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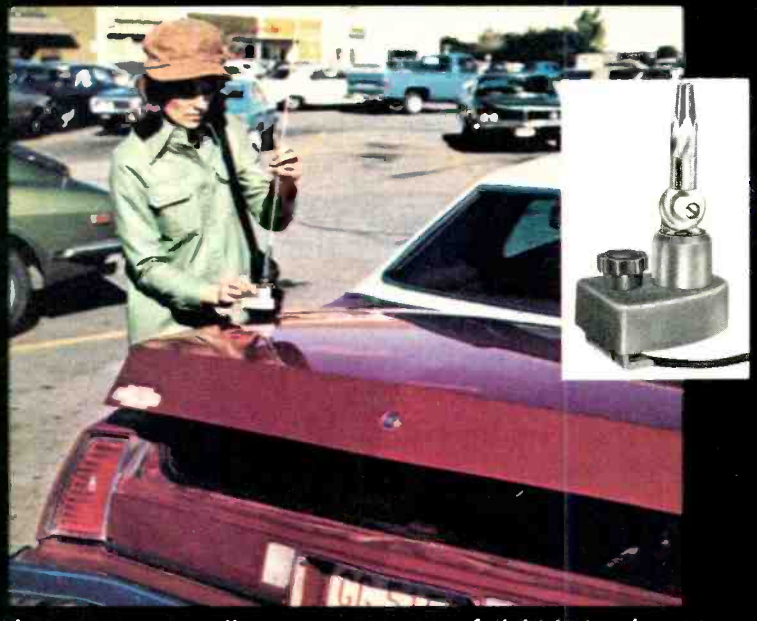

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COMMUNICATIONS HANDBOOK® 1977

CONTENTS

PRODUCT DIRECTORIES

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DIRECTORY OF MANUFACTURERS

AIRCOMMAND, Superscope, Inc. ... 31
20525 Nordhoff St., Chatsworth, Cal. 91311
AIREQUIPT, INC. 20 Jones St., New Rochelle, N. Y. 10802 ... 65
ALARON, B & B Import-Export, Inc. ... 31, 47, 53
185 Park St., Troy, Mich. 48084
ALPHA, Ehrhorn Technological Operations, Inc. ... 70, 122
P. O. 1297, Brooksville, Fla. 33512
AMERICAN ELECTRONICS, INC. ... 53, 65
91 N. McKinley, Greenwood, Ind. 46142
AMPHENOL SALES DIVISION 2875 S. 25th Ave., Broadview, Ill. 60153 ... 70
ANIXTER-MARK ... 53, 65, 94, 122
5439 W. Fargo Ave., Skokie, Ill. 60076
ANTENNA, INCORPORATED ... 53, 65
23850 Commerce Park Rd., Cleveland, O. 44122
ANTENNA POWER, INC. Box 2426, Cedar Rapids, Ia. 52406 ... 70
ANTENNA SPECIALISTS CO., THE ... 54, 65, 83, 122
12435 Euclid Ave., Cleveland, O. 44106
ANTLER, MCM Manufacturing Co., Inc. ... 56, 65, 122
6200 S. Freeway, Forth Worth, Tex. 76134
ASTRO-LOOP, Astro Enterprises ... 70
P. O. Box 44042, Dallas, Tex. 75234
ATLAS SOUND 10 Pomeroy Rd., Parsippany, N. J. 07054 ... 70
AVANTI RESEARCH & DEVELOPMENT, INC. ... 56, 66, 70, 83
340 Stewart Ave., Addison, Ill. 60101
BELL INDUSTRIES, J. W. Miller Division ... 70
19070 Reyes Ave., Compton, Cal. 90224
BIRD, Antenna, Incorporated ... 70
23850 Commerce Park Rd., Cleveland, O. 44122
BLAZER COMMUNICATIONS, INC. ... 56
34 Mildred Dr., Fort Meyers, Fla. 33901
BLUE STREAK, CPD Industries, Inc. ... 56, 66
2100 E. Wilshire Ave., Santa Ana, Cal. 92705
BOMAN INDUSTRIES 9300 Hall Rd., Downey, Cal. 90241 ... 31, 47
BROWNING LABORATORIES INC. ... 31, 47
1269 Union Ave., Laconia, N. H. 03246
CB CO-PILOT, RCA Distributor & Special Products Div. ... 32
Cherry Hill Office, Camden, N. J. 08101
CHANNEL MASTER, Ellenville, N. Y. 12428 ... 57, 66, 83
CLEGG COMMUNICATIONS CORP. ... 122
208 Centerville Rd., Lancaster, Pa. 17603
COBRA COMMUNICATIONS, Dynascan Corp. ... 32, 47
6460 W. Cortland St., Chicago, Ill. 60635
COLLINS RADIO GROUP, Rockwell International ... 94, 112, 122
Cedar Rapids, Ia. 52406
COLT COMMUNICATIONS, INC. ... 32, 47
5725 N. Central Ave., Chicago, Ill. 60646
COMMANDO COMMUNICATIONS CORP. ... 32, 47
P. O. Box 11071, Chattanooga, Tenn. 37401
COURIER, Fanon/Courier Corp. ... 33, 47, 57, 83
990 S. Fair Oaks Ave., Pasadena, Cal. 91005
CRAIG CORPORATION ... 33, 48
921 W. Artesia Blvd., Compton, Cal. 90220
CUSHCRAFT CORPORATION ... 57, 66, 70
P. O. Box 4680, Manchester, N. H. 03103
DRAKE, R. L. COMPANY ... 94, 112, 123
540 Richard St., Miamisburg, O. 45342
DYMEK, McKay Dymek Company ... 70, 112
675 N. Park Ave., Pomona, Cal. 91766
ELECTRA COMPANY Cumberland, Ind. 46229 ... 83
ELECTRO-VOICE, INC. 600 Cecil St., Buchanan, Mich. 49107 ... 70
ELENCO ELECTRONICS, INC. Northbrook, Ill. 60062 ... 71
EMERGENCY BEACON CORP. ... 33, 94, 123
15 River St., New Rochelle, N. Y. 10801
EMI-LINE, Marine Technology ... 71
2780 Temple Ave., Long Beach, Cal. 90806
EMPIRE MACHINES & SYSTEMS INC. ... 71
Shore Road, Glenwood Landing, N. Y. 11547
ENDURO, Beltex Corporation ... 33
1093 Bedmar St., Carson, Cal. 90746
FANON/COURIER CORPORATION ... 33, 48, 57, 84
990 S. Fair Oaks Ave., Pasadena, Cal. 91105
FINCO, The Finney Company 34 W. Interstate, Bedford, O. 44146 ... 66
FULCOMM, Arthur Fulmer Communications ... 34, 57, 66
P. O. Box 177, Memphis, Tenn. 38101
GC ELECTRONICS ... 58, 71
400 S. Wyman, Rockford, Ill. 61101
GEMTRONICS, Gem Marine Products, Inc. ... 34, 48, 84
P. O. Box 1408, Lake City, S. C. 29560
GENAVE, General Aviation Electronics, Inc. ... 94, 123
4141 Kingman Dr., Indianapolis, Ind. 46226
GENERAL ELECTRIC COMPANY ... 34, 48, 58, 84, 112
Audio Electronics Products Dept., Syracuse, N. Y. 13201
GLOBE, GC Electronics 400 S. Wyman, Rockford, Ill. 61101 ... 34, 48, 84
GOLD LINE CONNECTOR, INC. ... 71
25 Van Zant St., East Norwalk, Conn. 06855
GROVES MFG. COMPANY ... 72
1341 Wanda Ave., Ferndale, Mich. 48220
HAL COMMUNICATIONS CORP. ... 72, 123
P.O. Box 365, Urbana, Ill. 61801
HEATH COMPANY Benton Harbor, Mich. 49022 ... 72, 84, 123
HICKOK ELECTRICAL INSTRUMENT COMPANY, THE ... 72
10514 Dupont Ave., Cleveland, O. 44108
HUFCO P. O. Box 357, Provo, Utah 84601 ... 72
HUSTLER, New-Tronics Corporation ... 58, 66, 84, 124
15800 Commerce Park Dr., Brook Park, O. 44142
HY-GAIN ELECTRONICS CORPORATION ... 35, 48, 58, 67, 74, 84
R. R. #3, Lincoln, Neb. 68505
ICOM EAST, INC. ... 124
331 Towerwood Dr., Suite 307, Dallas, Tex 75234
INTECH, INC. ... 94
282 Brokaw Rd., Santa Clara, Cal. 95050
JFD ELECTRONICS CORPORATION ... 58, 67
Oxford, N. C. 27565
J. I. L. CORPORATION OF AMERICA ... 35
737 W. Artesia Blvd., Compton, Cal. 90220
JMR SYSTEMS CORPORATION ... 74
168 Lawrence Rd., Salem, N. H. 03079
JOHNSON, E. F. CO. Waseca, Minn. 56093 ... 35, 48, 74
KALIMAR INC. ... 36, 59
5 Goddard Ave., St. Louis Airpark, Chesterfield, Mo. 63017
KENWOOD, Trio Kenwood ... 112, 124
116 E. Alondra Blvd., Gardena, Cal. 90248
KLM ELECTRONICS, INC. ... 125
17025 Laurel Rd., Morgan Hill, Cal. 95037
KONEL 271 Harbor Way, So. San Francisco, Cal. 94080 ... 95
KRACO ENTERPRISES, INC. ... 36
505 E. Euclid Ave., Compton, Cal. 90224
KRIKET, Acoustic Fiber Sound Systems, Inc. ... 74
P. O. Box 18228, Indianapolis, Ind. 46218
KRIS INC. ... 36, 74
Pioneer Rd., Cedarburg, Wis. 53312
LAFAYETTE RADIO ELECTRONICS CORPORATION
111 Jericho Turnpike, Syosset, N. Y. 11791 ... 36, 48, 59, 67, 75, 84
LAKE COMMUNICATIONS INC. ... 37, 59
1948-E Lehigh Rd., Glenview, Ill. 60025
LEADER INSTRUMENTS CORP. 151 Dupont St., Plainview, N. Y. 11803 ... 75
MAGITRAN CO. 311 E. Park St., Moonachie, N. J. 07074 ... 75
MAR-LINE Marine Technology ... 95
2780 Temple Ave., Long Beach, Cal. 90806
METROSOUND ... 37, 59, 76
11144 Weddington St., North Hollywood, Cal. 91601
MFJ ENTERPRISES ... 76, 125
P. O. Box 494, Mississippi State, Miss. 39762
MIDLAND INTERNATIONAL CORP. ... 37, 85, 95, 125
P. O. Box 1903, Kansas City, Mo. 64141
MOSLEY ELECTRONICS, INC. ... 59, 68, 95
4610 N. Lindbergh Blvd., Bridgeton, Mo. 63044
MOTOROLA COMMUNICATIONS DIV. ... 37
1301 Algonquin Rd., Schaumberg, Ill. 60172
MURA CORPORATION ... 59, 68, 76
177 Cantiague Rock Rd., Westbury, N. Y. 11590
NATIONAL RADIO COMPANY, INC. ... 112, 125
Washington St., Melrose, Mass. 02176
NORDMENDE, Sterling Hi-Fidelity, Inc. ... 113
22-20 40th Ave., Long Island City, N. Y. 11101
NUVOX ELECTRONICS CORP. ... 37, 59, 76
150 Fifth Ave., New York, N. Y. 10011
NYE VIKING, Wm N. Nye Company, Inc ... 76
1614 130th N. E. Ave., Bellevue, Wash. 98005
OLSON ELECTRONICS 260 S. Forge St., Akron, O. 44327 ... 37, 59
PACER, Progress Inc. ... 59, 68, 76
3321 N. W. 79th Ave., Miami, Fla. 33122
PAL ELECTRONICS CO. 2614 E. Adams, Phoenix, Ariz. 85034 ... 60
PANASONIC, Matsushita Electric Corp. of America ... 37, 85, 113
One Panasonic Way, Secaucus, N. J. 07094
PARA DYNAMICS CORPORATION ... 77
14501 N. 73rd St., Scottsdale, Ariz. 85260
PEARCE-SIMPSON, Div. Gladding Corp. ... 37, 48, 85, 95
P. O. Box 520800, Biscayne Annex, Miami, Fla. 33152
JC PENNEY COMPANY, INC. ... 38, 49
1301 Avenue of the Americas, New York, N. Y. 10019
PRESIDENT ELECTRONICS, INC. ... 38, 49
16691 Hale Ave., Irvine, Cal. 92714
RADIO SHACK, A Tandy Corp. Co. ... 38, 49, 60, 68, 77, 85, 113
2617 W. 7th St., Forth Worth, Tex. 76107

(Continued on page 121)

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Now you're talking!

Sitting on top of a lot of CB brands you've probably never heard of, is a name you know and trust.

CB by RCA!

Dependable communications is what RCA is all about.

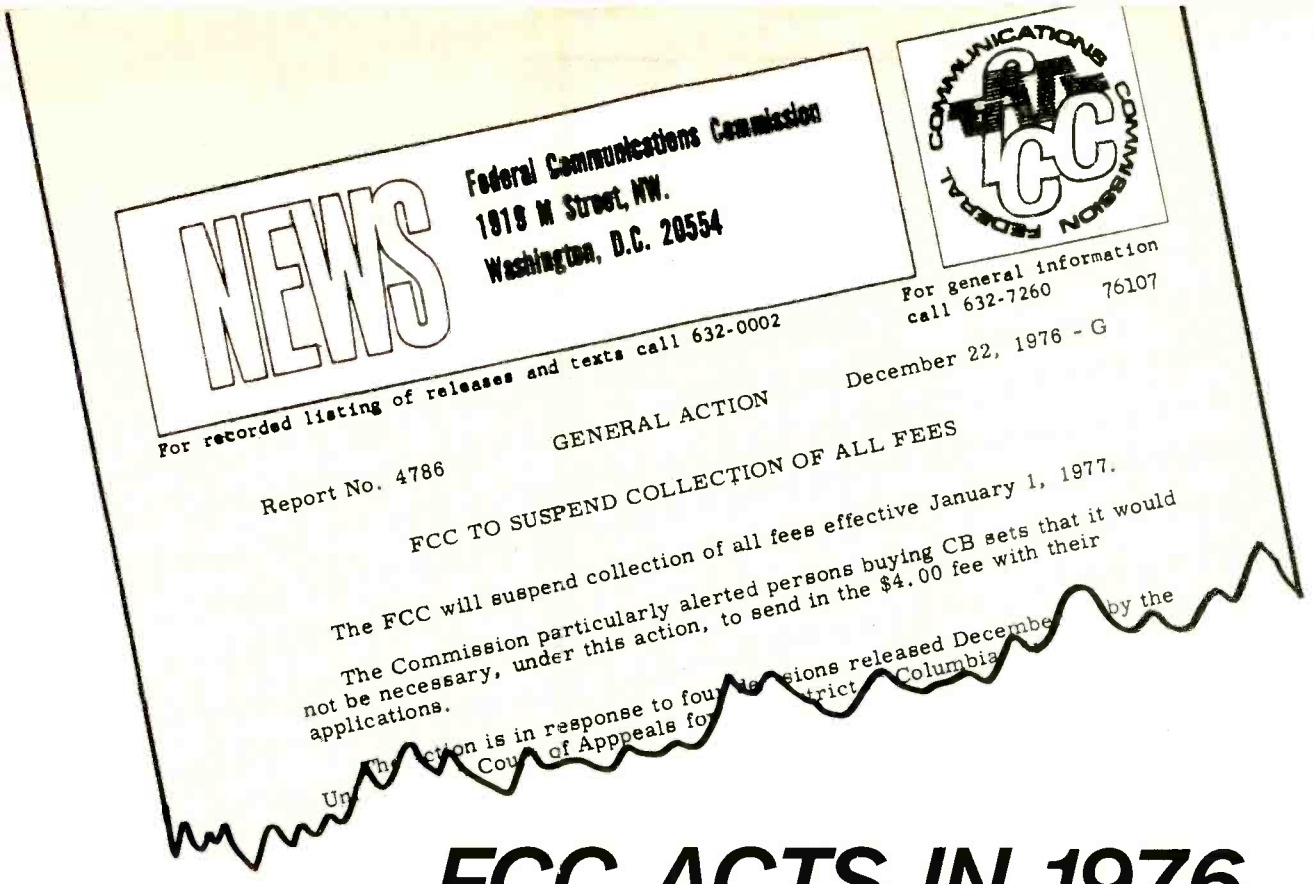
And now RCA is making it possible for you to get in on all the CB fun and excitement with equipment you know will keep you in touch. Like finding out traffic and weather conditions ahead. Radioing for help for yourself or others. Or just joining in on all the "CB Chatter."

The new RCA CB Co-Pilot line includes models with the latest engineering advances for the clearest possible reception and transmission. Features like Phase Lock Loop and Delta Tuning keep your transmitting and receiving frequencies as clear as can be and right on the button. Plus a host of other quality features your RCA Dealer will be happy to explain to you.

You've waited long enough! Walk into your RCA Dealer's today. And walk out with a CB Radio you *know* you can trust: RCA CB Co-Pilot.

Now you're talking!

RCA CB Co-Pilot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Federal Communications Commission
1919 M Street, NW.
Washington, D.C. 20554
For recorded listing of releases and texts call 632-0002
For general information call 632-7260
76107
Report No. 4786
GENERAL ACTION
December 22, 1976 - G
FCC TO SUSPEND COLLECTION OF ALL FEES
The FCC will suspend collection of all fees effective January 1, 1977.
The Commission particularly alerted persons buying CB sets that it would not be necessary, under this action, to send in the $4.00 fee with their applications.

FCC ACTS IN 1976

THE Federal Communications Commission (FCC) dropped its big bombshell in July 1976, when it released new rules that expanded the Class D Citizens Band from 23 to 40 shared AM and SSB frequencies. The channel-expansion date was effective January 1, 1977, accompanied by a host of other revisions and new rulings.

Earlier, the FCC had mentioned possible expansion to 45, 50, or even more than 100 CB channels, some possibly reserved for SSB (single-sideband) only. Engineers concluded, however, that only 40 channels could be made available in the 27-MHz band owing to an interference problem, and also because Class C (remote-control) licensees didn't want to lose five of their channels that are interspersed between Class D voice channels.

The new band extends from 26.965 MHz to 27.405 MHz. All channels are spaced 10 kHz apart except those adjacent to one of the five Class C channels. (The sixth Class C channel is 27.255 MHz, which is the same as Class D's channel 23.) The frequencies 26.965 MHz and 27.405 MHz are 440 kHz apart. Had the FCC added more channels above 27.405 MHz, it is believed that serious intermodulation interference would have resulted. For example, an AM signal with a 27.415-MHz carrier could occupy the 27.411-27.419 MHz space, and an AM signal with a 26.965 MHz carrier could occupy the 26.961-26.969 MHz space (allowing for carrier frequency error and sidebands). Intermodulation of these signals could result in a new signal occupying the 442-458 kHz space. If a CB receiver has the commonly used 455-kHz intermediate frequency (i.f.) amplifier, chances are that both signals would be received if on the air at the same time. This would apply to any combination of frequencies that would produce an intermodulation product that could enter a 455-kHz i.f. amplifier.

The new channels, listed in Table 1, are not numbered by the FCC. The original 23 channels were numbered 1 through 23 by the author of "Class D CB Radio" which was published in 1959 by *Ziff-Davis Publishing Company*. Later, the FCC adopted the same numbering scheme, but dropped it when the band was expanded from 23 to 40 channels. However, the industry quickly numbered the channels 1 through 40. Can you imagine a channel selector that indicates the frequency (such as 27.395) instead of a channel number?

Until the band was expanded, 27.235, 27.245, 27.265, and 27.275 MHz were not available for CB use. The frequency 27.225 MHz is CB channel 22 and 27.255 MHz is CB channel 23. To avoid confusion, channel 23 remains at 27.255 MHz, with channel 24 (27.235 MHz) and channel 25 (27.245 MHz) interspersed between channels 22 and 23. Channels 25 through 40 extend from 27.265 MHz to 27.405 MHz in 10-kHz steps. As far as the user is concerned, the frequencies actually used do not matter; only the consecutive channel numbers need be considered.

Channel 9 (27.065 MHz) is still reserved as an *emergency* channel. Since channel 11 (27.085 MHz) has been restored as a general-use channel, there are now 39 AM and 78 SSB channels available for standard communication, plus channel 9.

All CB transmitters must be type-accepted by the FCC, of course. Now, however, new CB *receivers* must be certified by the FCC as well. Because the second harmonic of a CB signal can cause TVI (television interference) to television channel 2, and the third harmonic can interfere with the reception of TV channel 5, the new rules require that the harmonic attenuation of newly type-accepted CB transceivers be at least 60 dB, as compared to the earlier 50 dB requirement. The strength of any harmon-

TABLE 1

CLASS D CB CHANNELS

Ch	MHz	Ch	MHz	Ch	MHz	Ch	Mhz
1	26.965	11	27.085	21	27.215	31	27.315
2	26.975	12	27.105	22	27.225	32	27.325
3	26.985	13	27.115	23	27.255	33	27.335
4	27.005	14	27.125	24	27.235	34	27.345
5	27.015	15	27.135	25	27.245	35	27.355
6	27.025	16	27.155	26	27.265	36	27.365
7	27.035	17	27.165	27	27.275	37	27.375
8	27.055	18	27.175	28	27.285	38	27.385
9	27.065	19	27.185	29	27.295	39	27.395
10	27.075	20	27.205	30	27.305	40	27.405

ic of a 4-watt transmitter may not exceed 4 microwatts (μW). (In the future, the FCC might increase the harmonic attenuation requirement to 100 dB, limiting the power of any harmonic of a 4-W transmitter to 0.0004 microwatt.)

Complaints by land-mobile radio users of radiation from CB receivers have caused the FCC to require CB *receiver* certification. Most 23-channel CB sets have a heterodyne-type frequency synthesizer that employs an oscillator operable on six different frequencies in the 27-MHz region. These signals, if radiated, can interfere with land-mobile radio systems operating in the 37-MHz region of the 30-50 MHz (low VHF) land-mobile band.

The FCC now requires that at any frequency a signal at the antenna terminals of a CB receiver not exceed a level of 2 nanowatts and will probably tighten this standard to 0.2 nanowatt in the future. Direct radiation from the chassis may not exceed 5 μV per meter, when measured at a distance of 3 meters. Also, interference arising from the power line (base station or mobile transceiver used with an a.c. adapter) may not exceed 100 microvolts.

In earlier days, type-acceptance of CB transceivers appears to have been granted largely on the basis of test measurements presented to the FCC. Now, however, the FCC examines a sample transceiver. Moreover, it is expected that the Commission will sample production models, too.

Samples of 40-channel CB tranceivers were not accepted for testing by the FCC until September 10, 1976, with a cutoff date of November 1 for those new rigs that would receive type-acceptance by January 1, 1977 (assuming they passed the tests). During early tests, it was found that many manufacturers had trouble limiting the *receiver's* signal radiation to the newly established 5-μV standard. Consequently, the FCC has been stretching the figure to 8 μV for actual units examined by the Commission. Furthermore, production models can get away with 15 μV on a sampling basis.

Clearly, the FCC is enabling CB radio manufacturers to phase-in the new standards, which, frankly, makes sense. Otherwise, production would be seriously curtailed and customers would be faced by higher price tags. (This relates only to the newly introduced receiver standard, which is designed to reduce interference-causing radiation to other communication equipment.)

The new rules prohibit the use of internal or outboard adapters to permit 23-channel transceivers to be operated on the new channels (24 through 40). However, the FCC voted to authorize manufacturers to convert 23-channel transceivers, in stock as of November 1, into 40-channel units. Although new 40-channel equipment must meet the 5 μV/meter (stretched to 8μV) specification for receiver chassis radiation, converted sets may radiate up to 50 μV/meter, measured at a distance of 3 meters.

Converted CB rigs (only those 23-channel units with "digital" circuitry are likely, for economic reasons, to be "convertible" by manufacturers) must carry a special label stating that they have been converted under a special FCC waiver dated November 10, 1976. Note also that the manufacturer must advise the FCC of the exact number of units to be converted and make quarterly reports to the FCC on inventory reduction.

There's nothing in the new rules that prohibits the manufacture of new 23-channel units, but they promise to be supplanted by newer models with the 17 new channels added. Manufacturers of 23-channel units that do not meet the new standards must cease production by August 1, 1977, and sales must be discontinued by January 1, 1978. (Owners of these units may continue to use these rigs, however.)

Other Changes. Other CB radio rules changes have occurred. For example, instead of having to wait weeks for a CB license before going on the air legally, you can now issue your own "temporary permit," make up your own temporary call sign, and start transmitting immediately after buying and installing a CB transceiver! When you unpack your CB transceiver, there should be a copy of FCC Form 505, a copy of FCC Form 555-B, and a copy of Part 95, FCC Rules and Regulations (the CB rules), in the carton.

You must complete FCC Form 505, the application for a CB station license, reproduced here, and mail it with a check or money order for $4.00 to the Federal Communications Commission, P.O. Box 1010, Gettysburg, Pa. 17326 (be sure to note this ZIP code). Then fill in FCC Form 555-B (use the one printed here if you wish), the temporary permit, and *keep it*—don't mail it to the FCC. On it, insert your temporary call sign consisting of the letter "K" followed by the initials of your first and last names and your ZIP code. Use this call sign until an official one is issued to you by the FCC. Most existing official call signs consist of three letters and four numerals (such as KDQ-1212). New ones now consist of four letters and four numerals.

Because of the high theft rate of CB mobiles, the revised FCC rules require that manufacturers engrave the unit's serial number on the chassis, making it hard for the thief to eradicate it.

Part 95 of the FCC Rules and Regulations may now be purchased for $1.50 from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402 (stock number 004-000-00324-1), as well as at GPO stores throughout the country. Previously, you had to buy Parts 95, 96, and 99 (96 and 99 don't relate to CB) for $5.35.

The FCC still requires operators to use their call signs at the beginning and end of a conversation, which is limited to

Experience is the best teacher. You might settle for any CB first time around. Understandably. A lot of people think they're all pretty much alike. But you'll soon discover that, like everything else, there are exceptions.

Ask the pros. America's long distance truckers. These guys talk CB day in and day out. And they demand the best. That's why truckers refer to the Cobra 29 as "The Diesel Mobile."

Listen to Cobra. You'll hear a big difference. Because the Cobra 29 gives you features which assure crystal clear reception. Like switchable noise limiting and blanking, to cut out practically all pulse and ignition interference. Add squelch control and RF gain and you've got exceptional—adjustable—receiver clarity. Even in the heaviest CB traffic. You also get Delta Tuning which makes up for the other guy, because even off-frequency transmitters are pulled in. Perfectly.

Talk to Cobra. And you know you're punching through. One glance at the 29's over-sized illuminated meter tells you just how much power you're punching out and pulling in. For voice modulation the DynaMike delivers at 100%. Same way with power: The 29 transmits at maximum power levels.

Sooner or later you'll get a Cobra. And you'll get engineering and craftsmanship second to none. Performance that will make your first CB seem obsolete. Reliability and durability that have set standards for the industry. Above all, you'll get power. The power to punch through loud and clear like nothing else. Because when it comes to CB radio, nothing punches through loud and clear like a Cobra.

Cobra

Punches through loud and clear.

Cobra Communications Products
DYNASCAN CORPORATION
6460 W. Cortland St., Chicago, Illinois 60635

CIRCLE NO. 13 ON FREE INFORMATION CARD

IF YOUR FIRST CB ISN'T A COBRA YOUR SECOND ONE WILL BE.

United States of America
Federal Communications Commission

Form Approved
GAO No. B-180227(R01 02)

FCC FORM 505

August 1975

APPLICATION FOR CLASS C OR D STATION LICENSE IN THE CITIZENS RADIO SERVICE

INSTRUCTIONS

A. Print clearly in capital letters or use a typewriter. Put one letter or number per box. Skip a box where a space would normally appear.

B. Enclose appropriate fee with application. Make check or money order payable to Federal Communications Commission. DO NOT SEND CASH. No fee is required of governmental entities. For additional fee details see FCC Form 76-K, or Subpart G of Part 1 of the FCC Rules and Regulations, or you may call any FCC Field Office.

C. Mail application to Federal Communications Commission, P.O. Box 1010, Gettysburg, Pa. 17325

NOTICE TO INDIVIDUALS REQUIRED BY PRIVACY ACT OF 1974

Sections 301, 303 and 308 of the Communications Act of 1934 and any amendments thereto (licensing powers) authorize the FCC to request the information on this application. The purpose of the information is to determine your eligibility for a license. The information will be used by FCC staff to evaluate the application, to determine station location, to provide information for enforcement and rulemaking proceedings and to maintain a current inventory of licensees. No license can be granted unless all information requested is provided.

1. Complete **ONLY** if license is for an Individual or Individual Doing Business AS

FIRST NAME | INIT | LAST NAME

2. DATE OF BIRTH

MONTH | DAY | YEAR

3. Complete **ONLY** if license is for a business, an organization, or Individual Doing Business AS

NAME OF BUSINESS OR ORGANIZATION

4. Mailing Address

4A. NUMBER AND STREET

4B. CITY | **4C.** STATE | **4D.** ZIP CODE

NOTE:
Do not operate until you have your own license. Use of any call sign not your own is prohibited

5. If you gave a P.O. Box No., RFD No., or General Delivery in Item 4A, you must also answer items 5A, 5B, and 5C.

5A. *NUMBER AND STREET WHERE YOU OR YOUR PRINCIPLE STATION CAN BE FOUND (If your location can not be described by number and street, give other description, such as, on RT. 2, 3 mi., north of York.)*

5B. CITY | **5C.** STATE

6. *Type of Applicant* **(Check Only One Box)**

- ☐ *Individual*
- ☐ *Association*
- ☐ *Corporation*
- ☐ *Business Partnership*
- ☐ *Governmental Entity*
- ☐ *Sole Proprietor or Individual/Doing Business As*
- ☐ *Other (Specify)* _____

7. *This application is for*

- ☐ *New License*
- ☐ *Renewal*
- ☐ *Increase in Number of Transmitters*

IMPORTANT
Give Official FCC Call Sign

8. *This application is for* **(Check Only One Box)**

- ☐ *Class C Station License (NON-VOICE—REMOTE CONTROL OF MODELS)*
- ☐ *Class D Station License (VOICE)*

9. *Indicate number of transmitters applicant will operate during the five year license period* **(Check Only One Box)**

- ☐ *1 to 5*
- ☐ *6 to 15*
- ☐ *16 or more (Specify No* ____ *and attach statement justifying need.)*

10. Certification I certify that:

- The applicant is not a foreign government or a representative thereof.
- The applicant has or has ordered a current copy of Part 95 of the Commission's rules governing the Citizens Radio Service. See reverse side for ordering information.
- The applicant will operate his transmitter in full compliance with the applicable law and current rules of the FCC and that his station will not be used for any purpose contrary to Federal, State, or local law or with greater power than authorized.
- The applicant waives any claim against the regulatory power of the United States relative to the use of a particular frequency or the use of the medium of transmission of radio waves because of any such previous use, whether licensed or unlicensed.

WILLFUL FALSE STATEMENTS MADE ON THIS FORM OR ATTACHMENTS ARE PUNISHABLE BY FINE AND IMPRISONMENT. U.S. CODE, TITLE 18, SECTION 1001.

11. _____

Signature of: Individual applicant, partner, or authorized person on behalf of a governmental entity, or an officer of a corporation or association

12. Date _____

Convenience is only half the story.

SBE TOUCH/COM 40

SBE adds the ultimate luxury to 40-channel operation: the convenience of microphone control that puts all CB functions right in the palm of your hand.

Quickly scan up or down through all 40 channels, or move channel by channel with the 2-speed channel selector. Identify your channel with the extra-large, high-intensity LED readout, clearly visible even in bright daylight. Adjust volume and squelch with the flick of a finger. And to transmit, simply push the "Press-to-Talk" control. It's all on the microphone.

But the convenience of TOUCH/COM 40 is only half the story. With such sophisticated features as SBE's "Speech Spancer" voice-operated modulation level control, "Anti-Blast" audio burst protection circuit, 4-pole IF filter, delta tune, and MIC gain control, Touch/Com 40 offers top performance under the toughest operating conditions, plus dependability backed by 100 per cent quality control.

And that's the half of the story that is the most important to you.

SBE-43CB

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CIRCLE NO. 26 ON FREE INFORMATION CARD

United States of America
Federal Communications Commission

FCC FORM 555–B
April 1976

Temporary Permit

Class D Citizens Radio Station

1 Instructions

- Use this form only if you want a temporary permit while your regular application , FCC Form 505, is being processed by the FCC.
- Do not use this form if you already have a Class D license.
- Do not use this form when renewing your Class D license.

2 Certification

Read, Fill In Blanks, and Sign

I Hereby Certify:

- ☐ I am at least 18 years of age.
- ☐ I am not a representative of a foreign government.
- ☐ I have applied for a Class D Citizens Radio Station License by mailing a completed Form 505 and $4.00 filing fee to the Federal Communications Commission, Box 1010, Gettysburg, PA. 17325.
- ☐ I have not been denied a license or had my license revoked by the FCC.
- ☐ I am not the subject of any other legal action concerning the operation of a radio station.

Name _____ Signature _____

Address _____

Date Form 505 mailed to FCC _____

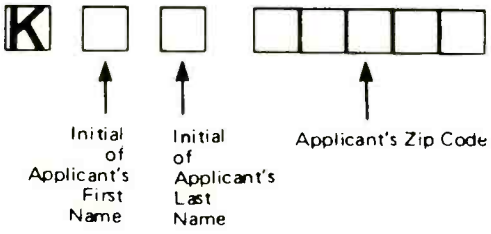
If you cannot certify to the above, you are not eligible for a temporary permit.

Willful false statements void this permit and are punishable by fine and/or imprisonment.

3 Temporary Call Sign

- **Complete the blocks as indicated.**

Use this temporary call sign until given a call sign by the Federal Communications Commission.



4 Limitations

Your authority under this permit is subject to all applicable laws, treaties and regulations and is subject to the right of use or control by the Government of the United States.

This permit is valid for 60 days from the date the Form 505 is mailed to the FCC.

You must have a temporary permit or a license from the FCC to operate your Citizens Band radio transmitter.

Do Not Mail this form, it is your Temporary Permit.

See the reverse side of this form for a summary of operating instructions.

five minutes between different station licensees. Nicknames or "handles" can be used, as long as the legal call sign is not ignored.

Antenna height for an omnidirectional antenna—the type used by most CB'ers at their base-station antenna—is still limited to 60 feet above ground. Consequently, if the antenna is mounted atop a building that is 25 feet high, it cannot exceed 35 feet in height. If a building is more than 60 feet high, the antenna structure cannot be higher than 20 feet.

Looking Ahead. In mid-1976, the FCC formed PURAC (Personal Use Radio Advisory Committee) whose members include CB users, equipment suppliers, engineers, and others who serve the FCC in an advisory capacity. The FCC took this step to improve contact with those whose use of radio the Commission regulates.

Since tightened technical standards cause CB equipment costs to rise, how is the public interest served? Standards had to be tightened so that TVI could be reduced and so that CB users would suffer less from adjacent channel interference ("bleedover" and "splatter"). With more than 7 million CB licensees operating an estimated 16 million transmitters, the problems could get worse as the CB transceiver "population" grows at the rate of around 760,000 *per month!* By the way, the FCC holds the CB'er responsible for maintaining interference-free communications. Thus, it's up to the CB'er to correct any problem his rig is causing to TV reception.

Nearly all CB transceivers are rated as being capable of 100 percent modulation. Few are capable of 100 percent positive (upward) modulation, but many can achieve greater than 100 percent negative (downward) modulation on peaks. It is the negative overmodulation that causes problems. When negative modulation reaches 100% or more, the carrier is cut off momentarily. Distortion is produced and the signal can splatter onto adjacent channels or over the entire band. For this reason, the FCC is taking a look at modulation limiter functioning, including momentary splatter.

Interference from low-power (no more than 100-mW input) "walkie-talkies" used by young children can be expected to abate as the FCC no longer permits such units to be manufactured for use on the CB 11-meter band. The frequency range of these two-way radio portables has been moved to 49.82-49.90 MHz—a far cry from CB's 27-MHz band. The older walkie-talkies can be used until 1983, but most will be out of service by then—given the rough handling they get from kids.

The 11-year sunspot cycle peak will be upon us in a few years, increasing the incidence of "skip" (bouncing of signals off the ionosphere so that they reappear hundreds, even thousands of miles away). For a brief time, it's expected that communication interference from distant CB'ers will appear periodically because of the nature of signals in the 27-MHz band. Although some CB'ers would be delighted to DX a CB'er 1500 miles away, you should know that the legal CB two-way radio communications limit is 150 miles.

To avoid this problem, which may crop up one year or so every eleven years, the FCC is studying the possibility of expanding the Citizens Band in the 220-225 MHz spectrum and the 890-947 MHz band to eliminate the problem. New frequencies would also serve to accommodate the hordes of new CB users that will join the throng in future years.

What about the new 40-channel rigs? There will probably be a shortage during the first quarter of this year, but production will likely catch up to demand later in the year. The 40-channel units offer 17 new, virtually unoccupied channels which will permit clearer and longer-range reception for awhile. Moreover, the widespread use of digital circuitry makes possible electronic numerical channel displays that are easier to read, can be built into a microphone, and add a certain "class" to the rig. There are many 23-channel rigs that have this feature, too. Some of the added 17 CB channels will be subject to the possibility of interference from Industrial, Land Transportation, and Public Services licensees which will share four new channels (24, 25, 26, and 27) for another three years before leaving the new frequencies.

In brief, there's safety in numbers with CB radios today, with close to 20-million CB radios in use throughout the country. Emergency calls, motorist assist, and just plain talk fun can be yours at modest cost—whether you are operating with 23 or 40 channels! ◇

LATE FLASH!

- *The FCC announced it has stopped collecting the $4 license fee that CB radio owners have been paying, effective January 1, 1977. The Commission will be making refunds as soon as possible.*

- *The names of the Citizens Radio Service and subdesignations (Class A, C, and D) have been changed, effective January 27, 1977. The overall name is now the* Personal Radio Service. *Class D Citizens Radio Service was changed to the* Citizens Band (CB) Radio Service; *Class C Citizens Radio Service to* Radio Control (R/C) Radio Service; *Class A Citizens Radio Service to the* General Mobile Radio Service.

- *Part 95 Rules and Regulations have been divided into four subparts, one for each of the three Personal Radio Services and one that contains technical standards for all the Services. Only Subpart D is now required to be furnished with each CB radio sold.*

40 channels ...and more

Browning is proud to be among the first to bring you 40-channel mobiles and base stations. Beyond their 40-channel capability, these new radios embody electronic innovations specifically designed to make your CB hours more pleasurable and rewarding. In the new Sabre, you'll find phase-lock loop circuitry (PLL) and LED digital readout — in the new Golden Eagle Mark IV are Browning engineering advances such as a revolutionary "Transcan System" which **lets you turn a knob and electronically sweep all transmit frequencies!**

If you're serious about CB, discover what Browning performance and quality are all about — you'll soon understand why CBers have relied upon the name Browning since Citizens Band began almost two decades ago.

Write for illustrated literature and specifications or see Browning's entire line of products at your nearby CB specialty store.

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WHAT TO LOOK FOR WHEN BUYING A CB SET

NEVER before has there been such a wide choice of CB transceivers. There are 23-channel units, 40-channel units, and a variety of 3- to 6-channel units, divided into mobile units, base stations, and hand-held units. There are so many types that buyers are often bewildered. Here are some guidelines to simplify CB transceiver selection.

FCC Approval. Since November 22, 1974 all newly marketed CB transceivers have had to be type-accepted by the FCC. If you own an earlier, non-type-accepted transceiver, you must stop using it by November 23, 1978. So be wary if you plan to buy a "used" CB rig.

All transceivers manufactured after January 1, 1977 must meet tighter technical standards for type-acceptance and also must have receiver certification. This doesn't mean that one cannot use other type-accepted units, but there is a cut-off date on manufacture and sales. The manufacture of non-certified (but type-accepted) units must cease by August 1, 1977 and marketing must terminate by the end of the year. They can be resubmitted for type-acceptance and certified to ensure compliance with the latest FCC technical standards.

So, for your own protection, look at the transceiver identification plate and be sure that it bears an FCC data or FCC type number.

All mobile and base transeivers are rated at essentially 4 watts radio-frequency output, the legal limit (the old 5-watt input limit no longer applies, even if the actual output is between 3 and 4 watts). Nearly all have a sensitivity rating of 1 microvolt (μV) or better. Modulation capability is nearly always rated at 100 percent, even if it is much lower when voice modulated. Where transceiver specifications vary most widely is the selectivity rating (more about that later).

Spec sheets appear to read alike, except in regard to size, weight, and gadgetry—which do not contribute to performance. Here are tips on what to look for, with some of the "finer points" which do make a difference in performance.

Basic Requirements. An AM mobile transceiver has the following basic controls: volume (on-off switch), squelch control, and channel selector. Such frills as an S/RF meter, illuminated channel selector, and transmitter-on lamp do not contribute to performance. You can talk and listen as far without these convenience features.

Reports from public service monitors and police officers who use CB radios indicate that, in most cases, transmission capability is satisfactory. However, some receivers are inadequate, especially in regard to adjacent-channel interference (bleedover) rejection.

Modulation Level. The FCC requires all type-accepted CB transceivers rated at above 2.5 watts to include an automatic modulation limiter that prevents overmodulation (greater than 100 percent). Some can achieve only low positive (upward) modulation, but many can be modulated more than 100 percent negative (downward).

Negative overmodulation causes interruption of the transmitted signal on peaks and is one of the prime causes of bleedover and splatter, particularly when an improperly adjusted power microphone is used. Units type-accepted after January 1, 1976 must be incapable of greater than 100 percent positive and negative modulation.

New transceivers, type-accepted and certified after January 1977, must be designed to attenuate carrier frequency harmonics at least 80 dB below carrier level so that TVI (television interference) will be minimized. (The FCC plans to increase this standard in the future to further minimize TVI.) Accordingly, when output power is 4 watts, the power level of no harmonic may exceed 4 microwatts (4 μW) under the existing 60 dB rule.

Output Power. Even if the spec sheet states that transmitter output power is 4 watts, the FCC limit for AM Class D CB transmitters, all sets of the same make and model do not deliver 4 watts. The actual output power may be between 3 and 4 watts. The variation is caused by differences in transmitter transistor characteristics. But don't worry about it. The difference at a distant receiver could hardly be noticed by the ear or the S-meter.

Receivers. The FCC does not set CB receiver standards except for its interference-producing capability. The FCC is not concerned with receiver sensitivity and selectivity, but manufacturers are since they have to be competitive. Listen to the rig you plan to buy (you don't need a license to do so). Switch channels to check intelligibility of male and female voices and children's voices. If you plan to use an external speaker, try one out. In most instances, sound quality will be

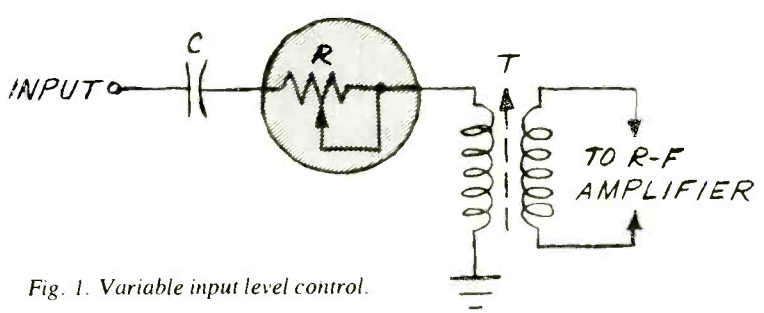

Fig. 1. Variable input level control.

PRESIDENT CB
The second generation radios

Every one with 40-channels.

Every one with a little something extra...like LED digital channel readout and Automatic Noise Limiter with manual override on even the least expensive model.

Every one sets a new standard of talk power. With President's new high level compression circuit and variable mike gain on every model, the modulation is fantastic.

Every one with quality control second-to-none because every single radio is checked thoroughly for peak performance before it leaves the factory.

President may be a new CB company but the people who founded President aren't new to CB. They're industry leaders who were there in the beginning and want to offer the American people CB's with a little bit extra.

President Radios

John Q—40-channel AM mobile. Mid-priced mobile with base station features. Volume, squelch, variable mike gain, ANL, receiver sensitivity switch, digital channel indicator with dimmer control, S/RF meter, PA.

Honest Abe—40-channel AM mobile. Designed and priced to become a best seller. Digital channel indicator with dimmer control, RF gain, delta tune, variable mike gain, S/RF/modulation meter, ANL, PA.

Teddy R —40-channel AM mobile. Top-of-the-line mobile. Volume, squelch, mike gain, RF gain, delta tune, true RF noise blanker, tone control, PA switch, S/RF modulation/SWR meter, digital channel display with variable dimmer control.

Zachary T—40-channel AM base station. A short step down from the top-of-the-line. Volume, squelch, variable mike gain, RF gain, S/RF meter, digital channel display, PA, ANL, AC/DC.

Dwight D—40-channel AM base station. Top-of-the-line base. Digital clock with built-in alarm, two meters reading signal strength, relative RF power output, modulation, SWR reflected and forward. Also, digital channel display, volume, squelch, mike gain, RF gain, tone, delta tune, true RF noise blanker, PA, AC/DC.

Grant—40-channel AM/SSB mobile. Variable brilliance channel indicator. Variable mike gain, local/distant switch, RF noise blanker, clarifier, large AM, upper and lower sideband control, LED transmit light, PA, volume, squelch.

Washington—40-channel AM/SSB base station. A quality price leader. LED transmit indicator. Volume, squelch, mike gain, RF gain, clarifier, PA, RF noise blanker, large S/RF meter, AC/DC, digital channel indicator.

PRESIDENT

Engineered to be the very best.

CIRCLE NO. 23 ON FREE INFORMATION CARD

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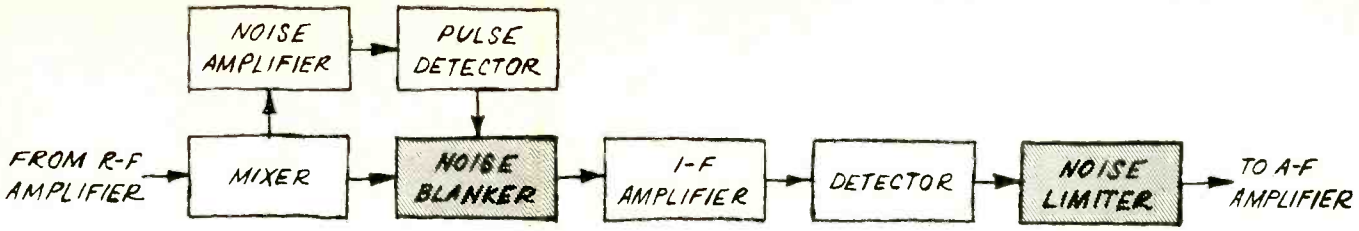

Fig. 2. Simplified block diagram showing location of noise blanker and noise limiter in receiver circuit.

improved. With very few rigs, however, the converse occurs.

Sensitivity. As stated earlier, most CB transceivers have a sensitivity rating of 1 microvolt or better—which is fine. When sensitivity is rated at 1 μV for 10 dB S + N/N, it means that an on-channel radio signal at the transceiver's antenna jack, having a level of 1 microvolt (1-millionth of 1 volt) will deliver 10 dB more audio to the speaker when modulated than when unmodulated. If sensitivity were significantly greater, receiving range may not necessarily be improved if the ambient electrical noise level masks very weak signals.

Selectivity. The better CB transceivers employ one or more selectivity filters that narrow the bandpass of the i.f. amplifier (s). If the ±10 kHz attenuation of the filter is 40 dB, for example, an adjacent-channel signal would have to be 100 times stronger (in voltage) than an on-channel signal to have the same effect at the output of the receiver and/or the automatic gain control (a.g.c.) circuit. If you're listening to a 5-microvolt signal, for example, the adjacent-channel signal would have to have a level of 500 microvolts at the receiver input. This doesn't mean the adjacent-channel signal will not affect your reception, but the 40-dB figure is a measure used by engineers. The higher the number, the less likelihood there is for bleedover of signals from channels on either side of the one switched in.

Even if a receiver has 60 dB adjacent-channel selectivity, an overly strong off-channel signal could overload the front end of your receiver and cause the a.g.c. to reduce sensitivity to on-channel signals. Since the CB channels are spaced only 10 kHz apart, it is difficult to design a receiver that will have both a sharp enough selectivity curve and immunity to strong off-channel signals without exceeding acceptable price limits for the general public.

On a spec sheet, the adjacent-channel (±10 kHz) rejection rating (in dB) is not the whole "selectivity" story. An important factor is how much of the signal passes through the i.f. filter's passband, as if it were a narrow doorway. The FCC permits only a maximum of ±4 kHz to do so. More often, CB manufacturers design receiver sections to allow only ±3 kHz to pass, since this is all that's really needed for intelligible voice communications. The leaves a 2-kHz guard band for each adjacent channel, thereby improving adjacent-channel rejection. A selectivity spec may also read ±3 kHz at −6 dB, with the −6 dB figure being the effective voltage point on the passband curve. So look for both ways to specify "selectivity," as one has an effect on the other. If this spec is less than ±2.5 kHz, for example, voice intelligibility would be impaired, while the adjacent-channel rejection figure would look especially good.

Only a limited amount of selectivity is provided by the receiver front end. A 23-channel receiver must pass all signals within the 26.96-27.26-MHz range, and a 40-channel unit must pass all signals within the 26.96-27.41-MHz range. The passband must be at least 450 kHz wide, although it is actually much wider since it would be very expensive to include an input filter that cuts off at 26.96 MHz and at 27.41 MHz. Since the r.f. amplifier and mixer input must be broadbanded, these stages do not add to adjacent-channel rejection; only to rejection of out-of-band signals.

Check image rejection too. The higher the number (−40 dB is better than −35 dB), the less possibility there is of another channel's signal sneaking through on the channel you are on.

When you tune an FM broadcast receiver, the r.f. amplifier and mixer input are tuned simultaneously to the frequency indicated by the dial. But in a CB receiver, channel selection is accomplished by changing the frequency of the local oscillator (s) without retuning the r.f. amplifier and mixer to a specific channel. The "front end" (where the antenna feeds in) is the mouth of the funnel whereas the r.f. amplifier (s) is the spout.

Input Level Control. One of the more notable features of some CB receivers is the so-called r.f. gain control, or at least a local/distance switch. Without this control, a very strong signal can overload the front end of a receiver. Some CB sets have an effective a.g.c. (automatic gain control) circuit that helps with this problem. It automatically reduces receiver amplification on strong signals. But, it might not totally prevent overload. A better way is to control the level of the signal at the receiver input.

The circuit of a continuously variable input level control is shown in Fig. 1. The signal from the antenna is fed through capacitor *C* and potentiometer *R* to the primary of r.f. input transformer, *T*. When the resistance of *R* is close to zero, the signal is not attenuated. As the resistance of *R* is increased, more of the signal is dropped across *R* and less of it reaches the primary of *T*. Thus, it varies the level of the signal reaching the receiver input, but does not vary the gain of the receiver. "Riding gain" is a popular, but inaccurate, term used in the audio field when audio level is controlled but not amplifier gain. For example, a receiver volume control is used to vary the level of the audio signal fed to the input of the audio amplifier, not the gain of the amplifier.

With a typical true r.f. gain control, a control is used to vary the gain of the field effect transistor (FET) that functions as the r.f. amplifier. As the control's resistance is increased, the source bias rises, causing the gate to become more negative with respect to the source, thereby reducing the gain of the FET. In addition to manual control of r.f. gain, a.g.c. voltage applied to the gate through a resistor automatically regulates the gain of the FET. This system costs more than the level control which, in turn, costs more than a local/distance switch setup.

Either an r.f. level control or an r.f. gain control enables a CB operator to offset the effects of overly strong signals. By reducing the gain of the r.f. amplifier or by adding attenuation in the input signal path, adjacent-channel bleedover and on-channel overload can be minimized.

Delta Tune. The "delta tune" feature included in many CB sets would not be at

RELATIVE MERITS OF FEATURES

Feature	Functions	*Improve Performance?
Amplified AGC	Improves immunity to overload by strong signals, and maintains more constant sound level from speaker as radio signal level varies.	YES
Channel Selector Illumination	Enables reading channel number in the dark.	NO
Clarifier Control	Enables clear reception of SSB signals.	ESSENTIAL (for SSB only)
Controls in Microphone	Enables remote control of transceiver.	NO
Crystal Synthesizer	Enables 23-channel operating using only about 14 crystals.	NO
Delta Tune	Enables clearer reception of off-frequency channels, and compensates for channel error.	SOMETIMES
Electronic Switching	Switches circuits from receive to transmit mode when PTT switch is keyed (more reliable because it eliminates need for relays).	NO
External Speaker Jack	Enables use of better-quality external speaker	YES
FET or MOSFET Amplifier	Provides greater immunity to interference and overload.	YES
FET or MOSFET Mixer	Provides greater immunity to intermodulation and overload.	YES
LED Channel Indicator	Provides electronic display of channel number.	NO
Microphone Gain Control	Enables adjustment of modulation level (can cause distortion if misused).	SOMETIMES
Modulation Lamp	Indicates that modulator is operating, but not actual modulation percentage.	NO
Noise Blanker	Blanks out noise pulses and reduces ambient noise.	YES
Noise Limiter	Reduces impulse-type noise by limiting amplitude of pulses.	YES
On-Off Lamp	Indicates that transceiver is turned on.	NO
PA Capability	Enables use of transceiver as a public address system.	NO
PLL Synthesizer	Enables use of few crystals for 23- or 40-channel operation.	NO
Polarity Protector	Protects transistors in the event battery cable leads are reversed.	NO
Positive/Negative Ground	Enables use of transceiver in any vehicle with 12-volt electrical system.	NO
Power Microphone	Provides stronger modulating signal to transmitter (can cause distortion if misused).	YES
Priority Channel Scan	Automatically scans a specific channel (such as 9) when transceiver set to any other channel.	NO
RF Gain Control	Enables reduction of receiver sensitivity to minimize overloading and bleed-over.	YES
RF Protector	Provides a warning and/or protects final r.f. power amplifier stage if antenna system SWR excessive.	NO
Selectivity Filter	Improves receiver selectivity	YES
Squelch	Mutes speaker when no signal is received.	ESSENTIAL
S/RF Meter	Indicates relative strength of received signal and relative output power.	NO
SSB Capability	Enables transmission and reception in LSB, USB and AM modes.	YES (in SSB mode)
SWR Meter	Indicates antenna system condition.	NO
Tone Control	Enables lowering of audio frequency response to suit ear or mask out high-frequency noise.	SOMETIMES
Transmit Lamp	Lights when transceiver keyed on.	NO
UL Approved	Certification that transceiver has been approved by Underwriters Laboratories.	NO
Voltage Regulator	Stabilizes voltage to critical stages.	YES

all necessary if all CB transmitters and receivers were absolutely on-frequency. But they aren't!

Assuming that your receiver's local oscillator (s) is on frequency, delta tune will enable you to offset the frequency error of a distant transmitter. On the other hand, if your receiver's local oscillator (s) is off-frequency, delta tune will enable you to offset the frequency error of your receiver. And, delta tune can help offset the frequency error of both the distant transmitter and your receiver. If the combined error is 2600 Hz, the i.f. (assuming it's 455 kHz) could be centered at 452.4 kHz or 457.6 kHz, with one of the sidebands extending beyond the i.f. bandpass. Typically, a delta tune control has a ±800 Hz to ±1000 Hz range.

With AM/SSB units, the control is called a "clarifier." In truth, the specification tolerance set down by the FCC is stringent enough to make the need for a delta tune control superfluous for AM units. It's imperative to have a clarifier control for SSB, though.

Channel Determination. Whereas 23-channel CB sets two years ago employed 14 crystals to enable transmission and reception on 23 channels, using the heterodyne principle for frequency synthesis, the late-model 23-channel sets and all known 40-channel sets employ a digital PLL (phase locked loop) frequency synthesizer. The latter requires only a few crystals for all-channel operation. This is important to the manufacturer since crystals cost money. But to the user it means little in terms of actual performance. It does, however, make it easy to obtain, as a byproduct, digital channel number readouts.

Noise Reducers. All CB transceivers today contain an automatic noise limiter (a.n.l.), either permanently connected internally or switchable. It does a good job of limiting pulse-noise interference. But, a noise blanker is far more effective. An a.n.l. is connected in the circuit after the detector. In contrast, the noise blanker, shown in Fig. 2, is connected ahead of the detector where it senses a noise pulse and cuts off the signal flow ahead of the detector. The deluxe CB sets often include both a.n.l. and a noise blanker. Switchable is better.

Indicators. You don't really *need* indicators except one that shows you which channel has been selected. Yet, most CB sets have an S/RF meter, and some deluxe units also have an SWR meter. Many also have a transmitter-on lamp, power-on lamp and/or modulation lamp. They're nice luxuries that are most useful when needed, which is once in a

BASIC CB TRANSCEIVER CONFIGURATION

Mobile Unit	Transceiver designed for installation in a vehicle; usually operates from a 12-volt d.c. electrical system.
Base Unit	Transceiver designed for use at a fixed location, normally operates from a.c. power line (some can also be operated from a 12 V d.c. source).
Walkie-Talkie	Handheld transceiver operable from self-contained battery.
Solid State	Transceiver uses only semiconductors, such as transistors, ICs and diodes, but not tubes.
Integrated Circuit(s)	Transceiver employs one or more integrated circuits (ICs) which may contain the equivalent of many transistors or diodes or both.
Hybrid	Transceiver uses one or more tubes in addition to semiconductors, such as transistors, ICs and diodes.

while. If you've got the extra money, though, they are worth having.

An S/RF meter indicates the relative level of an incoming signal in S units from S-1 (barely audible) to S-9 (extremely strong). Some are calibrated to indicate S-9 when a 50- or 100- microvolt signal is being received, where every S-unit below S-9 indicates a 5-dB (drop to 56 percent) weaker signal. But, don't bank on it. The meter calibration may be arbitrary. However, you can be sure that an S-8 signal is weaker than an S-9 signal. The main value of an S-unit display is being able to respond to a request for a radio check by saying "You're putting in an S-5 signal, Good Buddy." (Don't ever underestimate this "social" benefit!)

When transmitting, the S/RF meter indicates the "relative" output power of your transmitter, not the actual watts. If meter indication suddenly drops, you can suspect transmitter trouble. If it suddenly rises, chances are that something has happened to your antenna system.

Very few CB sets have a built-in SWR meter (a separate meter or one of the functions of a combination S/RF/SWR meter) that will alert you to antenna system malfunction. Unlike a detachable separate SWR meter, a built-in one is there all the time. It's a convenience to have it if you install your own antenna and for occasionally checking for possible antenna problems.

When you talk into the mike when transmitting, the S/RF meter indication should rise. (If it drops, have a technician check your rig because modulation percentage is more negative than positive.) If you select a CB set that has a modulation lamp, the lamp will flicker as you talk, indicating that modulation is being applied to the transmitter. But it doesn't indicate modulation percentage, either positive or negative. It only indicates that when you talk into the mike the modulator is working.

It's a handy indicator, but a radio check from another CB user can tell you if your modulation is OK. For example, if you get a report that you're putting out an S-9 signal, but your voice is weak, it is an indication of low modulation (low talk power).

When you push on the mike button to transmit, you will know if you're on the air if you get a response. A transmitter-on lamp will tell you that you have operated the PTT mike button, but won't tell you if your transmitter is operating (your S/RF meter will). The power-on lamp serves as a reminder that your CB set has been turned on. It could be the same one that illuminates the channel selector dial. Thus, if you can read the channel numbers you will know that the set is on.

One of the more interesting developments is the LED (light emitting diode) channel indicator. As you select channels, the number of the selected channel is displayed in glowing numerals as on an electronic calculator.

Transceiver Packaging. Remotely controlled mobile transceivers have been introduced of late to minimize CB radio theft. They come with a microphone that contains the basic operating controls and the channel indicator, generally a LED display. The transceiver box may be installed under the seat, hidden away under the dash, or in the trunk. It is connected to the microphone and through a long multi-conductor cable.

Also designed to make them more difficult to steal are the new in-dash CB transceivers that fit in the place intended for a car radio. They are available in combination with an AM radio, AM-FM stereo receiver, and AM-FM stereo receiver plus either a cassette or 8-track cartridge tape player. They usually cost more than a conventional mobile transceiver, but they save space and provide multiple functions.

Most popular by far, of course, are the conventional mobile transceivers that are designed for mounting under the dash or on the transmission hump. Using a quick-release mount, the transceiver can be removed and put in the trunk, or taken with you when the car is parked.

Most are designed for positive/negative ground electrical systems. Some

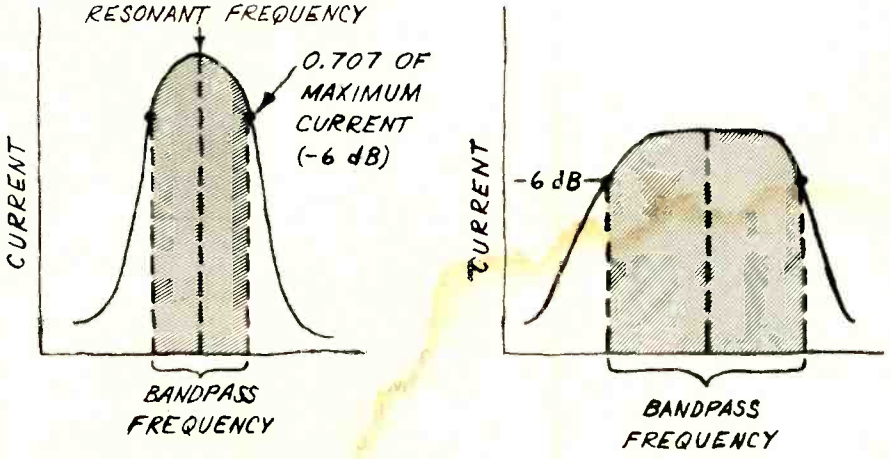

Fig. 3. (A) "Window" in which signal passes through receiver's tuned circuit. (B) Bandpass is wider, permitting broader range of frequencies to pass through. In tightly spaced channels, signals from adjacent channel would be passed to amplifier stages. More selective filters are used to avoid this, but if too selective would limit frequency range.

TYPICAL CB AM MOBILE TRANSCEIVER SPECIFICATIONS

GENERAL	SPECIFICATIONS
Frequency Range:	26.965 to 27.405 MHz
Frequency Stability:	±0.005%
Frequency Control:	PLL
Channel Display:	LED digital readout
Circuitry:	All solid state
Receiver System:	Single-conversion superheterodyne with FET mixer, ceramic filter.
Microphone:	Dynamic
Metering:	Illuminated S/RF meter with dimmer control.
PA System Output:	At least 3 watts audio
External Speaker Jack:	When in use, disconnects internal speaker
Input Voltage:	Mobile: 13.8 V d.c. ±20%, positive or negative ground with reverse polarity protection.
Circuit Protection:	Fused with plug-in power cable
Shock and Vibration:	Equal or exceed EIA Standard RS-382
	6.2" W x 9" D x 2.7" H.

TRANSMITTER	
RF Power Output:	4.0 watts
RF Harmonic Attenuation:	More than 60 dB down
Audio Distortion:	Less than 10% at 1000 Hz with 80% Modulation
Audio Frequency Response:	+2 to -14 dB, 300 to 3000 Hz
Modulation Limiting:	Modulation limited to less than 100% for inputs 25 dB above level required for 50% modulation.
Output Impedance:	50 ohms
Emissions:	6A3

RECEIVER	
Sensitivity:	0.75 µV or less for 10 dB (S+N)/N (30% modulation at 1 kHz)
Squelch Sensitivity:	Less than 1 µV at threshold setting, 50 µV to 1000 µV at maximum setting
Adjacent Channel Selectivity:	More than 50 dB down at ±10 kHz
Cross Modulation Rejection:	More than 70 dB of ±50 kHz
Spurious and Image Rejection:	More than 45 dB at Image More than 60 dB at all other spurious frequencies.
Automatic Gain Control:	Less than 20 dB audio rise with signal levels of 1 to 50 µV
Automatic Noise Limiter:	Built in
Noise Blanker:	Switchable
Audio Output:	3 watts minimum at less than 10% distortion; 30% modulation at 1 kHz
Speaker:	3-inch
Input Impedance:	50 ohms

are designed only for use in vehicles with a negative-ground electrical system, which is used in most cars. The advantage of a pos/neg ground type of set is that it can be used in any vehicle with a 12-volt electrical system.

Base Stations. You can use a mobile transceiver as a base station by powering it from an electric outlet through an a.c. adapter. Some of these adapters contain a front-facing speaker that is connected to the external speaker jack on the transceiver. Even walkie-talkies can be used as base stations in conjunction with an a.c. adapter and an external antenna system.

More convenient and usually more attractive is a transceiver specifically designed for base-station use. It contains an a.c. power supply to enable direct operation from the power line. Some also have a built-in voltage regulator that prevents loss of sensitivity and output power when line voltage is normally low and protects transceiver components when line voltage is abnormally high. The regulator maintains transceiver performance that could be affected by dips and surges in power-line voltage. Base-station units generally have more control frills than mobile types and invariably incorporate a front-panel headphone jack and larger speaker.

AM or SSB? It is easy to decide whether you want one or more mobile units for use in cars, boats, and other conveyances and/or a base station for the home or office, or for both. Many prospective CB users have never heard of SSB (single sideband) CB sets. Others have and ask themselves "should I buy an AM or SSB rig?"

According to a high FCC official, more than 90 percent of CB sets are AM-only types. But according to several CB dealers, there are more inquiries about SSB sets than in the past and many AM-only users are upgrading to SSB. Why?

SSB is a form of AM (amplitude modulation) that is more efficient than double sideband (conventional) AM. The result is greater talk range and two separate SSB channels in the spectrum space that a single AM channel would occupy.

When you use AM, your transmitter generates a carrier and two sidebands (AM is sometimes called "double sideband;" SSB is actually "AM" too, but uses only one sideband). Both of the sidebands (upper and lower) contain the same information while the carrier contains no information. The latter simply serves as a vehicle to carry information. Unfortunately, this vehicle uses up most of the power, leaving little left for the in-

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CIRCLE NO. 1 ON FREE INFORMATION CARD

telligence (audio). For instance, if your carrier power is 3 watts, the power in each sideband will be less than 0.75 watt, and then only during those voice peaks at which positive modulation approaches 100 percent. Keep in mind, too, that only one sideband is finally used.

In an SSB transmitter, the carrier and two sidebands are also generated. However, the carrier and one of the sidebands are suppressed (not transmitted) and only one sideband, which contains all of the available power, is transmitted. No signal is transmitted except when you talk into the mike. You can observe this on a CB radio's S meter, where the indicator moves up and down scale as the other party talks and drops to zero when talk ceases. When receiving AM, in contrast, the indicator remains steady on an S number. Because of the nature of the SSB wave, the FCC allows SSB transmitter output up to 12 watts p.e.p. (peak envelope power), whereas AM carrier output power is limited to 4 watts rms (root mean square) maximum.

If SSB is so much better, why use AM at all? For two reasons: (1) To demodulate an SSB signal, the carrier that was suppressed at the transmitter must be re-created at the receiver. This circuitry costs money. (2) Operating an SSB transceiver requires a minor "skill." An SSB set has a clarifier control that must be adjusted to clarify the reproduced voice which otherwise might sound like Donald Duck or Tubby the Tuba, or be just plain unintelligible. This is a slightly bothersome requirement, especially when one is driving.

There are very few SSB-only transceivers. Most are combination AM/SSB units that are operable in any of these modes: AM, LSB (lower sideband) and USB (upper sideband), on all channels. Some manufacturers advertise that their 23-channel AM/SSB sets have 69-channel capability, or 40-channel rigs with 120-channel capability. This claim is not precisely correct. In the LSB mode, you occupy the lower half of the spectrum of a channel, and in the USB mode the upper half of the spectrum of a channel. The selected channel cannot be shared at the same time by an AM station when either or both SSB signals are present.

Although more costly, an SSB transceiver can give you greater range. Also, there are few children using SSB and operators are generally more serious and very interested in following FCC rules and regulations.

External Speakers. Most CB sets have an external speaker jack to which a remote speaker or low-impedance headphone can be connected. When either is plugged in, the built-in transceiver speaker is automatically disconnected. In a noisy environment this is a good feature. You can install a more efficient external speaker aimed to direct the sound at you.

Many CB sets also have a p.a. (public address) speaker jack. It enables use of the transceiver's audio amplifier as a p.a. amplifier. With the CB/PA switch set to the PA position and with an external speaker plugged into the PA speaker jack, your voice will be amplified and reproduced as you speak into the microphone. In the PA mode, the transceiver will not transmit. This facility isn't used too often, but it should be. For example, installing a speaker under the auto's hood will give you a fine "hailing."

CB Advertising. When you see an advertisement for a CB transceiver, it may or may not be offered for sale. Look for a disclaimer that states, in effect, that the advertised transmitter is not available for sale or lease until it has been approved by the FCC. This is a fairly recent relaxation of FCC rules, which formerly prohibited manufacturers from promoting CB radios until they were type-accepted. During the early part of 1977, you can expect to see advertisements for CB sets that will not have been approved by the FCC at the time the advertisement was placed. However, it's very possible that by the time you see the advertisement in print, FCC approval has been granted. If you see such a rig on sale, you can assume that it has been approved by the FCC since it is unlawful to ship sets to dealers until FCC approval has been granted.

The Final Choice. Obviously, there are a host of factors to be considered when choosing a CB transceiver. These include size (do you have room under the dashboard, for example), aesthetics, brand name (are the manufacturer's models widely distributed), and dealer reliability, among them.

Be sure to check out magazine test reports such as those that appear in POPULAR ELECTRONICS, visit more than one dealer, check out the experiences of active CB-ers. If you don't know any of the latter, a CB dealer can generally tell you when a CB flea market or "coffee break" meet is being planned that's open to one and all.

There are still some 23-channel units on the market. Since there won't be many 40-channel CB-ers on the air for some time, you might consider purchasing one. They're available at great savings. If you are one who yearns for the latest model and are willing to pay the price for it, by all means buy a 40-channel rig, especially if your widest use is for communicating with family and close friends rather than engaging in gab fests with anyone you catch on the air. Also, you'll be enhancing the radio communications environment because the new rigs produce less interference to other two-way radios, TV, and audio gear. ◇

NATIONAL CB ORGANIZATION

Two major national CB emergency service organizations in the U.S. are REACT and ACBOA-ALERT (a merger of ALERT and American Citizens Band Operatiors Association, Inc.). As of October of last year, REACT had 1500 teams and over 100,000 participants, while the newly merged group expects to have 2000 working teams by the end of 1977.

REACT headquarters are at 111 E. Wacker Dr., Chicago, Ill. 60601 while ALERT/ACBOA is in Suite 818A, National Press Bldg., Washington, D. C. 20004.

A recently introduced public service from REACT is a special flag for motorists in distress to signal a request to call REACT on CB Ch. 9. The flag, of orange reflective vinyl, is made to roll up against the auto side window so that it faces the road at right angles.

All CB'ers who see these flags are asked to call their local REACT teams on Ch. 9. Distribution is through local REACT teams who are combining a community service and local fund-raising project or Headquarters will send a flag to those contributing $5.00 or more to REACT. It is a tax-deductible contribution.

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TIPS FOR CB OPERATORS

Here's a host of practical ideas to enhance your CB on-the-air communications contacts.

THE Citizens Band is a 40-lane communications freeway, recently widened from 23 lanes. Of all these lanes, one (Channel 19) carries the most traffic. It is the lane adopted by the truckers (18-wheelers) and, more recently, by motorists (4-wheelers). Most motorists set their CB rigs to Channel 19 to listen to the truckers and, sometimes, to talk to them as well as to other CB'ers on the highways. Channel 19 is used so often by so many, particularly in densely populated areas, that one CB user said his S-meter never drops back to zero until he gets off the major highways. It's not that crowded on the other channels, but in some areas, no channel is free from congestion. The new 17 channels should help matters.

In Brief. During periods of "skip" activity, it is especially important to keep CB transmissions brief since you could be interfering with communications hundreds of miles away. By maintaining short transmissions and not making unnecessary transmissions, you can help to relieve channel congestion. Everyone can benefit by the foregoing. Remember, too, that the FCC limits CB communications to a 5-minute maximum.

10-Codes. The revised APCO "Ten-Signals" is a "brevity code" devised by Associated Public-Safety Communications Officers, under government sponsorship, for use by the police and all radio services. Those who devised it feel that its use reduces on-the-air time.

More than twenty ten-codes are used by CB'ers, however all of them are based on the original APCO Ten-Signals. Because of the use of differing ten-codes, there are a lot of errors of interpretation. And because the original APCO Ten-Signals list was too long for everyone to memorize, an APCO task force reduced the number of signals to 34 and reserved 10-35 to 10-40 for future use. If you insist on using a ten-code, you are urged to use the newly revised APCO Ten-Signals so that a Smokey hearing you will understand you. Also, if you use a code, you must keep a "code-meaning" list at your station.

It isn't necessary to use a ten-code if you can make yourself understood as quickly in plain English. Does it take longer to say "Where are you?" than "What is your ten-twenty?" But jargon and codes seem to be part of the CB fun.

Breaking. If a channel is in use and you wish to speak (break in on a channel for a good reason), wait until the channel is clear. It's only common courtesy. If you cannot wait, then do select a period when there's a pause in the conversation to say, "Breaker 15 for travel information," or what have you. Then await a reply.

Modulating. Since publicity pictures almost invariably show a CB user holding the mike many inches from his mouth, too many persons think that's how to speak into a mike. Not so. You should typically hold it only about 2 inches from your mouth. You'll modulate more heavily, your effective range will be greater because of higher "talk power," and thus your voice won't be as weak-sounding at distant receivers. Doubling the distance from the mike to 4 inches will decrease mike output 6 dB (power is reduced 75%). However, some CB rigs have exceptionally high mike preamplification. So you should check out your modulation quality by calling for a "radio check."

To get greater talk power, many CB'ers have replaced their original mikes with power mikes. A power mike will drive the modulator section of a CB transceiver harder, but it won't necessarily cause a significant increase in positive modulation percentage (talk power) if the built-in modulation limiter is doing its job. If the mike's gain control is set too high, distortion and negative overmodulation can occur. Watch the S/RF meter as you talk. If its needle kicks downward, you're overmodulating downward and probably causing your signal to splatter on to other channels. So if someone tells you that your voice is distorted, turn down the mike gain.

With more stringent FCC requirements on modulation limits, however, some of the newer CB rigs may not develop enough talk-power punch when one speaks softly. In view of this, power

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mikes could well enhance communications.

Channel Use. Your CB license authorizes you to operate on any of the Class D channels. However, FCC rules prohibit the use of Channel 9 (27.065 MHz) except for emergency communication and motorist aid. There are no restrictions on the use of any of the channels for lawful purposes.

Since most truckers have adopted Channel 19 as "their" channel, many of them complain that they experience interference from CB base stations on that channel, especially when driving through or near a city or town. Truckers would appreciate it if all base-to-base and base-to-mobile communications would stay off Channel 19. Truckers not only use this channel for talking to each other, but also for aiding 4-wheelers (motorists). In some states, highway patrol officers monitor Channel 19 so they can be ready to assist truckers and motorists. Many arterial highways use Channel 10 or some other channel. So you may run into a situation where you were using Channel 19 on a highway, turn off to another highway, and have a CB'er tell you to switch to the other commonly used highway frequency.

The sidebanders (operators of SSB rigs) have adopted Channel 16 as "theirs." The FCC has not reserved Channel 16 exclusively for SSB use, but sidebanders *would* appreciate it if AM users would stay off Channel 16. If you try to use AM on this channel, you will interfere with SSB transmissions and an SSB signal can usually clobber your AM signal. Single-sidebanders are now eying Channels 36 through 39 for unofficial exclusive use.

Use of Channel 9. Channel 9 is not to be used for idle conversation. FCC rules state that the frequency 27.065 MHz (Channel 9) may be used solely for: Emergency communications involving the immediate safety or life of individuals or the immediate protection of property, or communications necessary to render assistance to a motorist. Permitted Channel 9 use has been clarified as follows:

A licensee, before using 27.065 MHz (Channel 9) must make a determination that his communication is either or both (a) an emergency communication, or (b) is necessary to render assistance to a motorist. To be an emergency communication, the message must have some direct relation to the immediate safety of life or immediate protection of property. If no immediate action is required, it is not an emergency. Note that there are many worthwhile public service communications that do *not* qualify as emergency communications. In the case of motorist assistance, the message must be necessary to assist a particular motorist and not, except in a valid emergency, motorists in general. (Don't advise motorists in general that a snow storm is expected, for example.) If communications are to be lengthy, the exchange should be shifted to another frequency (channel), if feasible, after contact is established. No non-emergency or non-motorist assistance communications are permitted on 27.065 MHz, even for the limited purpose of calling a licensee monitoring a frequency to ask him to switch to another frequency.

Although 27.065 MHz may be used for marine emergencies, it should not be considered a substitute for the authorized marine distress system. The Coast Guard has stated it will not "participate directly in the Citizens Radio Service by fitting with and/or providing a watch on any Citizens Band Channel."

The FCC cites examples of permitted and prohibited types of communications on Channel 9 in its Part 95 Rules and Regulations.

The FCC has established the following priorities regarding the use of Channel 9. (1) Communications relating to an existing situation dangerous to life or property; that is, fire, automobile accident, etc. (2) Communications relating to a potentially hazardous situation; that is, a car stalled in a dangerous place, a lost child, boat out of gas. (3) Road assistance to a disabled vehicle on the highway or street. (4) Road and street directions.

At a conference on the use of CB radio for motorist aid, several representatives of law enforcement agencies stated that Channel 9 is overly congested with route information requests, diminishing its use as an emergency channel. Although permitted by FCC rules, you can relieve the congestion by making route information requests on Channel 19 (or another "highway" channel if used) since the truckers usually have the answers.

To preserve the integrity of Channel 9, try to use it only for genuine emergencies. If you hear a route information call on 9, respond and ask the caller to switch to another channel to receive information.

If you can't help when you hear an emergency call on 9, don't respond unless no one who can help does. If there is no response from anyone else, respond and then relay the information via landline to the authorities.

Channel 9 is monitored coast-to-coast by ALERT and REACT volunteer teams as well as independent public service monitors. They can do a better job if Channel 9 is kept as uncongested as possible.

REVISED APCO "TEN CODE" USED BY SOME CB'ERS

10-1 Signal Weak
10-2 Signal Good
10-3 Stop Transmitting
10-4 Affirmative (OK)
10-5 Relay (To)
10-6 Busy
10-7 Out of Service
10-8 In Service
10-9 Say Again
10-10 Negative
10-11 _____ On Duty
10-12 Stand By (Stop)
10-13 Existing Conditions
10-14 Message/Information
10-15 Message Delivered
10-16 Reply to Message
10-17 Enroute
10-18 Urgent
10-19 (In) Contact
10-20 Location
10-21 Call (_____) by Phone
10-22 Disregard
10-23 Arrived at Scene
10-24 Assignment Completed
10-25 Report to (Meet)
10-26 Estimated Arrival Time
10-27 License/Permit Information
10-28 Ownership Information
10-29 Records Check
10-30 Danger/Caution
10-31 Pick Up
10-32 _____Units Needed (Specify/Number/Type)
10-33 Help Me Quick
10-34 Time

Call Signs. FCC rules require that you announce your official call sign during each transmission. It is no longer required that you must also announce the call sign of the station you are calling or talking to. The rules permit you to use a nickname or a "handle," but only if you also use your call sign. Listening in on CB will reveal that many CB'ers do not use their call signs, but that nearly all use a handle. However, more and more are starting to use their call signs as the FCC cracks down on violators. A member of an FCC advisory committee said that, on a trip through the South, he heard many CB'ers refuse to talk to those that didn't use their call signs properly.

The use of call signs is not an arbitrary requirement imposed on CB'ers by the FCC. The law under which the FCC operates requires that all licensed stations be properly identified. Some CB'ers are afraid to use their call signs because they think it will make it easier for the FCC to find them if they are heard violating the rules. Using sophisticated monitoring vans, however, the FCC is able to track down rules violators without knowing their call signs.

Staying Legal. In addition to identifying yourself by your call sign and being generally in compliance with the operating rules, there are other rules that should be observed. One is that you should attach a Form 452-C to every one of your transceivers, noting on it your call sign, name, and address. You can get copies of FCC Form 452-C (a tag) free by writing to the Federal Communications Commission, Forms Room B-10, Washington, D.C. 20554. In lieu of this official form, you can use a pressure-sensitive label attached to each transceiver.

To avoid being cited for technical violations you should have each transceiver checked out by an FCC-licensed technician at least once a year. The technician should make the following measurements, make a record of the measurement, and give you a copy of the record.

1. Transmitter frequency on all channels.
2. Transmitter output power on all channels.
3. Harmonic attenuation (2nd and 3rd harmonics of channel frequency).
4. Modulation percentage, positive and negative.
5. Modulation limiting.

TVI interference is generally displayed on a TV receiver's CRT as a "herringbone" pattern or a series of lines that start and stop, depending on when the CB operator is transmitting. There are many forms of video interference that are not due to CB radio transmissions, however.

If a neighbor complains that you interfere with his TV reception, be cooperative. If you don't cooperate, the FCC might get into the act. Interference to picture reception on Channels 2 and/or 5, but not on the other TV channels, indicates that your rig is probably emitting a strong second or third harmonic. In that case, install a high-quality low-pass filter at your transceiver. (The FCC can require you to do so.) On the other hand, if you cause TVI on all VHF channels, buy a high-pass TVI filter (inexpensive) and have it installed at the TV set.

Improving Reception. You're limited to 4 watts output when using AM (12 watts p.e.p. output when using SSB) and to less than 100% modulation. All you can do to increase transmitting range and solidity of coverage is to improve the antenna system. At a base station, you can increase antenna height to 60 feet (above ground) or 20 feet above a higher building, and you can use a better antenna (even a beam with a rotator) and a low-loss coax downlead. But improving a vehicular antenna system can be more difficult. Even if you want to place your antenna in the center of the car roof, your family might not stand for it. So you may have to settle for a trunk-mount or gutter-mount antenna; perhaps a co-phased dual antenna system which won't significantly increase transmit range, but will modify the radiation pattern. You can also improve receiving range by filtering out engine noise that masks weak signals.

As a rule of thumb, the taller the antenna (and the higher you mount it, within legal and practical limits) the better transmission and reception you'll get. For a mobile antenna, this makes a 9-ft whip the practical maximum, usually bumper mounted. Smaller, neater units are more popular, with the most-often-used mobile antenna a base-loaded one. Here, the physical height is reduced while coiled wire simulates the correct electrical size, which is some fraction of a full-wave antenna (about 36-ft for the 27-MHz band).

Be sure to "tune" your antenna for maximum power. This is indicated by a *minimum* "voltage standing wave ratio" or SWR. It should measure less than 1.5 for good transfer of power to the antenna or voltage from the antenna to the CB transceiver if receiving a signal. Many mobile antennas have an adjustable tip for this purpose, with the tip locked in place at the best height with an Allen-key wrench. Just a little movement up or down can reduce the system's efficiency and thereby waste power.

If your transceiver has a manual r.f. gain control or local/distance switch, use it to give you a cleaner reception of strong signals and to cut down adjacent channel bleedover. At a base station, if your unit has neither, you can get essentially the same effect by using a long-range antenna and a short-range antenna, either cut in as required by a coaxial switch.

The CB Rip-Off. Finally, do consider CB radio theft when installing your system. Remember that a CB antenna is an eye-catching signal to any thief. Consequently, be sure that your antenna can be easily removed and hidden in a trunk. You can screw out the antenna mast from its base, of course, but many people are lazy and don't do it after a while. An easier way would be to insert a socket onto the base that permits pulling the base-loading coil and mast out in one swift motion. Even better are the various accessories that permit an antenna to be completely hidden, base and all. These are generally called "flip flops," and allow the entire antenna to be folded down into a trunk.

Consider, too, protecting your CB mobile radio. There are two-piece units where most of the transceiver can be hidden in a trunk or under a seat and a detachable microphone with built-in controls removed and placed in the trunk or a glove compartment. Alternatively, one can have a mobile rig mounted on slide brackets so that it is easily removable and can be taken with the operator or placed in a locked trunk. If you take this route, be sure to get a slide bracket that includes a coax cable lead so that you do not have to remove and re-insert the antenna every time you pull out the transceiver. (If you transmit without an antenna, you'll likely blow out some output power transistors and drivers.) Finally, if theft is a major problem in your area, you can have a in-dash unit installed so that it looks like an ordinary AM-FM radio.

The problem of CB transceiver theft has reached such proportions that most insurance companies will not provide coverage under their blanket automobile policies. It is often necessary to pay a premium (typically $30 a year) for this coverage. ◇

40-CHANNEL RIGS GO DIGITAL

By WILFRED M. SCHERER

How only a few crystals produce 40 receive and transmit frequencies

It started last year, when 23-channel CB transceivers appeared with the magic word, "Digital" or "PLL" (for phase-locked loop). It's an old circuit come to life in the electronics industry, thanks to integrated circuits making it economical to produce. Moreover, it makes it easy to produce channel numbers electronically in bright, large digits on a transceiver or built into the face of a microphone.

With 40-channel units now King of the Road, a PLL circuit is the only way to go, except for hand-helds that have only a few channels. While crystal-controlled units require two crystals for every receive/transmit channel (23 channels means 46 crystals) and frequency synthesized circuits use 12 to 14 crystals for 23 channels, PLL designs need only a few crystals to produce 40 receive and transmit frequencies.

Digital Synthesizers. Using the so-called digital or PLL synthesizer, a full-coverage transceiver requires only two or three crystals and the synthesizer itself only needs one. (The other one or two are used in heterodyning stages.)

A basic synthesizer (Fig. 1) is composed of a *reference oscillator*, a *phase-locked loop*, a Schmitt trigger, a *phase comparator*, a *low-pass filter*, and an *error amplifier*. The reference oscillator is a crystal-controlled circuit that produces a stable, known frequency which will be used as a reference. This phase comparator samples the frequencies of two input signals and produces an output voltage that is directly proportional to the frequency difference of the inputs. The low-pass filter smooths this error signal into a dc level. The voltage-controlled oscillator or VCO is an oscillator whose output frequency varies directly with the level of a control voltage applied to it. The Schmitt trigger converts sine waves into square waves, and the ÷N circuit divides the frequency of an applied square wave by a whole number, N.

Now that we've defined some essential terms, let's consider (for simplicity's sake) the operation of a synthesizer that will generate one of three separate frequencies—26, 27, and 28 MHz.

The reference oscillator produces a steady square wave (sketched at its output in Fig. 1), whose frequency is governed by a 1-MHz crystal. At the same time, the VCO is oscillating at a frequency which we'll assume to be 26.52 MHz. We'll further assume that the FREQUENCY switch in the ÷N circuit is set at 26. The output of the VCO is "squared up" by the Schmitt trigger, as shown in Fig. 1, and is divided down to 1/26th of its original frequency by the ÷N circuit. Thus, two signals are applied to the phase comparator—one at exactly 1MHz and the other at 1.2 MHz.

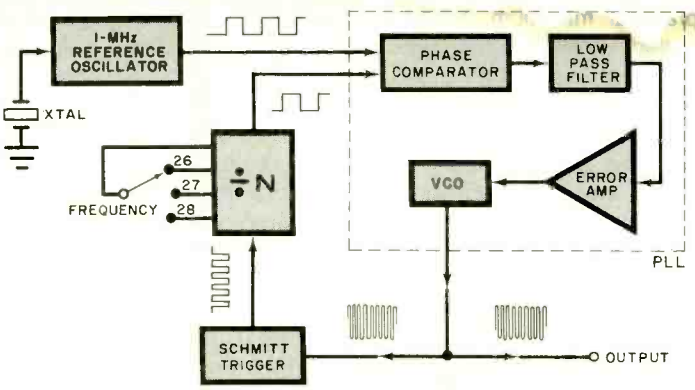

Fig. 1. A basic digital frequency synthesizer. Many frequencies can be generated using one reference crystal.

The output of the phase comparator will be an error voltage because the reference frequency is lower than that of the VCO (after it has been divided down). The lowpass filter will smooth out this voltage, which is amplified by the error amplifier. The amplified error voltage is applied to the VCO, and will cause the frequency of the VCO output to decrease. As the VCO frequency approaches 26 MHz, the output of the ÷N circuit approaches 1 MHz. In turn, the error signal gets smaller and smaller, and eventually disappears when the VCO is running at exactly 26 MHz. At that point, the frequency at the ÷N output is exactly 1 MHz, and is exactly in step with the output of the reference oscillator.

If we then turn the FREQUENCY switch to 27, the VCO momentarily keeps running at 26 MHz. Its output is now divided by 27, and the frequency applied to the phase comparator is about 0.96 MHz. The resulting error voltage is smoothed, amplified, and applied to the VCO, whose frequency moves upward. As it approaches 27 MHz, the error signal gets smaller and smaller, until the VCO is running at exactly 27 MHz. A similar chain of events now occurs if the FREQUENCY switch is set at 28.

The enormous advantage of the digital or PLL synthesizer is that we can obtain any number of frequencies from the circuit merely by changing the frequency divider (÷N) circuit. All synthesized frequencies are as stable and as accurate as the one reference oscillator. Moreover, being digital, it's easy to create lighted electronic-generated numerals to identify channel numbers.

Practical Circuits. A complete PLL-synthesis system used in a 23-channel, single-conversion AM/SSB transceiver is shown in Fig. 2. The VCO operates in the 19.140-to-19.430-MHz range to provide a local oscillator signal. This signal is heterodyned on receive with the incoming CB signal, resulting in a 7.825-

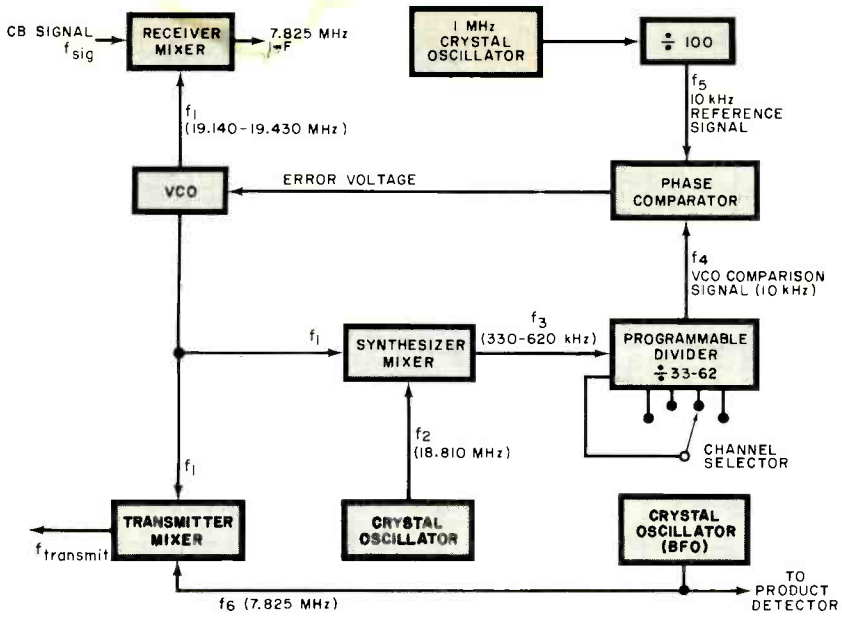

Fig. 2. A digital (PLL) synthesizer for AM/SSB use.

MHz i-f. The VCO comparison signal is obtained by first mixing the VCO output with the 18.810-MHz output of a crystal oscillator. Difference frequencies ranging from 330 to 620 kHz appear at the output of the synthesizer mixer. This, in effect, functions as an automatic predividing system.

The difference frequency for a given VCO output frequency is then divided by the programmable divider. In this stage, the amount of frequency division, ranging from ÷33 to ÷62, is determined by the setting of the channel selector. The resulting VCO comparison signal, at approximately 10 kHz, is then applied to a phase comparator, as is a 10-kHz reference signal. This reference is obtained by dividing the output of a 1-MHz, crystal-controlled oscillator by a factor of 100. The output of the phase comparator is an error voltage that shifts the VCO output until it is "on channel."

When the channel selector is set to Channel 13 and the transceiver is in the receive mode, an incoming signal at 27.115 MHz is heterodyned with the VCO's 19.290-MHz output to produce the 7.825-MHz i-f. Simultaneously, the VCO output is beat with the 18.810-MHz crystal oscillator output, and a difference signal at 480 kHz is extracted. This is divided by a factor of 48 in the programmable divider to produce a VCO comparison signal at 10 kHz. If the VCO drifts slightly, an error voltage is produced to correct the frequency shift. On transmit, the VCO output at 19.290-MHz is heterodyned with a 7.825-MHz crystal oscillator output to produce a sum frequency of 27.115 MHz. This 7.825-MHz crystal oscillator is also used as the bfo on receive.

A PLL synthesizer for a 23-channel AM transceiver with a dual-conversion receive section (to improve image response) is shown in Fig. 3. On receive, an incoming Channel 13 signal at 27.115 MHz is heterodyned with the 16.420-MHz VCO output to generate a 10.695-MHz first i-f. (The full range of the VCO is 16.270 to 16.560 MHz.) The first i-f is then heterodyned with the output of the reference oscillator. In the receive mode, this reference signal has a frequency of 10.240 MHz. Extracting the difference signal results in a 455-kHz second i-f. The reference oscillator output is divided by a factor of 1024 and applied to the phase comparator at a frequency of 10 kHz on receive. At the same time, the VCO output is divided by a factor of 1642, and the resulting 10-kHz signal is applied to the phase comparator. For 23-channel receive coverage, the dividing factor is varied from 1627 to 1656.

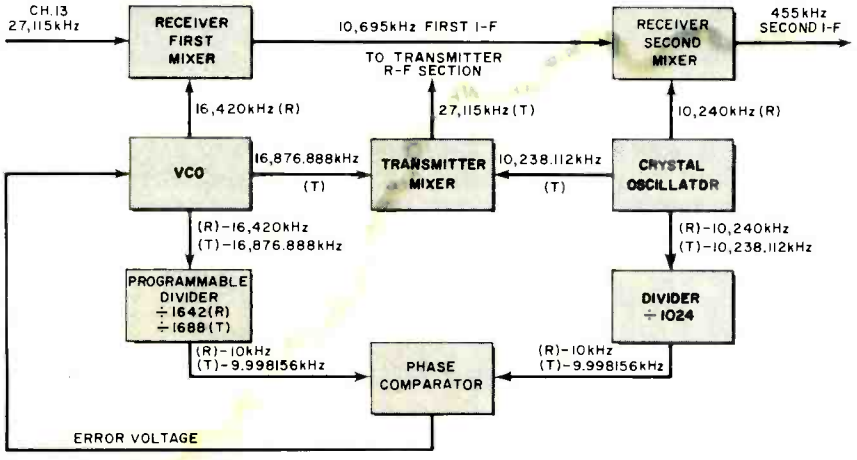

Fig. 3. Digital synthesizer for AM with dual conversion on receive.

On transmit, the VCO and reference oscillator outputs are heterodyned by the transmitter mixer, and the sum frequency is extracted. For this sum signal to be at the center frequency of Channel 13, the VCO output frequency must be increased 455 kHz, the i-f frequency. However, there is no integer that, when divided into the new VCO frequency, will result in a quotient of exactly 10 kHz.

The foregoing problem is solved by shifting the reference oscillator output downward by 1.888 kHz to 10.238112 MHz. Dividing this new reference by 1024 results in an output at 9.998156 kHz. Then, by increasing the new VCO frequency slightly (from 1.861 to 1.914 kHz, depending on the setting of the channel selector), and by programming the divider for a factor in the 1646-1702 range, the VCO comparison signal will also be 9.998156 kHz. The feedback arrangement of the PLL will keep the VCO and the sum of the VCO and the reference close to their ideal values.

The basic 23-channel PLL system is the obvious system used in the new 40-channel rigs. The only real modifications required are expansion of the programmable divider and the use of a VCO with wider range. Fortunately, these are readily accomplished, and some manufacturers are even offering to modify their existing 23-channel "digital" rigs for full 40-channel coverage.

The most exciting development in PLL synthesis is the development of LSI systems. That is, the production of complete PLL synthesizer circuitry in one or two large scale integrated circuits, requiring few additional external components. This methodology is clearly the wave of the future for generating frequencies for CB. ◇

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CB-640. Sensitivity 0.5 μV at 10 dB S+N/N; delta

tune ±1.5 kHz; LED readout SWR meter; r.f. gain control; channel 9 auto/scan; aux input for p.a. $229.95

CB-340. Sensitivity 0.5 μV at 10 dB S+N/N; delta tune ±1.5 kHz; r.f. gain control $179.95

CB-140. Sensitivity 0.6 μV at 10 dB S+N/N $139.95

ALARON

B-4075 Mobile Transceiver

40-channel transceiver with phase-locked loop synthesizer; 4-W r.f. output; pos. or neg. ground 12 V

d.c. system; illuminated S/RF meter; variable squelch control; PA switch; delta switch; automatic noise limiter; transmit and receive indicator lights; jacks for p.a. and extension speakers; mounting bracket included $129.95

B-1100 Mobile Transceiver

23 channels; r.f. power output 3.8–4.0 W; sensitivity 1 μV at 6 dB S + N/N; selectivity 6 dB at ±5 kHz; spurious response −60 dB; delta tune ±1.5 kHz; dual-conversion receiver; audio output 3 W at 10% distortion; spurious emissions −60 dB; variable squelch; a.n.l.; illuminated channel selector and S/RF meter; max. current drain 500 mA (receive), 1400 mA (transmit); comes with plug-in dynamic mike, jacks for external speakers, mounting bracket and hardware, mike holder, power cord; 13.8 V d.c. pos. or neg. ground 7¾″ D × 6¼″ W × 1⅝″ D $59.95

B-1150 Mobile Transceiver

23 channels; r.f. power output 3.8-4.0 W; sensitivity 0.5 μV at 10 dB S + N/N; selectivity 6 dB ±5.5 kHz; spurious response −50 dB; dual-conversion receiver; audio output 3 W at 10% dist.; spurious emissions −50 dB; variable squelch; local/DX switch; illuminated channel selector and S/RF meter; comes with plug-in dynamic mike, jacks for ext. speakers, mounting brackets and hardware, mike holder, power cord; 13.8 V d.c. pos. or neg. ground; 8¼″ D × 6½″ W × 2″ D $59.95

BOMAN

CBR-9940 CB/AM-FM Stereo Radio

Combines AM-FM stereo receiver with 40-channel CB transceiver; 3.5 W r.f. output; adjacent channel rejection −45 dB; selectivity −6 dB at ±5 kHz; digital synthesizer; max. modulation 0-100%; squelch; S/RF meter; LED channel readout; delta tune $306.00

CBR-9700. Same as 9940 but without S/RF meter $276.00

CBR-9000 CB/AM-FM Stereo Radio

Combines AM-FM stereo receiver with 40-channel CB transceiver; 4-W r.f. output; sensitivity 0.5 μV at 10 dB S + N/N; adj. channel rejection −45 dB; selectivity −6 dB at ±5 kHz; digital synthesizer; max. modulation 0-100%; switchable a.n.l.; squelch; S/RF meter; LED channel readout; 7.24″ W × 7.0 ″ D × 2.165″ H $250.00

CBR-9300. Same as 9000 except with AM radio only $230.00

CBM-6100 "Hideaway" Transceiver

40-channel coverage; 3.75-W r.f. output; sensitivity 0.5 μV at 10 dB S + N/N; digital synthesizer; 90% max. modulation; a.n.l.; mike gain control; attaches to car stereo or mounted at firewall; all controls in mike $250.00

CB-765 Under-Dash Transceiver

40-channel coverage; digital synthesizer; p.a. facilities; a.n.l.; squelch; external speaker jack; S/RF meter; r.f. gain control; LED Tx & Rx lights . $245.00

CB-760. Same as 765 but without r.f. gain control ...

..... $215.00

CB-930 Under-Dash Transceiver

40-channel coverage; 3.75-W r.f. output; sensitivity 0.5 μV at 10 dB S + N/N; selectivity −45 dB at ±10 kHz; digital synthesizer; 90% mod.; p.a. facilities; a.n.l.; squelch; external speaker jack; SWR meter; S/RF meter; r.f. gain control; automatic mod. control; LED readout with dimmer; delta tune; CB monitor switch $170.00

CB-920. Same as 930 but without SWR meter, r.f. gain control $160.00

CB-910. Same as 920 but without LED readout with dimmer $150.00

AM/SSB

CB-950 AM/SSB Mobile

40-channel AM coverage, 40-channel USB & LSB; digital synthesizer; 4-W r.f. output (AM), 12-W p.e.p. (SSB); sensitivity 0.5 μV (AM), 0.25 μV (SSB) at 10 dB S + N/N; selectivity −50 dB ±10 kHz; clarifier range +600 Hz; dual-conversion receiver (AM), single (SSB); audio output 3.5 W; p.a. facilities; a.n.l.; automatic mod. control on SSB; automatic level control on SSB; LED digital channel readout with dimmer control; illuminated S/RF/SWR meter; SWR calibrator; r.f. gain control; external speaker jack; 13.8 V d.c. negative- or positive ground $320.00

BROWNING

Sabre 40-Ch Mobile Transceiver

40-channel coverage; digital synthesizer; 3.5 W r.f. output; spurious emission −55 dB; 100% mod. with

speech compressor; sensitivity 0.5 μV at 10 dB S + N/N; adj. channel rejection 55 dB; squelch sensitivity 0.1 μV (threshold); switchable noise blanker; switchable noise limiter with variable a.n.l.; audio output 7 W into 8 ohms; p.a. facilities; LED readout; comes with chrome mounting bracket, mike with coiled cord and connector, tamperproof bolts with spanner wrench, spare fuses; 13.8-V positive- or negative-ground; 9.34″ D × 6.92″ W × 2.34″ H $239.95

SST Mobile Transceiver

All-solid-state with a high-level, 5 stage IC speech compressor driven by 7.5 W of class-B audio output. 3.5 W minimum r.f. power output; continuously variable delta tuning through 3 kHz; 23 channels (all crystals supplied); illuminated S/RF meter and channel selector; operates from either positive- or negative-ground supplies; regulated power supply insures constant output from 11.5 V to 16 V; p.a. function; comes with plug-in dynamic mike with coiled cord and bracket, multi-position mounting hardware $189.95

A NOTE TO OUR READERS .....

Some of the 40-channel CB transceivers listed had not received FCC Type Approval at the time product material was received for listing. Most of these undoubtedly received type approval in the interim period. Note that any 40-channel model legally offered for sale has received the necessary type approval and is so marked on chassis.

AM/SSB

LTD SSB/AM Mobile Transceiver
Solid-state unit covers all 23 channels plus upper and lower sidebands for 69-channel capability; 12 watts p.e.p. SSB r.f. output, 3.8 watts AM; features double superhet with frequency synthesis; adjacent-channel rejection 70 dB minimum; SSB sensitivity 0.25 μV/10 dB S + N + D/N + D; AM sensitivity 0.5 μV/12 dB S + N/N; 13.8 volt power supply; comes with mike, mounting bracket; 2.36″ H × 6.49″ W × 9.87″ D (less knobs) $359.95

CB CO-PILOT

14T270 CB Transceiver
40-channel frequency synthesized design; r.f. power output 4 W; receiver sensitivity 0.5 μV for 10 dB

S+N N; squelch sensitivity 0.5-100.0 μV; adjacent channel rejection −50 dB; spurious rejection −40 dB; audio output 3 W; illuminated S/RF/SWR meter; SWR calibration control; external speaker jack; noise blanker switch; delta tune switch; local/distant switch; switchable a.n.l; built-in a.l.c.; p.a. speaker jack; 12-V d.c. negative/positive ground; microphone bracket; underdash mounting bracket; 8¼″ × 7″ × 2 5/16″ $199.95
14T260. Similar to 14T270 except with illuminated S/RF meter; external speaker jack, transmit light, illuminated channel indicator; 7⅞″ × 6⅜″ × 2¼″ $174.95

COBRA

32 XLR 40-Ch Mobile
40-channel coverage; 4-W r.f. power output; sensitivity 0.5 μV; selectivity −6 dB at 4 kHz, −50 dB at 20 kHz; image rejection −40 dB; delta tune range ±1500 Hz; audio output 3 W into 8 ohms; Scan Alert for automatic monitoring of Ch 9; illuminated SWR/RF/S meter; LED channel readout; switchable noise blanking & limiting; p.a. capability; external speaker jack; detachable dynamic mike; 13.8-V d.c. positive- or negative-ground; 9.35″ D × 7.52″ W × 2.36″ H $279.95

29 XLR 40-Ch Mobile
40-channel coverage; 4-W r.f. power output; sensitivity 1.0 μV; selectivity −6 dB at 7 kHz, −60 dB at

10 kHz; image rejection −50 dB; delta tune range ±1.5 kHz; audio output 4 W into 8 ohms; LED channel selector; RF/S/SWR meter; r.f. gain control; mod. light; hash filter; switchable noise blanking & limiting; adjustable squelch; p.a. capability; 13.8 V d.c. positive- or negative-ground; 9.53″ D × 7.28″ W × 2.20″ H $229.95

29 CB Radio
23-channel mobile unit featuring "Dyna-Mike" gain control for 100% modulation; crystal filter; illuminated Power/S meter; double-conversion receiver; sensitivity 1 μV for 10 dB (S + N)/N; selectivity 6 dB at 4 kHz; adjustable squelch; a.g.c.; noise blanker; built-in speaker; PA/external speaker jack; plug-in dynamic mike. 2¼″ H × 6⅞″ W × 8½″ D. 5½ lbs $219.95

85 Base/Mobile
23-channels; 4 W r.f. output; 100% modulation with speech using built-in Dyna-boost circuitry; receiver sensitivity 0.5 μV nominal; selectivity −6 dB at 4 kHz, −40 dB at 20 kHz; image rejection −40 dB; i.f. rejection −80 dB; operates from ±12 V d.c. or 117 V a.c. (detachable power cords supplied); S/Power meter; plug-in mike; 10¼″ W × 6″ H × 8¼″ D $189.95

21 XLR 40-Ch Mobile
40-channel coverage; 4-W r.f. output; sensitivity 1.0 μV; selectivity −6 dB at 7 kHz, −40 dB at 10 kHz; image rejection −80 dB; audio output 4 W into 8 ohms; gain control; adjustable squelch; switchable noise limiting; LED channel readout; S/RF meter; p.a. capability; plug-in mike; 13.8 V d.c. positive- or negative-ground; 9.53″ D × 6.25″ W × 2.125″ H $179.95

21 CB Radio
23-channel mobile unit featuring "Dyna-Mike" gain control for 100% modulation; crystal filter; illuminated Power/S meter; dual-conversion receiver; 60 dB adjacent-channel rejection; switchable a.n.l.; adjustable squelch; a.g.c.; built-in speaker; PA/external speaker jack; plug-in dynamic mike. 2½″ H × 6″ W × 7½″ D. 3.5 lbs $169.95

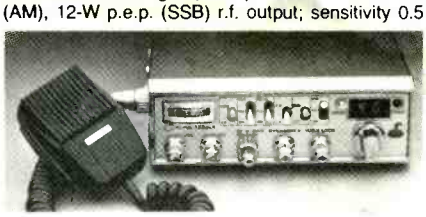
77X 40-Ch Mobile
40-channel coverage; 4-W r.f. output; sensitivity 1.0 μV; selectivity 6 dB at 7 kHz, −60 dB at 10 kHz; image rejection −50 dB; audio output 4 W; adj. squelch; switchable noise limiting; RF/S meter; p.a. capability; plug-in mike; 13.8 V d.c. positive- or negative-ground; 8.5″ D × 5.75″ W × 2.25″ H $149.95

19 Mobile
Compact 23-channel mobile operates from ±12 V d.c.; 100% modulation with speech using built-in Dynaboost circuitry; receiver sensitivity 0.5 μV nominal; selectivity −6 dB at 4 kHz, −40 dB at 20 kHz; image rejection −30 dB; i.f. rejection −80 dB; audio output 3.5 W typical; illuminated channel selector; plug-in mike; 5.2″ W × 1.5″ H × 8″ D $129.95

AM/SSB

138 AM SSB Mobile
AM/LSB/USB for 69 channel capability; 12 V d.c. operation; features illuminated channel selector and meter; volume control plus squelch control with threshold adjustable below 1 μV; delta tune; r.f. gain control; noise limiter; noise blanker; "Dyna-Mike" gain control; CB/PA switch; plug-in mike; extension speaker output; SSB sensitivity 0.25 μV; SSB selectivity −6 dB at 4.2 kHz, −60 dB at 7 kHz; image rejection −50 dB; delta tune range ±600 Hz; SSB carrier suppression −40 dB; 2.5″ H × 7.5″W × 10.5″ D $339.95
139. Same as 138 except 12 V d.c. negative-ground/120 V a.c. operation; 5.75″ H × 13⅜″ W × 12⅝″ D $419.95

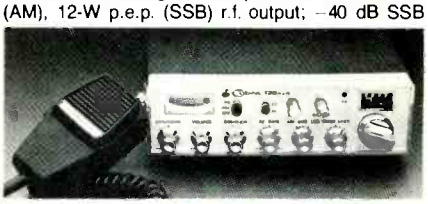
132 XLR AM/SSB Mobile
40-channel coverage on AM plus LSB & USB; 4-W (AM), 12-W p.e.p. (SSB) r.f. output; sensitivity 0.5



μV (AM), 0.25 μV (SSB); image rejection −50 dB; voice lock ±1.5 kHz, ±1 kHz (SSB); audio output 3 W; four-way meter; r.f. gain control; noise blanking; a.n.l.; illuminated LED channel readout; 13.8 V d.c. positive- or negative-ground; 10.94″ D × 7.52″ W × 2.36″ H $399.95

132 AM/SSB CB Radio
Features 23 AM and 46 SSB channels; crystal synthesizer. 13.8 V d.c. (positive or negative ground) operation; 4-W r.f. output (AM), 12 W p.e.p. (SSB); Power/S meter; receiver sensitivity: SSB 0.25 μV for 10 dB (S + N)/N (0.5 μV for AM); automatic gain control; adjustable squelch; noise blanker; audio output 3 W at 8 ohms; p.a. capability; with mike. 2⅜″ × 7½″ × 10⅜″ D $379.95

138 XLR 40-Ch AM/SSB Mobile
40-channel coverage on AM plus LSB & USB; 4-W (AM), 12-W p.e.p. (SSB) r.f. output; −40 dB SSB



carrier suppression; sensitivity 0.75 μV (AM), 0.25 μV (SSB); image rejection −50 dB; voice lock ±600 Hz; audio output 3.5 W into 8 ohms; switchable noise blanking & limiting; adjustable squelch; r.f. gain control; p.a. capability; tone control; LED channel readout; 13.8-V d.c. positive- or negative-ground; 10.5″ D × 7.875″ W × 2.375″ H $349.95

COLT

450 40-Ch. Mobile Transceiver
40-channel coverage; digital synthesizer; 4 W r.f. power output; sensitivity 0.5 μV at 10 dB S + N/N; adj. channel rejection −60 dB; selectivity −50 dB at ±10 kHz; image rejection +50 dB; delta tune +1.5 kHz; dual-conversion receiver; audio output 4.5 W at 6% dist.; spurious emissions −64 dB; frequency tolerance ±0.002%; max. modulation 95%; p.a. facilities; switchable a.n.l. and noise blanker; squelch; external speaker jack; S/RF meter; r.f. gain control; digital LED selector; mike gain control; Rx & Tx lamps; 7 11/16″ D × 7⅞″ W × 2 9/16″ H $229.95

290 40-Ch. Mobile Transceiver
40-channel coverage; digital synthesizer; 4 W r.f. power output; sensitivity 0.7 μV at 10 dB S + N/N; adj. channel rejection −60 dB; selectivity −50 dB ±10 kHz; image rejection +50 dB; dual-conversion receiver; audio output 4.5 W at 10% dist.; spurious emissions −65 dB; max. modulation 95%; p.a. facilities; switchable a.n.l. & noise blanker; squelch; external speaker jack; S/RF meter; r.f. gain control; digital LED selector; Tx lamp; 7½″ D × 6″ W × 2″ H $199.95

280 Mobile Transceiver
23-channel coverage; digital synthesizer; 4 W r.f. power output; sensitivity 0.5 μV at 10 dB S + N/N; adj. channel rejection −60 dB; selectivity −50 dB at ±10 kHz; image rejection +50 dB; delta tune +1.5 kHz; dual-conversion receiver; audio output 4.5 W at 10% dist.; spurious emissions −50 dB; frequency tolerance ±0.002%; max. modulation 95%; p.a. facilities; switchable a.n.l. & noise blanker; squelch; external speaker jack; S/RF meter; Rx & Tx lamps; 7 11/16″ D × 7⅞″ W × 2 9/16″ H $159.95

AM/SSB

480SSB Transceiver
Mobile unit; digital synthesizer; 4 W r.f. power output (AM), 12 W (SSB); sensitivity 1.0 μV (AM), 0.5 μV (SSB) at 10 dB S + N/N; adj. channel rejection −65 dB; selectivity −55 dB at ±10 kHz; image rejection −65 dB; dual-conversion receiver; frequency tolerance ±0.002%; 95% max. modulation; has p.a. facilities; switchable a.n.l. & noise blanker; squelch; external speaker jack; S/RF meter; r.f. gain control; LED channel selector; mike gain control; Rx & Tx lamps; 10″ D × 7½″ W × 7⅜″ H $349.95

COMMANDO

CC-5010 AM-FM Stereo/CB Unit
40-channel coverage; digital synthesizer; 4-W r.f. power; sensitivity 1.0 μV at 10 dB S + N/N; adjacent channel rejection −60 dB at 10 kHz; audio out-

put 3.5 W at 10% dist.; 60% max. modulation; FM sensitivity 1.8 μV; frequency response 100-8000 Hz; squelch & tone controls; stereo balance control; 12-V d.c. operation; 7.3" W × 7.1" D × 2.0" H $259.95

CC-4055 40-Ch Mobile Transceiver
40-channel coverage; digital synthesizer; 4-W r.f. power; sensitivity 2.0 μV at 10 dB S + N/N; adj.

channel selectivity −60 dB at 10 kHz; audio output 2.0 W at 10% dist.; p.a. facilities; external speaker jack; squelch; delta tune; r.f. gain control; a.n.l.; noise blanker; tone control; S/RF meter; 12-V d.c.; 7.2" W × 6.4" D × 1.9" H $219.95
CC-4050. Similar to CC-4055 but without delta tune, r.f. gain control, a.n.l.; noise blanker, or tone control; 7.7" W × 4.5" D × 1.4" H $179.95

AM/SSB

CC-4086 AM/SSB Mobile Transceiver
40-channel coverage; 4-W r.f. power (AM), 12-W p.e.p. (SSB); digital synthesizer; spurious rejection −50 dB (AM), −50 dB (SSB); carrier suppression −40 dB (SSB); sensitivity 0.5 μV (AM), 0.25 μV (SSB) at 10 dB S + N/N; S/RF meter; external speaker & p.a. jack; squelch control; clarifier; noise blanker, a.n.l., and PA/CB switches; 10-V/15-V d.c. operation $349.95

COURIER

Nightrider 40Dr
40-channel; phase lock loop circuitry; "wireless" de-

sign; LED channel display on microphone; channel selector on mike; r.f. gain control; extra large S/RF meter; tone control; p.a. capability; automatic noise limiter; pos/neg ground $239.95

Classic PLL 40
40-channel; phase lock loop circuitry; large S/RF meter; delta tuning; noise limiter switch; p.a. switch; plug-in microphone; built-in a.c. supply; pos/neg ground $219.95

Rangler 40D
40-channel; phase lock loop circuitry; "wireless" design; LED digital channel display; tone control; transmit light; automatic noise limiter/blanker switch; local/distance switch; p.a. switch; r.f. gain control; automatic modulation circuit; pos/neg ground $199.95

Blazer 40D Mobile Transceiver
40-channel; phase lock loop circuitry; r.f. gain; large S/RF meter; detachable microphone; digital channel display; p.a. switch; automatic noise limiter switch; transmit light; dim/hi switch for channel display; pos/neg ground $149.95

Renegade 40 Mobile Transceiver
40-channel; phase lock loop circuitry; r.f. gain; large S/RF meter; automatic noise limiter switch; detachable mike; transmit light; pos/neg ground .. $129.95

Rogue 40
40-channel; uses LSI chip; phase lock loop circuitry; detachable mike; extra large S/RF meter; p.a. switch; pos/neg ground; automatic noise limiter $119.95

Rebel 40
40-channel; uses digital phase lock loop synthesizer; illuminated S/RF meter; illuminated channel selector knob; adjustable squelch control; p.a. capability $119.95

AM/SSB

Gladiator PLL 40
40-channel; phase lock loop circuitry; single-side band; large S/RF meter; clarifier; r.f. gain control; noise blanker switch; p.a. switch; mode control switch; on-the-air light; plug-in microphone; pos/neg ground $429.95

Spartan PLL 40
40-channel; single-sideband transceiver; phase-lock loop circuitry; S/RF meter; clarifier; local/distance switch; noise blanker switch; p.a. switch; mode control switch; plug-in mike; pos/neg ground . $349.95

CRAIG

L600 AM-FM Stereo/CB Unit
40-channel coverage; digital synthesizer; in-dash mounting; 4-W r.f. power output; sensitivity 0.5 μV at 10 dB S + N/N; adj. channel rejection −60 dB; selectivity −6 dB at ±4 kHz, −50 dB at ±20 kHz; image response −60 dB; dual-conversion receiver; 3.5 W audio output at 10% dist.; adjustable squelch; digital channel readout; local/distance switch; p.a. facilities; 12-V negative-ground operation; 7 1/16" W × 6¼" D × 2⅛" H $279.95
L101. Similar to L600 but without AM-FM stereo re-

ceiver; 13.8-V positive- or negative-ground operation $169.95

AM/SSB

L131 AM/SSB Transceiver
40-channel coverage; digital synthesizer; 4-W (AM), 12-W p.e.p. (SSB) r.f. output; sensitivity 0.5 μV

(AM), 0.2 μV (SSB) at 10 dB S + N/N; adj. channel rejection −60 dB; selectivity −6 dB (AM) at ±4 kHz, −50 dB (SSB) at ±5.5 kHz; clarifier range ±800 kHz; dual-conversion receiver; audio output 3.5 W; spurious response −60 dB; carrier suppression −50 dB; switchable a.n.l. & noise blanker; S/RF/SWR meter; digital channel readout; local/distant switch; positive or negative ground operation; 10¼" D × 8½" W × 2¼" H $359.95

EMERGENCY BEACON

RT-23 CB Transceiver
23-channel coverage with digital synthesizer; r.f. power output 3.75 W; sensitivity 0.5 μV at 10 dB S+N/N; adj. channel rejection −60 dB; selectivity −60 dB at 10 kHz; image response −60 dB; delta tune ±2 kHz; dual-conversion receiver; audio output 4 W at 10% dist.; spurious emissions −60 dB; spurious response −60 dB; 95% max. modulation;

a.n.l.; switchable noise blanker; squelch; external speaker jack; S/RF meter; comes with PTT mike, d.c. power cable, mobile mounting bracket, mike clip; 11.5-14.5 V d.c. switchable negative/positive ground; 10¼" D × 7¾" W × 2⅝" H $249.00

ENDURO

23 Cycle CB Transceiver
23-channel mobile; r.f. power output 4 W; receiver sensitivity 0.7 μV at 10 dB S + N/N; selectivity −6

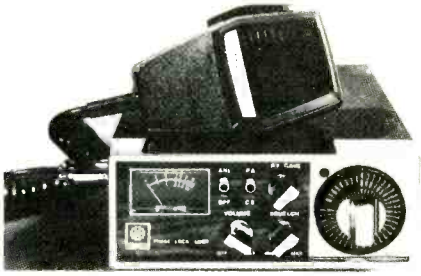
dB at 6 kHz, −60 dB at 30 kHz; spurious rejection 50 dB; audio output 4 W; power 13.8 V d.c. pos./neg.; can be mounted on handlebar or steering wheel; CB/PA and intercom switches; available with two mike connectors and cycle mounting bracket $229.95
Company also offers hand and passenger mikes and headsets, external speakers and mounting brackets for use with the Model 23.

FANON

Fanfare 185FR Mobile CB Transceiver
40-channel; phase lock loop circuitry; "wireless" design; S/RF meter; tone button; noise blanker; automatic noise limiter control; transmit indicator; digital channel display; p.a .button; local/distance switch; automatic modulation circuit; pos/neg ground $199.95

Fanfare 184DF Mobile CB Transceiver
40-channel; phase lock loop circuitry; r.f. gain control; detachable microphone; digital channel display; automatic noise limiter; p.a. switch; transmit light; dim/hi switch for channel display $149.95

Fanfare 182F Mobile Transceiver
40-channel; phase lock loop circuitry; S/RF meter; detachable microphone; p.a. switch; automatic



noise limiter switch; r.f. gain control; positive/neg ground $129.95

Fanfare 125F
40-channel; phase lock loop circuitry; detachable mike; extra large S/RF meter; p.a. switch; pos/neg ground $119.95

Fanfare 100F
40-channel mobile transceiver features phase lock loop circuitry; S/RF meter; adjustable squelch $119.95

AM/SSB

Fanfare 350F Mobile Transceiver
40-channel mobile AM, USB, LSB transceiver features S/RF meter; PA/CB switch; volume control; squelch control; clarifier control; local/distance switch; illuminated channel indicator. 349.95

FULCOMM

15-8200 CB/AM-FM Stereo Radio
23-channel coverage plus AM-FM stereo reception; 4-W r.f. power output; sensitivity 1 μV at 10 dB S + N/N; selectivity −40 dB at ±10 kHz; variable delta tune; digital synthesizer; dual-conversion receiver; 3.5 W audio output at 10% dist.; 100% max. modulation; built-in a.n.l.; squelch; S/RF meter; 8″ D × 7½″ W × 3″ H $329.95

15-2370 Mobile Transceiver
23-channel coverage; 4-W r.f. power output; sensitivity 0.7 μV at 10 dB S + N/N; selectivity −6 dB at ±6 kHz, −50 dB at ±20 kHz; delta tune; dual-conversion receiver; 3 W audio output at 10% dist.; p.a. facilities; switchable a.n.l.; squelch; external speaker jack; S/RF meter; comes with gutter-mount antenna and extension speaker; 13.8-V d.c. .. $196.95

15-2335. Similar to 15-2370 but with antenna warning light, without antenna & speaker; 7¾″ D × 6¼″ W × 2¼″ H $179.95

15-2330. Similar to 15-2335 except without delta tune, a.n.l., antenna & speaker $149.95

15-2301 Mobile Transceiver
23-channel mobile; 4-W r.f. output; 100% modulation; dual-conversion receiver; sensitivity 0.7 μV at

10 dB S + N/N; selectivity −6 dB at ±6 kHz; audio power output 3 W; delta tune; a.n.l.; illuminated S/RF meter; squelch control; mod. indicator; external speaker; p.a. capability; 13.8-V d.c. positive- or negative-ground; 7¾″ D × 6¼″ W × 2¼″ H $169.95

15-2302 Mobile Transceiver
23-channel mobile; 4-W r.f. output; 100% modulation; dual-conversion receiver; sensitivity 0.7 μV at 10 dB S + N/N; selectivity −6 dB at ±6 kHz; audio power output 3 W; illuminated S/RF meter; squelch control; transmit indicator; external speaker jack; p.a. capability; 13.8-V d.c. positive- or negative-ground; 7¾″ D × 6¼″ W × 2¼″ H $139.95

AM/SSB

15-2303 AM/SSB Mobile Transceiver
23-channel AM, 46-channel USB & LSB; 4-W r.f. output (AM), 12-W p.e.p. (SSB); dual-conversion receiver; sensitivity 0.7 μV at 10 dB S + N/N; selectivity −6 dB at ±3 kHz (AM), −6 dB at ±1.2 kHz (SSB); audio output 3 W; noise blanker, noise limiter, r.f. attenuator; fine tune; squelch control; illuminated S/RF meter; transmit indicator; external speaker jack; p.a. capability; quick-release mounting bracket; 13.8-V d.c. positive- or negative-ground; 9¾″ D × 8″ W × 2½″ H $349.95

GEMTRONICS

GTX-3323 Mobile Transceiver
23-channel synthesized mobile unit; 4 W r.f. output; sensitivity 0.7 μV at 10 dB S + N/N; selectivity −6 dB at 6 kHz, −60 dB at 20 kHz; image response −60 dB; audio output 3 W; spurious response −50 db; CB/PA switch; squelch; 3-position delta tune; S/RF meter; 13.8 V d.c. positive- or negative-ground; 8⅔″ D × 6″ W × 2″ H $179.95

GTX-23 "Apache"
23-channel synthesized mobile unit; 4-W r.f. output; sensitivity 0.7 μV at 10 dB S + N/N; selectivity −6 dB at 6 kHz, −60 dB at 20 kHz; image response −60 dB; audio output 3 W; spurious response −50 dB; p.a.; a.n.l.; squelch; auto. mod. limiter; 3-position delta tune; external speaker & p.a. jacks; S/RF meter; 13.8 V d.c. positive- or negative-ground; 8⅔″ D × 6″ W × 2″ H $169.95

GTX-3336 Mobile Transceiver
23-channel synthesized mobile unit; 4 W r.f. output; sensitivity 0.7 μV at 10 dB S + N/N; selectivity −6 dB at 6 kHz, −60 dB at 20 kHz; image response −60 dB; audio output 3 W; spurious response −50 dB; p.a.; PTT mike; squelch; 13.8 V d.c. positive- or negative-ground; 8⅔″ D × 6″ W × 2″ H $139.95

GTX-36 "Comanche"
23-channel synthesized mobile unit; 4-W r.f. output; sensitivity 0.7 μV at 10 dB S + N/N; selectivity −6 dB at 6 kHz, −60 dB at 20 kHz; image response −60 dB; 3-W audio output; spurious response −50 dB; p.a.; a.n.l.; squelch; auto. mod. limiter; built-in speaker; S/RF meter; 3-position delta tune; external speaker & p.a. jacks; 13.8-V d.c. positive- or negative-ground; 8⅔″ D × 6″ W × 2″ H $139.95

AM/SSB

GTX-2325 "Cherokee"
69-channel capability; suppressed carrier SSB; 4-W r.f. output (AM), 12-W p.e.p. (SSB); selectivity −6 dB at ±3 kHz, −50 dB at ±10 kHz (AM), −6 dB at ±1.2 kHz −50 dB at ±2.3 kHz (SSB); single-conversion receiver (SSB), dual-conversion (AM); 2-W audio output; p.a.; a.n.l.; squelch; auto. mod. limiter; built-in speaker; S/RF meter; r.f. attenuator; 13.8-V d.c. negative-ground; 9¼″ D × 8″ W × 2¼″ H $369.95

GENERAL ELECTRIC

3-5821 40-Ch Mobile Transceiver
40-channel coverage; digital synthesizer; 4-W r.f. output; sensitivity 1 μV at 10 dB S + N/N; adjacent channel rejection −50 dB; image response −40 dB; delta tune ±1.5 kHz; dual-conversion receiver; audio output 2.2 W at 10% dist.; spurious emissions −60 dB; spurious response −40 dB; 95% max. modulation; p.a. facilities; a.n.l.; noise blanker; squelch; external speaker jack; S/RF meter; r.f. gain control; quick-release mounting system; LED channel indicators; priority channel feature; 9.75″ D × 7.5″ W × 2.37″ H $239.95

3-5819 40-Ch Mobile Transceiver
40-channel coverage; digital synthesizer; 4-W r.f. output; sensitivity 1 μV; adj. ch rejection −50 dB; image response −40 dB; delta tune ±1.5 kHz; dual-conversion receiver; audio output 2.2 W at 10% dist.; spurious emissions −60 dB; spurious response −40 dB; 95% max. modulation; p.a. facilities; switchable a.n.l. & noise blanker; squelch; external speaker jack; SWR meter; S/RF meter; r.f. gain control; quick-release mounting system; LED channel indicators; 8.5″ D × 7.12″ W × 2.5″ H $219.95

3-5812. Same as 3-5819 but without SWR meter, LED channel indicators, or r.f. gain control; 8″ × 6.5″ W × 2.25″ H $174.95

3-5811. Same as 3-5812 but without delta tune, a.n.l., noise blanker; 8.75″ D × 6.5″ W × 2.25″ H $159.95

3-5801. Same as 3-5811 but without p.a. facilities;

8″ D × 5″ W × 2″ H $134.95

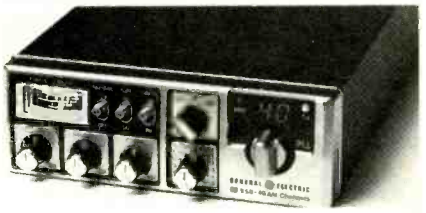
Portables

3-5975 Hand-Held Transceiver
3-channel coverage with crystal control; r.f. power output 1.2 W; single conversion receiver; has a.g.c., variable squelch; channel select switch; LED battery check, separate microphone and speaker, external power and antenna jacks, earphone jack, 44-in telescoping whip antenna; comes with crystals for Channel 14, shoulder strap, and detachable battery magazine; powered by 12 "AA" cells (extra); 2⅛″ D × 3½″ W × 10″ H $48.00

3-5970 Hand-Held Transceiver
Two-channel capability; superhet receiver; squelch and volume controls; jacks for optional accessories; alert system for initiating calls; front-mounted compartment for 9-V battery (not included) and two pair of crystals; crystals for Channel 14 included; LED battery-level indicator $30.00

AM/SSB

3-5825 AM/SSB Mobile Transceiver
Digital synthesizer; AM r.f. power output 4 W; 12 W p.e.p. (SSB); sensitivity 0.5 μV (AM), 0.25 μV (SSB)



at 10 dB S + N/N; adj. channel rejection −50 dB; image response −35 dB; clarifier range ±1350 Hz; single-conversion receiver; audio output 3.5 W at 10% dist.; spurious response −40 dB; carrier suppression −40 dB; 95% max. modulation; p.a. facilities; switchable a.n.l. & noise blanker; squelch; external speaker jack; S/RF meter; r.f. gain control; LED channel indicator; 10⅝″ D × 7½″ W × 2½″ H $329.95

GLOBE

18-9300 Mobile Transceiver
40-channel coverage; digital synthesizer; 4-W r.f. output; sensitivity 0.7 μV at 10 dB S + N/N; adj. channel rej. −55 dB; selectivity ±6 dB at 3.5 kHz; image response −50 dB; dual-conversion superhet; audio output 3.2 W at 10%, 4 W max; spurious emissions −60 dB; spurious response −55 dB; 100% max. modulation; p.a. facilities; switchable a.n.l. and noise blanker; squelch; external speaker jack; S/RF meter; 13.8 V d.c. positive or negative ground; 10½″ D × 8″ W × 2¾″ H $250.00

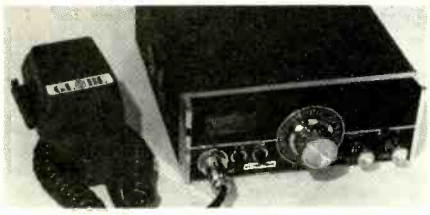
18-9260 Mobile Transceiver
40-channel coverage; digital synthesizer; 4-W r.f. output; sensitivity 0.26 μV at 10 dB S + N/N; adjacent channel rejection −70 dB; selectivity ±6 dB at 3.5 kHz; image response −50 dB; dual-conversion receiver; audio output 3.3 W at 10% dist.; spurious emissions −60 dB; spurious response −55 dB; 100% max. modulation; p.a. facilities; switchable a.n.l.; squelch; external speaker jack; S/RF meter; r.f. gain control; 3 ceramic crystals in i.f. section; 13.8 V d.c. positive or negative ground; 7″ D × 7″ W × 3″ H $230.00

18-9250 Mobile Transceiver
23-channel coverage; digital synthesizer; 4-W r.f. output; sensitivity 0.5 μV at 10 dB S + N/N; adj. channel rejection −50 dB; selectivity ±6 dB at 3.5 kHz; image response −50 dB; dual-conversion receiver; audio output 3.3 W at 10% dist.; spurious emissions −60 dB; spurious response −55 dB; p.a. facilities; switchable a.n.l.; squelch; external speaker jack; S/RF meter; r.f. gain control; 13.8 V d.c. positive or negative ground; 7″ D × 7″ W × 3″ H $200.00

18-9200 Mobile Transceiver
40-channel coverage; digital synthesizer 4-W r.f. output; sensitivity 0.7 μV at 10 dB S + N/N; adj. channel rejection −50 dB; selectivity ±6 dB at 3.5 kHz; image response −45 dB; dual-conversion receiver; audio output 3.2 W at 10% dist.; spurious emissions −60 dB; spurious response −50 dB; 100% max. modulation; p.a. facilities; switchable a.n.l.; squelch; external speaker jack; S/RF meter; 13.8 V d.c. positive or negative ground; 7¼″ D × 6½″ H × 2¼″ H $190.00

18-9001 Mobile Transceiver
23-channel crystal synthesized unit; 4-W r.f. output; spurious suppression 50 dB; mod. capability 100%; dual-conversion superhet receiver; bandwidth 5 kHz at 6-dB down; spurious response rejection 45 dB; sensitivity 0.75 μV at 10 dB S + N/N; squelch range 0.5-500 mV; adj. channel rejection 60 dB; delta tune ±1 kHz; a.g.c.; S/RF meter; a.n.l.; PA/CB switch; external speaker jack; comes with plug-in mike, mounting bracket, hardware $169.95

18-9000 Mobile Transceiver
23-channel crystal synthesized unit; 4-W r.f. output; spurious suppression 50 dB; a.g.c.; a.n.l.; S/RF me-



ter; dual-conversion superhet receiver; sensitivity 0.75 μV at 10 dB S + N/N; bandwidth 5 kHz at 6-dB down; adj. channel rejection 60 dB; max. audio output 3 W; spurious response rejection 45 dB; squelch range 0.5 to 500 μV; PA/CB switch; comes with plug-in mike, mounting bracket, hardware . $159.95

HY-GAIN

2679 Mobile Transceiver
23-channel coverage; r.f. power out 4 W; sensitivity 0.7 μ V at ±10 dB S + N/N; adj. channel rejection −40 dB; selectivity −50 dB at ±10 kHz; image response −40 dB; digital synthesizer; dual-conversion receiver; 3 W audio output at 10% dist.; spurious response −40 dB; 95% max. modulation; a.n.l.; squelch; external speaker jack; remote controlled LED readout; 13.8 V d.c.; 8¾″ D × 8″ W × 2½″ H $239.95

2703 Mobile Transceiver
40-channel coverage; r.f. power out 4 W; sensitivity 0.7 μV at 10 dB S + N/N; adj. channel rejection −40 dB; image response −40 dB; selectivity −50 dB at ±10 dB; dual-conversion receiver; audio output 3 W at 10% dist.; spurious response −40 dB; 95% max. modulation; p.a. facilities; switched a.n.l./noise blanker; squelch; external speaker jack; s.w.r. meter; S/RF meter; r.f. gain control; LED readout; 13.8 V d.c.; 9⅝″ D × 7⅛″ W × 2¼″ H $229.95
2702. Same as 2703 but without s.w.r. meter or noise blanker; 7⅝″ D × 6⅜″ W × 2¼″ H $189.95
2701. Same as 2702 but without p.a. facilities, built-

in a.n.l.; r.f. gain control, and LED readout . $139.95

2710 Mobile Transceiver
40-channel coverage; r.f. power out 4 W; sensitivity 0.7 μV at 10 dB S + N/N; adj. channel rejection −40 dB; image response −40 dB; dual-conversion receiver; audio output 3 W at 10% dist.; spurious response −40 dB; digital synthesizer; 95% max. modulation a.n.l.; squelch, external speaker jack; remote control; 13.8 V d.c.; 8¾″ D × 8″ W × 2½″ H $199.95

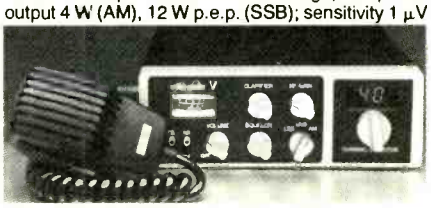
Portables

1292 6-Channel Portable
6-channel, crystal-controlled portable; 2.5 W r.f. power output; 1.0 μV sensitivity at 10 dB S + N/N; adj. channel rejection −30 dB; selectivity −40 dB; image response −10 dB; single-conversion receiver; 2.3 W audio output at 10% dist.; spurious response −40 dB; 95% max. modulation; a.n.l.; squelch; external speaker jack; S/RF meter; optional speaker/mike, internal/external speaker sw. available extra; channel 11 crystal included; 9-15 V d.c. battery pack; 11″ H × 3½″ D × 3¼″ H . $109.95
1291. Similar to 1292 except 3 channels; 1 W r.f.

power output; 0.8 W audio output at 10% dist $79.95

AM/SSB

2705 SSB Transceiver
40-channels plus USB/LSB coverage; r.f. power output 4 W (AM), 12 W p.e.p. (SSB); sensitivity 1 μV



(AM), 0.25 μV (SSB) at 10 dB S + N/N; adj. channel rejection −40 dB; selectivity −6 dB at ±6 kHz (AM), −6 dB at 2.4 kHz (SSB); image response −10 dB (SSB), −40 dB (AM); clarifier range ±600 Hz; dual-conversion AM receiver, single (SSB); audio output 3 W; spurious response −40 dB; carrier suppression −40 dB; digital synthesizer; 95% max. modulation; p.a. facilities; a.n.l.; external speaker jack; S/RF meter; r.f. gain control; 13.8 V d.c.; 11½″ D × 8½″ W × 2¾″ H $359.95

J.I.L.

860CB CB/AM-FM Stereo/8-Track

Combines 40-channel CB coverage with AM-FM stereo receiver, and 8-track stereo cartridge player; CB function controls on mike include channel selector, LED channel readout, r.f. gain, PTT switch; front-panel controls for squelch, standby monitor, Rx & Tx indicator lights; receiver has selector switch, manual tuning, local/distant switch, stereo indicator light, antenna trimmer; cartridge player has dial-in-door cartridge slot, channel indicator lights, manual track selector, volume with bass boost, balance & tone controls; 7″ W × 7″ D × 2″ H $349.95
615CB. Similar to 860CB but includes eject/fast-forward button, tape play indicator; 7½″ W × 7″ D × 2″ H $359.95

E.F. JOHNSON

Messenger 4175 40-Ch Mobile
40-channel coverage; 4-W r.f. output; sensitivity 0.5 μV at 10 dB S + N/N; selectivity −5 dB at ±6 kHz,

−60 dB at ±20 kHz; 3 W audio output; digital synthesizer; 100% max. modulation; switchable noise blanker; p.a. facilities; squelch; external speaker jack; S/RF "bar-graph" LED meter; digital channel indicator; 13.8 V d.c. positive- or negative-ground; 9.9″ D × 8.0″ W × 2.25″ H $249.95

Messenger 4170 40-Ch Mobile
40-channel coverage; 4-W r.f. output; sensitivity 0.5 μV at 10 dB S + N/N; selectivity −6 dB at ±6 kHz, −60 dB at ±20 kHz; 3 W audio output; digital synthesizer; 100% max. modulation; tapered automatic noise limiter & noise blanker; local/normal/extended range control switch; vane-type S/RF meter; electronic speech compression; p.a. facilities; external speaker jack; digital channel indicator; 13.8-V d.c. positive- or negative-ground; 9.9″ D × 8.0″ W × 2.25″ H $249.95

Messenger 4145 40-Ch Mobile
40-channel coverage; 4-W r.f. output; sensitivity 0.5 μV at 10 dB S + N/N; selectivity −6 dB at ±6 kHz, −60 dB at 30 kHz; 3-W audio output; digital synthesizer; 100% max. mod.; p.a. facilities; squelch; external speaker jack; "bar-graph" LED S/RF meter; LED channel readout with brightness control; 13.8-V d.c. positive- or negative-ground; 8.9″ D × 6.2″ W × 2.0″ H $179.95
Messenger 4140. Same as 4145 except vane-type S/RF meter; tapered automatic noise limiter $179.95
Messenger 4120. Similar to 4145 except no a.n.l. or noise blanker; no meter $129.95

Messenger 120A Mobile Transceiver
5 channels with selective calling; r.f. power output 4 W; sensitivity 0.5 μV at 8 dB S + N/N; selectivity −6 dB at ±6 kHz; adjacent channel rejection −50 dB; image response −10 dB; single-conversion receiver; audio output 2.5 W at 10% dist.; spurious response −50 dB; has a.n.l.; squelch; automatic modulation limiting; built-in speaker; pushbutton channel selection; speech compression; "tone alert"; call light; requires 1.2 A max. at 13.8 V d.c.; comes with crystals for Ch. 11; 9″ D × 6 3/16″ W × 2″ H $149,95

AM/SSB

Viking 4740 AM/SSB Mobile
4-W (AM), 12-W (SSB) r.f. output; sensitivity: 0.5 μV (AM), 0.3 μV (SSB) at 10 dB S + N/N; selectivity −6 dB ±6 kHz (AM), −60 dB ±30 kHz (SSB); clarifier range ±1350 Hz; digital synthesizer max. mod. 100%; p.a. facilities; built-in a.n.l.; switchable noise

blanker; squelch; external speaker jack; S/RF meter; r.f. gain control; digital channel indicator; 10.7" D × 7.5" W × 2.4" H $359.95

KALIMAR

K-740 Mobile Transceiver

40-channel dual-conversion unit with phase-locked loop digital synthesizer; 3.6 W r.f. output; sensitivity 0.7 μV at 10 dB S + N/N; −55 dB adjacent channel rejection; delta tune ±1 kHz; 3 W audio output; spurious emissions 70 dB; 0.002% frequency tolerance; 85% modulation; 13.8 V d.c. power source; p.a.; switchable automatic noise limiter; squelch control; external speaker jack; S/RF meter; r.f. gain control; digital channel indicator; 9½" D × 6½" W × 2⅞" H $239.95

K747 Mobile Transceiver

23-channel synthesized unit; 4-W r.f. output; dual-conversion superhet receiver; sensitivity 1 μV at 10 dB S/N; 3.5 W audio output; a.n.l.; squelch control; S/RF meter; delta tuning; comes with mike, mike hanger, mobile mounting bracket, d.c. power cord; 9½" D × 6½" W × 2 7/16" H $169.95

K727. Similar to K747 except does not include delta tune $149.95

KRACO

KCB-4030 40-Ch Mobile Transceiver

40-channel coverage; digital synthesizer; illuminated S/RF meter; delta tune; variable volume,

squelch, fine tune, r.f. gain controls; rotary switches for a.n.l. & noise blanker, CB/PA functions; Tx & Rx indicator lamps; detachable dynamic mike; designed for under-dash mounting $219.95

KCB-4020. Similar to 4030 but without noise blanker, r.f. gain control, Tx & Rx indicator lamps $179.95

KCB-4010. Basic unit with built-in a.n.l. circuit; p.a. switch; S/RF power meter; detachable mike $139.95

KRIS

23+ Base/Mobile Transceiver

Base/mobile transceiver; 4 W r.f. output; sensitivity 0.7 μV at 10 dB S + N/N; adj. channel rejection −45 dB; selectivity −6 dB ±6 kHz; image response −75 dB; dual-conversion receiver; delta tune ±2.5 kHz; audio output 4 W at 10% dist.; spurious emission −50 dB below carrier; spurious response −75 dB; synthesizer; a.n.l.; squelch; auto. modulation limiter; built-in speaker; S/RF meter; standby switch; mod. indicator; vacuum tube and transistor inverter; TVI trap; 117 V a.c. or 13.8 V d.c.; 6 A max. drain on 13.8 V d.c.; 12" W × 8.25" D × 5" H $259.95

XL-30 Mobile Transceiver

23-channel coverage; digital synthesizer; 4-W r.f. output; sensitivity 0.5 μV at 10 dB S + N/N; adj. channel rejection −60 dB; selectivity −6 dB at ±5 kHz; image response −25 dB; delta tune ±1 dB; dual-conversion receiver; audio output 3 W at 10% dist.; spurious emissions −50 dB below carrier; spurious response −50 dB; max. mod. 100% peak; p.a. facilities; a.n.l.; noise blanker (switchable); squelch; external speaker jack; S & RF meters; r.f. gain control; modulation meter; intercom facilities; digital channel readout; tone control; mike compressor; 9.5" D × 8.9" W × 3" H $249.95

XL-25. Similar to XL-30 except crystal synthesizer; no modulation meter, tone control, or mike compressor; 8.4" D × 6.5" W × 2.3" H $199.95

Victor II Mobile Transceiver

23-channel synthesized mobile transceiver; 4 W r.f. output; sensitivity 0.5 μV at 10 dB S + N/N; adj. channel rejection −70 dB; spurious emission −50 dB below carrier; spurious response −45 dB; 3 W audio output at 10% dist.; p.a.; a.n.l.; squelch; built-in speaker; S meter; LED channel readout; S-meter jack; 13.8 V d.c.; structural foam cabinet; 8.5" D × 7.625" W × 2.75" H. $229.95

Victor I. Similar to Victor II except has mike gain control but without LED readout $199.95

XL-23 Mobile Transceiver

23-channel synthesized mobile transceiver; 4 W r.f. output; sensitivity 0.5 μV at 10 dB S + N/N; adjacent channel rejection −60 dB; selectivity −6 dB at ±5 kHz; image response −45 dB; dual-conversion receiver; 3 W audio output at 10% dist.; spurious emissions −50 dB below carrier; spurious response −45 dB; p.a.; a.n.l.; squelch; auto. modulation limiter; built-in speaker; S/RF meter; S-meter jack; internal/external spkr. switch; 13.8 V d.c.; 8.375" D × 6.5" W × 2.25" H $179.95

"Tag-A-Long"

Combines XL-23 mobile transceiver and black leatherette travel case with mike, two 2" × 6" speakers, built-in antenna, and d.c. power cord with cigarette lighter adapter plug; permits transceiver to be unplugged and carried to home or office; for multi-car families, car rental users, and truckers $219.95

XL-40 Mobile Transceiver

40-channel coverage; digital synthesizer; 4-W r.f. output; sensitivity: 0.5 μV at 10 dB S + N/N; adjacent channel rejection −60 dB; selectivity −6 dB at ±5 kHz; image response −25 dB; dual-conversion receiver; audio output 3 W at 10% dist. spurious emissions −60 dB below carrier; spurious response −50 dB; p.a. facilities; switchable a.n.l.; squelch; external speaker jack; S/RF meter; 8.4" D × 6.5" W × 2.3" H $179.95

XL-45. Similar to XL-40 except delta tune ±1 kHz; a.n.l. and noise blanker (both switchable); intercom facilities; digital readout $229.95

XL-50. Similar to XL-45 except image response −45 dB; spurious response −55 dB; modulation meter; r.f. gain control; tone control; 9.5" D × 8.9" W × 3" H $259.95

AM/SSB

XL-70 Mobile AM/SSB Transceiver

23-channels plus USB and LSB; 4-W r.f. output (AM), 12 W p.e.p. (SSB); sensitivity 0.7 μV at 10 dB S + N/N, 0.2 μV at 10 dB S + N/N (SSB); adjacent channel rejection −65 dB; selectivity −6 dB ±3 kHz (AM), −6 dB ±1.2 kHz; image response −75 dB; clarifier range ±1 kHz; dual-conversion receiver; 2 W audio output at 10% dist.; spurious response −60 dB; carrier suppression −45 dB; p.a.; a.n.l.; noise blanker; squelch; auto mod. limiter; built-in speaker; S/RF meter; r.f. gain control; S-meter jack; internal/external speaker switch; 9.375" D × 8.25" W × 2.688" H $359.95

LAFAYETTE

HB-940 40-Ch Mobile Transceiver

40-channel coverage; digital synthesizer; 4-W r.f. output; 90% AM modulation; sensitivity 0.7 μV at 10 dB S + N/N; selectivity −45 dB down at ±10 kHz; spurious response −50 dB; audio output 3 W into 8 ohms; LED digital channel readout; switchable noise blanker & a.n.l.; SWR/Cal control; r.f. gain control; delta fine tuning; switchable CB/PA modes; variable squelch; Tx & Rx indicator lights; SWR/RF meter; range-boost circuit; comes with dynamic mike, mobile mounting bracket, d.c. line cord; 12-V d.c. positive- or negative-ground $199.95

HB-740. Similar to HB-940 but without LED digital

readout; has switchable local/distance functions $159.95

HB-640. Similar to HB-740 but without noise blanker, Rx indicator light; has automatic modulation limiter $119.95

Com-Phone 23 Mobile Radio

Handset-style 23-channel mobile transceiver; all crystals included; handset/speaker switch permits private listening; features "range boost" circuitry; dual-conversion receiver with 1 μV sensitivity at 10 dB S/N; variable squelch; illuminated channel indicator; p.a. switch; a.n.l.; operates on 12-V d.c.; comes with universal mounting bracket; 3½" H × 5⅜" W × 10" D $99.77

PORTABLES

Dyna-Com 23 CB Portable Radio

Hand-held, 23-channel crystal-controlled portable with external mike/speaker jack; operates from 12 nickel-cadmium rechargeable batteries or 10 "AA" alkaline or dry-cell batteries; optional eliminator/charger permits 117-volt a.c. base-station operation; combined S meter/battery-condition indicator; speech compressor; automatic noise limiter; variable squelch; p.a. facilities; dual-conversion superhet; 0.7 μV sensitivity at 10 dB S + N/N; supplied with all crystals $159.95

Dyna-Com 12A CB Portable Radio

Hand-held, 12-channel crystal-controlled portable with provision for optional external mike/speaker; operates on self-contained battery pack with provision for external 12-volt d.c. battery source, battery eliminator/charger for operation on 117-volt a.c. available as optional extra; combination battery/RF/S meter; variable squelch and volume controls; range-boost circuitry; pi-network antenna output; p.a. switch; superhet receiver with 0.7 μV sensitivity at 10 dB S + N/N includes transmit/receive crystals for channel 10, telescoping whip antenna .. $109.95

Dyna-Com 3b

3-channel portable transceiver; sensitivity 1 μV at 10 dB S + N/N; selectivity −26 dB at ±10 kHz; adjacent channel rejection −26 dB, image response −18 dB; single-conversion receiver; has a.n.l., squelch, automatic modulation limiting, built-in speaker and S/RF meter (also monitors battery condition); comes with battery charger jack, crystals for one channel; external speaker/earphone and antenna jacks are built-in; operates from 13.8-V d.c. source or built-in battery pack; 2 11/16" D × 3½" W × 10¼" H $74.95

AM/SSB

SSB-50A CB Transceiver

Mobile design (12 V); 23-channel crystal-controlled with AM and SSB modes of operation; sensitivity 0.5 μV on AM (0.15 μV on SSB) at 10 dB S + N/N; delivers 12 W p.e.p. output on SSB; automatic burglar alarm switch; CB/PA switch; mike and all crystals; 7¼" W × 2⅞" H × 9⅞" D $199.97

Telsat SSB-75 Mobile Transceiver

23-channel AM, 46-channel SSB with crystal syn-

thesizer; r.f. power output 4 W (AM); 12 W p.e.p. (SSB); sensitivity 1 μV at 10 dB S + N/N (AM), 0.25 μV at 10 dB S + S/N (SSB); selectivity −6 dB at ±4 kHz; adjacent channel rejection −90 dB; image response −40 dB; spurious response −50 dB; carrier suppression −40 dB; single conversion receiver; has a.n.l., squelch, automatic modulation limiter, v.s.w.r. meter, built-in speaker, S/RF meter, antenna tuning control, headphone/external speaker jack, transmit indicator lamp comes with crystals; 10½" D × 8¾" W × 3" H $159.97

LAKE

3000 Mobile Transceiver
40-channel coverage; digital synthesizer; 4-W r.f. output; sensitivity 1 μV at 10 dB S + N/N; selectivity −50 dB at ±10 kHz; image response −45 dB; delta tune; audio output 3 W, max. modulation 80%; LED channel readout; p.a. facilities; switchable noise blanker; squelch control; external speaker jack; S/RF meter; r.f. gain control; 13.8-V d.c., 8⅞" D × 6⅝ W × 2¼" H $199.95

650 Mobile Transceiver
40-channel coverage; 4-W r.f. output; p.a. facilities; squelch control; LED channel display; 9" D × 6⅝" W × 1⅞" H $129.95

AM/SSB

7000 AM/SSB Mobile Transceiver
40-channel coverage: 4-W (AM), 12-W p.e.p. (SSB) r.f. output; selectivity −60 dB; image response −50 dB; 2-W audio output at 10% dist.; spurious response −50 dB; carrier suppression −35 dB; p.a. facilities; a.n.l.; squelch r.f. gain control; clarifier; LED readout; 9" D × 6⅝" W × 1⅞" H $349.95

METROSOUND

MS-23 Mobile Transceiver
23-channel operation; 4-W r.f. output; Local/DX, PA/CB switches; variable squelch; external p.a., speaker jacks; S/RF meter; a.n.l.; dual-conversion receiver; on-the-air indicator light; fused polarity protection; 12 V d.c. neg. or pos. ground; detachable dynamic mike with PTT switch; 8¼" D × 6½" W × 2" H $169.95

MIDLAND

77-888 40-Ch Transceiver
40-channel coverage; 4-W r.f. output; dual-conversion superhet; a.n.l.; noise blanker; delta tune; vari-

able r.f. gain and tone control; built-in s.w.r. bridge & calibrator operates with 3-function S/RF SWR meter; p.a. facilities; CB speaker switch; audio tone control; comes with volume control mike, mobile mounting bracket, and hardware; 12-V d.c. negative- or positive-ground $244.95

77-882 40-Ch Transceiver
40-channel coverage; 4-W r.f. output; digital synthesizer; dual-conversion superhet; switchable noise limiter and noise blanker; a.g.c.; delta tuning; variable squelch control; antenna warning light; p.a. switch; 12-V d.c. positive- or negative-ground, with plug-in d.c. power cord $199.95

77-857 40-Ch Transceiver
40-channel coverage; 4-W r.f. output; digital synthesizer; dual-conversion superhet; delta tuning; switchable noise limiter; a.g.c.; variable squelch; S/RF meter; lighted channel selector; 12-V d.c. negative- or positive-ground $169.95

MOTOROLA

All four of the company's 40-channel under-dash models feature digital phase-lock-loop synthesizer; dual-gate FET front end; plug-in power mike with built-in amplifier; top-fire speaker; illuminated S/RF meter; external p.a. and speaker capability; a.n.l.; a.g.c.

4020. In addition to standard features has both "extender" noise blanker which rejects ignition noise in receiver and LED digital channel readout with dimmer $249.95

4010. Similar to 4020 but without "extender" but with LED readout with dimmer. ..... $219.95.

4005. Similar to 4020 but without LED digital readout $219.95

4000. Basic unit $189.95

NUVOX

CB-7000 Mobile Transceiver
23-channel mobile unit; r.f. output 4 W; illuminated S/RF meter; p.a.; a.n.l. with manual override; delta tune; receiver sensitivity 1 μV at 10 dB S/N; squelch sensitivity 1 μV max; audio power output 4 W; 12-V d.c. neg. or pos. ground; 9½" D × 6½" W × 2 7/16" H $169.95

HA-23C Mobile Transceiver
23-channel mobile unit; S/Pwr meter; lighted channel selector; on-the-air light; local/DX switch; p.a. switch; external speaker jack; receiver sensitivity 0.5 μV at 10 dB S/N; audio output 3 W; 12-V d.c. neg. or pos. ground $149.95

TC-5020 Mini Mobile Transceiver
23-channel mobile unit; S/RF meter; r.f. output 4 W; a.n.l.; vol. and squelch controls; external jack; lighted channel selector; audio power output 3 W; receiver sensitivity 1 μV at 10 dB S/N; 12-V d.c. neg. or pos. ground; 7" D × 4⅞" W × 2" H $129.95

OLSON

CB-409 Mobile Transceiver
23-channel synthesized unit; sensitivity 0.5 μV at 10 dB S + N/N; adj. channel rejection −50 dB; selectivity −6 dB at ±5.5 kHz; image response −75 dB; dual-conversion receiver; audio output 3 W at 2.5% dist.; spurious emissions −50 dB below carrier; built-in speaker; S/RF meter; local/DX switch; PA/CB switch $139.00

PANASONIC

CR-B1717 CB/AM-FM Stereo Radio
Combines 23-channel CB transceiver with pushbutton AM-FM stereo receiver; channel selector switch with illuminated channel indicator; 3.5-W r.f. output; S/RF meter; variable squelch; delta tuning; standby monitor permits reception of CB calls while listening to radio broadcasts; a.n.l.; audio power output 3.5 W at 10% dist.; comes with detachable mike; designed for in-dash mounting; 7½" W × 5" D × 2¾" H $299.95

RJ-3200 Mobile Transceiver
23-channel mobile unit; 4-W r.f. output; adjacent channel rejection −60 dB; selectivity −6 dB at 5 kHz; delta tune ±1 kHz; audio power output 3 W at 10% dist.; spurious emissions −50 dB; p.a.; a.n.l.; noise blanker; squelch; S/RF meter; on-the-air LED indicator; modulation indicator lamp; two-step tone control; quick-release mounting bracket; 13.8-V d.c.; 9¼" D × 7 3/16" W × 2½" H $179.95

RJ-3100 Mobile Transceiver
23-channel coverage; r.f. output 4 W; selectivity −6 dB at ±5 kHz; delta tuning ±1 kHz; spurious emissions −50 dB; adj. channel rejection −50 dB; switchable a.n.l.; p.a. facilities; squelch; external speaker jack; S/RF meter; max. mod. 90%; 9⅜" D × 6 7/16" W × 2 5/16" H $149.95

PEARCE-SIMPSON

Cougar 23B Mobile CB Radio
Mobile use: 13.5-volt d.c.; solid-state with FET and IC's; seven-way meter; r.f. noise blanker with manual override switch; built-in noise limiter; delta tune; noise canceling microphone; p.a. gain control; 23 channels (all crystals supplied); includes plug-in microphone & hanger, external power cord, mounting cradle and hardware $239.95

Tiger Mark 2 Transceiver
Uses three crystals for full 23-channel capability; features "Receiv-O-Slide" ±1 kHz (receive only); 4-W r.f. output; dual-conversion receiver with ceramic filter; sensitivity 0.7 μV at 10 dB S + N/N; spurious rejection −50 dB; audio output 3 W; features volume/power switch; squelch control; tone control; r.f. gain control; channel selector; CB/PA switch; a.n.l. & noise blanker; 13.8 V d.c. positive- or negative-ground; 8¼" D × 6⅞" W × 2¼" H $229.95

Tiger 23C Mobile CB Radio
Mobile use: 12-volt negative ground; all-solid-state with IC's; dual-conversion receiver with ceramic filter; 23-channel frequency synthesizer; series-gate noise limiter; squelch; combination S and relative-power output meter; delta tuning; modulation indicator light; p.a. and external speaker output jacks; speech compressor; SO-239 antenna connector $209.95

Bobcat 23C
Mobile use; 13.8 V d.c. negative or positive ground; 23 channels; 4-W r.f. output; 100% modulation; sensitivity 0.5 μV for 10 dB (S + N)/N; automatic self-adjusting noise limiter with manual override; illuminated S/RF meter; dual-conversion receiver; controls: channel selector, power on/volume, squelch, p.a., a.n.l., Receiv-O-Slide for receiver frequency adjustments; comes with plug-in mike & hanger, external power cord, mounting bracket & hardware; 2 3/16" H × 5⅞" W × 8¼" D $189.95

Puma 23B CB Radio
Mobile or base station use; 12-volt d.c.; 117-volt a.c. supply optional extra; 23 channels (all crystals included); sensitivity 0.5 μV; crystal filter; automatic noise limiter; full envelope modulation; noise-cancelling microphone; quick-disconnect power plugs; lighted S/RF meter; variable-volume p.a. with plug-in jacks for p.a. and external speaker $169.95

Tomcat 23 CB Radio
Mobile or base station use; 12-volt d.c.; 117-volt a.c. supply optional extra; 23 channels (all crystals included); sensitivity 0.5 μV; crystal filter; automatic noise limiter; full envelope modulation; noise canceling microphone; illuminated S/RF meter $139.95

Alleycat 23 CB Mobile
Solid-state mobile AM transceiver; 23 channels with crystals; 4-W r.f. output; double-conversion receiver; sensitivity 0.5 μV for 10 dB (S + N)/N; S/RF meter glows amber on receive and red on transmit; a.n.l.; squelch; external speaker jack; receiver current drain 0.28 A squelched, 0.9 A unsquelched; transmitter current drain 1.3 A (max. modulation); comes with noise-canceling mike, power cord, mounting bracket; 13.8-V d.c. negative and positive ground; 1½" H × 5" W × 8⅛" D $124.95

AM/SSB

Cheetah SSB Transceiver
Mobile use: 12-volt d.c.; 23 channels on AM, 23 channels upper sideband, 23 channels lower sideband; 12 watts p.e.p. on single sideband; crystal-lattice filter; SWR meter; S/RF meter; noise blanker; noise limiter; variable-volume p.a.; plug-in power, plug-in jack for p.a. and external speaker ... $419.95

Panther SSB/AM Radio
Mobile use; 12-volt d.c.; 23 channels on AM; 23 channels each upper and lower sideband; 12 watts p.e.p. on SSB; 5 watts input on AM; crystal lattice filter; S/RF meter; noise blanker; noise limiter; p.a. plug-in power leads; plug-in noise canceling microphone; local/distance switch $369.95

JCPENNEY

6225 AM-FM/CB Transceiver
In-dash AM-FM plus 40-channel CB transceiver; 4-W r.f. power output; double-conversion receiver; sensitivity 1.0 μV; selectivity ±3.5 kHz; delta tune; squelch; automatic noise limiter; S/RF meter; automatic modulation control; standby switch; push-button AM-FM tuning; 12-V d.c.; 7½" W × 5 15/16" D × 2 11/16" H $229.99

6221 40-Ch Mobile Transceiver
40-channel coverage; 4-W r.f. power output; 90% max. modulation; double-conversion receiver; sensitivity 0.35 μV; selectivity −50 dB at 10 kHz; adj. channel rejection 60 dB; audio output 5 W max.; adjustable delta tune; adjustable squelch; switchable a.n.l. and a.n.l. control; p.a. capability; aux. jacks; meters; r.f. gain control; ch 9 scanner; digital channel indicator; 12-V d.c.; 9⅛" D × 7⅜" W × 2½" H $169.00

6218 40-Ch Mobile Transceiver
40-channel coverage; 4-W r.f. power output; 100% max. modulation; double-conversion receiver; sensitivity 0.5 μV at 10 dB S + N/N; selectivity 6 dB at ±3 kHz; adj. channel rejection −55 dB; delta tune; squelch; automatic noise limiter/control; p.a. capability; aux. jacks for ext. speaker & p.a. speakers; S/RF/SWR meter; LED channel display; noise blanker; r.f. gain control; tone switch; volume control; 12-V d.c. positive- or negative-ground; 211 mm D × 175 mm W × 65 mm H $149.99

6214. Similar to 6218 but with S/RF meter; no LED channel display, tone control, r.f. gain control; 199 mm D × 163 mm W × 57 mm H $109.99

AM/SSB

6247 AM-SSB Mobile Transceiver
40-watt coverage; 4-W (AM), 12-W p.e.p. (SSB) r.f. output; 100% max. modulation; double-conversion (AM), single- (SSB) receiver; sensitivity 0.5 μV (AM), 0.25 μV (SSB); selectivity −3.8, ±4 kHz at 6 dB; adj. channel rejection 50 dB at 10 kHz; p.a. capability; S/RF meter; ext. speaker & p.a. speaker jacks; delta tune; squelch; a.n.l. limiter/control; noise blanker; r.f. gain control; LED channel display; volume control; mode switch; 12 V d.c. positive- or negative-ground $219.99

6241 AM/SSB Base/Mobile
40-channel coverage; 4-W (AM), 12-W p.e.p. (SSB) r.f. output; 90% mod.; double-conversion receiver;

sensitivity 0.5 μV (AM), 0.2 μV (SSB); selectivity −50 dB (AM), −60 dB (SSB) ±10 kHz; adj. channel rejection −60 dB; p.a. capability; adjustable delta tune & squelch; a.n.l.; adj. a.n.l. control; SWR meter; Tx indicator light; 120 V a.c. or 12 V d.c.; 12 7/16" D × 8⅞" W × 2¾" H $279.99

PRESIDENT

"Teddy R" Mobile Transceiver
40-channel coverage; r.f. power output 4 W; sensitivity 0.5 μV; adjacent channel rejection −60 dB; spurious emissions −65 dB has channel selector, volume, squelch, delta tune, meter mode, mike gain, r.f. gain, s.w.r. calibrate controls; PA/CB, noise blanker on/off, tone control switches; combination S/RF modulation/SWR meter; antenna, mike, p.a., external speaker jacks; requires 13.8-V d.c. positive- or negative-ground; 9⅝" D × 7 5/16" W × 2¾" H $229.95

"Honest Abe" Mobile Transceiver
40-channel unit; r.f. power output 4 W; sensitivity 0.5 μV; adjacent channel rejection −60 dB; spuri-

ous emissions −65 dB; controls include channel selector, volume, squelch, delta tune, mike gain, r.f. gain; has PA/CB a.n.l. on/off, meter mode switches; combination S/RF modulation meter; antenna, mike, p.a., external speaker, power supply jacks; operates on 13.8-V d.c. positive- or negative-ground; 9⅝" D × 7 5/16" W × 2¾" H $199.95

"John Q" Mobile Transceiver
40-channel coverage; r.f. power output 4 W; sensitivity 0.5 μV; adjacent channel rejection −60 dB; spurious emissions −60 dB; has channel selector, volume, squelch, mike gain, PA/CB, a.n.l. on/off, and local/distant controls; digital channel display; S/RF meter; p.a. and external speaker jacks; requires 13.8-V d.c. positive- or negative-ground; 9⅜" D × 6¼" W × 2⅛" H $169.95

AM/SSB

"Grant" Mobile
40-channel AM plus LSB and USB; 4-W r.f. output (AM), 12-W p.e.p. (SSB); sensitivity 0.5 μV (AM), less than 0.5 μV (SSB) at 10 dB S + N/N; adjacent channel rejection −60 dB; controls for channel selection, volume, squelch, mode selection, mike gain, ±1.25 kHz clarifier; PA/CB, noise blanker on/off, local/distant switches; digital channel display; S/RF meter; jacks for antenna, mike, p.a., external speaker; requires 13.8-V d.c. positive- or negative-ground; 10⅝" D × 7⅞" W × 2⅜" H $339.95

RADIO SHACK

Realistic TRC-56 Transceiver
23-channel telephone-type handset mobile unit; sensitivity 0.5 μV for 10 dB S + N/N; selectivity ±3

kHz at −6 dB; adj. channel rejection −50 dB; delta tune; noise blanker; S/RF meter; squelch control; dual-conversion receiver; FET front end; ceramic filters; speaker/handset sw.; audio output 3 W; p.a.; 12-V d.c. positive or negative ground; comes with power cables & bracket; 5" (max. in front) × 8¾" × 7" D. 21-153 ..... $179.95

Realistic Navaho TRC-30A
23-channel base/mobile transceiver; variable squelch; illuminated channel selector; S/RF meter; on-the-air and modulation indicator lights; delta tune; dual-conversion receiver with mechanical i.f. filter; headphone & external speaker jack; comes with PTT mike, mobile mounting bracket, a.c. and d.c. power cords; 120-V a.c./12-V d.c. positive- or negative-ground operation; 4" × 11½" × 9" 21-143 ..... $159.95

Realistic TRC-24C Transceiver
23-channel mobile unit; a.n.l. plus noise blanker; illuminated channel selector; S/RF meter with built-in mod. indicator; variable squelch; pi-network antenna matching; dual-conversion receiver; provision for ext. p.a.; comes with power cables; mike with coiled cord, mobile bracket; 12-V d.c. positive- or negative-ground; 1¾" × 6" × 7". 21-145 ..... $159.95

Realistic TRC-61 Transceiver
23-channel mobile unit; sensitivity 0.5 μV at 10 dB S + N/N; selectivity −6 dB at ±3 kHz; a.n.l. & noise blanker (not switchable); squelch; auto. mod. limiter; adj. channel rejection −60 dB; dual-conversion receiver; 3 W audio output at 10% THD; max. current drain 1.5 A; 13.8-V d.c. operation; all controls (channel select, volume, on/off, squelch) built into mike; 7" D × 5¼" W × 1½" H. 21-161 ..... $149.95

Realistic TRC-52 Transceiver
23-channel mobile unit; sensitivity 0.5 μV for 10 dB S + N/N; adj. channel rejection −45 dB; r.f. gain control; switchable a.n.l.; illuminated S/RF meter; LED mod. indicator; p.a. & jacks for remote PA/CB speakers; dual-conversion receiver; audio power output 3 W; comes with PTT mike, power cables, bracket; 12-V d.c. pos./neg. ground; 2" × 5⅞" × 7½". 21-142 ..... $129.95

Realistic TRC-68 Transceiver
23-channel miniaturized unit; illuminated rotary channel selector; mod. indicator; a.n.l.; dual-conversion receiver; 3 W audio output at 10% THD; comes with mike, mike clip, mounting bracket, power cables; 12-V d.c. neg./pos. ground: 1½" × 5¼" × 7⅞". 21-168 ..... $99.95

Realistic TRC-11 Transceiver
6-channel mobile unit (Ch. 14 crystals supplied); switchable a.n.l.; adjustable squelch; mod. indicator; push-pull audio; ceramic filter; comes with mike, coiled cord, power cable, mounting bracket; 12-V d.c. negative ground. 12-141 ..... $79.95

Realistic TRC-9A Transceiver
3-channel mobile unit (Ch. 14 crystals supplied); a.g.c.; noise limiter; speaker; jack for ext. speaker; pilot light doubles as mod. indicator; PTT mike; push-pull audio; comes with power cable, mike with coiled cord, mounting bracket; 12-V d.c. neg. ground; 6½" × 4¼" × 1½". 21-139 ..... $59.95

PORTABLES

Realistic TRC-101B Transceiver
Hand-held portable; adj. squelch; a.n.l.; center-loaded telescoping antenna; freq. synthesis for crystal control of 23 ch.; dual-conversion receiver; fine-tuning control; separate speaker & mike; battery/RF meter; jacks for ext. ant., speaker, mike, power & battery chargers; operates from ten "AA" cells (included); carrying case. 21-129 ..... $149.95

Realistic TRC-200 Transceiver
Hand-held portable; 5-watt input; 6-channel capacity (Ch. 14 crystals supplied); Range-Boost side panels couple body to antenna for extended range; a.n.l.; a.g.c.; auto. mod. control; hi/lo power switch; battery/RF meter; squelch; separate speaker and electret condenser mike; center-loaded antenna; jacks for external antenna, push-to-talk mike; d.c. power charger; operates from 8 "AA" cells (included); 9¾" × 3⅛" × 2½". 21-184 ..... $99.95

Realistic TRC-99C Transceiver
3-channel hand-held portable (Ch. 14 cyrstals supplied); 3 W output; squelch; a.n.l.; telescoping antenna; jacks for speaker, mike, antenna, battery charger; negative ground; uses ten "AA" cells (included) or rechargeable cells; 9" × 2⅞" × 2⅞" 21-133 ..... $69.95

Realistic TRC-180 Transceiver
3-channel, 2-W input hand-held portable (Ch. 14 crystals included); Range-Boost side panels; a.n.l.; a.g.c.; auto. mod. limiter circuit; separate speaker & mike; squelch; battery test button, LED indicator; external jacks for earphone/speaker, charger, d.c. power; 8 "AA" cells included; 10¼" × 3⅛" × 2½". 21-183 ..... $49.95

Realistic TRC-76 Transceiver
3-channel, 200 mW input; (Ch. 14 crystals included); a.g.c.; squelch; battery-test button; LED indicator; separate speaker & mike; jacks for external

speaker, charger, d.c. power; 8 "AA" cells (included); 10¼" × 3⅛" × 2½". 21-176 ..... $34.95

AM/SSB

Realistic TRC-48 AM/SSB Base/Mobile
Base/mobile transceiver with full AM and choice of USB or LSB; sensitivity 0.5 μV AM, 0.2 μV SSB at 10 dB S + N/N; has crystal lattice and mechanical filters; illuminated RF/S meter; illuminated channel selector; remote vol. control on mike; comes with mobile mounting bracket, separate a.c. and d.c. power cables; 120-V a.c./12-V d.c. neg. ground operation. 2¾" × 8⅞" × 10½". 21-150 ..... $329.95

Realistic TRC-47 AM/SSB Mobile
23-channel AM plus USB and LSB operation; mobile transceiver, 12-V neg. ground; all crystals included; concentric volume and r.f. gain controls; rotary channel selector; AM sensitivity 1 μV, 0.5 μV SSB for 10 dB S + N/N. 21-147 ..... $249.95

REGENCY

CB-601 40-Ch Mobile Transceiver
40-channel coverage; 4-W r.f. output; sensitivity 0.5 μV at 10 dB S + N/N; adj. channel rejection −60 dB; selectivity −7 dB at ±7 kHz; image response −55 dB; dual-conversion receiver; audio output 4 W at 10% dist.; spurious emissions −60 dB; digital synthesizer; 100% max. mod.; a.n.l.; noise blanker; squelch; external speaker jack; S/RF meter; r.f. gain control; tone control; LED channel readout; quick-connect package. 13.8-V d.c. operation $199.00

CB-501 40-Ch Mobile Transceiver
40-channel coverage; 4-W r.f. output; digital synthesizer; sensitivity 0.5 μV at 10 dB S + N/N; adj. channel rejection −55 dB; selectivity −6 dB at ±7

kHz; image response −50 dB; dual-conversion receiver audio output 4 W at 10% dist.; spurious emissions −60 dB; 100% max. mod.; p.a. facilities; noise blanker; squelch; external speaker jack; S/RF meter; LED readout with bright/dim switch; quick-convert package; 13.8V d.c. $179.00

CB-401 40-Ch Mobile Transceiver
40-channel coverage; 4 W r.f. output; digital synthesizer; sensitivity 0.5 μV at 10 dB S + N/N; adj. channel rejection −50 dB; selectivity −6 dB at 7 kHz; image response −50 dB; dual-conversion receiver; audio output 4 W at 10% dist.; spurious emissions −60 dB; 100% max. mod.; p.a. facilities; a.n.l.; squelch; external speaker jack S/RF meter; LED channel readout; 13.8-V d.c. $149.00

ROYAL SOUND

RS-546 Mobile Transceiver
23-channel synthesized mobile; 4 W r.f. output; sensitivity 1 μV for 10 dB S + N/N; adj. channel rejection −32 dB; selectivity −63 dB at 10 kHz; image response −30 dB; dual-conversion receiver; audio output 2 W at 10% dist.; spurious response −50 dB; 100% max. modulation; p.a. facilities; built-in a.n.l.; squelch; external speaker jack; S/RF meter; 7.1" D × 5.2" W × 2" H $150.00
M-336. Similar to RS-546 except spurious response −48 dB; 80% max. modulation; no S/RF meter; 5¾" D × 4½" W × 1⅜" H $129.00

ROYCE

617 CB/AM-FM Stereo Radio
40-channel coverage; digital synthesizer; 4-W r.f. output; sensitivity 0.5 μV for 10 dB S + N/N; 4-W audio output; FM sensitivity & selectivity 5 μV at 20 dB quieting; stereo separation 30 dB; audio output 3-W rms at 10% THD/ch; standby switch permits monitoring of any 40 CB channels; override; fader control for front-to-rear speaker balance; LED digital readout; AM-FM pushbuttons or lighted slide-rule type tuning dial; S/RF meter; plug-in mike; in-dash mounting $329.95

682 Mobile Transceiver
40-channel coverage; digital synthesizer; 4-W r.f. output; dual-conversion receiver; tuned r.f. stage; sensitivity 0.5 μV at 10 dB S + N/N; audio output 6 W max.; S/RF meter; comes with mounting bracket & hardware, d.c. cord, plug-in PTT mike, mike clip; 12-V d.c. positive- or negative-ground; LED digital readout $219.95

680 Mobile Transceiver
40-channel coverage; digital synthesizer; modular construction; 4-W r.f. output; dual-conversion receiver; 0.5 μV at 10 dB S + N/N; 6 W max. audio output; LED digital readout; S/RF meter; a.n.l.; amplified automatic gain control; PA/CB switch; comes with mounting bracket & hardware, d.c. cord, plug-in PTT mike & mike clip; 12-V d.c. positive- or negative-ground; 8 13/16" D × 8 9/16" W × 2⅜" H $189.95
678. Similar to 680 but with 1¼" × ¾" meter; remote-control mike for adjusting receiver volume; 8 13/16" D × 7 9/16" W × 2⅜" H $189.95
675. Similar to 678 but without remote-control mike feature $169.95
673. Similar to 675 except 1⅜" × ⅜" S/RF meter; 8 13/16" D × 7 1/16" W × 2⅜" H $149.95

648 Mobile Transceiver
40-channel coverage; digital synthesizer; 4-W r.f. output; 100% mod.; spurious suppression −60 dB; sensitivity 0.5 μV at 10 dB S + N/N; adj. channel rejection −50 dB; audio power output 3 W at 10% dist.; spurious rejection −45 dB; S/RF meter; variable squelch control; PA/CB switch; plug-in mike; positive- or negative-ground operation $136.95

590 Three-Channel Mobile
3-channel coverage; crystal control; 4-W r.f. output; single-conversion receiver; sensitivity 0.5 μV for 10 dB; a.g.c., a.n.l. plus 12-V d.c. line filter; PTT mike; comes with Channel 9 crystals installed; 12-V negative- or positive-ground operation; 6½" D × 4" W × 2½" H $64.95

AM/SSB

32 AM/SSB Mobile Transceiver
40-channel coverage plus USB and LSB; 4-W (AM), 12-W p.e.p. (SSB) r.f. output; a.g.c.; a.n.l.; clarifier/delta tune ±1500 Hz (AM, SSB); sensitivity 0.5 μV (AM), 0.2 μV (SSB) at 10 dB S + N/N; audio output power 3.5 W; S/RF meter; on/off/vol., variable squelch, SSB clarifier/delta tune controls; push-buttons for p.a. USB, LSB, AM; comes with mike, bracket, 12-V d.c. cord; 12-V d.c. positive- or negative-ground; 9⅛" D × 8" W × 2⅜" H $309.95

SBE

"Touch/Com 40" Mobile Transceiver
40-channel coverage with PLL synthesizer; r.f. power output 4 W; sensitivity 0.5 μV at 10 dB S + N/N;

adj. channel rejection −60 dB; dual-conversion receiver; on-microphone channel tuning or fast scan, PTT, volume, squelch controls, and LED channel display; delta tune; noise limiter; tone control; PA/CB switch; requires 13.8-V d.c.; 9.4" D × 6.7" W × 2.4" H $259.95

"Formula D" Mobile Transceiver
40-channel coverage with PLL synthesizer; r.f. power output 4 W; sensitivity 1.0 μV at 10 dB S + N/N; adj. channel rejection −60 dB; dual-conversion receiver; controls for delta tune, squelch, tone, volume, p.a. gain; CB/PA, local/distant, noise limiter switches; requires 13.8-V d.c. (115-V a.c. with optional power supply); 9.1" D × 6.6" W × 2.3" H $229.95

"Aspen" Mobile Transceiver
40-channel coverage with PLL synthesizer; r.f. power output 4 W; sensitivity 1.0 μV at 10 dB S + N/N; adj. channel rejection −60 dB; digital LED channel readout; squelch, noise limiter; dual-conversion receiver; requires 13.8-V d.c.; 8.75" D × 5.87" W × 2.12" H $189.95

"Cortez 40" Mobile Transceiver
40-channel coverage with PLL synthesizer; r.f. power output 4 W; sensitivity 1.0 μV at 10 dB S + N/N; adj. channel rejection −60 dB; dual-conversion receiver; delta tune; switches for a.n.l., CB/PA; r.f. gain and squelch controls; requires 13.8-V d.c.; 8.75" D × 5.875" W × 2.125" H $219.95

"Tahoe 40" Mobile Transceiver
40-channel coverage with PLL synthesizer; r.f. power output 4 W; sensitivity 1.0 μV at 10 dB S + N/N;

adj. channel rejection −60 dB; dual conversion receiver; digital LED channel readout; a.n.l.; volume and squelch controls; requires 13.8−V d.c.; 7.25" D × 4.5" W × 1.375" H. $179.95

"Malibu 40" Mobile Transceiver
40-channel coverage with PLL synthesizer; r.f. power output 4 W; sensitivity 1.0 μV at 10 dB S + N/N; adj. channel rejection −55 dB; dual-conversion receiver; squelch and volume controls; requires 13.8−V d.c.; 7.9" D × 6.3" W × 2.2" H. $159.95

AM/SSB

"Sidebander IV" AM SSB Mobile
40-channel coverage (AM) plus LSB and USB; digital synthesizer; r.f. power output 4 W (AM), 12 W

p.e.p. (SSB); receiver sensitivy 1 μV at 10 dB S + N/N, 0.5 μV at 15 dB S + N/N; adj. channel rejection − 65 dB; single-conversion receiver; audio output 3 W at 10% THD; switchable noise blanker & noise limiter; clarifier; power out/S meter; r.f. gain control; adjustable squelch; p.a. facilities; PA/Paging function with optional external speaker; 9.1" D × 6.6" W × 2.3" H. $379.95

SEARS

3808 Mobile Transceiver
40-channel coverage with P.L.L.; built-in a.n.l.; noise blanker switch; squelch; external speaker jack; r.f. gain control; SWR and S/RF meters; p.a.; LED readout; 9¼" D × 7½" W × 2½" H. $149.95

3807 Mobile Transceiver
40-channel coverage with P.L.L.; built-in a.n.l.; noise blanker switch; squelch; S/RF meter; r.f. gain control; p.a.; LED readout; 9⅛' D × 7¼" W × 2¼" H $119.95

3806 Mobile Transceiver
40-channel coverage with P.L.L.; built-in a.n.l.; squelch; external speaker jack; S/RF meter; r.f. gain control. 8¾" D × 5¼" W × 1 ⅞" H $99.95

AM/SSB

3826 Mobile/Base Transceiver
For base or mobile use; 40-channel coverage with P.L.L.; p.a.; built-in a.n.l.; switchable noise blanker; squelch; p.a.; external speaker jack; S/RF meter; r.f. gain control; SWR alert; 11" D × 8¾" W × 3⅛" H.....$249.95

SHAKESPEARE

GBS/2500 Mobile Transceiver
23-channel synthesized mobile; 3.5-W r.f. output; spurious and harmonic rejection −50 dB; dual-conversion receiver; sensitivity 0.7 μV at 10 dB S + N/N; selectivity −6 dB at ±6kHz; image rejection −60 dB; spurious response −50 dB; 3-W audio output; squelch; noise limiter; r.f. gain; S/RF meter; p.a. jack for external speaker; 13.8-V d.c. negative- or positive-ground; comes with plug-in mike; 8⅔" D × 6" W × 2" H.....$169.95

GBS/2000 Mobile Transceiver
23-channel synthesized mobile; 3.5-W r.f. output; dual-conversion receiver; squelch; a.n.l.; S/RF meter; p.a. jack. Tx indicator; PTT mike; 13.8-V d.c. positive- or negative-ground; 7½" D × 7" W × 2 5/16" H.....$159.95

GBS/1500 Mobile Transceiver
23-channel synthesized mobile; 3.5-W r.f. output; receiver sensitivity 0.7 μV at 10 dB S + N/N; selectivity −6 dB at ±6 kHz; squelch; S/RF meter; p.a. jack for external speaker; PTT mike; 13.8-V d.c. positive- or negative-ground; 8⅔" D× 6" W × 2" H.....$139.95

SHARP

CB2460 40-Ch Mobile Transceiver
40-channel coverage; digital synthesizer; 4-W r.f. output; sensitivity 0.7 μV at 10 dB S + N/N; adja-

cent channel rejection −50 dB; selectivity −50 dB at 3 kHz, −60 dB at 10 kHz; image response −60 dB; delta tune ±1 kHz; dual-conversion receiver; 3 W audio output at 10% dist.; spurious emissions −60 dB at any frequency; spurious response −60 dB; frequency tolerance ±0.003%; 100% max. modulation; p.a. facilities; built-in a.n.l.; squelch; external speaker jack; S/RF meter; LED digital channel indicator (flashes on Ch 9); 13.8 V d.c.; 7⅞" D × 5¾" W × 2¼" H $149.95
CB2260. Same as CB2460 except without digital channel indicator $139.95

CB-800 Transceiver
23-channel mobile transceiver; 3-W r.f. power output; sensitivity 0.7 μV at 10 dB S + N/N; adj. channel rejection −60 dB; selectivity 60 dB at 3 kHz, 50 dB at 10 kHz; image response −60 dB; delta tune ±1 kHz; spurious emissions −50 dB at any freq. except fundamental; spurious response −60 dB; max. current drain 1.2 A; dual-conversion receiver; audio output 3 W at 10% dist.; digital synthesizer; ½" LED channel indicator; flashing channel 9 and p.a. indicator; ext. speaker & p.a. speaker jacks; detachable mike; a.n.l.; squelch; automatic modulation limiter; built-in speaker; S/RF meter; 13.8 V d.c.; 7⅞" D × 5¾" W × 2¼" H $149.95
CB-760A. Similar to CB-800 except without LED's; red channel 9 indicator $139.95
CB-700. Similar to CB-760A except does not have a.n.l. p.a. jack, or S/RF meter $119.95

AD-112 Base Station Adapter
Designed to permit the company's mobile transceivers to be used as base stations; plugs into a.c. power line; on-off lever switch; power indicator (LED); 12-V d.c. output terminals; 6⅜" D × 5½" W × 3" H $29.95

SPARKOMATIC

CB-4020S 40-Ch Mobile Transceiver
Digital synthesized 40-channel mobile unit; 4-W r.f. output; sensitivity 0.5 μV at 10 dB S + N/N; adj.

channel rejection −40 dB; selectivity −30 dB at ±11 kHz; image response −45 dB; delta tune ±1 kHz; dual-conversion receiver; audio output 3 W at 10% dist.; spurious emissions −60 dB at all frequencies above 2nd harmonic; spurious response −50 dB; 100% max. modulation; p.a. facilities; a.n.l.; switchable noise blanker; squelch; external speaker jack; S/RF meter; 8" D × 6" W × 2" H $189.00
CB-1140. Similar to CB-4020S except sensitivity 0.8 μV; adj. ch. rejection −35 dB; image response −40 dB; no delta tune; crystal synthesizer; switchable a.n.l.; 6" D × 5½" W × 2" H $169.00

STANDARD

Horizon 29-A Mobile Transceiver
40-channel transceiver with phase-locked loop synthesizer; 26.965-27.405 MHz frequency range; 500

ohm dynamic microphone; 4 W max r.f. output; sensitivity 0.5 μV at 6 dB S+N/N; audio output 5 W at 10% dist; squelch control; delta tune control; r.f. gain control; hailer switch; noise blanker; automatic noise limiter; channel selector; on/off volume control; 12 V d.c. −16 V d.c. power supply; 8" × 7" × 2".....$229.95

TEABERRY

4004 "T Bear" Mobile Transceiver
40-channel capacity; digital synthesizer; 4-W r.f. output; 100% peak mod.; sensitivity 1.0 μV at 10 dB S + N/N; 2 W audio output at 10% dist.; digital channel indicator; S/RF meter; automatic mod. control; noise blanker switch; r.f. gain & tone controls; mod. indicator; dim/bright switch; external speaker jack; plug-in d.c. power cord; 13.8-V d.c. operation $200.00

4008 "T Hawk" Mobile Transceiver
40-channel coverage; digital synthesizer; 4-W r.f. output; 100% peak mod.; sensitivity 0.5 μV at 10 dB S + N/N; 3 W audio output at 10% dist.; adj. channel rejection −55 dB; image rejection −50 dB; digital channel indicator; S/RF meter; auto. mod. control; noise blanker; r.f. gain control; external speaker jack; 9 3/16" D × 6½" W × 2⅛" H.....$190.00

4005 "Titan T" Mobile Transceiver
40-channel coverage; digital synthesizer; 4-W r.f. output; 100% peak mod.; sensitivity 1.0 μV at 10 dB S + N/N; 2-W audio output at 10% dist.; adj. channel rejection −60 dB; digital channel indicator; S/RF meter; automatic mod. control; a.n.l. switch; mod. indicator; external speaker & p.a. jacks; plug-in d.c. cord; 13.8 V d.c.; 9¼" D × 7¼" W × 2¼" H $180.00

4006 "Racer T" Mobile Transceiver
40-channel coverage; digital synthesizer; 4-W r.f. output; 100% peak mod.; sensitivity 0.5 μV at 10 dB S + N/N; delta tune ±1400 Hz; 3-W audio output at 10% dist.; adj. channel rejection − 65 dB; S/RF meter; auto. mod. control; a.n.l. switch; external speaker & p.a. jacks; 13.8 V d.c.; 9¼" D × 6½" W × 2 3/16" H $170.00

4010 "T Charlie" Mobile Transceiver
40-channel coverage; 4-W r.f. output; 100% peak mod.; sensitivity 0.5 μV at 10 dB S + N/N; 3-W audio output at 10% dist.; adj. channel rej. −50 dB; S/RF meter; auto. mod. control; a.n.l. switch; external speaker & p.a. jacks; 13.8 V d.c.; 7 11/16" D × 5 3/16" W × 2" D $150.00

AM/SSB

4001 "Stalker One" Mobile Transceiver
40-channel coverage; 4-W (AM) 12-W p.e.p. (SSB) r.f. output; digital synthesizer; 100% peak mod.; sensitivity 0.5 μV (AM), 0.25 μV (SSB) at 10 dB S + N/N; clarifier ±1500 Hz; 3 - W audio output; adj. channel rejection −60 dB; image rejection −40 dB; S/RF meter; auto. mod. control; noise blanker; r.f. gain control; Rx & Tx indicator; external speaker & p.a. jacks; 13.8 V d.c.; 10 ⅝" D × 7¾" W × 2⅜" H $350.00

4012 "Ranger T" Mobile Transceiver
40-channel coverage; 4-W (AM), 12-W p.e.p. (SSB) r.f. output; digital synthesizer; 100% peak mod.; sensitivity 1.0μV (AM), 0.5 μV (SSB) at 10 dB S + N/N; clarifier ±500 Hz; audio output 3 W at 10% dist.; digital channel indicator; S/RF meter; auto. mod. control; noise blanker; r.f. gain control; Tx indicator; external speaker & p.a. jack; 13.8 V d.c.; 9⅞" D × 7⅞" W × 3¼" H $330.00

TRAM

D42 Mobile Transceiver
40-channel coverage; r.f. output 4 W; sensitivity 0.5 μV at 10 dB S + N/N; adj. channel rejection 70 dB;

delta tune range ±1.5 kHz; combination meter for power output, SWR or S meter functions; p.a.; a.n.l.; adjustable squelch; r.f. gain; audio output 4 W at 10% dist.; PTT mike; requires 13.8-V d.c. positive or negative ground; 9¼" D × 7" W × 2 ⅜" H .. $250.00

D12 Mobile Transceiver
40-channel coverage with P.L.L.; r.f. output 4 W; sensitivity 0.7 μV at 10 dB S + N/N; adj. channel rejection 55 dB; audio output 3 W at 10% dist.; CB/PA and local/distance switches; volume/mike gain and

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a.n.l./squelch controls; PTT mike; requires 13.8-V d.c. positive or negative ground; 6⅞" D × 5½" W × 2⅛" H $165.00

AM/SSB

D62 AM/SSB Mobile Transceiver
40-channel with P.L.L.; features include a.n.l., r.f. noise blanker, r.f. gain control, s.w.r. meter, mike gain, antenna monitor warns of antenna system failure, LED digital channel display requires 13.8-V d.c. positive or negative ground $450.00

TRS CHALLENGER

620 Mobile Transceiver
40-channel coverage; digital synthesizer; 4-W r.f. output; sensitivity: 1 μV at 10 dB S + N/N; adjacent

channel rejection −70 dB; selectivity −70 dB at ±7 kHz; delta tune ±1 kHz; dual-conversion receiver; audio output 4 W at 10% dist.; spurious emissions −60 dB; spurious response −70 dB; 100% max. modulation; p.a. facilities; switchable a.n.l. & noise blanker; squelch; external speaker jack; S/RF meter; LED digital readout; channel scanning; 13.8 V d.c.; 8½" D × 7" W × 2" H $279.95

600. Same as Model 620 except does not have channel scanning; has r.f. gain control $269.95
460. Same as Model 620 but does not have LED digital readout or channel scanning; has switchable a.n.l.; overall dimensions 10" × 5⅞"W × 2"H $179.95

ULTRA

402 40-Channel Transceiver
Mobile transceiver features digital LED channel readout; numbered channel selector; r.f. gain con-

trol; transmit, receive and modulation indicator lights; S/RF meter; noise blanker; automatic noise limiter; CB/PA switch; delta tune; squelch control; on/off volume control; front-panel microphone jack $229.95

401 40-Channel Transceiver
Mobile receiver features transmit and receive indicator lights; CB/PA switch; automatic noise limiter; delta tune; squelch control; S/RF meter; numbered channel selector $189.95

UNIMETRICS

Seahorse 1 CB Transceiver
23-channel CB transceiver combined with six VHF/FM monitor channels for marine, police/fire/civil defense; has p.a. jack; a.n.l.; squelch; S/RF meter; r.f. gain control; receiver sensitivity 0.15 μV at 10 dB S + N/N; solid-state switching; weatherproof construction; corrosion-resistant materials throughout; 12-V d.c. negative ground; comes with all crystals (including NOAA WX-1), mike, and mounting bracket; 9" × 8" × 2½" $274.95

Mako-1 CB Transceiver
23-channel CB transceiver with pushbutton monitoring of NOAA weather stations; 4 W r.f. output; solid-state switching; p.a. position; lighted S/RF meter; mechanical filter; squelch control; watertight construction; corrosion-resistant materials; receiver sensitivity 0.5 μV at 10 dB S + N/N; a.n.l.; 12-V negative ground; comes with all crystals; PTT mike, and mounting bracket. 9" × 8" × 2½" $234.95

Dolphone
23-channel CB transceiver; 4 W r.f. output; squelch; a.n.l.; speaker/handset sw.; p.a.; receiver sensitivity 1 μV at 10 dB S + N/N; watertight construction; corrosion-resistant material; 12-V negative ground; (adaptable for pos. ground); comes with telephone-type handset, all crystals; overall size 9½" × 5" × 4" $214.95

Marlin-1 CB Transceiver
Compact 23-channel CB transceiver; 4 W r.f. output; S/RF meter; p.a.; solid-state switching; watertight construction; corrosion-resistant materials; receiver sensitivity 0.5 μV at 10 dB S + N/N; a.n.l.; comes with all crystals. 12-V d.c. negative ground; 7" × 6" × 2" $164.95

AM/SSB

Stingray-II AM/SSB
23-channels AM plus USB and LSB crystal-controlled channels; front-panel S/RF meter; adjustable squelch; receiver sensitivity 1 μV at 10 dB S + N/N (AM), 0.25 μV (SSB); a.n.l.; watertight, corrosion-resistant construction; 12-V neg. or pos. ground; a.c. power supply optional extra; 10½" × 8¾" × 3" $299.95

UTAC

TRX-500 40-Ch Mobile
40-channel coverage; digital synthesizer; 4-W r.f. output; sensitivity 1 μV at 10 dB S + N/N; adj. channel rejection −50 dB; selectivity −60 dB at 10 kHz; image response −50 dB; delta tune ±10 kHz; dual-conversion receiver; 4-W audio output; 95% max. modulation; p.a. facilities; switchable a.n.l. & noise blanker; squelch; external speaker jack; SWR meter; S/RF meter; r.f. & mike gain controls; digital channel readout; two ch/VHF; 8¾" D × 6⅞" W × 2½" H $269.95
TRX-400. Similar to TRX-500 but without delta tune or two ch/VHF $239.95

TRX-30
23-channel crystal-controlled transceiver; r.f. output power 4 W; includes lighted S/RF meter; automatic noise limiter; dual-conversion receiver; p.a. system; positive or negative ground; dynamic, detachable microphone; 4-stage transmitter; backlit channel indicator; polished chrome bracket; heavy gauge steel case; sealed relay; built-in speaker; 5 15/16" W × 1½" H $169.95

Super Tiny
23-channel crystal-controlled transceiver; r.f. output power 4 W; single-conversion superheterodyne receiver with ceramic filter; variable squelch control and automatic noise limiter; p.a. system; positive or negative ground; illuminated channel selector dial and backlit S/RF meter; external speaker jack; comes with detachable microphone, brackets and power cord; 7" D × 4" W × 2⅛" H $139.95

AM/SSB

TRX-2000 Mobile SSB Transceiver
23-channel AM and SSB crystal-controlled transceiver operates in AM, SSB, LSB and USB modes; r.f. power output 4 W AM (12 W p.e.p. SSB); includes p.a. switch; volume control; variable squelch control; clarifier; noise blanker; S/RF meter; detachable microphone; detachable power cord; triple-conversion receiver on AM, dual-conversion on SSB; backlit channel indicator; external speaker jack; mobile rack; microphone hanger; 9" D × 7" W × 2½" H $349.95

VECTOR

XII 40-Ch Mobile Transceiver
40-channel coverage; digital synthesizer; 4-W r.f. output; sensitivity 0.5 μV at 10 dB S + N/N; adj. channel rejection −50 dB; selectivity −6 dB at ±3 kHz; dual-conversion receiver; audio output 4 W at 10% dist.; spurious emissions −70 dB; spurious response −65 dB; frequency tolerance ±0.002%; 100% max. modulation; p.a. facilities; switchable a.n.l. & noise blanker; squelch; external speaker jack; S/RF meter; r.f. gain control; digital channel indicator; tone control; 13.8 V d.c.; 8½" D × 6½" W × 2¼" H $209.95
X. Similar to XII but without noise blanker; has Tx

and mod. lights; 13.8 V d.c. positive- or negative-ground $189.95

III 40-Ch Mobile Transceiver
40-channel coverage; digital synthesizer; 4-W r.f. output; sensitivity 0.7 μV at 10 dB S + N/N; adj. channel rejection −50 dB; selectivity −6 dB at ±3 kHz; image response − 60 dB; delta tune ±1.3 kHz; dual-conversion receiver; 3 W audio output at 10% dist.; spurious emissions −70 dB; spurious response −55 dB; 100% max. modulation; p.a. facilities; switchable a.n.l.; squelch; external speaker jack; S/RF meter; mod. light; 13.8-V d.c.; 7½" D × 6" W × 2¼" H $149.95

XTAL

XCB-88 Radio/8-Track/CB
Combines 23-channel transceiver, AM-FM stereo radio, and 8-track player; 4 W r.f. output; receiver sensitivity 0.5 μV at 10 dB S + N/N; selectivity −6 dB at 6 kHz; adj. channel rejection −60 dB; built-in a.n.l., squelch control, CB on/off, and PTT switches on mike; tape section: 8-track, 2-channel continuous play; output power 4-W, 10% THD at 8 ohms; frequency response 50-10,000 Hz; stereo separation 25 dB; 13.8-V d.c. negative- or positive-ground operation; designed for in- or under-dash mounting; 7⅜" D × 7½" W × 2¼" H $349.95

XCB-28 Radio/8-Track/CB
Combines 23-channel transceiver AM-FM stereo radio, and 8-track player; 4-W r.f. output; receiver sensitivity 0.5 μV at 10 dB S + N/N; selectivity −6 dB at 5 kHz; adj. channel rejection 45 dB; tape section: 8-track, 2-channel continuous play; output power 6 W/ch; frequency response 50-10,000 Hz; stereo separation 25 dB; 13.8-V d.c. negative-ground operation; 8" D × 7¼" W × 2¼" H; designed for in-dash mounting $289.95

XCB-12 Mobile/Scan Transceiver
23-channel mobile transceiver with 2-channel scanning capability; 4-W r.f. output; dual-conversion receiver; delta tuning switch; r.f. gain control; squelch; Tx & Rx indicator lights; scan "on-off" switch; scanning indicator lights; ext. speaker jack; comes with dynamic mike; 13.8-V d.c. positive or negative ground; 8" D × 7½" W × 2⅝" H $216.50

XCB-7 Mobile Transceiver
23-channel coverage; 4-W r.f. output; dual-conversion receiver; Tx & Rx indicator lights; switchable a.n.l.; delta tuning; p.a.; variable squelch; external speaker jack; S/RF meter; audio output 5 W at 10% dist.; dynamic mike; 13.8-V d.c. operation; overall size 7½" W × 8 3/5" D × 2½" H $189.95
XCB-11. Similar to XCB-7; audio output 3 W at 10% dist.; 5-W p.a. output; 13.8-V d.c. positive or negative ground; 7 3/5" D × 6½" W × 2" H $169.95
XCB-5. Similar to XCB-11 except audio output 2 W at 10% dist.; 8 3/5" D × 6½" W × 2½" H $159.95

AM/SSB

XSSB-10 AM/SSB Mobile
23-channel AM plus 46 channels USB and LSB; 4-W r.f. output (AM), 12-W, p.e.p. (SSB); single-conversion superhet (SSB), dual-channel superhet (AM); variable squelch; RF/S meter; clarifier range ±600 Hz; audio power output 3 W at 10% dist., p.a. & ext. speaker jack; 13.8-V d.c. positive or negative ground; 9" D × 6 9/16" W × 2 7/16" H..... $379.95

ZODIAC

M-5026 Mobile Transceiver
23-channel synthesized mobile; 3.5-W r.f. output; dual-conversion receiver; sensitivity 0.3μV at 10 dB S + N/N; selectivity 6 dB at ±3 kHz; squelch control; a.g.c.; RF/S meter; jacks for external speaker, p.a., extra mike, selective call unit; comes with mike, mike holder, mounting backets; soft plastic front and knobs for safety; 11.4–14.4 V d.c. positive- or negative- ground; 6-V or 24-V battery; 220/117 V a.c.; overall size 9⅜" × 6⅜" × 2¼" $214.95

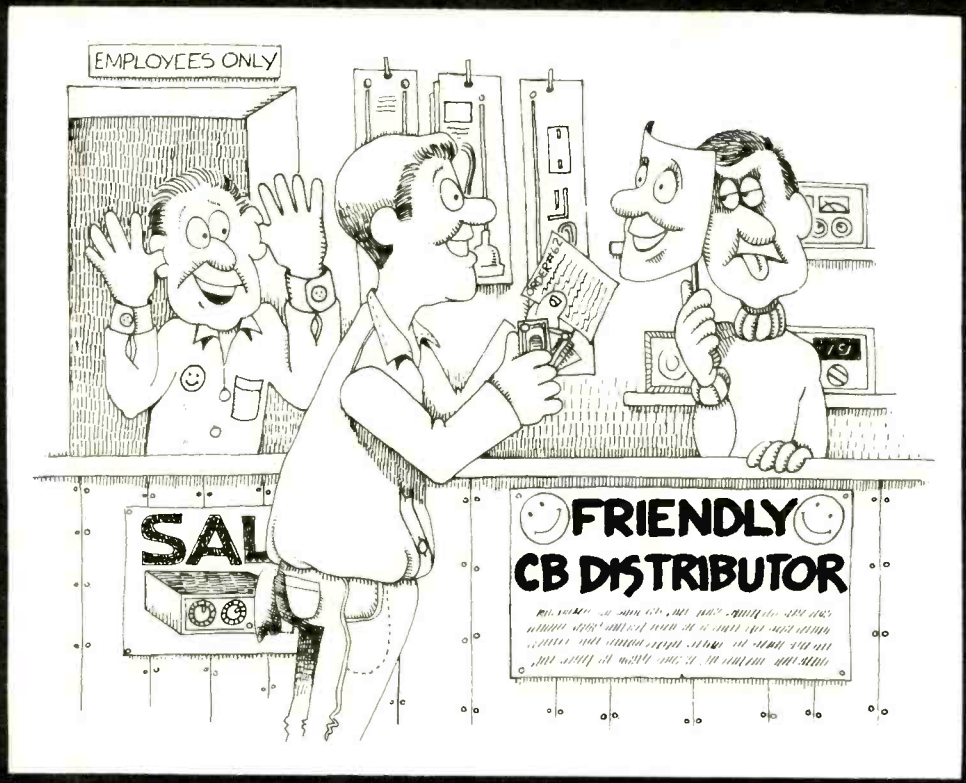
M-5023 Mobile Transceiver
23-channel synthesized mobile; 3.5-W r.f. output; dual-conversion superhet receiver; sensitivity 0.4 μV at 10 dB S + N/N; selectivity 6 dB at 3 kHz; continuous squelch control; 4-W audio power output; RF/S meter; jacks for antenna and extra speaker; 11.4-14.4 V d.c. positive- or negative-ground, or 117/220 V a.c.; comes with mike, mike holder, mounting brackets, antenna plug, and power supply cable; 6" × 5⅛" × 1½" $129.95

PORTABLE

P-5024 Hand-Held Transceiver
23-channel synthesized portable; 3.5-W r.f. output; dual-conversion receiver; sensitivity 0.5 μV at 10 dB S + N/N; selectivity 6 dB at ±3 kHz; RF/S; four-position function switch (on/off, squelch, and battery test); has tone-call, multijack for connecting external mike/earphone, hand micro telephone, or lip mike; designed for on-board use on boats; waterproof, lightweight casing; eight "AA" cells or NiCad battery, 12-V external power supply 9¾" × 3¼" × 2¼", 2½ lbs $199.95

A WORD ABOUT PRICES .....

The prices listed in the Directories are those supplied as "Suggested Retail Price" or "Fair Resale Value" as provided by the manufacturer and/or distributor. Prices in your particular shopping area may vary from those listed at the option of the retailer.



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CIRCLE NO. 9 ON FREE INFORMATION CARD

CB Base Station Transceivers

ALARON

B-5050 Base Station Transceiver

40-channel transceiver with phase-locked loop synthesizer; a.c./d.c. circuitry; 4-W max r.f. output; il-

luminated S/RF meter; variable squelch control; local-distant PA/CB switch; automatic noise limiter; transmit and receive indicators; front-panel jacks for p.a. extension speaker and headphones. .. $159.95

BOMAN

CBH-995 40-Ch Base Station

40-channel coverage; digital synthesizer; p.a. facilities; a.n.l.; squelch; external speaker jack; SWR &

S/RF meters; r.f. gain control; LED readout; earphone jack; 117-V a.c. operation. $290.00

CBH-990. Same as 995 except without SWR meter. $230.00

BROWNING

Golden Eagle Mark IV SSB/AM

SSB transmitter provides AM performance plus single-sideband with full 12 watts p.e.p. output; 8-step crystal lattice filter to give up to 80 dB rejection of the unused portion of the channel to develop maximum voice power; companion receiver offers 70 dB min. adjacent-channel rejection; continuous 40-channel tuning with separate bandspread control plus HF band to 27.595 MHz; 0.3 μV sensitivity at 10 dB (S + N)/N, electronic fine tuning. 6.75″ × 15.5″ W × 9.88″ D (each unit). $895.00

COBRA

89 XLR 40-Ch Base Station

40-channel coverage; 4-W r.f. power output; sensitivity 1.0 μV; selectivity −6 dB at 7 kHz, −60 dB at 10 kHz; image rejection −50 dB; delta tune range ±1500 Hz; audio output 4 W into 8 ohms; RF/S and Mod./SWR meters; adjustable squelch control; switchable a.n.l.; p.a. capability; LED digital channel selector; plug-in dynamic mike; 13.375″ W × 12.625″ D × 5.75″ H. $289.95

CAM 89 Base Station

23-channel base station featuring "Dyna-Mike" and r.f. gain control; noise blanking and limiting; delta tune; 1 μV sensitivity; −30 dB image rejection; delta tune range ±1500 Hz; separate modulation and RF power/signal strength meters; a.n.l.; p.a. capability; squelch control; tone control; operates from 120 V a.c. or 13.8 V d.c.; 5¾″ × 13⅜″ × 12⅝″ D. . $279.95

86 XLR 40-Ch Base Station

40-channel coverage; 4-W r.f. output; sensitivity 1.0 μV; selectivity −6 dB at 4 kHz, −50 dB at 20 kHz;

image rejection −40 dB; delta tune range ±1000 Hz; audio output 2 W into 8 ohms; RF/S meter; switchable a.n.l.; volume & squelch controls; LED channel readout; 13.8 V d.c. positive- or negative-ground or 120 V a.c.; detachable mike and power cords included; 10.24″ W × 8.27″ D × 5.91″ H. $199.95

AM/SSB

135 XLR 40-Ch AM/SSB Base Station

40-channel coverage; 4-W (AM), 12-W p.e.p. (SSB) r.f. power output; voice lock range ±600 Hz; SSB carrier suppression 40 dB; sensitivity 0.75 μV (AM), 0.25 μV (SSB); selectivity −6 dB at 3.8 kHz, −50 dB at 10 kHz (AM), −6 dB at 2.2 kHz, −60 dB at 5 kHz (SSB); image rejection −50 dB; voice lock ±1.5 kHz (AM), ±1 kHz (SSB); audio output 3.5 W; p.a. capability; automatic noise limiting/blanking; adj. squelch control; r.f. gain control; LED digital

channel indicator; SWR/RF/S meter; digital clock; 13.39″ W × 11.73″ D × 5.12″ H. $519.95

135 AM/SSB Base Station

23 AM and 46 SSB channels; crystal synthesizer; digital clock (117 V a.c.); meter showing relative power, signal-strength, and SWR; 4-W r.f. output (AM), 12 W p.e.p. (SSB); receiver sensitivity 0.25 μV for 10 dB (S + N)/N for SSB (0.5 μV for AM); double-conversion; automatic gain control; adjustable squelch; noise blanker. 3 W at 8 ohms output. p.a. capability; 117 V a.c. or 13.8 V d.c. (positive or negative ground); mike; 13⅜″ W × 12″ D × 5⅜″ H. $499.95

139 XLR 40-Ch AM/SSB Base Station

40-channel coverage; 4-W (AM), 12-W p.e.p. (SSB) r.f. output; SSB carrier suppression −40 dB; sensitivity 0.75 μV (AM), 0.25 μV (SSB); image rejection −50 dB; voice lock ±600 Hz; audio output 3.5 W into 8 ohms; S/RF and Mod/SWR meters; r.f. gain control; switchable noise limiting & blanking; LED readout; plug-in mike; 13.8 V d.c. positive- or negative-ground or 120 V a.c.; 13.5″ W × 13″ D × 5″ H. $449.95

COLT

800 40-Ch. Base-Station Transceiver

40-channel coverage; digital synthesizer; 4-W r.f. output; sensitivity 0.7 μV at 10 dB S + N/N; adj. channel rejection −60 dB; selectivity +50 dB ±10 kHz; image rejection +50 dB; delta tune + 1 kHz; dual-conversion receiver; audio output 4.5 W at 8% dist.; spurious emissions −65 dB; 95% max. modulation; p.a. facilities; switchable a.n.l. & noise blanker; squelch; external speaker jack; SWR meter; S/RF meter; r.f. gain control; digital LED selector; mike gain control; Rx & Tx lamps; 12¼″ W × 10″ D × 3¾″ H; 13.8 V d.c. operation $279.95

COMMANDO

CC-4045 40-Ch Transceiver

40-channel coverage; digital synthesizer; 4-W r.f. power; sensitivity 0.5 μV at 10 dB S + N/N; spuri-

ous rejection −45 dB; adj. channel selectivity −45 dB at 10 kHz; audio output 3 W at 10% dist.; volume, squelch, tone controls; delta tune; a.n.l. switch; CB/PA switch; 10.5/16 V d.c., 10.5 V/125 V a.c. operation $279.95

CC-4040. Similar to CC-4045 except 3.5-W r.f. power; S/RF meter; squelch; PA control; r.f. gain control; noise blanker switch; 10.5/16-V d.c. operation $189.95

COURIER

Conqueror 40D Base Station Transceiver

40-channel; LED digital channel display; digital clock; phase-locked loop circuitry; built-in a.c./d.c. power supply; large S/RF meter; noise limiter switch; p.a. switch; tone control; r.f. gain control; on-the-air indicator; receive indicator $269.95

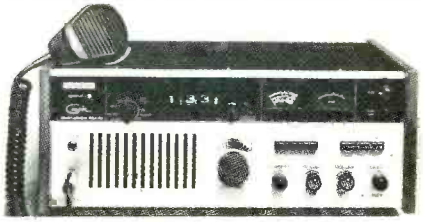
Caravelle 40D CB Transceiver

40-channel coverage; LED digital channel display; phase-locked loop circuitry; built-in a.c./d.c. power supply; large S/RF meter; noise limiter switch; p.a. switch; tone control; r.f. gain; on-the-air indicator; receive indicator $239.95

AM/SSB

Centurion PLL 40

40-channel single-side band transceiver; phase-



locked loop circuitry; S/RF meter-clarifier; r.f. gain control; noise blanker switch; p.a. switch; mode

control switch; on-the-air light; plug-in mike; a.c./d.c. power supply $569.95

CRAIG

L 231 AM/SSB Transceiver

40-channel coverage; digital synthesizer; 4-W (AM), 12-W p.e.p. (SSB) r.f. power output; sensitivity 0.5

μV (AM), 0.2 μV (SSB) at 10 dB S + N/N; adj. channel rejection −60 dB at ±10 kHz; selectivity 6 dB at 4 kHz, 50 dB at 5.5 kHz; clarifier range ±800 kHz; dual-conversion receiver; audio output 3.5 W; spurious response −50 dB; carrier suppression −50 dB; switchable a.n.l. & noise blanker; SWL meter; S-RF/Cal meter; digital clock; automatic transceiver "on-off" operation; 13.8-V d.c. negative- or positive-ground or 120-V a.c., 60 Hz; 17 1/16" W × 10½" D × 5 1/16" H $499.95

FANON

Fanfare 880DF Base Station

Phase lock loop circuitry; LED digital channel display; built-in a.c./d.c. power supply; S/RF meter; noise limiter; p.a. switch; tone control; r.f. gain control; on-the-air indicator; receive indicator .. $239.95

GEMTRONICS

GTX-3000 "Golden Chief"

23-channel synthesized base station; 4-W r.f. output; sensitivity 0.5 μV at 10 dB S + N/N; selectivity −6 dB at ±3 kHz, −55 dB at ±10 kHz; image response −50 dB; delta tune ±1.3 kHz; 4-W audio output; spurious response −55 dB; p.a.; a.n.l.; squelch; automatic modulation limiter; built-in speaker; SWR meter; S/RF meter; r.f. gain control; ext. speaker & p.a. jacks; digital clock; PTT mike; 117-V a.c./12-V d.c. operation; 13½" D × 9" W × 4¾" H. ..... $279.95.

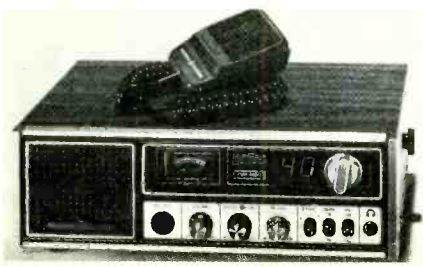
GTX-2300 "Warrior"

For base or mobile use; tube-type unit; 4-W r.f. output; sensitivity 0.8 μV at 10 dB S + N/N; selectivity −6 dB at 6 kHz; image response −75 dB; audio output 4 W; spurious resonse −55 dB; 3-position delta tune; external speaker & p.a. jacks; p.a.; a.n.l.; squelch; auto. mod. limiter; built-in speaker; S/RF meter; built-in converter for mobile use; 105-120-V a.c., 50/60 Hz; 12-V d.c.; 12" W × 8¼" D × 5" H. $269.95

GENERAL ELECTRIC

3-5871 40-Ch Base-Station Transceiver

40-channel coverage; digital synthesizer; 4-W r.f. power output; sensitivity 1 μV at 10 dB S + N/N; adj. channel rejection −50 dB; image response −40



dB; delta tune ±1.5 kHz; dual-conversion receiver; audio output 2.2 W at 10% dist.; spurious emissions −60 dB; spurious response −40 dB; 95% max. modulation; p.a. facilities; switchable a.n.l.; squelch; external speaker jack; S/RF meter; r.f. gain control; on-the-air and Tx indicator lights; 11½" W × 9" D × 4" H $249.95

GLOBE

18-9400 Base-Station Transceiver

40-channel coverage; digital synthesizer; 4-W r.f. output; sensitivity 0.02 μV at 10 dB; adj. channel rejection 75 dB; selectivity ±6 dB at 3.5 kHz; image response −50 dB; dual-conversion receiver; audio output 3.8 W at 10% dist.; spurious emissions −60 dB; spurious response −55 dB; p.a. facilities; switchable a.n.l. and noise blanker; squelch; external speaker jack; SWR meter; S/RF meter; r.f. gain control; "dim/bright" switch; digital channel readout; automobile voltage monitor meter; 117-V a.c. or 13.8 V d.c. operation; 12¾" W × 9½" D × 5" H $330.00

HY-GAIN

3084 Base-Station

23-channel coverage; digital synthesizer; r.f. power output 4 W; sensitivity 0.7 μV at 10 dB S+N/N; adj. channel rejection 40 dB; selectivity −50 dB at ±10 kHz; image response −40 dB; dual-conversion receiver; audio output 3 W at 10% dist.; spurious response −40 dB; max. mod. 95%; a.n.l.; squelch; external speaker jack; s.w.r. meter; S/RF meter; r.f. gain control; phone jack; 13.8 V d.c./117 V a.c.; 13¼" W × 11" D × 5" H $239.95

3087 Base Station

23-channel coverage; digital synthesizer; r.f. power output 4 W; sensitivity 0.7 μ V at 10 dB S+N/N; adj.

channel rejection 40 dB; selectivity −50 dB at ±10 kHz; image response −40 dB; dual-conversion receiver; 3 W audio output; max. mod. 95%; squelch; external speaker jack; S/RF meter; phone jack; 13.8 V d.c./117 V a.c.; 12⅜" D × 8¼" W × 4 3/16" H $219.95

AM/SSB

3108 SSB Base Station

23-channel plus USB/LSB coverage; digital synthesizer; 4 W (AM), 12 W p.e.p. (SSB) r.f. output; sensitivity 1 μV (AM), 0.25 μV (SSB) at 10 dB S+N/N; selectivity −6 dB at ±6 kHz, −6 dB at ±2 kHz (SSB); image response −10 dB (SSB), −40 dB (AM); clarifier range ±600 Hz; dual-conversion receiver (AM), single (SSB); audio output 3 W; spurious response −40 dB; carrier suppression −40 dB; max. mod. 95%; p.a. facilities; a.n.l.; squelch; external speaker jack; s.w.r. meter; S/RF meter; r.f. gain control; 13.8 V d.c./117 V a.c.; 16" W × 11" D × 4¾" H $449.95

E.F. JOHNSON

Messenger 4250 40-Ch Base Station

40-channel coverage; 4-W r.f. output; sensitivity 0.5 μV at 10 dB S + N/N; digital synthesizer; 3-W audio

output; radiotelephone styling with handset; tapered automatic noise limiter; electronic speech compression; LED channel readout; illuminated S/RF meter; p.a. facilities; 117-V a.c. or 13.8-V d.c. negative ground. $259.95

Messenger 4230 40-Ch Base Station

40-channel coverage; 4-W r.f. output; sensitivity 0.5 μV at 10 dB S + N/N; digital synthesizer; "bar-graph LED S/RF meter; LED channel readout; local/normal/extended range control switch; p.a. facilities; switchable a.n.l.; 117-V a.c. or 13.8-V d.c. negative ground; 12.175" D × 11.0" W × 4.16" H. $249.95

LAFAYETTE

Com-Phone 23 Mark II

Handset-style 23-channel base transceiver; dual-conversion superhet receiver; sensitivity 0.7 μV at 10 dB (S + N)/N; 4 W max. r.f. power output; features three-way operation; handset for private communication, speaker only, or both plus external mike jack; has high/low power switch; volume control; CB/PA switch; S/RF meter; transmit indicator; molded cabinet; comes with crystals; 5¼" × 12" overall. $139.95

PEARCE-SIMPSON

Super Lynx Base/Mobile

Base/mobile use; 115 V a.c./12 V d.c. positive or negative ground; 23 channels; digital clock for automatic turn-on; illuminated S/RF/modulation meter; dual-conversion superhet with ceramic filter; sensitivity 0.5 μV for 10 dB (S + N)/N; comes with plug-in dynamic mike, power cords; 13⅜" W × 5½" H × 10¾" D $284.95

Lynx 23 Transceiver

Base station or mobile use, 117 V a.c. or 12 V positive- or negative-ground d.c. input, dual-conversion receiver with ceramic filter; 23 channels with all crystals included; built-in variable preamp; combination S/RF/modulation meter; headphone jack on front panel; p.a. and loudspeaker jacks. $224.95

Pussycat 23 CB Radio

Mobile or base-station use; 23 channels with crystals; 4-W r.f. output; double-conversion receiver; sensitivity 0.7 μV for 10 dB (S + N)/N; a.n.l.; built-in speaker; p.a.; adjustable squelch; illuminated S/RF meter; comes with dynamic plug-in mike, a.c. and d.c. power cord; external speaker jack; 12-d.c./115-V a.c.; 10¾" × 3¾" × 9½" $179.95

AM/SSB

Simba SSB Transceiver

Mobile or base station use: 117-volts a.c. or 12-volts d.c.; 12 watts p.e.p.; S/RF modulation meter; SWR bridge; r.f. noise blanker; lighted digital clock with alarm to turn set on; p.a. and headphone jacks; variable r.f. gain control; desk microphone; built-in mike gain control $599.95

Bengal SSB/AM Radio

Base station or mobile use; 23 channels on AM; 23 channels each upper and lower sideband; 117-volt a.c. or 12-volt d.c.; 12 watts p.e.p.; 5 watts input on AM; S/RF modulation meter; noise blanker; noise limiter; p.a.; variable r.f. gain control; built-in mike gain with variable control. $429.95

JCPENNEY

6237 40-Ch Base-Station Transceiver

40-channel coverage; 4-W r.f. power output; double-conversion receiver; 0.5 μV sensitivity; selectivity 60 dB ±10 kHz; adj. channel rejection 60 dB; adjustable fine tune; adj. squelch; a.n.l.; adj. a.n.l. control; p.a. capability; Tx indicator; digital channel indicator; 120-V a.c. or 12-V d.c.; 11 7/16" W × 9 1/16" D × 3 9/16" H $169.99

PRESIDENT

"Dwight D" 40-Ch Base Station

40-channel coverage; digital synthesizer; 4 W r.f. output; spurious & harmonic suppression −60 dB;

receiver sensitivity 0.5 μV; spurious rejection −55 dB; adj. channel rejection −60 dB; squelch range 1-1000 μV; built-in a.n.l.; noise blanker with manual override, r.f. gain control; SWR/Mod and S/RF output meters; digital clock; digital channel display; comes with external speaker, plug-in mike, mobile mounting bracket, d.c. power cord and plug; 13.8-V positive/negative ground and 117-V a.c. operation; 15" W × 11½" D × 4¾" H; speaker 11½" D × 5¾" W × 4¾" H. $329.95

"Zachary T" CB Base Station

40-channel coverage with P.L.L. synthesizer; r.f. power output 4 W; sensitivity 0.5 μV; adjacent channel rejection −60 dB; spurious emissions −65 dB volume, squelch, mike gain, r.f. gain controls; PA/CB and a.n.l. switches; S/RF meter; jacks for antenna, r.f. gain, p.a., external speaker, phone, and mike; operates from a 117-V a.c. or 13.8-V d.c. source; 13½" W × 11½" D × 4¾" H. $249.95

AM/SSB

"Washington" 40-Ch AM/SSB

40-channel AM plus LSB and USB; 4-W r.f. output (AM), 12-W p.e.p. (SSB); sensitivity 0.5μV (AM), less than 0.25μV (SSB) at 10 dB S + N/N; adjacent channel rejection −60 dB; controls for channel selection, volume, squelch, mike gain, r.f. gain; switches include PA/CB, noise blanker on/off; operates on 117-V a.c. or 13.8-V d.c.; 13½" W × 11" D × 5" H. $429.95

RADIO SHACK

Realistic TRC-55 Transceiver

23-channel base/mobile transceiver; sensitivity 0.5 μV at 10 dB S + N/N; selectivity 6kHz at −6 dB; built-in a.l.c.; range-boost for added talk power; variable r.f. gain control; 3-way delta tune; dual-conversion receiver with i.f. filter & FET front end; digital clock timer with alarm; mike gain control for p.a. applications; illuminated channel selector; on-the-air modulation lights; headphone jack; audio power output 4 W ±10% THD; 120-V a.c./12-V d.c. neg. ground; 5" × 14⅔" × 9". 21-151 ..... $229.95

AM/SSB

Realistic TRC-57 SSB/AM

23-channel base/mobile unit; sensitivity 0.2 μV for 10 dB S + N/N; selectivity 4 kHz at −6 dB; adj. channel rejection: AM −60 dB, SSB −70 dB; clarifier range ±1.5 kHz; phase-lock synthesizer for 100-Hz accuracy; crystal lattice i.f. filter; r.f. gain control; separate S/RF and SWR meters; i.f. rejection −90 dB; image rejection −50 dB; LED digital display clock (a.c. only); audio power output 6 W; headphone or ext. speaker jack; squelch; noise blanker; a.n.l.; 12-V d.c. pos./neg. ground; 3⅞" × 14⅞" × 10½" (less legs). 21-157 ..... $399.95

REGENCY

CB-701 40-Ch Base Station

40-channel coverage; digital synthesizer; 4 W r.f. output; sensitivity 0.5 μV at 10 dB S + N/N; adjacent channel rejection −60 dB; selectivity −7 dB at ±7 kHz; image response −60 dB; dual-conversion receiver; audio output 4 W at 10% dist.; spurious emissions −60 dB; 100% max. mod.; a.n.l.; noise blanker; squelch; external speaker jack; S/RF meter; r.f. gain control; LED readout; mike gain control; mod. indicator; 117-V a.c. or 13.8 V d.c. $219.00

ROYCE

625 Base-Station Transceiver

40-channel coverage; modular construction; 4-W r.f. output; sensitivity 0.5 μV for 10 dB S + N/N; audio output 4 W; dual-conversion superhet; tuned r.f. stage; a.n.l.; a.g.c.; squelch; s.w.r. calibration control; S, RF power output & s.w.r. meters; Tx indicator; fine-tuning control; r.f. gain control; blackout front panel; walnut wood cabinet; 115-V, 60 Hz a.c./12-V d.c. positive or negative ground; 15" W × 10½" D × 4¾" H. $349.95

621 Base-Station Transceiver

40-channel coverage; 4-W r.f. output; sensitivity 0.5 μV at 10 dB S + N/N; 3-W audio output; 55 dB adj.

channel rejection; fine tune range ±1500 Hz; a.n.l.; ext. speaker & p.a. jacks; Rx & Tx lights; S/RF meter; 117-V, 60 Hz a.c./12-V d.c. positive or negative ground; 12" W × 8" D × 4½" H. $219.95

AM/SSB

641 AM/SSB Base Station

40-channel coverage; digital synthesizer; amplified automatic gain control; 4-W (AM), 12-W p.e.p. (SSB) r.f. output; unwanted sideband 50 dB down; clarifier ±1500 Hz; sensitivity 0.5 μV (AM), 0.2 μV (SSB) at 10 dB S + N/N; audio output power 3.5 W; backlighted S/RF meter; digital readout; Tx & Rx lights; a.c.-d.c. power supply; 12-V d.c. negative or positive ground; comes with a.c.-d.c. power cords; plug-in mike; 9⅛" D × 8" W × 2⅜" H. $399.95

SBE

"Trinidad III" 40-Ch Base Station

40-channel coverage; digital synthesizer; 4-W r.f. output; dual-conversion receiver; sensitivity 0.5 μV

for 10 dB S + N/N; adj. channel rejection −55 dB; audio output 3 W at 10% THD; delta tune; triple-function meter; switchable noise limiter; adjustable squelch; p.a. facilities with optional external speaker; fail/safe switchover to 12-V battery operation in case of power-line failure; LED readout; comes with dynamic mike, coiled cord, plug; 17.75" W × 8.75" D × 5.75" H. $279.95

TEABERRY

4007 "T Command" Base/Mobile

40-channel coverage; digital synthesizer; 4-W r.f. output; 100% peak mod.; sensitivity 1.0 μV at 10 dB S + N/N; delta tune ±1500 Hz; 3-W audio output at 10% dist.; image rej. −70 dB; digital channel indicator; S/RF and SWR meters; auto. mod. control; noise blanker; mike gain control; clock alarm; mod. indicator; Rx & Tx indicators; ext. speaker & p.a. jacks; 117-V a.c. or 13.8 V d.c.; 15" W × 11½" D × 4¾" H. $300.00

4011 "Model T" Base Station

40-channel coverage; digital synthesizer; 4-W r.f. output; 100% peak mod.; sensitivity 0.8 μV at 10 dB S + N/N; delta tune ±1500 Hz; audio ouput 3 W at 10% dist.; adj. channel rej. −55 dB; image rejection −70 dB; digital channel indicator; S/RF meter; auto. mod. control; mod., Tx & Rx indicators; ext. speaker & p.a. jacks; 117-V a.c.; 12" W × 8¼" D × 5" H. $290.00

4003 "T Dispatch" Base/Mobile

40-channel coverage; digital synthesizer; 4-W r.f. output; 100% peak mod.; sensitivity 0.5 μV at 10 dB S + N/N; 3-W audio output at 10% dist.; adj. channel rej. −60 dB; image rej. −40 dB; S/RF meter; auto. mod. control; a.n.l. switch; 117-V a.c. or 13.8 V d.c.; 13" W × 10¼" D × 4¾" H. $220.00

AM/SSB

4002 "Stalker Two" Base/Mobile

40-channel coverage; digital synthesizer; 4-W (AM), 12-W p.e.p. (SSB) r.f. output; sensitivity 0.5 μV (AM), 0.25 μV (SSB) sensitivity at 10 dB S + N/N; clarifier ±1500 Hz; 3-W audio output at 10% dist.; adj. channel rejection −70 dB; image rejection −40 dB; S/RF meter; SWR meter; auto. mod. control; noise blanker; r.f. gain control; Rx & Tx indicators; external speaker & p.a. jacks; 117-V a.c./13.8-V d.c.; 13⅜" W × 11¼" D × 5½" H. $440.00

TRAM

D201 AM/SSB Base Station

23-channel; controls include mike gain, transmitter tone, receiver tone, clarifier, r.f. noise blanker, variable a.n.l., optional foot-switch, crystal/manual switch, r.f. gain, two-speed reverse vernier tuning; sensitivity 0.1 μV at 10 dB S + N/N (SSB); 0.35 μV (AM); selectivity −60 dB at 4.65 kHz (SSB), −70 dB at 20 kHz (AM); r.f. output 12 W p.e.p. (SSB), 4 W (AM(; 21½" W × 13" D × 7½" H; comes with GD104 mike; 117-V a.c.; audio output 4 W at 10% dist. into 4 ohms. $850.00

UNIMETRICS

Purpoise-1 Base-Station Transceiver

23-channel base station plus one VHF/FM crystal-controlled channel; volume & squelch controls; S/RF meter; receiver sensitivity 0.5 μV at 10 dB S + N/N; a.n.l.; delta tune; watertight construction; corrosion-resistant materials; 117-V a.c. operation; 9" × 8" × 2½" $239.95

UTAC

Studio/6000 40-Ch Transceiver

40-channel coverage; digital synthesizer; 4-W r.f. output; sensitivity 1 μV at 10 dB S + N/N; adj. channel rejection −50 dB; selectivity −60 dB at 10 kHz; image response −50 dB; delta tune ±10 kHz; dual-conversion receiver; 4 W audio output; p.a. facilities; switchable a.n.l. & noise blanker; squelch; external speaker jack; SWR meter; S/RF meter; r.f. & mike gain controls; digital channel readout; digital clock; triple meter; two ch/VHF; 24" W × 9½" D × 5¼" H $329.95

THE COVER

Some of the newest communications equipment is shown on our cover, including:
Top Row
Browning's 40-channel "Sabre" mobile transceiver
Kricket/Kamel "hump mount" speaker/base unit for mobiles.
Center Row
Electra "Bearcat 101" scanner/monitor with 5-band coverage.
Pearce-Simpson "Carib 55" 55-ch marine radiotelephone.
Bottom Row
Kenwood TS-820 CW, SSB, FSK 16-10 m. ham transceiver.
Drake SSR-1 communications receiver.

TURN SPARE TIME INTO MONEY!

Start your own business, or prepare for a career, with this self-study

CB RADIO REPAIR COURSE

Even if you don't know anything about electronics, you can learn how to repair CB radios if you study this course and can master the use of hand tools. Lessons are mailed to you weekly, and they're easy to study because they employ the step-by-step PROGRAMMED INSTRUCTION TECHNIQUE!
Before you start learning about CB radio circuits, you learn about the fundamentals of electronics as explained in simple, easy to understand language.

To aid you in getting your Second Class Radio-Telephone Operator license, you will be given a FREE license examination study manual. No license is required if your work is to be checked by an appropriately licensed operator.

You can learn to TUNE UP RECEIVERS AND TRANSMITTERS-USE AN SWR METER-MEASURE FREQUENCIES-MEASURE MODULATION-INSTALL AND CHECK MOBILE UNITS AND BASE STATIONS-INSTALL ANTENNAS-TEST TUBES & TRANSISTORS-ISOLATE RADIO TROUBLES—and, perform other service functions!

After satisfactory completion of the course, you should be able to earn extra money (going rate is $16. per hour!) — as a part time radio technician working out of your own home; set up your own full-time CB radio repair business — or, work for a dealer or manufacturer!
You can buy the course on a cash-in-advance basis, on a low monthly payment basis, or through a national credit card firm. (No refunds will be made if you decide not to complete the course.)

Complete and mail the coupon below, or — send postcard marked "CB COURSE" to:
CB RADIO REPAIR COURSE, INC.,
531 North Ann Arbor, Oklahoma City, OK 73127
NO SALESMAN WILL CALL

CB RADIO REPAIR COURSE, INC. Dept. CH-77
531 North Ann Arbor, Oklahoma City, OK 73127

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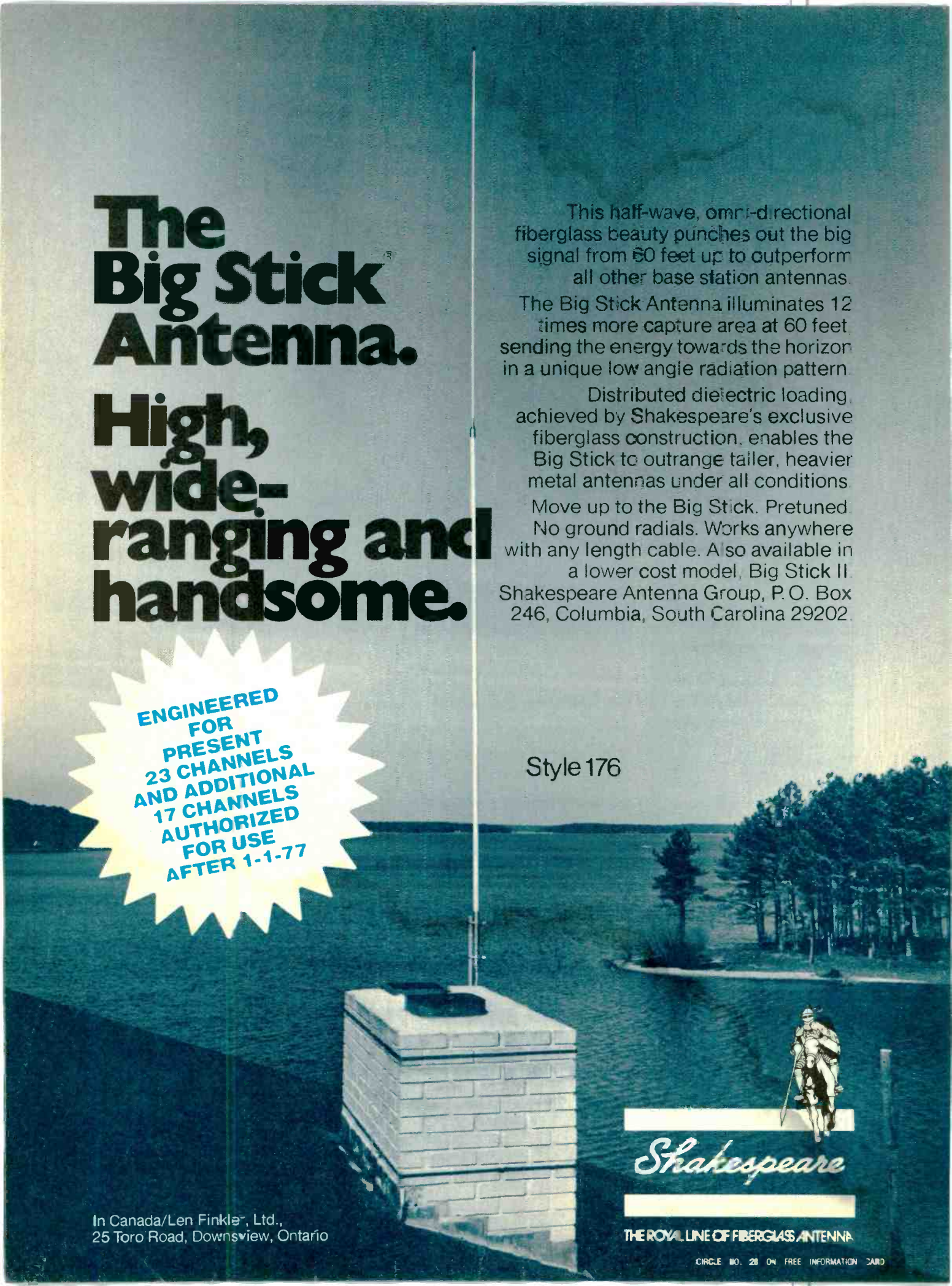

The Big Stick Antenna.
High, wide-ranging and handsome.
This half-wave, omni-directional fiberglass beauty punches out the big signal from 60 feet up to outperform all other base station antennas.
The Big Stick Antenna illuminates 12 times more capture area at 60 feet sending the energy towards the horizon in a unique low angle radiation pattern.
Distributed dielectric loading, achieved by Shakespeare's exclusive fiberglass construction, enables the Big Stick to outrange taller, heavier metal antennas under all conditions.
Move up to the Big Stick. Pretuned. No ground radials. Works anywhere with any length cable. Also available in a lower cost model, Big Stick II. Shakespeare Antenna Group, P.O. Box 246, Columbia, South Carolina 29202.
ENGINEERED FOR PRESENT 23 CHANNELS AND ADDITIONAL 17 CHANNELS AUTHORIZED FOR USE AFTER 1-1-77
Style 176
Shakespeare
THE ROYAL LINE OF FIBERGLASS ANTENNA
In Canada/Len Finkler, Ltd., 25 Toro Road, Downsview, Ontario
CIRCLE NO. 28 ON FREE INFORMATION CARD

Mobile Station Antennas

ALARON

TLS-100 Mobile Antenna
Adjustable fiberglass whip with shock spring; base-loaded; 43½" high; chrome-plated mounting base with rubber-lined edges to prevent scratching; attaches to side or rear edge of trunk lid; no holes; comes with setscrews; keys; 17-ft coax cable, PL-259 connector. $9.95

AMERICAN ELECTRONICS

Mobile Whip Line
The company offers ten top-loaded, 46-in whips; stainless-steel construction; 1.5:1 s.w.r.; all come with coax cable, tunable tips, 3/8-in dia. loading coils.

93-058. Cowl-mount, 108-in coax..... $18.45
93-104. Rain-gutter mount, 216-in coax, foldover base adapter $23.95
93-114. Universal mount, 216-in coax, foldover base adapter $25.95
93-136. Universal mount, 216-in coax..... $19.45
93-146. Dual universal mount, co-phasing harness, two 144-in "V" coax..... $35.45
93-154. Dual mirror/luggage rack, co-phasing harness, two 144-in "V" coax..... $26.95
93-190. Mirror/luggage rack mount, 216-in coax..... $15.45
93-180. Rain-gutter mount, 216-in coax..... $16.95
93-314. Trunk-lip mount, 216-in coax..... $16.95
93-324. Dual-loaded whips, dual-trunk-lip mount, co-phasing harness, 144-in and two 144-in coax..... $30.45

They offer six center-loaded, 29-in whips; stainless-steel construction; 1.5:1 s.w.r.; all come with 216-in coax cable, tunable tips.

93-105. Rain-gutter mount, foldover adapter. $22.45
93-120. Magnetic mount, no-mar contact surface $20.95
93-115. Universal mount, foldover adapter.... $16.95
93-137. Universal mount $17.95
93-147. Dual-loaded whips, co-phasing harness, two 144-in "V" coax..... $29.95
93-155. Dual-loaded whips, dual-mirror mount, co-phasing harness, two 144-in coax..... $23.95

They offer six center-loaded, 61-in whips, stainless-steel construction; 1.5:1 s.w.r., all come with 216-in coax cable, tunable tips.

93-102. Gutter-mount, foldover adapter..... $24.95
93-112. Universal mount, foldover adapter.... $31.95
93-134. Universal mount $24.95
93-152. Dual-loaded whips, dual-mirror/luggage rack mount, co-phasing harness, two 144-in "V" cables..... $38.45
93-184. Rain-gutter mount..... $22.95
93-188. Mirror/luggage rack mount..... $20.95
93-312. Trunk-lip mount..... $22.45
93-322. Dual-loaded whips, dual trunk-lip mount co-phasing harness, two 144" and one 144" "Y" cable $41.95
93-153. Dual mirror/luggage rack mount, 59" whip, co-phasing harness, two 144" V coax cables. $43.45
93-189. Mirror/luggage rack mount, 59" whip..... $24.95

ANIXTER-MARK

HW Heliwhip Antennas
Top-loaded, 50-ohm molded fiber glass whips with "Static Sheath" to improve S/N up to 20 dB; can be mounted on trunklip, cowl, fender, or hood.

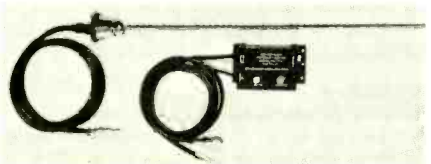
HW-11-SL18. 18-in.; 2:1 v.s.w.r. at 350 kHz .. $6.95
HW-11-S3. 3-ft., 2:1 v.s.w.r. at 400 kHz $7.25
HW-11-S4. 4-ft., 2:1 v.s.w.r. at 500 kHz $7.75
HW-11-S6. 6-ft., 2:1 v.s.w.r. at 1000 kHz $8.50
HW-11-4. 4-ft., heavy-duty; 2:1 v.s.w.r. at 500 kHz $12.50
HW-11-6. 6-ft., heavy-duty; 2:1 v.s.w.r. at 1000 kHz $14.00
HW-11-8. 8-ft., heavy-duty; 2:1 v.s.w.r. at 2500 kHz $16.50

Mark IV Co-Phase Whip
Similar to Heliwhips but designed for trucks, campers, etc.; comes with mounts and harness ... $54.95

HWM-1 Mobile Mount
Rugged, commercial-quality molded mount which will handle any Heliwhip, including heavy-duty models; ⅜-24 single-hole mount $8.25

AAC-11-4 Whip Antenna
Top-loaded 54" whip; trunk-lip mount; fiberglass & brass construction; 2 dB gain over isotropic; 1.1:1 s.w.r.; comes with 18-ft. coax. 40-channel coverage; tunable $36.00
HWC-11-4. Same except Heliwhip and spring only $20.50

AAF-11-4 CB/AM-FM Antenna
Bottom-loaded whip; cowl mount; telescoping mast adjustable from 22" to 55"; brass construction; max.



s.w.r. 1. 2:1 on any of 40 channels; allows operation of CB and AM or FM simultaneously; 6-ft. coax. $34.95

AAS-11-5 Whip Antenna
Adjustable, base-loaded 60" whip; trunk-lip mount; stainless-steel construction; 1 dB gain over isotropic; 1.2:1 s.w.r.; 40-channel coverage; tunable $31.75

SS-11-5 Whip Antenna
Bottom-loaded 60" stainless-steel whip; mounts in any position; +1 dB gain over isotropic; 1. 2:1 max. s.w.r.; 40-channel coverage; tunable $14.50

M-11-8 Marine CB Antenna
Eight-foot half-wave antenna with deluxe ferrule; permits operation on wood or fiberglass boats as well as mast-mounted; top-loaded; load coil wound on low-loss fiberglass; fiberglass tube with polyolefin; bottom ferrule machined brass with triple-plated chrome finish; ferrule threaded 1"-14 to mate with all marine mounts; launcher-matching cable to insure low v.s.w.r. across a minimum of 50 CB channels $79.95

M-11-6 Marine CB Antenna
Six-foot half-wave antenna with mount; 5-ft. coax cable terminating in SO-239 connector; includes "Quick-On" connector for quick antenna removal from base $41.50

ANTENNA INCORPORATED

Mobile CB Antenna Line
All units feature v.s.w.r. of 1.5:1 or less; coaxial cable included except as noted.

12510. Roof-mount, base-loaded, stainless-steel 34" whip; ⅜" snap-in mount; 17-ft coax; in-line connector $21.25
12520. Roof-mount, base-loaded, fiberglass 34" whip; ⅜" snap-in mount; 17-ft coax $24.40
12610. Universal hatchback mount, base-loaded; stainless-steel 34" whip; 17-ft coax $25.95
12611. Dual universal hatchback mount; base-loaded; stainless-steel 34" whip; 17-ft coax harness $47.95
13010. Roof-mount, center-loaded, stainless-steel 22" whip; ⅜" snap-in mount; 17-ft coax $20.50
13110. Gutter-mount, center-loaded, stainless-steel 22" whip; semi-permanent mount; 10-ft coax $21.50
13210. Gutter-mount, center-loaded, stainless-steel

22" whip; spring gutter mount; 10-ft coax $21.50
13111. Gutter-mount, base-loaded, stainless-steel 34" whip; semi-permanent gutter mount; 10-ft coax $25.95
13114. Center-loaded; dual gutter-mount; 22" stainless-steel whip; 17-ft coax harness $35.95
13212. Base-loaded; spring gutter-mount; 34" stainless-steel whip; 17-ft coax $25.95
13510. Roof- or trunk-mount, base-loaded, stainless-steel 34" whip; magnetic mount; 17-ft coax $28.88
13511. Roof- or trunk-mount, center-loaded, stainless-steel 22" whip; magnetic mount; 17-ft coax $28.88
14010. Mirror-mount, top-loaded, fiberglass 48" whip; single mirror mount; 17 ft coax $29.95
14110. Same as 14010 except dual-mirror mount $49.95
14011. Mirror-mount, base-loaded, stainless-steel 34" whip; single mirror mount; 17-ft coax $28.88
14111. Same as 14011 except dual-mirror mount $49.00
16010. Full-size, body-mount, stainless-steel 102" whip; swivel ball & spring; no coax cable $24.75
16020. Same as 16010 except 96" fiberglass whip .. $25.95
16012. Quarter-wave; 102" stainless-steel split whip; body-mount; no coax $26.95
16013. Same as 16012 except bumper-mount $30.95
16011. Full-size, bumper-mount, stainless-steel 102" whip; bumper mount & spring; no coax cable ... $28.88
16021. Same as 16011 except 96" fiberglass whip .. $31.88
17610. Base-loaded; trunk-lip mount; stainless-steel 34" whip; 17-coax; in-line connector; pre-assembled mount $25.95
17620. Base-loaded; trunk-lip mount; fiberglass 33" whip; 17-ft coax $28.88
17720. Top-loaded; trunk-lip mount; 48" fiberglass whip; 17-ft coax $23.95

38820. Top-loaded, marine half-wave 84" fiberglass whip; 7-ft coax $39.95

ANTENNA SPECIALISTS

MR-415 Antenna
Mirror-mount antenna for diesel trucks; 54-in stainless-steel whip; center-loaded; 1.75:1 s.w.r. in 40 channels; comes with 17-ft coax. $59.95

MR-315 Antenna
T-handle clamp mirror-mount; 50-in stainless-steel whip; center-loaded; 1.75:1 s.w.r. in 40 channels; comes with 17-ft coax $41.95

M-313 Antenna
Five-position, flipper, gutter-mount; 47-in stainless-steel whip; center-loaded; 2.0:1 s.w.r. in 40 channels; comes with 17-ft coax. $39.95

MR-267 Antenna
AM/FM/CB antenna; cowl-mount; 47-in stainless-steel whip; center-loaded; 1.5:1 s.w.r. in 23 channels, 1.75:1 s.w.r. in 40 channels; comes with 17-ft coax $37.95

MR-312 Antenna
Antenna for use on hatchback cars; 51-in stainless-steel whip; center-loaded 1.75:1 s.w.r. in 40 channels; comes with 17-ft coax $36.95

MR-411 Antenna
Roof-mount antenna installs in ¾-in hole; 47-in stainless-steel whip; base-loaded; comes with 17-ft coax $36.75

MR-510 Antenna
Trunk-lip or roof-top mount antenna; 45-in stainless-steel whip; base-loaded; 1.5:1 s.w.r. in 40 channels; comes with 17-ft coax $36.75

M-480 Antenna
Roof-top mount for recreational and off-the-road vehicles; 53-in fiberglass whip; base-loaded; comes with 17-ft coax $34.95

M-485 Antenna
Bumper-mount; full-size whip; 108-in max element length; 1.5:1 s.w.r. in 40 channels; comes with 17-ft coax $34.95

M-306 Antenna
Universal-mount antenna; no ground plane necessary; 53-in fiberglass whip; base-loaded; comes with 17-ft coax $32.95

M-307 Antenna
Bicycle-mount antenna; phone plug, no ground plane necessary; 72-in fiberglass whip; base-loaded; comes with 8-ft coax $32.95

M-486 Antenna
Bumper-mount; full-size stainless-steel whip; max element length 108-in; 1.5:1 s.w.r. in 40 channels; comes with 17-ft coax $32.00

M-488 Antenna
Gutter-mount antenna; 21-in stainless-steel whip; center-loaded; 2.0:1 s.w.r. in 23 channels; comes with 17-ft coax $32.00

MR-247 Antenna
Camper-mount for flat surfaces; 47½-in stainless-steel whip; base-loaded; 1.75:1 s.w.r. in 40 channels; comes with 17-ft coax $30.75

MS-264 Antenna
AM/FM/CB antenna; cowl-disguise mount; 47-in stainless-steel whip; coupler-loading; 2.0:1 s.w.r. in 40 channels; comes with 17-ft coax $29.95

M-269 Antenna
AM/FM/CB antenna; cowl-disguise mount; 47-in stainless-steel whip; coupler-loading; 2.0:1 s.w.r. in 40 channels $29.95

MR-275 Antenna
Trunk-lip mount; 50-in stainless-steel whip; base-loaded; 1.5:1 s.w.r. in 23 channels, 1.75:1 s.w.r. in 40 channels; includes swivel whip adapter to adjust to vertical; comes with 17-ft coax $25.95

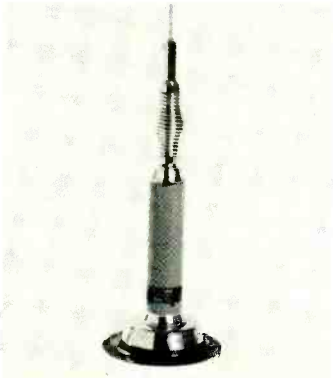
M-304 Antenna
Trunk-lip mount; 46-in fiberglass whip; base-loaded; comes with 17-ft coax $29.95

M-419 Antenna
Mirror-mount; stainless-steel whip; center-loaded; 1.75:1 s.w.r. in 40 channels; comes with 17-ft coax $29.95

M-484 Antenna
Gutter-mount; full-size stainless-steel whip; max element length 108-in; 1.5:1 s.w.r. in 40 channels; comes with 17-ft coax $29.95

M-325 Antenna
Roof-mount antenna installs in ⅜-in hole; 43-in fiberglass whip; center-loaded; comes with 17-ft coax $28.95

MR-276 Antenna
Trunk-lip waterproof-mount; 47-in stainless-steel whip; base-loaded; 1.5:1 s.w.r. in 23 channels,



1.75:1 s.w.r. in 40 channels; comes with 17-ft coax $27.95

M-1 Antenna
Full-sized whip antenna mounts on vehicle body; max element length 108-in; stainless-steel whip; 1.5:1 s.w.r. in 40 channels $27.75

M-499 Antenna
Magnetic-mount; 49-in stainless-steel whip; base-loaded; 1.75:1 s.w.r. in 40 channels; comes with 24-ft coax $27.50

MR-176 Antenna
Trunk-lip waterproof-mount with stainless-steel spring; 48-in stainless-steel whip; base-loaded; 1.5:1 s.w.r. in 23 channels, 1.75:1 s.w.r. in 40 channels; comes with 17-ft coax $24.95

MR-431 Antenna
Waterproof-mount for use on hatchback; 51-in stainless-steel whip; base-loaded; 1.5:1 s.w.r. in 23 channels, 1.75:1 s.w.r. in 40 channels; comes with 17-ft coax $26.95

MR-128 Antenna
Waterproof cowl-mount fits ⅞-in to 15/16-in hole and adjusts up to 35 degrees to keep antenna vertical; 47-in stainless-steel whip; base-loaded; 1.5:1 s.w.r. in 23 channels, 1.75:1 s.w.r. in 40 channels; comes with 17-ft coax $25.95

MR-210 Antenna
Luggage-rack or mirror-mount; 49-in stainless-steel whip; base-loaded; 1.75:1 s.w.r. in 40 channels; comes with 17-ft coax $25.95

MR-175 Antenna
Trunk-lip mount; 48-in stainless-steel whip; base-loaded; 1.5:1 s.w.r. in 23 channels, 1.75:1 s.w.r. in 40 channels; comes with 17-ft coax $24.95

M-303 Antenna
Roof-mount; 46-in fiberglass whip; base-loaded; comes with 17-ft coax $24.95

MT-178 Antenna
Die-cast ceramic magnetic-mount; 47-in stainless-steel whip; base-loaded; 1.5:1 s.w.r. in 23 channels, 1.75:1 s.w.r. in 40 channels; comes with 24-ft coax $24.75

M-542 Antenna
Hatchback-mount; 50-in stainless-steel whip; center-loaded; 1.5:1 s.w.r. in 23 channels, 2.0:1 s.w.r. in 40 channels; comes with 17-ft coax $24.75

MS-73 Antenna
Hatchback-mount; 52-in stainless-steel whip; base-loaded; 1.5:1 s.w.r. in 23 channels, 2.0:1 s.w.r. in 40 channels; comes with 17-ft coax $23.95

MS-180 Antenna
Five-position flipper gutter-mount antenna; 47-in stainless-steel whip; center-loaded; 1.5:1 s.w.r. in 23 channels, 2.0:1 s.w.r. in 40 channels; comes with 10-ft coax $22.95

MR-124 Antenna
Waterproof roof-mount; 47-in stainless-steel whip; base-loaded; 1.5:1 s.w.r. in 23 channels; 1.75:1 s.w.r. in 40 channels; comes with 17-ft coax $22.50

MS-131 Antenna
Temporary gutter-mount; 49-in stainless-steel whip; base-loaded; 1.5:1 s.w.r. in 23 channels, 2.0:1 s.w.r. in 40 channels; comes with 17-ft coax $21.95

MR-130 Antenna
Gutter-mount installs in ⅜-in hole; 48-in stainless-steel whip; base-loaded; comes with 17-ft coax $20.95

MR-310 Antenna
Trunk-lip mount; 47-in stainless-steel whip; center-loaded; 1.75:1 s.w.r. in 40 channels; comes with 17-ft coax $19.95

M-316 Antenna
Mirror-mount; 50-in stainless-steel whip; center-loaded; 1.75:1 s.w.r. in 40 channels; comes with 17-ft coax $19.95
M-326. Same as the M-316 except comes with 10-ft coax $19.95

M-416 Antenna
Uses any ⅜-in, 24 male thread, swivel ball-mount; center-loaded stainless-steel whip; 1.75:1 s.w.r. in 40 channels $19.95

M-432 Antenna
50-in stainless-steel whip; center-loaded; 1.5:1 s.w.r. in 23 channels, 1.75:1 s.w.r. in 40 channels; comes with 17-ft coax $19.95

MR-211 Antenna
Waterproof roof-mount installs in ⅜-in hole; 47-in stainless-steel whip; base-loaded; 1.5:1 s.w.r. in 23 channels 1.75:1 s.w.r. in 40 channels; comes with 17-ft coax $18.30

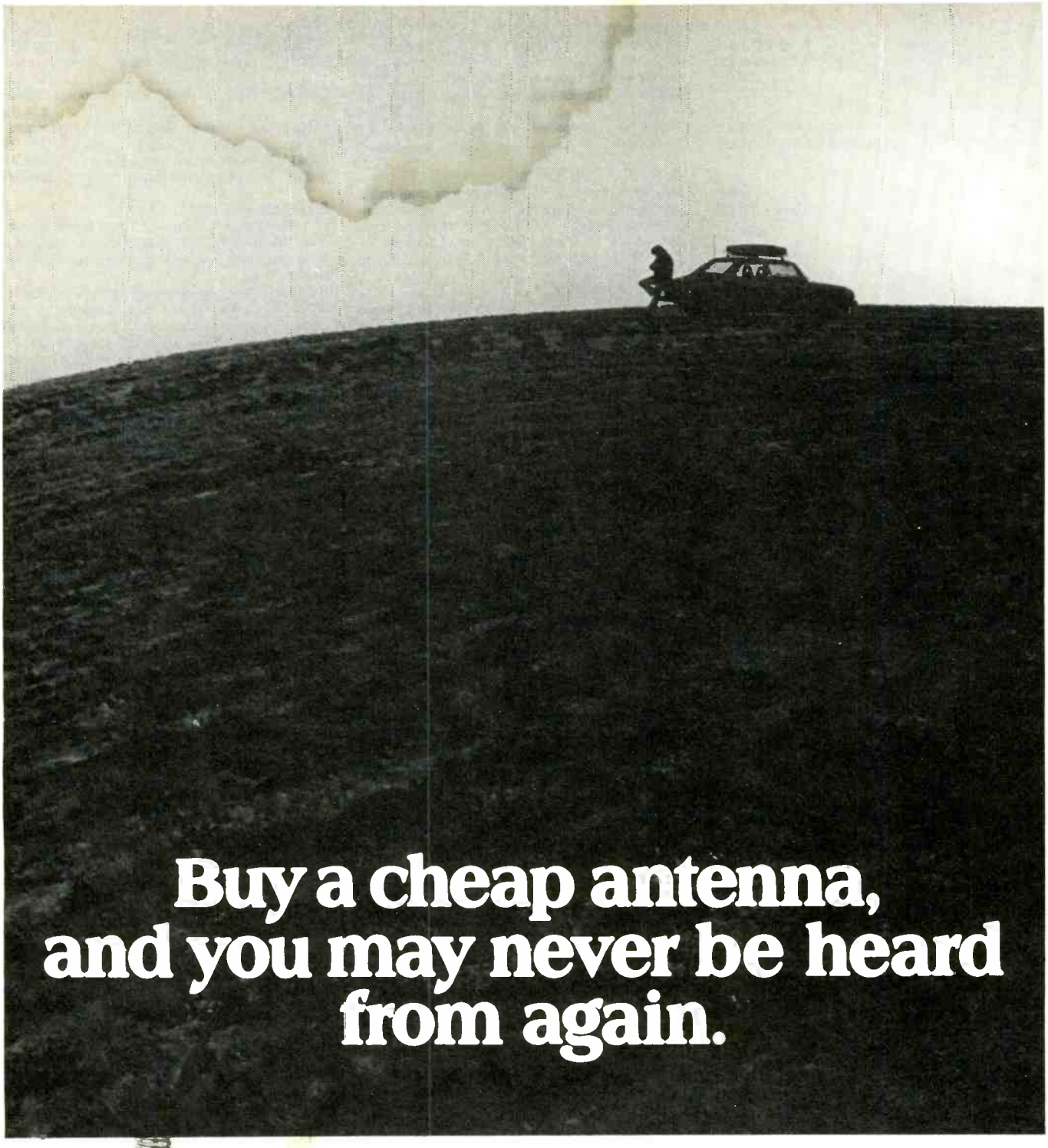
M-440 Antenna
Magnetic ceramic-mount with scratch shield; 39-in stainless-steel whip; base-loaded; 1.5:1 s.w.r. in 23 channels comes with 280-in coax $15.95

M-302 Antenna
Uses mounts that accept ⅜-in male thread; 64-in fiberglass whip; center-loaded $15.95

M-489 Antenna
Temporary gutter-mount; 21-in stainless-steel whip; center-loaded; 2.0:1 s.w.r. in 23 channels; comes with 12-ft coax $15.50

M-300 Antenna
Uses mounts that accept ⅜-in, 24 male thread; 36-in fiberglass whip; center-loaded $14.95

M-90 Antenna
Uses mounts that accept ⅜-in, 24 male thread; 96-in fiberglass whip. $13.95
MR-90. Same as M-90 except with jet black finish $13.95



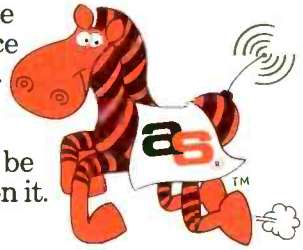
Buy a cheap antenna, and you may never be heard from again.

M-510 "Big Momma" Heavy Duty Antenna

When you're miles from help, you need a CB antenna that reaches for miles and miles. It could be your only link to safety. So saving a couple of dollars on a cut-rate brand could cost you.

But the price of an A/S antenna is worth the extra you might pay–just for the peace of mind. Every single A/S antenna is hand-tuned and tested for 23- and 40-channels. That's the kind of care and quality control that makes A/S the choice of police departments, truckers and safety people everywhere. And that's why A/S has been the leader in antennas for 24 years.

So look for the red and black A/S stripes. You'll be heard when you have to be heard. We'll bet our A/S on it.



the antenna specialists co.
12435 Euclid Avenue, Cleveland, Ohio 44106 · a member of **The Allen Group, Inc.**

M-420 Antenna
For use with mounts that accept ⅜-in, 24 male thread; 46-in stainless-steel whip; center-loaded; 1.75:1 s.w.r. in 40 channels $9.95

MS-53 Antenna
For use with mounts that accept ⅜-in, 24 male thread; 38-in fiberglass whip; center-loaded .. $9.95

M-38 Antenna
For use with mounts that accept ⅜-in, 24 male thread; 102-in stainless-steel full-sized whip .. $9.75

ANTLER

Mobile CB Antenna Line
All units feature moisture-sealed coils; chrome-plated brass coil fittings; chrome-plated heavy gauge steel mounting hardware; coax assembly including connector and terminal lugs.
1C42. Mirror or luggage-rack mount; twin center-loaded, stainless-steel whips; 48" max. element length; covers all 40 channels $38.95
1C32. Gutter-mount; center-loaded; stainless-steel whip; 30" max. element length; features low-profile to avoid overhead damage $30.95
1C80. Magnetic base-mount; base-loaded; stainless-steel whip $27.50
1C11. No-hole trunk-mount; base-loaded; pre-wired fiberglass whip. $27.50
1C90. No-hole trunk-lip mount; center-loaded; stainless-steel whip covers full 40 channels . $24.95
1C10. No-hole trunk-lip mount; base-loaded; stainless-steel whip. $24.95
1C40. Mirror or luggage-rack mount; center-loaded; stainless-steel whip; 48" max. element length; covers full 40 channels $24.95
1C75. Mirror or luggage-rack mount; base-loaded; stainless-steel whip; for recreational vehicles $23.95
1C70. Gutter-mount; base-loaded; stainless-steel whip $23.95
1C21. Snap-in roof-mount; base-loaded; pre-wired fiberglass whip. $23.95
1C30. Clip-on gutter-mount; center-loaded; stainless-steel whip; 30" max. element length $21.50
1C20. ⅜" snap-in roof-mount; base-loaded; stainless-steel whip. $21.50
1C57. Mounts with ball, bumper-mount or bracket (not incl.); full size ¼ wave, fiberglass whip .. $11.50
1C56. Mounts in ball, bumper-mount or bracket (not incl.); full-size, tapered stainless-steel whip . $10.50
1C29. "Ripp-Off Kit". Original equipment replacement for base-load stainless-steel models ... $14.95

AVANTI

AV-529 Truck Antenna
Dual antenna consisting of two fiberglass "Racer 4" mobiles; truck mirror mounts; co-phasing harness.....$53.95
AV-527. Base-loaded mobile with Racer 4 antenna with no-hole trunk mount; comes with 17-ft coax, PL-259.....$32.95
AV-537. Base-loaded mobile with Racer 27 antenna with fold-down thumbscrew camper mount; comes with 17-ft coax, PL-259.....$34.95

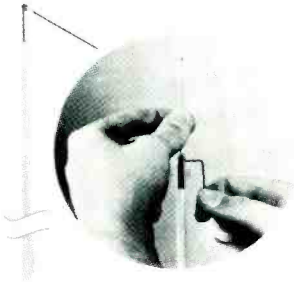
Fazer Mobile Antennas
Top-loaded; stainless-steel construction; unity gain; 1.5:1 s.w.r. over 23 channels, 1.45:1 s.w.r. over 40 channels; coax included.
AV-535. 18-in max element length; gutter-clip mount; 24-ft co-phase harness; 23-channel operation $42.95
AV-524. 48-in max element length; gutter-clip mount; 9-ft coax; 40-channel operation.....$23.95
AV-520. 18-in max element length; trunk-lip mount; 17-ft coax; 23-channel operation.....$23.95
AV-523. 48-in max element length; trunk-lip mount; 17-ft coax; 40-channel operation.....$22.95
AV-522. 18-in max element length; gutter-clip mount; 9-ft coax; 23-channel operation.....$21.95

"Hippo" Mobile Antennas
All units feature tunable tip with sliding stainless-steel tuning rod for proper resonance; A.B.S. housing covers coil for protection against elements.
Hippo 5. Base-loaded with snap mount; 5-ft long; comes with 17-ft coax and connector.....$35.50
Hippo 6. Top-loaded with ⅜"-24 thread; 6-ft long $26.95
Hippo 4. Top-loaded with ⅜"-24 thread; 4-ft long $25.95

Racer 27 Mobile System
Quarter-wave whip; 17-7 PH stainless-steel radiator; stainless-steel spring; whip 48-in; chrome-plated brass base with A.B.S. to form base and cover coil; v.s.w.r. 1.3:1; imp. 50-52 ohms; comes with 17-ft RG-58/0 coax; requires ½-in hole.....$25.95

AV-369 "Gatorwhip"
Combines 5-ft military-grade fiberglass bottom with 4-ft stainless-steel top; tunable to 1.1:1 v.s.w.r.; can be tuned from 25-40 MHz for business use; standard ⅜"-24 thread fits all popular body and bumper mounts; can be co-phased with AV-504 harness.....$22.50

Racer Mobile Antennas
Top-loaded, inductively shortened, quarter-wave antennas; s.w.r. tunable to 1.1:1; stainless-steel



and chromed brass hardware; setscrew adjustment for positive locking of tuning tip; impervious to moisture, corrosion, salt air, or fumes; military-type fiberglass; can be co-phased with various mounts and harnesses; ⅜"-24 thread fits standard mounting brackets.
Racer 4. 48 inches long.....$17.25
Racer 6. 72 inches long.....$18.50
Racer 105. 105 inches long, non-tunable.....$18.50

BLAZER

Blaster Antenna Line
All units feature v.s.w.r. of 1.5:1 or better; impedance 50-52 ohms; 18' RG58/U cable or phasing cables for twin mounts; stainless-steel whip. max. overall length including coil, spring and base 36".
B-1100. Deck or roof-mount $19.95
B-1121. Snap-in deck- or roof-mount, spring $23.45
B-1101S. Deck or roof-mount, spring, swivel $26.45
B-1231S. Quick-removal gutter/luggage mount, spring, swivel $34.95
B-1310. Mirror or side mount $26.95
B-1400. Trunk-lid mount $23.95
B-1401. Trunk-lid mount, spring $27.95
B-1501. Magnetic mount, spring $28.95
B-2101S. Twin roof/deck mount, springs, swivels $52.95
B-2310. Twin mirror/side mount $53.95
B-2400. Twin trunk-lid mount $47.95

Booster Antenna Line
All units feature v.s.w.r. of 1.5:1 or better; impedance 50-52 ohms; 18' RG58/U cable; stainless-steel whip, overall length from base to static ball including spring 22" max.
B-4110. Roof or deck-mount $18.95
B-4131. Snap-in roof or deck-mount, spring $21.95
B-4211. Quick-removal gutter/luggage mount, spring $22.95
B-4301. Mirror/side-mount, spring $26.45
B-4411. Trunk-lid mount, spring $26.95
B-4510. Magnetic mount $23.95
B-4201S. Gutter/luggage mount, spring, swivel $25.95
B-4111S. Roof or deck mount, spring, swivel $24.95
B-8211. Quick-removal twin gutter/luggage mount, spring $45.95
B-8411. Twin trunk-lid mount, spring $54.95
B-8301. Twin mirror/side mount, spring $52.95

Brute Antenna Line
All units feature v.s.w.r. of 1.5:1 or better; impedance 50-52 ohms; 18' RG58/U cable; stainless-steel whip, max. overall length from base to static ball 52".
B-3203. Gutter/luggage mount, spring $27.95
B-3203S. Gutter/luggage mount, spring, swivel $30.95
B-3303S. Mirror/side mount, spring, swivel . $34.95
B-3210S. Quick-removal gutter/luggage mount, swivel $23.95
B-6203. Twin gutter/luggage mount, spring . $56.95
B-6300S. Twin mirror/side mount, swivel $55.95
B-6303S. Twin mirror/side mount, spring, swivel $69.95
Blazer also offers an extensive line of mounts.

BLUE STREAK

EMA-100 Electric Antenna
Top-loaded 40" electric "disappearing" antenna, cowl mount, steel construction, unity gain, 1.5:1 s.w.r., comes with 18-ft. coax cable, fully automatic and manual switching $69.95
EMA-100C. With optional coupler for connection to AM-FM radio $79.95

Mobile CB Antenna Line
Company offers an extensive line of mobile antennas; all center-load whips are commercial rated for 11-meters with ⅜-24 thread; co-phase harness and single cable have PL-259 connector attached; mounts are extra-duty; heavy-gauge triple chrome plated.
TMC-11. Trucker mirror-mount, two lightweight center-loaded whips, harness. $41.95
TMS-11. Truck/camper mirror-mount, center-loaded whip, cable $22.95
RBC-11. Roof/body convertible-mount, two center-loaded whips harness $44.95
RBS-11. Roof/body convertible-mount, center-loaded whip, cable $23.95
TGC-11. Heavy-duty car trunk-groove mount, two center-loaded whips, harness $41.95
TLC-11. Trunk-lip heavy-duty mount, two center-loaded whips, harness $44.95
TLS-11. Trunk-lip heavy-duty mount, center-loaded whip, cable $23.95
HGC-11. Heavy-duty gutter mount, two center-loaded whips, harness, springs $49.95
HGS-11. Heavy-duty gutter-mount, center-loaded whip, cable, spring $25.95
CSL-11. Flush cowl-mount, center-loaded whip, cable $24.95
HCL-11. Quarter-wave center-loaded whip . $18.95
BLA-11. Quarter-wave base-loaded antenna, cable, spring $18.95
BLT-11DS. Quarter-wave base-loaded antenna, trunk-lip mount, cable $24.95
SSL-124. Center-loaded 24" whip, roof/truck mount, steel/Delrin construction; unity gain, max. s.w.r. 1.5:1, comes with 18-ft. coax cable, spin-lock mount for "blind" mounting in roof or trunk ... $21.95
SMS-124. Center-loaded 24" whip, mirror mount, steel/Delrin construction, unity gain, max. s.w.r. 1.5:1, comes with 12-ft. coax cable $20.95
SMC-224. Same as SMS-124 except co-phase for RV's, vans & campers $34.95
SGS-124C. Center-loaded 24" whip, rain-gutter mount, steel/Delrin construction, unity gain, 1.5:1 s.w.r., comes with 12-ft coax, anti-theft clip-on gutter mount $18.95
SGC-224C. Same as SGS-124C except co-phased $32.95
SGS-124. Center-loaded 24" whip, rain-gutter mount, steel/Delrin construction, unity gain, 1.5:1

s.w.r., 12-ft. coax cable, semi-permanent mount $18.95
SGC-224. Same as SGA-124 except co-phased $32.95
CWC-11. Center-loaded 54" whip, steel/Delrin construction, unity gain 1.5:1, 12-ft. coax $43.95
CWS-11. Same as CWC-11 except single system $24.95
The company offers a complete line of antenna mounting hardware and accessories.

CHANNEL MASTER

Power Wing Mobile Antenna
Low-profile antenna resembling tail section of jet plane will not bend at any speed; weather-proofed

aluminum construction; mounts on trunk without cutting or drilling; overall height 16-in plus 8-in telescoping for fine tuning; capacitive top-loading and a grooved-core coil provide performance equal to 42-48-in center and base-loaded antennas .. $39.95

COURIER

ACB-14A Motorized AM/FM/CB Antenna
26.9-27.505 MHz frequency range; 39.4-in overall length; 18-ft cable and connector; weight 3.3 lbs..... $69.95

ACB-13T Double Co-Phased Antenna
26.9-27.505 MHz frequency range; 51.2-in overall length; 18-ft cable and connector; weight 3.3 lbs..... $38.95

ACB-15 Trunk-Lid Mount
Antenna features 26.9-27.505 MHz frequency range; 44.5-in overall length; 18-ft cable and connector; weight 2.3 lbs..... $21.95

ACB-12 Cowl Mount Antenna
26.9-27.505 frequency range; 40-in overall length; 6-ft cable and connector; weight 1.6 lbs..... $19.95

ACB-11 Gutter-Mount Antenna
26.9-27.505 MHz frequency range; 30.5-in overall length; 12.5-ft cable and connector; weight 1.3 lbs..... $19.95

CUSHCRAFT

CM-421 Twin Buster
Co-phased, no-hole trunk mount; 48-in fiberglass whips; comes with co-phase harness and connectors; pre-assembled $36.50
CM-422. Same except with tunable tip whips $39.50

CM-423 Truck Buster
Fiberglass co-phased 48-in. whips; nickel-plated mirror mounts; coax connectors; phasing harness; pre-assembled $34.50
CM-424. Same except with tunable tip whips $38.50

CSQ-11 Squalo
Horizontally polarized antenna with suction cups for car-top mounting; 50-in square; comes with short aluminum boom for mast or tower mounting; pre-formed and partially pre-assembled; 52-ohm; s.w.r. 1.5:1 ..... $28.50

CM-406. Adjuster Buster
Tunable tip whip with 10-ft. cable and Jiffy mirror mount $24.50

CM-403 Trunk Buster
Fiberglass 48-in. whip; no-hole trunk-lip mount; foam pad protects finish; comes with 15-ft. cable and connector $22.50
CM-404. Same except with tunable 48-in. whip $24.50

CM-405 Uni Buster
48-in fiberglass whip with 10-ft. cable and Jiffy mirror mount $22.50

CM-402 Top Buster
Solid fiberglass shaft; sealed radiator; flexible; resists corrosion; stainless-steel tip for tuning; 48-in. overall $12.50
CM-401. Similar to CM-402 except top loaded, high-Q coil; 48-in. overall $10.50

FANON

BL-ACB-14A Motorized AM/FM/CB Antenna
26.9-27.505 MHz frequency range; 39.4-in overall length; 18-ft cable and connector; weight 3.3 lbs..... $69.95

BL-ACB-13T Double Co-Phase
26.9-27.505 MHz frequency range; 51.2-in overall length; 18-ft cable and connector; weight 3.3 lbs..... $38.95

BL-ACB-15 Trunk Lid Mount
26.9-27.505 MHz frequency range; 44.5-in overall length; 18-ft cable and connector; weight 2.3 lbs..... $21.95

BL-ACB-12 Cowl Mount
26.9-27.505 frequency range; 40-in overall length; 6-ft cable and connector; weight 1.6 lbs..... $19.95

BL-ACB-11 Gutter Mount
26.9-27.505 MHz frequency range; 30.5-in overall length; 12.5-ft cable and connector; 1.3 lbs weight..... $19.95

FULCOMM

15-2291 Dual Truck Antenna
Clamps to outside mirrors of diesels, pickups, vans, campers; center-loaded 55-in whips; tempered steel construction; locknuts for adjusting to minimum s.w.r.; 12-ft co-phased wiring harness; PL-259 connectors..... $69.95

15-2299 Dual Truck Antenna
Center-loaded, twin tempered-steel whips; mirror-mount; tunable s.w.r., comes with 12-ft coax, twin-phased coax harness $41.95

15-2296 Trunk/Roof Mount
Base-loaded, 40-in tempered-steel whip; trunk- or roof-surface mount; s.w.r. comes with 17-ft coax cable, stainless-steel shock spring; magnetic mount $27.95

15-2298 Trunk/Roof/Trunk Lip Mount
Base-loaded full-size tempered-steel whip; 40-in high; s.w.r. 1.5:1; mounts on trunk lip, trunk, or roof surface; comes with 17-ft coax cable, stainless steel shock spring..... $19.95

15-2297 Gutter-Mount Antenna
Center-loaded, 20-in gutter-mount antenna; tempered-steel construction; comes with 12-ft coax cable $15.95
15-2292. Same except magnetic roof mount. $17.95

GC

Whip Antennas

18-2000. Top-loaded 48" whip; optional mounting position; fiberglass-covered stainless steel; 2 dB gain over isotropic; 1.2 s.w.r. $16.00

18-2023. Bottom-loaded 46" whip; optional mounting; stainless-steel rod; 1.5 s.w.r. (rooftop); comes with 17-ft. RG-58/U cable $18.00

18-2025. Bottom-loaded 48" whip; optional mounting; stainless-steel rod; 1.5 s.w.r. (rooftop); comes with 17-ft. RG-58/U coax $19.00

18-2050. Top-loaded 19" whip; gutter mount; stainless-steel rod; 1.75 s.w.r.; comes with 17-ft. RG-58/U coax $18.00

18-2040. Center-loaded 50" whip; optional mounting position; stainless-steel rod; 1.5 s.w.r. max $14.00

18-2066. Top-loaded 36" whip; optional mounting position; fiberglass-encased stainless-steel rod; 1.5 s.w.r. max $15.00

18-2064. Top-loaded 48" whip; optional mounting position; fiberglass construction; 1.5 s.w.r. max.; factory pre-tuned $12.00

18-2066. Top-loaded whip; 54" convertible to 96"; optional mounting position; fiberglass; 1.5 s.w.r. in bumper position; two pieces (54" loaded stub, whip top) $28.00

18-2070. Top-loaded 96" whip; optional mounting position; fiberglass construction; 1.5 s.w.r. in bumper position $15.00

GENERAL ELECTRIC

EA68×45 Mobile Antenna

Base-loaded 41" whip; magnetic mount; non-corrosive construction; 1.5:1 s.w.r.; 5-m coax cable included $34.97

EA68×44 Mobile Antenna

Base-loaded 41" whip; roof, trunk, or gutter mount; non-corrosive construction; 1.5:1 s.w.r.; 5-m coax cable included $27.97

HUSTLER

DTG

Rain-gutter mount; 25-in. center-loaded; usable on station wagons and panel trucks and has 12-ft. phasing harness; includes coax connector .. $31.95

RTG-27L

Gutter clamp antenna; center-loaded; radiator 25-in. long; adjustable stainless steel tip rod; includes 12-ft. cable and connector $18.15

RTS-27L

Center-of-roof mounting; center-loaded; radiator 25-in. long; chrome plated brass tubing with adjustable stainless steel tip rod; includes 17-ft. cable and connector $18.15

TLA-27L

Trunk-lip mounting antenna; center-loaded, radiator 48-in. long; stainless steel; includes 17-ft. cable and connector $21.35

HTM-1 Twin Huskies

Designed especially for trucks; non-corrosive superflex stainless-steel radiators; slotted mirror mounts for attachment to all West Coast style mirrors; oversize power resonators; positive lock-in tip rods; twin 51" antennas; 17-foot coax to each antenna $39.95

HSM-1. Single Husky for RV's and vehicles with single West Coast style mirror; 12-foot coax $20.45

DFG Mobile CB Antenna

Designed specifically for rain-gutter mounting, especially on station wagons, truck cabs, VW's and other unusual body styles; fiberglass 42" design; to be used in pairs with phasing harness for exact match & minimum standing-wave ratio $36.95

HQ-27M Power Packer

Trunk-lip mount; 55-in. long; stainless-steel construction; oversize resonator; no holes to drill; comes with 17-ft. coax; all connectors soldered $28.95

CB-111

Center-fed, loaded whip; for fender or deck mounting; 74-in. long; 1.2:1 s.w.r.; brass & aluminum construction; foldover mast for garaging; coax cable not included $24.95

CB-211. Similar to CB-111 except for bumper mount $24.95

SDTs

Center-loaded whips with trunk-groove mounts; 48" long; stainless-steel construction; full coverage signal patterns; comes with 17-ft. dual coax cable $37.50

TLS-27L

Center-loaded whip with trunk-lip mount; 30" long; chrome, brass & stainless-steel construction; comes with 17-ft. coax cable $24.10

XBL-3

Base-loaded whip; for roof or deck mount; stainless steel construction; Mil Spec coax connectors (factory attached); 17-ft. coax; 48-in. long $22.95

XLB-4. Similar to XLB-3. ..... $26.95

XLBT-3. Similar to XLB-3 except for trunk-lip mount $25.95

XBLT-4. Similar to XLB-4 except for trunk-lip mount $28.95

HY-GAIN

Hellcat 1

Base-loaded whip; max. element length 54 in.; rooftop mount; nominal feedpoint impedance 52 ohms; v.s.w.r. 1.5:1 at resonant frequency; stainless steel whip; comes with 18-foot coaxial cable and connector $21.95

Hellcat 2

Base-loaded whip; max. element length 24 in.; rooftop mount; nominal feedpoint impedance 52 ohms; v.s.w.r. 1.5:1 at resonant frequency; stainless steel whip; comes with 18-foot coaxial cable and connector $21.95

Hellcat 3

Base-loaded whip; max. element length 35 in.; magnetic mount; nominal feedpoint impedance 52 ohms; v.s.w.r. 1.5:1 at resonant frequency; stainless steel whip; comes with 16-foot coaxial cable and connector $24.95

Hellcat 4

Base-loaded whip; max. element length 54 in.; trunk-lip mount; nominal feedpoint impedance 52 ohms; v.s.w.r. 1.5:1 at resonant frequency; stainless steel whip; comes with 20-foot coaxial cable and connector $26.95

Hellcat 5

Same as the Hellcat 1, but without stainless steel spring $18.95

Hellcat 6

Base-loaded whip; element length 54 in.; nominal feedpoint impedance 52 ohms; v.s.w.r. 1.5:1 at resonant frequency; has foldover mount for installation on top or side of camper; stainless steel whip; comes with 18-foot coaxial cable and connector $35.95

Hellcat 7

Base-loaded whip; max. element length 54 in.; rooftop mount with foldover adapter; nominal feedpoint impedance 52 ohms; v.s.w.r. 1.5:1 at resonant frequency; comes with 18-foot coaxial cable and connector $27.00

Hellcat 10

Base-loaded whip; element length 54 in.; stainless-steel whip and base spring; nominal feedpoint impedance 52 ohms; v.s.w.r. 1.5:1 at resonant frequency; comes with 18-foot coaxial cable and connector $23.95

Hellcat X

Base-loaded whip; element length 49 in.; stainless steel whip with swivel trunk-lip mount; nominal feedpoint impedance 52 ohms; v.s.w.r. 1.5:1 at resonant frequency; comes with 20-foot coaxial cable and connector $19.95

Mother Trucker II

Two center-loaded whips with coaxial phasing harness; overall height 75 in.; mirror mount; nominal feedpoint impedance 52 ohms; stainless-steel whip $59.95

Gypsy II

Two helically loaded fiberglass whips with 22-foot coaxial phasing harness; maximum element length 48 in.; mirror or rack mount; nominal feedpoint impedance 52 ohms; v.s.w.r. 1.5:1 at resonant frequency $44.95

Ten Pounder

Bottom-loaded whip; loading coil is helically wound into lower fiberglass whip section; upper section is stainless steel, overall height 80 in.; nominal feedpoint impedance 52 ohms; v.s.w.r. 1.5:1 at resonant frequency; for use with any mount that accommodates a ⅜-24 thread $29.95

Power Cats

Bottom-loaded whips; max. element length 57 in.; for roof-top (Model 509) or trunk-lip (Model 510) mounting; stainless-steel whips; roof-top mount has stainless-steel base spring; nominal feedpoint impedance 52 ohms; v.s.w.r. 1.5:1 at resonant frequency; comes with coaxial cable and connector $35.95

Model W102

Full-sized quarter-wave stainless-steel whip; max. element length 102 in.; nominal feedpoint impedance 52 ohms; for use with any mount that accommodates a ⅜-24 thread $10.95

424 Motorized Antenna

Top-loaded, retractable motorized whip for AM-FM/CB; front or back fender mount; chrome-plated steel construction; 2.0:1 max. s.w.r.; comes with 18-ft coax $79.95

426/428 Antenna

Base-loaded "disguised" whip for AM-FM/CB; 37" max. element length; cowl front or back mount; stainless-steel construction; 2.0:1 (or less) max. s.w.r.; comes with 18-ft coax $29.95

538 Antenna

Top-loaded 36" whip; gutter mount; fiberglass mast, steel base; 2.0:1 s.w.r.; comes with 15-ft coax $22.95

539. Same except dual unit; 18-ft coax $44.95

537 Antenna

Gutter-clip, foldover, zinc-plated steel whip; requires ⅜" mounting hole $3.95

JFD

All antennas have sealed heavy-duty wound copper wire base coil; non-corrosive, rust-proof 37-in stainless-steel whips (Allen wrench included); d.c. grounding; removable coil and rod assembly; heavy-duty shock springs; copper conductors; chrome-plated brass machined fittings; come complete with mount, cable, connectors, and hardware.

10-MR. Center-loaded dual twin-mirror-mount; horizontal or vertical mount; omnidirectional coverage; center loading; dual phasing harness includes preassembled 8-ft RG-59/U coax from each antenna plus 14-ft cable with preattached connectors for solderless connection $53.00

10-RV. Marine or RV mount; flips down 90 degrees from vertical to horizontal position for clearance; 17-

ft RG-58/U coax with preassembled PL-259 connector on one end. $37.80
10-MM. Base-loaded magnetic mount; removable when required; 17-ft RG-58/U coax with preassembled PL-259 connector on one end. $33.00
10-RT. Base-loaded combination roof/trunk mount; no-hole installation; chrome-plated brass mounting cup; 17-ft coax with PL-259 connector $28.95
10-LM. Base-loaded luggage/mirror mount; heavy-gauge bracket; adjustable mount; non-slip bracket; 17-ft coax with PL-259 connector $27.40

KALIMAR

SA-400 Rooftop Antenna
Heavy-duty, base-loaded whip antenna; 44-in long; stainless-steel whip; leak-proof rubber gasket; rooftop mounting provides omnidirectional signal radiation; comes with cable and connector; installs in ⅜" hole; no soldering required; factory matched to 50 ohms for all CB transceivers.....$29.95

S-100 Trunk-Mount Antenna
Adjustable mounting bracket fastens onto rain gutter; for use on tractors, RV's, trucks or where flat surface is not available; corrosion-proof stainless-steel whip; no soldering required; comes with cable, connector, and instructions.....$17.95

LAFAYETTE

Criterion Starfire III
Center-loaded dual-phased system designed for large trucks, RV's, etc.; dual-track mirror mount installs on round or square tubing up to 1" dia.; mounts rotate horizontally or vertically on West Coast mirror frames; includes heavy-duty loading coils, resonators, stainless-steel elements, matched phasing harness, coaxial connectors on both ends; 54" high $59.95

Criterion Starfire I
Adjustable cowl-mount for front, rear fender or deck mount; includes stainless-steel tapered whip, chrome-plated shock spring, weatherproof base-loaded matching coil, 17-ft coax cable, solderless coaxial connector; 46" high; for ⅞" to 15/16" mounting hole.....$21.95

Criterion Trunk-Lip Mount
Rapid-grip trunk-lid mount mobile with coax guard; no holes to drill; 52-in stainless-steel tapered whip with chrome-plated shock spring; weatherproof base loading coil with d.c. ground; includes 17-ft RG-58/U cable, solderless coaxial connector.....$27.95

Criterion Starfire IV
Mobile rooftop mount; v.s.w.r. 1.5:1; stainless-steel tapered whip; chrome-plated shock spring & trim parts; weather-proof loading & matching coil; snap-in mount for ⅜" dia. hole; with 17-ft cable & solderless coaxial connector.....$18.95

LAKE

210 Antenna Converter
Permits radio antenna to serve as CB antenna; converter is connected to CB transceiver and car radio; no visible external equipment to identify CB installation; tuning setscrew permits adjustment of s.w.r.; indicator light for proper antenna tuning; CB/car radio switch; 3½" D x 2¾" W x 1½" H; comes with mounting screws and bracket.....$19.95

METROSOUND

MS-5500 AM/FM/CB Antenna
Fully automatic antenna with duplexer for AM/FM/CB; cowl-mount; top-loaded; 41-in max element length; less than 1.5:1 s.w.r. stainless-steel construction; 40-channel capacity; 15-ft coax included $69.95

MS-725-DM Dual Mirror-Mount
Twin 57-in mirror-mount whips with "beer can" resonators; stainless-steel adjustable tip rods; heavy-duty mounting bracket; for West Coast style mirrors; vertical or horizontal mounting; center-loaded; 37-ft RG-59-U dual coax phasing harness with PL-259 connectors $65.95

MS-5400 AM/FM/CB Mobile Antenna
Fully automatic antenna with duplexer for AM/FM/CB; cowl-mount; center-loaded; stainless-steel whip; 45-in max element length; 1.5:1 s.w.r.; 40-channel capability; comes with 15-ft coax $57.95

MS-650-DM Dual Mirror-Mount
Twin 46-in mirror-mount whips with oversize resonators; stainless-steel adjustable tip rods; heavy-duty mounting brackets; for West Coast style mirrors; vertical or horizontal mounting; 1.2:1 s.w.r.; 37-ft RG-59-U dual coax phasing harness with PL-259 plug and solderless connectors $49.95

MS-450-MG Mobile Antenna
21-in center-loaded antenna; magnetic-mount; stainless-steel whip; 1.2:1 s.w.r.; comes with 16-ft coax $22.95

MS-270-BL Rooftop Mount
47-in base-loaded antenna for rooftop or trunk mount; stainless-steel adjustable whip; 1.2:1 v.s.w.r.; heavy-duty shock spring; 16-ft RG-58U coax cable with PL-259 connector; comes with mounting hardware and Allen wrenches $16.50
MS-275-BL. Similar to MS-270-BL but with hex loading coil $16.95

MOSLEY

Lancer Mobile Antennas
Antennas feature high "Q" hermetically sealed, solid-state, center-loaded coil; guying device to keep antenna in vertical position; tapered, stainless-steel whip; 26.9 to 27.3 MHz frequency range; 1.5:1 or better v.s.w.r.; omnidirectional radiation; 52-ohm nominal impedance.
CBL-500C. Includes reversible lower mast section and breakover which enables antenna to be fender, bumper or gutter mounted; capacity adapter for increased efficiency; 6-ft 11⅝-inch height; 1 lb. 4 oz. assembled weight $43.35
CBL-500D. 6-ft. 10⅝-inch height; 1 lb. assembled weight $29.20

Black Widow Mobile Antennas
Antennas feature high "Q," base-loaded coil; tapered, extra-hard tempered stainless-steel, 42-inch whip; screw-type base to allow for easy removal; 26.9 to 27.3 MHz frequency range; whip adjustment to allow peaking at required frequency; 52-ohm nominal impedance; v.s.w.r. 1.5:1, supplied with shock-spring.
BW-2. Gutter-mount clamp; maximum assembled height, 49-inches; assembled weight, 1 lb. 5 oz.; supplied with 52-ohm, 17-ft coax $35.75
BW-1. Trunk-lip clamp; maximum assembled height 48-inches; assembled weight 1 lb. 3 oz.; supplied with 52-ohm, 17-ft coax $34.50
BW-3. Mirror-mount clamp; maximum assembled height 50-inches; assembled weight 1 lb. 8 oz.; supplied with 52-ohm, 17-ft coax $33.10
BW-0. Assembled height 47-inches; assembled weight 8 oz $21.00

AD-1 Adaptor
Permits user to replace a 23-channel antenna with a 40-channel antenna without replacing the base-mount. For use with Black Widow antennas ... $3.75

CT-1 Tarantula Truck Antenna
Truck antenna features top-loaded, stainless-steel whip; injection-molded, hermetically sealed coil; 26.9 to 27.3 MHz frequency range; v.s.w.r. 1.5:1; omnidirectional radiation pattern; 52-ohms nominal impedance; 4-ft, 6-inches maximum height; ½ lb. assembled weight; 52-ohm coax.; base-mount $24.95

MURA

CBA-1 Gutter-Mount Antenna
21-inch antenna attaches to vehicle's gutter via sturdy clamp; 12-inch, high tensile-strength, stainless-steel whip; heavy gauge copper, center-loaded coil; PL-259 type plug; 9-foot coax.....$24.95

CBA-2 Trunk/Roof-Mount Antenna
Mobile antenna attaches to trunk lid without screws or drilling; can also be installed on rooftop; 45-inch, 17-7 stainless-steel whip; heavy-duty, stainless-steel tension spring; base loaded; rubber-rimmed, brass chrome-plated base; PL-259 connector; 15-foot coax.....$32.50

CBA-3 Twin Mirror-Mount Antenna
Designed for trucks and vehicles with paired, outside rear-view mirrors; no-holes mirror installation; 17-7 stainless-steel whip; center-loaded; PL-259 connectors; 18-foot co-phased coax.....$47.50

CBA-4 Mobile Antenna
Twin gutter-mount antenna; chrome-plated brass and stainless-steel construction; tunable for low s.w.r.; clip-on mount.....$29.95

CBA-6 Mobile Antenna
Trunk-mount antenna; copper coil helically wound on solid fiberglass core; stainless-steel whip adjustable for lowest s.w.r.....$23.95

NUVOX

DMM-505 Dual Mirror-Mount
Stainless-steel antenna and whip; center-loaded; quick-grip mount; no-holes installation; v.s.w.r. 1.5:1, height 50.4 in. $39.95

GC-303 Gutter-Clip Mount
All parts chrome-plated or stainless-steel; no-holes mount; v.s.w.r. 2:1; imp. 50 ohms; height 18 in $19.95

OLSON

CB-443 Mobile Antenna
Loaded whip antenna; 33-in long; stainless-steel construction; bottom loading coil; 1.5 max. s.w.r.; trunk-lip mount, 17-ft coax cable.....$25.00

CB-603 Mobile Antenna
Center-loaded whip; 23½-in max. element length; stainless-steel construction; gutter mount; max. s.w.r. 1.5:1; 10-ft coax.....$25.00

PACER

Top-Loaded Mobile Antennas
PTM-48. Trunk-mount with spring; rapid-grip mount for installation without holes; adapter permits removal of antenna; 20-ft RG-58/U cable with PL-259 connector $29.95
PTM-19. Same except with 19-in antenna ... $25.95
PGM-19. Gutter-mount; tunable top-loaded 19-in fiberglass antenna with aluminum mounting bracket; no-holes installation; adapter permits removal of antenna; 17-ft white RG-58/U cable with PL-259 connector $24.95
PDG-19. Same except dual gutter mounts; two 19-in antennas; diplexer phasing hamess $44.95
PDM-48. Dual mirror-mounts with spring; two 48-in antennas; adapter permits removal of antenna; 10½-ft RG-59/U white diplexer cable harness; PL-259 connector $44.95
PMM-48. Same except single 48-in antenna; 10½-ft RG-58/U white cable; PL-259 connector $29.95
PBM-72. 72-in antenna; heavy-duty swivel ball for side mount installation on vans & RV's; adapter permits removal of antenna; 20-ft RG-58/U white cable with PL-259 ..... $29.95
PBM-96. Same except with 96-in quarter-wave whip $29.95
PBU-72. Bumper-mount; heavy-duty stainless-steel

adjustable mount; 72-in antenna; 20-ft RG-58/U white cable; PL-259 connector $29.95
PBU-96. Same except with 96-in quarter-wave whip antenna $29.95
PBU-48. Same except with 47-in antenna; designed for Corvettes & VW's $34.95
PMG-19. Magnetic mount; weatherproof mount; low-profile 19-in antenna covers 40 channels; prewired with 15-ft RG-58/U cable; PL-259 connector $24.95

Base-Loaded Mobile Antennas

P-100. Base-loaded; rapid-grip mount; no-holes; radiating element enclosed in fiberglass; comes with mounting hardware and cable $17.95
P-100-S. Same except trunk-lid mount with spring $19.95
P-200. Roof-mount; snap-in hole mount; comes with mounting hardware and cable $17.95
P-200-S. Same except equipped with 2½" stainless-steel spring $19.95
Individual fiberglass antennas without cable or hardware.
P-48. ..... $12.95
P-19-R. $12.95
P-48R. $14.95
P-72. ..... $13.95
P-96. ..... $12.95

PCM-33 AM-FM/CB Cowl Mount

33-in black fiberglass antenna for cowl mounting; top loaded; fingertip tuning; comes with splitter and 7½-ft cable harness $34.95
PCM-33-S. Same except with stainless-steel spring $39.95

PAL

"Firestiks" KW-3

3-ft heavy-duty whip antenna; ⅝-wave top loaded; tuned from 26.965-27.505 MHz; average s.w.r. 1.5:1; fiberglass construction; fits any single- or co-phase antenna system; ⅜"-24 heavy-duty threaded base; red with white tip or white with red lip....$13.95
KW5. Same except with 5-ft heavy-duty whip.....$15.95
K-10 V-Bar. Special mount to permit two Firestiks to be used to increase signal reception; comes complete with hardware.....$2.95

RADIO SHACK

"Twin Truckers II"

For trucks with mirrors 100 inches or more apart; stainless-steel upper and lower rods; antenna mounts attach to side mirror brackets; oversize resonators; adjustable tip rods; 17-ft. dual phasing harness; PL-259 ends. 21-942.....$34.95

Marine/Camper Whip

Quarter-wave antenna for metallic or non-metallic surfaces; no ground plane needed; patented mount provides lay-down for both horizontal and vertical mounting surfaces; stainless-steel mounting hardware & leveling washer; transformer; 16-ft. cable; PL-259 connector. 21-912 .....$31.95

Twin-Trunk CB Antenna

Dual antenna mounts on sides of trunk lid; no holes required; center-loaded design; adjustable tip rods; 20-ft, 6-in co-phasing harness with PL-259 connector. 21-943 .....$29.95

Center-Loaded Whip

Center-loaded; bumper mount; stainless-steel construction; with adj. dual chains, bracket, and protective vinyl chain cover. 21-944.....$24.95

No-Hole Trunk-Lip Antenna

Base-loaded whip; 41-in element; no-hole trunk-lip mount; graphite whip; molded coil housing; no shock spring required; 16-ft coax cable. 21-975.....$29.95

Bumper-Mount Whip

Full-sized 102-in whip; fiberglass construction; bumper mount; adj. dual chains and bracket for mounting on most bumpers; vinyl chain cover; gutter clip. 21-927.....$22.95

Trunk-Mount CB Antenna

Includes stainless-steel shock spring; 42-in antenna with fiberglass whip; no-hole trunk-grip mount; two-screw installation; can be attached to front or sides or trunk lid; with 16-ft coax cable and connectors, cable. 21-926 .....$21.95

"Single Trucker II"

Offers full CB coverage; for RV's or vehicles with West Coast style mirrors; comes with heavy-duty mount, oversize resonators; adjustable tip rod; 10-ft. coax cable and connectors 21-941.....$21.95

No-Hole CB Antenna

Mounts with two set screws on either center or side of trunk lid without drilling hole; base-loading coil; 44-in stainless-steel whip and spring; with 16-ft coax cable and connectors. 21-908. .....$21.95

Magnetic-Mount CB Antenna

Installs with magnetic mounting on any flat metal surface; comes with 10-ft. coax and PL-259 connector. 21-940.....$21.95

Base-Loaded Whip

Base-loaded 40-in fiberglass whip; roof, fender, cowl or trunk mount; comes with 16-ft coax with connectors. 21-925.....$19.95

Bumper-Mount Whip

Full-size 102-in stainless-steel whip; bumper mount; comes with adjustable dual chains, bracket, and protective vinyl chain cover. 21-915.....$19.95

Cowl/Side Mount CB/AM-FM Antenna

CB antenna also replaces auto AM/FM antenna; telescoping 50-in whip and tunable loading coil; matching network; comes with cables for front-fender or body installations; 68-in cable has auto radio and PL-259 connectors. 21-930.....$18.95

Roof-Mount Whip

Base-loaded 42-in stainless-steel whip; roof mount; adj. whip for lowest s.w.r.; comes with 16-ft coax with connectors, stainless-steel spring. 21-904 .....$18.95

Gutter-Clamp Antenna

Center-loaded stainless-steel whip; for temporary car-to-car transfer; adjustable top clamp; gutter clamp mount; 10-ft coax. 21-909.....$17.95

Roof-Mount Antenna

Center-loaded stainless-steel whip; roof mount with snap-in mounting; 16-ft coax. 21-906.....$16.95

Body-Mount Whip

Full-sized 102-in stainless-steel whip; surface or body mount; swivel ball; insulator & heavy back-up plate for universal mounting. 21-1094.....$14.95

Cowl-Mount Antenna

Center-loaded 37-in stainless-steel whip; ball mount assembly permits mounting on surface with max. slant of 35 degrees; adjustable tip rod; 5-ft coax. 21-928.....$11.95

Center-Loaded Whip

Center-loaded whip; plugs directly into coax socket of CB rig; stainless-steel construction. 21-921.$6.95

RAIDER

800 Twin-Trucker Antenna

Stainless-steel whips and masts; designed to be mounted on West Coast style mirrors; overall height 58-in; v.s.w.r. 1.5:1; front/back directional pattern; comes with 18-ft dual coax phasing harness; PL-259 plugs at both ends $39.95
900. Single trucker; overall height 55¾-in; omnidirectional pattern; resonator; comes with 14-ft coax cable and plugs $24.95

120 Omnidirectional

Omnidirectional fiberglass 102-in whip antenna; v.s.w.r. 1.5:1; input imp. 50 ohms; comes with dual chain bumper mount, chrome-plated shock spring, gutter clip, 17-ft coax cable, PL-259 plug. $34.95
130. Similar to 120 except has ⅜"-24 thread chrome-plated stud instead of chain bumper mount $12.95

110 Truck-Mount Antenna

Stainless-steel whip; overall height 44-inch; v.s.w.r. 1.5:1; omnidirectional pattern; input imp. 50 ohms; no-holes mounting; comes with chrome-plated shock spring and base cup, solderless connectors, 17-ft coax cable, PL-259 plug. $21.95

700 Rooftop-Mount

Stainless-steel whip; overall height 42-in; v.s.w.r. 1.5:1; omnidirectional pattern; input imp. 50 ohms; comes with chrome-plated shock spring, snap-in mount; solderless connectors, 17-ft coax cable, PL-259 plug $19.95

600 Gutter-Mount Antenna

Omnidirectional 18-in center-load antenna; gutter-mount for use on RV's, vans, pickups, and cars; comes with chrome-plated shock spring, 10-ft coax cable, PL-259 plug; can be tuned by raising or lowering whip within loading coil $19.95

140 Hand-Held Antenna

Omnidirectional, loaded-coil replacement antenna for hand-held transceivers; fits over retracted built-in antenna and secured with thumbscrew; v.s.w.r. 1.5:1; overall height 14½ in $5.95

RAMM

EMA-11 Electric Antenna

Top-loaded 40" "disappearing" electric, cowl mount, steel construction, unity gain, 1.5:1 s.w.r., comes with 18-ft coax, fully automatic operation, includes CPD-100 coupler for AM-FM $69.95
EMA-1. Similar to EMA-11 but without coupler $49.95
EMA-1. With CPD-100 coupler $59.95

Mobile Antenna Line

RR-200. Top-loaded co-phased, rain-gutter mount, 36", steel/Delrin construction, unity gain, 1.5:1 s.w.r., comes with 12-ft coax $35.95
RR-218. Same except "Shorty" co-phased system $34.95
RCC-200. Top-loaded 36" whip, for vans, trucks, RV's, camper-wall mount, unity gain. 1.5:1 s.w.r., 12-ft coax $35.95
RCC-218. Same except compact version $34.95
RW-200. Top-loaded 36" whip, mirror mount, steel/Delrin construction, unity gain, 1.5:1 s.w.r., 12-ft coax $34.95
RW-100. Same except single system $19.95
RW-218. Top-loaded 18" whip, mirror mount, steel/Delrin construction, unity gain, 1.5:1 s.w.r., 12-ft coax, co-phased $33.95
RW-118. Same except single system $17.95
RMB-100. Base-loaded magna-mount 37" whip, roof/trunk mounting, steel/Delrin construction, unity gain, 1.5:1 s.w.r., 12-ft coax $26.95
RSB-100. Base-loaded 37" whip, roof/trunk mount, steel construction, unity gain, 1.5:1 s.w.r., 18-ft coax, snap-in mount $24.95
RSL-100. Same except top-loaded $22.95
RBK-100. Base-loaded 37" whip, trunk mount, hide-away feature for release/stowing, steel/Delrin construction, unity gain, 1.5:1 s.w.r., 18-ft coax $24.95
RSK-100. Top-loaded 36" whip, trunk mount, steel/Delrin construction, unity gain, 1.5:1 s.w.r., 18-ft coax, co-phased, hideway feature $22.95
RMB-118. Top-loaded 18" whip, magna roof/trunk mount, steel/Delrin construction, unity gain, 1.5:1 s.w.r., 12-ft coax $21.95
RR-100. Top-loaded 36" whip, rain-gutter mount; steel/Delrin construction, unity gain, 1.5:1 s.w.r., 12-ft coax $20.95
RR-118C. Same except with clip-on mount, 18" whip $19.95

Pacer CB antennas. We just made our complete line more complete.

Introducing the AntennaMent*

A new portable, powerful, compact, 4dB gain omni-directional CB base station antenna especially designed for the apartment or condominium CB'er.

Here's a new kind of antenna that not only gives you vertical and horizontal polarization but introduces a whole new concept of freedom and mobility. And like all Pacer antennas it's feature loaded; fiberglass construction, "finger-tip" tuning, top coil loaded and full 4dB gain. The AntennaMent is only 64" high and lightweight enough to take anywhere, indoors or outdoors.

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Pacer has a CB antenna for everyone.

Automobile, truck, tractor, boat, RV camper, home and apartment. Each is designed to perform to a specific need. We don't just make cosmetic changes.

Why Pacer

All Pacer CB antennas are manufactured in the U.S. under strict quality and testing controls. Every antenna is tested before it leaves the factory. And all antennas are made of military grade fiberglass and coaxial cable. Non-corrosive, stylized hardware, easy to follow instructions and all necessary special tools are included.

You Must Be Interested

For the name of your nearest Pacer dealer or distributor call or write:
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Pacer

*Paten Pending

CIRCLE NO. 24 ON FREE INFORMATION CARD

RM-400. Top-loaded 48" whip, universal mount, steel/Delrin construction, unity gain, 1.5:1 s.w.r. (also available in 36" & 18" lengths) $14.95
RA-102. 102" whip, bumper mount, steel construction, unity gain, 1.2:1 s.w.r. $9.95

RCA

Mobile Antenna Line
Each antenna is preassembled, no-holes mount, stainless-steel elements, weather-resistant loading coil, blister packed with all mounting hardware, comes with Allen wrench and coax cable with connectors attached.
14T150. Truck-lip mount, base-loaded, 45" high, imp. 50 ohms, 17-ft coax $21.95
14T152. Magnetic mount, center-loaded, 28" high, adj. v.s.w.r., imp. 50 ohms, 11-ft. coax., not recommended for vinyl or fiberglass roofs $19.95
14T151. Gutter-mount, center-loaded, adj. v.s.w.r., imp. 50 ohms, 11-ft coax $14.95

RIVERSIDE

11050 Whirly Bird II
40-channel mobile antenna features one base-loaded coil plus four 34-in whips; trunk-lip mount; antennaloy stainless construction; 1.1 :1 s.w.r. in 40 channels; 1.05:1 s.w.r. in 23 channels; 1.15:1 s.w.r. in 1 channel; comes with tuning ring, 16.5-ft coax.....$39.95

11000 Sonic Mobile Antenna
40-channel base-loaded antenna; 46-in whip; stainless-steel construction; trunk-lip mount; 1.45:1 s.w.r. in 40 channels; 1.05:1 s.w.r. in 23 channels; 1.4:1 s.w.r. in 1 channel; comes with tuning ring, 16.5-ft coax.....$29.95

RMS

CBRD-1 Replacement Whip Antenna
Designed as a replacement for most portable receivers, transceivers, and walkie-talkies; is flexible, unbreakable, continuously loaded; insulated vinyl coating; clamp with setscrew.....$14.50

ROYAL SOUND

Base-Loaded Mobile Antennas
Company offers seven base-loaded mobile whip antennas; all with stainless-steel construction (except as noted); all supplied with coax.
AFCB-3. Bumper mount; 1.3 s.w.r. max. $80.00
AFCB-2. Bumper mount; 1.3 s.w.r. max. $60.00
AFCB-1. Bumper mount; 1.4 s.w.r. max. $40.00
ABM-2. Full-size whip; bumper mount; 1.4 s.w.r. max.; fiberglass construction $35.00
ABI-1. Same as ABM-2 except stainless-steel construction $35.00
ATM-1. Trunk-lip mount; 38" element length; 1.5 s.w.r. max.; 72-in coax $32.00
AMM-1. Magnetic-mount; 23" element length; 1.4 s.w.r. max.; 72-in coax $24.00

Center-Loaded Mobile Antennas
Company offers four center-loaded mobile whip antennas; all supplied with coax.
AMRM-2. Twin mirror-mount; fiberglass construction; 40" element length; 180-in coax; 1.4 s.w.r. max. $60.00
AGC-2. Gutter clip-mount; stainless-steel construction; 23" element length; 1.5 s.w.r. max.; 72-in coax $45.00
AMRM-1. Mirror-mount; fiberglass construction; 40" element length; 1.4 s.w.r. max.; 180-in coax $32.00
AGC-1. Gutter clip-mount; stainless-steel construction; 23" element length; 1.5 s.w.r. max.; 72-in coax $24.00

SHAKESPEARE

Model 4038
Co-phased; fiberglass whip; center-loaded; maximum element length 76-in; maximum s.w.r. 1:9:1; comes with dual-mount and phrasing harness.....$74.50

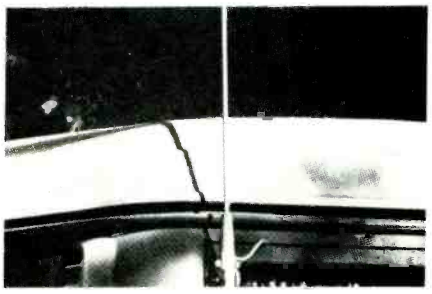
Model 464
Two antennas mounted on opposite sides of the trunk; co-phased, fiberglass whip; maximum element length 48-in; top-loaded; maximum s.w.r. 1:5:1; comes with 21-ft, 6-in coax.....$36.95
464-1. Top-loaded; co-phased, fiberglass whip; maximum element length 48-inches; single-bolt mirror-mount attaches to any horizontal bar up to ¾" dia.; maximum s.w.r. 1:5:1; includes 10-ft, 6-in coax cable and connector.....$34.95

Model 4039
Center-loaded, fiberglass marine CB antenna; maximum element length 10-ft, 6-in; style 366 ratchet-mount (not included); maximum s.w.r. 1:5:1; 7-ft coax.....$33.95

Model 4041
Features adjustable tip with setscrew for locking in lowest s.w.r. reading; helical-wound copper coil permanently sealed against environment in plastic housing for constant impedance and distributed capacitance; rooftop version with ¾" mounting hole $33.95

430 Series
Base-loaded; helical, fiberglass whip; maximum element length 45-inches; roof-top, cowl or trunk-mount; maximum s.w.r. 2:1 over entire band; comes with 15-ft coax.....$24.95

Model 4050
Full-length, RV antenna; fiberglass whip; base-



mount; maximum element length 36-in; maximum s.w.r. 2.0:1; 7-ft coax.....$24.95

VIP 173
Top-loaded; fiberglass whip; maximum element length 48-in; cowl, trunk, ball and spring or mirror-mount; maximum s.w.r. 1:5:1; comes with cable $24.95

Model 181
Capacitive-load, fiberglass whip; 102-in long; claimed s.w.r. 1:2:1; bumper-mount.....$12.95

Model 10-3
Fiberglass whip; maximum element length 96-in; ball, cowl or bumper-mount; claimed s.w.r. when mounted 1:5:1 .....$10.95

Mighty Mite Antennas
Low profile mobile antennas; continuous loaded 24-in radiator; ¼-wave whip; fiberglass construction; 2.0:1 or less s.w.r. over 23 channels; 50-ohm feedpoint impedance; comes with coax.
4090. 24-in whip antenna; ⅜ x 24 threads.....$8.95
4090-1. Gutter-mount.....$21.95
4090-2. Co-phased gutter-mount.....$32.95
4090-3. Mirror-mount.....$19.95
4090-4. Co-phased mirror-mount.....$31.95
4090-5. Trunk-mount.....$20.95
4090-6. Co-phased trunk-mount.....$31.95

SHARP

CA12 Mobile Antenna
Base-loaded 35" whip antenna; fiberglass construction; max. s.w.r. 2:1 over 40 channels; 18-ft coax cable; comes completely assembled; base & mount ... $20.00

SPARKOMATIC

SA-301 Disappearing Whip Antenna
Top-loaded whip; 40½-in element; cowl, rear-fender, or trunk mount; stainless-steel construction; −2 dB gain over isotropic; max. s.w.r. 1.3:1; comes with 17-ft coax; motorized disappearing feature .. $59.95
SA-300. Same as SA-301 except non-motorized $39.95

SA-25 Mobile Whip Antenna
Center-loaded whip; 19-in element; mirror, cab, or roof mounting; stainless-steel construction; −2 dB gain over isotropic; max. s.w.r. 1.3:1; comes with 17-ft coax $35.95

SA-11 Mobile Whip Antenna
Center-loaded whip; 11½-in element; universal magnetic mount (on iron or steel only); stainless-steel construction; −3 dB gain over isotropic; 1.3:1 max. s.w.r.; 10-ft coax $14.95
SA-10. Same as SA-11 except gutter mount $14.95

STAR FIRE

SF-176-TLS Trunk-Lip Mount
No-hole truck-lip mount; sealed coil; 17-7 PH stainless-steel tip rod; high-impact plastic trim cover; comes with stainless-steel chrome spring; 17-ft RG-58/U foam coax; PL-259 connector $26.95
SF-175-TL. Same as above but without spring $24.95

SF-99-TRS Roof Mount
Thick-roof mount; for pickup trucks; ⅜" special mount; comes with 17-ft RG-58/U foam coax and PL-259 connector $26.95

SF-168-RTM Magnetic Mount
For temporary installation; mounts on roof top or any flat surface; 80-lb-pull ceramic magnet; 18-ft RG-58/U foam coax; PL-259 connector $25.95

SF-125-RTS Roof/Deck Mount
⅜" snap-in mount; sealed construction; 17-7 PH condition 900 tip rod; comes with RG-58/U foam coax and connectors. $24.95
SF-67-RT. Same as above but without spring $21.95

SF-131-GMS Gutter Mount
Triple chrome-plated gutter mount antenna; comes with 17-ft RG-58/U foam coax and PL-259 connector $24.95

SF-77-TBM Tool-Box Mount
Designed to fit saddle-type tool boxes on pickup trucks; special ⅜" hole mount; comes with 17-ft RG-58/U foam coax and PL-259 connector . $19.95

TARGET

Mobile CB Antenna Line
Company offers extensive line of mobile antennas; maximum height 43-inches; all come with tapered stainless-steel whips; s.w.r. 1.5:1 or better; 52 ohms nominal impedance; chrome-plated steel mounting hardware; PL-259 connector; 17-ft coax.
CB-35. Fold-down side-mount; snaps into position $26.95
CB-20. Rain-gutter/luggage carrier mount; no drilling $25.45
CB-30. Mirror-mount $24.95
CB-5. Adjustable trunk-lip mount; for use with hatchback and fastback automobiles. $24.00
CB-25. Trunk-groove mount $23.85
CB-10. Trunk-lip mount; uses two set screws; no drilling $23.15
CB-15. Snap-in mount; ⅜-inch holes $21.00

CB 160
Single-trucker 51-inch antenna; SS high efficiency center-loaded; stainless-steel mounting brackets; heavy-duty waterproof coil; horizontal or vertical

The high performance CB-AM-FM antenna that disguises so well, only our competitors will try to rip it off.

You know the problems with CB disguise antennas. The "disguise" isn't complete, and the professional CB thief can spot an incomplete disguise a block away. Or the disguise works, but the antenna doesn't. It keeps the thief from wanting to get into your car, but the antenna design keeps your signal from getting out like it should.

These problems are over.

From its black insulator to the top of its stainless steel whip, our Model 11004 CB disguise antenna is identical to most standard replacement AM-FM receiving antennas. More important, it's pre-tuned at our factory for an SWR of 1.5:1 or less *across all 40 channels.* That means you get out with the strongest possible signal, without advertising the fact your car is CB equipped. And it's why we call the Model 11004 **"One-(Big)-Ten-Four."**

Like all our antennas, it's handcrafted using only the highest quality materials for years of dependable service. And the Model 11004 includes our exclusive in-line connector for simplified installation and 18 feet of low-loss RG-58/U coaxial cable.

For protection from CB rip-offs and a great output signal, you can't do better. Just ask for Antenna Incorporated's "One-(Big)-Ten-Four." At $34.95*, it's a steal.

You deserve the best. You get it from the Antenna Incorporated pros.

Antenna Incorporated

23850 Commerce Park Road, Cleveland, Ohio (216) 464-7075
In Canada: E.S. Gould Marketing Co. Ltd., 109 Montee De Liesse, Montreal, Quebec H4T 1S9 Canada
Antenna Incorporated, International Division, P.O. Box 1002, Rockville Centre, New York 11571

*suggested resale price

CIRCLE NO. 3 ON FREE INFORMATION CARD

mirror-mount; s.w.r. 1.5:1 or better; PL-259 connector; 17-ft. coax $19.90

CB 162. Double-trucker; same as CB 160 except has 2 complete antennas; 17-ft. dual co-phased coax $39.60

CB-320

Center-loaded 36" whip; folddown side mount for RV's; nickel-chrome steel & fiberglass construction; 1.5:1 s.w.r.; comes with 18-ft coax cable $25.85

CB-380

Top-loaded 48" whip; mirror mount; stainless steel & fiberglass construction; 1.5:1 s.w.r.; 18-ft coax cable $22.00

CB 90

19-inch antenna; gutter/luggage rack-mount; SS high efficiency center-loaded; adjustable for minimum s.w.r.; heavy-duty chrome-plated mounting hardware; PL-259 connector; 10-ft. cable $16.60

CB 85

19-inch antenna; clip-on gutter-mount; SS high efficiency center-loaded; adjustable for minimum s.w.r.; heavy-duty chrome-plated mount; PL-259 connector; 10-ft. coax $16.60

PC5

Base-load 34" whip; adjustable trunk-lip mount; vertical positioning on any style trunk; high efficiency printed circuit; s.w.r. 1.5:1 or better; chrome-plated mounting hardware; preassembled 17-ft. cable with PL-259 connector $17.50

TENNA

CBE-10 Power Antenna

Retractable electric antenna designed for fender mounting; antenna extends to full length at flick of switch turning radio on; retracts and turns radio off at same time; center-loaded; s.w.r. fine tuner; low v.s.w.r. $59.95

Mobile Antenna Line

All parts are stainless-steel; whips are made of 17-7 PH stainless-steel; all coax cable is RG-58/U.

CB-411-2. Dual-assembly for installation on West Coast mirrors; pre-tuned; center load; comes with co-phased coax $41.58

CB-411. Same except single antenna $29.92

CB-911-2. Dual-assembly for installation on West Coast mirrors; comes with co-phased coax; center load $36.58

CB-911. Same except single antenna $24.91

CB-103. Trunk-lip mounting; pre-tuned; will stand up at high speed $24.91

CB-203. Same as above but for rooftop mounting $21.58

CB-311. Center-loaded coil; adjustable bracket to fit different rain-gutter mounting situations $18.25

CB-603. Trunk-lid mounting; base loaded; removable coil $19.92

CB-703. Same as above except for roof-top mounting $16.58

CB-811. Gutter-mount; base-loaded; removable coil $13.25

TURNER

Gutter-Mount Antennas

SK411. Single gutter mount antenna with air coil shock spring; adjustable swivel ball; comes with 18-ft RG-58/U cable and connectors; 24 in..... $22.50

SK422. Dual co-phased antennas with cable harness and adjustable gutter mount brackets; air coil loading coil; 24-in antennas complete with adjustable swivel balls and shock springs..... $45.00

SK500. Single 47-in antenna with air coil center loading; adjustable mounting bracket; 18-ft RG-58/U coax cable with antenna and connectors; PL-259 and UG175/U for radio connection... $25.00

SK502. Dual co-phase antenna assembly with harness; same antennas as SK500 but includes two quarter-wave RG-59/U coax cables Y'd to 12-ft RG-58/U cable; PL-259 radio connector..... $50.00

Mirror-Mount Antennas

SK801. Single stationary antenna fastens to mirror strut with clamp; can be installed and removed without tools; center-loaded with low-drag air coil; 10-ft cable; standard PL-259 connector..... $22.50

SK802. Twin-Kicker dual co-phased antennas with tuned coax harness; two stainless-steel center-loaded antennas..... $45.00

SK811. Single adjustable antenna; can be lowered as much as 16 in; supplied with 10-ft cable and PL-259 connector..... $30.00

SK812. Twin-Kicker dual co-phased antennas with adjustable mounts; harness consists of quarter-wave leads Y'd into 12-ft cable with standard PL-259 connector..... $60.00

Trunk-Mount Antennas

SK200. Trunk-lip assembly including mount, base, screw-on antenna coil; stainless-steel antenna; 18-ft cable and connectors; 46 in..... $24.00

SK201. With swivel ball; can be adjusted and locked on slanted surface; 46 in..... $27.00

SK210. With stainless-steel shock spring threaded to loading coil and antenna rod; 46 in..... $26.00

SK211. Includes adjustable swivel ball and shock spring with threaded connections; adjustable swivel ball can be locked to assure vertical polarization $29.00

Roof-Mount Antennas

SK100. Roof mount with threaded connections at base; easily removed for low clearance; spring-loaded cable-to-coil contact; 46 in from top of base to antenna tip..... $20.00

SK101. Antenna with swivel ball; adjustable for correct vertical polarization; 46 in..... $23.00

SK110. Same as SK100 but with stainless-steel shock spring, no swivel $22.00

SK111. Combines adjustable swivel ball and shock spring features; 46 in..... $25.00

Bumper-Mount Antennas

SK300. Complete bumper-mount antenna assembly; 102-in from bracket to antenna tip..... $24.00

SK310. Antenna assembly with heavy-duty stainless-steel shock spring; 106 in..... $30.00

"Yellow Jackets" Antenna Line

All antennas are 23/40 channel units; of fiberglass construction; have micro-tunable stinger (tip).

FG-310. Full-size whip; 102-in; bumper mount with spring $30.00

FG-450. 30-in whip; gutter mount with swivel ball..... $18.00

FG-455. Same as FG-450 but co-phased pair $32.00

FG-500. 46-in whip; trunk groove mount..... $18.50

FG-502. Same as FG-500 except co-phased pair $37.00

FG-850. 46-in whip; mirror mount..... $17.50

FG-855. Same as FG-850 except co-phased pair $35.00

FG-900. 30-in whip; magnetic mount..... $25.00

FG-200. 46-in whip; trunk lip mount..... $19.00

FG-201. Same as FG-200 except with swivel ball..... $20.00

FG-210. Same as FG-200 except with spring $20.00

FG-460. 30-in whip; fold-down gutter mount with swivel ball..... $22.50

VENDETTA

Mobile Antenna Line

All models feature "V-Load" whips; no loading coil; ⅜" dia. rod; 52-in (folded 108-in) whips; flat frequency response 1-40 channels; fiberglass construction; 1.5:1 max. s.w.r.

VTT-1. Dual mirror-mount; co-phasing harness; two 18-ft coax cables $69.95

VTL-1. Trunk-lip mount; 18-ft coax cable $39.95

VST-1. Mirror-mount; 9-ft coax cable $36.95

VEN-1. Mast-mount only; no coax cable $19.95

CB Base Station Antennas

AIREQUIPT

"Gladiator 720" Base-Station Antenna
Cross-polarized on the X, Y, and Z planes for maximum radiation and omnidirectional reception; 19.2 dB gain over isotropic; consists of triple-section Cycolac center insulator and six full-length anodized aircraft-aluminum elements with Cycolac static discharge balls on each element end; v.s.w.r. 1:2 or 1:0; 18-ft, 3-in; wind rating 90 mph; mounts vertically from tripod or mast; feedline RG/58, RG/59, RG/8, RG/11 as required; suggested mount: BSM-1000 ..... $129.95
"Trojan 360c". Similar to 720 but 6-ft, 1-in in two planes; 10.5 dB gain over isotropic $99.95
"Centurion 360". Similar to 360c but 18-ft, 3-in in two planes; 15.4 dB gain over isotropic; comes preassembled; mounts vertically from window sill, vertically or horizontally from mast or tripod $89.95

"Avenger 180c" Compact Antenna
Can be mounted on window sill, roof gable, fence, pole, mast, or tripod; vertical or horizontal polarization; v.s.w.r. 1.3-1:0; Cycolac center insulator with SO-239 connector; wind rating 90 mph; 6-ft, 1-inch single plane; up to 9.2 dB gain over isotropic; weight 2 lbs $59.95
"Hercules 180". Similar to 180c except 18-ft, 3-in single plane; weight 2 lbs, 13 oz $49.95

BSM-1000 Universal Mounting Bracket
Designed to be used with any of the above antennas; Cycolac construction; comes with U bolts and stainless-steel screws $15.95

AMERICAN ELECTRONICS

93-373 Base-Station Antenna
Omnidirectional, ground-plane, 5/8-wave antenna; overall height of radiator 22-ft, 6-in; 100 mph max. wind survival; surface area 1.4 sq ft; double-thick aluminum construction; 50-ohm feedpoint imp.; shunt reactance feed; 4-dB gain over isotropic; max. s.w.r. 1.5:1; vertical polarization; 40-channel capability; comes with SO-239 cable connector $46.45

93-384 Base-Station Antenna
Omnidirectional, ground plane, 1/4-wave antenna; overall height of radiator 9-ft; 100 mph max. wind survival; surface area 1.0 sq ft; 50-ohm feedpoint imp.; shunt reactance; unity gain over isotropic; max. s.w.r. 1.5:1; vertical polarization; 40-channel capability; comes with SO-239 cable connector $30.95

93-385 Base-Station Antenna
Omnidirectional, ground plane, 1/4-wave antenna; overall height of radiator 9-ft; tubular aluminum construction; shunt reactance feed; 50-ohm feedpoint imp.; max. s.w.r. 1.5:1; vertical polarization; 40-channel capability; comes with SO-239 cable connector $18.45

ANIXTER-MARK

MK-V Base Station Antenna
Colinear array with two in-phase elements; feedpoint internally at center of antenna; low angle radiation; maximum omnidirectional gain through use of 20-foot antenna length; v.s.w.r. 1.2:1 at edges of band, 1.5:1 across 800 kHz, 2.0:1 across 1200 kHz for other low-power services adjoining Citizens Band; 52-ohm match across band; 3-wire cage acts as electrical sleeve to isolate antenna from support structure; aluminum and galvanized steel pipe construction; terminated in SO-239 connector ... $56.95

AMB-2 Base Station Antenna
Half-wave single 18-ft element; feedpoint imp. 50 ohms; launcher harness feed; gain over isotropic 4 dB; max. s.w.r. 1.2:1; d.c. ground; static sheath $49.75

MK-IIP Base Station Antenna
Features company's "Static Sheath" covering entire radiating portion of antenna providing electrical insulation and eliminating static interference for improved S/N and receiver sensitivity (up to 20 dB); half-wave vertical radiator; 50 ohm impedance match; v.s.w.r. 1.5:1 across band; d.c. ground $46.75

CBB-1-P "Beacon" Antenna
Half-wave (17-foot) radiator, voltage fed at bottom high-imp. point through special quarter-wave launcher-matcher section of RG-8/U cable; v.s.w.r. 1.5:1 from 26.5-27.5 MHz; gain 1 dB over standard ground plane with 9-ft. radials; d.c. ground for lightning protection; comes with U-bolt mounting hardware $30.80

HWD Base Station Antenna
Fiber glass molded dipole with helical-wound end loading sections; designed especially for apartment dwellers; can be mounted on small mast and projected out from balcony or window; horizontal or vertical polarization; 8-ft $25.90

ANTENNA INCORPORATED

22630 Base-Station Antenna
5/8-wave, ground-plane, 19-ft antenna; aircraft seamless aluminum construction; 50 ohms; PL-259 feed; 4 dB gain over isotropic $39.95

22530 Base-Station Antenna
Quarter-wave, ground-plane, 9-ft antenna; aircraft seamless aluminum construction; 50 ohms; PL-259 feed; unity gain over isotropic $14.25

ANTENNA SPECIALISTS

M-216 "Big Daddy"
Five-element yagi base station antenna; max element length 18-ft; 22-ft boom length; aluminum construction; 50 ohm feedpoint impedance; gamma match; 15.5 dB gain over 1/4 wave ground plane; 25 dB front-to-back ratio; 1.5:1 or less s.w.r.; vertical and horizontal polarization; assembled weight 40 lbs $219.95

MS-119 Base Station Antenna
Omnidirectional and directional antenna, control box permits switching; 3 elements; max element length 18-ft; aluminum construction; 50 ohm feedpoint impedance; split feed; 5.75 dB gain over 1/4 wave ground plane in omnidirectional mode, 8.75 dB gain over 1/4 wave ground plane in directional mode; front-to-back ratio 23 dB; 1.5:1 or less s.w.r.; vertical polarization; d.c. ground in omnidirectional mode; assembled weight 17 lbs $129.95

M-215 "Boss 303"
Three-element beam-yagi antenna; max element length 18-ft; 10-ft, 3-in boom length; aluminum construction; 50 ohm feedpoint impedance; gamma match; 9.75 dB gain over 1/4 wave ground plane; 25 dB front-to-back ratio; 1.5:1 or less s.w.r.; vertical and horizontal polarization; assembled weight 11 lbs $109.95

M-134 Base Station Antenna
Five-element directional-beam antenna; max element length 18-ft; 22-ft boom length; aluminum construction; 50 ohm feedpoint impedance; gamma match; 14.5 dB gain over 1/4 wave ground plane; 25 dB front-to-back ratio; 1.5:1 or less s.w.r.; vertical or horizontal polarization; assembled weight 18 lbs $89.95

M-201 Base Station Antenna
Four-element beam-antenna; max element length 18-ft; 12-ft, 6-in boom length; aluminum construction; 50 ohm feedpoint impedance; gamma match; 11 dB gain over 1/4 wave ground plane; 25 dB front-to-back ratio; 1.5:1 or less s.w.r.; vertical or horizontal polarization; assembled weight 6 1/2 lbs $64.95

M-202 Base Station Antenna
Three-element beam-antenna; 18-ft max element length; 9-ft, 1-in boom length; aluminum construction; gamma match; 9.75 dB gain over 1/4 wave ground plane; 50 ohm feedpoint impedance; 25 dB front-to-back ratio; 1.5:1 or less s.w.r.; vertical or horizontal polarization; assembled weight 6 lbs $56.95

M-227 "Mighty Magnum II"
Omnidirectional antenna with dual phasing coil; aluminum construction; 50 ohm feedpoint impedance; tapped autotransformer; 4 dB gain over 1/4 wave ground plane; 1.5:1 or less s.w.r.; vertical polarization; d.c. ground; loading coil; assembled weight 7 lbs $44.95

M-400 "Starduster"
Omnidirectional antenna; aluminum construction; 50 ohm feedpoint impedance; split dipole; 5 dB gain over 1/4 wave ground plane; 1.5:1 or less s.w.r.; vertical polarization; comes with SO-239 connector; assembled weight 3 1/2 lbs $44.95

M-117 "Super Magnum"
Omnidirectional antenna; aluminum construction; tapped autotransformer; 3.75 dB gain over 1/4 wave ground plane; 1.5:1 or less s.w.r.; vertical polarization; loading coil; d.c. ground; assembled weight 7 lbs. $39.95

M-417 "Polecat"
Omnidirectional base station antenna; aluminum construction; 50 ohm feedpoint impedance; tapped autotransformer; 3.75 dB gain over 1/4 wave ground plane; vertical polarization; comes with SO-239 connector; d.c. ground; assembled weight 5 lbs. $26.75

M-184 Base Station Antenna
Omnidirectional antenna; aluminum construction; 50 ohm feedpoint impedance; split feed; 1.5:1 or less s.w.r.; vertical polarization; comes with SO-239 connector; assembled weight 3 lbs $16.95

M-203 Antenna
Portable base station antenna for temporary operation of transceiver; omnidirectional; stainless-steel; 1.5:1 or less s.w.r.; vertical polarization; center-loaded; d.c. ground; assembled weight 1 lb ... $9.95

ANTLER

B-12 Base Station Antenna
Omnidirectional, 3-element radiator; 8'4" maximum

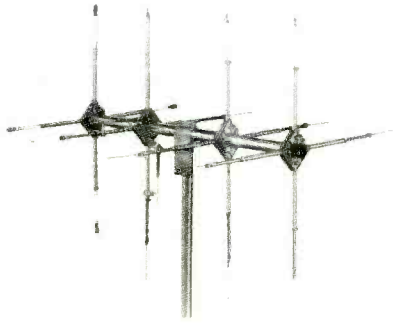
element length; 6'3" turning radius; 50-ohm impedance; natural match; vertical polarization; d.c. ground; aluminum construction $36.95

AVANTI

AV-146 Moonraker 6

Six-element dual-polarity beam combining five sets of crossed-dipole-type elements and quad-type reflector; gain 17 dB over isotropic; front-to-back separation 44 dB; v.s.w.r. 1.2:1; imp. 50-52 ohms; side rejection 24 dB; 31.5-ft boom with fiberglass rods as inner guy wire supports for boom; 3/16" solid fiberglass rods interlock elements; 24-inch, ⅛" dia. stainless-steel wire tips to reduce wind load area and ice prone surfaces; tunable gamma match on both vertical and horizontal elements; requires heavy-duty rotor; wind load of beams 6.9 sq. ft; weight 39 lbs; comes with switchbox which makes contact on one polarity before it breaks contact on the other $404.00

Moonraker 4. Similar to above except gain 14.5 dB over isotropic; front-to-back separation 38 dB; vertical to horizontal separation 25 dB; power multiplication 28 times; medium- to heavy-duty rotor required; boom length 16.5 ft; weight 24 lbs; comes with switchbox $170.50



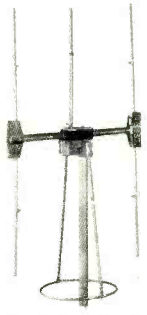
AV-120-2 P.D.L. II Antenna

Polar-diversity-loop antenna; cross arm spread and height 13-ft; aperture 90 sq ft; boom length 4-ft, 10-in; dual-polarity; forward gain 12 dB over isotropic; front-to-back ratio 32 dB; polarity isolation 23 dB vertical to horizontal; v.s.w.r. 1.2:1; suggested coax foam-filled RG-8/U; 50-52 ohms imp.; requires light- or medium-duty rotor; d.c. ground; power multiplication 16 times; comes with AV-501 single-switch switchbox; weight 13.5 lbs $117.50

AV-130. Stacking kit for above antenna; comes with co-phasing harness; requires heavy-duty rotor $104.75

AV-150 Astro Beam

Three-element beam with company's "Astro Plane" antenna as driven element; aircraft-quality aluminum tubing construction; hubs of weather-resistant Cycolac; forward gain 11 dB over isotropic; rejection 40 dB plus signal drop front-to-back; imp. 50-52 ohms; boom length 10½ ft; vertical beam; v.s.w.r. 1.3:1; turning radius 63 in; power multiplication 12.6 times; light- to medium-duty rotor can be used (including inexpensive TV rotors); weight 14 lbs. $79.95



AV-170 Sigma 5/8

5/8-wave ground-plane antenna; 22-ft high; 5.14 dB gain over isotropic; v.s.w.r. 1.3:1; power multiplication 3.3 times; imp. 50-52 ohms; omnidirectional; requires no rotor; radials 9 ft; weight 9 lbs; aluminum, aluminum castings, stainless-steel, fiberglass construction. $59.50

AV-101 Astro Plane

Omnidirectional; vertical polarization; top loaded; 4.46 dB gain over isotropic; pretuned for s.w.r. 1.2:1; imp. 50-52 ohms; power multiplication 2.8 times; total length 12 ft; weight 4 lbs; needs no rotor $39.95

AV-160 Ramrod

Full half-wave antenna adjustable from 27-170 MHz; omnidirectional for CB base-station use; unity gain with either horizontal or vertical polarization (depending on mounting). $20.50

BLUE STREAK

DMCL-11 Base Station Antenna

High-efficiency, all steel antenna; dual-phased half-wave colinear provides 3 dB gain; 5 ft high with radial dia. to 5 ft; mounts on masts up to 1.5" high with radi-
RG-5/8 U with connectors $39.95

SMCL-11 Base Station Antenna

High-efficiency, all-steel, unity-gain quarter-wave antenna; 5 ft high with 5 ft radial diameter; mounts on masts up to 1.5" dia; coax connector mates to PL-259, comes with 50-ft RG-5/8 U with connectors. $29.95

CHANNEL MASTER

Golden Hawk Base Antenna

Omnidirectional aluminum antenna features preassembled construction; ½-wave dipole; 1.3:1 s.w.r. over 40-ch band; average gain of 5 dB over ground plane; EPC coating prevents corrosion; comes with 3 screw-in capacitive loading stubs; overall height 16-ft; weight 4-lbs $49.95

CUSHCRAFT

CFB-8 Superfire

3-element horizontal/vertical power beam; selectable horizontal, vertical, or axial polarization; front-to-back ratio 30 dB, front-to-side 40 dB; forward gain 12.5 dB; heavy-duty seamless aluminum construction; boom 16-ft × ¾-in; longest element 18-ft; turn radius 12-ft; uses two 52-ohm feedlines with any standard coax switch; weight 25 lbs. $136.50

CFS-1. In-line three-rocker coax switch available as an optional extra; for desk or wall mount.

CB-115 Beam Antenna

Five-element beam; forward gain 10.5 dB; front-to-back ratio 28 dB; v.s.w.r. 1:1; boom 20-ft × 1¾-in; element diameter ¾"-½"; turn radius 12-ft; solid-hold telescope clamps; weight 20 lbs $94.50

CB-114. 4-element beam; forward gain 9.5 dB; front-to-back ratio 26 dB; boom 16-ft × 1⅝-in; turn radius 8-ft; weight 14 lbs. $66.50

CB-11. 3-element beam; forward gain 8 dB; front-to-back ratio 22 dB; boom 10 × 1½-in; turn radius 5-ft; weight 10 lbs $52.50

CB-2KD Dual-Beam Stak Pak

For use with 3-, 4-, or 5-element beams to provide up to 3-dB signal increase; includes heavy-duty seamless aluminum horizontal support boom with diagonal braces; coaxial phasing harness with preassembled connectors; adjustable to 2½ o.d. mast mount, all hardware $62.50

CX-1000 Antenna

Heavy-duty, high-efficiency antenna for AM or sideband use; end-fed with coax stub system for good match and low ohmic losses $38.50

CR-1 Ringo Antenna

Half-wave base antenna; "power ring" tuning for 3.75 dB gain; 10-inch ring dia.; can be installed in various positions; direct d.c. ground; low angle of radiation; will withstand winds of 80 mph; 17-ft, 10-in high $28.50

DGPA Ground Plane

Can be set for any service in 27-50 MHz range; comes with element setting chart; for two-way radio or monitor applications $22.50

TS-1 Trik Stik Antenna

All-purpose antenna for high or low monitor, CB, etc.; universal mount $14.50

FINCO

Stinger 540 Antenna

Five-element yagi, 19-ft element length, 21-ft boom length, turning radius 10.7 ft, aluminum construction, surface area 5.7 sq ft, wind loading 153 lbs at 80 mph, gamma feed, 50 ohm feedpoint imp., gain over isotropic 14.6 dBi; front-to-back ratio 25 dB, front-to-side 30 dB, half-power beamwidth 48-degrees E plane, max. s.w.r. 1.25:1 at 36 ft, polarization same as mounting plane, square boom, self-aligning elements, assembled weight 16.8 lbs $85.95

Stinger 440 Antenna

Four-element yagi, 19-ft element length, 14.3-ft boom length, turning radius 7.2 ft, aluminum construction, surface area 4.4 sq ft, wind loading 118 lbs at 80 mph, gamma feed, 50 ohm feedpoint imp., gain over isotropic 12.6 dBi, front-to-back ratio 23 dB, front-to-side 30 dB, half-power beamwidth 53 degrees E plane, max. s.w.r. 1.25:1 at 36 ft, polarization same as mounting plane, square boom, self-aligning elements, assembled weight 12.6 lbs $61.95

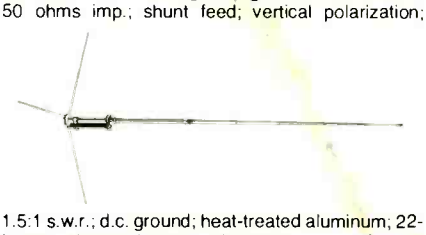
Stinger 340 Antenna

Three-element yagi, 19-ft element length, 10-ft boom length, turning radius 5.04 ft, wind loading 86 lbs at 80 mph, surface area 3.2 sq ft, aluminum construction, 50 ohm feedpoint imp., gain over isotropic 10.4 dBi, gamma feed, front-to-back ratio 20 dB, front-to-side 30 dB, half-power beamwidth 60 degrees E plane, max. s.w.r. 1.25:1 at 36 ft, polarization same as mounting plane, square boom, self-aligning elements, assembled weight 10 lbs $53.95

HUSTLER

27TD "Super Swamper"

Colinear 0.64 wavelength, single element antenna; 50 ohms imp.; shunt feed; vertical polarization; 1.5:1 s.w.r.; d.c. ground; heat-treated aluminum; 22-ft. max. element length; weight 9 lbs $52.95



27JR "Jam Ram"

Similar to 27TD except 19-ft., 10¾" max. element length; weight 7 lbs $39.95

HY-GAIN

Big Gun II Cubical Quad
Four-element cubical quad antenna; 14.6 dB gain over isotropic; half-power beam width 49 degrees; front-to-back ratio 38.7 dB; twin driven elements; vertical-horizontal separation 18 dB; feedpoint impedance 52 ohms nominal; v.s.w.r. 1.5:1 at resonant frequency; boom length 20 feet; boom diameter 2 inches; accommodate masts from 1¼ to 2½ inches; turning radius 11 feet; surface area 5.7 sq. feet; weight 39 lb.; wind survival 90 mph; stranded aluminum wire elements, all-aluminum frame $189.95

SDB 6 Super Duo-Beam
Twin "stacked" three-element yagi beams; 12.7 dB gain over isotropic; front-to-back ratio 23 dB; feedpoint impedance 52 ohms nominal; v.s.w.r. 1.5:1 at resonant frequency; boom length 12 ft. 2 in.; cross boom length 14 ft.; max. element length 18 ft. 6½ in.; boom diameter 1¼ in.' cross boom diameter 2 in.; turning radius 9 ft. 6 in.; accomodates masts from 1¼ in. to 2½ in.; surface area 6.1 sq. ft.; maximum wind survival 100 mph; weight 33.2 lb $129.95

Eliminator II Cubical Quad
Two-element quad with twin driven elements; 9 dB gain over isotropic; front-to-back ratio 30 dB; vertical-to-horizontal separation 15 dB; feedpoint impedance 52 ohms nominal; v.s.w.r. 1.5:1 at resonant frequency; overall spreader lengths 12 ft. 9¼ in. (driven element), 12 ft. 8¼ in. (reflector); boom diameter 1¼ in.; accomodates masts from 1¼ in. to 1⅝ in.; turning radius 9 ft. 2 in.; surface area 3 sq. ft.; wind survival 90 mph; weight 13.7 lb.; stranded aluminum wire elements and taper swaged spreaders $89.95

Long John Beam
Five-element yagi beam; 12.3 dB gain over isotropic; front-to-back ratio 31 dB; feedpoint impedance 52 ohms nominal; v.s.w.r. 1.5:1 at resonant frequency; boom length 24 ft.; max. element length 21 ft.; turning radius 14 ft.; surface area 5.34 sq. ft.; maximum wind survival 90 mph; weight 23 lb.; boom and elements made of aluminum, insulators molded of Cycolac, steel hardware is iridite treated; driven element at d.c. ground through beta match $89.95

411 5-Element Yagi
Five-element yagi beam; 10 dB gain over isotropic; front-to-back ratio 22 dB; feedpoint impedance 52 ohms nominal; v.s.w.r. 1.5:1 at resonant frequency; boom length 17 ft.; max. element length 21 ft.; turning radius 10 ft.; surface area 3.86 sq. ft.; max. wind survival 90 mph; weight 14.1 lb.; constructed of aluminum tubing; all hardware iridite treated; driven element at d.c. ground through beta match .. $59.95

Golden Penetrator
Omnidirectional base antenna; 5.1 dB gain over isotropic; composed of four quarter-wave radials and a ⅝-wave radiator, gold iridite plated; feedpoint impedance 52 ohms nominal; v.s.w.r. 1.2:1 at resonant frequency; radiator at d.c. ground; overall radiator height 22 ft. 9½ in.; radial length 8 ft. 9 in.; wind survival 100 mph; accepts masts from 1¼ in. to 1⅝ in., weight 12.4 lb $59.95

CB 3 Yagi Beam
Three-element yagi beam; 8.2 dB gain over isotropic; front-to-back ratio 20 dB; feedpoint impedance 52 ohms nominal; v.s.w.r. 1.5:1 at resonant frequency; boom length 8 ft.; max. element length 18 ft.; turning radius 4 ft.; max. wind survival 80 mph; surface area 3 sq. ft.; weight 6.6 lb.; all-aluminum construction; iridite treated hardware $49.95

The Penetrator Super CLR
Omnidirectional base-station antenna; 5.1 dB gain over isotropic; feedpoint impedance 52 ohms nominal; v.s.w.r. 1.2:1 at resonant frequency; composed of four quarter-wave radials and a ⅝-wave radiator with capacitive hat; overall radiator height 22 ft. 9½ in.; radial length 8 ft. 9 in.; wind survival 100 mph; accepts masts from 1¼ in. to 1⅝ in.; weight 12.4 lb.; radiator at d.c. ground $49.95

488 Omnidirectional
Loaded, half-wave dipole; 10½-ft element length; wind loading 80 mph; chrome-plated brass ferrules, fiberglass mast, stainless-steel whip and Lexan ratchet mount; feedpoint 50 ohms tunable (factory pretuned with 50-ft coax); ground independent feed (usuable with any length coax, no ground plate or radials required); 2:1 max. s.w.r. at any height; vertical polarization; comes with all hardware, matching network, and ratchet mount; 5.9 lbs assembled weight $49.95

CLR2 Base Antenna
Omnidirectional base antenna; 4 dB gain over isotropic; feedpoint impedance 52 ohms nominal; v.s.w.r. 1.04:1 at resonant frequency; composed of three quarter-wave radials and a ⅝-wave radiator with capacitive hat; overall radiator height 19 ft. 10 in.; radial length 8 ft. 6 in.; accepts mast from 1½ in to 1⅝ in.; wind survival 80 mph; weight 7.8 lb.; aluminum construction $39.95

The Silverrod
Omnidirectional base antenna; 3.8 dB gain over isotropic; feedpoint impedance 52 ohms nominal; v.s.w.r. 1.2:1 at resonant frequency; composed of three short, curved radials and a half-wave radiator; matching transformer places the radiator at d.c. ground; overall radiator height 17 ft 8 in; accepts masts up to 1⅝ in.; wind survival 80 mph; weight 5.1 lb.; aluminum construction $29.95

CBGP Base Antenna
Omnidirectional ground plane antenna with three quarter-wave radials and a quarter-wave radiator; feedpoint impedance 52 ohms nominal; v.s.w.r. 1.2:1 at resonant frequency; radiator is d.c. grounded through beta match; radiator and radial length 9 ft.; accepts masts from 1¼ in. to 1⅝ in.; wind survival 80 mph; weight 3.1 lb.; aluminum elements, Cycolac base insulator, and iridite-treated hardware $16.95

JFD

10-BS Base-Station Antenna
Omnidirectional transmit and receive; full aperture, half-wave dipole; s.w.r. 1.5:1 on all channels; 17-ft vertical whip radiator; 6-ft wing span; feedpoint unit can be secured by 1¼-in o.d. tubing or threaded 1-in waterpipe; corrosion- and wind-proof construction; comes with mounting hardware and assembly/installation instructions $44.85

LAFAYETTE

Criterion Starfire V
Half-wave center-fed base station antenna; 5 dB gain; v s.w.r. 1.5:1; withstands 100 mph wind; span less than 6 ft; 17 ft high; radials 8-ft, 10 in long; seamless aircraft aluminum tubing; mounts on 1¼" mast or threaded 1" water pipe; water-proof coaxial connector; comes without cable $44.95

3-Element Vertical
Directional pattern; forward gain 8 dB, front-to-back ratio 22 dB; 50-ohm feedline match; comes with bracket or vertical or horizontal mounting; 1½" o.d. aluminum boom 8-ft long; ⅝" to 7/16" o.d. elements approx. 16½-ft long; less mast and coax $42.95

Deluxe Range-Boost/II
End-fed, half-wave omnidirectional antenna; 4 dB gain; has hi-Q impedance matching coil; v.s.w.r. 1.4:1; loaded ground radials; seamless aircraft tubing and corrosion-proof steel; withstands 100 mph winds; direct-ground lightning protection; overall height 18 ft; stainless-steel mounting hardware will take up to 1½" mounting mast; less mast and coax .. $39.95

Range-Boost/II Antenna
End-fed, half-wave antenna; anti-static cloverleaf ball design; 3.75 dB gain; v.s.w.r. 1.5:1; phasing

transformer rubber covered for moisture resistance; vertical consists of 3 seamless aluminum tube sections topped by solid aluminum 108" top section; three 54" radials; direct-ground lightning protection; 17-ft, 6-in overall length; accepts up to 1½" masts; less mast and coax $28.95

MOSLEY

Scotch-Master Beams

Directional base-station antennas; stainless-steel tubing to withstand wind loads up to 80-miles per hour; all steel-hardware plated for corrosion resistance; 26.9 to 27.3 MHz frequency range; 20 dB front-to-back ratio; v.s.w.r. 1.5:1; gamma match; 52-ohm nominal impedance; 1½-inch o.d. boom diameter; 1½-inch o.d. recommended mast size; RG-8/U transmission line; supplied with color-coded, predrilled parts.

A-511-S. 5-element; 9.5 dB gain over half-wave dipole (11.6 dB over isotropic); 18-ft 8¾-in maximum element length; 24-ft boom length; turning radius: 15-ft 3-in horizontal, 12-ft vertical; wind surface area: 3.39 sq. ft horizontal, 6.43 sq. ft vertical; wind load: 67 lbs. 13 oz. horizontal, 128 lbs. 10 oz. vertical; assembled weight 16 lbs. 8 oz $104.20

A-411-S. 4-element; 8.7 dB gain over half-wave dipole (10.8 dB over isotropic); 18-ft 8¾-in maximum element length; 15-ft 2-in boom length; turning radius: 12-ft 7-in horizontal, 7-ft 7-in vertical; wind surface area: 2.75 sq. ft horizontal, 4.65 sq. ft vertical; wind load: 55 lbs. 1 oz. horizontal, 92 lbs. 15 oz. vertical; assembled weight 15 lbs $84.60

A-311-S. 3-element; 8 dB gain over half-wave dipole (10.1 dB over isotropic); 18-ft 5-in element length; 12-ft boom length; turning radius: 11 ft horizontal, 6-ft. vertical; wind surface area: 2.09 sq. ft horizontal, 3.59 sq. ft vertical; wind load: 41 lbs. 13 oz. horizontal, 71 lbs. 13 oz. vertical; assembled weight 12 lbs. 8 oz. $67.50

Scotch-Master beams have matching stacking kit.

Paragon Beam PA-311

3-element directional base station antenna features 26.9 to 27.3 MHz frequency range; 8 dB gain over half-wave dipole (10.1 dB over isotropic); 24 dB front-to-back ratio; 1.5:1 v.s.w.r.; gamma match; 52-ohm nominal impedance; 19-ft 2½-in maximum element length; 12-ft boom length; 1¼-in o.d. boom diameter; 1½-in o.d. recommended mast size; RG-8/U recommended transmission line; turning radius: 11-ft 3⅝-in horizontal, 6-ft vertical; wind surface area: 2.6 sq. ft horizontal, 3.8 sq. ft vertical; wind load: 52 lbs. horizontal, 76 lbs. vertical; assembled weight 11 lbs $72.10

Mini-Beam Antennas

Base-station antennas; hermetically sealed high "Q" coils molded on each element extension; 26.9 to 27.3 MHz frequency range; 1.5:1 v.s.w.r.; gamma match; 52-ohm nominal impedance; 1-in o.d. boom diameter; RG-8/U transmission line.

GA-5D. 9.5 gain over half-wave dipole (11.6 dB over isotropic); 20 dB front-to-back ratio; maximum element length 11-ft 2⅞-in; boom length 18-ft; 1¼-in o.d. recommended mast size; turning radius: 11-ft 9-in horizontal, 10-ft 4-in vertical; wind surface area: 1.916 sq. ft horizontal 3.316 sq. ft vertical; wind load: 38 lbs. 5 oz. horizontal, 66 lbs. 5 oz. vertical; assembled weight 12 lbs. $71.70

GA-3D. 7.5 dB gain over half-wave dipole (9.6 dB over isotropic); 25 dB front-to-back ratio; 1¼-in o.d. recommended mast size; 11-ft 4¼-in maximum element length; 9-ft boom length; turning radius: 7-ft 3-in horizontal, 4-ft 6-in vertical; wind surface area: 1.32 sq. ft horizontal, 2.07 sq. ft vertical; wind load: 26 lbs. horizontal, 41 lbs. 6 oz. vertical; assembled weight 6 lbs $50.85

Stacking kits are available

Devant Ground Plane Antennas

⅝-wave vertical ground-plane antennas for base-to-base and base-to-mobile communications; 360 degree omnidirectional radiation pattern; seamless tubing, swaged to reduce wind load and vibration; grounded element lightning protection; high strength Cycolac radial support base section; female coax connector lead-in termination; phenolic radiator support tube; 1.5:1 v.s.w.r.; 52-ohm nominal impedance; 19-ft 8-in assembled height; 8-ft 8-in radial length; 1-1½-in o.d. recommended mast size; assembled weight 8 lbs.

Devant Special. 3.4 dB gain over ¼-wave ground plane (5.5 dB over isotropic); wind load 42 lbs. at 80 mph; includes top-hat for lowered radiation angle $55.45

Devant One. 3 dB gain over ¼-wave ground plane (5.1 dB over isotropic); wind load 41 lbs at 80 mph $50.45

MURA

CBA-10 Base-Station Antenna

Full ¼-wave ground plane; omnidirectional radiation from five 104-in arms which make up vertical radiator and horizontal ground plane; lightweight, corrosion resistant aluminum construction $39.95

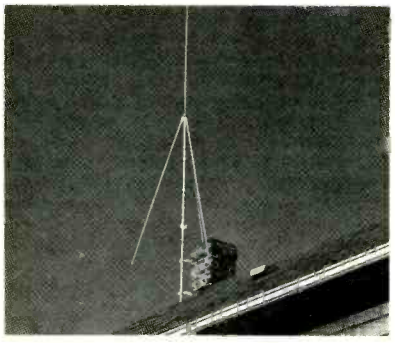
PACER

Base-Station Antennas

PBS-3. "AntennaMent" indoor/outdoor fiberglass base-station antenna for apartment dwellers; 4 dB gain; 64-in high; also for campers; prewired with SO-238 connector at feedpoint; 23-50 channel coverage $44.95

PBS-3-X. Same except with addition of 10½-ft cable; PL-259 connectors $49.95

PBS-1. "Sunburst" military-grade fiberglass antenna; protection against electrical shock; half-wave di-



pole with full aperture design for 5.0 dB; no coils or matching devices; 16-ft high; mount designed to accept threaded 1-in water pipe or 1½-in steel tubing; 1000 watt capacity; prewired with SO-238 connector at feedpoint $44.95

PBS-4. "Gemini" military-grade fiberglass antenna; gain 12-dB; front-to-back ratio 30 dB; s.w.r. 1.1:1; end-fire array; two elements; 16-ft high × 9-ft wide; mounts on 1½-in dia. tubing; prewired with PL-259 connector; 100 watt input; covers entire CB band $109.95

PIK-18. Base-station installation kit; contains three 6-ft telescoping anodized aluminum masts, mounting bracket, 50-ft RG-58/U cable $29.95

RADIO SHACK

21-933 3-Element Beam Antenna

Three-element beam; 18-ft max. element length; boom length 12-ft; aluminum construction; gamma match feed; 9 dB gain over isotropic; front-to-back ratio 25 dB $39.95

21-1133 Omnidirectional Antenna

Omnidirectional, ⅝-wave antenna; aluminum construction; 19-ft, 10-in vertical radiator with static-discharge arrester; 4 dB gain over isotropic $34.95

21-902 Omnidirectional Antenna

Omnidirectional, ½-wave gain-type antenna; end-fed ½-wave radiator; moisture-protected phasing transformer; 5-section seamless aluminum radiators; static-discharge arrester; three 52-in radials; aluminum construction; 3.75 dB signal gain $24.95

21-901 Omnidirectional Antenna

Omnidirectional, ¼-wave ground-plane antenna; three 108-in quarter-wave radials plus quarter-wave vertical element; static-discharge arrester; terminates with SO-239 connector (mates with PL-259 plug); beta matched feed $12.95

RAIDER

400 Crossbow Directional

Overall height 12-ft; three 18-ft elements; min. gain 9 dB; front-to-back ratio 25 dB; v.s.w.r. 1.5:1; base input imp. 50 ohms; adaptable for use with rotator; comes with all mounting hardware $54.95

550 Omnidirectional

Omnidirectional 0.64 wavelength antenna; overall height 23-ft, 3½-in; wind survival 90 mph; v.s.w.r. 1.5:1; base input imp. 50 ohms; d.c. grounding; all-aluminum construction; pre-drilled, de-burred holes for easy assembly $49.95

200 Omnidirectional

Ground-plane antenna; three aluminum quarter-wave, 108-in radials; quarter-wave vertical radiator; v.s.w.r. 1.5:1; base input imp. 50 ohm; comes with SO-239 connector; U clamp fits masts up to 1⅝-in dia.; static discharge protector $24.95

RIVERSIDE

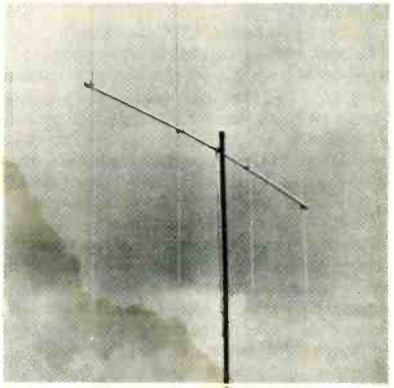
11040 Super Rangemaster Base Antenna

Omnidirectional antenna features low radiation angle; stainless-steel/aluminum construction; 4 whips and loading coils; 4 ¼-wave ground-plane rods; 44-in max element length; 108-in ground-plane radials; 100 mph wind loading; 50 ohm feedpoint impedance; direct feed; 9.7 dB gain over ground-plane; 1.3:1 s.w.r.; vertical polarization; d.c. ground; assembled weight 6 lbs $54.95

SHAKESPEARE

4104 Directional Yagi Antenna

4-elements, 1-driver, 1-reflector and 2-directors; fiberglass construction; polycarbonate feeding; max element length 91-in; boom length 15-ft 8-in; front-to-back ratio 26 dB; side rejection 22 dB; 50-ohm



nominal imp; 2.0:1 s.w.r.; 100 m/hr windloading; assembled weight 9 lbs 4 oz. $94.75

Model 176

Two-element antenna; fiberglass whip; maximum element length 18-ft, 6-inches; 8 lbs. 5 oz assembled weight; withstands winds up to 125 m/hr; 50-ohm feedpoint impedance; "V" polarization; RG58/U coax. $42.95

Model 61

Ground plane fiberglass whip; withstands winds up to 125 m/hr; 50-ohm feedpoint impedance; maximum s.w.r. 1.5:1; "V" polarization; SO-239 UHF connector. $39.50

Model 4061

Two-element half-wave antenna; maximum ele-

ment length 16-ft; withstands winds up to 125 m/hr; 50-ohm feedpoint impedance; "V" polarization; RG58/U coax. $32.95

SPARKOMATIC

SA-500 Base-Station Antenna
Half-wave, 5-element vertical; 17½-ft element length; aluminum construction; matching transformer; 0 dB gain over isotropic; 1.5 max. s.w.r.; vertical polarization; loading coil; d.c. ground $39.95

STAR FIRE

DB-327 "Starfire III"
3-element beam on 12-ft boom; heavy-duty wall tubing; power dividing matching system $49.95

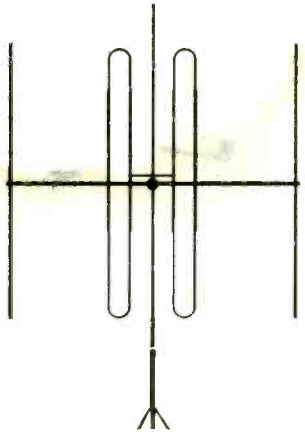
GLR-4 "Grand Slammer"
Full 0.64 wavelength antenna; heavy-duty wall construction; aircraft-type tubing; four full-size radials form tuned ground radial system for support-mast isolation; accepts coax connector and 52-ohm line $47.95

SLR-4 "Super Slammer"
5/8-wave vertical co-linear; four heavy-wall radials; top hat to dissipate precipation static; 4 dB gain; omnidirectional radiation; 19.7-in long $37.95

TURNER

Ultrakicker Beam Antenna
Five-element base-station antenna with eight-directional beam control; 8.3 dBi gain in directional mode; 3 dBi in omni mode; electronic switching for directional control to any of eight primary compass points; remote switching unit with lighted direction indicator; discrimination 25 dB max. rejection; v.s.w.r. 1.5:1 wind loading 100 mph +; height 20 feet; width 14 feet; mast size 2" o.d.; weight 42 pounds $239.95

Trikicker Beam Antenna
Three-element beam antenna with twin balanced-fed folded dipoles as an active center element; outer director and reflector elements spaced to optimize beam gain; gain 9.3 dB over an isotropic; v.s.w.r. 1.5:1; discrimination 20 dB max. rejection; wind loading 100 mph +; height 20 feet; width 14 feet; mast size 2" o.d.; weight 32 pounds $119.95



SK-22B Base-Station Antenna
Designed for omnidirectional performance; gamma matching system eliminates critical mast length problems; 4 dB gain over isotropic; v.s.w.r. 1.1:1; tapered 13-ft mast and 10-ft radials form ⅝ wave antenna assembly; mounting hub accepts standard 1-in threaded pipe or 1¼" aluminum tubing masts; total height 20 ft, mast 13 ft above hub; width 14 ft $44.95

Accessories

ALPHA

Vomax SBP-3 Speech Processor
Low-distortion, SSB compatible speech processor; a.g.c. ahead of compression circuit starting at 14 dB of peak limiting; compression does not exceed 17 dB; dynamic range 60 dB; automatic level control; visual level indicators; designed to be installed between any mike and exciter/transceiver; frequency response: band limits −6 dB points, 400 & 2500 Hz; passband ripple at 10 mV input ±1 dB 480 to 2200 Hz; 6½" D x 3¾" W x 2" H $179.50
A.c. power pack $10.00

AMPHENOL

Polyfoam Cable Assemblies
RG-58/U cable assemblies for all CB applications where small dia. cable is required; low-loss cable; non-tarnishing connectors; factory assembled and tested; copper-braid shield.
581-58081. 18-in length with UHF CB plugs on both ends $4.24
581-583. Same except 3-ft $4.75
581-5812. Same except 12-ft $6.34
581-5850. Same except 50-ft $11.20
581-5875. Same except 75-ft $14.00
581-58100. Same except 100-ft $16.10
581-585L. 5-ft length with CB plug & spade lugs $4.75
581-5812L. Same except 12-ft $5.65
581-5820L. Same except 20-ft $6.30

Low-Loss Cable Assemblies
Larger diameter cable for CB applications where signal loss is critical.
581-83. 3-ft length with UHF CB plugs on both ends $5.60
581-820. Same except 20-ft $11.80
581-850. Same except 50-ft $23.10
581-875. Same except 75-ft $30.30

Clearband 300°
Dual antenna polyfoam cable assemblies to help eliminate signal fade-out due to vehicle direction change.
581-5915L. Two 7½-ft lengths with UHF CB plug to set and ring lugs to antenna. $8.20
581-5945L. Same except two 22½-ft. $13.10
581-5915-259. Same except two 7½-ft lengths with plugs to set and antenna. $9.20

ANTENNA POWER

"No-Ears" Antenna Coupler
Coupling device permits use of regular and windshield antennas with CB transceivers and/or AM-FM radios; for 23- or 40-channel operation; adjustable for 1:1 s.w.r.; 3¼" W × 2⅛" D × 1⅝" H. $37.50

ASTRO-LOOP

CB Antenna Booster
To be used with any type mobile antenna, balances signals warped by improper ground plane, reduces over-modulation at close range, capacitively relates CB antenna to relative environment $3.95

ATLAS SOUND

AP-15 Extension Speaker
15 W, 8 ohm ext. speaker; sound level 121 dB at 4-ft on axis; 110° dispersion; voice-emphasis compression driver; all-metal baked epoxy finish; water-sealed, weatherproof for PA use; 275-14,000 Hz; 9" D × 8" W × 8" H; gray finish $29.80
AP-15C. Beige finish $29.80
AP-15-4. 4 ohms, gray finish $31.85

SC-15 Extension Speaker
15 W, 8 ohm ext. speaker; sound level 120 dB at 4-ft on axis; 130° dispersion; impact-molded re-entrant driver; for indoor/outdoor installation; 315-14,000 Hz; 6½" dia. × 6⅝" D; beige finish $22.70
SC-15-4. 4 ohms $24.70

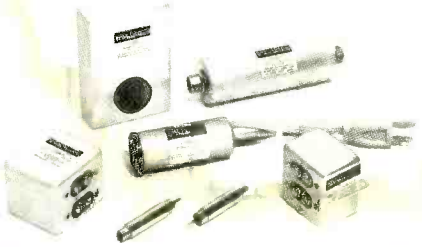
WR-5 Extension Speaker
5 W, 8 ohm ext. reflex-type speaker; sound level 105 dB at 4-ft on axis; 120° dispersion; all-metal construction; 6" dia. × 4" D; beige finish $17.75

AVANTI

TVI Filters
Low-pass filter designed to be installed at the CB transceiver to eliminate harmonics radiated into TV channels (especially Ch. 2 & 5).
CB signal rejection filter designed to be installed on the TV set's lead-in if interference is present after installation of low-pass filter.
AV-800. Low-pass filter $24.95
AV-820. A.c. line filter $19.95
AV-811. 27 MHz rejection filter $14.95

BELL INDUSTRIES

C-505-R Audio Interference Filters
Eliminates interference by radio stations or CB transmitters to hi-fi equipment or p.a. systems when



interference enters at input; has RCA-type female and male connectors; install at input jack of hi-fi equipment or p.a. system $8.77
C-506-R. Similar but designed to eliminate interference that enters at output; install between amplifier output and speaker; works with mono and stereo equipment $11.11

C-508-L Power Line Filter 3A
Three-section LC filter eliminates or reduces interference to radios & CB receivers; designed to be installed at appliance causing interference; 3 A max. rating $13.89
C-509-L 5A. Same except 5-section filter, 5 A max. rating $24.00

C-511-T Transmitter Low-Pass Filter
Eliminates CB interference in TV sets; input/output imp. 50 ohms; cut-off frequency 30 MHz; 80 dB attenuation at 54 MHz; 25 W max. AM, 50 W max. p.e.p. SSB; SO-239 connectors both ends; connect between antenna and transmitter $29.25

C-512-T High-Pass Filter
Eliminates or reduces interference picked up by i.f. amp section of TV sets; rejects interference from CB transmitters, ham stations, x-ray and diathermy equipment, electrical appliances; designed to attenuate all signals below 50 MHz, 300-ohm line $9.00

C-510-T TV Set Antenna Filter
Prevents CB from interfering with TV; reduces interference from appliances, plane and car ignition; connects to TV set at antenna terminals $2.80

BIRD

10043 "Thruline" Wattmeter/VSWR Bridge
Measures forward r.f. power up to 10 W, reflected r.f. power to 2.5 W, direct reading of s.w.r. of antenna system; may be left in-line for continuous monitoring or used as portable test instrument; accuracy ±5% of full-scale; directivity ±1 division v.s.w.r. resolution or ±0.2 of actual reading; imp. 50 ohms nominal; accepts PL-259 connector; 5¾" W × 3⅞" H × 3¼" D $88.00

CUSHCRAFT

Coaxial Lightning Arrester
Blitz Bug with exclusive static ring discharge points; provides constant static drain for full-time lightning protection; effective to 500 MHz without insertion loss; LAC-1 for connection at equipment; LAC-2 for in-line use $4.50

DYMEK

DA-7 LW/MW Antenna
Directional indoor antenna with nulling capability allows reception of AM stations up to 1500 miles away; frequency coverage of 150-300 kHz and 550-1600 kHz; has frequency and sensitivity controls; shielding reduces TV and electrical interference; 110 or 220 V a.c. operation; 13" × 11" × 9"; assembled $195.00
Kit form $129.00
DA-5. Same as the DA-7 except AM-only; assembled $175.00
Kit form $119.00

DA-100 General Coverage Antenna
Compact omnidirectional antenna covers 50 kHz to 30 MHz frequency range; broadband; untuned preamplifier; exterior module is weatherproof box with 56-in whip; comes with 50-ft coax $125.00

ELECTRO-VOICE

Model 661 Dynamic Mike
Super-cardioid dynamic type with patented "Variable-D" feature to eliminate proximity effect; response 90-13,000 Hz; imp. 150 ohms/hi-Z (selectable); "Acoustalloy" diaphragm; EIA sensitivity −150 dB (low-Z), −150.5 dB (hi-Z); pressure-cast zinc case; 7⅛" × 1½" (max.); with on/off switch in stud; 2-cond. shielded 15-ft cable. $78.00

Model 620L Dynamic Mike
Pressure-gradient type with special noise-cancelling characteristics; frequency response 70-4000 Hz; imp. lo-Z; press-to-talk button; d.p.d.t. switch shorts mike in "off" position, operates external relay in "on," 9-11/16" H × 4½" W × 4-13/16" D. $60.00

Model 607 Dynamic Mike
Pressure-gradient type with special noise-cancell-

ing characteristics; frequency response 300-3800 Hz; imp. (specify) 150 ohms or hi-Z; EIA sensitivity −148 dB (150 ohms), −149 dB (hi-Z); 15-ft shielded cable; Amphenol cable connector; ⅝"-27 thread stand coupler; 1¾" × 3¼" D × 4⅛" (including stud). $51.00

Model 602F Mobile Mike

Dynamic noise-cancelling type for high articulation under high ambient noise conditions; bidirectional, pressure gradient polar pattern; response 200-5000 Hz; imp. (specify) hi-Z or 150 ohms; output level −60 dB; EIA sensitivity −154 dB (low-Z), −158 dB (hi-Z); "Acoustalloy" diaphragm; 3-cond. (1 shielded) coiled cord extendible to 6 ft (hi-Z), 4-cond. (2 shielded) coiled cord (low-Z); comes with dash mounting bracket. $48.00

Model 619 Mike

Base-station dynamic communications mike; press-to-talk switch in base may be moved to upper part of stand for grip-to-talk use; switch shorts mike in "off" position and provides for relay operation; response 70-10,000 Hz; output −57 dB; specify hi-Z or balanced lo-Z; 15-ft cable. $51.00

Model 634ASRL Dynamic Mike

Dynamic omnidirectional type with integral cable and dpdt push-to-talk "on/off" switch; response 70-10,000 Hz; imp 150 ohms; output level −57 dB; features mechanical noise isolation to reduce mechanical noise transmission. $36.30

Model 600E Mobile Mike

Dynamic omnidirectional type with company's nonmetallic "Acoustalloy" diaphragm which is unaffected by environmental extremes; response 100-7000 Hz; switch assembly combines spring return with high reliability leaf switch; imp. (specify) 150 ohms or high-Z; output level −55 dB; EIA sensitivity −148 dB (150 ohms), −151 dB (high-Z); 4-cond. (2 shielded) coiled cord extendible to 6 ft (150 ohms), 3-cond. (1 shielded) coiled cord (high-Z); comes with panel mounting bracket. $39.00

Model 719 Ceramic Mike

Press-to-talk base station mike; integral stand and head; die-cast, non-reflecting gray and chrome; switch may be used for press-to-talk in base or moved to upper part of stand for grip-to-talk use; switch shorts in "off" position allowing relay operation or electronic switching; hi-Z; output −58 dB; response 70-7000 Hz; 4-ft cable. $45.00

967M Dynamic Headset

Miniature headset dynamic mike for use under high ambient noise conditions; frequency response 300-4300 Hz; imp: matches 100- and 500-ohm carbon mike input; omnidirectional polar pattern; transistor amplifier power gain (adjustable) 45 dB (12V); current drain 20 mA (27 V); rated supply voltage 6-30 V; comes with headband and carrying pouch. $93.00

967ME. Same except with receiver earpiece, additional plug for receiver circuit. $126.00

Model PA30A Paging Projector

30-W re-entrant paging projector for use with CB transceivers having PA option; frequency response 250-14,000 Hz; will handle 60 W peak; imp. 8 ohms (45 ohms available); SPL 125 dB at 4 ft (30 W input); EIA sensitivity 63 dB; universal swivel bracket; 11" H × 6½" W × 8½" D; high impact molded housing. $35.00

All prices listed are Zone 1 suggested net. Prices slightly higher in Western States.

ELENCO

CB-23 Converter

Designed to be used with any AM radio; built-in noise blanker; no special antenna required; no-tools installation; power consumption less than ½ W $24.95

EMI-LINE

Mobile Transceiver Filters

EMI-15A. Low-pass filter prevents coupling of ignition impulses into car's primary wiring system $6.95

EMI-80A. Three-element low-pass filter; 80 A continuous, 100 A ICAS to accommodate up to 1 kW ham rigs; suppresses alternator whine $9.95

EMI-200A. Same as 80 A but handles up to 200 A for commercial vehicles $13.95

EMI-ACE. For automotive accessory noise; three bypass capacitors feature low lead inductance; effective through v.h.f. $6.95

EMI-ISO. Isolates CB from residual interference present in 12-V power wiring system; suppresses electronic ignition system noise $11.95

Base-Station Filters

EMI-TVX2. Suppresses base-station harmonics; mounts in transmitter 50-ohm antenna output cable; effective over CB and 160-10 m ham bands; rated 4 kW p.e.p., 1 kW AM $16.95

EMI-TVR. High-pass filter mounts on TV or FM receiver antenna terminals to prevent saturation of input stages by nearby CB or ham transmitters . $7.95

EMI-120V. For base-station CB transmitters; keeps transmitting signal off 115-V power lines; helps prevent TVI $12.95

EMPIRE

E4PS Security System

Includes 113-dB siren with optional cut-off feature; tampering with hood, trunk, or doors activates alarm; entry by cutting through roof or breaking glass activates alarm when brake pedal is depressed; external lock and key arms and shuts off system; siren can be mounted under hood or other convenient location; comes with all parts and installation instructions $39.95

Paging Speaker

5-in. 10-W, 8-ohm speaker; weather-resistant; for p.a. applications; bracket for underhood mounting $9.95

GC

18-000 Power Base Mike

Built-in two-stage amp increases transceiver range by boosting modulation up to 50 times; push-to-talk bar can be locked; adjustable microphone output; sensitivity −40 dB (1000 Hz); frequency response 300-5000 Hz; impedance 600 ohms; amp. voltage gain 0-15 dB; uses standard 9-V battery; comes with 6-ft shielded coiled cord (1 shield & 3 cond.) $44.45

18-010 Power Hand Mike

Designed especially for CB transceivers; power amplified; output level adjust with slide volume control; solid-state circuitry to withstand temperature extremes; sensitivity −42 dB; frequency response 300-5000 Hz; output imp. 600 ohms; amp. voltage gain 0-12 dB (adjustable); comes with 6-ft shielded coiled cord (1 shield & 3 cond.) $27.30

18-034 Noise-Cancelling Mike

Compact hand mike in A.B.S. case; cancels background noise of engine, wind, road noise; can be connected for relay or electronic switching; comes with 6-ft coiled cord $10.75

18-565 Remote CB Speaker

Designed for use inside car or at base stations; any-angle mount; black A.B.S. resin case; 8-ohms; prewired with 8-ft cord/miniature plug; adapter included for standard ¼-in phone jack; plugs into external speaker or headphone jack $11.40

18-560 CB/PA Speaker

Weatherproof speaker; designed for mounting in grille; p.a. or monitoring of CB transceiver; any-angle mount; 8-ohms; 5-W power capacity .. $12.10

18-151 Power/SWR Meter

Includes dual-range wattmeter with front-panel selection of 0-10 watts or 0-100 watts; reads true r.f. power output; s.w.r. meter designed to be left in-line as constant monitor; range 1:1 (0-10) and 1:3 (0-100 W); response 3-55 MHz; imp. 52 ohms; 4" H × 5¼" W × 4" D $49.95

18-153 CB Multi-Meter

Measures r.f. power in two ranges (0-10 or 0-100 watts), v.s.w.r., and relative modulation; s.w.r. ranges 1:1 (0-10), 1:3 (0-100); frequency response 1.5-150 MHz; imp. 50-52 ohms; may be left in-line; 6½" W × 3¾" D × 3¼" H $34.45

18-157 CB Omni-Meter

Multi-purpose meter which measures power/s.w.r. and field strength; power ranges 0-10 W and 0-100 W; s.w.r. ranges 1:1, 1:3; response 1.5-220 MHz; imp. 52 ohms; 2¼" H × 4¼" W × 2¼" D $30.25

18-155 SWR/FS Meter

Measures s.w.r. for peak system performance; may be used for measuring field strength; may be permanently installed as constant monitor; power range up to 1 kW; frequency response 1.5-144 MHz; imp. 52 ohms; 6" H (inc. connectors) × 2 3/16" W × 2¼" D $20.40

18-260 Noise-Suppression Kit

Reduces or eliminates most common causes of engine noise in cars with alternators; includes 8 spark-plug suppressors, distributor suppressor, and alternator suppressor $7.30

18-262. Same except for cars equipped with generators $4.80

18-730 CB/AM Coupler

Permits standard auto antenna to be used for CB transceiver; two screwdriver adjustments tune to 1.1:1 s.w.r. or better; no holes to drill; designed to be plugged in and adjusted once $14.95

GOLD LINE

GLC-1043 "Signal Hunter"

Direction-finding antenna; tracks any signal without triangulation; mounts on any car in seconds; simple, foolproof operation; designed for club-sponsored self-policing and education committees to track down rule-breakers and trace interference from leaking power-pole insulators, etc.; hidden transmitter hunts $20.56

GLC-1086 Antenna Matcher

Designed to be inserted between transmitter and antenna lead-in; turning knobs adjust for perfect match; frequency range 13-78 MHz; 300 watts $15.95

GLC-1046. Same as 1086 but 13-78 MHz, 250 watts $8.49

GLC-1056 Inline Wattmeter

Reads true output power in watts; negligible insertion loss; 5 W continuous; frequency range 8-30 MHz; designed to be used with GLC-1086 antenna matcher. $15.60

GLC-1051 CB TVI Filter

Designed to be inserted between antenna and transmitter; harmonic rejection 40 dB minimum; selector dial on TV is set to Ch. 2 or 6, when transmitting adjust control knob on filter until TVI is corrected $7.30

GLC-1077 Low-Pass TVI Filter

Designed to be inserted in CB power line; attenuation starts at 39 MHz, 40 MHz (20 dB down), 45 MHz (26 dB down), imp. 50 ohms; insertion loss ½ dB at 27 MHz; rated 100 W input $8.25

GLC-1093 TVI Filter

Designed to be installed on TV set; attaches to twin-lead; reduces interference to 1/25th its strength; filters interfering transmissions up to 50 MHz ... $8.95

GLC-1083 Phone Patch

For use with mobile rigs; for 3-16 ohm speakers and high-Z mike inputs; modulation gain control compensates for varying line levels; on/off switch for disconnecting patch $15.95

GLC-1106 Noise Filtering Hookup Harness
Reduces noise picked up by vehicle wiring; filtering action supplied by heavy-duty coax for power pick-up which shields against unwanted noise and a ferro-magnetic filter that reduces any remaining interference; in-line power fuse for set protection $12.50

GLC-1114 "Zing Ring"
Designed to improve mobile antenna performance by providing 360-degree launching pad for signal; for gutter, mirror, or bumper-mounted antennas which are not centered; offers 360-degree primary ground plane and centering effect to enhance omni radiation pattern; reduces antenna vibration and whiplashing $3.95

GROVES

CB/Stereo Slide Mount
Heavy-duty slide mount; total disconnect system permits one-hand removal; interlocking power leads for positive signal reception; theft-preventing construction with speaker cut-out for hump mount or underdash installations; 12- or 6-volt positive or negative ground; s.w.r. 1:1 at 27 MHz $10.95

HAL COMMUNICATIONS

ST-6 RTTY Demodulator
Features autostart operation with selectable response time; antispace circuitry; 850- and 170-Hz shifts; self-contained loop supply; accepts input data up to 75 baud standard; input audio tones between 2000 and 3000 Hz; 600-ohm unbalanced input; bandpass and discriminator filters, linear discriminators for each shift; front-panel tuning meter; CW ID key input; loop or low level outputs: TTY current loop, 60 mA at 175 V d.c., or bipolar low level voltage −15 V d.c. mark, +15 V d.c. space into 1000-ohm load; glass epoxy circuit board construction. 17" W × 12" D × 3.5" H (table mount), 19" W × 12" D × 3.5" H (rack mount); requires 105-125 V a.c. @ 100 mA max. (210-250 V a.c. optional); ..... $182.50 (kit)
AK-1. Tone keyer ..... $29.00 (kit)
XTK-100. Crystal tone keyer ..... $55.00 (kit)
425-Hz. Discriminator ..... $29.00 (kit)

ID-1A Repeater Identifier
Provides automatic CW station identification for base stations and repeaters at intervals in accordance with FCC regulations; variable code stream pitch, level, speed (5-50 wpm) and timing interval (3, 6, 12, or 24 minutes from 60-Hz line); internal clock oscillator for 12 V d.c. operation; code stream programmable by placing diodes in a diode matrix ROM with 38 dots, dashes, and intercharacter spaces (for typical call, 30 diodes required); transistor switch output rated at ±25 V d.c. @ 500 mA; input control, ID inhibit; test inputs and output control provided; audio output level and frequency adjusted by PC-mounted potentiometer; maximum 3 V_{p-p} into 600 ohms with internal monitor speaker connected, 4 V_{p-p} into 600 ohms with speaker disconnected. 19" W × 4" D × 1.5" H (rack mount); requires 105-125 V a.c., 7 W (210-250 V a.c. optional), or +12 V d.c. 400 mA $195.00

DKB 2010 Dual Mode Keyboard
Generates Morse or Baudot (5-level) code; standard or optional buffer memory allows typing rate in excess of data output rate; alphabetic, numeric, punctuation mark, special character, and identifier (up to 15 character) keys; transistor switching rated at ±150 V d.c. @ 150 mA CW, 250 V d.c. @ 80 mA TTY current loop; data output rate variable 8-60 wpm CW, 45, 50, 57, or 74 baud TTY ±.05%; CW sidetone with built-in speaker and audio output jack; audible tone burst and video end-of-line TTY indicators; selectable CW character weight; 13.5" W × 9" D × 5" H; requires 105-125 V a.c. @ 125 mA (210-250 V a.c. optional) $375.00
Options: 64 Key Buffer Memory stores up to 64 key entries; light indicator glows at half brilliance when buffer is half full, at full brilliance when full $50.00
128 Key Buffer Memory. As above, but has a 128-key entry capacity $85.00

ST-6000 FSK Demodulator/Keyer
Features autostart operation with selectable response time; keyboard operated switch (KOS) circuitry; antispace circuitry; 850, 425, 170 Hz circuitry; accepts input data up to 110 baud standard; input audio tones between 1200 & 3000 Hz; 600-ohm balanced or unbalanced input; bandpass filters and discriminators for each shift; front-panel tuning meter or scope (optional); current loop, RS-232C, or MIL 188C data output; crystal-controlled tone keyer output; 17" W × 9" D × 3.5" H; requires 105-125 V a.c., 20 watts (210-250 V a.c. optional).
ST-6000 with scope $595.00
ST-6000 with meter $495.00

HEATH

HD-1410 Electronic Keyer
Operates as an iambic or single-paddle (with dot and dash memories) keyer over 10-35 or 10/60 wpm ranges; self-completing characters with fixed weight; built-in sidetone and speaker with volume control on front panel; external key jack; built-in twin paddles; positive keyed output line rated at 300 V, 200 mA; negative keyed output rated at −200 V, 10 mA; operates from 12-V d.c. or 120/140 V a.c.; headphone jack. 7½" D × 5" W × 3" H; kit (mail order) $49.95

HD-1416 Code Practice Oscillator
Has built-in speaker and phone jack; volume and tone (200-800 Hz) controls; can also be used as a sidetone for grid-block keyed transmitters; operates from a 9-volt transistor battery (not supplied); straight key included; kit (mail order) $9.95

HN-31 "Cantenna" Dummy Load
Provides 50-ohm resistive load for transmitter tune-up over a 1.5-250 MHz range with less than 1.5:1 SWR; requires cooling oil (not included); relative output phono jack for use with voltmeter; calibration curve provided. kit (mail order) $12.95

HM-102 HF Wattmeter/Dummy Load
Provides 50-ohm resistive load from 1.8 to 30 MHz; handles 175 W continuous, 1000 W intermittent; high temperature lamp and test circuit included; less than 1.2:1 SWR; power meter ranges 0-200 W, 0-1000 W; ±10% full-scale accuracy. kit (mail order) $37.95

HM-2102 VHF Wattmeter
Tests transmitter output in power ranges 1-25 watts and 10-250 watts ±10% of full scale; 50-ohm nominal impedance; built-in SWR bridge requires less than 10 watts output for full-scale deflection. mail order $37.95

HD-1982 "Micoder" Mike/Auto Patch
Combination mobile mike/auto patch encoder; electret condenser mike with 300-3000 Hz response; 30 V rms max. output; push-to-talk bar; auto patch encoder generates stable tones for making phone calls through repeaters equipped with auto patch input; operates on self-contained 9-V battery (not included); can be used with any transceiver with high-Z mike input; comes with 6-ft coiled cord & hanger clip. mail order kit $49.95

HICKOK

380 Series Counters
Available in four configurations, all units in series are autoranging with autodecimal for "hands-off" operation; have bright 0.3" LED numerals in a 7-digit display; fast update with 1.1 second update in "Auto" mode below 10 MHz and 5 per second update in "Speed Read" mode or above 10 MHz.
Model 380. Basic unit with 80-MHz range; full frequency display with 1 Hz resolution to 10 MHz; above 10 MHz decimal point shifts automatically and display changes to 10 Hz resolution; provision for external time-base input on rear panel .. $269.00
Model 380X. Same features as Model 380 plus high-stability temperature-compensated crystal oscillator time base with 1 ppm stability; time-base output at rear panel to drive up to four counters without crystal oscillator feature $395.00
Model 385. Measures frequencies to 512 MHz; built-in UHF prescaler; time-base stability 10 ppm ... $499.00

388 In-Line CB Tester
Provides digital readout of s.w.r., power, % modulation, and frequency; crystal-oscillator time base; frequency 10 MHz; stability (with line) 0.1 ppm for ±10% line variation (with temperature) 10 ppm from 0 to 50 degrees C; power 105-125 V a.c./210-250 V a.c., 50-400 Hz 14 watts; provision for 12-14 V d.c. operation; display: frequency 7 digits, power 3 digits, s.w.r. 4 digits, % modulation 3 digits; resolution: frequency 10 Hz, power 0.1 W, s.w.r. 0.01 ratio point, % mod. 1%; AM output for scope display of modulation; single function switch; front-panel BNC for 10 Hz-55 MHz frequency at 1 meg. impedance; 8½" W × 6" D × 4" H (plus stand/handle) .. $349.00
388X. Same except with temperature-compensated crystal oscillator (TCXO) timebase frequency reference $475.00

38 In-Line Digital CB Monitor
Monitors frequency, power, and s.w.r.; designed to be installed in-line between antenna and transceiver; can be operated from 105-125 V a.c. or 12-V car battery; 6-digit frequency readout, 3-digit power output, 4-digit s.w.r. readings; in normal operation with either AM or SSB transceivers will provide continuous digital readout of frequency output of transmitter, power output of final stages, and functional condition of antenna and transmission cable; 7" D × 6" W × 2¼" H $279.00

256 40-Ch CB/RF Generator
Five-band frequency tuning covers channels 1 through 40 on expanded tuning range for precise channel selection; frequencies of 100 kHz through 16 MHz are covered on other four bands for i.f. requirements: 455 kHz, 10.7 MHz, and any other, current or future; calibrated/attenuated output control provides r.f. signal output of 100,000 μV down to less than 1 μ V for receiver sensitivity checks; attenuated output variable in 20-dB steps and by 20-dB continuously variable control calibrated in μV $279.00

244 "Mobil/Com" Power Supply
Fully adjustable voltage range of 10.5-14.5 V; 2½" meter with calibrated standard 13.8-volt setting indicated; full adjustability and 0.5% regulation permits storage-battery operating conditions (including low- and over-voltage operation); continuous duty 3-A output; overload conditions indicated by front-panel "Overload" light; 5-way binding posts for output connections $125.00

HUFCO

TWS-6000 Frequency Counter
Six digits through 500 MHz; readout to ±10 Hz at 500 MHz; gating at 1 ms and 1 sec. ..... (kit) $169.95
Assembled $199.95

TWS-600 Frequency Counter
Six-digit readout to 250 MHz; input sensitivity 300 mV (in MHz position), 500 mV (in kHz position); imp. 1000 ohms; range: 250 MHz (in MHz position), 30 MHz (in kHz position); readout kHz or MHz, decimal shifts to show range; timebase: crystal frequency 1 MHz; frequency trimming ±2-3 digits; sample rate ½ to 1 sec.; gating time 10 ms; 115 V a.c. or 12 V d.c. through 6 ohms at 4 W; 6½" W × 5½" H × 2¼" D. ..... (kit) $119.95
Assembled $139.95

TWS-6 Frequency Counter
Six-digit readout through 30 MHz; designed for experimenters, technicians, or service technicians; accurate to 100 Hz; operates through all CB and ham frequencies; range 100 Hz to 30 MHz; gating time 1

THE MOST IMPORTANT DISCS IN YOUR ENTIRE COLLECTION!

Stereo Testing! *Spectacular Sound!*

NEW STANDARD in Stereo Testing!

Model SR12
STEREO TEST RECORD

The most complete . . . most sophisticated . . . most versatile Test Disc available today. Whether you're an avid audiophile who'll settle for nothing but peak performance from his stereo components . . . a casual listener who'd like more insight into the challenging world of stereo reproduction . . . or a professional technician who needs precise standards for lab testing . . . the SR12 is a must for your record collection.

Make these important stereo checks BY EAR . . . Frequency response • Separation • Cartridge tracking • Channel balance • Hum and rumble • Flutter • Cartridge and speaker phasing • Anti-skating adjustment • "Gun shot test" for stereo spread • Multipurpose musician's "A." Equal-tempered Chromatic octave • Guitar-tuning tones.

7 critical TEST EQUIPMENT checks . . . Attention professionals: SR12 is also designed to be used as a highly efficient design and measurement tool. In the following tests, recorded levels, frequencies, etc. have been controlled to laboratory tolerances—affording accurate numerical evaluation when used with oscilloscope, chart recorder, output meter, intermodulation-distortion meter and flutter meter.

- 1,000-Hz square waves to test transient and high-frequency response of phono pickups.
- 500 to 20,000 Hz frequency-response sweep.
- Sine-wave tone-bursts to test transient response of pickup.
- Intermodulation test using simultaneous 400-Hz and 4,000-Hz signals.
- Intermodulation sweep to show distortion caused by excessive resonances in tone arm and cartridge.
- 1,000-Hz reference tones to determine groove velocity.
- 3,000-Hz tone for flutter and speed tests.

Sample waveforms—illustrating both accurate and faulty responses are provided in the Instruction Manual for comparison with the patterns appearing on your own oscilloscope screen.

FREE—An informative manual which includes charts, tables and diagrams.

The Most Spectacular Sound Exhibition of Stereo Fidelity Ever Available on Disc and Cassette

STEREO DEMONSTRATION RECORD AND CASSETTE

This record (and cassette) is the result of 2 years of intensive research in the sound libraries of Deutsche Grammophon Gesellschaft, Connoisseur Society, Westminster Recording Company and Cambridge Records, Inc. The Editors of Stereo Review have selected and edited those excerpts that best demonstrate each of the many aspects of the stereo reproduction of music. The record and cassette offer you a greater variety of sound than has ever before been included on a single disc or tape. It is a series of independent demonstrations, each designed to show off one or more aspects of musical sound and its reproduction. Entirely music, the record and cassette have both been edited to provide self-sufficient capsule presentations of an enormous variety of music arranged in a contrasting and pleasing order. It includes all the basic musical and acoustical sounds that you hear when you listen to records and tapes, isolated and pointed up to give you a basis for future critical listening.

WIDE RANGE OF DEMONSTRATIONS

• Techniques of separation and multiple sound sources • Acoustic depth • The ambiance of a concert hall • Sharp contrasts of dynamics • Crescendo and diminuendo • Very high and very low pitched musical sounds • Polyphony (two or more melodies going on at once) with both similar and contrasting instruments • Tonal qualities of wind, string and percussion instruments • Sounds of ancient instruments • Sounds of oriental instruments • Sound of the singing voice, both classically trained and untrained • Plus a large sampling of finger snapping, hand clapping, foot stamping and other musical and percussive sounds.

13 SUPERB SELECTIONS:

STRAUSS: Festive Prelude, Op. 61 (excerpt) DGG • **DEBUSSY:** feux d'artifice (excerpt) Connoisseur Society • **BEETHOVEN:** Wellington's Victory (Battle Symphony) (excerpt from the first movement) Westminster • **MASSAINO:** Canzona XXXV à 16 (complete) DGG Archive • **CORRETTE:** Concerto Comique Op. 8, No. 6, "Le Plaisir des Dames" (third movement) Connoisseur Society • **KHAN:** Raga Chandranandan (excerpt) Connoisseur Society • **ROORIGO:** Concert—Serenade for Harp and Orchestra (excerpt from the first movement) DGG • **MANITAS DE PLATA:** Gypsy Rhumba (complete) Connoisseur Society • **MARCELLO:** (arr. King): Psalm XVII "The Heavens are Telling" (complete) Connoisseur Society • **PRAETORIUS:** Terpsichore: La Bourrée XXXII (complete) DGG Archive • **BERG:** Wozzeck (excerpt from Act III) DGG • **BARTOK:** Sonata for two pianos and Percussion (excerpt from the first movement) Cambridge • **BEETHOVEN:** Wellington's Victory (Battle Victory) (excerpt from the last movement) Westminster.

THE RECORD IS AVAILABLE IN YOUR CHOICE OF 33⅓ RPM OR 45 RPM.

FREE—Booklet which discusses and describes each of the selections performed.

Created specifically for playback through stereo headphones.

BINAURAL DEMONSTRATION RECORD

This unique record presents sound of unsurpassed realism.

Binaural recording re-creates the directions, distances, and even the elevations of sounds better than any other recording method. The super-realism of binaural recording is accomplished by recording the acoustical input for each ear separately, and then playing it back through stereo headphones. Thus the sound intended for the left ear cannot mix with the sound for the right ear, and vice versa.

Binaural recording offers the listener the identical acoustical perspective and instrument spread of the original. The sound reaching *each ear* is exactly the same as would have been heard at the live scene.

"MAX"—GENIE OF BINAURAL RECORDING. "Max," a specially constructed dummy head, cast in silicone rubber, duplicates the role of the human head as an acoustical absorber and reflector of sound. Super-precision capacitor microphones were installed in Max's ears so that each microphone would pick up exactly what each human ear would hear. The result is a demonstration of phenomenal recorded sound.

STARTLING REALITY. The Binaural Demonstration Record offers 45 minutes of sound and music of startling reality. You'll marvel at the eerie accuracy with which direction and elevation are re-created as you embark on a street tour in binaural sound—Sounds Of The City . . . Trains, Planes & Ships . . . a Basketball Game, a Street Parade, a Street Fabrication Plant, The Bird House at the Zoo—all demonstrating the incredible realism of binaural sound reproduction.

MUSIC IN BINAURAL. The musical performances presented on the Binaural Demonstration Record transport you to the concert hall for a demonstration of a wide variety of music. Selections total 23 minutes, and include examples of jazz, organ, and chamber music.

The Stereo Review Binaural Demonstration Record is the ultimate in sound reproduction. It has been made without compromise.

Although headphones are necessary to appreciate the near-total realism of binaural recording, the record can also be played and enjoyed on conventional stereo systems.

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RECORDS $6.95, POSTPAID — CASSETTE $7.95, POSTPAID

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CASH: Mail your order along with your name, address and correct remittance. (Residents of Calif., Col., Fla., Ill., Mich., Mo., N.Y. State, D.C. and Tex. add applicable sales tax.)

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Records are $6.95 each, postpaid—Cassette $7.95 postpaid. Outside U.S.A. Records and Cassette are $8.95 each, postpaid. When ordering the Stereo Demonstration Record please be sure to indicate your choice of 33⅓ RPM or 45 RPM.

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ms or 10 ms; other specs similar to TWS-600. ..... (kit) $79.95
Assembled $110.00

Voice-Operated Transmit
VOX for hands-free transmission; works with any microphone; 9 V battery operation ..... (kit) $29.95
Assembled $39.95

CB Timer
LED indicator lights when 5-minute transmission time is up; 9 V battery operation ..... (kit) $19.95
Assembled $29.95

Ham Timer
Timer begins 3-minute count automatically at beginning of transmission; adjustable LED indicator gives from 0-30 sec warning; 9 V battery operation ..... (kit) $19.95
Assembled $29.95

Power Mike Adapter
Increases power/transmitting distance; 9 V battery operation. ..... (kit) $14.95
Assembled $24.95

HY-GAIN

421B Power Meter
In-line meter measures r.f. output power in watts, peak modulation levels, and v.s.w.r. $59.95

422B Receiver Preamp
Provides 12 dB of gain for received signals also has an "on-the-air" sign; preamp circuitry is switched in and out by a transceiver output detecting circuit, which also controls signal; requires 100 mA from a 12-V d.c. source $49.95

402 Phone Patch
For patching a CB transceiver to telephone lines through phone company's voice coupler attachment; has gain control and on/off switch $29.95

477 Antenna Matcher
Will convert load impedances from 10 to 1000 ohms to 50-ohm resistive impedance for optimum match to transceiver output stage $14.95

LA-1 Sure Safe Protector
Lightning arrester; sturdy construction; manufacturer claims it will bypass to ground at least 10 direct lightning strokes; for chassis wall or panel mounting; fitted with SO-239 input and output connector $34.95

LA-2 Lightning Arrester
Discharges static, reducing chance of full lightning stroke; won't affect signals; handles 1 kW insertion with no insertion loss; accepts one PL-259 and one SO-239 for insertion in any 52-ohm line $4.50

Walkie-Talkie Replacement
Base-loaded replacement antenna for walkie-talkies; no tuning required; offset clamp permits antenna to be folded for self-storage when not in use $4.95

610 Base Microphone
Desk microphone with dynamic element, 800 ohms output impedance; as preamp with compression and slide-type gain control; push-to-talk bar with locking switch; comes with coiled cable and 5-pin DIN plug prewired for use with company's transceivers $39.95

611 Mobile Microphone
Hand-held microphone with built-in preamp; has gain control and push-to-talk switch; comes with coiled cable and prewired 5-pin DIN plug for use with company's transceivers $24.95

1022 Telephone Handset
Handset has push-to-talk button and privacy switch to silence transceiver speaker; comes with coiled cable, 5-pin DIN plug prewired for use with company's transceivers, and spring-grip cradle $24.95

613 Power Speaker
Speaker with built-in 3-W rms amplifier; requires 12 V d.c.; comes with swivel bracket, 6-foot cable and plug wired for use with company's transceivers $27.95

612 External Speaker
Same speaker and enclosure as the Model 613 but without amplifier $15.95

JMR

1015-A "Mobil-Ear" Headset
Combines electret-capacitor boom mike, palm-held talk switch, and single 8-ohm dynamic headphone;

built-in FET transistor amplifier; frequency response 200-6000 Hz; relay or electronic switching capability; palm-held talk switch has Velcro pad for easy mounting; self-adjusting headband with spring-flex hinge; reversible for left or right ear; powered by 7-V TR-175 battery $69.95
1015-C. Similar to 1015-A except with skin-contact electret-capacitor mike; frequency response 200-3000 Hz; suitable for noisy locations $69.95

40 "Mobil-Ear Clear-1" Mike
Electret-capacitor mobile mike; pistol-grip case; Velcro pad permits mike to be attached to steering wheel; sensitivity: -42 dB (re: 1 V/μ bar); frequency response 200-6000 Hz; FET variable gain amplifier; relay or electronic switching capability; 7-V TR-175 battery operated; five-conductor cable extends to 6-ft; compatible with 40-ch transceivers $39.95

E.F. JOHNSON

Antenna Meter
Performs in-line measurement of v.s.w.r. $18.95

Matchbox
In-line pi-network matches antenna/feed-line to transceiver's 50-ohm output for maximum efficiency $21.00

Antenna Mate
Combination antenna matching network and v.s.w.r. meter; in-line device with pi-network allows optimum antenna-to-transceiver coupling $39.95

In-Converter
Permits the use of most solid-state CB transceivers in vehicles with 6- or 12-volt, positive- or negative-ground electrical systems $29.50

Transceiver Tester
Functions as an in-line r.f. wattmeter, v.s.w.r. meter, modulation level meter, and permits earphone monitoring of transmitted signal; has built-in dummy load, built-in r.f. and audio signal generator; also checks crystal activity; can be used as a portable relative field-strength meter $65.00

KRIKET

KC-3085 "KAMEL" Hump-Mount Speaker
Speaker/base unit to accommodate transceiver and mike; "teeth" in speaker base holds unit in place for driving; entire unit can be removed by unplugging antenna and power leads for storage in car trunk; air-sealed speaker within acoustic fiberboard enclosure; 3½" waterproof cone, 3 oz. ceramic magnet; power handling 5 W rms; response 150-10,000 Hz; comes with connector cord with mini-plug; black Duralex; 11½" D × 8" W × 7⅝" H $29.95

KC-3055 Base-Station Speaker
Designed for base-station use; has 5" waterproof-cone speaker; will handle 7 W rms; response 80-10,000 Hz; 8 ohms; comes with removable base; 6-ft cord with mini-plug; 5⅝" × 5½" H × 4⅝" D $24.95

KC-3035 Mobile Speaker
Can be mounted in most positions with 360-degree

rotation of speaker and/or bracket; 3½" weatherproof-cone speaker; power handling 5 W rms; response 150-10,000 Hz; imp. 8 ohms; 6-ft cord with mini-plug; 5¼" W × 4½" H × 4¼" D $17.95

KC-3045 External Speaker
Waterproof external or p.a. speaker; 3½" water-resistant cone; 5 W rms; frequency response 150-10,000 Hz; 8 ohms; miniature phone jack; Duralex Copolymer construction; 7" H × 5 1/16" W × 4¾" D $21.95

KC-3065 Flush-Mount Speaker
Impervious to water damage (as might occur with flush-mount speakers placed in vehicle doors); 3½" weather resistant cone; 5 W rms; frequency response 150-10,000 Hz; 8 ohms; miniature phone jack 5⅞" W × 5½" H × 3¼" D $16.95

KRIS

417-238 Mobile "Matchmaker"
Designed to eliminate mismatches and power losses in mobile installations; pretuned to 50 ohms; tunes out reactance in coax feedline for better match $16.95
418-238. Same except base model $19.95

423-126 VSWR Meter
Provides field-strength and s.w.r. readings; can be left in-line; 100-μA meter with two-color scale $22.95

423-136 VSWR Bridge
Dual 100-μA meters read relative transmitter output on calibrated scale and reflected power loss due to

antenna and/or line mismatch; will work on any transmitter from 3-150 MHz from ½ W to 1000 W; can be left in-line for continuous monitoring . $29.95

423-500 VSWR Bridge/Wattmeter
VSWR bridge can be used to adjust antenna system for peak efficiency, shorted or open coax, poor ground connection, or improper coax; read power output in watts; max. freq. 30 MHz; s.w.r. 1:1 to 1:3; accuracy ±5%; imp. 50 ohms; meter sensitivity 200 μA; 4″ × 2″ × 2″ $19.95

418-502 Coaxial Switch
For those using multiple antennas or multiple transceivers; three switch positions plus 10-W dummy load in fourth position; checks transceiver performance and s.w.r. bridge calibration; input/output connectors on rear panel; freq. range to 50 MHz; 4″ × 3¼″ × 3½″ $12.95

417-126 Mobile SWR Meter
Designed for in-line installation or transceiver/antenna matching; max. frequency 30 MHz; s.w.r. 1:1 to 1:3; accuracy +5%; imp. 52 ohms; 200 μA d.c. meter; 5″ × 4″ × 3″ $24.95

417-127 Mobile S/RF Meter
25-μA d'Arsonval meter; front-mounted illumination control; can be permanently connected to company's mobile transceivers with external S-meter jack; measures received signal strength and transmitter output power $29.95
418-127. Same except base model housed in extruded aluminum case $33.95

418-111 "Antenna Fire II"
Increases receive gain by as much as 20 dB; connects between antenna and CB transceiver; automatic SSB delay; automatic relay switching; reverse polarity protection; LED mode indicators; two JFET amplifiers; power required 12-14 V d.c. $36.95
417-111. Same except mobile unit $34.95

416-400 Base Preamp Microphone
Dynamic, omnidirectional base-station mike with 0-24 dB gain transistorized preamp; frequency response 300-5000 Hz; output level 44 dB max.; output imp. 800 ohms; red LED indicator for transmit mode; PTT button; lock button; will operate with both relay and electronic switching transmitters $39.95

416-401 Base-Station Microphone
Dynamic, omnidirectional type; output level 68 dB; output imp. 600 ohms; frequency response 30-5000 Hz; PTT button; lock button; standard 4-pin plug; will operate with both relay and electronic switching transmitters $29.95

417-500 Extension Speaker
Mobile extension speaker; molded ABS plastic case; 3½″ speaker with ceramic magnet & moisture-resistant case; gimbal mounting bracket; molded cable with 3.5-mm phone plug; power handling 3 W; 4¾″ × 4″ × 3″ $12.95

LAFAYETTE

Range Boost Preamplified Desk Mike
For base stations; has built-in audio compressor/preamp with overmodulation safeguards; for relay and electronic switching; has touch-to-talk bar with slide lock, volume control, and self-contained battery; output −23 dB; four-conductor cable with shield $44.95

Noise-Cancelling Amplified Mike
Built-in two-stage preamp; noise-cancelling design; for relay and electronic switching; output impedance 1000 ohms; powered by 7-volt mercury battery (supplied); coiled cable has four conductors plus shield $34.95

Power Gain Mike
Built-in preamp boosts output levels; has output level control; powered by 9-volt battery; for relay and electronic switching; coiled cable has four conductors plus shield $19.95

Dynamic Mike
For solid-state transceivers with low-impedance input; 3-conductor (one shielded) coiled cable and four-prong miniature plug included; PTT button; wired for relay switching for Lafayette transceivers $12.95

Antenna Impedance Meter
Measures antenna impedance from 10 to 500 ohms, allowing precise adjustment of antenna for optimum impedance match; comes with separate 27-MHz plug-in oscillator $69.95

SWR/Power/Modulation/FS Meter
Four-function instrument measures v.s.w.r. from 1:1 to 20:1; also serves as an r.f. wattmeter for monitoring r.f. output; indicates modulation levels from 0 to 100%; functions as a relative field strength meter for antenna tests. $32.95

SWR/Power Meter
In-line instrument monitors v.s.w.r. with meter calibrated from 1:1 to 3:1; also functions as a dual-range wattmeter for monitoring r.f. output of CB transceiver. $24.95

SWR/Field Strength Meter
In-line monitor for measurements; can also be used at antenna site as a field-strength meter; for 52-ohm coaxial lines; 1-15/16″ × 2¾″ × 5⅞″. $15.95

LEADER

LBO-310 Ham 3″ Scope
Monitors SSB sideband and AM signals; permits observation of i.f. circuit waveforms; continuous monitoring of r.f. output to 500 W; indicates tuned condition for RTTY operation; vertical amplifier sensitivity 20 mV p-p/div., bandwidth d.c. or 2 Hz to 4 MHz; horizontal amplifier sensitivity 300 mV p-p/div., bandwidth d.c. to 250 kHz; sweep frequency 10 Hz-100 kHz in four ranges; internal, negative polarity synchronization; two-tone oscillator 1300 & 1900 Hz; output voltage 50 mV rms max.; 115/230 V, 50/60 Hz; 12 VA (approx); 11⅞″ D × 7-1/16″ H × 5″ W $269.95
LA-31. 3″ scope adapter for output monitoring; frequency range 1.8-54 MHz, imp. 50-75 ohms; measurable output power 5 to 500 W; 2″ W × 3⅛″ D $22.95

LAC-895 Antenna Coupler
Frequency range is 3.5, 7, 14, 21, and 28 MHz (can also be used at 27 MHz); input imp. 50 ohms; load imp. 50 or 70 ohm coax, single-wire antenna 10-250 ohms; power handling 100 W continuous, 200 W 50% duty (CW keying), SSB, voice 500 W p-p transmitter input; in-line wattmeter range 20- and 250-W full scale, accuracy ±10% of full scale; insertion loss 0.5 dB at tuned condition; 7″ D × 7″ W × 5″ H $159.95

LPM-880 R.F. Power Meter
Direct-reading meter measures r.f. output in 0.5 to 120 W range from 1.8 to 500 MHz; push-button range selection; measures power losses in low-pass filters and coax cables; load imp. 50 ohms; accuracy within ±10% of full scale; 9″ D × 5″ H × 4½″ $149.95

MAGITRAN

CB10-39 CB Antenna Matcher
Built-in antenna matcher with tuning-eye v.s.w.r. indicator; knob adj. of tuning eye readout sets optimum antenna performance; built-in r.f. bridge for imp. indication of antenna for minimum v.s.w.r. adj.; permits continuous monitoring of antenna condition; operates on all 23 or 40 CB channels; coax connection between transceiver and antenna; for mobile or base-station operation; 4 9/16″ × 2⅜″ × 1⅞″ $24.95

CB10-10 Signal Booster/Attenuator
Provides front-end r.f. amplification to boost received signals by 35 dB or more; removes unwanted spurious signals for improved S/N; attenuator to eliminate "convoy overloading," variable adjust-

ment up to 65 dB attenuation; operates over 40-channel CB band; automatic transmit pass-through; operates on 10-15 V d.c. negative ground; for all AM, SSB mobile, or base-station operation; 4 9/16" × 2⅜" × 1⅞" $34.95

CB10-43 CB Radio Check Monitor

Self-contained receiver picks up actual "off-the-air" transmission for monitoring on earphone provided;

tells whether your signal is actually being transmitted and modulated properly; meter reading of relative transceiver power output and percent modulation; operates over all 40 CB channels, no tuning required; no installations or connections needed; operates on 9-V battery; 6⅛" × 3⅝" × 1⅝" $39.95

CB10-33 Anti-Theft Alarm System

Sensitive to gloved or fingertip touch; no connection to audio electrical system required; self-contained built-in alarm and battery design; powered by 9-V transistor battery; 100 dB alarm operates over 3 hours; built-in sensitivity control; alarm sensor can be extended to cover other equipment; supplied with sensor tape & interconnecting wire but without battery $29.95

CB10-14. Similar to CB10-33 except uses horn or existing burglar alarm system; built-in battery design; 4 9/16" × 2⅜" × 1⅞" $29.95

CB-51 Speaker

Weatherproof design; black hi-impact, hi-temp housing; omnidirectional sound distribution; surface mount with all-metal 360-degree swivel bracket; 4½" × 8½" speaker; 10 W rms power handling; frequency range 80-20,000 Hz with voice-band peak 200-3000 Hz; imp. 8 ohms; comes with all hardware and 12-ft speaker cable; 9" × 5" × 1⅜" $18.95

CB10-69 Clip-On Voice-Com Speaker

Clips on to vehicle sun visor or window; frequency range 200-3000 Hz; for improved voice clarity in high-noise mobile environment; weatherproof design permits use as p.a. speaker; 10 W rms; 12-ft audio cable with miniplug; 9" × 5" × 1⅜" D .. $17.95

CB-10-4 Speaker

Shallow surface-mount wedge for custom sound direction; heavy-duty 5¼" speaker; black hi-impact, hi-temp housing with snap-on vinyl grille; 10 W rms power handling; frequency range 80-20,000 Hz with voice-band peak 200-3000 Hz; imp. 8 ohms; comes with all hardware and 12-ft speaker cable; 7" dia. wedge × 2"-3¼" depth $13.95

METROSOUND

MS-07-CB Lockmount

Pre-soldered PL-259 connectors; female PL-259 jack riveted to bracket; silver-plated antenna slide contacts; lead-in wires for extension and p.a. speakers pre-soldered with mini-pin plugs; twin-button quick release lock for use with or without key $11.95

MS-08-CB. Top section only for use in other vehicles $4.95

MS-09-CB. Economy version of MS-07-CB; unichrome plated finish; PC-259 plug and jack; single-conductor speaker lead-in $8.50

MFJ

LSP-520BXII Super Log Speech Compressor

Solid-state speech compressor increases average r.f. power output of SSB transmitters up to 6 dB; selectable cut-off active high-pass filter removes voice frequencies not needed for intelligibility; uses an IC logarithmic amplifier with 30-dB dynamic range for speech compression; six-pole sharp roll-off active low-pass filter removes all components above 2700 Hz; uses a 9-volt transistor battery; packaged in a Ten-Tec enclosure with front-panel compression control and high-pass cut-off (500 or 1400 Hz) selector/power switch; front-panel mike input and uncommitted four-pin jacks; three-conductor output cable; 5-9/16" × 3⅝" × 2⅛". $59.95

LSP-520BX. Same as above, but uses a slide function/power switch, has no uncommitted four-pin jack; and is packaged in a standard MFJ enclosure; 4" × 3¼" × 2-3/16". $49.95

LSP-520PC. Same as above (wired and tested pc board, compression level control) but less enclosure, jacks, and switch. $37.95

CMOS-8043 Electronic Keyer

Uses Curtis 8042 CMOS IC keyer; has built-in paddle with adjustable contact travel; dot memory; iambic operation with external squeeze paddle; instant start with keyed time base; self-completing dots and dashes; jam-proof spacing; variable weight control; speed adjustable from 8 to 50 wpm; built-in sidetone with adjustable volume and pitch; solid-state keying with grid-block and direct outputs; four-position mode/power switch; uses four AA cells; 4" × 3¼" × 2-3/16" $49.95

MFJ-1030BX Receiver Preselector

Covers 10 through 30 MHz; overvoltage-protected dual-gate MOSFET; separate input and output tuning capacitors; 20-dB gain; rejects out-of-band signals; increases signal 3 to 5 S units; uses a 9-volt transistor battery; rotary power switch; packaged in a Ten-Tec enclosure; 5-9/16" × 3⅝" × 2⅛". $49.95

MFJ-16010 Antenna Tuner

Matches unbalanced, 50-75 ohm transmitters and transceiver outs to random wire antennas; variable L network is reversible for matching both high- and low-impedance loads; covers 1.8 through 30 MHz; rated power handling 200 W of r.f.; uses SO-239 coaxial connectors and 12-position tapped toroidal inductor; 4" × 3¼" × 2-3/16". $39.95

MFJ-100BX Frequency Standard

Provides marker signals every 100, 50, or 25 kHz well into the vhf region; markers are gated for positive identification; no direct connection to receiver is required; CMOS IC's used for low current drain; front-panel switch selects marker intervals and power on/off; uses a 9-volt transistor battery; 4" × 3¼" × 2-3/16". $27.95

MURA

PRM Series CB Microphones

All models feature peak-redistribution modulation (PRM); 9-V battery power source; relay or electronic switching; 5-wire, color-coded, shielded cord.

PRX-100. Hand-held; maximum sensitivity −50 dB; 0-2500 ohms impedance; maximum gain 16 dB with variable gain setting controlled by slide switch $39.95

PRX-200. Hand-held; impact-resistant case; −50 dB, −52 dB, −54 dB sensitivity levels; 12 dB, 14 dB, 16 dB gain levels; 2000 ohms nominal impedance $34.95

PRX-300. Base-station mike; −50 dB maximum sensitivity; 16 dB maximum gain; push-to-talk button; lock switch; slide-type gain control; sensitive dynamic cartridge; transistor amplifier $69.95

DX-116 Variable Gain Mike

Hand-held mike features PTT button; slide-type switch for variable gain control; sensitive dynamic cartridge; transistor amplifier; 9-V battery power source; relay or electronic switching; −42 dB maximum sensitivity; 20 dB maximum gain; 0-2500 ohms impedance range; 5-wire, color-coded, shielded cord $29.95

DX-119 Noise-Cancelling Mike

Hand-held CB mike features noise-cancelling circuitry for clear transmissions in high-level background noise situations; PTT button; high-impact resistant case; −65 dB sensitivity; 500 ohms nominal impedance; electronic or relay switching; 5-wire, color-coded, shielded cord $19.95

DX 120 Three-Level Gain Mike

Hand-held CB mike features three separate gain levels, 23 dB, 21 dB and 12 dB; −54 dB, −45 dB, −34 dB sensitivity levels; PTT button; 9-V battery power source; relay or electronic switching; 2000 ohms nominal impedance; 5-wire, color-coded, shielded cord. $24.95

DX-2000 Variable Gain Base-Station Mike

Base-station mike features variable-gain slide control; PTT button and lock switch; all-metal, sturdy construction; −36 dB maximum sensitivity; 28 dB maximum gain; 9-V battery power source; electronic or relay switching; 5-wire, color-coded, shielded cord $49.95

CBM-10 Dual-Function CB Meter

Measures standing-wave ratio and field-strength; features 5-section, telescopic antenna for relative field-strength measurement; s.w.r. scale 1:1-1:3 v.s.w.r.; 0-5 relative FS scale; 3.5-150 MHz frequency range; 52 ohms impedance; can be left in coax line permanently; 6" H x 2½" D x 2½" W..... $29.95

CBM-30 Twin-Scale CB Meter

Separate r.f. output power and s.w.r. scales for simultaneous monitoring; precision-built d'Arsonval meter movement; 1:1-10:1 v.s.w.r. ±5% s.w.r. scale; 0-100 watts ±20% power scale; 3.5-150 MHz frequency range; 52 ohms impedance; can be permanently installed in coax line; 6" W x 3" H x 2" D..... $46.50

NUVOX

NEC-4 Filtered Power Supply

Permits mobile CB transceiver to operate as base station; ripple-free 12-V output; supplies max. 4-A output; 115 V, 50/60 Hz input $24.95

TCB-76 Lock Mount

Universal mounting bracket; will fit most CB transceivers; has PL-259 connection $9.95

NYE VIKING

250-20 Low-Pass Filter

Consists of four full sections; cut-off frequency 45 MHz with "M" derived end sections adjustable to provide max. attenuation of 57 MHz (center of TV Ch. 2); attenuation of harmonic & spurious frequencies above 54 MHz 75 dB; insertion loss 0.5 dB; characteristic impedance 52 ohms standard SO-239 coax connectors for input & output terminals; comes factory assembled and pre-tuned; all mounting hardware $19.95

PACER

PSW-3 SWR/Pwr/Field-Strength Meter

Measures s.w.r. and field strength for antenna tuning, power output up to 100 W; slide-lever adj.; 16-in cable for immediate installation $29.95

PSW-2. Similar but without power output meter $24.95

PSW-1. Mobile s.w.r. and power meter; comes with special mounting bracket for under-dash installation $19.95

PCB-1 CB Converter

Converts AM, AM-FM, or AM-FM stereo radio for reception of 40 channels CB; conversion gain & image rejection 15 dB; 11-16 V d.c., 10 mA max.; mounting bracket; extra-length cable; cigarette-lighter plug $19.95

PRS-1 Extension Speaker
Delivers up to 5 W at 8 ohms; 5-ft cable; mounting bracket for installation on auto dash or overhead; 360-degree swivel base; weatherproofed $9.95

CB Portable Protector
Metal slide-out tray half of which attaches permanently to car; other half of tray attaches to radio; quick disconnect for removing CB rig to safe storage; installs in seconds; adapts to all CB radios; comes with built-in locking system; prewired for external speaker or alarm system; prewired with RG-58/U cable $6.95

PHM-1 "Hugger"
For hump-mounting CB radio or stereo; can be screwdriver adjusted to any car; tilts up or down as desired; center opening for tranceivers with speakers in base $5.95

PARA DYNAMICS

PDC2812 Frequency Counter
Frequency range d.c. to 40 MHz (min.); accuracy 0.0001%/°C and 1 ppm/°C; sensitivity 100 mV; 1 kW power output; resolution: 1 Hz on kHz range, 1 kHz on MHz range; five digit readout; operates from 10-15 V d.c. or 117 V a.c.; BNC and through-line inputs, 4-MHz crystal oscillator $150.00

PDC700 Power Scanner
Reads power, modulation, and s.w.r. on single 4" × 6" meter; peak reading up to 1000 W output; frequency range to 220 MHz; factory calibration set at 27 MHz; mod. to 100% and overmodulation indication to +3 dB; requires two coax connections; 9¾" × 4½" × 2¼" $89.95

PDC600. Similar to PDC700 except three separate meters for simultaneous reading of power, modulation, and s.w.r. $87.96

PDC550. Similar to PDC600 except 7½" × 3" × 3⅛" $76.95

PDC137. Similar to PDC700 except meter is 2.9" × 4.5" and instrument reads power and s.w.r.; 8¼" × 3½" × 2¼" $59.95

PDC162 Regulated Power Supply
Converts 117-V a.c. to 13.8 V d.c.; comes with car cigarette-lighter-type jack, fuse protection; heavy-duty case; PC board design; high-voltage protection circuitry; ripple less than 60 μV peak-to-peak; provides 2.5 A continuous power, 4 A for 15 min $34.00

RADIO SHACK

Archer 3-Range SWR/Power Meter
Connects between CB equipment and antenna; separate SWR and RF power meters, SWR forward and reflected power; switch-selectable 10, 100, or 1000 watt ranges, 3 to 30 MHz; 4½" × 7½" × 4¼". 21-520 ..... $39.95

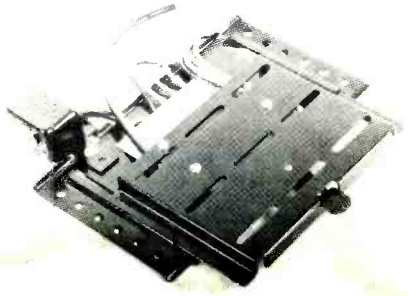
Archer 3-Way CB Tester
CB station tester with jack for antenna or dummy load; transceiver output; meter reads r.f. output power, SWR, % modulation, calibration control; 50 ohms. 1⅞" × 7" × 2½". 21-526 ..... $24.95

Archer Antenna SW/SWR Meter
Two-position switch changes from one antenna to another; checks SWR without switching leads; up to 500 W; 1⅞" × 1⅞" × 2½". 21-521 ..... $17.95

Archer FS/SWR Meter
Field-strength/SWR meter; checks r.f. field strength; SWR forward and reflected to 1 kW; 2 to 30 MHz; 100 μA meter; 52 ohms; 1⅞" × 6-3/16" × 2½". 21-525 ..... $16.95

RCA

14T170 Mounting Bracket
Quick-release mounting brackets; constructed of



heavy-gauge steel with nickel-plated electrical connectors, includes brackets for mounting on vehicle floor over transmission hump; hardware, instruction book $9.95

14T171. Similar but designed to permit same CB unit to be used in several vehicles $6.75

14T172 External CB Speaker
For underdash or ondash mounting; swivel; base for mounting flexibility; high-impact plastic case; for use with mobile or base-station transceivers; frequency response 200-9000 Hz; 8 ohms; max. input 5 W; 5¾" H × 4⅜" dia.; comes with 8-ft wire with plug and mounting hardware $7.50

14T173 P.A. Speaker
Weatherproof hailing horn for use in cars, boats, trucks & RV's; 90-degree tilt base for mounting flexibility; frequency response 300-3000 Hz; 8 ohms; max. input 8 W; anodized aluminum silver color finish; comes with 8-ft wire with plug; 5" dia. × 4 13/16" × 5" bell $12.95

RMS

RMS CB Microphones
All mikes feature a push-to-talk switch, dynamic long-life cartridge; high impact shock-proof housing, and 5-ft coiled cord.

CBM-5006. Amplified mike; two-position slide gain control; 9-V battery operation $26.75

CBM-5009. Noise-cancelling mike $14.25

CBM-5004. Basic CB replacement mike $11.75

CBWM-50 Window Antenna Mount
Window mount accommodates any mobile CB antenna; adjustable window extension fits windows up to 42-in wide; self-grounding; aluminum weatherproof elements; steel mounting bracket and hardware $12.95

CB Interference Filters
Designed for 75-ohm TV systems; combines CB interference filter and 75-300 ohm matching transformer; miniaturized printed circuitry; shielded network and housing; heavy-duty twisted and tinned twin-lead; blocks CB, ham, ignition interference/noise. 2600F $3.15

CB-300F. Same except for 300-ohm systems; connects to VHF antenna terminals on rear of TV set $7.75

SENCORE

CB41 Automatic CB Tester
For checking CB performance; measures s.w.r., r.f. power, % modulation for any mobile or base rig; no calibrating, zeroing, or switching of leads; 4½-in color-coded meter; portable battery operation for all mobile work; checks all 23 or 40 channels by rotating channel selector; antenna tuning with built-in sensor unit that connects to CB through optional EX203 12-ft extension cable; switch on sensor selects 25 W dummy load for testing CB power and modulation output accurately; operates from standard 9 V transistor battery or from optional PA202 power adapter for a.c. $148.00

PA202. Power adapter for 3-way battery, rechargeable, a.c. line operation $9.95

EX303. 12-ft extension cable $9.95

CB42 Automatic CB Analyzer
For all troubleshooting and performance testing of CB units; receiver tests include: automatic EIA sensitivity test, direct digital readout of audio output power, all frequency stages, any internal frequency checks front-end alignment, i.f. alignment of any single- or dual-conversion receiver, a.g.c., adjacent-channel rejection, any audio stage, speaker, receiver noise, SSB alignment, a.n.l. circuits (with optional NL204 noise limiter accessory); transmitter tests include: direct digital readout of transmitter frequency, percent of transmitter frequency error, AM power, SSB p.e.p., AM modulation (%), SSB modulation using EIA standard two-tone test, all frequency synthesis stages; checks mike using dynamic mike tester, crystal operation out-of-unit, all audio driver or modulation stages; and, using any general service scope, checks instantaneous modulation peaks, residual transmitter carrier noise, comes equipped with 45-channel capability; will operate from any 12 V battery or up to 4 hours off the PS43 Porta-Pak $975.00

PS43 Porta-Pak
Portable power supply/battery eliminator, two adjustable supplies 0-14.4 V d.c. in 0.6 V steps for powering mobile equipment, 200 mA continuous output current when operated from a.c. line with extended 5 A peak for high current requirements; fixed 12-V output for servicing mobile equipment; fixed 6-V output; operates from standard 1.2 AH Ni-Cad batteries for standard use or heavy-duty 4 AH Ni-Cad batteries for extended portable use. 117-V a.c., heavy-duty vinyl-clad steel case for portable use (less batteries) $98.00

SHAKESPEARE

TS-1 The Defender
Test console connected to CB transceiver monitors r.f. power output; standing wave ratio and percentage of modulation; 3:1 s.w.r.; 5 W power output up to 120% modulation; antenna match and impedance from 4-1 matched to 1.5:1 or less $99.95

SHURE

Super Punch Model 526T
CB base-station microphone features dynamic 9-V d.c. battery-powered transistor preamplifier; 200 to 6000 Hz frequency response; 5000 ohms output impedance; 1000 ohms minimum load impedance; 0.63 to 14 mV adjustable output level; electronic or relay switching; single-bar, locking or non-locking, push-to-talk switch; Normal/VOX, single-pole, double-throw slide switch; constructed of high-impact plastic; comes with non-detachable, 7-ft, three-conductor, plastic-jacketed cable 10⅜" H × 4¼" D; weight, 2 lbs. $47.00

450 Microphone
Features telescoping height adjustment, high/low impedance switch, push-to-talk switch bar that activates both microphone & relay circuits, a mike-on locking switch, and desk stand; frequency range 100-10,000 Hz; Lo imp. 1 mW/10 μ bar; high imp. 2 mV/μ bar; 7-ft. four-conductor (two shielded) cable $40.20

Dispatcher 520 Series Mikes
Features grip-to-talk, slide-to-lock switch & desk stand; switch bar activates both relay and microphone muting circuits; mike portion of switch is normally shorted and relay portion normally open; frequency range 100-9000 Hz

Model 520SLB. Low imp. (150-250 ohms), 0.281 mV/μ bar; with 7-ft four-conductor shielded cable $40.20

Model 520B. Same except head only; 7-ft non-detachable, single-conductor shielded cable $18.75

Model 520SL. High-imp. 2.38 mV/μ bar with 7-ft two-conductor shielded cable $36.60

Model 520. Same except head only; 7-ft non-detachable, single-conductor shielded cable $18.75

524C Hand-Held Microphone
Transistorized dynamic microphone for use with mobile or fixed-station transceivers; 300-5000 Hz frequency response; low sensitivity to hum pickup; low susceptibility to r.f. interference; load imp. 250-2200 ohms; 2.5-35 V d.c. supply; double-pole single-throw leaf-type push-to-talk switch; non-detachable 5-ft jacket coil-cord $39.60

CB41 Long Ranger
CB base station microphone; controlled-magnetic cartridge; dual impedance; adjustable height; momentary or locking press-to-talk transmit/ receive switch; selector switch for grounded or isolated transceiver switching; 200-6000 Hz frequency response; load imp. range: lo-Z 200-1000 ohms, hi-Z 15-100 kilohms; 6-ft extended four-conductor cable $39.00

444 Controlled Magnetic Microphone
Omnidirectional amateur desk-top mike; 200-6000 Hz frequency response; 14,000 ohms imp.; press-to-talk or VOX switch; adjustable microphone height; 7-ft 2-conductor cable $35.10

Amateur/Mobile Mikes
Model CB45. Controlled-magnetic noise-cancelling operation; dual impedance; 200-5000 Hz frequency response; load imp. range: lo-Z 200-1000 ohms, hi-Z 15-100 kilohms; push-to-talk leaf-type switch; 5-ft four-conductor cable; comes with mounting bracket $50.00
Model CB44. Controlled-magnetic modular microphone; dual impedance; load imp range: lo-Z 200-1000 ohms, hi-Z 15-100 kilohms; 200-5000 Hz frequency response; push-to-talk leaf-type switch; 5-ft four-conductor coil-cable; comes with mounting bracket $32.00
CB43. Same except not modular $30.00
CB42. Same except push-to-talk switch; 200-4000 Hz frequency response $20.00
Model 201. Ceramic omnidirectional; frequency range 200-4000 Hz; high imp. 1.68 mV/μ bar, 5-ft three-conductor (one shielded) cable $15.15
Model 202. Ceramic noise-reducing; frequency range 200-4000 Hz; high imp. 3.5 mV/μ bar; 5-ft three-conductor (one shielded) cable $15.45

Mike Accessories
A15A. Attenuator inserts 15 dB loss $18.00
A15LP. Low-pass filter provides high-freq. cutoff $18.00
A15LA. Line input adapter converts balanced low-imp. mike input to bridging line-level input $18.00
A15BT. Bridging transformer; balanced unit that matches balanced or unbalanced devices of different impedances (33 kohms primary and 600 or 7500 ohms secondary) $18.00

SOLAR COMMUNICATIONS

"Compressar-Mike"
Speech-compression mike increases CB range by increasing average modulation and power output; incorporates low-impedance microphone and battery-powered compression amplifier; max. gain 100 dB with −85 input signal; compatible with AM, FM and SSB transmitters $21.95
Handset and desk-top models also available

SPARKOMATIC

CB-11 40-Ch CB Converter
Converts any AM or AM-FM radio into a CB receiver; receives all 40 CB channels; illuminated channel selector; AM/CB switch; fine-tune control; sensitivity control; noise silencer switch; red LED indicates when converter is activated; input antenna jack; radio output cable plug; power cable; 12-V d.c. negative-ground operation; 5″ D × 5″ W × 2¼″ H $39.99
CB-10. Similar to CB-11 except for AM radios only, does not have fine-tune, illuminated channel selector, or silencer switch; 5″ D × 4 3/16″ W × 1⅝″ H $29.99

LM-500 CB Slide Mount
For CB transceivers only; coaxial cable "quick disconnect" connector prevents r.f. loss; spring-loaded power contacts; silver-plated contacts and r.f. plug; fits all cars, trucks, campers, vans, tractors, and boats $14.99

SUPEREX

CB10-2 SVX Mike/Headphone
Designed to be used with any mobile CB radio; mike automatically "keys" radio with sound of operator's voice; noise-cancelling mike; complete hands-free operation; instantaneous communication response; earphone equipped with a.g.c. circuit to prevent blasting $100.00
CB10-2VX. Mobile unit with voice-activated mike mounted on headband; remote-control switch $85.00
M-606VX. Base-station version; flexible gooseneck construction; operates on 110 V a.c. or 12 V d.c.; comes complete with "Vox-Box" $110.00
610VX. Voice-activated control station (as supplied with M606VX) which can be used with most dynamic mikes $60.00

Mobile Safety Mikes
CB-SMC. Electret mike with FET preamp $55.00
CB10-2 SMD. Safety mike with single phone $45.00
CB10-2 MD. Safety mike on headband with safety switch $30.00
CB-900. Motorcycle safety mike; helmet speaker; safety switch $45.00

CB Handsets
Can be used with most existing transceivers; 500-ohm dynamic mike; 8-ohm receiver; multiple switching and jack for remote speaker; can be wired for electronic or relay switching transceivers.
HS-10. Handset $40.00
HS-19. Handset with VS-19 visor speaker ... $50.00

Base-Station Mikes
Electret-condenser base-station amplified mike with variable gain control; self-contained power supply;

operates with one "AA" battery; interlocking PTT switch; flexible gooseneck construction; 500 ohm imp $45.00
M-606. Similar to M607 but without variable gain control $35.00

CB Headphones
CB10-2. Base station phone; automatic level-limiting circuit; impedance-matched circuits; 300-4000 Hz frequency response; cushioned earphone with adjustable headband; 500 ohm imp $25.00
CB10-2S. Single-sided mobile version of CB10-2 permits monitoring without disturbing others $20.00

TEKNIK

"The Count" Frequency Counter
Six-digit readout; frequency range 100 Hz to 32 MHz; accuracy ±0.00005% at 27 MHz; sensitivity 1 W—100 W; 6″ W × 4″ D × 2″ H.
FC106A. 12-V d.c. $149.98
FC106B. 12-V d.c. with 12- or 24-hour digital clock $174.98
FC106AA. 110-V a.c. $167.98
FC106BA. 110-V a.c. with 12- or 24-hour digital clock. $192.98

WM SWR 102 Wattmeter/SWR Bridge
Three-scale, peak-reading 4-in wattmeter reads 0-10, 0-100, or 0-1000 watts; forward/reverse power switch; SWR bridge. $69.98

BE 107 Receiver Preamp
For use between radio and antenna; gain 20 dB at 2.5 dB noise figure; panel mounted in/out switch and indicator light; 6″ W × 4″ D × 2″ H. $49.98

Longranger Speech Processor
Designed to be inserted between mike and CB set (SSB, DSB, or AM); increases the average-to-peak-

power ratio of audio output to approach 100% average modulation; circuitry to prevent overmodulation; battery powered (internal or vehicle); 6½″ W × 2″ H × 4″ D. $49.98

TELCO

"BoosTwenty"
Mobile in-line preamp with r.f. sniffer circuit; automatic operation; trunk, firewall, or dash mount; operates neg. or pos. ground vehicles; freq. range 2-30 MHz; 10-15-V d.c., 50 mA max.; 6″ long × 1½″ W × 1¼″ H.
BT-20. For AM transceivers $29.95
BT20SSB. For SSB transceivers with built-in SSB delay $29.95

"Swatt-Meter" 10-10 Meter
Reads actual power on 3 separate scales; measures s.w.r.; negligible insertion loss; monitors signal during tune-up; chrome/steel case; 8″ W × 4½″ D × 4″ H $59.95

"Channel Guard" XL-1000
Adjustable transmitter low-pass filter; eliminates TVI; functions as antenna tuner; 100 dB rejection of spurious r.f. above 40 MHz; variable input imp. (50-70 ohms); 12″ long × 2⅛″ W × 1½″ H ... $34.95

"Port-a-Test" Set PAT-1140
Multi-purpose tester; generates selectable 500/1000 Hz siren tone or steady 1 kHz; emits audio modulated r.f. to 250 MHz; LED indicates voltage, polarity & continuity $29.95

"Base Booster" 10-4
In-line preamplifier; operates automatically when mike button is pressed; causes "on-the-air" sign to light up and de-activate booster circuit; connects between transceiver and antenna; chrome-plated cabinet; 120-V a.c. operation; 8″ W × 4½″ D × 4″ H $59.95

TELEX

CB-88 Lightweight Headset
Single-side magnetic earphone element; includes adaptor for use with eyeglasses without headband; noise-cancelling power mike with IC amplifier; variable gain control; pivoting boom; PTT switch; 8-ft cord (no plugs); weight less than 3 oz $69.95

CB-1200 Headset/Mike
Designed for hands-free transmit/receive of CB communications for all types of mobile operation;

headset combines dynamic receiver with ceramic boom mike; talk-switch, and FET battery-powered amplifier (separate long-life battery); adjustable mike boom rotates 310 degrees to move out of way when not transmitting; talk switch; unterminated headset cord so jacks can be installed to match rig. $59.95

HTC-2 "Twinset"
Lightweight twin receiver for monitoring CB at home; dual magnetic drivers 3.2–20 ohms; sensitivity 120 dB SPL ±3 dB; response 100-3000 Hz $19.95

C-610 Base Headphone
Dual receivers for base-station use; dual-magnetic drivers 3.2–20 ohms; sensitivity 103 dB SPL ±5 dB; response 40-15,000 Hz. $9.95

Dual Muff Headphones
Circumaural ear cushions to seal out ambient noise; adjustable headband; self-aligning earcups; equipped with 5-ft cord terminated in 0.250" dia. phone plug; 3.2–20 ohms; dual receiver magnetic drivers. $9.95

"Earset"
Single magnetic driver; 500 ohms; sensitivity 117 dB SPL ±3 dB; frequency response 200–3000 Hz; 5-ft cord $8.10

CB-73 "Double-Header" Mike
Dynamic, noise-cancelling power mike; has noise-cancelling defeat control, battery operated IC amplifier with adj. output; fits front or back on mounting bracket; aviation-type acoustic housing; high-flex coiled cord.
CB-73R For relay switching transceivers. $39.95
CB-73E. For electronic switching transceiver $39.95
CB-73S. For special switching transceiver. .. $39.95

tenna-loc

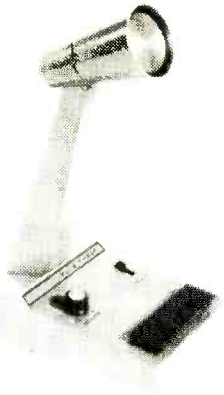
Anti-Theft CB Antenna Locks
The company offers four models to accommodate most mobile CB antennas. All feature notched, locking U-bolts; 5-tumbler, chrome-plated key locks; all metal components not of stainless-steel, chrome-plated to automotive specifications; fast installation.
Model H. For all Hustler or similar type base-loaded trunk-mount car antennas (large diameter base) $11.95
Model S. For all SignalKicker-type trunk-mount antenna; has lock-in stud; chrome-plated bracket with 1/way screws, protective nuts and washers . $11.95
Model FX. For most fiberglass-type, hexagon barrel antennas; turn-proof locking plate $11.95
Model M. For most trunk-mount antennas; heavy-duty replacement mounting cup with no-mar rubber grommet; lock-in stud $11.95

TURNER

EX-500 Base-Station Mike
Pre-amplified base-station mike; separate volume & tone controls; built-in meter for reading audio input & battery condition; 6-wire cable to make unit compatible with all transceivers; volume slide control can be used with level meter to optimize radio input; compression preamp prevents overmodulation; tone slide control adjusts bass-treble balance; uses 9-V battery for preamp and meter functions . $65.00

Model M + 3 Mobile Mike
Transistorized mobile version of Model +3; provides up to 15 dB gain; slide-action volume control; compression amplifier circuit to prevent overmodulation; ceramic design; 300-3500 Hz tailored for voice transmission; push-to-talk switch; 7-volt replaceable mercury battery; designed for relay switching; (Model JM + 3 for electronic switching) $40.00
M + 3 Special. Same as M + 3 except with six-conductor cable $40.00

Model +3B Base-Station Mike
Base-station microphone with solid-state preamplifier; built-in compression circuit to guard against



overmodulation; adjustable volume output control; ceramic microphone cartridge with high speed intelligibility limited to 300-3000 Hz; touch-to-talk front bar with slide-lock; self-contained battery $40.00

Model M+2 Base-Station Mike
Has temperature and humidity-resistant ceramic cartridge; two-stage silicon transistor preamp with volume control; up to 35 dB more gain than conventional ceramic units; adaptable to both relay & electronic switching with slide-mount switch in base; lock-down lever to hold down PTT bar; die-cast case; light blue finish; polished chrome grille ring $45.00
M + 2/U. Mobile version with up to 15 dB more gain; built-in two-stage amp powered by 9-V mercury battery; will modulate any transceiver; Cycolac case; coiled cord; wired for relay switching .. $36.00
JM + 2/U. Same except wired for electronic switching $36.00

Road King CB Mikes
Designed for truck applications; available in six versions.
50. Noise-cancelling dynamic type; response 100-8000 Hz; impedance 2000 ohms (for use with all transistorized equipment with 600-5000 ohm input imp.); output level −60 dB (0 dB = 1 mW/10 μ bar); wired for relay switching $23.00
50J. Same except wired for electronic switching $23.00
56. Same as 50 except with six-conductor coiled cord for transceivers requiring this feature ... $23.00
60. Features high-output compression amplifier; response 300-3500 Hz; imp. 1000 ohms; adjustable output level −42 dB; wired for relay switching $40.00
60J. Same except wired for electronic switching $40.00
66. Same as 60 except with six-conductor coiled cord $40.00

360DM Mobile Mike
Dynamic replacement mike for transistorized equipment with 2000-ohm impedance; full-length switch lever; 2000 ohms output impedance; response 100-8000 Hz; output level −75 dB (0 dB = 1 V/μ bar); wired for relay switching; coiled cord $15.00
J360DM. Same except for electronic switching applications $15.00

ULTRA

10-2 Speech Processor
Compact audio compressor and preamplifier for CB transceivers; 34 dB gain; 200-5000 Hz frequency response; 1500 ohms output impedance; 30K ohms input impedance; 4.5 V d.c. power supply, battery incl.; has on/off switch, gain control and compression control knobs; CB microphone plugs into front panel; 4⅜"W × 3¼"D × 1⅜"H. $39.95

Eavesdropper Jr. Converter
Crystal-controlled portable transmitter converts AM radio to receive public service bands; no connections necessary; solid-state circuitry; 9 V battery operation; 3½"H × 2½"W × 1¼"D.
E-1. VHF (lo band) 30-50 MHz. $19.95
E-2. VHF (hi band) 145-175 MHz. $19.95
E-50. UHF 450-512 MHz. $19.95

UTAC

Mobile Prevox
Voice-activated control and microphone preamp 11-16 V d.c. pos. or neg. ground; relay contact response 250 ms or better at 75 dB input; 0.5-1 second delay; mike amplifier gain 15 dB; frequency response 50-15,000 Hz at 6 dB down; current drain 65 mA; VOX sensitivity 75 dB at 1 kHz input; electronic or relay switching; control knobs for microphone amp sensitivity, anti-trip (VOX sensitivity) and VOX manual; AMP-off and CB-off switches; 5¼" D × 4¼" W × 1½" H.
K-100. 4-wire operation $59.95
K-200. 6-wire operation $59.95
Matching headset also available.

WAWASEE

JBC-1000-SM Scope/Wattmeter/SWR Bridge
Provides continuous monitoring of transmitted signals (3 W to 2000 W units) in 27-30 MHz range; permits actual r.f. output delivered to antenna; visual monitoring of r.f. and voice modulation on each transmission; SWR meter; light shield over scope tube; 13" H × 12⅛" W × 6" D.....$179.95

JB-2000SW Power Meter/SWR Bridge
Designed for in-line connection; three ranges (0-20 W, 0-200 W, 0-2000 W); v.s.w.r. can be measured at any r.f. level from 3 to 2000 W; 4-position rotary selector switch; 5⅞" H × 5¼" W × 4½" D.....$62.95

JB-1000 Dummy Load
Portable r.f. load capable of handling 1 kW (with oil bath); frequency up to 400 MHz; v.s.w.r. 1.1 to 1.5 .. .. $40.00

NEED MORE INFORMATION?
If so, please write direct to the manufacturer and/or distributor. The addresses are given in the Directory of Manufacturers, beginning on page 5 of this issue.

HEAR THE NEWS AS IT IS BEING MADE

With a monitor/scanner you can keep track of all the local action—including police chases, fires, aircraft operating in your area, and other news-making events.

LISTENING to police, fire, and other public safety transmissions has become a national pastime, akin to the radio listening "fad" of the 1920s, when the family gathered around the radio to listen to broadcasts from all parts of the country when "skip" was in.

Today's radio monitorists listen to the transmissions of local landmobile radio systems—fire departments, police patrols, ambulance drivers, weather reports, and so on. Those near navigable waters may also monitor ship-to-shore and ship-to-ship transmissions. Too, conversations of airplane pilots and mobile telephone owners can be overheard. Even 2-meter FM radio amateurs can be heard on many Public Service Band monitor receivers.

In essence, PSB listeners can hear the news as it's being made—fire fighting, shoot-outs, etc.—as well as being titillated by eavesdropping on private conversations.

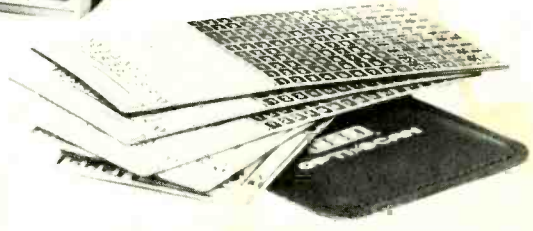
There's always plenty to hear on the landmobile bands: the 30-50 MHz and 152-174 MHz bands in most areas, the 450-470 MHz band in metropolitan areas. In a few states, it is unlawful to install a public safety receiver in a vehicle without a police permit. Some states have attempted to ban use of such receivers in homes. Barring local ordinance, however, only the FCC has the authority to regulate the use of radio—and it does not prohibit listening to public safety radio transmissions. However, the Communications Act of 1934, as amended, prohibits a listener from telling any one what is heard except transmissions by amateur and broadcast stations. At a conference of police communications officers, most voiced no objection to public monitoring of their radio transmissions. In fact, they said doing so is good for police public relations and, sometimes, they get tips from monitorists about suspicious and wanted persons (ostensibly winking at third-party relaying of information). Narcotics drops and prostitution ring information has been overheard by people monitoring the various PSBs, for example.

Scanners. Manually tunable receivers for the PSBs are not satisfactory for most people who are serious listeners. It simply requires too much time to hunt for elusive, short-duration communications. As a consequence, multi-channel, fixtuned receivers that automatically pick up transmissions when they are made on a selected group of frequencies have become popular. They are called "scanners."

With a scanner, there is no need to fiddle with a tuning dial or to monitor a specific channel in the hope that something would be heard. A scanner receiver automatically "scans" a specific number of channels. It skips past the channels on which no signals are present and locks on to the first active channel. After the station on that channel ceases transmitting, the scanning action resumes.

In densely populated ares, there may be so much action on some channels

This 10-channel scanner from SBE can be set to any ten of some 16,000 channels in the 30–50 Mhz, 150–170 MHz, and 49–510 MHz bands. Channels to be scanned are selected with a do-it-yourself programmed card. Other channels can be scanned by inserting a different card into receptacle on front panel.



E.F. Johnson's four-channel portable scanning receiver.

that silent periods will be infrequent, of course. But you don't have to listen to all of the channels. A scanner receiver has lock-out switches with which any of the channels can be eliminated from the scan cycle. You might be interested at times in only listening to the police, sheriff, and fire departments, locking out the sanitation and public works departments.

There are many types of scanners, all employing the same basic scanning principles. They are available in single-band, dual-band, and multi-band types and with the capability of scanning from 4 to 16 channels. Most require the installation of a crystal for each channel to be scanned. Some use a card or a metal comb that is plugged in to make the receiver scan preselected frequencies. And some are programmable to any frequency within a band (or bands) by means of front-panel controls. The programming can be changed by readjustment of the controls.

Scanning is performed by a digital electronic circuit that automatically cuts in one channel at a time in sequence. Typically, channels are scanned at the rate of 10 to 20 channels per second. The scan rate varies among receivers, some of which have a scan-rate control.

Channel frequencies are determined by plug-in crystals (one per channel) in most receivers and, in some, by a PLL (phase locked loop) digital frequency synthesizer. It is the scanning circuit that cuts in the crystal or programs the PLL for the frequency of each channel as it is scanned.

If you choose a crystal-type scanner (the least expensive type, excepting manual-tuning ones), you will have to buy and install (or have installed) a crystal for each channel you want to monitor. You only have to install crystals for the number of frequencies of prime interest to you. Crystals for others can be added later. Or, you can replace the crystals for the frequencies that are of little interest to you for more interesting channels.

Within the four prime landmobile bands, the 30-50 MHz (low VHF) band is used primarily for relatively long-range base-to-mobile communication, as for county-wide coverage; the 152-174 MHz (high VHF) band is widely used for urban area base-to-mobile communication, and includes the 156-162 MHz marine band and the 162.40 MHz and 162.55 MHz National Weather Service channels; the 450-470 MHz (UHF) band is rapidly becoming the most popular band for metropolitan areas; the newest band, the 470-512-MHz (UHF-T) is used only in certain areas. The last band occupies the space allocated in some areas to television Channels 14, 15, 16, 17, and 18.

Whether you need a single-band, dual-band, or multi-band scanner depends on which bands are most used in your area. To know what there is to listen to, you have to know the frequencies used by your local public safety agencies. Your local dealer should be able to tell you. If you buy your scanner by mail order, you may need to consult a public safety radio directory such as "Police Call," Lebanon, N.J. 08833, or "Police Call Radio Directory," P.O. Box 35002, Los Angeles, Cal. 90035. Although Part 90 of the FCC Rules and Regulations lists the frequencies available to the public safety, industrial, and land transportation radio services, the rules do not list the organizations which are licensed to use them.

You don't need a directory to find the frequencies of marine radio stations since the same frequencies are used internationally. The most interesting frequencies to the monitorist living within radio range (15-30 miles) of navigable waters are 156.3 MHz (ship-to-ship/safety) and 156.8 MHz (safety and calling). Nor do you need a directory to find out the frequency of the weather station serving your area—it is either 162.40 MHz, 162.55 MHz and, in some rare instances, 162.475. To find out which it is, phone the nearest National Weather Service office (U.S. Department of Commerce). Transmissions often have about a 40-mile range.

Most of the stations operating in the 30-50 MHz and 152-174 MHz bands use single-frequency simplex communication. Base stations and mobile units transmit on the same frequency. Although many 450-470 MHz band stations use this mode, there are many that use two-frequency simplex (or duplex) communication, as shown in Fig. 1. Base stations transmit to mobile units on one frequency (f1) and mobile units transmit to the base station on another frequency (f2). You'll hear more and at a greater distance by monitoring the base-station frequency.

Antennas. If you install a scanner in your car, your range depends greatly on the effectiveness of its antenna. For a single-band receiver, you can use a quarter-wave whip (6 feet for 30-50 MHz, 18 inches for 150-174 MHz, 6 inches for 450-470 MHz, or 5 inches for 470-512 MHz), preferably mounted in the center of the metal car roof which serves as the ground plane. Since a 6-

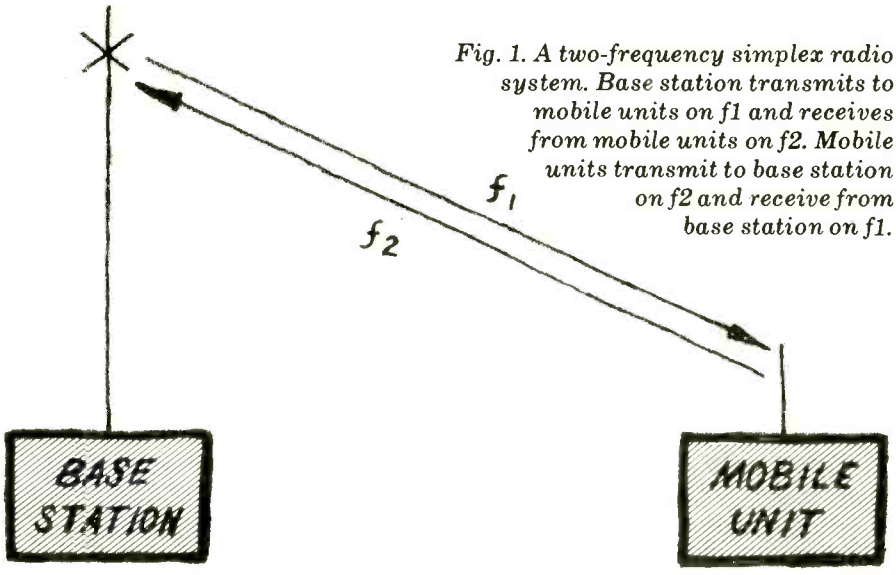


Fig. 1. A two-frequency simplex radio system. Base station transmits to mobile units on f1 and receives from mobile units on f2. Mobile units transmit to base station on f2 and receive from base station on f1.

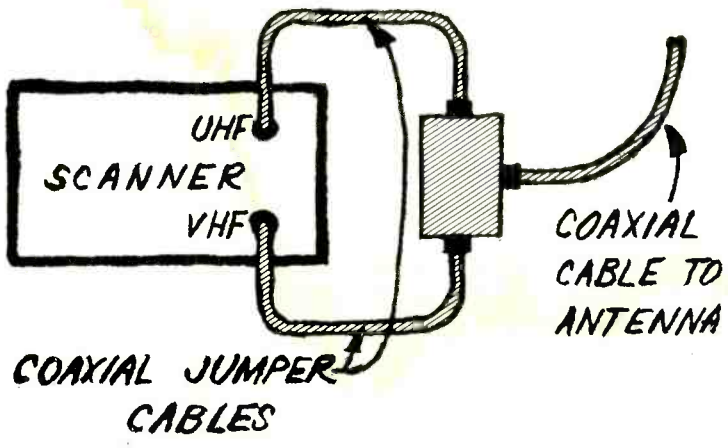


Fig. 2. Splitter permits use of one multi-band antenna with scanner having separate VHF and UHF antenna jacks.

foot (30-50 MHz) whip is too tall for car-top mounting, it can be mounted on the fender, cowl, or bumper. Or a shorter loaded trunk-lid mount antenna can be used, CB style. For more range in the 450-470 MHz or 470-512 MHz band, a gain-type antenna, mounted on the roof or trunk lid, can be used.

At a fixed location, you may get satisfactory results when using the plug-in antenna usually furnished with a scanner, provided you are fairly close to the stations to be monitored or you are located on a hill top. In some cases, you will need an outdoor antenna, mounted as high above the ground as possible.

For use with a single-band or multi-band scanner, you have a choice of wideband antennas for both mobile and fixed applications. There are multi-band ground-plane antennas as well as antennas that can be used at fixed locations for receiving on all four of the land-mobile bands.

A single-band receiver has only one antenna jack, usually one that mates with a Motorola-type auto radio antenna plug. A low-high VHF scanner usually has one similar antenna jack through which signals from both bands are fed in. A multi-band receiver usually has separate antenna jacks for VHF and UHF.

When separate VHF and UHF antenna jacks are provided, you can use a single multi-band antenna and a splitter, connected as shown in Fig. 2, or you can use separate antennas for VHF and UHF.

At fixed locations, antenna transmission line losses can become significant, particularly in the UHF and UHF-T bands. To limit loss to 3 dB (10% signal voltage loss) when using RG-58 coaxial cable, you can use 100 feet at 50 MHz, 50 feet at 160 MHz, or 25 feet at 460 MHz. If you need a 50-foot down-lead from a roof antenna, RG-58 will be OK for VHF. But at UHF, the loss would be about 6.5 dB (53% signal voltage loss). On the other hand, if you use the more expensive RG-8 coax, the loss will be within the 3 dB range.

Antenna height is also important. Increasing antenna elevation 3.75 times causes a 10 dB gain (320% signal voltage increase) in signal level. For example, if the plug-in antenna of your scanner is 10 feet above the ground, an outdoor antenna 50 feet above the ground will be at least 10 dB better.

If you use a unity-gain antenna at 48 MHz, the level of the signal at the receiver input (in microvolts) should be approximately the same as the field intensity (in microvolts-per-meter) at the antenna, not allowing for coax loss. At 30 MHz, a unity gain antenna will deliver more microvolts to the receiver input than the microvolts-per-meter intensity at the antenna. At frequencies above 48 MHz, the reverse is true because of the smaller capture area at the antenna. To get a 1-microvolt UHF signal to the receiver input when coax loss is 6 dB (50% signal voltage loss), the field intensity at the antenna must be on the order of 20 microvolts-per-meter. To partially offset loss, you can use a gain-type antenna with a larger capture area.

Range is shorter at UHF because of the antenna factor and because the very short waves are more easily absorbed by vegetation. At the same time, these waves are more readily reflected by solid objects, allowing them to penetrate areas where longer waves won't reach.

Unless you have a very high antenna, don't count on hearing mobile units anywhere nearly as far as base stations with tall antennas and, generally, more powerful transmitters.

Most scanner receivers have a rated sensitivity of better than 1 microvolt for 20 dB quieting. When you unsquelch a scanner (rotating the squelch control counterclockwise, which in effect increases receiver sensitivity), you will hear a rushing noise that is generated within the receiver because of its high gain. When a signal is received, this noise is quieted. If it is quieted 20 dB (10 times drop in noise voltage at the speaker) by a 1-microvolt signal, the receiver's sensitivity is said to be 1 microvolt.

This degree of sensitivity cannot be expected across the band (s). A typical receiver is rated as having maximum sensitivity at any frequency between 37 MHz and 43 MHz (±3 MHz of 40 MHz), 149 MHz and 157 MHz (±4 MHz of 153 MHz), and 455 MHz and 465 MHz (±5 MHz of 460 MHz). At frequencies beyond these limits, sensitivity will be less.

A typical scanner employs a double-conversion superheterodyne circuit with a 10.7 MHz first i.f. (intermediate frequency) and a 455-kHz second i.f. for low-high UHF reception. Some multi-band scanners employ a triple-conversion circuit for UHF reception. The UHF signal is down-converted to 44 MHz, then to 10.7 MHz, and finally to 455 kHz. Selectivity is usually obtained through the use of 10.7-MHz and 455-kHz ceramic or crystal-lattice filters. Typically, selectivity is rated at 50 dB at +25 kHz and −25 kHz of the selected channel frequency.

In a dual-band or multi-band scanner, there is a separate front end (r.f. amplifier, mixer) for each band because it is not feasible to design a single front end to cover from 30 to 512 MHz. It probably could be done, but not at reasonable cost.

Crystals are seldom interchangeable among different brands of scanners. When ordering crystals, specify the make and model of scanner as well as the receiving frequency (which is not the same as the channel frequency). The owner's manual usually gives the formula for determining crystal frequency. Do consider the type of scanner that doesn't require changing crystals to obtain different frequencies. They're more costly, but offer a lot more fun and convenience.

Once you catch the local action on PSB scanners, you'll find that you're days ahead of the newspapers and often know more about what's happening in your area than anyone else. ◇

POLICE & FIRE Monitor Receivers

ANTENNA SPECIALISTS

Mobile Monitor Antennas

All antennas are of stainless-steel construction and come with coaxial cable.

MON-S10. 25-50 MHz and 150-174 MHz frequency range; center-loaded; cowl-mount; 5-ft coax $36.95

MON-R21. 450-470 MHz frequency range; base-loaded; trunk-lid mount $27.50

MON-R16. 130-174 MHz frequency range; base-loaded; trunk-lid mount; 17-ft coax $26.50

MON-32. Tri-band; center-loaded; 21-in max element length; trunk-lid mount; 17-ft coax $22.95

MON-33. ¾-in hole; tri-band; center-loaded; roof-top-mount $22.95

MON-60. Tri-band; center-loaded; hatchback or trunk-groove mount; 17-ft coax $22.95

MON-13. 25-50 MHz and 150-174 MHz frequency range; center-loaded; trunk-lid mount; 17-ft coax $21.95

MON-R6. 25-50 MHz and 150-174 MHz frequency range; center-loaded; cowl-mount; 15-ft coax $19.95

MON-9. 130-174 MHz and 450-512 frequency range; full-size whip; magnetic-mount; 12-ft coax $17.95

MON-2. 450-470 MHz frequency range; full-size whip; 26-in max element length; trunk-lid mount; 15-ft coax $16.95

MON-R12. 25-50 MHz and 150-174 MHz frequency range; center-loaded; gutter-mount; 10-ft coax $15.95

MON-30. 130-174 MHz and 450-470 frequency range; gutter-mount; 10-ft coax $11.50

MON-1. ⅜-in hole; 130-174 MHz frequency range; full-size whip; 26-in max element length; 15-ft coax $9.95

Monitor Base Antennas

All antennas are of stainless-steel construction.

MON-R20. 450-470 MHz frequency range; 2-elements; 30-in max element length; vertical polarization; loading coil $28.95

MON-31. Tri-band; 1-element; 30-in max element length; vertical polarization; loading coil $26.50

MON-R17. 130-174 MHz frequency range; 1-element; 48-in max element length; vertical polarization; loading coil $26.50

MON-8. Ground-plane antenna; 25-50 MHz and 150-174 MHz frequency range; 1-element; 85-in max element length; base and center-loaded; d.c. ground. $25.95

MON-7. 150-174 MHz frequency range; telescopic whip; center-loaded $16.95

MON-4. Ground-plane antenna; 25-50 MHz frequency range; 1-element; 109-in max element length $15.95

MON-3. Ground-plane antenna; 150-512 MHz frequency range; 1-element; 26-in max element length $10.95

AVANTI

Mobile Monitor Antennas

Designed to improve reception of mobile monitors; covers 25-50 MHz, 140-175 MHz, and VHF; ABS coil housing; stainless-steel whip; 32" long; 17-ft coax; connector.

AV-610. With AV-503 snap mount $21.95

AV-608. With AV-508 trunk mount $22.95

AV-606. With AV-506 mount $18.95

AV-604. With ⅜"-24 thread adapter for common mounts; no cable or connector provided $14.95

Ramrod AV-160

All purpose, half-wave antenna; fully adjustable from 27 to 170 MHz for coverage of CB, business radio, SW, monitor, TV-FM, CD, ham, aircraft, marine bands; imp. 50 or 72 ohms; will handle up to 1000 W; heavy-duty aircraft-aluminum tubing. $20.50

Tracer AV-602 Antenna

For use with UHF-band monitors; aircraft grade seamless aluminum tubing $14.95

AV-601 Interceptor. For coverage of 25-50 MHz, 140-175 MHz bands $29.95

CHANNEL MASTER

CS-6794 4-Band Scanner/Monitor

Automatically scans 10 crystal-controlled channels, VHF low-band 30-50 MHz, UHF high-band 150-174 MHz, UHF Band I 450-470 MHz, or UHF Band II 470-512 MHz; individual channel bypass pushbutton switches; 12-volt negative ground; on-off volume control; automatic or manual scan switch; squelch control; individual channel indicator lights; comes with two telescoping antennas, one for UHF and one for VHF; car mounting bracket; 12-volt d.c. power cord and 117-volt a.c. power cord; 9¼"D × 7¾" W × 3"H $169.95

CS-6258 Hand-Held Scanner

VHF 4-channel high-band scanner; automatic switching; crystal-controlled; flexible rubber antenna; automatic carrier delay; bypass channel switch; automatic/manual channel selector; squelch control; on/off volume control; a.c. adapter jack; earphone jack; charger jack; belt clip; 300 mW audio output; 150-170 MHz frequency range; r.f. bandwidth 10 MHz; sensitivity 0.5 μV for 20 dB quieting; 0.3 μV minimum squelch; ±7 MHz modulation acceptance; 6"H × 2¾"W × 1½"D $109.95

CS-6790. Same except VHF high or low bands; frequency range: high 148-174 MHz, low 30-50 MHz; bandwidth: high 10 MHz, low 8 MHz $129.95

COURIER

Cop-Scan Monitor/Scanner

Four-channel portable scanning monitor; has 2 sec. delay; has volume/squelch control; channel 1 bypass; manual/auto scan; dual-conversion superhet with high frequency crystal filter; ceramic i.f. filter; comes with flexible antenna and earphone; operates from four "A" cells or optional NiCad battery pack; optional accessories include battery charger and power supply, automobile adapter power supply and charger.

VHF/HIGH. 146-175 MHz. $119.95

VHF-LOW. 30-50 MHz. $119.95

UHF/LOW. 450-470 MHz. $125.95

VHF/HIGH-LOW. 145-175 MHz; 30-50 MHz. $134.95

UHF/HIGH. 475-512 MHz. $129.95

Cop-Scan Mobile Scanner

Eight channel, dual-band mobile scanner; individual channel scan bypass switches; LED indicators; manual/automatic channel selection; scan rate 9 cycles/sec with 2 sec. delay; audio power output 2 W; black and brushed chrome housing; comes with d.c. power cord & all mounting hardware. 6¾" D × 5" W × 1½" H.

M8-HL. 146-175 MHz, 30-50 MHz. $114.95

M8-HU. 146-175 MHz; 450-475 MHz. $149.95

M8-HUH. 146-175 MHz; 475-512 MHz. $149.95

PSK-1. Power supply kit; a.c. power adapter; multi-band plug-in adjustable reflex antenna; tilt-up stand to adapt M8 series to base-station use. ..... $15.95.

SCMA-1 Mobile Adapter

Adapts 4-channel models to mobile operation; amplifies audio to 2.5 W; built-in speaker; external antenna connector. $34.95

ELECTRA

Bearcat 101 Scanner/Monitor

Five-band, synthesized scanning monitor; covers both low- and high-VHF bands, both UHF bands, 146-148 MHz ham bands, UHF frequencies from 416-450 MHz; can monitor 16 frequencies at a time; LED channel monitor lights; individual lock-out switch; reprogrammable; selective scan delay; six-pole quartz-crystal filter; scan rate 20 ch/sec; audio output 3 W rms; comes with telescoping antenna, 117-V, 60-Hz a.c.; 9" W × 3⅝" H × 7¼" D . $349.95

Optional mobile accessory package available

Bearcat IV Scanner/Monitor

Four-band coverage, low- and high-VHF, UHF (450-470 MHz), plus "T" band (470-512 MHz); scan rate 25 ch/sec; LED channel monitor lights; 2.5 W audio output; six-pole quartz-crystal filter; single-lever function switch; external speaker/antenna/power jacks; front-panel squelch control; 8-channel lock-out switches; comes with telescoping antenna; 117-V, 60 Hz a.c. or 13.8-V d.c.; 9" W × 3⅝" H × 6⅛" D $179.95

Crystals (each) $5.00

Bearcat 8 Scanner/Monitor

Four-band, 8-channel coverage; frequency range

33-48 MHz, 146-174 MHz, 450-470 MHz, 470-512 MHz; electronically switched antenna; LED channel indicators; 20 ch/sec automatic scanning; single manual/scanner switch; quartz crystal filter; lockout switches; front-mounted speaker; sensitivity 0.6 μV for 20 dB S/N on U & T bands; audio output 2 W rms; 117-V a.c., 10 W; 9" D × 7" W × 3½" H $159.95

Crystals (each) $5.00

Bearcat III Scanner/Monitor

Features interchangeable plug-in modules to permit band changes; 25 ch/sec scan rate; 2.5 W rms audio power; quartz-crystal filter; single-lever function switch; LED channel indicators; front-panel squelch control; 8-channel lock-out switches; 3" × 5" front-mounted speaker; 9" W × 3⅝" H × 6⅛" D.

BC3-L. VHF low (30-50 MHz) $139.95

BC3-H. VHF high (148-174 MHz) $139.95

BC3-U. UHF (450-470 MHz); $139.95

BC3-T. "T" (470-512 MHz) $139.95

BC3-L/H. VHF low/high $159.95

BC3-L/U. Low/UHF $159.95

BC3-H/U. High/UHF $159.95
BC3-H/T. High/T $159.95
BC3-L/T. Low/T $159.95
Replacement modules (specify band) $24.95
Crystals (each) $5.00

Bearcat Hand-Held Portable

Covers either VHF low/high or UHF (450-470 MHz); individual channel lock-out switches; 8 ch/sec scanning rate; 250 mW rms audio power; single-lever function switch; comes with telescoping antenna, belt clips; jacks for earphone, external antenna, a.c. adapter, battery charger (all optional accessories); 6 V d.c. (4 "AA" cells) operation; 6¼" H × 2¾" W × 1½" D.
SP-L/H. VHF low/high $129.95
SP-U. UHF $129.95
Crystals (each) $5.00

Bearcat 6 Scanner

Two-band, 6-channel coverage; frequency range 30-48 MHz, 146-174 MHz; electronically switched antenna; LED channel indicators; 20 ch/sec scanning; quartz crystal filter; lockout switches; front-mounted speaker; sensitivity 0.6 μV for 20 dB S/N; audio output 1.5 W rms; 117-V a.c., 10 W; 9" W × 8" D × 4" H $119.95
Crystals (each) $5.00

FANON

Scanfare 8-Channel

Dual-band mobile scanner; full intermix, manual or automatic channel selector; individual channel scan bypass switches; dual-conversion superhet; h.f. crystal filter; ceramic i.f. filter; scan rate 9 cycles/sec.; 2-sec. delay; audio power output 2 W; LED indicators; 5" W × 1½" H × 6¾" D.
M8-HL. Hi/Low VHF (146-175 & 30-50 MHz). $144.95
M8-HU. Hi VHF/UHF (146-175 & 450-475 MHz). $149.95
M8-HUH. Hi VHF/Hi UHF (146-175 & 475-512 MHz). $149.95
PSK-1. Power supply kit; a.c. power adapter; multi-band plug-in antenna: tilt-up stand for base-station use. $15.95

Scanfare Monitor/Scanner

Four-channel portable monitor/scanner; dual-conversion superhet receiver; high-frequency crystal filter; 2 sec. delay; features LED display; manual/auto scan; channel 1 bypass; volume & squelch controls; comes with flexible antenna and plug-in earphone; optional accessories include rechargeable NiCad batteries; power supply/charger; cigarette lighter power supply/charger.
VHF/HIGH. 146-175 MHz. $129.95
VHF/LOW. 30-50 MHz. $139.95
UHF/LOW. 450-470 MHz. $154.95
VHF/HIGH-LOW. 145-175 MHz; 30-50 MHz. ..... $134.95.
UHF/HIGH. 475-512 MHz. $129.95

GEMTRONICS

"Scanmaster 12" Scanner

Covers low VHF (30-50 MHz), high VHF (150-174 MHz), and UHF (450-470 MHz); sensitivity 0.5 μV for 20 dB quieting; squelch sensitivity 0.5 μV; audio output 1.7 W; power consumption 5.5 W d.c., 11 W a.c.; solid-state construction; priority channel capability; comes with mounting bracket, a.c./d.c. power cord, and aux. indoor antenna; 9½"D × 7⅞"W × 2¾"H $229.95

"Scanmaster 8" Scanner

Covers low VHF (35-45 MHz), and high VHF (150-160 MHz); sensitivity 0.5-0.7 μV for 20 dB quieting; squelch sensitivity 0.3-0.5 μV; audio output 1.5 W; power consumption 10 W d.c., 15 W a.c.; delay switch to permit both sides of conversation to be heard; comes with mounting bracket, a.c./d.c. power cord, and built-in swivel antenna; 8¾"D × 6¾"W × 2¼"H $169.95

GENERAL ELECTRIC

7-2995 "Searcher"

Covers AM, FM, and 150-174 MHz PBS bands; slide-rule vernier tuning for FM-AM; individual channel controls for tuning four separate PSB frequencies; manual/scan control; bypass select switches; separate PSB tuning meter; 4" speaker; swivel telescopic whip for FM and PSB, built-in ferrite rod for AM; operates on six "D" cells or 117-V, 60-Hz a.c.; earphone jack; battery check button; 13¾" W × 9" H × 11" D $150.00

7-2985 "Mobile 1 Searcher"

Hand-held, tunable scanning radio with a.c. converter; scans four Hi-PSB channels; LED's show scan action; bypass switch on channel 4 allows monitoring of continuous broadcasts (such as weather) $69.95

GLOBE

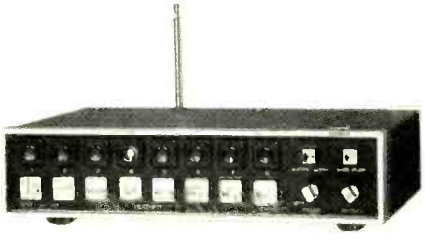
18-9700 Two-Band Scanner

Covers both hi-band (144-174 MHz) and lo-band (30-50 MHz); 16-channel capacity (two 8 low band, 8 high band or any combination of two); 3-way scanning switch (automatic, manual, or delay setting); selector button for instant channel selection during manual scanning; dual superhet receiver; squelch control; LED channel indicators; comes with a.c.-d.c. power cords, mounting bracket, antenna, and hardware but less crystals; audio output 3 W at 10% dist., 5 W max.; 117-V a.c./13.8 V d.c. operation; 7¼" D × 6¼" W × 2⅜" H $190.00

HEATH

GR-1131 Hi-Band VHF Scanning Monitor

Covers any 8-MHz segment of 146-174 MHz VHF high band; crystal control; built-in telescoping antenna; external antenna provision; volume & squelch controls; lighted channel indicators; automatic or manual channel selection; priority channel feature checks priority channel every 4 seconds even when locked on another channel, override if activity on priority channel; 4-pole crystal filter; built-in speaker; sensitivity 0.5 μV for 12 dB SINAD; scan rate 16 ch per sec.; audio output 1 W a.c., 2 W d.c. at 10% THD; a.c. or 12-V d.c. mobile operation; walnut-grained metal case; 11 1/16" W × 8½" D × 3 3/16" H; less crystals. mail order kit $89.95
MR-1134. Marine scanning monitor similar to GR-1131 with blue and white marine styling; splash-proof metal case. mail order kit $99.95
GRA-1131-1. Mobile mounting bracket $3.95
GRA-1100-2. 8-pole crystal filter for improved selectivity in crowded signal areas $9.95



HUSTLER

Discone-DCX Monitor Antenna

Base station broadband design covering 40 to 700 MHz. will cover Police, Fire, Weather, Marine, FM, and Industrial channels. Vertically polarized with 55-in cone element and 20-in disc elements. $15.95
MODEL DCL. Discone antenna with 50-ft cable $23.50

Monitor-Match LY-5

Designed to be used with regular outside-mounted or windshield auto antenna; provides performance of four separate antennas; AM-FM radio reception, low-band, high-band, and UHF monitors; separate leads for VHF and UHF monitor antenna ports; no installation required; comes with all cables $8.95

HY-GAIN

Monitor Antennas

Manufacturer offers complete line of monitor antennas for both mobile and base-station applications covering low-band, VHF, UHF, as well as all three bands. Mobile antennas are available with roof-mount, trunk-lip mount or magnetic-mount in all four types. All use 17-7ph stainless-steel whips, Cyclolac plastic, and chrome-plated brass base fittings. Prices range from $9.95-$26.95. Base units come in several configurations including ground planes, yagis, colinears, and receiver-mounted whips. Prices range from ..... $2.95-$22.95

Hy-Scan 10

Ten-channel scanner; operates from external d.c. or internal battery and a.c. (with optional converter); flip-top feature for access to plug-in crystals; individual lockouts for each channel; automatic/manual scan switch; jacks for earphone & external antenna; jerk-and-run style mount.
618L. 30-50 MHz $139.95
618H. 150-170 MHz $139.95
618U. 450-470 MHz $139.95
618LHU. Tri-band $169.95

Hy-Scan 4

Individual channel lockouts; continuous volume & squelch thumbwheel controls; external antenna jack; automatic/manual scan switch; operates from 4 "AA" cells; uses standard 10.7-MHz scanner crystals.
624G. 30-50 MHz $129.95
625G. 150-170 MHz $129.95
626G. 450-470 MHz $129.95

LAFAYETTE

Monitorscan 4B-10 Scanner

Five-band, 10-channel scanner; covers 30-50, 144-148, 148-174, 450-470, 470-512 MHz including police, fire, transportation, 2-meter amateur bands; switchable scan delay permits reception of full message after pause; self-tuning scans entire frequency range automatically; fast-scanning; dual-conversion superhet; 10 front-panel LED's provide visual scan of monitored station; bypass switches; auto/manual switch; external speaker & tape recorder jacks; u.h.f. & v.h.f. antennas; 117-V a.c. or 12-V d.c. operation; crystals not included; 8½" × 8¼" × 2¾" $169.95
Crystal certificates (one for each frequency to be monitored) $4.95

Monitorscan 5B-8 Scanner

Five-band, 8-channel scanner; covers 30-50, 144-148, 148-174, 450-470, 470-512 MHz including police, fire, transportation, Civil Defense, U.S. Weather, local government, industrial, 2-meter

amateur; other specs same as 4B-10; variable squelch; comes with antenna, external speaker, headphone & external antenna jack; 117-V a.c. operation; comes without crystals; 9½"W × 7"D × 3¾"H $169.95
Crystal certificates (one for each frequency to be monitored) $4.95

Monitorscan DB-8 Scanner

Two-band, 8-channel scanner; covers 30-50 and 150-170 MHz; police/public service, U.S. Weather; dual-conversion superhet; 1 μV sensitivity on both bands; switchable automatic scan delay; built-in whip antenna; tape recorder & external speaker jacks; volume & squelch controls; front-panel lockout buttons; regulated power supply for 117 V a.c. and 12-V d.c. negative ground; crystals not included; 8½"D × 8¼"W × 2¾"H $139.95
Crystal certificates (one for each frequency to be monitored) $4.95

MIDLAND

13-919 Scanner/Monitor

Dual-band, four-channel hand-held covers 150-170 MHz (VHF Hi) and 30-50 MHz (VHF Lo) bands; scans 9 ch/sec. or manually; dual-conversion superhet receiver with variable squelch; Channel 1 bypass switch; LED scan indicators; powered by 4 "AA" cells or external adapter; jacks for a.c. adapter, battery charger, external antenna, speaker/earphone; includes telescoping & wire antennas, holster carrying case; accepts optional coil-loaded rubber antenna. $149.90
13-921. Same except 150-170 MHz; 450-470 MHz UHF bands. $159.95

13-904 Scanner/Monitor

Four-channel, hand-held scanner-monitor; scans 12 ch/sec; dual-conversion superhet receiver; sensitivity 0.5 μV for 20 dB quieting; adjacent channel rejection 60 dB; powered by four penlight cells or "AA" NiCad cells; comes with telescoping antenna; external antenna and power/battery charger jacks; automatic or manual scanning; Channel 1 bypass switch; holster-style case with belt clip; 5⅜"H × 2¾"W × 1⅜"D; weight 10 ounces, less battery & case. VHF/High (150-170 MHz). $124.95
13-903B. Same except varactor-tuned UHF (450-470 MHz). $154.95

PANASONIC

RF-1005 "Tech 300"

FM-AM/VHF-Public Service Band-High portable; covers police, fire, continuous weather reports; vertical slide-rule tuning dial; squelch control on PBS; two-step tone control; 3½" PM dynamic speaker; a.c./battery operation; jacks for earphone/external speaker, a.c. power in; comes with four "AA" cells, power cord, and earphone $49.95

RF-1080 "Tech 500"

FM/AM/PSB VHF high 3-band portable radio operates on a.c. or d.c. (4 "C" batteries included); a.f.c. on FM; dial light; tape tuning dial; battery condition/tuning meter; squelch and continuous tone controls; 4" PM dynamic speaker. $59.95

RF-940 "Tech 700"

Four-band a.c./battery portable with VHF high & low band coverage of police, fire, and continuous weather reports; has battery/tuning meter; a.f.c. switch on FM; lighted vertical slide-rule tuning dial; 4" dynamic speaker; loudness control; continuous tone control; squelch control; jacks for earphone/external speaker, MPX out, external power, comes with earphone, four "C" cells. $99.95

RF-888 "Tech 800"

FM/AM and VHF high band PSB coverage; 6½" speaker; mike mixing permits use as p.a. system and guitar amplifier; 2-hour timer switch; a.f.c. switch; VU/battery/tuning meter; squelch control; lighted tape tuning dial; offers a.c./battery/car-boat operation with optional car/boat cord; features loudness control, separate bass & treble controls, power switch with jacks for external speaker/earphone, record output, MPX output, mike, mike record output, external power; comes with four "D" cells, earphone, mike, shoulder strap, carrying case for mike & a.c. cord. $99.95

RF-1115 "Tech 900"

Covers UHF/VHF-Public Service band (high for police, fire, continuous weather, and other communications); squelch control on PBS; tuning/battery meter indicates signal and battery strength; lighted tape tuning dial with dial light; tuning knob with extendible spinning lever; a.f.c. switch on FM; continuous tone control; loudness switch; separate power switch; 4" PM dynamic speaker; loop antenna for UHF1 jacks for ext. speaker/earphone, rec. out, a.c. power in; comes with four C cells, a.c. power cord, earphone $99.95

RF-1150 "Tech 1000"

Six-band portable with AM/FM/MB/SW2/CB coverage; features fine tuning with gyro antenna for AM/MB and whip for other bands; AFC/DX-Local switch; b.f.o. switch for SSB & CW; 120-minute on/off timer; tape deck and dial light button; detachable shoulder strap. $129.95

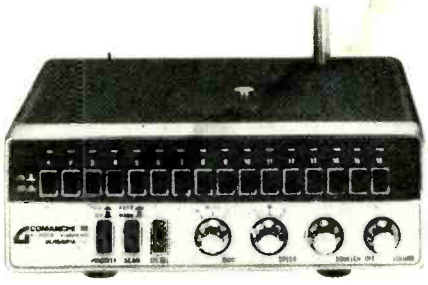
RF-1170 "Tech 1100"

Five-band a.c./battery portable with UHF/VHF high and VHF low PSB coverage of police, fire, continuous weather reports, and TV audio, has 5" speaker; battery/tuning meter; band selector switch and indicator; squelch control on VHF and UHF; a.f.c. switch on FM; directional AM antenna; telescoping FM/VHF antenna; separate UHF antenna; features separate bass & treble controls; separate power switch; loudness control; lighted tape tuning dials; 2-hour timer turns unit on and off; jacks for earphone/ext. speaker, MPX out, record output, external power; comes with detachable/adjustable shoulder strap, earphone, a.c. power cord, six C cells. $169.95

PEARCE-SIMPSON

Comanche 16 FM Scanner

VHF-FM Hi-Band/Low-Band scanner. 117 V a.c. and 12 V d.c. input; dual-conversion receiver with



ceramic filter; scans 16 crystal-controlled channels either automatically or manually; can handle as many as 16 Hi-Band channels and 8 Low-Band channels; has bypass capability on all channels, one priority channel, and adjustable scanning rate $199.95

Cherokee + 8 FM Scanner

VHF-FM Hi-Band/Low-Band scanner. 117 V a.c. and 13 V d.c. input; dual-conversion receiver with ceramic filter; has 16 crystal sockets, 8 Hi-Band, 8 Low-Band, and bypass; has automatic or manual scanning, adjustable scanning rate, and priority channel $179.95

Cheyenne 8 FM Scanner

VHF-FM Hi-Band scanner. 117 V a.c. or 12 V d.c. power supply; dual-conversion receiver with ceramic filter; scans 8 crystal-controlled channels automatically or manually; has one priority channel; bypass capability on all channels and adjustable scanning rate $149.95

RADIO SHACK

Patrolman PRO-16A

Automatically scans 16 crystal-controlled channels on VHF high, VHF low, or UHF in any combination of all three bands; variable scanning speed (10 to 20 ch/sec); 2-sec scan delay; delay lock-out button; individual channel lockout buttons; built-in skipper circuit; priority button; dual-conversion VHF, triple-conversion UHF plus ceramic filters for reduction of adjacent-channel interference; a.f.c. on UHF; adjustable squelch; features manual channel selector button, jacks for tape recording and headphone listening; separate UHF and VHF antenna inputs; built-in speaker; provision for external speaker; sensitivity 1.0 μV for 20 dB quieting; comes with mobile mounting bracket; power cords for 12-V d.c. negative ground or 120-V a.c.; requires up to 16 crystals; 3¼" × 9½" × 10". 20-165 ..... $229.95
PRO-14. Same as above but 10 channels; does not include delay lockout, priority, or variable scan rate; 2⅞" × 7½" 10".20-159 ..... $189.95
PRO-40. 8-channel mobile UHF/VHF-Hi/Lo scanner; dual-conversion circuitry on all bands with single antenna input; 12-V d.c. neg. ground only; 7" × 5¼" × 1½". 20-140 ..... $139.95

PRO-77A Dual Band Scanner

Automatic scanning of 8-crystal-controlled channels; covers 30-50 and 148-174 MHz bands; chan-

nel lock-out, skipper, 2-second scan-delay circuits; speed 10 ch/sec; a.c. or 12-volt d.c. negative-ground operation; optional manual channel selection; 3" × 7½" × 9½". 20-172 ..... $149.95

PRO-7B Monitor Receiver

Solid-state scanning receiver for 148-174 MHz; automatic or manual selection of up to 8 channels; lighted channel indicators; crystal filter; IC/FET circuitry; built-in speaker, d.c. gated squelch; 2-second scan delay; channel lock-out; 117-volt a.c. or 12-volt d.c. 20-173 ..... $119.95

PRO-6 Pocket Scanner

Scans four crystal-controlled VHF high/low channels automatically; four lock-out switches; ceramic filters; dual-conversion circuitry; variable squelch and volume; LED channel indicator lights; built-in speaker and antenna; jacks for earphone; external antenna, external power and charger; powered by four "AA" cells (included); rechargeable nickel cadmium penlight batteries optional; requires up to four crystals; 7½" × 2¾" × 1¼". 20-171 ..... $119.95
PRO-5. Same except for UHF band. 20-169 ..... $119.95

PRO-4A Pocket-Scan

Battery-operated; covers 148-174 MHz; manual or automatic channel selection; sensitivity 0.75 μV for 20 dB quieting; speed 10 ch/sec; adjustable squelch; built-in wire loop antenna and dynamic speaker; uses one 9-volt battery or 12-volt negative-ground source; 5½" × 2¾" × 1¼". 20-174 ... $99.95
270-1532. D.c. auto adapter cable. $7.95
20-189. A.c. adapter/charger. $6.95

RCA

16S400 VHF/UHF "Scan-Aire" Scanner

Ten-channel, 4-band scanner for home or mobile use; covers VHF/Lo, VHF/Hi, UHF, UHF/T; varactor tuned with adjustable scan delay and scan speed control; crystal-controlled with automatic scan circuit; can be programmed for any band on each channel position; separate lock-out switch for

each channel; squelch control; volume control; automatic/manual scan controls; built-in speaker; two telescoping antennas; LED channel indicators; comes with two power cables: 120 V a.c. and 12 V d.c.; mounting bracket for underdash installation in vehicles; 8½" D × 7¾" W × 2⅝" D. Crystals not included $184.95

16S300 VHF/UHF "Scan-Aire" Scanner

Eight-channel, 3-band scanner for home or mobile use; covers VHF/Lo, VHF/Hi, UHF; adjustable scan delay; other specifications same as 16S400 ..... $166.50

16S200 "Pockette" Scanning Monitor

Four-channel, 2-band scanner; varactor tuned; automatic scan circuitry; lock-in feature; IC's; separate lock-out switch for each channel; squelch control; volume control; automatic/manual scan control; built-in speaker; telescoping antennas; LED channel indicators; operates on four "AA" batteries or from 120 V a.c. with adapter; 6 5/16" H × 2¾" W × 1⅝" D; weight 14 oz; crystals not included . $133.50

16S100. Same as 16S200 except covers VHF/Lo

and VHF/Hi $129.50

REGENCY

ACT-W 10 Monitor/Scanner

Covers all public service bands and two amateur bands; volume and squelch controls; built-in whip antenna; when used with accessory frequency synthesizer, up to 5200 different frequencies can be monitored without crystals; rated sensitivity is 0.5 μV (30-50 MHz), 0.6 μV (146-174 MHz), 0.7 μV (440-512 MHz); audio output 2 W at 8 ohms. 10" × 8½" × 4"; requires 105-130 V a.c. 60 Hz, or 11-15 V d.c. at 18 W max $329.00

DFS-5K. Accessory frequency synthesizer. $199.00

ACT-R 20/6 Monitor/Scanner

Provides 20-channel capacity on six public service bands; squelch, volume, scan/manual controls; rated sensitivity 0.5 μV (30-38, 38-50, 148-160, 160-174 MHz), 0.7 μV (450-480, 480-512 MHz); scan rate 20 channels/sec.; 2 W audio output at 8 ohms. 11" × 9⅞" × 3¼"; requires 105-130 V a.c. 60 Hz, or 11-15 V d.c. at 18 W max. $219.00

ACT-R-10H/L/U Scanner

Three-band, 10-channel monitor for high band (148-174 MHz), low band (30-50 MHz), and UHF (450-470 MHz); push-button program control; 117-volt a.c. or 12-volt d.c. operation; comes with a.c. and d.c. cords and mounting bracket; crystals $4.95 each. $169.00

ACT-E-8H Scanner

8-channel scanner for high band; push-button control; vinyl-covered cabinet; telescopic antenna; remote speaker and external antenna terminals; 117-volt a.c. operation; optional 12-volt d.c. cord available; crystals $4.95 each. $139.00

ACT-E-8L. Same except for low band. $139.00

ACT-E-8H/L. Dual-band version. $159.00

ACT-R-106 Five-Band Scanner

10-channel scanner; covers any combination of VHF hi, VHF low, 2-m amateur, UHF, plus extended UHF frequencies; single antenna is electrically optimized to cover all bands; comes with a.c. and d.c. power cords, detachable mobile mounting bracket. $149.00

TME-8A Scanner

Monitors 8 aircraft band channels with automatic tri-speed scan action; push-button program control; a.c. power cord; detachable antenna; built-in 3½" speaker; covers 118-136 MHz AM; crystals $6.50 each. $149.00

TMR-8A Scanner

8-channel, push-button program controlled automatic signal-search aircraft band receiver (118-136 MHz AM); stops to cover active transmissions then resumes search; supplied with a.c.-d.c. power cords; mobile mounting bracket; detachable telescopic antenna, built-in 4" speaker; (Model TMR-1A single channel model $119.00). $149.00

TMR-2MW Marine Monitor

Dual-channel, crystal-controlled marine receiver for monitoring channel 16, plus push-button access to weather information; tone decoding facility on weather channel; operates on a.c. or d.c.; supplied with a.c. power cord; mobile mounting bracket, detachable antenna, built-in 4" speaker; crystals included. $124.00

TMR-12 Monitor

12-channel monitor for high band (148-174 MHz-Model TMR-12H) or low band (30-50 MHz-Model TMR-12L); channels selected by 12-position switch; 117-volt a.c. or 12-volt d.c. operation; comes with a.c. and d.c. cords, mobile mounting bracket; crystals $4.95 each. $119.00

TMR-1W Monitor

Single-channel weather receiver with push-button control for instant and continuous weather information; reception within 30-40 mile radius of National Weather Service transmitter sites; a.c. or d.c. operation; has a.c. power cord, detachable antenna, and built-in 4" speaker; crystal included. $119.00

ACT-C4 H/L/U Scanner

Four channel scanner covers VHF Hi, VHF Lo, and UHF; single antenna electrically tuned; patented channel lockout feature; automatic bypass with lockout switch $99.95

SBE

Pocket Sentinel Series

Four-channel pocket scanner; receiver sensitivity 0.7 μV for 12 dB SINAD; operates from 6 V d.c. (4 "AA" or 4-AA NiCd); comes with rod antenna; 6.5" H × 2.75" W × 1.375" D.

SBE-9SM. 148-174 MHz. $119.95

SBE-10SM. 450-512 MHz. $129.95

SBE-11SM. 30-50 MHz; 148-174 MHz. $139.95

Sentinel Series Scanners

Receiver sensitivity 0.5 μV for 20 dB quieting; 0.3 μV for stop scan at band center; scan rate 10 ch sec; audio output 3-4 watts; operating voltages 13.8-volt d.c. & 117-volt a.c.; 2¼" H × 6" W × 7½" D.

SBE-1SM. Low-band (30-51 MHz), high-band (144-171 MHz); 8 channels; frequency coverage 6 MHz (low), 8 MHz (high). $179.95

SBE-2SM. 144-171 MHz frequency range; 8 channels; frequency coverage 8 MHz. $159.95

SBE-3SM. 30-51 MHz frequency range; 9 channels; 6 MHz frequency coverage. $159.95

SBE-5SM. 450-470 MHz frequency range; 8 channels; 10 MHz frequency coverage. $174.95

SBE-12SM Opti-Scan

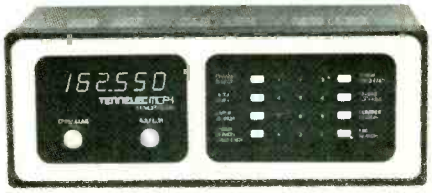
Digitally synthesized 10-channel, four-band (30-50 MHz, 150-170 MHz, 450-470 MHz, 490-510 MHz)

scanning monitor receiver; no crystals required; manual/automatic scanning; 13.8-V d.c./115 V a.c. operation; 2.625"H × 7.88"W × 10" D. $349.95

TENNELEC

Memoryscan MCP-1 Scanner

Provides unlimited search capability; features a minicomputer operating off a micro-processor; when



"Enter Search" button is pushed, unit searches 256 channels at a 10 ch/sec rate; desired channels are stored by pushing "Enter Search Frequency" button; storage capacity 16 different frequencies; total frequency coverage: 31.180-51.655 MHz, 151.180-171.655 MHz, 451.180-471.655 MHz; tuning resolution 5 kHz; adj. channel selectivity 60 dB; antenna input matched to 18" whip (supplied) on all bands; audio output 1.0 W at 10% dist.; digital frequency channel display; 110- to 120-V, 60 Hz; 10¾" W × 9¾" D × 4½" H $399.95

Memoryscan MS-2

Central control center eliminates need for channel crystals; will handle up to 16 channels for scanning and reception at any one time; push-button controls log codes into "Memory Bank" which can handle 16,000 frequencies; code book lists 4000 low, high, and UHF band frequencies most used; 9-volt transistor radio battery "holds" station selections when unit is moved from one power source to another; filter screens out station overlap; built-in 2-sec. scan delay; frequency ranges: 33-48, 146-148, 151-163, 453-460, 490-497 MHz; adjacent channel selectivity −50 dB ±25 kHz; matched for optimum response with 18" whip antenna (provided); scan rate 10 ch/sec; power requirements 105-130 V a.c. at 25 W; mobile (with MK-1 mobile power converter only) 13.8 V d.c. negative ground; 6 mA in standby mode with power switch "off;" 4½" W × 10¾" W × 9¾" D $339.95

ULTRA

308 Scanner/Monitor

8-channel scanning monitor operates in three bands VHF (lo band) 30-50 MHz, VHF (hi band) 150-170 MHz and UHF 450-512 MHz; unit is crystal controlled; has separate volume control; LED channel indicators; lock-out switch to omit unwanted channels; squelch control; 120 V a.c. or 12 V d.c. power supply neg. ground only; 2 sec scan delay; channel 1 priority; 6 dB± 10 kHz and 50 dB± 20 kHz selectivity; comes with 19-in whip antenna; 9¼" × 5⅝" × 3" $169.00

MARINE RADIOTELEPHONE COMMUNICATIONS TODAY

By RICHARD HUMPHREY

IN THE LATE '50s and early '60s, marine radio communication was getting out of hand. It was solely an American phenomenon. The number of licensees of two-way radios in the 2-3 MHz marine band was edging close to the quarter-of-a-million mark, with the bulk being pleasure boaters. France, by comparison, had less than *400* pleasure boats with marine radiotelephones aboard. Congestion and interference was the order of the day in America. On summer weekends, thousands of pleasure boaters lined up at their floating phone booths in the hopes of making a ship-to-shore telephone call sometime within the next three or four hours.

The U.S. Coast Guard was becoming increasingly irritated by pleasure boatmen using 2182 kHz, the international distress frequency, for non-distress or emergency traffic. The FCC was fretful because it had written all these beautiful rules and regulations and it seemed that days would go by before some pleasure boater would use his call letters.

In an effort to find a solution, the FCC thinking might have gone like this: let's separate local communication from medium- and long-distance communications by forcing local traffic onto the VHF/FM (156-162 MHz) marine band which had been adopted in October 1960. These frequencies are more-or-less line-of-sight, so any communication on them couldn't help but be pigeonholed in its own local backyard.

The FCC could do this by rewriting and making more forceful the existing requirements in its Rules & Regulations, which said, in effect, that the 2-3 MHz frequencies must *not* be used when 156-162 MHz VHF/FM "would provide effective communications." This provision had been in its Rules & Regulations for some 15-20 years, but few boatmen had read it.

This would mean the FCC would gain a double-barreled benefit: since pleasure boaters seldom venture farther from shore than 20-25 miles, they would be forced to use the line-of-sight VHF frequencies, while the commercial ships would mostly be using the other marine bands. In effect: a separation of local and distance traffic and commercial and non-commercial traffic with one stone.

However, since ocean-going ships also would be using the VHF/FM frequencies, the Commission decided to reserve certain frequencies for exclusively commercial traffic and others for non-commercial traffic, with the remaining channels available for both pleasure boats and commercial marine interests.

Finally, the FCC intended at-long-last to bring single sideband communications to the 2-3 MHz marine band because (a) it was just a better, more-efficient way to communicate and (b) it needed only about half the bandwidth "AM" occupied thus theoretically making more channels available.

To make these changes, the Federal Communications Commission faced some problems. First was that the U.S., like most countries in the world, was a member of the International Telecommunicational Union and couldn't come out all on its own and make these changes without presenting these ideas to the rest of the world and persuading it to agree with the proposals.

The FCC also faced a lot of local flack from the marine communications industry (confronted with the possibility of having to make two new kinds of two-way radios) and the First- and Second-Class technicians licensed by the FCC who would have to install, maintain and repair these two new types of gear.

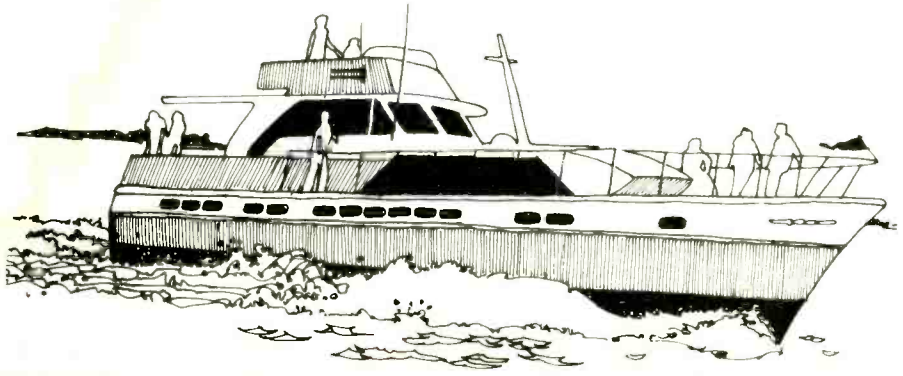
So it was a pretty mean-eyed, talk-scarred bunch of guys who took that 707 out of Washington's Dulles Airport to go to Geneva to present America's position to the ITU's World Administrative Radio Conference in autumn of 1967. Among our representatives were Daniel K. Child, dedicated Chief of the FCC's Aviation & Marine Division, and that Division's head honcho, Walter Weaver.

Obviously, Child's dedication and Weaver's know-how paid off because they returned from Geneva with even more than we had asked for. Within days, the FCC began the first extensive reorganization of marine communications in fifty years. Here's how it went:

1. The VHF/FM marine band was expanded from 18 channels (which it had been from October 1962 when it had been adapted from the already-existing 28-channel international FM band) to 39 channels. Moreover, by reducing the spacing between channels from 50 kHz to 25 kHz and the FM "swing" from ± 15 kHz to ± 5 kHz, the FCC managed to squeeze those 39 channels into the same 156-162 MHz spread the former 18 channels had occupied.

2. A five-year transition plan was introduced—January 1, 1972 to January 1, 1977—to phase out "AM" and phase in single-sideband communication in the familiar 2-3 MHz band by prohibiting first-time installations of "AM" equipment (although you could use an existing "AM" rig or even take it with you to another boat just as long as it had been licensed before January 1, 1972) and prohibiting its use *entirely* after January 1, 1977.

In addition, if you wanted a new instal-



lation of a *single sideband* transceiver after January 1, 1972 you first had to have a properly licensed VHF/FM station aboard. This was frankly aimed directly at pleasure boats. If a pleasure boater wanted 2-3 MHz communication, he'd have to buy *two* radios. It was clear that most would go for the less expensive VHF/FM gear alone and possibly fill in with 27-MHz Citizen Band radios, conversations not monitored by the U.S. Coast Guard. Some of the VHF/FM regulations became effective September 3, 1968, but the bulk became effective on March 1, 1969.

There were minor details affecting both VHF/FM and the 2-3 MHz bands, but by-and-large the reorganization was complete. On paper. We had our separation of local and distance marine communication, and separation of commercial and pleasure boat traffic (both to a degree). In effect, we had an efficient two-legged marine communication system that looked like it was going to do the job.

But you know what happens to a freshly laid stretch of sidewalk. Inside of ten minutes every kid in the neighborhood is on permanent record for the next ten or twenty years. Seems like the human spirit just can't tolerate perfection. The first thing to bust out was the new VHF/FM "Environmental" channel (FM/15; 156.75 MHz). The FCC had had great hopes for it, seeing it as broadcasting (FM/15 was a ship-receive-only channel) continuous weather information and forecasts specially aimed at mariners along with USCG signal piped through from WWV as a navigation aid.

Since the National Weather Bureau's 162.55 MHz and 162.40 MHz taped services were already well established, outside of a few months broadcasting in the USCG 7th District (Miami) on a test basis, FM/15 remains unused to this day.

The "State Control" channel (FM/17; 156.85 MHz) which, like FM/15, had been carved out of the greatly increased guard bands on either side of FM/16 when the FM was reduced from ± 15 kHz to ± 5 kHz, had better luck. Police harbor units and State marine patrols began using it as their "house" channel, even though it was a ship-to-shore authorization only (no ship-to-ship traffic). Only a few safety-minded pleasure boatmen installed this channel as a backstop to FM/16 (156.8 MHz).

FM/16 had been the "Safety & Calling" frequency in the FM band over all the world. A notation in FCC and international rules had said that "distress messages may be transmitted" on that frequency, but that was superfluous because you can transmit a distress call on any frequency in any band (Law of Survival, section 1). In the new 39-channel framework, FM/16 (156.8 MHz) had been designated the "National *Distress,* Safety & Calling" frequency. This meant that it had to be monitored during the VHF/FM stations' "hours of service" while in American waters. In the case of pleasure boats (which were voluntarily equipped) this was from the time the set was turned on until the time it was turned off. I have been aboard literally thousands of boats—both pleasure and commercial—doing maintenance and one-thing-and-another and even today I've heard only three or four FM transceivers even *tuned* to FM/16 much less monitoring it. Another one rained out for the FCC! (By-the-way, what are "American" waters? The three-mile limit?

PRESENT VHF/FM FREQUENCIES

Channel	Frequency (MHz)		Use	Communication permitted between	Notes
	Ship	Coast			
FM/6	156.300	156.300	Port Operations	Ship-Ship Ship-Coast	-
FM/7	156.350	156.350	Commercial only	"	-
FM/8	156.400	-	"	Ship-Ship	-
FM/9	156.450	156.450	"	Ship-Ship Ship-Coast	-
FM/10	156.500	156.500	"	"	-
FM/11	156.550	156.550	"	"	-
FM/12	156.600	156.600	Port Operations	"	-
FM/13	156.650	156.650	Navigational	"	1
FM/14	156.700	156.700	Port Operations	"	-
FM/15		156.750	Environmental	Coast-Ship	2
FM/16	156.800	156.800	Distress, Safety, & Calling	Ship-Ship Ship-Coast	3
FM/17	156.850	156.850	State Control	Ship-Coast	-
FM/18	156.900	156.900	Commercial only	Ship-Ship Ship-Coast	-
FM/19	156.950	156.950	Commercial only	Ship-Ship Ship-Coast	-
FM/20	157.000	161.600	Port Operations	"	-
FM/22	157.100	157.100	Non-Emergency U. S. Coast Guard	"	-
FM/24	157.200	161.800	Marine Operator	Ship-Coast	-
FM/25	157.250	161.850	"	"	-
FM/26	157.300	161.900	"	"	-
FM/27	157.350	161.950	"	"	-

FM/28	157.400	162.000	"	"	-
FM/65	156.275	156.275	Port Operations	Ship-Ship Ship-Coast	-
FM/66	156.325	156.325	"	"	-
FM/67	156.375	-	Commercial only	Ship-Ship	-
FM/68	156.425	156.425	Non-commercial only	Ship-Ship Ship-Coast	-
FM/69	156.475	156.475	"	Ship-Coast	-
FM/70	156.525	-	"	Ship-Ship	-
FM/71	156.575	156.575	Non-commercial only	Ship-Coast	-
FM/72	156.625	-	"	Ship-Ship	-
FM/73	156.675	156.675	Port Operations	Ship-Ship Ship-Coast	-
FM/74	156.725	156.725	"	"	-
FM/77	156.875	-	Commercial only	Ship-Ship	-
FM/78	156.925	156.925	Non-commercial only	Ship-Coast	-
FM/79	156.975	156.975	Commercial only	Ship-Ship Ship-Coast	-
FM/80	157.025	157.025	"	"	-
FM/84	157.225	161.825	Marine Operator	Ship-Coast	-
FM/85	157.275	161.875	"	"	-
FM/86	157.325	161.925	"	"	-
FM/87	157.375	161.975	"	"	-
FM/88	157.425	-	Commercial only	Ship-Ship	4

NOTES:

1. Restricted to exchange of navigational information pertaining to directing movements of ship.
2. For broadcast coast-to-ship of environmental information, weather, sea conditions, time signals. Largely supplanted by National Weather Service's 162.55 MHz and 162.40 MHz stations.
3. The National or "American" distress frequency. Must be monitored during ship and shore stations' hours of service.
4. Available only to commercial fishing vessels and to associated aircraft operating in conjunction with commercial fishing vessels for communication among these vessels and aircraft.

Twelve miles? 200 miles? The *assumed* 20-mile ship-to-shore range of VHF/FM?)

Beyond the fairly successful separation of commercial and pleasure boat traffic and distance- and local-communications by the economic sword of requiring *one* marinephone for VHF/FM coverage and *two* marinephones if you wanted 2-3 MHz coverage, the FCC also finalized the divorce of commercial/non-commercial traffic by setting aside 11 channels for the exclusive use of commercial vessels & traffic and 6 channels for the exclusive use of pleasure boats & traffic.

The Commission *did* flub around with FM/9 (156.45 MHz) for a while. It had been the "marina" frequency in the old 18-channel network (marinas, yacht clubs and others controlling public moorage were extended the privilege of licensing a coast station on this channel), but the privilege was not exclusive.

When the FCC enlarged the FM band, it made FM/9 a pleasure-boat-only channel. Then it discovered there were nearly 90 *commercial* users on the channel. It quickly changed the channel to a commercial/pleasure shared frequency, but forgot to step on second base in its haste and made it ship-to-ship and ship-to-shore for commercial vessels, although only ship-to-ship for pleasure boat use. This was discriminatory so they "un-discriminatoried" it and both classes may use it intership or ship-to-coast.

Unfortunately, in spite of the FCC's giving those ashore who wanted to service the marine public the privilege of licensing on no less than four channels in the non-commercial (pleasure boat) *only* frequencies, the bulk of the community didn't want to limit themselves to pleasure boats alone. There were fuel docks, businesses with docking and mooring facilities, marine supply stores, grocery stores, ship and boat yards and marine electronic shops who wanted a shot at *both* commercial and non-commercial customers. So, today, FM/9 is a communication ghetto with more licensees than all the other four "marina" channels combined.

Then the nibbling began. The "safety only" channel, FM/6 (156.3 MHz), was expanded to include on-scene communication with Coast Guard mobile units during search and rescue operations. A good and useful change. But still something lost to civilian sailors. As recompense, the FCC and the Coast Guard gave the maritime community the use of FM/22 (157.1 MHz) as a civilian-Coast Guard liaison channel (this made 40 channels now authorized in the band) for non-emergency traffic (just as 2670 kHz is used in the 2-3 MHz band).

The big Coast Guard gulp was in the major port areas (New York, San Francisco, for example) and revolved around the Navigational Channel, FM/13 (156.65 MHz). Channel 13 was restricted to the exchange of navigational information (primarily ship-to-ship; secondarily ship-to-coast) in all areas except the Great Lakes, where it could also be used for business and operational, since October 1962 when it was a part of the original 18-channel band. It remained the "Navigational" channel in the expanded 39-channel band. Then Congress passed the Bridge-to-Bridge Radiotelephone Act (effective May 1, 1971) requiring a continuous listening watch on a "designated frequency" on certain vessels when within certain waters.

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*Radiotelephone Restricted Operator Permit costs $4.00; issued for life. Application Form 753 should be sent with fee to the FCC, P.O. Box 1050, Gettysburg, PA 17325. No exam required, but applicant must be at least 14 years old.

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*Personal conversations not related to safety, boating information, and calling are not permitted on marine radiotelephone (excepting the public radio-telephone service).

*For public radio-telephone service, register with the telephone company in the area you want to be billed.

*Emergency messages, MAYDAY (grave and imminent danger requiring immediate aid), PAN (vessel or person in jeopardy, such as a man overboard), and SECURITY (navigation safety or weather warning) have precedence over ordinary communications.

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The unfortunate happenstance was that the Coast Guard laid claim to the channels on each side of FM/13 for support-communications in harbor areas for its vessel traffic control system. Since FM/13 had to be continuously guarded in these areas, all non-essential traffic had to be conducted elsewhere, namely FM/12 (156.6 MHz) and FM/14 (156.7 MHz). While pleasure boaters could monitor and use FM/13 to stay out of the way of the big boys they were, in effect, denied the use of FM/12 and FM/14. If this pruning goes on, we're liable to be right back where we started: up to our armpits in congestion and interference.

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Somehow, it seems that everyone is forgetting the name of the game: communication. With everyone chipping away at the marine bands and writing new rules and regulations, you'd almost believe they were trying to scuttle marine communication.

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2003	Safety[1]	Great Lakes only
2082.5	Safety	All areas
2142	Safety	Pacific Coast only, south of 42°N, daytime only
2203	Safety	Gulf of Mexico only
2638	Safety	All areas
2670	Safety[2]	All areas
2738	Safety	All areas except Great Lakes & Gulf of Mexico
2830	Safety	Gulf of Mexico only

All these frequencies may also be used --- with the exception of 2670 kHz --- for communication relating to the movement of vessels.

1. On St. Lawrence Seaway, St. Mary's River & Great Lakes may, under certain conditions, may be used to communicate with government & Coast Guard stations.

2. For communication with Coast Guard units only.

FM/28	157.400	162.000	"	"	-
FM/65	156.275	156.275	Port Operations	Ship-Ship Ship-Coast	-
FM/66	156.325	156.325	"	"	-
FM/67	156.375	-	Commercial only	Ship-Ship	-
FM/68	156.425	156.425	Non-commercial only	Ship-Ship Ship-Coast	-
FM/69	156.475	156.475	"	Ship-Coast	-
FM/70	156.525	-	"	Ship-Ship	-
FM/71	156.575	156.575	Non-commercial only	Ship-Coast	-
FM/72	156.625	-	"	Ship-Ship	-
FM/73	156.675	156.675	Port Operations	Ship-Ship Ship-Coast	-
FM/74	156.725	156.725	"	"	-
FM/77	156.875	-	Commercial only	Ship-Ship	-
FM/78	156.925	156.925	Non-commercial only	Ship-Coast	-
FM/79	156.975	156.975	Commercial only	Ship-Ship Ship-Coast	-
FM/80	157.025	157.025	"	"	-
FM/84	157.225	161.825	Marine Operator	Ship-Coast	-
FM/85	157.275	161.875	"	"	-
FM/86	157.325	161.925	"	"	-
FM/87	157.375	161.975	"	"	-
FM/88	157.425	-	Commercial only	Ship-Ship	4

NOTES:

1. Restricted to exchange of navigational information pertaining to directing movements of ship.
2. For broadcast coast-to-ship of environmental information, weather, sea conditions, time signals. Largely supplanted by National Weather Service's 162.55 MHz and 162.40 MHz stations.
3. The National or "American" distress frequency. Must be monitored during ship and shore stations' hours of service.
4. Available only to commercial fishing vessels and to associated aircraft operating in conjunction with commercial fishing vessels for communication among these vessels and aircraft.

Twelve miles? 200 miles? The *assumed* 20-mile ship-to-shore range of VHF/FM?)

Beyond the fairly successful separation of commercial and pleasure boat traffic and distance- and local-communications by the economic sword of requiring *one* marinephone for VHF/FM coverage and *two* marinephones if you wanted 2-3 MHz coverage, the FCC also finalized the divorce of commercial/non-commercial traffic by setting aside 11 channels for the exclusive use of commercial vessels & traffic and 6 channels for the exclusive use of pleasure boats & traffic.

The Commission *did* flub around with FM/9 (156.45 MHz) for a while. It had been the "marina" frequency in the old 18-channel network (marinas, yacht clubs and others controlling public moorage were extended the privilege of licensing a coast station on this channel), but the privilege was not exclusive.

When the FCC enlarged the FM band, it made FM/9 a pleasure-boat-only channel. Then it discovered there were nearly 90 *commercial* users on the channel. It quickly changed the channel to a commercial/pleasure shared frequency, but forgot to step on second base in its haste and made it ship-to-ship and ship-to-shore for commercial vessels, although only ship-to-ship for pleasure boat use. This was discriminatory so they "un-discriminatoried" it and both classes may use it intership or ship-to-coast.

Unfortunately, in spite of the FCC's giving those ashore who wanted to service the marine public the privilege of licensing on no less than four channels in the non-commercial (pleasure boat) *only* frequencies, the bulk of the community didn't want to limit themselves to pleasure boats alone. There were fuel docks, businesses with docking and mooring facilities, marine supply stores, grocery stores, ship and boat yards and marine electronic shops who wanted a shot at *both* commercial and non-commercial customers. So, today, FM/9 is a communication ghetto with more licensees than all the other four "marina" channels combined.

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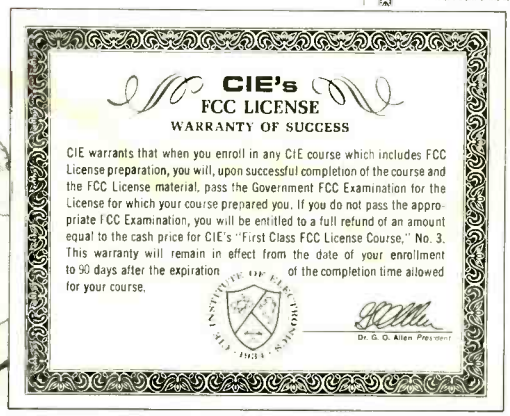

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If an FCC "ticket" is part of your career goal, you'll have to pass a tough licensing exam administered by the Federal Communications Commission (an agency of the U.S. Government). And you'll be prepared. Based on a series of continuing surveys, *close to 9 out of 10 CIE grads pass* their FCC exams!

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In some communications job fields, federal law requires that you have an FCC License. And, even in careers where a license is not required, it can be valuable evidence to prospective employers of certain electronics knowledge and skills.

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MARINE Radiotelephones

ANIXTER-MARK

M-6160 VHF/FM Colinear Gain Antenna
Provides up to 6 dB of gain; no conducting ground plane or ground radials required; can be used on deck, cabin, or mast-mounted; working aperture equals two half wavelengths in free space; fiberglass tube covers antenna structure; white plastic jacket of polyolefin; bottom ferrule is brass with triple plating; chrome and nickel plating; 8-ft long; 1"-14 thread mates with any standard marine mount; 10-ft coax terminated in PL-259 connector ... $79.95

COLLINS

MR-201 VHF-FM Transceiver
All-solid-state; synthesized; frequency range 156.025-162.550 MHz; 55 channels; 25-kHz spacing; transmit output selectable 25 W/1 W; meets or

exceeds FCC and ITU requirements; power input 115-230 V a.c. ±15%, 50-400 Hz single-phase or 12, 24, 32 V d.c. battery operation; frequency stability 0.0005%; integral universal power supply; transceiver can be mounted in any convenient location while control panel, speaker panel, and handset can be mounted remotely. 18" W x 5" H x 7.6" D (transceiver) ... $4355.00

DRAKE

TRM SSB Radiotelephone
Eleven-channels, simplex or semi-duplex; 2 through 8 MHz SSB transceiver; 150-watts p.e.p.; channels are programmable in ranges of 2.0 to 2.9 MHz, 3.75 to 5.0 MHz, 6.0 to 9.0 MHz; operating modes; A3A, A3J, A3H; includes built-in antenna coupler, power supply, low-current-drain switch on receive, environment-resistive materials; power consumption, after warm-up; receiver, 0.7 amp; transmitter, 25 amps on 12.9 V or 0.45 and 10 amps, respectively, on 35 V operation. 5⅓" H x 12" W x 15½" D, 22 lbs. ... $1300.00

EMERGENCY BEACON

EBC-RT-55M VHF/FM Marine Transceiver
Fully synthesized; 67 channels plus four receive-only channels cover all U.S. and international channel assignments; receives W1 & W2; automatic-emergency monitoring (set reverts to Ch. 16 when mike is picked up or hung up); built-in battery charger; built-in two-way hailer; front-facing 3" × 5" speaker; receiver sensitivity 0.35 μV for 12 dB SINAD; selectivity 90 dB adj. channel rejection; audio power output 5 W; squelch range 0.2-0.5 μV; r.f. power output 1 W & 20 W nominal; comes with dynamic high-impact cased mike; 13" D × 10⅜" W × 3¾" H ... $679.00

GENAVE

GSB-1000 SSB Transceiver
Solid-state marine SSB transceiver with 2-9 MHz frequency range; r.f. output power 60 W p.e.p. nominal, 50 W min.; USB (A3J), Compatible AM (A3H) and Reduced Carrier (A3A) operating modes; frequency stability ±20 Hz; carrier and unwanted sideband suppression 50 dB; harmonic suppression 60 dB; intermodulation distortion −25 dB; output impedance 50 ohms; sensitivity 0.5 μV for 10 dB (S+N)/N; selectivity −6 dB at ±2.4 kHz; −60 dB at 4.8 kHz; image response −50 dB; audio output power 5 W (4 W min. at 15% distortion); a.g.c. (fast attack, slow decay) less than 6 dB audio output change from 4 μV to 0.1 V; FCC type-accepted under Parts 81, 83, 87, 89, 91 and 93; automatic remote antenna coupler switching; internal crystal oven; headphone provisions; receiver clarifier control; front-panel speaker; backlit panel; remote speaker output; r.f. sensing transmit indicator; environmentally protected; requires 13.6 V d.c.; 10-channel capacity; includes ceramic microphone, microphone clip, mounting bracket, d.c. power cord, and crystals for 2.182 MHz (factory installed); 9" x 6½" x 2½" ... $685.00
ETA/4. Antenna coupler ... $295.00
GSB-1000. Transceiver package includes transceiver, antenna coupler, factory installed crystals for 2.182 MHz, microphone, microphone clip, mounting bracket and power cord ... $949.00
PSI-50. Regulated power supply for operating the GSB-1000 from 28-32 V d.c. supplies; output 13.7 V d.c. ... $99.00
Crystals for GSB-1000, factory installed; specify frequency; ... per pair. $39.00
Crystals for GSB-1000, for field installation; specify frequency ... per pair $28.00
Coupler Cable multi-conductor; in 10-foot increments only ... $7.50

Marine Master-1 Hand-Held Transceiver
VHF FM transceiver with 6-channel capacity; r.f. output power 2.5 W; sensitivity 0.5 μV for 20 dB quieting, 0.25 μV for 12 dB SINAD; selectivity −3 dB at ±7.5 kHz; image response −45 dB; spurious response −50 dB; audio output 400 mW; squelch threshold 0.25 μV; adjacent channel rejection 50 dB at ±30 kHz; r.f. power output can be reduced to 1 W; has BNC antenna connector; battery powered; frequency range 156-162 MHz (receive), 156-158 MHz (transmit); crystals for Channels 6 and 16 included; 8" H x 2.63" W x 1.28 D ... $499.95
PSI-15. NiCd battery charger ... $49.95
PSI-19. NiCd battery pack ... $39.95
JL-1. Leather carrying case ... $17.05

Marine Master-202 Transceiver
VHF FM transceiver with 20-channel capacity plus two weather receiving channels; r.f. output power 25 W max.; frequency range 156-162 MHz (receive), 156-158 MHz (transmit); sensitivity 0.45 μV for 20 dB quieting, 0.25 μV for 12 dB SINAD; selectivity −3 dB at ±10 kHz; adjacent channel rejection 70 dB at ±30 kHz; image response −70 dB; spurious response −70 dB; squelch threshold 0.5 μV; audio output power 5 W at 15% distortion; requires 5 A max. at 13.8 V d.c.; backlit channel selector; includes crystals for Channels 6, 16, WX1, and WX2; 9" x 6½" x 2½" ... $464.95
Marine Master-202 with crystals for Channels 6, 16, 22A, 26, 68, WX1 and WX2 ... $499.95

Marine Master 25W/A Transceiver
VHF-FM transceiver with 10-channel capacity; r.f. output power 25 W max.; frequency range 156-162 MHz (receive), 156-158 MHz (transmit); sensitivity 0.35 μV for 20 dB quieting, 0.25 μV for 12 dB SINAD; selectivity −3 dB at ±8 kHz; image response −45 dB; spurious response −50 dB; squelch threshold 0.35μV; adjacent channel rejection 45 dB at ±30 kHz; audio output 1.5 W at 15% distortion; requires 5 A max. at 13.8 V d.c.; pushbutton channel selector; backlit for nighttime operations; crystals for Channels 6, 16 and weather monitor; 9" x 6½" x 2½" ... $364.95
Marine Master-25W/A with crystals for Channels 6, 16, 22A, 26, 68, WX1, and WX2 ... $399.95

Marine Mate-100 Transceiver
VHF FM transceiver with 10-channel capacity; r.f. output power 25 W max.; frequency coverage 156-162 MHz (receive), 156-158 MHz (transmit); sensitivity 0.75 μV for 20 dB quieting, 0.5 μV for 12 dB SINAD; selectivity −3 dB at ±8 kHz; adjacent channel rejection 45 dB at ±30 kHz; squelch threshold 0.5 μV; image response −45 dB; spurious response −50 dB; audio output power 1.5 W at 15% distortion; requires 5 A max. at 13.8 V d.c.; has rotary channel selector switch; crystals for Channels 6, 16, and weather monitor included; 9" x 6½" x 2½" ... $349.95

Marine Gain-100 Antenna
Marine antenna with 6-dB gain; requires no ground plane; white Lexan base with quick-release ratchet; corrosion-proof white fiberglass and polyurethane encapsulation; comes with cable and connector ... $89.95

Marine Gain-50M Sailboat Antenna
For use on sailboats; 3-dB gain; white fiberglass and polyurethane encapsulation; does not require ground plane; includes mounting hardware, 60 feet of RG-58C/U coaxial cable and solderless connector ... $69.95

Marine Gain-50 Antenna
Marine antenna with 3-dB gain; requires no ground plane; white fiberglass and polyurethane encapsulation; comes with cable connector and laydown quick-release base ... $49.95

INTECH

Mariner V101 VHF/FM
Nine-channel capability (channels 6 & 16 factory installed); hand-held; battery operated (10 "AA" cells); high-impact Cycolac case; will withstand 90% humidity at 122 degrees F for 8 hours; operates −20 to +60 degrees C; 10" H × 2.4" D × 3.3" W; features battery saver circuit which switches receiver on and off for sampling; LED battery condition indicator; r.f. power output 1 W; receiver sensitivity 0.5 μV for 20 dB quieting; audio power output 0.5 W; separate mike and speaker; BNC connector for antenna replacement or storage/transport ... $439.50

Mariner V106 VHF/FM
Thirteen-channel capability (channels 6 & 16 factory installed); unique frequency synthesis circuit requires single crystal per channel instead of two; pushbutton returns unit to channel 16 for standby operation; 25 W/1 W power output; receiver sensitivity 0.5 μV for 12 dB SINAD; adjacent channel rejection 70 dB; audio power output 2 W at 10% dist.; frequency range 156-163 MHz; 13.6 V negative-

ground operation; marine-type construction; 8.4" × 2.8" × 12"; 3½ pounds $439.50

Mariner V107 VHF/FM

Twelve-channel capability; 10 W/1 W r.f. power output; audio response nominal 6 dB/octave, preemphasis 300 to 3000 Hz; receiver sensitivity 0.5 μV for 12 dB SINAD; adjacent channel rejection 80 dB; audio power output 3W; frequency range 156-163 MHz; 12-14 V d.c. negative ground (24, 32, 110 V d.c. and 115 V a.c. operation possible with accessory power converter); terminals for remote handset or external speaker. 3.7" H × 10" W 10" D; $488.50

V108. Same except 25 W/1 W r.f. power output; $596.50

V108BB. Modular construction; bridge-to-bridge version; same specifications as V108; $669.50

Mariner V109 VHF/FM

Six-channel capability; 25 W/1 W r.f. power output; frequency range 156-163 MHz; 12 V-14 V d.c. negative-ground operation; receiver sensitivity 0.5 μV for 20 dB quieting; adjacent channel rejection 80 dB; audio power output 3W; designed to be installed by user; 3.7" H × 10" W × 10" D; $652.50

Mariner V119 Monitor Receiver

Companion unit to V109 transceiver; monitors channel 16 continuously; six optional channels electronically scanned; independent squelch/volume controls for channel 16 and scan receiver; optional lockout for each channel; frequency range 156-163 MHz; 12 V-14 V d.c. negative-ground power supply; 3.7" H × 10" W × 10" D; $560.00

Mariner V118 Monitor

Bridge-to-bridge monitor receiver; operates on any channel in marine VHF band with proper crystal selection; operates on either 115 V a.c. or 12 V d.c. line.

A.C. version; $354.00
D.C. version; $299.00

Mariner '76 VHF/FM

15-channel capacity (channels 06, 16, W1 & W2 installed); requires one crystal per channel; remote channel changing capability; will accept selective call ringer; frequency range 156-163 MHz; channel spacing 25 kHz; 13.6 V negative-ground d.c.; operating temperature range −20 to +50 degrees C; power output 25 W or 1 W, frequency stability ±10 ppm; deviation ±5 kHz; spurious and harmonics 60 dB below carrier; current drain at 25 W 5 A; 100% continuous duty cycle; receiver sensitivity 0.5 μV for 12 dB SINAD; squelch threshold 0.3 μV; adj. channel rejection 70 dB; spurious rejection 75 dB; audio power output 4 W at 10% dist.; snap-in mounting bracket; mounts in any position; 12" D × 10¾" W × 3½" H $499.00

Mariner 12 VHF/FM

12-channel capacity (channels 6 & 16 factory installed); requires one crystal per channel; snap-in mounting bracket $439.50

Mariner M-500 SSB

Solid-state 100 W p.e.p. HF SSB transceiver; frequency range 2.0-5.25 MHz (transmit), 1.6-5.25 MHz (receive); channel capacity is 7 semi-duplex plus one simplex or 8 simplex; crystal oven; 12 V d.c. negative-ground operation; output 50 ohms; will match other whip antennas by use of built-in antenna tuner; operating modes A3a (SSB) A3h (AME), A3j (SSB); front-panel controls: volume on/off, clarifier, channel selector, antenna tune; power output (50 ohms) 100 W p.e.p. (A3a, A3j), 25 W carrier (A3h); receiver sensitivity 1.5 μV for 12 dB SINAD (SSB), 3 μV (AME); audio power 4 W at 10% dist.; audio response 400-2400 Hz; 16" D × 10" W × 4" H $995.00

KONEL

KR-100SB SSB Radiotelephone

100 watts peak SSB output power; 17 simplex channels with A/B switch or 8 half-duplex channels; A3A, A3H, and A3J modes; frequency range: 1.6 MHz (optional), 2.9-3.3 MHz, 4, 6, 8, 12, and 16 MHz marine bands; receiver stability ±20 Hz (−30 to +60 degrees C); audio output 5 W max.; sensitivity: 0.5 μV for 12 dB SINAD (SSB); selectivity 60 dB down at 2 kHz, 60 dB down at 4 kHz (both SSB); controls: off/volume, clarifier/illumination off, squelch/local-distance switch, AM/SSB, A/B frequency select, transmit off/standby, channel selector; RF output/S meter; $1395.00

K-100/12. 12-V d.c. plug-in power supply; . $200.00
K-100/24. 24-V d.c. plug-in power supply; . $200.00
K-100/34. 4-V d.c. plug-in power supply; ... $200.00
K-100/115 115/230 V a.c., 50/60 Hz power supply; $350.00

Simplex "A" channel; ..... $50.00 ea.
Simplex "B" channel for A/B operation; . $15.00 ea.
Duplex channel $65.00

KR-28VN VHF/FM Marine Radio

Twelve channels plus two weather channels (6, 16, and 162.55 WX included); convertible to 24 channels and full remote; 25 W/1 W output; requires only one crystal per channel; receiver sensitivity 0.5 μV for 20 dB quieting; 0.25 μV for 12 dB SINAD; spurious attenuation 90 dB; adjacent channel attenuation 80 dB; audio output 3.5 W; designed to operate with most commercial ringers; controls: squelch/pull for light; volume/power off; transmit lo/hi; channel select; 9½" W × 4" H × 13" D; $539.00

CK-28. 12-channel add-on kit; $60.00
RSK-28. Remote station kit; includes all control functions; mounting bracket; 30-ft cable. $239.00

MAR-LINE

Marine Radio Interference Filters

The company offers an extensive line of filters to eliminate electrical interference which degrades performance of marine radiotelephones in the MF, high-seas, and VHF band as well as depth sounders, direction finders.

MAR-60A. Alternator filter; 3-element LC filter; will handle up to 60 A; for use with systems from 6 to 125 V $12.50

MAR-LSOL. R.f. line filter; designed to be inserted in power line; double-L, low-pass filter; rated 30 A; 6 to 125 V $13.30

MAR-ACE. Accessory filter; for installation at small d.c. or universal motors; designed to be installed in the power leads of each offending unit $9.90

MAR-AF. Audio line filter; suppresses a.f. power-line hum; designed to be installed across power lines at the affected unit; 6- or 12-volt systems $16.50

MIDLAND

13-525 12-Ch VHF/FM Transceiver

Twelve-channel plus 2-channel weather monitor capability (equipped for channels 6 and 16); dual-conversion superhet receiver; 0.5 μV for 20 dB quieting; audio output 5 W at 4 ohms; r.f. output power 25 W/1 W; harmonic suppression 60 dB; comes with d.c. cable; mike; mike holder; spare fuse; has diode switching circuit; MOSFET front-end; polarity and antenna mismatch protection; 13.8V d.c. operation; 3' H x 8½" W x 10" D $374.95

MOSLEY

CC-27-C Channel Cat

Marine CB half-wave antenna features high "Q" transformer enclosed in weatherproof base; lower mast sections and break-over chrome-plated brass; collet-style clamping mechanism prevents whip from breaking loose; center-loaded; 26.9 to 27.3 MHz frequency range; omnidirectional radiation pattern; transformer match; 52-ohm nominal impedance; v.s.w.r. 1.5:1; RG-8/U recommended transmission line; assembled height 6-ft 1-inch; assembled weight 2½ lbs $70.45

PEARCE-SIMPSON

Carib 55 Marine VHF Radiotelephone

Covers 55 channels (plus international) and both Wx; 25 W/1 W power output; priority mode for switchover to Coast Guard emergency channel #16; receiver sensitivity 0.5 μV for 12 dB SINAD 3.5 kHz deviation; audio output power 4 W at 10% dist.; spurious rejection −70 dB; quick-disconnect power cord, mike, and mounting cradle included; 13.6 V d.c. negative ground ±15%; frequency range: 156.275 MHz-162.550 MHz (receiver), 156.025 MHz-157.425 MHz (transmit); 10½" D × 7½" W × 2¾" H $679.95

Capri 25 Marine VHF Radiotelephone

Covers 12 transmit and receive channels plus both receive-only Wx channels and AM broadcast band; 25 W/1 W power output; frequency range 156.275-163.275 MHz (receive), 156.275-157.425 MHz (transmit); harmonic & spurious emission −60

dB; receiver sensitivity 0.7 μV for 12 dB SINAD at 60% system deviation; audio power output 2.5 W at 10% dist.; spurious rejection −50 dB; selectivity ±7.5 kHz at 6 dB down, ±25 kHz at 60 dB down; comes with mounting bracket; 13.6-V d.c. negative ground; 11" D × 6½" W × 3" H $419.95

Bimini 25 Marine VHF/FM Radiotelephone

Covers 12 transmit and 14 receive channels; power output 25 W; receiver sensitivity 0.7 μV at 12 dB SINAD; frequency range 156.275-163.275 MHz (receive), 156.275-157.425 MHz (transmit); spurious rejection 50 dB; adj. channel rejection −50 dB; comes with noise-canceling ceramic mike; 13.6-V d.c. negative ground; 11" D x 6½" W × 3" H. $379.95

Catalina VHF Marine Radiotelephone

Covers 12 transmit and receive channels; power output 6 W/1W; designed for sailboats & outboards or boats with power systems; 13.6 V d.c. negative ground or self-contained batteries; sensitivity 0.5 μV for 20 dB quieting; frequency range 156.275-163.275 MHz (receive), 156.275.-157.425 MHz (transmit); 9¼" D x 6½" W × 3" H $299.95

RAY JEFFERSON

CB-802 Marine CB Transceiver

40-channel coverage plus three VHF/FM Wx receive; r.f. power output 3-4 W; max. mod. 85-100%; digital synthesizer; dual-conversion receiver; sensitivity 0.5 μV at 10 dB S + N/N (CB), 2 μV (Wx); squelch sensitivity 0.5 μV; audio output 3 W; digital readout; r.f. gain control; S/RF meter; external speaker option; noise limiter; front-panel speaker; plug-in PTT mike; 115 V a.c.; 9" W × 9" D × 4" H $279.95

CB-712. Mobile version of CB-802; same except does not have noise limiter; has mounting gimbal & mike hanger; 13.6-V d.c.; 9" D × 7½" W × 3" H $229.95

CB-845 Mobile CB Transceiver

40-channel coverage; r.f. power output 3-4 W; max. mod. 85-100%; digital synthesizer; dual-conversion receiver; sensitivity 0.5 μV at 10 dB S + N/N; squelch sensitivity 0.5 μV to 100 μV; 3 W audio output; digital readout; S/RF meter; CB/PA switch; delta tune; SWR meter; noise blanker & limiter; variable r.f. gain & tone controls; 13.6 V d.c.; comes with PTT mike, mounting gimbal, mike hanger; 8½" D × 7" W × 2½" H $199.95

CB-740. Similar to CB-845 but squelch sensitivity 0.5 μV to 300 μV; does not have delta tune, SWR meter; noise limiter or variable r.f. gain and tone controls; 13.6 V d.c. positive or negative ground; 8" D × 6" W x 2¼" H $149.95

CB-7120 AM/SSB CB Transceiver
40-channel coverage plus 40 USB/40 LSB; r.f. power output 3-4 W (AM), 12 W p.e.p. (SSB); digital synthesizer; dual-conversion receiver; sensitivity 0.7 μV (AM), 0.2 μV (SSB) at 10 dB S + N/N; squelch sensitivity 0.2 μV to 300 μV; audio output 3 W; S/RF meter; CB/PA switch; clarifier; Tx indicator light; external speaker option; pushbutton mode switch; comes with PTT mike, mounting gimbal, mike hanger; 13.6 V d.c.; 9" D x 8" W × 2½" H $299.95

RAYTHEON

RAY-50A VHF/FM Radiotelephone
Frequency range 156.050-157.425 MHz (transmit), 156.000-162.550 MHz (receive); 56 transmit channels, 96 receive, plus 4 weather; "Seawatch" monitors Ch. 16 or any other selected channel; 25 W/1W power output; receiver sensitivity 0.5 μV for 20 dB quieting; 0.35 μV for 12 dB SINAD; audio output 3 W at 10% dist.; provisions for remote control; operates on 12-V d.c. (optional supplies available for 24- and 32-V d.c. or 115-V a.c.); 15¼" D x 12" W x 4½" H..... $895.00

RAY-48A VHF/FM Radiotelephone
Frequency range 156.275-157.425 MHz (transmit, receive) plus 161.600-162.550 MHz (receive); crystal-control; 12 transmit & receive 2 ESSA weather channels; 25 W/1W power output; receiver sensitivity 0.5 μV for 20 dB quieting, 0.35 μV for 12 dB SINAD; audio output 3 W at 10% dist.; comes with crystals for channels 6, 16, 22A, 26, 28, 68, plus 1 Wx; operates on 12-V d.c. (optional supplies available for 24- and 32-V d.c. or 115-V a.c.); 8" W x 7⅞" D x 2¾" H..... $399.00

RAY-1209 SSB Radiotelephone
Frequency bands (receive, transmit) 1.6-13 MHz (marine bands); 11 duplex, 22 simplex, or any combination; 100 W p.e.p.; crystal control (in ovens); sensitivity 0.5 μV (SSB), 3.0 μV (AM) at 10 dB S + N/N; selectivity 6 dB at 2400 Hz, 60 dB at 5000 Hz; audio output 4 W; a.g.c.; squelch; a.l.c.; clarifier control; 12 V d.c. operation; 16½" D x 12" W x 4½" H..... $1695.00

RAY-1210 SSB Radiotelephone
Frequency bands 2 & 4 MHz; 8 channels; 50 W p.e.p.; crystal control (in ovens); sensitivity 1 V at 12 dB S + N/N; selectivity 6 dB at 2400 Hz, 50 dB at 5500 Hz; audio output 3 W; automatic gain control; a.l.c.; clarifier control; manual gain control; 14" D x 12" W x 5½" H $750.00

REGENCY

MT-55 Marine Transceiver
Covers 55 domestic and international VHF/FM marine channels; coax rotary switches for channel se-

lection; LED digital display; channel 16 monitoring operates automatically with programmable priority scan circuit; separate control for continuous weather information on either 162.55 or 162.40 MHz; 25 W/1W r.f. power; corrosion-resistant aluminum construction to resist marine environment; shock-mounting bracket; Hi/Lo power switch; dynamic mike..... $629.00

MT-15S VHF Radiotelephone/Scanner
6-channel transceiver covers 156-163 MHz with 17.5 W/1 W selectable output power; built-in speaker; squelch; receiver scans channels at a rate of 15 ch/sec; rated sensitivity 0.35 μV for 20 dB quieting; s.w.r. protection for final amplifier; comes with hand-held PTT ceramic mike, crystals for channels 6 and 16 transmit and receive, plus weather crystal, and mounting bracket. Requires 13.8 V d.c. at 3 A max. $349.00

MT-25 VHF Radiotelephone
FM radiotelephone provides 12 channels with 25 W/1 W output power; has channel selector, Hi/Low output power, squelch, and power/volume controls; rated receiver sensitivity 0.35 μV for 20 dB quieting; built-in s.w.r. protection for final amplifier; comes with hand-held PTT ceramic mike, internal speaker, transmit and receive crystals for channels 6 and 16, and receive crystals for weather broadcasts; mounting bracket; decals for channel identification. Requires 13.8 V d.c. at 3.5 A max..... $299.00

Aquacom 1 VHF Radiotelephone
Delivers 2.2 W/1 W (selectable) output power from a 14.4-volt rechargeable NiCad battery; 5 channel capacity; on/off/volume, squelch, and channel selector controls; comes with battery, transmit and receive crystals for channels 6 and 16; has built-in whip antenna..... $289.00
BC-101. Battery charger..... $34.95

Aquafone VHF Radiotelephone
Provides 8 channels on the VHF FM marine band (6 transmit, 8 receive) with 12.5 W/1 W output power; built-in speaker; squelch, channel selector, power/volume, and Hi/Lo output power controls; comes with hand-held PTT ceramic mike, transmit and receive crystals for channels 6 and 16.7½" x 5½" x 2½" requires 13.8 V d.c. at 2.7 A max..... $199.00

SBE

"Key-Com Fifty-Five" VHF/FM
Frequency range 156-162 MHz; 55 channels plus all weather & Coast Guard/government receive; digital synthesizer; keyboard channel selection; LED

channel indicators (flashing LED indicators indicate unauthorized channel); 25 W/1 W r.f. output; receiver sensitivity 0.2 μV at 20 dB quieting; squelch sensitivity 0.25 μV min.; adj. channel selectivity 80 dB; spurious & image rejection −80 dB; audio output 4 W; triple-function meter (S/RF/Battery condition); vinyl-clad anodized aluminum enclosure; dynamic mike with coiled cord; power cables; fuses; reversible mounting bracket for easy removal of unit; 10-16 V d.c.; 9¼" D x 7¾" W x 2¾" H..... $599.00

SHAKESPEARE

GBS-12-2 VHF/FM Marine Radiotelephone
12 channel receiving and transmitting capability plus 2 weather receive channels; positive r.f. indicator light; lighted channel selector; squelch control; hi/lo power switch; provision for remote speaker; fully treated for marine environment: frequency range: transmit 156.25-156.8 MHz, receive 156-157.5 MHz, weather 161.0-162.55 MHz; 13.6 V d.c. neg ground; 25/1 W output power; output impedance 50 ohms; ±5 kHz deviation; 0.5 μV for 12 dB SINAD sensitivity; 3 W audio output at less than 5% dist; adjacent channel rejection −90 dB; weight 7 lbs; 13" D x 9" W x 3" H..... $495.00

GBS-1200 VHF/FM Marine Radiotelephone
12 transmit and receive channels plus 2 weather receive channels; lighted channel selector; extension speaker provision; 3-position mounting bracket; hi/lo power switch; automatic noise limiter; solid-state circuitry; 156-162.5 MHz frequency range; 0.5 μV sensitivity; audio output 5 W at 10% dist.; phase type modulation; 25/1 W r.f. power output...$339.95

476 VHF-FM Marine Antenna
21-ft fiberglass antenna for shore stations, larger yachts and work boats; phased ½-wave elements produce 10 dB gain over ¼-wave; d.c. ground; 155-164 MHz frequency range..... $190.00
476-1. 146-154 MHz frequency range..... $190.00

425 Helmsman VHF-FM Marine Antenna
18-ft fiberglass antenna delivers 6 dB gain over ¼-wave; two full ⅝-wave elements operate in phase with an additional ¼-wave isolating stub; lead-in cables are enclosed in lower mast; uses standard lay-down marine and standoff bracket..... $126.00

339-1 Commodore VHF-FM Marine Antenna
9½-ft, two-section antenna; vertical colinear array; 6 dB gain over conventional ¼-wave mobile installations; d.c. ground; uses standard 1-in, 14 thread ferrule, female..... $81.50

420 Skipper VHF-FM Marine Antenna
5-ft fiberglass antenna; 3 dB gain; white molded lift and laydown mount; comes with connector, leveling plate and chromed brass screws..... $52.00
420M-2. Aluminum channel for mast mounting $53.00

TELE COMM

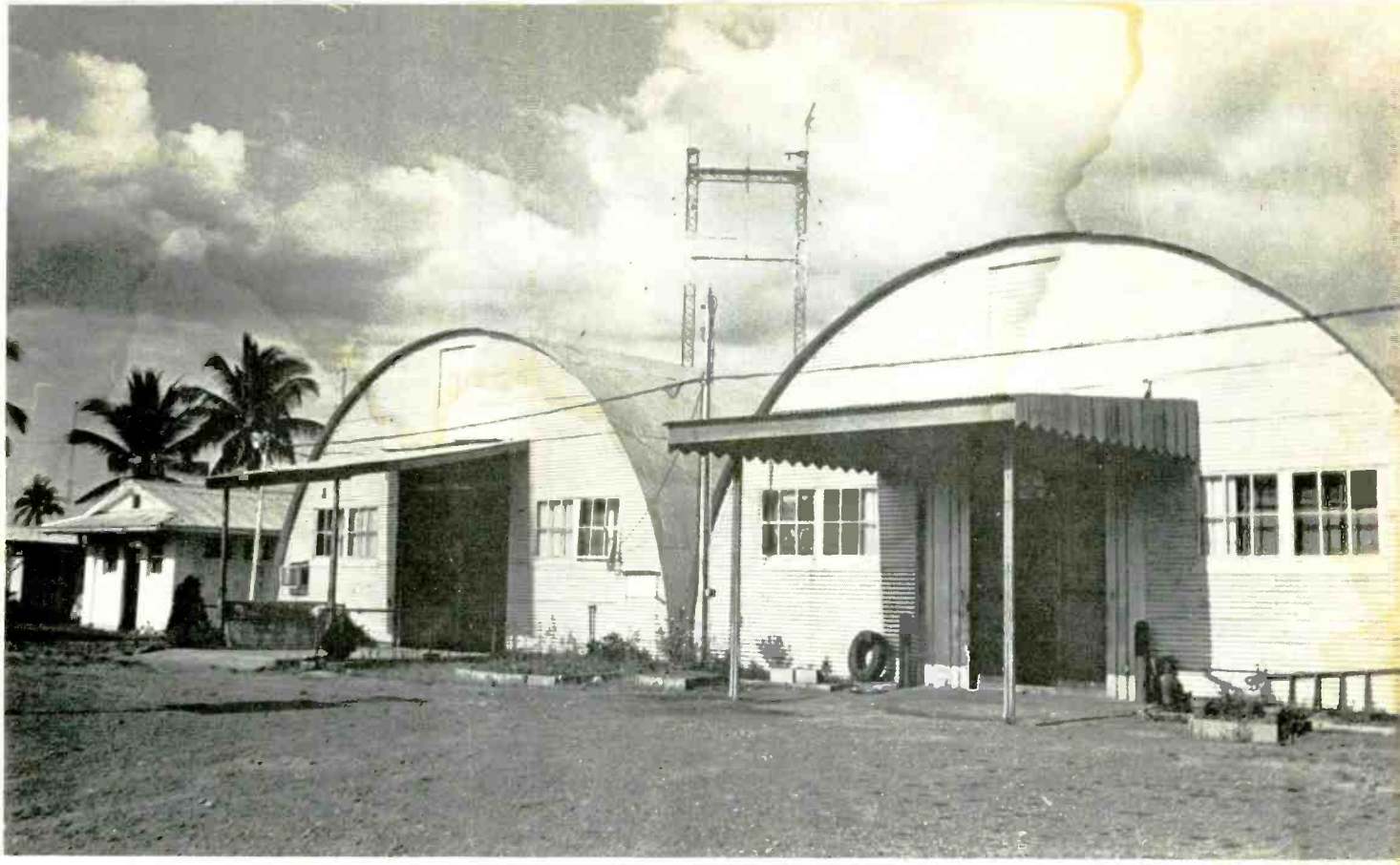
VHF25M Marine Transceiver
Frequency range 156-163 MHz; 11 channels plus two weather bands; hi/lo power switch (25 W to 1 W); will operate from −30 to +60 degrees C; solid-state switching; remote-control capability; reverse polarity protection; up-front speaker; circuit consists of seven plug-in modules; weatherproof; 5 W audio output; 0.3 μV sensitivity for 20 dB quieting; available with various crystal options and antennas; 12 V d.c.; also available as base station with 110 V a.c. to 12 V d.c. power supply; comes with crystals for 5½ channels & 6-dB 8½-ft antenna $599.00

SSB Marine Transceivers
Can be used as base or mobile units; all-solid-state; 50 or 90 W output AM transmitter module available as accessory; no tuning or special programming needed to set up the channels; frequency range 2-9 MHz.
WA 300SSB. 300 W p.e.p. $1495.00
WA 150SSB. 150 W p.e.p. $1295.00
WA 100SSB. 100 W p.e.p.; 22 channels max. $1095.00
Channel-changing remote control $299.00
Antenna tuner for special applications $350.00
SSB1000. Linear amplifier for use with above or any 100 to 200 W unit $1495.00

UNIMETRICS

Seacom 55
55-channel, crystal-controlled VHF/FM marine radiotelephone; provides operation on virtually every available marine channel throughout the world; synthesized circuit; two front-panel push-button priority switches for monitoring Ch. 16 and 13; push-button selection of Weather 1 & 2; volume & squelch controls; telephone-type handset; solid-state switching; 12-V d.c. negative-ground operation; frequency range (transmitter) 156-157.5 MHz, (receiver) 156-163 MHz; receiver sensitivity 0.5 μV for 20 dB quieting; selectivity −70 dB at 25 kHz; spurious and image rejection 85 dB; threshold squelch sensitivity 10 dB noise quieting level; switchable r.f. power output 25 W/1 W; comes with choice of 6-dB or sailboat antenna $775.00

Marlin-I CB Transceiver
23-channel, 5-W CB transceiver built for marine use; watertight construction; corrosion-resistant materials; S/PRF meter; PA position for public address; receiver sensitivity 0.5 μV for 10 dB (S + N)/N; a.n.l.; 12-V d.c. negative-ground; 6" × 7" × 2". $164.95
MAKO-I. Similar to Marlin -I except includes push-button monitoring of WX1 & WX2; 8" × 9" × 2½". $229.95



SHORTWAVE LISTENING ENTERS 1977

New Stations, New Relays, and New Receivers to Hear them on.

Dr. Richard E. Wood, shortwave listening writer for Communications Handbook, is the author of "Short Wave Voices of the World," and co-author of "Radio in Foreign Language Education." He teaches at Adelphi University, Garden City, N.Y.

(Top) The Voice of the Philippines, Manila, can be heard mornings around 1400, with antennas directed toward San Francisco. These are its transmitter buildings at Malolos, Bulacan Prov.

THINGS are on the march once again in shortwave listening. Broadcasters and receiving equipment manufacturers are beginning to get the message that the shortwave listeners are really out there, everywhere in the world. This includes the United States, where a recent Gallup Poll concluded that about eighteen-million Americans tune in to a shortwave broadcast at least once a week.

Among the first to get the message were the receiver manufacturers. There are clear signs of a reversal of the pessimistic trend of the early 1970s. During this period, one major U.S. SW receiver maker went out of business, others concentrated on the governmental and professional market with equipment in the multi-thousand dollar range, while yet others produced only beginners' sets or kits suitable for casual listening, without the features of selectivity and frequency calibration needed for serious SWL'ing.

All that has changed now, and the change for the better seems to be part of the world's gradual climb out of a gloomy economic recession. A little over two years ago, the Japanese electronics industry decided, now that Japanese households were fully equipped with color television, refrigerator, dishwasher, vacuum cleaner, and other major appliances, the time had come to provide them with another basic necessity of 20th-century living . . . a good shortwave radio! This went hand-in-hand with a broad social and cultural trend in Japan. Its people were now prosperous and secure. They were seeing the world in tour groups and learning foreign languages, especially English.

And so the campaign began. At electronics exhibitions in Japan, all the foreign stations broadcasting in Japanese—the BBC, Radio Moscow, Peking, HCJB Quito, the FEBC in Manila and others—were piped in to the equipment manufacturers' stands, where they could be tuned at the flick of a switch. Fine new receivers were produced, with direct frequency readout, smaller, neat-

Israel's Minister of Defense, Shimon Peres, inaugurates new IBA shortwave transmitter. In Arab garb, Deputy Minister Jabar Mu'adi.

er, better engineered and better styled than the previous generation. The result: a massive upswing in sales and in listening. At least two stations broadcasting in Japanese, BBC London and Radio Australia Melbourne, had to impose moratoria on answering letters received from hundreds of thousands of listeners in Japan. People at Radio Australia describe how Japanese fan mail overflowed from the mailroom into broom closets, studios, and basements.

The new generation of SW equipment is beginning to enter the U.S., and U.S. manufacturers, too, promise to get involved.

What about the shortwave-broadcasting medium itself? What are the current trends? There is good news and bad news. The good news is that the recognition of the big new audience has brought new broadcasts beamed to listeners in North America. The highspot of 1976 was the inauguration of the joint BBC-Deutsche Welle relay complex on two adjacent Caribbean islands, Montserrat (which was originally settled in the 17th century by planters from Ireland, and whose largely black population today still speaks with a hint of an Irish brogue) and nearby Antigua. The first BBC relay from Montserrat was heard in late August, while early October saw the first relay of the German station. BBC Montserrat was good news, especially for "night owls" on the U.S. East Coast, and for evening listeners in the West. (World Service transmissions, which had previously run only to 0430 GMT for North America—11:30 p.m. Eastern Standard Time, but only 8:30 p.m. in the Pacific zone—were extended another full three hours to 0730 GMT on the effective new frequency of 6175 kHz in the 49-meter band. This single frequency blankets all of North America at that hour.)

It is interesting to listen to 6175 kHz at 0430 and keep your eyes on the S-meter of your receiver. That is when the BBC relay switches from Sackville, Canada to the West Indies transmitter site. Listeners in most parts of North America will notice the difference. In the Northwest, for example, the signal from Sackville, New Brunswick has to pass through the auroral zone and is likely to suffer from fading. In the U.S. Northeast, within a thousand miles or so of Sackville, listeners are likely to find that they are inside the skip zone, so the signal will be weak. But Montserrat will deliver a punchy signal pretty well everywhere, all the time. So we now have our second major West Indian relay base, after the famous Radio Nederland station on Bonaire, Netherlands Antilles.

Self-Interference. Another frequency used by what the BBC officially calls the Leeward Islands Relay Station, also in the 49-meter band, is 6195 kHz. You can hear a strange phenomenon there—the BBC interfering with itself! Yes, when conditions are right, listeners in North America can observe that the BBC is using 6195 kHz from two different transmitter sites to two different target audiences at the same time. At 2000-2115 GMT, 6195 kHz is used with the World Service in English from the Leeward Islands to the rest of the Caribbean. But a BBC transmitter in England, also audible in North America, carries the BBC European Service in German to Germany at the same time and frequency. Condtions vary from day to day, of course.

An even more striking case of a station attempting to use frequencies sparingly by putting two different transmissions on the same channel at the same time, to different target areas, was noted during the fall broadcast season (September 5 thru November 6). At this time, Radio Canada International transmitted on the same frequency, 9625 kHz, from the *same transmitter site* (Sackville) two different programs to two different listening zones! At 1959-2057 it was in French to Western Europe, and at 2059-2157 in English (also to Europe) on 9625. Meanwhile, it transmitted the Northern Service with a different antenna beam on 9625 kHz toward the Sverdrup Islands in the High Arctic, also in English but with different programming. The result? In most of the United States, at least, a horrendous mess; a shocking mixture of two different CBC programs at roughly equal strength. And in the respective target areas? Traveling in Europe last summer, this writer observed the Northern Service on 9625 kHz, so it seems unlikely that only the European Service was heard there and vice versa.

Many SWL's have heard John Touhey on the BBC World Service from London. He is commentator, roving reporter, often heard on Radio Newsreel.

Directional antennas such as those of the CBC at Sackville are sophisticated and effective, yet they do produce minor lobes and send some power in directions other than the primary beam. It is unlikely that the 80° angle between the European beam (68° from Sackville) and the Arctic azimuth (348°) reduced mutual interference to zero. The fact that the practice was not continued during the winter 1976–77 broadcast season might tell us something.

Changes. Discussing conditions, our thoughts turn to the threat of termination of the valuable propagation forecast broadcasts over the standard time and frequency station, WWV Fort Collins, Colorado. SWL's were dismayed when, in the early summer of 1976, WWV began announcing, and mailing out, a "Notice of Termination of Services." As of October 1, 1976, the Environmental Research Laboratories in Boulder would, so the message said, no longer provide broadcast or mailed geoalerts. This termination was supposedly an economy measure. The information would be provided to subscribers for payment, but not to the public as a service. Active SWL's, who had come to rely on the propagation forecasts and reports for their listening and research, were quick to respond with a flood of letters to WWV. The result—a letter from the Chief of the Space Environment Services Center in Boulder stating that the services would resume on the scheduled termination date. And so, they can still be heard at 18 minutes past each hour, and provide the solar radio 10 centimeter flux, the geomagnetic A-index and summaries of major solar flare events. They did not resume on WWVH Hawaii, but listeners throughout North America will have no trouble getting the word from Fort Collins.

One surprise change in program policy came on November 7, 1976, when Radio Canada International, entering the winter broadcast season, cut its English and French transmissions, most of which had lasted an hour, for each of the main target areas, to half an hour. Duration of transmissions was thus cut, but the number of transmissions increased. This was probably a response to findings by market researchers that most SWL's do not listen to a single station for extended periods.

The Swiss Broadcasting Corporation recognized this some years ago when it reduced the duration of each English broadcast from 45 minutes to a straight half hour. Since then it has gone from strength to strength with its lively, informal magazine-type programming. This writer had the pleasure of seeing SBC Berne at work this summer, and being interviewed over the SBC microphones for several of the different language services. It is a real radio station, not a government department like some of its counterparts further east and south in Europe.

Israel Teaches Hebrew The Israel Broadcasting Authority in Jerusalem, which had long neglected U.S. listeners, made a bid for a bigger chunk of the listening audience in 1976 by going on the air in English to North America at a somewhat later hour—2230-2300 GMT. It still isn't late enough, still being an afternoon rather than an evening hour. For most U.S. listeners, this catches them at work or commuting, rather than at home by their receivers. But it is a step forward.

It seems that the fly in the ointment that prevents a genuine mid-evening broadcast to North America in English is the Histadrut, the Israel Labor Federation, which doesn't want to see its members at IBA forced to work in the middle of the Israeli night. This is unfortunate.

For listeners in North America, IBA now presents "Ulpan of the Air," a series of Hebrew lessons which can be heard each Thursday at about 2250 GMT. Current frequencies are 5900, 7412.5, 9435 and 9815 kHz. *Ulpan* is the Hebrew word for an intensive practical Hebrew immersion course, as provided to new immigrants in Israel. The lessons are pleasant, with clear explanations in English, and listeners wishing to follow the lessons and to learn to read and write also can write for scripts to IBA Jerusalem. IBA has been engaging in some pioneering publicity for its broadcasts through direct mail to potential listeners and press advertising, particularly in the Philadelphia area. This is a welcome initiative.

U.S.S.R. Threat. Late summer 1976 saw the sudden emergence of a potential threat to the future of shortwave broadcasting, point-to-point communi-

Broadcasting to Eastern Europe. A Czechoslovak announcer at Radio Free Europe.

cations, and amateur radio. A superpowered, extremely broad-band nonbroadcast transmitter came on the air, transmitting rapid pulses which frequently covered several megahertz of frequency range.

Speculation was and is intense on the purpose of these transmissions, ten or fifteen of which, in operation simultaneously, would be enough to kill the entire SW medium. At first there was also speculation as to the transmitter site, but direction-finding equipment has triangulated it as located near Poltava, in the Ukraine. It seems to operate close to the m.u.f. (maximum usable frequency) over the European U.S.S.R./North America circuit. Thus, during European daylight it is heard around 14 MHz—wiping out the 20-meter amateur band and playing havoc with broadcasters on 19 meters—while during darkness it is around 6 or 7 MHz, intensely troubling amateurs on 40 meters and broadcasts on 49 and 41 meters. As this is being written, for example, its rapid, pulsing beats are centered on 6200 kHz and spread over 100 kHz in both directions. Among the many signals ruined by this apparently Soviet-based transmitter is that of Radio Moscow's North American service on 6125 kHz.

As to its purpose, speculation has been varied and conflicting. At first it was suggested that it was an attempt to disrupt communications during a period of NATO exercises in Europe. When the maneuvers ended, however, the pulse transmissions did not. Speculation then focussed on a new kind of over-the-horizon radar. Analysis has yet to reveal any message content in the transmissions, or at least, it has not been made public.

Bright Spots. As the high-frequency bands have become increasingly the stomping ground of the big guys—the major international broadcasters with their superpower and relay arrangements intermeshing into a worldwide network—it is good to note some essentially independent, non-political broadcasters active on the higher frequencies. A delightful case in point is Radio Clarin, Santo Domingo, with its fifty-kilowatt transmitter on 11700 kHz at the edge of the 25-meter band. It announces as a private, commercial station, but it operates a consistent international service on 11700 (in parallel with 4850 kHz with 3000 watts, heard during darkness), daily at 1900-0100 GMT in Spanish, with English talks on history and tourism in the Dominican Republic around 2330-0000. It is welcome voice of home for the many Dominicans living in the United States and other foreign countries.

Another station for entertainment rather than politics is the "Happy Station," the Sunday music, information and fun show from Radio Nederland in Hilversum. Tom Meyer—whose late predecessor, Edward Startz, is memorialized on a QSL card now being sent out by the Happy Station—keeps the program (the longest-established on the shortwave dial) as fresh and spontaneous as ever. He specializes in quiz games, little anecdotes, fun facts and figures, light musical requests, and rapid switches from his two main languages—English and Spanish—into a smattering of a dozen other languages. The program is transmitted every Sunday, and takes over the full 100-minute transmission time of Radio Nederland's English and Spanish services. Listeners on the Gulf Coast and other areas not too far from Bonaire or too close to other stations on 800 kHz can hear a bilingual (English/Spanish) version on that AM frequency at 2300-0010 GMT.

We talked above about how the geoalerts on WWV were saved by public response. The same thing happened in 1976 with a pleasant, medium-ranking Western SW broadcaster which was threatened with closure and did actually cease shortwave transmissions for a month. Happily, Radio New Zealand is back on the air again, and reception throughout North America has recently been very good despite its minuscule 7.5 kilowatt power. Doing what other Western stations (but never communist ones!) had threatened to do in the past (experienced SWL's will recall the past crises over budget cuts at Radio Canada International and the Austrian Shortwave Service), Radio New Zealand announced that it would leave the air. Its newscasts, which had previously been relayed by small South Pacific island stations as their main source of information, would be provided by cabled Telex, or else the stations would have to rely on relays of Radio Australia and the BBC. There would be no more transmissions from New Zealand in the languages of the islands—Cook Islands Maori, Samoan and Tongan. Reaction was not slow in coming in. Listeners throughout the Pacific and in other parts of the world, such as North America, which have enjoyed Radio New Zealand with its cricket and rugby, its Maori chants and reports on a peaceful, beautiful, low-crime nation with harmonious race relations and a tradition of producing great sportsmen, outdoorsmen, travelers and explorers, protested the shortsighted budget cut. By April, Radio New Zealand was back on the air! It can be heard on a number of frequencies in the U.S., including 6105 kHz around 0600-0800 and 15130 kHz in the early evening hours.

Two of the finest North European broadcasters have recently implemented much-needed power increases. On the whole, this writer is no great supporter of superpower operations. But if it has to be, it couldn't have been done by two nicer stations than Radio Finland and Radio Norway. Their new 250-kilowatt transmitters give them the punch that they desperately need to cross the auroral belt to reach North American listeners. Radio Finland is now using two parallel transmitters to North America, and its frequencies of 15110 and 11755 kHz with English at 1330-1400 and again at 1430-1500 deliver fair to good signals with some of the best half-hour programs on the air anywhere.

It seems that SW has turned the corner and a brighter future for listeners lies ahead. ◇

Radio Sweden's Mailbag man, Stanley Bloom, was born and grew up in London. He claims, however, to miss only two things from the country of his birth: Indian restaurants and cricket. Interests include concert-going, folk music, literature, photography, sports in general, and stamps.

TIME CONVERSION FROM GREENWICH MEAN TIME (GMT)

GMT	2400	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
– 3/4	2315	0015	0115	0215	0315	0415	0515	0615	0715	0815	0915	1015	1115	1215	1315	1415	1515	1615	1715	1815	1915	2015	2115	2215
– 1	2300	2400	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200
– 2	2200	2300	2400	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100
– 3	2100	2200	2300	2400	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000
– 3 1/2	2030	2130	2230	2330	0030	0130	0230	0330	0430	0530	0630	0730	0830	0930	1030	1130	1230	1330	1430	1530	1630	1730	1830	1930
– 3 3/4	2015	2115	2215	2315	0015	0115	0215	0315	0415	0515	0615	0715	0815	0915	1015	1115	1215	1315	1415	1515	1615	1715	1815	1915
– 4	2000	2100	2200	2300	2400	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900
– 4 1/2	1930	2030	2130	2230	2330	0030	0130	0230	0330	0430	0530	0630	0730	0830	0930	1030	1130	1230	1330	1430	1530	1630	1730	1830
– 5	1900	2000	2100	2200	2300	2400	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800
– 6	1800	1900	2000	2100	2200	2300	2400	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700
– 7	1700	1800	1900	2000	2100	2200	2300	2400	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600
– 8	1600	1700	1800	1900	2000	2100	2200	2300	2400	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500
– 9	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400
– 10	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300
– 10 1/2	1330	1430	1530	1630	1730	1830	1930	2030	2130	2230	2330	0030	0130	0230	0330	0430	0530	0630	0730	0830	0930	1030	1130	1230
– 11	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200
– 12	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100

INTERNATIONAL DATE LINE

+ 12	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100
+ 11 1/2	1130	1230	1330	1430	1530	1630	1730	1830	1930	2030	2130	2230	2330	0030	0130	0230	0330	0430	0530	0630	0730	0830	0930	1030
+11	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000
+10	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	0100	0200	0300	0400	0500	0600	0700	0800	0900
+9 1/2	0930	1030	1130	1230	1330	1430	1530	1630	1730	1830	1930	2030	2130	2230	2330	0030	0130	0230	0330	0430	0530	0630	0730	0830
+9	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	0100	0200	0300	0400	0500	0600	0700	0800
+8 1/2	0830	0930	1030	1130	1230	1330	1430	1530	1630	1730	1830	1930	2030	2130	2230	2330	0030	0130	0230	0330	0430	0530	0630	0730
+8	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	0100	0200	0300	0400	0500	0600	0700
+7 1/2	0730	0830	0930	1030	1130	1230	1330	1430	1530	1630	1730	1830	1930	2030	2130	2230	2330	0030	0130	0230	0330	0430	0530	0630
+7	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	0100	0200	0300	0400	0500	0600
+6 1/2	0630	0730	0830	0930	1030	1130	1230	1330	1430	1530	1630	1730	1830	1930	2030	2130	2230	2330	0030	0130	0230	0330	0430	0530
+6	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	0100	0200	0300	0400	0500
+5 2/3	0540	0640	0740	0840	0940	1040	1140	1240	1340	1440	1540	1640	1740	1840	1940	2040	2140	2240	2340	0040	0140	0240	0340	0440
+5 1/2	0530	0630	0730	0830	0930	1030	1130	1230	1330	1430	1530	1630	1730	1830	1930	2030	2130	2230	2330	0030	0130	0230	0330	0430
+5	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	0100	0200	0300	0400
+4 1/2	0430	0530	0630	0730	0830	0930	1030	1130	1230	1330	1430	1530	1630	1730	1830	1930	2030	2130	2230	2330	0030	0130	0230	0330
+4	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	0100	0200	0300
+3 1/2	0330	0430	0530	0630	0730	0830	0930	1030	1130	1230	1330	1430	1530	1630	1730	1830	1930	2030	2130	2230	2330	0030	0130	0230
+3	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	0100	0200
+2	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	0100
+1	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400

YESTERDAY **TODAY** **TOMORROW**

GOOD LISTENING

120 meters (2300–2500 kHz)

The lowest shortwave broadcast band, first and least well-known of the tropical bands. Only stations from Latin America, Africa, the Pacific Islands and Asia operate here. In North America and Europe, you'll hear point-to-point communications intermittently here. Many experienced SWL's have heard only two or three SW broadcast stations in this band. Some, especially in the Northeastern U.S., may have heard none at all, since the most active stations here are located in Central America and Papua-New Guinea, and best audible in southerly and westerly regions. In each band, we'll pick out a few possible catches, trying to mix easy ones with those harder to snare.

kHz

2390 La Voz de Atitlán, Guatemala. From the delightful artists' colony and Indian settlement on the shores of Guatemala's largest lake, formed by a mighty volcanic eruption which sealed off a valley, this station broadcasts marimba music and Spanish and literacy lessons for Mayan Indians. Hear it around 0100–0200 GMT.

2428 Radio New Ireland, Papua-New Guinea. About as far away from Old Ireland as you can get, this station broadcasts mostly in Pidgin English (not "Irish"), often with U.S. pop music. It signs off at 1201 GMT and is perhaps the easiest logged of several 120-meter Papua-New Guineans, at least in the West and Midwest.

90 meters (3200-3400 kHz)

The second tropical broadcast band is also used by the well-known Canadian time-signal station, CHU, on 3330 kHz. This is the favorite band of many discerning SWL's, as there are many weak, rare, changeable Latin Americans, Asians and Africans here, more challenging than the larger, more fixed, nightly audible tropicals on 60 meters.

3200 & 3400 Fukien Front Station, People's Liberation Army, China. Both edges of the band are flanked, sentry-like, by the military stations which, from coastal Fukien Province, confront Taiwan across the straits of that name. These are heard with military marches and pep-talks for the troops, all in Chinese, about 1100 GMT or local dawn.

3250 Radio South Africa, Johannesburg. The higher frequencies provide Radio RSA, the external service, but here you can easily hear the all-night service also received by local listeners. Mostly quiet late-night music, noted around 0000-0400 GMT.

3300 TGNA, Radio Cultural, Guatemala. An American-supported missionary station like the famous HCJB on the higher frequencies, this one is in Spanish and English with mixed religious, cultural and musical programming until variable sign-off around 0430-0530, later during emergencies and special events.

3316 Freetown, Sierra Leone. One of the easiest-to-receive English-speaking Africans on 90 meters, the capital of this one reminds us that this was the British equivalent of the American-sponsored Liberia: a home for freed slaves returned to Africa. Easiest in the East and Midwest at 2330 or 0000 GMT sign-off and everywhere at 0600 sign-on, this is one of the fairly few countries where GMT is actually local time the whole year round.

3339 Radio Tanzania, Zanzibar. Broadcasting from historic Zanzibar Island—known in Swahili as Unguja—this all-Swahili-speaking station crosses Africa and the Atlantic with its modest 10 kilowatts some good nights around 0300-0500. August seems to be the best month for this difficult catch, and for other rare tropical-band East Africans.

3346 Zambia Broadcasting Service, Lusaka. Variable, but often good, thanks to 120 kilowatts, which makes it one of the most powerful stations on 90 meters. This one is in English around 0400-0500 with pop and soul music.

3380 Escuelas Radiofonicas Chortis, Guatemala. Operated by missionaries and educators for the Chortis Indians, this is one of the most flavorful stations on the band. Good reception evenings until around 0400, and often again at dawn, especially in the West.

3396 Rhodesia Broadcasting Corp., Salisbury. As the shooting war steps up, Rhodesia is still heard with calm programming, news and commercials. From sign-on 0355 in English.

75 meters (3900-4000 kHz)

The first of the international bands, this is also the most limited in three ways. It is the narrowest (only 50 kHz is assigned for international use in Europe and Africa, 3950-4000), it is not assigned for broadcasting in the Americas (where it is used by amateurs) and, being the lowest in frequency of the ISWBC bands, it is useful only in, or close to, darkness.

3910 Far East Network, Japan. U.S. troops may not always be stationed in Japan, and the future of this American station is uncertain. So get it while you can—its counterpart in Taiwan has already closed. Much easier reception in the West, around 1100 GMT, like other low-frequency Asians.

3925 Port Moresby, Papua-New Guinea. Still called by its colonial name, this is the capital of a new Pacific-Island nation. Mostly in English, best around 1000-1300, often mixed with NSB, Japan.

3930 Radio Barlavento, Cape Verde Islands. Not much has been published in the U.S. press about these islands since their independence from Portugal. But they can be heard directly until sign-off 0000, on nights of very good propagation and when amateurs are not dominant.

3985 Escuelas Radiofónicas Populares, Riobamba, Ecuador. The Ecuadorian government has moved most out-of-band stations into the assigned bands, but 75 meters is *not* assigned for broadcasting in the Americas. So it can only be a matter of time before it clamps down on this one. Hence, get it while you can, with its wild Andean flute melodies around 0900-1100.

3995 Deutsche Welle, Germany. One of many easily-heard Europeans here, broadcasting to North America at 2200-0550. This band, though international, is not designated for use to the Western Hemisphere.

& RARE CATCHES

60 meters (4750-5060 kHz)
The prime tropical band, home of easily logged Latin Americans, with Venezuela on even frequencies (in 0) and Colombia on odd ones (in 5). Dominicans and others are on both. West Africans are equally easy to catch. There are Asians, too, and some Soviet Europeans which ought not to be on this tropical band. 5000 kHz falls within the band, but is not part of it, being a standard frequency used by WWV, WWVH and many foreign standard frequency and time stations. Here is just a small selection of the hundreds of fascinating stations to be heard in among the North American utility transmitters which plague this band.

4780 Djibouti, French Territory of the Afars and Issas. The only French-held territory on the African mainland, this political hotspot has a strongly Muslim population. Therefore, after its 0300 sign-on, Koran chants can be heard. This is true on most Arab and Muslim stations, including the BBC Arabic Service, Voice of Nigeria in Arabic, etc. A difficult catch with a mere 4 kilowatts.

4810 La Voz de Galápagos, Ecuador. Made famous by Darwin in the *Beagle,* these islands, with their unique fauna, reach their peak of reception each fall. Sign-off is about 0400, sign-on 1100. Unlike mainland Ecuador (EST) the Galápagos are on Central Standard Time.

4820 La Voz Evangélica de Honduras, Tegucigalpa. From the charming old colonial tile-roofed capital of Honduras, this missionary station has English nightly 0300-0400; mostly Spanish at other times.

4832 Radio Reloj de Costa Rica, San José. Is nominally in 24-hour operation, although off the air at times. Calls Costa Ricans abroad in the middle of the night, around 0900-1000, GMT when reception is best.

4870 La Voix de la Revolution Béninoise, Cotonou. An ancient name was given in 1976 to a new country, the former Dahomey. This one is now very strong in French with militant political programs until 2300 sign-off.

4875 La Cruz del Sur, Bolivia. A fairly difficult country to hear, it's best to listen in the early evening, around 2330-0130, with classical music, news and cultural features. It is a missionary station with Canadian Baptist backing.

4970 Radio Rumbos, Caracas. Venezuela's leading commercial station is one of some twenty from that oil-rich country, easily heard on 60 meters. Closes with an impressive anthem, generally 0500.

5045 Radio Cook Islands, Rarotonga. Operated by the quaintly named Cook Islands Broadcasting and Newspaper Corporation, this very low-powered operation (500 watts) is reported back here after moves elsewhere. Best time is toward 0900. Often relays Radio Australia, but for a convincing reception report it is better to report locally originated programming.

49 meters (5950-6200 kHz)
The lowest international band assigned to the whole world, this has more and more become the stamping-ground of powerful relay stations in the Caribbean. This makes it difficult for more distant stations to get through, especially Europeans who have to rely on this low-frequency band in winter. The BBC and Deutsche Welle Antigua-Montserrat relays, added to the old-established Radio Nederland Bonaire, eat up half this band. No wonder all the Ecuadorian local stations which were once active on 49 meters have gone silent. Low-powered stations simply cannot compete! There is not as much DX to be had on 49 meters as there was five or ten years ago.

6040 Deutsche Welle relay, Antigua. The North American service in English is now carried over the new relay transmitter at 0130-0150 nightly, in parallel, elsewhere on 49 meters, with transmitters in Germany on 6010 and 6075 kHz. You can compare reception conditions from two areas—the Caribbean and Europe—by contrasting signal strength and fading on these frequencies.

6175 BBC relay, Antigua. This is Antigua again, but this time the BBC side of the operation. It provides a punchy signal into all of North America, especially the West, with World Service programs 0430-0730 nightly.

41 meters (7100-7300 kHz)
Neither the amateurs nor the broadcasters are very happy with the situation on this band. It is not designated for broadcasting in or to the Americas, but is, in fact, very widely used for transmissions to North America by a dozen or so countries. Let's hope that, after the 1979 frequency-assignment conference, such conflicts will be resolved and both broadcast- and ham-bands extended, although not at each other's expense. There are no broadcasters in the Americas on this band, so if you hear the Voice of America it is coming from one of the overseas relays (say, in Tangier, Monrovia, or Kavala, Greece). Since the Voice has, unfortunately, stopped identifying most of its relay sites at the microphone, it'll be difficult to tell exactly which relay you have.

7215 Brunei. This oil-rich sultanate on the north shore of Borneo is the most prosperous country in Southeast Asia. Its well-equipped radio station puts through a fair-to-good signal in the Western U.S., but is a hard catch in the East; mostly in Chinese around 1100.

7245 Angola. The government station from Luanda is heard at its usual 0500 GMT sign-on in Portuguese. This time—around dawn in West Africa—is the best hour for West African stations on the 41-meter band.

31 meters (9500-9775 kHz)
A very important band. Since it is useful night and day in most areas, 31 meters provides masses of worldwide signals. Some fine DX stations continue to operate here, in among the big guys. In the North American evening, especially in winter when the band is largely closed to Europeans, nice low-powered South American stations are often heard at high levels.

9525 All India Radio, Delhi. The largest country which does not broadcast to

North America can, happily, be heard with its haunting music around 1800-2215 when conditions are good. All in English.

9540 Radio New Zealand, Wellington. Back on the air after a reprieve from permanent shut-down, this one changes frequencies each season like most international broadcasters, but is one of its most permanent channels. Look for it, in English, around 0500-0800.

9585 Radio Mogadishu. You may not understand much of this, as it's mostly in Somali, but for the music buff it is a delight as the melodies are a subtle blend of Arab and African traditions. A powerful signal until regular 2100 sign-off, later during political crises.

9620 Saigon/Ho Chi Minh City. This station was not destroyed during the capture of the city, and is still on its traditional frequency, which dates back to French colonial times. All in Vietnamese, a difficult catch around 1300-1600.

9645 Faro del Caribe, San José. With its meager 500 watts, the "Lighthouse of the Caribbean" shows that all the megawatts are not really necessary. It often beats the biggies during its English religious programs 0300-0400, the rest of the day in Spanish.

9730 Voice of Uganda, Kampala. The Voice of Idi Amin is heard only on Monday, Wednesday, Friday and Sunday in English 2000-2100.

25 meters (11700-11975 kHz)

Another prime international band, open days and evenings, but often fades out at night except for a few straggling signals from southerly or westerly directions.

11700 Radio Clarin Internacional, Santo Domingo. Tropical rhythms, baseball games with commentaries in Spanish, tourist talks in English, live reports on the visit of the King and Queen of Spain. This is one of the finest and most audible stations on the whole dial. On the air 1900-0100 weekdays, somewhat less on weekends.

11755 Radio Finland, Helsinki. Has put its new 250-kilowatt transmitter on here, with English to North America 1330-1400 and repeat 1430-1500. Not a very good choice because of splash from Havana 11760. 15110 kHz in parallel, although using "only" 100 kW, is often better. However, it, too, has to cope with another Latin American powerhouse, HCJB on 15115.

11789 Voice of Indonesia, Jakarta. Supposed to be on 11790, but the 1000-hertz heterodyne tells us that Jakarta is really here. In English 1400-1500, this may be a little easier in the East in Indonesian (1000-1100) or French (1300-1400).

11880 Voice of Turkey, Ankara. A popular station due to the duration and variety of its English programming, this one is heard 2200-0030 with DX-ing features, views on the Aegean Sea waters dispute with Greece, and more Western pop music than Turkish styles.

19 meters (15100-15450 kHz)

For daytime reception of Europe; afternoons especially of Africa, Australia and the Pacific best in the evening; and the Far East evenings, especially in summer, this long-haul band is popular everywhere.

15105 Radio Grenada. It's good to know that a small Caribbean island can produce and operate its own international broadcast service, year in and year out, while others only host relays of European high-powered stations. Radio Grenada's international service isn't listed in the 1976 *World Radio TV Handbook*, but it is on the air with 5 kilowatts around 2000-2200, mainly for Grenadian emigrants in Great Britain.

15170 France-Régions 3, Papéété, Tahiti. Low-powered, exotic, full of local color, and beautifully audible most evenings in most parts of North America, especially in summer, all SWL's seem to love this station. It's actually intended for listeners in the Tuamotu archipelago and other outlying districts of French Polynesia. The best part is the Tahitian, 0300-0500, often extended during song festivals, elections, etc.

15349.5 Radio Luxembourg. It's rare for stations in the advanced nations of Northwest Europe to drift, but this commercial one does. Radio Luxembourg is noted here at present rather than on its nominal 15350 kHz. All in French. Times of best reception vary. In summer, it can be heard well into darkness, but look for it around 1200-2100. Tour de France bicycle race reports are a prominent feature.

16 meters (17700-17900 kHz)

Almost no small stations operate here. The selection is pretty well confined to high-powered, long-haul broadcasters; it's a narrow band, too.

17685 IBA, Jerusalem. Just outside the official band, Israel carries the same English newscast which is heard by local listeners within the country, at 1215-1230. Many parallels then include good 15100.

17795 Radio Australia, Melbourne. The North American service of this old favorite is heard, as it has been here for years, at 0100-0300 GMT.

13 meters (21450-21750 kHz)

A good band when it's open since there is little crowding or jamming, this is a daylight-only band in much of North America most of the year. Not used at all for broadcasting to North America at present. Since it's above the m.u.f. (maximum usable frequency), it still provides fine, undisturbed listening when propagation allows.

21535 Radio RSA, Johannesburg. Down in the Tropics, the highest frequencies are open much longer than at high latitudes. So South Africa uses this band for broadcasts to the rest of Africa. It is best at 1300-1650 GMT, mostly in English with some Swahili.

21590 Broadcasting Service of the Kingdom of Saudi Arabia, Riyadh. A newcomer to this band, this high-powered, lavishly equipped conservative Arab voice is heard mostly in Arabic around 1200-1600.

11 meters (25600-26100)

It's a broad band, but, at present, an empty one. There's one exception, though. The only station which believes it can get through to a target audience on this, the topmost of the ISWBC bands, is Israel. So let's list it:

25605 IBA, Jerusalem. Your one and only chance of a logging on 11 meters is limited to one hour a week—Saturdays and Sundays 1000-1030 in Russian (to the U.S.S.R.). Reception in North America is just possible on certain mornings, though a later transmission time, around 1200-1300 GMT, would have been better. ◇

MEDIUM-WAVE DX'ING

By GLENN HAUSER

New Twists in Capturing Long-Distance Broadcast-Band Stations.

MEDIUMWAVE DXing is a specific DX pursuit in North America. But everywhere else in the world, DX listeners take a broader view of the bands! For example, with the exception of two exclusive clubs in Europe limited to MW-only, every other foreign club we know of covers more than one band—often from longwave to VHF.

The main reason for our overspecialization is the huge number of domestic MW stations in this country. This means that the casual listener hears nothing but domestic stations, and finds it remarkable once he happens across a Canadian, a Mexican border station, or PFB. Brazil is probably the only other country with this combination of a large number of domestic MW stations/geographical extent/isolation status that makes it likely for a hobby called "domestic DXing" to flourish. Yet, to our knowledge, it does not. Probably, this is because Brazil permits domestic shortwave broadcasting (unlike the USA).

The great majority of American DXers who become interested in MW (also known as AM or BCB) regard it as primarily a domestic-listening pursuit. This way, there is no language problem. Goals, such as hearing all 50 states, can be strived for and there is an inexhaustible supply of stations to be heard. A relatively small number of DXers, with more sophisticated equipment or a greater interest in the rest of the world, go after foreign DXing on MW.

Often, Americans DXing foreign MW are not attracted to the SW bands owing to the ease with which world-wide broadcasters are heard. They seek a greater challenge, failing to realize that all modes of broadcasting are closely interrelated. The MW DXer who ignores SW broadcasts cuts himself off from a potential broadening of his expertise, which he could also apply to MW. The *Voice of America* is so seldom heard by pure DXers, for instance, that one reported the "Yankee Doodle" VOA interval signal as a new thing—a great many months after it had replaced "Columbia, Gem of the Ocean."

The domestic MW DXers often use simple receivers which do not even cover shortwave. Thus they cannot benefit from DXing harmonics of domestic mediumwave stations, which they otherwise might have little or no chance of ever hearing due to interference on the fundamental. Some deliberately avoid harmonic DX opportunities, feeling it's a form of cheating to hear MW stations on SW. But it's not cheating unless they claim to have heard a harmonic on its fundamental!

We know of only one domestic station which has a program especially for DXers (KDWN-720, Las Vegas, Nevada, Wednesdays at 10 p.m. Pacific time). Yet, many of the shortwave stations ignored by the MW-only DXer have DX programs including items of interest to MX DXers. And, for that matter, some programs also cover news of amateur

radio activities—but how many hams even know about these programs?

Shortwave DXers tend to avoid mediumwave, where the station congestion problem is even worse and the resulting interference much greater. They also tend to think of MW as being of domestic interest only. This leads SW specialists not to consider such goals as seeing how many *states* can be heard via SW broadcasts. (Beyond the first five, you have to go after pirates and harmonics from MW.)

The simple fact that programming material obviously designed for public consumption—in other words, a broadcast—originated at a domestic MW station is enough for your average SW Dxer to lose all interest in hearing it. It's simply too close! MW harmonics are often regarded as nuisances, rather than golden DX opportunities. By any objective measure, harmonics of MW stations appearing on SW—or heard beyond the local area—are as noteworthy, if not more so, than "true" shortwave broadcasters. They are always low-powered; unintentionally transmitted; and transitory, as traps are installed and transmitters become adjusted and maladjusted.

One reason for the lack of interest in DXing these little gems is the fact that organized SW clubs do not allow them to be tallied in station and country totals, or to qualify for awards, because they do not originate on SW. At the same time, MW clubs exclude them from such recognition because they fall above the arbitrary upper limit of the MW band (1605 kHz). They're in limbo, and so are those who would DX and report them, although many editors have come around to publishing harmonic DX items.

Among the most-sought-after SW stations are those regional or tropical broadcasters which are not intended to be received overseas, but only in the country or continent of origin. These operate primarily on the 120, 90, 60, and 49-meter bands. Almost without exception, these stations carry exactly the same programming as MW stations at the same studio. Yet, for the simple reason that these transmitters are *not* harmonically related to their corresponding MW stations, they are considered bonafide SW, whereas any harmonics of these very same MW stations are not!

All of this is no problem for the DX listener who sets his own goals. But those swept into the "mainstream" of organized clubs are likely to be diverted from such fascinating oddities, for which they will get little or no recognition or even criticism. Once we break away from the idea of categorizing DX by band limits, and instead think of types of programming first, we find the boundaries between MW, SW, FM, and even TV becoming less and less rigid. To illustrate the point, we'll show examples of how one can hear mediumwave programming without possessing a broadcast-band AM radio.

"Mediumwave programs, whether heard on MW, or simulcast on SW, more closely reflect a nation's character and concerns, as they are intended primarily for domestic consumption. International SW programs are designed to put across a certain favorable national image, not necessarily meshing with reality."

Tuning In. Chances are good that within a few hundred kilometers of you (in the USA) there will be at least one BCB AM station radiating enough power on an exact multiple of its proper frequency (usually twice or thrice) to allow you to hear it somewhere in the 2 or 3 MHz area—when you *can't* hear it on the fundamental frequency because of distance, daytime absorption, or a closer co-channel station. If you find none at first, just wait a while and one will eventually appear.

For instance, in eastern Tennessee we hear WMTC, Vancleve, Kentucky on 2190 kHz, while its fundamental of 730 kHz is blocked by a much closer station in Lenoir City, Tennessee (which has much better harmonic suppression).

Western USA DXers have a chance to hear a *trans-oceanic* harmonic from Cheju Island, part of South Korea. Station HLDA occasionally puts out a very strong signal on 3140 kHz (2 × 1570). Best time to try is just before local sunrise.

Albania is the Cheju-Do of Europe, with harmonics on 2914 kHz (2 × 1457) and 2428 (2 × 1214). However, we know of no North American receptions of these yet. Best time to try is around 0400 GMT.

All other MW harmonics we can hear come from Latin America. With the selection constantly changing, the best approach is to tune the 2-3 MHz area frequently, familiarizing yourself with which frequencies are ordinarily open, which bear fundamental broadcasters or utility stations, which have local harmonics or mixing products, and which provide DX harmonics.

A good place to start is 2200 kHz, where two Latin American harmonics have held forth for several years now: Radio Superior in Guatemala, and Emisora La Lider in Nicaragua (currently the best, or even the only way to hear that country on SWBC). One of them signs off earlier than the other, around 0400 GMT. Although "Rumbos" doesn't refer to the effects of an earthquake, a station by the name of Radio Rumbos appeared on 2420 kHz from Guatemala following the quake. Perhaps its 1210 kHz transmitter/antenna system was jostled out of whack by the shock. Before it submerged, it put out enough signal to be heard as far away as Invercargill, New Zealand.

Radio Pipaton also appeared for the first time last spring on 2580 kHz. This Colombian station belongs to the Todelar network, in Barrancanermeja (meaning Crimson Cliff). It began with an 0300 GMT close, but then went all night. R. Pipaton intends to transmit only on 1290 kHz. As with all harmonics, DXers should *not* report reception to the station, lest it become alarmed about its harmonic radiation level. If you cannot detect R. Pipaton now, chances are somebody told them about 2580 kHz since press time. If it's gone, others will replace it, perhaps even on the same frequency.

How else can you hear MW programming without a BCB AM radio? Almost every Latin American station on SW is merely a parallel transmission of its main MW outlet to extend coverage. It's easy to tell from listing in the "World Radio-TV Handbook" which are the few SW-only Latin American stations. Some of them, such as La Voz del Maestro in Mexico City, took to SW-only because there was no room for them on the densely packed local MW dial. Such an alternative is never even considered in major U.S. cities!

The "SW parallelers" are "once removed" from their MW origin—but now and then an SW transmitter relaying

MW, itself puts out a harmonic, for "twice removed" transmission, such as Radio Neiva, Colombia, originating on 1230 kHz (where hearing it in the USA is virtually impossible), relayed on 4855 kHz, and that "harmonicized" to 14565 kHz, where we heard it ten years ago.

Play-by-play coverage of special sports events by certain AM stations sometimes appears on SW, where it can be fed to other countries more economically than via satellite. For instance, Bob Zilmer in Wisconsin heard a Cincinnati vs New York baseball game, from WNEW, on 9460 kHz one night around 0245 GMT. The WNEW feed was simply transmitted by an RCA station on Long Island, N.Y., in what's called a "blind broadcast" by a point-to-point station. Such transmissions are often on regular AM (here referring to the type of modulation, not the band; AM can be employed at any frequency, with the standard broadcast band called "mediumwave"), but SSB is preferred if the receiving antenna can handle it. Another such case is 11675 kHz, where Pitt McNeil of Washington, D.C. reports that Venezuelan Radio Continente games are carried on upper sideband.

Mediumwave programs, whether heard on MW, or simulcast on SW, more closely reflect a nation's character and concerns, as they are intended primarily for domestic consumption. International SW programs are designed to put across a certain favorable national image, not necessarily meshing with reality.

South Africa has bought a pair of new 100-kW SW transmitters, for the purpose of relaying the MW "Radio Five" program (which replaced "LM Radio" from Mozambique upon independence). After several false stops, once again all MW transmitters are to be phased-out in South Africa, once the SW is established.

FM and TV Broadcasts. At first, almost all FM programs in the USA were simulcasts of AM. As FM listenership increased, more and more FM-originated programming ensued, by law. Still, you can hear FM stations in some small communities carrying the same programming as their companion AM station, with hardly a mention on the air that FM exists.

In Latin America, the FM band was first used as a convenient way to link an AM studio with its transmitter in another part of town (although we've seen some small Mexican MW stations with the tower on top of the building—and no radials at all!). Some of these highly directional, low-powered anachronisms remain in Mexico, despite an official move to bands such as 170, 217, or 950 kHz for studio-transmitter links. Since receivers covering the FM band can be bought easily by the public, many stations publicized their links proudly as their FM outlet, although there is rarely any advantage to tuning for the FM link instead of the AM retransmission.

We were amused by one enterprising station in Sabinas, Coahuila, which for years has promoted its 173.42 MHz link to the general public, long before low-cost VHF-band portable radios were commonplace (see photo).

Even in Mexico City, many of the FM stations serve this dual purpose, although the trend is toward more and more FM-only programming. But a link that never appeared in the usual lists was on 90.9 MHz there, carrying XEW (AM) programming (not to be confused with XEW-FM, separately programmed on 96.9 MHz). It's so low powered and so directional that hearing it in most of Mexico City itself is more difficult than hearing it 1500 km away via a good sporadic-E opening!

Not only is MW programming to be heard on FM, but also on TV! Those who are closest to the 1500-km arc from Cuba (roughly, Texas to North Carolina), and have channel 2, 3, 4, 5, or 6 open in that direction, can pick up Cuban TV most often, especially in the summer. TV Cubana programs are not continuous during the day, so while palm-tree test patterns fill the video void, "Reloj Nacional" audio accompanies it. This lively service includes bits of news, socialist homilies, by a man and woman alternating, and highly accurate time stingers every minute. It's actually one of Cuba's several MW networks, transmitted daily on TV too.

During extremely good SW propagation periods, French TV audio can be heard all over the world, thanks to the low (for TV) frequency of an antiquated 819-line channel, 41.25 MHz. When we heard it, they were carrying audio from a Bordeaux MW station. Perhaps for this reason, no verification was forthcoming. The Soviet Union does this too. We've heard Russian radio programs carried on 56.25 MHz, the audio frequency of OIRT Channel 1.

The top-rated adults-only Mexican news program, "24 Horas," is projected nationally on the TV network of Canal 2, weeknights at 0430-0600 GMT. But it's also carried on XEX (AM), clear channel 900 kHz. Here we have the reverse—a TV program being relayed on MW!

Not only can you hear MW programs on SW broadcast and utility, FM, and even TV, but also on longwave. Many of the superpower longwave emissions from Europe are also carried on mediumwave, although it is our North American point of view that makes us think of LW as duplicating MW, rather than vice versa.

Conclusion. If MW DXing appeals to you, by all means become involved in an MW-specialty club, such as NRC (Box 127, Boonton, N.J. 07005) or IRCA Box 21462, Seattle, Wash. 98111). If SW DXing is of interest, by all means join a SW-specialized club, such as NASWA (Box 13, Liberty, Ind. 47353). And if FM/TV DXing is your bag, there's no equal to WTFDA (Box 163, Deerfield, Ill. 60015). But to keep in touch with a little of everything, try an all-band club such as NNRC (Box 539, Newark, N.J. 07101).

Keep in mind the examples we have given of the unified and interrelated nature of broadcasting, however, lest you become carried away with the arbitrary divisions that have come to be taken for granted in the U.S. DX community.

Perhaps you don't have the time, or the equipment, to be interested in everything at once. Nevertheless, you can change your emphasis every few years as the spirit moves you; or concentrate on each aspect when its particular frequency range is most productive. The average listener in Europe, where countries are the size of U.S. states, does not restrict his attention to AM only, FM only, or SW only. Multi-band radios are commonplace and the listener chooses whichever band delivers best the country he wants to hear at a particular time. The same attitude carries over to those who go into radio listening deeply enough to be called DXers. It's a holistic outlook American DX listeners could emulate. ◇

"The average listener in Europe, where countries are the size of U.S. states, does not restrict his attention to AM only, FM only, or SW only."

DX CLUBS AROUND THE WORLD

ONCE you get into the SWL hobby, you'll want to exchange notes and compare DX catches with other hobbyists. One of the best ways is by joining a club. There are two main types of club—one is operated by major international shortwave stations and links up their active listeners through a club program on the air, and often through a club newsletter which is mailed direct to members. Requirements for membership generally consist of proof of regular listening, such as six accurate reception reports mailed within two months. Other than the cost of postage on reception reports, membership in station-run clubs is free. The other type of club is organized by SWL's and DXers for the exchange of up-to-date DX information . . . how-to-do-it articles, background on stations, but above all a log of the latest DX catches by the members. Some clubs are general, covering all bands. Others are highly specialized and cater to those who concentrate on a single range of frequencies (such as shortwave broadcast, VHF/UHF, standard broadcast). Run by volunteer effort, these clubs have to charge annual dues, mostly between $10 and $20 per year, to cover postage and printing of their club organ. Since they are operating on tight budgets, we suggest you enclose 50¢ in stamps with any request for a sample bulletin.

In this list, we've included some of the major clubs around the world. We've also listed some other useful contacts.

ADDX, D-2130 Rotenburg, Postfach 201, West Germany. For German-speaking DXers.

American SWL Club, 16182 Ballad Lane, Huntington Beach, Cal. 92649. An all-band club. Many catches from its "SWL Monthly" are broadcast on the "DX Party Line" over HCJB, Quito, Ecuador.

Australian Radio DX Club, Box 227, Box Hill, Vic. 3128, Australia. Useful for the West Coast SWL and all interested in stations in the Pacific. Excellent coverage of the hundred-plus small SWBC stations in Indonesia.

Benelux DX Club, Box 1306, Nijmegen 6800, The Netherlands. If you want to join a European club, this one has lots of English in its bulletin.

British Broadcasting Corporation, Bush House, London, England. Free booklets on aerials (antennas). Of course, you can ask this and all other international stations to place you on the mailing list for regular program schedules; from the BBC, they're monthly.

Canadian International DX Radio Club, 169 Grandview Ave., Winnipeg, Manitoba, Canada R25 OL4. Shortwave and broadcast bands, TV/FM, QSL, Utility, and ham bands.

Danish Short Wave Clubs International, DK 8382 Hinnerup, Denmark. The English edition of "Shortwave News" is a valuable source for tropical band DX, clandestines, and rare Europeans.

Friendly DX Club, Box 214, SF 00101 Helsinki, Finland. Partly in English, in "Sunspot" you can read about transpolar DX to the Far East and rare medium-wave catches from North America and the Pacific. Beautiful illustrations in this glossy, printed magazine.

International Short Wave League, 1 Grove Road, Lydney GL15 5EP, England. All-band coverage including listening to amateurs. One of the pioneer clubs.

International Radio Club of America, P.O. Box 21462, Seattle, Washington 98111. One of the two specialized clubs for those chasing the 4000-plus standard broadcast (AM) stations in the U.S., and AM stations around the world. 34 issues of "DX-Monitor" yearly, concentrated during the winter DX season.

Israel DX Club, Box 7125, Haifa. Small, recently founded club in a part of the world where shortwave broadcasting is intensely active and fast-moving.

Japan Short Wave Club, CPO Box 79, Sendai, Japan. Only parts of the monthly "SW-DX Guide" are in English, but useful for specialists in Chinese domestic broadcasting.

Language by Radio Interest Group, c/o Dept. of French and Italian, University of Illinois, Urbana, Ill. 61801. For language teachers and students interested in applying the shortwave medium. Holds annual seminar.

Medium Wave Circle, 7 The Avenue, York Y03 6AS, England. Read how British DXers hear U.S. AM stations—sometimes coast-to-coast—and good catches from around the world.

National Radio Club, Box 127, Boonton, N.J. 07005. The pioneer MW-only club, with excellent technical articles and current DX reports in 32-times-yearly "DX News."

Newark News Radio Club, Box 539, Newark, N.J. 07101. Old, East-Coast based club which gives equal weight to all bands, including the amateur radio bands.

North American Shortwave Association, Box 13, Liberty, Ind. 47353. If your interests are in the mainstream of shortwave broadcasting, this is your choice—the sole SWBC-only club in North America, with detailed coverage and prompt notification of rare catches.

Radio Australia Listeners' Club, Box 428G, Melbourne 3001, Australia. A popular club run by a popular station. Membership must be retained by regular reports sent on postcards provided by the station.

Radio Nederland, Box 222, Hilversum, The Netherlands. Prints special booklets on antennas and converters for receivers lacking the 13- and 16-meter bands.

RC-USA, 1602 W. Pierson Ave. #229, Phoenix, Arizona 85015. Articles on SWL and BCB, QSL, station loggings.

SPEEDX, Box E, Elsinore, CA 92330. Good coverage of SWBC, Utilities, other bands. Bi-monthly "Speedx-Grams" during the winter season.

Sweden Calling DX-ers, Radio Sweden, S-10510. Stockholm, Sweden. The program is broadcast every Tuesday. If your DX tip is used on the air, you will be sent the script; regular contributors get it regularly.

SWL International, c/o Chris Hansen,

100 W. 92nd St., Apt. 5B, New York, N.Y. 10025. A medium-sized club, publishes "SWL-News."

World DX Club, 11 Wesley Grove, Portsmouth P03 5ER, England. Bulletin "Contact" covers all the bands.

World Radio-TV Handbook, Billboard Publications, Inc., One Astor Plaza, New York, NY 10036. The "bible" of the SWL—lists all frequencies, times, schedules. Annually, next edition January.

Worldwide TV-FM DX Association, Whiting, Ind. 46394. Covers VHF-UHF bands only; articles, listings, and photos on TV, FM, VHF, Utility DXing.

WWV, Fort Collins, Colorado 80521. The famous standard time and frequency station will send you a schedule listing its services. The propagation forecasts 14 minutes past the hour are of great value to the SWL.

Specialized organizations and "special interest" or "regional" clubs include the following:

Association of North American Radio Clubs, Executive Secretary, 557 N. Madison Ave., Pasadena, California 91101. ANARC is confederation of DX radio clubs. ANARC is *not* a club itself. It is a congress of member clubs, now in its eleventh year of service to DXers. Individuals cannot join ANARC but they may subscribe to the monthly ANARC Newsletter at a cost of $2.50 a year. ANARC will also supply an updated list of ANARC-affiliated DX Clubs specializing in LW, MW, SW, SW Utilities, ham, FM, and TV reception upon receipt of a self-addressed, stamped envelope sent to the ANARC Executive Secretary at the above address. The organization also holds an annual summer convention and congress of its affiliate clubs.

Handicapped Aid Program (HAP), Ted Poling, HAP Director, P.O. Box 163, Mt. Sterling, Illinois 62353.

Miami Valley DX Club, c/o Bob Beck, 1102 Delverne Ave., S.W., Canton, Ohio 44710.

Minnesota DX Club, Tom Gavaras, 16920 17th Ave., N., Wayzata, Minn. 55391.

Transworld DX Club, John Chapman, 606 St. Andrews Rd., West Vancouver, B.C. Canada V7S 7V4.

University of Manitoba DX Club, Room 517, University Centre, Winnipeg, Manitoba, Canada R3T 2N2.

European DX Council, Rudolf Heim, Secretary General, P.O. Box 25-03-25, D-4630, Bochum, Federal Republic of Germany (West Germany). For information, send two IRC's for reply, plus your name and address. ◇

SW Receivers

COLLINS

651S-1 Shortwave Receiver
All-solid-state: tuning range 400 kHz-30 MHz with coarse frequency adjustment in 100-kHz and 1-MHz steps, plus tuning dial that varies frequency in 100-Hz increments at a rate of 10-kHz per revolution; direct frequency digital readout; squelch; combination calibrated r.f. and audio-line-level output meter; switchable a.g.c.; b.f.o.; r.f. gain control; modes of reception include AM, single sideband (USB, LSB, ISB), FM (narrow-band), CW, RTTY, and data, with selection of various bandwidths provided; phase-lock frequency synthesizer; built-in 117/230-volt, 47-420 Hz a.c. power supply; 28-volt d.c. power supply availabie as optional extra. $6295.00

51S-1 Shortwave Receiver
Vacuum-tube design tunes from 200-2000 kHz (primarily for lab applications and broadcast monitoring) and 2.0-30.0 MHz; triple-conversion below 7.0 MHz; double-conversion in range 7.0-30.0 MHz; 30 bands each 1-MHz wide excepting 200-1000 kHz; direct digital readout of frequency; r.f. gain control; accurately calibrated S meter and audio output metering; mechanical filters for SSB reception; crystal-lattice filter for CW reception; bridged-T rejection notch filter; product detector; b.f.o.; built-in 100 kHz calibrator; requires external speaker; built-in 117 volt a.c. power supply. $2567.00

DRAKE

DSR-2 Communications Receiver
All-solid-state; dual-gate MOSFET's; continuous coverage 10 kHz-30 MHz; phase-locked digital readout frequency synthesizer giving incremental frequency selection in 100-kHz, 1-MHz, and 10-MHz steps; 100-Hz readout of received frequency; multiple-conversion; noise blanker; b.f.o.; various modes of reception including CW, lower and upper single sideband, AM, independent sideband, etc.; company claims AM sensitivity of 1 μV and selectivity of 6 kHz at 6 dB down and 12 kHz at 60 dB down on AM; CW selectivity at 6 dB down either 250 Hz or 1200 Hz; SSB selectivity at 6 dB down 2.4 kHz; built-in 117/230-volt, 50-420 Hz a.c. power supply; 5.5″ H × 13.38″ W × 15″ D. $2950.00

SPR-4 Programmable Receiver
All-solid-state with FET r.f. stage; tuning range covers 150-500 kHz plus any 23 500-kHz wide ranges in spectrum from 500 kHz to 30.0 MHz (10 ranges

supplied by manufacturer); dual-conversion; direct frequency readout; three built-in bandwidths, corresponding to mode of reception; 400 Hz for CW, 2400 Hz for SSB, and 4800 Hz for AM; built-in speaker; notch filter; 100-kHz calibrator and i.f.-type noise blanker available as optional extras; S meter; crystal-lattice i.f. filters; product detector; may be operated from 12-volt battery; may be used with external speaker; built-in 117/230 V a.c. power supply; 5.5″ H × 10.75″ W × 12.25″ D. $629.00

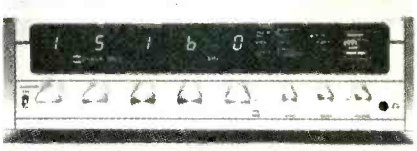
R-4C Communications Receiver
Amateur radio bands plus accessory crystal sockets for 15 additional 500-kHz ranges; see "Amateur Radio" section for specifications. $599.00

SSR-1 Communications Receiver
All-solid-state; tuning range covers 500 kHz to 30 MHz; sensitivity; SSB typically 0.5 μV for 10 dB (S+N)/N; AM better than 2 μV for 10 dB (S+N)/N;

synthesized; selectable sidebands; preselector; clarifier; built-in speaker; S meter; headphone jack; telescoping antenna; coarse and fine tuning controls; built-in 117/234 V a.c. power supply; automatically switches to internal battery pack if a.c. power fails; on-off pushbutton for reduced current drain on d.c. operation; 5¾″ H × 13″ W × 10½″ D. $350.00

DYMEK

DR-22 General Coverage Receiver
Continuous coverage from 50 kHz to 29.7 MHz with



phase-locked loop synthesizer and 5-digit, seven-segment LED frequency readout; uses quartz crystal reference; has selectable (4 kHz/8 kHz) bandwidth, S-meter, fine-tune control; functions in AM, LSB, and USB modes; has front-panel headphone jack; 17½″ × 14½″ × 5½″ $895.00

GENERAL ELECTRIC

7-2971 10-Band Portable
Covers AM, FM, Public Service 30-50 MHz and 150-174 MHz; aircraft 108-136 MHz; Public Service UHF 450-512 MHz; CB 26.95-27.405 MHz; weather 162.4 or 162.55 MHz; SW1 6-9.8 MHz; SW2 12.0-21.0 MHz; features separate UHF tuning control; 5″ dynamic speaker; push-button controls for UHF, CB, and Weather; "Memory Log" indicator; squelch control; vernier tuning; bass & treble boost switches; three antennas (60″ whip, ferrite rod, and built-in UHF); operates from six "D" cells or 117-V a.c. power sources; 13″ W × 9⅜″ H × 4″ D. $116.95

KENWOOD

R-300 Communications Receiver
General coverage, solid-state communications receiver; coverage extends from 170 kHz to 30 MHz in six bands; bandspread tuning for 3.82-4.0 MHz (75 m), 4.75-5.1 MHz (60 m), 5.9-6.2 MHz (49 m), 7.0-7.5 MHz (41 m), 9.4-9.8 MHz (31 m), 11.7-12.0 MHz (25 m), 15.0-15.5 MHz (19 m), 17.6-18.0 MHz (16 m), 21.4-21.8 MHz (13 m), 25.6-26.2 MHz (11 m); AM, SSB, and CW modes; sensitivity 1μV (AM) and 0.3 μV (CW and SSB) from 170 kHz through 3.0 MHz, and from 18.0 through 30 MHz, 1.5 μV (AM) and 0.5 μV (CW and SSB) from 3.0 through 18 MHz, for 10 dB S+N/N; selectable selectivity rated at −6 dB at 2.5 kHz, −60 dB at 12 kHz (narrow), −6 dB at 5 kHz, −60 dB at 17 kHz (wide); audio output 1.5 W into 8 ohms at 10% distortion; 500-kHz marker generator for calibration; has dual-gate MOSFET r.f. amplifier and mixer, dual conversion from 18 through 30 MHz; has r.f. and a.f. gain controls, antenna trim, S meter, switchabie hi/lo tone and a.n.l., dial light switch, headphone jack, 50-75 ohm unbalanced antenna input; requires 8 W at 100/120/220/240 V a.c., or 6.9 W max. (light on) at 13.8 V d.c.; can be powered by 12-16 V external d.c. source or internal batteries; power circuit automatically switches from a.c. to d.c. in case of a.c. power failure; 14¼″ W × 12-11/16″ D × 6⅜″ H. $239.00

NATIONAL

HRO-500 Shortwave Receiver
All-solid-state; tuning range covers 5.0 kHz-30.0 MHz in sixty 500-kHz wide segments; dual-conversion with phase-lock first oscillator enabling visual resolution of frequency to less than 1 kHz; four built-

in bandwidth selections including 500, 2500, 5000, and 8000 Hz; r.f. gain control and r.f. input attenuator; selectable tuning ratio of either 10 kHz or 50 kHz per knob revolution; passband tuning of i.f. filter; built-in crystal calibrator; S meter; variable b.f.o.; reception modes; AM, CW, lower and upper

single sidebands; product detector; rejection or notch tuning in i.f. strip; SO-239 antenna input connection; built-in 117-volt a.c. supply but may be operated from 12.6-volt d.c. $3000.00

HRO-600 Shortwave Receiver

All-solid-state with FET's and continuous coverage from 16 kHz to 30 MHz; phase-locked frequency synthesizer with two frequency-control plug-in options: Type 601 digital readout search v.f.o.; Type 602 Veeder-Root setup synthesizer; b.f.o.; combination calibrated S, r.f. input, and audio line-voltage output meter, switchable a.g.c. with three options; antenna attenuator switchable 20 dB; headphone jack on front panel; built-in 117-230 volt, 47-420 Hz a.c. power supply, 17" W × 15½" D × 5¼" H.

Main frame $4190.00
HRO 600/601. VFO search version $4990.00
HRO 600/602. Synthesizer version $4990.00
Various accessories available, including spare parts kits.

NORDMENDE

Galaxy Mesa 9000st

Seventeen-band portable (FM, AM, LB, two separate SW bands with continuous coverage, plus eleven separate bandspread SW bands with dual-channel amplifiers; features built-in b.f.o. with product demodulator for SSB reception; dual-conversion on SW bands; electronically stabilized SW tuner; tuned r.f. stage on SW; has built-in speaker with crossover network; four separate antennas; individually illuminated dial scales; push-button band selection; jacks for external antennas, speaker, tape/phono, external power source, stereo indicator light; stereo defeat switch; operates from six "D" cells or built-in 110/220 V a.c./10-16 V d.c. or a.c. $549.00
9000. Same as 9000st, except with single-channel amplifier. $499.00

Globemaster Portable

Six-band portable (AM, FM, two spread SW, five continuously tunable SW, and LW bands); variable fine tuner on SW; external & internal antennas; separate variable slide controls for bass & treble; output 4 W continuous; switchable a.f.c.; switches for battery test/tape/phono; jacks for tape/phono/speaker/earphone; visual tuning meter; front-firing 6¼" × 4½" speaker; compartment for a.c. line cord storage; thumb tuning; operates from 110/220 V a.c. (convertible) or six "D" cells; 15" W × 8" H × 3½" D; 7½ lbs $229.95

Galaxy Mesa 6606

Nine-band portable (AM, FM, LW, 49, 41, 31, 25, 19, and 16 meter bands); operates from six "C" cells or built-in 110 V a.c. supply; bandspread on SW bands; dual-conversion for SW; presetting on FM or AM/SW station; slide controls for bass & treble; push-button band selection; walnut wood grained plastic cabinet; 15¾" W × 7¾" H × 3" D $189.95

PANASONIC

RF-8000 Shortwave Receiver

Twenty-four band FM-AM-SSB-CW receiver; covers 8 VHF bands, one LW, one MW, two MB, 12 SW bands; has two rod antennas for VHF, ferrite core antennas for LW, MW, MB, frame antenna for SW, LW, MW, MB; external antenna terminals; two 7" × 4" oval speakers; headphone & earphone jacks; tuning fork battery-operated clock; operates from 120-V, 60 Hz or 7 "D" cells, 12-V d.c.; features pushbutton band selection, a.f.c., a.n.l., tuning/battery meter, squelch, crystal markers for dial calibration, 14¼" H × 20-3/16" W × 8⅜" D; weight 48 lbs, 5 ounces. $2500.00

RADIO SHACK

Realistic DX-160 Receiver

Communications receiver covering ham, SWL, SSB, and CB (150 Hz-30 MHz); electrical bandspread for 160-10 meters; FET's in all critical stages; product detector and variable b.f.o.; eleven front-panel controls including a.n.l., fast-slow a.v.c., receive/standby, a.f. and r.f. gain, antenna trim, main and bandspread tuning; features OTL audio, cascade r.f. stage; zener stabilization; noise limiting in i.f. and audio stages; logging scale; headphone jack; illuminated S meter; operates on 12-V d.c. negative ground or 120-V a.c. 6½" × 14¼" × 9¼"; matching speaker 7" × 3½" × 5⅛" 20-152 ..... $159.95

TANDBERG

TP-43 AM/FM/SW Receiver

Covers four wavebands (FM, AM, 1.6-4.5 MHz, 5.8-18.5 MHz); SW vernier fine tuning; separate bass & treble controls; 5" × 9" speaker; ferrite & telescoping antennas; external antenna connector; frequency response 40-20,000 Hz; 9-V (six "D" cells) or 120 V a.c.; 11" W × 7⅛" H × 3¼" D $250.00

YAESU

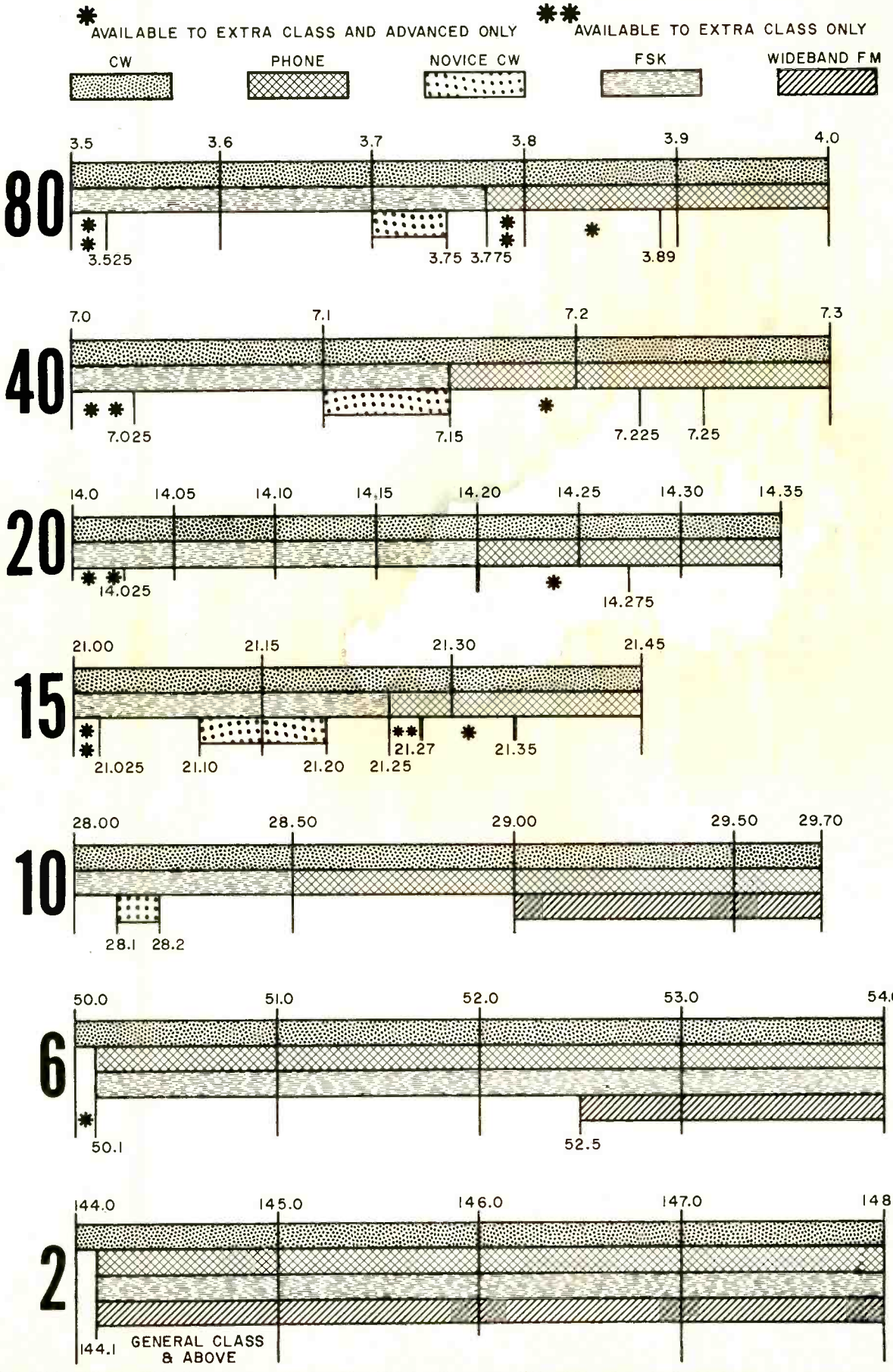
FRG-7 Communications Receiver

General coverage, solid-state receiver; frequency coverage 0.5-29.9 MHz in 4 bands; AM, LSB, USB, and CW modes; sensitivity 0.7 μV at 10 dB S/N (SSB, CW); selectivity −6 dB at 3 kHz, −50 dB at 7 kHz; frequency stability with 500 Hz within any 30-min. period after warm-up; audio output 2 W into 4 ohms; antenna input impedance high (0.5-1.6 MHz), 50-75 ohms unbalanced (1.6-29.9 MHz); Wadley Loop drift cancellation circuit; triple conversion; automatic noise suppression circuit (AM/ANL mode); three-position tone switch; three-position r.f. attenuator; 5-kHz direct dial readout; requires 117 V a.c., or 13.5 V d.c. or eight 1.5-volt batteries (mounted internally); 11.2" D × 13.4" W × 6" H. $299.00

TIME CONVERSION WITHIN U.S.A.

Universal Time (Greenwich Mean Time) (hours)	Eastern Daylight Time	Eastern Standard or Central Daylight	Central Standard or Mountain Daylight	Mountain Standard or Pacific Daylight	Pacific Standard Time
0000	8:00 p.m.	7:00 p.m.	6:00 p.m.	5:00 p.m.	4:00 p.m.
0100	9:00 p.m.	8:00 p.m.	7:00 p.m.	6:00 p.m.	5:00 p.m.
0200	10:00 p.m.	9:00 p.m.	8:00 p.m.	7:00 p.m.	6:00 p.m.
0300	11:00 p.m.	10:00 p.m.	9:00 p.m.	8:00 p.m.	7:00 p.m.
0400	Midnight	11:00 p.m.	10:00 p.m.	9:00 p.m.	8:00 p.m.
0500	1:00 a.m.	Midnight	11:00 p.m.	10:00 p.m.	9:00 p.m.
0600	2:00 a.m.	1:00 a.m.	Midnight	11:00 p.m.	10:00 p.m.
0700	3:00 a.m.	2:00 a.m.	1:00 a.m.	Midnight	11:00 p.m.
0800	4:00 a.m.	3:00 a.m.	2:00 a.m.	1:00 a.m.	Midnight
0900	5:00 a.m.	4:00 a.m.	3:00 a.m.	2:00 a.m.	1:00 a.m.
1000	6:00 a.m.	5:00 a.m.	4:00 a.m.	3:00 a.m.	2:00 a.m.
1100	7:00 a.m.	6:00 a.m.	5:00 a.m.	4:00 a.m.	3:00 a.m.
1200	8:00 a.m.	7:00 a.m.	6:00 a.m.	5:00 a.m.	4:00 a.m.
1300	9:00 a.m.	8:00 a.m.	7:00 a.m.	6:00 a.m.	5:00 a.m.
1400	10:00 a.m.	9:00 a.m.	8:00 a.m.	7:00 a.m.	6:00 a.m.
1500	11:00 a.m.	10:00 a.m.	9:00 a.m.	8:00 a.m.	7:00 a.m.
1600	Noon	11:00 a.m.	10:00 a.m.	9:00 a.m.	8:00 a.m.
1700	1:00 p.m.	Noon	11:00 a.m.	10:00 a.m.	9:00 a.m.
1800	2:00 p.m.	1:00 p.m.	Noon	11:00 a.m.	10:00 a.m.
1900	3:00 p.m.	2:00 p.m.	1:00 p.m.	Noon	11:00 a.m.
2000	4:00 p.m.	3:00 p.m.	2:00 p.m.	1:00 p.m.	Noon
2100	5:00 p.m.	4:00 p.m.	3:00 p.m.	2:00 p.m.	1:00 p.m.
2200	6:00 p.m.	5:00 p.m.	4:00 p.m.	3:00 p.m.	2:00 p.m.
2300	7:00 p.m.	6:00 p.m.	5:00 p.m.	4:00 p.m.	3:00 p.m.

PRINCIPAL AMATEUR BAND ALLOCATIONS



HOW TO BECOME A RADIO AMATEUR

By JOHN J. McVEIGH, WB2BLS

AS WITH all worthwhile things, you'll have to *earn* your amateur privileges. Exactly what you have to do to become a ham depends on what class license you set your sights on. Basically, you'll need to develop a working knowledge of Morse Code (both sending and receiving), FCC rules and regulations that pertain to the Amateur service, and basic electronic theory.

Which License to Get? Under current FCC rules, there are five classes of amateur licenses. Let's examine each, with special emphasis on the "beginner" classes. The *Novice* license is the easiest to obtain. The applicant must demonstrate rate proficiency in Morse Code operations at a speed of 5 words per minute (wpm), or about one character every 2 seconds. Basic electronic theory and a knowledge of FCC rules is also required. This is so because the prospective Novice must understand the fundamentals of the transmitter he will operate and how to function within the limits of the law. Novices get CW (Morse Code) privileges on several segments of the HF (3–30 MHz) amateur bands. Permitted frequencies are 3.7–3.75 MHz, 7.1–7.15 MHz, 21.1–21.2 MHz, and 28.1–28.2 MHz. Maximum transmitter input power is 250 watts. The Novice test is a free, "by-mail" exam administered by a volunteer amateur. The resulting license is good for two years, but is not renewable.

The Technician license grants many amateur privileges in the VHF and UHF regions (above 50 MHz or near television Channel 2). Techs must pass a 5-wpm code test, as well as a comprehensive exam on electronic and radio theory and FCC regulations. Technicians are permitted all privileges on 50.1–54 MHz, 145–148 MHz, and on all amateur frequencies above 220 MHz, as well as Novice class privileges. Communication on these bands is generally limited to about 50 miles, but under certain conditions can extend out to distances common on the HF bands—one-thousand miles or more. Maximum transmitter input power is 1000 watts(!). The Technician exam is normally given by mail. A Tech's license and the succeeding ones are good for five years, and are renewable.

General licenses provide many operating prerogatives. However, the requirements are stiffer, and most amateurs get one only after coming up through the ranks from the Novice or

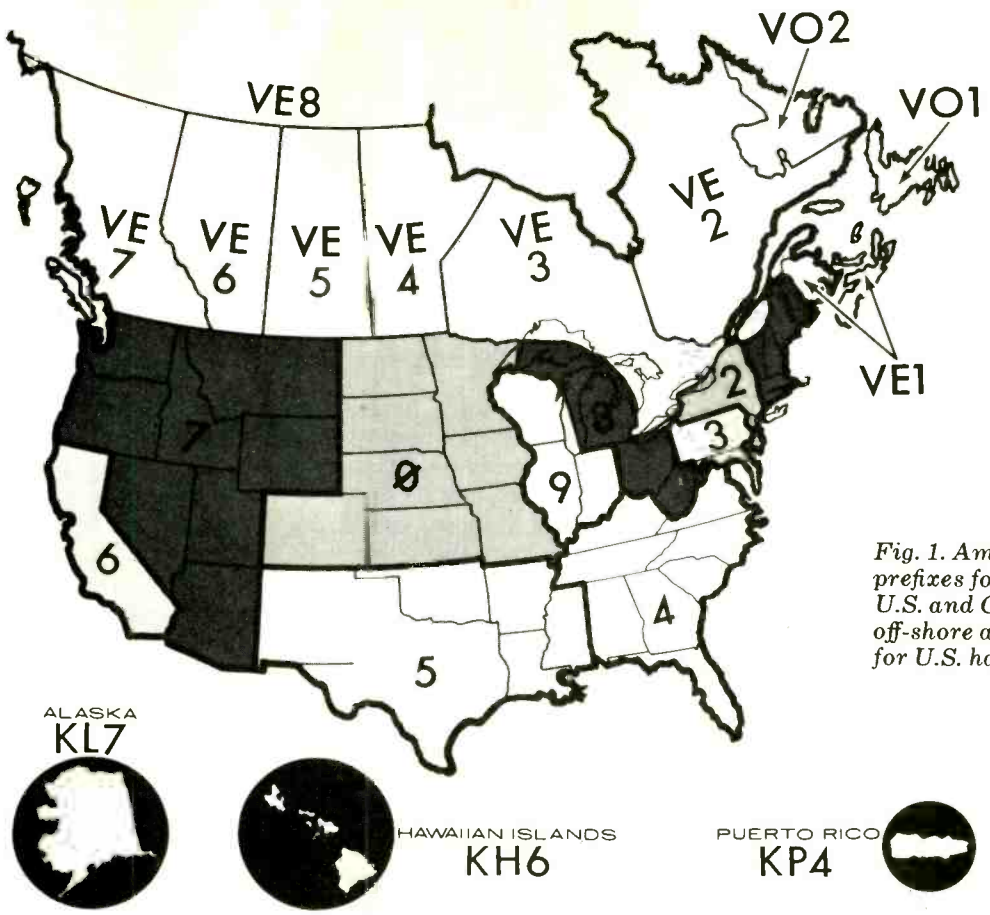


Fig. 1. Amateur call letter prefixes for continental U.S. and Canada, plus off-shore assignments for U.S. hams.

Technician Class. The theory and regulations test is the same as that for the Tech, but the code exam is conducted at 13 wpm—more than twice that for the lower licenses. The prospective General must appear before an FCC representative to take it. There are exceptions to this, say, for handicapped persons, who were formerly issued Conditional licenses. This class has been eliminated, and all such persons will be issued Generals at renewal time.

General privileges are wide-ranging. They include all operating privileges in the CW portions of the 3.5, 7, 14, 21, and 28-MHz bands except those segments restricted to Extra Class amateurs (generally the bottom 25 kHz of each band). All phone privileges in the HF bands are granted on the above bands, except for the sub-bands restricted to the Advanced and/or Extra Class licensees (usually the bottom 50–100 kHz of each phone band). They also have all amateur privileges in the VHF and UHF regions above 50.1 MHz. Maximum input power is 1000 watts.

Advanced and Amateur Extra Class licenses confer the most and all amateur privileges, respectively. However, requirements are rather stiff from the beginner's viewpoint. The theory exams are very thorough and code requirements are 13 wpm (Advanced) and 20 wpm (Extra). Almost every amateur who attains these levels has had at least two years of on-the-air experience before tackling these tests.

The Bands. Every amateur license carries an authorization to transmit on more than one band although the selection varies with the class of license. You will have to decide which ones to use. To help you make a choice, a brief description of the major bands is given below.

160 meters. During the day, range is limited to 100 miles; at night this increases to 2000 miles or more. Winter operations are easier than summer, when static is a problem. Greatest range is obtained when the sunspot approaches its minima (every eleven years).

80 meters. Daytime operations are similar to 160 with maximum range about 200 miles. During the night, range opens up and the transoceanic contacts are regularly made. Conditions are best on winter nights, summer static levels are high.

40 meters. Conditions parallel those on 80 except the distances covered are greater. Daytime operations can span 800 miles or more; night time 8000 miles, especially in the winter. Ham activities are limited on this band because of the many high-powered foreign broadcast stations that dominate the upper 200 kHz.

20 meters. This is the major "DX" band which delivers the long-distance contacts many hams desire. 20 is useful from dawn to dusk, but drops out at night. During the sunspot maxima, the band is open to some part of the world over practically the entire 24-hour day.

15 meters. This band can bring contacts from all parts of the world when sunspot activity is high. It stays open from dawn to the late evening. When sunspots are scarce, performance suffers and it becomes a daytime band or drops out entirely. Contacts up to 2000 miles can be made due to sporadic-E activity, which is totally unpredictable.

10 meters. More than any high-frequency band, 10's conditions are governed by solar activity. During the maxima, 10 is a DX band during the day and into the evening; but deteriorates or drops out as the minima approaches. North-South contacts to Latin America can, however, be made even when the band is not open to Europe and Asia.

6 meters. Between 6 and 10 meters lies the boundary between HF and VHF. During the sunspot maxima, DX coverage of the entire world is possible; when the intensity of solar radiation fades, range is reduced to 100 miles or so. Occasional openings many range from 400 to 2500 miles from sky-wave effects. Auroral and meteor activity can generate openings on a similar scale.

2 meters. Communications on this band are limited most of the time to line-of-sight ranges, since signals do not readily reach over the horizon. Consistent operations can be conducted 50 to 60 miles on this band. Repeaters can extend this range.

THE AMERICAN RADIO RELAY LEAGUE

Imost 100,000 U.S. and Canadian radio amateurs belong to the ARRL, which is also the headquarters society for the International Amateur Radio Union. It is made up of many similar societies in over 80 countries. ARRL was founded more than a half century ago by Hiram Percy Maxim, noted inventor, automotive pioneer, and ardent ham. The League's famous headquarters station is a memorial to him and bears his call letters, W1AW. The League functions as the amateur's own organization through 16 directors elected annually from each of 15 U.S. regions and Canada. It provides representation before government regulatory agencies and at international conferences involving frequency allocations and other matters affecting amateur radio. It publishes "QST," a monthly amateur technical journal; the "Radio Amateur's Handbook," an annual reference work; and a number of other specialty publications. Among these are the Gateway series, a group of manuals for beginners and newcomers: "How to Become a Radio Amateur," "The License Manual," "Learning the Radio Telegraph Code," and "Operating an Amateur Radio Station." The League maintains an experimental and developmental laboratory, provides a Technical Information Service for anyone requesting help or information, and, finally, coordinates a wide variety of field activities and services. Anyone interested in amateur radio can be a member of ARRL, although full, voting membership is limited to licensed amateurs. Its headquarters is at 225 Main Street, Newington, Connecticut 06111.

Publications for Potential Amateurs

ARRL Publications

"Radio Amateur's License Manual" ($1.00)
"How to Become a Radio Amateur" ($1.00)
"Learning the Radiotelegraph Code" ($0.50)
"Radio Amateur's Handbook" ($5.50)
"A Course in Radio Fundamentals" ($2.00)
"Understanding Amateur Radio" ($2.50)
"Tune In the World with Ham Radio" (includes cassette tape and call-area map, $7.00)

Available from the ARRL, Newington, Conn. 06111 and from most radio supply stores.

Other Publications

"Novice Radio Guide," Jim Ashe, W1EZT ($3.95 + 25 cents postage)
Available from ham radio, Greenville, N.H. 03048

"Radio Handbook," William I. Orr, W6SAI ($14.95)
Available from Howard W. Sams, Inc., Indianapolis, Ind. 46406 and from most radio supply stores.

"Amateur Radio Theory Course," Martin Schwartz ($4.95)
Available from AMECO, 314 Hillside Ave., Williston Park, N.Y. 11596 or from most radio supply stores.

"From 5 Watts to 1000 Watts." ($2.25)
Available at Radio Shack stores throughout the country.

AMATEUR LICENSING

WHERE EXAMINATIONS ARE HELD
FCC FIELD ORGANIZATION

The Federal Communications Commission maintains an extensive Field Engineering Bureau, which among many other duties conducts examinations for radio operator licenses. There are 24 district administrative offices, as follows:

Boston, Mass.
New York, N.Y.
Philadelphia, Pa.
Baltimore, Md.
Norfolk, Va.
Atlanta, Ga.
Miami, Fla.
New Orleans, La.
Houston, Tex.
Dallas, Tex.
Los Angeles, Calif.
San Francisco, Calif.
Portland, Ore.
Seattle, Wash.
Denver, Colo.
St. Paul, Minn.
Kansas City, Mo.
Chicago, Ill.
Detroit, Mich.
Buffalo, N.Y.
Honolulu, Hawaii
San Juan, P.R.
Anchorage, Alaska
Washington, D.C.

Examinations are given frequently at the above offices, as well as at the following five suboffices.

Savannah (branch of Atlanta)
Tampa (branch of Miami)
San Diego (branch of Los Angeles)
Mobile (branch of New Orleans)
Beaumont (branch of Houston)

Examinations are held four times a year at:

Albany, N.Y.
Birmingham, Ala.
Charleston, W. Va.
Cincinnati, Ohio
Cleveland, Ohio
Columbus, Ohio
Corpus Christi, Tex.
Davenport, Iowa
Des Moines, Iowa
Fort Wayne, Ind.
Fresno, Calif.
Grand Rapids, Mich.
Indianapolis, Ind.
Knoxville, Tenn.
Little Rock, Ark.
Louisville, Ky.
Memphis, Tenn.
Milwaukee, Wis.
Nashville, Tenn.
Oklahoma City, Okla.
Omaha, Nebr.
Phoenix, Ariz.
Pittsburgh, Pa.
St. Louis, Mo.
Salt Lake City, Utah
San Antonio, Tex.
Sioux Falls, So. Dak.
Syracuse, N.Y.
Tulsa, Okla.
Williamsport, Pa.
Winston-Salem, N.C.

Examinations are held twice a year at the following:

Albuquerque, N.M.
Boise, Idaho
El Paso, Texas
Fairbanks, Alaska
Hartford, Conn.
Jackson, Miss.
Jacksonville, Fla.
Juneau, Alaska
Ketchikan, Alaska
Las Vegas, Nev.
Lubbock, Texas
Portland, Me.
Salem, Va.
Spokane, Wash.
Tucson, Ariz.
Wichita, Kans.
Wilmington, N.C.

This makes a total of 77 cities in which examinations for amateur radio operator licenses are held at least as often as twice a year.

ADDITIONAL EXAMINING POINTS

There are additional cities visited by traveling FCC inspectors for the purpose of giving examinations, but such visits are made only once each year. Examinations are thus conveniently available to applicants in those vicinities.

Annual examinations are held at:

Bakersfield, Calif.
Bangor, Maine
Billings, Mont.
Great Falls, Mont.
Hilo, Hawaii
Helena, Mont.
Jamestown, N.D.
Klamath Falls, Ore.
Lihue, Hawaii
Marquette, Mich.
Rapid City, S.D.
Waiuku, Hawaii

Examinations are also conducted occasionally by the District Communications Officer, U.S. Naval Station, Guam. Consult your local telephone directory for addresses.

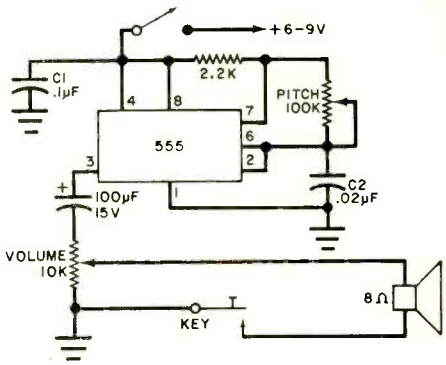


Fig. 2. Code practice oscillator. Capacitors are 25-V disc ceramics, resistor is ½-W carbon. 555 IC is Signetics or equiv.

Special Activities. Experienced hams have a wide choice of activities. "Rag chewing" about virtually any subject is popular, as is DX chasing. But there are other popular pursuits. Some enjoy message handling and emergency preparation activities. Others devote time to one or more of the following activities.

Amateur Satellites. "Oscar 7," the latest in a series of satellites orbited by amateurs, receives 2-meter signals and rebroadcasts them on 10 meters. Using this relay, the range of VHF communications has been greatly increased. Many hams use Oscar 7 for this purpose, employing not-too-sophisticated equipment.

Television. Amateurs are experimenting with two types of television. On the bands above 420 MHz, regular or "fast-scan" television contacts can be made. Using converted receivers and surplus vidicon tubes makes it fairly inexpensive to get involved in this activity. Ranges are limited to 50 miles or so, because of the high frequencies used.

On the HF bands, "slow-scan" signals are transmitted. In this scheme, still pictures are transmitted about every 8 seconds. Moving pictures cannot be transmitted because the scanning rate must be slow enough to allow the SSTV signal to fit in the bandwidth normally occupied by a voice signal (about 3 kHz). Signals can be transmitted for great distances on these bands, due to sky-wave propagation. Monitors and cameras can be obtained ready-made, although some surplus equipment can be found.

2-Meter FM. Many amateurs escape the crowding and noise problems of the HF bands by going to VHF bands with 2-meter equipment. Although range is limited to line-of-sight distances, many ham clubs have installed repeaters on high buildings or hills to overcome this limitation.

One of the special activities enjoyed by hams is slow-scan television transmission. Typical of equipment available is Venus SS2 slow-scan TV monitor.

A signal is received at the repeater, which is automated, and rebroadcast by a powerful transmitter and radiated by a high antenna. Taking advantage of these systems, many hams have installed 2-meter FM gear in their cars to provide solid communications using low power and simple whip antennas.

The Changing Amateur Scene. The framework that we've been examining may soon change in Docket 20282, issued around New Year's (1975), the FCC served notice that it's thinking of changing the organization of the Amateur Service, adding some privileges and taking away some from license classes.

Perhaps the hottest proposal is the establishment of a Communicator Class License. Unlike any other amateur license, no code test would be required. After passing a simple theory and regulations exam, the Communicator would be permitted to operate on amateur frequencies above 144 MHz with a reasonable power level (more on this later). FM voice transmissions could be used.

How to Prepare. It's faitly certain that these proposed changes will be adopted in a form not too different from the way they have been presented here. So, how do you prepare for an amateur license, given this changing scene?

The best advice that can be given at present is to continue along just about as you were planning.

If you want to get on the air but find the code requirement a major stumbling block, the Communicator license is a possible goal. But it is best to learn the code—it's not that hard to do. Most of the action in Amateur radio will involve hams holding tickets with a code requirement. The Novice license is an ideal starting point—people from 7 to 70 have become Novices, and many then moved to the General and higher classes.

Learning the Code. To learn Morse Code with a minimum of "pain," you'll have to think of it as a "spoken" language. Each letter of the alphabet, number, and punctuation mark has been assigned a specific combination of long sounds (dah's) and short ones (dit's). By all means, *DON'T LEARN VISUAL SYMBOLS!* Such "tables" of Morse Code are worse than worthless—they're detrimental.

Here's why. If you learn the code in visual terms (say, the letter A as • — , or dot-dash), instead of aural ones (A as the sound "didahh"), every time you hear a code element, you'll have to convert it to a visual symbol either in your mind or on paper. Then, you'll convert the visual symbol into the appropriate letter or number. However, by learning Morse Code as if it were a spoken foreign language—which it is in a sense—you'll eliminate the time-consuming intermediate step. I'm speaking from experience here. In every code class that I've given, those who learned the code by sound got licenses, while those who learned it by visual symbols didn't.

The essential ingredient for getting Morse Code under your belt is *practice*. There are several ways to get material to copy. The first is pre-recorded code sessions, either on disc or tape. These can be played over and over again at your convenience. (Stress receiving over transmitting—it's harder, but once you can copy code well, sending it is a breeze.)

Code classes are invaluable. See if your local ham club, school, or Scout troop is offering them. Having an experienced Morse Code operator send material and listen to your "fist" is really necessary. If you can't find an organized course, seek out a local amateur to help you along.

"Live" code is not only educational, but is often fun. Many hundreds of Morse Code transmissions can be picked up as you tune across the amateur and shortwave bands. Of course, a receiver must be at your disposal. Two of the best sources are Amateur Radio Station W1AW and maritime stations. W1AW transmits letter-perfect code for practice three times daily. Ship-to-shore stations often send excellent code, but it might be too fast for you. However, if you have a multi-speed tape recorder, you can slow the transmissions down. Record the messages at 7½ or even 15 ips. Then play them back at 3¾, 1⅞, or 15/16 ips, whichever yields a sending rate within your capabilities.

Once you can copy code fairly well, you should start to practice sending it because you'll have to do this for the license exam. Necessary equipment includes a telegraph key (available from surplus dealers and most electronic houses) and a code oscillator. The latter can be bought assembled or in kit form, or your can "roll your own." If you're handy with a soldering iron, the circuit shown in Fig. 2 can be put together in a few minutes. Both tone (pitch) and volume controls should be adjusted to your personal taste. Your code should be smooth, rhythmic, and have proper spacing.

Mastering Radio Theory. All amateurs must take a written test covering radio theory and FCC regulations. The depth of coverage of course, varies with the class of license. There are two ways to acquire knowledge on the subject matter. First, you could read a broad reference work on radio theory and study the FCC regulations. Second, you could purchase one of the many study guides (most in Q&A format) and ingest its contents.

But there's really a better way—to combine the best of both methods. A book like "The Radio Amateur's Handbook" will tell you almost everything there is to know about basic electronic

theory, construction practices, and operating procedure. However, it won't give you a "feel" for the FCC written exam. That can be obtained from a study guide like "The Radio Amateur's License Manual." Material is presented in Q&A form and the questions are a lot like those you'll find on the actual exam sheet.

So, you should first look over all the questions in the section of the Manual you're interested in. Read each answer. If you don't understand what's being discussed, look up the topic in a suitable reference work. Always make sure that you thoroughly understand each question and answer. Never memorize an answer without knowing what's going on. The written exam will very likely pose a question similar to one contained in a study guide, but hardly ever will it be exactly the same. A good understanding of the material will give you the required flexibility.

Taking the Test. You shouldn't try to take an amateur exam without having a good chance of passing it. If you fail, you'll lose the application fee (if any), and you'll have to wait 30 days before your next chance. For a code test, you should leave a comfortable margin of proficiency. Undoubtedly, you'll be nervous taking the test and that extra "cushion" will vastly improve your chances.

So, before attempting the Novice or Technician test, be sure you can copy a "solid" 8 wpm. That will enable you to copy 25 consecutive characters without any problem. (To pass the receiving code test, you must copy one full minute of text. So, at 5 characters per word and 5 words per minute, 25 is the magic number.) If you're going after a General, 15 to 16 rpm should be your "comfortable" speed. (To pass the sending portion, you must send a minute's worth of error-free code.)

The theory test is a multiple-choice type consisting of about 20 questions for the Novice and about 50 questions for the higher license classes. A score of 74% is deemed passing. If you have gone over the subject matter carefully in your study guides, you should have no trouble passing the test. But, if for some reason, there are questions that you are unsure of, make an educated guess. Since an unanswered question penalizes you as much as a wrong answer, guessing will improve your chances of passing.

The answer sheet itself contains spaces for 150 answers. Each is numbered, with five pairs of parallel dashed lines labeled A through E. When you decide one answer is correct, you shade in the appropriate pair of lines with a pencil. Only a portion of the answer sheet will be used. Follow the numbers of the questions very carefully.

If you want to take a by-mail test, write to the nearest FCC office and ask for Form 610. When you get it, fill it out and have a licensed ham(s) give you the code test. Then submit Form 610 with a letter from the amateur(s) affirming that you have passed the code test. Include the application fee, if any. When the test papers arrive, have the amateur(s) proctor the exam. Then send the papers back to the FCC within 30 days.

If you're going to take the test in front of an FCC official, arrive at the nearest FCC office on the appropriate day at the proper time. You'll then fill out Form 610 (there's no longer a fee required), and take the receiving code test. If you pass, you'll then have to send some code. After successfully doing that, you'll be given the written test. No time limit is specified (as per by-mail tests) except for the normal closing time of the office.

If you've failed any part of the exam, you'll have to wait 30 days for another chance. If you've passed, you'll get your new license from the Gettysburg office of the FCC in a few weeks.

Call Letters. Each licensed amateur is given a set of call letters that is uniquely his or her own. If you were a Novice in the continental U.S. before October 1, 1976, the first two letters were WN. Next a number placed you within one of the ten geographical zones (See Fig. 1). Then three letters completed your "call." If you lived outside of the 48 states and got a Novice ticket, the last number of the two-letter prefix (see map) was W. So, a Novice in Alaska would be WL7XYZ. Now, however, the Novice WN prefix has been dropped.

Whether Novice, Tech, General, or higher class license, your prefix will become K, W, WA or WB, depending on what's available. Outside the 48 states, the W will become a K. Thus, our Alaskan Novice will become KL7XYZ when he moves up the ladder.

73's. That's the way radio amateurs traditionally say goodby. But in this case, I think BCINGU ("be seeing you") or CUL ("see you later") is more appropriate. ◇

250 WATTS FOR NOVICES

By HERBERT S. BRIER

EFFECTIVE July 23, 1976, the FCC raised the permissible dc power input limit for Novices from 75 to 250 watts. The Commission also set the same power limit for *all* other amateurs using Novice frequencies. In the same notice, Technicians received Novice hf privileges. Also, the Technician and Conditional Class licenses issued by mail became equivalent in all respects to Technician and General Class licenses, respectively, earned before an FCC examiner.

Since that date, the only amateur license issued by mail is the Novice Class, with one exception. If an applicant is disabled, and that disability is confirmed by a doctor's certificate, examinations can be conducted in the home under the supervision of a volunteer examiner selected by the Commission.

Two other changes affect Novices. The one-year wait between the expiration date of a previous amateur license and a Novice ticket has been eliminated. Now, by proper timing, a Novice whose license will expire can be retested before his current term runs out. In addition, the Novice exam contains material not covered in any other amateur examination. Therefore, all higher class tests will include the Novice exam. To prevent applicants who want Novices in a hurry from trying to get the ticket at an FCC office, the Novice questions will be graded only after the other elements have been passed.

Equipment. The eyes of many Novice and Technician operators probably gleam as they imagine how much stronger their signals will be with 250 watts of input power in place of 75 watts. But the change will not be as dramatic as they might hope. This increase is equivalent to 5.2 dB. If the fellow you're working has an *S* meter that moves one *S* unit for a 6-dB increase in signal strength, switching from the old power limit to the new one will boost your signal just under one *S* unit—a useful, but hardly spectacular, change. (However, very few of us have S meters that follow this "textbook" behavior!)

The most important benefit that Novices receive from this change is a wider selection of equipment suitable for Novice use. In the 75-watt category, the only transmitters that can be purchased *new* are the Heath DX-60B and the HW-16. The DX-60B has a maximum input power of 90 watts, covers 80 through 10 meters in the CW and AM (screen modulation) modes. The HW-16 transceiver covers the CW portions of the 80-, 40-, and 15-meter bands. Both are in kit form, and have given many amateurs valuable experience in building and operating them. But most amateurs who have "cut their teeth" using the rigs have sold them upon receipt of the General or Advanced Class license, and applied the proceeds to the purchase of a CW/SSB transmitter or transceiver. So, although they were ideal "starter" rigs, these units were not long-term investments.

Under the amended rules, a Novice can now acquire one of the many transmitters or transceivers in the 180-to-250-watt class not only for use under his current license, but for General and higher class operation as well. These rigs work excellently on CW, most with partial or full break-in. Plugging a mike into them makes operation on SSB phone possible, and many will also work on RTTY and slow-scan TV with the addition of accessory equipment.

Standard amateur gear in transceiver or "separate" form covers 80 through 10 meters. A few also offer 160 meters. Transceivers use many stages which perform two different functions. (For example, a buffer amplifier during transmit can be an i-f amplifier on receive.) Their advantages are economy, compactness, and ease of operation. However, they can transmit and receive only on the same frequency, unless the transceiver has "receiver incremental tuning" or can accommodate an external vfo. Receiver incremental tuning allows the receive frequency to be shifted up or down a few kilohertz without affecting the transmit frequency. External vfo's allow you to transmit at one end of the band and receive at the other.

Most often, amateurs on the hf bands transmit and receive on the same frequency. But some DX stations won't listen on their own frequency, directing stations to call "10 kHz up" or so. Also, some DX SSB stations transmit in the "foreign phone" bands, such as 14.1 to 14.2 MHz. U.S. amateurs wishing to talk to them must transmit somewhere above 14.2 MHz and listen below that frequency. So, if you plan to chase a lot of DX, you should get either a separate transmitter and receiver or a transceiver that can accept a remote vfo.

"Separates" are more expensive than transceivers, require more room, and are more versatile. Because they can be individually adjusted for optimum performance, separates operate somewhat more efficiently, especially on receive. Exact comparisons on a cost-vs-performance basis are difficult, however. A compromise between transceivers and separates are "matched" transmitters and receivers. They can be operated in the transceive or independent mode at the flick of a switch.

Oddly enough, most matched transmitters have lower power output levels than transceivers—150 to 200 watts compared to up to 500 watts PEP, respectively. The first SSB transceivers were designed for mobile operation, and TV sweep tubes were put in them to get high peak power in a small package. Such tubes work well, but their distortion

products are somewhat higher than those from tubes specifically designed for hf SSB transmitting. As a result, most separates and some transceivers accept one to three dB less output power in return for measurably lower distortion, and use 6146B tubes. But even those rigs with 180 watts of input power (about 100 watts out) can drive 2000-watt, grounded-grid linears. So don't let their "low" power levels fool you. They can be operated barefoot for most contacts, and be switched over to drive a linear if conditions get really bad.

High-power r-f transistors are still very rare, and those solid-state transceivers currently on the market are limited to about 200 watts of input power. Most transmitters are either hybrid (solid-state oscillators, etc. with tube drivers and finals) or all-tube designs. Many transceivers are hybrids. However, many new receivers use no vacuum tubes, and this is the trend of the future for *all* amateur gear.

More important than the number of tubes or transistors that a piece of equipment has are its key specifications. For example, a receiver should have a sensitivity of less than 1 μV at 10 dB S+N/N, an SSB selectivity of 2.1 to 2.5 kHz, and a CW selectivity of less than 500 Hz at the 6-dB points. A transceiver or transmitter should have 150 to 400 watts of input power on CW. A transceiver should be able to operate from 12 volts dc or 117 volts ac.

You should also consider how flexible a rig is before you buy it. For example, if you want to work vhf, does that receiver accept plug-in converters? Or, will that transceiver interface easily with a transverter, speech processor, or monitor scope? Get as much information as possible about each rig you are considering before making any decisions.

(Continued from page 5)

AMATEUR RADIO Equipment

ALPHA

PA-770 Linear Amplifier
Power output 2 kW p.e.p. (SSB), 1 kW continuous carrier (d.c. plate input to 4 kW p.e.p., 1.8 kW continuous carrier (no time limit); frequency coverage 1.8-2.0 and 3-30 MHz manually tuned, standard; input & output imp. 50 ohms unbalanced; v.s.w.r. 2:1 or less; drive power 100 W for 2 kW output; 8877 grounded-grid Eimac ceramic triode; 2.4 kVA transformer with "ducted-air" cooling system; ball-bearing blower; plate output network: full pi-L, vacuum-tuning capacitor, 6 kV/20A bandswitch; silver-plated tubing main pi coil; Teflon insulated auxiliary toroids; desk-top cabinet 22" D × 19.5" W × 11" H $2995.00

ANIXTER-MARK

Vehicular Antennas
HW-3. 10/15/20 meter Heliwhip. 6-ft. $27.75
HW-3/40. 40-meter whip with HW-3 element; 4-ft. $11.90
HW-880. 80-meter whip; 8-ft. $21.25
CVS-2144. 2-meter, 5/8 wave fiberglass whip; 54-in. $10.75
CV-3147. 2-meter, 3-dB gain colinear fiberglass, 6-ft. $46.50
CV-5455. 3/4 meter, 5-dB gain colinear fiberglass; 6-ft, 7-in $46.50
CV-2220. 1¼ meter. 5/8 wave fiberglass; 4-ft. $11.00
AAL-220. Same as CV-2220 except with trunk-lip mount, 18-ft coax $27.95

Fixed Station Antennas
ABB-6P. 6-meter, "Beacon" half-wave vertical; 11-ft. $32.95
HWD-40. 40-meter, short Heliwhip dipole, 16-ft. $58.46
CV-3147. 2-meter, 3-dB gain colinear fiberglass; 6-ft. $46.50
CV-5455. 3/4-meter; 5-dB gain colinear fiberglass; 6-ft, 7-in $46.50

ANTENNA SPECIALISTS

HM-222 Base Station Antenna
1¼-meter omnidirectional antenna; max element length 16.2-ft; 100 mph wind loading; aluminum construction; 6 dB gain over ½ wave dipole; 1.5:1 or less s.w.r.; assembled weight 9.5 lbs $184.00

HMR-173 2-Meter Yagi
11-elements; max element length 42-in; 17-ft boom length; 9.3-ft turning radius; 100 mph wind loading; aluminum construction; 50 ohm feedpoint impedance; gamma match; 13 dB gain over ½ wave dipole; 15 dB front-to-back ratio; 36 degrees half-power beamwidth; 1.5:1 s.w.r.; vertical or horizontal polarization; assembled weight 6.5 lbs $49.50

HM-17 2-Meter Antenna
Ground plane; 4-elements; 47¼-in max element length; 100 mph wind loading; nickel and copper plated stainless-steel construction; 50 ohm feedpoint impedance; tapped autotransformer; unity gain; less than 1.5:1 s.w.r.; loading coil; d.c. ground $36.95

HMR-172 2-Meter Yagi
5-elements; max element length 42-in; 6-ft boom length; 100 mph wind loading; aluminum construction; 50 ohm feedpoint impedance; gamma match; 10 dB gain over ½ wave dipole; 15 dB front-to-back ratio; 58 degree half-power beamwidth; 1.5:1 s.w.r.; vertical or horizontal polarization; assembled weight 3 lbs $36.95

HMR-174 ¾-Meter Antenna
Yagi-beam; 11-elements; 6-ft max element length; 35-ft turning radius; 100 mph wind loading; aluminum construction; gamma match; 13 dB gain over ½ wave dipole; 18 dB front-to-back ratio; less than 1.5:1 s.w.r.; assembled weight 3 lbs $36.95

HM-7A Ground-Plane Antenna
Two, 1¼, or ¾-meters; 4-elements; 26-in max element length; 100 mph wind loading; stainless-steel construction; 50 ohm feedpoint impedance; split dipole; −2½ dB gain over ½ wave dipole; less than 1.5:1 s.w.r.; vertical polarization; assembled weight 3 lbs $11.25

HM-178 Mobile Antenna
2-meter; base-loaded; 47½-in max element length; trunk-lid mount; stainless-steel construction; 3 dB gain over ¼ wave ground-plane; 1.5:1 or less s.w.r.; comes with 17-ft coax $40.50
HM-181. Same as the HM-178 except 6-meters $32.25
HM-180. Same as the HM-178 except 54-in max element length $32.25
HM-179. Same as the HM-178 except 54-in max element length; low-profile roof-top mount ... $28.50

HM-187 2-Meter Mobile Antenna
Base-loaded; 54-in max element length; magnet-mount; stainless-steel construction; 3 dB gain over ¼ wave ground plane; 1.5:1 or less s.w.r.; comes with 17-ft coax $39.95

HM-177 Mobile Antenna
2-meters; base-loaded; 47½-in max element length; roof-top mount; stainless-steel construction; 3 dB gain over ¼ wave ground plane; 1.5:1 or less s.w.r.; comes with 17-ft coax $36.95
HM-176. Same as the HM-177 except ¾-meter; 34-in max element length $33.50
HM-175. Same as the HM-177 except 34-in max element length; ¾-meter; 5 dB gain over ¼ wave ground plane $26.50

HM-224 Mobile Antenna
1¼-meters; center-loaded; 48-in max element length; trunk-lid mount; stainless-steel construction; 4 dB gain over ¼ wave ground plane; comes with coax $33.50
HM-223. Same as the HM-224 except base-loaded; 30-in max element length $30.50

HM-225 Marine Antenna
1¼-meters; base-loaded; 3-ft max element length; masthead or vehicle surface mount; fiberglass whip; 3 dB gain; comes with 2-ft coax $31.75

HM-182 Mobile Antenna
6-meters; base-loaded; 47½-in max element length; rooftop-mount; stainless-steel construction; 1.5:1 or better s.w.r.; comes with 17-ft coax $28.50

HM-85 6-Meter Mobile Antenna
Full-size whip; 55-in max element length; cowl-disguise mount; stainless-steel construction; unity gain; 1.5:1 or less s.w.r. $19.95

HM-221 1¼-Meter Mobile Antenna
Base-loaded; trunk-lid mount; stainless-steel construction; unity gain; 1.5:1 or less s.w.r.; comes with 13-ft coax $15.50
HM-220. Same as the HM-221 except roof-mount $11.95

ANTLER

A-280 2-Meter Antenna
Frequency coverage 144-156 MHz; 3 dB gain; base-loaded; ⅝ wave, tapered stainless-steel whip; 47" max. element length; magnetic-mount for flat steel surfaces $38.95

CLEGG

FM-DX 2-M FM Transceiver
Digital PLL synthesized 35-watt transceiver covers 143.5 to 148.5 MHz in 5-kHz steps; speech processing; transmit offset crystals for simplex, +600 kHz and −600 kHz; provisions for three additional offsets up to 1.5 MHz; Hi/lo (750 mW) power output switch; 6-digit numeric direct-frequency readout; receiver sensitivity 0.25 μV for 12 dB SINAD, 8-pole monolithic crystal i-f filter, 60-dB adjacent channel rejection; built-in speaker; S meter with 50-dB range; dual-gate FET front-end; dynamic mike; remote control and accessory tone input receptacle; mobile mounting bracket; 10½" D × 7" W × 3⅛" H; weighs 5½ lb; requires 12-14.3 V d.c. at 10 A max. $625.00
Model 031A. Speaker and a.c. power supply $98.00

Mark-3 2-M FM Transceiver
12-channel capability (146-148 MHz); 16F3 modulation; r.f. power output 15 W min., 1 W typical; 12 crystal-controlled channels with individual trimmers; frequency deviation ±5 kHz (adj. to ±8 kHz); variable reactance phase modulation; mike 10 k ohms (dynamic mike with PTT); receiver sensitivity 0.4 μV for 12 dB SINAD; spurious response −55 dB; squelch threshold 0.3 μV; bandwidth ±6 kHz/−6 dB, ±12 kHz/−50 dB; audio output power 2.5 W; audio output imp. 8 ohms; comes with mike, mike hanger, spare fuse, mounting bracket, channel frequency ID card, instruction manual, external speaker plug, 4-prong plug for tone burst generator and discriminator meter, crystals (installed) for Ch. 1 146.52/146.52 Simplex; 8⅞" D × 6⅜" W × 2¼" H $169.50

COLLINS

KWM-2A Transceiver
Covers 80-10 meters with 15-MHz WWV reception; d.c. power input 175 W p.e.p. (SSB), 160 W (CW); r.f. power output 100 W p.e.p. (3.4-15 MHz), 90 W p.e.p. (15-25 MHz); 80 W p.e.p. (35-30 MHz); carrier and unwanted sideband suppression −50 dB; oscillator feedthrough and/or mixer products −50 dB except −40 dB at 3.500 MHz; second harmonic −40 dB; third-order distortion −30 dB; noise level 40 dB below single-tone carrier; frequency stability within 100 Hz during any one-hour period after 20-min. warm-up; backlash 50 Hz; visual dial accuracy 200 Hz; output impedance 50 ohms nominal; not more than 2:1 v.s.w.r.; break-in CW and sidetone; ALC in r.f. and i.f. stages for up to 10 dB of compression; 10 dB of r.f. feedback around p.a. and driver; receiver sensitivity 0.5 μV for 10 dB (S + N)/N; selectivity −6 dB at 2.1 kHz, −60 dB at 4.2 kHz; image response −40 dB; internal spurious below 1 μV equivalent antenna input; audio output 1 W; a.g.c.; noise blanker; a.f., r.f., and mike gain controls; 100-kHz crystal calibrator; can be used for RTTY if forced air cooling is employed; provisions for up to 14 crystals for operation outside amateur bands (MARS, etc.); requires 800 V d.c. at 230 mA, 285 V d.c. at 210 mA, 6.3 V at 11 A, −55 to −80 V d.c. with no current requirement; power consumption

430 W max.; 14¾" W × 14" D × 7¾" H $2464.00
KWM-2A. Same as above but without noise blanker $2120.00
312B-5. Console/VFO includes remote VFO, speaker, phone patch, directional wattmeter and frequency control selector $795.00
516F-2. Power Supply provides required KWM-2A operating voltages from 115-V a.c. source . $265.00

DRAKE

R-4C Communications Receiver

Vacuum-tube design except for solid-state v.f.o., audio, a.g.c., and accessory noise blanker; bandspread tuning 80/75, 40, 20, 15, plus a 500-kHz segment of 10-meter ham bands; dual-conversion with crystal-controlled first local oscillator; 15 accessory crystal sockets provided for coverage of any 15 additional 500-kHz ranges between 1.5-30.0 MHz (excepting 5.0-6.0 MHz); antenna trimmer and preselector; r.f. gain control; S meter; crystal lattice i.f. filter; product detector; notch filter; 2.4-kHz selectivity at 6 dB, accessory filters for 0.25, 0.5, 1.5, 4.0, and 6.0 kHz selectivity available; requires external speaker; built-in 25 kHz calibrator and 117/230 V a.c. power supply; 5.5" H × 10.75" W × 12.25" D $599.00

EMERGENCY BEACON

EBC-144 Jr. 2-M FM Transceiver

Fully synthesized mobile transceiver covering 143.5-148.5 MHz; modulation ±5 kHz deviation; r.f. output 20 W into 50-ohm load; load imp. 50-75 ohms; harmonic & non-harmonic spurious outputs −40 dB; pre-emphasis +6 dB/octave (1000 Hz); offset switch-selected ±600 kHz; automatic repeater offsets; fully selectable priority channel; single-conversion receiver; modulation acceptance FM, ±6 kHz deviation; sensitivity 0.35 μV for 12 dB SINAD; 10-pole crystal filtering; adj. channel rejection 60 dB at 15 kHz, 90 dB at 30 kHz; spurious signal & image rejection 60 dB (re: rated sensitivity); noise-activated squelch; audio output 4 W into 3.2 ohms at 10% THD; built-in speaker; S meter; 10¾" D × 6½" W × 3½" H metal cabinet $529.95

GENAVE

GTX-1T 2-Meter Hand-Held Transceiver

Six-channel, crystal-controlled FM hand-held with built-in autopatch encoder; frequency range 144-148 MHz; channel separation 2 MHz max.; r.f. output power 3.5 W or 1 W (selectable) into 50 ohms; frequency stability ±0.001%; modulation deviation ±7.5 MHz; sensitivity 0.35 μV for 20 dB quieting, 0.2 μV at 12 dB SINAD; selectivity −3 dB ±7.5 kHz; adjacent channel rejection (20 dB quieting) 55 dB at ±30 kHz; image response −60 dB; spurious response −65 dB; audio output power 500 mW; squelch sensitivity 0.2 μV; dual-conversion receiver with 6-pole crystal filter; 10.7-MHz and 455-kHz i.f.'s; auto patch encoder generates all standard double-frequency tones used in signalling circuits; flexible rubber duck antenna attaches via BNC connector; requires 0.65 A max. from 8 "AA" alkaline or NiCd cells, or from an external 12-volt source; 8" H × 2.63" W × 1.28" D $299.95
GTX-1. Same as above, but without built-in tone encoder $249.95
TE-111. Tone encoder for use with GTX-1 ... $49.95
PSI-2. Line-powered (120 V a.c.) NiCd battery charger $39.95
PSI-3. NiCd battery charger for use with 12-volt vehicle supplies $34.95
PSI-18. NiCd battery pack $29.95
GLC-1. Leather carrying case $12.95

GTX-200-T 2-Meter Mobile/Tone Encoder

FM mobile transceiver with independent crystal selectors for transmit and receive frequencies; switch for lock-in of preselected frequency pairs allows one-knob operation; built-in autopatch tone encoder; r.f. output power 30 W nominal (25 W min.) into 50 ohms; frequency stability ±0.001%; deviation adjustable to 10 kHz max.; frequency range 144-148 MHz; channel separation 4 MHz max.; 100 possible channel combinations; sensitivity 0.35 μV at 20 dB quieting, 0.25 μV at 12 dB SINAD; selectivity −3 dB at ±8 kHz; squelch sensitivity 0.35 μV; adjacent channel rejection 45 dB at ±30 kHz; image response −45 dB; spurious response −50 dB; audio output power 1.5 W at 15% distortion; dual-conversion receiver with 10.7-MHz first i.f.; backlighted for night operation; includes crystals for 146.94 MHz; requires 5 A max. at 14 V d.c., negative ground; 9" D × 6½" W × 2½" H $249.95
GTX-200. Same as above, but without autopatch encoder $199.95

GTX-202 2-Meter FM Mobile Transceiver

Crystal-controlled 2-meter FM transceiver with 22-channel capacity; frequency range 144-148 MHz; channel separation 4 MHz max.; r.f. output power 35 W nominal (30 W min.) into 50 ohms; frequency stability ±0.001%; deviation adjustable to 10 kHz max.; sensitivity 0.45 μV for 20 dB quieting, 0.25 μV at 12 dB SINAD; selectivity −3 dB at ±8 kHz; adjacent-channel rejection 45 dB at ±30 kHz; image and spurious responses −70 dB; audio output 5 W at 15% distortion; dual-conversion receiver with 10.7-MHz, 8-pole crystal filter; squelch sensitivity 0.5 μV; requires 6 A max. at 14 V d.c.; 9" D × 6½" W × 2½" H $239.95

GTX-2 2-Meter FM Transceiver

Crystal-controlled 2-meter FM transceiver with 10-channel capacity; r.f. output power 30 W nominal (25 W min.) into 50 ohms; frequency stability 0.001%; deviation adjustable to 10 kHz max.; sensitivity 0.35 μV at 20 dB quieting, 0.25 μV at 12 dB SINAD; selectivity −3 dB at ±8 kHz; squelch sensitivity 0.5 μV; adjacent-channel rejection (20 dB quieting) 45 dB at ±30 kHz; image response −45 dB; spurious response −50 dB; audio output power 1.5 W at 15% distortion; dual-conversion receiver with 10.7-MHz first i.f.; has pushbutton channel selection; dual-gate MOSFET front end; backlighted for night operation; transmit indicator light; frequency range 144-148 MHz; channel separation 4 MHz max.; requires 5 A max. at 14 V d.c., negative ground; 9" D × 6½" W × 2½" H; includes crystals for 146.94 MHz $189.95

GTX-10-S 2-Meter FM Transceiver

Crystal-controlled 2-meter FM transceiver with 10-channel capacity; r.f. output power 10 W nominal into 50 ohms; frequency stability ±0.001%; deviation adjustable to 10 kHz max.; sensitivity 0.75 μV at 20 dB quieting, 0.5 μV at 12 dB SINAD; selectivity −3 dB at ±8 kHz; squelch sensitivity 0.5 μV; adjacent-channel rejection (20 dB quieting) 45 dB at ±30 kHz; image response −45 dB; spurious response −50 dB; audio output power 1.5 W at 15% distortion; dual-conversion receiver with 10.7-MHz first i.f.; requires 1.5 A max. at 14 V d.c., negative ground; 9" D × 6½" W × 2½" H $149.95

HAL COMMUNICATIONS

RVD-1005 Visual Display Unit

Accepts serial Baudot (5-level) code at 45, 50, 57, or 74 baud (any baud rate to 400 baud optional); provides silent display on a video monitor or television receiver; output 1.0 V_{p-p} standard 525-line video, 2:1 interlace, crystal-controlled timing to ±0.05%, with negative sync; output impedance 75 ohms; display capacity 1000 characters; character format 5 × 7 dot matrix; page format 25 lines, 40 characters/line; 26 alphabetic, 10 numeric, 16 punctuation characters (up to 10 special European characters may be displayed by deleting some standard characters); input data signals either current or voltage sensing (bipolar voltage standard, TTL compatible optional). 17" W × 9" D × 3.5" H (table mount cabinet, 19" W × 9" D × 3.5" H (rack mount cabinet); requires 105-125 V a.c. @ 200 mA (210-250 V a.c. optional) $375.00

RVD-1005A Video Display Unit

Converts ASCII (8-level) input to standard video output (1 V_{p-p}) with 525 lines, 2:1 interlace, negative sync; selectable odd, even, or no parity; parallel data input TTL compatible; bipolar serial data input with voltage or (optional) current sensing; input data rate 110 or 300 baud standard; 1000 character display capacity; 5 × 7 dot matrix character format; page format 25 lines, 40 characters/line; serial ASCII data output. Measures 17" W × 9" D × 3.5" H (table mount), 19" W × 9" D × 3.5" H (rack mount); requires 105-125 V a.c., 25 W (210-250 V a.c. optional). Options: AKB-1005 ASCII Keyboard generates parallel ASCII for local data entry and transmission with the RVD-1005A, from which it draws operating power; current loop option $375.00
RVD-1005A. With keyboard $475.00
Current Loop option $25.00

HEATH

HW-8 "Mini-Rig" Transceiver

Three-band, low-power CW transceiver with VFO and provision for crystal transmit operation; covers 80, 40, 20 & 15 meter bands; sensitivity 0.2 μV for readable copy; has 3.5 W input power on 80 meters, 3 W on 40 meters; 3 on 20 meters; 2.5 on 15 meters; has built-in sidetone & power meter; battery operated. 4¼" × 9¼" × 8½" D. (kit) mail order $89.95
HWA-7-1. 117 V a.c. power supply (kit) $14.95

HW-101 Transceiver

Covers 80-10 meters with 180 W p.e.p. (SSB), 170 W d.c. (CW) power input; built-in VOX, 100-kHz calibrator; FET VFO; ALC; semi-break-in CW; 4-function meter monitors S units (receive) and ALC, relative r.f. output and final amplifier cathode current on transmit; receiver sensitivity 0.35 μV for 10 dB (S + N)/N; selectivity 2.1 kHz at 6 dB; less than 100 Hz drift after 45 min. warmup period. 14-9/16" W × 6-5/16" H × 13⅜" D $339.95
SBA-301-2. Crystal filter provides 400-Hz selectivity at 6 dB for CW reception $29.95
HP-13B. Mobile power supply $84.95
HP-23B. Fixed-station power supply for 120 V/240 V a.c. operation $57.95

SB-104 Solid-State Transceiver

Completely solid-state design with 100 W p.e.p. (SSB), 100 W rms (CW) output; broadbanded circuits require no receiver preselection or driver/final tuning and load adjustments on transmit for 80-10 meters; 15-MHz WWV reception; 6-digit frequency readout (both transmit and receive) to nearest 100 Hz; switchable AGC; audio and r.f. gain controls; ALC/S/relative output/d.c. input voltage meter; VOX (defeatable) with front-panel sensitivity and delay controls; headphone and PTT mike jacks; phone patch output and input; Hi/Lo (1 W) power switch; can operate mobile directly from 12-V battery; receiver sensitivity 1 V for 10 dB (S + N)/N; selectivity 2.1 kHz @ 6 dB down; 2.5 W audio output into 4 ohms; internal CW sidetone; semi break-in or manual CW operation. 14-15/32" W × 5¾" H × 13⅞" D; requires 12 V d.c. @ 20 A max. $669.95
HW-104. Same as SB-104 but without digital readout; frequency coverage to 29.0 MHz $489.95

HW-202 2-M FM Transceiver

Solid-state 10-watt transceiver with protection from infinite v.s.w.r.; push-button selection of 6 transmit/6 receive frequencies for 36-channel capability over 1-MHz segment between 143.9-148.3 MHz; includes gimbal bracket mobile mount, push-to-talk mike, and 12-volt hook-up cable. (kit) mail order $79.95
HWA-202-2. Tone Burst Encoder. Permits pushbutton selection of four tones, fully adjustable for frequency and duration. Fits behind removable front-panel bezel on transceiver. ..... (kit) $26.95 mail order
HWA-2036-3. Regulated A.C. Power Supply. Gives transceiver base-station capability. ..... (kit) $32.95 mail order
HWA-202-3. ⅝-wave mobile whip for use with transceiver. ..... $19.95 mail order.

HA-202 2-Meter Amplifier

Boosts output of mobile 2-meter FM transceiver delivering 5-15 watts to 40 watts nominal; 7 A max. drain from 12-volt d.c. system; solid-state circuitry;

internal changeover relay and sensing circuitry automatically switches for transmit-receive modes; comes with connecting cable and antenna jacks. .....(kit) $59.95 mail order

HW-2021 2-M FM Hand-Held Transceiver

Hand-held 1-watt transceiver accepts up to 5 plug-in crystals; each crystal provides both transmit and receive; covers 143.9 through 148.3 in 2-MHz segments; Simplex/Offset switch (supplied with −600 kHz crystal) provides up to 10 transmit channels; 0.5 μ V receiver sensitivity; separate mike; built-in rechargeable batteries and external charger; battery saver circuit extends standby/receive duty cycle 75%. Includes 146.94-MHz crystal, flexible antenna, external antenna/amplifier jack. Optional extra autopatch Touch-Tone encoder mounts directly on case. 2 lb. with batteries. Not for first-time kit builders. ..... $169.95 mail order kit

HWA 2012-2. Carrying case with strap for HW-2021. ..... $12.95

HW-2036 2-Meter FM Transceiver

Digitally synthesized 10-W transceiver; covers 2-M band without crystals; front-panel switches select any frequency in any 2-MHz segment of 143.5-148.5 MHz operating range; LED's indicate when synthesizer is locked on frequency and when channel is in use; built-in continuous tone encoder for repeater operation; built-in simplex, + and −600 kHz offsets, plus optional aux. offset crystal; infinite v.s.w.r. transmitter protection; receive sensitivity 0.5 μ V; Schmitt-trigger squelch; 8-pole i.f. filter; comes with built-in speaker, mobile mounting bracket; 9⅞" D × 8¼" W × 2¾" H. with standard PTT mike; mail order kit $269.95

Same but with "Micoder" combination mike/autopatch encoder; mail order kit $299.95

HWA-2036-3. A.C. power supply; mail order kit $32.95

HR-1680 SSB/CW Receiver

Covers 500-kHz segments of 80, 40, 20, 15-meter ham bands plus two 500-kHz segments for lower 1-MHz of 10 meters; double-conversion receiver with double-tuned r.f. stage; four-pole crystal filter; two-stage active audio filter; "S" meter; a.f. & r.f. gain controls; pre-selector; extra-large spinner with dial calibrated in 500-Hz increments; receiver sensitivity 0.5 μ V for 10 dB S + N/N SSB); audio output 1.2 W into 4 ohms; 120/240 V, 60/50 Hz; 12¾" W × 12" D × 6¾" H. mail order kit $199.95

HS-1661. Matching speaker. mail order kit .. $19.95

HP-13B. Mobile power supply. mail order kit $84.95

HUSTLER

4-BTV Station Antenna

Vertical design covering 10-15-20-40 meters; s.w.r. 1.6:1; solid 1" fiberglass trap for electrical and mechanical stability; heavy-duty aluminum mounting bracket; low-loss high-strength insulators; 1¼" heavy wall high-strength aluminum throughout; has ⅜"-24 stud at top to accept RM-75 or RM-75-S Hustler resonator for 75-m operation; feed with any length 50-ohm coax; ground mount with or without radials, roof mount with radials; 21 ft, 5 in $79.95

G6-144A 2-Meter Base Antenna

Colinear array for amateur repeater service or any fixed station 2-meter operation; 6 dB gain over half-wave dipole; shunt-fed with d.c. grounding; SWR at resonance 1.2:1 or better; power rating 1000 watts FM; wind survival 100 mph; installs on vertical pipe up to 1¾" o.d.; SO-239 coax connector; radiator; ⅝ wave lower section, ¼ wave phasing, ⅝ wave upper section; height 117" $52.95

CGT-144 2-Meter Mobile Antenna

Frequency coverage 143-149 MHz; 5.2 dB gain over quarter-wave mobile; s.w.r. at resonance 1.1:1; power rating 200 watts FM; 86" colinear array; no-holes installation on side or edge of trunk lip; comes with 17-ft RG-58/U and PL-259 ..... $39.95

2-Meter Mobile Antennas

Frequency coverage 143-149 MHz; ⅝ wavelength; 3.4 dB gain over quarter-wave mobile; 52" antenna mounts on any flat surface in ¾" hole; includes impact spring, 17-ft RG-58/U, and PL-259; antenna removable from mount; BBL-144 ..... $26.95

MODEL BBLT-144. Same except for no-holes trunk lip mount ..... $28.75.

SF-2 2-Meter Mobile Antenna

Two-meter, 51" antenna; 3.4 dB power gain over quarter-wave antenna; adjustable for lowest s.w.r.; ⅜"-24 base fits wide range of mounting hardware (not included) $12.75

Masts

Foldover mast for quick and easy interchange of individual amateur-band resonators (10 through 80 meters) or when entering garage; in operation, mast is held vertical in shake-proof sleeve clutch; 54" mast serves as 6-meter antenna; stainless-steel base; ⅜"-24 threads to fit mobile ball or bumper mount.

MO-1. For deck or fender mounting; fold is at roof line 15" above base $15.95

MO-2. For bumper mounting; fold is at roof line 27" above base $15.95

ICOM

IC-211 2-M All-Mode Transceiver

Fully LSI synthesized in 100 Hz or 5 kHz steps; dual tracking; optically coupled v.f.o.'s displayed by 7-segment LED readouts; frequency coverage 144-148 MHz; SSB, FM, CW modes; power output 10 W. p.e.p. (SSB), 10 W (CW, FM); selectivity −60 dB ±2.4 kHz (SSB), −60 dB ±16 kHz (FM); sensitivity 0.25 μ V at 10 dB SINAD (SSB), 0.4 μ V for 20 dB quieting; power supply 117 V a.c. or 13.8 V d.c.; 264 mm D × 241 mm W × 111 mm H. $749.00

IC-245 2-M FM Transceiver

Mobile 144-148 MHz FM transceiver; LSI synthesizer with 4-digit LED readout; 50-detent-step tuning knob; all-mode operation on 12-V d.c. (with optional adapter); in FM, synthesizer command frequency is displayed in 5-kHz steps from 146-148MHz; 100 Hz steps from 144-146 MHz (with sideband adapter); transmit & receive frequencies independently programmable on any separation; multiple-pin Molex connector for remote control; transmitter output (F3) 10 W; carrier suppression 40 dB; spurious radiation −60 dB below carrier; max. freq. deviation ±5 kHz; mike imp. 600 ohms; receiver sensitivity (F3) 0.6 μV for 20 dB quieting S + N + D/N at 1.0 μV input, 30 dB; squelch threshold (F3) −8 dB; spurious response −60 dB; 13.8-V±15% d.c.; 235 mm D × 155 mm W × 90 mm H $499.00

IC-21A 2-M FM Transceiver

Coverage 144-148 MHz in 24 channels (22 in 144 MHz band, 2 priority); ready on 94/94, 34/94, 16/76, 76/76, 22/82, 28/88, and 52/52; power output 0.1 to 10 W; dual-conversion receiver; sensitivity 0.4 μV for 20 dB quieting; audio output power 1.5 W; netting switching for calibration; discriminator meter; built-in SWR bridge; 13.5 V d.c. ±20%, 110/220 V a.c.; built-in provision for external tone and frequency generating devices and digital v.f.o. units; front-panel mike gain control and switch-selected wide or narrow deviation settings. $449.00

IC-225 2-M FM Transceiver

Updated version of 22A; covers 144-148 MHz in 23 channels (synthesized; no crystals required); mobile r.f. power output 10 W (hi), 1 W (lo); dual-conversion superhet; sensitivity 0.4 μ V for 20 dB quieting; audio output power 1 W; 4" speaker; input signal strength/r.f. output meter. $289.00

DV-21 Digital VFO

Synthesized VFO with direct LED readout covers 146-148 MHz in 10-kHz steps; 0-5 kHz offset (variable) control for exact frequency generation; separate selection and display at T/R frequencies; can also scan received frequencies; built-in memories for Simplex 1, Simplex 2, and Duplex operation; includes 117-V a.c. supply, but can be run directly from d.c. source. $389.00

IC-3PA. Power Supply/Speaker converts 117 V a.c. to 13.8 V (regulated) for use with all ICOM transceivers. $89.95

KENWOOD

TS-820 Transceiver

Full 160- through 10-m coverage in CW, SSB, and FSK modes; hybrid design with tube driver and finals; has noise blanker, r.f. speech processor, ±5-kHz RIT, r.f. monitor, 5-function meter, 25-kHz calibrator, VOX, semi-break-in CW with sidetone, passband tuning, phase-locked loop frequency derivation, r.f. attenuator, two-speed tuning mechanism; features internal speaker, 8-pole crystal filter, 15-MHz WWV reception, built-in p.a. cooling fan; rated input power is 200 W p.e.p. (SSB), 160 W d.c. (CW), 100 W d.c. (FSK); requires 110 V/220 V a.c., 50/60 Hz, 280 W max (26 W receive); 13⅛" W × 13-3/16" D × 6" H $830.00

DG-1. Digital Frequency Readout $170.00

VFO-820. Remote VFO $139.00

DS-1A. DC/DC converter $59.00

CW-820. 500-Hz CW filter $45.00

MC-50. Desk microphone $39.50

HS-4. 8-ohm headphones $16.00

TS-520 Transceiver

Five-band HF transceiver for SSB or CW; built-in 110V/220V a.c. and 12-volt d.c. power supplies; VOX with adjustable gain, delay, and anti-VOX; 1-kHz dial readout; built-in noise blanker and receive offset circuit; 8-pole crystal filter; 25-kHz crystal oscillator; semi-break-in CW with sidetone; solid-state except for driver and final; built-in fixed channel operation (4 channels); internal speaker; selectable SSB; push-button WWV (15-MHz) reception $629.00

VFO-520. External VFO $115.00

CW-520. CW filter $45.00

SP-520. Matching speaker $22.95

T-599D Transmitter

Hybrid design; built-in 110V/220V power supply; full metering; AM, SSB, CW operation; 1-kHz frequency readout; VOX with delay, sensitivity, and anti-VOX adjustments; built-in semi-automatic CW with sidetone; built-in "spotting" function when used with companion R-599D receiver; full 10-80 meter coverage; low-pass TVI filter, 200 watts p.e.p. nominal SSB input, 200 W d.c. CW (80-15m), 160 W (10m); 10 W-power "tune" position; built-in cooling fan; selectable low or hi mike impedance; 10.5" W × 5.5" H × 12.2" D $479.00

R-599D Receiver

Companion receiver to T-599D transmitter; solid-state; full 10-160 meter coverage; AM, SSB, CW, FM reception; selectable a.g.c.; built-in 25-kHz calibrator; squelch circuit; 1-kHz frequency readout; split-channel operation with T-599D; automatic or manual selectivity selection; built-in SSB/8-pole, CW/8-pole, and AM filters; five built-in fixed-frequency channel positions; built-in power supply for 115/230-V a.c. or 12-V d.c. operation; built-in 10-MHz WWV reception; S meter; 10.125" W × 5.50" H × 12.25" D $459.00

FM-599A. FM filter $45.00

CC-69A. 6-Meter converter $31.00

CC-29A. 2-Meter converter $31.00

S-599D. Matching speaker $19.00

TR-7400A 2-Meter Transceiver

Solid-state mobile FM transceiver; full band (144-148 MHz) coverage in 5-kHz increments with phase-locked loop synthesizer; power output 25 W or 10 W (selectable); 6-digit, seven-segment LED frequency readout; selectable transmit frequency offset (−600 kHz, 0, +600 kHz); continuous tone-coded squelch for transceive or transmit only with optional tone elements; tone burst circuitry (tone elements optional); receive sensitivity 0.4 μV at 20 dB quieting; selectivity −6 dB at 12 kHz; spurious radiation −60 dB; squelch sensitivity 0.25 μV $399.00

TR-7200A 2-Meter Transceiver

Solid-state mobile FM transceiver; 22-channel ca-

pacity (crystals for 6 channels supplied); power output 10 W or 1 W (selectable); v.s.w.r.-protected final; reverse polarity power protection; priority channel switch; r.f. monitor circuit; diode antenna switching; receive sensitivity 1 μV for 30 dB S/N; squelch sensitivity 0.25 μV; selectivity −6 dB at 12 kHz, −70 dB at 24 kHz; features multi-angle, quick-release mounting bracket, stand-off leg; requires 11.5 to 16 V d.c., negative ground, at 3 A. maximum; 9-7/16" D × 7-1/16" W × 2⅜" H $249.00

PS-5. Power supply with 24-hour clock/timer for a.c. operation $79.00

TV-502 2-Meter Transverter

Adapts low-band Kenwood equipment for 2-meter coverage; frequency range 144-145.7 MHz (144-146 MHz optional); input/output i.f. 28.0-29.7 MHz; CW and SSB modes; rated output 8 W; receive sensitivity 1 μV at 10 dB S/N; i.f. and image response −60 dB; frequency stability ±2.5 kHz from 1 to 60 min. after power-up, within 150 Hz per 30 min. thereafter; solid-state circuitry; requires 50 W max. at 110 or 220 V a.c., or 2 A. max. at 13. V d.c.; 13¼" D × 6⅜" W × 6" H $249.00

TR-2200A Portable 2-M Transceiver

Solid-state portable 2-m transceiver; 12-channel capacity (crystals for 6 channels supplied); power output 2 W or 0.4 W (selectable); uses rechargeable NiCad power source (charger and batteries included); detachable quarter-wavelength whip antenna; receive sensitivity 0.4 μV at 10 dB (S + N)/N; selectivity −6 dB at 16 kHz, −60 dB at 32 kHz; audio output 0.7 W into 8 ohms at 10% distortion; maximum frequency deviation ±5 kHz; comes with carrying case and strap, external speaker provisions, external power source (13.8 V d.c.) cable and plug; draws 700 mA max.; 7-33/64" D × 5-5/16" W × 2-9/32" H $229.00

MB-1A. Mounting bracket $13.00

KLM

Multi 2700 2-Meter Transceiver

All mode 2-meter transceiver with PLL synthesizer; covers 143-149 MHz continuously in 10-kHz steps; ±5 kHz RIT; VFO covers 144-148 MHz continuously with 1-kHz dial calibration increments; VOX ±7 kHz; seven-segment LED frequency readout; OSCAR 10-meter receiver built-in synchronized with 2-meter transmissions; operates in WBFM, NBFM, AM, USB, LSB, and CW modes; 8-pole SSB filter and two FM filters; power output selectable (10 W or 1 W, 10 W p.e.p. SSB); carrier suppression and image rejection −50 dB; image response and spurious radiation −60 dB; sensitivity 1 μV for 30 dB S/N (FM), 0.5 μV for 10 dB S/N (CW and SSB), 2 μV for 10 dB S/N (AM); selectivity −6 dB at 12 kHz, −60 dB at 24 kHz (NBFM), −6 dB at 20 kHz, −60 dB at 40 kHz (WBFM), −6 dB at 2.4 kHz, −60 dB at 4.8 kHz (SSB, CW, AM); ±600 kHz offsets; 100-kHz crystal calibrator; VOX; speech compression; noise blanker; S/RF output meter; FM center/deviation meter; simplex and duplex operation; OSCAR switchover; audio output 2 W at 10% distortion; dual conversion receiver; requires 4 A. at 12.3 V d.c. or 50 W at 115/220 V a.c.; 14.88" W × 12" D × 5" H $795.95

Echo 70 432-MHz Transceiver

SSB u.h.f. transceiver covers 432-432.46 and 435-435.46 MHz in 20-kHz steps; PLL synthesizer; VXO with ±12-kHz range; "auto watcher" circuit scans 20-kHz segment on receive; dual-conversion receiver; RIT; noise blanker; squelch; S/power output meter; operates in CW, LSB, and USB modes; r.f. power output 10 W; carrier suppression −45 dB; spurious output −60 dB; unwanted sideband suppression −50 dB; selectivity −6 dB at 2.2 kHz, −60 dB at 4.4 kHz; sensitivity 0.5 μV for 10 dB S/N; audio output 1 W; requires 4.5 A at 13.8 V d.c. negative ground; supplied with two power cables, PTT microphone, and mounting bracket; 9⅝" D × 8½" W × 2⅝" H $495.95

Multi 11 VHF FM Transceiver

2-meter FM transceiver with 23-channel capacity; provision for external VFO; RIT ±5 kHz; operates in WBFM (±15 kHz deviation) and NBFM (±5 kHz) modes; continuous scanning of any four channels; also has manual scan; selectable power output (10 W or 1 W); two r.f. stages with dual-gate MOSFET's; dual-conversion receiver; output stage v.s.w.r. protected; sensitivity 0.5 μV at 20 dB quieting; selectable selectivity −6 dB at 14 kHz, −60 dB at 20 kHz (wide), −6 dB at 7 kHz, −60 dB at 12 kHz (narrow); image response and spurious radiation −60 dB; switchable tone oscillator; multi-function meter power out/S, switchable to FM centering; requires 2.5 A max. at 13.5 V d.c., negative ground; 8.66" D × 6.41" W × 2.2" H $325.95

KLM-144-150-16C 2-Meter Beam Antenna

Circularly polarized, 16-element beam covering 144-150 MHz; v.s.w.r. less than 1.2:1 across the band; gain 11 dB over half-wave dipole; half-power beamwidth 24 degrees; feed impedance 50 ohms unbalanced using supplied harness/balun; boom length/diameter 12.7 ft/1.5 in; max. mast size 1.5 in; weight 10 lbs $67.95

KLM-144-148-11 2-Meter Beam Antenna

11-element, 2-meter beam covering 144-148 MHz; gain 14.5 dB over isotropic; v.s.w.r. 1.2:1 across the band; feedpoint impedance 50 ohms balanced (balun optional); boom length/diameter 12.5 ft/1.5 in; max. mast size 1.5 in; weight 6 lbs; center mounting $39.95

MFJ

MFJ-40T QRP Transmitter

40-meter CW transmitter; solid-state circuitry; d.c. power input to final amplifier 5 W; fixed pi-network matching section for 50-ohm loads; power transistor is v.s.w.r. protected against short and open circuit loads; frequency control switch selects one of three crystals or external VFO; requires 12 V d.c.; 4" × 3¼" × 2-3/16" $27.95

MIDLAND

13-505 2-M FM Transceiver

Twelve channel; 30W/5W/5W r.f. output; 144-148 MHz coverage; 13.8 V d.c. negative ground operation; transmit crystals included for 144.16, 146.34, 146.94; receive crystals included for 146.76, 146.94; receiver sensitivity 0.5 μV for 20 dB quieting; selectivity 60 dB ±25 kHz (EIA SINAD); audio output 4 W into 4 ohm load at 10% dist.; audio response 300-3000 Hz; discriminator meter; S/RF/SWR meter; comes with metal cabinet, push-to-talk mike, mobile mounting bracket, and hardware. $309.95

13-509 220-MHz Mobile

Twelve-channel capability in 220-225 MHz band; 10 W/1 W r.f. output; dual-conversion superhet receiver; 13.8 V d.c. negative ground; crystals for 223.5 MHz supplied; comes with mounting bracket and hardware, dynamic mike, and accessory connector for attaching tone burst and discriminator meter; 2¼" H × 6⅜" W × 8⅞" D $179.95

13-500 2-M FM Transceiver

12 channel capability; 15 W/1 W r.f. output; covers 144-148 MHz; squelch; crystals included for 146.13, 146.34, 146.94 MHz (transmit), 146.76, 146.94 MHz (receive); S/RF meter; receiver sensitivity 0.3 μV for 20 dB quieting; audio output 2.1 W into 4 ohms @ 10% distortion; tone burst/discriminator meter jack; 13.8 V d.c. negative-ground supply required; includes PTT mike and mobile mounting bracket $185.95

NATIONAL

NCX-1000 Transceiver

Five-band (80 through 10), hybrid transceiver; power input 1000 W p.e.p. on SSB, 1000 W CW; 500 W AM or FSK; grid-block keying on CW; output impedance 25-100 ohms; carrier and opposite SB suppression 40 dB; IM dist. 25 dB down (two-tone test); features r.f. speech processor; forced air cooled 8122 ceramic tetrode final; crystal or dynamic audio output; receiver sensitivity 0.5 μV for 10 dB (S + N)/N; 2.7 kHz selectivity (crystal lattice filter); 105 dB dynamic range; image & i.f. rejection 60 dB; audio output 2 W min. into 3.2 ohms; built-in monitor speaker; built-in 117/234 V a.c. power supply; 16⅛" W × 7¾" H × 13¼" D. $1600.00

REGENCY

HR-440 440-MHz Transceiver

Operates in the NBFM mode from 420 to 450 MHz, factory tuned to 442.448 MHz segment; 10 W power output; sensitivity 0.5 μV for 20 dB quieting; selectivity 6 dB at 7 kHz, 50 dB at 20 kHz; a.f.c. with ±6-kHz range; squelch, v.s.w.r. protection for final amplifier; 12 channels; deviation adjustable 0-10 kHz (factory set to ±5 kHz); crystal multiplication 36; comes with transmit and receive crystals for 446.00 MHz, PTT ceramic mike, and mounting bracket; requires 11.5-14.5 V d.c. at 4.0 A max. $349.00

P-109. Base power supply operates from 120-V a.c. line, provides 13.8-V d.c. (regulated) at 4 A max., for base station use of Regency amateur transceivers $44.95

P-110. Same as above, but 5 A max. output $49.95

HR-312 2-Meter FM Transceiver

Crystal-controlled FM transceiver; frequency range 144-148 MHz; r.f. output power 35 W max. into 50 ohms; harmonic and spurious emissions −58 dB; phase modulation; deviation adjustable from 0 to 15 kHz (factory set at ±5 kHz); has 12 transmit and receive crystal capacity for 144 combinations; crystal multiplication 18; sensitivity 0.15 μV for 12 dB SINAD, 0.25 μV for 20 dB quieting; selectivity −6 dB at ±9 kHz; adjacent channel rejection 75 dB at ±30 kHz; intermodulation −65 dB; image response −70 dB; spurious response −60 dB; squelch threshold 0.1 μV; audio output 3.2 W at 2% distortion into internal 3.2-ohm speaker; requires 7 A max. at 13.8 V d.c., negative ground; comes with ceramic microphone, crystals for 146.94 simplex operation; 9½" × 6½" × 2⅝" $269.00

HR-220 220-MHz Transceiver

Operates in the NBFM mode on the 220-225 MHz band with 10W/1 W (selectable) power output; 12 transmit and receive channels; squelch; rated sensitivity 0.4 μV for 20 dB quieting; selectivity 6 dB at 7 kHz, 55 dB at 20 kHz; deviation 0-10 kHz (factory set to ±5 kHz); v.s.w.r. protection for final amplifier; comes with transmit and receive crystals for 223.50 MHz, plug-in PTT ceramic mike, and mounting bracket; requires 13.8 V d.c. at 2.5 A max. . $239.00

HRT-2 2-M Handheld Transceiver

Portable FM transceiver covers 144-148 MHz with 2 W/1 W (selectable) power output; receive sensitivity 0.7 μV for 20 dB quieting; selectivity 6 dB at 7 kHz, 50 dB at 20 kHz; 0.5 W audio output; 5 channel capability; squelch; telescoping whip antenna. 9¾" × 3 5/16" × 1 15/16"; comes with transmit and receive crystals for 146.94 MHz; requires 11-16 V d.c. at 600 mA max. $179.00

With MA-50 NiCad battery $229.00

HR-2B 2-M Transceiver

Covers 144-148 MHz with 15 W output power; rated sensitivity 0.35 μV for 20 dB quieting; selectivity 6 dB at 7 kHz, 50 dB at 20 kHz; narrow band FM with 0-10 kHz deviation (factory set at ±5 kHz); 12 channel capacity; squelch v.s.w.r. protection for final amplifier; requires 8.0- to 8.22-MHz crystals. 7½" × 5½" × 2¼"; comes with crystals for transmit and receive for 146.94 MHz, plug-in ceramic mike, and mounting bracket; requires 13.8 V d.c. at 3.0 A max. $229.00

ROBOT

Model 400 TV Scan Converter

Solid-state scan converter using 16 4096-bit Ran-

dom Access Memory (RAM) IC's; slow-to-fast and fast-to-slow scan conversion permits use of standard TV receiver and fast-scan camera in slow scan communications; converts video frame into a 128 × 128 array of picture elements, each coded to one of 16 gray shades; input standard 525-line TV video signal, 1-V p-p white positive, into 1000 ohms; BNC input jack; positive or random interlace; slow-scan input from 20 mV to 1 V; 10,000-ohm input impedance; minimum S/N ratio for clear pictures 6 dB; modulation standards are 2300 Hz white, 1500 Hz black, 1200 Hz sync (6 ms horizontal, 66 ms vertical); video output standard video at 1.4 V p-p white positive into 75 ohms; BNC video output jack; scan compatible with standard 525-line TV receivers; slow-scan output 1200-2300 Hz audio FM, 2 V p-p max. into 1000 ohms; horizontal sync 6 ms; vertical retrace 66 ms; line rate 15 Hz. $695.00

VENUS

C-1 Slow-Scan/Fast-Scan TV Camera

Dual-mode TV camera; 128 lines slow scan, 525 lines fast scan; line rate 15 Hz slow scan, 15.75 kHz fast scan; frame rate 8.5 sec. slow scan, 30 Hz fast scan; aspect ratio 1:1 slow scan, 4:3 fast scan; modulation FM (1200-2300 Hz) slow scan, AM fast scan; sync 1200 Hz tone slow scan, compatible with EIAJ fast scan; output 1 V p-p with 1000-ohm source impedance slow scan, 1 V p-p with 90-ohm source impedance fast scan video, and 100 mV with 90-ohm source impedance modulated r.f.; real time focusing and framing in fast scan mode; 25-mm f1.8 lens allows close-ups; r.f. modulated output for direct connection to standard TV receivers $385.00

SS2 Slow-Scan TV Monitor

Converts audio tones into a picture with full gray shade complement; input signals FM, 1200 Hz to 2300 Hz; sync 1200 Hz tone, black 1500 Hz, white 2300 Hz; input amplitude 40 mV to 10 V; input impedance 1000 ohms; horizontal sync 5 ms; vertical sync 30 ms; line rate 15 Hz; frame rate 8.5 sec; cathode-ray tube uses P-7 high-persistence phosphor; picture size 3¼" × 3⅛"; inputs provided for slow-scan camera, microphone (voice input), communications receiver, tape recorder and telephone line (transformer isolated); outputs provided for transmitter microphone preamp, tape recorder, and telephone line (transformer isolated)..... $285.00

VHF ENGINEERING

RPT 144B 2-Meter Repeater Kit

Complete repeater system consisting of receiver, transmitter, control circuitry, CW identifier, and 115/230 V a.c. power supply standard relay-rack panel and chassis unit; solid-state circuitry, frequency coverage 140-170 MHz; r.f. power output 15 W into 50 ohms; harmonic radiation −40 dB; spurious radiation −50 dB; audio processing with pre-clipping pre-emphasis (clipping 6-dB roll-off above 3000 Hz); deviation adjustable up to ±7 kHz (factory pre-set to ±5 kHz); true FM; sensitivity 0.3 μV for 20 dB quieting; squelch sensitivity 0.25 μV; modulation acceptance bandwidth ±7.5 kHz; selectivity −70 dB at 30 kHz; audio output 2 W into panel speaker; frequency stability 0.0005% with commercial spec. crystals (not supplied with kit); requires 115/230 V a.c. or 12-14 V d.c.; 19" W × 11¾" D × 7" H $465.95

RPT 144B W/T. Same as above but wired, tested, supplied with commercial spec. crystals $695.95

Synthesizer II 2-M Frequency Synthesizer Kit

Uses TTL logic; covers 140.000 through 149.995 MHz in 5-kHz steps; transmit offsets −600 kHz, 0 kHz, and +600 kHz, plus three additional field programmable offsets; r.f. output 3 V into 50 ohms; lockup time 150 ms typical; 2-pole output filter on receive line; can be programmed to any i.f. and offset between 100 kHz and 30 MHz; all frequencies locked to one master crystal oscillator; single jumper wire change enables use with 6-8 or 12 MHz transmit crystal rigs; low spurious output direct readout thumbwheel switching; requires 0.9 A at 11-18 V d.c.; complete kit includes all electronics, crystal, thumbwheel switches, cabinet, etc.; 8" D × 5½" W × 2¼" H $169.95

Synthesizer II. Same as above but wired and tested $239.95

YAESU

FT-301D Solid-State Transceiver

Covers 160 through 10 meters with 15-MHz WWV reception; solid-state circuitry; six-digit, seven-segment frequency readout; LSB, USB, CW, AM and FSK modes; power input 200 W p.e.p. (SSB), 200 W (CW), 50 W (AM and FSK); carrier suppression −40 dB; unwanted sideband suppression −50 dB; spurious radiation −40 dB; distortion products −31 dB; frequency stability 100 Hz in any 30 min. period; sensitivity 0.25 μV at 10 dB S/N; selectivity −6 dB at 2.4 kHz, −60 dB at 4 kHz (SSB), −6 dB at 0.6 kHz, −60 dB at 1.2 kHz (CW, FSK), −6 dB at 6 kHz, −60 dB at 12 kHz (AM); image response −60 dB from 1.9 through 21 MHz, −50 dB at 28 MHz; i.f. rejection −70 dB; audio output 3 W at 10% THD; output impedance 4 ohms; requires 21 A max. at 13.5 V d.c., negative ground; 11.6" D × 11" W × 4.9" H $935.00

FP-301. A.c. power supply with clock and CW ID $199.00

FV-301. External VFO $109.00

FT-101E Transceiver

Covers 160 through 10 meters with 10-MHz WWV reception; hybrid circuitry with tube driver and finals; LSB, USB, CW and AM modes; power input 260 W p.e.p. (SSB), 180 W (CW), 80 W (AM); carrier and unwanted sideband suppression −50 dB; spurious radiation −40 dB; distortion products −30 dB; frequency stability 100 Hz during any 30-min. period after warm-up; calibration accuracy 2 kHz max. after 100-kHz calibration; sensitivity 0.3 μV for 10 dB (S + N)/N at 14 MHz; selectivity −6 dB at 2.4 kHz, −60 dB at 4 kHz (SSB, AM, CW), −6 dB at 600 Hz, −60 dB at 1.2 kHz with optional CW filter; image response −50 dB; internal spurious signals below 1 μV equivalent to antenna input; AGC threshold 3 μV nominal, attack time 8 ms, release time 1800 ms; audio output 3 W to internal or external 4-ohm speaker at 10% distortion; built-in r.f. speech processor; 1-kHz readout; noise blanker; VOX; break-in CW with sidetone; selectable 25-kHz and 100-kHz calibrator; ±5-kHz RIT with on/off switch; adjustable carrier level for tune-up and QRP; internal crystal control provision and dual VFO adapter; requires 350 W max. at 110/220 V a.c. or 20 A. max. at 13.5 V d.c.; 11.2" D × 13.4" W × 6" H $749.00

FT-101EE. Same as above but without r.f. speech processor $659.00

FL-2100B. 80-10 meter, 1200-W linear amplifier $399.00

FTV-250. 2-meter transverter with 10 W output (CW), 12 W p.e.p. (SSB), 4 W (AM and FM), 0.5 μV for 20 dB (S + N)/N sensitivity $219.00

FR-101 Digital Communications Receiver

160 through 10 meter coverage (29.0-29.9 MHz optional); solid-state circuitry, LED frequency readout to nearest 100 Hz; sensitivity 0.3 μV for 10 dB S/N at 14 MHz (SSB, CW), 1 μV for 10 dB S/N at 14 MHz (AM), 1 μV at 12 dB SINAD (FM); selectivity −6 dB at 2.4 kHz, −60 dB at 4 kHz (SSB, CW, RTTY), −6 dB at 600 Hz, −60 dB at 1.5 kHz with optional CW filter, −6 dB at 6 kHz, −60 dB at 12 kHz with optional AM filter, −6 dB at 20 kHz, −60 dB at 45 kHz with optional FM filter; image response −60 dB; internal spurious signals below 1 μV equivalent to antenna input; selectable a.g.c. (off, fast, slow); audio output 2 W into 4 ohms at 10% distortion; dual-conversion; noise blanker; squelch; r.f. attenuator; r.f. gain control; 25- and 100-kHz calibrator; ±5-kHz fine tuning; provisions for v.h.f. converters and auxiliary crystals for shortwave and WWV reception; requires 110/220 V a.c. or 13.5 V d.c.; 11.2" D × 13.4" W × 6" H $629.00

FR-101S. Same as above, but without digital frequency readout $489.00

XF-30D. FM filter $49.00

XF-30B. AM filter $45.00

FC-2. 2-meter converter $40.00

FC-6. 6-meter converter $30.00

Auxiliary crystal $5.00

FT-221 2-Meter Transceiver

Solid-state, all mode synthesized 2-meter transceiver; 144-148 MHz coverage in 8 bands; r.f. power output 14 W (FM and CW), 12 W p.e.p. (SSB), 2.5 W (AM); spurious radiation −60 dB; carrier and unwanted sideband suppression −50 dB; sensitivity 0.5 μV for 10 dB (S + N)/N on SSB and CW, 1.0 μV for 10 dB (S + N)/N on AM, 0.75 μV for 20-dB quieting on FM; selectivity −6 dB at 2.4 kHz, −60 dB at 4.1 kHz (SSB, CW, AM), −6 dB at ±6 kHz, −60 dB at ±12 kHz (FM); image response −60 dB; audio output 2 W to internal or external 4-ohm speaker; squelch threshold 0.3 μV; single conversion (10.7-MHz i.f.) on SSB, AM, and CW; dual conversion on FM (10.7 MHz and 455 kHz i.f.'s); dual rate, concentric VFO dial drive with 1-kHz calibration; selectable ±600-kHz offset; built-in VOX and break-in CW; 100-kHz calibrator; noise blanker; S/power output/FM discriminator meter; 11 crystal-controlled channels per band (88 total); clarifier control; squelch; r.f. gain control; built-in speaker; requires 100 W max. at 110/220 V a.c. or 3 A max. at 13.5 V d.c.; 11.6" D × 11" W × 4.9" H $629.00

Mobile mounting bracket $19.00

FT-224 2-Meter FM Transceiver

Solid-state mobile transceiver; frequency range 144-146 or 146-148 MHz; channel capacity 23 plus one priority channel; crystal control; simplex and ±600-kHz transmit offset; r.f. power output 1 or 10 W (selectable); deviation ±5 kHz; spurious radiation −60 dB; sensitivity 0.3 μV for 20 dB quieting; selectivity −6 dB at 15 kHz, −60 dB at 25 kHz; frequency stability ±0.001%; audio output 2.5 W into 4 ohms; final amplifier v.s.w.r. protected; reverse polarity power protection; built-in speaker; comes with crystals for three channels, mounting bracket, and dynamic microphone; requires 2.2 A max. at 13.5 V d.c.; 8.7" D × 7" W × 2.76" H $249.00

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inside front cover - CB indoor antenna
28 - synthesizer basics

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