log as current as possible at press time. If we left your name out, please forgive us!

Frank E. Aden, Boise, Idaho  
Michael Ames, Cortland, N.Y.  
Gordon Amey, Jr., Baltimore, Md.  
Charles J. Anders, Berwyn, Ill.  
Lillian Lucille Blair, St. Petersburg, Fla.  
William Boerner, Massillon, Ohio  
Curt P. Bramblett, Bronx, N.Y.  
David L. Buda, Fort Walton Beach, Fla.

David Butler, Lombard, Ill.  
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Tom Czaja, Milwaukee, Wis.  
Frank Delancy, Holly Hill, Fla.  
Patrick J. Donahue, St. Petersburg, Fla.  
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Lud Ehlman, Damariscotta, Maine  
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W. Levett, Vancouver, B.C.  
Jean Longwith, K5YM-FM, San Antonio, Texas

Robert D. McAllister, Rosslard, B.C.  
Grant McDonald, Islington, Ontario  
John M. Meier, Woodward, Iowa  
O. E. Millett, Toronto, Ontario  
P. J. Monaghan, Jr., EPO San Francisco, Calif.  
Paul Newman, Hawthorne, N.J.  
Marke Paize, North Surrey, B.C.  
Kenneth Pfleger, Lubbock, Texas  
Robert F. Post, Upland, Calif.  
John N. Ramsey, W. Hartford, Conn.  
Richard L. Rotz, Shippensburg, Pa.  
Charles W. Schroeder, WVIC-FM, Rock Island, Ill.  
James Scott, Chesterland, Ohio  
David Sittler, Bloomsburg, Pa.  
Gary W. Steward, Port Moody, B.C.  
Sheldon Swartz, Sharon, Mass.  
Jimmy Thinner, Nampa, Idaho  
Stephen G. Turco, Jackson Heights, N.Y.  
John Vanderplough, Bloomington, Ind.  
Rex Walker, Burlington, N.C.  
C. M. Wilkinson, Riverdale, Ill.

# WHITE'S RADIO LOG

## Location C.L. kHz

Ville Platte, La. KPVI 1050  
Vincennes, Ind. WAOV 1450  
Vineland, N.J. WWBZ 1360  
WDVL 1270  
Vinita, Okla. KWBN 1470  
Vinton, Va. KVBA 1550  
Virginia, Minn. WHLB 1400  
Virginia Beach, Va.  
WVAB 1550  
WISV 1360  
Visalia, Calif. KONG 1400  
Vista, Cal. KMLD 1000  
Vivian, La. KNCB 1600  
Waco, Tex. WAGO 1500  
KAWA 1010  
KBGO 1580  
KWTX 1230  
Wadena, Minn. KWAD 920  
Wadsworth, N.C. WADE 1210  
Wagoner, Okla. KWLJ 1310  
Wahpeton, N.D.-Breck-  
enridge, Minn. KBMW 1450  
Wailuku, Hawaii. KMVI 550  
Waipanua, Hawaii. KAHU 940  
Wahalla, S.C. WGGG 1000  
Wallace, Idaho. KWAL 620  
Wallace, N.C. WLSE 1400  
Walla Walla, Wash.  
KHIT 1820  
KUJ 1010  
KTEL 1400  
Walnut Ridge, Ark. KRLW 1320  
Walsenburg, Colo. KFLJ 1380  
Walterboro, S.C. WALD 1280  
Waltham, Mass. WCRB 1330  
Walton, N.Y. WDLA 1270  
Ward Ridge, Fla. WJOE 1570  
Ware, Mass. WARE 1250  
Warner Robbins, Ga.  
WRBN 1600  
WAVC 1350  
Warren, Ark. KWRF 860  
Warren, Ohio. WHHH 1440  
WDNL 1570  
Warren, Pa. WNAE 1310  
Warrensburg, Mo. KOKO 1450  
Warrenton, Mo. KWRE 730  
Warrenton, Va. WEER 1250  
WKWC 1420  
Warsaw, Ind. WRSW 1480  
Warsaw, Va. WNNT 690  
Warwick-E. Greenwich, R.I.  
WARV 1500  
Waseo, Calif. KWSO 1050  
Washington, D.C. WMAL 630  
WOL 1450  
WOOB 1340  
WUST 1120  
WVDC 1260  
WRC 960  
WTFD 1500  
Washington, Ga. WLOV 1370  
Washington, Ind. WAMW 1580  
Washington, Iowa. KCII 1380  
Washington, N.J. WCRV 1580  
Washington, N.C. WEEW 1320  
WITN 930  
Washington, Pa. WJPA 1450  
Washington Court  
House, Ohio. WCHO 1250  
Walterboro, S.C. WALD 1060  
Waterbury, Conn. WATR 1320

Location	C.L. kHz
Waterbury, Vt.	WTBY 1590
Waterloo, Iowa	WWGO 1240
	WDEW 550
	KXEL 1540
	KNWS 1090
	KNWL 1330
Watertown, N.Y.	WATN 1240
	WOTT 1410
Watertown, S.Dak.	WWAY 730
	KSDR 1480
	KWAT 950
Watertown, Wis.	WTTN 1580
Water Valley, Miss.	WVLY 1320
Waterville, Me.	WTVL 1490
Watkins Glen, N.Y.	
Watkins, Ill.	WGMF 1500
Watsonville, Calif.	WGFA 1300
Wausau, Wis.	KOMY 1340
Wauchula, Fla.	WAUC 1310
	WPRW 1600
Waukegan, Ill.	WKRS 1220
Waukesha, Wis.	WAUK 1510
Waukon, Ia.	KNEI 1140
Wausau, Wis.	WUDJ 800
Waupun, Wis.	WLKE 1170
Wausau, Wis.	WRIG 1400
	WSAU 550
	WXCO 1230
Waverly, Iowa	KWVY 1470
Waverly, Ohio	WPKO 1380
Waverly, Tenn.	WPHC 1060
Waxahachie, Tex.	WABC 370
Waycross, Ga.	WAYX 1230
Wayne, Neb.	KTCH 1590
Waynesboro, Ga.	WBRO 1310
Waynesboro, Miss.	WABO 990
Waynesboro, Pa.	WAYZ 1380
Waynesboro, Va.	WAYE 1490
Waynesville, Mo.	WANN 970
Waynesville, Pa.	WANB 1580
Waynesville, Mo.	KJPW 1390
	KFBD 1270
Waynesville, N.C.	WHCC 1400
Weatherford, Okla.	KZYX 1590
Weatherford, Tex.	KZEE 1220
Weatherford, Tex.	KJFJ 1370
Weatherford, Tex.	KWEC 1300
Weatherford, Tex.	WEIR 1430
Weiser, Idaho	KWEI 1260
Welch, W.Va.	WELC 1150
Weldon, N.C.	WSNY 1400
Wellington, Kan.	KLEY 1130
Wellsboro, Pa.	WNBT 1490
Wellston, Ohio	WKOV 1350
Wellsville, N.Y.	WLSV 790
Wenatchee, Wash.	KPO 560
	KUEN 900
	KMEL 1340
Wendell-Zebulon, N.C.	
	WETC 540
	KRGV 1290
Weslaco, Tex.	KRGV 1290
West Allis, Wis.	WAWA 1500
West Bend, Wis.	WBKV 1470
Westbrook, Me.	WJAB 1440
West Chester, Pa.	WCHE 1520
West Covina, Cal.	KGRB 900
W. Frankfort, Ill.	WFRX 1300
W. Hartford, Conn.	
	WEXT 1550
West Jefferson, N.C.	
	WXSX 1600
W. Liberty, Ky.	WLKS 1450
West Loena, Cal.	KGBB 900
W. Memphis, Ark.	KUSD 730
W. Monroe, La.	KUZN 1310
W. Palm Beach, Fla.	
	WEAT 850
	WIND 1230
	WIRK 1290
West Plains, Mo.	KWPM 1450
West Point, Ga.	WBMC 1310

Location	C.L. kHz
West Point, Miss.	WROB 1450
Westport, Conn.	WMMH 1260
W. Springfield, Mass.	
	WXTL 1480
W. Yarmouth, Mass.	
	WOCB 1240
W. Yellowstone, Mont.	
	KWYS 920
Westerly, R.I.	WERI 1290
Westfield, Mass.	WDEW 1370
Westminster, Md.	WTRR 1470
Weston, W.Va.	WHAW 980
W. Warwick, R.I.	WWRI 1450
Wetumpka, Ala.	WETU 1290
Wewaka-Seminole, Okla.	
	KWSH 1260
Wharton, Tex.	KANI 1300
Wheatland, Wyo.	KYCN 1840
Wheaton, Md.	WOON 1500
Wheeling, W.Va.	WHLL 1640
	WBZE 1470
	WKWK 1400
	WWVA 1170
White Castle, La.	KEVL 1500
Whitehall, Mich.	WHDJ 1400
White Plains, N.Y.	WFAS 1230
White River Junction, Vt.	
	WNHW 910
Whitesburg, Ky.	WTCW 920
Whiteville, N.C.	WENC 1220
Wichita, Kans.	KAKE 1240
	KEYN 900
	KFDI 1070
	KFH 1330
	KWBB 1410
Wichita Falls, Tex.	KNIN 990
	KTRN 1290
	KWFT 520
Wickburg, Ariz.	KHIL 1250
Wickford, R.I.	WFOF 1370
Wiggins, Miss.	WIGG 1420
Wilcox, Ariz.	KHIL 1250
Wildwood, N.J.	WCMC 1290
Wilkes-Barre, Pa.	WBAJ 1240
	WBRE 1340
	WILK 960
Wilmington, Del.	WMTL 1240
Wilmington, N.C.	WYZZ 1440
Wilmington, Va.	WBGI 740
Williamsport, Pa.	WBTH 1400
	WLUC 1050
	WRAC 1400
	WWPA 1340
Williamston, N.C.	WJAM 900
Williamstown, Conn.	WILL 1400
Williston, N.D.	KEYZ 1360
Willmar, Minn.	KWLM 1340
Willoughby, Ohio	WELW 1330
Willow Springs, Mo.	KUKU 1390
Willows, Calif.	KIQS 1560
Wilmington, Del.	WAMS 1360
	WOTM 1500
	WILM 1450
	WTUX 1290
Wilmington, N.C.	WMFD 630
	WHSL 1490
	WKLM 980
	WGNL 1840
Wilmington, O.	WVVI 1090
Wilson, N.C.	WOTM 1500
	WVLY 1350
	WVOT 1420
Winchester, Ky.	WWKY 1380
Winchester, Tenn.	WCOT 1340
Winchester, Va.	WINC 1400
	WHPL 610
Windsor, Pa.	WVBR 1350
Windsor, Ga.	WILS 1300
Windsor, Fla.	WVCF 1430
Window Rock, Ariz.	KDAM 1530
	KHAC 1300

Location	C.L. kHz
Windsor, Conn.	WEHW 1480
Windsor, Colo.	KUAD 1380
Windsor, Ala.	WEZQ 1350
Winfield, Kan.	KNIC 1300
Winnemucca, Nev.	KNWA 1400
Winfield, La.	KVCL 1270
Winner, S.Dak.	KWYR 1560
Winnsboro, La.	IKMAR 1270
Winnsboro, S.C.	WKCM 1250
Winona, Minn.	WZLQ 1230
	KAGS 1380
Winona, Miss.	WONA 1570
Winstow, Ariz.	KVNC 1010
	KINO 1230
Winston-Salem, N.C.	
	WAAA 980
	WAIR 1340
	WFCM 1550
	WJSJ 600
Winter Garden, Fla.	WOKB 1600
Winter Haven, Fla.	WSIR 1490
	WINT 1360
Winter Park, Fla.	WABR 1440
Wisconsin Rapids, Wis.	
	WFHR 1320
	WTMB 1460
Wolf Pt., Mont.	KVCK 1450
Woodburn, Ore.	KWRC 940
Woodbury, Tenn.	WBFI 1540
Wood River, Ill.	WRTH 590
Woodruff, S.C.	WSJW 1510
Woodville, Tex.	WZAC 1310
Woodward, Okla.	KSIW 1450
Woodsoket, R.I.	WNRI 1380
Woonsocket, R.I.	WWON 1240
Wooster, Ohio	WWST 960
Worcester, Mass.	WAAB 1440
	WNEB 1230
	WORC 1310
	WTAC 580
Worland, Wyo.	KWOR 1340
Worthington, Minn.	KWOA 730
Worthington, Ohio	WRFO 860
Wynne, Ark.	KWYN 1400
Wyoming, Mich.	WERX 1530
Wytheville, Va.	WYVE 1280
Xenia, O.	WELX 1110
	WGIC 1500
Yadkinville, N.C.	WYDK 1480
Yakima, Wash.	KIT 1280
	KIMA 1440
	KBBQ 1390
	KOOT 930
	KUTI 960
	KYAK 1390
Yankton, S.D.	KYNT 1450
	WNAX 570
Yaueo, P.R.	WAKE 1550
Yazoo City, Miss.	WZFF 1230
York, Nebr.	KAWL 1370
York, Pa.	KNOW 1250
	WBYC 1350
	WSBA 910
York, S.C.	WYCL 980
Youngstown, Ohio	WBWW 1240
	WFMJ 1390
	WKBN 570
Ypsilanti, Mich.	WSDS 1480
	WYNZ 1520
Yreka, Calif.	WYOC 1490
Yuba City, Calif.	KUBA 1600
	KZIN 1450
Yuma, Ariz.	KLEU 1320
	KVOY 1400
	KYUM 560
Zanesville, Ohio	WHIZ 1240
Zenonville, N.J.	WAWZ 1380
Zebulon-Wendell, N.C.	
	WPCS 540
Zephyrhills, Fla.	WETA 1400
Zion, Ill.	WZBN 1500

## World-Wide Shortwave Stations

□ We're going to forego our usual quickie quiz this time so that we can "take 5" to discuss a little matter which seems to crop up in so much of our mail. Seems that many of our readers want a capsule summation of tips and techniques on sending out reception reports which are accurate, useful to the station which receives it, and at least stand a 50/50 or better chance of pulling back a QSL card or letter for your wall.

Before we go any further, let's clear the air—always be honest! Never try to fake a report from

published schedules or from reports of reception by other listeners. Obviously it isn't cricket, it will probably be insufficient data, and mainly it will get you blacklisted by many broadcasters. Now that we understand that little matter, let's get on with it.

1. Reports should contain detailed facts on from at least 15 minutes of program monitoring—closer to 30 minutes is preferred. List songs by title, ads by product name, names of personalities or locations discussed, program names,

etc. If you don't savvy the lingo, then guess at as much as possible and give close descriptions of what you think was going on.

2. Give the time and date in *Greenwich Mean Time*. That sounds stupid to you? Well, when it's 0100 GMT in London on January 5th, it's 2000 in New York, and still January 4th. It won't become January 5th in New York for another 4 hours. Nevertheless, if you are in New York and hearing a transmission at 0100 GMT Jan. 4th, you'll want to list the correct GMT date (Jan. 5) or else the station may not be able to check you out in its log.

3. List the exact or approximate frequency; many stations operate on several frequencies and you'll have to let them know which one. Give a signal report which discusses S-Meter readings, modulation quality, fading, interference from noise or other stations, and the overall quality of the reception. You might add some opinions on the programming. Don't lie or exaggerate in your signal report, if the reception is a fizzle, don't be afraid to say so.

4. Give details of your receiving station; the receiver, antenna, and any accessories. Toss in some details about yourself; your age, occupation, other hobbies, number of verifications already collected. Throw in a plug for any SWL clubs to which you belong.

5. Although it is not really necessary to do so with government owned broadcasting stations (such as Radio Sweden, Radio Australia, etc.), it is standard policy for all reception reports to be accompanied by return postage. This can be done by means of uncanceled stamps of the country to which the report is being sent, or by an International Reply Coupon (available for purchase at post offices).

6. Request that the station kindly honor your desire for a verification of reception, do not demand one. QSL's are a courtesy to the DX'ing hobby which are offered by the majority of stations. Some broadcasters (such as BBC) do not QSL under any circumstances, others need reminding, so if you draw a blank on your first

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report, wait 3 or 4 months then send another report. If 3 reports fail to bring a QSL, then either you're doing something wrong or the station is filing your letters. Some stations take a full 90 days (or even more) to QSL.

7. Send reports in either English or in the language of the country to which the report is being sent. Latin American stations prefer Spanish reports. Foreign language report forms are available from several SWL clubs. Now's a good time to join one!

8. While a report addressed to *Radio Australia, Melbourne, Australia* will be promptly delivered, you will get a better chance for delivery to smaller stations (especially in foreign language countries) if you use the full street address. Publications such as *The World Radio-TV Handbook* give this data along with current schedules and frequencies of all broadcasters. WRTH is available by mail from Gilfer Associates, P.O. Box 239, Park Ridge, N. J. 07656—write for their catalog of DX-ing aids and accessories.

9. If you follow all of these suggestions and still get poor returns, perhaps you would be interested in a subscription to Nifty Knitting Notions Magazine!

kHHz	Call	Station Name	Location	GMT
<b>90-Meter Band—3200 to 3400 kHz</b>				
3300	—	Brit. Honduras BC	Belize, Brit. Honduras	0035
3315	—	R-TV Francaise	Fort de France, Martinique	0230
3953	—	BBC	London, England	0530
3975	—	BBC	London, England	0500
4670	—	R. Nacional Espejo	Quito, Ecuador	0515
4730	HCEH3	R. El Progreso	Loja, Ecuador	0255
<b>60-Meter Band—4750 to 5060 kHz</b>				
4775	ZYR81	R. Progreso	Sao Paulo, Brazil	0240
4787	—	R. Popular	San Jose, Costa Rica	0230
4807	—	R. Popular de Cuenca	Quito, Ecuador	0250
4810	YVMG	R. Popular	Maracaibo, Venez.	0230
4820	CR6RZ	Emissora Oficial	Luanda, Angola	0400
4830	—	R. Hanoi	Hanoi, N. Vietnam	1230
4835	—	R. Mali	Bamako, Mali	0610
4840	VUD	All India Radio	Bombay, India	1230

kHHz	Call	Station Name	Location	GMT
4865	—	R. Clube de Para	Belem, Brazil	0230
—	—	R. Cenit	Quito, Ecuador	0445
4885	ZYG26	R. Pioneer	Teresina, Brazil	0815
4890	—	R. Caracas	Caracas, Venez.	1800
—	YLT4	Austral. BC	Port Moresby, Papua	0830
4920	—	R. Mil	Santo Domingo, D.R.	0230
—	VLM4	Austral. BC	Brisbane, Australia	1300
4940	—	R. Mil	Santo Domingo, D.R.	0250
4972	—	R. Yaounde	Yaounde, Cameroon	2210
5010	—	R. Bocono	Caracas, Venez.	0100
5040	—	R. Tbilisi	Tbilisi, USSR	0230
5045	—	R. Lome	Lome, Togo	2200
5875	HRN	V. de Honduras	Tegucigalpa, Honduras	2320
<b>49-Meter Band—5950 to 6200 kHz</b>				
5955	TGNA	R. Nacional	Guatemala City, Guat.	0430
5970	—	R. Canada	Montreal, P.Q.	0135

# WORLD-WIDE SHORTWAVE STATIONS

kHz	Call	Station Name	Location	GMT
5985	WNYW	R. New York WW	New York, N.Y.	0030
6010	CJCX	CJCX	Sydney, N.S.	1130
6025	CSA	R. Portugal	Lisbon, Portugal	0100
6030	CFVP	CFVP	Calgary, Alberta	1000
6050	—	BBC	London, England	0530
6065	—	R. Reloj	San Jose, C.R.	0200
6075	HJHV	R. Sufatadio	Bogota, Colombia	2345
6085	VUD	All India Radio	Madras, India	1400
6100	DMQ6	Deutsche Welle	Cologne, W. Germany	0000
6110	—	BBC	London, England	2350
6115	—	R-TV Congolaise	Brazzaville, Congo	0450
6125	—	V. Friendship	Brussels, Belg.	0100
6130	—	R. Nacional	Madrid, Spain	0330
6145	DMQ6	Deutsche Welle	Cologne, W. Germany	0150
6200	—	R. Moscow	Moscow, USSR	2155
6210	ZAA	T. Tirana	Tirana, Albania	0230
6215	—	R. Peking	Peking, China	0100
6480	—	R. Pyongyang	Pyongyang, N. Korea	1100

## 41-Meter Band—7100 to 7300 kHz

7105	—	BBC	Ascension I.	0440
—	—	V. Thailand	Bangkok, Thailand	1145
7130	—	V. America relay	Rhodes, Greece	0445
—	—	BC China	Taipei, Taiwan	0945
7165	—	V. America relay	Okinawa	1245
7170	—	R. Noumea	Noumea, New Caledonia	1030
7205	—	V. America relay	Thessaloniki, Greece	2140
7210	—	R. Dakar	Dakar, Senegal	0445
7275	—	RAI	Rome, Italy	0420
9065	—	R. Peking	Peking, China	1045
9400	—	R. Alma Ata	Alma Ata, USSR	0120

## 31-Meter Band—9500 to 9775 kHz

9505	ZAA	T. Tirana	Tirana, Albania	2030
9510	YVXJ	R. Barquisimeto	Barquisimeto, Venez.	1200
9515	—	R. Ankara	Ankara, Turkey	2015
9525	—	R. Habana	Havana, Cuba	0130
9580	VLM	R. Australia	Melbourne, Australia	1245
9585	—	RR1	Djakarta, Indonesia	1345
9590	—	R. Pres Balmaceda	Santiago, Chile	1110
9600	—	R. Tashkent	Tashkent, USSR	1210
9605	—	Trans World R.	Bonaire, Neth. Antilles	2330
9615	—	V. Friendship	Brussels, Belg.	0055
9620	HVJ	R. Vatican	Vatican City	0115
—	—	R. Belgrade	Belgrade, Yugoslavia	2210
9635	—	R. Nacional	Bogota, Colombia	1200
9645	TIFC	Faro del Caribe	San Jose, C.R.	0145
9650	—	R. Nationale	Canakry, Canary Islands	2210
9655	OAX9G	R. Nor Peruana	Chachapoyas, Peru	1100
9660	—	R. Kiev	Kiev, USSR	0045
9685	—	R. Kiev	Kiev, USSR	0345
9690	—	BBC	London, England	0500
9695	—	Trans World R.	Bonaire, Neth. Ant.	0300
9700	—	R. Sofia	Sofia, Bulgaria	2300
9705	—	R. RSA	Johannesburg, U. S. Africa	0000
9725	—	Kol Yisrael	Jerusalem, Israel	2120
9735	—	R. Peking	Peking, China	0010
9745	—	V. Andes	Quito, Ecuador	0430
9760	—	R. Sweden	Stockholm, Sweden	1235
9770	OEI47	Viennese R.	Vienna, Austria	2345
—	—	R. Ghana	Accra, Ghana	2030
9784	ZAA	R. Tirana	Tirana, Albania	0220
9800	—	R. Peking	Peking, China	0400
9810	—	R. Moscow	Moscow, USSR	0345
10530	—	R. Alma Ata	Alma Ata, USSR	0145
11445	—	R. Peking	Peking, China	2210

## 25-Meter Band—11700 to 11975 kHz

11700	—	West Indies BC	St. Georges, Grenada	2230
—	TGQB	TGQB	Quezaltenango, Guat.	1930
11710	—	R. Nacional	Madrid, Spain	2300
11720	—	R. Canada	Montreal, P.Q.	1920
11735	—	V. America relay	Tangier, Tangiers	1845

kHz	Call	Station Name	Location	GMT
11740	XEMP	XEMP	Mexico City, Mex.	0220
11780	—	R. Clube Mozamb.	Lourenco Marques, Mozamb.	0355
11800	—	R. Ceylon	Colombo, Ceylon	1300
11805	—	RFE	Lisbon, Portugal	0500
11820	—	BBC	London, England	2030
11850	—	R. Accra	Accra, Ghana	2000
11855	WNYW	R. New York WW	New York, N.Y.	0110
11865	—	R. Lubumbashi	Lubumbashi, Congo	2015
11875	—	NHK	Tokyo, Japan	1020
11890	—	Far East BC	Manila, Phil.	1015
11900	CEI190	Valparaiso	Valparaiso, Chile	0300
11905	—	BBC relay	Cyprus	0430
11910	—	R. Budapest	Budapest, Hungary	0440
11955	—	BBC Far East	Tebrau, Malaysia	2345
11990	—	R. Prague	Prague, Czech.	2145

## 19-Meter Band—15100 to 15450 kHz

15075	—	West Indies BC	St. Georges, Grenada	1745
15105	—	NHK	Tokyo, Japan	0210
15115	HCJB	V. Andes	Quito, Ecuador	1445
—	—	R. Senegal	Dakar, Senegal	2100
15125	BED60	V. Free China	Taipei, Taiwan	0215
—	—	V. West	Lisbon, Portugal	1515
15135	—	R. Japan	Tokyo, Japan	0215
15153	—	R. Cooracion	Sanitago, Chile	0150
15155	—	R. Habana	Havana, Cuba	1345
15190	—	R. Congolaise	Brazzaville, Congo	1800
15220	—	R. RSA	Johannesburg, U. S. Africa	2300
15230	—	R. Moscow	Moscow, USSR	1900
15235	—	R. Japan	Tokyo, Japan	0215
15260	—	BBC relay	Ascension I.	0100
15270	ETLF	R. V. Gospel	Addis Ababa, Ethiopia	1550
15285	—	R. Ghana	Accra, Ghana	2030
15310	VUD	All India R.	Delhi, India	1330
—	—	R. Sweden	Stockholm, Sweden	1815
15335	—	R. Pakistan	Karachi, Pakistan	0200
15345	—	R. Nacional	Buenos Aires, Arg.	1730
15360	—	Trans World R.	Bonaire, Neth. Ant.	2330
15400	ETLF	R. V. Gospel	Addis Ababa, Ethiopia	1445
15410	DMQ15	Deutsche Welle	Cologne, W. Germany	2230
15425	V LX15	Australian BC	Perth, Australia	0110
15430	HLK41	V. Free Korea	Seoul, S. Korea	0210
15435	—	BBC Far East	Tebrau, Malaysia	2350
15440	DZF8	Call of Orient	Manila, Phil.	0145
15445	ZYN32	R. Nacional	Brasilia, Brazil	0240
15520	—	R. Pakistan	Karachi, Pakistan	0125
16315	—	R. Pyongyang	Pyongyang, N. Korea	0930
17675	—	R. Peking	Peking, China	0110

## 16-Meter Band—17700 to 17900 kHz

17715	—	R. Australia	Melbourne, Australia	2145
17720	WINB	WINB	Red Lion, Pa.	1745
—	BE C39	V. Free China	Taipei, Taiwan	0200
17730	—	R-TV Francaise	Paris, France	0245
17750	—	R. Habana	Havana, Cuba	2110
17765	—	Deutsche Welle	Kigali, Rwanda	1700
17775	—	R. Moscow	Moscow, USSR	2345
17805	—	R. RSA	Johannesburg, U. S. Africa	1800
17820	—	V. America relay	Poro, Phil.	2215
17845	—	R. Prague	Prague, Czech.	1810
17855	HCJB	V. Andes	Quito, Ecuador	2110

## 13-Meter Band—21450 to 21750 kHz

21455	—	V. Nigeria	Lagos, Nigeria	0610
21470	—	BBC	London, England	1845
21580	—	R-TV Francaise	Paris, France	1830
21450	—	R. Prague	Prague, Czech.	1720
—	—	V. Nigeria	Lagos, Nigeria	1515
21500	—	R. Brazzaville	Brazzaville, Congo	1530
21535	—	R. RSA	Johannesburg, S. Afr.	1545
21540	HER	Swiss BC	Berne, Switz.	1500
25610	—	R. Nederland	Hilversum, Neth.	1430
25650	—	BBC	London, England	1450
25730	LLL	R. Norway	Oslo, Norway	1630
25790	—	R. RSA	Johannesburg, S. Afr.	1800
25900	LLA	R. Norway	Oslo, Norway	1800

# Emergency Radio Station Listings for San Francisco County and portions of Alameda, Contra Costa, Marin, Napa, San Mateo, Santa Clara, Salamo, and Sonoma Counties.

□ RADIO-TV EXPERIMENTER and SCIENCE AND ELECTRONICS furnishes this exclusive listing of emergency radio stations as an aid to our many readers now engaged in the fascinating and rapidly growing hobby of monitoring emergency radio communications. We have and will be publishing similar lists devoted to different metropolitan areas in forthcoming issues so that you'll be able to accumulate a sizable array of this difficult-to-obtain data. Refer to the index on page 83 for our 1969 program.

If you desire to obtain similar lists from other areas in the United States that have not or will not be published in this magazine in 1969, then we suggest you write to Communications Research Bureau, Box 56, Commack, N. Y. 11725. They may have a list of emergency radio services that covers your locality. Include a stamped, self-addressed envelope with your request.

Station	Police	Fire
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### SAN FRANCISCO POLICE DEPT.

KBL512	45.10 45.14 45.58	
KMA438	45.58 155.55 155.67	
KMJ408-17	45.10 45.14 45.58	
(Univ. Campus PD: KMG226 155.55)		

### SAN FRANCISCO FIRE DEPT.

KBL513	154.43	KMA526 46.46
KBL514	46.46	KMB488.98 46.46
KMA473-5	46.46	KMK510-11 46.46

### MUNICIPAL DEPARTMENTS

Station	Police	Fire
Alameda	KMA217 155.61	KMB873 154.13
Albany	KMA247 155.31 KMA247 155.67	154.385
Alto		KMH439 46.50 KMJ614 46.50 KMH234 33.82
American Canyon		KDB502 154.385
Anjioch	KMB427 155.31 KMB427 155.67 mobiles 155.07	KMC901 154.37 KMD854 154.37 mobiles 153.89 mobiles 154.28
Atherton		KAQ941 46.50 KMA704 154.19 KMA704 154.28
Belmont	KBR220 155.07	
Belvedere		
Berkeley	KGJ719 155.85 KGJ719 155.97 KMA550 155.97 (U. Cal.) KMC290-1 155.85	KJK560 154.01 KJK560 154.28 KML238 154.01 KML238 154.01 KCX952 153.95 KCX952 154.28 KJ1519 153.95 KJ1519 154.28 KJL666 154.07 KJL666 154.28 KME904.5 154.07 KME903 154.07
Brisbane	KFZ809 45.62	
Burlingame	KMA959 159.15	
Castro Valley		
Cherryland		
Colma	KFZ285 45.62	
Concord	KMC308 155.31 KMC308 155.67 KML968 155.31 KD1234 39.82 KMA519 155.07	KCT600 154.28 KBF242 46.38 KBF242 154.07 KBF242 154.28 KJK522 154.07 KJK522 154.28
Corte Madera		
Daley City		
Dublin		

Station	Police	Fire
E. Palo Alto		KMC902 154.37 KBQ628 154.385
El Cerrito	KMA963 34.96 KMA963 155.31 KMA963 155.67	
El Granada		KDA730 46.14 KDK719 154.07 KDK719 154.28
Emeryville	KMB294 39.46 KMB294 155.67 KMB294 158.85 KMJ215 39.82	
Fairfax		KAR970 46.50 KFR710 154.07
Fairview		KAR980 154.07 KAR980 154.28
Fremont	KAY979 155.07 KAY979 155.67 KAY979 156.03	KDA429 same KFB977 same KMF852 same KMG326 same KMG384 same KMJ766 same KMJ427 46.14 KMH427 154.28 KET379 154.07 KME907 154.07 KME907 154.28 KFR710 154.07 KMF896 154.07 KMF896 154.28 KMG877 154.07 KMJ316-7 154.07 KCX551 153.95 KCX551 154.28 KFF377 same
Half Moon Bay	mobiles 45.78	KBU663 154.385 KMM600 46.50
Hayward	KMG876 154.89 KMG876 155.07	KFC493 46.50 KMA727 46.10 KMA727 46.38 KMC309 154.28 KMC309 154.37 KME630 same KMC900 154.37 KCW710 154.28 KAT237 46.50 KBZ298 46.50 KML703 46.50
Hillsborough	KMA398 159.15	KMF853 154.07 KME906 154.07 KME906 154.28
Keenston		
Larkspur	KFF269 39.82	
Los Altos	KCV356 154.74	
Marinwood		
Martinez	KMG537 155.31 KMG537 155.67 KMF934 154.95	
Menlo Park		
Millbrae	KMJ310 159.15	
Mill Valley	KMG956 39.82	
Mountain View	mobiles 39.06	
Mulford Gardens		
Newark	KDB523 155.07 KDB523 156.03 KJE249 155.67	
Novato	KAW383 39.70 KAW383 39.82	KJZ234 46.50 KME663 46.50 KMJ591 46.50 KMA703 154.385
Oakland	mobiles 42.18 mobiles 42.28 mobiles 155.79 mobiles 159.21 mobiles 458.34	
Orinda		KMG983 46.10 KMG983 46.38 KDE237 154.28
Pacifica	KMA741 154.95	
Piedmont	KMA819 155.67 KMA819 158.73 KMJ446 155.31	KME945 46.10 KME945 46.38 KME976 46.38 KMH388 46.38 KJ5748 154.07 KJ5748 154.28 KMF477 same
Pinole	KMJ446 155.67 KMA779 39.66 KMA779 155.67 KBS330 155.01 KFK590 155.625	
Pittsburg		KML266 46.14 KMF960 153.89 KMF960 154.28 KML302 153.89
Pleasanton		KMB332-9 33.70 KMB332 46.38
Point Montara	KMA663 154.86	
Redwood City	KMA455 159.15	
Richmond	KMA358 39.46 KMA358 155.37 KMA358 155.67 KDB408 39.82 KMA361 39.82 KME410 159.15 KMF253 154.77 KMH864 154.77 KRB218 155.07 KCW727 155.67	
Ross		KAX590 46.50 KMM608-9 46.50 KGN533 154.28 KMH830 153.89 KMH830 154.28
San Anselmo		
San Bruno		
San Carlos		
San Jose	KMA359 155.07 KMA359 155.13 KMA359 155.58	KMH603 154.01

# EMERGENCY RADIO STATIONS

Station	Police	Fire
San Leandro	KMA359 155.67	
	KMJ398 458.95	
	KJH316 154.80	KJF896 154.07
	KDB522 155.07	KJF896 154.28
		KME901 154.07
	KME902 154.07	
	KME902 154.28	
	KME911 154.07	
	KMF628 154.07	
	KMF849 154.07	
	KMF850-1 154.07	
		KMF853 154.07
San Lorenzo		KME900 154.07
San Mateo	KMA822 154.77	KMH426 153.95
	KBR219 155.07	KMH426 154.28
	KGR360 155.67	
San Pablo	KMA863 39.46	
	KMA863 155.31	
	KMA863 155.67	
	KMD936 155.31	
San Rafael	KMA224 39.46	KAR967 46.50
	KMA224 39.82	KFG493 46.50
		KGW771 46.50
		KAQ934 46.50
Sausalito	KME375 39.82	KMH665 154.01
S. San Francisco	KML269 45.62	KMH665 154.28
	KML269 155.67	KGW771 46.50
Terra Linda		KAX591 46.50
Tiburon		KUA750 46.50
Union City	KIZ604 155.07	KMF849 154.07
		KMF849 154.28
		KMH234 33.82
Vallejo	KGJ658 37.06	
	KGJ658 154.83	
	KMA818 155.67	
	KMA818 155.91	
Walnut Creek	KMF388 155.31	
	KMF388 155.67	
Winters		KMD994 154.19
Woodside		KMK430-1 153.89
		KMK431 154.28

## COUNTY AGENCIES

Station	Police	Fire
<u>ALAMEDA COUNTY</u>		
Alameda	KMA217 155.61	
Hayward		KME910 154.07
Pleasanton		KMG325 154.07
		KMG325 154.28
San Leandro	KMA539 39.46	KME911 154.07
	KMA539 154.80	KME911 154.28
	KMA539 155.07	
	KMA539 155.25	
	KMA539 155.67	
	KJT997 154.80	
Sunol Ridge county		KME911 154.07
		KJJ393 154.28
portable	KME908 154.80	KJJ393 154.28
	KME903 155.07	KJF895 154.07
	KME908 155.25	KJF895 154.28
	KME903 156.03	
	KME908 453.75	
Forestry stations:	44.92	
<u>CONTRA COSTA COUNTY</u>		
Alamo		KMK522 46.10
		KMK522 46.38
Clayton		KMB392 same
Concord		KMA467 46.10
		KMA467 46.32
Crocket		KMB592 46.10
		KMB592 46.38
Danville		KMA635 same
Dublin		KBF242 same
El Sobranfe		KMB591 same
Kregor Peak	KMA371 155.19	KMF371 same
	KMA371 155.64	KMF371 46.32
		KMA461 46.10
		KMA461 46.38
Lafayette		
Marsh Creek Rd.	KMA499 155.64	KJN818 46.38
Martinez	KJF892 155.19	KMA462 46.10
	KJF892 155.64	KMA462 46.38
	KMA371 155.19	KMA462 46.38
	KMA371 155.64	KMF371 same
	KFK694 155.67	KMF371 46.32
	KJF892 155.67	
Moraga		KMD877 46.10
		KMD877 46.38

Station	Police	Fire
Oakley	KMG264 155.19	KMH648 46.10
	KMG264 155.64	KMH648 46.38
		KEY923 46.10
		KEY923 46.38
		KME945 same
		KMA466 same
		KMA466 46.32
		KEY922 46.10
		KEY922 46.38
		KMA470 same
Pineole Pleasant Hill		KMA463 same
		KMD937 same
Port Chicago		KDN478 same
Rodeo		
San Pablo		
San Ramon		
Walnut Creek portable	KFK695 155.19	
	KJC967 155.19	KJH267 same
	KJC967 155.64	KJH267 46.32
<u>MARIN COUNTY</u>		
Mill Valley		
Point Reyes	KMA224 39.70	KML959 46.28
		KDG801 46.28
		46.50
		same
San Rafael	KMA224 39.46	KML964 same
	KMA224 39.70	KML959 same
Woodacre portable	KMA862 39.46	KML962 same
	KMA862 39.70	
	KMA862 39.82	
	KMA862 155.67	
<u>NAPA COUNTY</u>		
Napa	KMA519 154.43	mobiles 154.415
	KML505 154.43	
	KMD523 155.67	
<u>SAN MATEO COUNTY</u>		
La Honda	KMG962 45.78	
Redwood City	KFD601 45.78	KDJ539 154.28
	KMA455 45.62	
	KMA455 45.78	
	KMA455 154.83	
	KMA455 154.86	
	KMA455 154.95	
	KMA455 155.07	
	KMA455 155.52	
	KMA455 155.67	
San Mateo county	KFD601 45.78	
	KMG961 45.78	
<u>SANTA CLARA COUNTY</u>		
Campbell		KAU447 154.25
		K8C202 154.25
		KMA668 154.25
		KMA667 154.25
Cupertino		KEX213-4 154.40
Los Altos	KCV356 154.74	KMB314 154.40
		KMB449 154.28
		KMB449 154.40
		KBP901 154.25
		KMA669 154.25
		KGK683 154.40
		KDN997 154.25
		KMG456 154.25
		KAT234 154.40
		KMA670 154.25
		KMB448 154.52
		KMD228 154.25
		KMM242 154.25
Los Gatos		
Menlo Park		
Milpitas		
Mountain View		
San Jose	KMA376 39.92	
	KMA376 154.74	
	KMA376 154.875	
	KMA376 155.67	
	KMA376 155.70	
	KMA376 156.15	
	KMA376 156.21	
	KMD403 156.15	
Saratoga		KPV911 154.25
Sunnyvale		154.28
		KDG370 154.40
		KDN998 154.40
county		KMD419 154.28
portable		KMD419 154.40
		KMF786 154.25
		KMF786 154.28
		KMF786 154.40
<u>SOLANO COUNTY</u>		
Benicia		KAW893 154.34
Cordelia		KET233 154.34
Fairfield		
	155.13	
	KB1701 155.49	KAW891 154.28
	KMA755 155.49	KB1702 154.34
	KMA755 155.67	
	KMA755 158.79	
	KGV202 155.67	
Vallejo portable	KMH571 154.83	KAW892 154.34



Station Call Frequency

155.49  
155.91

**SONOMA COUNTY**

Guerneville KBP408 45.98  
Santa Rosa KMA392 155.67  
county mobiles 39.74

**CALIFORNIA HIGHWAY PATROL**

Concord	KMB442	42.12	42.34	42.40	42.44
		42.54	42.56	45.86	
Contra Costa Co.	KMG445	42.12	42.34	42.40	42.44
		42.54	42.56		
Los Gatos	KEL350	42.12	42.34	42.44	42.54
		42.56			
	KMB441	same			
Martinez	KJS942	154.92			
Mt. Tamalpais	KDV752	42.12	42.34	42.44	42.54
		42.56			
Napa	KMH961	42.12	42.34	42.40	42.44
		42.54	42.56	45.86	
Oakland	KJK725	42.12	42.34	42.44	42.54
	KMG612	155.67			
Redwood City	KAY845	42.12	42.34	42.44	42.56
		45.86			
	KBH635	39.10			
San Francisco	KMA962	42.12	42.34	42.44	42.54
		42.56	45.86		
	KML204	42.34	42.44		
San Jose	KFB975	42.12	42.34	42.44	42.54
		42.56			
	KMH700	same & 45.86			
	KZV889	154.92			
San Leandro	KMD592	42.12	42.34	42.44	42.54
		42.56	45.86		
San Quentin	KMA890	42.34			
San Rafael	KMD773	42.12	42.34	42.44	42.54
		42.56			
Vailejo	KFA802	42.12	42.34	42.44	42.54
		42.56			
portable	KFA408	same & 42.40			
	KMF588	42.12	155.07	155.43	155.67
	KML270	155.67			
	KME923	42.34			
	KMF454	42.34	42.42	42.56	45.86
	KJF891	154.92			

**CALIFORNIA DEPT. OF JUSTICE**

Contra Costa Co. KBE462 154.68  
San Francisco KBS993 154.68  
portable KMA962 154.68  
KCX979 154.68

**CALIFORNIA STATE FIRE DEPTS.**

Belmont	KMK252	33.66	33.98
	KJR229	154.28	
Martinez	KMK251	33.66	33.98
Mt. Diablo	KMF694	154.16	
San Francisco	KMF687	154.16	
San Jose	KMJ567	154.16	
San Lorenzo	KMJ562	154.16	
Woodacre	KMJ564	33.66	33.98
portable	KMJ876	33.66	33.98
	KMG412	33.66	33.98
	KCY631	154.16	
Forestry conservation networks:		30.86	31.26 45.00
		151.205	151.295 151.340 151.355 151.385 151.415
		151.445	151.475 159.30 159.345

**MISCELLANEOUS EMERGENCY STATIONS**

E. Bay Reg. Parks Dist., Orinda	KBB840	44.64
Am. Red Cross, Oakland	KB1776	47.42
Richmond	KDP299	47.42
San Francisco	KB1955	47.42
San Rafael	KJS924	47.42
Walnut Creek	KDO287	47.42
Golden Gate Assn., San Rafael	KGJ712	155.16
various hospitals		47.62 154.34
Calif. State CD net		47.58

□ Did you miss any of the Emergency Stations Listings in our previous issues? Well, they are still available for the New York and Chicago Areas. Just send your check or money order for \$1 for each issue—see page 83 to determine which issue you want.

**LAFAYETTE RADIO ELECTRONICS**

**VHF FM RECEIVERS**

**MONITOR:**

Police Department  
Fire Department  
Railroads

U.S. Weather Bureau  
Auto Emergencies  
Forestry Conservation

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**TUNES:**  
30-50 MHz  
152-174 MHz

**Stock No.**  
99-2589WX\*

PF-175

Only **99<sup>95</sup>** No Money Down

Operates on 117 VAC or 12 VDC. One crystal position each channel.

**SINGLE BAND RECEIVERS** Similar to Above.

Model PF-60 (152-174MHz) 99-2590WX\* ..... 79.95  
Model PF-30 (30-50MHz) 99-2591WX\* ..... 79.95

**MOBILE RECEIVER**



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PB-150

6 1/4 x 2 1/2 x 8"D

**Stock No.**  
99-2592WX\*

Tunes 152-174/MHz plus 1 crystal position. Operates on 12 VDC negative ground.

Model PB-50 (30-50MHz) 99-2593WX\* ..... 69.95

**HAND-HELD RECEIVER**



Only **17<sup>95</sup>** Pocket Size: 6 x 2 x 1 1/2" Tuneable: 146-175 MHz

**Stock No.**  
99-3531L\* 10 Transistor-Superheterodyne

27-50 MHz RECEIVER 99-3533L\* ..... 17.95

\*Imported

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## Tommy's Dying Voice

Continued from page 82



with West Coast DXers finding reception better during the last part of the schedule.

**QSL Today!** BFBS-Singapore responds to correct listeners' reports with QSL cards, provided return postage is sent. International reply coupons, available at your post office, may be used. Reports go to BFBS, c/o

BRITISH FORCES BROADCASTING SERVICE  
SINGAPORE - HQ FARELF, c/o GPO SINGAPORE

TRANSMITTER TYPE Marcconi 50000A AERIAL Co-Linear Dipole  
EFFECTIVE RADIATED POWER 10 KW WATTS  
Thank you for your report concerning 59.88 Meters  
Kies 5.010 Meters covering the period 1131 hrs to 1154 hrs  
on 12 September 1961. The contents of your report have been checked with our Station Log for that date and found correct. May we take the opportunity of wishing you good luck and happy listening during 1961.

*J. M. Campbell*  
SENIOR ENGINEER  
J. M. CAMPBELL

Singapore, the gateway to Asia and the land of the vanishing British Forces Broadcasting Service QSL card. The author pulled in the above valuable prize two years ago when Tommy and friends were stationed there.

GHQ, FARELF, General Post Office, Singapore.

How much longer will the station be around? Probably even Parliament couldn't answer that one now. But surely its life expectancy is short. So get busy, Bunky. Time's running out!

## Positive Feedback

Continued from page 9

**Dog Talk.** We received a letter from one of our readers requesting a device which consists of a transmitter and receiver—the transmitter being held by a dog trainer and the receiver secured to the collar of the dog being trained. The writer describes the setup in this manner: "A signal from the transmitter causes the receiver to impart a shock to the dog through high-voltage electrodes that are also mounted on the collar." Dog lovers of America, how does that grab you?

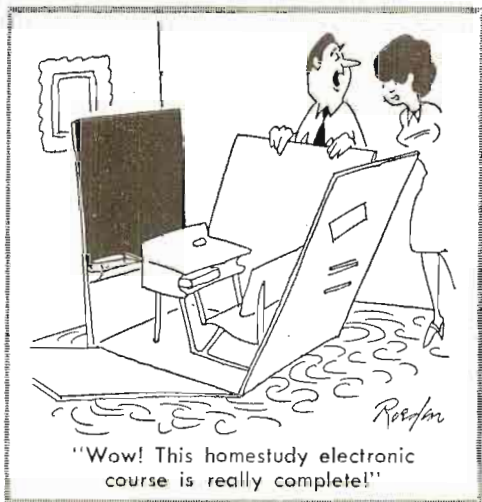
Now before you start writing Dear John letters to me, I suggest you read my reply to the sender.

"Recently I have had my dog, an Irish setter, trained by a recognized and reputable dog trainer. My dog now performs beautifully on voice and hand signals from me, as well as from other members of my family. We have found our dog to be an excellent member of the family now, well mannered and a delight to have in our presence.

"This was all done with love and care by the trainer as well as the members of my

family. At no time did we physically punish our dog. It is my recommendation that any trainer who wishes to use such a device as your letter describes, should have the device attached around his neck, and pulsed periodically as a reminder that pain can never replace love."

Okay, dog lovers, don't send letters—send pictures of your dogs. I'd like to see them.



## New Products

Continued from page 13



Lafayette LA-125TA Stereo Amplifier

source selector, concentric balance/volume, treble, bass, loudness, and tape monitor. The rear panel includes low and high tuner inputs, ceramic phono, magnetic phono, aux., tape input, tape output, speakers outputs (4, 8, 16 ohms), and 2 AC outlets (1 switched, 1 unswitched). Measures 13 x 3 $\frac{3}{8}$  x 10 in., and has simulated walnut-grained metal enclosure. Price of the LA-125TA is \$129.95 at Lafayette Stores or write to Lafayette Radio Electronics, 111 Jericho Tpke., Syosset, N. Y. 11791.

### NOT EXACTLY A PRODUCT

But we thought some of you more sophisticated experimenters would like to know about the availability of the 1969 Heath Scientific Instrumentation Catalog. In its 68 pages are full specifications, illustrations, and many schematics for, e.g.: Malmstadt-Enke spectroscopy system, instrumentation laboratory, chart recorders, recording pH electrometers, polarography system, Berkeley Physics Laboratory, and Heath oscilloscopes, power supplies, voltmeters, signal generators, testers, bridges, etc. Write on your school or company letterhead for your free copy to Heath Co., Benton Harbor, Mich. 49022.



Heath 1969  
Scientific  
Instrumentation  
Catalog

### TUNE IN, TURN ON, WHEREVER YOU ARE

If you're fortunate enough to have speaker systems throughout your house, the Alco Audio Control Center allows up to 4 or 6 stereo speaker systems to be selected for simultaneous operation. Its *push-on* and *push-to-release* switches allow the user to opt for the speaker systems of his choice of one up to six speaker pairs. The six models have easy access rear panel connectors to suit your particular systems. No external power required for operation; no internal resistors to affect impedance matches. The leather-look black metal has a brushed alumi-

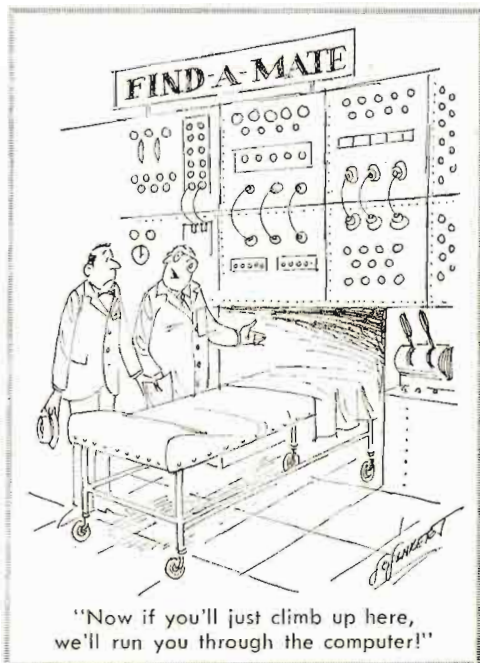
num escutcheon plate, and the size is 5 $\frac{5}{8}$  x 2 $\frac{1}{8}$  x 3 $\frac{3}{16}$  in. In the 4-channel models there are: *CC4RCA* for RCA jacks (\$19.95), *CC4PHM* for miniature phone jacks (\$21.95), *CC4PHS* for standard phone jacks (\$22.95). If you gotta have six channels, there's *CC6RCA* for RCA jacks (\$26.95), *CC6PHM* for miniature phone jacks (\$28.95), and *CC6PHS* for standard phone jacks (\$29.95). Anything else you want to know, write to AE Div. of Alco Electronic Products, Inc., Lawrence, Mass. 01840.



Alco Audio Control Center

### TOO LAZY TO HOLD THE PHONE?

The Knight-Kit KG-205 Telephone Amplifier has many uses and requires no electrical connection to the phone. A suction cup mount on the pickup attaches itself instantly to any telephone. The solid-state circuit amplifies telephone sound to room level for hands-free conversation and group listening, and it's a nice little device for the hard-of-hearing. Easily assembled with basic tools, the KG-205 is equipped with volume control and on-off switch. It's priced at \$6.95 with 9-volt battery and step-by-step instructions. Write for Sales Book No. 283, free from Allied Radio Corp., 100 N. Western Ave., Chicago, Ill. 60680.



"Now if you'll just climb up here,  
we'll run you through the computer!"

## Liquid Window

Continued from page 35

arrays resembling bundles of sticks.

The RCA display panel consists of a one mil thick layer of clear liquid crystal sandwiched between two glass plates. The rear plate has a reflective mirror-like conductive coating (it can be made transparent), while the front plate has a transparent conductive coating of tin oxide.

When an electric charge is applied to the two coatings, the liquid crystal molecules are disrupted from their orderly, parallel positions and the sandwich takes on the appearance of frosted glass because of increased light *reflectivity* rather than transmission as in the case of the Marks system.

Note that the effect of the applied electric field is just the opposite to that in the *VARAD* system. In the latter system, the crystals are in random disarray when the current is off and tend to align when the current is on. In the RCA system the crystals are in alignment when in the *rest state*, and become disarrayed when the electric field is applied. Despite the differences, Marks Polarized Corp. claims it holds the basic pat-

ents which it licenses to RCA.

To display stationary patterns such as letters or images of other kinds, the *coatings* are shaped in accordance with the desired pattern. To display motion, the conductive coatings are laid down in the form of a fine mosaic whose individual elements can be charged independently, in accordance with a scanning signal such as is used for facsimile, television, and other electronic displays.

Applications envisioned for RCA liquid crystal display panels include all-electronic clock and watch displays, auto dashboard displays, scoreboards, stock tickers, and—well in the future—pocket-size TV receivers.

**Polarized Palaces.** If the Marks ideas really take hold, every man's home will become a new kind of castle—a *polarized* palace. As the company name (Marks Polarized Corp.) implies, the firm has more than passing interest in the application of polarized light.

Light control by the use of *VARAD* windows would be just one part of an overall light-control program in a truly modern home. Ceiling lights should be polarized to reduce glare and make colors appear more "natural." Wall reflections should be eliminated with polarizing coatings. Even drapes should receive anti-glare treatments. ■

## Baseball Timer

Continued from page 63

**Using the Timer.** The frame supporting the foil strips should be placed about 10 ft. from the "pitchers' mound" at a height to keep it centered along the line of travel of the ball. In addition to the "pitcher," another person should operate the timer. To time the speed of a ball, he first turns *on* power switch S3. He depresses S1 just before the pitcher tosses the ball, and releases it as quickly as possible after the ball has cleared the second foil ribbon. At the moment S1 is released the meter reading should be taken since delays will result in inaccurate readings. This assures a peak reading before the pointer begins to drop.

Reset the instrument to zero before timing another ball, by turning *off* power switch S3 for a minimum of 10 seconds. Oh yes, before tossing another ball you must insert new foil strips.

A full-scale reading of the meter repre-

sents a time interval of 1/10 second. This is equivalent to a ball speed of about 20 feet per second, a very slow ball. A reading of 0.11 on the meter scale represents a time interval of approximately 0.011 seconds, which is equivalent to a ball speed of over 180 feet per second (about 120 miles per hour). The latter is just about as fast as a human can toss a ball. Your most speedy pitch will most likely be between these two extremes. ■

## Stamp Shack

Continued from page 64

Europe, is generally used in intensive care sections of hospitals, to enable the medical staff to constantly watch the heart action of seriously afflicted coronary patients.

● Until now, there're only three such instruments in use in Israeli facilities. These have been manufactured by Elta Electronics Industries, Ltd., a subsidiary of Israel Aircraft Industries, Ltd., at the Lod Airport, outside of Tel Aviv. ■

## Design Solid-State Circuits

*Continued from page 70*

Now that R1 is attached to the collector, an increase in Ic decreases the voltage across R1 as it reduces the voltage across the collector to emitter. And, since

$$I_B = \frac{\text{voltage across } R1}{R1}$$

I<sub>B</sub> goes down if I<sub>C</sub> goes up. This tends to keep I<sub>C</sub> constant.

With all this going on, how can we calculate a value of R1 in order to change our circuit from Fig. 3 to Fig. 4?

First, let's assume that all conditions are the same. Current I<sub>C</sub>, in order to meet the collector conditions, has to be 10 microamperes. Our formula for R1 is now:

$$R1 = \frac{V_{CC} - V_{BE}}{10 \mu A}$$

Since the V<sub>BE</sub> is still 0.2 volt (as it is for all germanium transistors), and the collector voltage is 4.5 volts, the V<sub>BE</sub> is less than 5% of the voltage across R1 and can be ignored. However, if the V<sub>BE</sub> becomes larger than 5% it will have to be dealt with. Therefore:

$$R1 = \frac{V_{CE}}{10 \mu A} = \frac{4.5 V}{10 \mu A} = 450,000 \text{ ohms}$$

Although I<sub>B</sub> now flows through R2 along with I<sub>C</sub>, and will increase R2's voltage drop slightly, 10 microamperes is only 1% of I<sub>C</sub> and can also be ignored.

**Feedback.** By the act of connecting R1 from the transistor's collector to base we have introduced a negative feedback path to the circuit. A portion of the output voltage developed at the collector is fed back to the input and is compared to the input voltage. As we've just seen, with feedback any thermal changes which cause a change in I<sub>C</sub> are compensated for at the transistor's base, and this buys us *stability*.

The feedback path sends back a signal in opposite phase which partially cancels out the base signal, and we end up with a loss in gain. In order to *buy stability* we *sell off* some *gain*.

**Rules of the Road.** Let's stack up the rules and tips for designing these circuits:

1. The battery voltage (V<sub>CC</sub>) should be well below the transistor breakdown voltage.
2. The V<sub>CC</sub> determines the maximum

output swing, so don't look for 20 volts of AC output with a 9-volt battery.

3. Design your collector voltage to be half your battery voltage in order to get the maximum undistorted output voltage.

4. Remember the *rms* output is about 1/3 the peak-to-peak swing.

5. The collector load resistor should be much smaller than the load it's driving, or your amplifier gets swamped.

As for the formulas, just follow them in succession and you can't go too far off:

1. For maximum undistorted power output:

$$V_{CE} = \frac{V_{CC}}{2}$$

2. For selecting R2:

$$R2 = \frac{\text{load impedance}}{5 \text{ (minimum)}}$$

3. To find I<sub>C</sub>:

$$I_C = \frac{V_{CE} - V_{CC}}{R2}$$

4. To find I<sub>B</sub>:

$$I_B = \frac{I_C}{H_{FE}}$$

5. To find R1:

$$\text{(in Fig. 3)} R1 = \frac{V_{CC}}{I_B}$$

$$\text{(in Fig. 4)} R1 = \frac{V_{CE}}{I_B}$$

**From Amplifier to Test Set.** So far everything is pretty straightforward, provided we know the H<sub>FE</sub> of the transistor. But what happens to the amplifier in Fig. 5 (it's just like Fig. 3 with the addition of a meter) if the H<sub>FE</sub> of the transistor is 90 instead of 100?

For an H<sub>FE</sub> of 100, which the circuit was designed for, 1.0 mA flows in the collector circuit. Now, let's change the transistor to one with an H<sub>FE</sub> of 90. What happens to the I<sub>B</sub>?

In Fig. 5, I<sub>B</sub> is basically determined by the formula.

$$I_{BJ} = \frac{V_{CC} - V_{BE}}{R1}$$

V<sub>BE</sub> is a negligible part of the equation. We can then say that I<sub>B</sub> is fixed for any *pn*p transistor we plug in. Now back to the collector. Since I<sub>B</sub> is fixed, with an H<sub>FE</sub> of 90, the meter in the collector circuit would read

90 × 10 uA, or 0.9 mA. If we change the HFE to 50, the meter will read 0.5 mA.

If we multiply the meter reading by 100 we can read the HFE *directly from the meter*. Now our amplifier is an HFE tester.

Since full scale on the meter equals an HFE of 100, how can we measure an HFE greater than 100? Well, we would have to change the base resistor. If we use the formula—hold it!

Let's let you, the reader, figure this one out. In fact let's put it in quiz form. Answer these two questions:

1. What value of base resistor is needed to extend the scale range of the meter shown in Fig. 5 to HFE = 1000 at full scale?

2. What switching arrangement do we need to change the circuit in Fig. 5 from an *npn* to *pnp* transistor type with one switch?

The answers to the above questions will

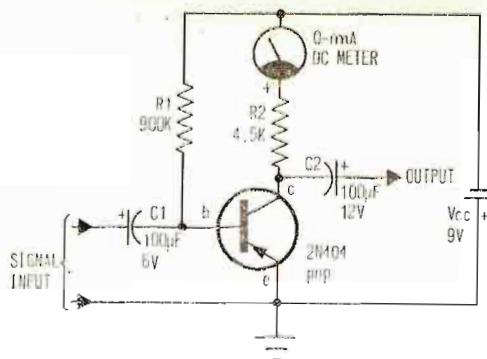


Fig. 5. Capacitors C1 and C2 are not used when preamp circuit is used as HFE tester.

appear in the next issue of SCIENCE AND ELECTRONICS. Also, some more facts on transistor circuit design will be offered. ■

"Fox-Charlie-Charlie," mean nothing to the average reader unless they're explained. And that's usually not worth the effort *unless* such terms are critical to the story.

Don't push photographs. Let the editor decide if there's a picture possibility in your article. Sure, you'd like to get yourself in good with the boys by arranging a group shot of the MyTee Five Watters' officers. But three columns of nothing but wall-to-wall grins makes your friendly, neighborhood newsman shudder.

Don't fail to make a friend of the fellow who writes your story. He carefully combs and carries his daily news contacts. Do the same. And the next time you have a good story, seek him out. He'll remember you and your club and will be better able to do the job because of this background.

Having made a friend, don't bug him! Wait until you think you have a real news story. Don't figure you can get him to cover the club's banquet and good deeds award night by offering him a free meal. What you're really saying is, "Come and work overtime as my guest." And that's asking a bit much of anyone.

Unless it is a dire emergency, don't ever, ever call him at home! An annoyed reporter is an exceedingly unfriendly one. Rub him the wrong way and your press releases will surely join the 102 from other community groups already in the circular file.

In short, learn the rules of the publicity game. Follow them, and your efforts will stand a far better chance of boosting the MyTee Five Watters to even greater glory. ■

## CB Club Publicity

*Continued from page 66*

**Canned Or Fresh?** There are two ways to give your story to the press—1) a written news release, 2) personal contact with a reporter. But whether you send the paper a release or give your story to a newsman in person (the latter is usually your best bet, at least initially), remember that the typical reporter scarcely knows the difference between CB and TV. Unless you want to see the MyTee Five Watters described as a ham radio club, explain carefully and simply the distinction between CB and amateur operators.

And stick to the facts, man, just the facts! Give full names, dates, places, and anything else pertinent. But don't pad or polish them. Make it "nine club members joined in the search," if that was the case, not "many local CBers took part."

**The Pitfalls.** Now for a few don'ts.

Don't bother the editor or reporter when his deadline is staring him in the face. There are times when he literally doesn't have 30 seconds to spare to talk to you.

Don't tell the reporter how to write his story. If club proxy Herkimer Heterodyne was home in bed catching a few z-z-z-z's while the rest of the boys were freezing out in the fields with their walkie-talkies, don't expect the reporter to work in ol' Herk's name just to keep him happy.

Don't overdo CB jargon. Talk American, boy, big A-A-A! Terms like "10-20" and

## The Value of a Hobby

*Continued from page 79*

for the short time they were in range. It was growing late, and only a few people walked the street. A drunk, whose incoherent ramblings disgusted Ed, a policeman (and Ed gained a new sympathy for law officers), a couple returning from a movie who fascinated him. Finally Ed fell into bed exhausted.

Ⓢ Ed slept until ten o'clock the following morning, Tuesday. He called his boss. Ed explained that he was sick with the flu and the doctor had ordered him to stay in bed for the rest of the day. His boss, George Royal, was a little short with him, well, maybe more than a little short. He had been complaining that Ed had not been up to his old standards during the last few months, and lately he had hardly spoken to Ed at all. Ed had worked for five years and in all that time he had only received one small raise. Really, he thought, there was nothing for him there but year after year at the same job, maybe a foremanship and perhaps a small pension.

Ⓢ For the rest of the day Ed sat at the receiver, listening in on people on the street below. He made himself a sandwich and drank a glass of milk around two, and ate a TV dinner a little after five. He was starting on the green beans when George Royal happened to walk past. Ashamed, but none the less unable to resist, with his antenna he followed his employer on his way to his car. He discovered that George was thinking about him. He intended to give Ed only a little more time until the seasonal rush was over and then fire him. Ed had worked hard for little enough for five years now, and they were just going to dump him. It hurt, and made Ed mad. Why should he work year after year for a small company doing the same thing day in, and day out. With his receiver there must be an easier and more enjoyable way to make a living.

Ed thought of gambling, but he knew hardly anything about it, and the inconvenience of a quarter ton of equipment and an antenna that must be pointed at someone's head were too much to overcome. Besides, it seemed like a fine way to get hurt to win too often at cards or other games. But how else? Maybe as a salesman of some sort? It would be very handy to overcome a custom-

ers objections before he voiced them, to be able to appeal to a persons deepest emotions and desires, to know exactly whether a person was a potential buyer or not. All good salesmen have an instinct for this type of thing, but to be certain . . .

As Ed was thinking about this a prominent councilman happened to walk by the house. Ed was intrigued as he listened on the receiver. Maybe he could become a political advisor. But then, why be just an advisor?

Ⓢ With the last of his savings, Ed bought an old panel truck. He carefully shock mounted the receiver in the rear, and concealed the antenna in a small searchlight on top. Then he drove to that little restaurant next to city hall, stopped the engine, and climbed into the back, which was completely enclosed. He started the tape recorder, sat back, and listened.

Ⓢ All this took place about four years ago. Ed is the mayor of our town, and is very popular with the people and greatly respected by the opposition party. He seems to know just the right things to say to make people like him. The party is considering him for the Senate next year, and Ed seems very confident. He still works on his electronics hobby, although he doesn't have as much free time as he used to. Someone asked him the other day what he was building now, and he mentioned something about a transmitter. ■



## Ham Traffic

Continued from page 77

The situation keeps flopping back and forth—first Ma Bell wins a round, then the radio folks win a round. With all the money and legal talent Ol' Ma has, this could go on for a long time.

Meanwhile, presumably to cover themselves in case they lose their case, the good folks at Bell have put together a gadget called a voice coupler. This may be what they require you to rent, at a regular monthly charge, if you connect your radio gear to their phone lines. (Everything Ma Bell has in her kit bag has a regular monthly charge attached to it.)

While the battling goes on, keep two things in mind. First, phone patches are neither legal nor illegal—and they never were. There's no law that says they'll throw you in the jug if you hook your rig to the phone line. But there is a clause in most telephone company regulations that says they can deny you telephone service if you hook up something that causes them trouble.

Second, this phone-patch situation may not clear up for quite a while. The "winner" of the battle probably will change several times as Ma Bell and the radio folk keep maneuvering for advantageous positions. So, don't be suckered in by the latest rumor—it may be true for only a short time.

**A Back-Door Ticket.** For fellows who dropped out of ham radio and want an easy way to get back in, the FCC has good news. Now, anyone not licensed as an amateur for the previous 12 months may take the Novice exam. Formerly, Novice exams were not allowed for anyone who had been licensed previously. At the same time as they handed out this one, the FCC denied a request that Technician operators be allowed to take the Novice test.

Maybe there's more here than meets the eye, but it seems to me they got things 180 degrees out of phase from what they should be. I see *no* reason for allowing a person who has had a higher class license, then let it drop, to be allowed back into ham radio by a softer route. And, for the Technician who wants to get some on-the-air code practice in preparation for the General test, I think the Novice ticket *should* be permitted.

After all, the whole purpose of the Novice license is supposed to be to provide a chance

for on-the-air CW experience. Anyone who has ever tried to make a CW contact on a Technician band knows it's virtually impossible. Those guys turn a deaf ear to CW signals. The Tech who really wants to improve his communications ability by improving his CW has two strikes against him. Now the FCC has added a third.

**Zooks, George!** In a recent column, I briefly described the use of commercial FM communications equipment by hams who have converted it to the 2- and 6-Meter ham bands.

This is a growing trend, which quite a few of the more technically-minded members of our hobby are involved in. A lot of them put considerable study and work into learning how this modern gear works and into wringing the maximum potential from it in their ham operating. My hat is certainly off to those FM operators who use this activity to improve their knowledge of electronics.

However, there's another side of the coin, as evidenced by a letter in a ham magazine recently. Part of it reads:

"It's certainly a relief and a satisfaction to be able to drop my mobile unit off at the local two-way service shop and pick it up later with the assurance that it's in tiptop shape and meets specifications."

How about that, sports fans? Isn't that a nice attitude for a fellow who claims to be a ham? ■

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